SHOP MANUAL

HONDA ACCORD

MAINTENANCE AND REPAIR **86-89**

INTRODUCTION

How to Use This Manual

This manual is divided into 14 sections. The first page of each section is marked with a black tab that lines up with one of the thumb index tabs on the front and back covers. You can quickly find the first page of each section without looking through a full table of contents. The symbols printed at the top corner of each page can also be used as a quick reference system.

Each setion includes:

1. A *table of contents, or an exploded view index showing:*
   - Parts disassembly sequence.
   - Bolt torques and thread sizes:
   - Page references to descriptions in text.
2. Disassembly/assembly procedures and tools.
3. Inspection.
4. Testing/troubleshooting.
5. Repair.
6. Adjustments.

Special Information

WARNING Indicates a strong possibility of severe personal injury or loss of life if instructions are not followed.

CAUTION: Indicates a possibility of personal injury or equipment *damage if instructions are not followed.*

NOTE: Gives helpful information.

CAUTION: Detailed descriptions of *standard* workshop procedures, safety principles and service operations are not included. Please note that this manual does contain warnings and cautions *against some specific service methods which could cause* PERSONAL INJURY, or could damage a vehicle or make it unsafe. Please understand that these warnings cannot cover all conceivable ways in which service, whether or not recommended by Honda motor, might be done, or of the possible hazardous consequences of each conceivable way, nor could Honda motor investigate all such ways. Anyone using service procedures or tools, whether or not recommended by Honda motor, *must satisfy himself thoroughly* that neither personal safety nor vehicle safety will be jeopardized.

First Edition 10/85
Third Print 11/89 896 pages

HONDA MOTOR CO., LTD.
Service Publication Office

General Information

Chassis and Engine Codes

Vehicle Identification Number

JHMCA53400C000001

Model Name
- CA4: Acoord 1600
- CA5: Accord 2000

Transmission Group
- 3: 5-speed (3D)
- 4: Automatic (3D)
- 5: 5-speed (4D)
- 6: Automatic (4D)

Vehicle Version
- 2: STD, LX, GL
- 3: EX
- 4: EX 2.0i
- 5: EXR
- 6: EXC

Model Year
- 0: 1986

Plant
- C: Sayama Plant

Serial Number

Engine Serial Number

A20A4 – 1000001

Engine Type
- A20A1: 2000 with Carburetor (KG only)
- A20A2: 2000 with Carburetor
- A20A4: 2000 with Fuel-Injection
- A16A1: 1600 with Carburetor

Model Year
- 1: 1986

Transmission Group
- 0: 5-speed
- 3: 5-speed (KX, KQ)
- 5: Automatic Transmission
- 7: 5-speed (KG)
- 8: Automatic (KX, KQ, KG)

Serial Number

Transmission Number

(Manual Transmission)

A2K5 – 1000001

Transmission Type
- A2K5: with 2000 Engine
- A1M5: with 1600 Engine

Serial Number

Transmission Number

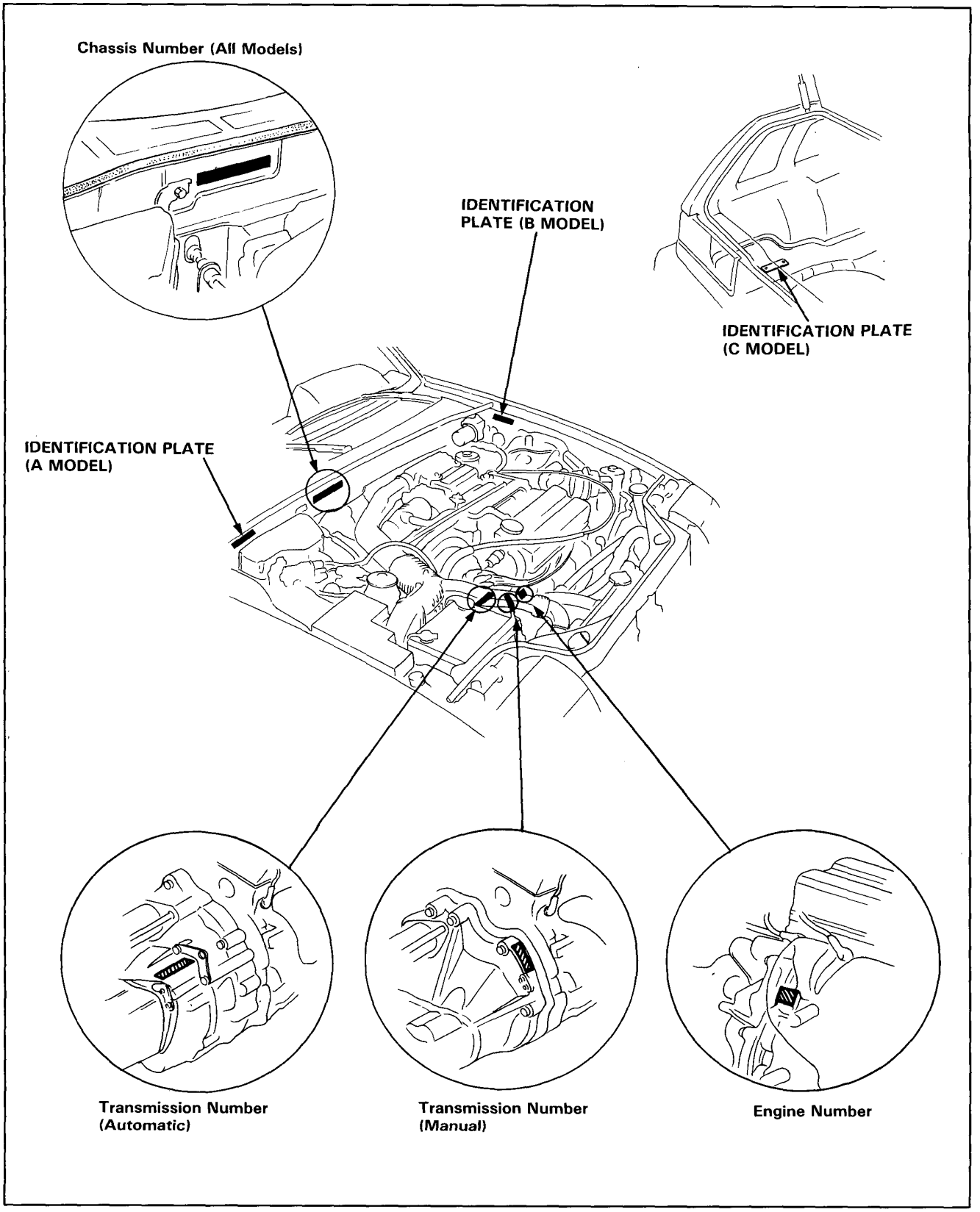
(Automatic Transmission)

F4 – 6000001

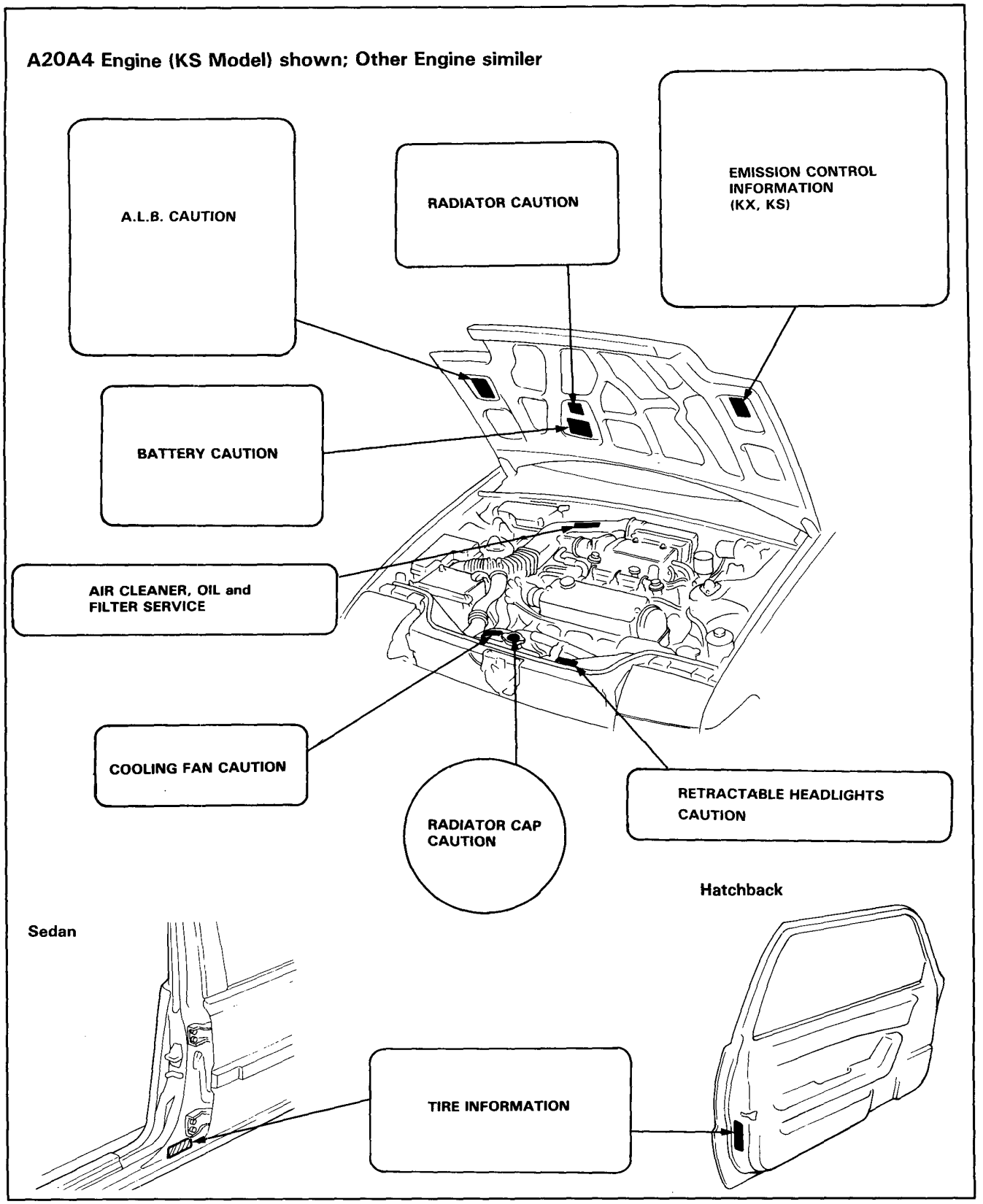
Transmission Type
- F4: with 2000 Engine
- C9: with 1600 Engine

Serial Number

Identification Number Locations



Label Locations



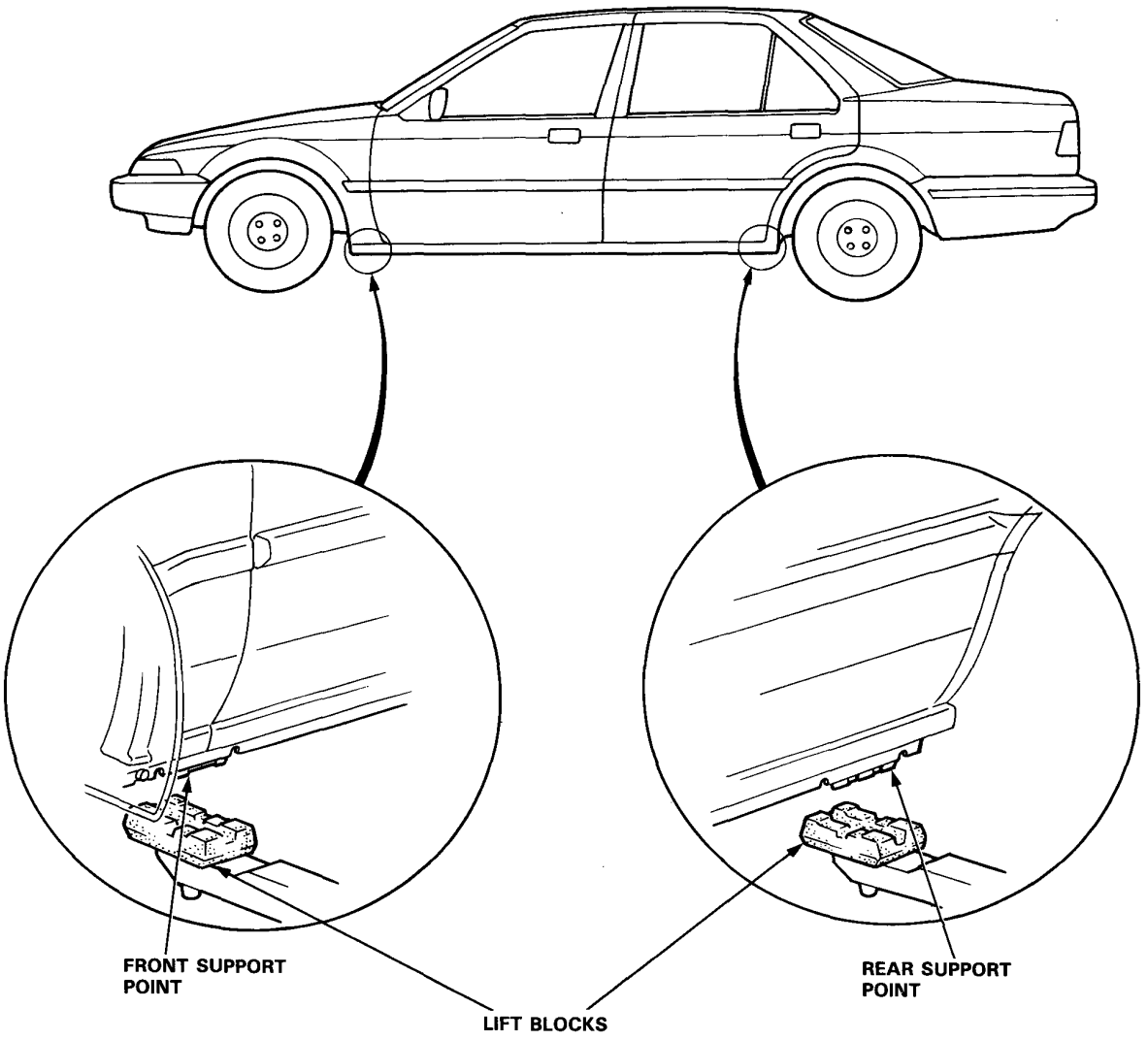
Lift and Support Points

Hoist

1. Place the lift blocks as shown.
2. Raise the hoist a few inches and rock the car to be sure it is firmly supported.
3. Raise the hoist to full height and inspect lift points for solid support.

WARNING When heavy rear components such as suspension, fuel tank, spare tire and trunk lid/hatch are to be removed, place additional weight in the trunk before hoisting. When substantial weight is removed from the rear of the car, the center of gravity may change and can cause the car to tip forward on the hoist.

NOTE: Since each tire/wheel assembly weights approximately 14 kg (30 lbs), placing the front wheels in the truck can assist with the weight transfer.



(cont'd)

Lift and Support Points (cont'd)

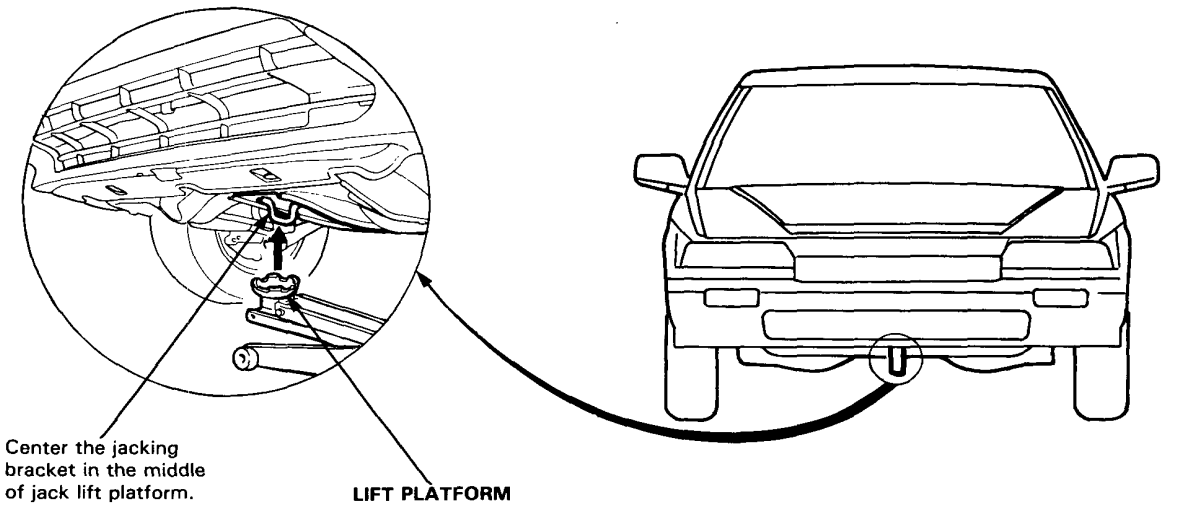
Floor Jack

1. Set the parking brake and block the wheels that are not being lifted.
2. When lifting the rear of car, put the gear shift lever in reverse (Automatic in PARK).
3. Raise the car high enough to insert the safety stands.
4. Adjust and place the safety stands as shown on page 1-8 so the car will be approximately level, then lower car onto them.

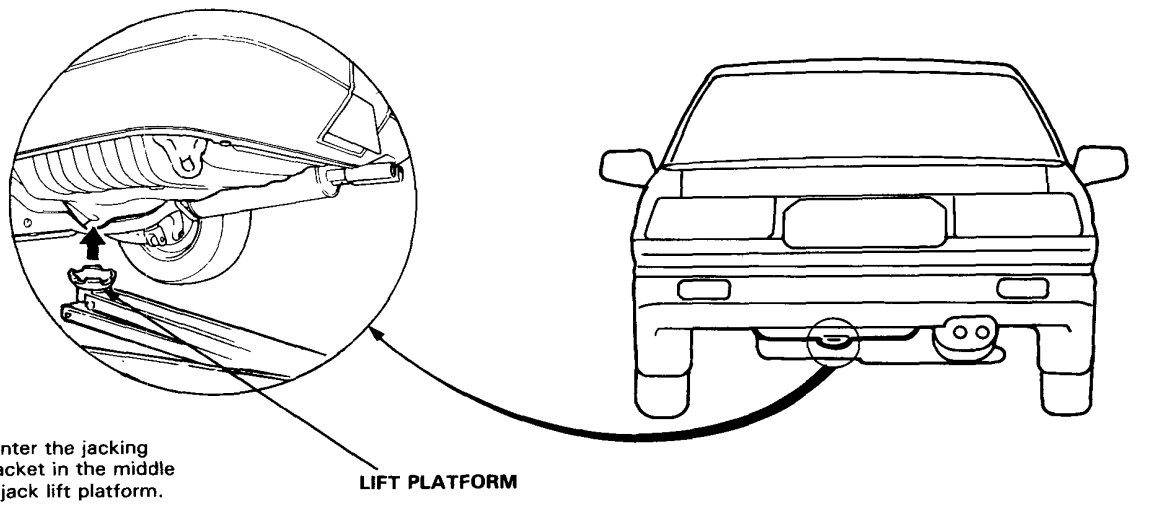
WARNING

- **Always use safety stands when working on or under any vehicle that is supported by only a jack.**
- **Never attempt to use a bumper jack for lifting or supporting the car.**

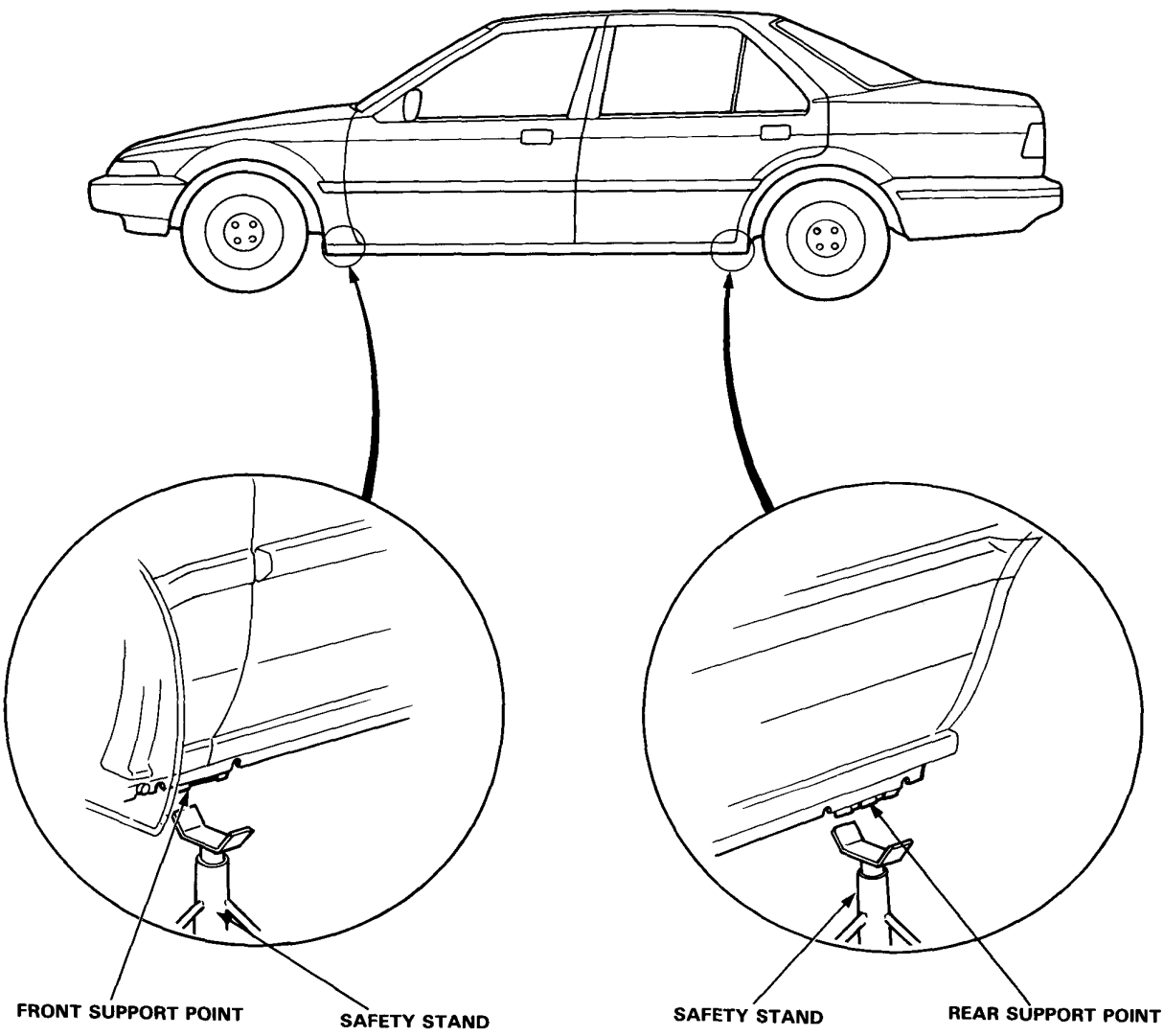
Front



Rear



Safety Stands



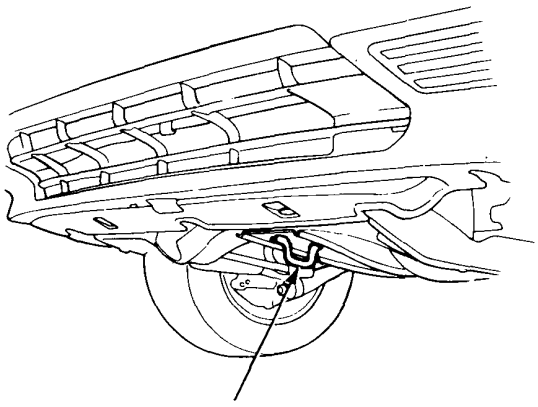
Towing

Towing

If possible, always tow the car with the front wheels off the ground. Do not use the bumpers to lift the car or to support the car's weight while towing. Check local regulations for towing with a chain or frame-mounted tow bar. A chain may be attached to the hook shown in the illustration. Do to attach a tow bar to either bumper.

If the car is to be towed with four wheels on the ground, observe the following precautions:

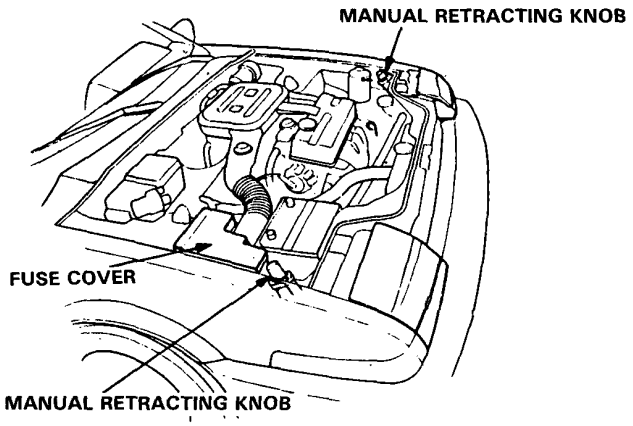
1. Wheels and axle must not be touching body or frame.
2. Turn the ignition key to the "I" position and make sure the steering wheel turns freely.
3. Place the transmission in NEUTRAL.
4. Release the parking brake.
5. DO NOT exceed 55KPH (35 MPH) for distances of more than 80 km (50 miles).



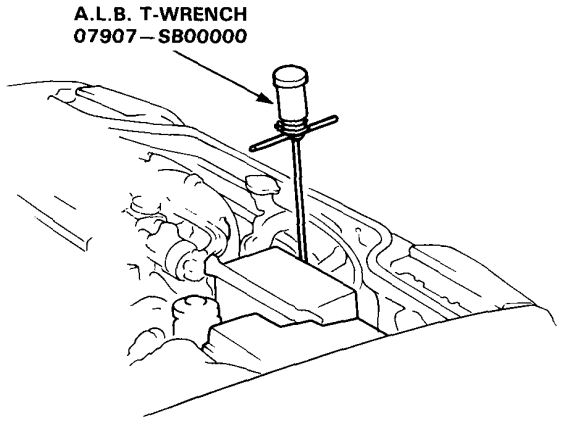
TOWING POINT

Special Caution Items For This Car

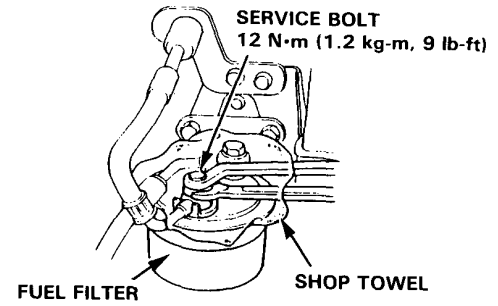
1. Retractable headlights are installed. For manual raising and lowering, the fuse must be pulled. When raising and lowering is executed without pulling the fuse, danger may be caused by rapid turning of the manual retracting knob.



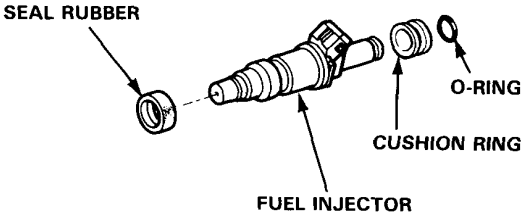
2. For cars equipped with A.L.B., the high-pressure brake fluid must be drained before disassembly of the A.L.B. piping system. When this is not done, danger may be caused by brake fluid squirting out under high pressure. For draining of the high-pressure brake fluid, refer to Section 20.



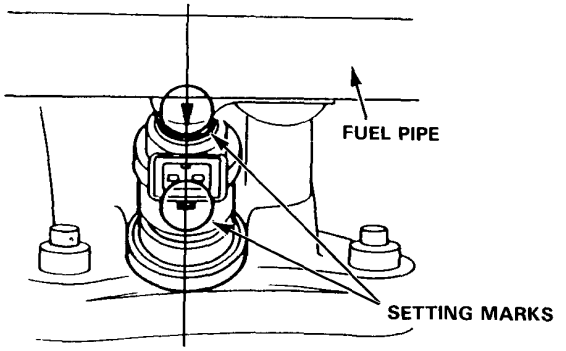
3. Fuel Line Servicing (A20A4 Engine)
   - Relieve fuel pressure by loosening the service bolt provided on the top of the fuel filter before disconnecting a fuel hose or a fuel pipe.



   - Be sure to replace washers, O-rings, and seal rubbers with new ones when servicing fuel line parts.
   - Always apply oil to the surfaces of O-rings and seal rings before installation. Never use brake fluid, radiator fluid, vegetable oils or alcohol-based oils.



   - When assembling the flare joint of the high-pressure fuel line, clean the joint and coat with new engine oil.
   - When installing an injector, check the angle of the coupler. The center line of the coupler should align with the setting mark on the injector holder.



(cont'd)

Special Caution Items For This Car (cont'd)

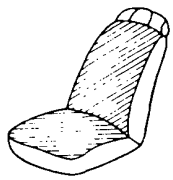
4. Inspection for fuel leakage
   - After assembling fuel line parts, turn ON the ignition switch (do not operate the starter) so that the fuel pump is operated for approximately two seconds and the fuel is pressurized. Repeat this operation two or three times and check whether any fuel leakage has occurred in any of the various points in the fuel line.

5. Installation of an amateur radio for cars equipped with PGM-FI and A.L.B.
   Care has been taken for the PGM-FI and A.L.B. control units (computer) and its wiring to prevent erroneous operation from external interference, but erroneous operation of the computer may be caused by entry of extremely strong radio waves. Attention must be paid to the following items to prevent erroneous operation of the computer.
   - The antenna and the body of the radio must be at least 200 mm (7.9 in.) away from the computer. (The computer installation position is under the right side seat.)
   - Do not lead the antenna feeder and the coaxial cable over a long distance parallel to the wiring, and when crossing with the wiring is required, execute crossing at a right angle.
   - Do not install a radio with a large output (max. 10 W).

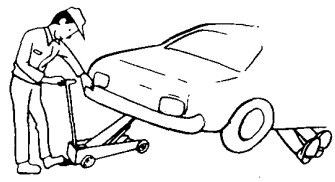
6. Apply liquid gasket to the transmission, oil pump cover, right side cover and water outlet. Use HONDA PARTS NO 08740—99986 as a liquid gasket.
   - Check that the mating surfaces are clean and dry before applying liquid gasket. Degrease the mating surfaces if necessary.
   - Apply liquid gasket evenly, being careful to cover all the mating surface.
   - To prevent leakage of oil, apply liquid gasket to the inner threads of the bolt holes.
   - Do not allow liquid gasket to stand for more than 20 minutes before assembly.
   - Fill the case with clean engine oil or coolant 30 minutes after assembly.

CAUTION: Observe all safety precautions and notes while working.

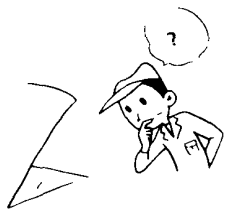
1. Protect all painted surfaces and seats against dirt and scratches with a clean cloth or vinyl cover.



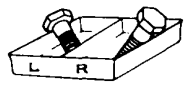
2. Work safely and give your work your undivided attention. When either the front or rear wheels are to be raised, block the remaining wheels securely. Exchange signals as frequently as possible when a work involves two or more workers. Do not run the engine unless the shop or working area is well ventilated.



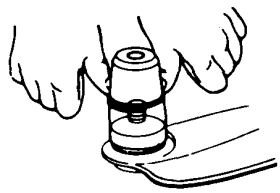
3. Prior to removing or disassembling parts, they must be inspected carefully to isolate the cause for which the service is called for. Observe all safety notes and precautions and follow the proper procedures as described in this manual.



Mark or place all removed parts in order in a parts rack so they can be placed back to their original places or parts from which they were removed or with which they were mated.

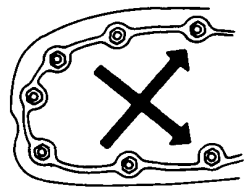


4. Use special tool when use of such a tool is specified.

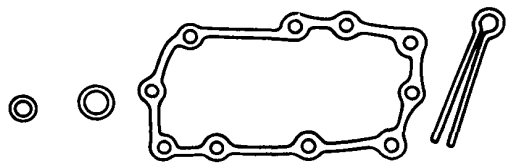


5. Parts must be assembled with the proper looseness or tightness according to the maintenance standards established.

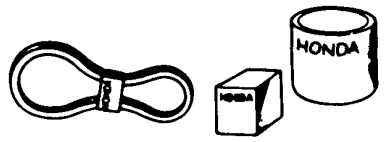
6. When tightening bolts or nuts, begin on center or large diameter bolts and tighten them in crisscross pattern in two or more steps if necessary.



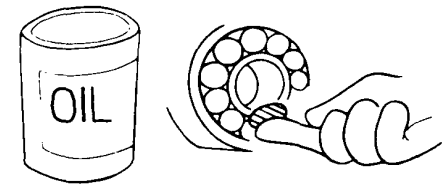
7. Use new packings, gaskets, O-rings and cotter pins whenever reassembling.



8. Use genuine HONDA parts and lubricants or those equivalent. When parts are to be reused, they must be inspected carefully to make sure they are not damaged or deteriorated and in good usable condition.



9. Coat or fill parts with specified grease where specified grease where specified (page 4-2). Clean all removed parts in or with solvent upon disassembly.

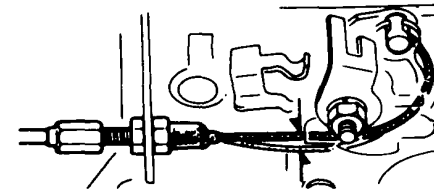


10. Brake fluid and hydraulic components
    - When replenishing the system, use extreme care not to allow dust and dirt from entering the inside.
    - Do not mix different brands of fluid as they may not be compatible.
    - Do not reuse drained brake fluid.
    - Brake fluid can cause damage to the painted surfaces. Wipe up spilled fluid at once.
    - After disconnecting brake hoses or pipes from the joint, be sure plug the opening to prevent loss of brake fluid.
    - Clean all disassembled parts only in clean BRAKE FLUID. Blow open all holes and passages with compressed air.

    - Keep disassembled parts form air-borne dust and abrasives.
    - Check that parts are clean before assembly.

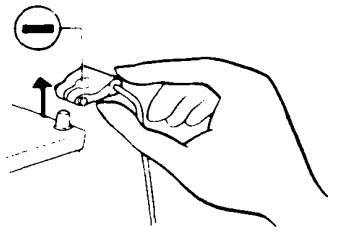
11. Avoid oil or grease getting on rubber parts and tubes.

12. Upon assembling, check every possible part for proper installation and movement or operation.

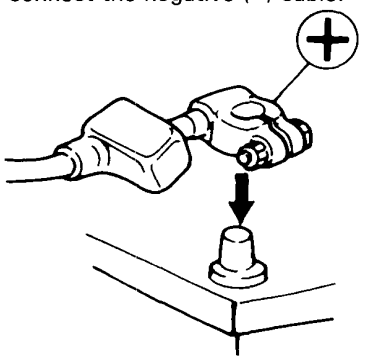


Electrical

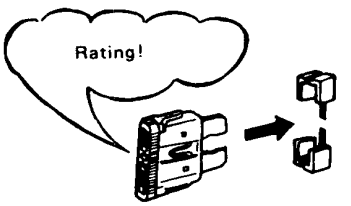
- Before making any repairs on electric wires or parts, disconnect the battery cables from the battery staring with the negative (−) terminal.



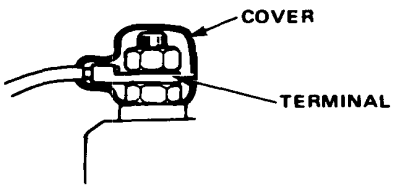
- After making repairs, check each wire or part for proper routing and installation. Also check to see that they are connected properly.
- Always connect the battery positive (+) cable first, then connect the negative (−) cable.



- Coat the terminals with clean grease after connecting the battery cables.
- Don't forget to install the terminal cover over the positive battery terminal after connecting.
- Before installing a new fuse, isolate the cause and take corrective measures, particularly when frequent fuse failure occurs.

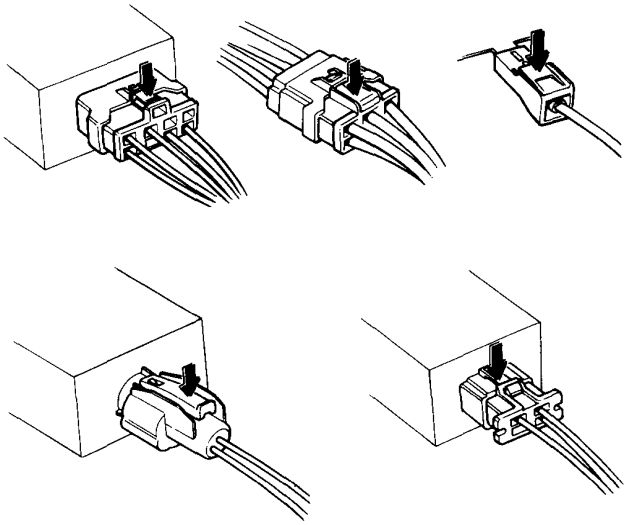


- Be sure to install the terminal cover over the connections after a wire or wire harness has been connected.

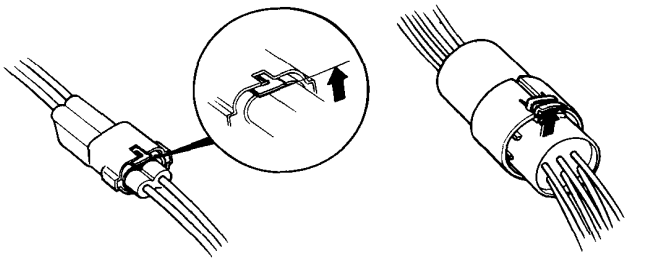


- When removing locking couplers, be sure to disconnect the lock before performing work.
- Couplers may be of two types, those in which the lock is pressed to remove, and those in which the lock is pulled up to remove. Be sure to ascertain the type of locking device before beginning work. The following is a depiction of the means of disconnecting various typical couplers.

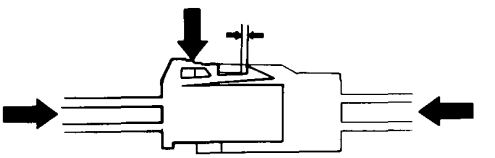
Press to disengage:



Pull up to disengage:

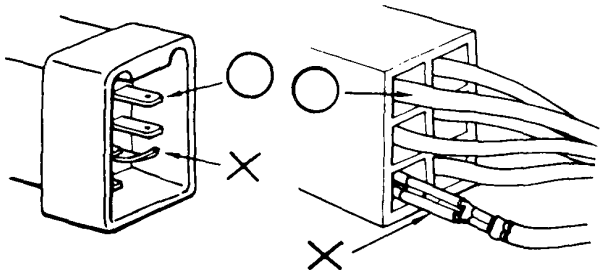


- When disconnecting locks, first press in the Coupler Tightly (to provide clearance to the locking device), then operate the tab fully and remove the coupler in the designated manner.

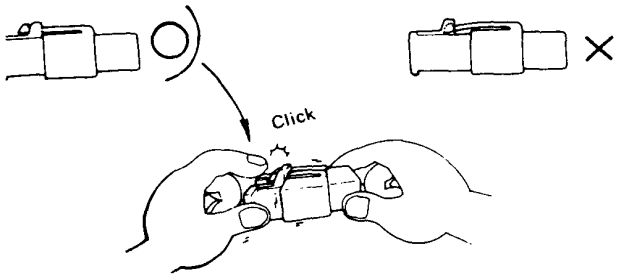


- When disconnecting a coupler, pull it off from the mating coupler by holding on both couplers.
- Never try to disconnect couplers by pulling on their wires.

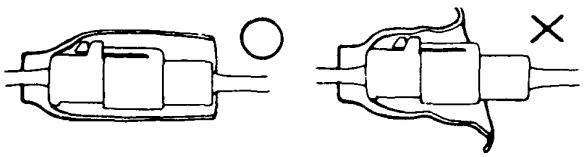
- Before connecting couplers, check to see that the terminals are in place and are not bent or distorted.



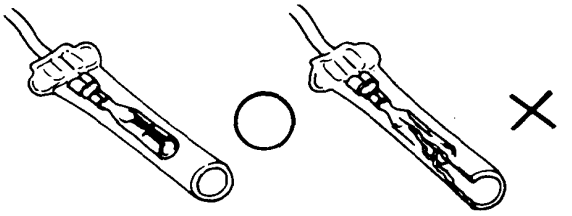
- Insert couplers fully until they will no longer go.
- Some couplers have locking tabs that must be aligned and engaged securely.
- Don't use wire harnesses with a loose wire or coupler.



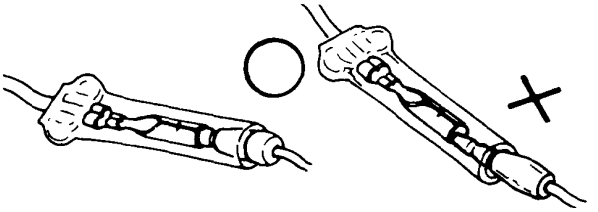
- Place the plastic cover over the mating coupler after reconnecting. Also check that the end is not inverted.



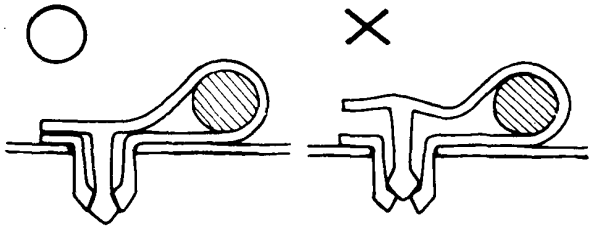
- Before connecting, check each connector cover for breakage. Also make sure that the female connector is tihgt and not pried open from the previous use.



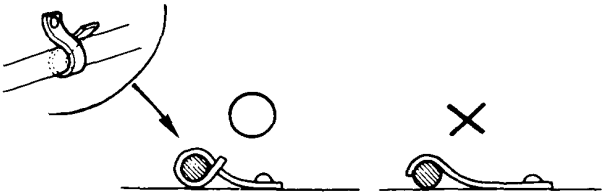
- Insert male connectors into the female connectors fully until they will no longer go.
- Be sure that plastic cover is placed over the connection.
- Don't place the opening of each plastic cover facing up.



- Secure wires and wire harnesses to the frame with their respective wire bands at the designated locations. Tighten the bands so that only the insulated surfaces contact the wires or wire harnesses.



- A loose wire harness or cable can be a hazard to safety. After clamping, check each wire for security in its clamp.

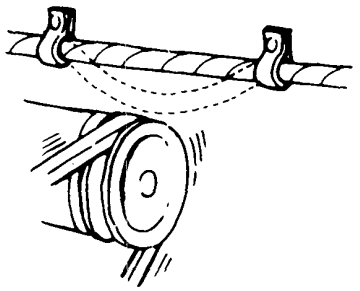


- Do not squeeze wires against the weld or nugget of its clamp when a weld-on clamp is used.

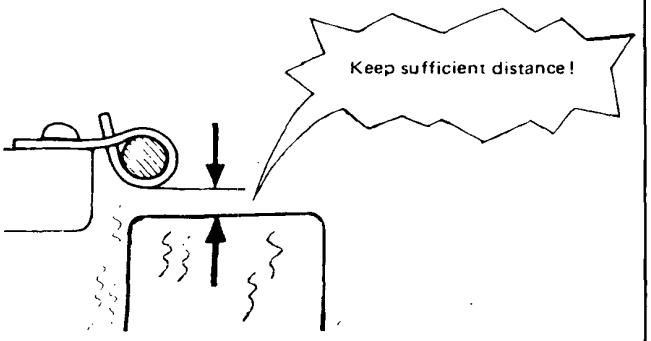
(cont'd)

Electrical (cont'd)

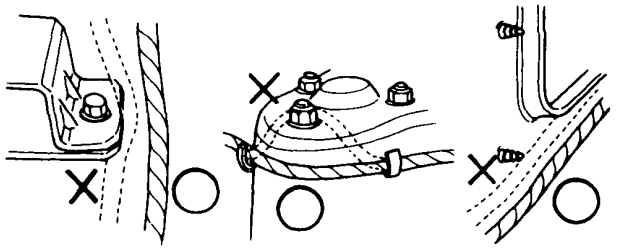
- After clamping, check each harness to be certain that it is not interferring with any moving or sliding parts of the vehicle.
- Keep wire harnesses away from the exhaust pipes and other hot parts.



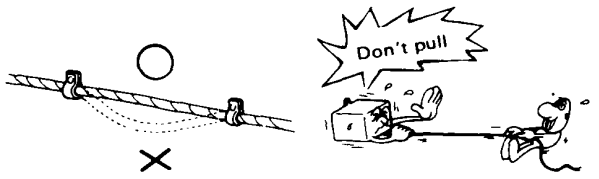
- Always keep a safe distance between wire harnesses and any heated parts.



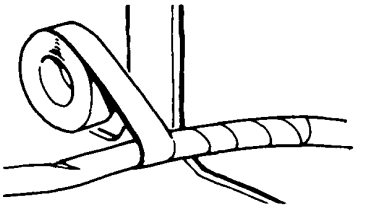
- Do not bring wire harnesses in direct contact with sharp edges or corners.
- Also avoid contact with the projected ends of bolts, screws and other fasteners.



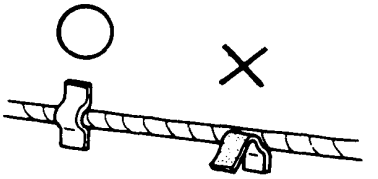
- Route harnesses so they are not pulled taut or slackened excessively.



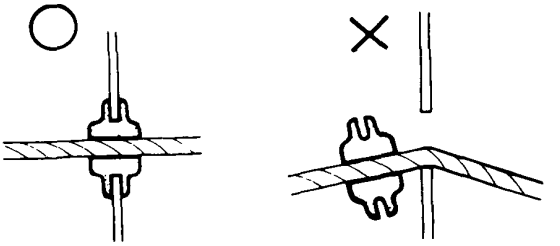
- Protect wires and harnesses with a tape or tube if they are in contact with a sharp edge or corner.



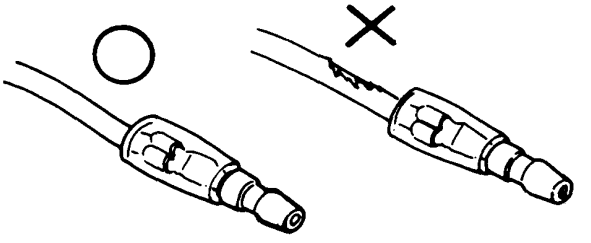
- Clean the attaching surface thoroughly if a plaster is used. Use a spirit wipe if necessary.



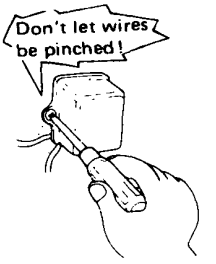
- Seat grommets in their grooves properly.



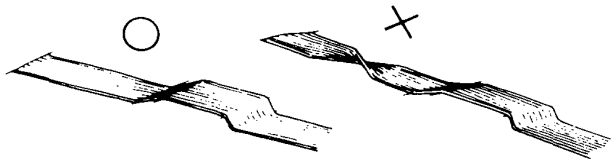
- Do not damage the insulator when connecting a wire.
- Do not use wires or harnesses with a broken insulator. Repair by wrapping with a protective tape or replace with new ones if necessary.



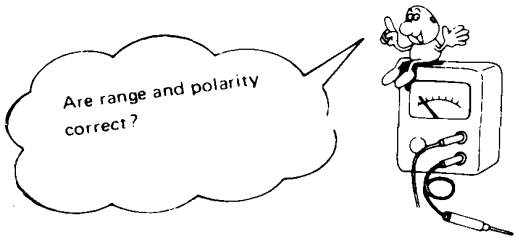
- After installing parts, make sure that wire harnesses are not pinched.



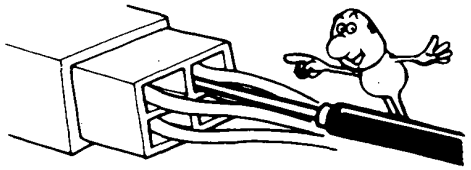
- After routing, check that the wire harnesses are not twisted or kinked.



- Wire harnesses should be routed so that they are not pulled taut, slackened excessively, pinched, or interferred with adjacent or surrounding parts in all stering positions.



- When using the Service Tester, follow the manufacturer's instructions and those described in the Shop Manual.



- Do not throw or let parts fall.

- Rust is the enemy of all finished surfaces. Before connecting connectors and couplers, check the terminals and remove, if any, rust using a fine sand paper or emery cloth.

Symbol Marks

The following symbols stand for:

:Apply engine oil.

:Apply brake fluid.

:Apply grease.

:Apply Automatic Transmission Fluid.

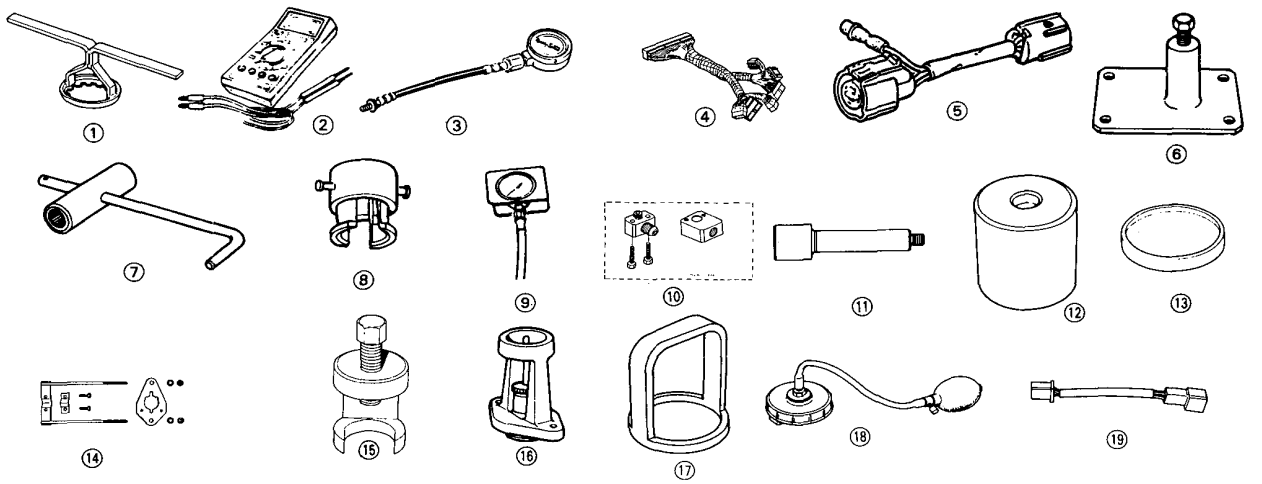
:Apply Power Steering Fluid.

Special Tools

Special Tools

Newly Provided Tools

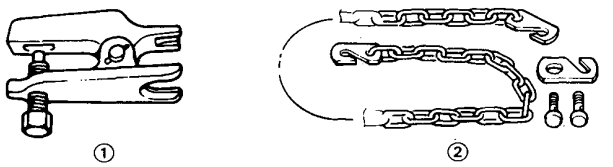
Ref. No.	Tool Number	Description	Q'ty	Remarks	Section
①	07GAC—SE00200	Fuel Sender Wrench	1		11
②	07411—0020000	Digital Circuit Tester	1		11
③	07406—0040000	Fuel Pressure Gauge Set	1		11
④	07999—PD6000A	System Checker Harness	1		11
⑤	07GAZ—SE00300	R.P.M. Connecting Adaptor	1		11
⑥	07GAC—PF40100	Transmission Housing Puller	1		14 and 15
⑦	07GAB—PF50100	Mainshaft Holder	1		15
⑧	07GAC—PF40210	Bearing Remover Attachment	1		15
⑨	07406—0070000	Low Pressure Gauge	1		15
⑩	07GAK—SE00100	Joint Adaptor Kit	1		18
⑪	07GAF—SE00100	Hub Assembly Pin	1		19
⑫	07GAF—SE00200	Hub Assembly Driver Attachment	1		19
⑬	07GAF—SE00400	Front Hub Driver Base	1		19
⑭	07GAE—SE00100	Absorber Spring Compressor	1		19
⑮	07GAC—SE00100	Ball Joint Remover	1		19
⑯	07GAG—SE00100	Brake Booster Adjusting Gauge	1		20
⑰	07GAF—SE00300	Pulser Driver Attachment	1		20
⑱	07GAZ—SE00100	A.L.B. Hand Pump Assembly	1		20
⑲	07GAZ—SE00200	A.L.B. Checker Harness Adaptor	1		20



Special Tools (Common with Other Models)

5. Engine Removal/Installation

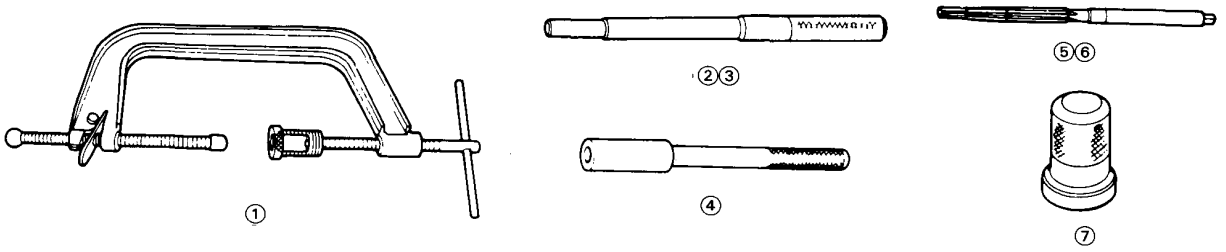
Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07941—6920002	Ball Joint Remover	1	
②	07966—6340011	Engine Block Hanger	1	



Special Tools (Common with Other Models)

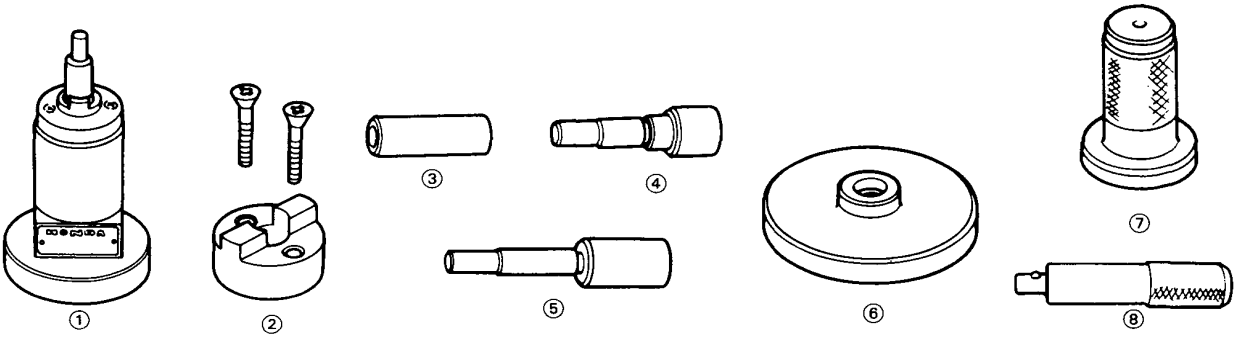
6. Cylinder Head/Valve Train

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07757—0010000	Valve Spring Compressor	1	07957—3290001 may also be used
②	07942—6110000	Valve Guide Driver/Remover	1	07742—0010200 may also be used
③	07942—SA50000	Valve Guide Driver/Remover	1	
④	07743—0020000	Valve Guide Driver	1	
⑤	07984—6110000	Valve Guide Reamer	1	
⑥	07984—SA50000	Valve Guide Reamer	1	
⑦	07947—SB00100	Oil Seal Driver	1	Camshaft



7. Engine Block

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07973—6570002	Piston Pin Insert Base Set	1	
②	07973—SB00100	Piston Pilot	1	
③	07973—SB00200	Piston Pin Insert Attachment A	1	Not included in base set. Use each with the base set.
④	07973—PE00302	Piston Pin Pilot Collar	1	
⑤	07973—SB00400	Piston Pin Insert Attachment B	1	
⑥	07948—SB00101	Driver Attachment	1	Crankshaft Oil Seal (Clutch side)
⑦	07947—SB00200	Oil Seal Driver	1	Crankshaft Oil Seal
⑧	07749—0010000	Driver	1	07949—6110000 may also be used

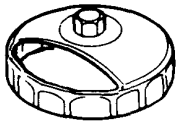


(cont'd)

Special Tools (Common with Other Models)

8. Engine Lubrication

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07912—6110001	Oil Filter Socket Wrench	1	
②	07406—0030000	Oil Pressure Gauge Adaptor	1	



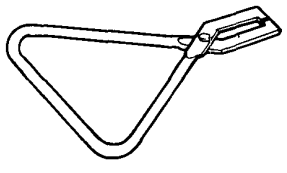
①

②

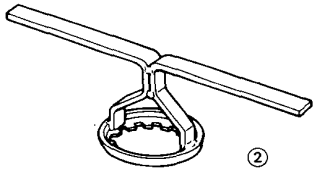
11. Fuel and Carburetor

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07614—0050100	Fuel Line Clip	1	
*②	07GAC—SE00200	Fuel Sender Wrench	1	
*③	07406—0040001	Fuel Pressure Gauge Set	1	
*③-1	07406—0040100	Pressure Gauge	(1)	Component Tools
*③-2	07406—0040201	Hose Assy	(1)	
*④	07999—PD6000A	System Checker Harness	1	A20A4 Engine only
*⑤	07411—0020000	Digital Circuit Tester	1	A20A4 Engine only
⑥	07GAZ—SE00300	R.P.M. Connecting Adaptor	1	Carbureted Engine only

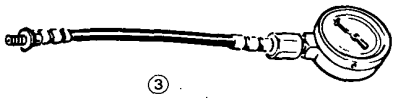
* Newly Provided Tools



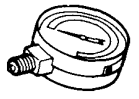
①



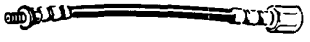
②



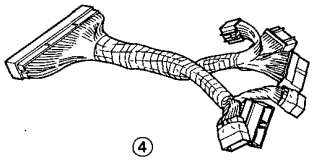
③



③-1

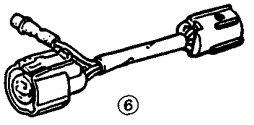


③-2



④

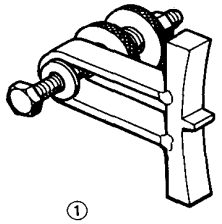
⑤



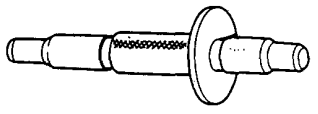
⑥

13. Clutch

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07924—PD20001	Ring Gear Holder	1	
②	07974—6890101	Clutch Disc Alignment Tool	1	



①

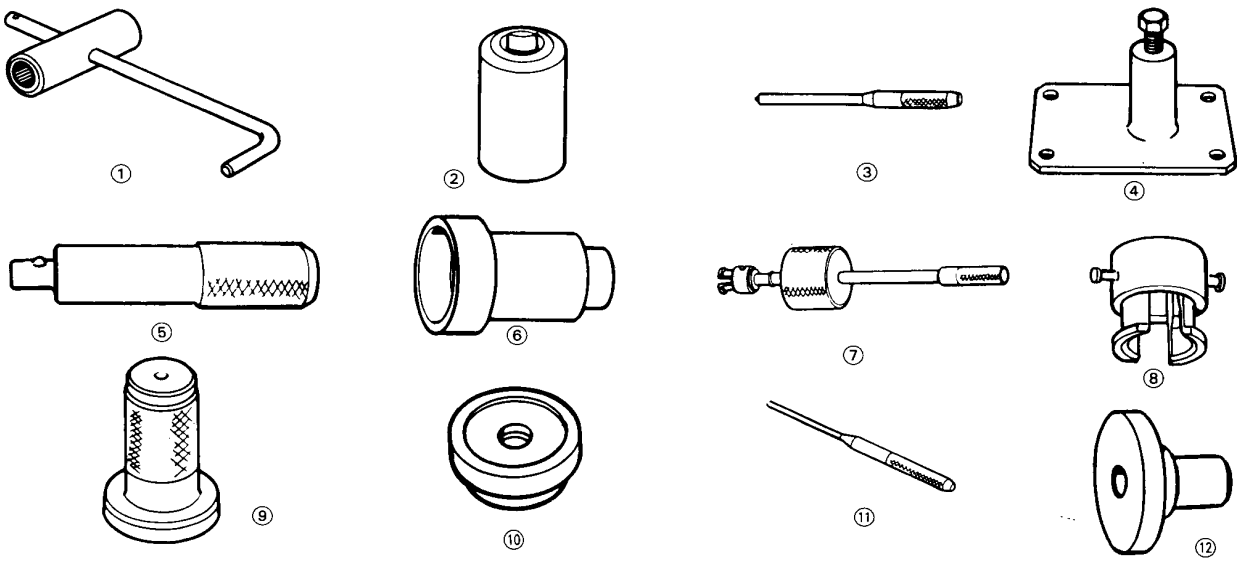


②

14. Manual Transmission

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07923—6890101	Mainshaft Holder	1	07923—6890100 may also be used
②	07907—PD10000	Socket Wrench 30 mm	1	07907—689100 may also be used
③	07744—0010400	5 mm Pin Punch	1	07944—6110100 may also be used
*④	07GAC—PF40100	Transmission Housing Puller	1	
⑤	07749—0010000	Driver	1	07949—6110000 may also be used
⑥	07947—6340500	Driver Attachment E	1	
⑦	07936—6340000	Bearing Remover Set	1	
⑧	07936—6890101	Bearing Remover Attachment	1	Use changed to 07936—6340000 attachment
⑨	07947—6340000	Oil Seal Driver	1	
⑩	07746—0010400	Driver Attachment 52 x 55 mm	1	
⑪	07744—0010200	3 mm Pin Punch	1	
⑫	07947—6110500	Driver Attachment E	1	Differential Oil Seal

* Newly Provided Tool



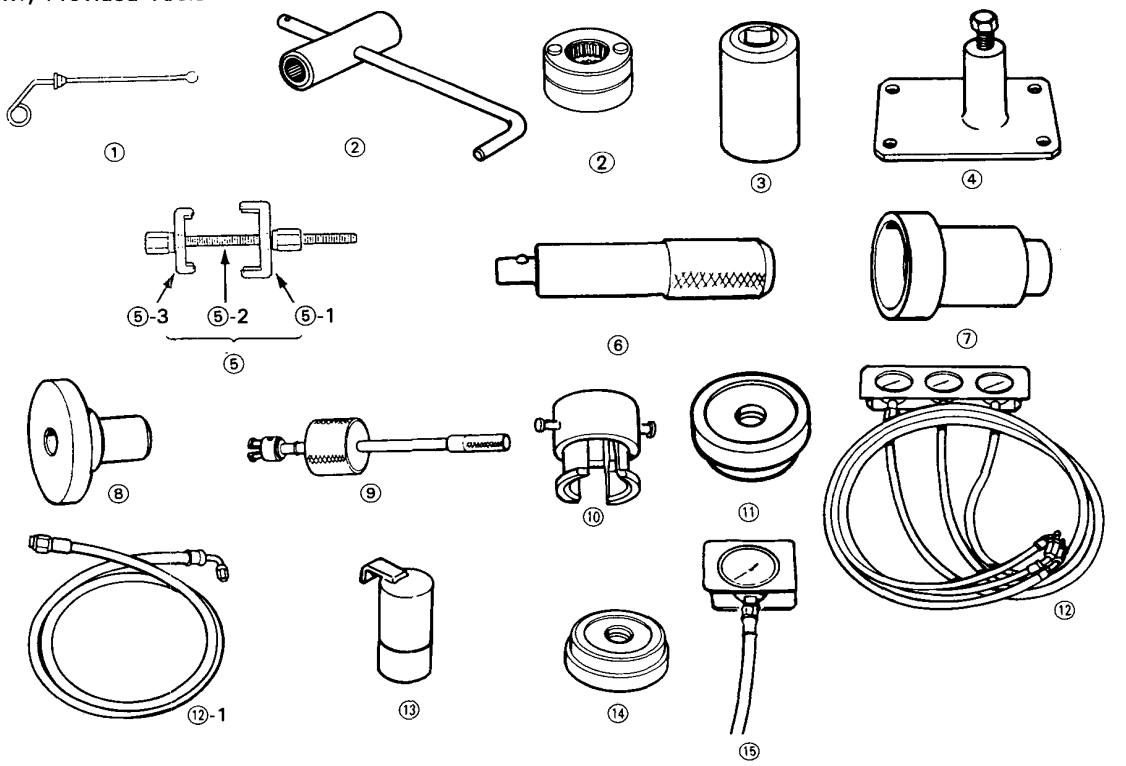
(cont'd)

Special Tools (Common with Other Models)

15. Automatic Transmission

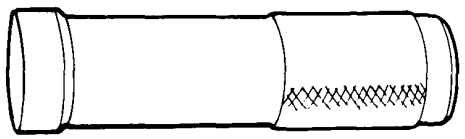
Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07974—6890300	Throttle Cable Adjustment Gauge	1	Carbureted Engine Only
*②	07GAB—PF50100	Mainshaft Holder	1	with F4 Transmission (2000 Engine)
②	07923—6890202	Mainshaft Holder	1	with C9 Transmission (1600 Engine)
③	07907—PD10000	Socket Wrench 30 mm	1	07907—6890100 may also be used
*④	07GAC—PF40100	Transmission Housing Puller	1	
⑤	07GAE—PG40000	Clutch Spring Compressor Set	1	
⑤-1	07GAE—PG40100	Clutch Spring Compressor Attachment	1	
⑤-2	07GAE—PG40200	Clutch Spring Compressor Bolt Assembly	1	
⑤-3	07960—6120100	Clutch Spring Compressor Attachment	1	
⑥	07749—0010000	Driver	1	07949—6110000 may also be used
⑦	07947—6340500	Driver Attachment	1	
⑧	07947—6110500	Driver Attachment E	1	
⑨	07936—6340000	Bearing Remover Set	1	
*⑩	07GAC—PF40210	Bearing Remover Attachment	1	Use changed to 07936—6340000 attachment
⑪	07746—0010500	Driver Attachment 62 x 68 mm	1	
⑫	07406—0020003	Oil Pressure Gauge Set	1	
⑫-1	07406—0020201	Oil Pressure Gauge Hose	(3)	Component Tool
⑬	07998—SA50000	Accelerator Pedal Weight Set 1.5 kg	1	Carbureted Engine Only
⑭	07947—6340201	Oil Seal Driver	1	
*⑮	07406—0070000	Low Pressure Gauge	1	

* Newly Provided Tools



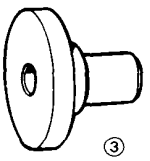
16. Differential

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07746—0030100	Driver C	1	
②	07944—SA00000	4 mm Pin Punch	1	
③	07947—6110500	Oil Seal Driver	1	
④	07749—0010000	Driver	1	07949—6110000 may also be used
⑤	07947—6340500	Driver Attachment E	1	



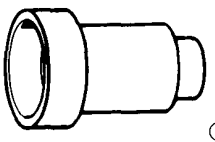
①

②



③

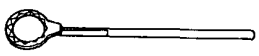
④



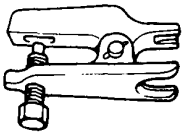
⑤

17. Steering

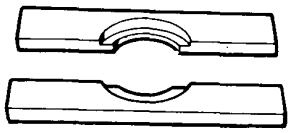
Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07916—SA50001	Steering Gearbox Locknut Wrench	1	
②	07941—6920002	Ball Joint Remover	1	
③	07965—6340301	Front Hub Dis/Assembly Tool Base A	1	
④	07746—0010300	Driver Attachment 42 x 47 mm	1	
⑤	07974—SA50800	Clip Guide (B)	1	



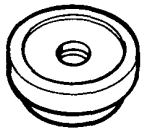
①



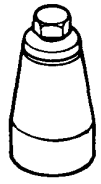
②



③



④



⑤

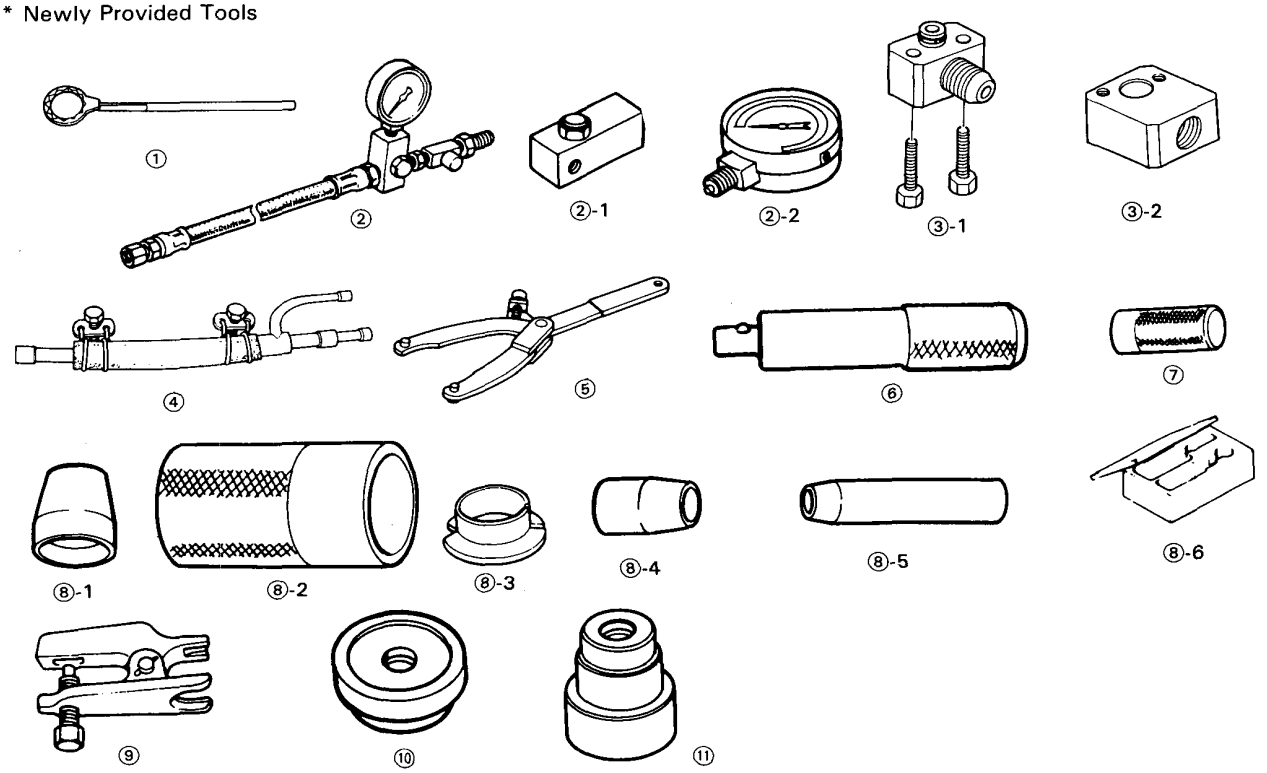
(cont'd)

Special Tools (Common with Other Models)

18. Power Steering

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07916—SA50001	Steering Gearbox Locknut Wrench	1	
②	07406—0010200	PS. Pressure Gauge Assy.	1	
②-1	07406—0010300	Oil Pressure Control Valve	(1)	Component tools
②-2	07406—0010400	PS. Pressure Meter	(1)	
*③	07GAK—SE00100	Joint Adaptor Kit	1	
*③-1	07GAK—SE00110	Pump Joint Adaptor	(1)	Component tools
*③-2	07GAK—SE00120	Hose Joint Adaptor	(1)	
④	07406—0010101	Bypass Tube Joint	1	
⑤	07725—0010100	Universal Holder	1	07725—0030000 may also be used
⑥	07749—0010000	Driver	1	07949—6110000 may also be used
⑦	07953—7190000	Collar Driver	1	
⑧	07900—SA50000	Power Steering Tool Kit	1	PS. Gearbox Overhaul Kit
⑧-1	07974—SA50100	Piston Seal-Ring Guide	(1)	Component tools
⑧-2	07974—SA50200	Piston Seal-Ring Sizing Tool	(1)	
⑧-3	07974—SA50300	Cylinder End Packing Slider	(1)	
⑧-4	07974—SA50400	End Seal Guide	(1)	
⑧-5	07974—SA50600	Dust Seal Guide	(1)	
⑧-6	07974—SA50900	PS. Tools Kit Case	(1)	
⑨	07941—6920002	Ball Joint Remover	1	
⑩	07746—0010300	Driver Attachment 42 x 47 mm	1	
⑪	07947—6340000	Bearing Driver Attachment	1	

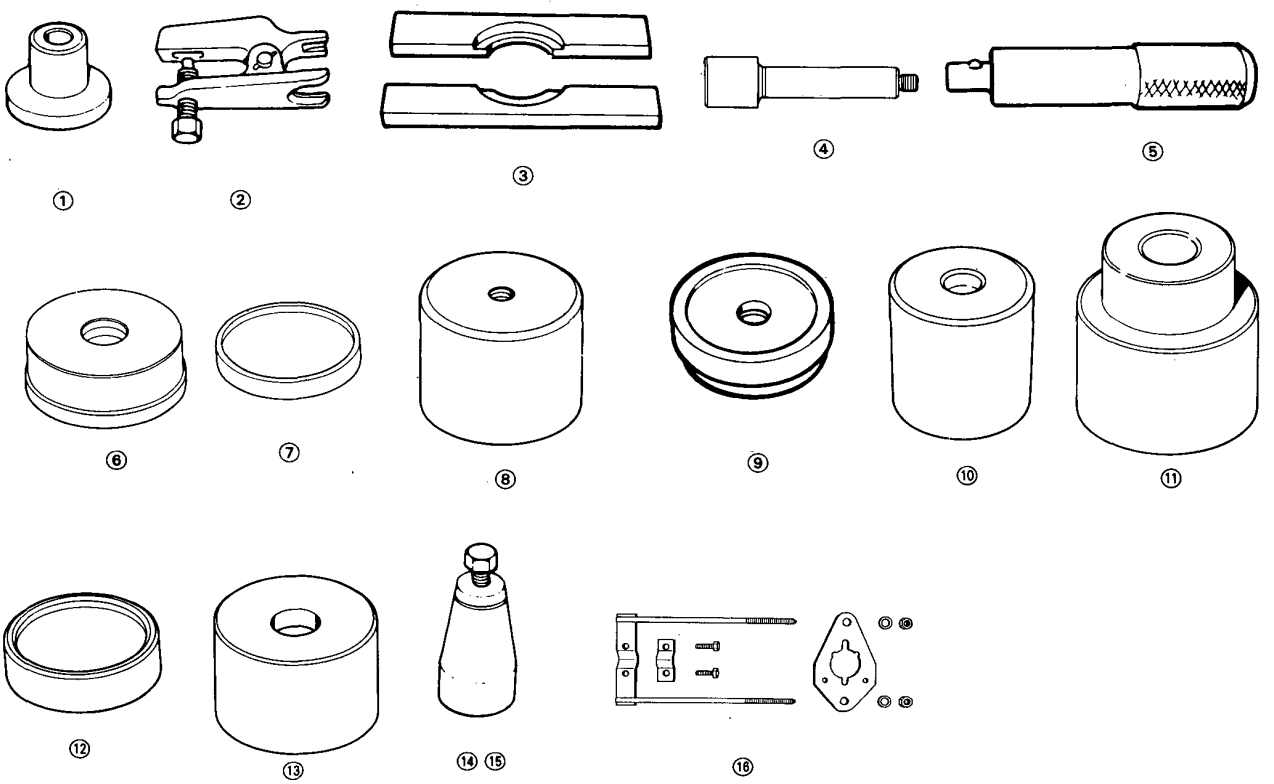
* Newly Provided Tools



19. Suspension

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07410—0010200	Front Wheel Alignment Attachment B	1	07HGK-0010100 may also be used
②	07941—6920002	Ball Joint Remover	1	
③	07965—6340301	Front Hub Dis/Assembly Tool Base A	2	
*④	07GAF—SE00100	Hub Assembly Pin	1	
⑤	07749—0010000	Driver	1	07949—6110000 may also be used
⑥	07746—0010400	Driver Attachment 52 x 55 mm	1	
*⑦	07GAF—SE00401	Front Hub Driver Base	1	
⑧	07965—6920200	Front Hub Dis/Assembly Tool B	1	
⑨	07947—6340200	Driver Attachment	1	
*⑩	07GAF—SE00200	Hub Assembly Driver Attachment	1	
⑪	07965—SB00100	Front Hub Dis/Assembly Tool A	1	
⑫	07965—SB00200	Frint Hub Dis/Assembly Tool B	1	
⑬	07965—SB00300	Front Hub Dis/Assembly Tool C	1	
⑭	07974—SA50700	Clip Guide A	1	
⑮	07974—SA50800	Clip Guide B	1	
*⑯	07GAE—SE00100	Absorber Spring Compressor	1	

* Newly Provided Tools



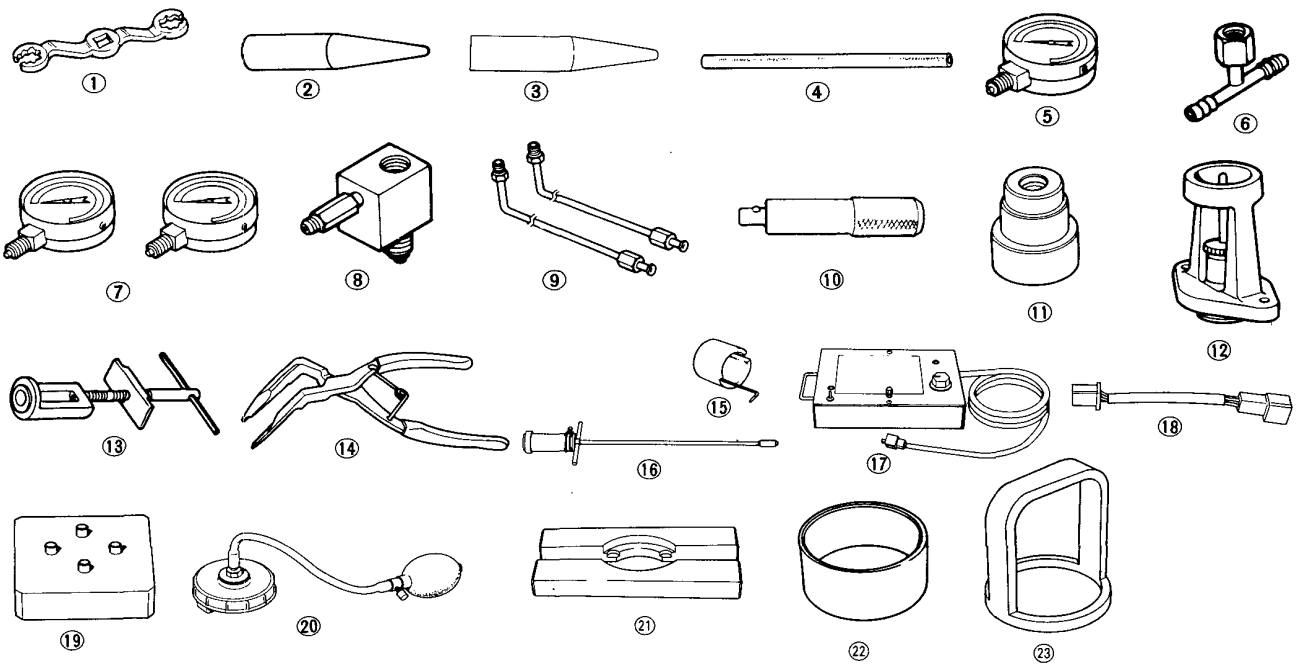
(cont'd)

Special Tools (Common with Other Models)

20. Brake

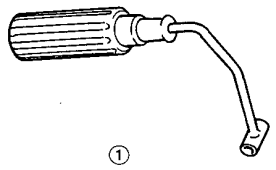
Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07921—0010100	Flare Nut Wrench	1	
②	07965—5790300	Cup Guide	1	with 8'' Master cylinder
③	07965—5790400	Cup Guide	1	with 9'' Master cylinder
④	07510—6340300	Vacuum Joint Tube A	1	Short parts of the brake power kit 07504—6340100
⑤	07404—5790300	Vacuum Gauge	1	
⑥	07410—5790500	Tube Joint Attachment I	1	
⑦	07406—5790200	Oil Pressure Gauge	2	
⑧	07410—5790100	Pressure Gauge Attachment C	1	
⑨	07510—6340100	Pressure Gauge Attachment	2	
⑩	07749—0010000	Driver	1	07949—6110000 may also be used
⑪	07947—6890300	Driver Attachment C	1	
*⑫	07GAG—SE00100	Brake Booster Adjusting Gauge	1	
⑬	07960—SA50002	Brake Spring Compressor	1	
⑭	07914—SA50000	Snap Ring Pliers	1	Rear Caliper
⑮	07973—SA50000	Rear Caliper Guide	1	
⑯	07907—SB00000	A.L.B. T-Wrench	1	
⑰	07508—SB00000	A.L.B. Checker	1	
*⑱	07GAZ—SE00200	A.L.B. Checker Harness Adaptor	1	
⑲	07929—SB00000	Moduletor Holder	1	
⑳	07GAZ—SE00100	A.L.B. Hand Pump Assembly	1	
㉑	07965—6340301	Front Hub Dis/Assembly Tool Base A	2	
*㉒	07GAF—SE00300	Pulser Driver Attachment	1	
㉓	07967—SB00000	Pulser Driver	1	

* Newly Provided Tool



21. Body

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07GAZ—SE30100	Torsion Rod Assembly Tool	1	



①

Specifications

Standards and Service Limits

Cylinder Head/Valve Train — Section 6

MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Compression	300 rpm and wide-open throttle	Nominal A20A4 Engine (Expect KS, KX)	1,226 kPa (12.5 kg/cm², 178 psi)
		Other Engines	1,176 kPa (12.0 kg/cm², 171 psi)
		Minimum A20A4 Engine (Expect KS, KX)	1,030 kPa (10.5 kg/cm², 149 psi)
		Other Engines	980 kPa (10.0 kg/cm², 142 psi)
		Maximum variation	196 kPa (2 kg/cm², 28 psi)
Cylinder head	Warpage	—	0.05 (0.002)
	Height	90 (3.54)	89.8 (3.54)
Camshaft	End play	0.05–0.15 (0.002–0.006)	0.5 (0.02)
	Oil clearance No. 1,3 and 5 Journals	0.050–0.089 (0.002–0.004)	0.15 (0.006)
	No. 2 and 4 Journals	0.130–0.169 (0.005–0.008)	0.23 (0.009)
	Runout	0.03 (0.001) max.	0.06 (0.002)
	Cam lobe height A20A4 Engine KX Manual and Automatic IN A	38.858 (1.5102)	—
	IN B	38.604 (1.5198)	—
	EX	38.796 (1.5274)	—
	A20A4 Engine Others IN	38.858 (1.5102)	—
	EX	38.607 (1.5200)	—
	A20A1 Engine MT IN	38.477	—
	EX	38.353	—
	A16A1 Engine IN	38.175	—
	EX	37.776	—
	Other Engines IN	38.541 (1.5174)	—
	EX	38.607 (1.5200)	—
Valve	Valve clearance IN	0.12–0.17 (0.005–0.007)	—
	EX	0.25–0.30 (0.010–0.012)	—
	Valve stem O.D. IN	6.58–6.59 (0.2591–0.2594)	6.55 (0.258)
	EX	6.94–6.95 (0.2732–0.2736)	6.91 (0.272)
	Stem-to-guide clearance IN	0.02–0.05 (0.001–0.002)	0.08 (0.003)
	EX	0.06–0.09 (0.002–0.004)	0.12 (0.005)
	Stem installed height IN	48.59 (1.913)	49.34 (1.943)
	EX	47.66 (1.876)	48.41 (1.906)
Valve seat	Width IN and EX	1.25–1.55 (0.049–0.061)	2.0 (0.08)
Valve spring	Free length IN	49.2 (1.94)	48.2 (1.90)
	EX Inner	39.8 (1.57)	38.8 (1.53)
	Outer	49.8 (1.96)	48.8 (1.92)
	Squareness Inner and Outer	—	1.75 (0.068)
Valve guide	I.D. IN	6.61–6.63 (0.260–0.261)	6.65 (0.262)
	EX	7.01–7.03 (0.276–0.277)	7.05 (0.278)
Rocker arm	Arm-to-shaft clearance	0.008–0.054 (0.0003–0.0021)	0.08 (0.003)

Engine Block — Section 7

*A16A1 Engine only

MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Cylinder block	Warpage of deck surface	0.08 (0.003) max.	0.10 (0.004)
	Bore diameter A	82.70–82.71 (3.2559–3.2563)	82.74 (3.2575)
	B	82.69–82.70 (3.2555–3.2559)	82.73 (3.2571)
	A	*80.01–80.02 (3.1500–3.1504)	80.05 (3.1516)
	B	*80.00–80.01 (3.1496–3.1500)	80.04 (3.1512)
	Bore taper	0.007–0.012 (0.0003–0.0005)	0.05 (0.002)
	Reboring limit	—	0.5 (0.02)
Piston	Skirt O.D. (At 21 mm (0.83 in) from bottom of skirt) A	82.67–82.68 (3.2574–3.2551)	82.66 (3.2543)
	B	82.66–82.67 (3.2543–3.2574)	82.65 (3.2539)
	A	*79.98–79.99 (3.1488–3.1492)	79.97 (3.1484)
	B	*79.97–79.98 (3.1484–3.1500)	79.96 (3.1480)
	Clearance in cylinder	0.02–0.04 (0.0008–0.0016)	0.08 (0.003)
	Piston-to-ring clearance Top	0.030–0.060 (0.0012–0.0024)	0.13 (0.005)
	2nd	0.030–0.055 (0.0012–0.0022)	0.13 (0.005)
	* Top and 2nd	*0.02–0.05 (0.0008–0.0020)	0.13 (0.005)
Piston ring	Ring end gap Top A20A1 Engine	0.15–0.35 (0.006–0.014)	0.6 (0.02)
	A16A1 Engine	0.20–0.37 (0.008–0.015)	0.6 (0.02)
	Others	0.20–0.35 (0.008–0.014)	0.6 (0.02)
	2nd A16A1 Engine	0.20–0.37 (0.008–0.015)	0.6 (0.02)
	Others	0.30–0.42 (0.012–0.017)	0.6 (0.02)
	Oil RIKEN	0.30–0.90 (0.012–0.035)	1.0 (0.04)
	TEIKOKU	0.20–0.70 (0.008–0.028)	0.8 (0.03)
Connecting rod	Pin-to-rod interference	0.013–0.032 (0.0005–0.0013)	0.013 (0.0005)
	Large end bore diameter	Nominal 48 (1.89) *45 (1.77)	—
	End play installed on crankshaft	0.15–0.30 (0.006–0.012)	0.40 (0.016)
Crankshaft	Main journal diameter	49.970–49.994 (1.9673–1.9683)	—
	Taper/out-of-round, main journal	0.005 (0.0002) max.	0.010 (0.0004)
	Rod journal diameter	44.976–45.000 (1.7707–1.7717)	—
		*41.976–42.000 (1.6530–1.6535)	—

Engine Block — Section 7

*A16A1 Engine Only Unit: mm (in.)

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Crankshaft (cont'd)	Taper/out-of-round, rod journal	Other Engine	0.005 (0.0002) max.	0.010 (0.0004)
	End play		0.10—0.35 (0.004—0.014)	0.45 (0.018)
	Runout		0.024 (0.0009) max.	0.04 (0.0016)
Bearings	Main bearing-to-journal Oil clearance	No. 1, 2, 4, and 5 Journals	0.026—0.055 (0.0010—0.0022)	0.07 (0.003)
		No. 3 Journal	0.032—0.061 (0.0013—0.0024)	0.07 (0.003)
	Rod bearing-to-journal oil clearance		0.020—0.038 (0.0008—0.0015)	0.07 (0.003)

Engine Lubrication — Section 8

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Engine oil	Capacity ℓ (US. qt., Imp. qt.)		4.0 (4.2, 3.5) After engine disassembly 3.5 (3.7, 3.1) After oil change, including oil filter 3.0 (3.2, 2.6) After oil change, without oil filter	
Oil pump	Displacement		40.3 ℓ (10.6 US. gal., 8.9 Imp. gal.) 5,500 min⁻¹ (rpm)	
	Inner-to-outer rotor radial clearance		0.15 (0.006) max.	0.2 (0.008)
	Pump body-to-rotor radial clearance		0.10—0.18 (0.004—0.007)	0.2 (0.008)
	Pump body-to-rotor side clearance		0.03—0.108 (0.001—0.004)	0.15 (0.006)
Relief valve	Pressure setting 80°C (176°F)	Idle	98 kPa (1.0 kg/cm², 14 psi) min.	
		3,000 min⁻¹ (rpm)	373—451 kPa (3.8—4.6 kg/cm², 54—65 psi)	

Cooling — Section 10

	MEASUREMENT	STANDARD (NEW)	
Cooling fan belt	Deflection midway between pulleys/load	6—9 (0.24—0.35) /98N (10 kg, 22 lb) for used belt 5 (0.20) /98N (10 kg, 22 lb) after replacement of belt	
Radiator	Capacity (incl. heater) ℓ (US. Gal., Imp. Gal.) (Includes reservoir tank 0.8 (0.21, 0.18)	A20A4 Engine	Manual 6.4 (1.7, 1.4) Automatic 7.0 (1.8, 1.5)
		A20A1. A20A2 Engines	Manual 6.3 (1.7, 1.4) Automatic 6.9 (1.8, 1.5)
		A16A1 Engine	Manual 6.3 (1.7, 1.4) Automatic 6.2 (1.6, 1.4)
	Pressure cap opening pressure	74—103 kPa (0.75—1.05 kg/cm², 11—15 psi)	
Thermostat	Starts to open	Primary: 82°C ±2 (180°F ±3) Secondary: 85°C ±2 (185°F ±3)	86—90°C (187—194°F)
	Full open	95°C (203°F)	100°C (212°F) OPTIONAL
	Valve lift at full open	8 (0.31) max.	8 (0.31) max.
Water pump	Gear ratio (crankshaft) Capacity: ℓ per min/at min⁻¹ (rpm)	1.34 124/5,000 (32.7 US. gal/5,000 min⁻¹ (rpm)	
Cooling fan	Fan-to-core clearance Thermoswitch "ON" temperature Thermoswitch "OFF" temperature	26.0 (1.02) 87°—93°C (188°—199°F) 83°C (181°F) or more (hysteresis 2°C (35°F) or more)	

Fuel and Emissions — Section 11

	MEASUREMENT		STANDARD (NEW)	
Fuel pump A20A4	Delivery pressure		230—270 kPa (2.35—2.75 kg/cm², 33—39 psi)	
	Displacement		230 cc/min in 10 seconds	
	Relief valve opening pressure		441—588 kPa (4.5—6.0 kg/cm², 64—85 psi)	
Pressure regulator A20A4	Pressure		230—270 kPa (2.35—2.75 kg/cm², 33—39 psi)	
Fuel pump A16A1 and A20A2	Delivery pressure Displacement		17.6—22.5 kPa (0.18—0.23 kg/cm², 2.6—3.3 psi) 760 cc at 12V (46 cu. in./12V)	
Fuel Tank	Capacity		60ℓ (15.9 US. Gal., 13.2 Imp. Gal.)	
Throttle Body A20A4	Fast idle		1,000—1,800 min⁻¹ (rpm)	
	Idle Speed	with headlights and cooling fan off	Manual 800±50 min⁻¹ (rpm) KX: 750±50 min⁻¹ (rpm) Automatic 800±50 min⁻¹ (rpm) KX: 750±50 min⁻¹ (rpm) (in "N" or "P")	
	idle CO		KX 0.1 %, Others: 2.0 %	
Carburetor A16A1 and A20A2	Choke fast idle		A20A2: 2,000—3,000 min⁻¹ (rpm) A16A1: 1,500—2,500 min⁻¹ (rpm)	
	Idle Speed	with hedlights and cooling fan off	Manual 750±50 min⁻¹(rpm) Automatic 700±50 min⁻¹ (rpm) KS: 750±50 min⁻¹ (rpm) (in gear)	
	Idle CO		KX, KQ: 0.1% Others: 1.0%	

(cont'd)

Standards and Service Limits (cont'd)

Clutch — Section 13

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Clutch pedal	Pedal height	205 (8.1) to floor	—
		178 (7.0) to carpet	—
	Stroke	138–143 (5.4–5.6)	—
	Pedal play	15–25 (0.6–1.0)	—
	Disengagement height	73 (2.9) min. to floor	—
		49 (1.9) min. to carpet	—
Clutch arm	Release arm adjustment	2.5–4.5 (0.098–0.177)	—
Flywheel	Clutch surface runout	0.05 (0.002) max.	0.15 (0.006)
Clutch plate	Rivet head depth	1.3 (0.05) min.	0.2 (0.008)
	Surface runout	0.8 (0.03) max.	1.0 (0.04)
	Radial play in splines	0.7–2.1 (0.028–0.083)	4.0 (0.16)
	Thickness	8.1–8.8 (0.32–0.35)	5.7 (0.22)
Clutch release bearing holder	I.D.	31.00–31.059 (1.220–1.223)	31.09 (1.224)
	Holder-to-guide sleeve clearance	0.05–0.15 (0.002–0.006)	0.22 (0.009)
Clutch cover	Uneveness of diaphragm spring	0.8 (0.03) max.	1.0 (0.04)

Manual Transmission (A1/A2) — Section 14

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission oil	Capacity ℓ (US. qt., Imp. qt)	2.6 (2.7, 2.3) at assembly	
		2.5 (2.6, 2.2) at oil change	
Mainshaft	End play	0.10–0.35 (0.004–0.014)	0.5 (0.02)
	Diameter of needle bearing contact area	28.002–28.015 (1.1024–1.1030)	27.95 (1.100)
	Diameter of third gear contact area	31.984–32.000 (1.2592–1.2598)	31.93 (1.2571)
	Diameter of ball bearing contact area	24.980–24.993 (0.9835–0.9840)	24.93 (0.981)
	Runout	0.04 (0.0016) max.	0.10 (0.004)
Mainshaft third and fourth gears	I.D.	37.009–37.025 (1.4570–1.4577)	37.07 (1.459)
	End play	0.03–0.18 (0.0012–0.0071)	0.3 (0.012)
	Thickness	30.42–30.47 (1.1976–1.1996)	30.3 (1.193)
Mainshaft fifth gear	I.D.	37.009–37.025 (1.4570–1.4577)	37.07 (1.459)
	End play	0.03–0.13 (0.0012–0.0051)	0.3 (0.012)
	Thickness	29.92–29.97 (1.1780–1.1799)	29.8 (1.173)
Countershaft	End play	0.10–0.35 (0.004–0.014)	0.5 (0.02)
	Diameter of needle bearing contact area	33.000–33.015 (1.2992–1.2998)	32.95 (1.297)
	Diameter of ball bearing contact area	24.980–24.993 (0.9835–0.9840)	24.93 (0.981)
	Diameter of low gear contact area	33.984–34.000 (1.3380–1.3386)	33.93 (1.336)
	Runout	0.04 (0.0016)	0.10 (0.004)
Countershaft low gear	I.D.	39.008–39.025 (1.5357–1.5364)	39.07 (1.538)
	End play	0.03–0.08 (0.0012–0.0031)	0.18 (0.007)
Countershaft second gear	I.D.	43.008–43.025 (1.6932–1.6939)	43.07 (1.696)
	End play	0.03–0.10 (0.0012–0.0039)	0.18 (0.007)
	Thickness	30.42–30.47 (1.1976–1.1996)	30.3 (1.193)
Spacer collar (Countershaft second gear)	I.D.	30.98–30.99 (1.2197–1.2201)	31.4 (1.236)
	O.D.	37.989–38.000 (1.4956–1.4961)	37.93 (1.493)
	Length	30.53–30.55 (1.2020–1.2028)	30.51 (1.201)
Spacer collar (Mainshaft fourth and fifth gears)	I.D.	25.002–25.012 (0.9843–0.9847)	25.06 (0.987)
	O.D.	31.989–32.000 (1.2594–1.2598)	31.93 (1.257)
	Length	27.03–27.08 (1.0642–1.0661)	27.01 (1.063)
Reverse idler gear	I.D.	17.016–17.043 (0.6699–0.6710)	17.09 (0.673)
	Gear-to-reverse gear shaft clearance	0.032–0.077 (0.0013–0.0030)	0.15 (0.006)
Synchronizer ring	Ring-to-gear clearance (ring pushed against gear)	0.73–1.18 (0.031–0.046)	0.4 (0.016)
Shift fork	Synchronizer sleeve gear	6.75–6.85 (0.266–0.270)	6.0 (0.24)
	Fork-to-synchronizer sleeve clearance	0.35–0.65 (0.014–0.026)	1.0 (0.04)
Reverse shift fork	End gap	11.8–12.1 (0.46–0.48)	—
	Fork-to-reverse idler gear clearance	0.2–1.0 (0.008–0.039)	1.7 (0.07)
	Groove width	7.05–7.25 (0.278–0.285)	—
	Fork-to-fifth/reverse shift shaft clearance	0.05–0.35 (0.002–0.014)	0.5 (0.02)
Shift arm	Width of groove in shift rod guide	11.8–12.0 (0.46–0.47)	—
	Shift arm-to-shift rod guide clearance	0.05–0.35 (0.002–0.014)	0.8 (0.03)
	Width in shift guide	7.9–8.0 (0.311–0.315)	—
	Shift arm-to-shift guide clearance	0.1–0.3 (0.004–0.012)	0.6 (0.02)
Shift rod guide	I.D.	14.000–14.068 (0.5512–0.5539)	—
	Guide-to-shaft clearance	0.011–0.092 (0.0004–0.0036)	0.15 (0.006)
	O.D.	11.9–12.0 (0.469–0.472)	—
	Guide-to-fifth/reverse shift shaft clearance	0.2–0.5 (0.008–0.020)	0.8 (0.03)
Selector arm	Width	11.9–12.0 (0.469–0.472)	—
	Arm-to-shift rod guide clearance	0.05–0.25 (0.002–0.010)	0.5 (0.02)
	End gap	10.05–10.15 (0.396–0.400)	—
	Arm-to-interlock clearance	0.05–0.25 (0.002–0.010)	0.7 (0.03)
	Arm-to-holder clearance	0.01–0.20 (0.0004–0.0079)	Selection with 5 types of shims

Automatic Transmission (F4: 2000 Engine) — Section 15

Unit: mm (in.)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission oil	Capacity ℓ (US. qt., Imp.qt)	3.0 (3.2, 2.6) at oil change 6.0 (6.3, 5.3) at assembly	
Hydraulic pressure	Line pressure at 2,000 min^{-1} (rpm) in [N] or [P]	834—883 kPa (8.5—9.0 kg/cm², 121—128 psi)	785 kPa (8.0 kg/cm², 114 psi)
	4th, 3rd, 2nd clutch pressure at 2,000 min^{-1} (rpm) in [D3] or [D4]	441—834 kPa (4.5—8.5 kg/cm², 64—121 psi)	392 kPa (4.0 kg/cm², 57 psi) with lever released 736 kPa (7.5 kg/cm², 107 psi) with lever in full throttle position
	1st clutch pressure at 2,000 min^{-1} (rpm) in [D4] 2nd clutch pressure at 2,000 min^{-1} (rpm) in [2]	785—883 kPa (8.0—9.0 kg/cm², 114—128 psi)	785 kPa (8.0 kg/cm², 114 psi)
	Governor pressure at 60 km/h in [D3] or [D4]	* 191—201 kPa (1.75—2.05 kg/cm², 28—29 psi) 211—221 kPa (2.15—2.25 kg/cm², 31—32 psi)	* 186 kPa (1.90 kg/cm², 27 psi) 206 kPa (2.10 kg/cm², 30 psi)
	Throttle pressure A at 1,000 min^{-1} in [D3] or [D4]	* 495—510 kPa (5.05—5.2 kg/cm², 72—74 psi) 485—500 kPa (4.95—5.1 kg/cm², 70—73 psi)	* 490 kPa (5.0 kg/cm², 71 psi) 481 kPa (4.9 kg/cm², 70 psi)
	Throttle pressure B at 1,000 min^{-1} in [D3] or [D4]	834—883 kPa (8.5—9.0 kg/cm², 121—123 psi)	785 kPa (8.0 kg/cm², 114 psi)
Stall speed	Check with car on lever ground	2,500—2,800 min^{-1} (rpm)	—
Clutch	Clutch initial clearance 1st	0.65—0.85 (0.026—0.033)	—
	2nd, 3rd, 4th	0.4—0.6 (0.016—0.024)	—
	Clutch return spring free length	31.0 (1.22)	29.0 (1.14)
	Clutch disc thickness	1.88—2.0 (0.074—0.079)	Until grooves worn out
	Clutch plate thickness	1.95—2.05 (0.077—0.079)	Discoloration
	Clutch end plate thickness Mark 1	2.05—2.10 (0.081—0.083)	
	Mark 2	2.15—2.20 (0.085—0.087)	
	Mark 3	2.25—2.30 (0.089—0.091)	
	Mark 4	2.35—2.40 (0.093—0.094)	
	Mark 5	2.45—2.55 (0.096—0.098)	
	Mark 6	2.55—2.60 (0.100—0.102)	
	Mark 7	2.65—2.70 (0.104—0.106)	
	Mark 8	2.75—2.80 (0.108—0.110)	
	Mark 9	2.85—2.90 (0.112—0.114)	
	Mark 10	2.95—3.00 (0.116—0.118)	Discoloration
Transmission	Diameter of needle bearing contact area on main and stator shaft	22.980—22.993 (0.9047—0.9052)	Wear or damage
	Diameter of needle bearing contact area on mainshaft 2nd gear	35.975—35.991 (1.4163—1.4169)	
	Diameter of needle bearing contact area on mainshaft 4th gear collar	31.975—31.991 (1.2588—1.2594)	
	Diameter of needle bearing contact area on mainshaft 1st gear collar	30.975—30.991 (1.2195—1.2201)	
	Diameter of needle bearing contact area on countershaft (L side)	38.505—38.515 (1.5159—1.5163)	
	Diameter of needle bearing contact area on countershaft 3rd gear	31.975—31.991 (1.2589—1.2595)	
	Diameter of needle bearing contact area on countershaft 4th gear	27.980—27.993 (1.1016—1.1021)	
	Diameter of needle bearing contact area on countershaft reverse gear collar	31.975—31.991 (1.2589—1.2595)	
	Diameter of needle bearing contact area on countershaft L gear collar	31.975—31.991 (1.2589—1.2595)	
	Diameter of needle bearing contact area on reverse idle gear	13.990—14.000 (0.5508—0.5512)	
	Reverse idler shaft holder diameter	14.416—14.434 (0.5676—0.5683)	
	Mainshaft 2nd gear I.D.	41.000—41.016 (1.6141—1.6148)	
	Mainshaft 1st gear I.D.	36.000—36.016 (1.4173—1.4179)	
	Countershaft 4th gear I.D.	33.000—33.016 (1.2992—1.2998)	
	Countershaft 3rd gear I.D.	38.000—38.016 (1.4961—1.4966)	
	Countershaft 2nd gear I.D.	31.000—31.016 (1.2204—1.2210)	
	Countershaft 1st gear I.D.	38.000—38.016 (1.4961—1.4966)	
	Countershaft reverse gear I.D.	38.000—38.016 (1.4961—1.4966)	
	Reverse idle gear I.D.	18.006—18.017 (0.7089—0.7093)	Wear or damage
	Mainshaft 4th gear end play	0.10—0.22 (0.004—0.009)	—
	Mainshaft 2nd gear end play	0.07—0.15 (0.003—0.006)	—
	Mainshaft 1st gear end play	0.08—0.24 (0.003—0.009)	—
	Countershaft 3rd gear end play	0.07—0.15 (0.003—0.006)	—
	Countershaft 2nd gear end play	0.08—0.40 (0.003—0.016)	—
	Reverse idler gear end play	0.05—0.18 (0.002—0.007)	—
	Countershaft reverse gear end play	0.10—0.25 (0.004—0.016)	—
	Reverse gear hub O.D.	51.87—51.90 (2.0421—2.0433)	Wear or damage

* EC, KP and KT types

(cont'd)

Standards and Service Limits (cont'd)

Automatic Transmission (F4: 2000 Engine) — Section 15

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Transmission (cont'd)	Thrust washer thickness			
	Mainshaft 2nd gear	A	3.97–4.00 (0.156–0.157)	—
		B	4.02–4.05 (0.158–0.159)	—
		C	4.07–4.10 (0.160–0.161)	—
		D	4.12–4.15 (0.162–0.163)	—
		E	4.17–4.20 (0.164–0.165)	—
		F	4.22–4.25 (0.166–0.167)	—
		G	4.27–4.30 (0.168–0.169)	—
		H	4.32–4.35 (0.170–0.171)	—
		I	4.37–4.40 (0.172–0.173)	—
	Mainshaft bearing contact area (R side)		2.95–3.05 (0.116–0.120)	Wear or damage
	Mainshaft 1st gear		2.43–2.50 (0.096–0.098)	Wear or damage
	Countershaft 3rd gear	A	2.97–3.00 (0.1169–0.1181)	—
		B	3.02–3.05 (0.1189–0.1201)	—
		C	3.07–3.10 (0.1209–0.1220)	—
		D	3.12–3.15 (0.1228–0.1240)	—
		E	3.17–3.20 (0.1248–0.1260)	—
		F	3.22–3.25 (0.1268–0.1280)	—
		G	3.27–3.30 (0.1287–0.1299)	—
		H	3.32–3.35 (0.1307–0.1319)	—
		I	3.37–3.40 (0.1327–0.1339)	—
	Countershaft 4th gear collar thickness	A	38.97–39.00 (1.5342–1.5354)	—
		B	39.02–39.05 (1.5362–1.5374)	—
		C	39.07–39.10 (1.5382–1.5394)	—
		D	39.12–39.15 (1.5402–1.5413)	—
		E	39.17–39.20 (1.5421–1.5433)	—
		F	39.22–39.25 (1.5441–1.5453)	—
		G	39.27–39.30 (1.5461–1.5472)	—
	Thrust washer thickness (mainshaft 1st gear L side)		1.45–1.50 (0.057–0.059)	1.4 (0.055)
	Mainshaft 1st gear collar length		24.50–24.55 (0.4646–0.9665)	—
	Mainshaft 1st gear collar flange thickness		2.5–2.6 (0.098–0.102)	Wear or damage
	Countershaft reverse gear collar length		12.0–12.05 (0.472–0.474)	—
	Countershaft reverse gear collar flange thickness		2.4–2.6 (0.094–0.102)	Wear or damage
	Countershaft 1st gear collar length		12.0–12.1 (0.472–0.476)	—
	Countershaft 1st gear collar flange thickness		2.4–2.6 (0.095–0.102)	Wear or damage
	Diameter of countershaft one-way clutch contact area		83.339–83.365 (3.2811–3.2821)	Wear or damage
	Diameter of parking gear one-way clutch contact area		66.635–66.695 (2.6234–2.6258)	Wear or damage
	Mainshaft feed pipe O.D. (at 20 mm front end)		6.97–6.98 (0.2744–0.2748)	6.95 (0.2736)
	Countershaft feed pipe O.D. (at 20 mm from end)		7.97–7.98 (0.3138–0.3142)	7.95 (0.31)
	Mainshaft sealing ring 32 mm Thickness		1.980–1.995 (0.0780–0.0785)	1.8 (0.071)
	Mainshaft bushing I.D.		6.018–6.030 (0.2369–0.2374)	6.045 (0.238)
	Mainshaft bushing I.D.		9.000–9.015 (0.3543–0.3549)	9.03 (0.356)
	Countershaft bushing I.D.		8.000–8.015 (0.3150–0.3156)	8.03 (0.316)
	Mainshaft sealing ring groove width		2.025–2.060 (0.0797–0.0811)	2.08 (0.082)
Regulator valve body	Sealing ring contact area diameter		35.000–35.025 (1.3780–1.3789)	35.05 (1.38)
Shifting device and parking brake control	Reverse shift fork thickness		5.9–6.0 (0.232–0.236)	5.4 (0.21)
	Parking brake ratchet pawl		—	Wear or other defect
	Parking gear		—	Wear or other defect
	Throttle cam stopper		18.5–18.6 (0.728–0.732)	—
Servo body	Shift fork shaft bore I.D.	A	14.000–14.005 (0.5512–0.5514)	—
		B	14.006–14.010 (0.5514–0.5516)	—
		C	14.011–14.015 (0.5516–0.5518)	—
	Shift fork shaft valve bore I.D.		37.000–37.039 (1.4567–1.4582)	37.045 (1.4585)
Valve body	Oil pump gear side clearance		0.03–0.05 (0.0012–0.0020)	0.07 (0.003)
	Oil pump gear-to-body clearance	Drive:	0.240–0.265 (0.009–0.010)	—
		Driven:	0.125–0.175 (0.005–0.007)	—
	Stator camshaft needle bearing bore I.D.		27.000–27.021 (1.0630–1.0638)	Wear or damage
	Stator camshaft needle bearing contact and O.D.		29.000–30.013 (1.1417–1.1816)	Wear or damage
	Oil pump driven gear I.D.		14.016–14.034 (0.5518–0.5525)	Wear or damage
	Oil pump shaft O.D.		13.980–13.990 (0.5504–0.5508)	Wear or damage

Automatic Transmission (C9: 1600 Engine) —— Section 15

Unit: mm (in.)

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Transmission oil	Capacity ℓ (US. qt., Imp.qt.)		2.8 (3.0, 2.5) at oil change 5.8 (6.1, 5.1) at assembly	
Hydraulic pressure	Line pressure at 2,000 min⁻¹ (rpm) in [N] or [P]		785–834 kPa (8.0–8.5 kg/cm², 114–121 psi)	736 kPa (7.5 kg/cm², 107 psi)
	4th, 3rd, 2nd clutch pressure at 2,000 min⁻¹ (rpm) in [D3] or [D4]		441–834 kPa (4.5–8.5 kg/cm², 64–121 psi)	392 kPa (4.0 kg/cm², 57 psi) with lever released 736 kPa (7.5 kg/cm², 107 psi) with lever in full throttle position
	1st clutch pressure at 2,000 min⁻¹ (rpm) in [D4] 2nd clutch pressure at 2,000 min⁻¹ (rpm) in [2]		736–834 kPa (7.5–8.5 kg/cm², 107–121 psi)	736 kPa (7.5 kg/cm², 107 psi)
	Governor pressure at 60 km/h in [D3] or [D4]		198–208 kPa (2.02–2.12 kg/cm², 29–30 psi)	193 kPa (1.97 kg/cm², 28 psi)
	Throttle pressure A at 1,000 min⁻¹ (rpm) in [D3] or [D4]		495–510 kPa (5.05–5.20 kg/cm², 72–74 psi)	490 kPa (5.0 kg/cm², 71 psi)
	Throttle pressure B at 1,000 min⁻¹ (rpm) in [D3] or [D4]		735–834 kPa (8.0–8.5 kg/cm², 114–121 pai)	736 kPa (7.5 kg/cm², 107 psi)
Stall speed	*Check with car on lever ground*		*2,600–2,900 min⁻¹ (rpm)*	——
Clutch	Clutch initial clearance	1st	0.4–0.7 (0.016–0.028)	——
		2nd	0.65–0.80 (0.026–0.031)	——
		3rd, 4th	0.4–0.6 (0.016–0.024)	——
	Clutch return spring free length	1st	31.0 (1.22)	28.5 (1.12) ——
		2nd–4th	30.5 (1.20)	28.5 (1.12) ——
	Clutch disc thickness		1.88–2.0 (0.074–0.079)	Until grooves worn out
	Clutch plate thickness		1.95–2.05 (0.077–0.079)	Discoloration
	Clutch end plate thickness	Mark 1	2.3–2.4 (0.091–0.094)	↕
		Mark 2	2.4–2.5 (0.094–0.098)	
		Mark 3	2.5–2.6 (0.098–0.102)	
		Mark 4	2.6–2.7 (0.102–0.106)	
		Mark 5	2.7–2.8 (0.106–0.110)	
		Mark 6	2.8–2.9 (0.110–0.114)	
		Mark 7	2.9–3.0 (0.114–0.118)	
		Mark 8	3.0–3.1 (0.118–0.122)	
		Mark 9	3.1–3.2 (0.122–0.126)	
		Mark 10	3.2–3.3 (0.126–0.130)	Discoloration
Transmission	Diameter of needle bearing contact area on main and stator shaft		19.980–19.983 (0.7866–0.7867)	Wear or damage
	Diameter of needle bearing contact area on mainshaft 2nd gear		35.975–35.991 (1.4163–1.4169)	↕
	Diameter of needle bearing contact area on mainshaft 4th gear collar		31.975–31.991 (1.2588–1.2594)	
	Diameter of needle bearing contact area on mainshaft 1st gear collar		30.975–30.991 (1.2195–1.2201)	
	Diameter of needle bearing contact area on countershaft (L side)		38.505–38.515 (1.5159–1.5163)	
	Diameter of needle bearing contact area on countershaft 3rd gear		31.975–31.991 (1.2589–1.2595)	
	Diameter of needle bearing contact area on countershaft 4th gear		27.980–27.993 (1.1016–1.1021)	
	Diameter of needle bearing contact area on *countershaft reverse gear collar*		29.980–29.993 (1.1803–1.1808)	
	Diameter of needle bearing contact area on countershaft L gear collar		29.980–29.993 (1.1803–1.1808)	
	Diameter of needle bearing contact area on reverse idle gear		13.994–14.000 (0.5509–0.5512)	
	Reverse idler shaft holder diameter		14.416–14.434 (0.5676–0.5683)	
	Mainshaft 2nd gear I.D.		41.000–41.016 (1.6141–1.6148)	
	Mainshaft 1st gear I.D.		36.000–36.016 (1.4173–1.4179)	
	Countershaft 4th gear I.D.		33.000–33.016 (1.2992–1.2998)	
	Countershaft 3rd gear I.D.		38.000–38.016 (1.4961–1.4966)	
	Countershaft 2nd gear I.D.		31.000–31.016 (1.2204–1.2210)	
	Countershaft 1st gear I.D.		35.000–35.016 (1.3779–1.3785)	
	Countershaft reverse gear I.D.		36.000–36.016 (1.4173–1.4179)	
	Reverse idle gear I.D.		18.007–18.020 (0.7086–0.7094)	Wear or damage
	Mainshaft 4th gear end play		0.10–0.22 (0.004–0.009)	——
	Mainshaft 2nd gear end play		0.07–0.15 (0.003–0.006)	——
	Mainshaft 1st gear end play		0.08–0.24 (0.003–0.009)	——
	Countershaft 3rd gear end play		0.07–0.15 (0.003–0.006)	——
	Countershaft 2nd gear end play		0.08–0.40 (0.003–0.016)	——
	Reverse idler gear end play		0.05–0.18 (0.002–0.007)	——
	Countershaft reverse gear end play		*0.10–0.20 (0.004–0.008)*	——
	Reverse gear hub O.D.		51.87–51.90 (2.0421–2.0433)	Wear or damage

(cont'd)

Standards and Service Limits (cont'd)

Automatic Transmission (C9:1600 Engine) — Section 15

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Transmission (cont'd)	Thrust washer thickness			
	Mainshaft 2nd gear	A	3.47—3.50 (0.137—0.138)	——
		B	3.52—3.55 (0.139—0.140)	——
		C	3.57—3.60 (0.141—0.142)	——
		D	3.62—3.65 (0.143—0.144)	——
		E	3.67—3.70 (0.144—0.146)	——
		F	3.72—3.75 (0.146—0.148)	——
		G	3.77—3.80 (0.148—0.150)	——
		H	3.82—3.85 (0.150—0.152)	——
		I	3.87—3.90 (0.152—0.154)	——
	Mainshaft bearing contact area (R side)		2.95—3.05 (0.116—0.120)	Wear or damage
	Mainshaft 1st gear		2.43—2.50 (0.096—0.098)	Wear or damage
	Countershaft 3rd gear	A	2.97—3.00 (0.1169—0.1181)	——
		B	3.02—3.05 (0.1189—0.1201)	——
		C	3.07—3.10 (0.1209—0.1220)	——
		D	3.12—3.15 (0.1228—0.1240)	——
		E	3.17—3.20 (0.1248—0.1260)	——
		F	3.22—3.25 (0.1268—0.1280)	——
		G	3.27—3.30 (0.1287—0.1299)	——
		H	3.32—3.35 (0.1307—0.1319)	——
		I	3.37—3.40 (0.1327—0.1339)	——
	Countershaft 4th gear collar thickness	A	38.97—39.00 (1.5342—1.5354)	——
		B	39.02—39.05 (1.5362—1.5374)	——
		C	39.07—39.10 (1.5382—1.5394)	——
		D	39.12—39.15 (1.5402—1.5413)	——
		E	39.17—39.20 (1.5421—1.5433)	——
		F	39.22—39.25 (1.5441—1.5453)	——
		G	39.27—39.30 (1.5461—1.5472)	——
	Thrust washer thickness (mainshaft 1st gear L side)		1.45—1.50 (0.057—0.059)	1.4 (0.055)
	Mainshaft 1st gear collar length		22.50—22.55 (0.886—0.888)	——
	Mainshaft 1st gear collar flange thickness		2.5—2.6 (0.098—0.102)	Wear or damage
	Countershaft reverse gear collar length		12.00—12.05 (0.472—0.474)	——
	Countershaft reverse gear collar flange thickness		2.45—2.55 (0.096—0.100)	Wear or damage
	Countershaft 1st gear collar length		11.0—11.1 (0.433—0.437)	——
	Countershaft 1st gear collar flange thickness		2.4—2.6 (0.095—0.102)	Wear or damage
	Diameter of countershaft one-way clutch contact area		74.414—74.444 (2.9297—2.9309)	Wear or damage
	Diameter of parking gear one-way clutch contact area		57.755—57.768 (2.2738—2.2743)	Wear or damage
	Mainshaft feed pipe O.D. (at 20 mm from end)		6.97—6.98 (0.2744—0.2748)	6.95 (0.2736)
	Countershaft feed pipe O.D. (at 20 mm from end)		7.97—7.98 (0.3138—0.3142)	7.95 (0.31)
	Mainshaft sealing ring 32 mm Thickness		1.980—1.995 (0.0780—0.0785)	1.8 (0.071)
	Mainshaft bushing I.D.		6.018—6.030 (0.2369—0.2374)	6.045 (0.238)
	Mainshaft bushing I.D.		9.000—9.015 (0.3543—0.3549)	9.03 (0.356)
	Countershaft bushing I.D.		8.000—8.015 (0.3150—0.3156)	8.03 (0.316)
	Mainshaft sealing ring groove width		2.025—2.060 (0.0797—0.0811)	2.08 (0.082)
Regulator valve body	Sealing ring contact area diameter		32.000—32.025 (1.2598—1.2608)	32.05 (1.262)
Shifting device and parking brake control	Reverse shift fork thickness		5.90—6.00 (0.232—0.236)	5.4 (0.21)
	Parking brake ratchet pawl		——	Wear or other defect
	Parking gear		——	Wear or other defect
	Throttle cam stopper		18.5—18.6 (0.728—0.732)	——
Servo body	Shift fork shaft bore I.D.	A	14.000—14.005 (0.5512—0.5514)	——
		B	14.006—14.010 (0.5514—0.5516)	——
		C	14.011—14.015 (0.5516—0.5518)	——
	Shift fork shaft valve bore I.D.		37.000—37.039 (1.4567—1.4582)	37.045 (1.4585)
Valve body	Oil pump gear side clearance		0.03—0.05 (0.0012—0.0020)	0.07 (0.003)
	Oil pump gear-to-body clearance	Drive:	0.240—0.265 (0.009—0.010)	——
		Driven:	0.125—0.175 (0.005—0.007)	——
	Stator camshaft needle bearing bore I.D.		24.000—24.021 (0.9449—0.9457)	Wear or damage
	Stator camshaft needle bearing contact and O.D.		26.000—26.013 (1.0236—1.0241)	Wear or damage
	Oil pump driven gear I.D.		14.016—14.034 (0.5518—0.5525)	Wear or damage
	Oil pump shaft O.D.		13.980—13.990 (0.5504—0.5508)	Wear or damage

Unit: mm (in.)

Differential — Section 16

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Ring gear	Backlash	0.085—0.149 (0.0033—0.0059)	0.2 (0.0079)
Differential carrier	Pinion shaft bore diameter	18.000—18.018 (0.7087—0.7094)	18.1 (0.71)
	Carrier-to-pinion shaft clearance	0.016—0.052 (0.0006—0.0020)	0.1 (0.004)
	Driveshaft bore diameter	28.000—28.021 (1.1024—1.1032)	—
		*1 26.000—26.021 (1.0236—1.0244)	—
	Carrier-to-driveshaft clearance	0.025—0.066 (0.0010—0.0026)	0.12 (0.005)
	Side clearance	0.10—0.20 (0.004—0.008)	0.15 (0.006)
Differential pinion gear	Backlash	0.05—0.15 (0.002—0.006)	Selection with 8 types of washers
	Pinion gear bore diameter	18.041—18.061 (0.7103—0.7111)	—
	Pinion gear-to-pinion shaft clearance	0.057—0.093 (0.0022—0.0037)	0.15 (0.006)

*1 A1 Transmission only

Driveshaft — Section 17

	MEASUREMENT			STANDARD (NEW)	SERVICE LIMIT
Driveshaft	Right boot	As installed		506.0—510.5 (19.9—20.1)	—
	Left boot	As installed	MT	805.0—809.5 (31.7—31.9)	—
			AT	812.0—816.5 (32.0—32.1)	—

Steering — Section 18

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Steering wheel	Play		10 (0.39) Max.	—
			15 (1.5, 3.31) Max	
	Steering assist N (kg, lb)	P/S	18 (1.8, 3.97) Max	
Power steering	Pump pressure with valve closed (Oil temp./ speed: 40°C (104°F) min/idle. Do not run for more than 5 seconds) kPa (kg/cm², psi)		7845—8826 (80—90, 1138—1280)	
	Fluid capacity	Reservoir	0.5ℓ (0.53 US. qt., 0.44 Imp. qt.)	—
		At change	approx 1.7ℓ (1.8 US. qt., 1.5 Imp. qt.)	—

Suspension — Section 19

	MEASUREMENT			STANDARD (NEW)		SERVICE LIMIT
Wheel alignment				Front	Rear	
	Camber			0° 00' ± 1°	0° 00' ± 1°	
	Caster			0°31'± 1°		
	Toe-in			0 ± 3 (0 ± 0.118)	0 ± 2 (0 ± 0.079)	
	Kingpin inclination			6° 50'		
	Steering angle	R/L	Inside	39°30'		
			Outside	30°30'		
Wheel	Rim runout	Steel	Axial	0—1.0 (0—0.039)		—
			Radial	0—1.0 (0—0.039)		—
		Aluminum	Axial	0—0.7 (0—0.028)		—
			Radial	0—0.07 (0—0.003)		—
Wheel bearing	Front wheel bearing axial play			0—0.05 (0—0.002)		—
	Rear wheel bearing axial play			0—0.05 (0—0.002)		—

(cont'd)

Standards and Service Limits (cont'd)

Unit: mm (in.)

Brake — Section 20

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Parking brake lever	Play in stroke 200N (20 kg, 44 lbs)		To be locked when pulled 7—11 notches	
Foot brake pedal	Pedal height		205 (8.1) from floor	—
	Free play		1—5 (0.04—0.20)	5 (0.20)
Master cylinder	Piston-to-push rod clearance		0—0.4 (0.016)	—
		with ALB	0—0.6 (0—0.024)	—
Brake drum	I.D.		200.0 (7.87)	201.0 (7.91)
Lining	Thickness		4.5 (0.18)	2.0 (0.08)
Disc brake	Disc thickness	Front	19.0 (0.75)	17.0 (0.67)
		Rear	10.0 (0.39)	8 (0.31)
	Disc runout	Front/Rear	—	0.10 (0.004)/0.15 (0.006)
	Disc parallelism		—	0.015 (0.0006)
	Pad thickness	Front	11.0 (0.43)	3.0 (0.12)
		Rear	8.0 (0.31)	1.6 (0.06)

		Vacuum (mm Hg)	Pedal Pressure kg (lbs)	Line Pressure kPa (kg/cm², psi)	
				8" Booster	9" Booster
Brake booster	Characteristics	0	20 (44)	1.304 (13.3, 189.1) min	1.177 (12.0, 170.6) min
		300	20 (44)	4.501 (45.9, 652.7) min	4.766 (48.6, 691.1) min
		500	20 (44)	6.629 (67.6, 961.3) min	7.149 (72.9, 1,036.6) min

Engine Electrical — Section 24

	MEASUREMENT		STANDARD (NEW)		
Ignition coil	Rated voltage		12 Volts		
	Insulation resistance		10,000 ohms min.		
	Performance: Make sure strong sparks jump across electrodes (3-point tester)				
	Voltage	Camshaft	Secondary Voltage	3-point gap	Condition
	6V	75 min⁻¹ (rpm)	30 ± 4 kV	15—21 mm (0.59—0.83)	
	12V	3,000 min⁻¹ (rpm)	22 ± 4 kV	13—19 mm (0.51—0.75)	At 80°C (176°F)
Ignition wire	Resistance		25,000 ohms max.		
Spark plug	Type	Standard	See page 24-6		
	Gap		1.0—1.1 (0.039—0.043)		
Ignition timing			See page 24-4		
Battery	Lighting capacity (20-hour ratio)		47 Ampere Hours		
	Starting capacity (5-second ratio)		8.4 V minimum at 300 Ampere draw		
Alternator	Output at no-load		14 V at 1,000 min⁻¹ (rpm) max.		
	Output		14V/65A at 5,500 min⁻¹ (rpm) max.		
	Coil resistance (rotor)		2.8—3.0 ohms		± 0.1 ohms
	Slip ring O.D.		32.5 (1.28)		32.1 (1.26)
	Brush length		10.5 (0.41)		5.5 (0.22)
	Brush spring tension		300—500 g (10.6—18.6 oz)		—

Starting motor		1.0 KW, 1.4 KW (ND)		1.0 KW, 1.4 KW (MITSUBA)	
	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT	STANDARD (NEW)	SERVICE LIMIT
	Mica depth	0.4—0.8 (0.016—0.031)	0.2 (0.008)	0.4—0.5 (0.016—0.020)	0.15 (0.006)
	Commutator runout	0—0.02 (0.001)	0.05 (0.02)	0—0.02 (0.001)	0.05 (0.002)
	Commutator O.D.	30.0 (1.18)	29.0 (1.14)	28.0 (1.10)	27.5 (1.08)
	Brush length	1.0 KW: 12.5—13.5 (0.49—0.53) 1.4 KW: 14.5—15.5 (0.57—0.61)	8.5 (0.33) 10.0 (0.39)	14.3—14.7 (0.56—0.58)	9.3 (0.37)
	Spring pressure (new)	1.75 kg (3.8 lb)	—	2.1 kg (4.6 lb)	—

Design Specifications

European Model

	ITEMS		METRIC	ENGLISH	NOTE
DIMENSION	Overall length	3D	4,335 mm	170.6 in.	KW: 4,365 mm
		4D	4,535 mm	178.5 in.	KW: 4,565 mm
	Overall width		1,695 mm	66.7 in.	
	Overall height	3D	1,335 mm	52.6 in.	
		4D	1,355 mm	53.3 in.	
	Wheel base		2,600 mm	102.4 in.	
	Tread	Front	1,480 mm	58.3 in.	
		Rear	1,475 mm	58.1 in.	
	Ground clearance		160 mm	6.3 in.	
	Seating Capacity	(F/R)	5(2/3)		
WEIGHT	Curb weight				
	(5–MT)	3D EX (A20A2)	1,065 kg	2348 lb.	KF, KG, KB, KW
			1,030 kg	2271 lb.	Holland
			1,085 kg	2392 lb.	KX
			1,070 kg	2359 lb.	SF
			1,095 kg	2414 lb.	KS
			1,075 kg	2370 lb.	KE
		3D EXi (A20A4)	1,100 kg	2425 lb.	KF, KG, KB, KX
			1,050 kg	2315 lb.	Holland
			1,110 kg	2447 lb.	SF
			1,120 kg	2469 lb.	KS
			1,105 kg	2436 lb.	KE
		4D STD (A16A1)	1,050 kg	2315 lb.	KG, KB, KW, SF
			1,020 kg	2249 lb.	Holland
		4D LX (A20A2)	1,060 kg	2337 lb.	KG, KB, KW, SF
			1,030 kg	2271 lb.	Holland
			1,065 kg	2348 lb.	KX
			1,075 kg	2370 lb.	KS
		4D EX (A20A2)	1,085 kg	2392 lb.	KF, KG, KB, KE
			1,095 kg	2414 lb.	KG, KW
			1,050 kg	2315 lb.	Holland
			1,100 kg	2425 lb.	KX, SF
			1,105 kg	2436 lb.	Swiss, Austria
			1,120 kg	2469 lb.	AUSTOLY KS
		4D EXi (A20A4)	1,105 kg	2436 lb.	KF, KG, KB
			1,070 kg	2205 lb.	Holland
			1,120 kg	2469 lb.	KX, SF, KS
			1,115 kg	2458 lb.	KW, KE
	(4–AT)	3D EX (A20A)	1,085 kg	2392 lb.	KF, KG, KB, KW
			1,040 kg	2293 lb.	Holland
			1,105 kg	2436 lb.	KX
			1,090 kg	2403 lb.	SF
			1,115 kg	2458 lb.	KS
			1,095 kg	2414 lb.	KE
		3D EXi (A20A4)	1,120 kg	2469 lb.	KF, KG, KB, KX, KW
			1,130 kg	2491 lb.	SF
			1,140 kg	2513 lb.	KS
			1,125 kg	2480 lb.	KE

(cont'd)

Design Specifications (cont'd)

European Model (cont'd)

ITEMS				METRIC	ENGLISH	NOTE
WEIGHT (cont'd)	(4—AT)	4D	STD (A16A1)	1,060 kg	2337 lb.	KG, KB, KW, SF
			LX (A20A2)	1,080 kg	2381 lb.	KG, KB, KW, SF
				1,045 kg	2304 lb.	Holland
				1,085 kg	2392 lb.	KX
				1,095 kg	2414 lb.	KS
			EX (A20A2)	1,105 kg	2436 lb.	KF, KG, KB, KE
				1,115 kg	2458 lb.	KG, KW
				1,065 kg	2348 lb.	Holland
				1,120 kg	2469 lb.	KX, SF
				1,125 kg	2480 lb.	Swiss, Austria
				1,140 kg	2513 lb.	KS
			EXi (A20A4)	1,125 kg	2480 lb.	KF, KG, KB
				1,140 kg	2513 lb.	KX, SF, KS
				1,135 kg	2502 lb.	KW, KE
	Weight Distribution (Fr/Rr)					
	(5—MT)	3D	EX (A20A2)	645/420 kg	1422/926 lb	KF, KG, KB, KW
				665/420 kg	1466/926 lb.	KX
				650/420 kg	1433/926 lb.	SF
				670/425 kg	1477/937 lb.	KS
				655/420 kg	1444/926 lb.	KE
		3D	EXi (A20A4)	665/435 kg	1466/959 lb.	KF, KG, KB, KX
				675/435 kg	1488/959 lb.	SF
				680/440 kg	1499/992 lb.	KS
				670/435 kg	1447/959 lb.	KE
		4D	STD (A16A1)	625/425 kg	1378/937 lb.	KG, KB, KW, SF
		4D	LX (A20A2)	635/425 kg	1400/937 lb.	KG, KB, KW, SF
				655/440 kg	1444/992 lb.	KW
				640/425 kg	1411/937 lb.	KX
				640/435 kg	1411/959 lb.	KS
		4D	EX (A20A2)	650/435 kg	1433/959 lb.	KF, KG, KB, KE
				660/435 kg	1455/959 lb.	KG, KW
				660/440 kg	1455/970 lb.	KX, SF
				665/440 kg	1466/970 lb.	SWISS, AUSTRIA
				680/440 kg	1499/970 lb.	KS
		4D	EXi (A20A4)	660/445 kg	1455/981 lb.	KF, KG, KB
				670/450 kg	1477/992 lb.	KX, SF, KS
				665/450 kg	1466/992 lb.	KW, KE
	(4—AT)	3D	EX (A20A2)	665/420 kg	1466/926 lb.	KF, KG, KB, KW
				685/420 kg	1510/926 lb.	KX
				670/420 kg	1477/926 lb.	SF
				690/425 kg	1521/937 lb.	KS
				675/420 kg	1466/926 lb.	KE
		3D	EX (A20A4)	685/435 kg	1510/959 lb.	KF, KG, KB, KX, KW
				695/435 kg	1532/959 lb.	SF
				700/440 kg	1543/970 lb.	SF
				690/435 kg	1521/959 lb.	KE
		4D	LX (A16A1)	635/425 kg	1400/937 lb.	KG, KB, KW, SF
		4D	LX (A20A2)	655/425 kg	1446/937 lb.	KG, KB, KW, SF
				660/425 kg	1455/937 lb.	KX
				675/440 kg	1466/992 lb.	KW
				660/435 kg	1455/959 lb.	KS

	ITEMS		METRIC	ENGLISH	NOTE
WEIGHT (cont'd)	EX (A20A2)		670/435 kg	1477/959 lb.	KF, KG, KB, KE
			680/435 kg	1499/959 lb.	KG, KW
			680/440 kg	1499/992 lb.	KX, SF
			685/440 kg	1510/992 lb.	SWISS, AUSTRIA
			700/440 kg	1543/992 lb.	KS
	EXi (A20A4)		680/445 kg	1499/981 lb.	KF, KG, KB
			690/450 kg	1521/992 lb.	KX, SF, KS
			685/450 kg	1510/992 lb.	KW, KE
	Max. Loaded Vehicle Weight (ADR)	5–MT	1,570 kg	3,462 lb.	
		4–AT	1,585 kg	3,495 lb.	
	Max. Permissible Weight (EC)	2000	1,660 kg	3,660 lb.	
		1600	1,580 kg	3,484 lb.	
ENGINE	Type		Water cooled, gasoline fueled, 4-cycle OHC		
	Cylinder arrangement		4-cylinder in-line transverse		
	Bore and Stroke	1600	80.0 x 79.5 mm	3.15 x 3.13 in.	
		2000	82.7 x 91.0 mm	3.25 x 3.58 in.	
	Displacement	1600	1.598 cm^3	97.8 cuin	
		2000	1.955 cm^3	119 cuin	
	Compression Ratio		A16A1: 9.0		
			A20A1, A20A2: 9.2, KX: 9.1		
			A20A4: 9.4, KS: 8.9, KX and KG (with Cata): 8.8		
	Valve Train		Trochoid Pump		
	Fuel Required		Regular gasoline with 91 RON (Research Octane Number) or higher Super/Premium gasoline with 97 RON (Research Octane Number) or higher.		
TRANS-MISSION	Clutch	4–AT	Three element, one strage, two phase		
		5–MT	Single dry plate, diaphragm spring		
	Transmission	4–AT	Torque converter with lock up clutch		
		5–MT	Synchromesh 5 forward speeds, 1 reverse		

		1.6ℓ KW	KB,KE,KF KG, KW	KS, KX
Primary Reduction		1.000	1.000	1.000	1.000
Gear Ratio	I	3.181	<2.421>	<2.529>	<2.529>
< > : 4–AT	II	1.842	<1.560>	<1.481>	<1.481>
	III	1.250	<0.969>	<1.060>	<1.030>
	IV	0.937	<0.729>	<0.743>	<0.700>
	V	0.711	–	–	–
	Reverse	3.000	<1.954>	<1.904>	<1.904>
	Final	4.066	<3.933>	<4.066>	<4.066>

Clutch Facing Area (2.0ℓ)	1600	160 cm^2	24.8 sq. in.	
	2000	176 cm^2	27.3 sq. in.	
STEERING SYSTEM	Type	Rack and Pinion Integral		
	Power Steering	Power assisted Rack and Pinion integral		
Overall Ratio		19.4		
	Power Steering	16.0		
Turns, lock-to-lock		3.78		
	Power Steering	3.11		
Steering Wheel Dia.		375 mm	14.76	
Power Steering Oil Tank Capacity		1.4ℓ	1.2 Imp. pt., 1.5 US pt.	
Power Steering Oil		Honda Genuine power steering fluid		
SUSPENSION SYSTEM	Type, F	Duble Wishbone		
	Type, R	Duble Wishbone		
	Shock Absorber F/R	Telescopic hydraulic		

(cont'd)

Design Specifications (cont'd)

European Model (cont'd)

	ITEMS		METRIC	ENGLISH	NOTE
WHEEL ALIGNMENT	Wheel Alignment				
	Camber	Front	0°		
		Rear	0°		
	Caster	Front	0°30'		
	Toe	Front	0 mm	0.0 in.	
		Rear	0 mm	0.0 in.	
BRAKE SYSTEM	Type, F		Self-adjusting power assisted disc brake type		
	Type, R		Drum *1		*1 Disc for EX 2.0ℓ and cans equipped with Anti-Lock Brake.
	Lining Surface Area F/R		43.3/21 (disc) 67.2 (drum) cm²		
	Effective Disc Dia.		208 mm		
	Effective Brake Drum I.D.		200 mm	7.9 in	
	Parking Brake Type		Mechanical expanding, Rear two wheel brakes*2		*2 Machanical to rear disc for equipped with Disc Brake.
TIRES	F/R		165SR13, 185/70HR13		
		Spare	T105/80D13, T135/70D15		For cars equipped with Anti-Lock Brake <Except for KE>
ELECTRICAL SYSTEM	Battery		12V–50AH (Cold cranking current –17.7°C [0°F] 410A)		
	Starting Motor		12V–1.0/1.4KW		
	Generator		12–65AH		
	Fuses		7.5A, 10A, 15A, 20A, 30A		
	Main Fuse		70A, 40A		
	Headlights		12V–60/55W		
	Turn signal lights	Front	12V–21W		
		Rear	12V–21W		
		Side	12V–5W		
	License Plate Lights		12V–5W		
	Back-up Lights		12V–21W		
	Stop Lights		12V–21W		
	Tail Lights		12V–5W		
	Rear Fog Light		12V–21W		
SERVICE DATA (Engine)	Ignition Timing	4–AT	20°BTDC A16A1 10°BTDC A20A2 10°BTDC A20A2 10°BTDC A20A2 15°BTDC A20A4		
		5–MT	20°BTDC A20A2 5°BTDC KX 10°BTDC KS 15°BTDC		
		4–AT	10°BTDC A20A4		
		5–AT	10°BTDC KS		
	Valve Timing	IN open	10°ATDC A16A1 10°ATDC A20A1 (10°ATDC (No.1) / 35°ATDC (No.2)) A20A2 KX 5MT		
		IN close	30°ABDC A16A1 35°ABDC A20A1 35°ATDC (No.2) A20A2 KX 5MT		
		EX open	35°BBDC A16A1 40°BBDC A20A2 40°BBDC A20A2 KX 5MT		
		EX close	10°BTDC A16A1 5°BTDC A20A1 10°BTDC A20A2 KX 5MT		
		IN open	10°ATDC A20A4 (10°ATDC (No.1) / 20°ATDC (No.2)) A20A4 KX 5°ATDC A20A4 KS, 4AT		
		IN close	35°ABDC A20A4 35°ABDC A20A4 KX 35°ABDC A20A4 KS, 4AT		
		EX open	40°BBDC A20A4 40°BBDC A20A4 KX 40°BBDC A20A4 KS, 4AT		
		EX close	10°BTDC A20A4 10°BTDC A20A4 KX 5°BTDC A20A4 KS, 4AT		
	Spark plug		NGK	ND	
			BPR6ES-11, BPR6EY-11	W20EPR-U11, W20EXR-U11	
			BPR5ES-11, BPR5EY-11	W16EPR-U11, W16EXR-U11	
			BPR7ES-11, BPR7EY-11	W22EPR-U11, W22EXR-U11	
	Spark Plug Gap		1.0–1.1 mm	0.039–0.043 in.	

	ITEMS		METRIC	ENGLISH	NOTE
SERVICE DATA (Engine) (cont'd)	Idling Speed (with headlights off and cooling fan off.)	4—AT	700 ± 50 min^{-1} (rpm)		
		5—MT	750 ± 50 min^{-1} (rpm)		
	Fuel Tank Capacity/Remaining Gasoline Capacity		60ℓ	13.2 Imp. gal. 15.9 US gal.	
	Coolant Capacity/Adding Coolant				
	4—AT	A16A1	5.5ℓ	4.8 Imp.qt., 5.8 US qt.	
		A20A1, A20A2	6.2ℓ	6.2 Imp.qt., 6.6 US qt.	
		A20A4	6.3ℓ	6.3 Imp.qt., 6.7 US qt.	
	5—MT	A16A1	5.6ℓ	4.9 Imp.qt., 5.9 US qt.	
		A20A1, A20A2	5.6ℓ	4.9 Imp.qt., 5.9 US qt.	
		A20A4	5.7ℓ	5.7 Imp.qt., 6.0 US qt.	
	Alternator Belt Tension (Applied load)		6—9 mm (98N, 10 kg)	0.2—0.4 in. (22 lb.)	
	Valve Clearance (Cold)		IN 0.12—0.17	0.005—0.007	
			EX 0.25—0.30	0.010—0.012	
	Compression Pressure	A20A4 Except KS, KX	1,225 kPa (12.5 kg/cm^2, 178 psi) at 250 min^{-1} (rpm)		
		Others	1,177 kPa (12.0 kg/cm^2, 170 psi) at 250 min^{-1} (rpm)		
	Engine Oil		4.0ℓ	3.5 Imp.qt., 4.2 US qt.	
	Manual Transmission Oil		2.6ℓ	2.3 Imp.qt., 2.7 US qt.	
	Automatic Transmission Fluid		DEXRON®	5.3 Imp.qt., 6.3 US qt.	
	Automatic Oil Capacity	2000	6.0 ℓ	5.1 Imp.qt., 6.1 US qt.	
		1600	5.8 ℓ		
(Chassis)	Brake Fluid		DOT 3 or 4 Type SAE J1703		
	Brake Pedal Free Play		1—5 mm	0.04—0.20 in.	
	Brake Pedal-to Floor Clearance		205 mm	8.4 in.	
	Brake Pad Wearing Limit (Fr and Rr)		3.0 mm	0.12 in	
	Brake Shoe Wearing Limit (Rr)		2.0 mm	0.08 in.	
	Clutch Pedal Free Play		15—25 mm	0.59—0.98 in.	

(cont'd)

Design Specifications (cont'd)

KQ Model

NOTE:Only the design specifications for models below different from those of the European model are listed. For the other items not given here, refer to the European Model design specification.

	ITEMS			METRIC	ENGLISH	NOTE
DIMENSION	Curb Weight					
	(5—MT)	3D	STD	1,070 kg	2,359 lb.	
			EX	1,090 kg	2,403 lb.	
		4D	STD	1,105 kg	2,436 lb.	
			EX	1,120 kg	2,469 lb.	
			EX(SR)	1,140 kg	2,513 lb.	(SR): Sunroof
	(4—AT)	3D	STD	1,085 kg	2,392 lb.	
			EX	1,105 kg	2,486 lb.	
		4D	STD	1,120 kg	2,469 lb.	
			EX	1,135 kg	2,502 lb.	
			EX(SR)	1,155 kg	2,546 lb.	
	Weight Distribution (F/R)					
	(5—MT)	3D	STD	655/415 kg	1,444/915 lb.	
			EX	670/420 kg	1,477/926 lb.	
		4D	STD	665/440 kg	1,466/970 lb.	
			EX	675/445 kg	1,488/981 lb.	
			EX(SR)	685/455 kg	1,510/1,003 lb.	
		3D 4—AT	STD	670/415 kg	1,477/915 lb.	
			EX	685/420 kg	1,510/926 lb.	
		4D	STD	680/440 kg	1,499/970 lb.	
			EX	690/445 kg	1,521/981 lb.	
			EX(SR)	700/455 kg	1,543/1,003 lb.	
ENGINE	Compression ratio			9.1 : 1		
TRANS-MISSION	Gear Ratio		I	3.181 <2.529>		
	< >: 4AT		II	1.842 <1.481>		
			III	1.250 <1.060>		
			IV	0.937 <0.743>		
			V	0.771 ———		
			Reverse	3.000 <1.904>		
			Final	4.066 <4.066>		
TIRES	Tire size F/R			185/70 R13 86T 165SR13 (STD)		
ELECTRICAL SYSTEM	Starting Motor			12V—1.0KW		
	Battery			12V—40AH		
SERVICE DATA (Engine)	Idling Speed (with headlight on and cooling fan off)		4—AT	15° ± 2° BTDC 750 ± 50 min^{-1} (rpm)		
			5—MT	20° ± 2° BTDC 750 ± 50 min^{-1} (rpm)		
SERVICE DATA	Idling Speed (with headlights on and cooling fan off)			10° ± 2° BTDC 750 ± 50 min^{-1} (rpm) 10° ± 2° BTDC 750 ± 50 min^{-1} (rpm)		

NOTE: Only the design specifications for models below different from those of the European model are listed. For the other items not given here, refer to the European Model design specification.

	ITEMS			METRIC	ENGLISH	NOTE
DIMENSION	Ground Clearance			170 mm	6.7 in.	KY
	Curb weight					
	(5–MT)	3D (A20A2)	STD	1,060 kg	2,337 lb.	
			EX	1,080 kg	2,381 lb.	with P/S,P/W — KP,KT KU
			EX	1,130 kg	2,491 lb.	with P/S,P/W,A/C — KY
			EXR	1,140 kg	2,513 lb.	with P/S,P/W,A/C — KY
		4D (A16A1)	STD	1,048 kg	2,310 lb.	
			EX	1,068 kg	2,354 lb.	with P/S,P/W — KT
			EX	1,086 kg	2,394 lb.	with P/S,P/W,S/R — KT
		4D (A20A2)	STD	1,060 kg	2,337 lb.	
			EX	1,085 kg	2,392 lb.	with P/S,P/W — KP, KT, KU
			EX	1,103 kg	2,432 lb.	with P/S,P/W,S/R — KP, KT, KU
			GL	1,130 kg	2,491 lb.	with P/S,A/C — KY
			EX	1,140 kg	2,513 lb.	with P/S,P/W,A/C — KY
			EX	1,160 kg	2,557 lb.	with P/S,P/W,S/R, A/C — KY
			EXR	1,170 kg	2,579 lb.	with P/S,P/W,S/R, A/C — KY
	(4–AT)	3D (A20A2)	STD	1,075 kg	2,370 lb.	
			EX	1,095 kg	2,414 lb.	with P/S,P/W — KP,KT, KU
			EX	1,150 kg	2,535 lb.	with P/S,P/W,A/C — KY
			EXR	1,160 kg	2,557 lb.	with P/S,P/W,S/R, A/C — KY
		4D (A16A1)	STD	1,058 kg	2,332 lb.	
			EX	1,078 kg	2,376 lb.	with P/S,P/W — KT
			EX	1,096 kg	2,416 lb.	with P/S,P/W,S/R — KT
		4D (A20A2)	STD	1,080 kg	2,381 lb.	
			EX	1,105 kg	2,436 lb.	with P/S,P/W — KP KT KU
			EX	1,123 kg	2,476 lb.	with P/S,P/W,S/R — KP KT KU
			GL	1,150 kg	2,535 lb.	with P/S,A/C — KY
			EX	1,160 kg	2,557 lb.	with P/S,P/W,A/C — KY
			EX	1,180 kg	2,601 lb.	with P/S,P/W,S/R, A/C — KY
			EXR	1,190 kg	2,623 lb.	with P/S,P/W,S/R, A/C
	Weight Distribution (Fr/Rr)					
	(5–MT)	3D (A20A2)	STD	645/415 kg	1,422/915 lb.	
			EX	660/420 kg	1,455/926 lb.	with P/S,P/W — KP KT KU
			EX	690/440 kg	1,521/970 lb.	with P/S,P/W — KP KT KU
			EXR	695/445 kg	1,532/981 lb.	with P/S,P/W,A/C — KP KT KU
		4D (A16A1)	STD	625/324 kg	1,378/932 lb.	
			EX	640/428 kg	1,411/943 lb.	with P/S,P/W
			EX	649/437 kg	1,431/963 lb.	with P/S,P/W,S/R

(cont'd)

Design Specifications (cont'd)

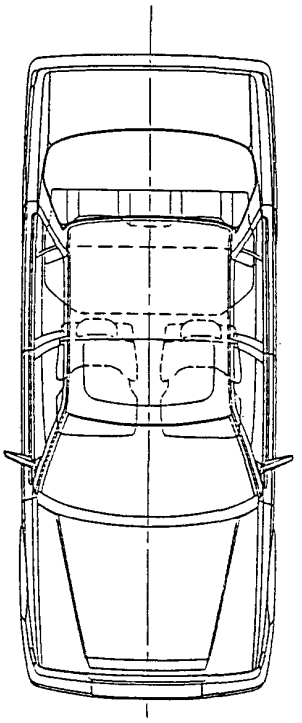
General Export Model

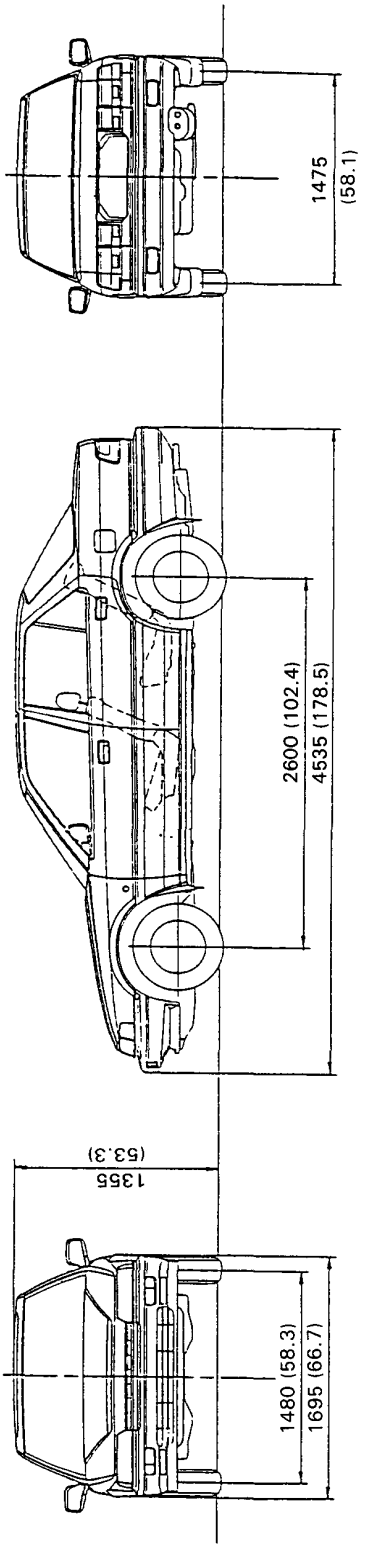
	ITEMS			METRIC	ENGLISH	NOTE
DIMENSION (cont'd)	Weight Distribution					
		4D (A20A4)	STD	635/425 kg	1,400/937 lb.	
			EX	650/435 kg	1,433/959 lb.	with P/S,P/W } KP, KT
			EX	659/444 kg	1,453/979 lb.	with P/S,P/W,S/R } KU
			GL	690/440 kg	1,521/970 lb.	with P/S,A/C
			EX	695/445 kg	1,532/981 lb.	with P/S,P/W,A/C
			EX	705/455 kg	1,554/1,003 lb.	with P/S,P/N,S/R, A/C } KY
			EXR	710/460 kg	1,565/1,014 lb.	with P/S,P/W,S/R, A/C
	(4–AT)	3D (A20A2)	STD	660/415 kg	1,445/915 lb.	
			EX	675/420 kg	1,488/926 lb.	with P/S,P/W } KP,KT, KU
			EX	710/440 kg	1,565/970 lb.	with P/S,P/W,A/C
			EXR	715/445 kg	1,576/981 lb.	with P/S,P/W,A/C
		4D (A16A1)	STD	635/423 kg	1,400/932 lb.	
			EX	650/428 kg	1,433/943 lb.	with P/S,P/W } KT
			EX	659/437 kg	1,453/963 lb.	with P/S,P/W,S/R } KT
		4D (A20A2)	STD	655/425 kg	1,444/937 lb.	
			EX	670/435 kg	1,477/959 lb.	with P/S,P/W } KP, KT
			EX	679/444 kg	1,497/979 lb.	with P/S,P/W,S/R } KU
			GL	710/440 kg	1,565/970 lb.	with P/S,A/C
			EX	715/445 kg	1,576/981 lb.	with P/S,P/W,A/C
			EX	725/455 kg	1,598/1,003 lb.	with P/S,P/W,S/R A/C } KY
			EXR	730/460 kg	1,609/1,104 lb.	with P/S,P/W,S/R, A/C
ENGINE	Compression Ratio			A20A2: 9.2:1		
TRANS-MISSION	Gear Ratio		I	3.181 <2.529> (2.421)		
			II	1.842 <1.481> (1.560)		
			III	1.250 <1.060> (0.969)		
	< >: 4AT with 2000		IV	0.937 <0.743> (0.729)		
			V	0.771 —— ——		
	( ): 4AT with 1600		Reverse	3.000 <1.904> (1.954)		
			Final	4.066 <4.066> (3.933)		
TIRES	Tire Size F/R Sedan		STD 1600 EX Others	165SR13 185/70SR13 185/70HR13		KY:GL
ELECTRICAL SYSTEM	Battery			12V–40AH		
	Starting Motor			12V–1.0W		

Body Specifications

4 D Sedan

Unit: mm (in)

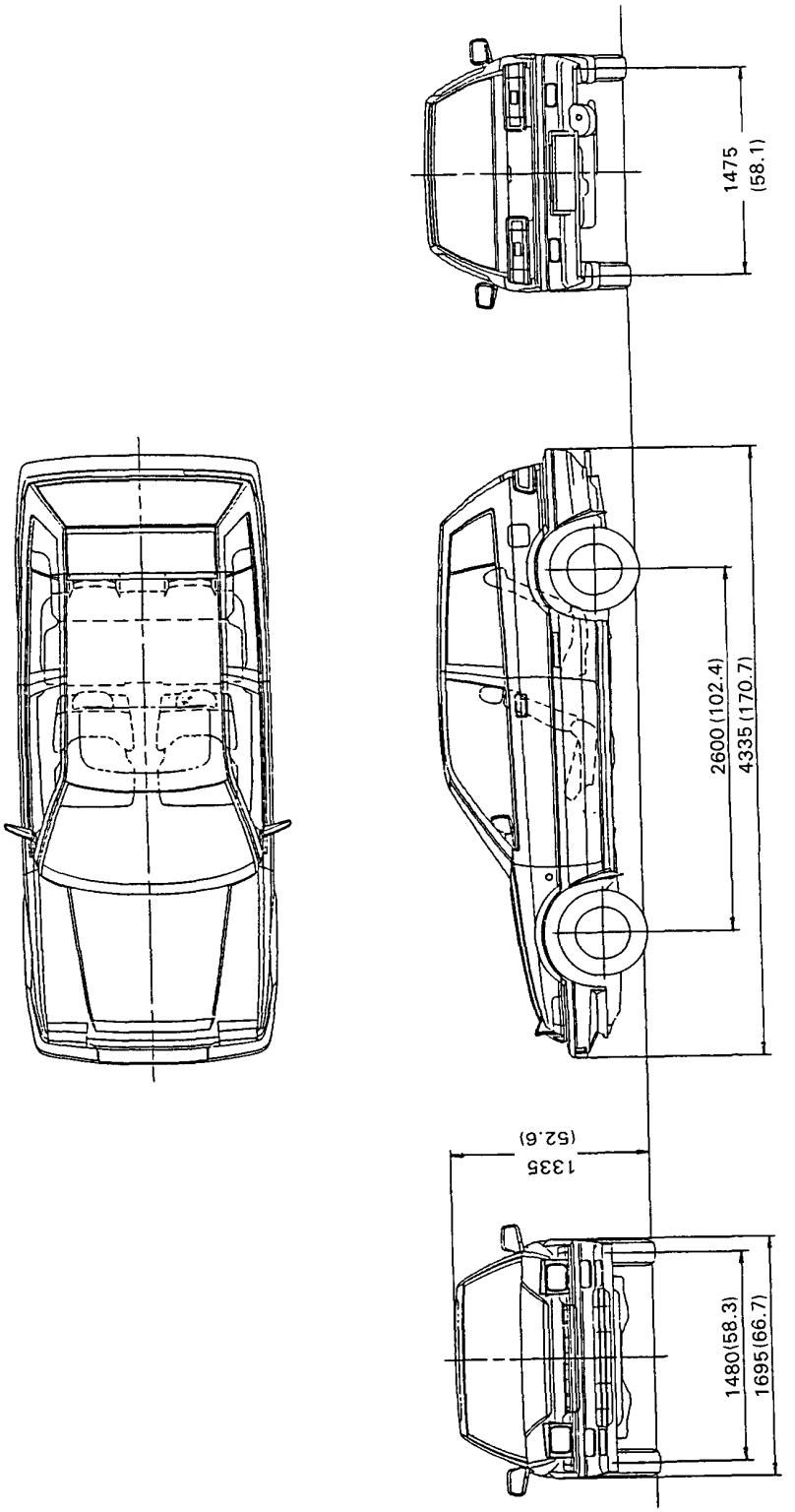




Body Specifications

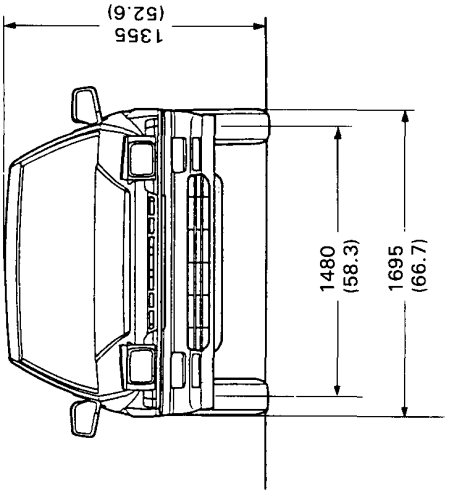
Aerodeck

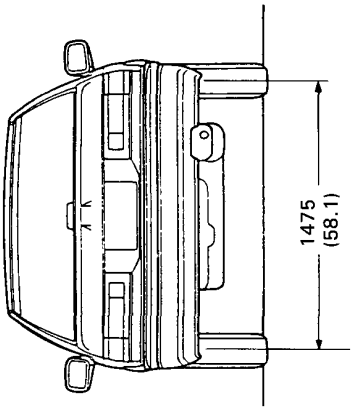
Unit: mm (in.)

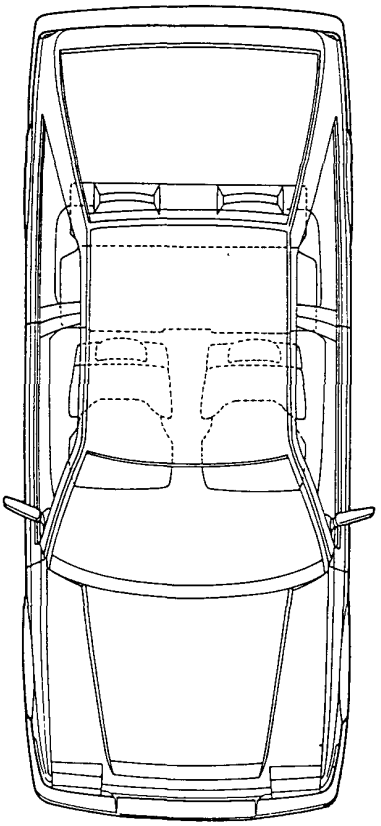


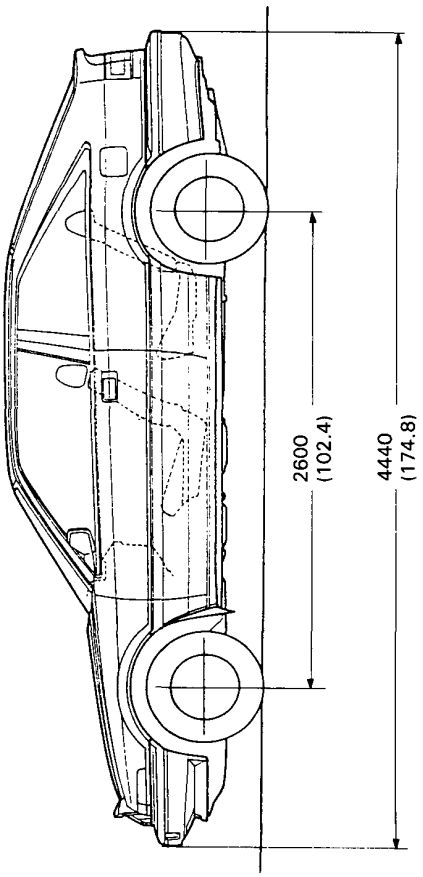
Glass Back

Unit: mm (in.)







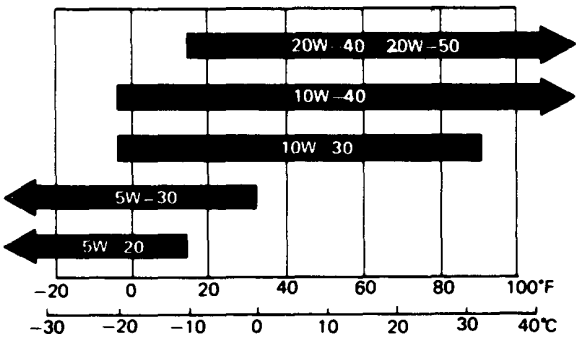


Maintenance

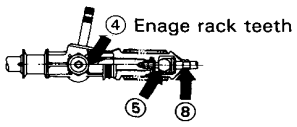
Lubrication Points

No	LUBRICATION POINTS		LUBRICANT
1	Engine		API Service Grade: SE or SF SAE Viscosity: See chart below
2	Transmission	Manual Automatic	API Service Grade: SE or SF SAE30, 10W−30, 10W−40 or 20W−40 grade oil DEXRON® Automatic transmission fluid
3	Brake reservoir		Brake fluid DOT 3
4	Steering gearbox (Power)		Honda steering grease P/N 08733-B070E
4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27	Steering gearbox (Manual) Steering ball joint Suspension ball joints Front upper arm Steering Boot Shift lever pivot (Manual) Steering column bushings Horn contact Shift rod clevis bushings Select lever (Automatic) Pedal linkage Throttle cable end Brake master cylinder push rod Rear caliper Tailgate hinges (Hatchback) Trunk hinges (Sedan) Door hinges upper and lower Door opening detents Fuel filler lid Engine hood hinges Engine hood latch Tilt lever Select lever Rear brake shoe linkage		Multipurpose Grease
28 29	Caliper	Piston seal Dust seal Caliper pin Piston	Silicone Grease
30	Power steering reservoir		Honda power steering fluid P/N 08208−99961

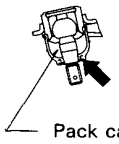
Recommended Engine Oil
(SE or SF Grade only)



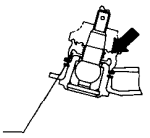
Engine oil viscosity for
ambient temperature ranges.



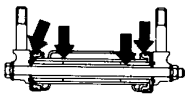
④ STEERING GEARBOX
⑤ STEERING BALL JOINT
⑧ STEERING BOOT



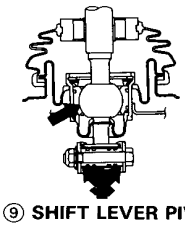
⑥ FRONT SUSPENSION BALL JOINTS



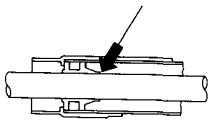
⑥ REAR SUSPENSION BALL JOINTS



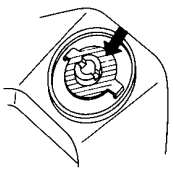
⑦ FRONT UPPER ARM



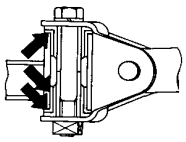
⑨ SHIFT LEVER PIVOT



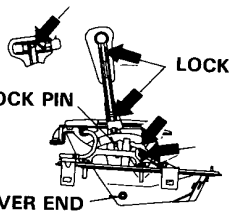
⑩ STEERING COLUMN BUSHING



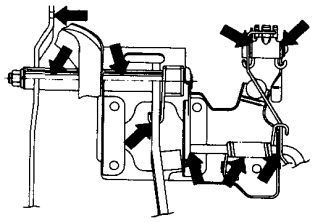
⑪ HORN CONTACT



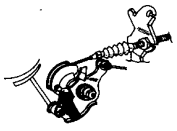
⑫ SHIFT ROD CLEVIS BUSHINGS



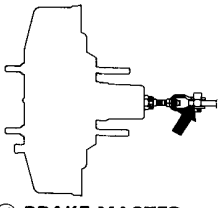
⑬ SELECT LEVER



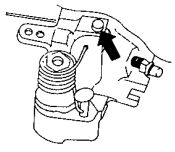
⑭ PEDAL LINKAGE



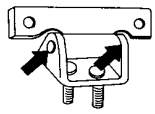
⑮ THROTTLE CABLE END



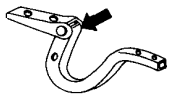
⑯ BRAKE MASTER CYLINDER PUSH ROD



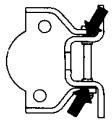
⑰ REAR CALIPER



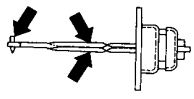
⑱ TAILGATE HINGES



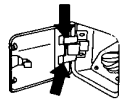
⑲ TRUNK HINGES



⑳ DOOR HINGES

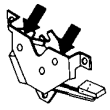


㉑ DOOR OPENING DETENTS

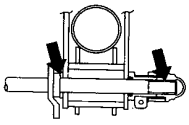


㉒ FUEL FILLER LID

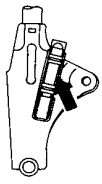
㉓ ENGINE HOOD HINGES



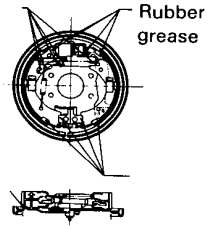
㉔ ENGINE HOOD LATCH



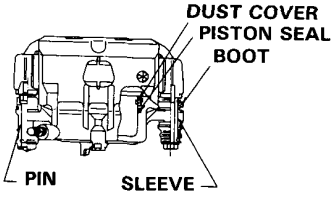
㉕ TILT LEVER



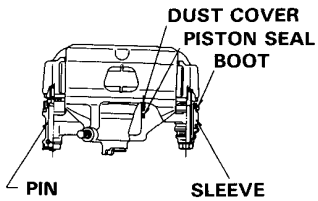
㉖ SELECT LEVER



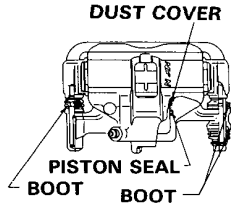
㉗ REAR BRAKE



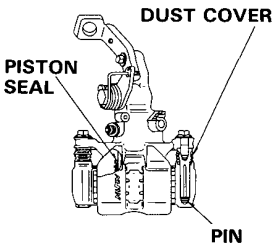
㉘ FRONT CALIPER



㉘ FRONT CALIPER



㉘ FRONT CALIPER



㉙ REAR CALIPER

Required Maintenance Schedule

	ITEMS	SERVICE AT THE INTERVAL OF LISTED KM (MILES) OR MONTHS, WHICHEVER OCCURS FIRST.					
		x 1,000 km	20	40	60	80	100
		x 1,000 miles	12	24	36	48	60
		months	12	24	36	48	60
	IDLE SPEED AND IDLE CO		I	I	I	I	I
	VALVE CLEARANCE		I	I	I	I	I
	ALTERNATOR DRIVE BELT			I		I	
■	ENGINE OIL AND OIL FILTER		Replace every 10,000 km (6,000 miles) or 6 months				
■	TRANSMISSION OIL			R		R	
■	RADIATOR COOLANT					R*1	
	COOLING SYSTEM, HOSES AND CONNECTIONS			I		I	
	E.G.R. SYSTEM (For carburetor type)*2						I
	SECONDARY AIR SUPPLY SYSTEM (For carburetor type)*2						I
	AIR CLEANER ELEMENT		R*5	R	R*5	R	R*5
	FUEL FILTER (Including aux. filter for carburetor type)			R		R	
	INTAKE AIR TEMP. CONTROL SYSTEM (For carburetor type)						I
	TANK, FUEL LINE AND CONNECTIONS			I		I	
	THROTTLE CONTROL SYSTEM (For carburetor type)			I		I	
	CHOKE MECHANISM (For carburetor type)			I		I	
	CHOKE OPENER OPERATION (For carburetor type)*3						I
	EVAPORATIVE EMISSION CONTROL SYSTEM*4						I
	IGNITION TIMING AND CONTROL SYSTEM			I		I	
	SPARK PLUGS (For cars using leaded gasoline)		R	R	R	R	R
	SPARK PLUGS (For cars using unleaded gasoline)			R		R	
	DISTRIBUTOR CAP AND ROTOR			I		I	
	IGNITION WIRING			I		I	
	CRANKCASE EMISSION CONTROL SYSTEM			I		I	
	BRAKE HOSES, LINES (Includes ALB hoses and pipes for ALB models)		I	I	I	I	I
	BRAKE FLUID (Includes ALB fluid for ALB models)			R		R	
	FRONT BRAKE DISCS AND CALIPERS		I	I	I	I	I
	FRONT BRAKE PADS		Inspect every 10,000 km (6,000 miles) or 6 months				
	REAR BRAKES			I		I	
	PARKING BRAKE		I	I		I	
	CLUTCH RELEASE ARM TRAVEL		I	I	I	I	I
	ENGINE EXHAUST SILENCER, SUSPENSION MOUNTING BOLTS		I	I	I	I	I
	FRONT WHEEL ALIGNMENT		I	I	I	I	I
	STEERING OPERATION, TIE ROD ENDS, STEERING GEAR BOX AND BOOTS		I	I		I	
	ALB HIGH PRESSURE HOSES			R		R	
	ALB OPERATION		I	I		I	
	POWER STEERING SYSTEM		I	I	I	I	I
	POWER STEERING PUMP BELT			I		I	
	CATALYTIC CONVERTER HEAT SHIELD						I

R—Replace I—Inspect. After inspection, clean, adjust, repair or replace if necessary

■ REMARK: Day to day care (such as oil, coolant check and replenishment) should be done practically according to the Owner's Manual.

*1 Thereafter, replace every 2 years or 48,000 km (30,000 miles), whichever comes first.

*2 Only for cars using unleaded gasoline

*3 Only for 2.0 ℓ model

*4 Only for KQ type and for KG, KW types using unleaded gasoline

*5 Except KQ type

CAUTION: The following items must be serviced more frequently on cars normally used under severe driving conditions. Refer to the chart below for the appropriate maintenance intervals.

"Severe driving conditions" include:

A: Repeated short distance driving
B: Driving in dusty conditions
C: Driving in severe, cold weather
D: Driving in areas using road salt or other corrosive materials
E: Driving on rough and/or muddy roads
F: Towing a trailer

R—Replace
I —Inspect. After inspection, clean, adjust, repair or replace if necessary.

Condition	Maintenance item	Maintenance operation	Interval
A, B, F	Engine oil and oil filter	R	Every 5,000 km (3,000 miles) or 3 months
A, B, D, E, F	Front brake discs and calipers	I	Every 10,000 km (6,000 miles) or 6 months
A, B, D, E, F	Rear brakes (Only for disc type brakes)	I	Every 20,000 km (12,000 miles) or 12 months
A, B, C, E, F	Clutch release arm travel	I	Every 10,000 km (6,000 miles) or 6 months
B, C, E	Power steering system	I	Every 10,000 km (6,000 miles) or 6 months

Engine

Engine Removal/Installation

Engine Removal/Installation

WARNING

- **Make sure jacks and safety stands are placed properly (pages 1-6 thru 8), and hoist brackets are attached to correct positions on the engine (page 5-8).**
- **Apply parking brake and block rear wheels, so car will not roll off stands and fall on you while working under it.**

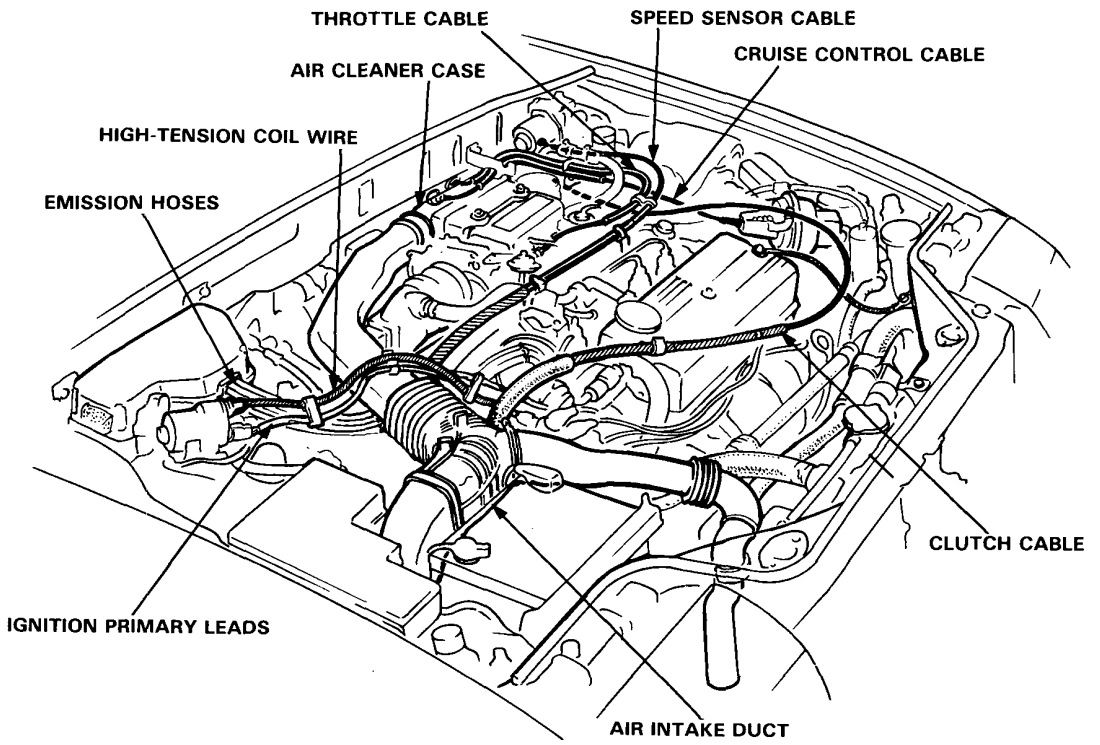
CAUTION: Use fender covers to avoid damaging painted surfaces.

1. Disconnect the battery negative terminal first, then the positive terminal.
2. Unbolt the hood brackets and remove the hood.
   - Disconnect the washer fluid tube.

   CAUTION: Use care when storing the hood to avoid damaging the paint.
3. Drain the engine oil. Remove the oil filler cap to speed draining. Reinstall the drain plug with a new washer.

   CAUTION: Do not re-use old washer.
4. Drain the coolant from the radiator into a clean pan so it may be re-used. Remove the radiator cap to speed draining.

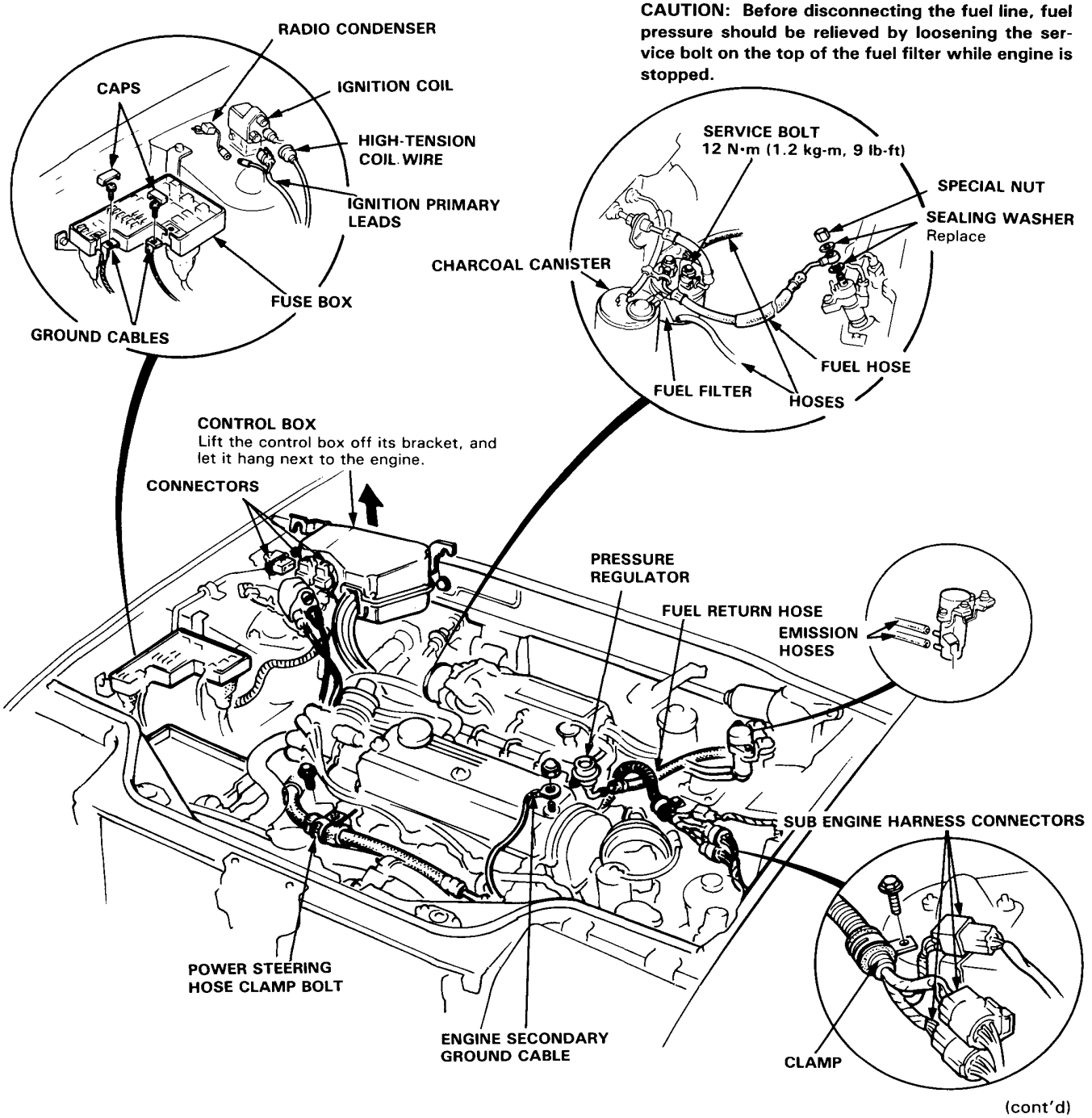
   WARNING Use care when removing radiator cap to avoid scalding by hot coolant or steam.
5. Drain transmission oil/fluid. Use a 3/8'' drive socket wrench to remove the drain plug. Remove the oil filler plug to speed draining. Reinstall the drain plug with a new washer.
   Remove the air intake duct.
6. Remove the air cleaner case mounting bolts (nuts) then remove the air cleaner case.



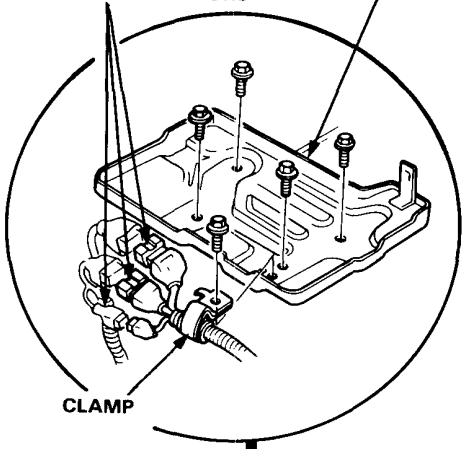
7. Relieve fuel pressure.

WARNING **Do not smoke while working on fuel system. Keep open flame away from work area. Drain fuel only into an approved container.**

CAUTION: Before disconnecting the fuel line, fuel pressure should be relieved by loosening the service bolt on the top of the fuel filter while engine is stopped.

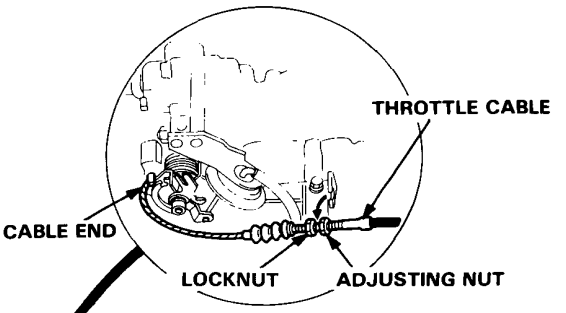


(cont'd)



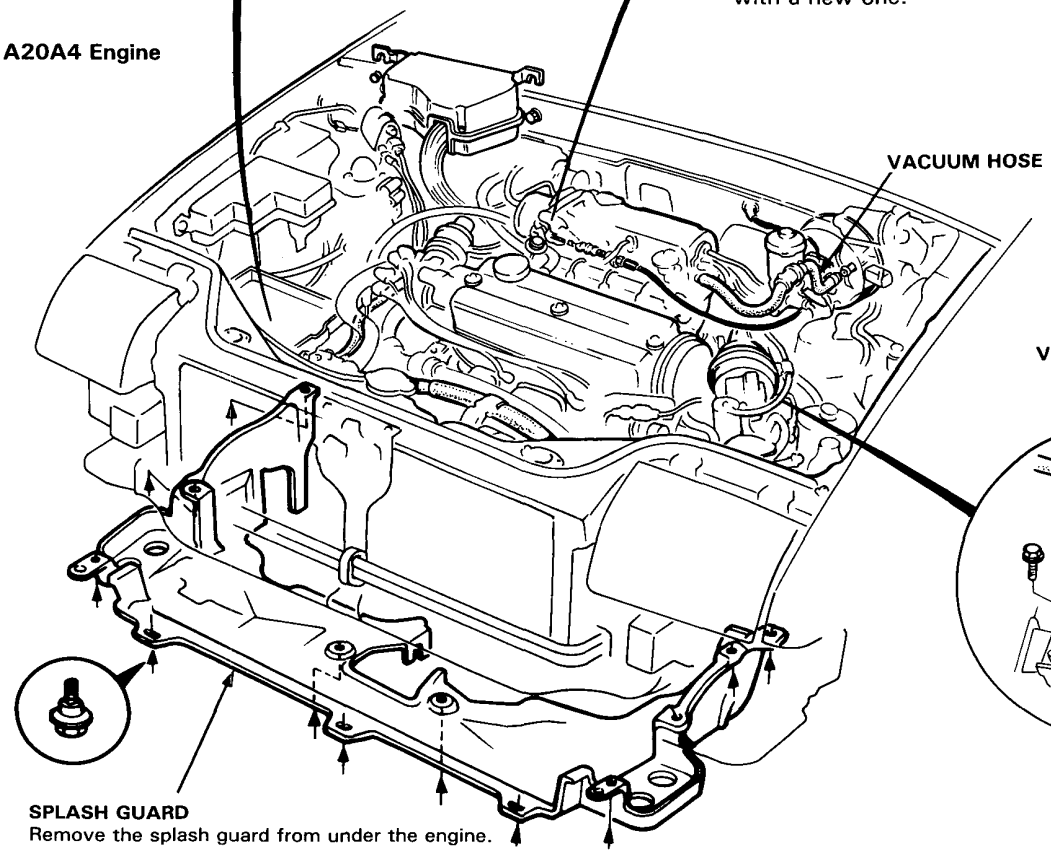
THROTTLE CABLE

Remove the throttle cable by loosening the locknut and adjusting nut, then slip the cable and out the bracket and linkage.

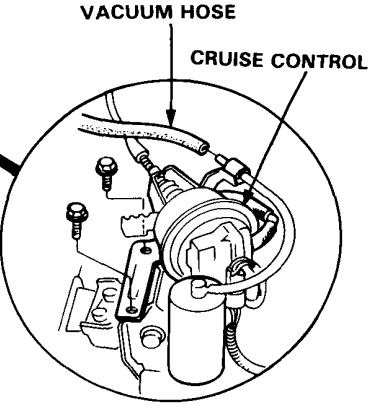


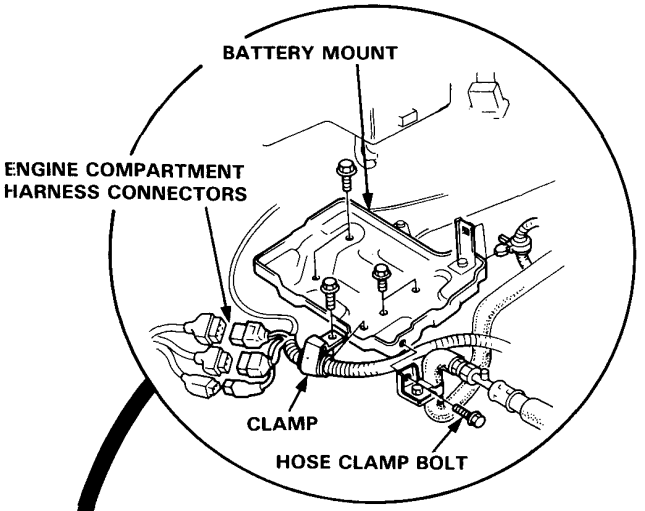
NOTE: Take care not to bend the cable when removing it. Do not use pliers to remove the cable from the linkage. Always replace a kinked cable with a new one.

A20A4 Engine



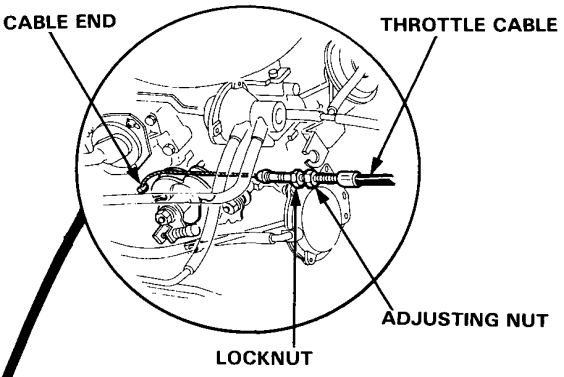
Remove the splash guard from under the engine.





THROTTLE CABLE

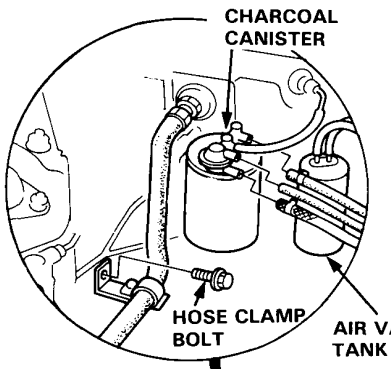
Remove the throttle cable by loosening the locknut and adjusting nut, then slip the cable end out of the throttle bracket and carburetor linkage.

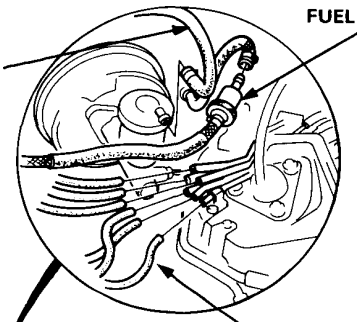


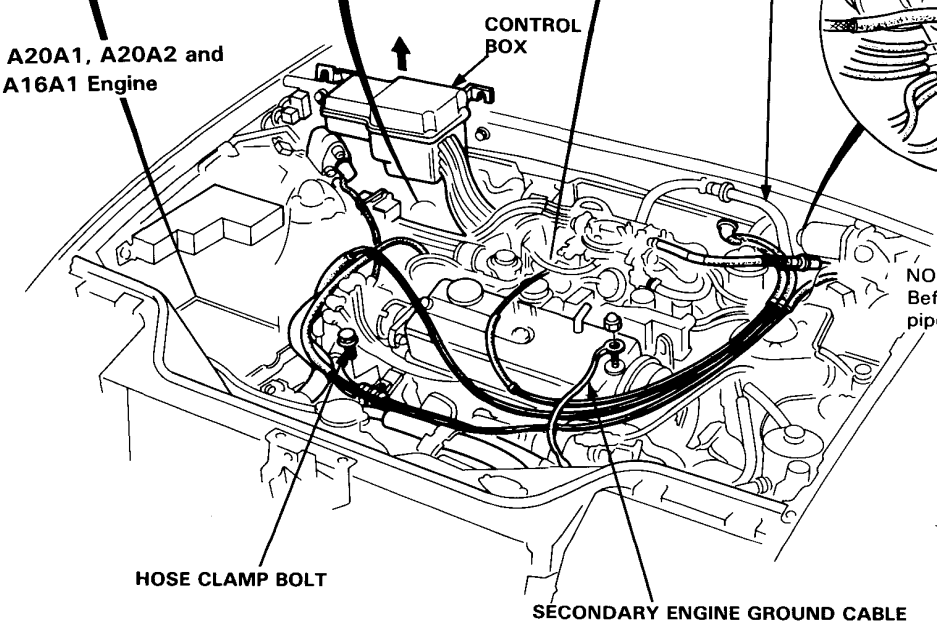
NOTE: Take care not to bend the cable when removing it. Do not use pliers to remove the cable from the linkage. Always replace a kinked cable with a new one.

Disconnect the fuel hose at the fuel filter.

WARNING Do not smoke while working on fuel system. Keep open flame away from work area.

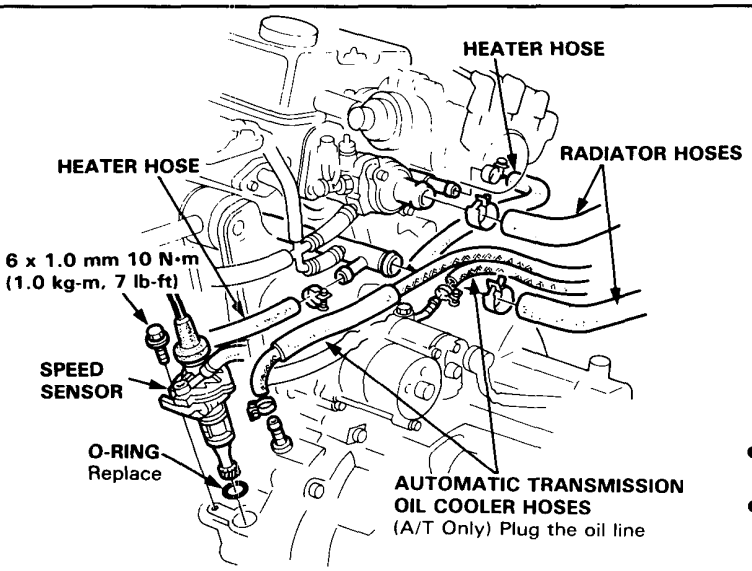






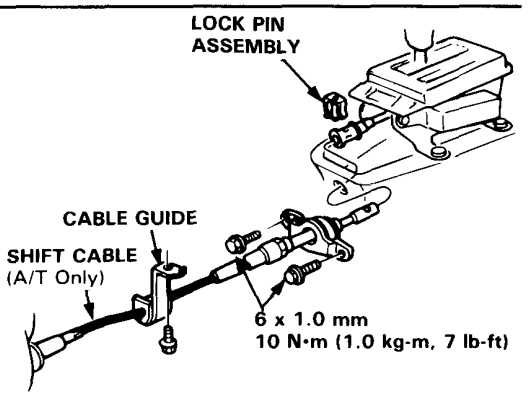
NOTE:
Before disconnecting, mark hoses and pipes to ensure original connection

(cont'd)



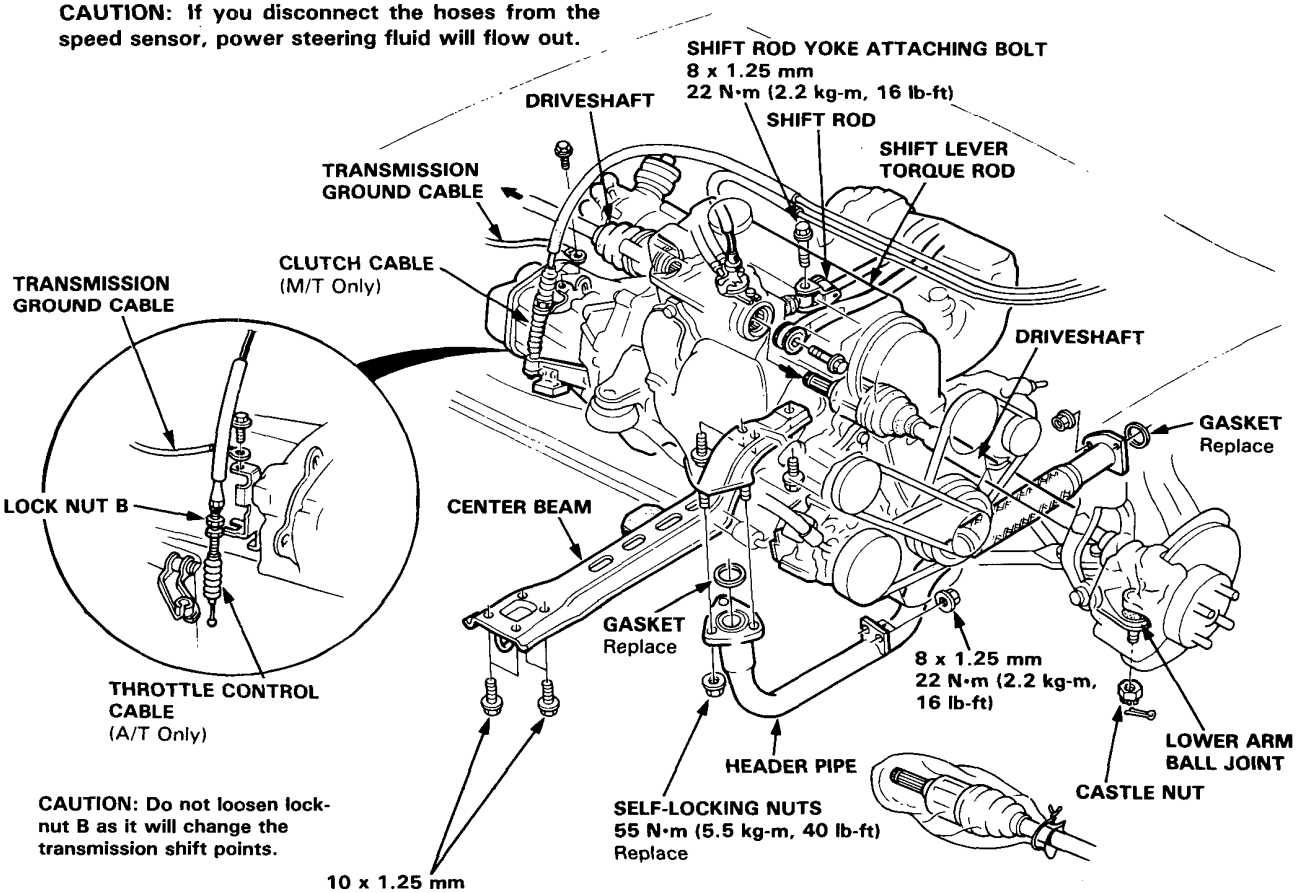
- Remove speed sensor complete with hoses.

CAUTION: If you disconnect the hoses from the speed sensor, power steering fluid will flow out.



- Remove the center console.
- Place the shift lever in reverse, then remove the lock pin from the end of the shift cable.

NOTE: On reassembly, check the cable adjustment. (page 15-66).

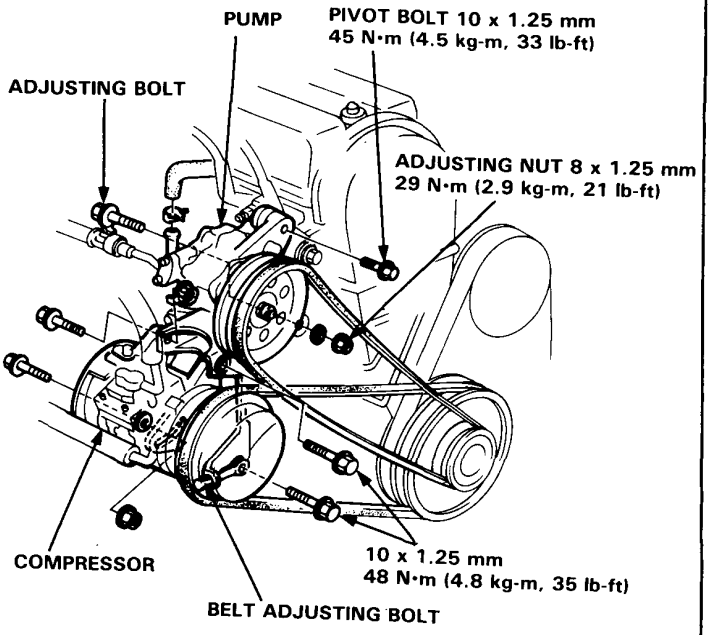


CAUTION: Do not loosen locknut B as it will change the transmission shift points.

NOTE: Coat all precision finished surfaces with clean engine oil or grease. Tie plastic bags over the drive shaft ends.

POWER STEERING PUMP

- Remove adjusting bolt and V-belt.
- Without disconnecting outlet hose pull the pump away from its mounting bracket.
  Do not disconnect hose or fluid will flow out.

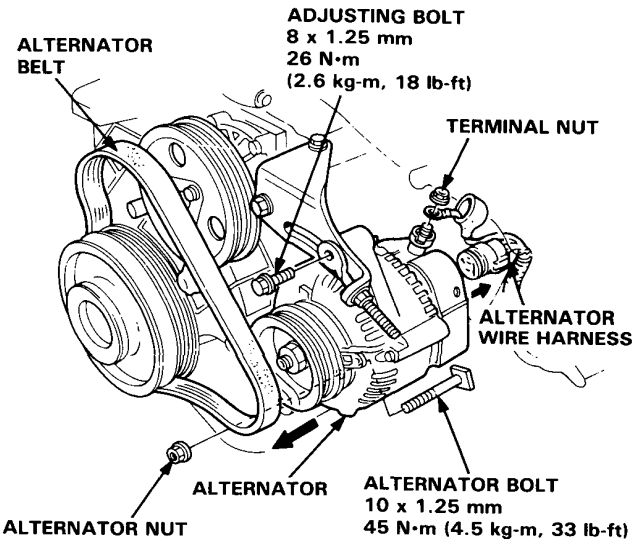


A/C COMPRESSOR

- Remove the compressor clutch lead wire.
- Loosen the comperssor mount bolts and adjusting bolt the remove the compressor belt.

NOTE: The compressor can be moved without discharging the air conditioner system.

- Remove the compressor mounting bolts, then lift the compressor out of the bracket with hoses attached, and wire it up to the front bulkhead.



ALTERNATOR

- Disconnect the alternator wire harness connectors.
- Remove the belt adjusting bolt and remove the belt.
- Remove the alternator mount bolt and remove the alternator.

(cont'd)

8. Attach a chain hoist to the engine block and raise the hoist just enough to remove slack from chain.

9. Check that the engine/transaxle is completely free of vacuum, fuel, and coolant hoses, and electrical wires.

10. Remove the bolt from the rear torque rod at the engine, then loosen the bolt in the frame mount and swing the rod up out of the way.

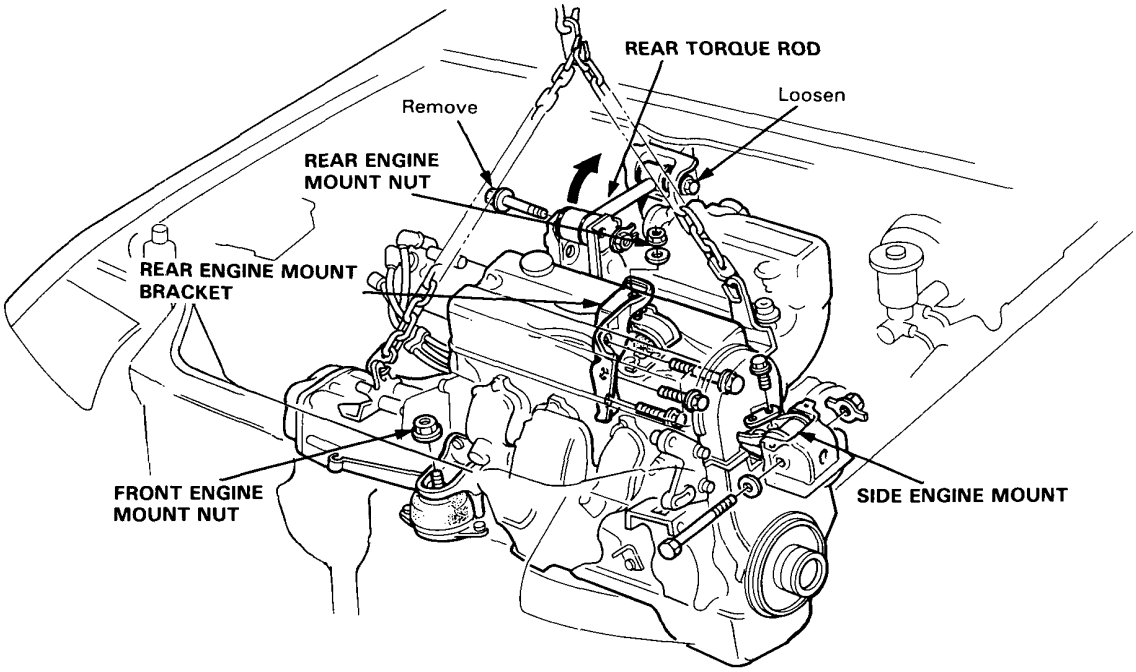
12. Install the engine in the reverse order of removal. After the engine is in place:

- Torque engine mount bolts in sequence shown on next page.

CAUTION: Failure to tighten the bolts in the proper sequence can cause excessive noise and vibration, and reduce bushing life; check that the bushings are not twisted or offset.

- Check that the spring clip on the end of each driveshaft clicks into the differential.

CAUTION: Use new spring clips on installation.

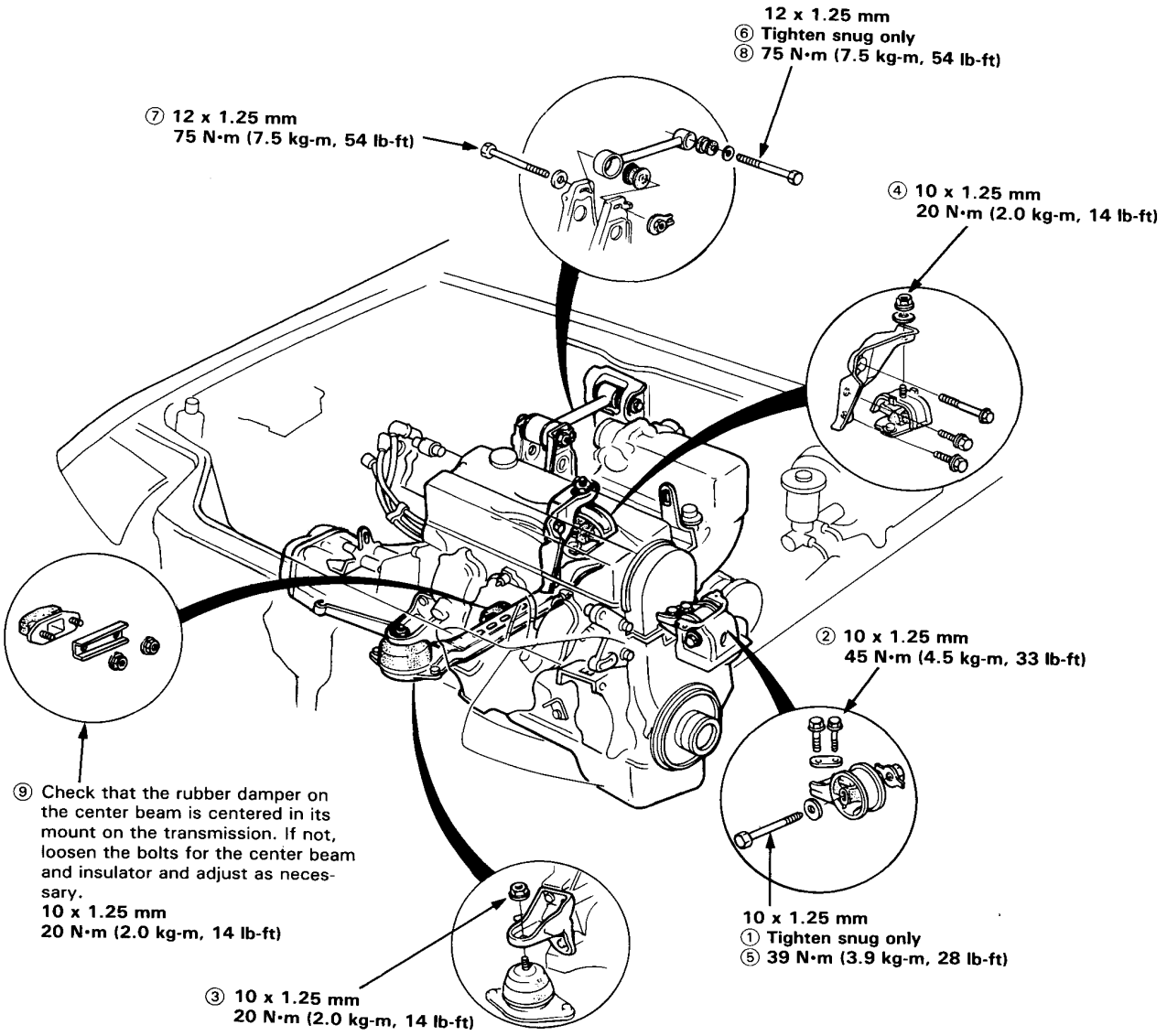


11. Raise the engine just enough to let the engine mounting brackets clear the mounting studs, then lower the engine onto the mounts. Shorten the length of the chain from 13 to 7 links on the timing belt side, then raise the engine all the way and remove it from the car.

- Bleed air from the cooling system at the bleed bolt with the heater valve open.
- Adjust the throttle cable tension.
- Adjust the alternator belt tension.
- Check the clutch pedal free play.
- Check that the transmission shifts into gear smoothly.
- Connect the air conditioning hoses, wiring and V-belt.
- Clean battery posts and cable terminals with sandpaper, assemble, then apply grease to prevent corrosion.

NOTE:

- For proper suppression of noise and vibration, and maximum bushing life, tighten the bolts in the sequence shown with the bushings centered in their mounts.
- From step 5 on, the car must be sitting level; make sure that the engine hoist is not holding up the engine and car.



Cylinder Head/Valve Train

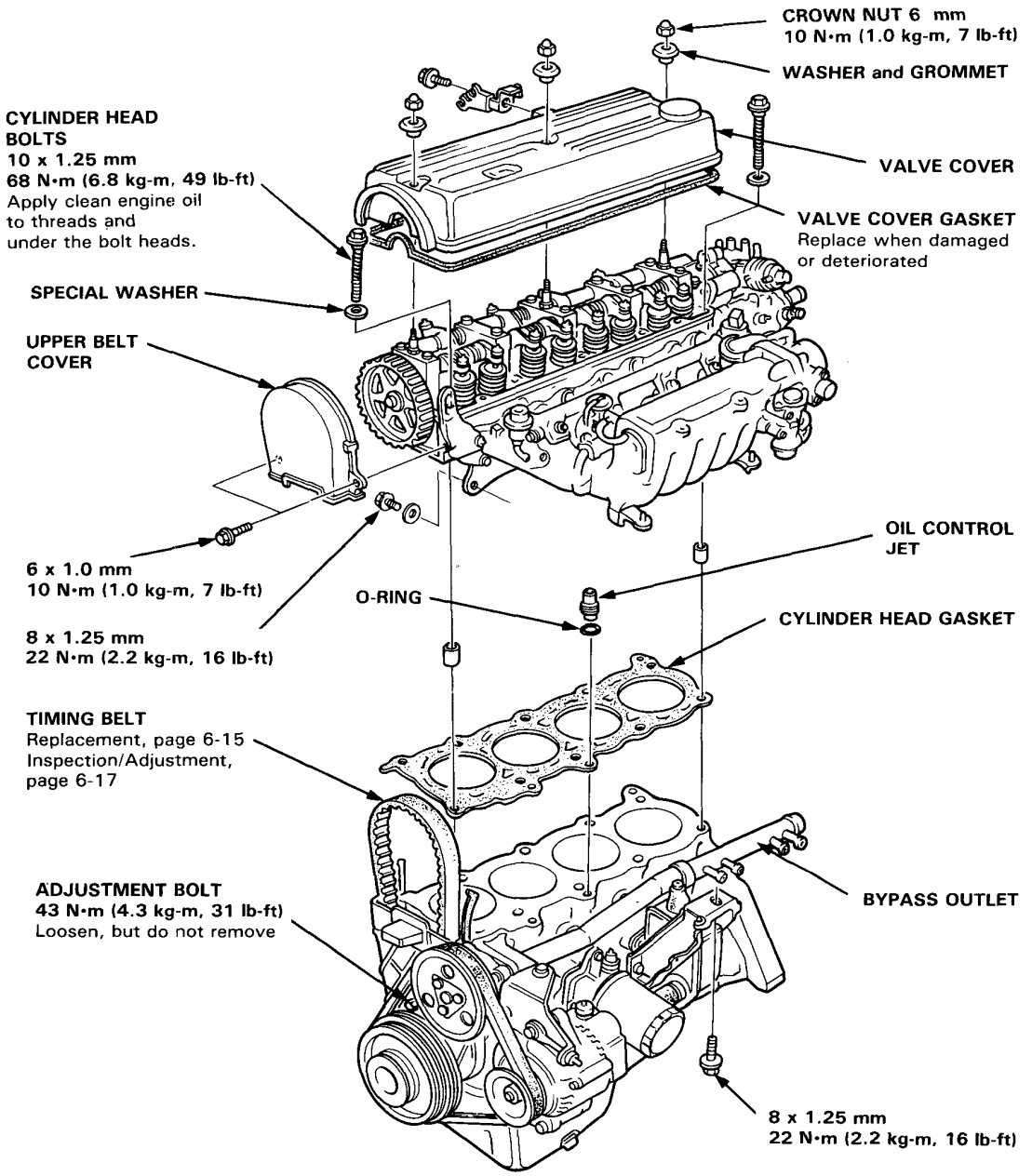
Cylinder Head/Valve Train

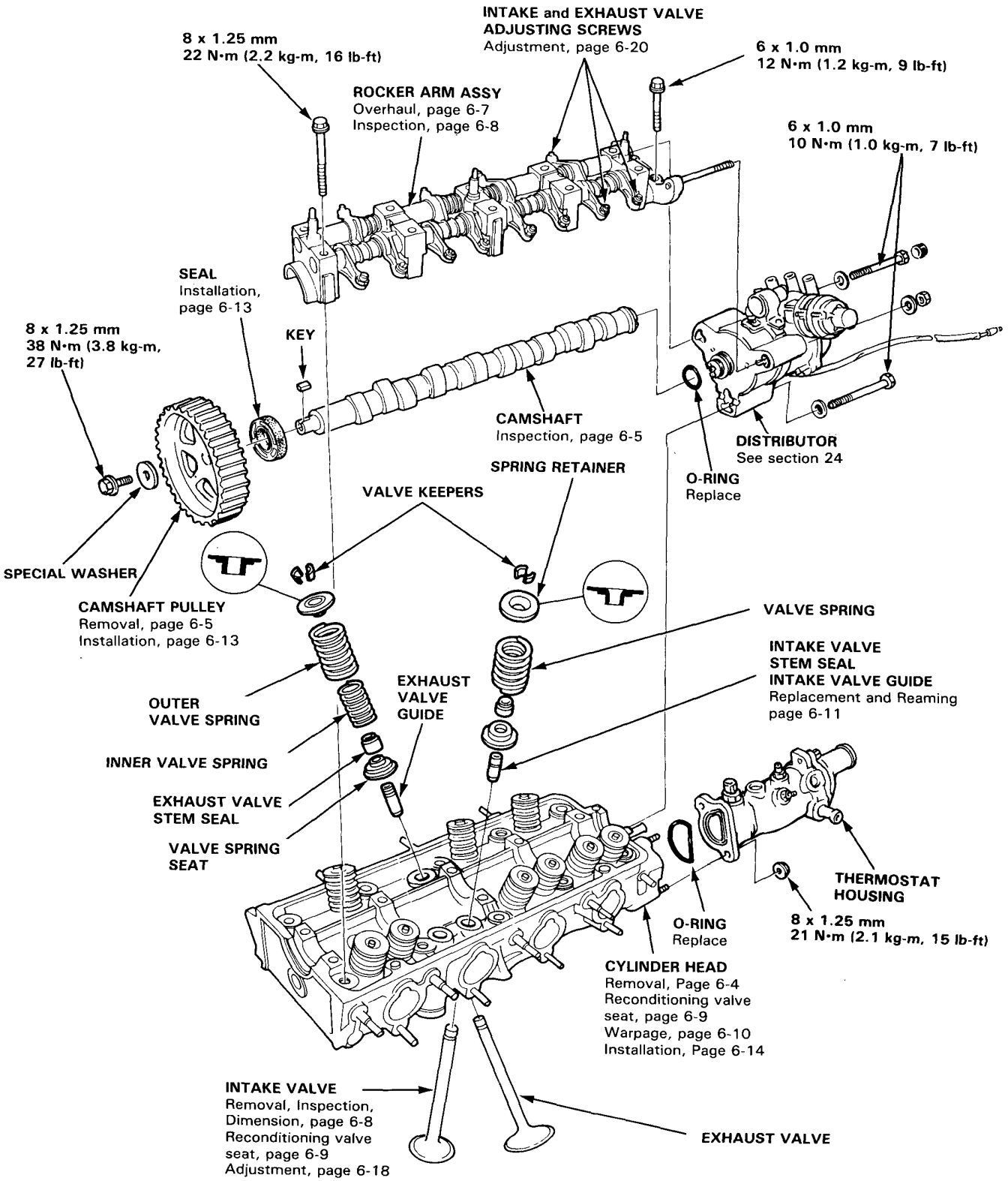
Illustrated Index

A20A4 Engine shown; A20A1, A20A2, A16A1 Engine similar

CAUTION: To avoid damaging the cylinder head, wait until the coolant temperature drops below 38°C (100°F) before removing it.

NOTE: Use new O-rings and gaskets whenever reassembling




8 x 1.25 mm
22 N·m (2.2 kg-m, 16 lb-ft)
INTAKE and EXHAUST VALVE ADJUSTING SCREWS
Adjustment, page 6-20
6 x 1.0 mm
12 N·m (1.2 kg-m, 9 lb-ft)
ROCKER ARM ASSY
Overhaul, page 6-7
Inspection, page 6-8
6 x 1.0 mm
10 N·m (1.0 kg-m, 7 lb-ft)
SEAL
Installation, page 6-13
KEY
8 x 1.25 mm
38 N·m (3.8 kg-m, 27 lb-ft)
CAMSHAFT
Inspection, page 6-5
DISTRIBUTOR
See section 24
O-RING
Replace
SPRING RETAINER
VALVE KEEPERS
SPECIAL WASHER
CAMSHAFT PULLEY
Removal, page 6-5
Installation, page 6-13
VALVE SPRING
INTAKE VALVE STEM SEAL
INTAKE VALVE GUIDE
Replacement and Reaming page 6-11
EXHAUST VALVE GUIDE
OUTER VALVE SPRING
INNER VALVE SPRING
EXHAUST VALVE STEM SEAL
VALVE SPRING SEAT
THERMOSTAT HOUSING
8 x 1.25 mm
21 N·m (2.1 kg-m, 15 lb-ft)
O-RING
Replace
CYLINDER HEAD
Removal, Page 6-4
Reconditioning valve seat, page 6-9
Warpage, page 6-10
Installation, Page 6-14
INTAKE VALVE
Removal, Inspection, Dimension, page 6-8
Reconditioning valve seat, page 6-9
Adjustment, page 6-18
EXHAUST VALVE

Cylinder Head

Removal (engine removal not required)

CAUTION: Do not remove the cylinder head until the coolant temperature drops below 38°C (100°F)

NOTE:

- Inspect the timing belt before removing the cylinder head.
- Before removal of the cylinder head, turn the flywheel so that the No. 1 cylinder is at top-dead-center (page 6-16).
- Mark all emissions hoses before disconnecting them.

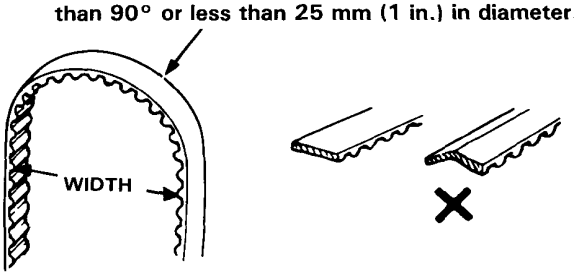
1. Disconnect the negative terminal from the battery.
2. Drain the cooling system.
3. Remove the brake booster vacuum tube from the tubing manifold (page 5-4).
4. Remove the engine secondary ground cable from the valve cover (pages 5-3 and 5).
5. Disconnect the radio condenser connector, high tension wire and ignition primary connector (page 5-3).

A20A4 Engine (Other engines, go to 13)

6. Remove the air cleaner cover.
7. Relieve fuel pressure.
   WARNING Do not smoke while working on fuel system, keep open flame or spark away from work area. Drain fuel only into an approved container.
8. Disconnect the fuel hose and fuel return hose (page 5-3).
9. Disconnect the throttle cable at the throttle body (page 5-4).
10. Disconnect the charcoal canister tube at the throttle valve.
11. Disconnect the engine sub harness connectors and couplers from the cylinder head and intake manifold.
    - Four injector couplers
    - TA sensor connector
    - Temperature unit connector
    - Ground terminals at the fuel pipe
    - Throttle sensor connector
    - TW sensor connector
    - Crankshaft angle snesor coupler
    - Four wire harness clamps
12. Disconnect the oxygen sensor coupler.

Other Engines (A20A4 engine, go to 20)

13. Remove the air cleaner cover.
14. Remove the air cleaner and identify all its emission hoses.
15. Disconnect the electrical wires from the fuel cut-off solenoid valve, automatic choke thermosenser and temperature gauge sending unit.
16. Disconnect the fuel lines and the throttle cable from the carburetor (page 5-5).
    WARNING Do not smoke while working on fuel system. Keep open flame or spark away from work area.
17. Disconnect the connector from the distributor and remove the vacuum hoses.
18. Disconnect the No. 1 control box emission hoses from the tubing manifold.
19. Disconnect the air jet controller hoses.
20. Disconnect the upper radiator hose, heater inlet hose, and bypass inlet hose from the cylinder head (page 5-6).
21. Remove the hose between the thermostat housing and the intake manifold.
22. Disconnect the connecting pipe-to-valve body hose and bypass outlet hose.
23. Remove the power steering oil pump but do not disconnect the pump hoses (page 5-7).
24. Remove the hose clamp bolt on the cylinder head.
25. Remove the power steering pump bracket from the cylinder head.
26. On cars equipped with air conditioning, disconnect the idle control solenoid hoses.
27. If so equipped, remove the cruise control actuator (page 5-4).
28. Remove the exhaust header pipe nuts.
29. Remove the header pipe bracket and pull the pipe clear of the exhaust manifold.
30. Remove the air cleaner base mount bolts.
31. Disconnect the hose from the intake manifold to the breather chamber.
32. Remove the valve cover and the timing belt upper cover.
33. Loosen the tensioner adjustment bolt, then remove the timing belt.
    CAUTION: Do not crimp or bend timing belt more than 90° or less than 25 mm (1 in.) in diameter.



34. Remove the cylinder head bolts, then remove the cylinder head.

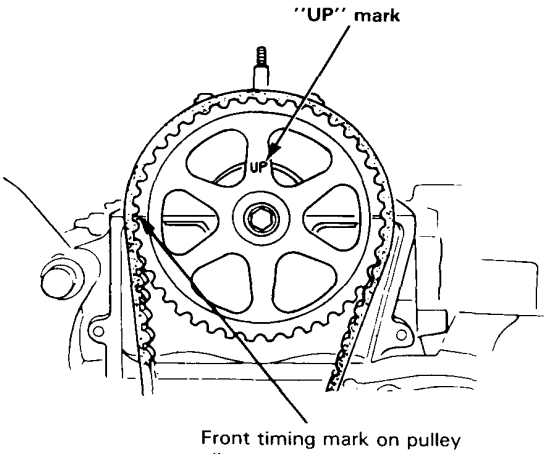
    CAUTION: To prevent warpage, unscrew bolts 1/3 turn each time and repeat sequence until loose.

35. Remove the exhaust manifold from the cylinder head.
36. Remove the air cleaner base from the intake manifold.
37. Remove the carburetors.
38. Remove the intake manifold from the cylinder head.

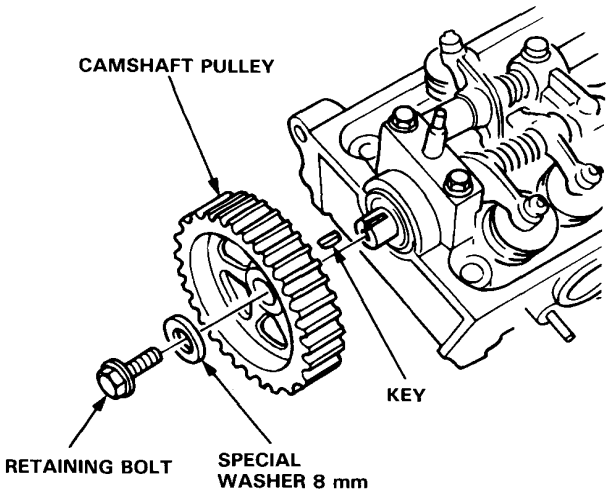
Camshaft Pulley

Removal

1. To ease reassembly, turn the pulley until the "UP" mark faces up, and the front timing mark is aligned with the valve cover surface.



2. Remove the pulley retaining bolt and washer, then remove the pulley.



NOTE: Before removing rocker arm assembly, check camshaft end play.

Camshaft

Inspection

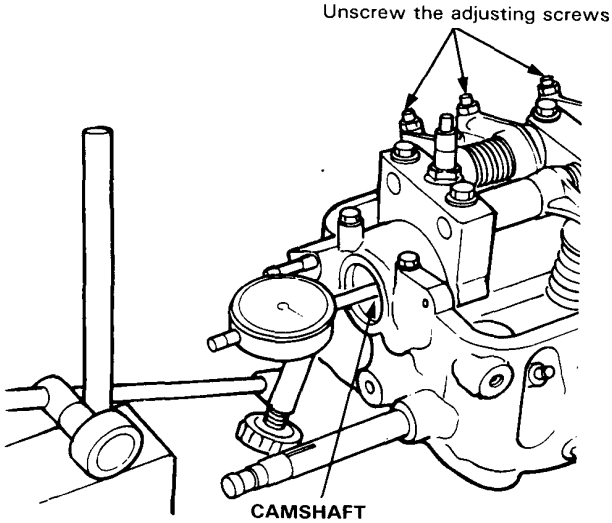
NOTE: Do not rotate camshaft during inspection; loosen the adjusting screws before starting.

1. Seat camshaft by prying it toward distributor end of head with screwdriver.

2. Zero dial indicator against end of distributor drive, then pry camshaft back and forth, and read end play.

Camshaft End Play:
Standard (New): 0.05—0.15 mm (0.002—0.006 in.)
Service Limit: 0.5 mm (0.02 in.)

Unscrew the adjusting screws



3. Remove the rocker arm bolts, then remove the rocker assembly from the cylinder head.

NOTE: Unscrew the rocker arm bolts, two turns at a time, in a criss-cross pattern, to prevent damaging valves or rocker assembly.

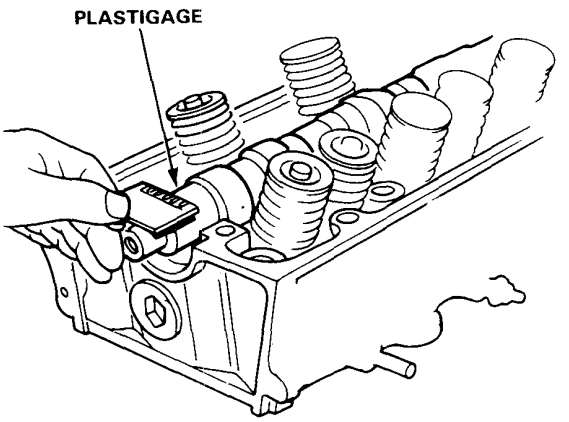
- Lift camshaft out of cylinder head, wipe clean, then inspect lift ramps. Replace camshaft if lobes are pitted, scored, or excessively worn.
- Clean the camshaft bearing surfaces in the cylinder head, then set camshaft back in place.
- Insert plastigage strip across each journal.
- Install the rocker arm assembly and torque bolts to values and in sequence shown on page 6-13, then remove the bolts and the rocker arm assembly.

(cont'd)

Inspection (cont'd)

4. *Measure widest portion of plastigage on each journal.*

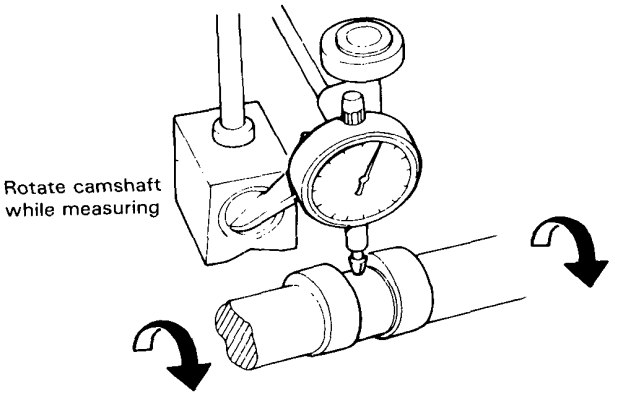
No. 1, 3 and 5 JOURNALS
Camshaft Bearing Radial Clearance:
Standard (New): 0.050—0.089 mm (0.002—0.004 in.)
Service Limit: 0.15 mm (0.006 in.)
No. 2 and 4 JOURNALS
Standard (New): 0.130—0.169 mm (0.005—0.007 in.)
Service Limit: 0.23 mm (0.009 in.)



5. If camshaft bearing radial clearance is out of tolerance:

- And camshaft has already been replaced, you must replace the cylinder head.
- If camshaft has not been replaced, first check total runout with the camshfat supported on V-blocks.

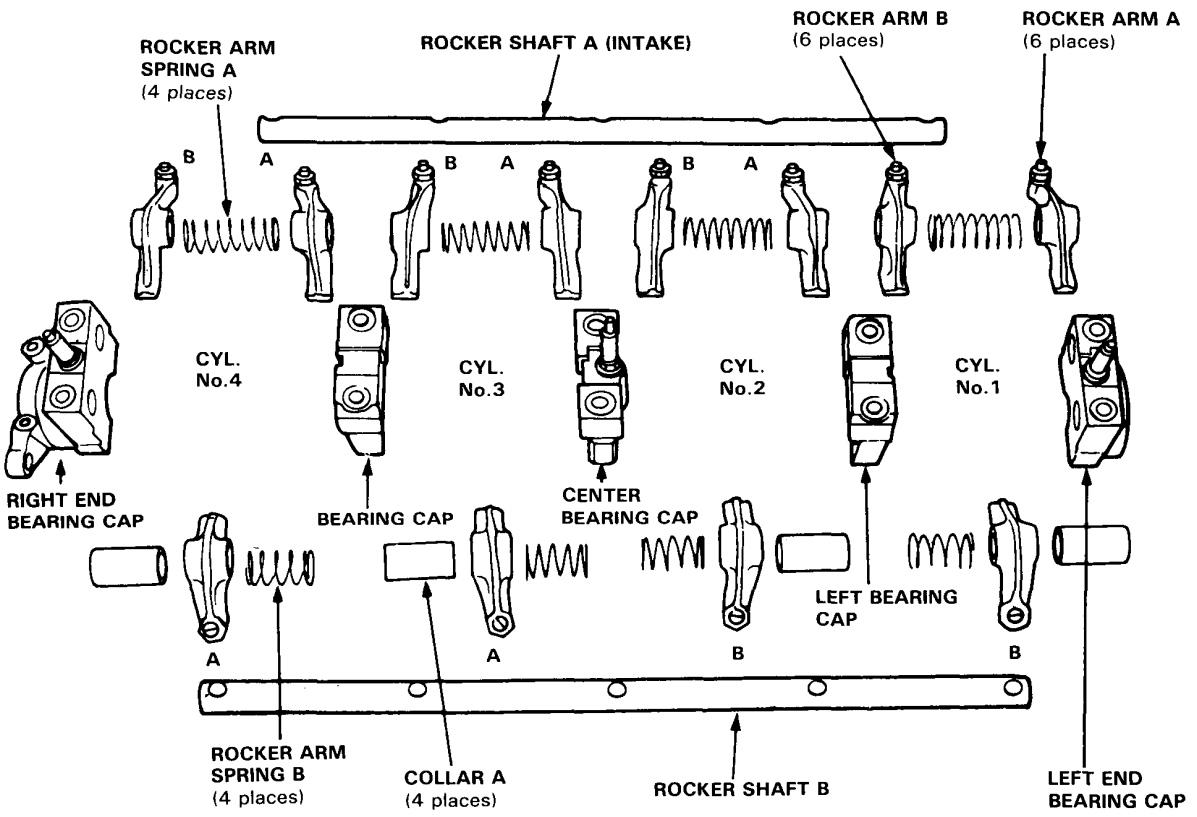
Camshaft Total Runout:
Standard (New): 0.03 mm (0.001 in.)
Service Limit: 0.06 mm (0.002 in.)



— If the total runout of the camshaft is within tolerance, replace the cylinder head.

— If the total runout is out of tolerance replace the camshaft and recheck. If the bearing clearance is still out of tolerance, replace the cylinder head.

Overhaul



NOTE:

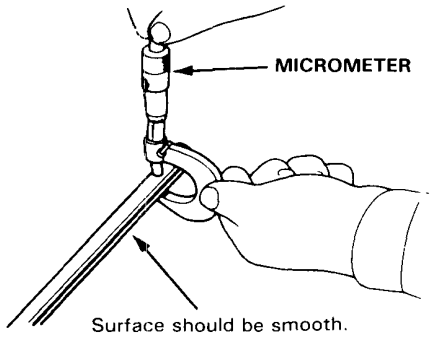
- Identify parts as they are removed to ensure reinstallation in original locations.
- Inspect rocker shaft and rocker arms (page 6-8).
- Rocker arms must be installed in the same position if reused.

Rocker Arms

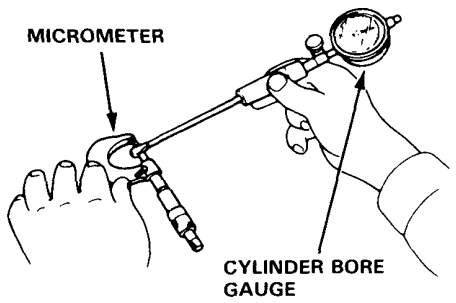
Clearance

Measure both the intake rocker shaft and exhaust rocker shaft.

1. Meausre diameter of shaft at first rocker location.

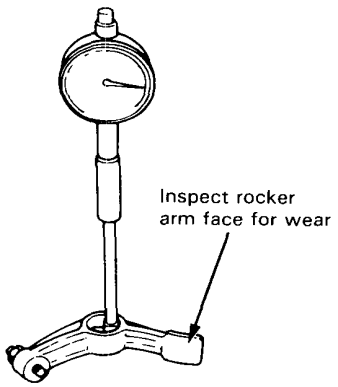


2. Zero gauge to shaft diameter.



3. Measure inside diameter of rocker arm and check for out-of-round condition.

Rocker Arm Radial Clearance:
Service Limit: 0.08 mm (0.003 in.)



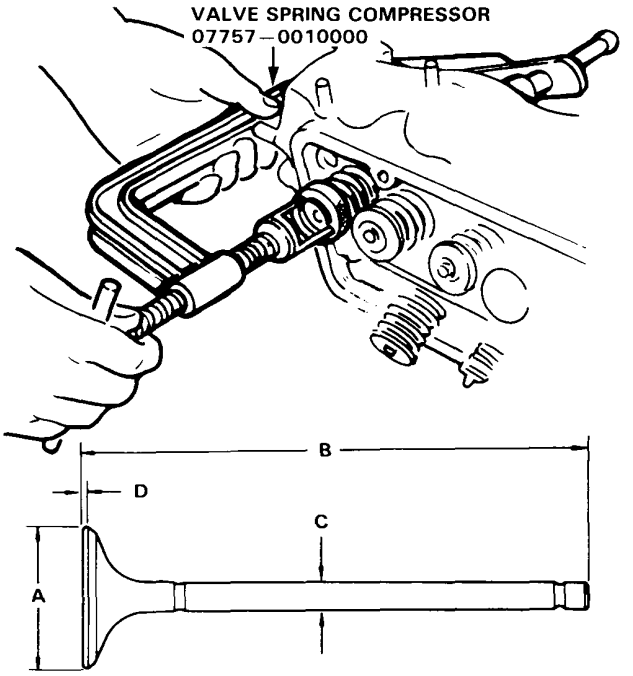
Repeat for all rockers. If over limit, replace rocker shaft and all over-tolerance rocker arms.

Intake and Exhaust Valves

Replacement

NOTE: Identify valves and valve springs as they are removed so that each item can be reinstalled in its original position.

1. Tap each valve stem with a plastic mallet to loosen valve keepers before installing spring compressor.
2. Install spring compressor. Compress spring and remove valve keeper.

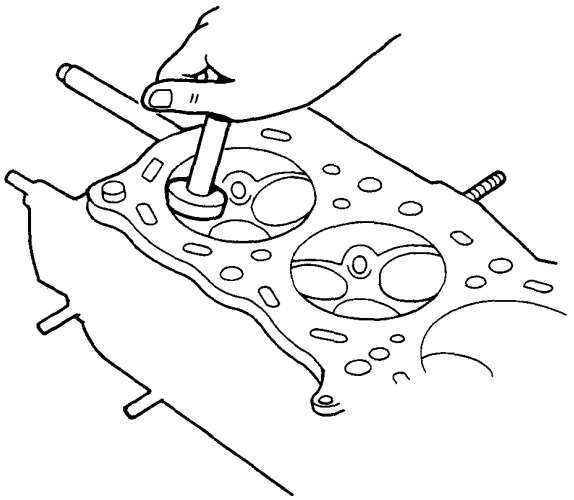


Intake Valve Dimensions
A Standard (New): 29.9–30.1 mm (1.177–1.185 in.)
B Standard (New): 120.29–120.59 mm (4.736–4.748 in.)
C Standard (New): 6.58–6.59 mm (0.2591–0.2594 in.)
C Service Limit: 6.55 mm (0.258 in.)
D Standard (New): 1.35–1.65 mm (0.053–0.065 in.)
Service Limit:
Exhaust Valve Dimensions
A Standard (New): 34.9–35.1 mm (1.374–1.382 in.)
B Standard (New): 120.66–120.96 mm (4.750–4.762 in.)
***121.36–121.66 mm (4.778–4.790 in.)**
C Standard (New): 6.94–6.95 mm (0.2732–0.2736 in.)
C Service Limit: 6.41 mm (0.272 in.)
D Standard (New): 1.75–1.95 mm (0.069–0.077 in.)
***3.85–4.15 mm (0.152–0.163 in.)**
*** A20A1 and A20A4 KX Type**

Valve Seat Reconditioning

1. Renew valve seats in cylinder head using valve seat cutter.

   NOTE: If guides are worn (page 6-12), replace them (page 6-13) before cutting valve seats.



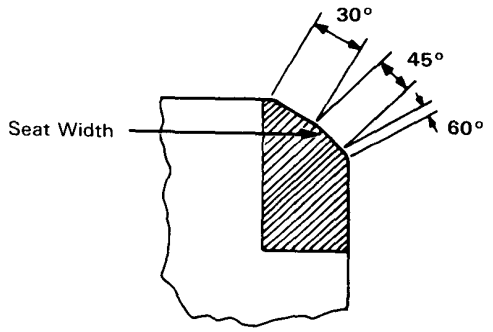
CUTTER	INTAKE	EXHAUST
30°	07780–0012900	07780–0012300
60°	07780–0014000	07780–0014100
45°	07780–0010800	07780–0010400
HOLDER	07781–0010201 and 07781–0010301	

2. Bevel the upper edge of seat with the 30° cutter until required seat width is obtained.

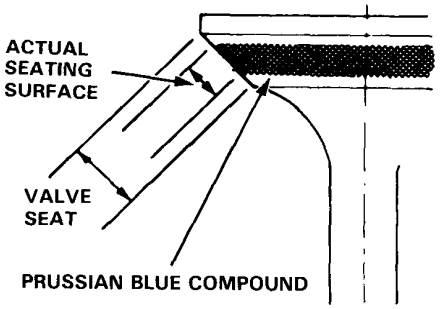
3. Bevel the inner edge of seat slightly with the 60° cutter.

4. *Carefully center 45° cutter.*
   Remove as little material as possible. (See measurement after reconditioning shown below.)

   Valve Seat Width:
   Standard: 1.25–1.55 mm (0.049–0.061 in.)
   Service Limit: 2.0 mm (0.08 in.)



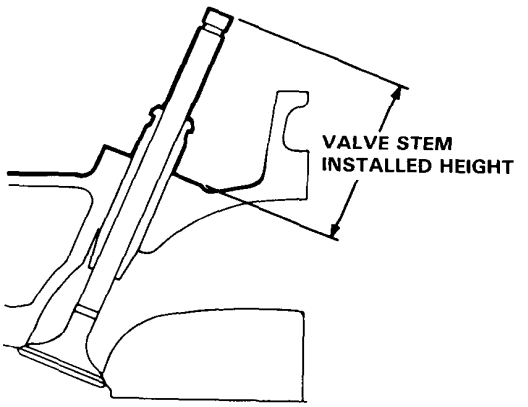
5. After resurfacing seat, inspect for even valve seating: Apply Prussian blue compound to valve face, *and insert valve in original location in head, then lift* it and snap it closed against seat several times.



6. The actual valve seating surface, as shown by the blue compound, should be centered on the seat.
   - If it is too high (closer to the valve stem), you must make a second cut with the 60° cutter to move it down, then one more cut with the 45° cutter to restore seat width.
   - If it is too low (closer to valve edge), you must make a second cut with the 30° cutter to move it up, then one more cut with the 45° cutter to restore seat width.

     NOTE: The final cut should always be made with the 45° cutter.

7. Insert intake and exhaust valves in head and measure valve stem installed height.
   Intake Valve Stem Installed Height:
   Standard (New): 48.59 mm (1.913 in.)
   Service Limit: 49.34 mm (1.943 in.)
   Exhaust Valve Stem Installed Height:
   Standard (New): 47.66 mm (1.876 in.)
   Service Limit: 48.41 mm (1.906 in.)



8. If valve stem installed height is over service limit, replace valve and recheck. If still over service limit, replace cylinder head; the valve seat in the head is too deep.

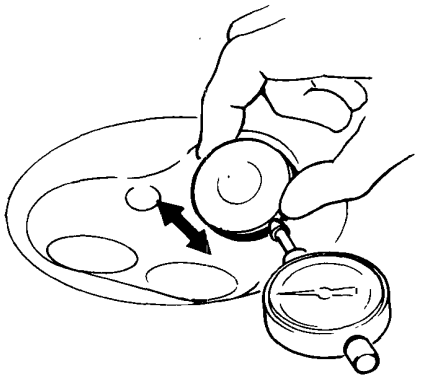
Intake and Exhaust Valves

Valve Guide-to-Valve Stem Clearance

1. Measure the guide-to-stem clearance with a dial indicator, while rocking the stem in the direction of normal thrust (wobble method).

Intake Valve Stem-to-Guide Clearance
Standard (New): 0.04—0.10 mm (0.0016—0.004 in.)
Service Limit: 0.16 mm (0.006 in.)
Exhaust Valve Stem-to-Guide Clearance
Standard (New): 0.12—0.18 mm (0.005—0.007 in.)
Service Limit: 0.24 mm (0.009 in.)

Valve extended 10 mm out from seat.



- If measurement exceeds the service limit, recheck using new valve.
- If measurement is now within service limit, reassemble using new valve.
- If measurement still exceeds limit, recheck using alternate method below, then replace valve and guide, if necessary.

NOTE: An alternate method of checking guide to stem clearance is to subtract the O.D. of the valve stem, measured with a micrometer, from the I.D. of the valve guide, measured with an inside micrometer or ball gauge.
Take the measurements in three places along the valve stem and three places inside the valve guide. The difference between the largest guide measurement and the smallest stem measurement should not exceed the service limit.

Intake Valve Stem-to-Guide Clearance
Standard (New): 0.02—0.05 mm (0.001—0.002 in.)
Service Limit: 0.08 mm (0.003 in.)
Exhaust Valve Stem-to-Guide Clearance
Standard (New): 0.06—0.09 mm (0.002—0.004 in.)
Service Limit: 0.12 mm (0.005 in.)

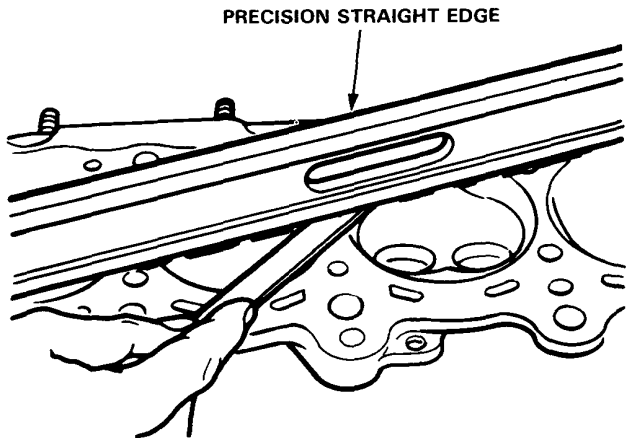
Cylinder Head

Warpage

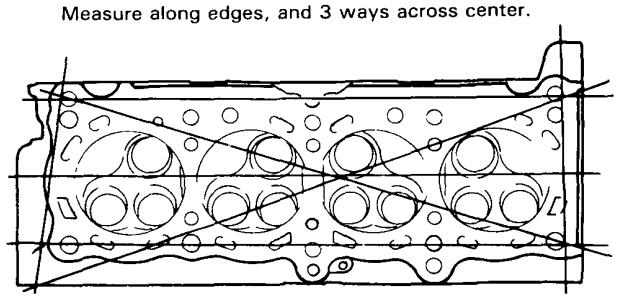
NOTE: If camshaft bearing clearances are not within specification, the head cannot be resurfaced (page 6-6).

If camshaft bearing radial clearances are within specifications, check head for warpage.

- If warpage is less than 0.05 mm (0.002 in.) cylinder head resurfacing is not required.
- If warpage is between 0.05 mm (0.002 in.) and 0.2 mm (0.008 in.), resurface cylinder head.
- Maximum resurface limit is 0.2 mm (0.008 in.) based on height of 90.0 mm (3.54 in.).



Measure along edges, and 3 ways across center.



Cylinder Head Height:
New: 90.0 mm (3.54 in.)
Service Limit: 89.8 mm (3.54 in.)

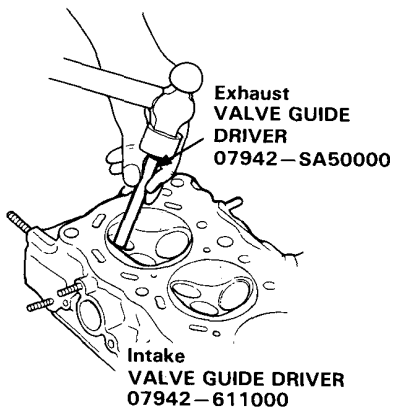
Valve Guide

Replacement

NOTE:
- For best results, heat cylinder head to 150°C (300°F) before removing or installing guides.
- It may be necessary to use an air hammer to remove some valve guides.

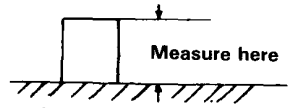
CAUTION: To avoid burns, use heavy gloves when handling heated cylinder head.

1. Drive the valve guide out from the bottom of the cylinder head.

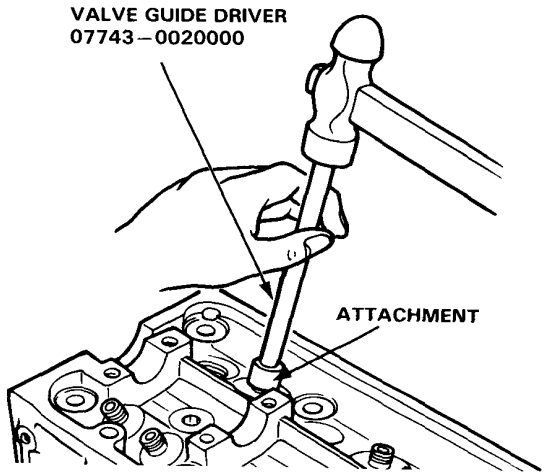


2. Drive in a new valve guide to the specified depth.

Intake: 15.5 mm (0.61 in.)
Exhaust: 15.5 mm (0.61 in.)



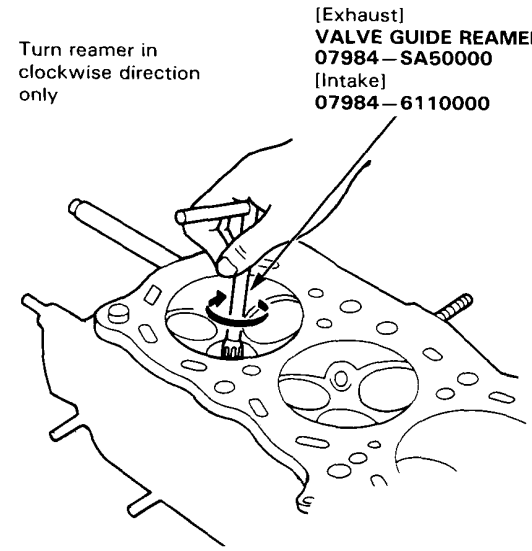
NOTE: If using adjustable valve guide driver *07743—0020000*, adjust the collar depth to correspond with the measurements given above.



Reaming

NOTE: For new valve guides only.

1. Coat reamer and valve guide with cutting oil.
2. Rotate reamer clockwise the full length of the valve guide bore.

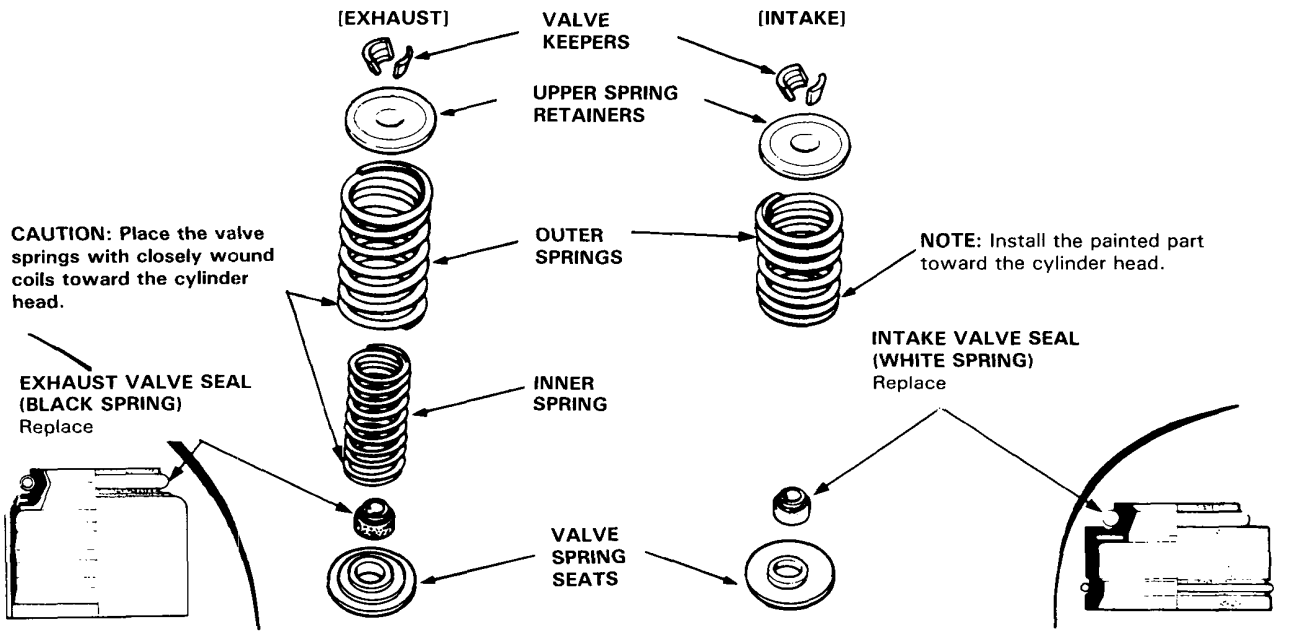


3. Continue to rotate reamer clockwise while removing.
4. Thoroughly wash the guide in detergent and water to remove any cutting residue.
5. Check clearance with valve (page 6-10).

Valve Spring, Valve

Valve Spring Installation Sequence

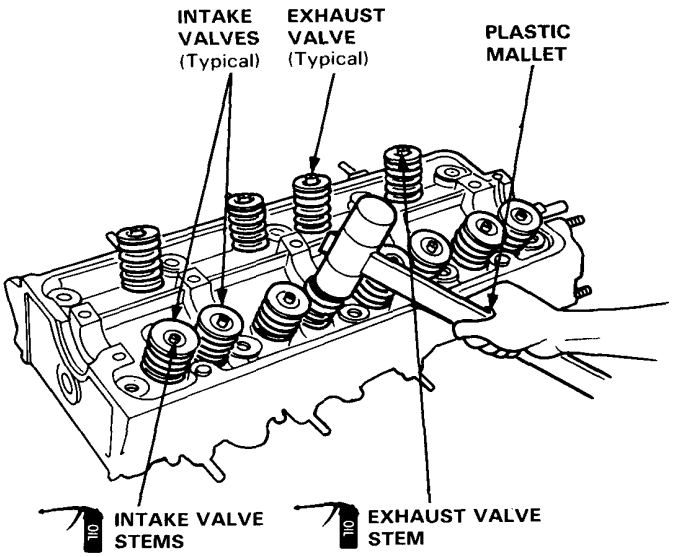
NOTE: Exhaust and intake valve guide seals are NOT interchangeable.



Valve Installation

When installing valves in cylinder head, coat valve stems with oil before inserting into valve guides, and make sure valves move up and down smoothly.

When valves and springs are in place, lightly tap the end of each valve stem two or three times with a plastic mallet to ensure proper seating of valve and valve keepers.

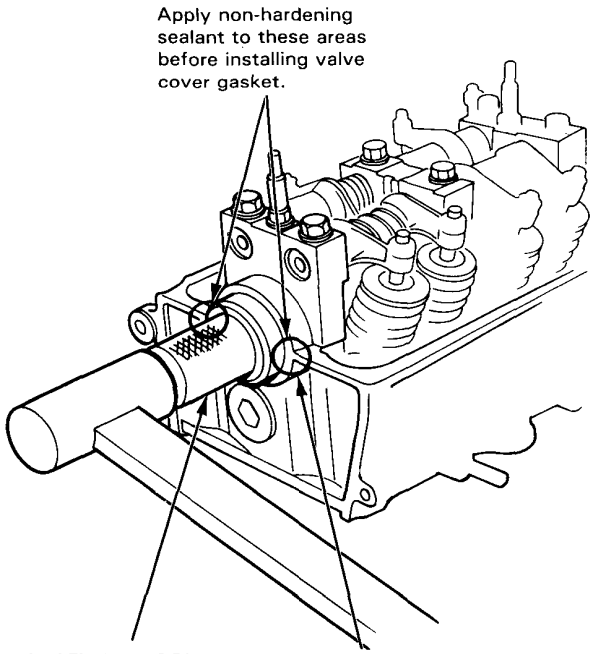


Installation

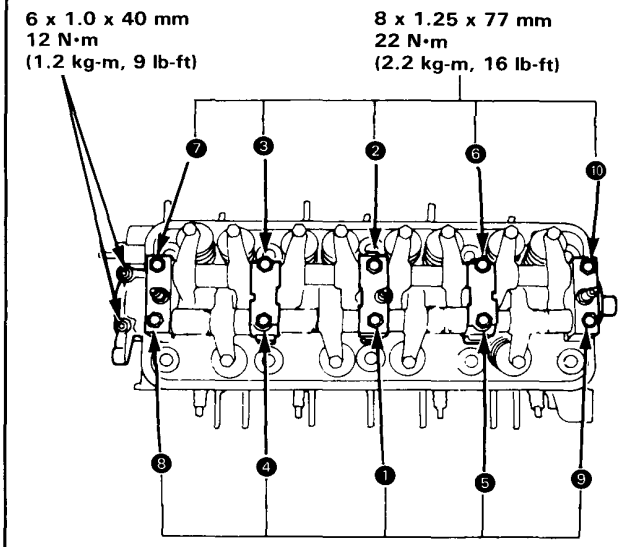
CAUTION:
- **Make sure that all rockers are in alignment with valves when torquing rocker assembly bolts.**
- **Valve locknuts should be loosened and adjusting screws backed off before installation.**

1. After wiping down cam and journals in cylinder head, lubricate both surfaces and install camshaft.
2. Turn camshaft until its keyway is facing up. (No. 1 cylinder TDC).
3. Install the camshaft seal with the open side (spring) facing in.

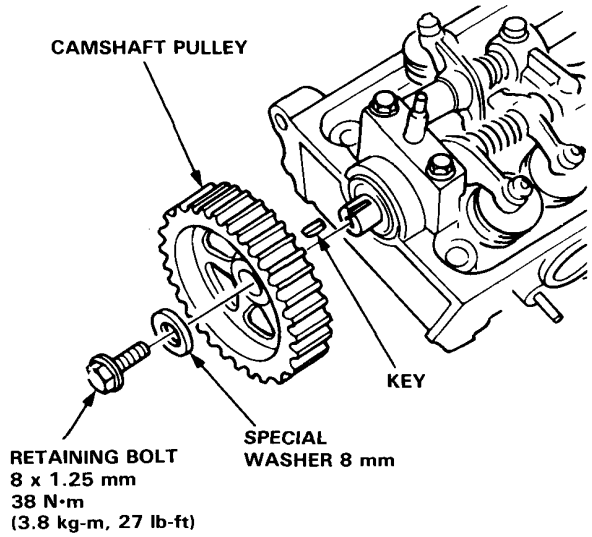
   Lubricate cam lobes after reassembly.
4. Set rocker arm assembly in place and loosely install the bolts.
5. Drive in the camshaft oil seal securely with the special tool.



6. Tighten each bolt two turns at a time in the sequence shown below to ensure that the rockers do not bind on the valves.



7. Install key into groove in camshaft.
8. Push camshaft pulley onto camshaft, then tighten retaining bolt to torque shown.

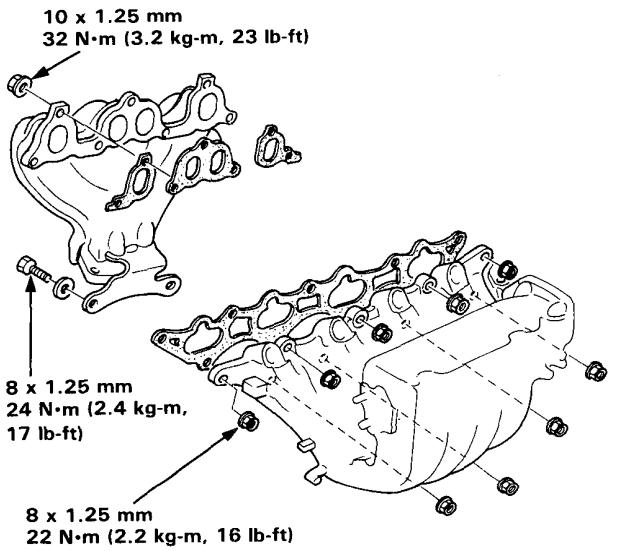


Cylinder Head

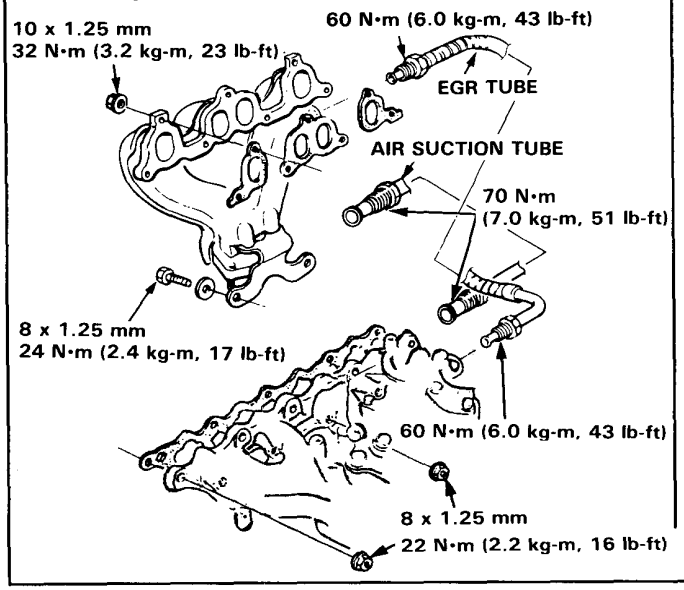
Installation

1. Install the cylinder head in reverse order of removal:
   - Always use a new head gasket.
   - Cylinder head and engine block surface must be clean.
   - "UP" mark on timing belt pulley should be at the top.
2. Install the intake and exhaust manifolds and tighten the nuts in a criss-cross pattern in 2 or 3 steps, beginning with the inner nuts.

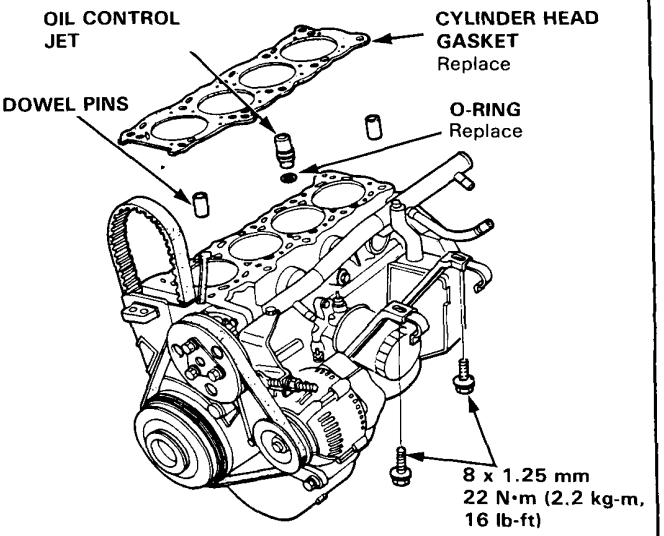
A20A4 Engine



Other Engine

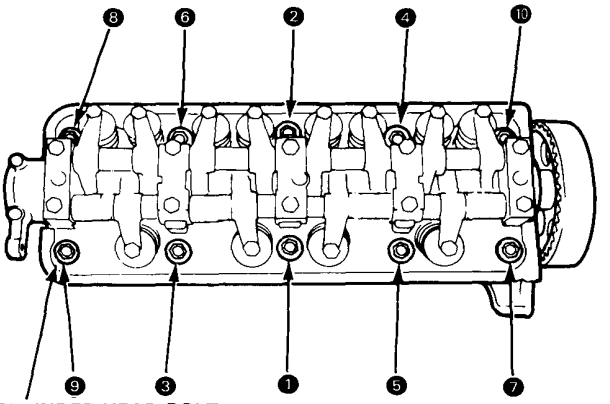


3. Cylinder head dowel pins and oil control jet must be aligned.



4. Install the bolts that secure the intake manifold to its bracket but do not tighten them yet.
5. Position the cam correctly (page 6-18).
6. Tighten cylinder head bolts in two steps.
   In the first step tighten all bolts and nuts, in sequence, to about 30 N·m (3.0 kg-m, 22 lb-ft); in the final step tighten, in same sequence, to 68 N·m (6.8 kg-m, 49 lb-ft).

CYLINDER HEAD TORQUE SEQUENCE



CYLINDER HEAD BOLT
10 x 1.25 mm
68 N·m (6.8 kg-m, 49 lb-ft)

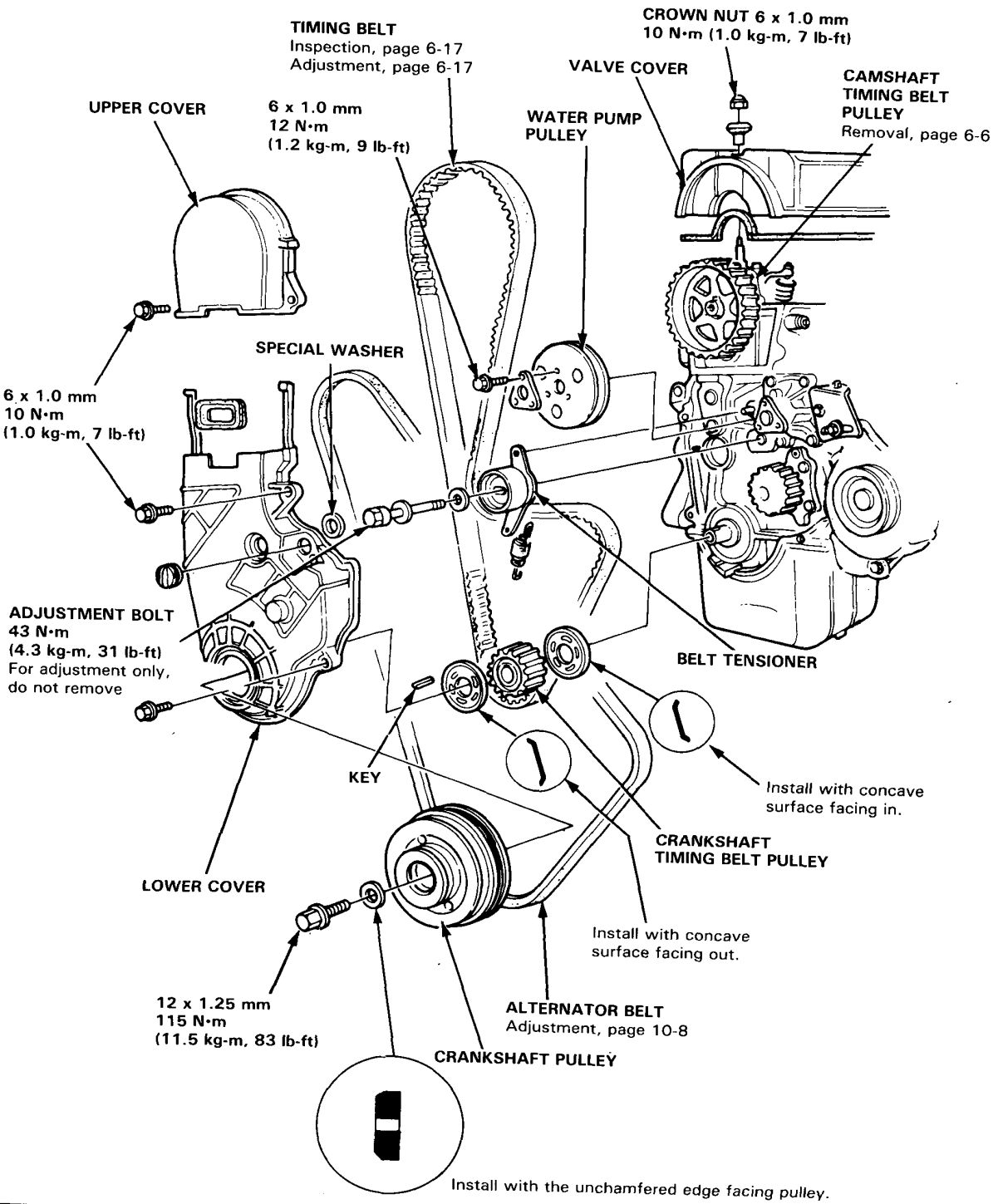
7. Install the header pipe on the exhaust manifold. Tighten the bolts for the intake manifold bracket.
8. Install the header pipe on its bracket.
9. After the installation, check that the tubes, hoses and connectors are installed correctly.
10. Adjust the valve timing (page 6-16).

Timing Belt

Replacement

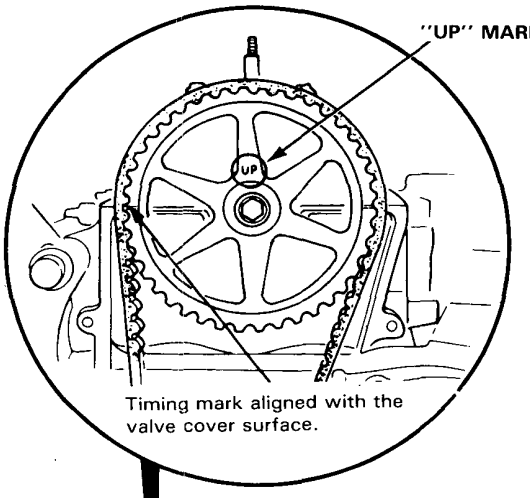
NOTE:

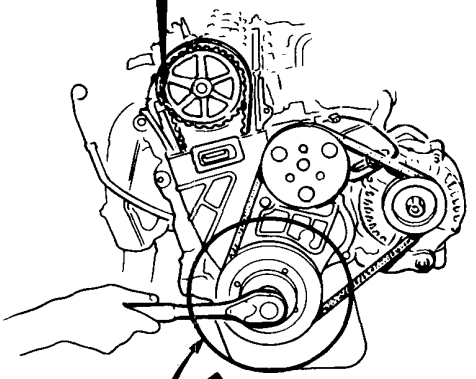
- Refer to next page for positioning crank and pulley before installing belt.
- Refer to cooling system, page 10-8, for alternator belt adjustment.
- Mark direction of rotation before removing.



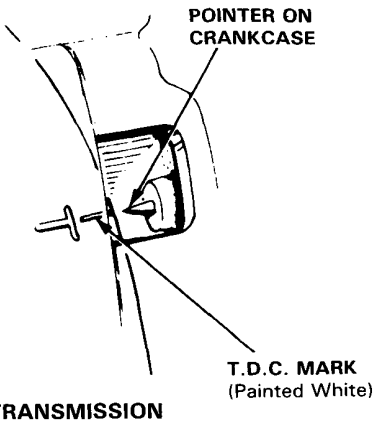
Positioning Crankshaft Before Installing Timing Belt

NOTE: Install the timing belt with the No. 1 piston at TDC (Top Dead Center) of the compression stroke.

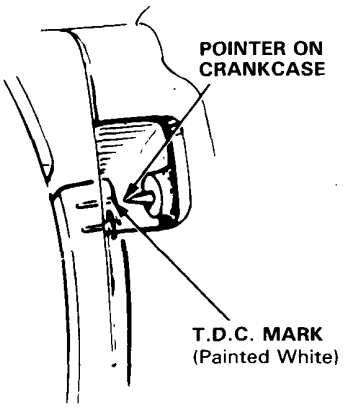


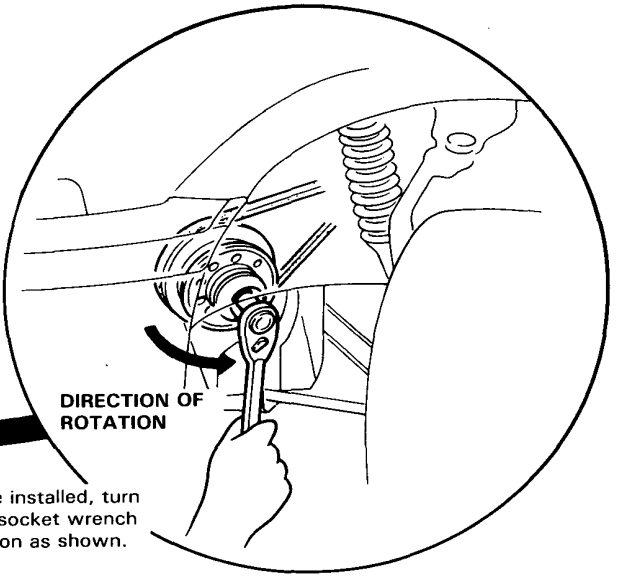


MANUAL TRANSMISSION



AUTOMATIC TRANSMISSION

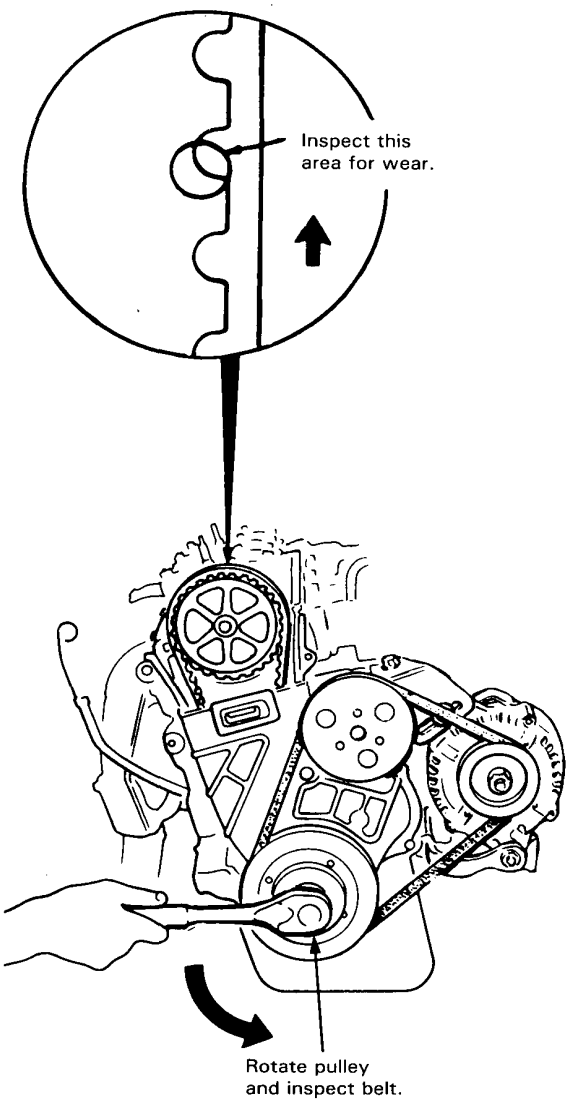




With engine installed, turn crank with socket wrench and extension as shown.

Inspection

NOTE:
- Replace belt if oil soaked.
- Remove any oil or solvent that gets on the belt.

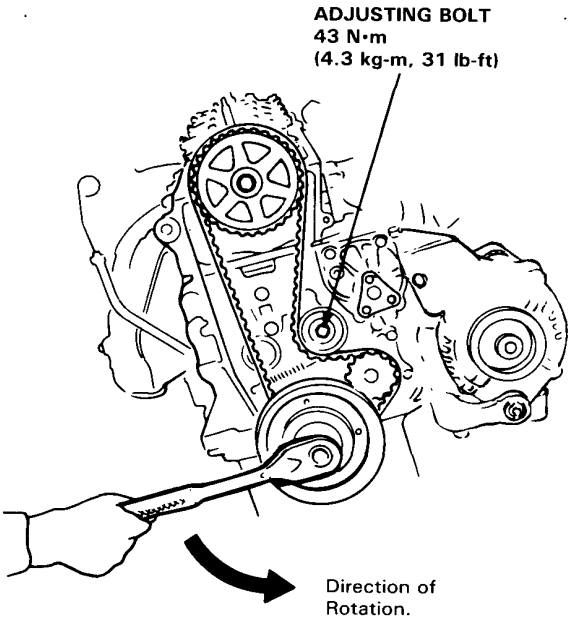


Tension Adjustment

CAUTION: Always adjust timing belt tension with the engine cold.

NOTE: Tensioner is spring-loaded to apply proper tension to the belt automatically after making the following adjustment:

1. Set the No. 1 piston at TDC.
2. Loosen adjusting bolt.



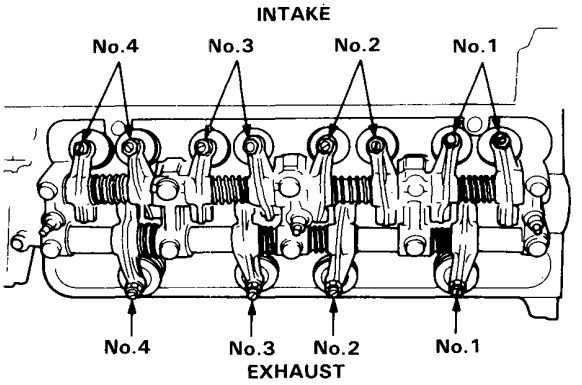
3. Rotate crankshaft counterclockwise 3-teeth on camshaft pulley to create tension on timing belt.
4. Tighten adjusting bolt.
5. If pulley bolt broke loose while turning crank, re-torque it to 115 N·m (11.5 kg-m, 83 lb-ft).

   NOTE: Put transmission in gear and set parking brake before retorquing pulley bolt.

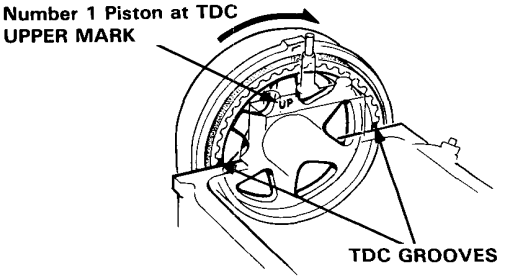
Adjustment

NOTE: Valves should be adjusted cold when the cylinder head temperature less than 38°C (100°F). Adjustment is the same for intake and exhaust valves.

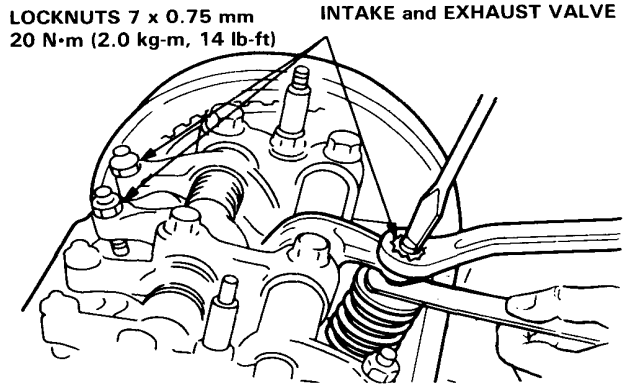
1. Remove valve cover.



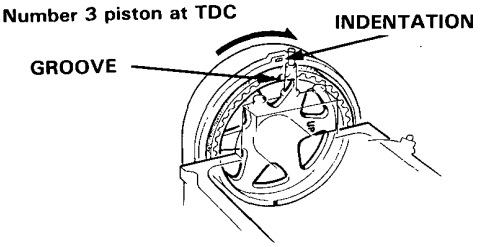
2. Set No.1 piston at TDC. "UP" mark in pulley should be at top, and TDC grooves on back side of pulley should align with cylinder head surface. The distributor rotor must be pointing towards No. 1 plug wire.



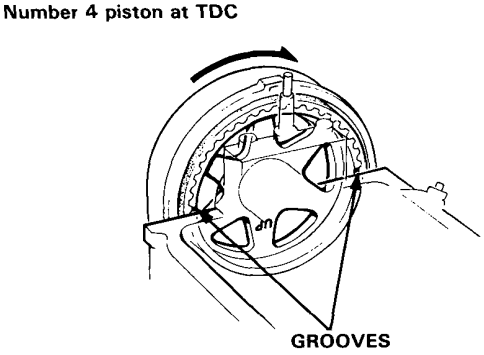
3. Adjust valves on No.1 cylinder.
   Intake: 0.12—0.17 mm (0.005—0.007 in.)
   Exhaust: 0.25—0.30 mm (0.010—0.012 in.)
4. Loosen locknut and turn adjustment screw until feeler gauge slides back and forth with slight amount of drag.



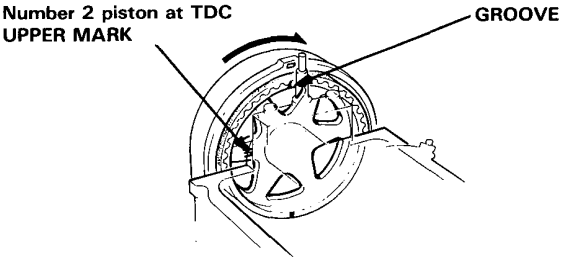
5. Tighten locknut and check clearance again. Repeat adjustment if necessary.
6. Rotate crankshaft 180° counterclockwise (cam pulley turns 90°). TDC groove should be aligned with the indentation in the belt cover. "UP" mark should not be visible. Distributor rotor should point to No.3 plug wire. Adjust valves on No.3 cylinder.



7. Rotate crankshaft 180° counterclockwise to bring No. 4 piston to TDC. Both TDC grooves are once again visible and distributor rotor points to No.4 plug wire. Adjust valves on No.4 cylinder.



8. Rotate crankshaft 180° counterclockwise to bring No.2 piston to TDC. Mark on pulley should align with indentation on the belt cover. "UP" mark should be visible. Distributor rotor should point to No.2 plug wire. Adjust valves on No.2 cylinder.



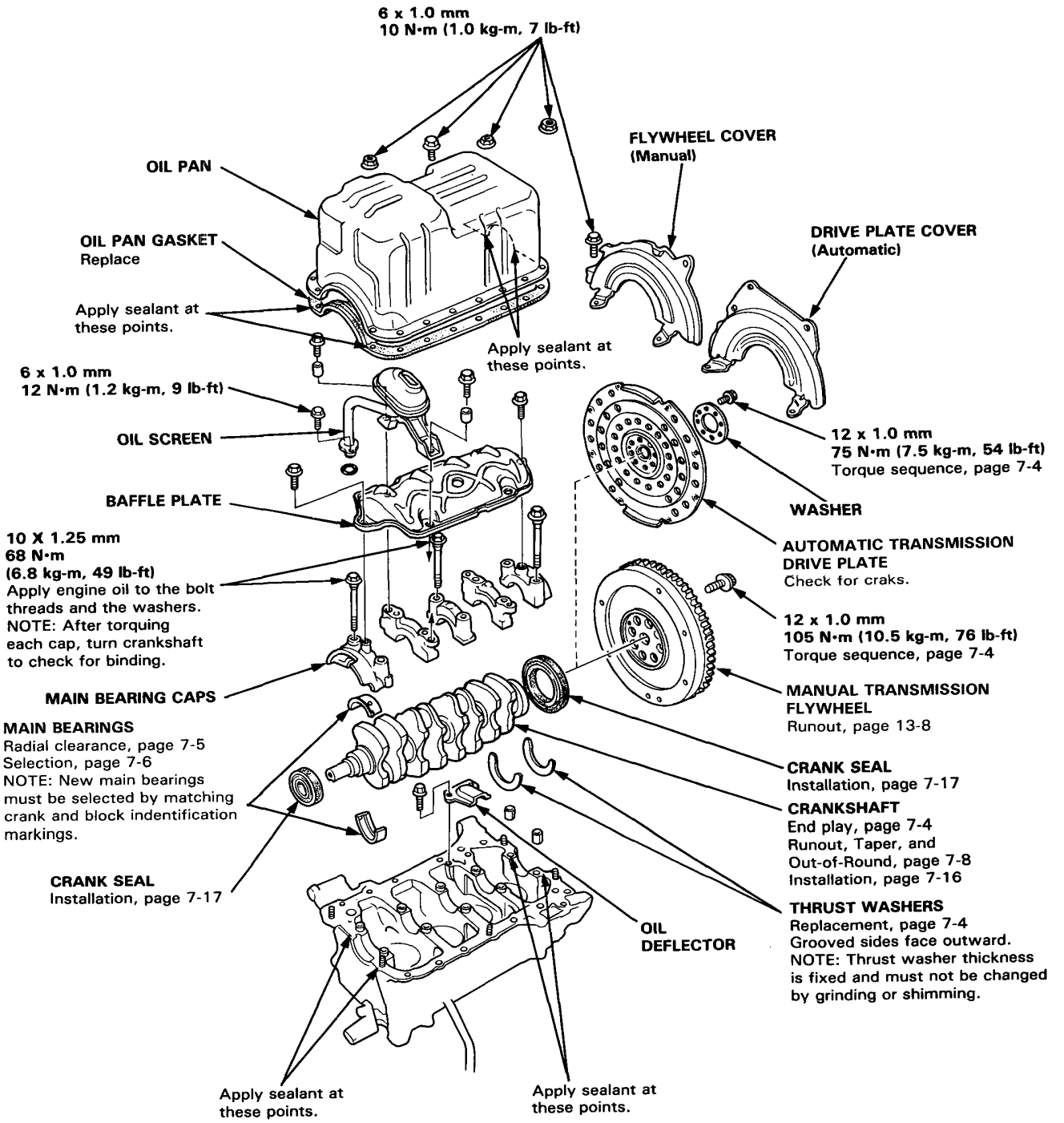
Engine Block

Engine Block

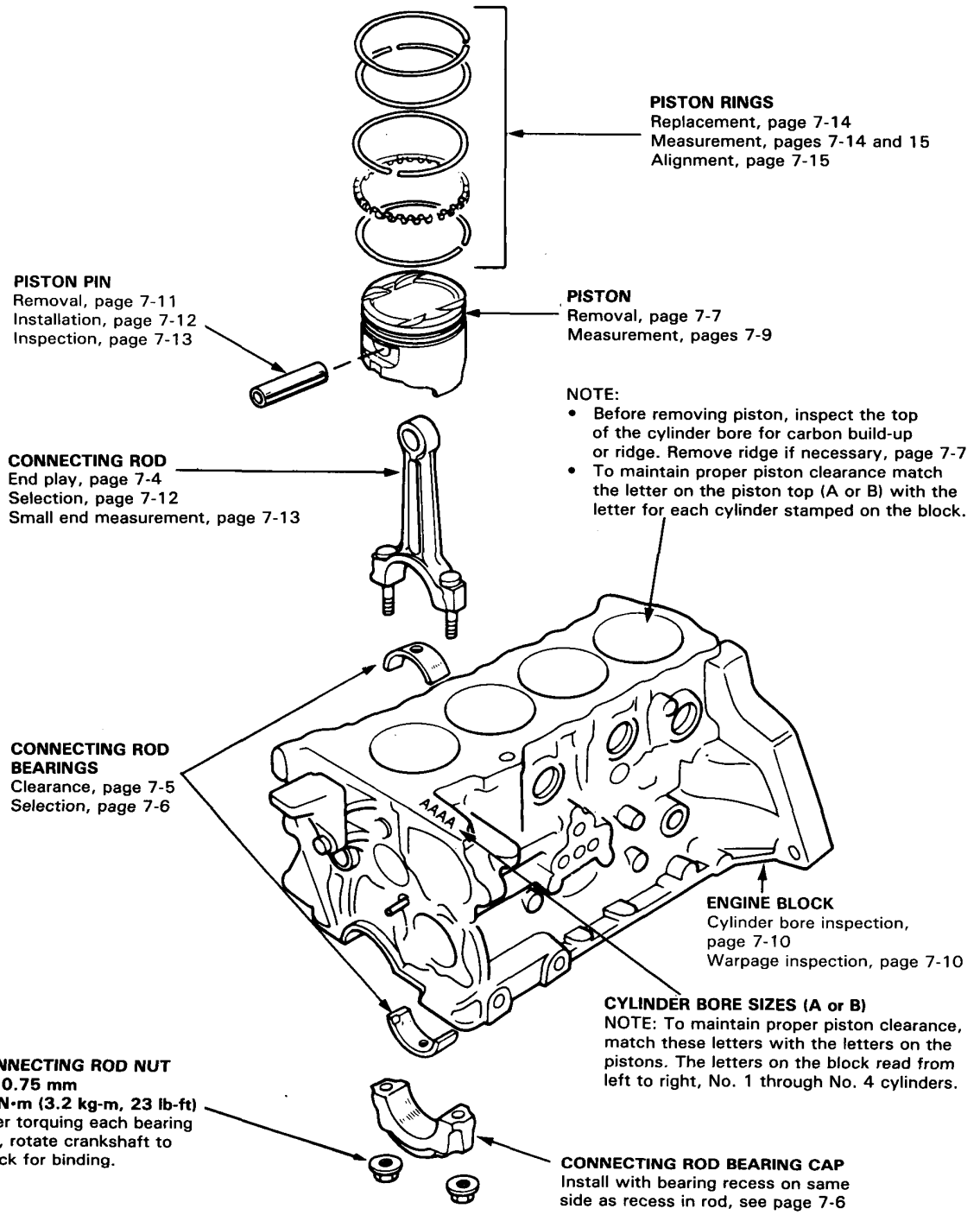
Illustrated Index

A20A Engine shown; A16A Engine similar

Lubricate all internal parts with engine oil during reassembly.



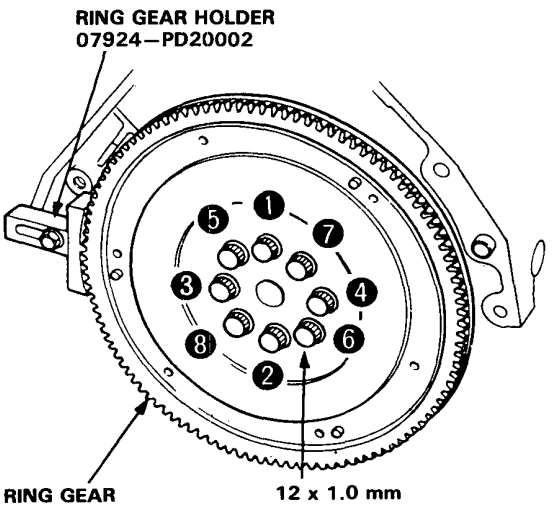
NOTE: New rod bearings must be selected by matching connecting rod and crankshaft identification markings (page 7-6)



Engine Block

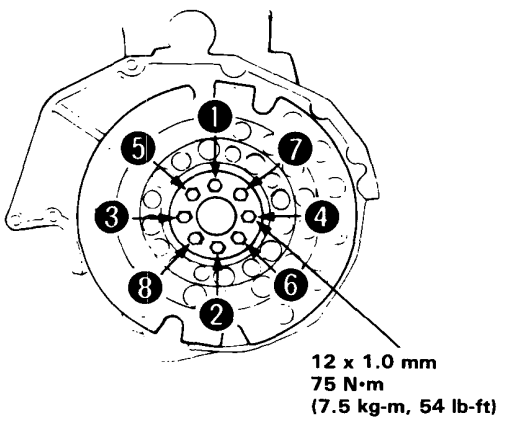
Flywheel Replacement (Manual Transmission)

Remove the eight flywheel bolts, then separate the flywheel from the crankshaft flange. After installation, tighten the bolts in the sesquence shown.



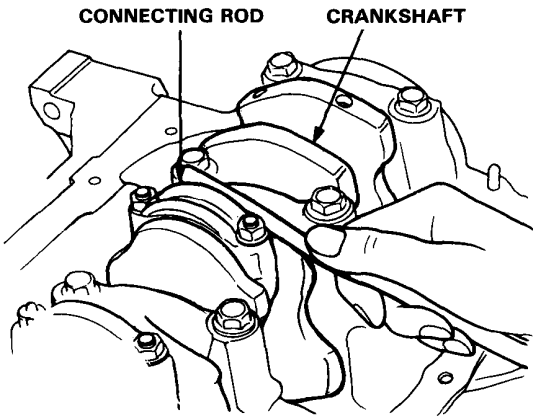
Drive Plate Replacement (Automatic Transmission)

Remove the eight drive plate bolts, then separate the drive plate from the crankshaft flange. After installation, tighten the bolts in the sequence shown.



Connecting Rod End Play

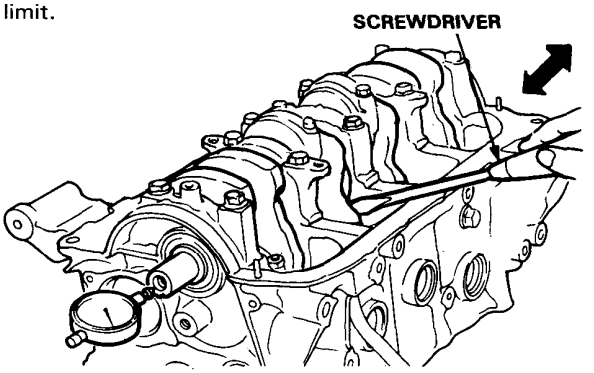
Standard (New): 0.15—0.30 mm (0.006—0.012 in.)
Service Limit: 0.40 mm (0.016 in.)



- If out-of tolerance, install new connecting rod.
- If still out-of-tolerance, replace crankshaft (pages 7-7 and 7-16).

Crankshaft End Play

Push crank firmly away from dial indicator, and zero dial against end of crank. Then pull crank firmly back toward indicator; dial reading should not exceed service limit.



Standard (New): 0.1—0.35 mm (0.004—0.014 in.)
Service Limit: 0.45 mm (0.018 in.)

- If end play is excessive, inspect thrust washers and thrust surface on crankshaft. Replace parts as necessary.

NOTE: Thrust washer thickness is fixed and must not be changed either by grinding or shimming. Thrust washers are installed with grooved sides outward.

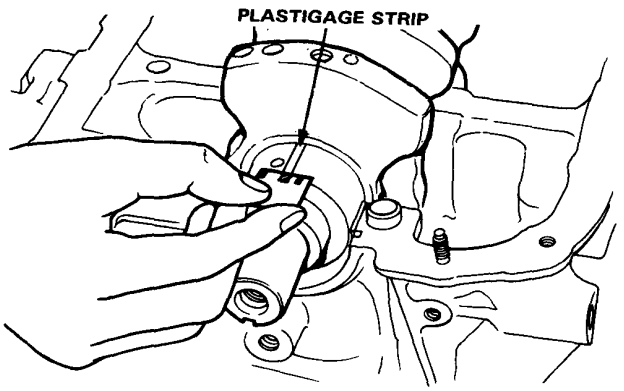
Main Bearing

Clearance

1. To check main bearing clearance, remove the main caps and bearing halves.
2. Clean each main journal and bearing half with a clean shop rag.
3. Place one strip of plastigage across each main journal.
   NOTE: If the engine is still in the car when you bolt the main cap down to check clearance, the weight of the crank and flywheel will flatten the plastigage further than just the torque on the cap bolts, and give you an incorrect reading. For an accurate reading, support the crank with a jack under the counterweights and check only one bearing at a time
4. Reinstall the bearings and caps, then torque the bolts to 68 N·m (6.8 kg-m, 49 lb-ft).
5. Remove the caps and bearings again, and measure the widest part of the plastigage.

Main Bearing Clearance:
Standard (New):

No. 1, 2, 4 and 5 Journals	**0.026—0.055 mm (0.0010—0.0022 in.)**
No. 3 Journal	**0.032—0.061 mm (0.0013—0.0024 in.)**
Service Limit:	**0.07 mm (0.003 in.)**



6. If the plastigage measures too wide or too narrow, (remove the engine if it's still in the car), remove the crank, remove the upper half of the bearing, then install a new, complete bearing with the same color code (select the color as shown on the next page), and recheck the clearance.
   CAUTION: Do not file, shim, or scrape the bearings or the caps to adjust clearance.
7. If the plastigage shows the clearance is still incorrect, try the next larger or smaller bearing (the color listed above or below that one), and check again.
   NOTE: If the proper clearance cannot be obtained by using the appropriate larger or smaller bearings, replace the crank and start over.

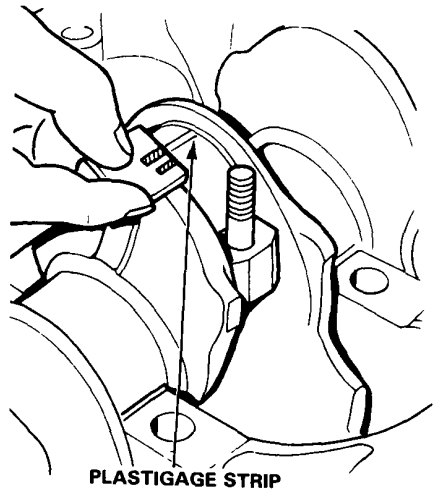
Rod Bearing

Clearance

1. Remove the connecting rod cap and bearing half.
2. Clean the crankshaft rod journal and bearing half with a clean shop rag.
3. Place plastigage across the rod journal.
4. Reinstall the bearing half and cap, and torque the nuts to 32 N·m (3.2 kg-m, 23 lb-ft).

   NOTE: Do not rotate the crank during inspection.
5. Remove the rod cap and bearing half and measure the widest part of the plastigage.

Connecting Rod Bearing Clearance:
Standard (New): 0.020—0.038 mm (0.0008—0.0015 in.)
Service Limit: 0.07 mm (0.003 in.)



6. If the plastigage measures too wide or too narrow, remove the upper half of the bearing, install a new, complete bearing with the same color code (select color as shown on next page), and recheck the clearance.

   CAUTION: Do not file, shim, or scrape the bearing or the caps to adjust clearance.
7. If the plastigage shows the clearance is still incorrect, try the next larger or smaller bearing (the color listed above or below that one), and check clearance again.

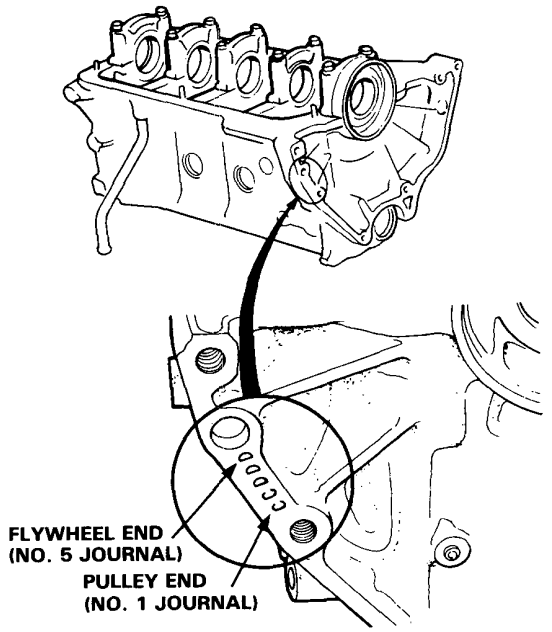
   NOTE: If the proper clearance cannot be obtained by using the appropriate larger or smaller bearings, replace the crank and start over.

Main Bearing

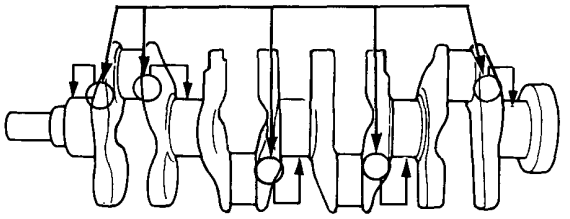
Selection

Crank Bore Code Location (Marks)

Marks have been stamped on the end of the block as a code for the size of each of the 5 main journal bores. Use them, and the numbers stamped on the crank (codes for main journal size), to choose the correct bearings.



Main Journal Code Locations (Numbers)



Bearing Identification

Color code is on the edge of the bearing

→ Larger crank bore

A or I	B or II	C or III	D or IIII

→ Smaller bearing (thicker)

Red	Pink	Yellow	Green
Pink	Yellow	Green	Brown
Yellow	Green	Brown	Black
Green	Brown	Black	Blue

1
2
3
4

Smaller main journal

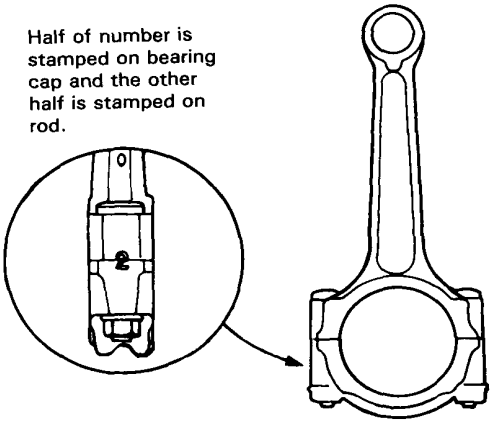
Smaller bearing (thicker)

Rod Bearing

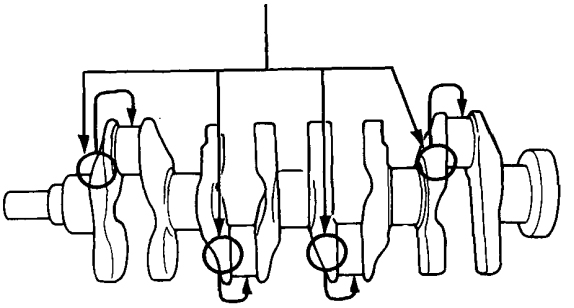
Selection

Rod Code Location (Numbers)

Numbers have been stamped on the side of each connecting rod as a code for the size of the big end. Use them, and the letters stamped on the crank (codes for rod journal size), to choose the correct bearings.



Rod Journal Code Locations (Letters)



Bearing Identification

Color code is on the edge of the bearing

→ Larger big end bore

1	2	3	4

→ Smaller bearing (thicker)

Red	Pink	Yellow	Green
Pink	Yellow	Green	Brown
Yellow	Green	Brown	Black
Green	Brown	Black	Blue

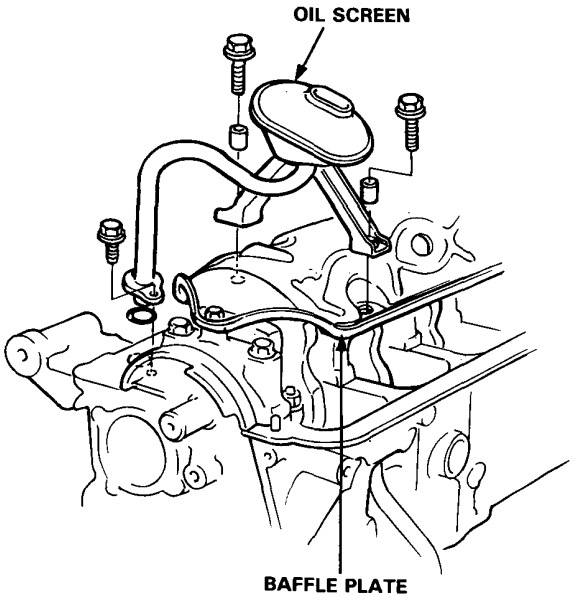
A
B
C
D

Smaller rod jounal

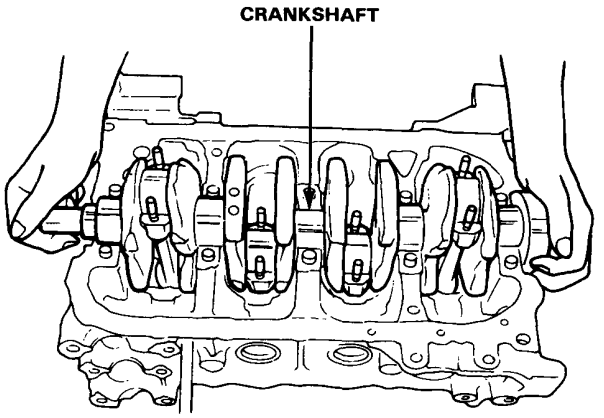
Smaller bearing (thicker)

Removal

1. Remove the oil screen.

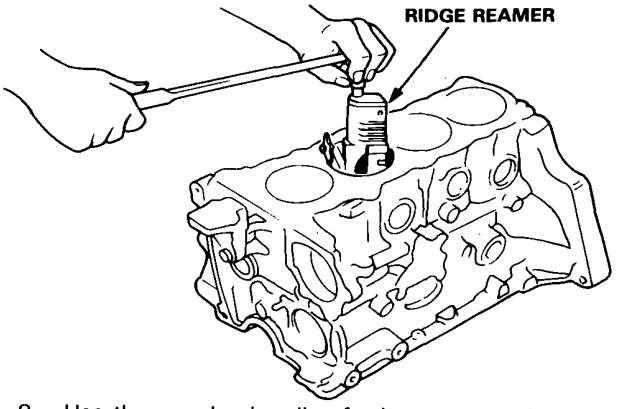


2. Remove the baffle plate.
3. Turn the crankshaft so No. 2 and 3 crankpins are at the bottom.
4. Remove the rod caps/bearings and main caps/bearings. Keep all caps/bearings in order.
5. Lift the crankshaft out of engine, being careful not to damage journals.

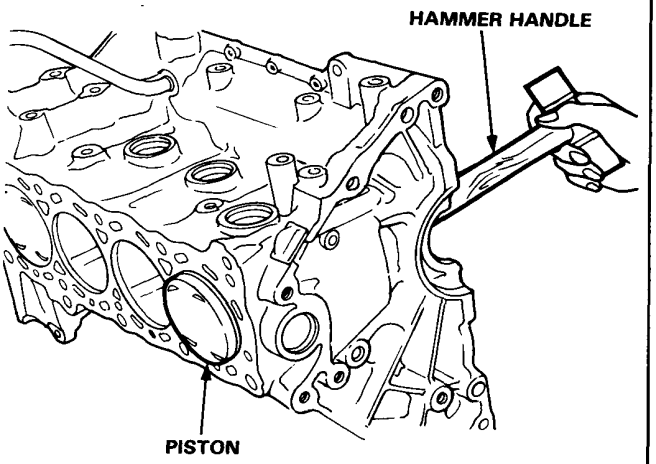


6. Remove upper bearing halves from connecting rods and set aside with their respective caps.
7. Reinstall main cap and bearings on engine in proper order.
8. If you can feel a ridge of metal or hard carbon around the top of each cylinder, remove it with a ridge reamer. Follow reamer manufacturer's instructions.

CAUTION: If the ridge is not removed, it may damage the pistons as they are pushed out.



9. Use the wooden handle of a hammer to drive out pistons.



10. Reinstall the rod bearings and caps after removing each piston/connecting rod assembly.
11. Mark piston/connecting rod assemblies with cylinder numbers to avoid mixup on reassembly.

NOTE: The existing number on the connecting rod does not indicate its position in the engine, it indicates the rod bore size.

Inspection

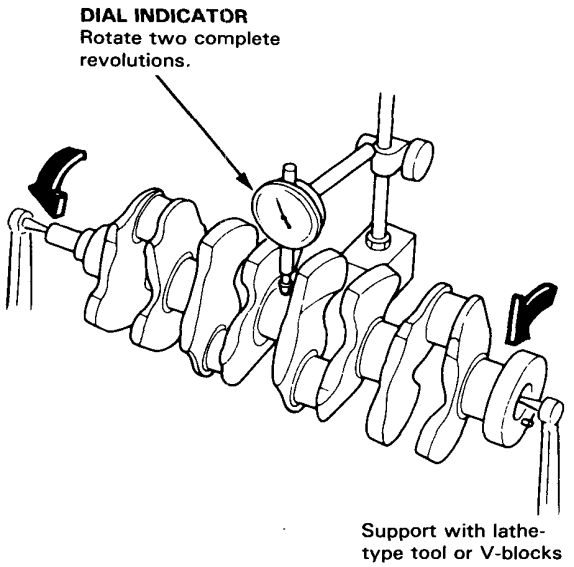
- Clean the crankshaft oil passages with pipe cleaners or a suitable brush.
- Check the keyway and treads.

Alignment

- Measure runout on all main journals to make sure the crank is not bent.
- The difference between measurements on each journal must not be more than the sevice limit.

Crankshaft Total Indicated Runout:
A20A Engine:
Standard (New): 0.024 mm (0.0009 in.)
Service Limit: 0.04 mm (0.0016 in.)

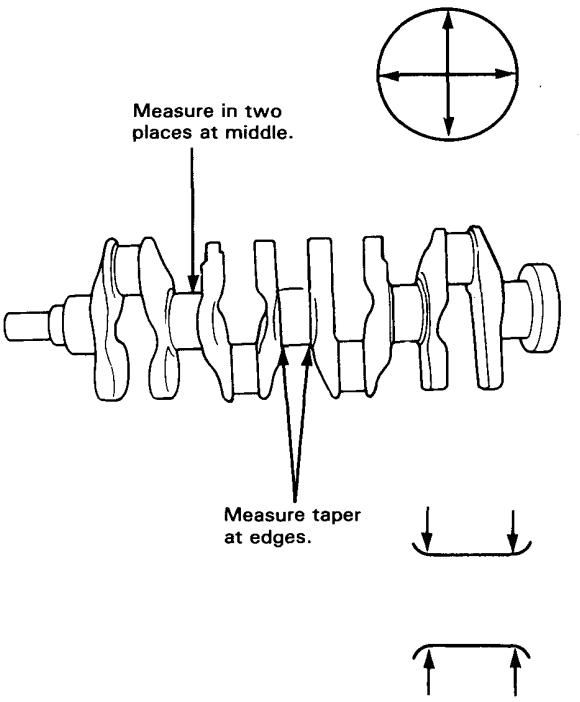
A16A Engine:
Standard (New): 0.03 mm (0.0012 in.)
Service Limit: 0.06 mm (0.0024 in.)



Out-of-Round and Taper

- Measure out-of-round at the middle of each rod and main journal in two places.
- The difference between measurements on each journal must not be more than the service limlit.

Journal Taper:
Standard (New): 0.005 mm (0.0002 in.)
Service Limit: 0.010 mm (0.0004 in.)



- Measure taper at edges of each rod and main journal.
- The difference between measurements on each journal must not be more than the service limit.

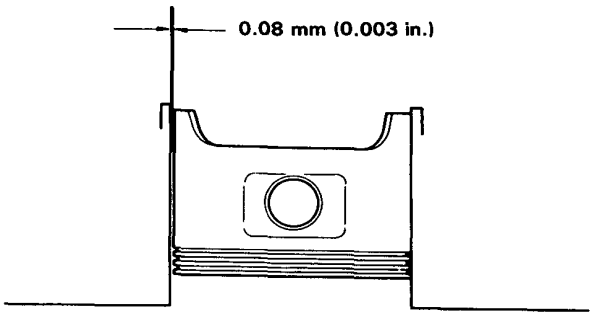
Journal Out-of-Round:
Standard (New): 0.005 mm (0.0002 in.)
Service Limit: 0.010 mm (0.0004 in.)

Piston

Piston-to-Block Clearance

1. Make a preliminary piston-to-block clearance check with a feeler gauge:

   Service Limit: 0.08 mm (0.003 in.)



   If the clearance is near or exceeds the service limit, inspect the piston and cylinder block for excessive wear.
   To confirm the feeler gauge check, further measurement with a micrometer will be necessary.

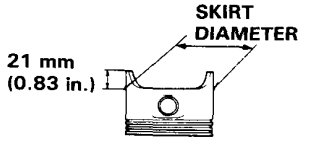
2. Calculate difference between cylinder bore diameter on page 7-10 and piston diameter.

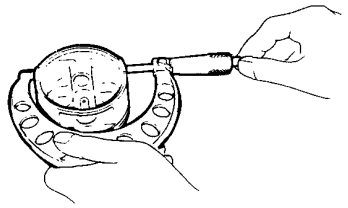
   Piston-to-Cylinder Clearance:
   Standard (New): 0.02—0.04 mm (0.0008—0.0016 in.)
   Service Limit: 0.08 mm (0.003 in.)

Inspection

1. Check the piston for distortion or cracks.
   NOTE: If cylinder is bored, an oversized piston must be used.
2. Measure piston diameter at a point 21 mm (0.83 in.) from bottom of skirt.
   NOTE: There are two standard-size piston (A and B). The letter is stamped on the top of the piston (B only). These letters are also stamped on the block as cylinder bore sizes.

   A20A Engine:
   Piston A Diameter
   Standard (New): 82.67—82.68 mm (3.2547—3.2551 in.)
   Service Limit: 82.66 mm (3.2543 in.)
   Piston B Diameter
   Standard (New): 82.66—82.67 mm (3.2543—3.2547 in.)
   Service Limit: 82.65 mm (3.2539 in.)
   A16A Engine:
   Piston A Diameter
   Standard (New): 79.98—79.99 mm (3.1488—3.1492 in.)
   Service Limit: 79.97 mm (3.1484 in.)
   Piston B Diameter
   Standard (New): 79.97—79.97 mm (3.1484—3.1488 in.)
   Service Limit: 79.96 mm (3.1480 in.)



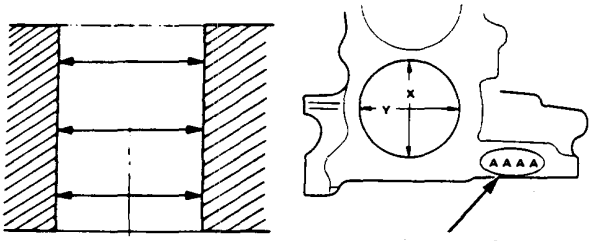


   Oversize Piston Diameter
   A20A Engine:
   Standard 0.30: 82.98—82.99 mm (3.2669—3.2673 in.)
   A16A Engine:
   Standard 0.25: 80.22—80.23 mm (3.1583—3.1587 in.)
   Standard 0.5: 80.47—80.48 mm (3.1681—3.1685 in.)
3. Check the piston pin-to-piston clearance. Coat the piston pin with engine oil.
   It should then be possible to push the piston pin into the piston hole with thumb pressure.
   Piston Pin-to-Piston Clsearance:
   Service limit: 0.012—0.024 mm (0.0005—0.0009 in.)

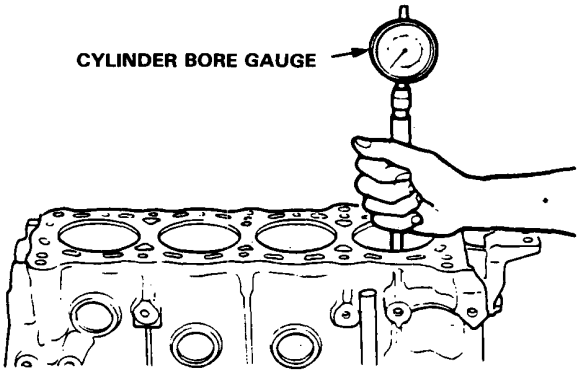
Cylinder Block

Inspection

1. Measure wear and taper in directions X and Y at three levels in each cylinder as shown.



CYLINDER BORE SIZES (A or B)
Read the letters from left-to-right for No. 1 through No. 4 cylinders.



A20A Engine:
Cylinder Bore Size A
Standard (New): 82.70—82.71 mm (3.2559—3.2563 in.)
Service Limit: 82.74 mm (3.2575 in.)
Cylinder Bore Size B
Standard (New): 82.69—82.70 mm (3.2555—3.2559 in.)
Service Limit: 82.73 mm (3.2571 in.)
Oversize
Standard 0.30 (New): 83.01—83.02 mm (3.2681—3.2685 in.)

A16A Engine:
Cylinder Bore Size A
Standard (New): 80.01—80.02 mm (3.1500—3.1504 in.)
Cylinder Bore Size B
Standard (New): 80.00—80.01 mm (3.1496—3.1500 in.)
Service Limit: 80.04 mm (3.1512 in.)
Oversize
Standard 0.25 (New): 80.25—80.26 mm (3.1594—3.1598 in.)
Standard 0.5 (New): 80.50—80.51 mm (3.1693—3.1697 in.)

Bore Taper
Limit: (Difference between first and third measurement) 0.05 mm (0.002 in.)

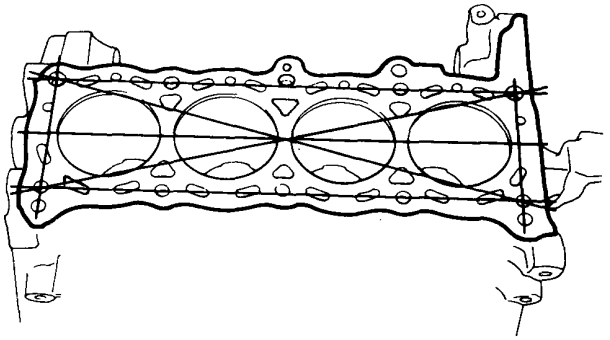
- If measurements in any cylinder are beyond Oversize Bore Service Limit, replace the block.
- If block is to be rebored, refer to Piston Clearance Inspection (page 7-9) after reboring.

NOTE: Scored or scratched cylinder bores must be honed.

Out-of-Round
Service Limit: 0.05 mm (0.002 in.)

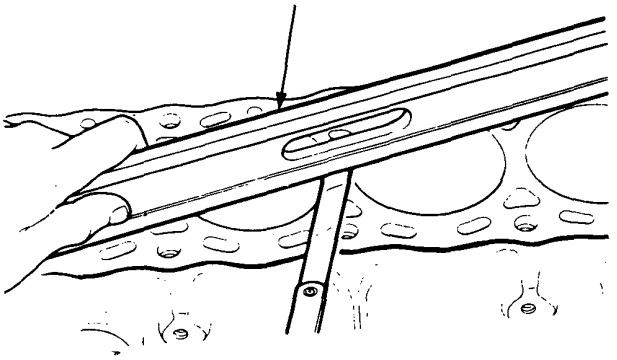
2. Check the top of the block for warpage. Measure along the edges and across the center as shown.

SURFACES TO BE MEASURED



Engine block Warpage:
Standard (New): 0.08 mm (0.003 in.)
Service Limit: 0.10 mm (0.004 in.)

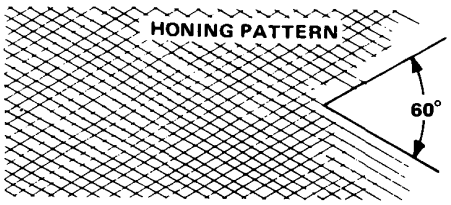
PRECISION STRAIGHT EDGE



Bore Honing

1. Measure cylinder bores as shown on page 7-10. If the block is to be re-used, hone the cylinders and remeasure the bores.

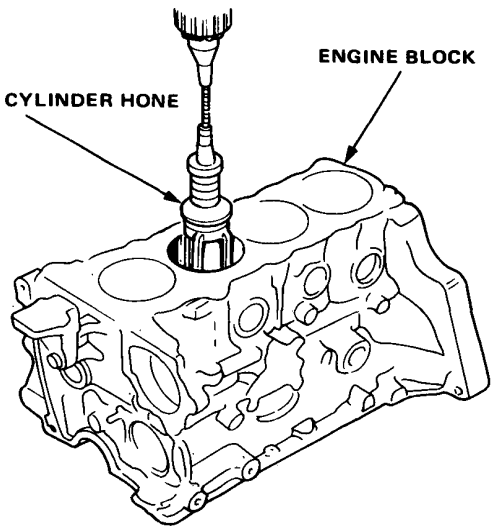
2. Hone cylinder bores with honing oil and a fine (400 grit) stone in a 60 degree cross-hatch pattern.



3. When honing is complete, thoroughly clean the engine block of all metal particles. Wash the cylinder bores with hot soapy water, then dry and oil immediately to prevent rusting.

4. If scoring or scratches are still present in cylinder bores after honing to service limit, rebore the engine block.

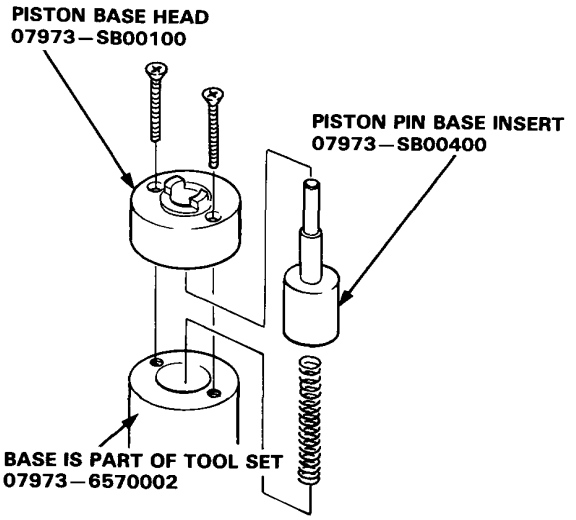
   NOTE: Some light vertical scoring and scratching is acceptable if it is not deep enough to catch your fingernail and does not run the full length of the bore.



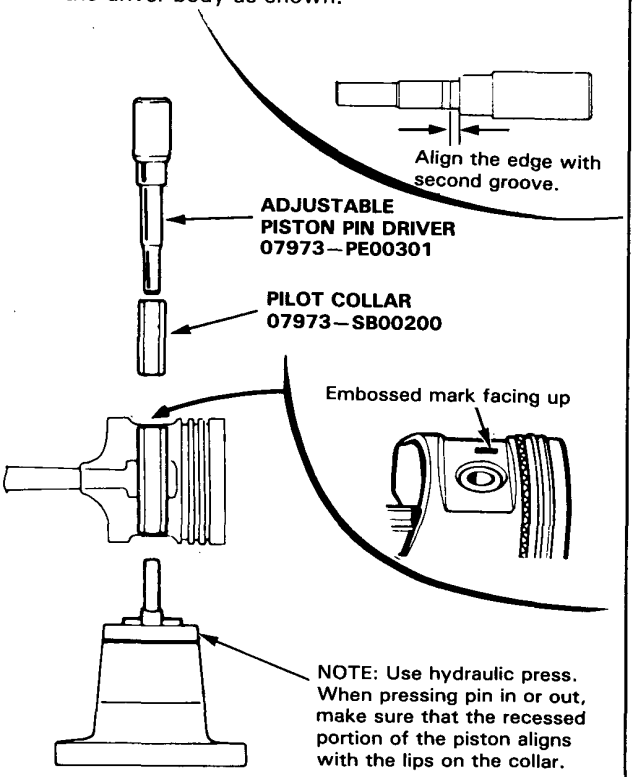
Piston Pin

Removal

1. Install the attachment on the piston base.



2. Turn the handle of the piston pin driver so that the end of the drive aligns with the second groove of the driver body as shown.



3. Place the piston on the piston base and press the pin out with a hydraulic press.

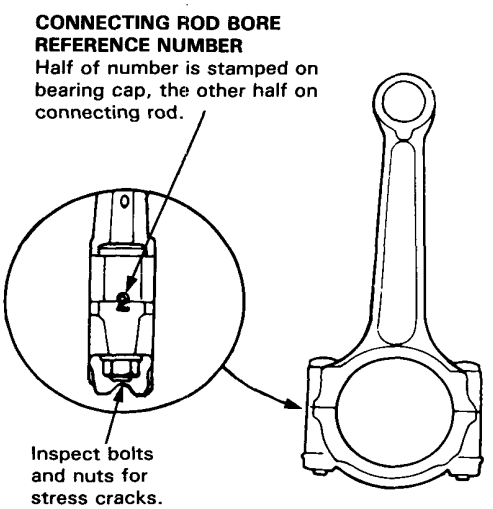
Connecting Rod

Selection

Each rod is sorted into one of four tolerance ranges (from+0.006 to +0.024 mm, in 0.006 mm increments) depending on the size of its big end bore. It's then stamped with a nubmer (1, 2, 3, or 4) indicating that tolerance. You may find any combination of 1, 2, 3, or 4, in any engine.

Normal Bore Size:
A20A: 45 mm (1.77 in.)
A16A: 42 mm (1.65 in.)

NOTE:
- Reference numbers are for big end bore size and do NOT indicate the postition of rod in engine.
- Inspect connecting rod for cracks and heat damage.



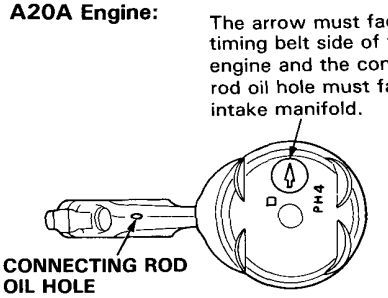
Piston Pin

Installation

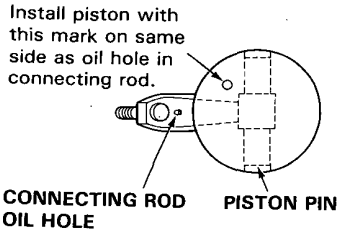
1. Use a hydraulic press for installation.

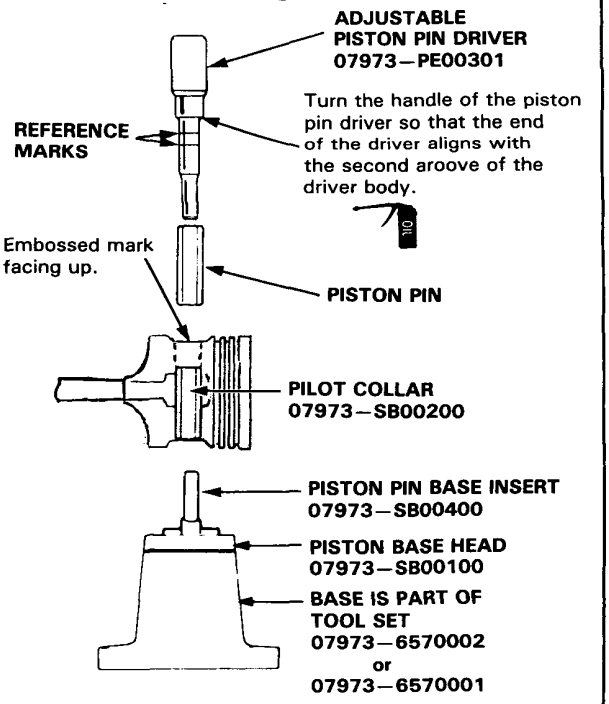
   - When pressing pin in or out, be sure you position the recessed flat on the piston against the lugs on the base attachment.

A20A Engine:



A16A Engine:





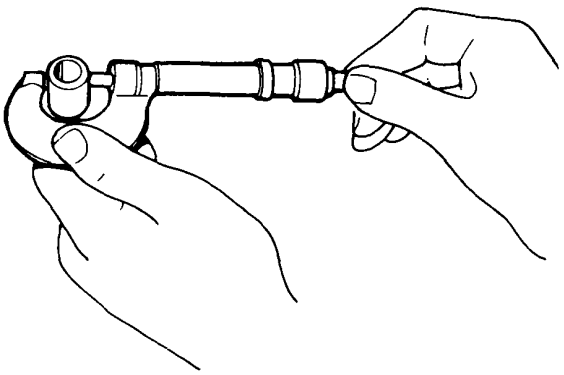
NOTE: Install the assembled piston and rod with the oil hole facing the intake manifold.

Inspection

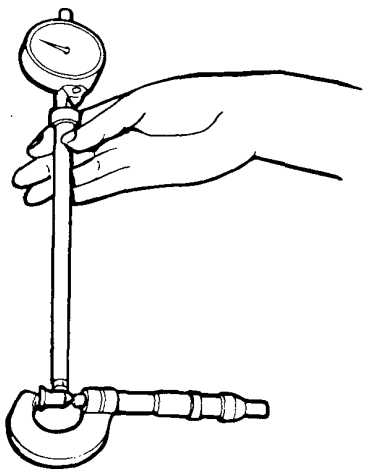
1. Measure the diameter of the piston pin.

Piston Pin Diameter:
Standard (New): 19.994—20.0 mm
(0.7872—0.7874 in.)
Oversize: 19.997—20.003 mm
(0.7873—0.7875 in.)

NOTE: All replacement piston pins are oversize.



2. Zero the dial indicator to the piston pin diameter.

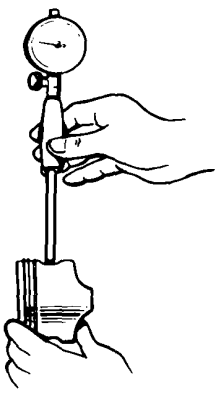


3. Measure the piston pin-to-piston clearance.

NOTE: Check the piston for distortion or cracks.

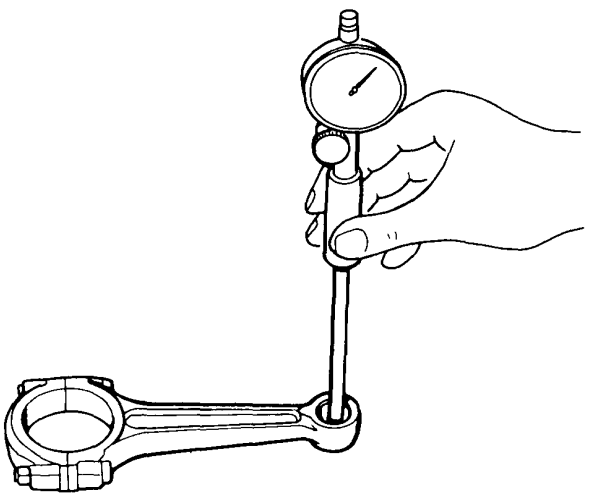
If the piston pin clearance is greater than 0.024 mm (0.0009 in.), re-measure using an oversize piston pin.

Piston Pin-to-Piston Clearance:
Service Limit: 0.012—0.024 mm
(0.0005—0.0009 in.)



4. Check the difference between piston pin diameter and connecting rod small end diameter.

Piston Pin-to-Connecting Rod Interference:
Standard (New): 0.013—0.032 mm
(0.0005—0.0013 in.)



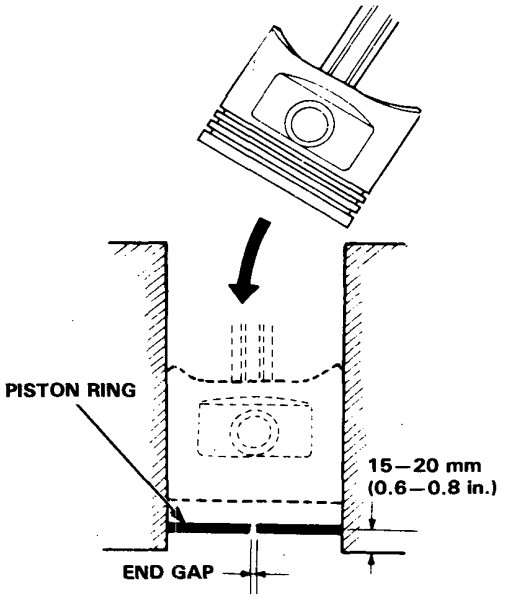
Piston Ring

End Gap

1. Using a piston, push a new ring into the cylinder bore 15—20 mm (0.6—0.8 in.) from the bottom.
2. Measure the piston ring end-gap with a feeler gauge:
   - If the gap is too small, check to see if you have the proper rings for your engine.
   - If the gap is too large, re-check the cylinder bore diameter against the wear limits on page 7-9. If the bore is over limit, the engine block must be rebored.

Piston Ring End-Gap:
A20A Engine:
Top Ring
Standard (New): 0.20—0.35 mm (0.008—0.014 in.)
Service Limit: 0.60 mm (0.02 in.)
Second Ring
Standard (New): 0.25—0.37 mm (0.010—0.015 in.)
Service Limit: 0.60 mm (0.02 in.)
Oil Ring
Standard (New): 0.2—0.7 mm (0.008—0.028 in.)
Service Limit: 0.8 mm (0.03 in.)

A16A Engine:
Top and Second Ring
Standard (New): 0.20—0.35 mm (0.008—0.014 in.)
Service Limit: 0.60 mm (0.024 in.)
Oil Ring
Standard (New): 0.2—0.7 mm (0.008—0.028 in.)
Service Limit: 1.1 mm (0.043 in.)



Replacement

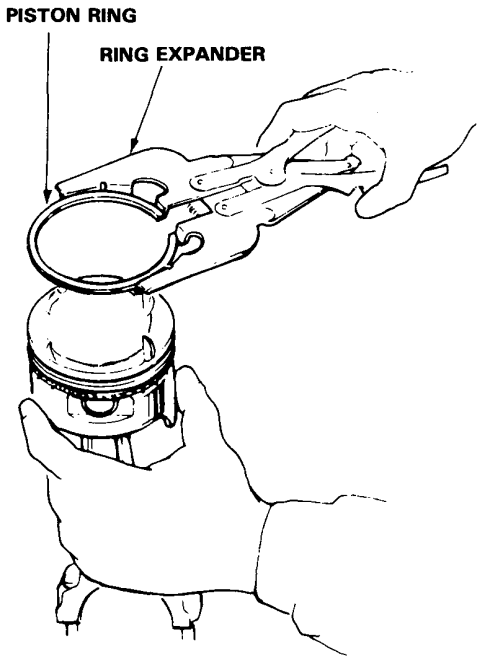
1. Using ring expander, remove old piston rings.
2. Clean all ring grooves thoroughly.

   NOTE: Use squared-off broken ring, or file down blade on ring groove cleaner to fit (compression rings are 1.5 mm wide; oil ring is 4.0 mm wide).

   CAUTION: Do not use a wire brush to clean ring lands, or cut ring lands deeper with cleaning tool.

   NOTE: If piston is to be separated from connecting rod, do not install new rings yet.
3. Install new rings in proper sequence and position (page 7-15).

   NOTE: Do not re-use old piston rings.

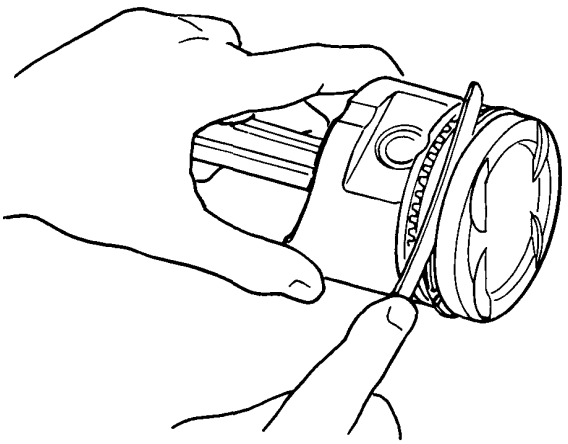


Land Clearances

After installing new set of rings, measure ring-to-land clearances:

Top and Second Rings Clearance
A20A Engine:
Standard (New): 0.030—0.055 mm (0.0012—0.0022 in.)
Service Limit: 0.13 mm (0.005 in.)

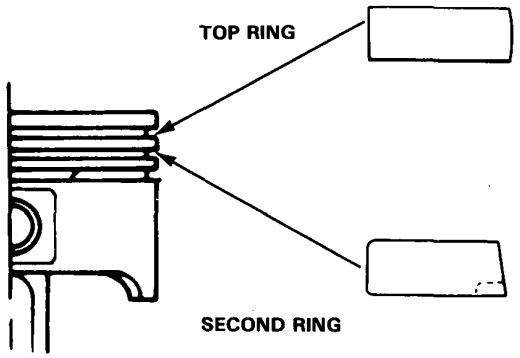
A16A Engine:
Standard (New): 0.020—0.040 mm (0.0008—0.0016 in.)
Service Limit: 0.13 mm (0.005 in.)



Alignment

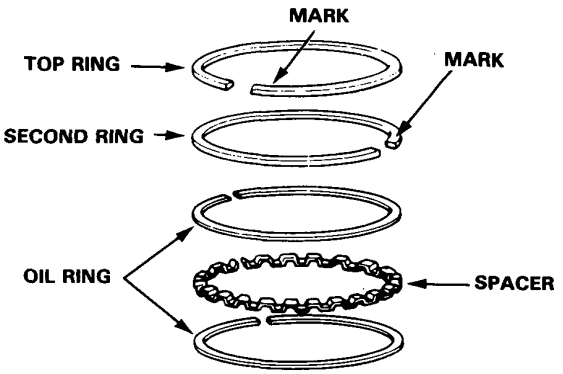
1. Install the rings as shown on page 7-14.

   Identify top and second rings by the chamfer on the edge, and make sure they are in proper grooves on piston.

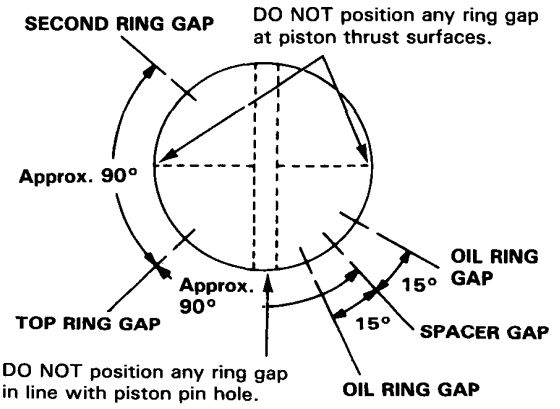


2. Rotate the rings in grooves to make sure they do not bind.

3. The manufacturing marks must be facing upward



4. Position the ring end gaps as shown:



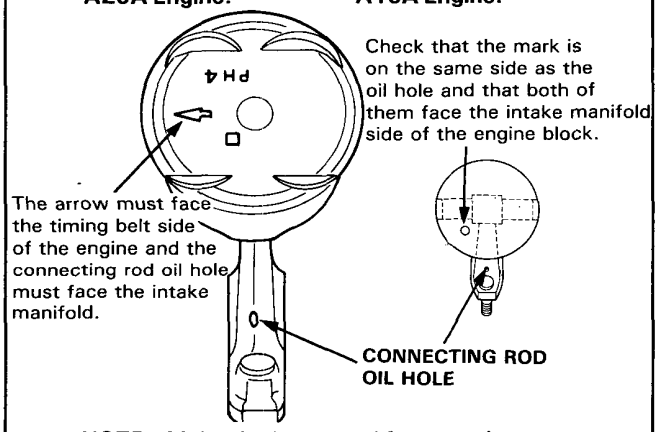
Piston

Installation

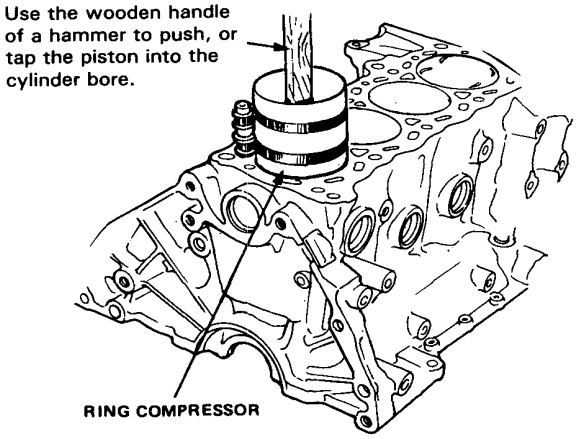
Before installing the piston, apply a coat of engine oil to the ring grooves and cylinder bores.

1. If the crankshaft is already installed:
   - Remove the connecting rod caps, then slip short sections of rubber hose over the threaded ends of the connecting rod bolts.
   - Install the ring compressor, check that the bearing is securely in place, then position the piston in the cylinder and drive it in using the wooden handle of a hammer.
     Stop after the ring compressor pops free and check the connecting rod-to-crank journal alignment before driving rod into place.
   - Install the rod caps with bearings, and torque the nuts to 32 N·m (3.2 kg-m, 23 lb-ft).
2. If the crankshaft is not installed:
   - Remove the rod caps and bearings, install the ring compressor, then position the piston in the cylinder and drive it in using the wooden handle of a hammer.
   - Position all pistons at top dead center.

A20A Engine: **A16A Engine:**



NOTE: Maintain downward force on ring compressor to prevent rings from expanding before entering the cylider bore.

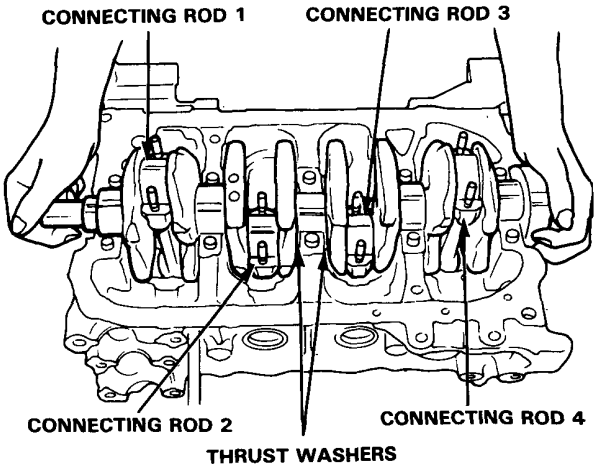


Crankshaft

Installation

Before installing the crankshaft, apply a coat of engine oil to the main bearings and rod bearings.

1. Insert bearing halves in the engine block and connecting rod.
2. Hold the crankshaft so rod journals for cylinder No. 2 and No. 3 are straight down.
3. Lower the crankshaft into the block, seating the rod journals into connecting rods No. 2 and No. 3 and install rod caps and nuts finger tight.



4. Rotate the crankshaft clockwise, seat journals into connecting rods No. 1 and No. 4, and install the rod caps and nuts finger tight.
5. Install the thrust washers, main bearing halves and caps, check clearance with plastigage (page 7-5), then torque the nuts to 68 N·m (6.8 kg-m, 49 lb-ft), Oil thrust washer surfaces.
6. Check the rod bearing clearance with plastigage (page 7-5), then torque nuts to 32 N·m (3.2 kg-m, 23 lb-ft).

   NOTE: Reference numbers on connecting rod are for big-end bore tolerance and do NOT indicate the position of piston in engine.

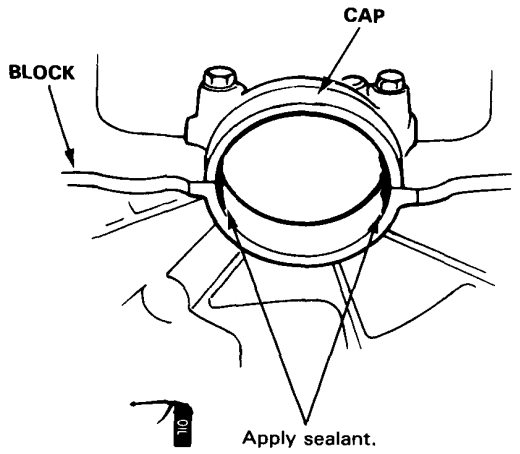
   CAUTION: Whenever any crankshaft or connecting rod bearing is replaced, after reassembly run the engine at idling speed until it reaches normal operating temperature, then continue to run for approximately 15 minutes.

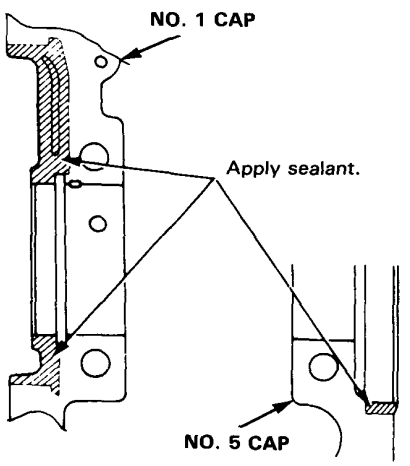
Installation

NOTE: Install the seals before you tighten the main bearing cap bolts.

The seal surface on the block should be dry. Apply a light coat of oil to the crankshaft and to the lip of seal.

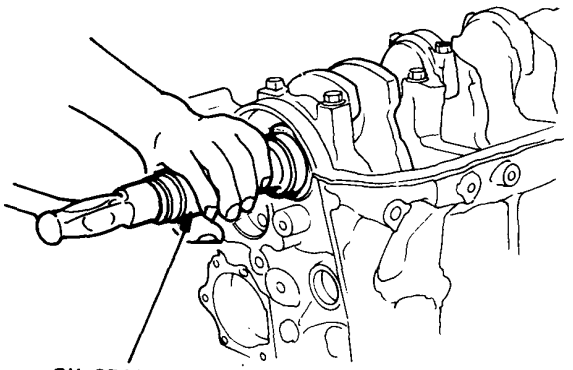
1. Apply non-hardening sealant along the seams where the cap joins the block before installing the seals.





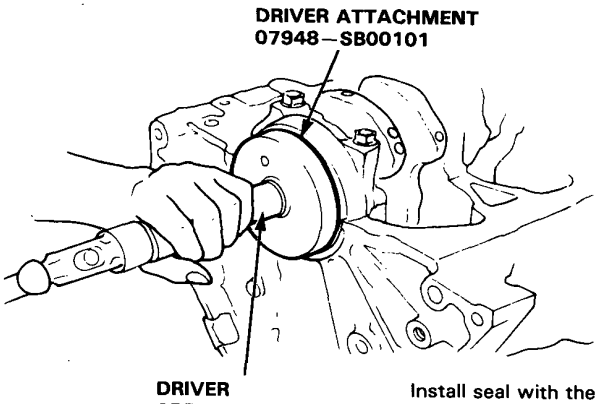
2. Apply a light coat of grease to the sealing surfaces of both oil seals. Also fill the back (the spring side) of each seal with grease to help keep the spring in place during installation.

3. Drive in timing gear-end seal until the driver bottoms against crankshaft snout.



4. Drive in flywheel-end seal until the driver bottoms against block.

NOTE: Align the hole in the driver attachment with the pin on the crankshaft.

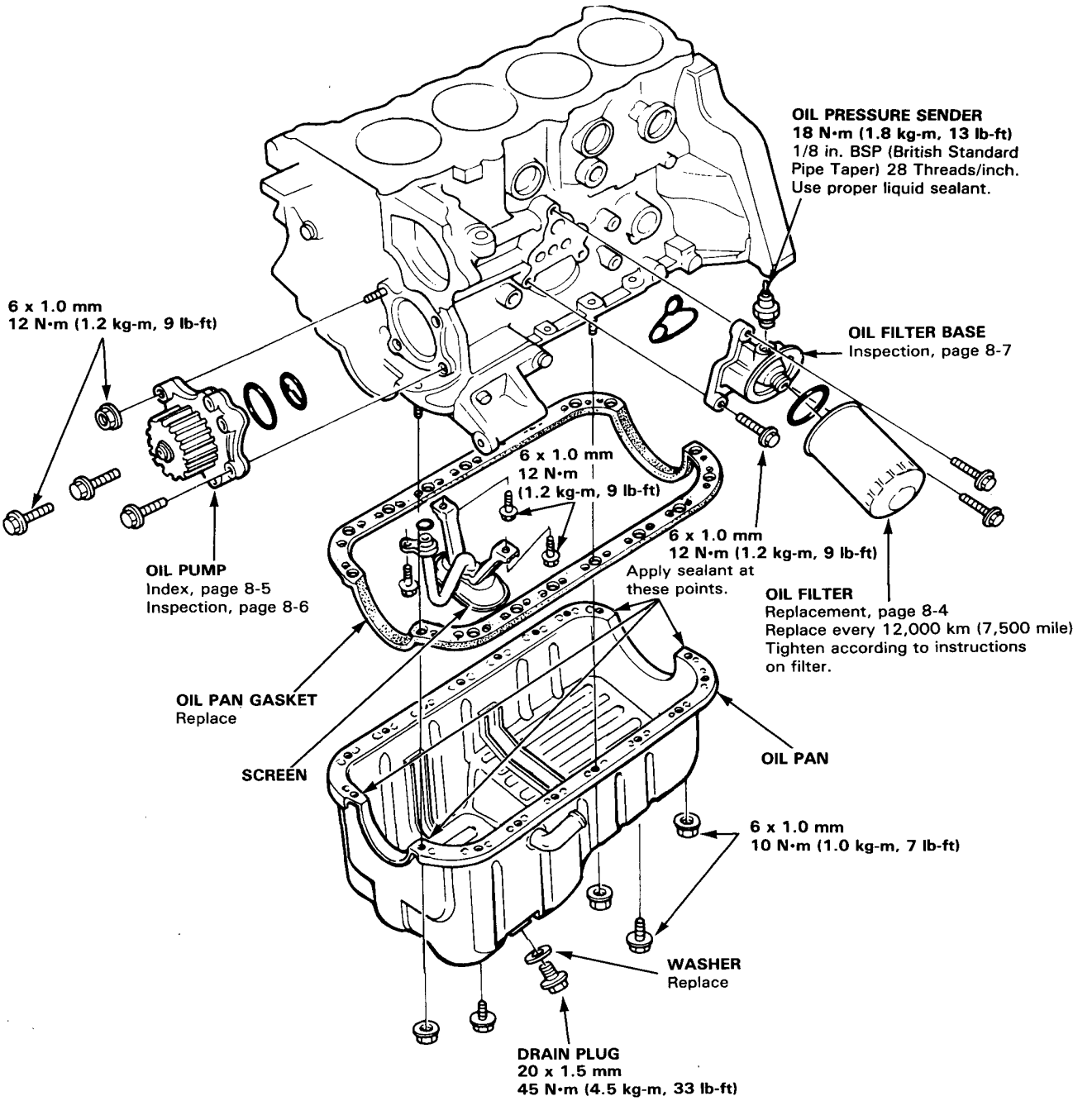


Engine Lubrication

Engine Lubrication

Illustrated Index

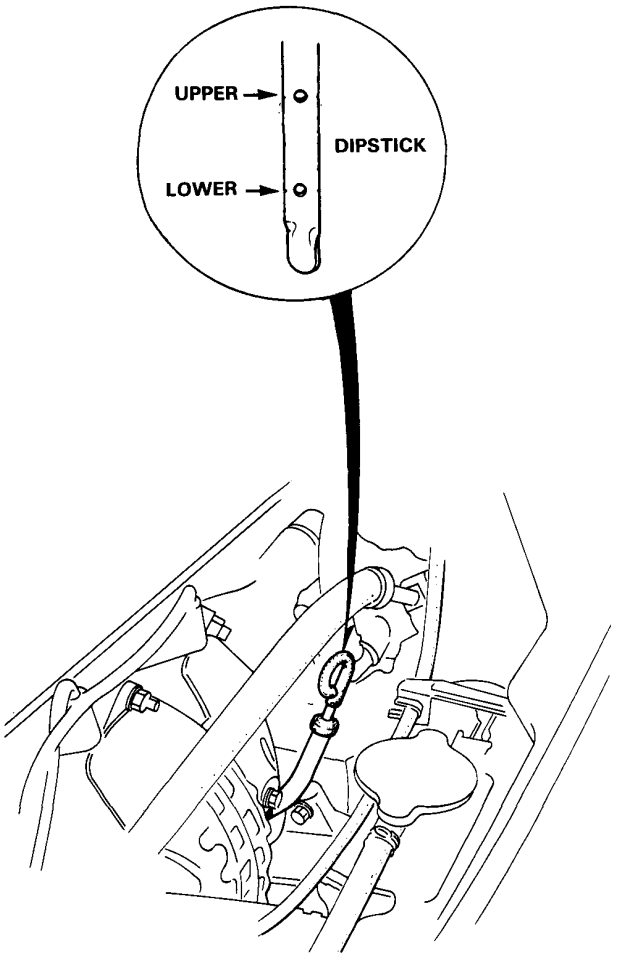
NOTE: Use new O-rings whenever reassembling.



Oil Level

Inspection

1. Check engine oil with the engine off and the car parked on level ground.
2. Make certain that the oil level indicated on the dipstick is between the upper and lower marks.
3. If the level has dropped close to the lower mark, add oil until it reaches the upper mark.

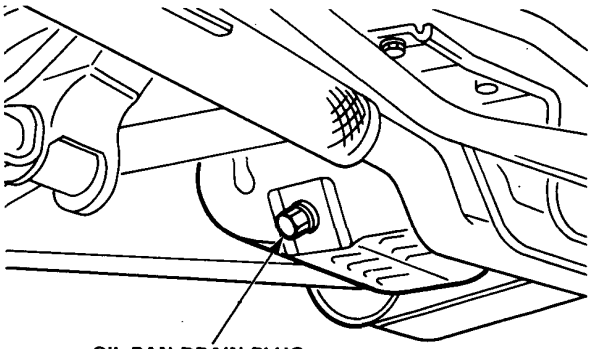


Engine Oil

Replacement

1. Warm up the engine.
2. Drain the engine oil.

   NOTE: Remove the filler cap to speed draining.



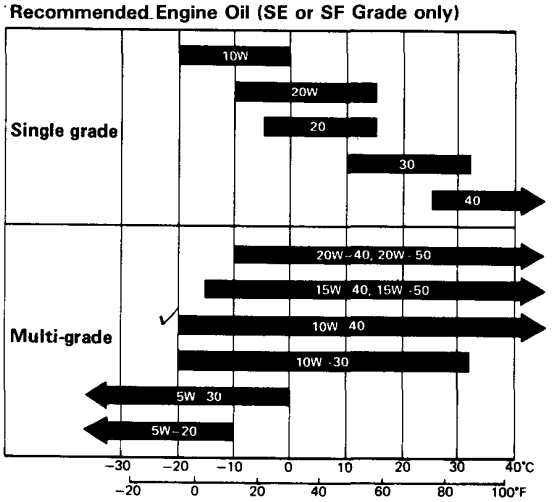
OIL PAN DRAIN PLUG
45 N·m (4.5 kg-m, 33 lb-ft)

3. Reinstall the drain plug with a new washer, and refill with the recommended oil.

Capacity	3.0 lit (3.2 US qt, 2.6 Imp. qt) Exclude Oil filter 3.5 lit (3.7 US qt, 3.1 Imp. qt) Adding replace oil filter 4.0 lit (2 US qt, 3.5 Imp. qt) Means designed value
Change	Every 10,000 km (6,000 miles) or 6 months.

NOTE: Oil filter should be replaced at each oil change.

Recommended Engine Oil (SE or SF Grade only)



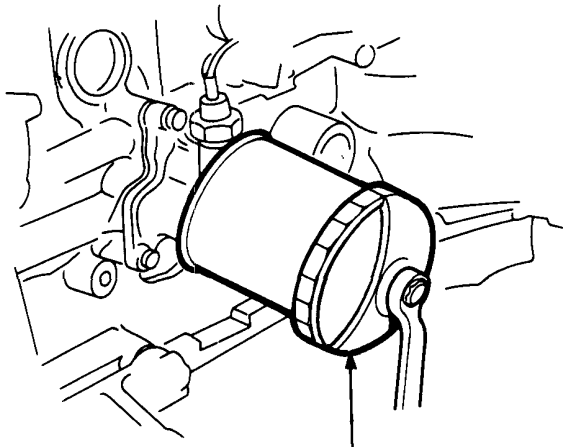
Expected Ambient Temperature before next oil change

Oil Filter

Replacement

CAUTION: After the engine has been run, the exhaust pipes will be hot; be careful when working around the exhaust manifold.

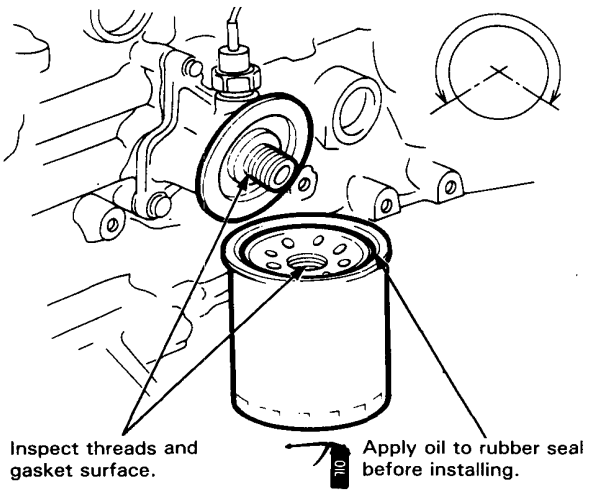
1. Remove the oil filter with the special oil filter socket.



OIL FILTER SOCKET
07912—6110001
22 N·m (2.2 kg-m, 16 lb-ft)

2. Inspect the threads and gasket on the new filter. Wipe off seat on engine block, then apply a light coat of oil the gasket, and install filter. Tighten according to instructions on, or with, the filter.

   NOTE: Use only filters with a built-in bypass system.



Inspect threads and gasket surface.

Apply oil to rubber seal before installing.

Oil Pressure

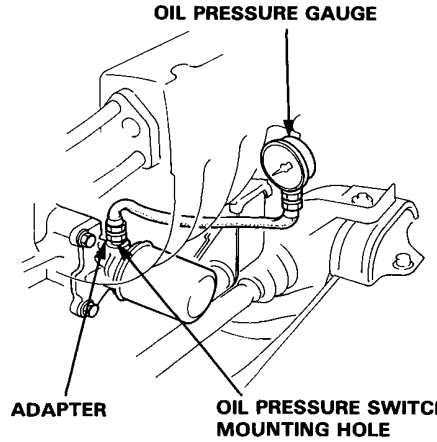
Test

If the oil pressure warning light stays on with the engine running. Check the engine oil level. If the oil level is correct:

1. Remove the oil pressure sender and install an oil pressure gauge.
2. Start the engine and allow to reach operating temperature (fan comes on at least twice).
3. Pressure should be:

   Engine Oil Pressure:
   Idle: 98 kPa (1.0 kg/cm², 14 psi) minimum
   3,000 min⁻¹(rpm): 373—451 kPa (3.8—4.6 kg/cm² 54—65 psi)

   - If oil pressure is within specifications, replace oil pressure sender and recheck.
   - If oil pressure is NOT within specifications, inspect oil pump (pages 8-6).

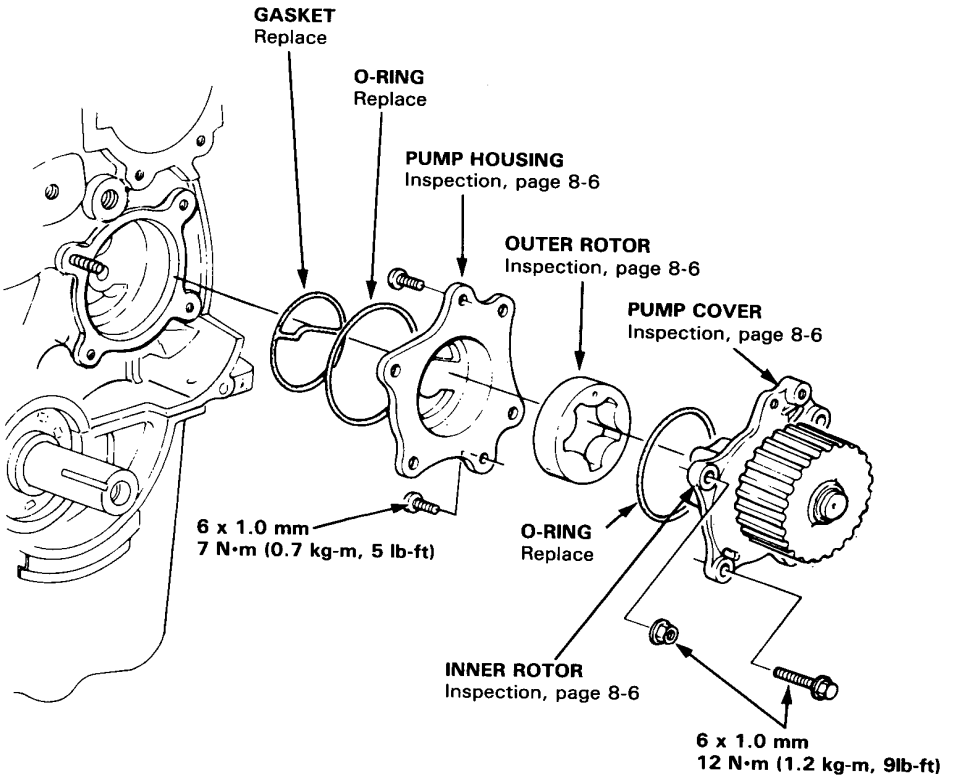


OIL PRESSURE GAUGE

ADAPTER

OIL PRESSURE SWITCH MOUNTING HOLE

Illustrated Index

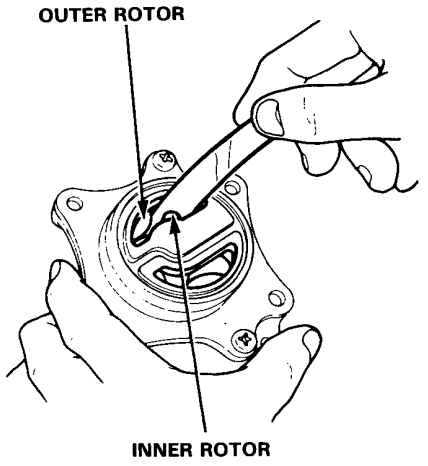


Oil Pump

Removal/Inspection

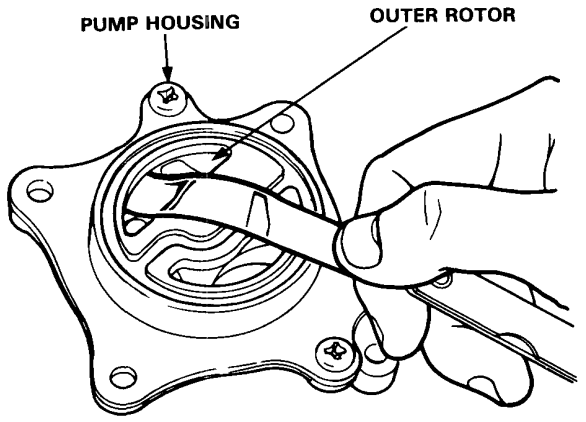
1. Drain the engine oil.
2. Remove the three bolts and one nut that secure the oil pump to the engine block, then remove the pump.
3. Check the radial clearance on the pump rotor.

Rotor Radial Clearance
Standard (New): 0.15 mm (0.006 in.)
Service Limit: 0.2 mm (0.008 in.)



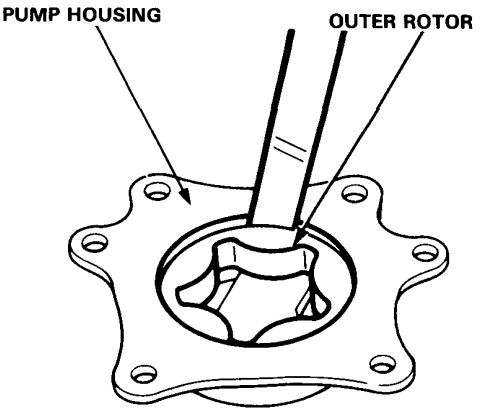
4. Check the axial clearance on the outer pump rotor.

Housing-to-Rotor Axial Clearance
Standard (New): 0.03—0.108 mm (0.001—0.004 in.)
Service Limit: 0.15 mm (0.006 in.)

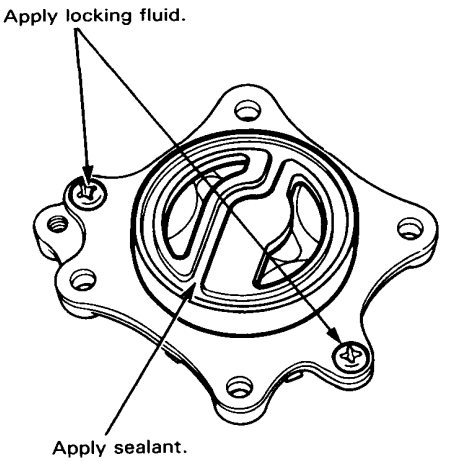


5. Remove the two screws from the pump housing, then separate the housing and cover.
6. Check the radial clearance between the housing and the outer rotor.

Housing-to-Rotor Radial Clearance
Standard (New): 0.1—0.18 mm (0.004—0.007 in.)
Service Limit: 0.2 mm (0.008 in.)



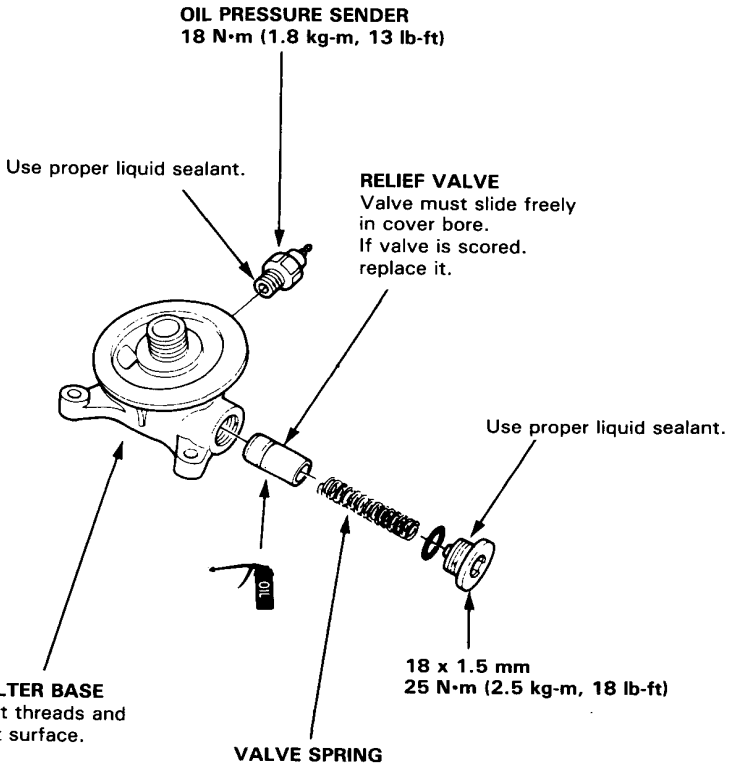
7. Inspect both rotors and pump housing for scoring or other damage.
   Replace parts as necessary.
8. Reassemble the oil pump, applying thread locking fluid to the pump housing screws.



9. Apply sealant around the O-ring groove, then install the new O-ring.
10. Install a new gasket to the pump housing and re-install the oil pump.
11. Check that the oil pump turns freely.

Oil Filter Base

Inspection

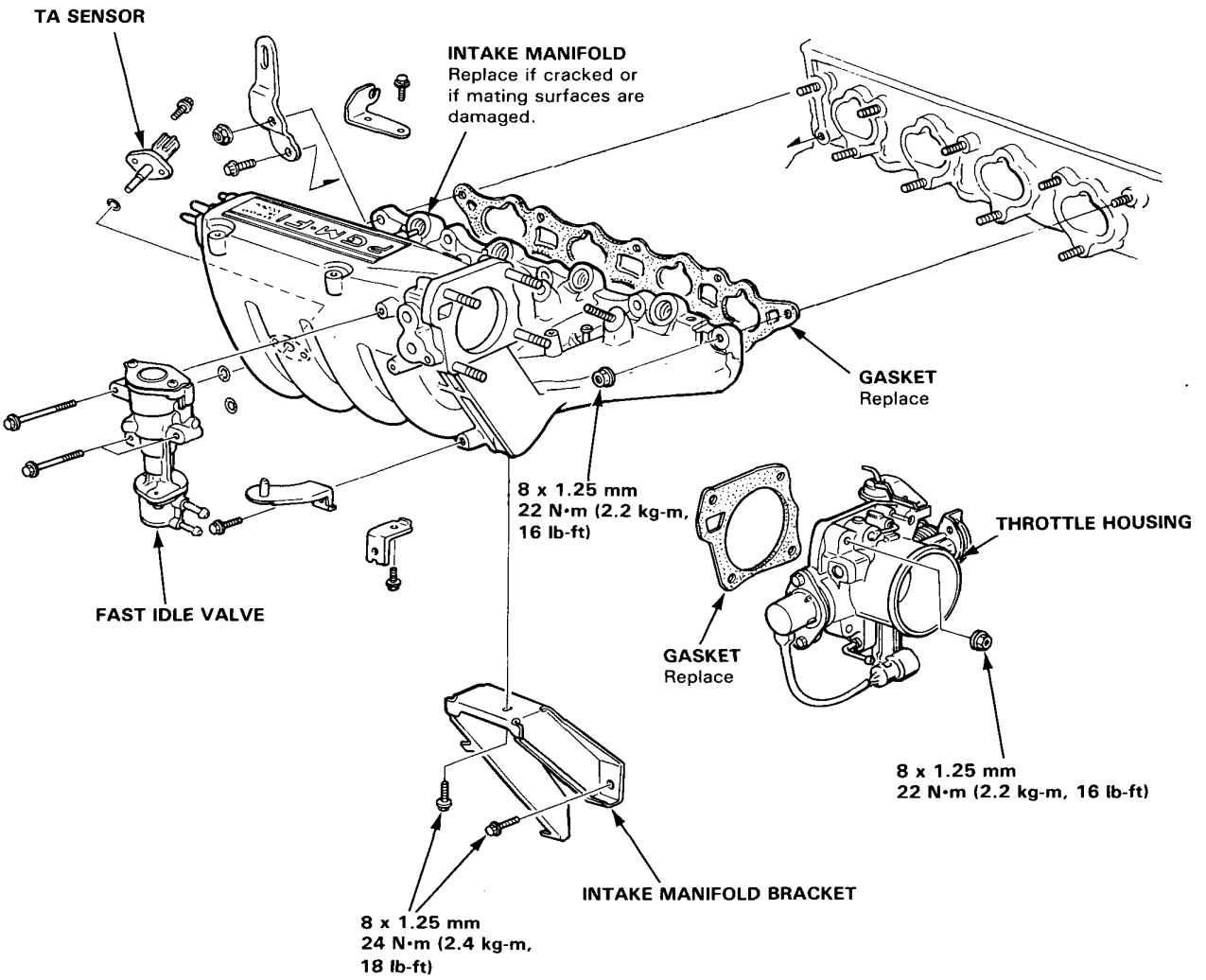


Intake Manifold/Exhaust System

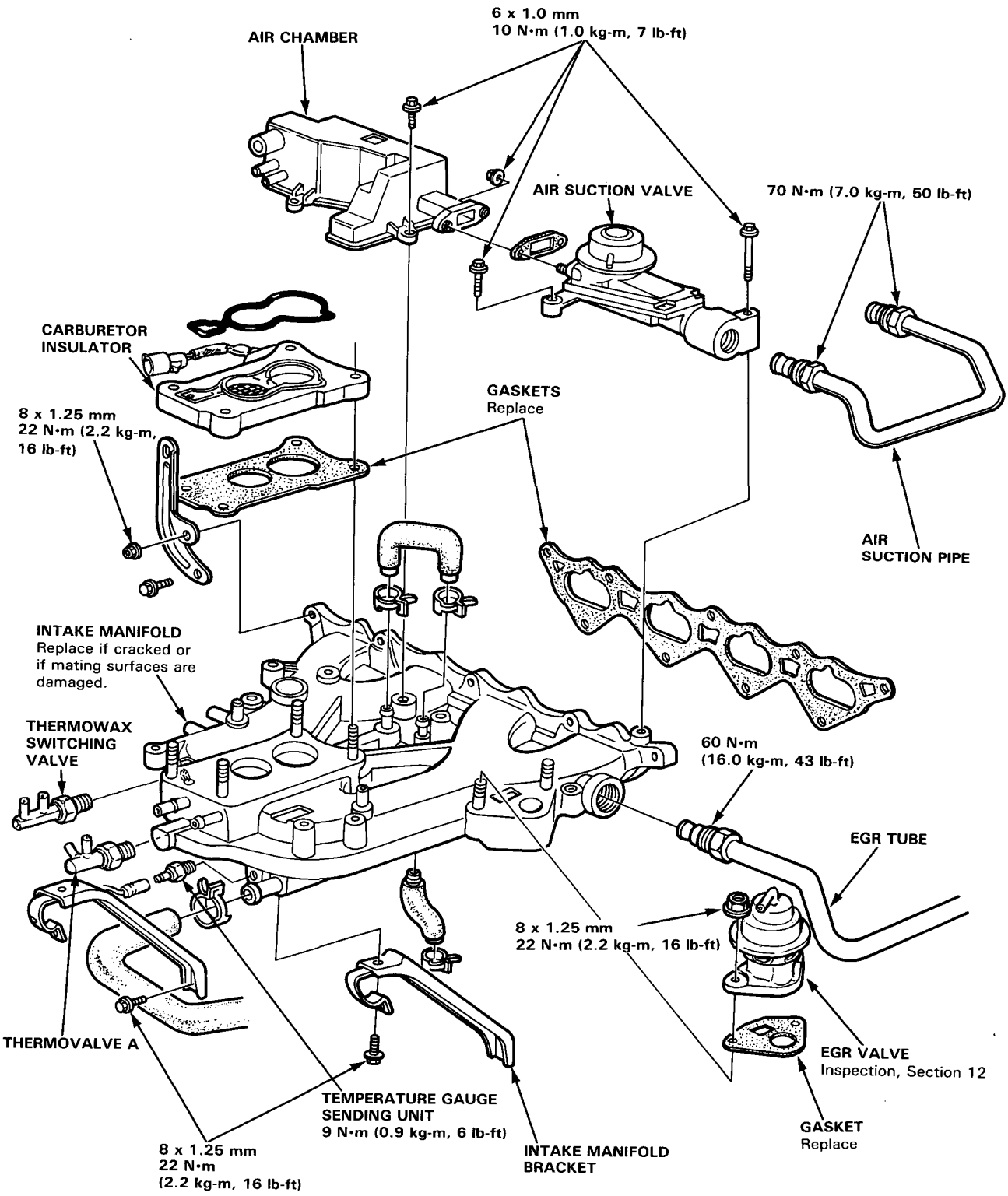
Intake Manifold

Illustrated Index

A20A4 Engine



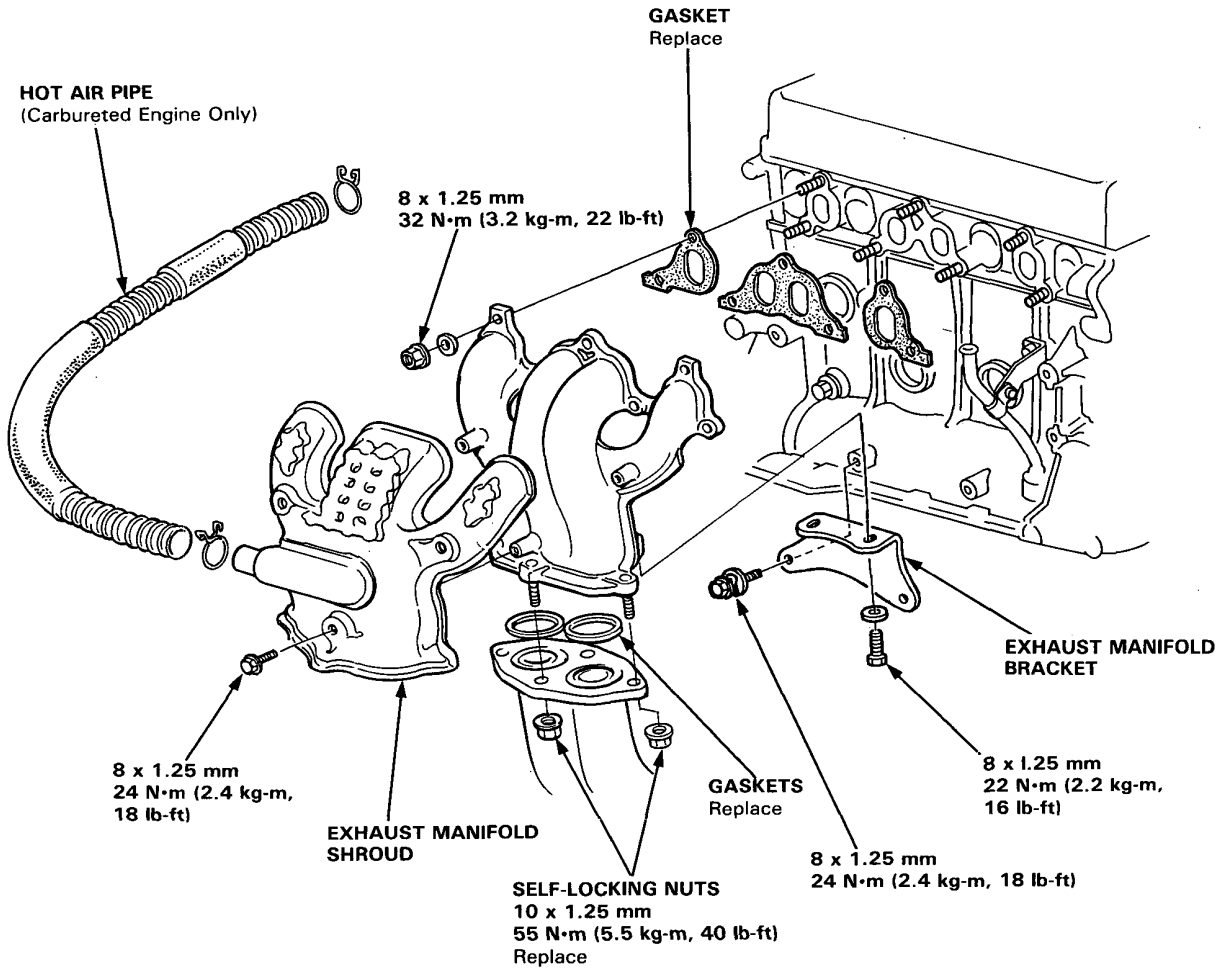
A20A1 Engine shown; A20A2 and A16A1 Engine similar



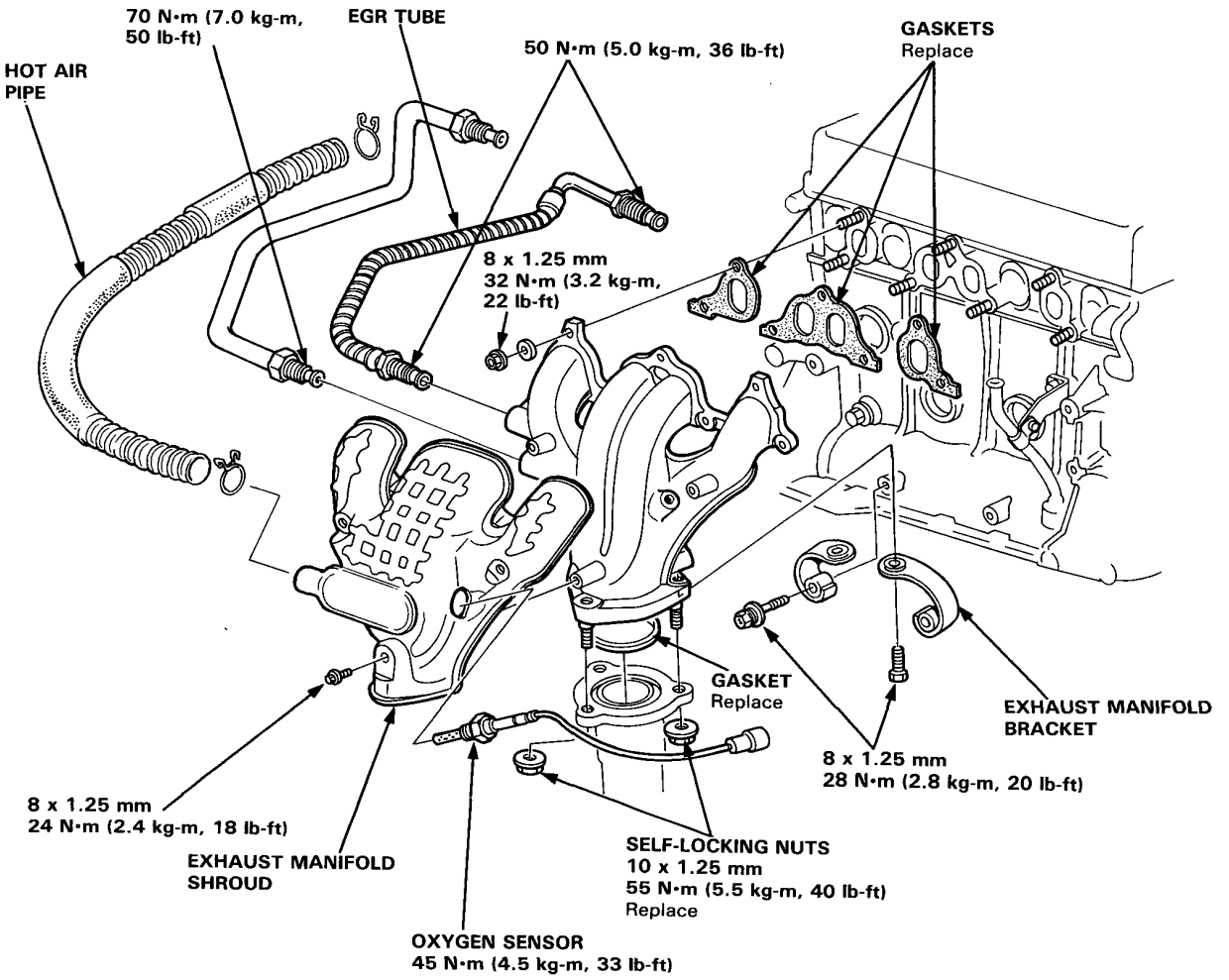
Intake Manifold

Illustrated Index

European Model Engine and KY Model Engine



KG and KW Model Engine (With Catalytic Converter)

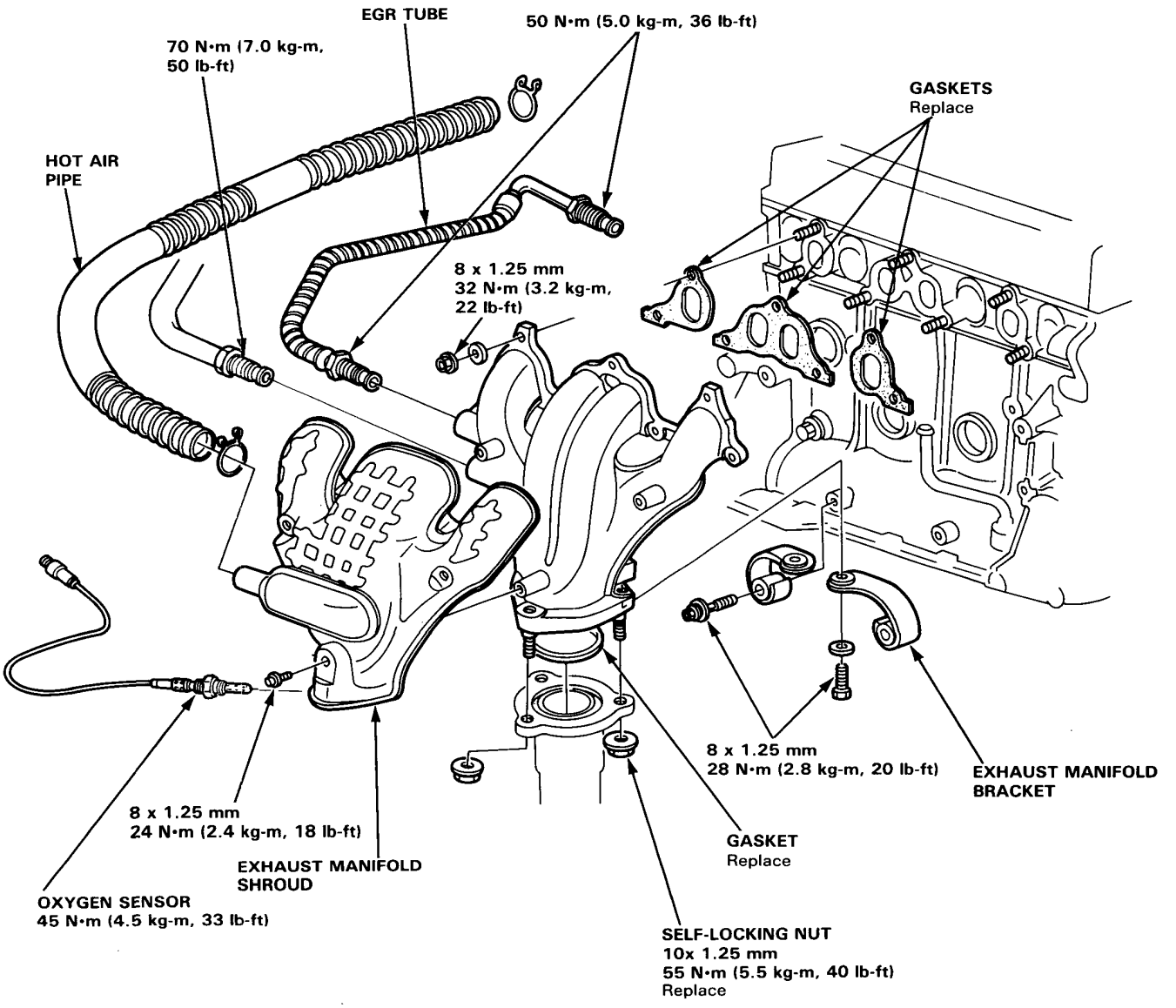


(cont'd)

Exhaust Manifold

Illustrated Index (cont'd)

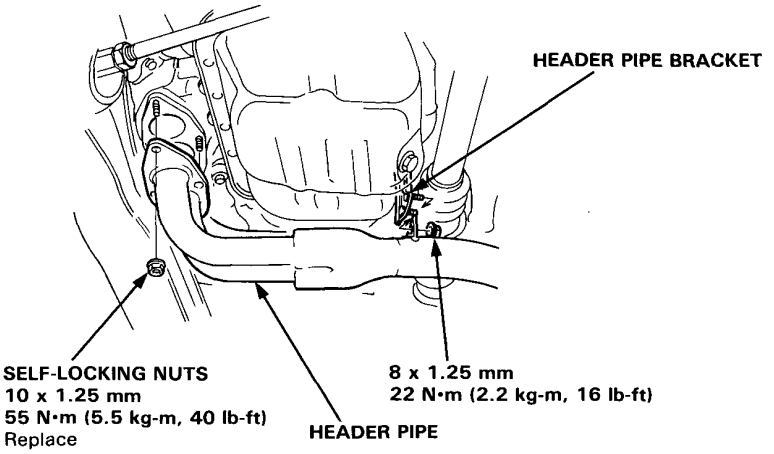
Other Engine Model

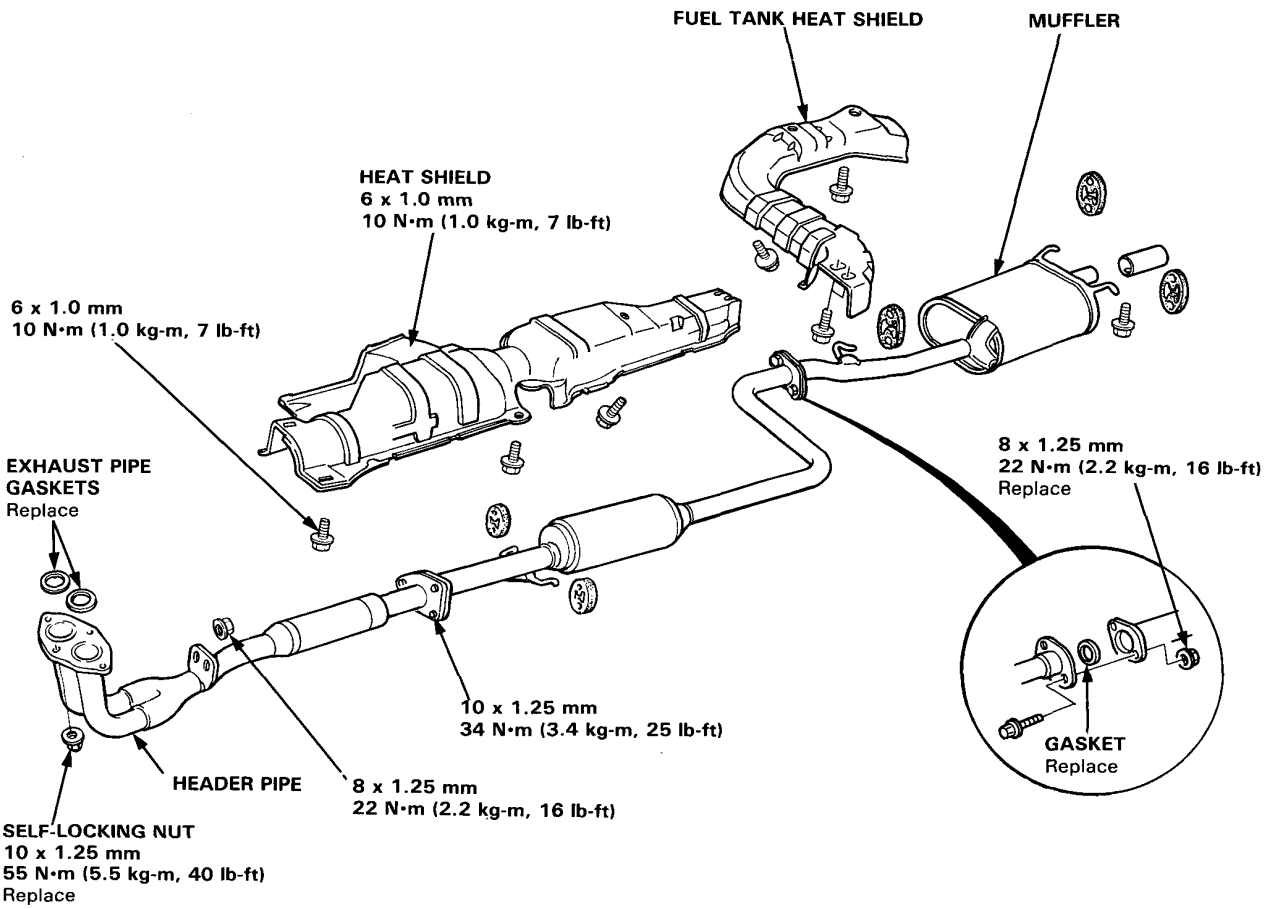


Exhaust Pipe and Muffler

Replacement

European Mode Engine (expect KG and KW with catalytic converter engine, KX and KY Model Engine)

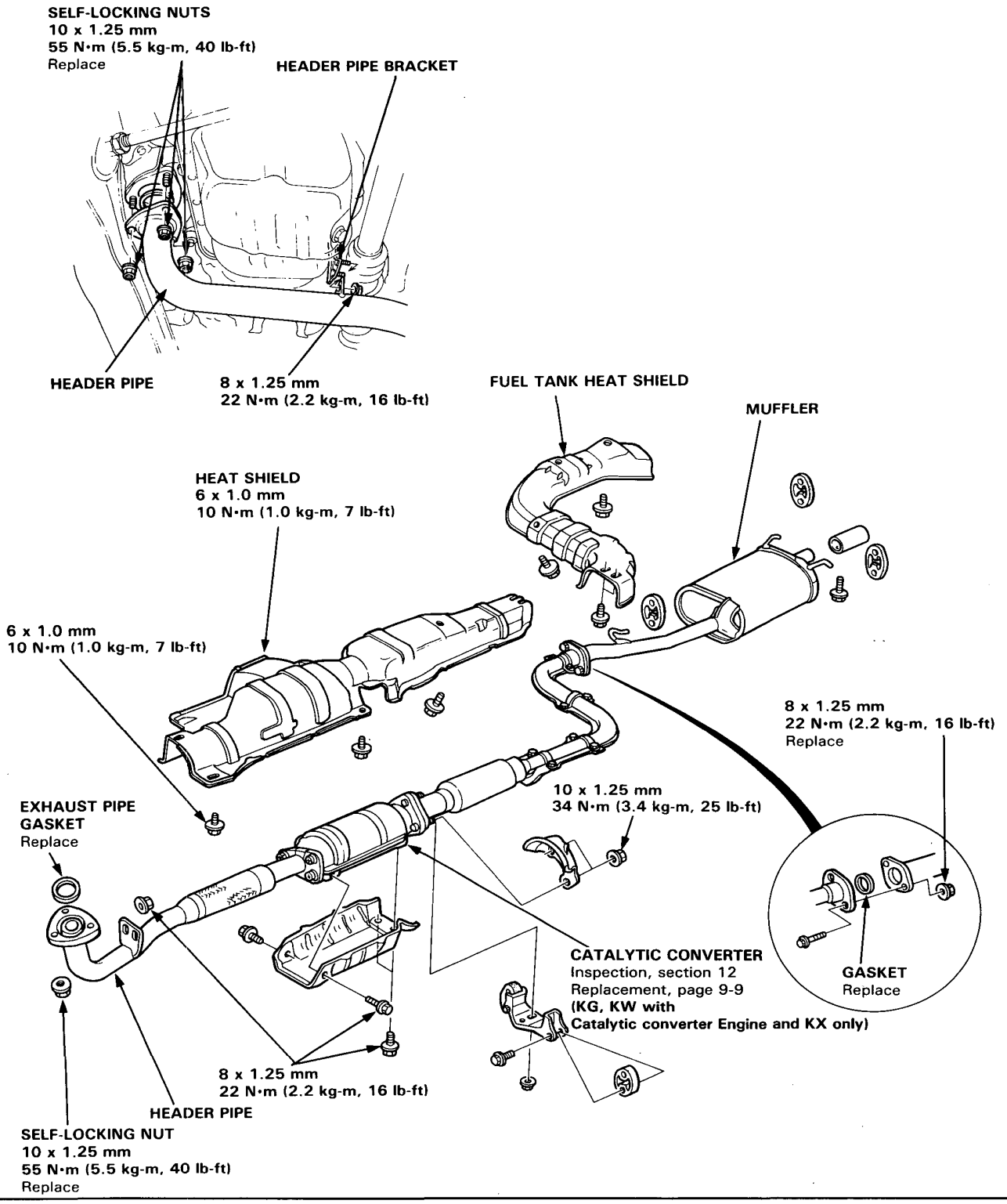




Exhaust Pipe and Muffler

Replacement

Other Engine Model



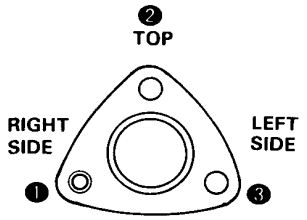
Catalytic Converter

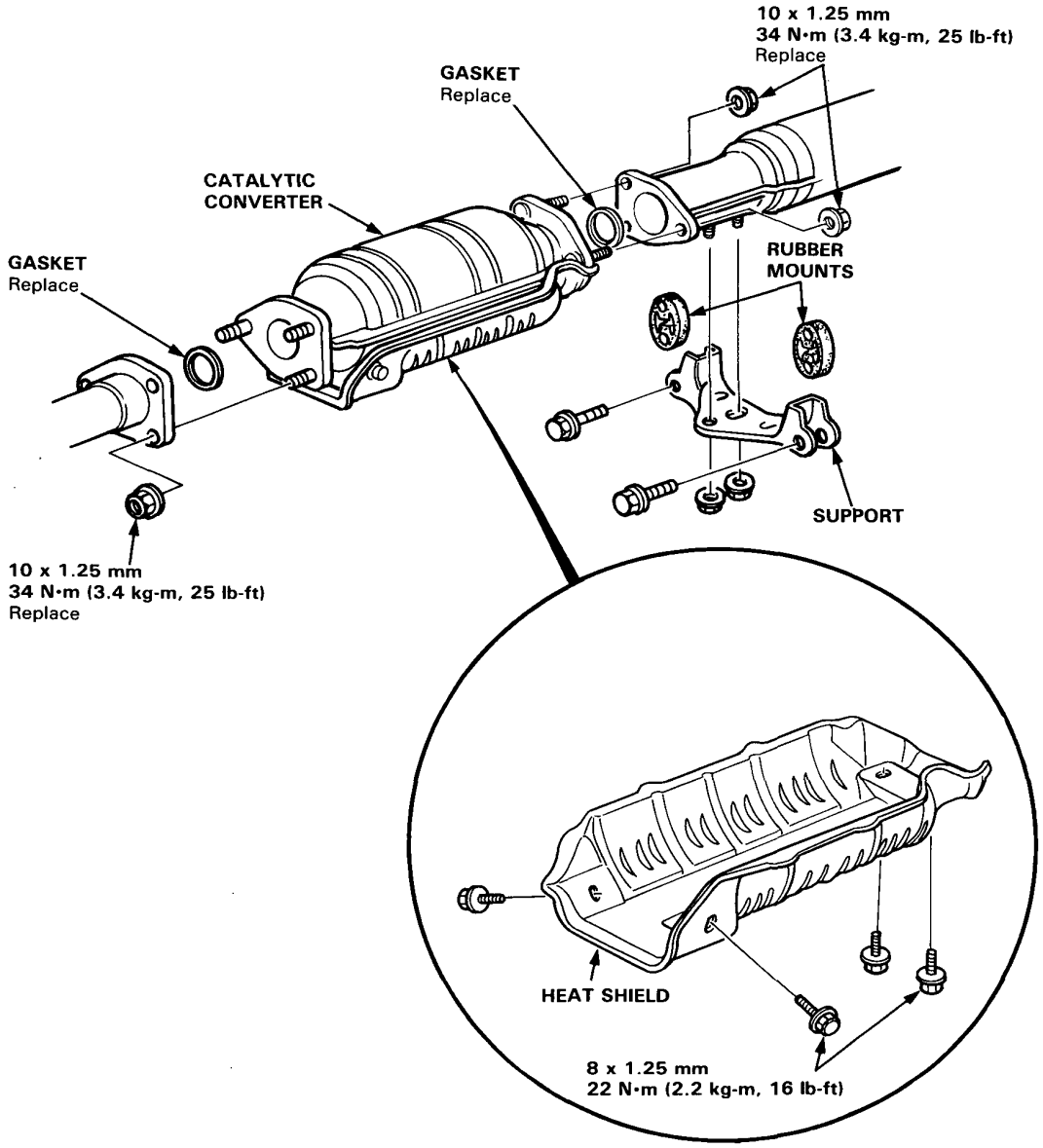
Replacement

1. Disconnect the rubber mounts from the catalytic converter support.
2. Remove the six nuts, then remove the catalytic converter from the exhaust system.
3. Remove the converter support and heat shield.
4. Install in reverse order of removal.

CAUTION: Torque the converter flange nuts in the sequence shown.

CATALYTIC CONVERTER TORQUE SEQUENCE





Cooling

Radiator

Replacement

A20A4 Engine

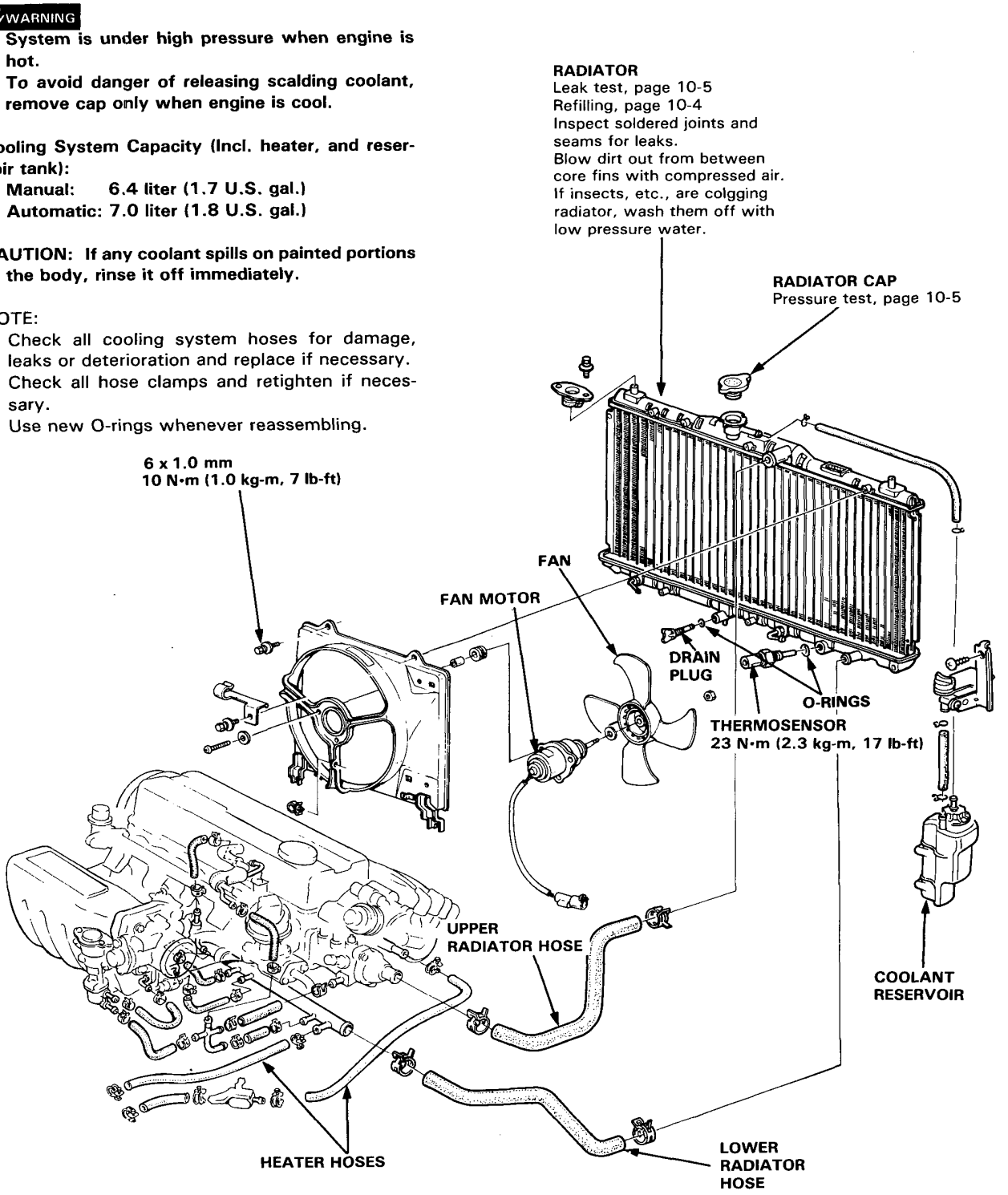
WARNING

- **System is under high pressure when engine is hot.**
  To avoid danger of releasing scalding coolant, remove cap only when engine is cool.

Cooling System Capacity (Incl. heater, and reservoir tank):
Manual: 6.4 liter (1.7 U.S. gal.)
Automatic: 7.0 liter (1.8 U.S. gal.)

CAUTION: If any coolant spills on painted portions of the body, rinse it off immediately.

NOTE:
- Check all cooling system hoses for damage, leaks or deterioration and replace if necessary.
- Check all hose clamps and retighten if necessary.
- Use new O-rings whenever reassembling.



A20A2 Engine Shown: A20A1 and A16A1 Engine Similar

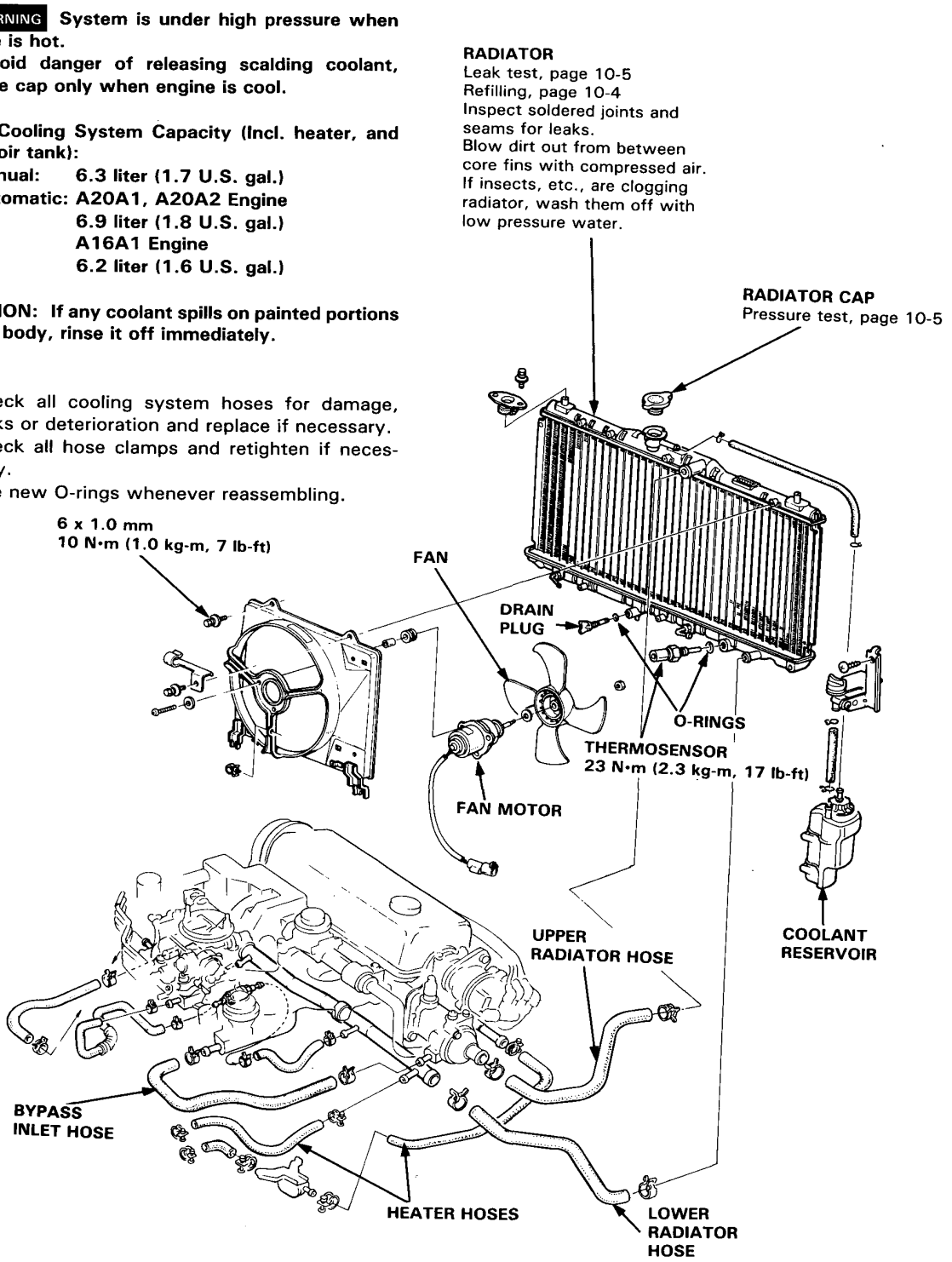
WARNING **System is under high pressure when engine is hot.**
To avoid danger of releasing scalding coolant, remove cap only when engine is cool.

Total Cooling System Capacity (Incl. heater, and reservoir tank):

Manual: **6.3 liter (1.7 U.S. gal.)**
Automatic: **A20A1, A20A2 Engine**
6.9 liter (1.8 U.S. gal.)
A16A1 Engine
6.2 liter (1.6 U.S. gal.)

CAUTION: If any coolant spills on painted portions of the body, rinse it off immediately.

NOTE:
- Check all cooling system hoses for damage, leaks or deterioration and replace if necessary.
- Check all hose clamps and retighten if necessary.
- Use new O-rings whenever reassembling.



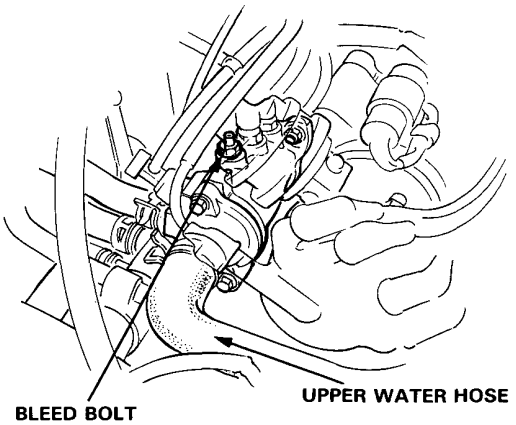
Refilling and Bleeding

1. Set the heater temperature lever to maximum heat.
2. When the radiator is cool, remove the radiator cap and drain plug, and drain the radiator.
3. Reinstall the radiator drain plug and tighten it securely.
4. Remove, drain and reinstall the reserve tank. Fill the tank halfway to the MAX mark with water, then up to the MAX mark with coolant.
5. Mix the recommended anti-freeze with an equal amount of water, in a clean container.

   NOTE:
   - Use only HONDA-RECOMMENDED anti-freeze/coolant.
   - For best corrosion protection, the coolant concentration must be maintained year-round at 50% MINIMUM. Coolant concentrations less than 50% may not provide sufficient protection against corrosion or freezing.
   - Coolant concentrations greater than 60% will impair cooling efficiency and are not recommended.

   CAUTION:
   - **Do not mix different brands anti-freeze/coolants.**
   - **Do not use additional rust inhibitors or anti-rust products; they may not be compatible with the recommended coolant.**

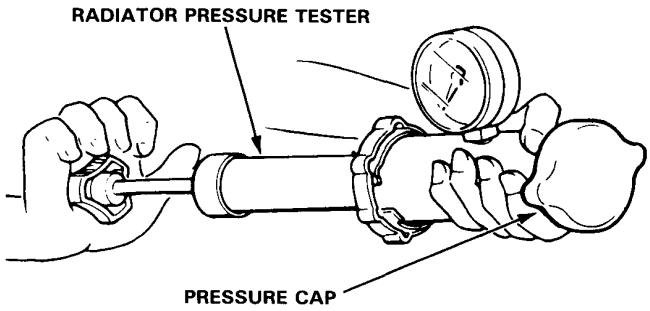
   Radiator Coolant Refill Capacity
   A20A4 Engine
   Manual: 3.9 liters (1.0 U.S. gal.)
   Automatic: 4.5 liters (1.2 U.S. gal.)
   A20A1, A20A2 Engine
   Manual: 3.8 liters (1.0 U.S. gal.)
   Automatic: 4.4 liters (1.2 U.S. gal.)
   A16A1 Engine
   Manual: 3.8 liters (1.0 U.S. gal.)
   Automatic: 3.9 liters (1.0 U.S. gal.)
6. Loosen the air bleed bolt in the water outlet, then fill the radiator to the bottom of the filler neck with the coolant mixture. Tighten the bleed bolt as soon as coolant starts to run out in a steady stream without bubbles.



7. With the radiator cap off, start the engine and let it run until warmed up (fan goes on at least twice). Then, if necessary add more coolant mix to bring the level back up to the bottom of the filler neck.
8. Put the radiator cap on, then run the engine again and check for leaks.

Cap Testing

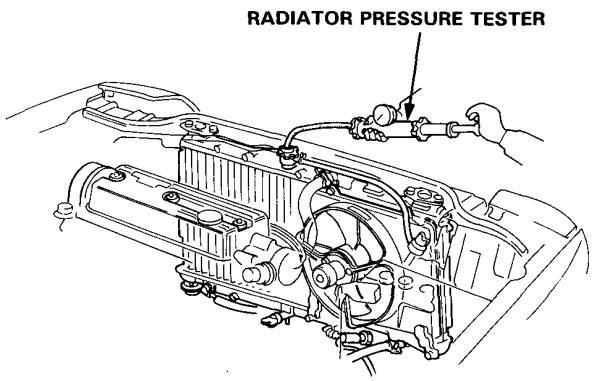
1. Remove the radiator cap, wet its seal with coolant, then install it on the pressure tester.
2. Apply a pressure of 0.75—1.05 kg/cm² (78—98 kPa, 11—14 psi).
3. Check for a drop in pressure.
4. If the pressure drops, replace the cap.



Radiator Testing

1. Wait until the engine is cool, then carefully remove the pressure cap and fill the radiator with coolant to the top of the filler neck.
2. Attach the pressure tester to the radiator and apply a pressure of 0.75—1.05 kg/cm² (78—98 kPa, 11—14 psi).
3. Inspect for coolant leaks and a drop in pressure.
4. Remove the tester and reinstall the pressure cap.

   NOTE: Check for engine oil in coolant and/or coolant in engine oil.

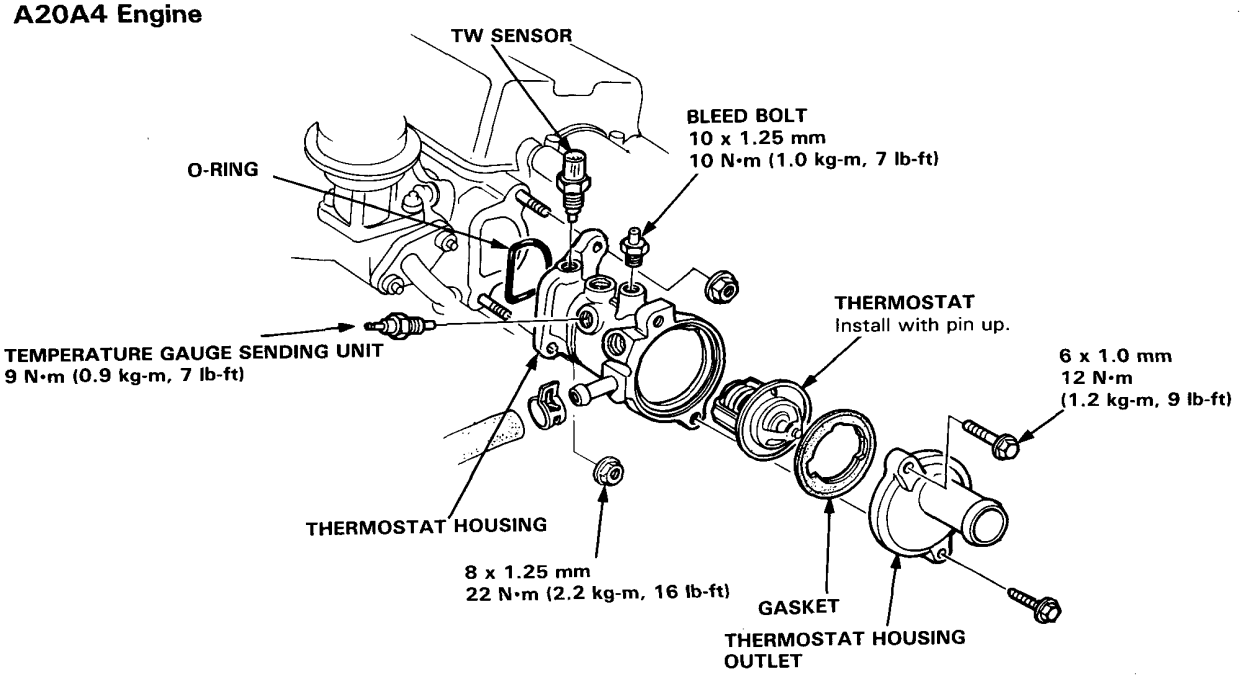


Thermostat

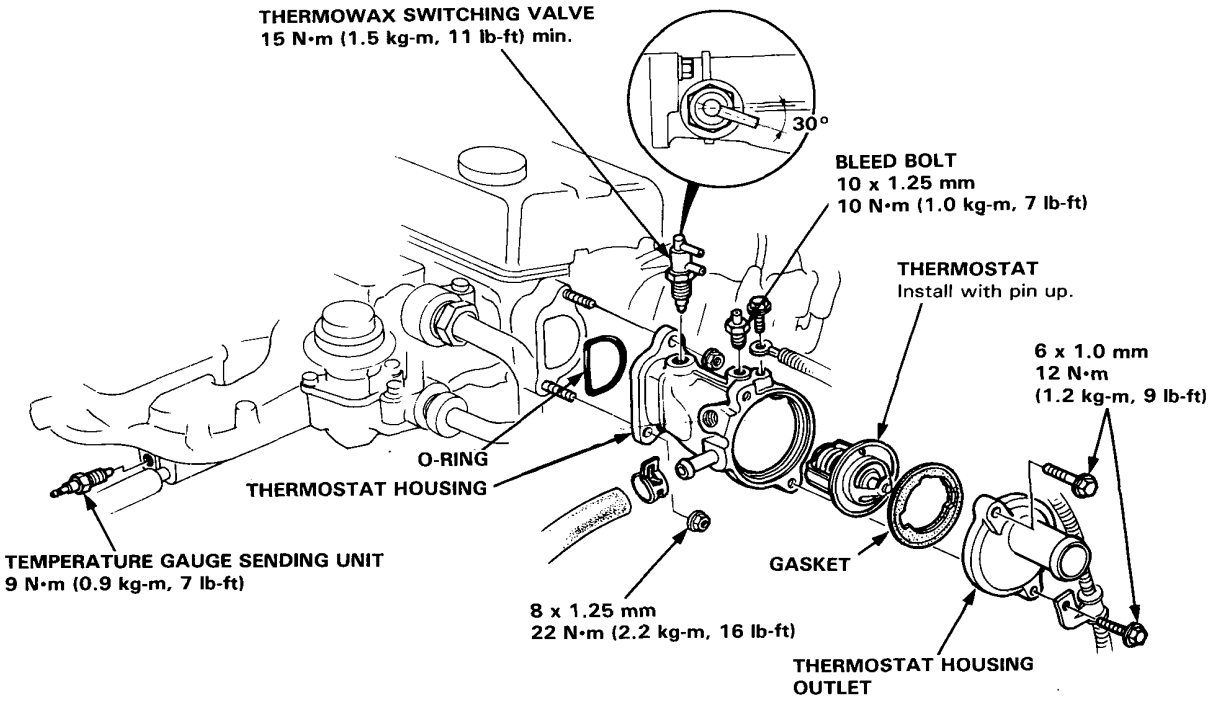
Replacement

NOTE: Use new gaskets and O-rings whenever reassembling.

A20A4 Engine



A20A2 Engine shown: A20A1 and A16A1 Engine similar



Termostat/Water Pump

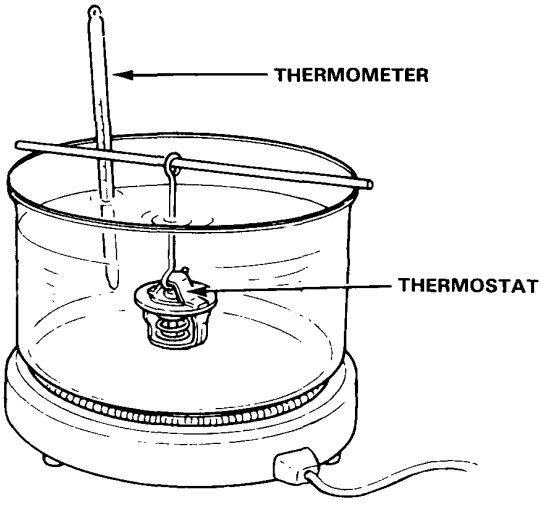
Thermostat Testing

Replace thermostat if it is open at room temperature.

To test a closed thermostat:

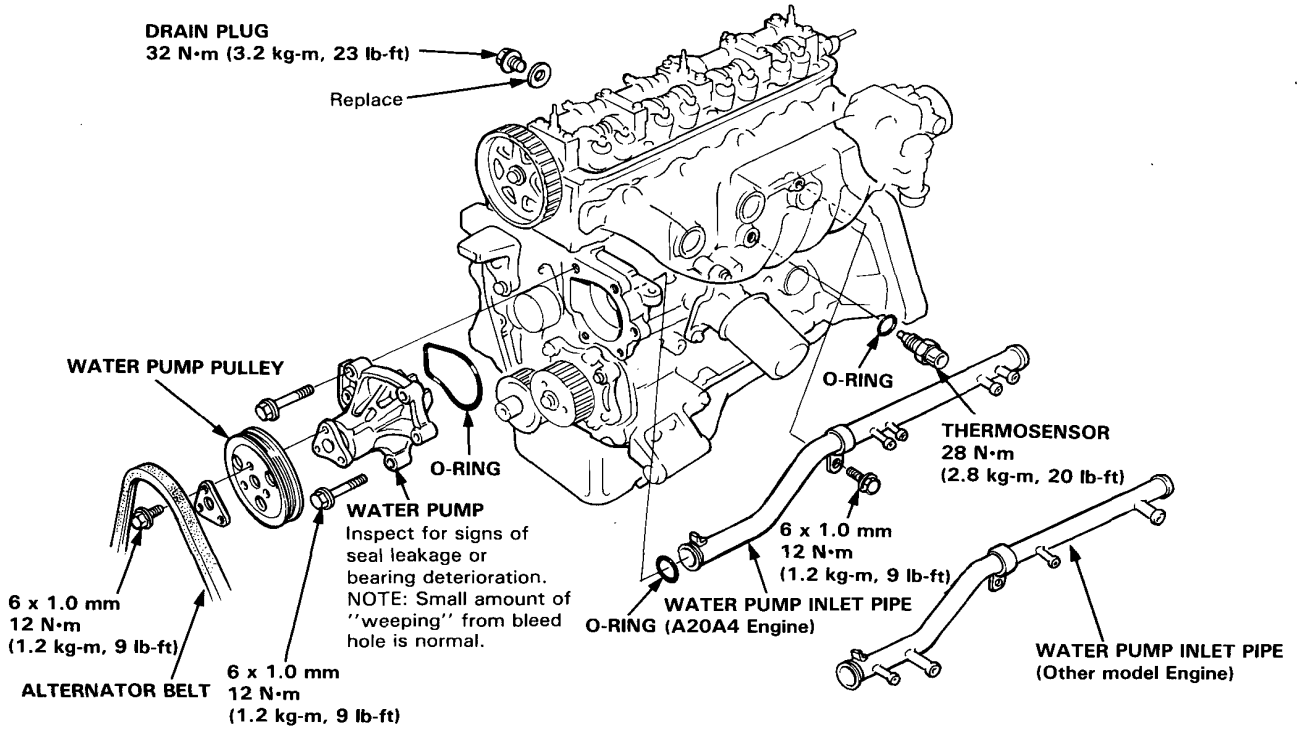
1. Suspend the thermostat in a container of water as shown.
2. Heat the water and check the temperature with a thermometer. Check the temperature at which the thermostat first opens and at full lift.

   CAUTION: Do not let thermometer touch bottom of hot container.
3. Measure lift height of thermostat when fully open.



STANDARD THERMOSTAT
Lift height: 8 mm (0.31 in.)
Starts opening:
Primary: 82°C ± 2 (180°F ± 3)
Secondary: 85°C ± 2 (185°F ± 3)
Fully open: 95°C (203°F)
OPTIONAL THERMOSTAT
Lift height: 8 mm (0.31 in.)
Starts opening: 86–90°C (187–194°F)
Fully open: 100°C (212°F)

Water Pump Replacement



Temperature Gauge

Temperature Gauge Testing

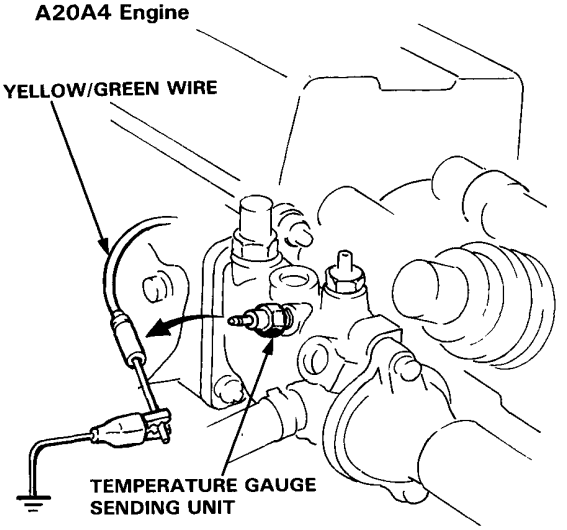
NOTE: If both the temperature gauge and fuel gauge malfunction simultaneously (and show H and F respectively), replace the fuel/temp gauge assembly.

1. Disconnect yellow/green wire from the temperature gauge sending unit and short it to ground.
2. Turn ignition switch to on.
3. Temperature gauge needle should move all the way to H.

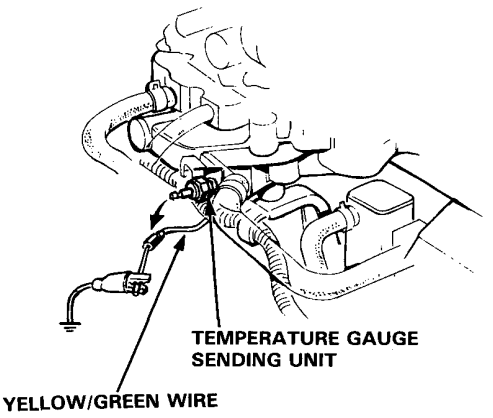
   If not, check fuse, wiring and connections; if all are OK, replace gauge.

   CAUTION: Do not leave sending unit wire grounded for longer than a few seconds or temperature gauge will be damaged.
4. Turn ignition switch off.

A20A4 Engine



Other Engine



Fan Thermosensor

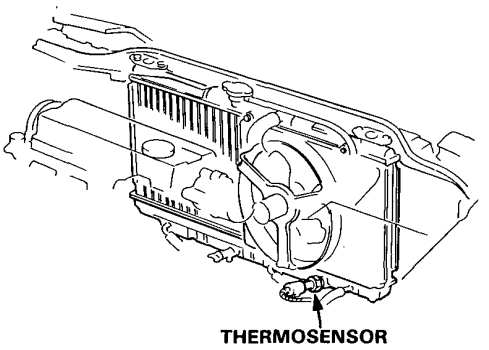
Testing

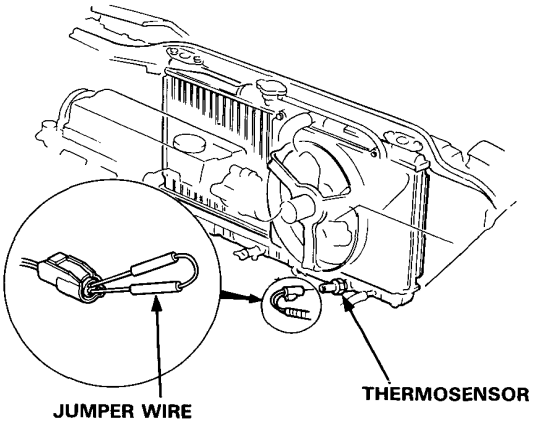
The cooling fan motor is actuated by a thermosensor located in the right tank of the radiator. Run the engine until the coolant temperature reaches 87—93° (189—199°F). The fan motor should start running.

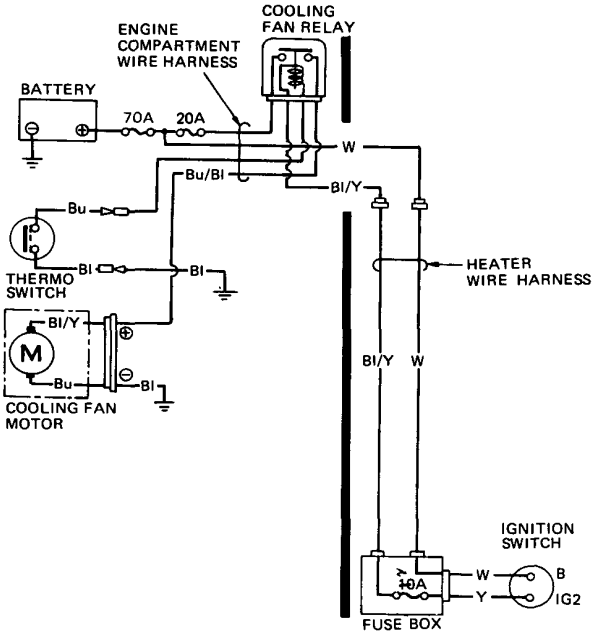
The fan motor should stop when the coolant temperature drops to 82—87°C (180—189°F).

If the fan motor does not start:

1. Disconnect the black and the blue wire leads from the cooling fan thermosensor and short the wires together.
2. Turn the ignition switch on.
3. The cooling fan motor should start running.
   - If the motor runs, replace the cooling fan thermosensor and re-test.
   - If the motor does not run, check for battery voltage from the blue wire lead (positive) to the black wire lead (negative) of the cooling fan motor.
     - — If voltage is not available, check for a blown or faulty fuse, loose terminals and connectors, and open circuit.
     - — If voltage is available, check for faulty cooling fan motor.



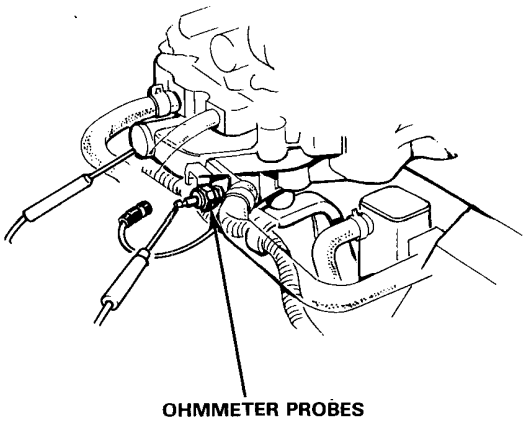




Temperature Gauge Sending Unit, Belt Adjustment

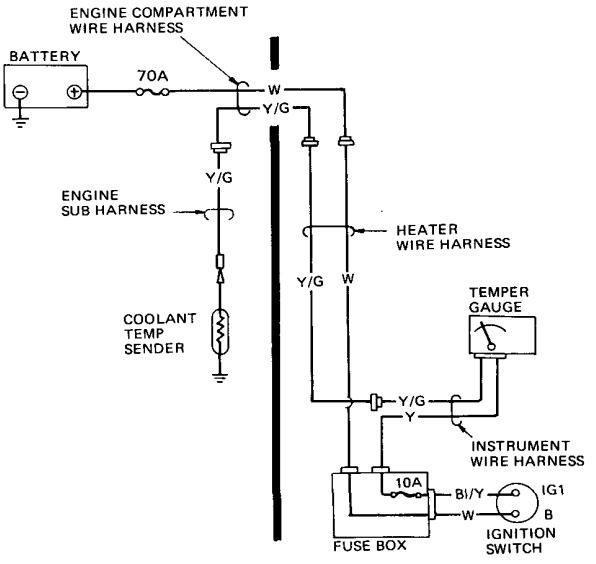
Temperature Gauge Sending Unit Testing

1. Disconnect the yellow/green wire from the sending unit.
2. With the engine cold, use an ohmmeter to measure the resistance between the sending unit terminal and the engine as shown.



3. Check the temperature of the coolant.
4. Run the engine and measure the change in resistance with engine at operating temperature.

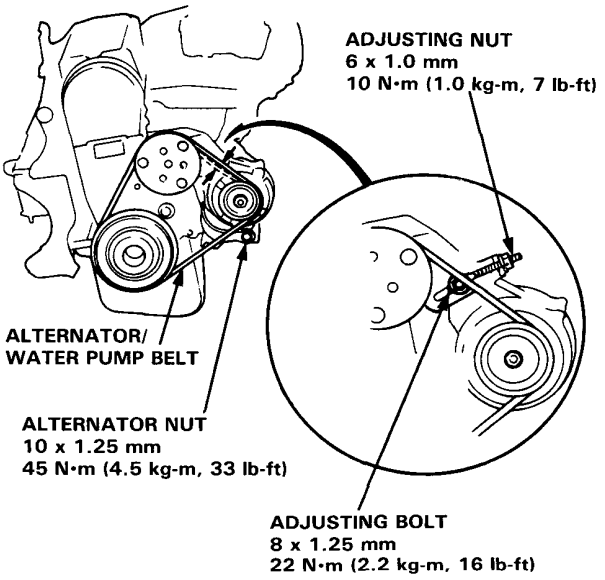
Temperature	50°C (122°F)	80°C (176°F)
Resistance (ohms)	154 +22 −20	52 +4.9 −4.4



Belt Adjustment

1. Apply a force of 98N (10 kg, 22 lb) and measure the deflection between the alternator and the water pump pulley.

   Deflection: 6—9 mm (0.24—0.35 in.)
   5 mm (0.20 in.) when first measured after replacing belt

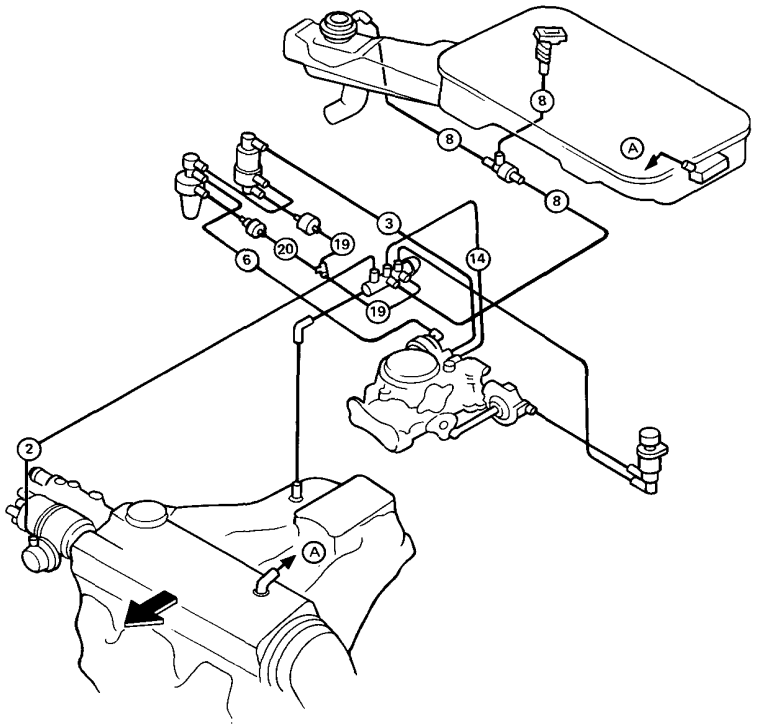


2. Loosen the alternator adjusting nut bolt and mounting nut.
3. Move the alternator to obtain the proper belt tension and retighten the adjusting nut and mounting nut.
4. Recheck the deflection of the belt, and readjust if necessary.

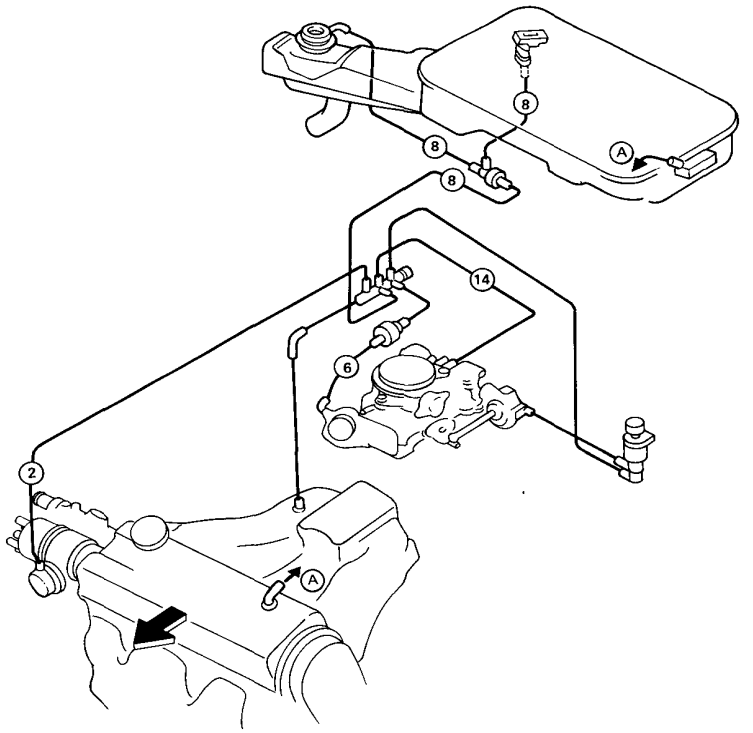
Fuel and Emission Controls (Carbureted Engine)

Interconnect Diagram

[A16A1 KG, KF, KW (M/T) model]

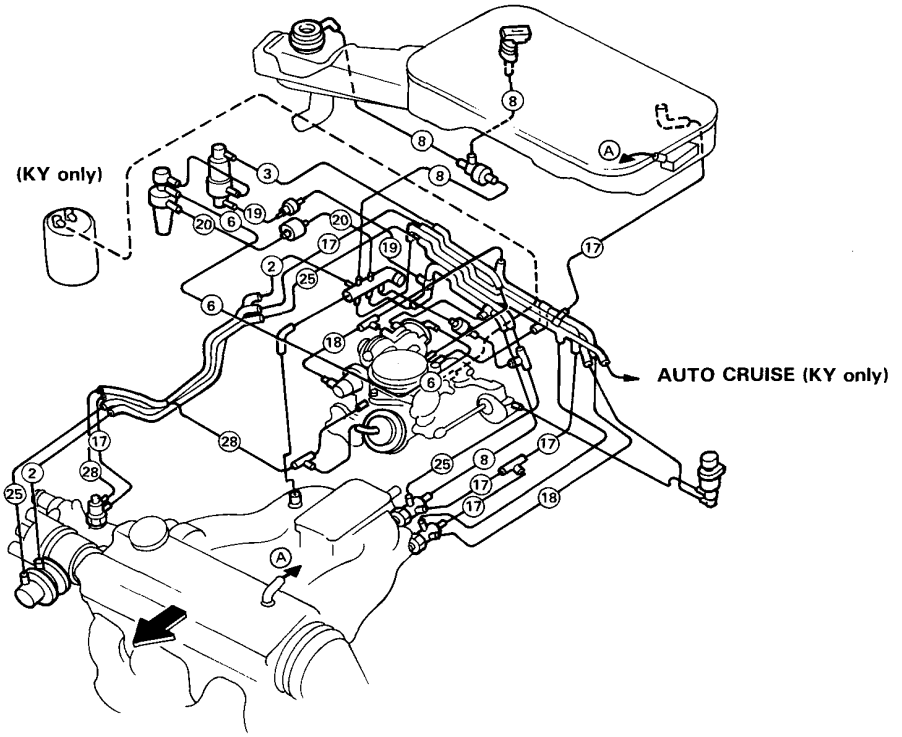


[A16A1 KG, KF, KW (A/T) and KT model]

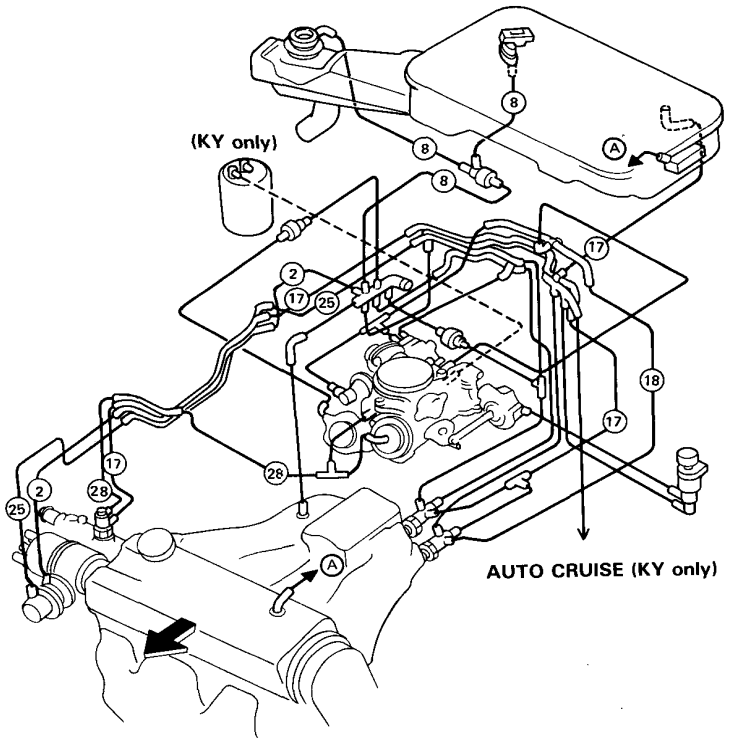


[A20A2 KF, KG, KW, KE, KY model]

(M/T)

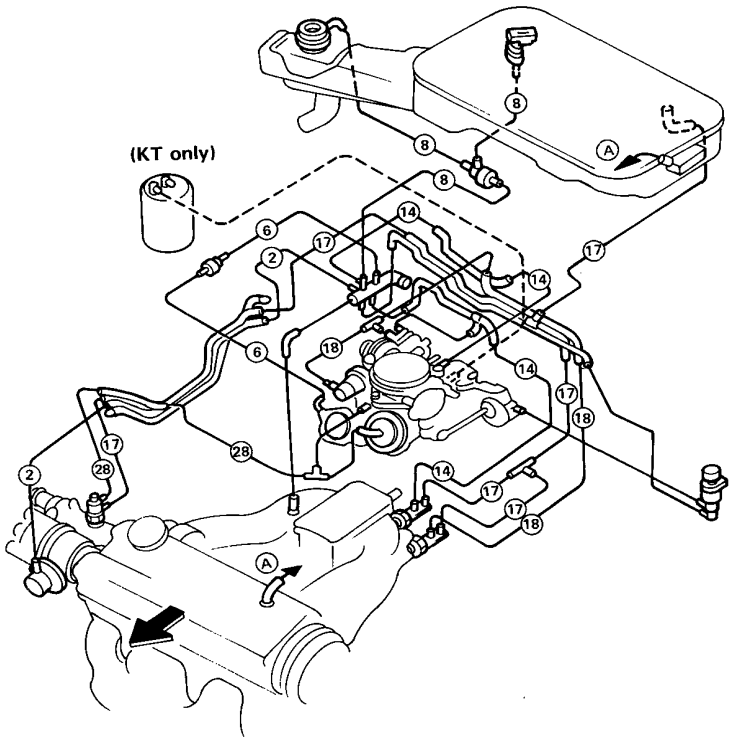


(A/T)

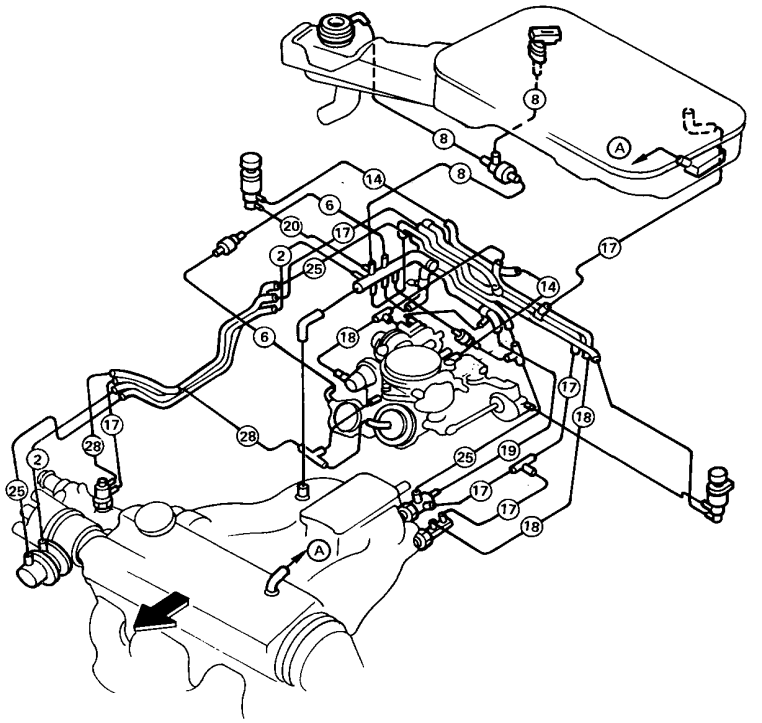


Interconnect Diagram

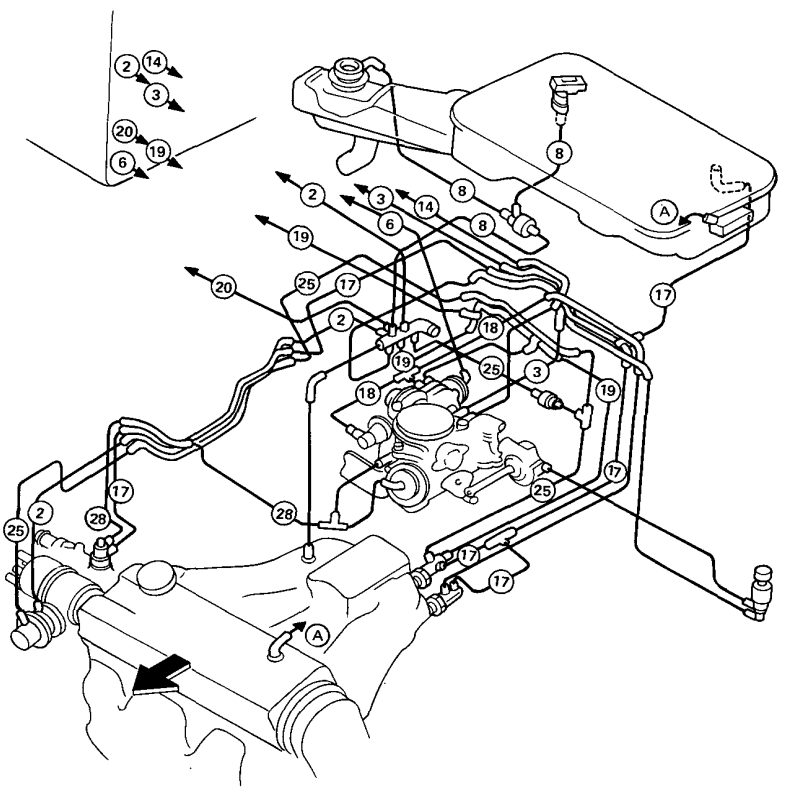
[A20A2 KP, KT model]



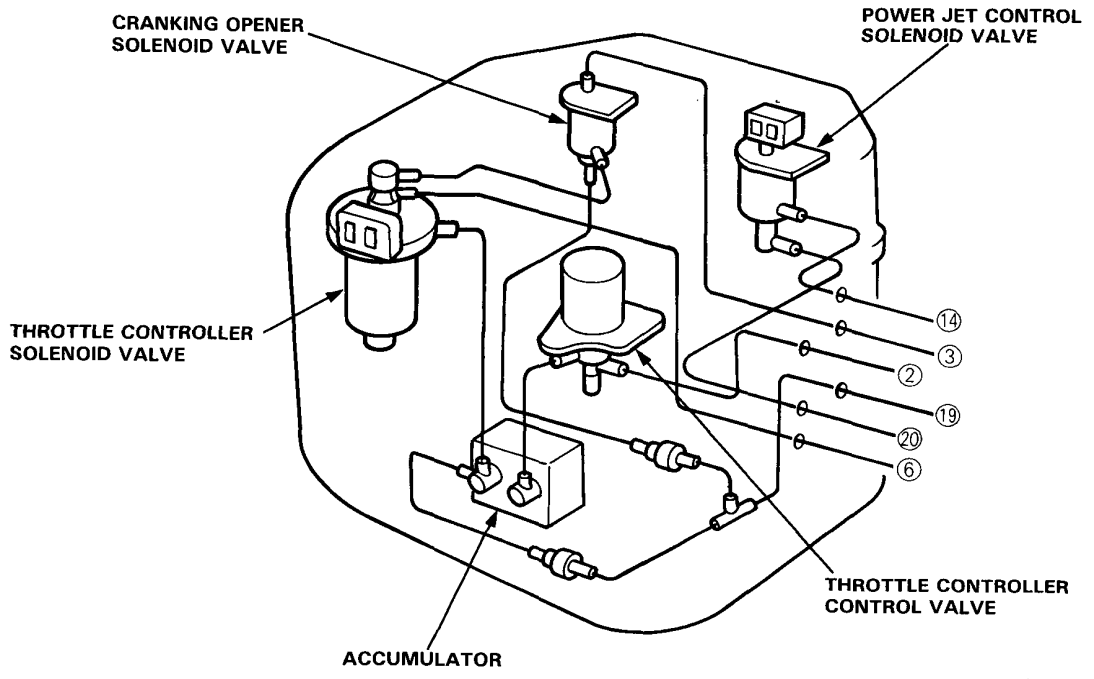
[A20A2 KS (A/T) model]



[A20A2 KS (M/T) model]

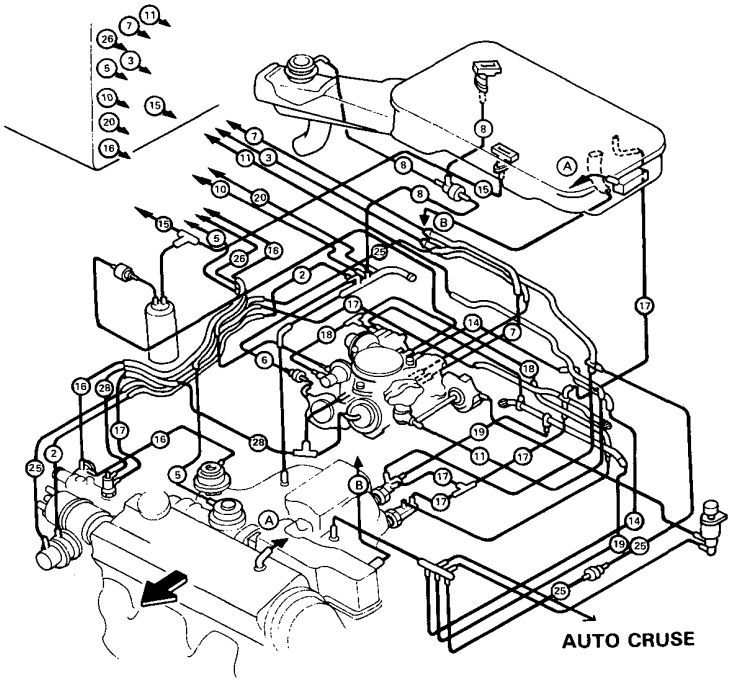


Control Box

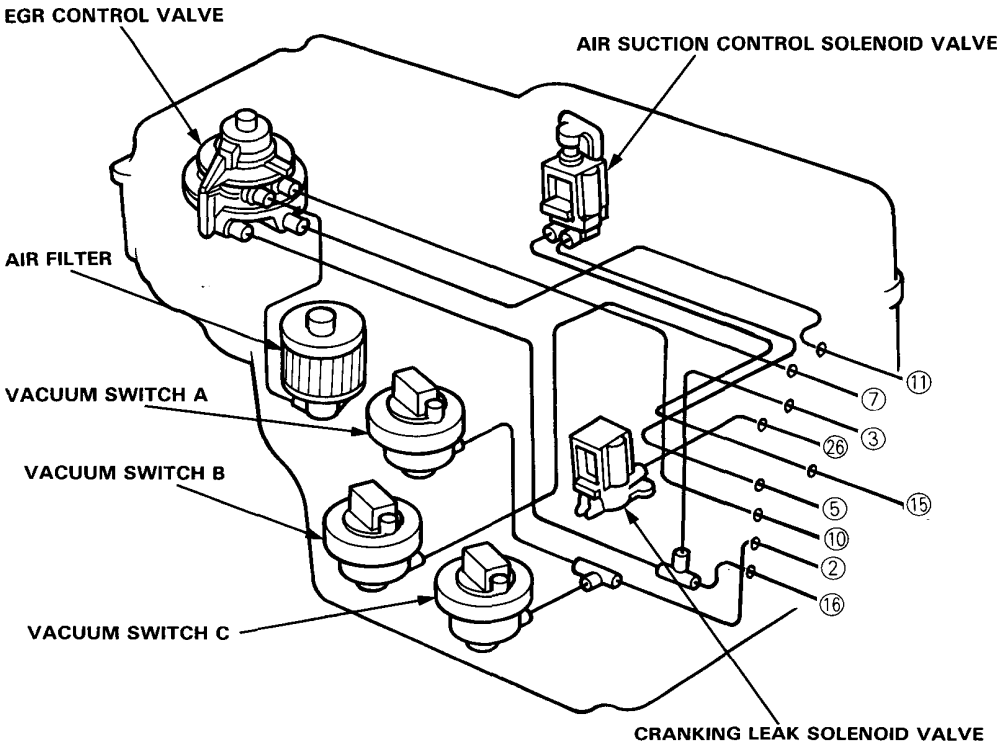


Interconnect Diagram

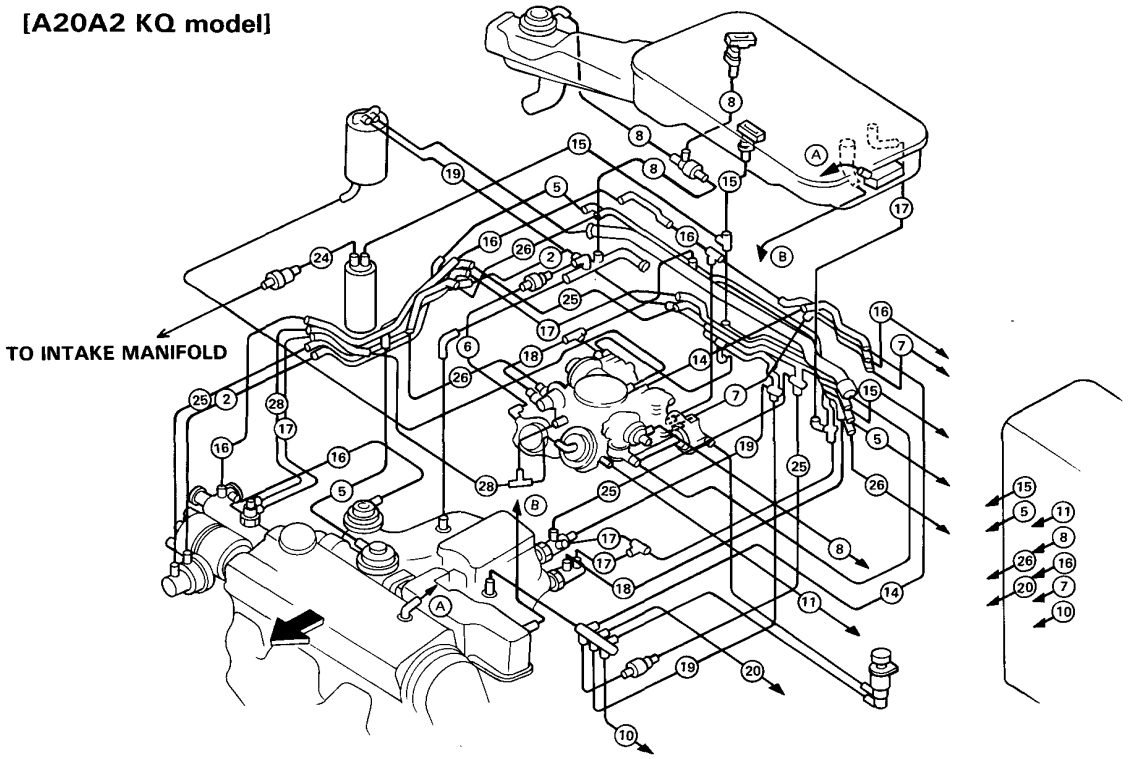
[A20A2 KX model]



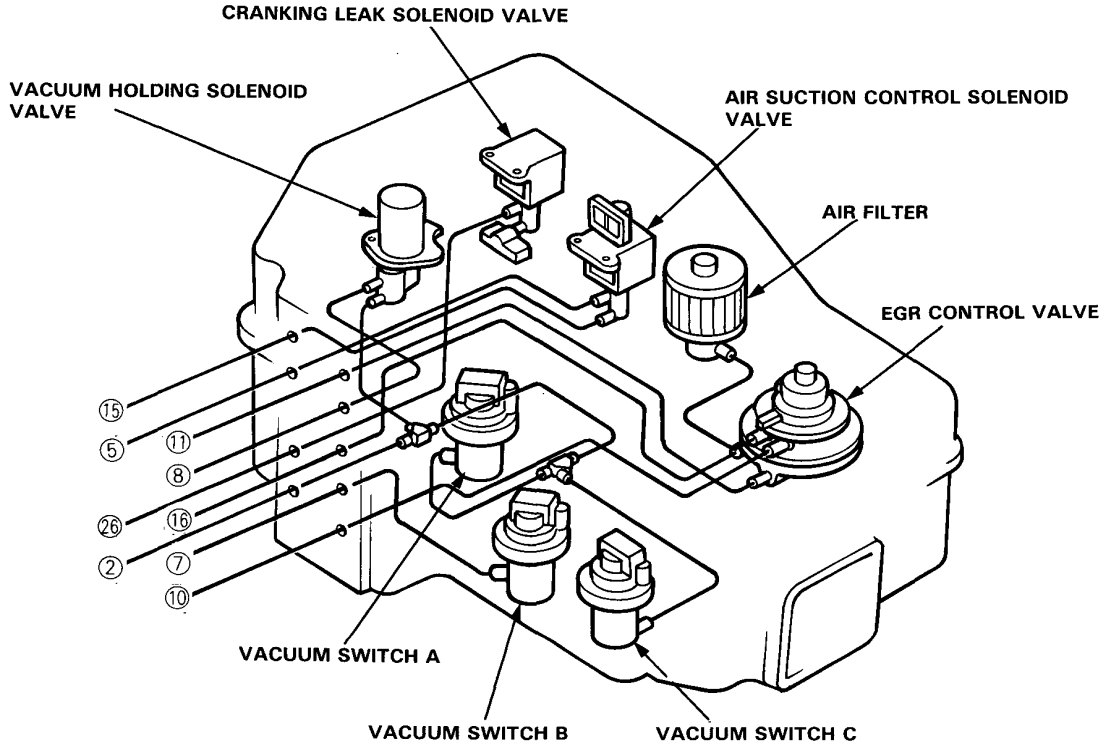
Control Box



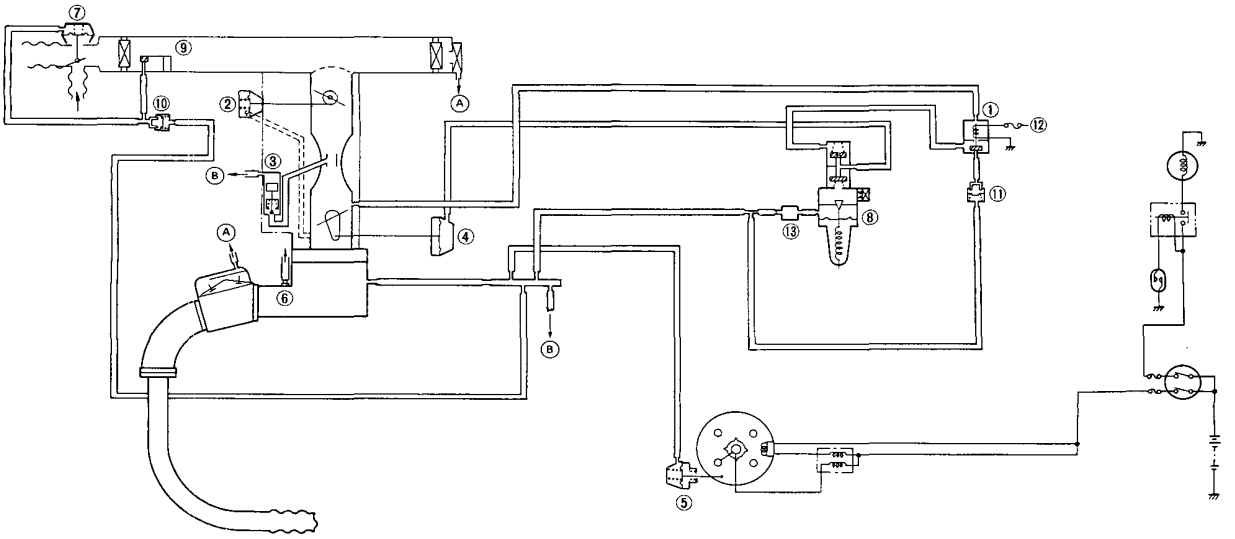
[A20A2 KQ model]



Control Box

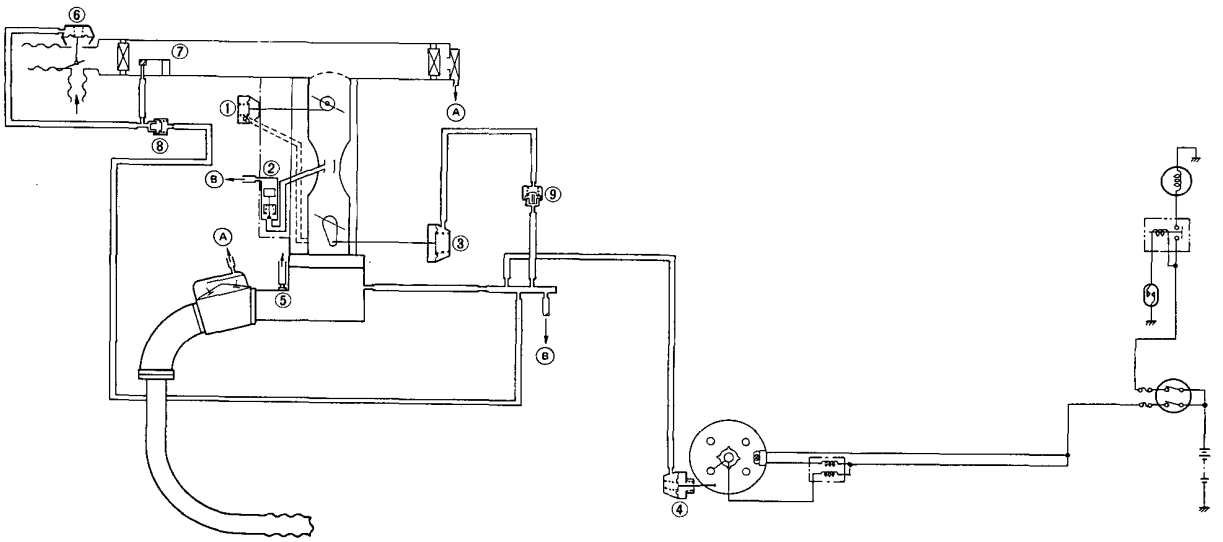


[A16A1 KF, KG, KW (M/T) model]



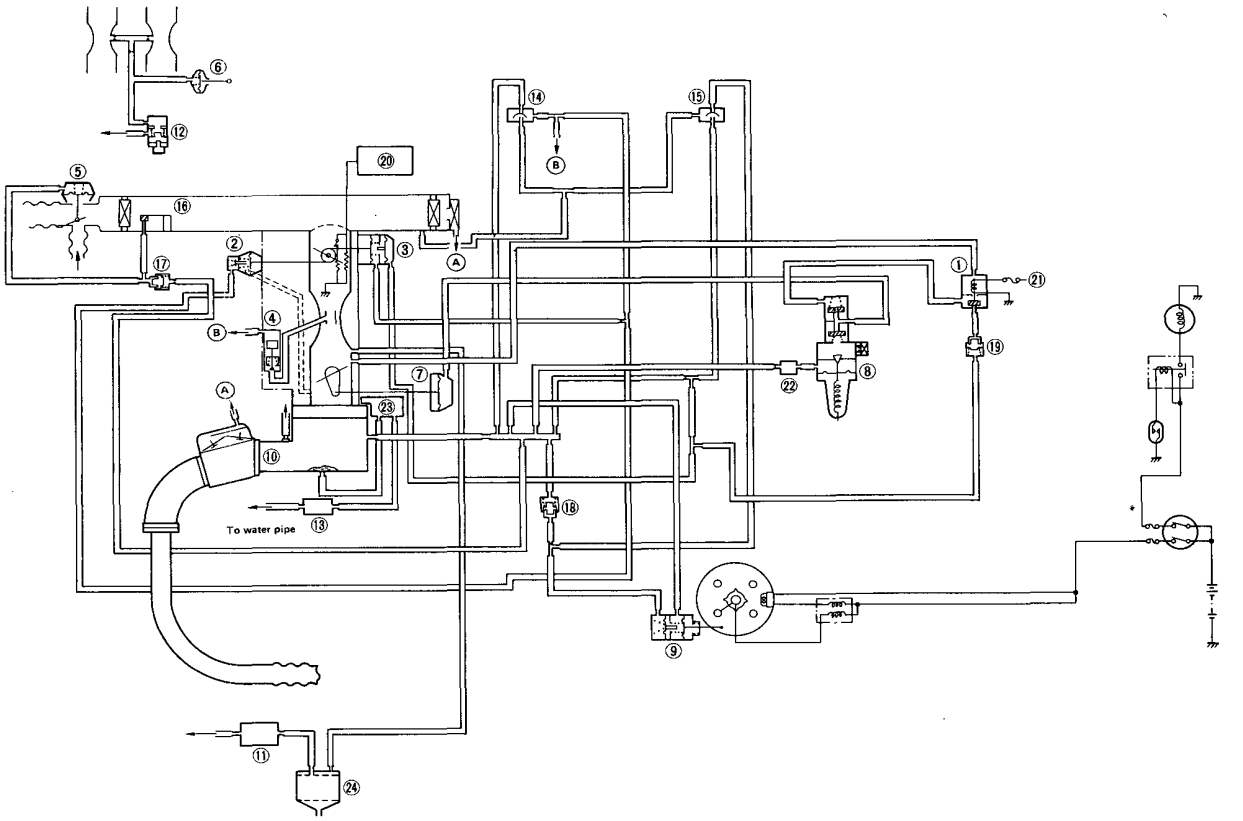
① CRANKING OPENER SOLENOID VALVE
② CHOKE OPENER
③ POWER VALVE
④ THROTTLE CONTROLLER
⑤ VACUUM ADVANCE DIAPHRAGM
⑥ PCV VALVE
⑦ AIR CONTROL DIAPHRAGM
⑧ THROTTLE CONTROLLER CONTROL VALVE
⑨ AIR BLEED VALVE A
⑩ CHECK VALVE A
⑪ CHECK VALVE E
⑫ IGNITION SWITCH STARTER SIGNAL
⑬ ACCUMULATOR

[A16A1 KG, KW, KF (A/T) and KT model]



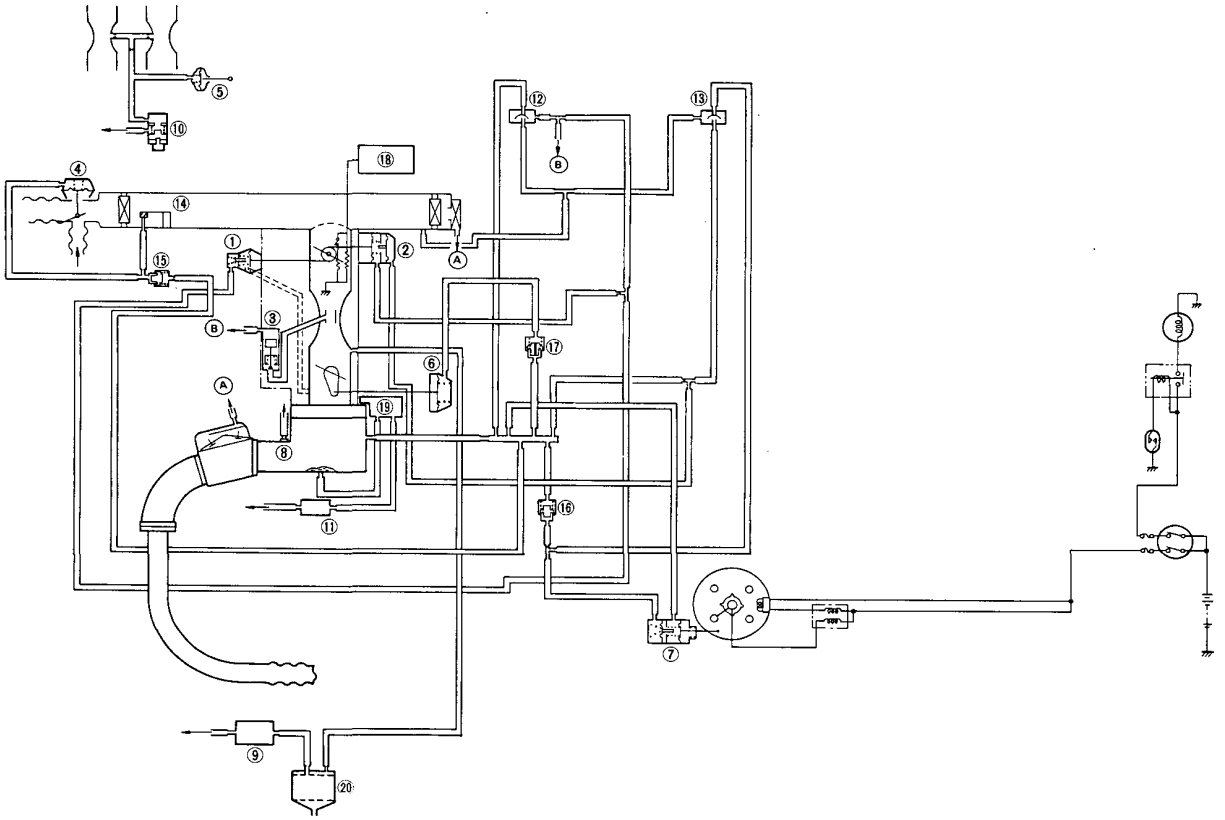
① CHOKE OPENER
② POWER VALVE
③ THROTTLE CONTROLLER
④ VACUUM ADVANCE DIAPHRAGM
⑤ PCV VALVE
⑥ AIR CONTROL VALVE
⑦ AIR BLEED VALVE A
⑧ CHECK VALVE A
⑨ CHECK VALVE C

[A20A2 KF, KG, KW, KE, KY (M/T) model]



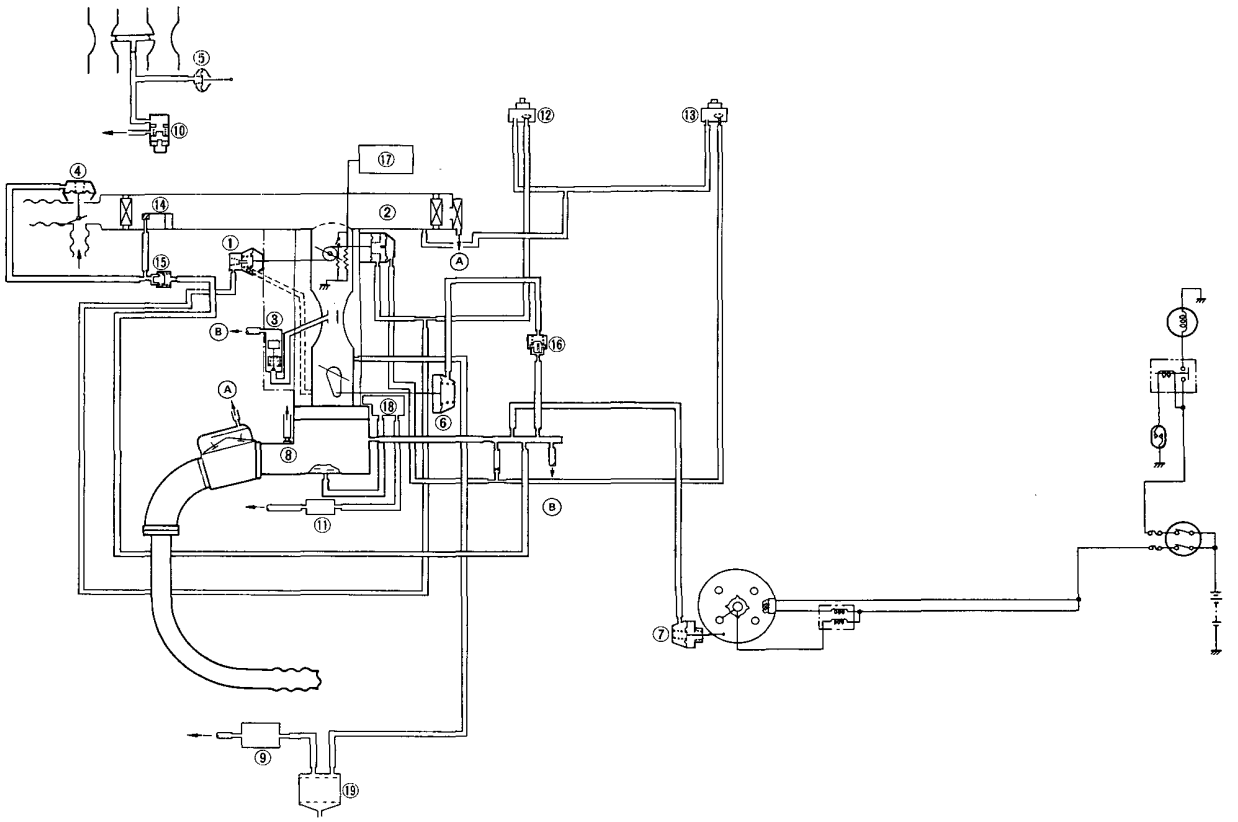
① CRANKING OPENER SOLENOID VALVE
② CHOKE OPENER
③ FAST IDLE UNLOADER
④ POWER VALVE
⑤ AIR CONTROL DIAPHRAGM
⑥ SECONDARY DIAPHRAGM
⑦ THROTTLE CONTROLLER
⑧ THROTTLE CONTROLLER CONTROL VALVE
⑨ VACUUM ADVANCE DIAPHRAGM
⑩ PCV VALVE
⑪ TWO-WAY VALVE
⑫ THERMO WAX VALVE A
⑬ THERMO WAX VALVE B
⑭ THERMOVALVE A
⑮ THERMOVALVE B
⑯ AIR BLEED VALVE A
⑰ CHECK VALVE A
⑱ CHECK VALVE B
⑲ CHECK VALVE E
⑳ "L" TERMINAL OF REGULATOR
㉑ IGNITION SWITCH STARTER SIGNAL
㉒ ACCUMULATOR
㉓ HEAT RISER
㉔ CHARCOAL CANISTER (KY ONLY)

[A20A2 KF, KG, KW, KE, KY (A/T) model]



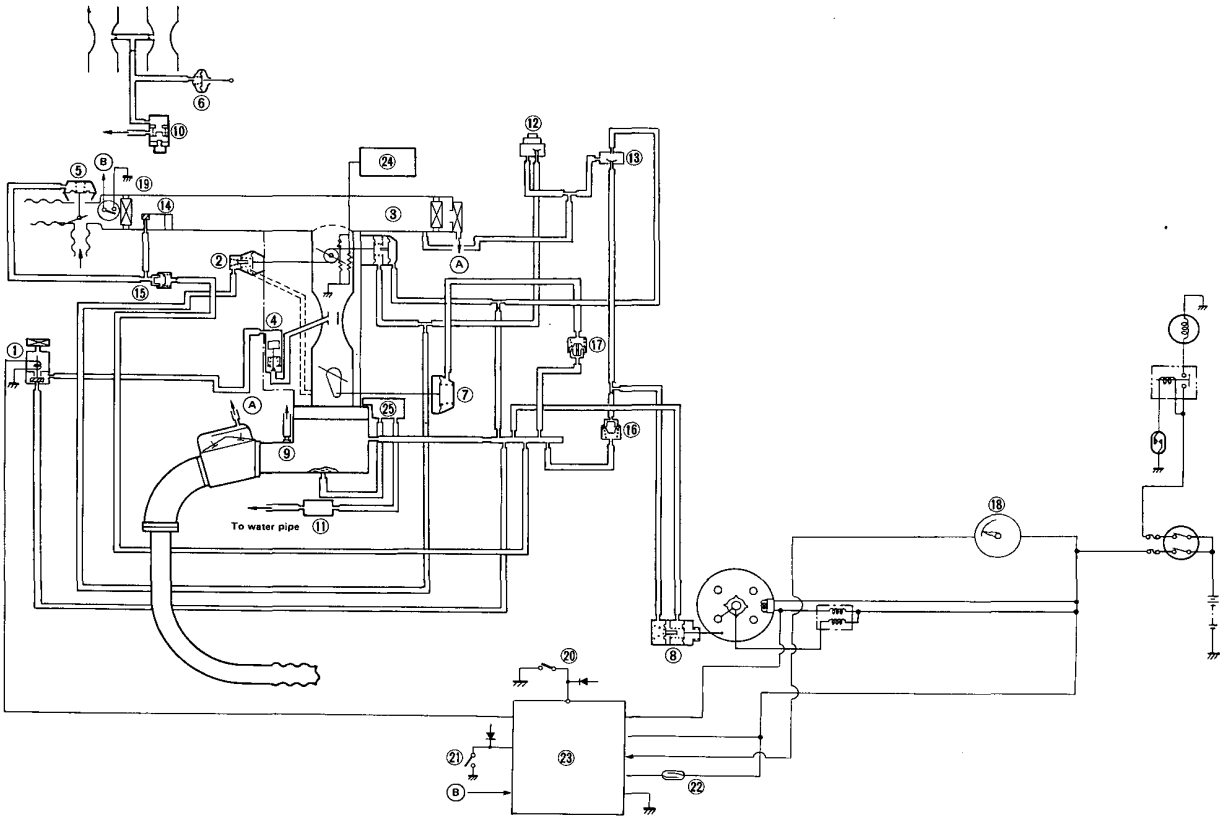
① CHOKE OPENER
② FAST IDLE UNLOADER
③ POWER VALVE
④ AIR CONTROL DIAPHRAGM
⑤ SECONDARY DIAPHRAGM
⑥ THROTTLE OPENER
⑦ VACUUM ADVANCE DIAPHRAGM
⑧ PCV VALVE
⑨ TWO-WAY VALVE
⑩ THERMO WAX VALVE A
⑪ THERMO WAX VALVE B
⑫ THERMOVALVE A
⑬ THERMOVALVE B
⑭ AIR BLEED VALVE A
⑮ CHECK VALVE A
⑯ CHECK VALVE B
⑰ CHECK VALVE C
⑱ "L" TERMINAL OF REGULATOR
⑲ HEAT RISER
⑳ CHARCOAL CANISTER (KY ONLY)

[A20A2 KP, KT model]



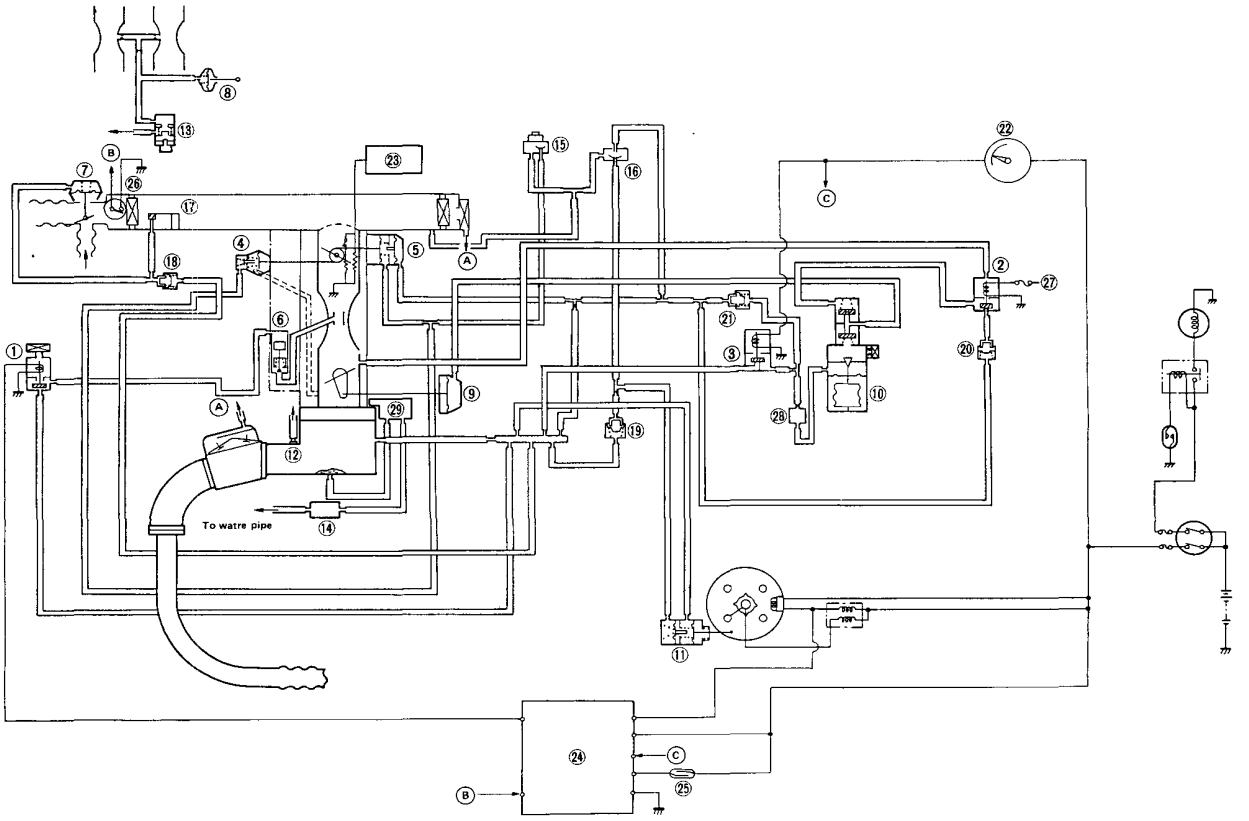
① CHOKE OPENER
② FAST IDLE UNLOADER
③ POWER VALVE
④ AIR CONTROL DIAPHRAGM
⑤ SECONDARY DIAPHRAGM
⑥ THROTTLE CONTROLLER
⑦ VACUUM ADVANCE DIAPHRAGM
⑧ PCV VALVE
⑨ TWO-WAY VALVE
⑩ THERMO WAX VALVE A
⑪ THERMO WAX VALVE B
⑫ THERMOVALVE A
⑬ THERMOVALVE B
⑭ AIR BLEED VALVE A
⑮ CHECK VALVE A
⑯ CHECK VALVE C
⑰ "L" TERMINAL OF REGULATOR
⑱ HEAT RISER
⑲ CHARCOAL CANISTER (KT ONLY)

[A20A2 KS (A/T) model]



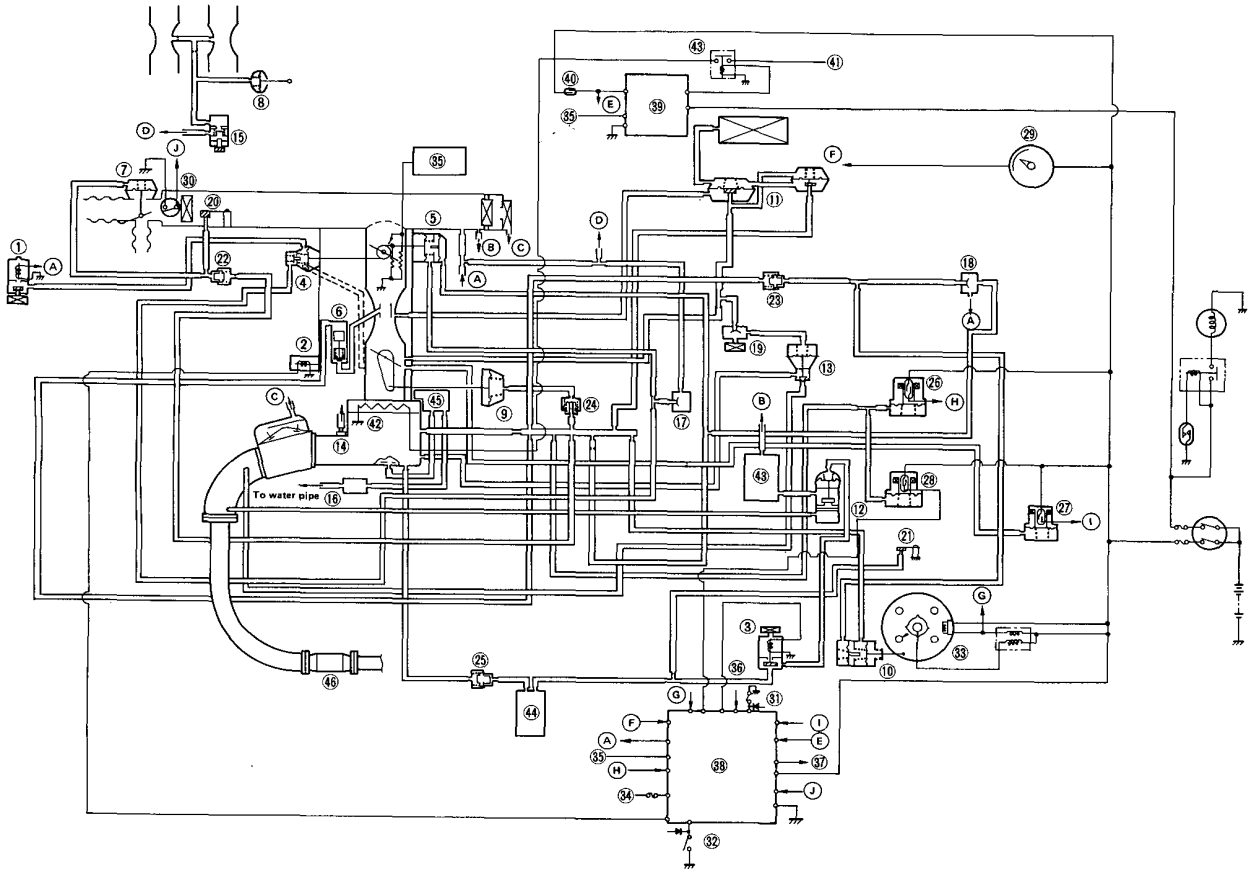
① POWER VALVE CONTROL SOLENOID VALVE
② CHOKE OPENER
③ FAST IDLE UNLOADER
④ POWER VALVE
⑤ AIR CONTROL VALVE
⑥ SECONDARY DIAPHRAGM
⑦ THROTTLE CONTROLLER
⑧ VACUUM ADVANCE DIAPHRAGM
⑨ PCV VALVE
⑩ THERMO WAX VALVE A
⑪ THERMO WAX VALVE B
⑫ THERMOVALVE A
⑬ THERMOVALVE B
⑭ AIR BLEED VALVE A
⑮ CHECK VALVE A
⑯ CHECK VALVE B
⑰ CHECK VALVE C
⑱ SPEED SENSOR
⑲ INTAKE AIR TEMP. SWITCH
⑳ NEUTRAL SWITCH
㉑ PARKING SWITCH
㉒ THERMOSWITCH
㉓ SOLENOID VALVE CONTROL UNIT
㉔ "L" TERMINAL OF REGULATOR
㉕ HEAT RISER

[A20A2 KS (M/T) model]



① POWER VAVLE CONTROL SOLENOID VALVE
② CRANKING OPENER SOLENOID VALVE
③ THROTTLE CONTROLLER SOLENOID VALVE
④ CHOKE OPENER
⑤ FAST IDLE UNLOADER
⑥ POWER VALVE
⑦ AIR CONTROL DIAPHRAGM
⑧ SECONDARY DIAPHRAGM
⑨ THROTTLE CONTROLLER
⑩ THROTTLE CONTROLLER CONTROL VALVE
⑪ VACUUM ADVANCE DIAPHRAGM
⑫ PCV VALVE
⑬ THERMO WAX VALVE A
⑭ THERMO WAX VALVE B
⑮ THERMOVALVE A
⑯ THERMOVALVE B
⑰ AIR BLEED VALVE A
⑱ CHECK VALVE A
⑲ CHECK VALVE B
⑳ CHECK VALVE E
㉑ CHECK VALVE F
㉒ SPEED SENSOR
㉓ "L" TERMINAL OF REGULATOR
㉔ SOLENOID VALVE CONTROL UNIT
㉕ THERMOSWITCH
㉖ INTAKE AIR TEMP. SWITCH
㉗ IGNITION SWITCH STARTER SIGNAL
㉘ ACUUMULATOR
㉙ HEAT RISER

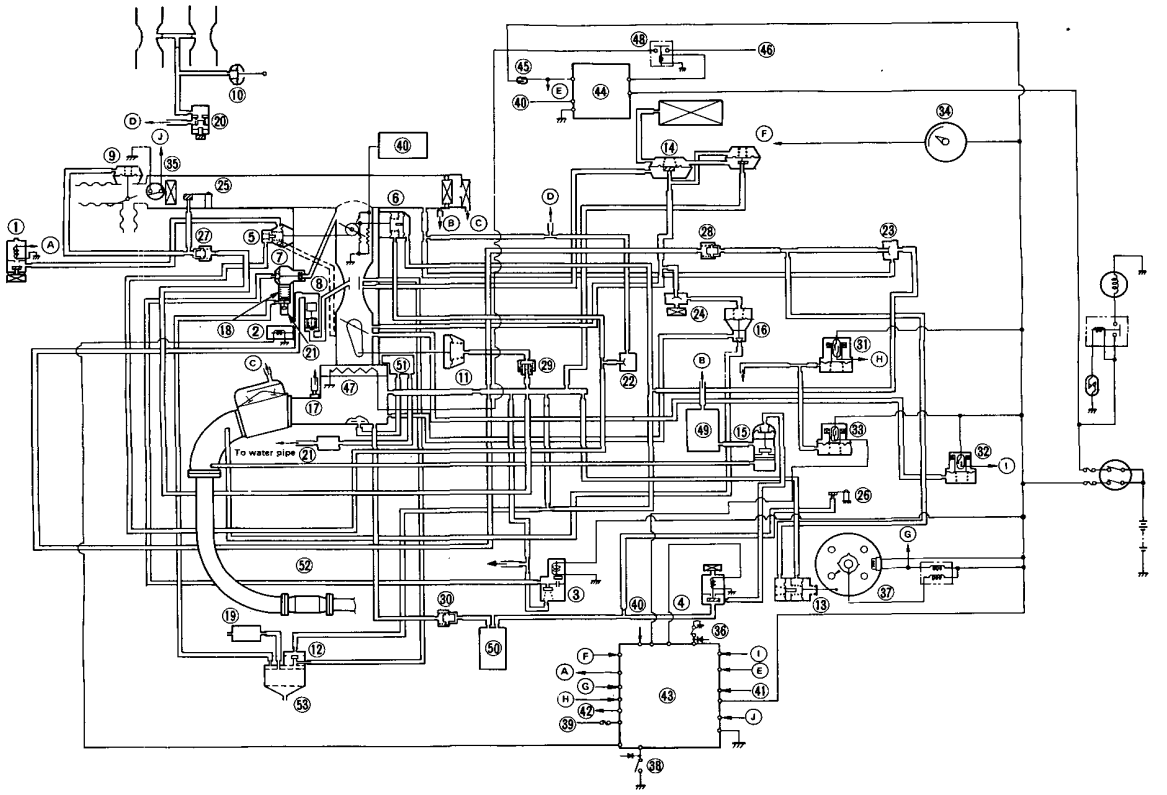
[A20A2 KX model]



① CRANKING LEAK SOLENOID VALVE
② PRIMARY SLOW MIXTURE CUT-OFF SOLENOID VALVE
③ AIR SUCTION VALVE CONTROL SOLENOID VALVE
④ CHOKE OPENER
⑤ FAST IDLE UNLOADER
⑥ POWER VALVE
⑦ AIR CONTROL DIAPHRAGM
⑧ SECONDARY DIAPHRAGM
⑨ THROTTLE CONTROLLER
⑩ VACUUM ADVANCE DIAPHRAGM
⑪ EGR CONTROL VALVE
⑫ AIR SUCTION VALVE
⑬ EGR VALVE
⑭ PCV VALVE
⑮ THERMO WAX VALVE A
⑯ THERMO WAX VALVE B
⑰ THERMOVALVE A
⑱ THERMOVALVE B
⑲ THERMOVALVE C
⑳ AIR BLEED VALVE A
㉑ AIR BLEED VALVE B
㉒ CHECK VALVE A
㉓ CHECK VALVE B
㉔ CHECK VALVE C
㉕ CHECK VALVE D
㉖ VACUUM SWITCH A
㉗ VACUUM SWITCH B
㉘ VACUUM SWITCH C
㉙ SPEED SENSOR
㉚ INTAKE AIR TEMP. SWITCH
㉛ SHIFT LEVER POSITION SWITCH (A/T ONLY)
㉜ CLUTCH SWITCH (M/T ONLY)
㉝ DISTRIBUTOR
㉞ IGNITION SWITCH STARTER SIGNAL
㉟ "L" TERMINAL OF REGULATOR
㊱ AIR CONDITIONER SWITCH SIGNAL
㊲ TO A/C IDLE BOOST SOLENOID VALVE
㊳ SOLENOID VALVE CONTROL UNIT
㊴ EFE HEATER CONTROL UNIT
㊵ THERMOSWITCH
㊶ BATTERY
㊷ EFE HEATER
㊸ EFE RELAY
㊹ ACCUMULATOR
㊺ VACUUM TANK
㊻ HEAT RISER
㊼ CATRISTIC CONVERTER

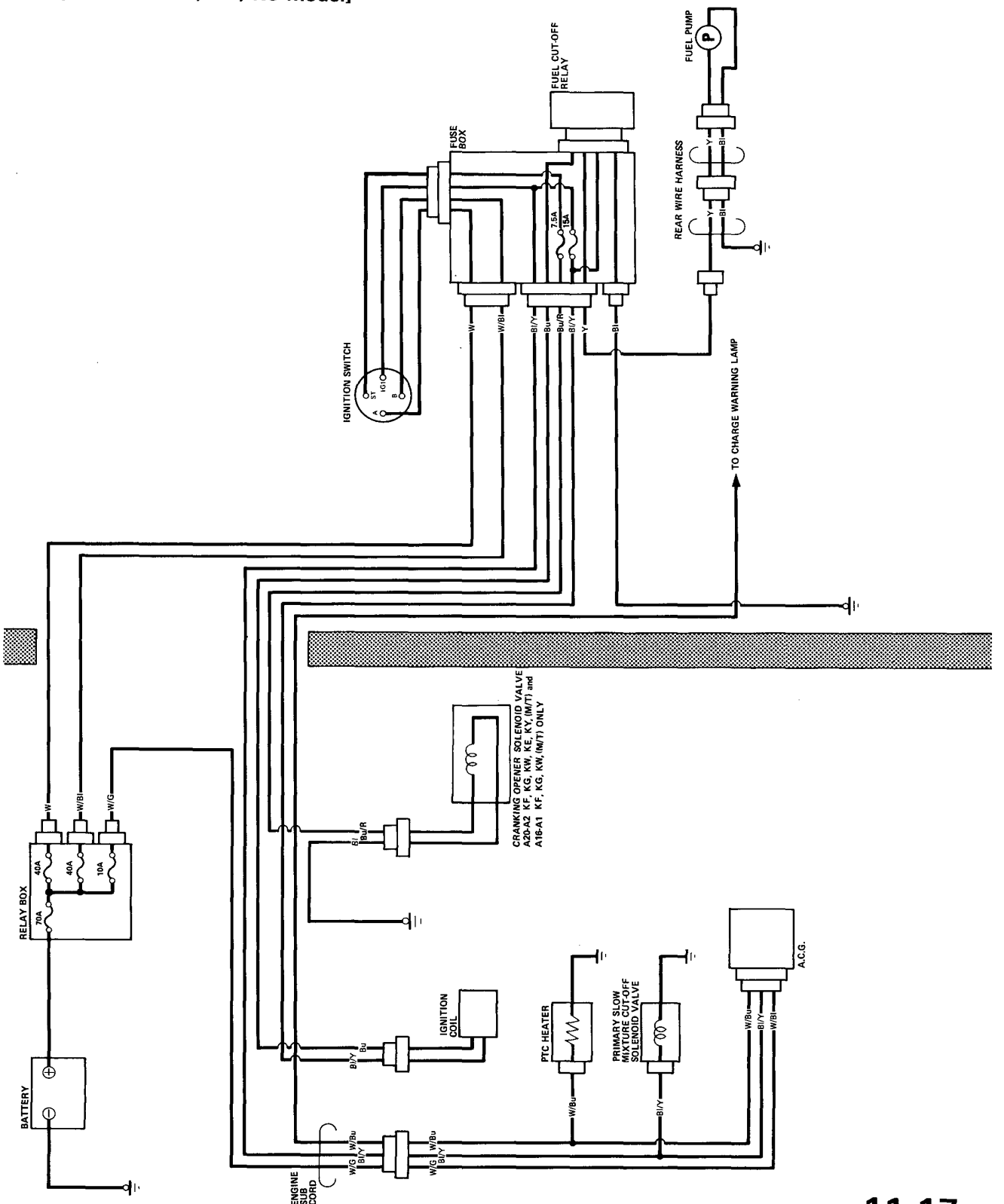
Vacuum and Electrical Connections

[A20A2 KQ model]



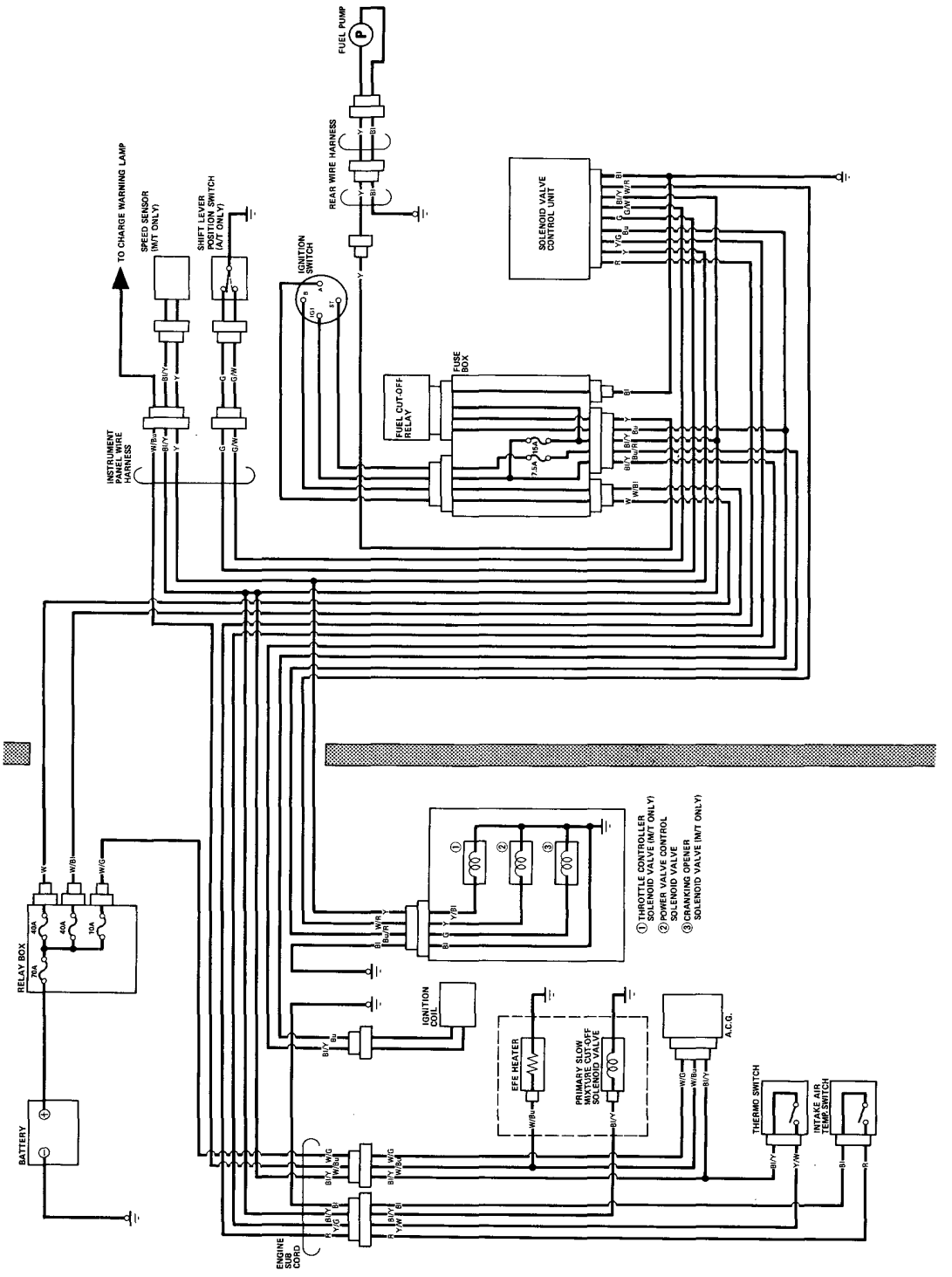
① CRANKING LEAK SOLENOID VALVE
② PRIMARY SLOW MIXTURE CUT-OFF SOLENOID VALVE
③ VACUUM HOLDING SOLENOID VALVE
④ AIR SUCTION VALVE CONTROL SOLENOID VALVE
⑤ CHOKE OPENER
⑥ FAST IDLE UNLOADER
⑦ AIR VENT CUT-OFF DIAPHRAGM
⑧ POWER VALVE
⑨ AIR CONTROL DIAPHRAGM
⑩ SECONDARY DIAPHRAGM
⑪ THROTTLE CONTROLLER
⑫ PURGE CONTROL DIAPHRAGM
⑬ VACUUM ADVANCE DIAPHRAGM
⑭ EGR CONTROL VALVE
⑮ AIR SUCTION VALVE
⑯ EGR VALVE
⑰ PCV VALVE
⑱ CARBURETOR THERMOVALVE
⑲ TWO-WAY VALVE
⑳ THERMO WAX VALVE A
㉑ THERMO WAX VALVE B
㉒ THERMOVALVE A
㉓ THERMOVALVE B
㉔ THERMOVALVE C
㉕ AIR BLEED VALVE A
㉖ AIR BLEED VALVE B
㉗ CHECK VALVE A
㉘ CHECK VALVE B
㉙ CHECK VALVE C
㉚ CHECK VALVE D
㉛ VACUUM SWITCH A
㉜ VACUUM SWITCH B
㉝ VACUUM SWITCH C
㉞ SPEED SENSOR
㉟ INTAKE AIR TEMP. SWITCH
㊱ SHIFT LEVER POSITION SWITCH (A/T ONLY)
㊲ DISTRIBUTOR
㊳ CLUTCH SWITCH (M/T ONLY)
㊴ IGNITION SWITCH STARTER SIGNAL
㊵ "L" TERMINAL OF REGULATOR
㊶ AIR CONDITIONER SWITCH SIGNAL
㊷ TO A/C IDLE BOOST SOLENOID VALVE
㊸ SOLENOID VALVE CONTROL UNIT
㊹ EFE HEATER CONTROL UNIT
㊺ THERMOSWITCH
㊻ BATTERY
㊼ EFE HEATER
㊽ EFE RELAY
㊾ ACCUMULATOR
㊿ VACUUM TANK
(51) HEAT RISER
(52) CATRISTIC CONVERTER
(53) CHARCOAL CANISTER

[Except A20A2 KQ, KX, KS model]

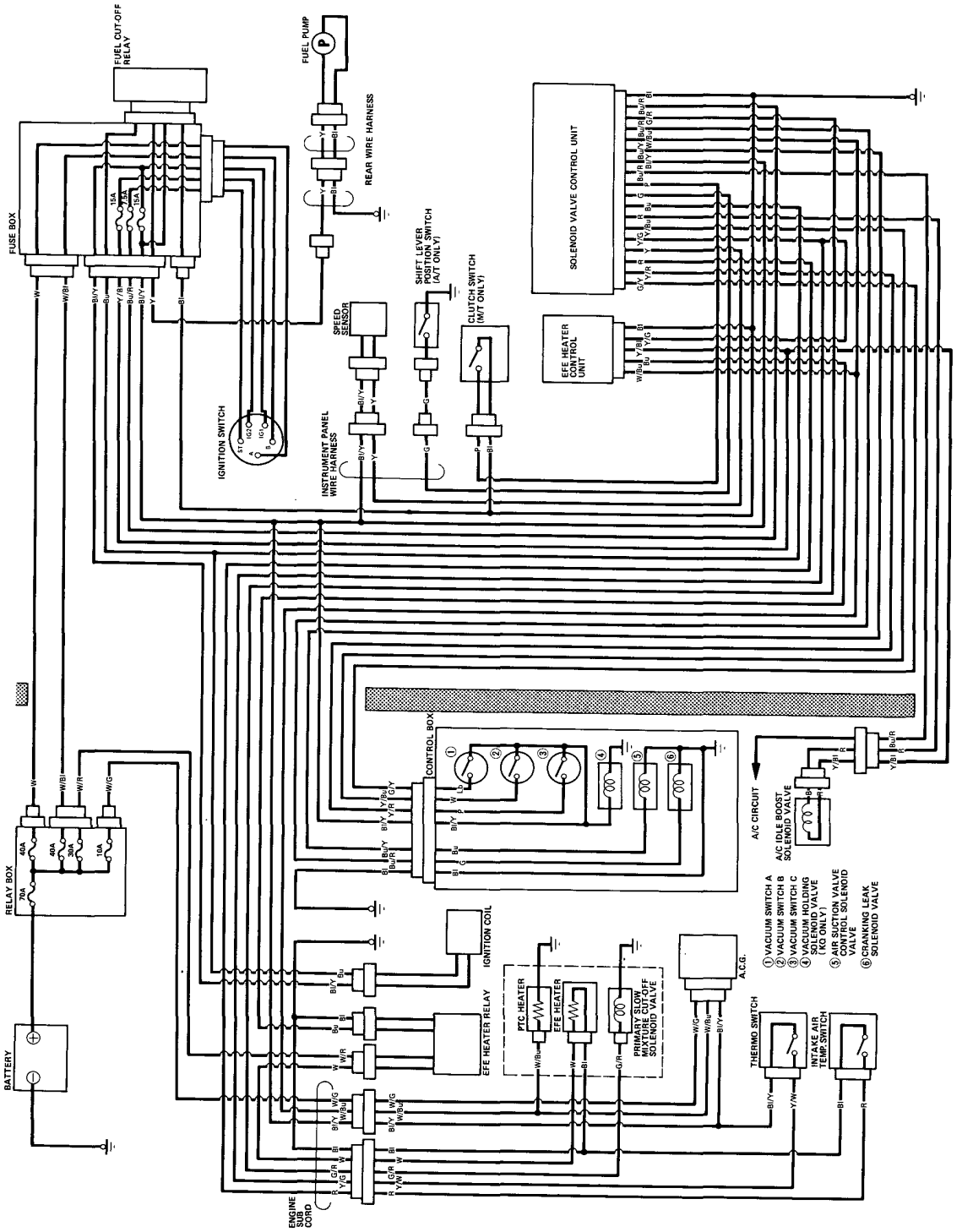


Wiring Diagram

[A20A2 KS model]

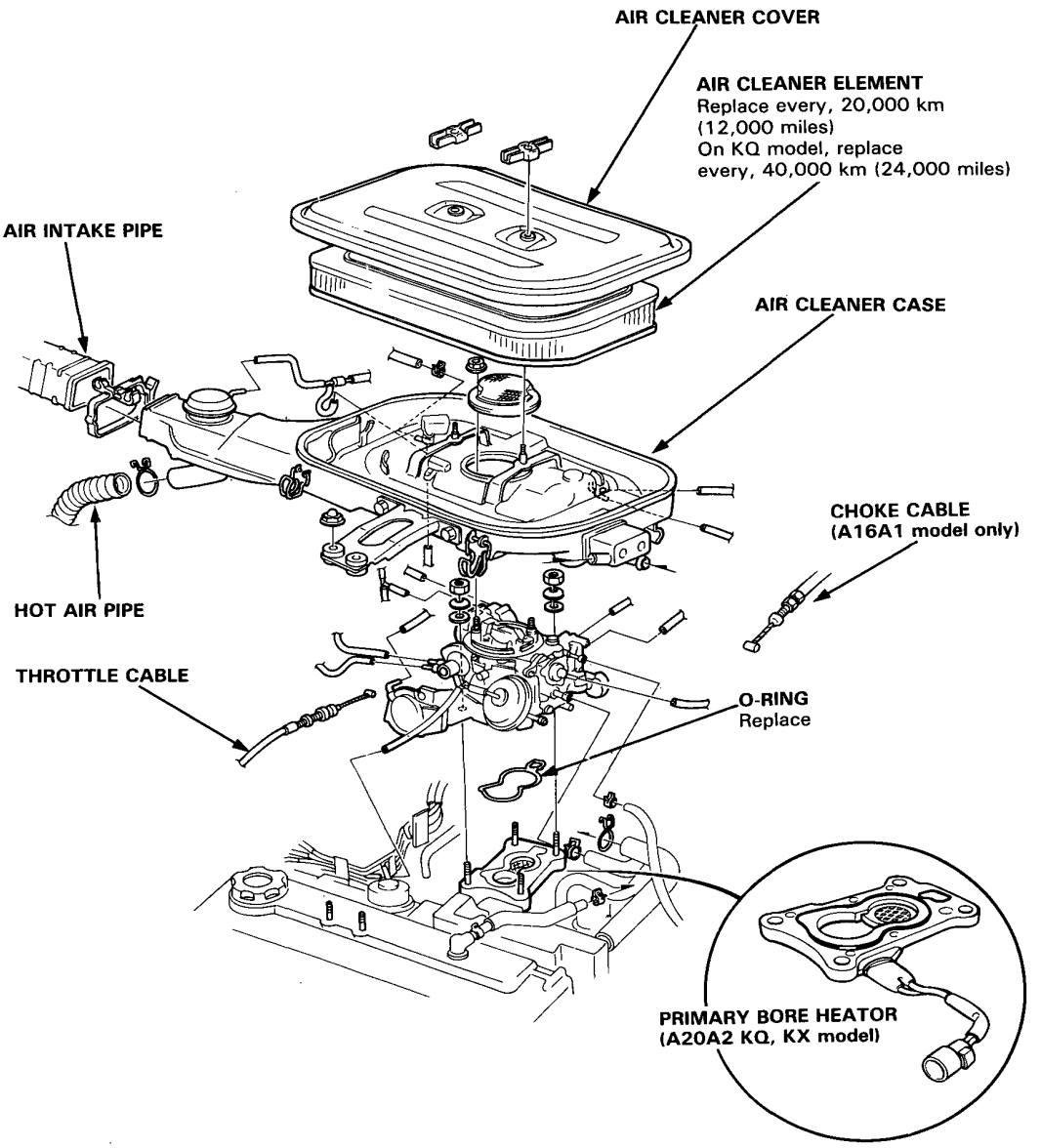


[A20A2 KX, KQ model]



Carburetor

Index



Inspection/Adjusting

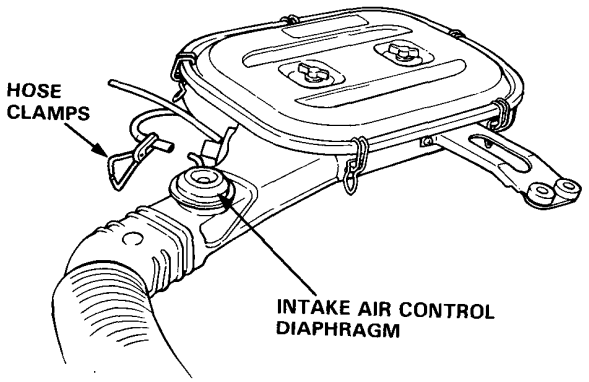
[A20A2 KQ, KX model]

Propane Enrichment Method

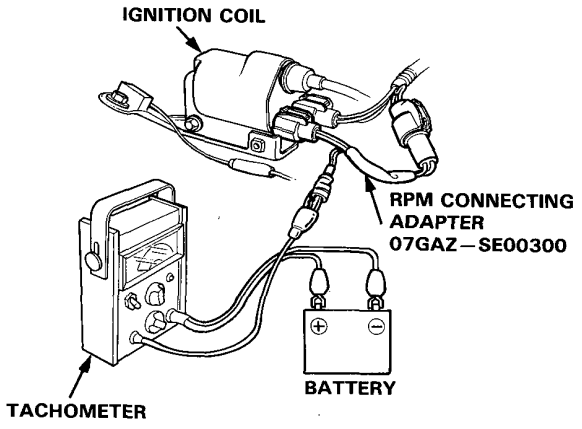
WARNING Do not smoke during this procedure. Keep any open flame away from your work area.

NOTE: This procedure requires a propane enrichment kit.

1. Start engine and warm up to normal operating temperature; the cooling fan will come on.
2. Remove the vacuum hose from the intake air control diaphragm and clamp the hose end.

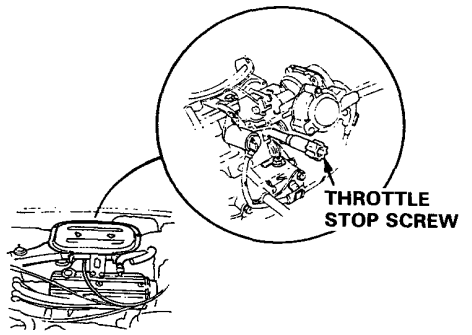


3. Connect a tachometer.



4. Check idle speed with the headlights, heater blower, rear window defroster, cooling fan and air conditioner off.

Transmission	Idle Speed
Manual Transmission (in neutral)	750 ± 50 min^{-1} (rpm)
Automatic (in gear)	700 ± 50 min^{-1} (rpm)

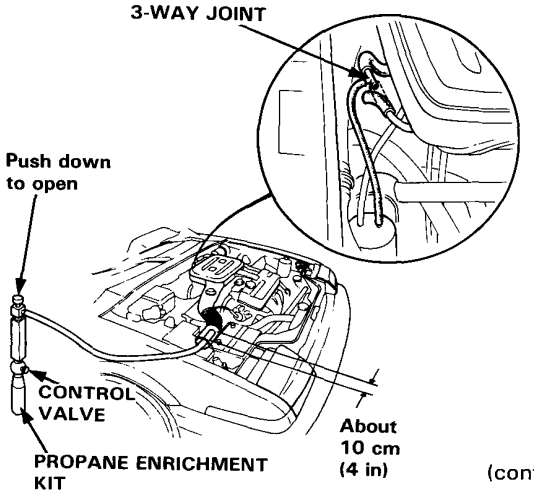


Adjust the idle speed, if necessary, by turning the throttle stop screw.

NOTE: If the idle speed is excessively high, check the dashpot system (page 11-42).

5. Disconnect air cleaner intake tube from air duct.
6. Disconnect the #15 hose to the air bleed valve B at the 3-way joint and insert the hose of the propane enrichment kit approximately 10 cm (4 in) into the intake tube.

NOTE: Check that propane bottle has adequate gas before beginning test.

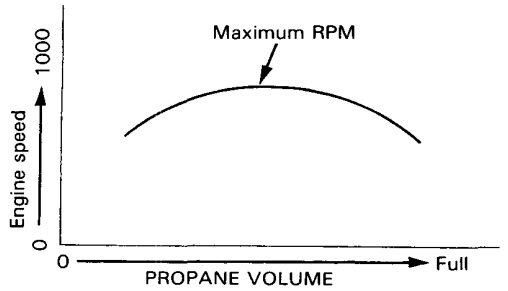


(cont'd)

Inspection/Adjusting (cont'd)

7. With engine idling, depress push button on top of propane device, then slowly open the propane control valve to obtain maximum engine speed.
   Engine speed should increase as percentage of propane injected goes up.

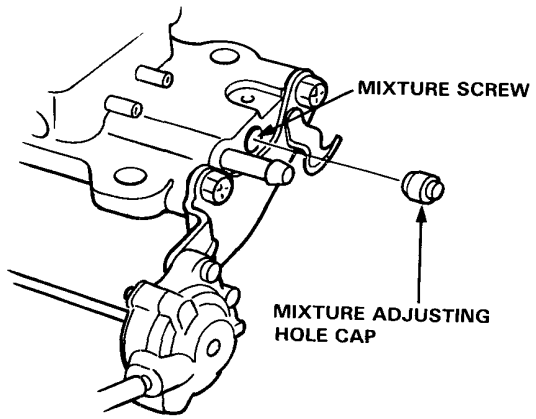
   NOTE: Open the propane control valve slowly; a sudden burst of propane may stall the engine.



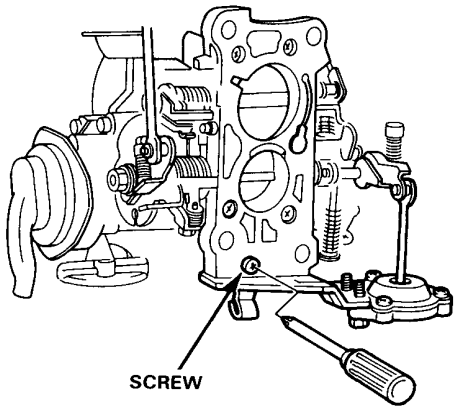
Propane Enriched Maximum Engine Speed
Engine Speed increase should be:
M/T 60 ± 20 min^{-1} (rpm)
A/T 30 ± 20 min^{-1} (rpm)

- If engine speed does not increase per specification, mixtue is improperly adjusted. Go to step 8.
- If engine speed increases per specification, go to step 21.

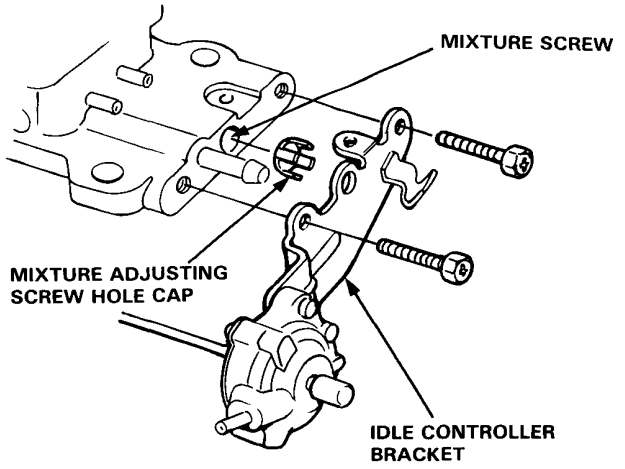
8. Close the propane control valve and remove mixture adjusting hole cap, then go on to step 20 (KX model) or remove the air cleaner (KQ model).



9. Disconnect the vacuum hose to the fast idle unloader.
10. Pull the throttle cable out of its bracket.
11. Remove the carburetor nuts and the bolt securing the steel tubing vacuum manifold.
12. Lift the carburetor clear of its studs, them tilt it backwards so you can remove the idle controller bracket screws.
13. Remove the idle controller bracket.



14. Remove the mixture adjusting screw hole cap, then reinstall the idle controller bracket.



15. Reinstall the carburetor, but first check the insulator block for damage.
16. Reconnect the vacuum hose to the fast idle unloader.
17. Reinstall the air cleaner.
18. Start engine and warm up to normal operating temperature; the cooling fan will come on.
19. Remove the vacuum hose from intake air control diaphragm and clamp the hose end.
    Reinstall the propane enrichment kit.

20. Recheck maximum propane enriched engine speed.

- If the propane enriched speed is too low, mixture is too rich: turn the mixture screw 1/4-turn clockwise and recheck.
- If the propane enriched speed is too high, mixture is too lean: turn the mixture screw 1/4-turn counterclockwise and recheck.

21. Close the propane control valve and recheck idle speed.

NOTE: Raise the engine speed to 2,500 rpm 2 or 3 times, and after 10 seconds of that, check the idle speed.

- If idle speed is as specified (step 4), go to step 23.
- If idle speed is not as specified (step 4), go to step 22.

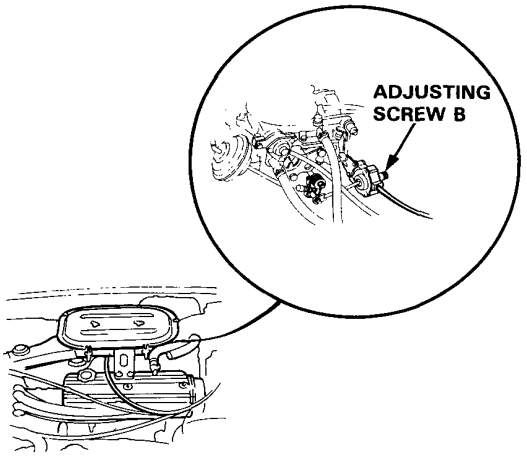
22. Recheck idle speed and, if necessary, adjust by turning throttle stop screw, then repeat steps 20 and 21.

23. Remove the propane enrichment kit and reconnect air cleaner intake tube.

24. Reinstall the mixture adjusting screw hole cap.

25. If equipped with air conditioner, check the idle speed with the A/C on.

Idle speed should be: 750 ± 50 min^{-1} (rpm)



Adjust the idle speed, if necessary, by turning the adjusting screw B.

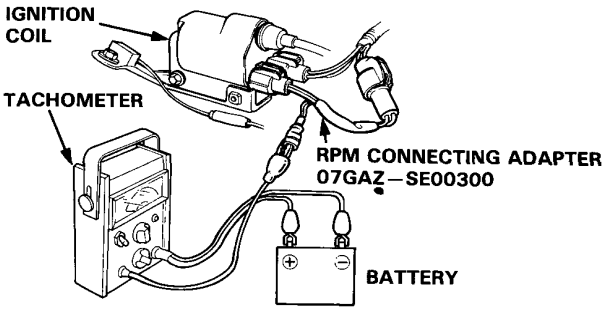
[Other model]

NOTE: Ignition timing and valve clearance must be correct, and engine must be normal operating temperature; the cooling fan will come on.

WARNING Do not smoke during this procedure. Keep any open flame away from your work area.

CO Meter Method

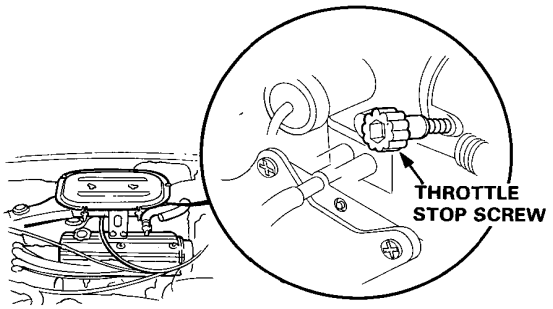
1. Warm-up and calibrate the NDIR CO Meter in accordance with the manufacturer's recommended procedures.
2. Insert exhaust gas sampling probe into the tail pipe at least 40 cm and connect a tachometer.



3. Check specification for idle speed with cooling fan, air conditioner OFF and (except for Swedish model) headlights OFF.

Transmission	Idle Speed
Manual	750 ± 50 min^{-1} (rpm)
Automatic (in gear)	KS model : 750 ± 50 min^{-1} (rpm) Other models : 700 ± 50 min^{-1} (rpm)

4. If not within specification, adjust by turning throttle stop screw to obtain proper idle speed.
If idle speed cannot be adjusted properly, check for proper throttle cable adjustment.



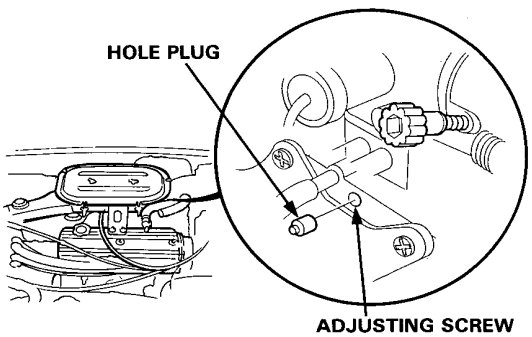
(cont'd)

Inspection/Adjusting (cont'd)

5. Check specification for idle CO with cooling fan, air conditioner OFF and (except for Swedish model) headlights OFF.

   Specified CO %:
   KS model 0.5 ± 0.5%
   Other models 1.0 ± 1.0%

6. If not within specification, remove mixture adjusting screw hole plug and adjust by turning mixture adjusting screw to obtain proper CO reading.



Turning mixture adjusting screw
clockwise: CO reading decreases
counterclockwise: CO reading increases

- Readjust idle speed if necessary, and recheck idle CO.

7. Install the hole plug.

   If unable to obtain a CO reading of specified % by this procedure, check the engine turn-up condition.

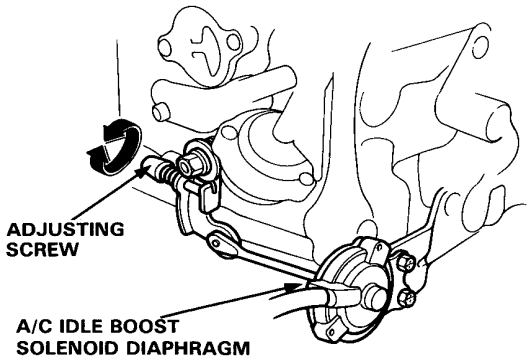
Idle Speed (Cars with Air Conditioner)

This system prevents the idle speed from dropping when the air conditioner is ON.
An idle boost diaphragm operated by manifold vacuum is attached to the throttle linkage.
Vacuum is controlled by a solenoid valve that is energized whenever the air conditioner switch is turned on and compressor is energized.
When the air conditioner is OFF or the compressor is not engaged, the solenoid valve is deenergized and the vacuum in the ilde boost diaphragm is relieved through the filter on the solenoid valve.

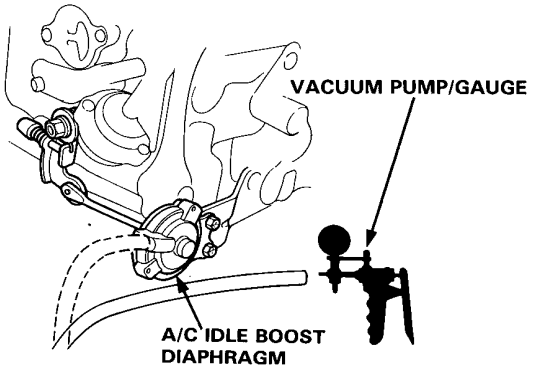
1. If car is equipped with air conditioning, recheck idle speed with air conditioner ON;
   Speed should still be within specification.

   Idle speed should be: 750 ± 50 min.[1] (rpm)

   - If the speed is ouside the specification, remove the rubber cap on the idle boost diaphragm and adjust by turning adjusting screw.

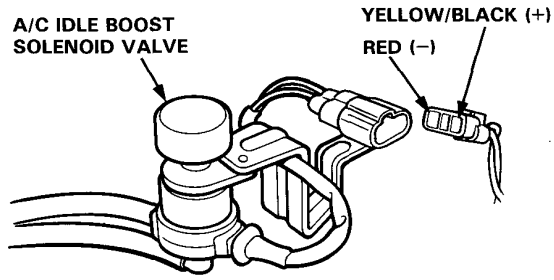


2. If the idle speed cannot be adjusted with the adjusting screw, disconnect the hose from the idle boost diaphragm and check for vacuum with the air conditioner ON.



- If there is vacuum, check the idle boost diaphragm for leaks, replace it if necessary and re-test.

- If there is no vacuum, check for voltage at the A/C idle boost solenoid valve with the air conditioner ON.



— If there is no voltage, check the wiring and fuse, repair or replace as necessary and re-test.

— If there is voltage, check the vacuum line to the intake manifold for leaks or blockage.
If OK, replace the A/C idle boost solenoid valve and re-test.

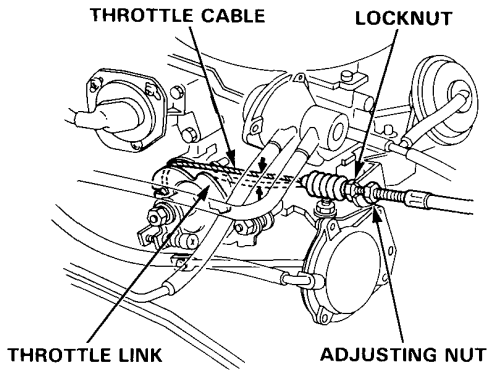
Idle-Drop Method

1. Start the engine and warm up to the normal operating temperature.
2. Remove the adjusting screw hole plug.
3. With the headlights OFF and the cooling fan OFF, adjust the engine speed and mixture for best idle at 800 min^{-1} (rpm) (Manual Transmission in neutral) or 780 min^{-1} (rpm) (Automatic in gear).
4. Turn the mixture adjusting screw clockwise until engine speed drops to 800 min^{-1} (rpm) (M/T in neutral), 750 min^{-1} (rpm) (KS A/T in gear) or 730 min^{-1} (rpm) (other A/T in gear).
5. Replace the hole plug.

Throttle Cable Inspection/ Adjustment

1. Check that throttle cable operates smoothly with no binding or sticking. Repair as necessary.
2. Start the engine and check cable free-play at throttle linkage at idle.

   Cable deflection should be 4—10 mm (3/16—3/8 in.).



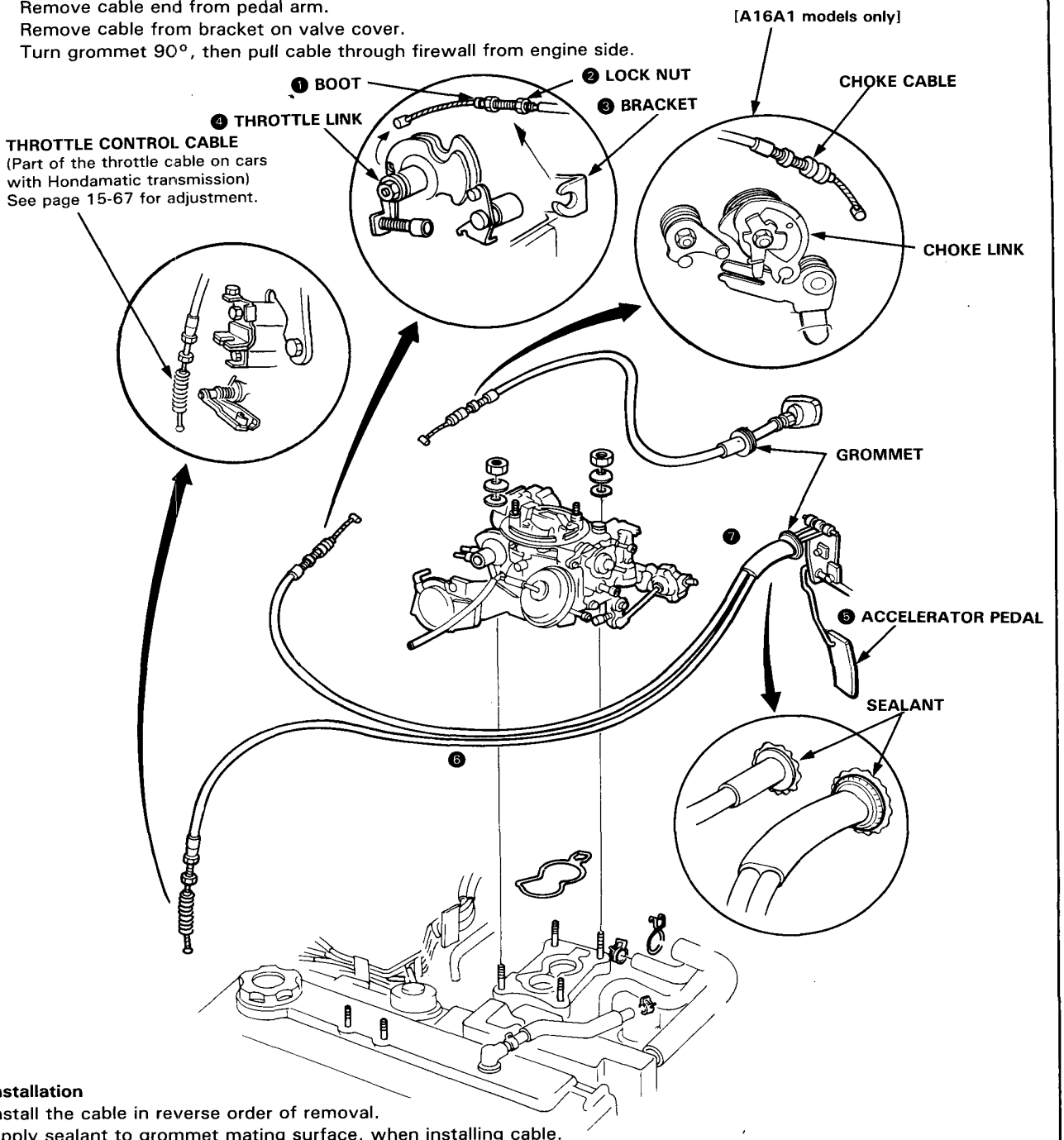
3. If deflection is not within specs, loosen locknut and turn adjusting nut until you can deflect cable as specified. Then tighten locknut.
4. With cable properly adjusted, check throttle valve to be sure it opens fully when you push accelerator pedal to the floor.

   CAUTION: Check throttle valve to be sure it returns to idle position whenever you release accelerator.

Throttle/Choke Cable

Removal/Installation

1. Push back the boot.
2. Loosen locknut.
3. Pull back cable housing and slide cable out of throttle bracket.
4. Remove cable end from throttle link.
5. Remove cable end from pedal arm.
6. Remove cable from bracket on valve cover.
7. Turn grommet 90°, then pull cable through firewall from engine side.



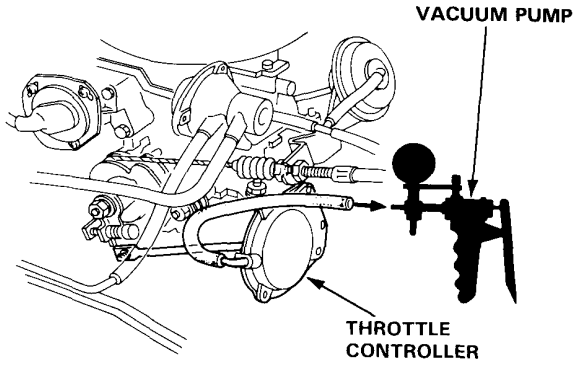
Installation

Install the cable in reverse order of removal.

Apply sealant to grommet mating surface, when installing cable.

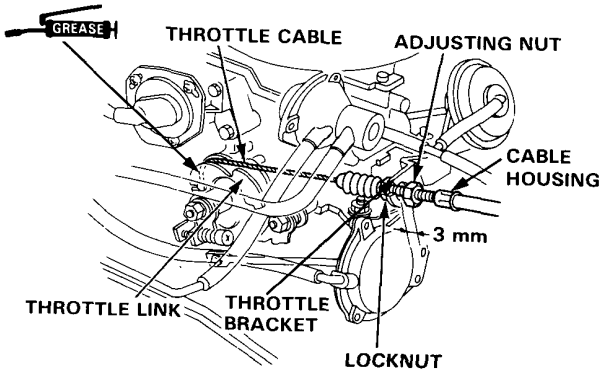
Throttle Cable Installation

1. Disconnect the hose from the throttle controller and connect a vacuum pump to the controller, then apply vacuum (A/T model and KT, KP, KQ, KX (M/T) model only).



2. Fully open the throttle and choke valves, then close the throttle valve. Now, release the choke valve; the throttle linkage will be off the fast idle cam (A20A2 model only).

3. Install the throttle cable in the throttle link.



4. Turn the adjusting nut until it is 3 mm (1/8 in.) away from the cable bracket.
   Tighten the locknut.

5. Disconnect the vacuum pump and reconnect the throttle controller hose (A/T model and KT, KP, KQ, KX (M/T) model only).

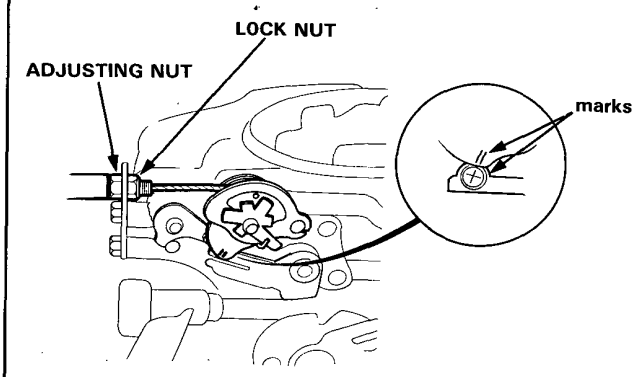
6. On models with automatic transmission, adjust the throttle control cable. See page 15-67.

Choke Cable Adjustment

[A16A1 model]

1. Check that choke control operates smoothly with no evidence of binding or sticking.
   Repair as necessary.

2. Set choke knob in the third detent position and check that the marks are aligned.



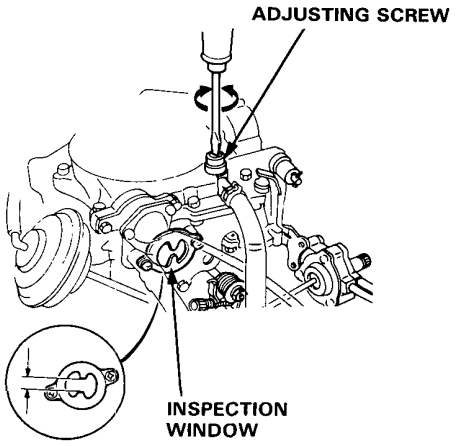
3. If not aligned, loosen the lock nut and adjust the adjusting nut, then retighten the lock nut.

Float Level

Inspection/Adjustment

WARNING Do not smoke while working on fuel system. Keep open flame away from work area.

1. Place the car on level ground.
2. Start and warm up the engine, snap the throttle between idle and 3,000 min^{-1} (rpm) several times then allow it to idle.
3. When the fuel level stabilizes, check that it is centered in the inspection window.



4. If the fuel level is not centered, adjust it by slowly turning the adjusting screw.
5. Paint the adjustment screw with white paint after adjustment.

   NOTE: Do not turn the adjusting screw more than 1/8-turn every 15-seconds.

Automatic Choke

Choke Coil Tension and Linkage

[A20A2 model]

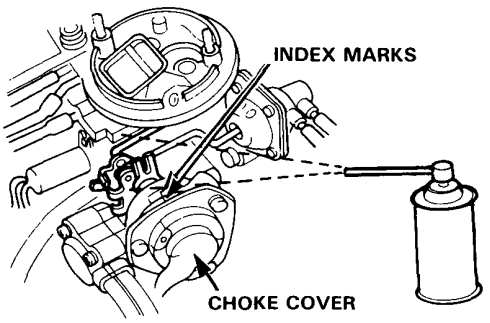
1. Remove the air cleaner.
2. Open and close the throttle fully to let the choke close.

   The choke valve should close completely.

   NOTE: Above about 28°C (82°F) the choke will not close completely, but should still close to less than 3 mm (1/8 in.).

   - If the choke closes properly, go on to the fast idle unloader test in the next column.
   - If the choke does not close properly, spray its linkage with carburetor cleaner, and check the linkage for signs of mechahical binding (use a spray can with an extension on the nozzle to reach the linkage).

   CAUTION: Carburetor cleaner is very caustic; always wear safety goggles or a face shield when spraying.



   - If the choke still does not close properly, remove the choke cover (page 11-35) and inspect the linkage for free movement. Repair or replace parts as necessary, Then reinstall the cover and adjust it so the index marks line up, and re-test.
   - If the choke still does not close properly, replace the cover (page 11-35).

Fast Unloader

[A20A2 model]

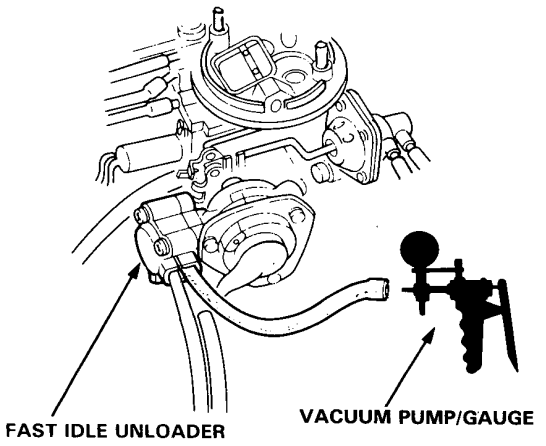
NOTE: Carburetor temperature must be below 20°C (68°F).

1. Disconnect the two hoses from the fast idle unloader.
2. Open and close the throttle fully to engage the fast idle cam.
3. Start the engine.

   The engine should run at fast idle.

   - If the engine has fast idle, go on to step 4.
   - If the engine does not run at fast idle, remove the choke cover (page 11-35) and check the operation of the fast idle cam.

4. Connect a vacuum pump to the inside fitting of the unloader and apply vacuum.



   The fast idle speed should drop.

   - If idle speed drops, go on to step 5.
   - If idle speed does not drop, check the unloader for leaks, blockage or damaged diaphragm. Remove the choke cover and check the unloader rod for free movement. Repair or replace as necessary.

5. Reconnect the hose.
6. Wait for the engine to warm up (cooling fan comes on).

   NOTE: When the engine warms up, its speed should drop below 1400 min^{-1} (rpm) as the unloader pulls the internal choke linkage off the fast idle cam.

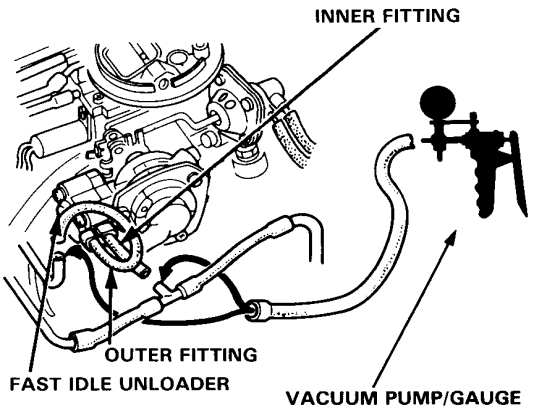
   - If fast idle drops below 1,400 min^{-1} (rpm), go on to the Fast Idle check on page 11-33.
   - If fast idle does not drop below 1,400 min^{-1} (rpm), disconnect the two unloader hoses, and check that vacuum is present.

   — If vacuum is present, check the unloader for leaks or blockage. Remove the choke cover, and check the unloader rod for free movement. Repair or replace parts as necessary, and retest.

   — If there is no vacuum at inner fitting, check for vacuum at the choke opener (page 11-30), and thermovalve A.

   — If there is no vacuum at the outer fitting, check thermovalve B.

   — Repair or replace as necessary.



Automatic Choke

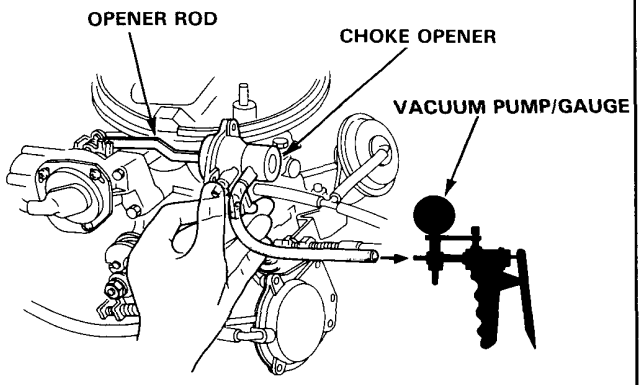
Choke Opener

[A20A2 model]

NOTE: Engine coolant temprature must be below Thermovalve A set temprature 11°C (52°F).

1. Disconnect the choke heater wire.
2. Open and close the throttle fully to let the choke close.
3. Start the engine.
   The choke valve should partially open.
   - If the choke partially opens, go on to step 4 or step 5, depending on coolant temperature.
   - If the choke does not partially open, check the linkage for free movement, repair as necessary, and re-test.
   - If the choke valve still does not partially open, check the choke opener diaphragm:

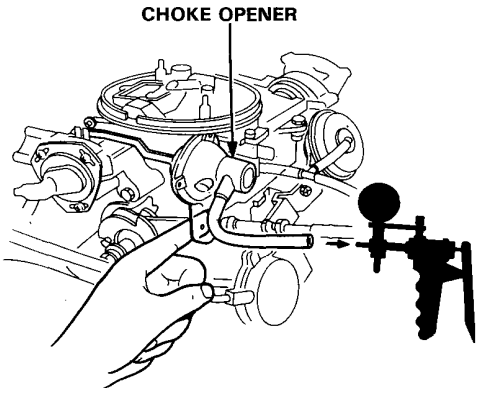
[KQ, KX model]
Remove diaphragms two bolts, and attach a vacuum pump to the upper hose fitting. Block the lower fitting and orifice in the opener while you apply enough vacuum to pull the opener rod all the way in, then stop.



— If the rod will not stay in, replace the opener.

— If the rod stays in, check the vacuum port in the carburetor for blockage. If it is clean, check the cranking leak system (page 11-32).

[Other models]
Remove diaphragms two bolts, and attach a vacuum pump to the hose fitting. Block the orifice in the opener while you apply enough vacuum to pull the opener rod all the way in, then stop.

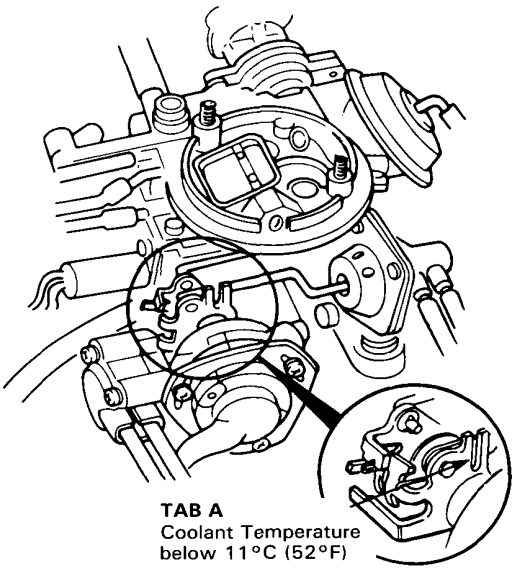


— If the rod will not stay in, replace the opener.

— If the rod stays in, check the vacuum port in the carburetor for blockage.

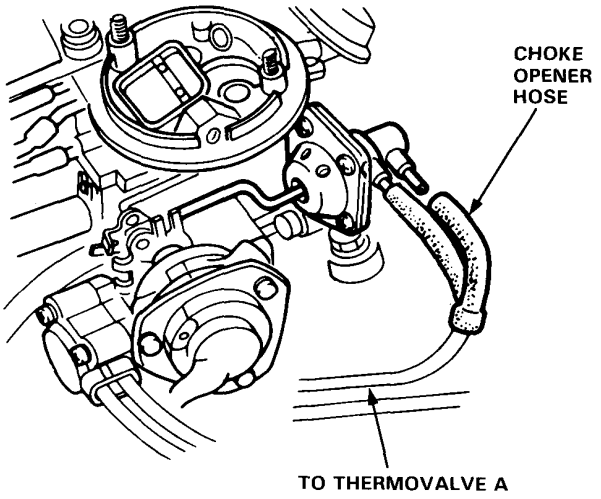
After replacing or re-installing the chock opener, re-test it, then adjust it if necessary (page 11-33).

4. If coolant temperature is below about 11°C (52°F). Tab A on the choke opener lever should not be seated against the carburetor.



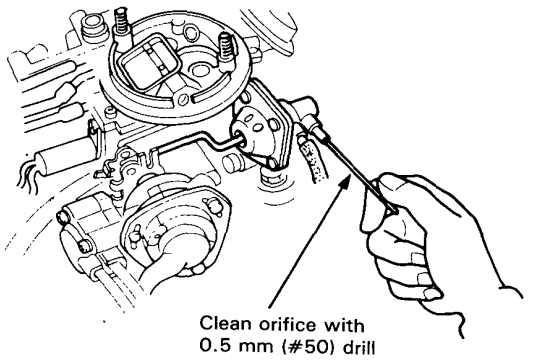
TAB A
Coolant Temperature below 11°C (52°F)

- If Tab A is not seated, go on to step 5.
- If Tab A is seated, disconnect the choke opener hose #18 from upper fitting.



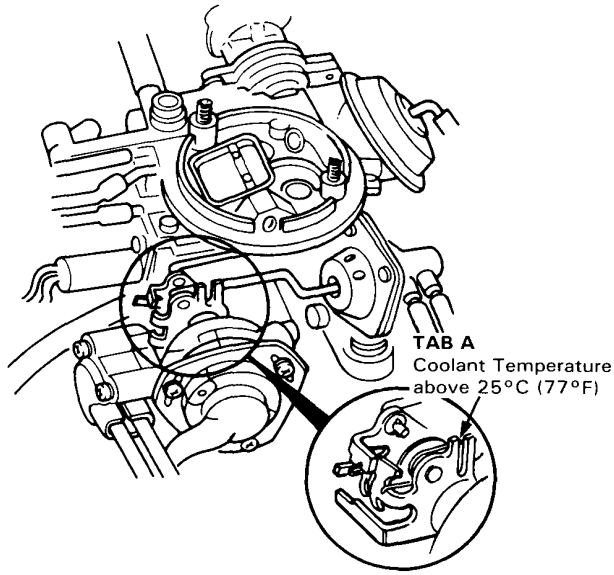
— If Tab A comes off its seat, check line #18 to thermovalve A blockage and check that the thermovalve is open.

— If Tab A does not come off its seat, press down on the choke opener lever until it does; if it won't stay off, clean out the choke opener fitting with a 0.5 mm (#50) drill bit, then re-test.



— If Tab A still does not come off its seat, replace the choke opener.

5. If coolant temperature is above about 25°C (77°F), Tab A on the choke opener lever should be seated against the carburetor.



- If Tab A is seated, reconnect the choke heater wire.
- If Tab A is not seated, check line #18 for leaks and check that thermovalve A is closed.

Automatic Choke

Cranking Leak System

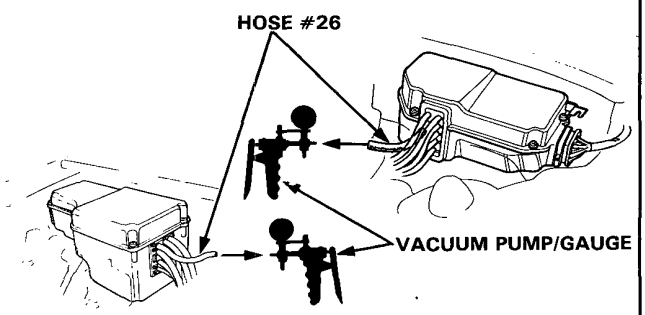
[KQ, KX model]

NOTE: Engine coolant temprature must be below 70°C (158°F) and intake air temprature must be below 18°C (64°F).

1. Disconnect hose #26 from the vacuum manifold at the control box, attach a vacuum pump to the hose and apply vacuum.

   Vacuum should remain steady.

   [KX model] **[KQ model]**

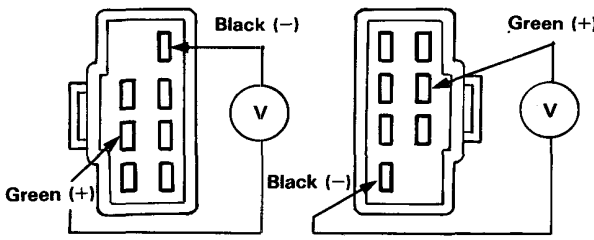


   - If vacuum remains steady, go on to Step 2.
   - If vacuum drops, check vacuum line #26 for leakage.
     If OK, replace the cranking leak solenoid valve and re-test.

2. Turn the ignition switch to III (START).
   Vacuum should be released.

   - If vacuum is released, the test is complete.
   - If vacuum is not released, check for voltage at the cranking leak solenoid valve (Control box. Green and Black terminal) with the ignition switch turned to III.

[KQ model] **[KX model]**



   — If there is no voltage, go to troubleshooting (page 11-68).
   — If there is voltage, check vacuum line #26 for blockage.
     If OK, replace the cranking leak solenoid valve and re-test.

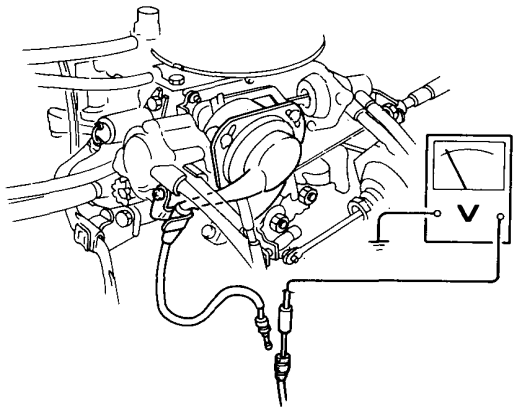
Choke Coil Heater

[A20A2 model]

Start the engine and let in run. As the engine reaches normal operating temperature, the choke valve should fully open:

- If it does, test is complete.
- If it doesn't, inspect the linkage, and clean or repair it as necessary (page 11-28).
- If the choke still does not open all the way, disconnect the white/blue choke cover wire from the engine compartment wire harness and check for voltage.

  There should be battery voltage with the engine running.



— If the voltmenter reads O volts, check for an open circuit in the white/blue wire between the choke cover connector and voltage regulator connector, then check the charge warning light circuit and alternator (page 24-18).

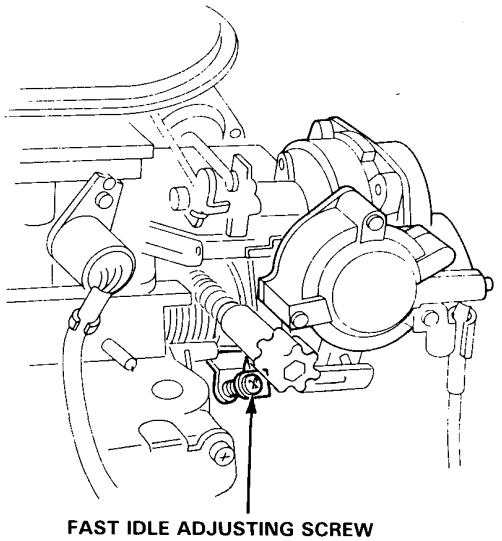
Fast Idle Adjustment

[A20A2 model]

1. Start the engine and wait for the engine to warm up (cooling fan comes on), then stop it and connect a tachometer.
2. Disconnect and plug the inside vacuum hose of the fast idle unloader.
3. While holding the choke valve closed, open and close the throttle fully to engage the choke and fast idle linkage.
4. Re-start the engine.

   Fast idle should be 2500 ± 500 min^{-1} (rpm).

   - If not OK, reset the fast idle speed by turning the screw shown.



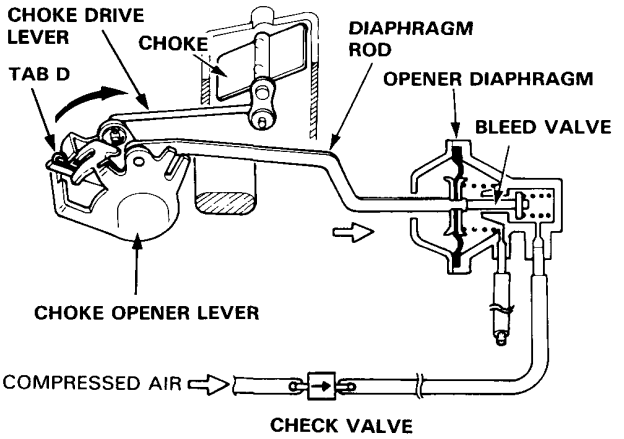
FAST IDLE ADJUSTING SCREW

Linkage Adjustment

[A20A2 model]

NOTE:
- This check is not necessary unless the linkage has been bent, choke opener has been replaced, or the car has poor cold starting.
- This check can be made with the engine HOT or COLD.

1. Remove the choke cover (page 11-35).
2. While holding the choke valve closed, open and close the throttle fully to engage the choke and fast idle linkage.
3. Disconnect the choke opener hose from the vacuum manifold, and attach a check valve to it as shown. Then pressurize the choke opener with compressed air, 103—586 kPa (15—85 psi) is OK, to hold the bleed valve in it closed.



4. Gently push the choke opener lever towards the opener until it stops until you feel (the opener rod seats against the pressurized bleed valve), then pull the choke drive lever down against the opener lever (to take all free play out of the linkage), and measure the clearance between the choke blade and casting:

1st Stage Clearance:

unit: mm (in)

Trans \ model	KQ	KX	KY	KS	Other model
M/T	1.54 ± 0.07 (0.061 ± 0.003)	1.54 ± 0.07 (0.061 ± 0.003)	1.33 ± 0.07 (0.052 ± 0.003)	1.46 ± 0.07 (0.057 ± 0.003)	1.33 ± 0.07 (0.052 ± 0.003)
A/T	1.46 ± 0.07 (0.057 ± 0.003)	1.46 ± 0.07 (0.057 ± 0.003)	1.33 ± 0.07 (0.052 ± 0.003)	1.46 ± 0.07 (0.057 ± 0.003)	1.33 ± 0.07 (0.052 ± 0.003)

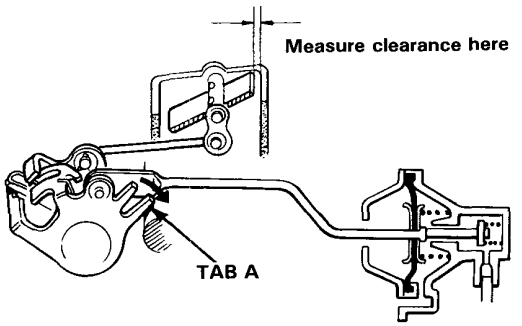
Adjust clearance by bending Tab D.

(cont'd)

Linkage Adjustment (cont'd)

5. Remove the check valve, and reconnect the choke opener hose.

6. Hold both levers togeter, then push them toward the diaphragm again until they stop (Tab A on the opener lever seats against the carburetor), and measure the clearance at the choke valve.

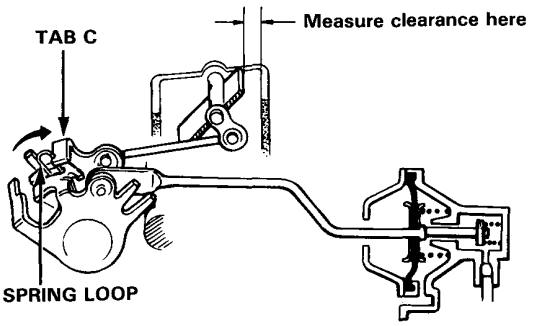


2nd Stage Clearance:

Trans \ model		KQ	KX	KY	KS	Other model
M/T	(mm)	2.90 ± 0.09	3.28 ± 0.09	2.20 ± 0.09	2.69 ± 0.09	2.20 ± 0.09
	(in)	0.114 ± 0.004	0.129 ± 0.004	0.087 ± 0.004	0.106 ± 0.004	0.087 ± 0.004
A/T	(mm)	2.90 ± 0.09	3.28 ± 0.09	2.20 ± 0.09	2.69 ± 0.09	2.20 ± 0.09
	(in)	0.114 ± 0.004	0.129 ± 0.004	0.087 ± 0.004	0.106 ± 0.004	0.087 ± 0.004

Adjust clearance by bending Tab A.

7. While still holding opener lever Tab A against its seat, release the choke drive lever, and measure the clearance at the choke valve (Tab C on the drive lever should stay seated against the spring loop; if not, repeat step 2 and re-check):



3rd Stage Clearance:

Trans \ model		KQ	KX	KY	KS	Other model
M/T	(mm)	5.25 ± 0.20	5.25 ± 0.20	4.84 ± 0.20	4.84 ± 0.20	4.84 ± 0.20
	(in)	0.207 ± 0.008	0.207 ± 0.008	0.191 ± 0.008	0.191 ± 0.008	0.191 ± 0.008
A/T	(mm)	5.25 ± 0.20	5.25 ± 0.20	4.84 ± 0.20	4.84 ± 0.20	4.84 ± 0.20
	(in)	0.207 ± 0.008	0.207 ± 0.008	0.191 ± 0.008	0.191 ± 0.008	0.191 ± 0.008

Adjust clearance by bending Tab C.

Choke Cover-Replacement

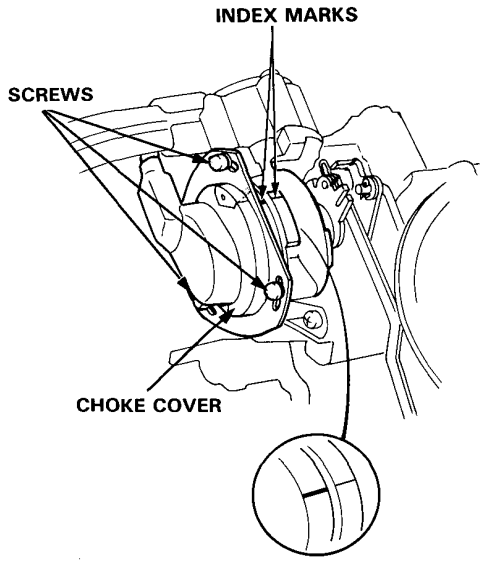
[A20A2 model]

Removal:

1. Remove the air cleaner.
2. Remove the choke cover.

Installation:

1. Reinstall the cover and adjust it so that index marks align, then secure it with screws.
2. Reinstall the air cleaner.



Choke Opener

[A16A1 model]

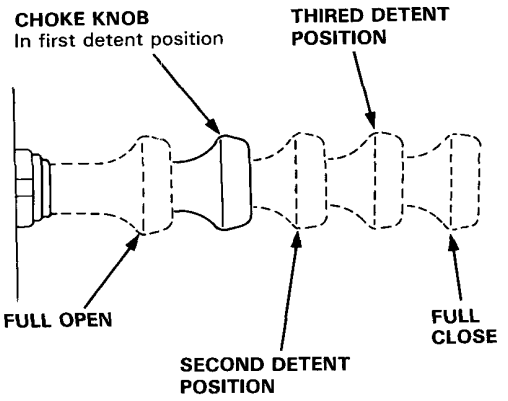
1. Pull the choke knob to the fully closed position.
2. Start the engine.
   The choke valve should partially open.
   - If the choke valve partially opens, test is complete.
   - If the choke valve does not partially open, check the linkage for free movement, repair as necessary, and re-test.
   - If the choke valve still does not partially open, check the choke opener diaphragm: Remove its two bolts and check the vacuum port in the carburetor for blockage. If it is clean, replace the choke opener diaphragm and re-test.

Manual Choke

Fast Idle Adjustment

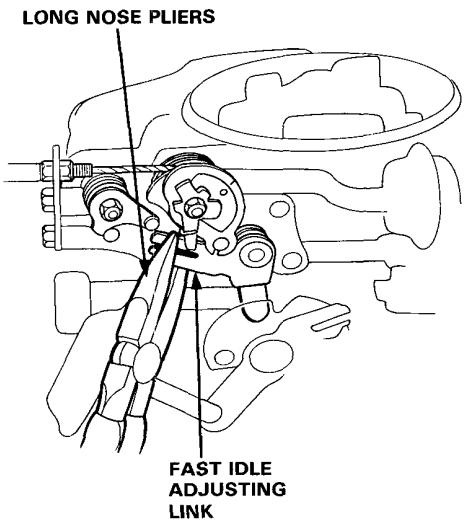
[A16A1 model]

1. Connect a tachometer, start the engine and wait for the engine to warm up (cooling fan comes on).
2. Place choke control knob in first detent position.

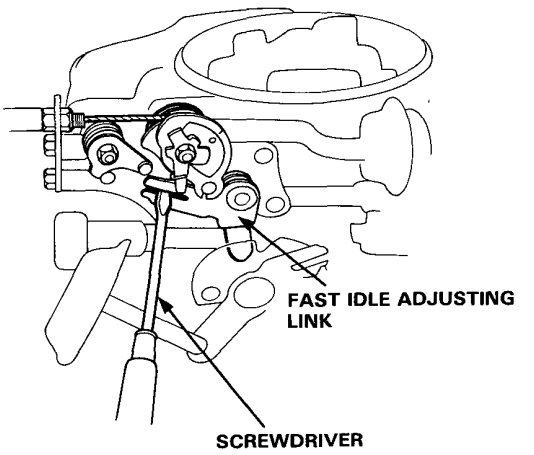


Fast idle should be: 1,500—2,500 min^{-1} (rpm)

- If engine speed is too high, use long nose pliers to narrow the slot in the fast idle adjusting link. Make the adjustment in small increments.

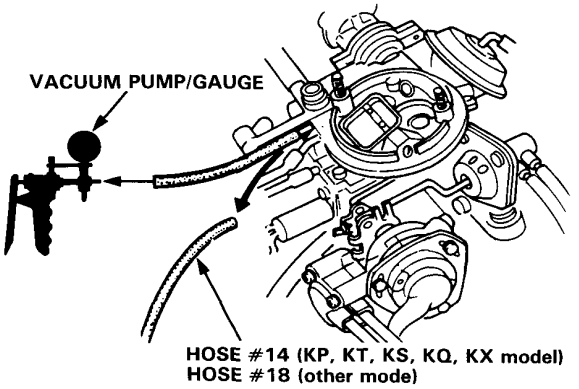


- If engine speed is too low, insert a screwdriver in the fast idle adjusting link slot and widen the slot. Make adjustments in small increments.



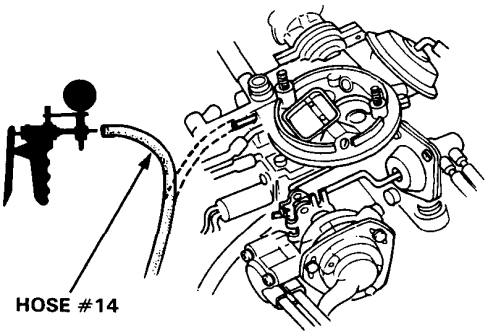
Inspection

1. Disconnect the hose #14 (KP, KT, KS, KQ, KX model) or hose #18 (other model) from the power valve and connect a vacuum pump to the valve. Apply vacuum and listen for a clicking noise from the power valve.



- If no sound is heard, replace the carburetor and re-test.
- If a clicking sound is heard, go on to step 5 (KS model), step 3 (A20A2 KF, KG, KW, KE, KY model) or step 2 (other model).

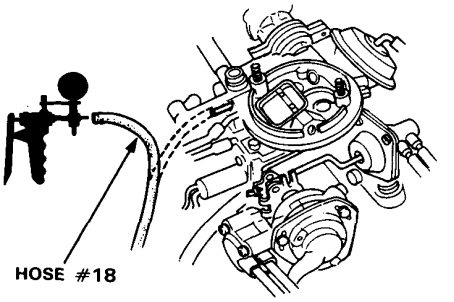
2. Connect a vacuum pump/gauge to the hose #14. Start the engine and check that there is vacuum at idleing.



- If there is vacuum, test is complete.
- If there is no vacuum, check the vacuum hose #14 for disconnection, tears or clogging.

3. Connect a vacuum pump/gauge to the hose #18. Start the engine and check that there is no vacuum at idleing.

   NOTE: Engine coolant temprature must be *below* thermovalve A set tempratore (11°C, 52°F).



- If there is no vacuum, go on to step 4.
- If there is vacuum, replace the thermovalve A and re-test.

4. Wait for the engine to warm up (cooling fan comes on). Check that there is vacuum at idling.

- *If there is vacuum, test is complete.*
- If there is no vacuum, pinch the thermovalve vacuum hose #17.

— If there is vacuum, replace the thermovalve A and re-test.

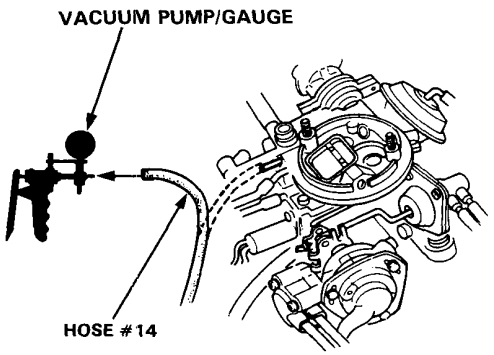
— If there is no vacuum, check the vacuum hose#18 and the intake manifold-to-thermovalve A vacuum hose for blockage, pinch, and disconnection. Replace if necessary.

(cont'd)

Inspection (cont'd)

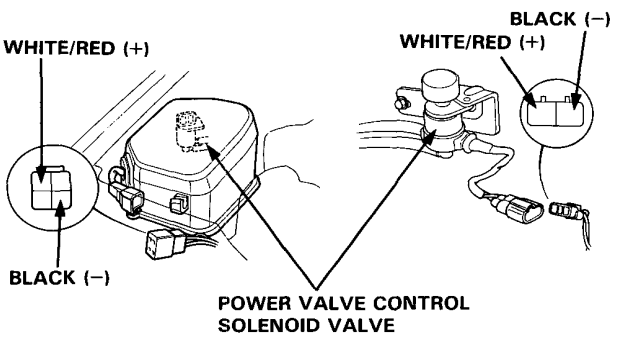
5. Connect a vacuum pump to hose #14.
   Start the engine and place the shift lever in 2 position (A/T only), then check that there is no vacuum at idling.

   NOTE: Engine coolant temprature must be below 43°C (109°F).



- If there is no vacuum, go on to step 6.
- If there is vacuum, check for voltage at the power valve control solenoid valve.

[M/T] [A/T]



– If there is voltage go on to troubleshooting (page 11-70).

– If no voltage, re-place the power valve control solenoid valve and re-test.

6. Wait for the engine to warm up (cooling fan comes on). Check that there is vacuum at idleing.

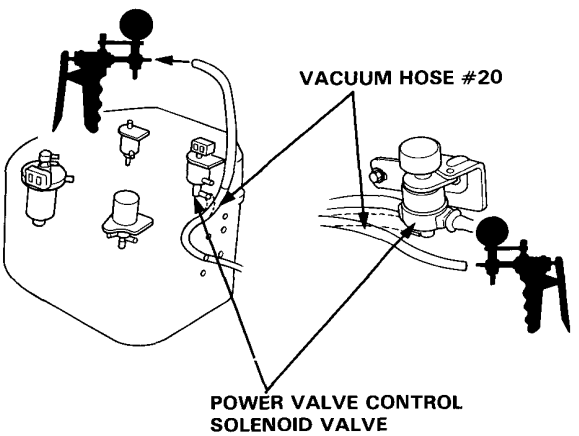
   - If there is vacuum, test is complete.
   - If there is no vacuum, check for voltage at the power valve control solenoid valve at idling.

   – If there is voltage, go on to step 7.

   – If no voltage, go on to troubleshooting (page 11-70).

7. Remove the control box from the fire wall, then remove the control box cover by removing the two screws (M/T only).
   Disconnect the vacuum hose #20 from the power valve control solenoid valve and connect a vacuum pump/gauge to the vacuum hose #20.
   Check that there is vacuum at idling.

[M/T] [A/T]



- If there is no vacuum, check the vacuum line #20 to the imtake manifold.
- If there is vacuum, check the vacuum line #14. If there is no problem, replace the power valve control solenoid valve.

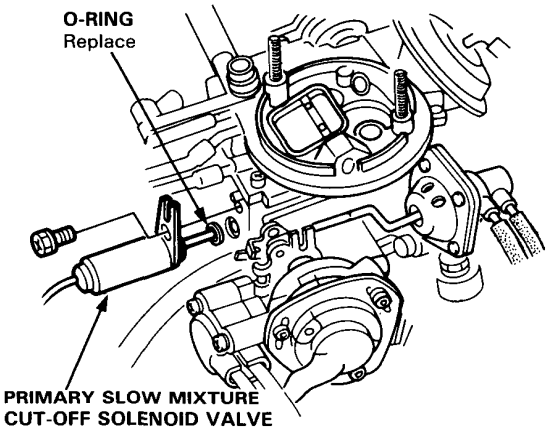
Primary Slow Mixture Cut-off Solenoid Valve

Testing

[A20A2 KQ KX model]

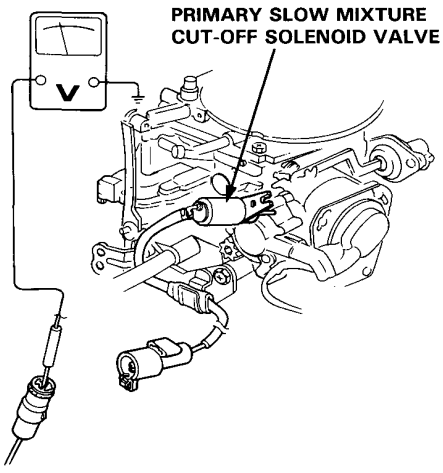
1. Place a clean towel around the solenoid valve, to soak up any gasoline, then loosen the screw and remove the solenoid valve.

WARNING
- **Wipe up any spilled gasoline before testing.**
- **If cut-off valve is removed for testing, be sure you ground it to prevent sparking or fire when the key is turned on.**



2. Ground the valve as far from the carburetor as possible and turn on the ignition while you watch the valve needle.

   - If the needle retracts, go to step 3.
   - If the needle does not retract, check the voltage which is from the control unit with the ignition switch on.



   - If voltage is present, replace the solenoid valve and re-test.
   - If voltage is not present, check the wiring and go to troubleshooting (page 11-68).

3. Reinstall the solenoid valve.

4. Start the engine, wait for it to warm up, Coolingfan comes on.

WARNING **Block rear wheels before jacking up front of car.**

5. Jack up the front of the car, and support with safety stands. Block rear wheels and st the parking brake.

6. Place the shift or selector lever in second or 2 position and accelerate, then suddenly release the throttle and check for voltage during deceleration above 24 km/h (15 mph).

   There should be no voltage.

   - If voltage is not present, test is complete.
   - If voltage is present, go to troubleshooting (page 11-68).

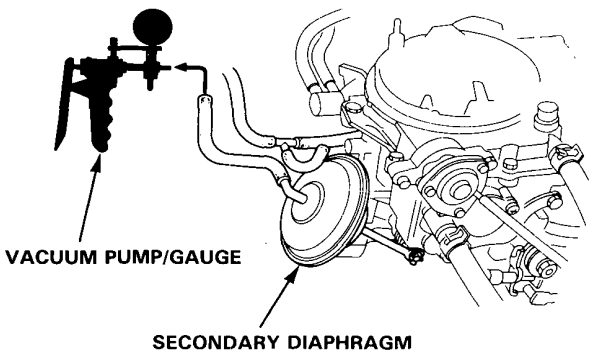
Vacuum Controlled Secondary

Inspection

[A20A2 model]

1. Disconnect the secondary diaphragm vacuum hose and attach a spare piece of hose between the diaphragm and a vacuum pump.

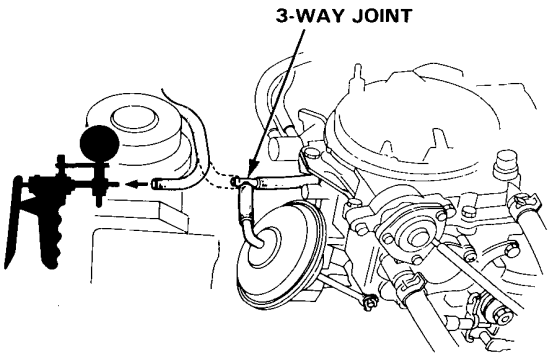
2. Open the throttle valve fully and apply a vacuum. Check that the diaphragm rod moves as vacuum is applied and that the vacuum then remains steady.



- If the vacuum does not hold or the rod does not move, first check the hose for proper connection and condition, then replace the diaphragm and re-check.

3. With the engine cold water temperature below 50°C (122°F) disconnect the vacuum hose from the 3-way joint, connect a vacuum pump and apply a vacuum.

   Vacuum should not hold.



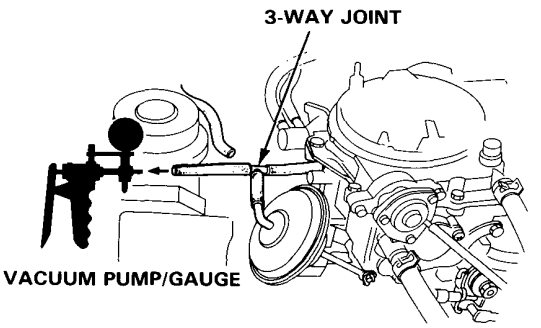
- If vacuum holds, first make sure the hose is not clogged, then replace thermo wax valve A.

4. After the engine has warmed up, disconnect the vacuum hose from the 3-way joint, connect a vacuum pump, and apply vacuum.

   Vacuum should remain steady.

   - If it does not remain steady, check the hose for proper connection and condition and replace thermo wax valve A.

5. Disconnect the vacuum hose from the 3-way joint and connect to a vacuum pump, then apply vacuum.



   - If vacuum does not remain steady, test is complete.

   - If vacuum remains steady, check the hose and the 3-way joint and clean the carburetor port.

System Inspection

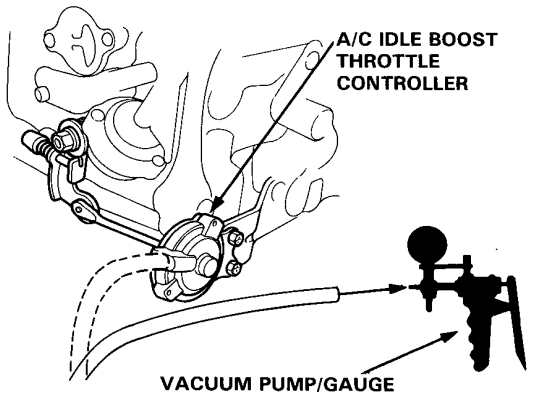
[A20A2 KQ, KX model]

1. Start the engine and wait for it to warm up (cooling fan comes on).
2. Turn A/C switch ON (compressor and condenser cooling fan work).

   Idle speed should rise.

   - If idle speed rises, go on to step 4.
   - If idle speed does not rise, disconnect vacuum hose from the A/C idle boost throttle controller and check for vacuum at vacuum hose.

     There should be vacuum.

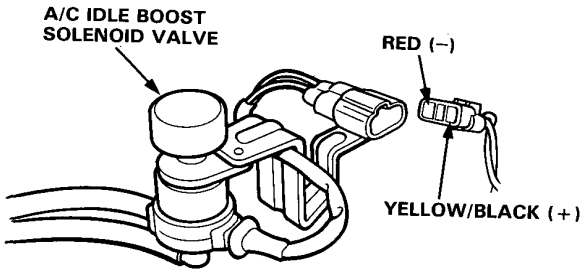


   — If there is no vacuum, go on to step 3.

   — If there is vacuum, replace the throttle controller and re-test.

3. Check for voltage at A/C idle boost solenoid valve.

   There should be voltage.



   - If there is no voltage, go on to troubleshooting (page 11-68)
   - If there is voltage, check the vacuum line for leaks, blockage or disconnected hose, then replace the solenoid valve and re-test.

WARNING Block rear wheels before jacking up front of car.

4. Jack up front of car, support with safety stands, block rear wheels, and set hand brake.
5. Place the shift or selector lever in second or 2 position and raise the engine speed to 3,500 min^{-1} (rpm), then release the throttle suddenly. Check for voltage at A/C idle boost solenoid valve.

   There should be no voltage.

   - If there is voltage, go on to troubleshooting (page 11-68).
   - If no voltage, test is complete.

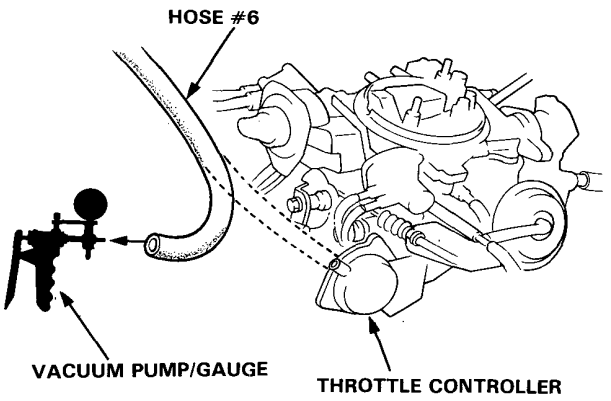
Dashpot System

System Inspection

[A/T model and KP, KT, KQ, KX (M/T) model]

NOTE: If the dashpot diaphragm in the throttle controller is damaged or vacuum to the dashpot diaphragm is blocked or leaks, correct idle speed will not be optained. The idle speed will be excessively high after warming up the engine.

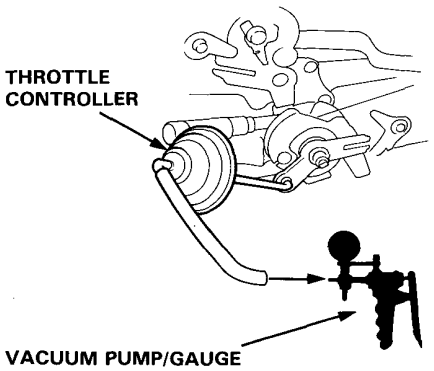
1. Connect a tachometer, start the engine and allow it to reach normal operating temperature (cooling fan comes on).
2. Check that the idle speed is not excessively high.
   - If the idle speed is within specification (pages 11-21, 23), go on to throttle controller adjustment (page 11-47).
   - If the idle speed is excessively high, disconnect vacuum hose #6 from the throttle controller and check for vacuum at the hose.



   - — If there is vacuum, replace the throttle controller and re-test.
   - — If there is no vacuum, check vacuum line #6 for leaks or blockage and check the check valve for blockage. Repair or clean as necessary and re-test.

[KF, KG, KW, KE, KY, KS (M/T) model]

1. Disconnect vacuum hose #6 from the throttle controller and connect a vacuum pump/gauge to the controller, then apply 400 mmHg (16 in.Hg) vacuum.



   - If the engine speed does not rise, replace the throttle controller and re-test.
   - If the engine speed rises, disconnect the vacuum pump/gauge and reconnect vacuum hose #6.
2. Connect a tachometer and wait for the engine to warm up (cooling fan comes on).
   Jack up front of car, support with safety stands, block rear wheels, and set hand brake.
3. Place the shift lever in second, raise the engine speed to 3,500 min^{-1} (rpm) and maintain for 2 to 3 seconds. Release the throttle suddenly, and watch how long the throttle controller arm takes to fully extend.

   Return time should be 1 to 3 seconds.
   - If the engine speed returns to idle in 1 to 3 seconds with arm fully extended, go on to cranking opener solenoid valve inspection (page 11-45).
   - If the engine speed returns to idle in less than 1 second, go on to throttle control valve inspection, (page 11-44 for KS/page 11-43 for except KS).
   - If the engine speed returns to idle in more than 3 seconds, go on to throttle control valve inspection, (page 11-45 for KS/page 11-43 for except KS).

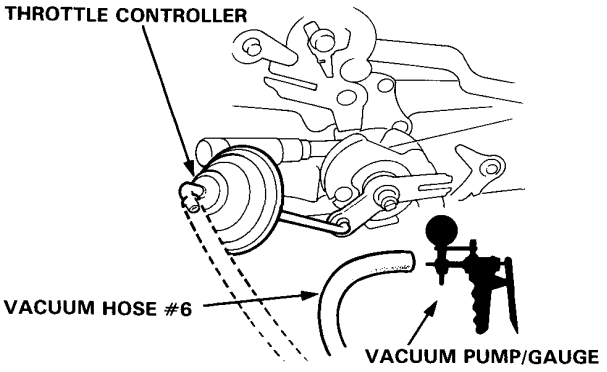
Throttle Control valve Inspection

[Except KS (M/T) model]

Engine speed returns to idle in less than 1 second in System Inspection Step 3.

1. Disconnect vacuum hose #6 from the throttle controller and connect a vacuum gauge to the hose #6.
   Rise the engine speed to 4,000 min^{-1} (rpm).

   Vacuum should be at least 30 mmHg (1.2 in.Hg) at 4,000 min^{-1} (rpm).



- If vacuum is at least 30 mmHg (1.2 in.Hg) at 4,000 min^{-1} (rpm), replace the control valve and re-test.
- If vacuum is below 30 mmHg (1.2 in.Hg), check for vacuum at the carburetor port.

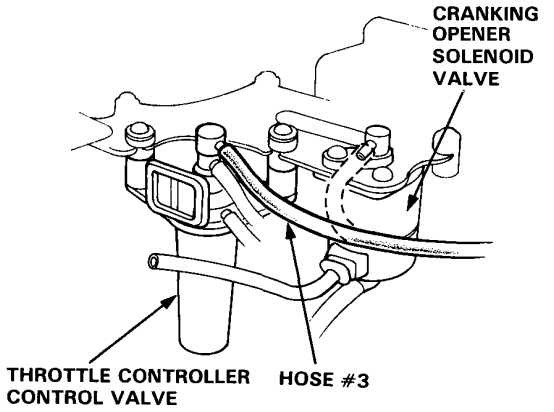
— If there is no vacuum, clean the carburetor port and re-test.

— If vacuum is present, check the vacuum line #20 for leaks, blockage or disconnected hose and re-test.

[Except KS (M/T) model]

Engine speed returns to idle in more than 3 seconds in System Inspection Step 3.

1. Disconnect hose #3 from the opener solenoid valve and connect it to control valve as shown.



2. Repeat system inspection step 3 (page 11-42).

- If there is no change, replace the control valve and repeat system inpsection step 3.
- If the throttle returns within the limits, go on to cranking opener solenoid valve inspection (page 11-45).

(cont'd)

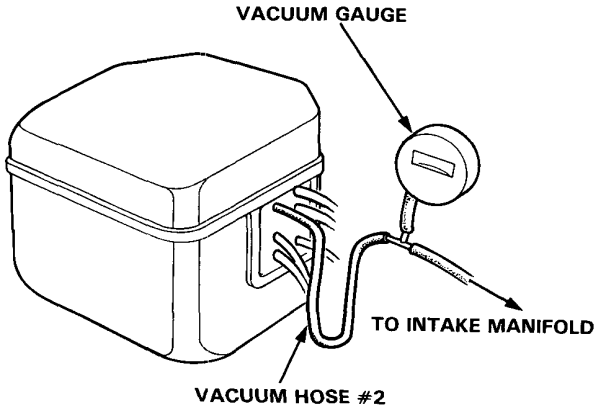
Dashpot System

Throttle Control Valve Inspection (cont'd)

[KS (M/T) model]

Engine speed returns to idle in less then 1 second in System Inspection 3.

1. Start engine and wait for the engine to warm up (cooling fan comes on).
   Disconnect vacuum hose #2 at vacuum port and connect to T-fitting from vacuum gauge as shown.

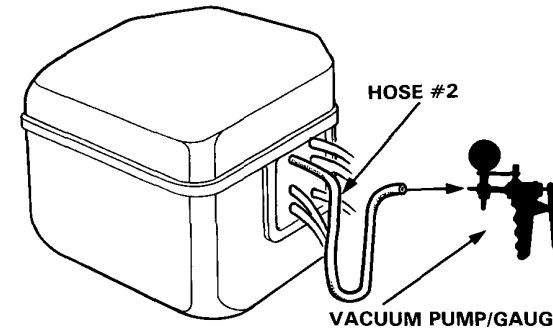


2. Place the shift in second, raise the engine speed to 2,000 min^{-1} (rpm) and check for vacuum.

   Vacuum should stabilize at 565 to 595 mmHg (22.2 to 23.4 in.Hg).

   - If vacuum stabilizes between above range, replace the control valve and re-test.
   - If vacuum is below 565 mmHg (22.2 in.Hg), check the vacuum lines #19 and #2 for leaks or disconnected hose. If no problem, replace the control valve and re-test.
   - If vacuum is above 595 mmHg (23.4 in.Hg), go on to step 3.

3. Disconnect the vacuum gauge and connect a vacuum pump/gauge to hose #2.



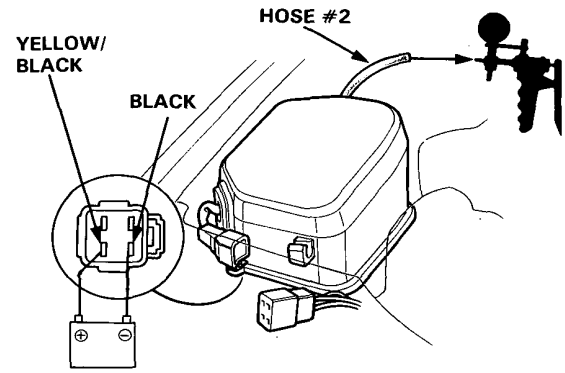
4. Apply vacuum. Vacuum should remain steady.
   - If vacuum remains steady, go on to step 5.
   - If vacuum decreases, replace throttle controller solenoid valve and re-test.

5. Place the shift lever in second and raise the vehicle speed above 24 km/h (15 mph). Apply a vacuum.

   Vacuum should not be available.

   - If vacuum remains steady, go on to step 6.
   - If vacuum is not available, replace the control valve.

6. Apply battery voltage to the control solenoid valve and apply a vacuum to the hose #2.



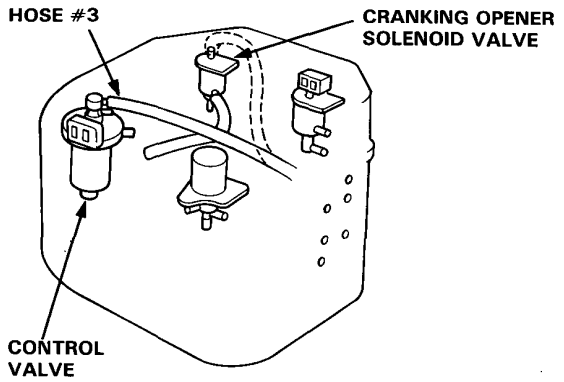
   - If vacuum remains steady, replace the controller solenoid valve and re-test.
   - If vacuum is not available, check for speed sensor (page 11-46).

[KS (M/T) model]

Engine speed returns to idle in more than 3 seconds in System Inspection 3.

1. *Remove the control box cover by removing the two* screws.

2. Disconnect hose #3 from the opener solenoid valve and connect it to control valve as shown.



3. *Repeat system inspection step 3 (page 11-42).*

   - If there is no change, replace the control valve and repeat system inspection step 3.

   - If the throttle return time is within the limits with hose pinched, go on to cranking opener solenoid valve inspection in the next columm.

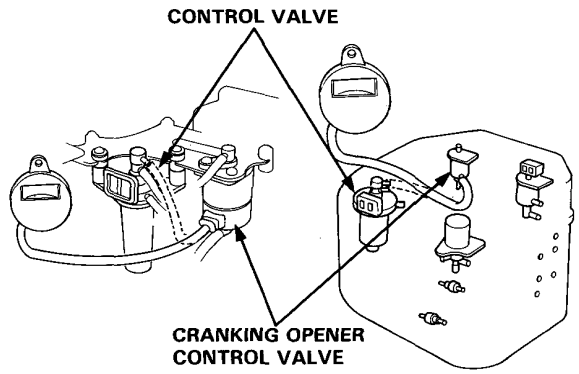
Cranking Opener Solenoid valve Inspection

[KF, KG, KW, KE, KY, KS (M/T) model]

1. Start the engine and wait for the engine to warm up (cooling fan comes on).

2. Remove the control box cover by removing the two screws (KS M/T model). Disconnect vacuum hose between the cranking opener solenoid valve and control valve at the control valve and connect a vacuum gauge to the disconnected hose.

   [Except KS model] **[KS model]**



3. *Check for vacuum with the ignition switch turned* to III (start).

   Vacuum should be at least 100 mmHg (3.9 in.Hg).

   - If there is no vacuum go on to step 4.

   - If vacuum is below 100 mmHg (3.9 in.Hg), check for vacuum at the carburetor port.

   — If there is no vacuum, clean the carburetor port and re-test.

   — If vacuum is present, check the vacuum line #19 for leaks, blockage or disconnected hose, then replace the thermovalve B (A20A2 model) and re-test.

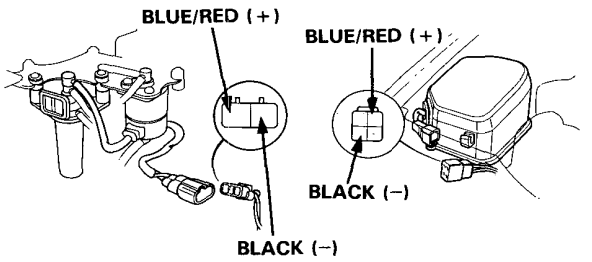
(cont'd)

Cranking Opener Solenoid Valve Inspection (cont'd)

4. Check for voltage at the cranking opener solenoid valve with the ignition switch turned to III (start).

   There should be voltage.

   [Except KS model] **[KS model]**



   - If there is voltage, replace the cranking opener solenoid valve and re-test.
   - If no voltage, check the wiring and ignition switch and re-test.

5. Check for vacuum at idle.

   There should be no vacuum.

   - If there is vacuum, go on to step 6.
   - If no vacuum, test is complete.

6. Check for the voltage at cranking opener solenoid valve with the ignition swith II (on).

   There should be no voltage.

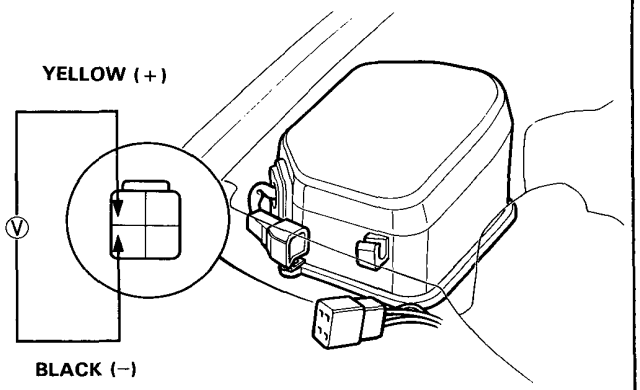
   - If there is voltage, replace the ignition switch and re-test.
   - If there is no voltage, replace the cranking opener solenoid valve and re-test.

Speed Sensor Inspection

[KS (M/T) model]

WARNING Block rear wheels before jacking up front of car.

1. Jack up front of car and place jack stands in proper locations. Set the parking brake.
2. Attach the voltmeter probes to the contol box connector as shown.



3. Start the engine. Place the shift lever in second and accelerate slowly, while observing the voltmeter.

   The voltmeter should show battery voltage above 32 km/h (20 mph), and no voltage below 16 km/h (10 mph).

   - If there is no voltage below approximately 32 km/h (20 mph), and there is battery voltage above approximately 16 km/h (10 mph), the speed sensor is OK
   - If the voltmeter readings do not correspond to the above km/h (mph) range, replace the speed sensor and re-test.
   - If there is no voltage during speed sensor test, go on to step 4.

4. Check for loose or improper wire connections, faulty fuse or speed sensor. Replace or repair as necessary and re-test.

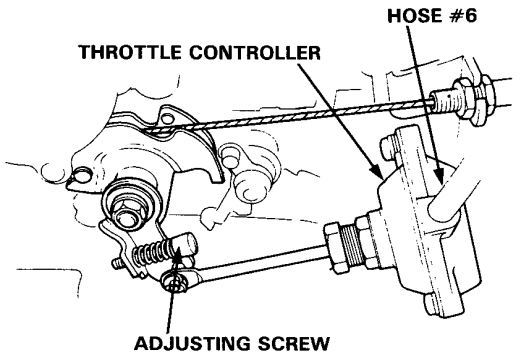
Throttle Controller Adjusting

[A/T model and KP, KT, KQ, KX (M/T) model]

1. Connect a tachometer, start the engine and wait for the engine to warm up (cooling fan comes on).
2. With the engine idling, disconnect vacuum hose #6 from the throttle controller.

   Engine speed should rise to 1,300—2,300 min^{-1} (rpm).

   - If the engine speed is not within 1,300—2,300 min^{-1} (rpm), adjust by turning the adjusting screw.

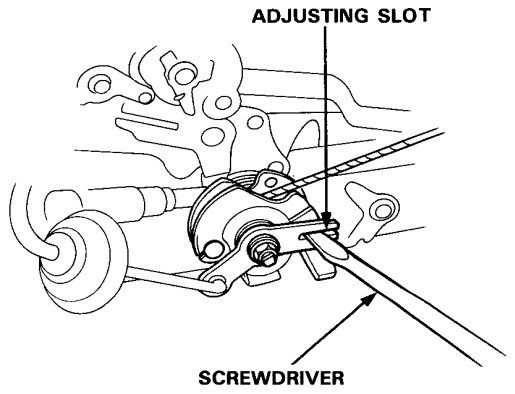


[KF, KG, KW, KE, KY, KS (M/T) model]

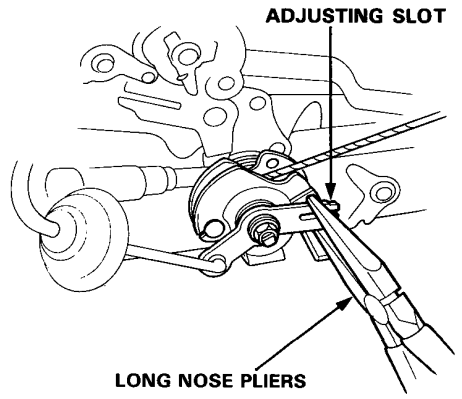
1. Connect a tachometer, start the engine and wait for the engine to warm up (cooling fan comes on).
2. Disconnect vacuum hose #6 from the throttle controller, connect a vacuum pump to the controller and apply 400 mmHg (16 in .Hg) vacuum.

   Engine speed should rise to 1,500—2,500 min^{-1} (rpm) with in 1 minute.

   - If the engine speed is too LOW: Widen the adjusting slot in the controller lever with a screwdriver.



   - If the engine speed is too HIGH: Narrow the adjusting slot in the lever with a long nose pliers.



Primary Bore Heater (Early Fuel Evaporator System)

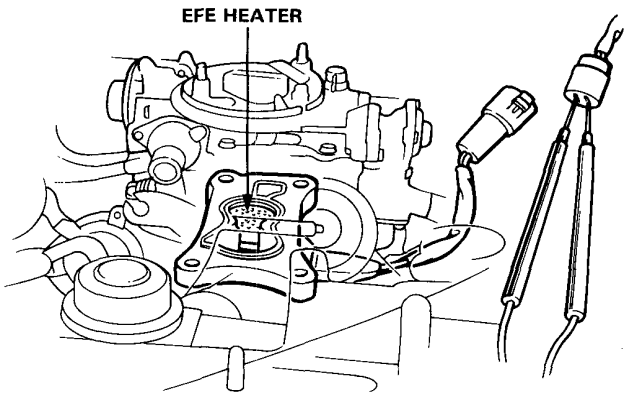
System Inspection

[KQ, KX model]

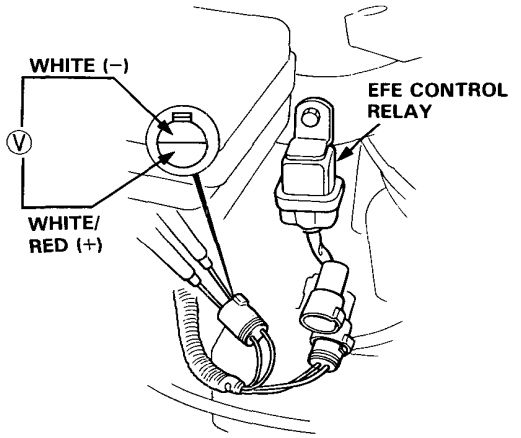
1. Start the engine.

   NOTE: Engine coolant temperature must be below 60°C (140°F).

2. Check for voltage at the EFE Heater Connector.

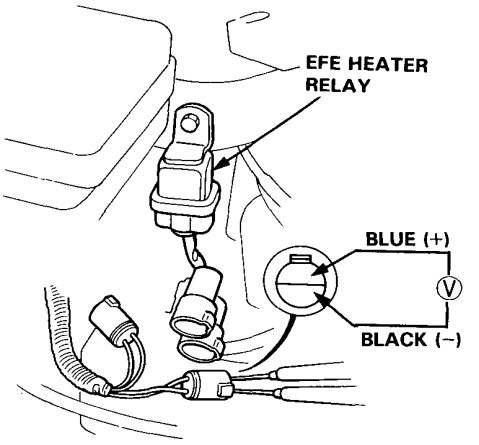


- If there is voltage, go on to step 3.
- If there is no voltage, first check for an open circuit between the EFE control relay and the EFE heater, then check for voltage at the battery-to-relay connector as shown.



— If there is no voltage, check the fuse and wiring between relay and battery.

— If there is voltage, check for the voltage at the EFE control unit-to-relay connector as shown.



- If there is no voltage, check the wiring, then check the EFE control unit (page 11-49).
- If there is voltage, replace the relay and re-test.

3. Wait for the engine to warm up. (cooling fan comes on)

4. Check for the voltage at the EFE Heater.

   - If there is no voltage, the test is complate.
   - If there is voltage, check for voltage between relay and control unit.

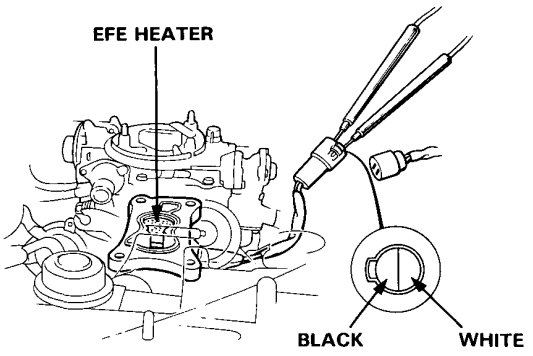
   — If there is no voltage, replace the relay and re-test.

   — If there is voltage, check the control unit (page 11-49).

EFE Heater Inspection

[KQ, KX model]

1. Check for continuity between white terminal and black terminal.



- If no continuity, replace the EFE unit.
- If there is continuity, the test is complate.

CAUTION:

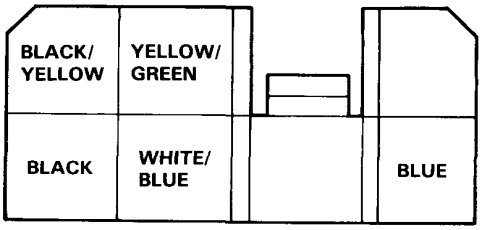
- **Be careful not to damage the insulator when servicing the carburetor.**
- **Make sure that there is no foreign matter on the insulator after installing.**
- **Make sure that the O-ring and seal are properly installed.**
- **Do not pull the harness while removing/installing the insulator.**
- **when removing, make sure to disconnect the coupler connected to the engine sub cord.**

EFE Heater Control Unit Inspection

[KQ, KX model]

If there is no voltage from the control unit when there should be voltage or if there is voltage from the unit when there shouldn't be voltage, inspect as follow.
If no defects can be found, replace the control unit and re-test.

1. Check to see if there is continuity between the black terminal and the stable ground.



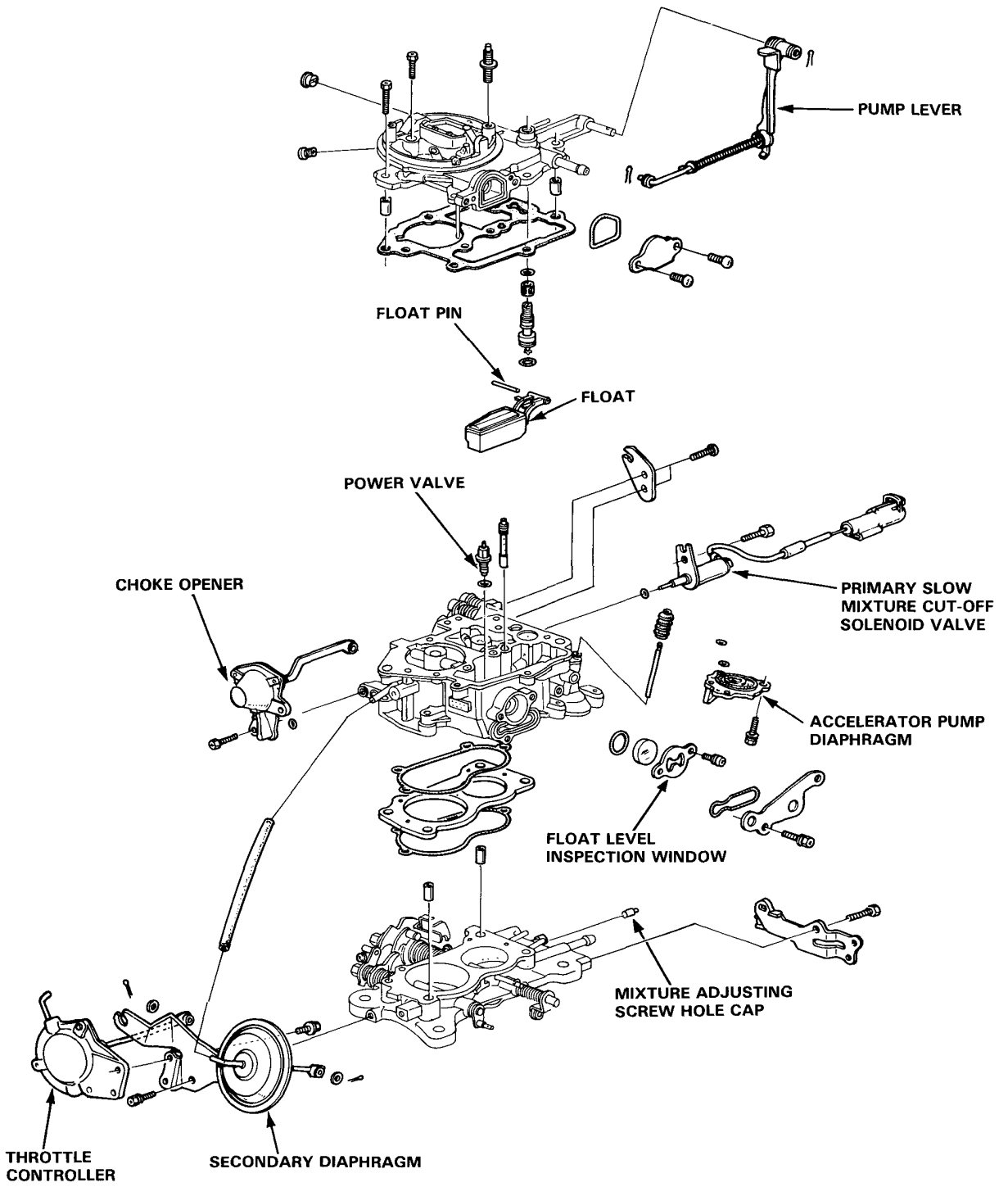
EFE HEATER CONTROL UNIT CONNECTOR

- If there is no continuity, check for an open circuit in the black wire.

2. Check to see if there is voltage between black/yellow and black terminals with the ignition switch on.
   - If there is no voltage, check the black/yellow wiring and fuse.
3. Check to see if there is voltage between white/blue and black terminals with the engine running.
   - If there is no voltage, check the white/blue wiring, and alternator (24-18).
4. Check to see if there is voltage between the yellow/green and black terminals with the coolant temperature below 60°C (140°F).
   - If there is no voltage, check yellow/green wiring, then replace the thermoswitch and re-test.
5. Check to see if there is no voltage between yellow/green and black terminals with the coolant temperature above 60°C (140°F).
   - If there is voltage, replace the thermoswitch and re-test.

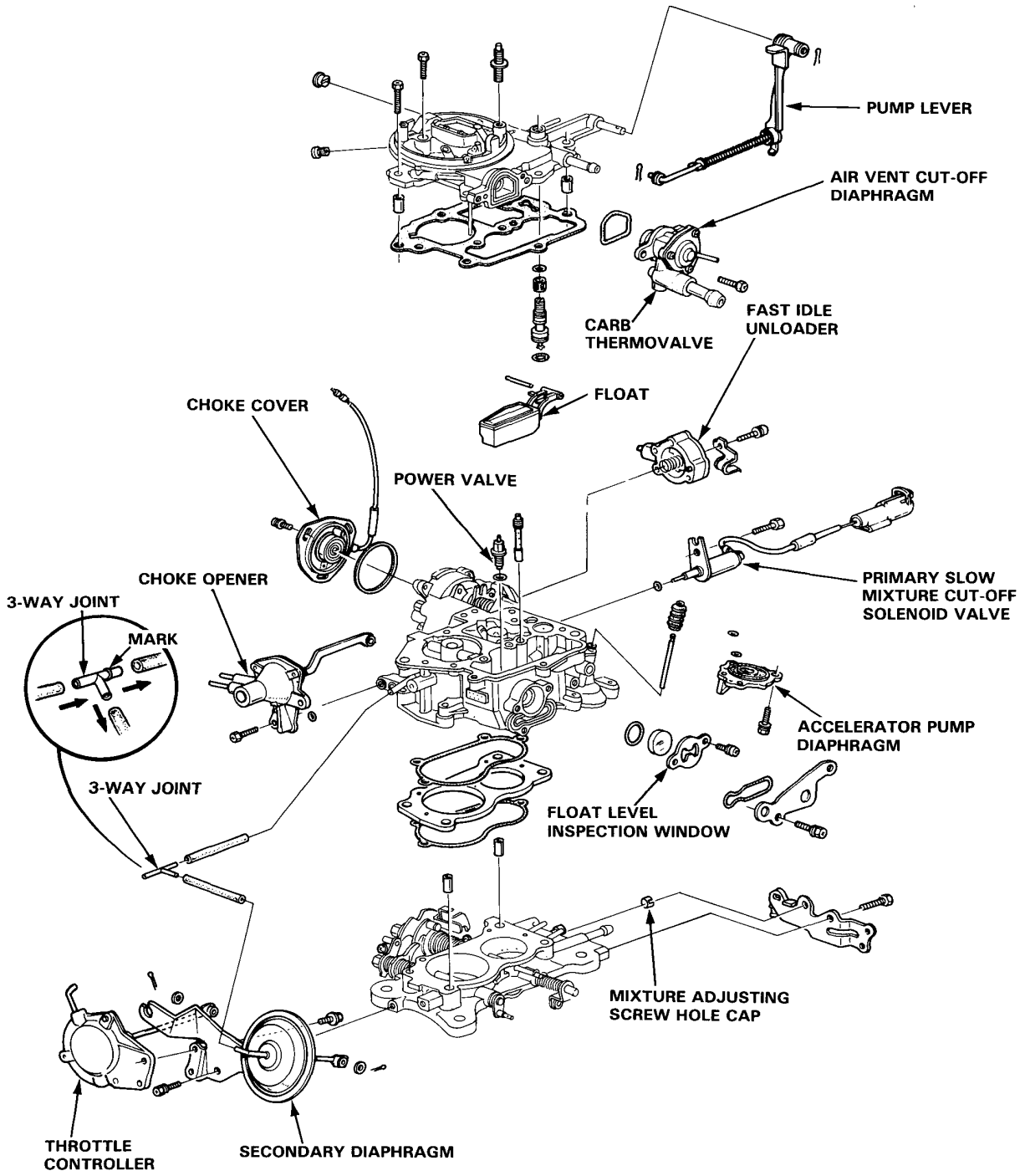
Replacement of Attached Parts

[A16A1 model]



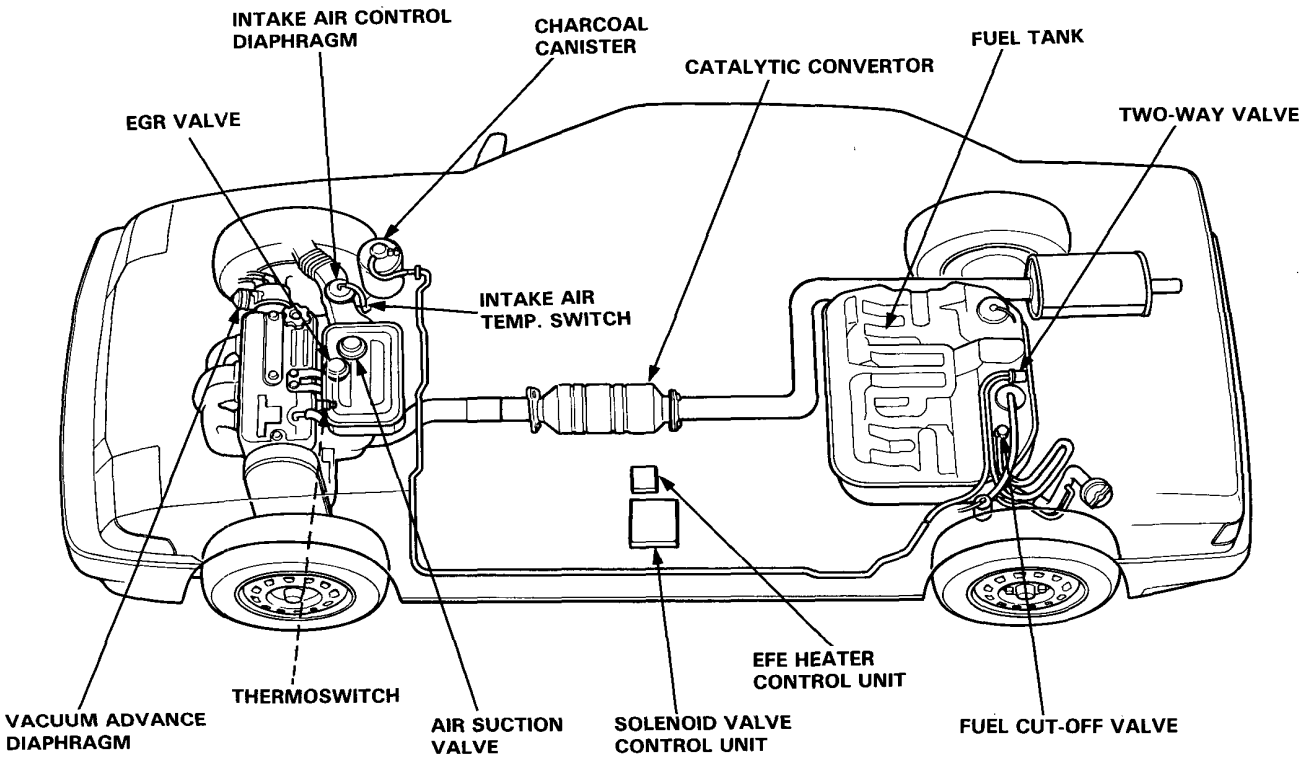
[A20A2 model]

NOTE: Be sure that no foreign material gets on the EFE heater when reinstalling the carburetor.



Emission Controls

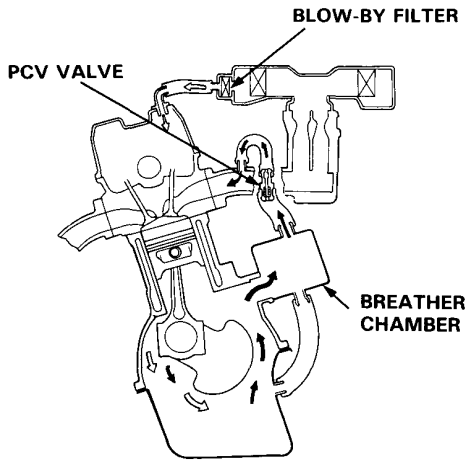
Index



Inspection/Replacement

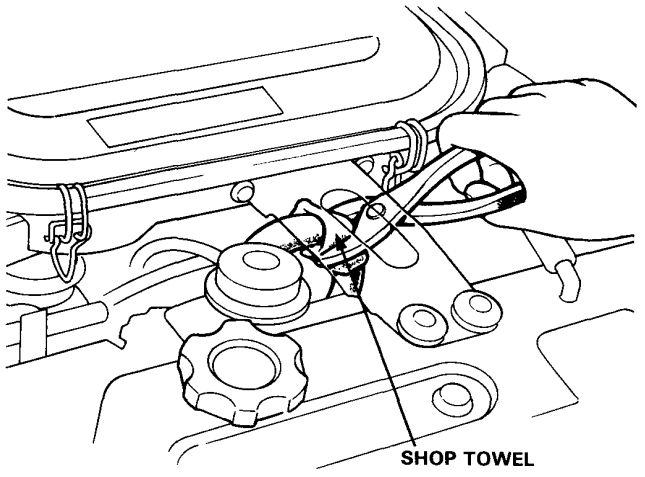
PCV Valve

1. Check the crankcase ventilation hoses and connections for leaks, croks or clogging.



2. Start the engine and allow it to idle.
3. Lightly pinch the breather hose between the PCV valve and intake manifold.

   There should be a clicking sound from the PCV valve.

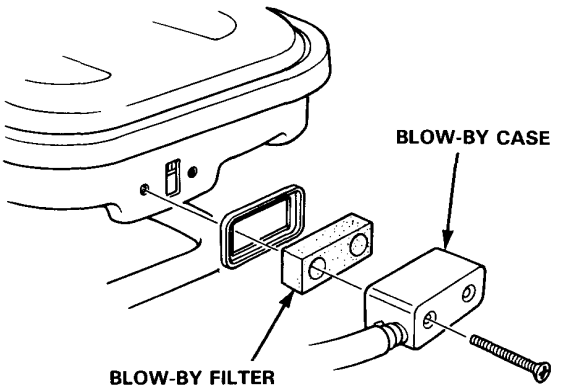


- If no sound is heard, replace the PCV valve and re-test.

Blow-by Filter

Inspect the condition of the blow-by filter.

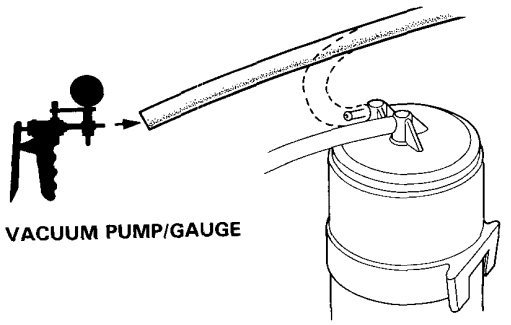
- Replace the filter in the following instances:
  - When the filter is stuck fast and oil is dripping or seeping through.
  - When the filter is covered with dust and dirt so that clogging is evident.



Inspection

[A20A2 KT, KY model]

1. Disconnect vacuum hose at the charcoal canister, connect a vacuum pump/gauge to hose.



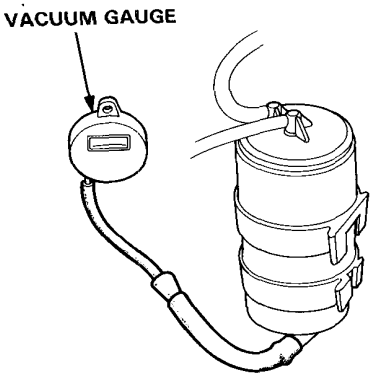
2. Start the engine and raise speed to 3,500 min^{-1} (rpm).

   There should be vacuum.

   - If vacuum is available, go on to step 3.
   - If vacuum is not available, check the vacuum line.

3. Disconnect a vacuum pump/gauge and reconnect hose. Remove fuel filler cap.

4. Remove canister purge air hose from frame and connect hose to a vacuum gauge as shown.



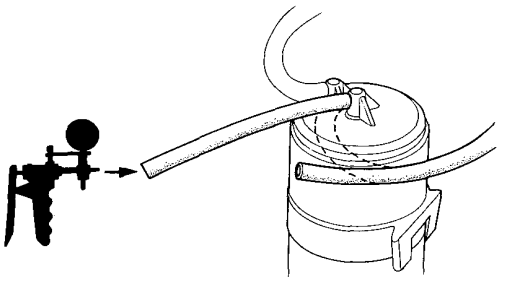
5. Raise engine speed to 3,500 min^{-1} (rpm). Vacuum should appear on gauge within 1 minute.

   - If vacuum appears on gauge in 1 minute, remove gauge and go on to step 7.
   - If no vacuum, disconnect a vacuum pump/gauge and go on to step 6.

6. Remove charcoal canister and check for signs of damage or defects.

   - If defective, replace the charcoal canister.
   - If OK, go on to step 7.

7. Connect vacuum pump/gauge to TANK fitting as shown, and apply vacuum.



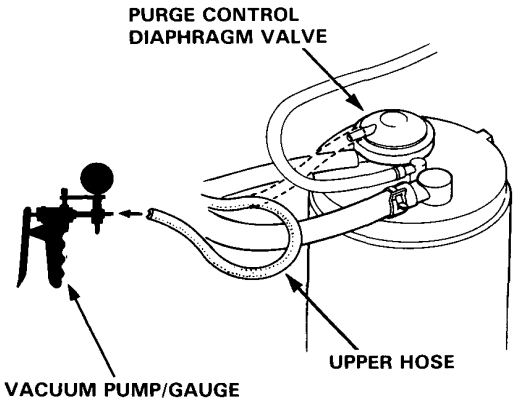
   - If vacuum does not remain steady, test is complete.
   - If vacuum remains steady, replace the charcoal canister.

[A20A2 KQ model]

Thermovalve B

NOTE: Engine coolant temperature must be below thermovalve B set temperature (50°C 122°F).

1. Disconnect the upper hose at purge control diaphragm valve and connect a vacuum pump/gauge to the hose.



2. Start the engine and allow to idle.

   Vacuum should not be available.

   - If there is no vacuum, go on to step 3.
   - If there is vacuum, replace thermovalve B and re-test.

3. Wait for the engine to warm up (cooling fan comes on).

   There should be vacuum at idle, once engine is warm.

   - If vacuum is available, go on to step 4.
   - If no vacuum , disconnect vacuum hose #25 at the thermovalve B and check for vacuum at the hose #25.

     — If there is no vacuum, check the routing for the vacuum hose #25 and repair or replace as necessary.

     — If there is vacuum, replace the thermovalve B and re-test.

4. Disconnect the vacuum pump/gauge and reconnect hose.

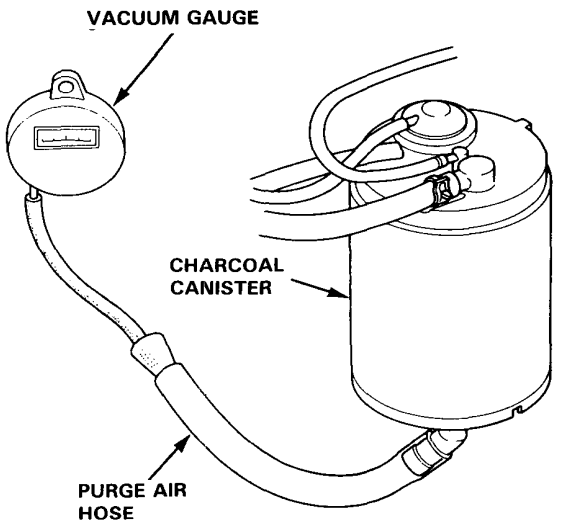
(cont'd)

Inspection (cont'd)

[A20A2 KQ model]

Charcol Canister

1. Start the engine and allow to reach normal operating temperature (cooling fan comes on).
2. Remove fuel filler cap.
3. Remove the canister purge air hose from frame and connect hose to a vacuum gauge as shown.



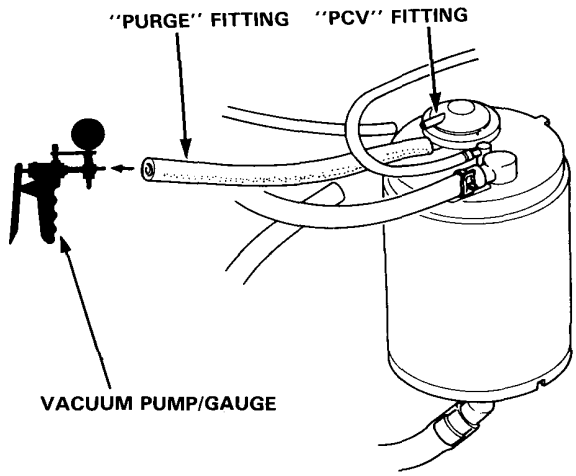
4. Start engine and rise speed to 3,500 min^{-1} (rpm).

   Vacuum should appear on gauge within 1 minute.

   - If vacuum appears on gauge in 1 minute, remove gauge and go on to Step 8.
   - If no vacuum, disconnect vacuum gauge and re-install fuel filler cap.

5. Remove charcoal canister and check for signs of damage.
   If damaged, replace canister.
   If OK, go on to step 6.
6. Stop engine. Disconnect hose from canister PCV fitting.
   Connect a vacuum pump to canister PURGE fitting as shown, and apply vacuum.

   Vacuum should remain steady.



   - If vacuum remains steady, go on to Step 7.
   - If vacuum drops, replace canister and re-test.

7. Re-start engine. Re-connect hose to canister PCV fitting.

   PURGE side vacuum should drop to zero.

   - If PURGE side vacuum does not drop to zero, replace canister and re-test.
   - If PURGE side vacuum drops to zero, connect a vacuum pump to canister PCV fitting, and apply vacuum.

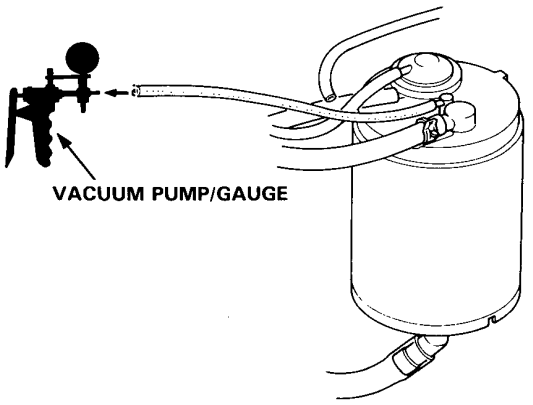
     Vacuum should remain steady.

     — If vacuum remains steady, disconnect the vacuum pump. Recheck thermovalve B operation on previous page.

     — If vacuum drops, replace canister and re-test.

8. Connect a vacuum pump to TANK fitting as shown, and apply vacuum.

   There should not be any vacuum.

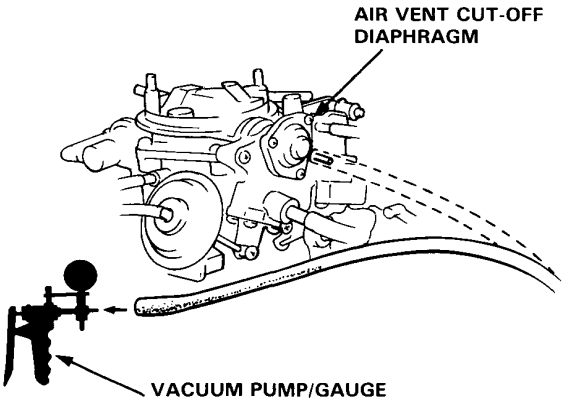


- If no vacuum, reinstall fuel filler cap and canister, test is complete.
- If there is vacuum, replace canister and re-test.

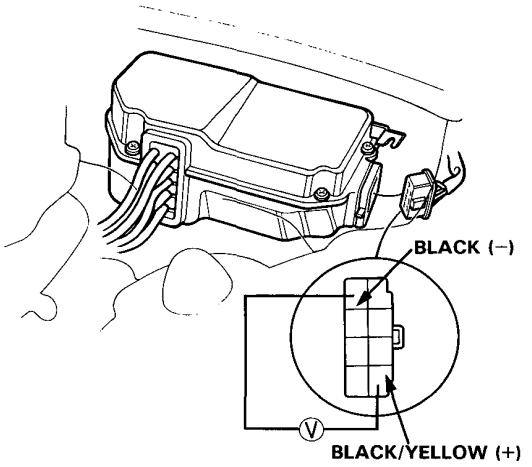
[A20A2 KQ model]

Air Vent Cut-Off Diaphragm

1. Disconnect hose at air vent cut-off diaphragm and *install a vacuum pump/gauge to hose.*



2. Apply vacuum. Vacuum should not be available.
3. Turn ignition switch on.
4. Apply vacuum. Vacuum should remain steady.
   - If vacuum remains steady, go on to step 5.
   - If vacuum is not available, check for leaks in hose connections. if vacuum is still not available, check for voltage at vacuum holding solenoid valve.



   — If there is voltage, replace vacuum holding solenoid valve and re-test.

   — If no voltage, check the wiring (Black/Yellow).

(cont'd)

Inspection (cont'd)

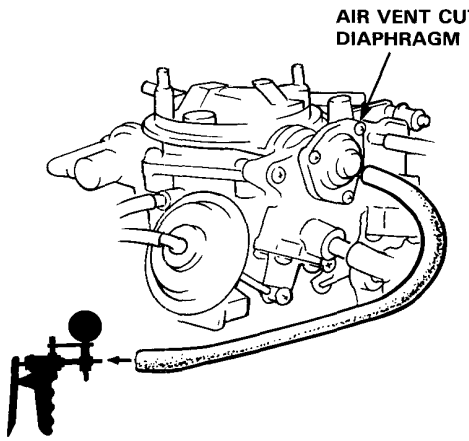
5. Start engine and allow to idle. vacuum should be available.

   — If vacuum is available, go on to step 6.

   — If vacuum is not available, check for blockage in hose. If vacuum is still not available, replace vacuum holding solenoid valve and re-test.

6. Turn ignition off. Vacuum should drop to zero.

7. Disconnect the vacuum pump/gauge from vacuum holding solenoid valve hose and connect to air vent cut-off diaphragm. Apply a vacuum.



   Vacuum should remain steady.

   - If vacuum remains stable, diaphragm is OK.
   - If vacuum decreases, replace diaphragm and re-test.

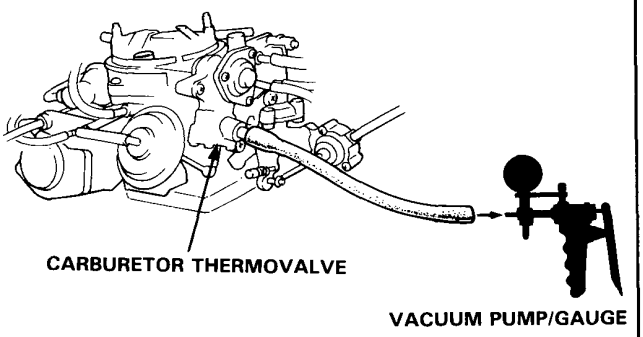
8. Remove the vacuum pump/gauge and re-connect hose between air vent cut-off diaphragm and vacuum holding solenoid valve.

[A20A2 KQ model]

Caburetor thermovalve

NOTE: Carburetor temperature must be below carburetor thermovalve set temperature (30°C, 86°F).

1. Disconnect the hose at the carburetor thermovalve and connect a vacuum pump/gauge to the thermovalve.



2. Apply 200 mmHg (7.8 inHg) vacuum to thermo valve. Vacuum should remain steady.

   - If vacuum remains steady, go on to step 3.
   - If vacuum does not remain steady, replace the carburetor thermovalve and re-test.

3. Start the engine and wait for the engine to warm up.

   NOTE: Carburetor temperature must be above carburetor thermovalve set temperature (40°C, 104°F).

2. Apply vacuum to thermovalve.

   the valve should not hold vacuum.

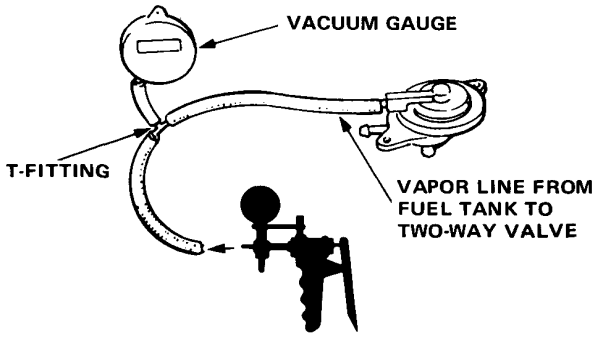
   - If vacuum does not hold, the thermovalve is OK. Reconnect the hose to the valve.
   - If vacuum is hold, replace the thermovalve and re-test.

Two-Way Valve

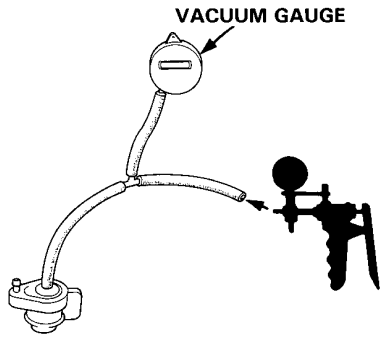
[KY, KT, KQ model]

1. Remove the fuel filler cap.
2. Remove vapor line from the fuel tank and connect to T-fitting from vacuum gauge and vacuum pump as shown.

[KY, KQ models]



[KT model]



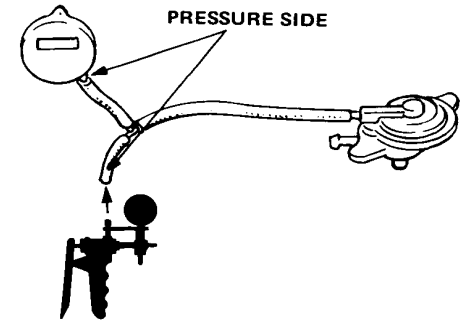
3. Slowly apply a vacuum while watching the gauge.

   Vacuum should stabilize at 5 to 15 mmHg (0.2 to 0.6 in. Hg).

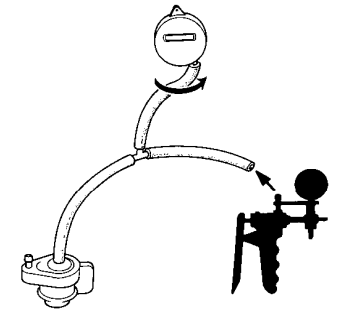
   - If vacuum stabilizes momentarily (two-way valve opens) between above range, go on to step 4.
   - If vacuum stabilizes (valve opens) out of above range, install new valve and re-test.

4. Move pump hose from vacuum to pressure fitting, and move vacuum gauge hose from vacuum to pressure side as shown.

[KY, KQ models]



[KT model]



5. Slowly pressurize the vapor line while watching the gauge.

   Pressure should stabilize at:

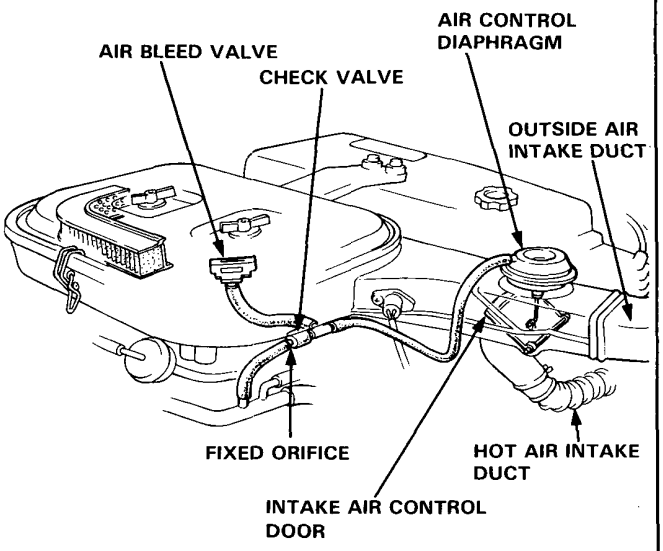
KY, KT models	10 to 25 mmHg (0.4 to 1.0 in. Hg)
KQ model	25 to 55 mmHg (1.0 to 2.2 in. Hg)

   - If vacuum stabilizes momentarily (two-way valve opens) between above range, the valve is OK.
   - If vacuum stabilizes (valve opens) out of above range, install new valve and re-test.

Intake Air Control System

Inspection

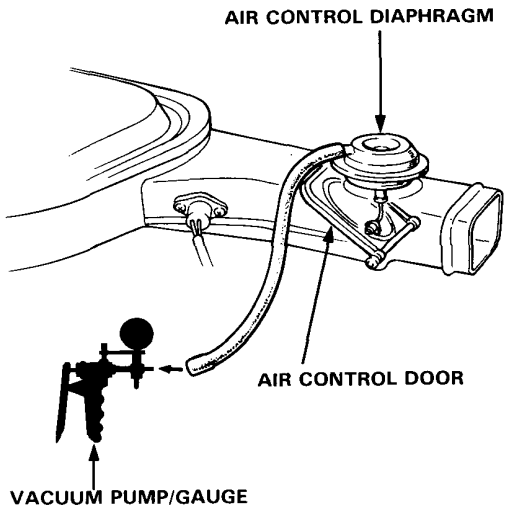
1. Disconnect the air intake duct.
2. With the engine cold, start the engine and let it run for about 5 seconds and stop. The air control door should rise on start-up and remain fully open for at least 3 seconds after stopping the engine.



- If the door rises, go on to step 6.
- If the door does not rise, check to see if the door is binding. If the door is not binding but fails to rise, or it rises but fails to stay up for 3 seconds after the cold cranking test, go to step 3.

3. Disconnect and plug the hose leading to the air bleed valve.
4. Crank the engine for approximately 5 seconds.
   - If the air control door does not rise or stay open for at least 3 seconds, proceed to step 5.
   - If the door rises and stays up for at least 3 seconds, replace the air bleed valve and re-test (step 2).
5. Disconnect the vacuum hose from the air control diaphragm, connect a vacuum pump to the diaphragm inlet pipe and apply vacuum.

   The air control door should rise and stay up.

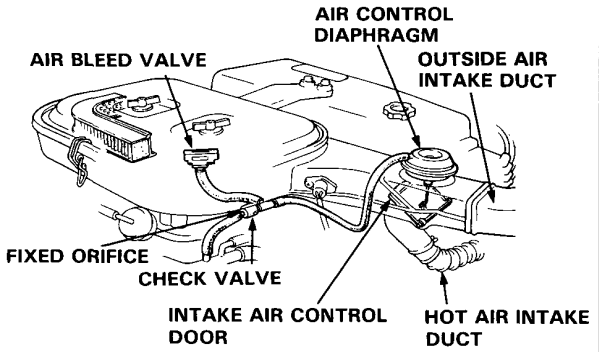


   - If the door stays up, replace the check valve and re-test.
   - If the door does not rise or stay up, replace the air control diaphragm and re-test.
6. Wait for the engine to warm up (cooling fan comes on).

   NOTE: As the outside air temperature drops, the bimetal spring in the bleed valve closes, causing the air control door to rise and allowing pre-heated air into the air cleaner; consistent intake air temperature (approximately 100°F) is maintained in this way.

7. Check the control door position.

   The air control door should be down.



   - If the control door has dropped down to fully close the hot air intake duct: stop the engine and reconnect the air intake duct. Test is complete.
   - If the control door has not dropped to the fully closed position, go on to step 2.

8. Disconnect the vacuum hose from the air control diaphragm.

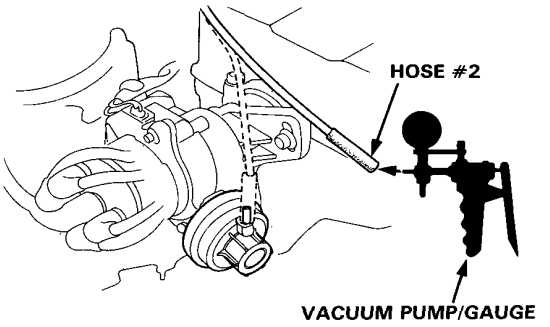
   - If the control door now closes, replace the air bleed valve and re-test.
   - If the control door does not close, correct whatever is causing the door to bind, and/or replace the air control diaphragm. Re-test.

9. Stop the engine and reconnect the air intake duct. Test is complete.

Inspection

[A16A1 model and A20A2 KP, KT model]

1. Disconnect vacuum hose #2 from the distributor and connect a vacuum pump/gauge to hose #2.



2. Start the engine, allow it to idle and check for vacuum.

   There should be vacuum.

   - If there is vacuum, test is complete.
   - If there is no vacuum, check the vacuum hose #2 for leaks, blockage or disconnected hose.

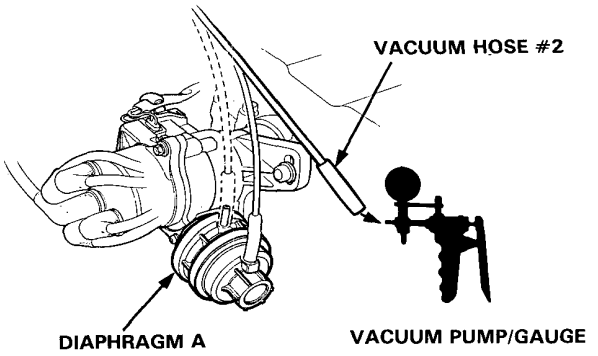
3. If there is not abnormalty at test, inspect the vacuum advance diaphragm (page 24-10).

(cont'd)

Inspection (cont'd)

[A20A2 model (Except KP, KT)]

1. Disconnect vacuum hose #2 from the vacuum advance diaphragm A on the distributor and connect a vacuum pump to hose #2.



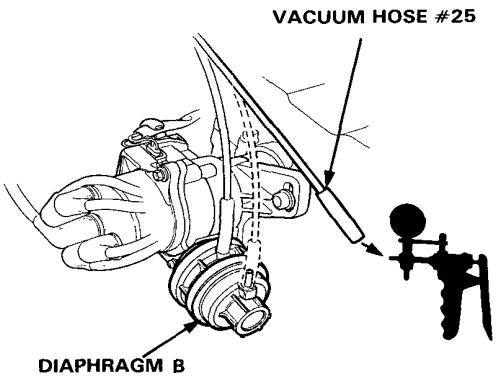
2. Start the engine, allow it to idle and check for vacuum.

   There should be vacuum.

   - If there is vacuum, go on to step 3.
   - If there is no vacuum, check the vacuum hose #2 for leaks, blockge or disconnected hose.

3. Disconnect vacuum hose #25 from the vacuum advance diaphragm B on the distributor and connect a vacuum pump to hose #25.

   NOTE: Engine coolant temperature must be below thermovalve B set temperature 50°C (122°F).



4. Check for vacuum at idle.

   There should be vacuum.

   - If there is vacuum, go on to step 5.
   - If there is no vacuum, replace the thermovalve B and re-test.

5. Wait for the engine to warm up.

   NOTE: Engine coolant temperature must be above thermovalve B set temperature 50°C (122°F).

6. Check for vacuum at idle.

   There should be no vacuum.

   - If there is no vacuum, test is complete.
   - If there is vacuum, replace thermovalve B and re-test.

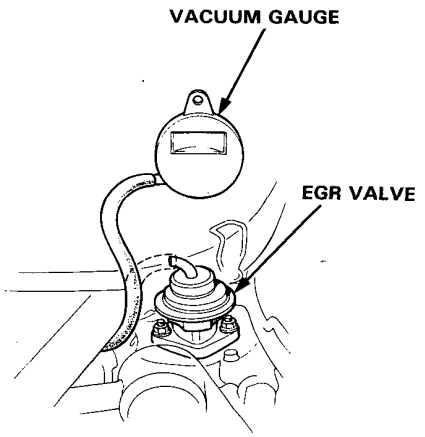
7. If there is no abnormality at each test, inspect the vacuum advance diaphragm (page 24-10).

Inspection

[A20A2 KQ, KX model]

NOTE: The engine coolant temperature must be below the thermovalve C set temperature (55°C, 131°F).

1. Disconnect the vacuum hose from the EGR valve and connect a vacuum gauge to the hose.



2. Start the engine and raise the engine speed to 3,000 rpm.

   Vacuum should not be available.

   - If vacuum is not available, go on to step 3.
   - If vacuum is available, replace thermovalve C and re-test.

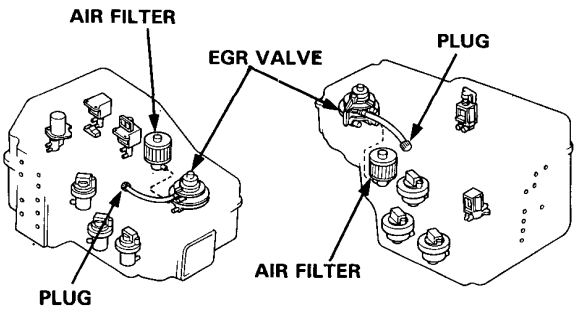
3. Wait for the engine to warm up (cooling fan comes on).

4. Remove the control box from the firewall by removing the two bolts, then remove the control box cover by removing the four screws.

Vacuum should be as shown below:

	Condition	Vacuum at EGR hose
1	Idle	No
2	3,000 min^{-1} (rpm)	Yes,1.5—6'' Hg
3	3,000 min^{-1} (rpm) with blocked vacuum bleed (shown next column)	Less than1.5'' Hg
4	Rapid acceleration	Yes,1.5—6''Hg
5	Deceleration	No

[KX model] [KQ model]



- If vacuum is available at idle (condition 1) check the vacuum hoses for proper routing and connections, then check for correct idle speed and idle mixture, and make adjustments as necessary.
- If there is no vacuum in conditions 2 and 4, check for vacuum at the inlet and outlet of thermovalve C. If there is vacuum at the inlet but none at the outlet, replace the thermovalve. If there is no vacuum at the inlet, check the routing of the vacuum hoses and repair or replace as necessary.
- If vacuum is more than 2'' Hg in condition 3, replace the EGR control valve and check to vacuum hoses for proper routing and connections.

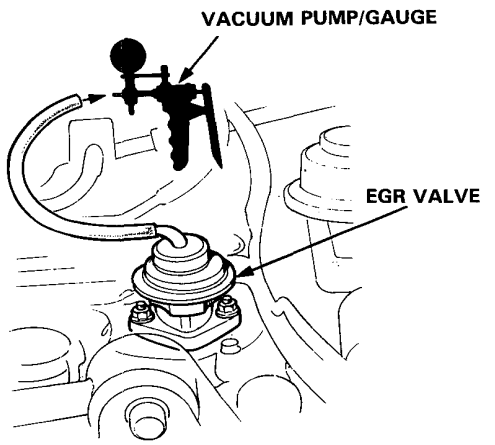
(cont'd)

EGR System

Inspection (cont'd)

EGR Valve

1. Start engine and allow to idle.
2. Disconnect vacuum hose from EGR Valve and connect a vacuum pump to EGR Valve.



3. Apply 150 mm Hg (6 in. Hg) vacuum to EGR Valve. Vacuum should remain steady and engine should die.
   - If vacuum remains steady and engine dies, EGR valve is working properly. Remove vacuum pump and reconnect EGR vacuum hose; test is complete.
   - If vacuum does not remain steady and engine does not die, replace EGR valve and re-test.
   - If vacuum remains steady but engine does not die: Remove EGR valve; check EGR valve and manifold for blockage, clean or replace as necessary and re-test.

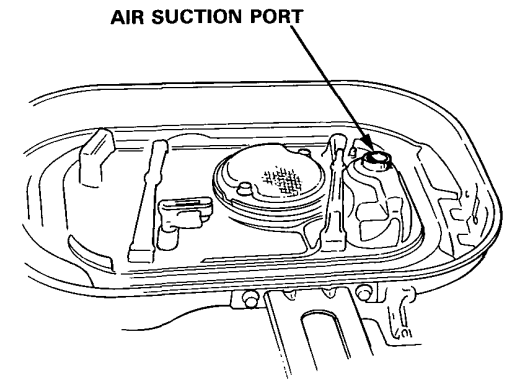
Air Injection System

Air Suction Valve Inspection

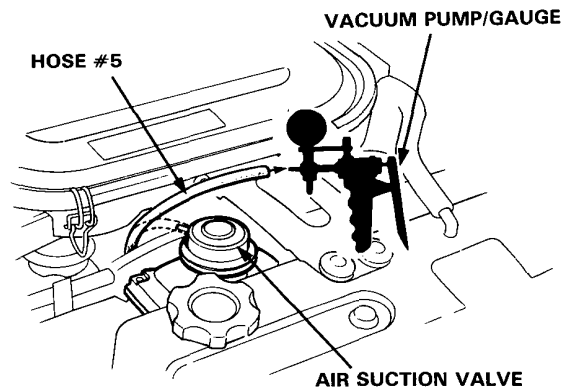
[A20A2 KQ, KX model]

1. Remove the air cleaner cover and filter.
2. Start the engine and check for air suction noise (bubbling noise) from the air suction port at idle.

   Bubbling noise should be heard.



- If bubbling noise is heard, go on to step 5.
- If bubbling noise is not heard, disconnect hose #5 from the air suction valve and check for vacuum at idle.



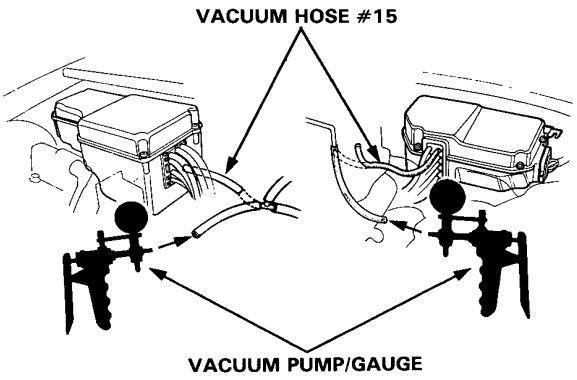
– If there is vacuum, replace the air suction valve and re-test.

– If there is no vacuum, reconnect #5 hose and go on to step 3.

3. Disconnect hose #15 routed from the control box at the vacuum port and check for vacuum at the vacuum port (KQ model) or disconnect hose #15 routed from the control box at the three way joint and check for vacuum at the three way joint (KX model).

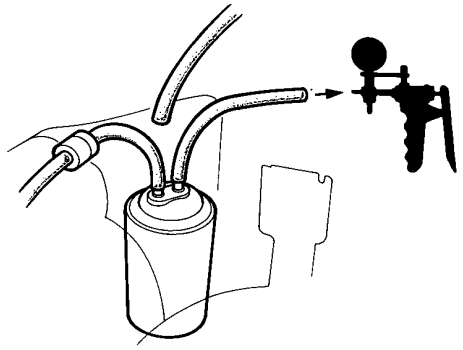
   There should be vacuum.

   [KX model] **[KQ model]**



- if there is vacuum, go on to step 4.
- If there is no vacuum, disconnect hose #15 at the accumulator and check for vacuum at the accumulator.

There should be vacuum.

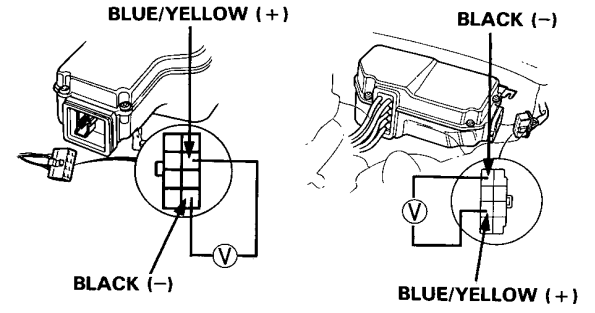


— If there is vacuum, check the vacuum line #15. If there is no problem, replace air bleed valve B and re-test.

— If there is no vacuum, check the vacuum line #24, and re-test.

4. Check for voltage at the air suction control solenoid valve.

   [KX model] **[KQ model]**

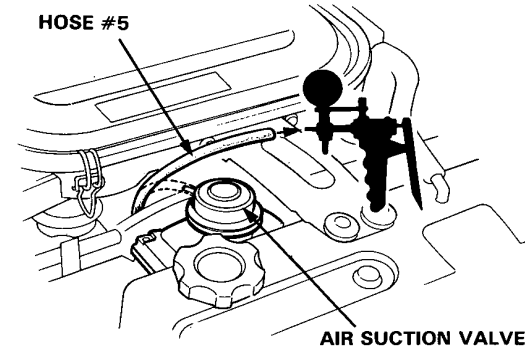


- If no voltage, go on to troubleshooting (page 11-68).
- if there is voltage, replace the air suction control solenoid valve and re-test.

5. Raise the engine speed above 3,500 min^{-1} (rpm)

   There should be no bubbling noise.

- If there is no bubbling noise, go on to step 7.
- If bubbling noise is heard, disconnect hose #5 from the air suction valve and check for vacuum.



— If there is vacuum, go on to step 6.

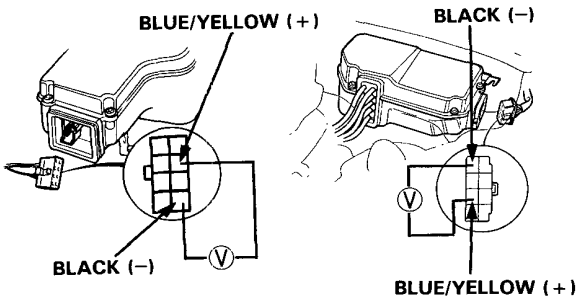
— If there is no vacuum replace the air suction valve and re-test.

(cont'd)

Air Suction Valve Inspection (cont'd)

6. Check for voltage at the air suction control solenoid valve above 3,500 min^{-1} (rpm).

[KX model] **[KQ model]**



- If there is voltage, go to troubleshooting (page 11-68).
- If no voltage, replace the air suction control solenoid valve and re-test.

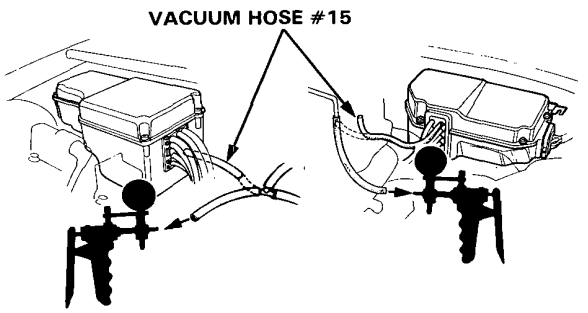
7. Wait for the engine to warm up (cooling fan comes on). check for air suction noise (bubbling noise) from the air suction port at idle.

   Bubbling noise should be heard.

   - If bubbling noise is heard, go on to step 8.
   - If bubbling noise is not heard, disconnect hose #15 routed from the control box at the vacuum port or three way joint and check for vacuum at the vacuum port or three way joint.

   There should be vacuum.

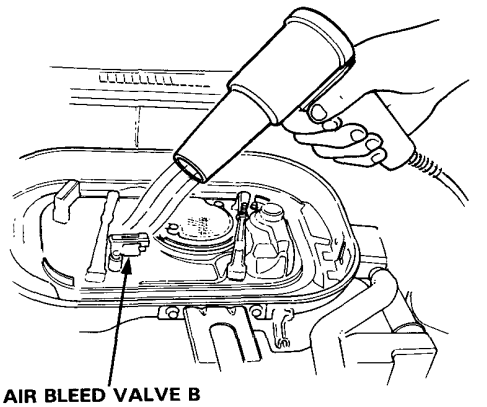
[KX model] **[KQ model]**



   - If there is no vacuum, replace air bleed valve B and re-test.
   - If there is vacuum, go on to troubleshooting (page 11-68).

8. Warm the air bleed valve B with a dryer and check for air suction noise (bubbling) from the air suction port at idle.

   NOTE: Air bleed valve B opens at 50°C (122°F)



- If bubbling noise is not heard, test is complete.
- If bubbling noise is heard, replace the air bleed valve B and re-test.

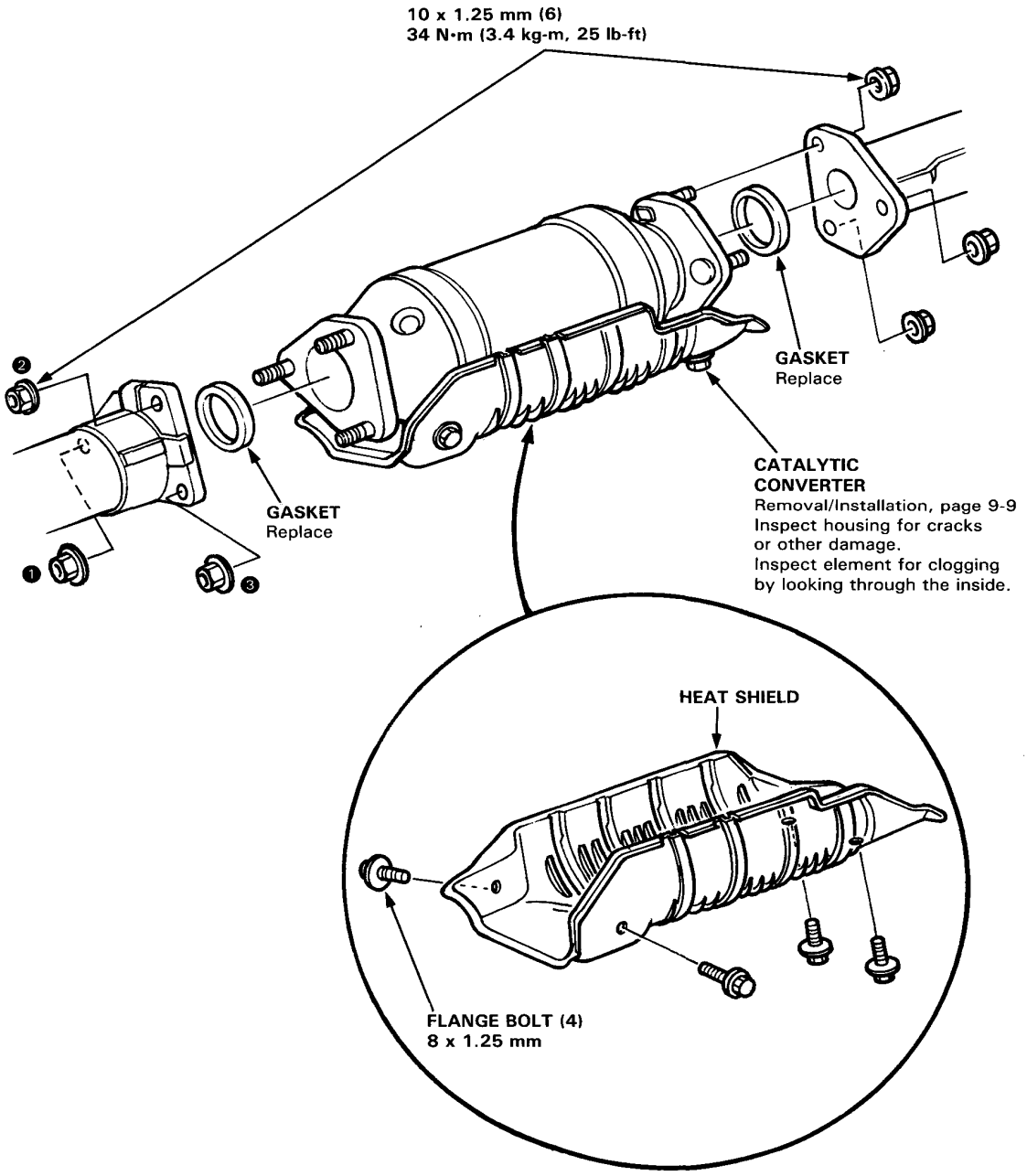
Catalytic Converter

Inspection

[KQ, KX models]

If excessive exhaust system back-pressure is suspected, remove the catalytic converter from the car and make a visual check for plugged, melting or cracking of the catalyst. Replace the catalytic converter if more than 50% of the visible area is damaged or plugged.

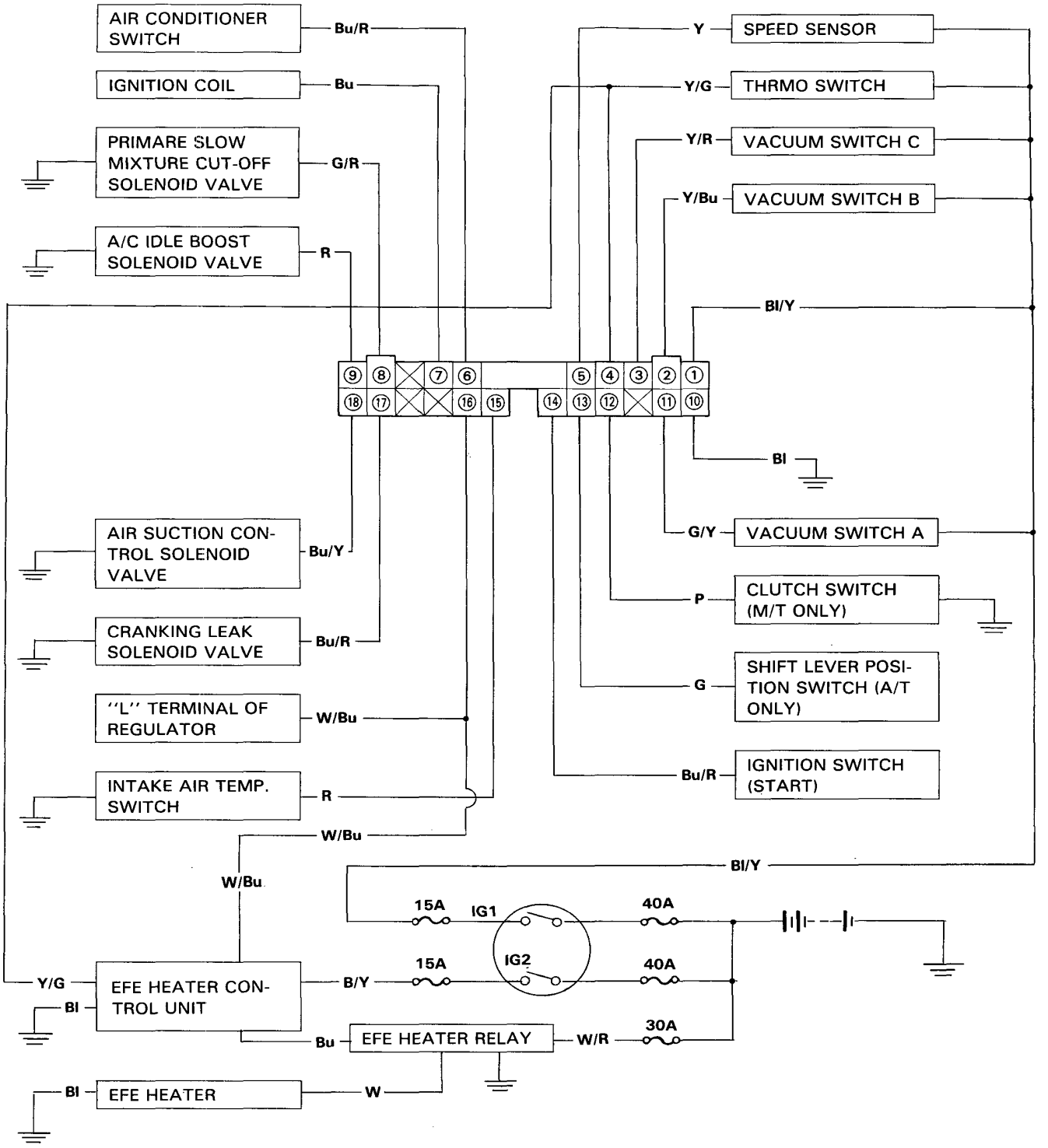
NOTE: Tighten each not in the sequence shown below.



Solenoid Valve Control Unit

Electrical Connection

[KQ, KX model]



Troubleshooting

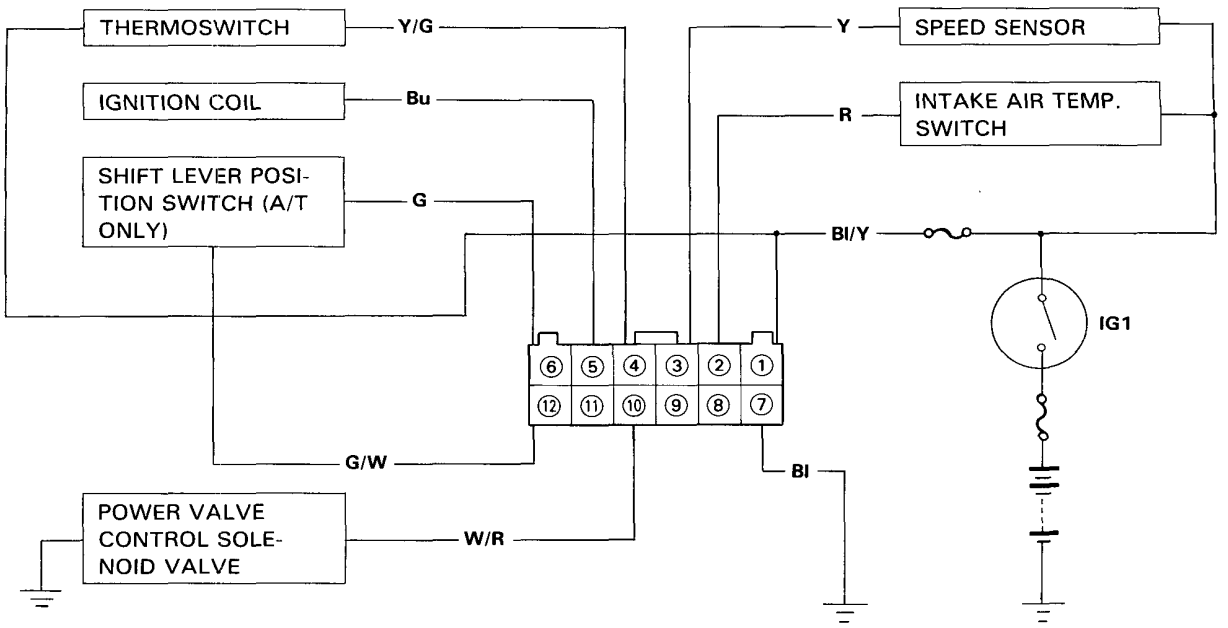
If there is no voltage from the control unit when there should be voltage or if there is voltage from the unit when there shouldn't be voltage, inspect as follows. If no defects can be found, replace the control unit and re-test.

PROBLEMATIC CIRCUT	REFER TO:		CHECK
To air suction control solenoid valve (⑱ Blue/Yellow)	1, 2, 4, 8, 10, 12, 13		1. Check for voltage at the control unit connector ① and ⑩ with the ignition switch on. There should be voltage. ● If no voltage, check the wiring and fuse. 2. Check the ⑩ wire for continuity between the control unit and a suitable ground. There should be continuity. 3. Check for voltage at the control unit connectors ⑭ and ⑩ with the ignition switch turened to III (start). There should be voltage. ● If no voltage, check the wiring and ignition switch. 4. Check for voltage at the control unit connectors ⑦ and ⑩ with ignition switch on. There should be voltage. ● *If no voltage, check the wiring and ignition coil (24-7).* 5. After starting the engine, check for the voltage between ⑯ and ⑩. There should be voltage. ● If no voltage, check the wiring and the alternator (24-18). 6. Check there is continuity between ⑬ and ⑩ with the shift lever set to N. ● If not, check the wiring and shift lever position switch (25-70). 7. Inspect the clutch switch (11-72). 8. Inspect vacuum switch A (11-73). 9. Inspect vacuum switch B (11-73). 10. Inspect vacuum switch C (11-74). 11. Inspect the speed sensor (11-71). 12. Inspect the thermoswitch (11-71). 13. Inspect the intake air temperature switch (11-72). 14. Inspect the air conditioner switch signal (11-74).
To cranking leak solenoid valve (⑰ Blue/Red)	1, 2, 3, 5, 12, 13		
To primary slow mixture cut-off solenoid valve (⑧ Green/Red)	M/T	1, 2, 4, 7, 8, 9, 11, 12	
	A/T	1, 2, 4, 6, 8, 9, 11, 12	
To A/C idle boost solenoid valve (⑨ Red)	M/T	1, 2, 4, 7, 8, 11, 12, 14	
	A/T	1, 2, 4, 6, 8, 11, 12, 14	

Solenoid Valve Control Unit

Electrical Connection

[KS model]



Troubleshooting

If there is no voltage from the control unit when there should be voltage or if there is voltage from the unit when there shouldn't be voltage, inspect as follows. If no defects can be found, replace the control unit and re-test.

PROBLEMATIC CIRCUT	REFER TO:		CHECK
To power valve control solenoid valve (⑩ White/Red)	M/T	1, 2, 3, 5, 6, 7	1. Check for voltage at the control unit connectors or ① and ⑦ with the ignition switch on. There should be voltage. ● If no voltage, check the wiring and fuse. 2. Check the ⑦ wire for continuity between the control unit connector and a suitable ground. There should be continuity. 3. Check for voltage at the control unit connectors ⑤ and ⑦ with ignition switch ON. There should be voltage. ● If no voltage, check the wiring and ignition coil (24-7). 4. Check there is continuity between ⑥ and ⑦, and beween ⑫ and ⑦ with the shift lever set to N or P. ● If not, check the wirings and shift lever position switch (25-70). 5. inspect the speed sensor (11-71). 6. Inspect the thermoswitch (11-71). 7. Inspect the intake air temperature switch (11-72).
	A/T	1, 2, 3, 4, 5, 6, 7	

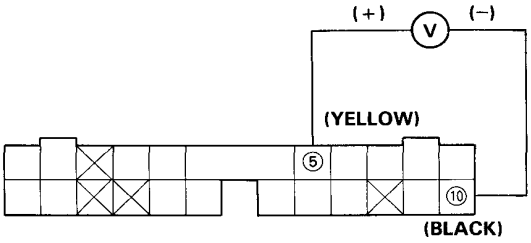
Speed Sensor

[A20A2 KQ, KX, KS model]

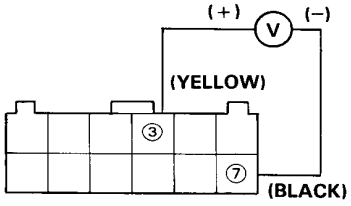
WARNING **Block rear wheels before jacking up front of car.**

1. Jack up front of car, support with safety stands, block rear wheels, and set hand brake.
2. Attach the voltmeter probes to the control unit connector as shown.

[KQ, KX model]



[KS model]



3. Start engine. Select 2nd gear or 2 position and accelerate slowly, while observing voltmeter.

   Voltmeter should show battery voltage above 32 km/h (20 mph) and no voltage below 10 km/h (6.2 mph).

   - If there is voltage above approximately 32 km/h (20 mph), and there is no voltage below 16 km/h (10 mph), speed sensor is OK. Go on to step 5.
   - If voltmeter readings do not correspond to above km/h (mph) ranges, install a new speed sensor and re-test.
   - If there is no voltage during speed sensor test, go to Step 4.

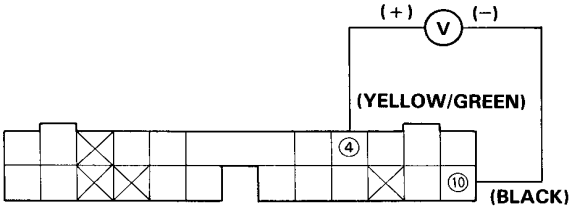
4. Check for bad electrical connection, fuse or failed speed sensor. Replace or repair as necessary and re-test per Step 3.
5. Stop the engine, lower the car to ground, and disconnect the voltmeter.

Thermoswitch

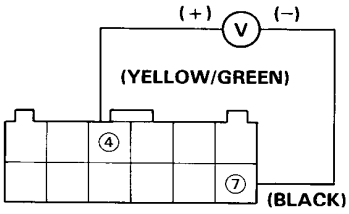
[A20A2 KQ, KX, KS model]

1. Attach the voltmeter probes to the control unit connector as shown.

[KQ, KX model]



[KS model]



2. Start the engine and measure the voltage.
   Voltage should be available with the coolant temperature below 60°C (140°F)/40°C (109°F) (KS model) and should not be available with the coolant temperature above 75°C (167°F)/53°C (127°F) (KS model).

   - If not, check the wiring, replace the thermo switch, and re-test.

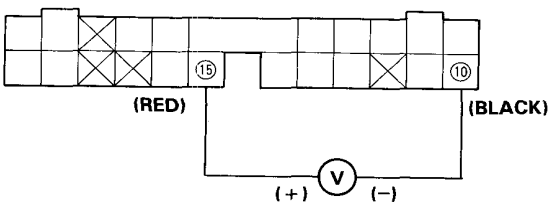
Solenoid Valve Control Unit

Intake Air Temperature Switch

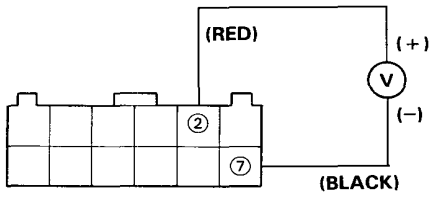
[A20A2, KQ, KX, KS model]

1. Attach the voltmeter probes to the control unit connector as shown.

[KQ, KX model]



[KS model]

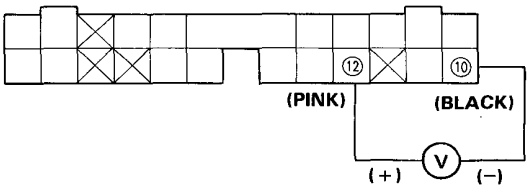


2. Measure the voltage with the ignition switch on. Voltage should be available with the intake air temperature below 15°C (59°F) and should not be available with the intake air temperature above 21°C (70°F).
   - If not, check the wiring, replace the intake air temperature switch, and re-test.

Clutch Switch

[KQ, KX (M/T) models]

1. Attach the voltmeter probes to the control unit connector as shown.



2. Turn the ignition switch on and check for voltage.

   Voltage should be available.
   - If voltage is available, go on to step 3.
   - If no voltage, check the clutch switch. Adjust or replace as necessary and re-test.

3. Depress the clutch pedal and check for voltage.

   There should be no voltage.
   - If no voltage, the clutch switch is OK.
   - If voltage is available, check the clutch switch adjustment. Adjust, as necessary, then re-test.

Vacuum Switchs

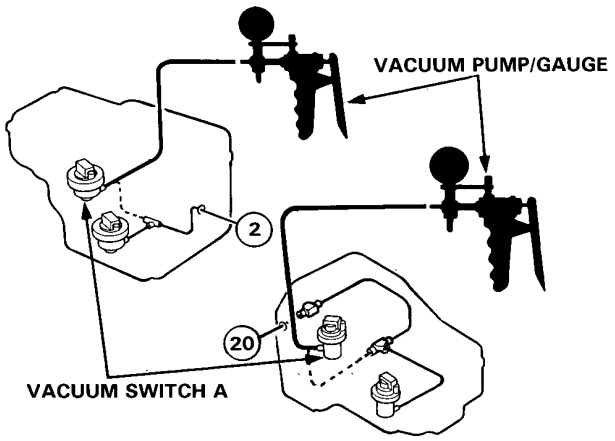
[A20A2 KQ, KX model]

Vacuum Switch A

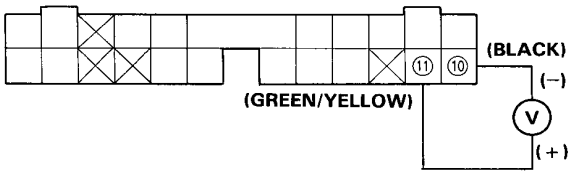
1. Remove the control box from the fire wall by removing the two bolts, then remove the control box cover by removing the four screws.

2. Disconnect the hose to vacuum switch A and connect a vacuum pump to vacuum switch A.

[KX model] **[KQ model]**



3. Attach the positive probe of a voltmeter or test light to ⑪ terminal (Green/Yellow) and the negative probe to ⑩ terminal (Black) of the control unit connector.



4. Turn the ignition switch on and check for voltage.

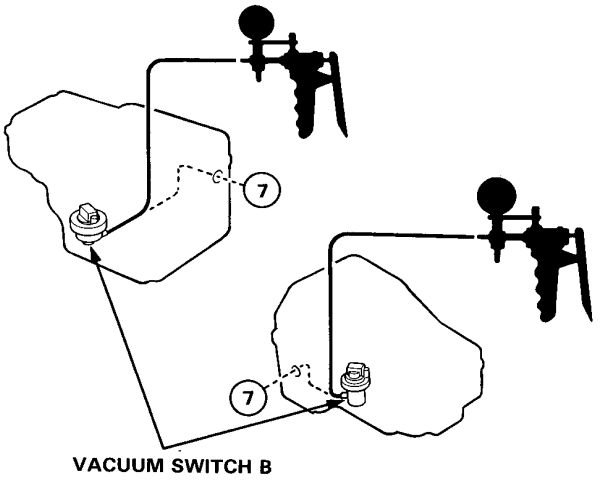
   There should be no voltage when vacuum above 100 mmHg (3.9 in.Hg) is applied, and voltage should be available when vacuum is released.

Vacuum Switch B

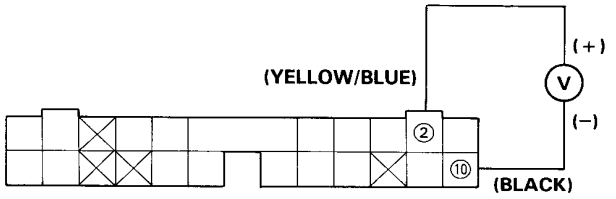
1. Remove the control box from the fire wall by removing the two bolts, then remove the control box cover by removing the four screws.

2. Disconnect the hose to vacuum switch B and connect a vacuum pump to vacuum switch B.

[KX model] **[KQ model]**



3. Attach the positive probe of a voltmeter or test light to ② terminal (Yellow/Blue) and the negative probe to ⑩ terminal (Black) of the control unit connector.



4. Turn the ignition switch on and check for voltage.

   There should be no voltage when vacuum above 30 mm Hg (1.2 in.Hg) is applied, and voltage should be available when vacuum is released.

(cont'd)

Solenoid Valve Control Unit

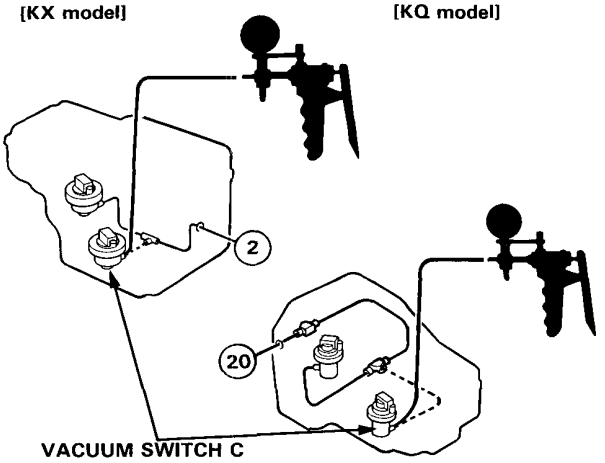
Vacuum Switchs (cont'd)

Vacuum Switch C

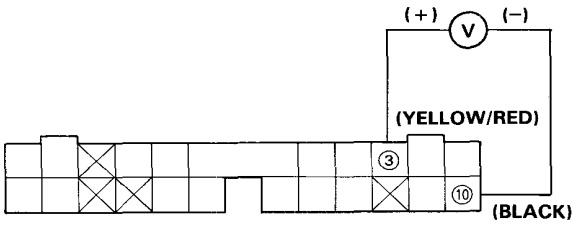
1. Remove the control box-from the fire wall by removing the two bolts, then remove the control box cover by removing the four screws.

2. Disconnect the hose to vacuum switch and connect a vacuum pump to vacuum switch.

[KX model] [KQ model]



3. Attach the positive probe of a voltmetor or test light to ③ terminal (Yellow/Red), and the negative probe to ⑩ terminal (Black) of the control unit connector.

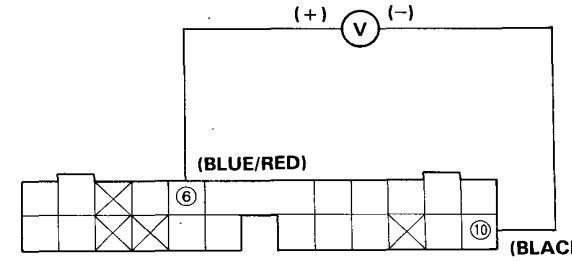


4. Turn the ignition switch on and check for voltage. Voltage should be available when vacuum above 330 mmHg (13 in.Hg) is applied, and there should be no voltage when vacuum is released.

Air Conditioner Switch Signal

[A20A2 KQ, KX model]

1. Attach the positive probe of a voltmater or test light to ⑥ terminal (Blue/Red), and negative probe to ⑩ terminal (Black) of control unit connector.

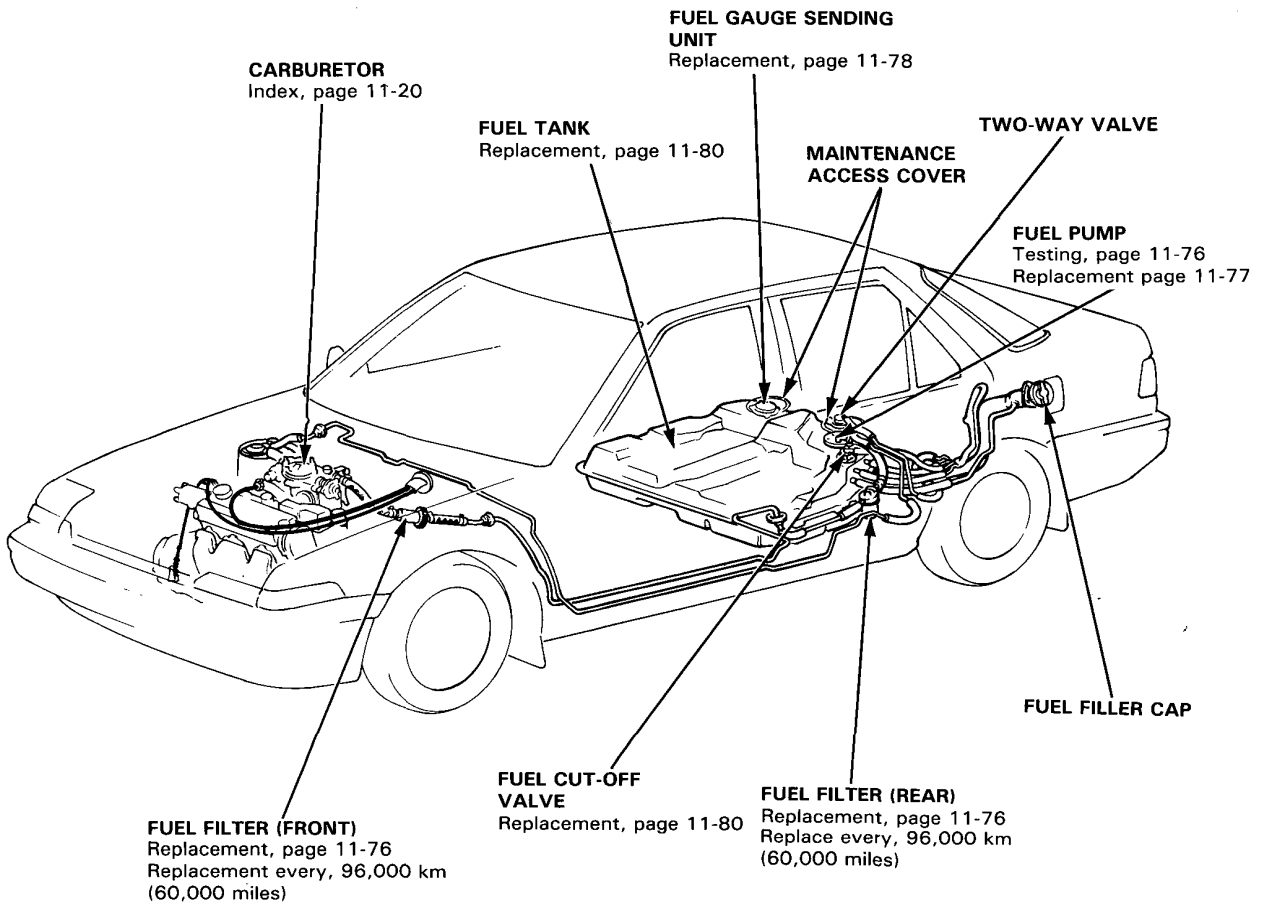


2. Start the engine and make sure that the compressor and cooling fan operate with the blower and A/C switch on. Check the voltage.

   There should be no voltage.

   - If there is voltage, check the wiring and air conditioner circuit.

Index


FUEL GAUGE SENDING UNIT
Replacement, page 11-78
CARBURETOR
Index, page 11-20
FUEL TANK
Replacement, page 11-80
TWO-WAY VALVE
MAINTENANCE ACCESS COVER
FUEL PUMP
Testing, page 11-76
Replacement page 11-77
FUEL FILLER CAP
FUEL CUT-OFF VALVE
Replacement, page 11-80
FUEL FILTER (REAR)
Replacement, page 11-76
Replace every, 96,000 km
(60,000 miles)
FUEL FILTER (FRONT)
Replacement, page 11-76
Replacement every, 96,000 km
(60,000 miles)

Fuel Filters

Replacement

Replace both front and rear filters in every 40,000 km (24,000 miles).

WARNING

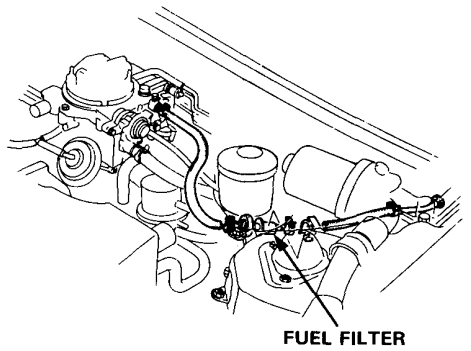
- **Do not smoke while working on the fuel system. Keep open flame away from work area.**
- **Block front wheels before jacking up rear of car.**

Front

1. Use fuel line clamps to pinch off the fuel lines.
2. Disconnect the fuel lines and remove the fuel filter.

CAUTION: When disconnecting the fuel lines, slide back the clamps then twist the lines as you pull, to avoid damaging them.

3. Install the new fuel filter.
4. Remove the fuel line clamps.

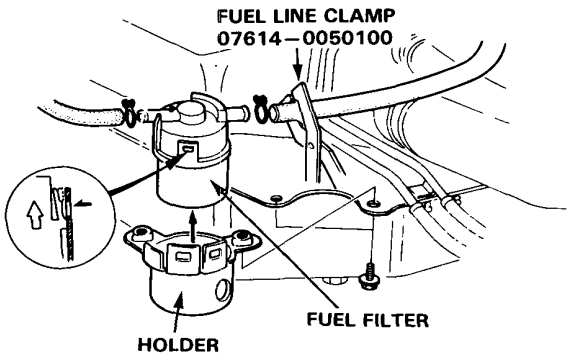


Rear

1. Raise the rear of the car and place jackstands in proper locations.
2. Push in the tab of the fuel filter to release the holder, then remove the filter from its bracket.
3. Attach fuel line clamps to the fuel lines and disconnect the lines from the filter.

CAUTION: To avoid damaging the fuel lines when disconnecting, slide back the clamps then twist the lines as you pull.

4. Install in the reverse order of removal.

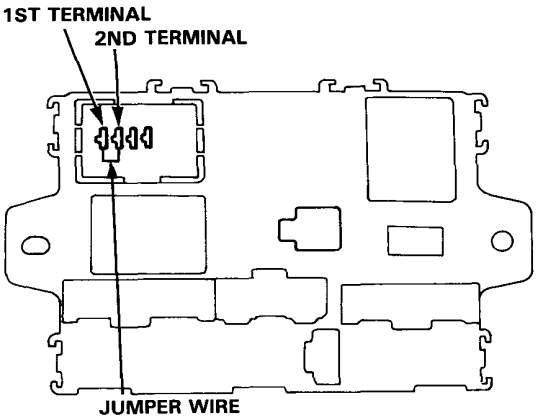


Fuel Pump

Testing

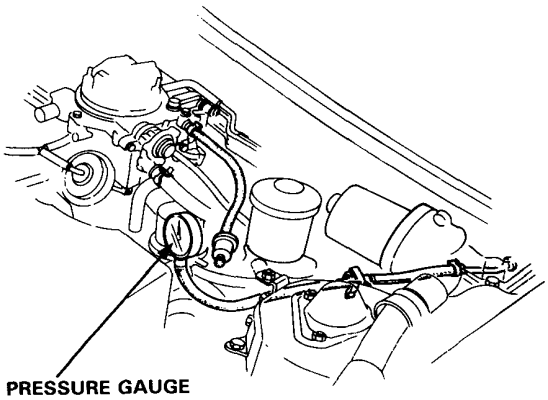
NOTE: Check for a clogged fuel filter and/or fuel line before checking fuel pump pressure.

1. Remove the fuel cut-off relay from the fuse box.
2. Connect the 1st and 2nd terminals together using a jumper wire.



WARNING **Do not smoke during the test. Keep any open flame away from your work area.**

3. Disconnect the fuel line at the fuel filter in the engine compartment, and connect a pressure gauge to it as shown.



4. Turn ignition ON until pressure stabilizes, then turn key off.

Pressure should be 17.7–22.6 kPa (0.18–0.27 kg/cm², 2.6–3.3 psi)

- If gauge shows at least 17.7 kPa (0.18 kg/cm², 2.6 psi), go on to step 4.
- If gauge shows less than 17.7 kPa (0.18 kg/cm², 2.6 psi), replace pump and re-test.

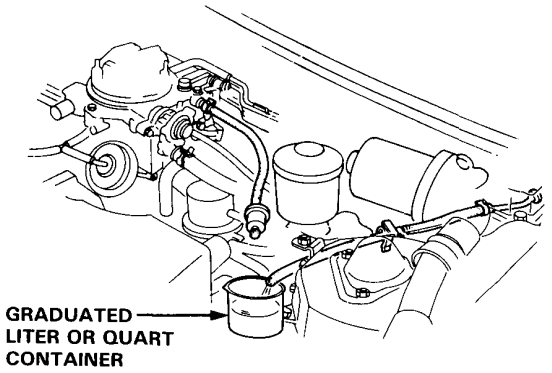
5. Remove pressure gauge and hold a graduated container under the hose.

6. Turn ignition ON for 60 seconds, then turn it OFF and measure amount of fuel flow.

   Fuel flow should be more than 760 cc (25.7 oz.).

   - If fuel flow is 760 cc (25.7 oz.) or more in 60 seconds, reconnect cut-off relay and fuel hose.
   - If fuel flow is less than 760 cc (25.7 oz.), replace the fuel pump and re-test.

   NOTE: Check for a clogged fuel filter and/or fuel line before replacing pump.



Replacement

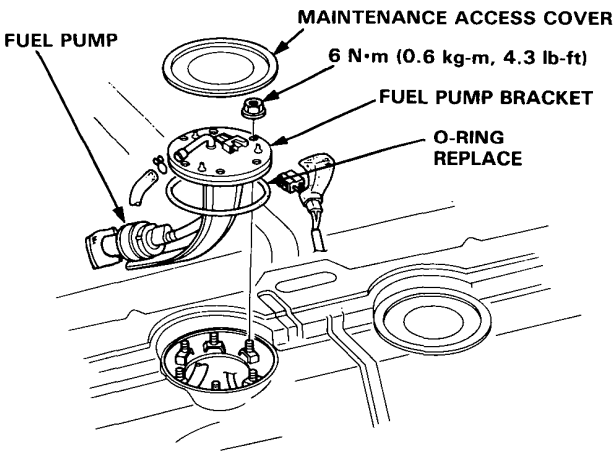
WARNING Do not smoke while working on fuel system. Keep open flames away from your work area.

1. Remove the left maintenance access cover in the luggage area.
2. Disconnect the fuel lines and coupler.
3. Remove the fuel pump mounting bolts.
4. Remove the fuel pump from the fuel tank.

   NOTE: If it is hard to remove, slide the fuel tank down by loosening the fuel tank mounting nuts.

5. Install the fuel pump in the reverse order of removal.

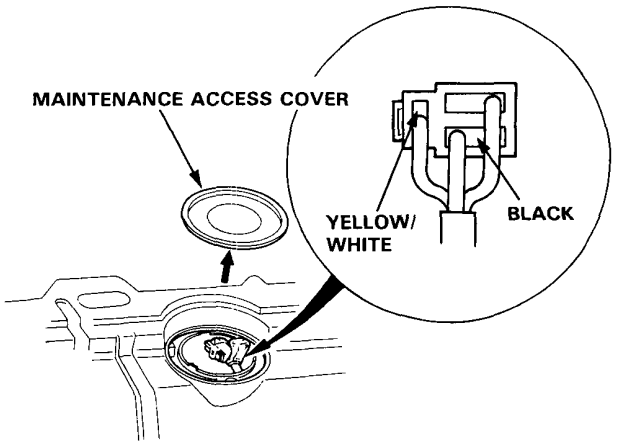
   NOTE: When installing the access cover, make sure the seal is in place.



Fuel Gauge

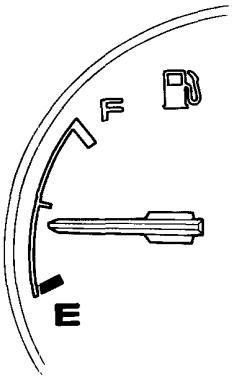
Testing

1. Remove the right maintenance access cover in the luggage area.
2. Make sure the ignition is off, then disconnect the fuel unit coupler and connect the yellow/white terminal at the power source side to the black terminal with a piece of jump wire.



3. Turn the ignition switch ON.
   Check that the pointer of the fuel gauge starts moving toward F.

   CAUTION: Turn the ignition switch OFF within 5 seconds before the pointer reaches "F" mark on the gauge dial. Failure to turn the ignition switch OFF before the pointer reaches the "F" mark may cause damage to the fuel gauge.

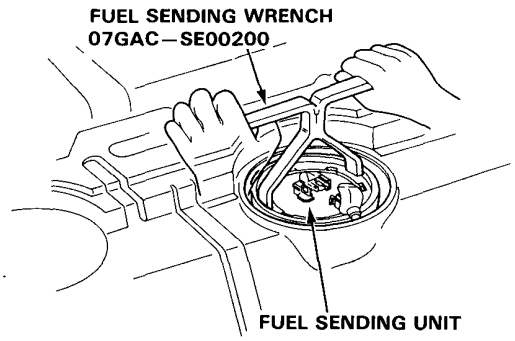


- If the pointer of the fuel gauge does not swing at all, check the fuse, wire harness and coupler. Replace the fuel gauge if they are normal.
- Inspect the fuel gauge sending unit if the fuel gauge is OK.

Fuel Gauge Sending Unit

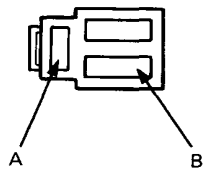
Testing/Replacement

1. Remove the right maintenance access cover in the luggage area.
2. Check that the ignition switch is off then disconnect the fuel sending unit connector.
3. Remove the fuel gauge sending unit.

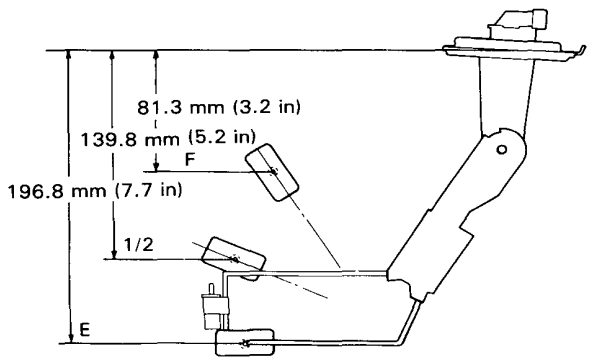


4. Measure the resistance between A and B terminals at E (EMPTY), 1/2 (HALF FULL) and F (FULL) by moving the float.

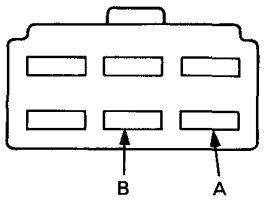
[Except KY (EXR) model]



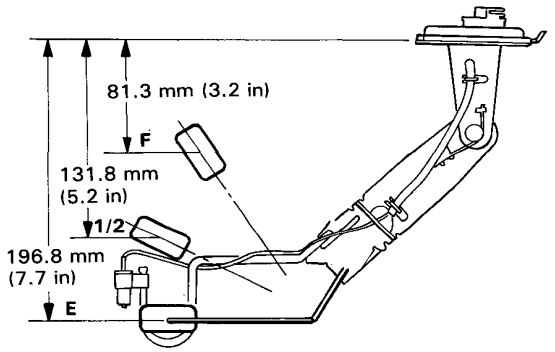
Float Position	E	1/2	F
Resistance (Ω)	105—110	25.5—39.5	2—5



[KY (EXR) model]



Float Position	E	1/2	F
Resistance (Ω)	233–247	121–103	8–18



- If unable to obtain the above readings, replace the fuel unit with a new one.

Testing

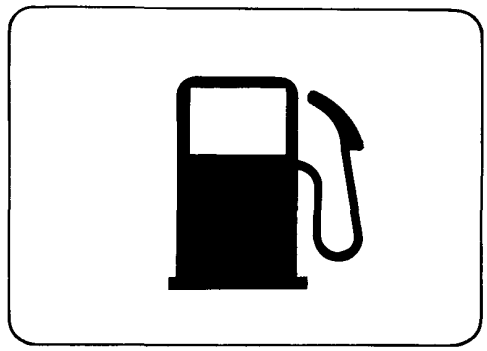
1. Park car on level ground.

   WARNING Do not smoke while working on fuel system. Keep open flame away from work area. Drain fuel only into an approved container.

2. Drain fuel tank into an approved container. Then install the drain bolt with a new washer.

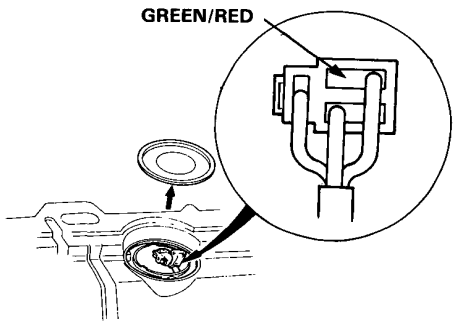
3. Add less than 11.2 ℓ of fuel and turn the ignition switch on.
   The low fuel warning light should come on within 3 minutes.

4. Then add one more gallon of fuel (approximately 4 ℓ). The light should go out within three minutes.



- If the dash warning did not come on in step 3, remove the right maintenance access cover and disconnect the coupler from the fuel gauge sending unit. Connect the green/red terminal and the black terminal with a jumper.

  – If the light comes on, the problem is either the sending unit or its ground.
  – If the light does not comes on, the problem is a break in the green/red wire to the gauge, no power to the gauge or a bad indicator bulb.



Fuel Cut-off Valve

Replacement

WARNING

- **Do not smoke while working on the fuel system. Keep open flame away from work area.**
- **Block front wheels beofe jackfing up rear of car.**

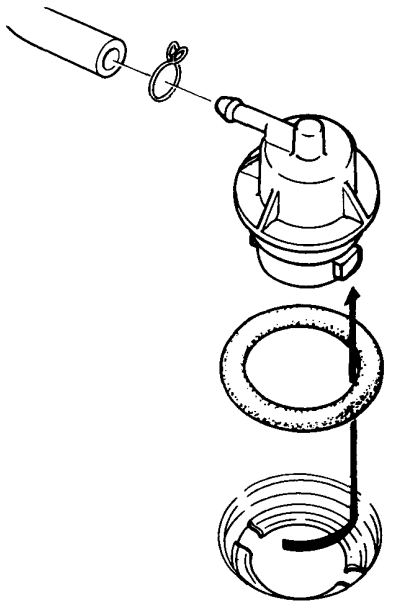
1 Raise rear of car and place jackstands in the proper locations.

2. Place jack under fuel tank.

   CAUTION: Place a flat piece of wood on the jack lifting pad to prevent damage to the fuel tank.

3. Remove the tank mounting nuts, then lower the tank just enough to gain access to the fuel cut-off valve.

4. Turn the valve 1/4 turn (90°), so its lugs are aligned with the slots in the mount, then lift it out.



Fuel Tank

Replacement

WARNING

- **Do not smoke while working on fuel system. Keep open flame away from work area.**
- **Block front wheels before jacking up rear of car.**

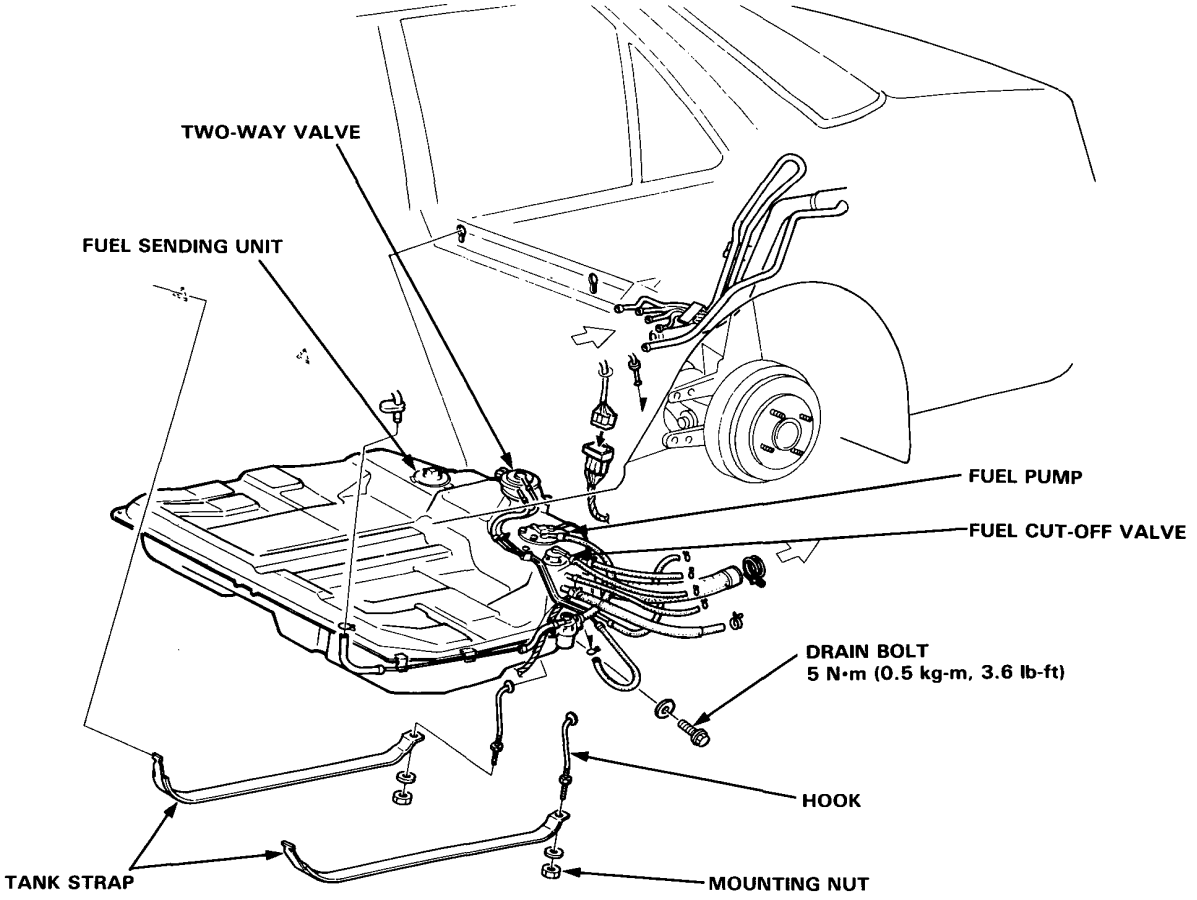
1. Raise the rear of the car and place jackstands in the proper locations.
2. Remove the drain bolt and drain the fuel into an approved container.
3. Disconnect the fuel gauge sending unit connectors.
4. Disconnect the hoses.

   CAUTION: When disconnecting the hoses, slide back the clamps, then twist hoses as you pull, to avoid damageing them.

5. Place a jack, or other support, under the tank.
6. Remove the strap nuts and let the straps fall free.
7. Remove the fuel tank.

   NOTE: The tank may have stuck on the undercoat applied to its mount. To remove carefully pry it off the mount.

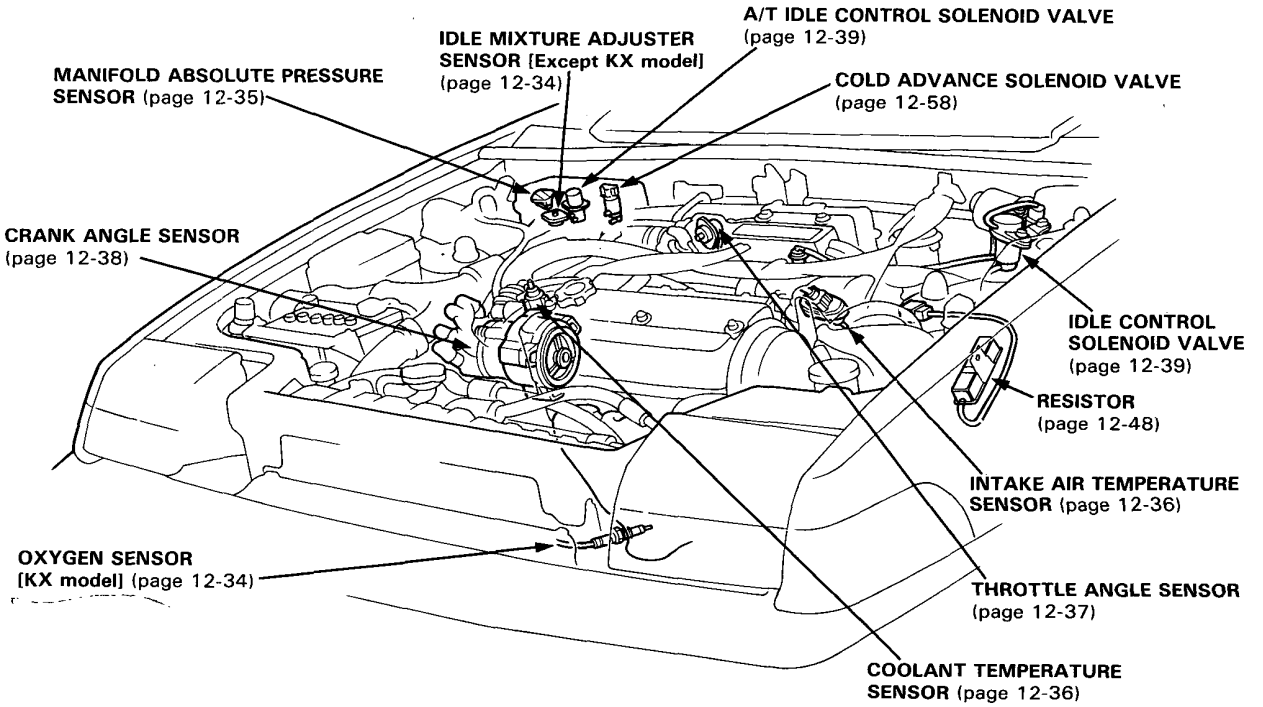
8. Install a new washer on the drain bolt, then install parts in the reverse order of removal.

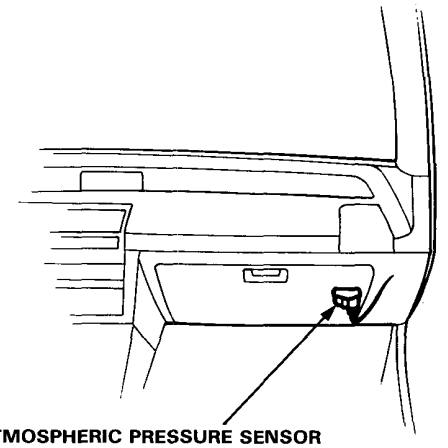


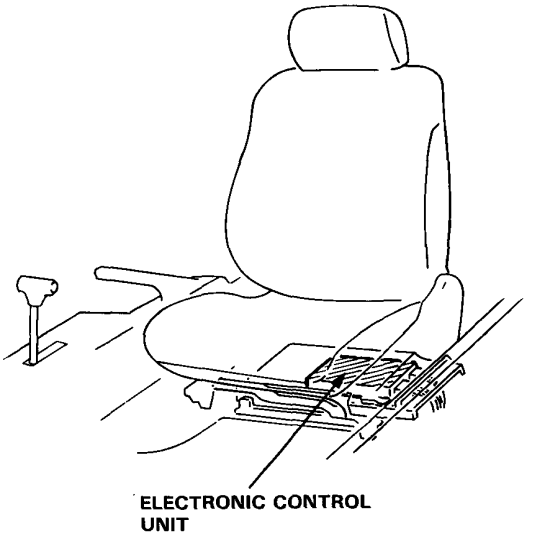
Fuel and Emission Controls (Fuel Injected Engine)

NOTE: Fuel Gauge Sending Unit, Fuel Tank and Catalytic Converter for the Fuel-Injected model are the same as for the carbureded model (page 11-78, 11-81 and 11-67).

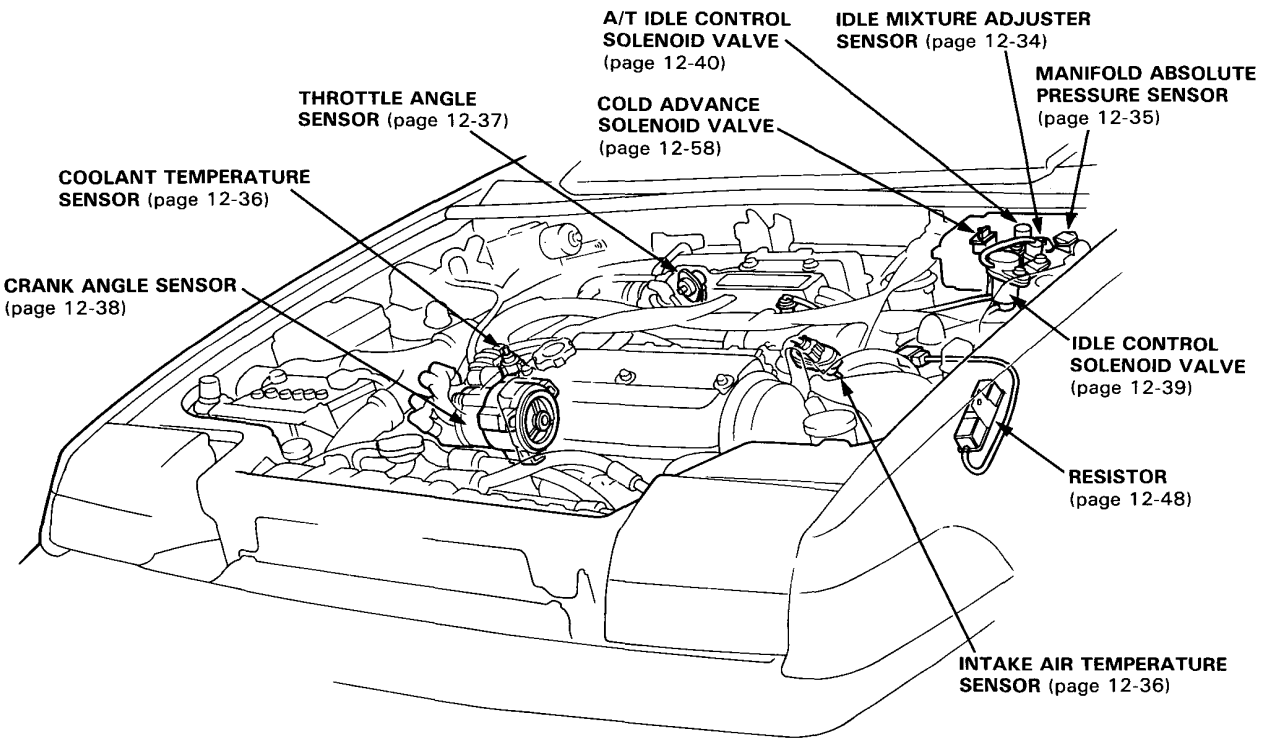
[Except KE model]

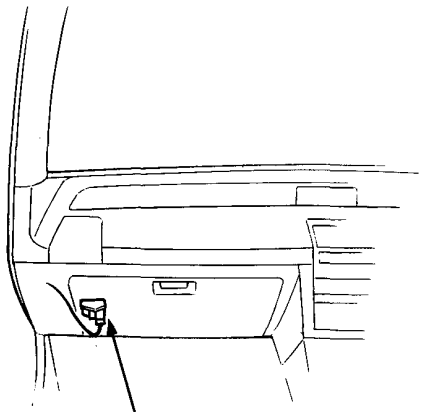


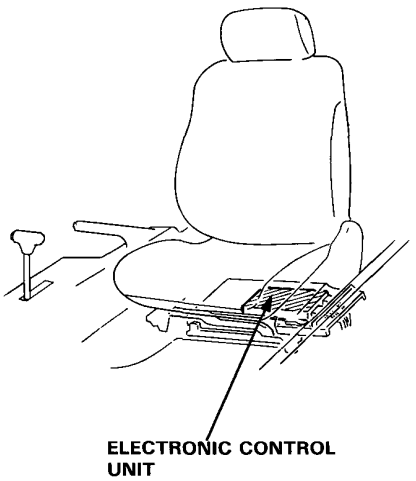


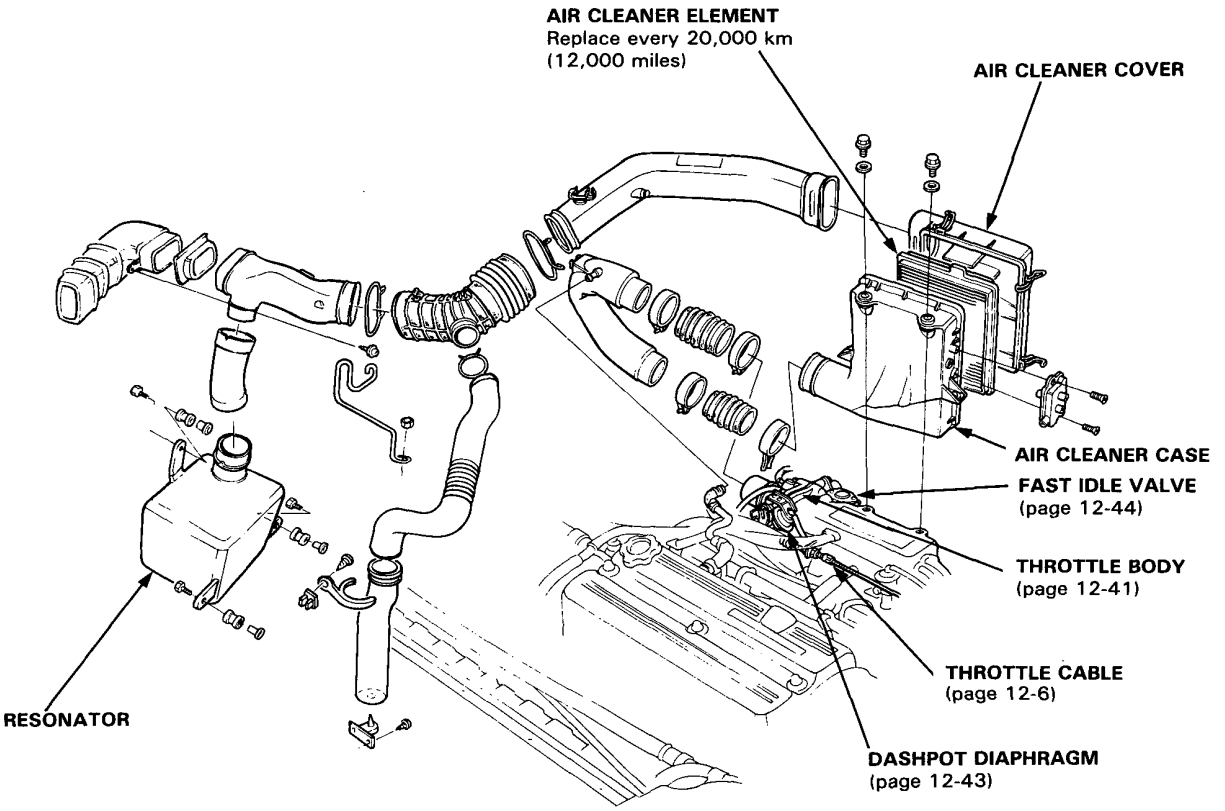


[KE model]

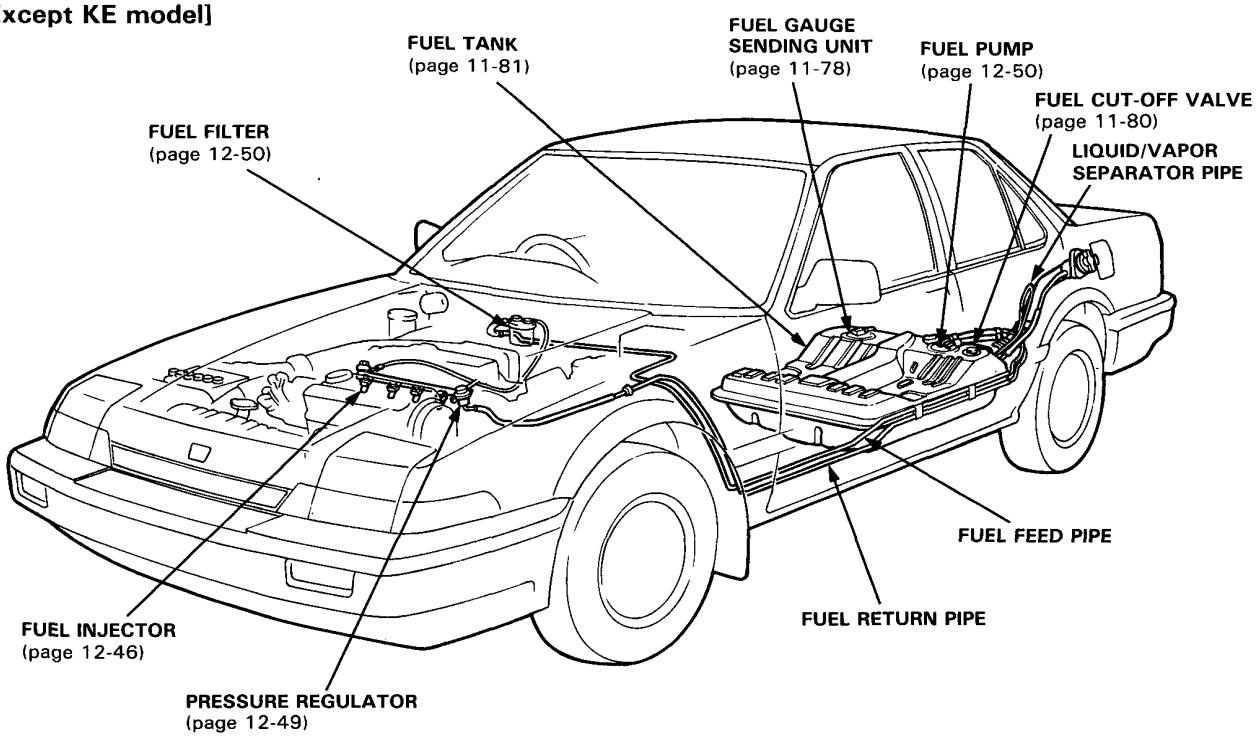

A/T IDLE CONTROL SOLENOID VALVE (page 12-40)
IDLE MIXTURE ADJUSTER SENSOR (page 12-34)
MANIFOLD ABSOLUTE PRESSURE SENSOR (page 12-35)
THROTTLE ANGLE SENSOR (page 12-37)
COLD ADVANCE SOLENOID VALVE (page 12-58)
COOLANT TEMPERATURE SENSOR (page 12-36)
CRANK ANGLE SENSOR (page 12-38)
IDLE CONTROL SOLENOID VALVE (page 12-39)
RESISTOR (page 12-48)
INTAKE AIR TEMPERATURE SENSOR (page 12-36)


ATMOSPHERIC PRESSURE SENSOR (page 12-38)

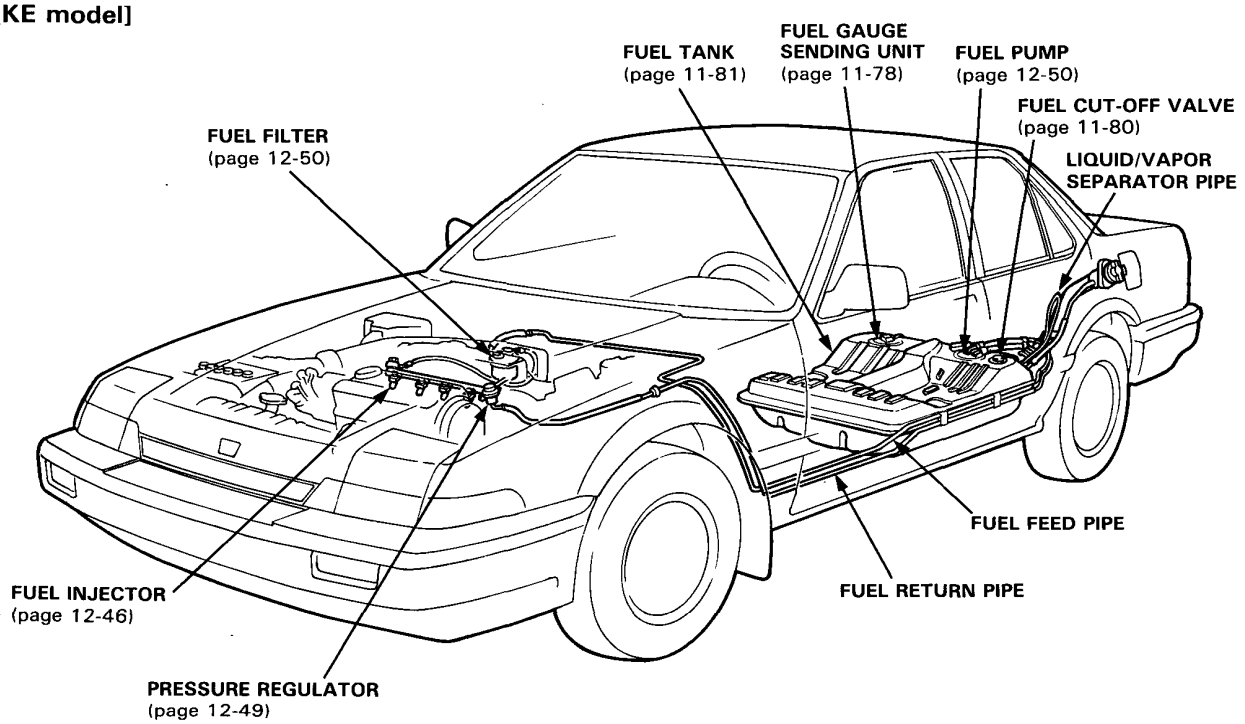

ELECTRONIC CONTROL UNIT


AIR CLEANER ELEMENT
Replace every 20,000 km
(12,000 miles)
AIR CLEANER COVER
AIR CLEANER CASE
FAST IDLE VALVE
(page 12-44)
THROTTLE BODY
(page 12-41)
THROTTLE CABLE
(page 12-6)
DASHPOT DIAPHRAGM
(page 12-43)
RESONATOR

[Except KE model]



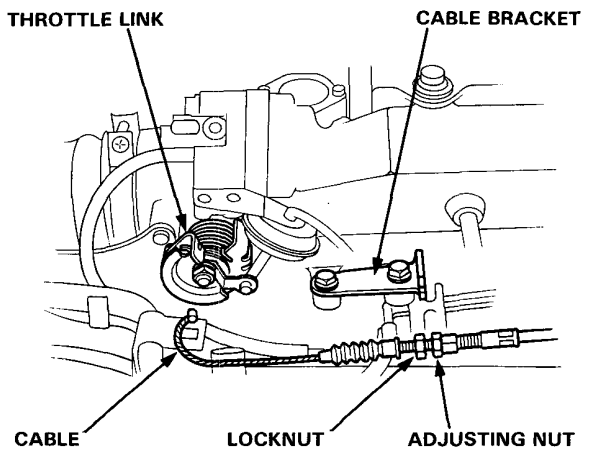
[KE model]



Throttle Cable

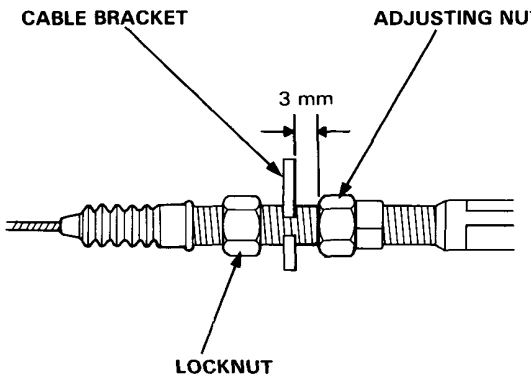
Replacement

1. Loosen the locknut and remove the throttle cable from the cable bracket.
2. Remove the cable from the throttle linkage.



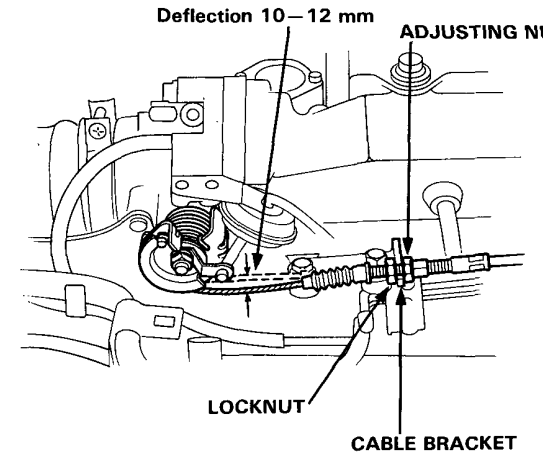
Installation

1. Hold the cable sheath, removing all slack from the cable.
2. Turn the adjusting nut until it is 3 mm away from the cable bracket.
3. Tighten the locknut. The cable deflection should now be 10—12 mm (0.39—0.47in.) If not, see Inspection/Adjustment.

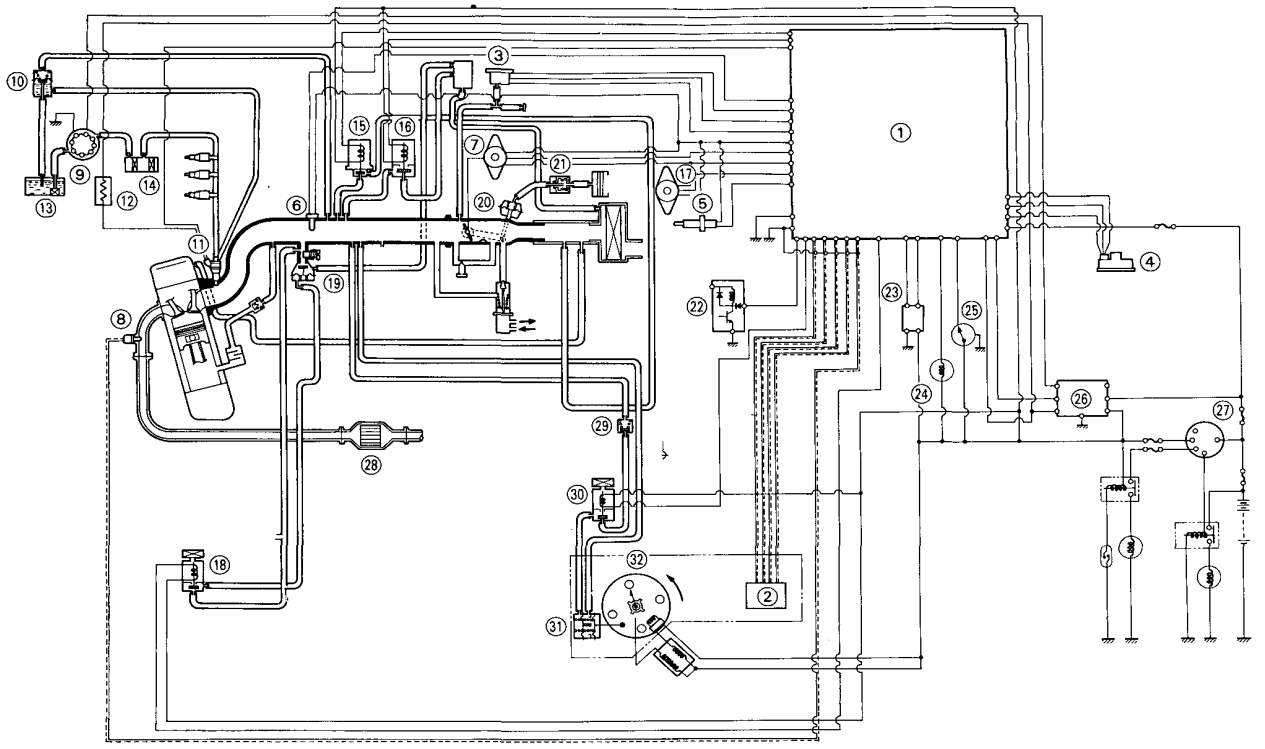


Inspection/Adjustment

1. Check that the throttle cable operates smoothly with no binding or sticking. Repair as necessary.
2. Check cable free play at the throttle linkage. Cable deflection should be 10—12 mm (0.39—0.47 in.)



3. If deflection is not within specs, loosen the locknut and turn the adjusting nut until the deflection is as specified.
4. With the cable properly adjusted, check the throttle valve to be sure it opens fully when you push the accelerator pedal to the floor. Also check the throttle valve to be sure it returns to the idle position whenever you release the accelerator.

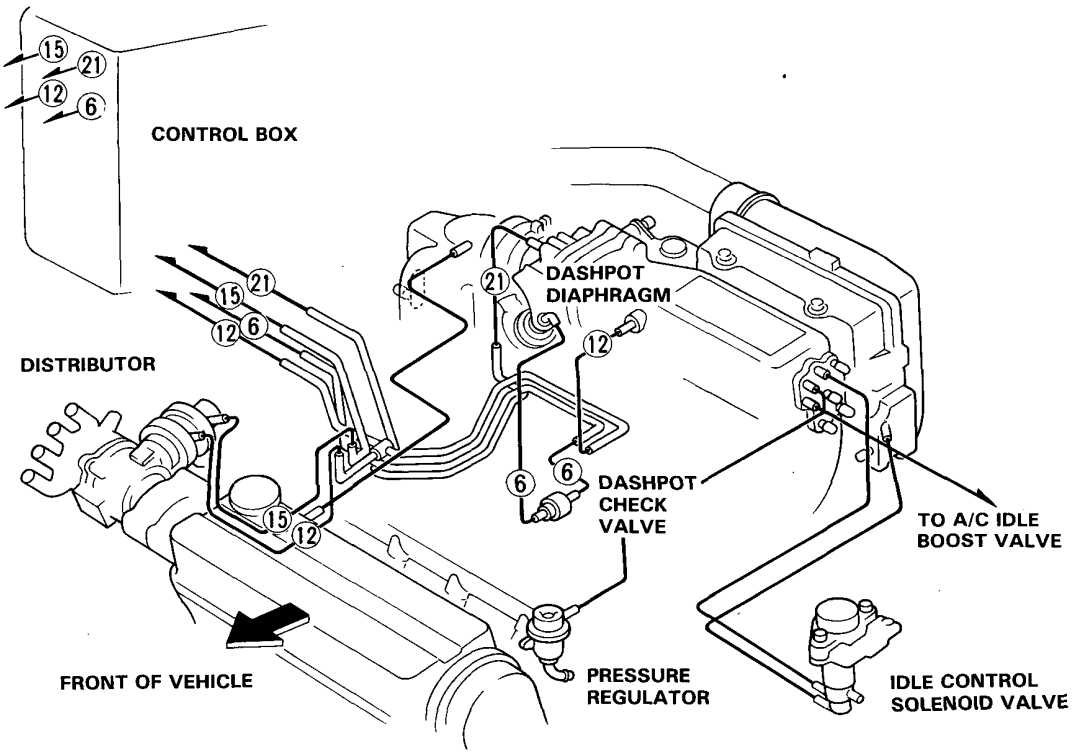


① ELECTRONIC CONTROL UNIT (ECU)
② CRANK ANGLE SENSOR
③ MANIFOLD ABSOLUTE PRESSURE SENSOR
④ ATMOSPHERIC PRESSURE SENSOR
⑤ COOLANT TEMPERATURE SENSOR
⑥ INTAKE AIR TEMPERATURE SENSOR
⑦ THROTTLE ANGLE SENSOR
⑧ OXYGEN SENSOR (KX Model)
⑨ FUEL PUMP
⑩ PRESSURE REGULATOR
⑪ INJECTOR
⑫ RESISTOR
⑬ FUEL TANK
⑭ FUEL FILTER
⑮ A/T IDLE CONTROL SOLENOID VALVE
⑯ IDLE CONTROL SOLENOID VALVE
⑰ IDLE MIXTURE ADJUSTER SENSOR (Except KX Model)
⑱ A/C IDLE BOOST SOLENOID VALVE
⑲ A/C IDLE BOOST VALVE
⑳ DASHPOT DIAPHRAGM
㉑ DASHPOT CHECK VALVE
㉒ ALTERNATOR
㉓ A/T SHIFT POSITION SWITCH
㉔ PGM-FI WARNING LIGHT
㉕ SPEED SENSOR
㉖ MAIN RELAY
㉗ IGNITION SWITCH
㉘ CATALYTIC CONVERTER (KX model)
㉙ CHECK VALVE (KX model)
㉚ COLD ADVANCE SOLENOID VALVE
㉛ VACUUM ADVANCE DIAPHRAGM
㉜ DISTRIBUTOR

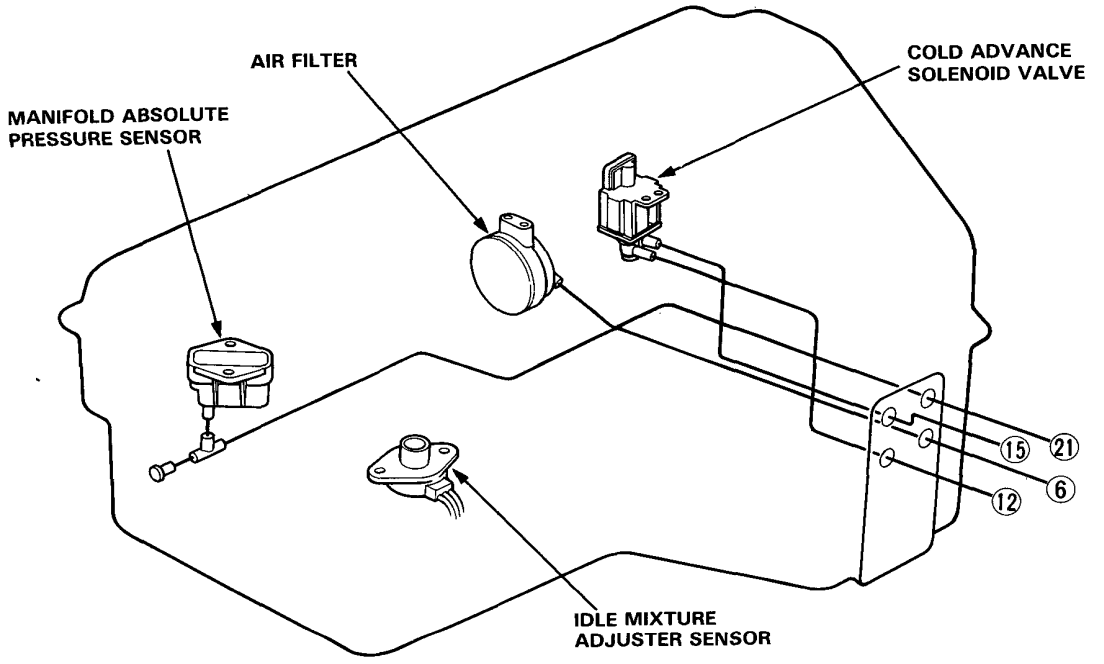
Interconnect Diagram

[Except KE and KX model]

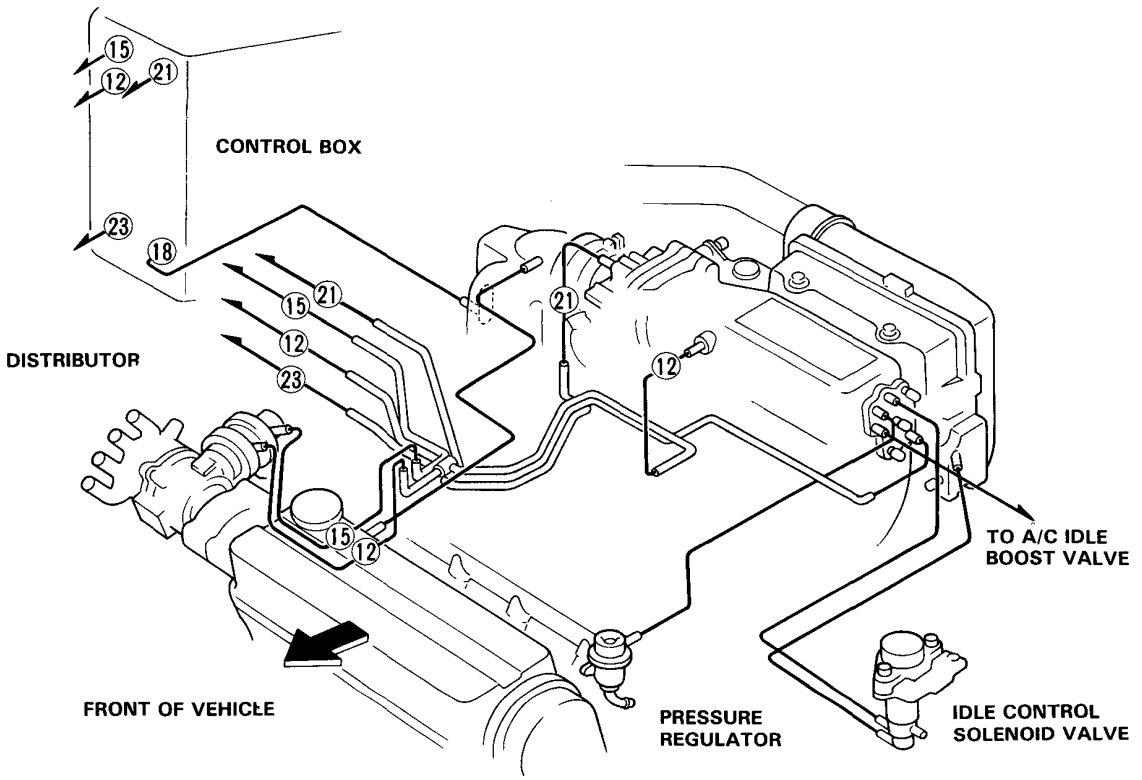
[M/T]



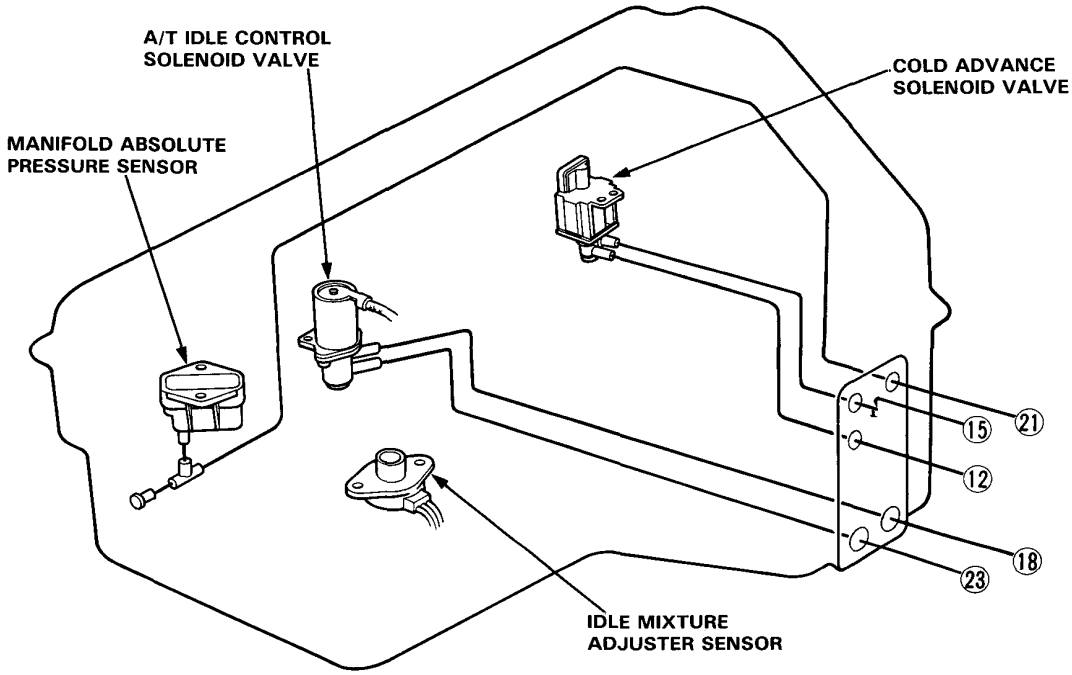
Control Box



[A/T]



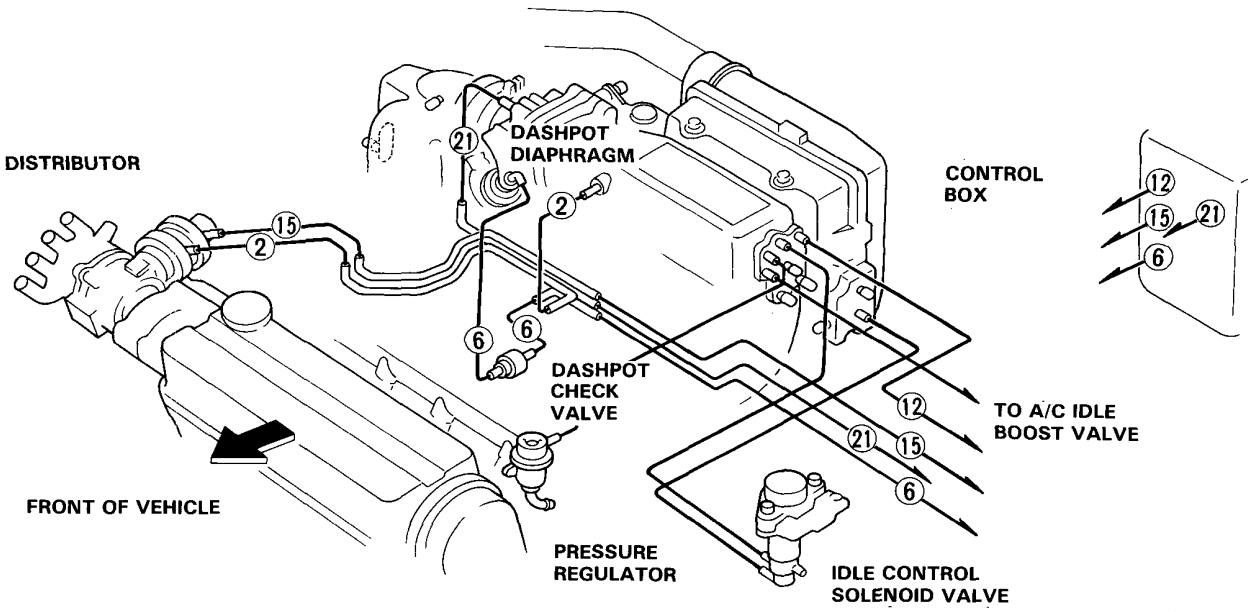
Control Box



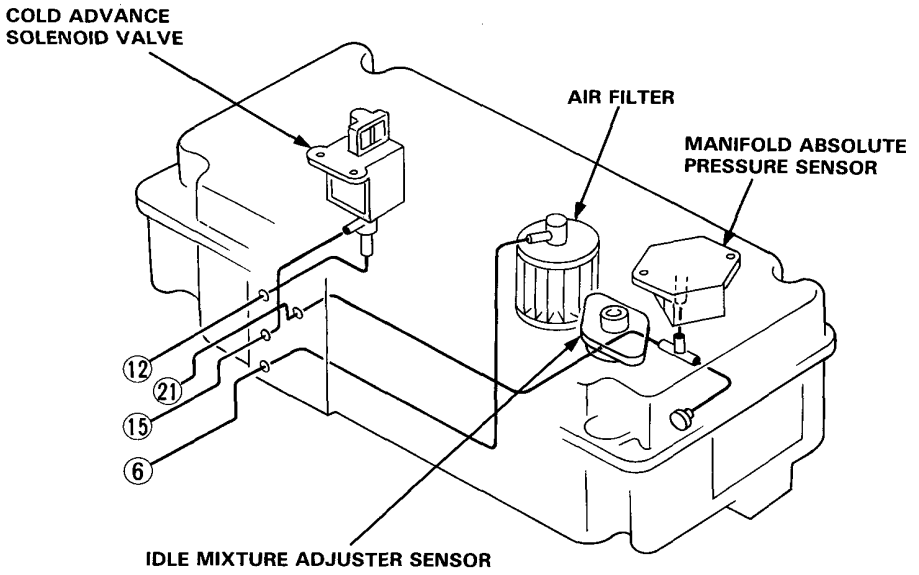
Interconnect Diagram

[KE model]

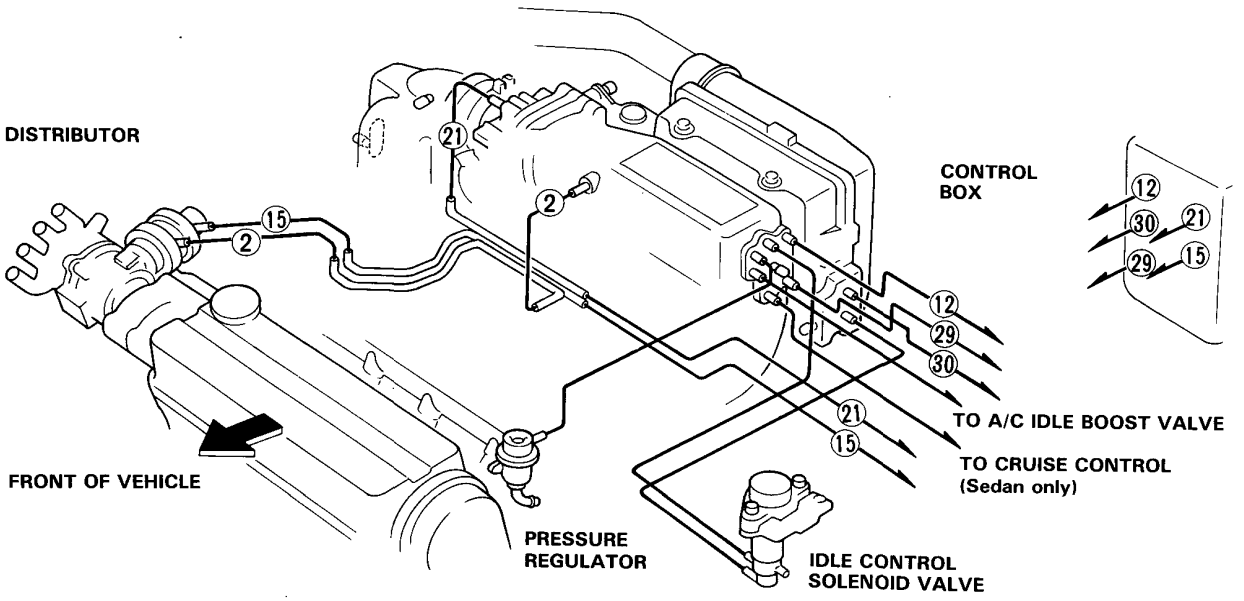
[M/T]



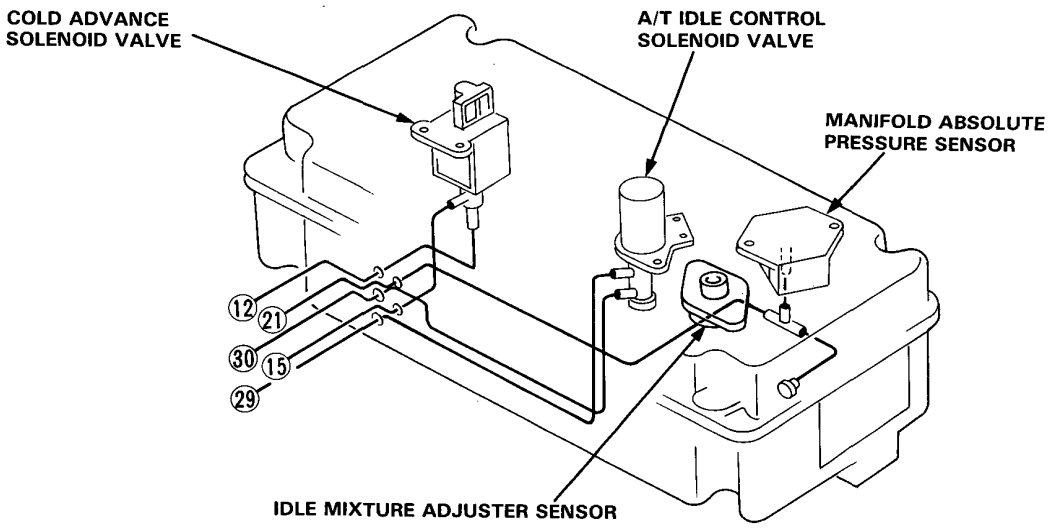
Control Box



[A/T]



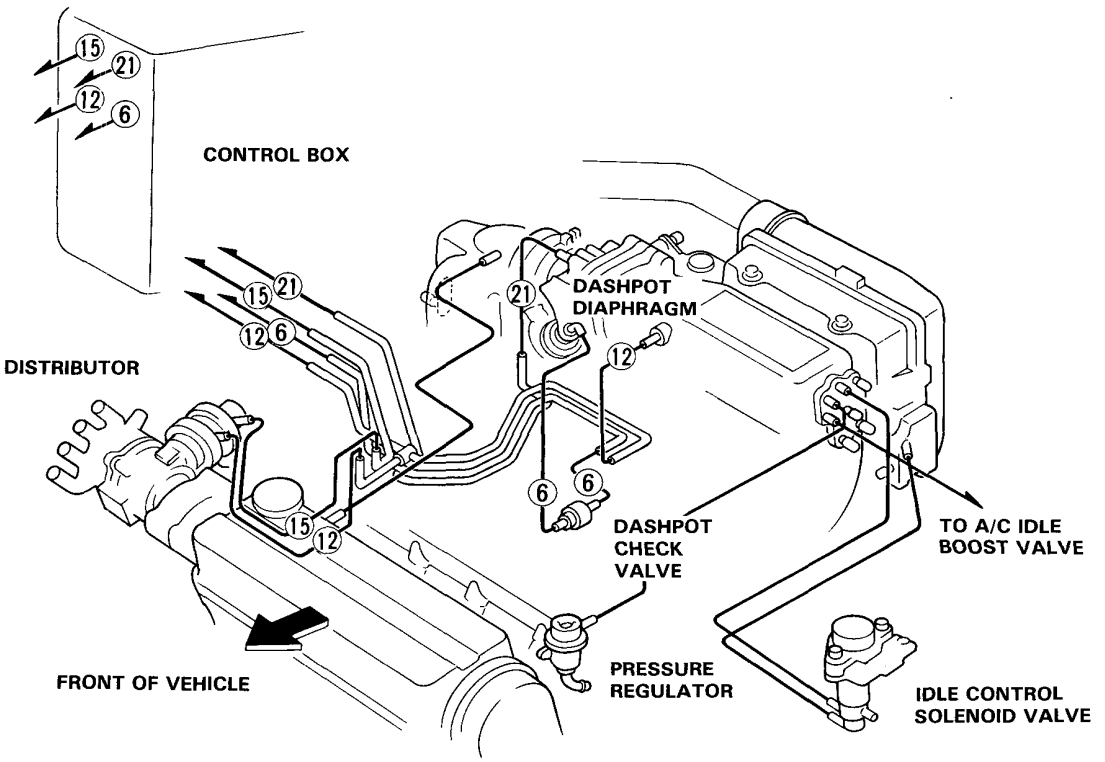
Control Box



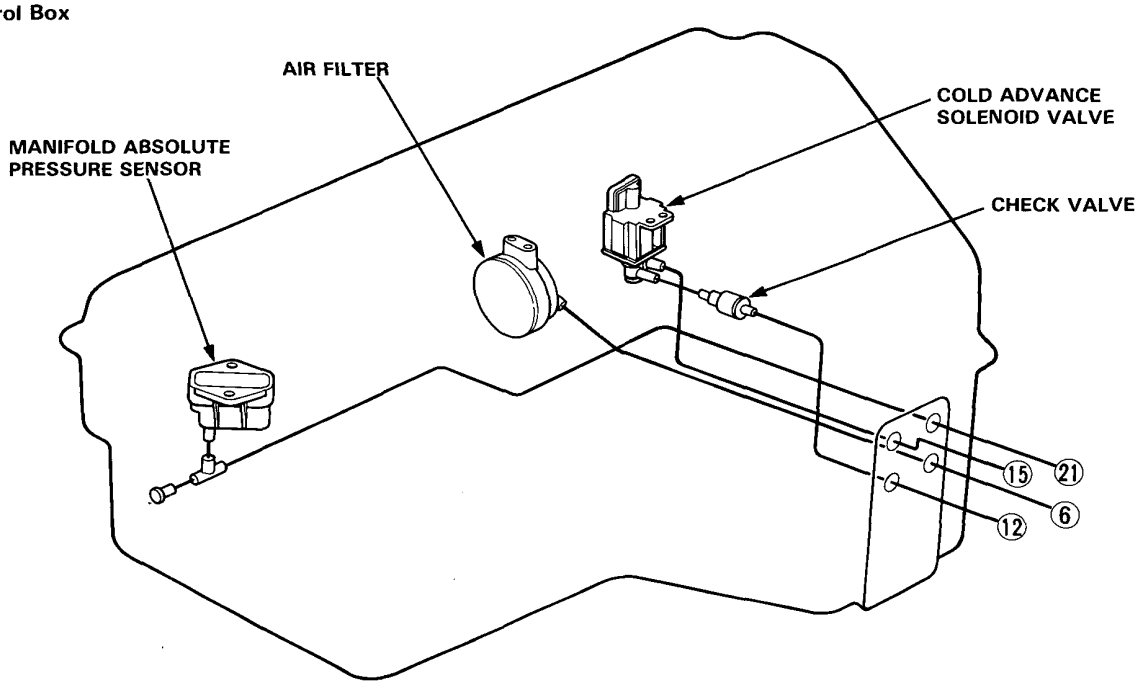
Interconnect Diagram

[KX model]

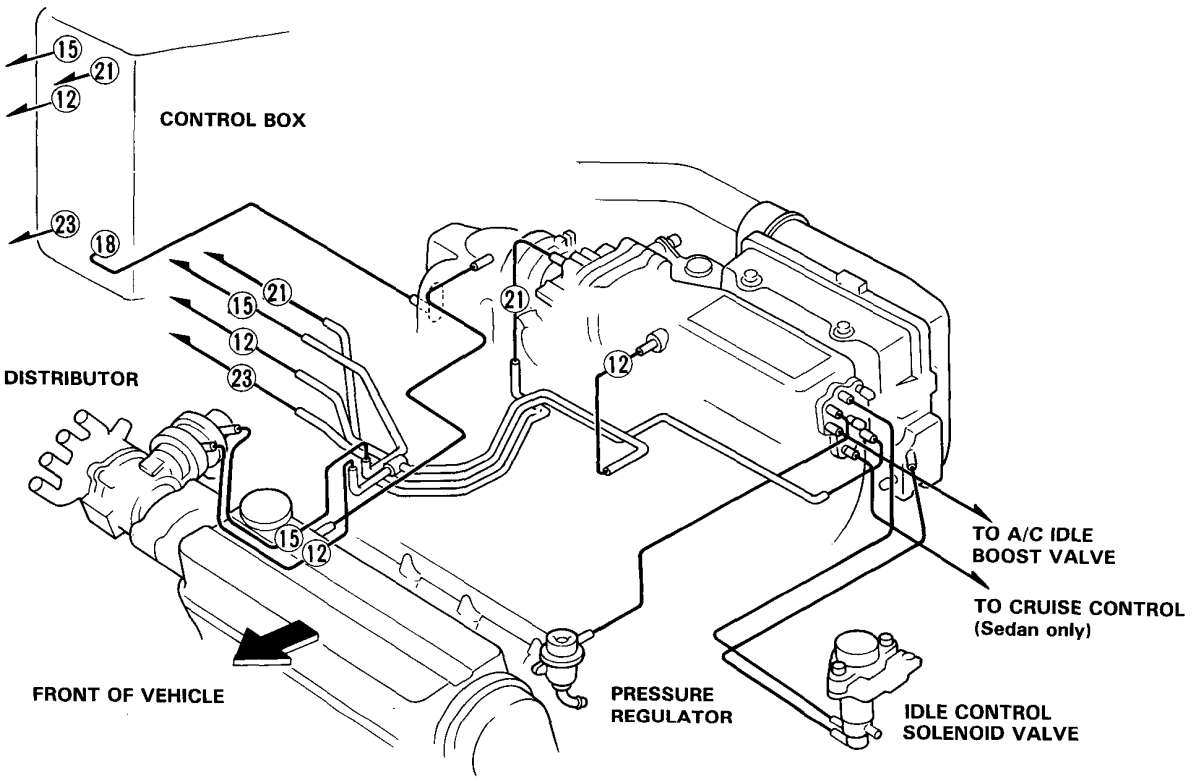
[M/T]



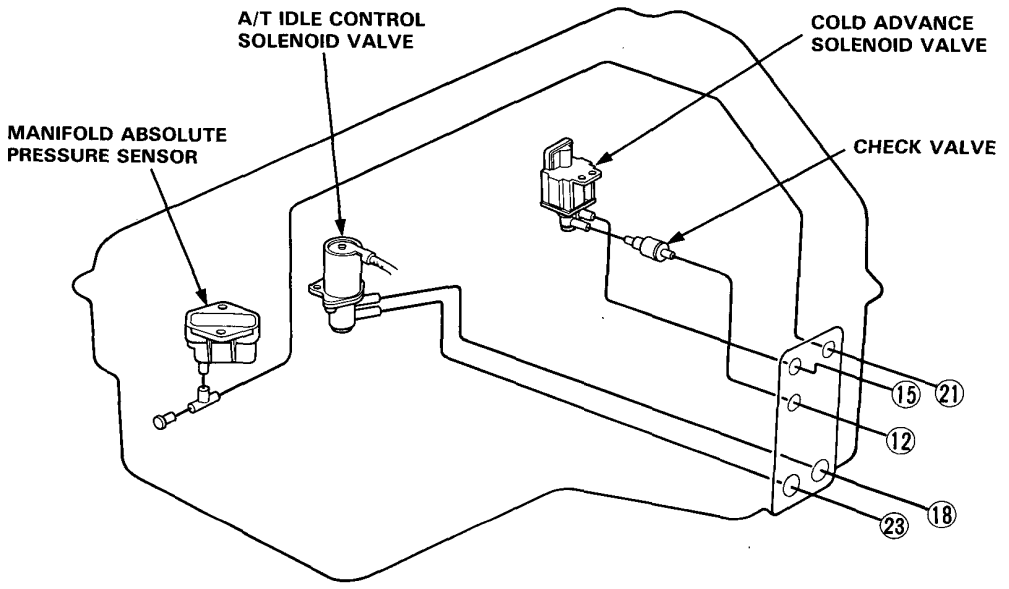
Control Box



[A/T]



Control Box



Troubleshooting

Before starting troubleshooting on the PGM-FI system, check that other items that affect engine performance are within specification. Check the valve clearance, air cleaner, and PCV valve. In addition, check the ignition timing, function of the vacuum and centrifugal advance, and the condition of the spark plugs. If those items are all within specifications, begin with the troubleshooting listed.

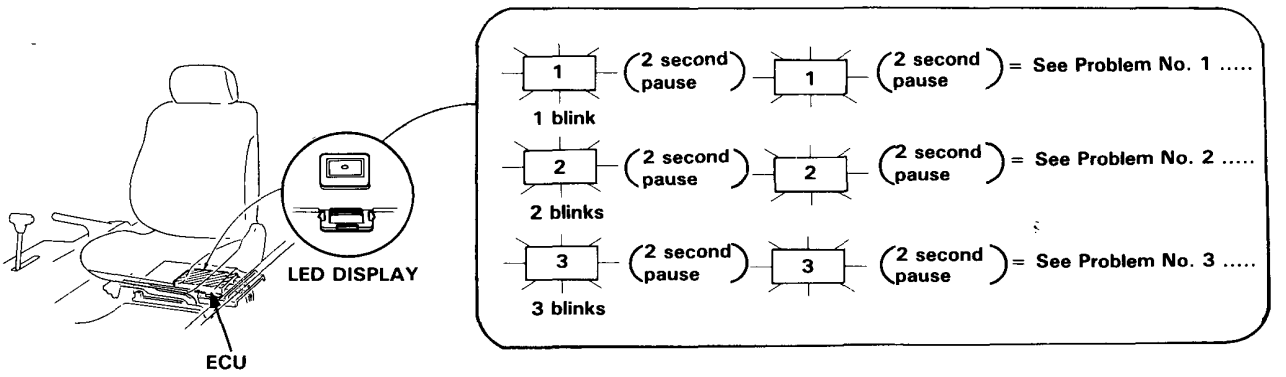
SYMPTOM / CAUSAL PART		ECU	INJECTOR	FUEL PUMP	FUEL LINE	FAST IDLE MECHANISM	THROTTLE BODY	CRANK ANGLE SENSOR	MANIFOLD ABSOLUTE PRESSURE SENSOR
ENGINE WON'T START		FAULTY ECU	• OPEN/SHORT CIRCUIT • DAMAGED INJECTORS	• FAULTY PUMP/MAIN RELAY • POOR GROUNDING	• FROZEN FUEL LINE • BLOCKED FILTER			• OPEN/SHORT CIRCUIT • FAULTY SENSOR	
DIFFICULT TO START ENGINE WHEN COLD		↑	• OPEN/SHORT CIRCUIT • FAULTY INJECTOR	↑	• ICE IN FUEL LINE • CLOGGED FILTER	STUCK AIR BYPASS VALVE		↑	
IRREGULAR IDLING	WHEN COLD	↑	• OPEN/SHORT CIRCUIT • STUCK INJECTOR			↑		↑	• OPEN/SHORT CIRCUIT • BROKEN/DISCONNECTED HOSE • FAULTY SENSOR
	AFTER WARMING UP	↑	↑			↑		↑	↑
	RPM TOO HIGH					↑	• IDLE ADJUSTING SCREW OUT OF ADJUSTMENT • THROTTLE VALVE STUCK OPEN		↑
	RPM TOO LOW						• IDLE ADJUSTING SCREW OUT OF ADJUSTMENT		
FREQUENT STALLING	WHILE WARMING UP	FAULTY ECU	• OPEN/SHORT CIRCUIT • STUCK INJECTOR	• FAULTY PUMP/MAIN RELAY • POOR GROUNDING	• IMPROPER LINE PRESSURE • CLOGGED FILTER	STUCK AIR BYPASS VALVE			• OPEN/SHORT CIRCUIT • BROKEN/DISCONNECTED HOSE • FAULTY SENSOR
	AFTER WARMING UP	↑	↑	↑	↑		IDLE ADJUSTING SCREW OUT OF ADJUSTMENT	• OPEN/SHORT CIRCUIT • FAULTY SENSOR	↑
POOR PERFORMANCE	POOR DRIVEABILITY HIGH FUEL CONSUMPTION	↑	↑	↑	↑	STUCK AIR BYPASS VALVE		↑	↑
	AFTERBURN	↑	↑						↑
	BACKFIRE	↑	↑	• FAULTY PUMP/MAIN RELAY • POOR GROUNDING	• IMPROPER LINE PRESSURE • CLOGGED FILTER				↑
	KNOCKING	↑	↑	↑	↑				
	LACK OF POWER AT LOW RPM	↑	↑	↑	↑				
	LACK OF POWER AT MID RPM	↑	↑	↑	↑				• OPEN/SHORT CIRCUIT • BROKEN/DISCONNECTED HOSE • FAULTY SENSOR
	LACK OF POWER AT HIGH SPEED	↑		↑	↑				↑
WARNING/ INDICATOR LIGHT TURNS ON	PGM-FI WARNING LIGHT	↑						• OPEN/SHORT CIRCUIT • FAULTY SENSOR	↑
	SELF DIAGNOSIS INDICATOR	↑						↑	↑

ATMOSPHERIC PRESSURE SENSOR	OXYGEN SENSOR (KX model)	COOLANT TEMPERATURE SENSOR	THROTTLE ANGLE SENSOR	INTAKE AIR TEMPERATURE SENSOR	IDLE CONTROL SYSTEM	IDLE MIXTURE ADJUSTER SENSOR (Except KX model)	IMPORTANT POINTS
							• CHECK FUEL PUMP/INJECTOR
(AT HIGH ALTITUDE) • OPEN/SHORT CIRCUIT • FAULTY SENSOR		• OPEN/SHORT CIRCUIT • FAULTY SENSOR					• CHECK FUEL PUMP/INJECTOR • POSSIBLE TO START BY OPERATING THROTTLE? (STUCK AIR BYPASS VALVE)
↑		↑					• CHECK IGNITION SYSTEM (SPARKS) AND EACH INJECTOR. POSSIBLE TO START BY OPERATING THROTTLE? (STUCK AIR BYPASS VALVE)
					FAULTY SOLENOID VALVE		↑
							• DISCONNECTED OR LEAKY VACUUM LINES • • CHECK SELF DIAGNOSIS INDICATOR
			SENSOR OUT OF ADJUSTMENT				
		• OPEN/SHORT CIRCUIT • FAULTY SENSOR		• OPEN/SHORT CIRCUIT • FAULTY SENSOR			• CHECK AIR BYPASS VALVE • CHECK COOLANT TEMPERATURE SENSOR
					• FAULTY SOLENOID VALVE (RPM DOWN)		• CHECK IDLE SPEED • CHECK FOR FUEL CUT-OFF OPERATION
	• OPEN/SHORT CIRCUIT • FAULTY SENSOR	• OPEN/SHORT CIRCUIT • FAULTY SENSOR	• OPEN/SHORT CIRCUIT • FAULTY SENSOR	• OPEN/SHORT CIRCUIT • FAULTY SENSOR	FAULTY SOLENOID VALVE (STUCK OPEN)	OPEN/SHORT CIRCUIT	• CHECK IGNITION TIMING • CHECK FOR FUEL CUT-OFF OPERATION
		↑	↑				↑
		↑	↑				• CHECK IGNITION TIMING • CHECK MANIFOLD ABSOLUTE PRESSURE SENSOR/ INJECTORS
		↑	↑				• CHECK IGNITION TIMING
	• OPEN/SHORT CIRCUIT • FAULTY SENSOR	↑	↑				• CHECK IGNITION TIMING (DISCONNECTED OR BROKEN LINES) • CHECK INJECTORS
	↑	↑	↑				• CHECK IGNITION TIMING
							• CHECK MANIFOLD ABSOLUTE PRESSURE SENSOR • CHECK IGNITION TIMING
• OPEN/SHORT CIRCUIT • FAULTY SENSOR	• OPEN/SHORT CIRCUIT • FAULTY SENSOR	• OPEN/SHORT CIRCUIT • FAULTY SENSOR	• OPEN/SHORT CIRCUIT • FAULTY SENSOR	• OPEN/SHORT CIRCUIT • FAULTY SENSOR		• OPEN/SHORT CIRCUIT • FAULTY SENSOR	• CONSULT TROUBLESHOOTING CHART ON PAGE 12-17
↑	↑	↑	↑	↑		↑	↑

Self-Diagnosis Indicator

Troubleshooting

The PGM-FI system's ECU is equipped with a self-diagnosis function. When an abnormality is detected, the PGM-FI dash warning light comes on, and the LED display on the ECU blinks. The location of the PGM-FI control system's trouble can be diagnosed from the frequency of the LED display blinks.



The quick reference chart on the next page covers the failure modes and possible causes for the PGM-FI.
If you run through all the possible causes listed and the problem is still unsolved, go on to the more detailed troubleshooting on the following pages.

Sometimes the PGM-FI dash warning light and/or ECU LED display will come on, indicating a system problem, when, in fact, there is a bad or intermittent electrical connection. To troubleshoot bad connections, note the ECU LED display blink frequency, refer to the diagnosis chart on page 12-17 and check the connectors associated with the items mentioned in the "Possible Cause" column. Clean or repair connections if necessary.

NOTE:

- The memory for the "PGM-FI" dash warning light will be erased when the ignition switch is turned off; however, the memory for the LED display will not be cancelled. Thus, the warning light will not come on when the ignition is again turned on unless the trouble is once more detected. Troubleshooting should be done according to the LED display even if the warning light is OFF.
  If the LED display fails to come on when the ignition switch is turned on again, check for:
  — Blown No. 11 fuse in the engine compartment (also the fuse for the clock).
  — Open circuit in White/Yellow wire between ECU A17 terminal and No. 11 fuse.
  Then, if there is no problem, substitute a known-good ECU and re-check.
- Turn the ignition switch ON. The PGM-FI dash warning light should come on for about 2 seconds.
  If the warning light won't come on, check for:
  — Blown No. 2 fuse (also the fuse for the back-up lights, turn signals, and fuel gauge)
  — Open circuit in Yellow wire between No. 2 fuse and combination meter.
  — Open circuit in Green/Red wire between combination meter and ECU B6 terminal.
  — Open circuit in Black wires between ECU A2, A4 and ground 1.
  — Blown warning light bulb.
  Then, if there is no problem, substitute a known-good ECU and re-check.
- After making repairs, disconnect the No. 11 fuse for at least 10 seconds to reset the ECU memory.
  After reconnecting the fuse, check that the LED display is turned off.

No. of LED Blinks between 2 second pauses	Dash warning light	Symptom	Possible cause
0		• Engine will not start	• Disconnected control unit ground wire • Faulty ECU
		• Engine will not start • No particular symptom shown	• Loose or poorly connected power line to ECU • Disconnected control unit ground wire • Short circuit in combination meter or warning light wire • Faulty ECU
1 [KX Model]		• No particular symptom shown • Erratic idling (Erratic injector, coupler and wiring Insufficient fuel)	• Disconnected oxygen sensor coupler • Spark plug mis-fire • Short or open circuit in oxygen sensor circuit • Faulty oxygen sensor • Faulty fuel system
3		• Fuel fouled plug • Frequent engine stalling • Hesitation	• Disconnected manifold absolute pressure sensor coupler • Short or open circuit in manifold absolute pressure sensor wire • Faulty manifold absolute pressure sensor
5		• Hesitation • Fuel fouled plug • Frequent engine stalling	• Disconnected manifold absolute pressure sensor piping
6		• High idle speed during warm-up • High idle speed • *Hard starting at low temp*	• Disconnected coolant temperature sensor coupler • *Open or short circuit in coolant temperature* sensor wire • Faulty coolant temperature sensor (thermostat housing)
7		• Poor engine response to opening throttle rapidly • High idle speed • Engine does not rev up when cold	• Disconnected throttle angle sensor coupler • Open or short circuit in throttle angle sensor wire • Faulty throttle angle sensor
8		• Engine does not rev up • High idle speed • Erratic idling	• Short or open circuit in crank angle sensor wire • Crank angle sensor wire interfering with spark plug wires • Crank angle sensor at fault
9		• Same as above	• Same as above
10		• High idle speed • Erratic idling when very cold	• Disconnected intake air temperature sensor • Open or short circuit in intake air temperature sensor wire • Faulty intake air temperature sensor
11 [Except KX Model]		• No particular symptom shown • High idle speed	• Disconnected idle mixture adjuster sensor coupler • Shorted or disconnected idle mixture adjuster sensor wire • Faulty idle mixture adjuster sensor
13		• Poor acceleration at high altitude • Hard starting at high altitude when cold	• Disconnected atmospheric pressure sensor coupler • Shorted or disconnected atmospheric pressure sensor wire • Faulty atmospheric pressure sensor

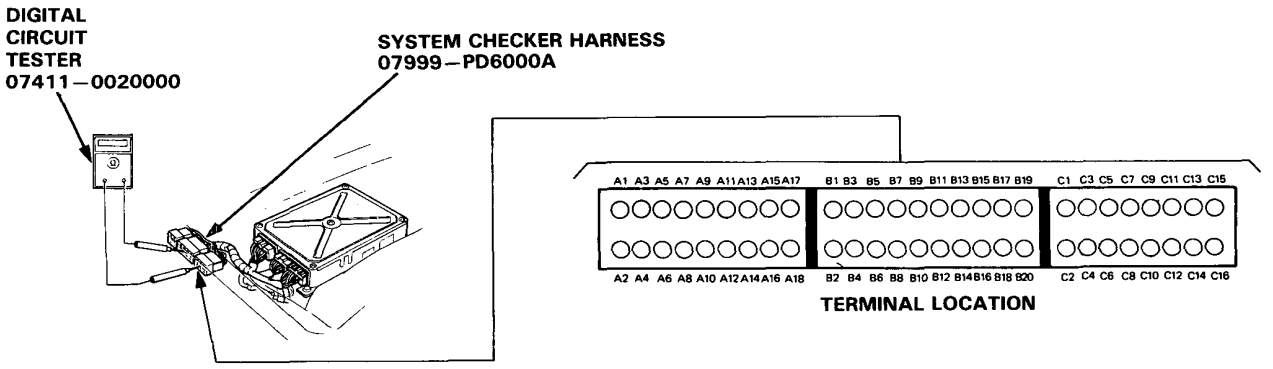
NOTE:

- If the number of blinks between 2 second pauses otherwise above, or if the LED indicator stays on, substitute a known-good ECU and re-check. If the indication goes away, replace the original ECU.
- Some failure indications (such as , one blink) require the full test procedures on the following pages to confirm that the failure has or has not been eliminated.

(cont'd)

Troubleshooting (cont'd)

Use the system checker harness and digital circuit tester to check the system.



0 — Self-diagnosis indicator remains off — The dash warning light is not lit.

Connect the system checker harness between the ECU and connector.

Check for continuity between the A2 (Black), the A4 (Black) terminals and body ground.

Does continuity exist?

NO — Faulty ground circuit at GND 1.

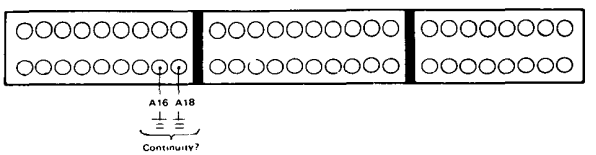
YES

Substitute a known-good ECU and re-check. If symptom goes away, replace the original ECU. If symptom does not go away, check to see if the dash warning light is on and the LED indicator is now blinking, and troubleshoot the true cause.

0 — Self-diagnosis indicator remains off — The dash warning light is lit.

Connect the system checker harness between the ECU and connector.

Check for continuity between the A16 (Brown/Black), the A18 (Black/Red) terminals and body ground.



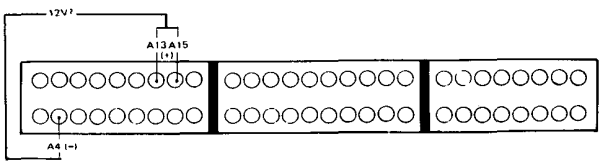
Does continuity exist?

NO — Faulty ground circuit at GND 2.

YES

Turn the ignition switch ON.

Measure voltage between A15 (Yellow/Black (+)), the A13 (Black/Yellow (+)) terminals and the A4 terminal (Black (—)).



(To page 12-19)

(From page 12-18)

Is 12 V available?

NO
- No. 1 fuse (10 A) in the engine compartment blown
- Open circuit in Yellow/Blue wire between No. 1 fuse and main relay
- Faulty main relay
- Open circuit in Yellow/Black wire between main relay and ECU
- No. 1 fuse (15 A) blown (fuel pump is not working).
- Open circuit in Black/Yellow wire between No.1 fuse and main relay
- Open circuit in main relay ground wire (Black)
- Faulty ECU.

NOTE: No voltage available.

YES

Check for short circuits in the Green/Red wire between the combination meter and B6 terminal (Gree/Red), as well as in the combination meter printed circuit board.

Are wires normal?

NO — Faulty circuit or combination meter.

YES

Substitute a known-good ECU and re-check. If symptom/indication goes away, replace the original ECU.

1 Self diagnosis indicator blinks once [KX model]

NOTE: First, check the spark plugs.
Plug mis-fire can be another source of this trouble.

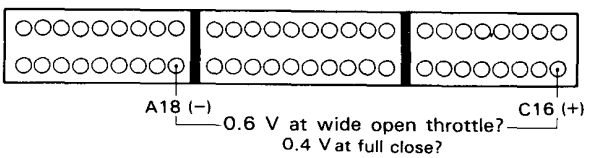
Warm up engine to operating temperature.

Rev up and slow down engine between idle and 4,000 min^{-1} (rpm) quickly.

Stop engine.

Connect system checker harness between ECU and connector.

Attach positive probe of voltmeter to C16 terminal (White) of checker, and negative probe to A18 (Black/Red) terminal.



Restart the engine, then open the throttle wide open then close it.

Check that voltage rises over 0.6 V at wide open throttle, and falls below 0.4 V at full close.

Is voltage above 0.6 V ... below 0.4 V?

NO
- Stop engine.
- Disconnect engine wire harness from oxygen sensor.

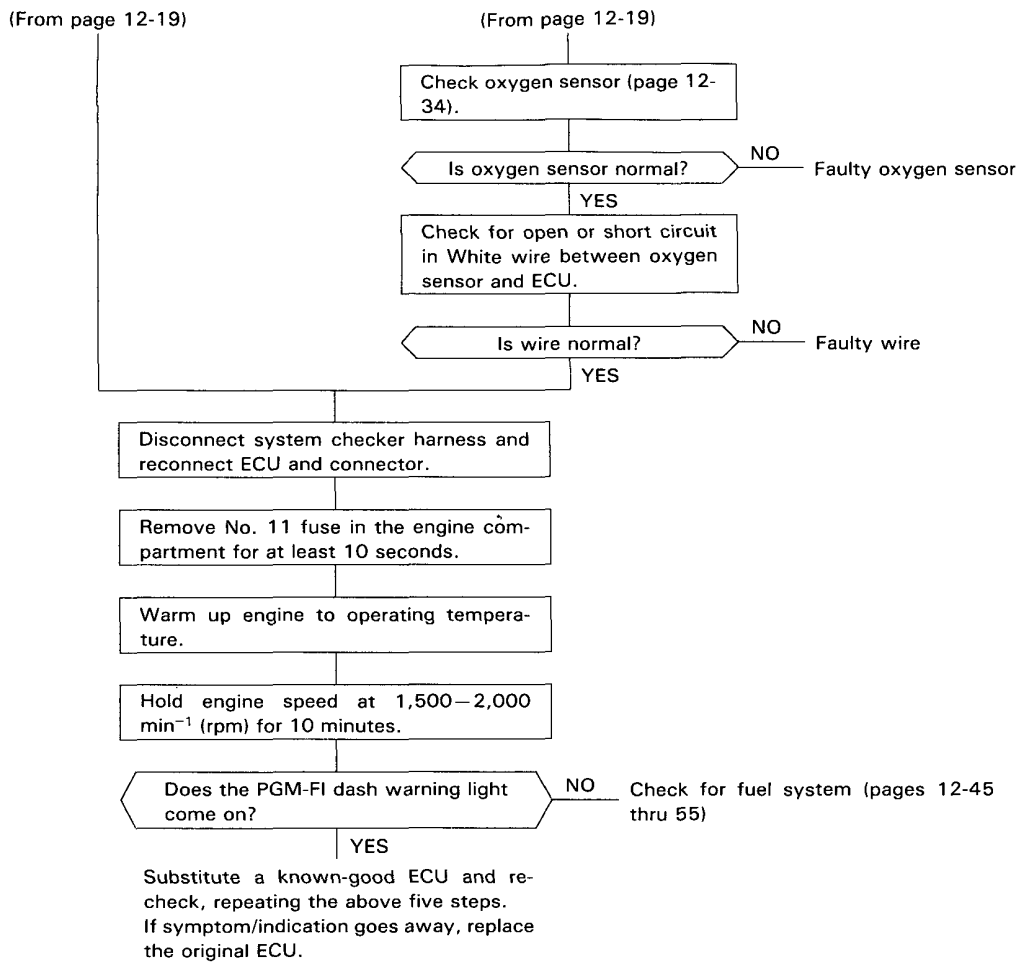
(To page 12-20)

YES

(To page 12-20)

(cont'd)

Troubleshooting (cont'd)



3 **Self diagnosis indicator blinks three times.**

Connect system checker harness between the ECU and connector.

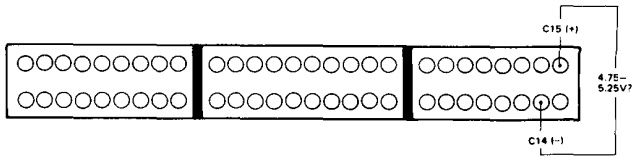
Turn ignition switch ON.

Measure voltage between C15 terminal (Red/White (+)) of system checker harness and C14 terminal (Blue/White (–)).

Is voltage between 4.75 and 5.25 V?

NO

Substitute a known-good ECU and re-check.
If prescribed voltage is now available, replace the original ECU.



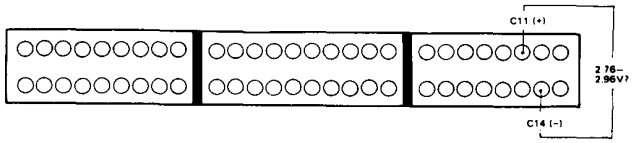
YES

Measure voltage between C11 terminal (White/Blue (+)) of system checker harness and C14 terminal (Blue/White (–)).

Is voltage between 2.76 and 2.96 V?

NO

Open or short circuit in White/Blue wire or Blue/White wire between manifold absolute pressure sensor and ECU.
Faulty manifold absolute pressure sensor.



NOTE: If the voltage is below the specified range, there are open or poorly connected wires. If the wires are normal, the manifold absolute pressure sensor is at fault.

YES

Substitute a known-good ECU and re-check.
If symptom/indication goes away, replace the original ECU.

(cont'd)

Troubleshooting (cont'd)

5 — Self diagnosis indicator blinks five times.

Check that the manifold absolute pressure sensor pipe is connected securely.

NOTE: Also check hose routing inside control box.

Is routing normal? — NO — Reconnect routing

YES

Disconnect pipe from manifold absolute pressure sensor and plug open end.

Disconnect vacuum hose #21 from throttle body.

Connect hand vacuum pump to vacuum hose #21 and check for a leak.

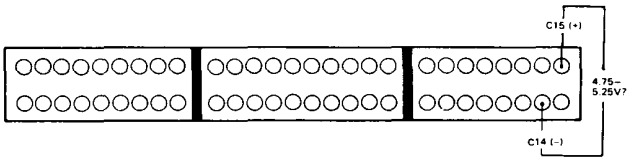
Is vacuum maintained? — NO — Replace vacuum hose.

YES

Connect system checker harness between the ECU and connector.

Turn ignition switch ON.

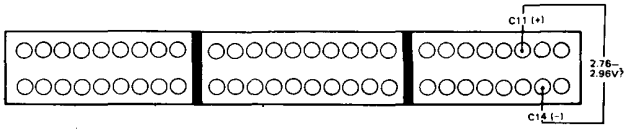
Measure voltage between C15 terminal (Red/White (+)) of system checker harness and C14 terminal (Blue/White (−)).



Is voltage between 4.75 and 5.25 V? — NO — Substitute a known-good ECU and re-check.
If prescribed voltage is now available, replace the original ECU.

YES

Measure voltage between C11 terminal (White/Blue (+)) of system checker harness and C14 terminal (Blue/White (−)).



Is voltage between 2.76 and 2.96 V? — NO — Open or short circuit in White/Blue or Blue/White wire between manifold absolute pressure sensor and ECU.
Faulty manifold absolute pressure sensor.

NOTE: If there is no voltage, or if voltage is low, check for a shorted wire.
If voltage is high, wire may be open or bad contact.
If wire is normal, manifold absolute pressure sensor is at fault.

YES

Connect hand vacuum pump to manifold absolute pressure sensor.

Check that voltage changes as vacuum is applied.

Has voltage changed? — NO — Faulty manifold absolute pressure sensor

YES

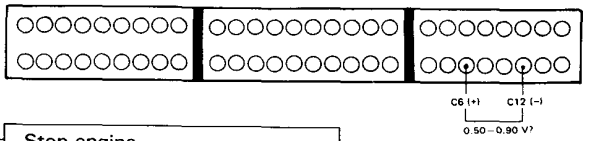
Substitute a known-good ECU and re-check.
If symptom/indication goes away, replace the original ECU.

6 Self diagnosis indicator blinks six times.

Connect system checker harness between the ECU and connector.

Warm up engine until radiator fan comes on twice.

Measure voltage between C6 terminal (Yellow/Green (+)) of system harness checker and C12 terminal (Green/White (−)).



Is voltage between 0.50 and 0.90 V?

NO → Stop engine.

YES

Substitute a known-good ECU and re-check.
If symptom/indication goes away, replace the original ECU.

Check for open or short circuit in Yellow/Green and Green/White wires between coolant temperature sensor and the ECU.

NOTE: If there is no voltage or if voltage is low, check for shorted wire. If voltage is high, wire may be open or bad contact.

Are wires normal?

NO → Faulty wires

YES

Check coolant temperature sensor (page 12-36).

Is sensor normal?

NO → Faulty coolant temperature sensor

YES

Substitute a known-good ECU and re-check.
If symptom/indication goes away, replace the original ECU.

(cont'd)

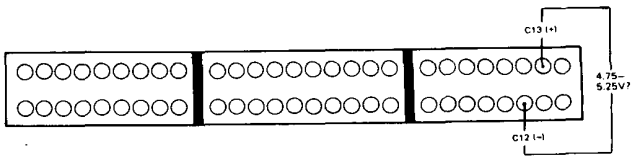
Troubleshooting (cont'd)

7 Self diagnosis indicator blinks seven times.

Connect system checker harness between ECU and connector.

Turn ignition switch ON.

Measure voltage between C13 terminal (Yellow/White (+)) of system checker harness and C12 terminal (Green/White (−)).



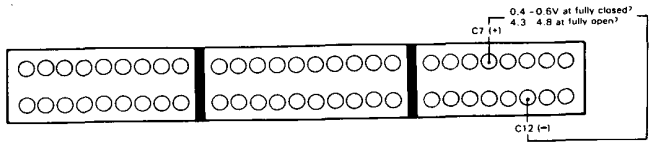
Is 4.75—5.25 V attained?

NO — Substitute a known-good ECU and re-check.
If prescribed voltage is now available, replace the original ECU.

YES

Connect voltmeter positive probe to C7 terminal (Red/Yellow), and negative probe to C12 terminal (Green/White (−)) of system checker harness.

Operate accelerator pedal from fully closed to fully open.



Check that 0.4—0.6 V is available at fully closed, and 4.3—4.8 V at fully open.

Are voltages within above ranges?

NO — Check for short or open circuit in Red/Yellow and Green/White wires between the ECU and throttle angle sensor.

Are wires normal?

NO — Replace wires

YES

Adjust or replace throttle angle sensor (page 12-37).

YES

Substitute a known-good ECU and re-check.
If symptom/indication goes away, replace the original ECU.

8 Self diagnosis indicator blinks eight times.

Check for open or short circuit in Orange/Blue and White/Blue wires between the ECU and crank angle sensor.

NOTE: Check that crank angle sensor harness is not interfering with the spark plug wires.

Are wires normal?

NO — Replace wires

YES

Check crank angle sensor (page 12-38).

Does crank angle sensor operate properly?

NO — Faulty crank angle sensor

YES

Substitute a known-good ECU and re-check.
If symptom/indication goes away, replace the original ECU.

9 Self diagnosis indicator blinks nine times.

Check for open or short circuit in Orange and White wires between the ECU and crank angle sensor.

NOTE: Check that sensor harness is not interfering with the spark plug wires.

Are wires normal? — NO → Replace wires

YES

Check crank angle sensor (page 12-38).

Is sensor normal? — NO → Faulty crank angle sensor

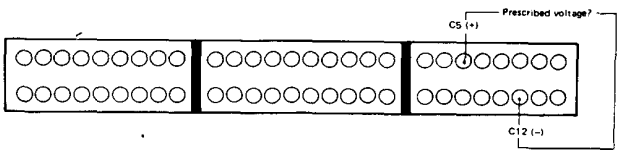
YES

Substitute a known-good ECU and re-check.
If symptom/indication goes away, replace the original ECU.

10 Self diagnosis indicator blinks ten times.

Connect system checker harness between the ECU and harness connector.

Attach voltmeter positive probe to C5 terminal (White/Red), and negative probe to C12 terminal (Green/White) of system checker harness.



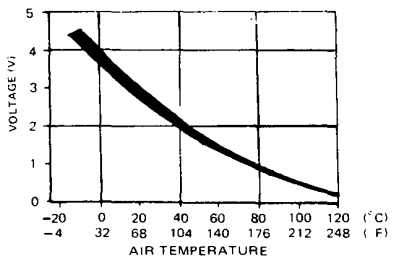
Turn igniton switch ON.

Check that voltage is correct for the intake air temperature.

Is voltage correct? — NO → Turn ignition switch OFF.

YES

Substitute a known-good ECU and re-check.
If symptom/indication goes away, replace the original ECU.



Check for open or short circuit in White/Red and Green/White wires between intake air temperature sensor and the ECU.

NOTE: If voltage is low, or there is no voltage, check wires for short circuit. If voltage is high, probability is open or bad contact.

Are wires normal? — NO → Faulty wires

YES

Check intake air temperature sensor (page 12-36).

Is sensor normal? — NO → Faulty intake air temperature sensor

YES

Substitute a known-good ECU and re-check.
If prescribed voltage is now available, replace the original ECU.

(cont'd)

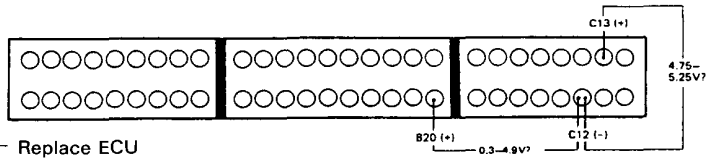
Troubleshooting (cont'd)

11 **Self diagnosis indicator blinks eleven times [Except KX model].**

Connect system checker harness between the ECU and harness connector.

Turn ignition switch ON.

Measure voltage between C13 terminal (Yellow/White (+)) of system checker harness and C12 terminal (Green/White (−)).



Is 4.75—5.25 V available? NO → Replace ECU

YES

Measure voltage between B20 terminal (Brown (+)) of system checker harness and C12 terminal (Green/White (−)).

Is 0.3—4.9 V available? NO → Turn Ignition switch OFF.

YES

Substitute a known-good ECU and re-check. If symptom/indication goes away, replace the original ECU.

Check for open or short circuit in Brown and Green/White wires between idle mixture adjuster sensor and the ECU.

NOTE: If there is no voltage, check for short circuit in the wires. If voltage is high, probability is open or bad contact.

Are wires normal? NO → Faulty wires.

YES

Check idle mixture adjuster sensor (page 12-34).

Does sensor operate properly? NO → Faulty idle mixture adjuster sensor.

YES

Substitute a known-good ECU and re-check. If symptom/indication goes away, replace the original ECU.

13 Self diagnosis indicator blinks thirteen times.

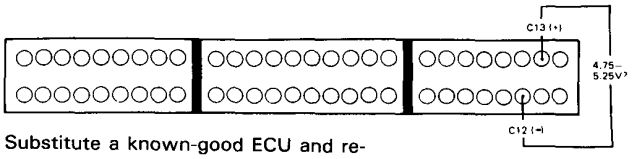
Connect system checker harness between the ECU and harness connector.

Turn ignition switch ON.

Measure voltage between C13 terminal (Yellow/White (+)) of system checker harness and C12 terminal (Green/White (–)).

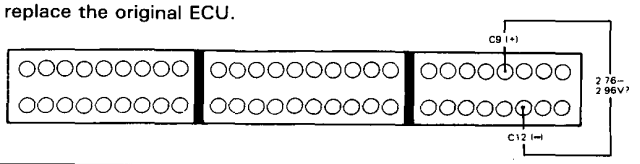
Is 4.75–5.25 V available?

NO → Substitute a known-good ECU and re-check.
If prescribed voltage is now available, replace the original ECU.



YES

Measure voltage between C9 terminal (Red (+)) of system checker harness and C12 terminal (Green/White).



Is 2.76–2.96 V available?

NO → Turn Ignition switch OFF.

YES

Substitute a known-good ECU and re-check.
If symptom/indication goes away, replace the original ECU.

Check for open or short circuit in Red and Green/White wires between atmospheric pressure sensor and the ECU.

NOTE: If there is no voltage, check for a short circuit. If voltage is high, wires may be open or bad contact.

Are wires normal?

NO → Faulty wires.

YES

Check atmospheric pressure sensor (page 12-38).

Does sensor operate properly?

NO → Faulty atmospheric pressure sensor.

YES

Substitute a known-good ECU and re-check.
If prescribed voltage is now available, replace the original ECU.

Idle Control

Troubleshooting

Part / Symptom	Idle control solenoid valve	A/T idle control solenoid valve	A/C idle boost solenoid valve	A/C idle boost valve	Throttle body
Idle speed does not increase after initial start-up.	Valve failure/ pinched vacuum hose				Adjusting screw out of adjustment
Idle speed too high in neutral.	Leaky solenoid valve	Leaky solenoid valve	Valve failure		↑ Valve stuck open
Idle speed changes under electrical load.	Valve failure/ pinched vacuum hose				↑ Throttle angle sensor out of adjustment
Idle speed drops when blipping throttle with electrical load.					
On models with automatic transmission, the idle speed drops in gear.					
Idle speed drops when A/C switch is turned ON.	Valve failure/ pinched vacuum hose	Valve failure/ pinched vacuum hose	Valve failure/ pinched vacuum hose	Adjusting bolt out of adjustment	
Idle speed fluctuates when idle control comes into operation.	Valve failure				

Fast idle mechanism	Starter switch signal	Alternator FR terminal signal	A/T shift position signal	A/C switch signal	ECU	Remarks
	Open circuit				Failure in ECU	Is signal available at ECU?
Leaky fast idle valve					Failure (signal not stopped)	• Pinch idle control solenoid valve hose and re-adjust. • Any intake or bypass leak.
					Failure (signal not available)	Is idle control solenoid valve working?
		Open circuit			Failure in ECU	Is there big difference between no load and loaded conditions?
			Abnormal signal		↑	• Is shift signal available at ECU? • Is A/T idle control solenoid valve working?
				Open circuit	↑	• Is vacuum applied to A/C idle boost valve? • Is A/C idle boost valve openning adjusted properly?
					↑	Is condition improved when solenoid valve is replaced?

(cont'd)

Troubleshooting (cont'd)

Starter Switch Signal Inspection

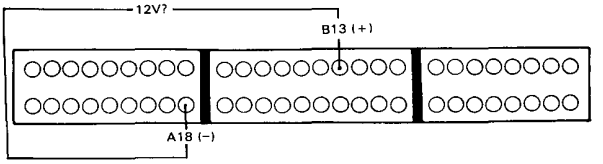
Connect system checker harness between ECU and wire harness connector.

Attach positive probe of voltmeter to B13 terminal (Blue/Red), and negative probe to A18 terminal (Black/Red) of system checker harness.

Turn ignition switch to START.

Is battery voltage available?

NO — Blown No. 10 fuse (7.5 A)
Open circuit in Blue/Red wire between No. 10 fuse and ECU



Alternator FR Terminal Signal Inspection

Before inspection, check operation of alternator as follows:
With the engine running, and the upper vacuum hose of idle control solenoid valve pinched (to cut off the idle control system), turn the headlights on and off.
Engine rpm should be changed. If engine rpm remains steady, re-charge battery and re-test.

Connect system checker harness between ECU and wire harness connector.

Attach positive probe of voltmeter to B14 terminal (White/Red), and negative probe to A18 terminal (Black/Red) of system checker harness.

Start engine.

Turn headlights ON and OFF.

Check that voltage drops when headlights are ON, and rises when headlights are OFF, within 0 and 5 V.

Is voltage changed?

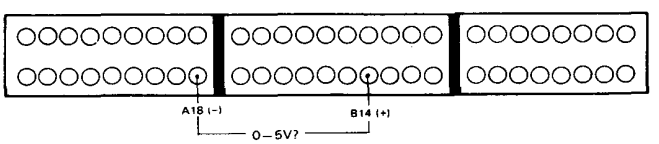
NO — Stop engine.

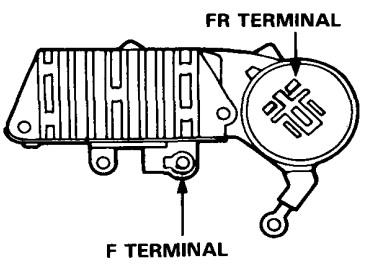
Check for continuity in White/Red wire between alternator and ECU.

Is there continuity?

NO — Open circuit in harness

YES — Faulty voltage regulator or alternator





NOTE: FR terminal diode is faulty if continuity or no continuity exists in both directions between F and FR terminals of voltage regulator.

A/T Shift Position Signal Inspection

Connect system checker harness between ECU and wire harness connector.

Attach positive probe of voltmeter to B7 terminal (Green) and negative probe to A18 terminal (Black/Red) of system checker harness.

Turn ignition switch ON.

Move shift lever into gear.

Check that more than 5 V appears in positions other than "N" (0 V in "N").

Is correct voltage available?

NO
- Open circuit in Green wire between A/T position indicator and ECU.
- Faulty A/T "N" switch

YES

Turn ignition switch OFF.

Connect positive probe of voltmeter to B9 terminal (Green/White) and negative probe to A18 terminal (Black/Red) of system checker harness.

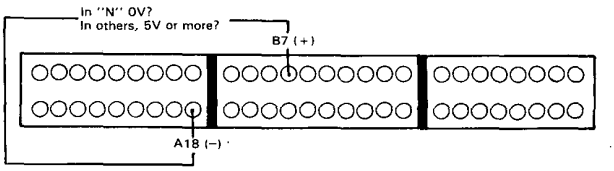
Turn ignition switch ON.

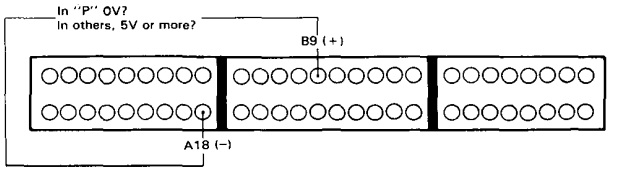
Move shift lever into gear.

Check that more than 5 V appears in positions other than "P" (0 V in "P").

Is correct voltage available?

NO
- Open circuit in Green/White wire between A/T position indicator and ECU.
- Faulty A/T "P" switch





(cont'd)

Troubleshooting (cont'd)

Air Conditioner Switch Signal Inspection

Connect system checker harness between ECU and wire harness connector.

↓

Start engine.

↓

Blower switch ON.

↓

A/C switch ON.

↓

Check that compressor and condenser cooling fan work.

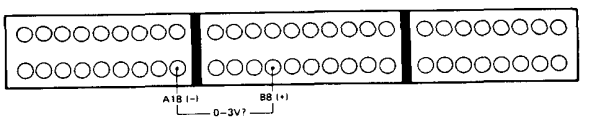
↓

Measure voltage between B8 terminal (Blue/Red (+)) and A18 terminal (Black/Red (−)) of system checker harness.

↓

Is 0—3 V available?

NO — Open circuit in Blue/Red wire between A/C diode coupler and ECU.



NOTE: Voltage will be over 9 V if compressor or condenser cooling fan stops when power is cut off by pressure switch or thermostat.

Idle Control Solenoid Valve Inspection

Connect system checker harness between ECU and wire harness connector.

↓

Attach positive probe of voltmeter to A11 terminal (Green/Black) and negative probe to A18 terminal (Black/Red) of system checker harness.

↓

Start engine.

NOTE: Measure within 10 seconds.

↓

Is 0—1.5 V available?

NO —
- Open circuit in Black/Yellow wire between No. 1 fuse (15 A) and idle control solenoid valve.
- Open circuit in Green/Black wire between idle control solenoid valve and ECU.
- Open circuit in idle control solenoid valve.
- Faulty ECU. NOTE: Voltage should be above 9 V.

NOTE: No voltage available.

YES

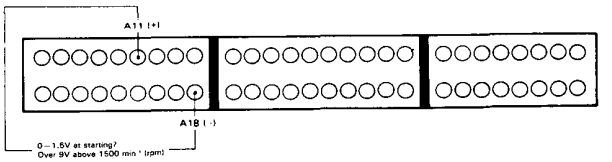
↓

Raise engine speed over 1,500 min^{-1} (rpm).

↓

Is more than 9 V available?

NO — Faulty ECU.



A/T Idle Control Solenoid Valve Inspection

NOTE: Apply parking brake securely.

Connect system checker harness between ECU and wire harness connector.

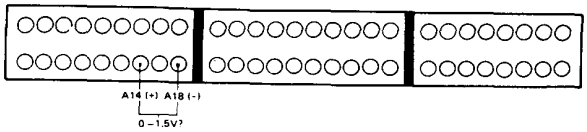
Start engine.

Shift transmission into "D_3" or "D_4".

Measure voltage between A14 terminal (Green (+)) and A18 terminal (Black/Red (−)) of system checker harness.

Is 0—1.5 V available?

NO



- Open circuit in Black/Yellow wire between No. 1 fuse (15 A) and A/T idle control solenoid valve.
- Open circuit in Green wire between A/T idle control solenoid valve and ECU.
- Open circuit in A/T idle control solenoid valve

NOTE: No voltage available.

- Faulty ECU. NOTE: Voltage should be above 9 V.

A/C Idle Boost Solenoid Valve Inspection

Connect system checker harness between ECU and wire harness connector.

Start engine.

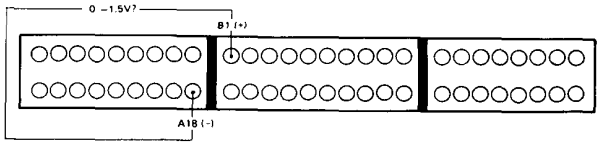
Turn A/C switch ON.

Check that compressor and condenser cooling fan work.

Measure voltage between B1 terminal (Blue/Yellow (+)) and A18 terminal (Black/Red (−)) of system checker harness.

Is 0—1.5 V available?

NO



- Open circuit in Yellow/Black wire between No. 5 fuse (10 A) and A/C idle boost solenoid valve
- Open circuit in Red wire between A/C idle boost solenoid valve and ECU
- Open circuit in A/C idle boost solenoid valve

NOTE: No voltage available.

- Faulty ECU. NOTE: Voltage should be above 9 V.

(cont'd)

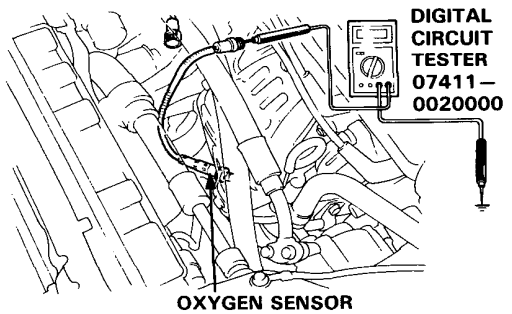
Oxygen Sensor [KX model]

1. Disconnect the connector of the oxygen sensor.
2. Start the engine and warm up for 2 minutes at 3,000 min^{-1} (rpm) under no load. Raise the engine speed to 4,000 min^{-1} (rpm) and release the throttle suddenly at least 5 times.
3. Within one minute after the engine has been warmed up, measure the voltage between the connector terminal and body ground as described in steps 4 and 5.

   NOTE: If it takes more than one minute to complete the checks, warm up the engine as in step 2 before continuing.
4. Raise the engine speed to 5,000 min^{-1} (rpm), then lower to 2,000 min^{-1} (rpm) by operating the accelerator pedal.

   Voltage should be below 0.4 V.
5. Disconnect the vacuum hose # 21 from the throttle body; plug the opening in the throttle body. Connect a vacuum pump to the open end of the vacuum hose and apply 300 mmHg, and raise the engine speed to 4,000 min^{-1} (rpm).

   Voltage should be above 0.6 V.



- Replace the oxygen sensor if the voltages are out of the above ranges.

6. Reconnect the connector.

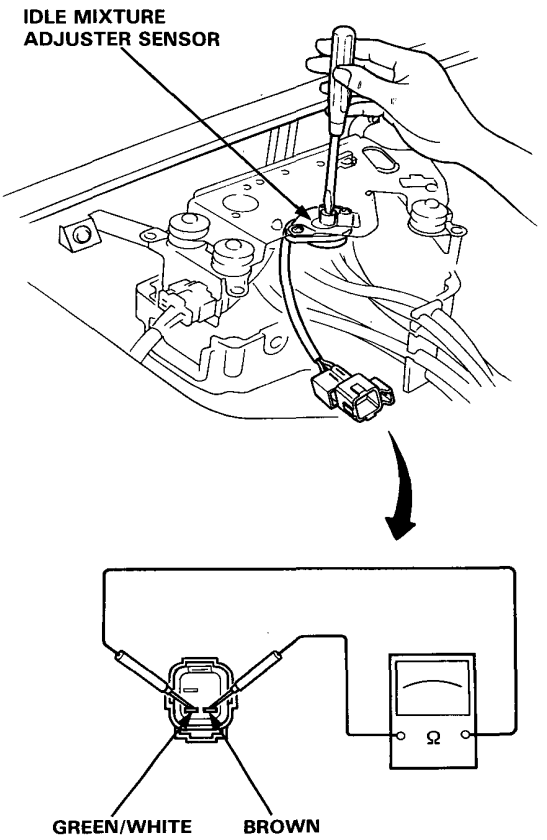
   NOTE:
   - Avoid damaging the wire harness.
   - To prevent cross-threading, first tighten the sensor finger tight, then tighten to the specified torque with a torque wrench.
   - Oxygen sensor does not operate when its intake is clogged.
   - Be extremely careful not to spray anything over the oxygen sensor.

Idle Mixture Adjustor (IMA) Sensor

[Except KX model]

1. Open the control box lid and disconnect the connector of the IMA sensor at the control box.
2. Turning the adjusting screw on the sensor fully, measure resistance between the Brown terminal and the Green/White terminal at the sensor.

Resistance should be: 0.25—6.2 KΩ



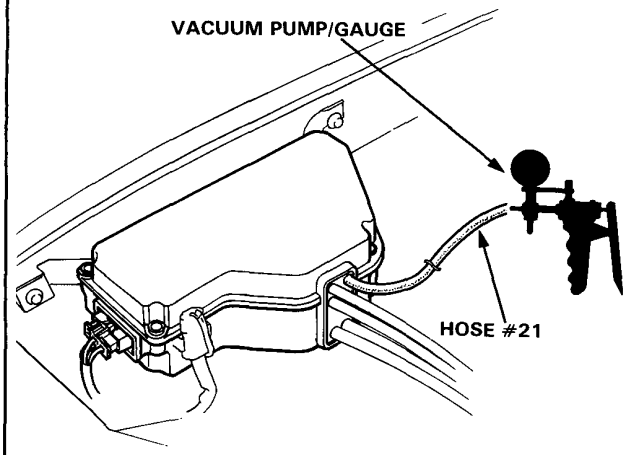
- If resistance is outside above ranges, replace IMA sensor.

NOTE: Whenever the inspection or the replacement of IMA sensor is performed, check specification for CO. See page 12-43

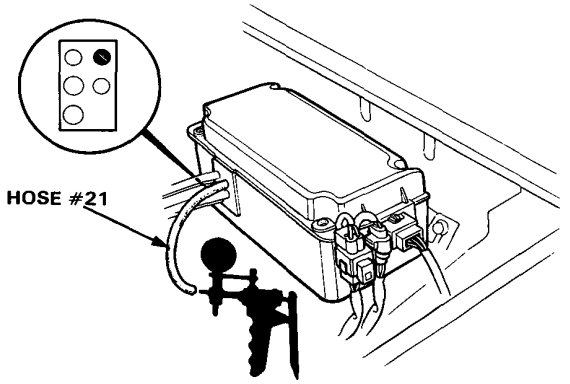
Manifold Absolute Pressure (MAP) Sensor

1. Disconnect the vacuum hose #21 from the throttle body; plug the opening in the throttle body. Connect a vacuum pump to the open end of the vacuum hose.

[Except KE model]

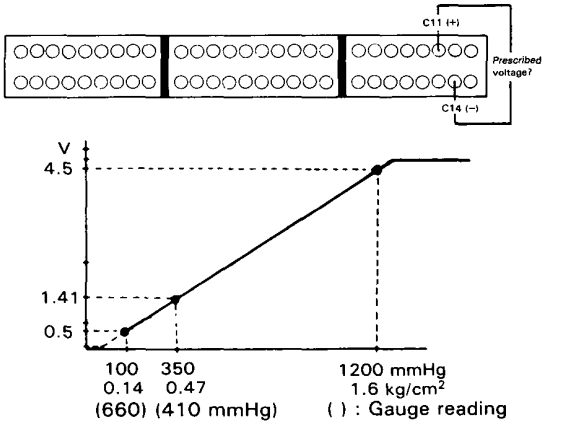


[KE model]



2. Disconnect the connector from the control unit. Connect the system checker harness (No. 07999—PD6000A) between the control unit and wire harness connector.

3. Turn the ignition switch ON. Connect a digital voltmeter positive probe to the C11 terminal of the system checker harness and negative probe to the C14 terminal. Measure the voltage between the two terminals.



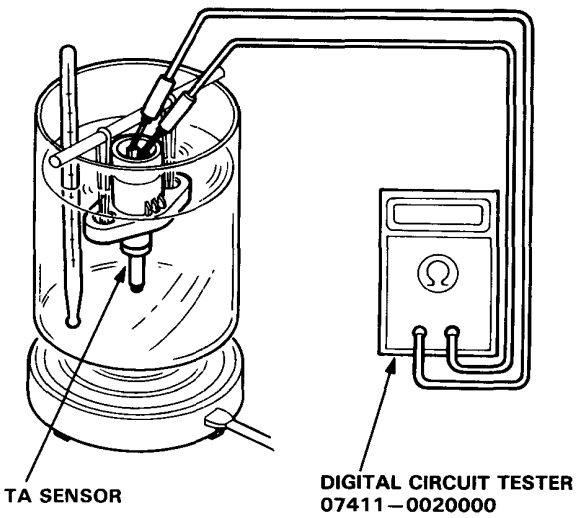
Voltmeter should indicate voltage along with the chart above.

- If the voltage is incorrect, check the vacuum hose for leakage, and wires between the control unit and sensor for open or short circuit. Replace the sensor if the wires are normal.

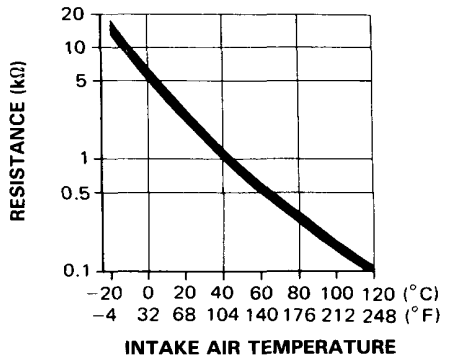
Intake Air Temperature (TA) Sensor

1. Disconnect the connector, then remove the TA sensor from the intake manifold.
2. To test the sensor, suspend it in cold water and heat the water slowly.
   Make sure more than half of the connector is submerged. Measure the resistance between the terminals.

   STANDARDS: 0.98—1.34 kΩ at 40°C (104°F)
   0.22—0.35 kΩ at 80°C (176°F)



3. The chart below shows the change in resistance over a range of intake air temperature.



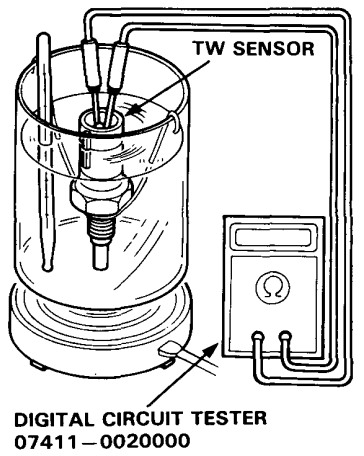
- Replace the sensor if resistance is outside the range.

NOTE:
- Don't let the sensor touch the bottom of the container.
- During the test, stir the water in the container to ensure even temperature.

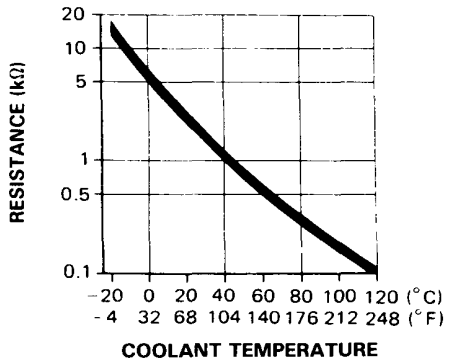
Coolant Temperature (TW) Sensor

1. Disconnect the connector, then remove the TW sensor from the thermostat housing.
2. To test the sensor, suspend it in cold water and heat the water slowly.
   Make sure more than half of the connector is submerged. Measure the resistance between the terminals.

   STANDARDS: 0.98—1.34 kΩ at 40°C (104°F)
   0.22—0.35 kΩ at 80°C (176°F)



3. The chart below shows the change in resistance over a range of coolant temperature.



- Replace the sensor if resistance is outside the range.
- On installing the sensor, torque to:
  28 N·m (2.8 kg-m, 20 lb-ft)

NOTE:
- Don't let the sensor touch the bottom of the container.
- During the test, stir the water in the container to ensure even temperature.

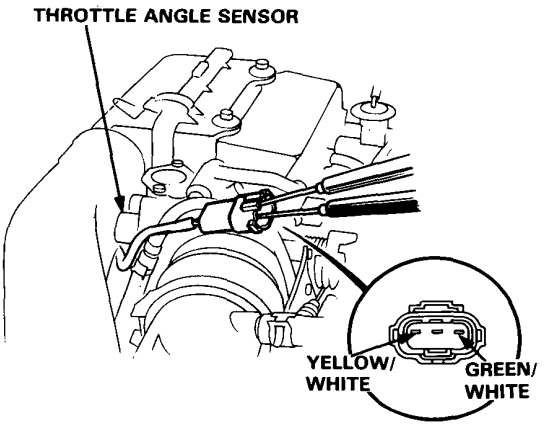
Throttle Angle Sensor

Testing/Removal:

CAUTION: The throttle stop screw is non-adjustable.

1. Disconnect the connector of the throttle angle sensor.
2. Measure full resistance between the Yellow/White terminal and Green/White terminal at the sensor.

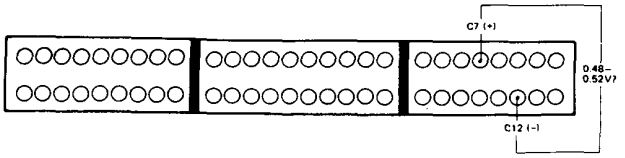
Resistance should be: 4—6 kΩ



- If the resistance is outside the above range, adjust the installation position of the sensor and re-test. Replace if necessary.

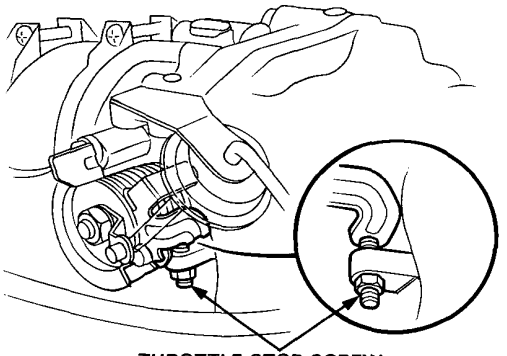
Installation:

1. Align the pin of the sensor with the throttle valve shaft groove and tighten temporarily.
2. Disconnect the control unit connectors and connect the System Checker Harness (NO. 07999—PD6000A) between the control unit and wire harness connector.
3. Connect a digital voltmeter positive probe to C7 terminal of the system checker harness and negative probe to C12 terminal.

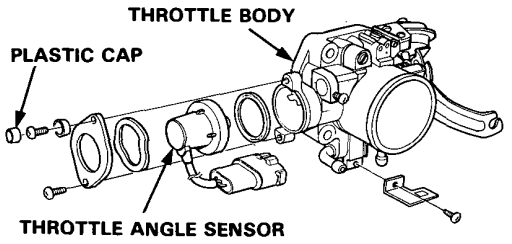


4. With the ignition switch turned ON, adjust the sensor to a position where the throttle stop lever just touches the stop screw. Then measure the voltage between the two terminals.

There should be: 0.48—0.52 V



5. If the voltage is within specification, tighten the screws provisionally.



6. After reassembling the sensor, test the deceleration fuel cut-off system (page 12-55).
   - If the deceleration fuel cut-off system is OK, tighten the screws.
   - If the deceleration fuel cut-off system does not work, repeat steps 1 through 5 and check the voltage.

Sensors

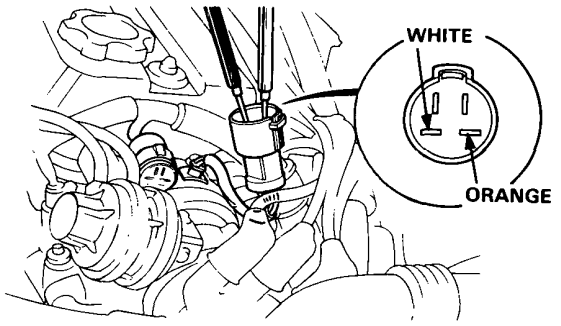
Crank Angle Sensor

NOTE: If either the CYL or TDC sensor tests bad, replace the distributor assembly.

CYL Sensor Inspection

1. Disconnect the connector of the distributor.
2. Measure the resistance between the white terminal and Orange terminal at the sensor.

Resistance should be: 0.65—0.85 kΩ



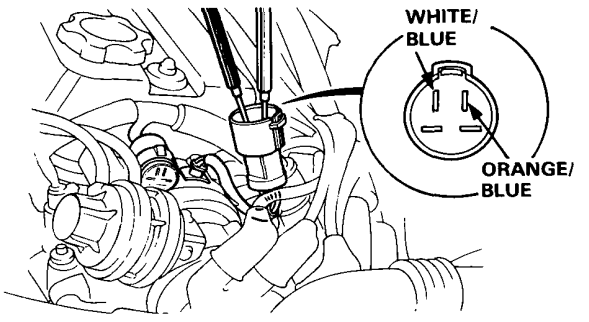
3. Measure the resistance between the White and Orange terminals and the crank angle sensor housing.

Resistance should be: 100 KΩ or more

TDC Sensor Inspection

1. Disconnect the connector of the distributor.
2. Measure the resistance between the Orange/Blue terminal and White/Blue terminal at the sensor.

Resistance should be: 0.65—0.85 kΩ



3. Measure the resistance between the Orange/Blue and White/Blue terminals and the crank angle sensor housing.

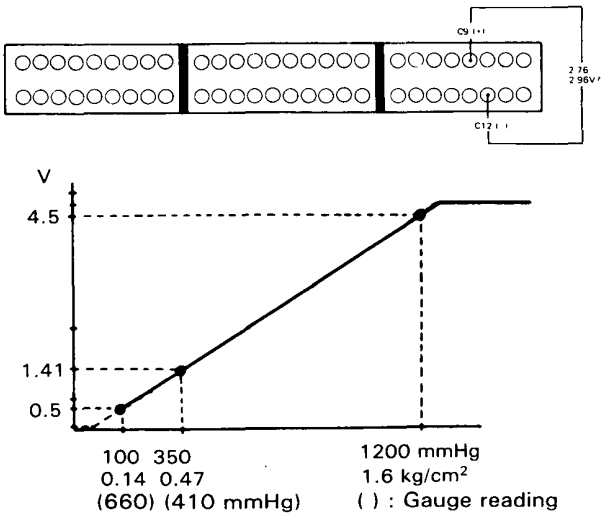
Resistance should be: 100 kΩ or more

Atmospheric Pressure (PA) Sensor

NOTE: Check the sensor at the ECU connector.

1. Disconnect the wire harness connector from the control unit and connect the system checker harness (No. 07999—PD6000A) to the control unit and wire harness connector.
2. Turn the ignition switch ON. Connect a digital voltmeter positive probe to the C9 terminal of the system checker harness and negative probe to the C12 terminal.

There should be: 2.76—2.96 V



- If voltage is outside ranges, check for open or short circuit between the ECU and PA sensor. Replace the PA sensor with a new one if the wires are in good condition.
- On installing the sensor, torque to: 5 N·m (0.5 kg-m, 4 lb-ft)

Solenoid Valves

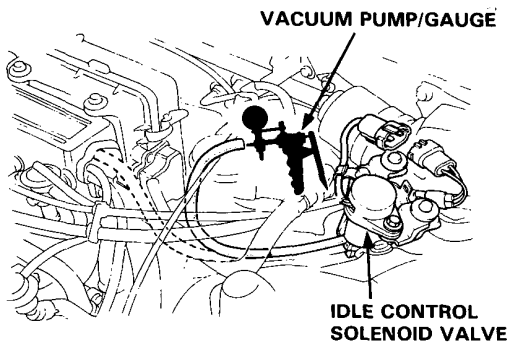
Idle Control Solenoid Valve

The idle control solenoid valve is activated by commands from the ECU. When the solenoid valve opens, this causes vacuum in the upper vacuum hose of the solenoid valve (from the intake manifold) and increases idle speed under the following conditions:

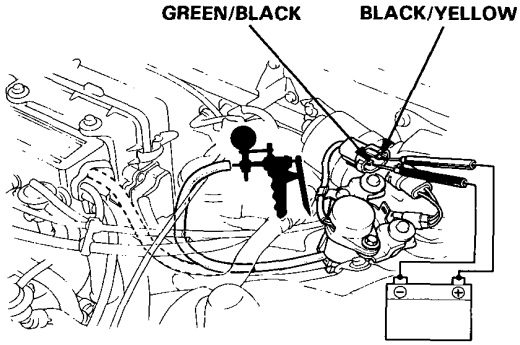
- For a short period after starting the engine.
- Whenever electrical loads are turned ON (vacuum will disappear when engine rpm is raised over 1,500 rpm by operating the throttle).

While the solenoid valve is being activated, 9 V or higher should be available between the Black/Yellow terminal (+) and Green/Black terminal (−) of the valve leads.

1. Disconnect the wire harness from the idle control solenoid valve.
2. Disconnect the upper vacuum hose of the solenoid valve from the intake manifold.
3. Apply vacuum to the hose.
   Vacuum should hold steady.
   If it does not hold vacuum, replace the valve.



4. Connect the battery positive terminal to the Black/Yellow terminal of the solenoid valve, and negative battery terminal to the Green/Black terminal.
5. Apply vacuum to the hose.
   It should not hold vacuum.
   If it holds vacuum, replace the valve.

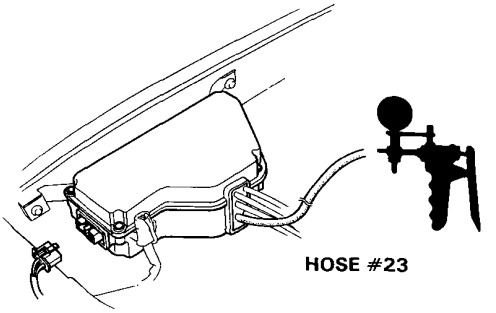


A/T Idle Control Solenoid Valve

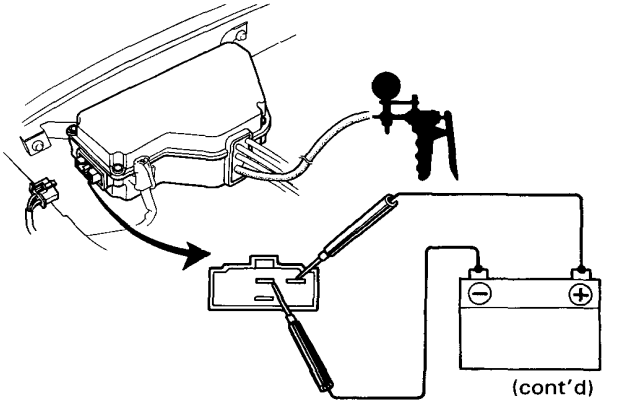
[Except KE model]

The A/T idle control solenoid valve is energized when the A/T shift lever is in gear, allowing and to bypass the throttle valve and maintain the specified idle speed. While the valve is energized, 9 V or higher should be available between the Black/Yellow terminal (+) and Green terminal (−) of the main harness at the control box.

1. Disconnect the 6 cavity rectangular connector from the control box.
2. Disconnect the vacuum hose #23 from the vacuum hose manifold.
3. Apply vacuum to hose #23.
   It should hold vacuum.
   If it does not hold vacuum, replace the valve.



4. Connect the battery positive terminal to the Black/Yellow terminal of the control box coupler and the battery negative terminal to the Yellow/Black (KX model: Blue) terminal.
5. Apply vacuum to the hose.
   It should not hold vacuum.
   If it holds vacuum, replace the valve.



(cont'd)

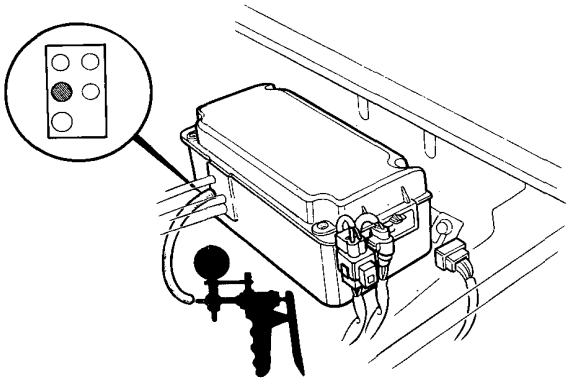
Solenoid Valves

A/T Idle Control Solenoid Valve (cont'd)

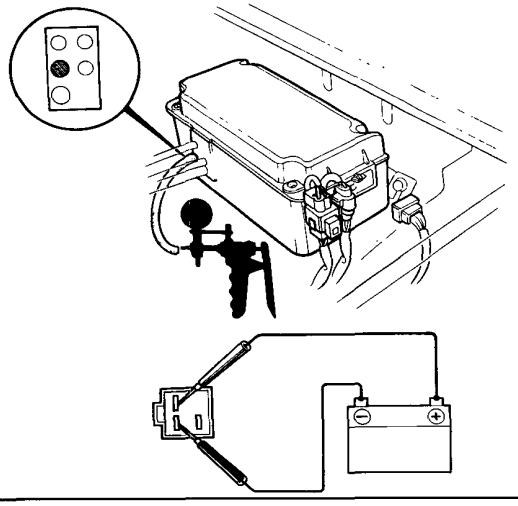
[KE model]

The A/T idle control solenoid valve is energized when the A/T shift lever is in gear, allowing air to bypass the throttle valve and maintain the specified idle speed. While the valve is energized, 9 V or higher should be available between the Black/Yellow terminal (+) and Green terminal (−) of the mainharness at the control box.

1. Disconnect the 4 cavity rectangular connector from the control box.
2. Diconnect the vacuum hose #30 from the intake manifold.
3. Apply vacuum to hose #30.
   It should hold vacuum.
   If it does not hold vacuum, replace the valve.



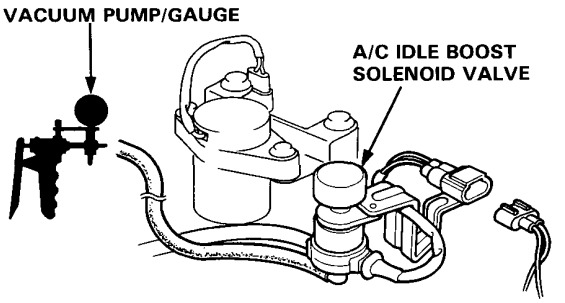
4. Connect the battery positive terminal to the Black/Yellow terminal of the control box coupler and the battery negative terminal to the Yellow/Black terminal.
5. Apply vacuum to the hose.
   It should not hold vacuum.
   If it holds vacuum, replace the valve.



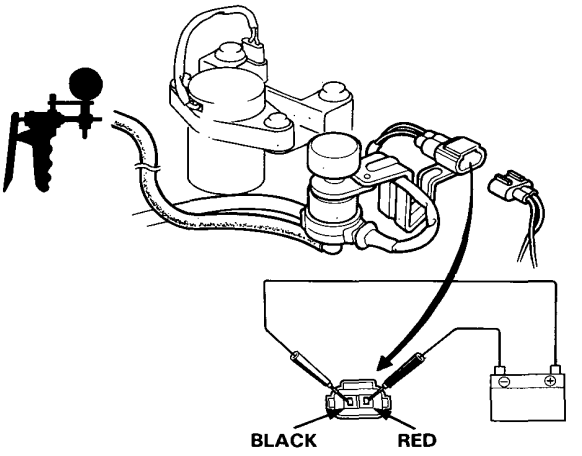
A/C Idle Boost Solenoid Valve

The A/C idle boost solenoid valve is activated when the A/C switch is turned ON. When the solenoid valve is activated, vacuum is generated in the vacuum hose #19 between the solenoid valve and A/C idle boost valve. 9 V or higher should be detected between the Yellow/Black terminal (+) and Red terminal (−) of the A/C harness at the solenoid valve.

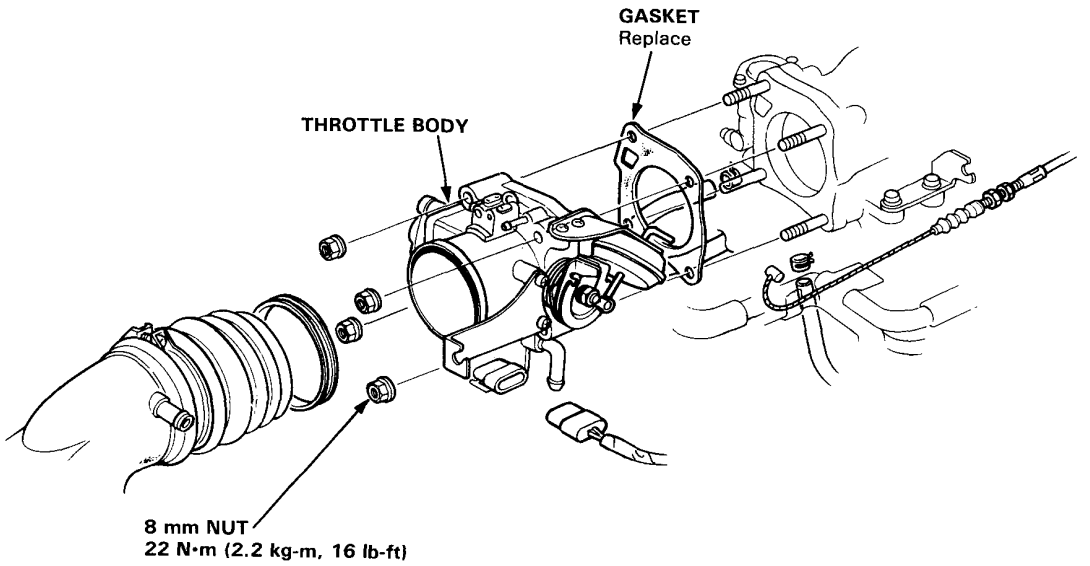
1. Disconnect the connector of the A/C idle boost solenoid valve.
2. Disconnect the lower vacuum hose of the valve (between the intake manifold and the valve) from the intake manifold.
3. Apply vacuum to the hose.
   It should hold vacuum.
   If it does not hold vacuum, replace the valve.



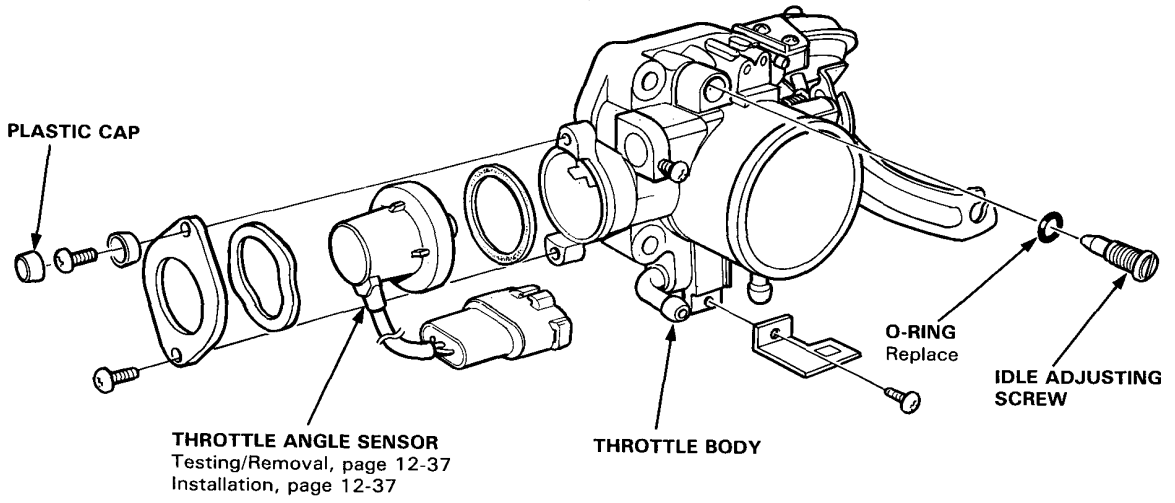
4. Connect the battery positive terminal to the Black terminal of the conector of the valve and the negative terminal to the Red terminal.
5. Apply vacuum to the hose.
   It should not hold vacuum.
   If it holds vacuum, replace the valve.



Throttle Body Disassembly

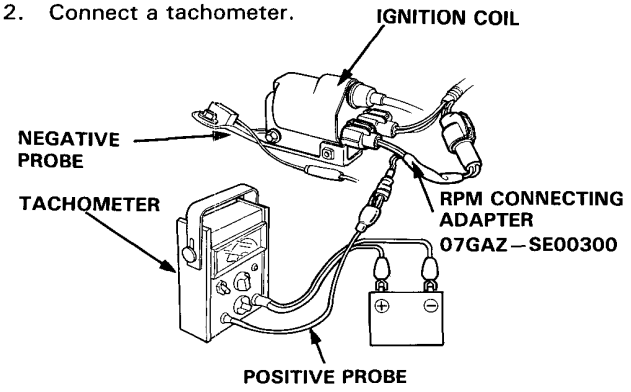


CAUTION: The throttle valve stop screw is non-adjustable.

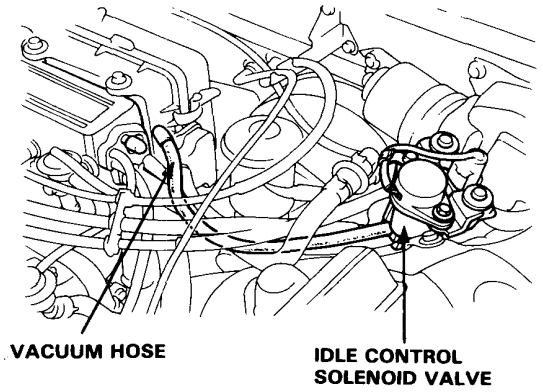


Idle Speed Inspection

1. Start the engine and warm it up to normal operating temperature (the cooling fan goes on twice).
2. Connect a tachometer.



3. Disconnect the upper vacuum hose of the idle control solenoid valve (between the valve and intake manifold) from the intake manifold.
4. Cap the end of the hose and intake manifold.



5. Adjust the idle speed with headlights, heater blower, rear window defroster, cooling fan and air conditioner off.
   Idle Speed should be:

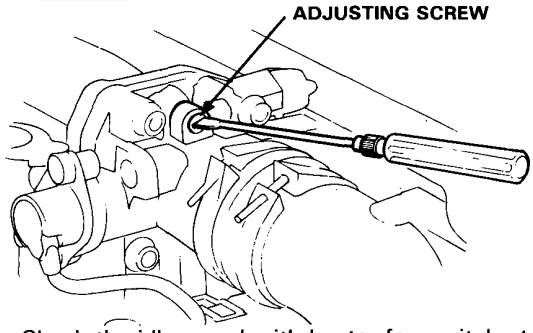
Except KX model

M/T	800 ± 50 min^{-1} (rpm)
A/T	800 ± 50 min^{-1} (rpm) (in "N" or "P")

KX model

M/T	750 ± 50 min^{-1} (rpm)
A/T	750 ± 50 min^{-1} (rpm) (in "N" or "P")

Adjust the idle speed, if necessary, by turning the adjusting screw on the top of the throttle body.



6. Check the idle speed with heater fan switch at HI (right end) and air conditioner on.
   Idle Speed should be:

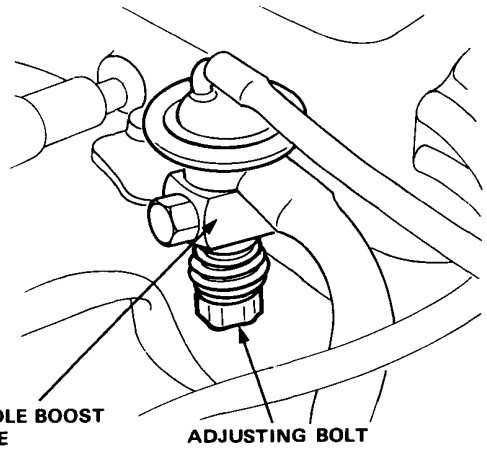
Except KX model

M/T	800 ± 50 min^{-1} (rpm)
A/T	800 ± 50 min^{-1} (rpm) (in "N" or "P")

KX model

M/T	750 ± 50 min^{-1} (rpm)
A/T	750 ± 50 min^{-1} (rpm) (in "N" or "P")

Adjust idle speed, if necessary, by turning the adjusting bolt on the A/C idle boost valve.



7. After adjustment, connect the idle control solenoid valve vacuum hose.
8. On Automatic Transmission model, after adjusting the idle speed, check that it remains within the specified limit when shifted in gear ("D_3" or "D_4").
   Idle speed should remain:
   750 ± 50 min^{-1} (rpm) (in "D_3" or "D_4").
9. Check the idle speed with headlights,heater blower, rear window defroster, and cooling fan on but air conditioner off.
   It should be the same as normal idle speed.
   NOTE: If the idle speed is not within specifications, see Troubleshooting on pages 12-28 and 12-29.

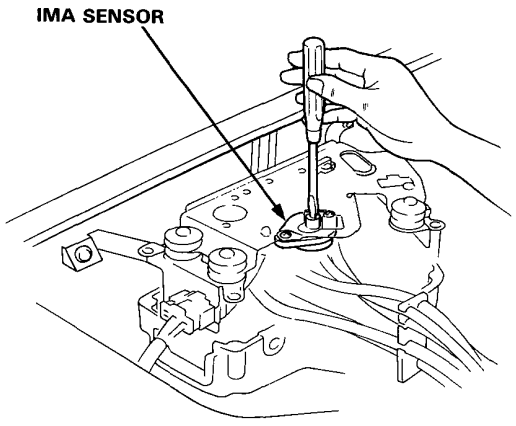
Idle Mixture Inspection

NOTE:
- Perform the measurement in a place with good ventilation and with no direct exposure to the wind and rain.
- Perform the measurement while the engine is idling. (under no load).
- Use a precise tachometer to check engine rpm.
- Use the NDIR CO meter in accordance with the manufacturers' recommended procedures.
- The following inspections and adjustments should be completed before the measurement.

  Air cleaner element
  Ignition timing and control system
  Spark plugs
  Idling speed
  Valve clearance
  PCV valve

1. Start the engine, and, after the radiator cooling fan works two times, further warm up the engine at 3,000 min^{-1} (rpm) for two minutes or more.
2. Insert exhaust gas sampling probe into the tail pipe at least 40 cm (16 in.)
3. Check idle CO with the headlights, heater blower, rear window defroster, cooling fan, and air conditioner off.

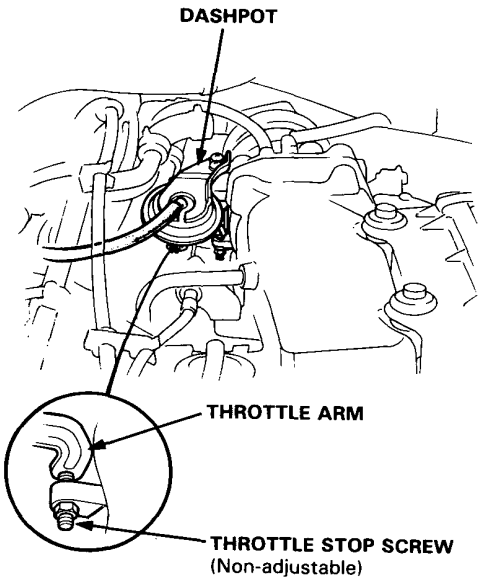
   CO meter should indicate:
   KX Model: 0.1% maximum
   Except KX Model: 1.0 ± 1.0%
4. On except KX Model, if unable to obtain this reading, adjust by turning adjusting screw of the IMA sensor.



- If unable to obtain a CO reading of specified % by this procedure, check the engine tuen-up condition.

Throttle Control System

1. With the engine shut off, slowly open the throttle arm until the dashpot rod is raised up as far as it will go.



2. Release the throttle arm and measure the time until the throttle arm contacts the stop screw.

   Time should be: less than 2 seconds

   - If the time is over 2.0 seconds, replace the dashpot check valve and re-test.
   - If the rod does not operate, check for bound linkage, or for clogged check valve or vacuum line.

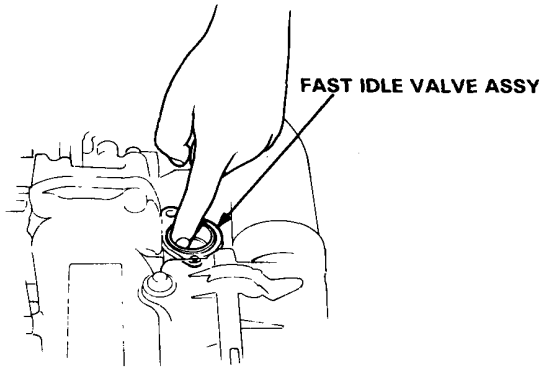
   — If they are OK, replace the dashpot with a new one.

Fast Idle Valve

NOTE:
- The fast idle valve is factory adjusted; it should not be disassembled.
- Check the PCV (engine breather) circuit tubing for breakage, disconnection, clogging, etc.
- Check that the throttle valves are fully closed.

If idle speed is too high after engine is warmed up:

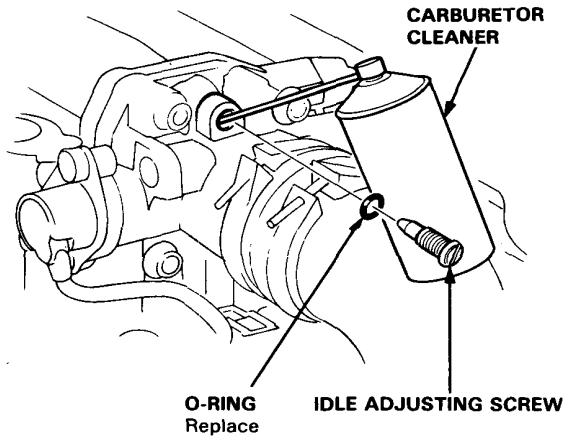
1. Remove the cover of the fast idle valve.
2. Check that the valve is completely closed. If not, an air suction sound can be heard in the valve seat area.



- If any suction is heard, the valves is leaking. Replace the fast idle valve and adjust idle speed (page 12-42).

If idle speed is too low after engine is warmed up:

1. Remove the idle adjusting screw.

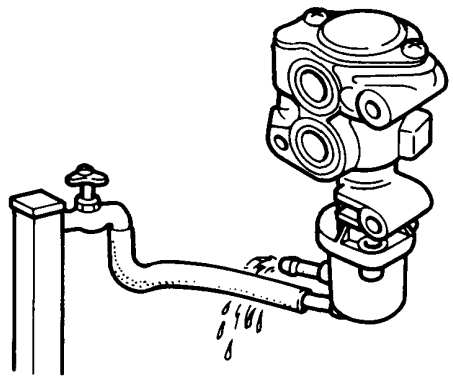


2. Wash the idle adjusting screw and the air bypass channel with carburetor cleaner.
3. Readjust idle speed after cleaning.

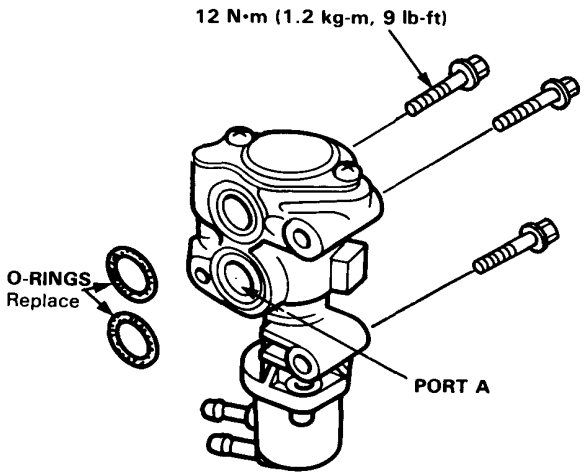
If fast idle speed is low when engine is cold (coolant temperature below 30°C (86°F)). (Fast idle valve may be stuck closed):

Fast idle speed should be:
1,000—1,800 min^{-1} (rpm) for M/T
1,000—1,800 min^{-1} (rpm) for A/T (in "N" or "P")

1. Remove the fast idle valve assy from the throttle body.
2. Apply cold water and cool down the wax part of the fast idle valve to 5—30°C (41—86°F).



3. Blow through port A of the fast idle valve, and check that a fairly large amount of air flows without resistance.



- If air does not flow or the resistance is large, replace the fast idle valve and adjust idle speed. (page 12-42).

Fuel Pressure Relieving

WARNING

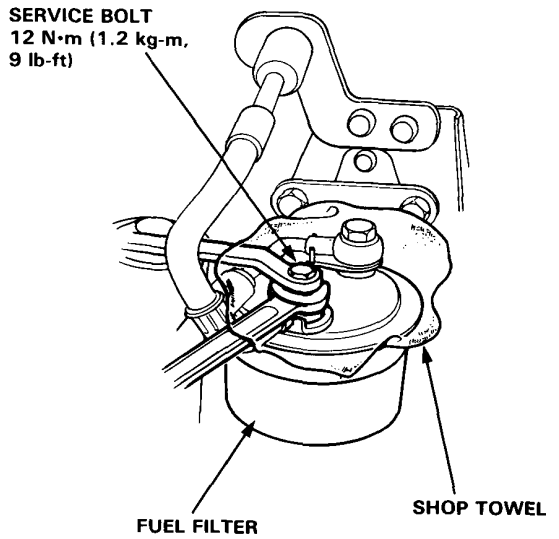
- **Do not smoke while working on the fuel system. Keep open flames or sparks away from the work area.**
- **Be sure to relieve fuel pressure while the engine is off.**

NOTE: Before disconnecting fuel pipes or hoses, release pressure from the system by loosening the 6 mm service bolt at top of the fuel filter.

1. Disconnect the battery negative cable from the battery negative terminal.
2. Use a box end wrench on the 6 mm service bolt at top of the fuel filter, while holding the special banjo bolt with another wrench.
3. Place a rag or shop towel over the 6 mm service bolt.
4. Slowly loosen the 6 mm service bolt one complete turn.

NOTE:

- A fuel pressure gauge can be attached at the 6 mm service bolt hole.
- Always replace the washer between the service bolt and the Special Banjo Bolt, whenever the service bolt is loosened to relieve fuel pressure. Replace all washers whenever the bolts are removed to disassemble parts.



Injector Testing

NOTE: Check the following items before testing idle speed, ignition timing, valve clearance and idle CO %.

If the engine will run:

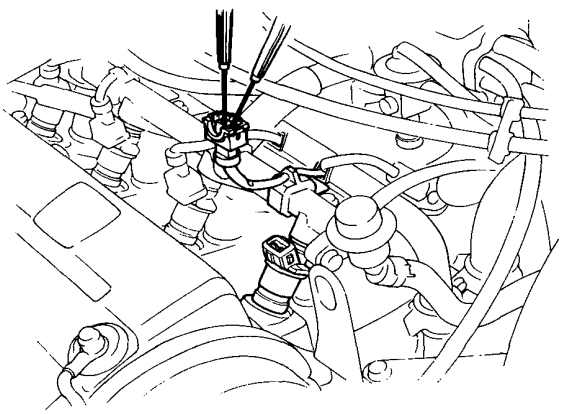
1. With the engine idling, disconnect each injector coupler individualy and inspect the change in the idling speed.

- If the idle speed drop is almost the same for each cylinder, the injectors are normal.

- If the idle speed or quality remains the same when you disconnect a particular injector, check for voltage at that coupler.

— If voltage is fluctuates between 0 and 2 volts, replace the injector.
— If there is no voltage, check the following:

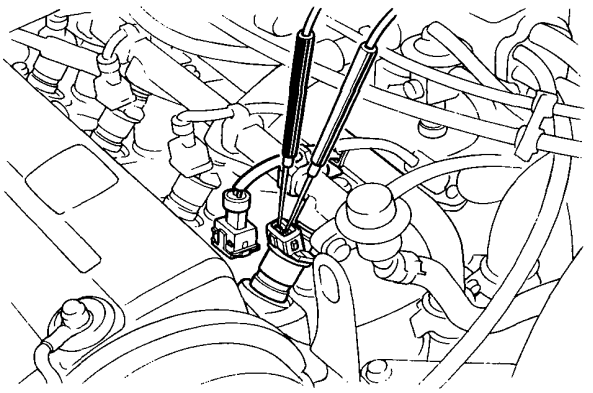
- Whether there is any short-circuiting, wire breakage, or poor connection in the wiring between the resistor and the injector.
- Whether the resistor is normal.
- Whether there is any short-circuiting, wire breakage, or poor connection in the wire between the resistor and ECU.



If the engine cannot be started:

1. Remove the coupler of the injector, and measure the resistance between the terminals of the injector.

Resistance should be: 1.5—2.5 Ω



- If resistance is not as specified, replace the injector.

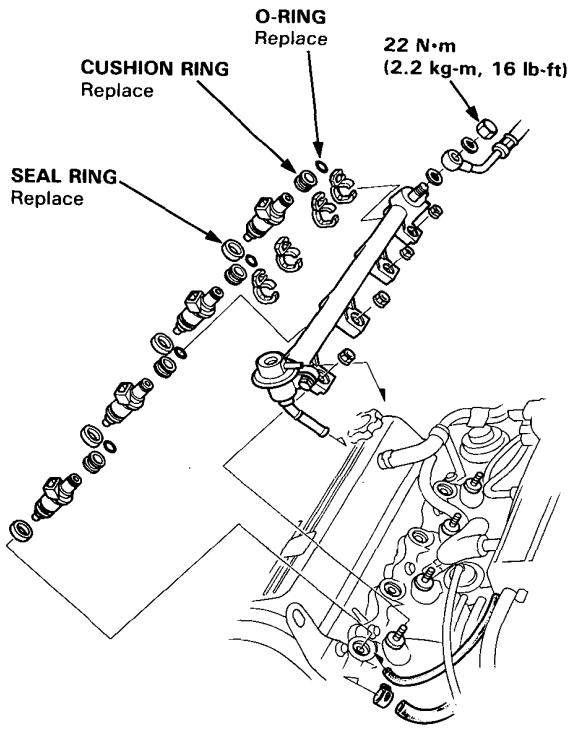
- If the resistance is normal, check the following:
  - Whether there is any short-circuiting, wire breakage, or poor connection in the wiring between the resistor and the injector.
  - Whether the resistor is normal.
  - Whether there is any short-circuiting, wire breakage, or poor connection in the wire between the resistor and ECU.

Injector Replacement

WARNING Do not smoke during the work. Keep open flames away from your work area.

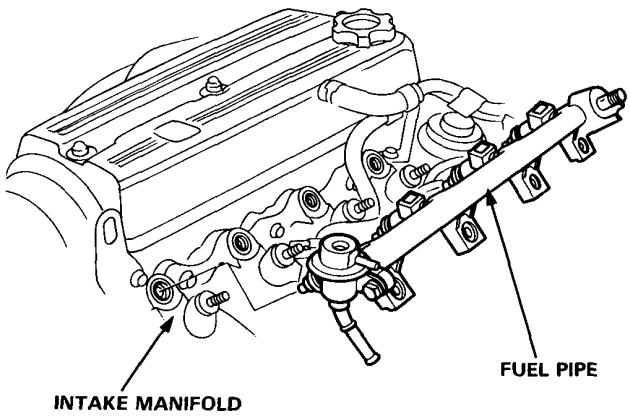
1. Disconnect the battery negative cable from the battery negative terminal.
2. Relieve fuel pressure (page 12-45).
3. Disconnect the couplers of the injectors.
4. Disconnect the vacuum hose and fuel return hose from the pressure regulator.

   NOTE: Place a rag or shop towel over the hose and tube before disconnecting them.
5. Loosen the retainer nuts on the fuel pipe.
6. Disconnect the fuel pipe.
7. Remove the injectors from the intake manifold.

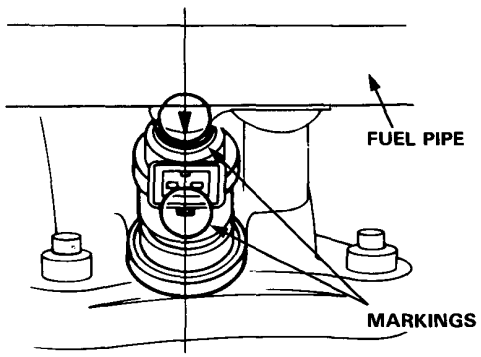


8. Slide new cushion rings onto the injectors.
9. Coat new O-rings with clean engine oil and put them on the injectors.
10. Insert the injectors into the fuel pipe first.
11. Coat new seal rings with clean engine oil and press them into the intake manifold.
12. Install the injectors and fuel pipe assembly in the manifold.

    CAUTION: To prevent damage to the O-ring, install the injectors in the fuel pipe first, then install them in the intake manifold.



13. Align the center line on the coupler with the mark on the fuel pipe.

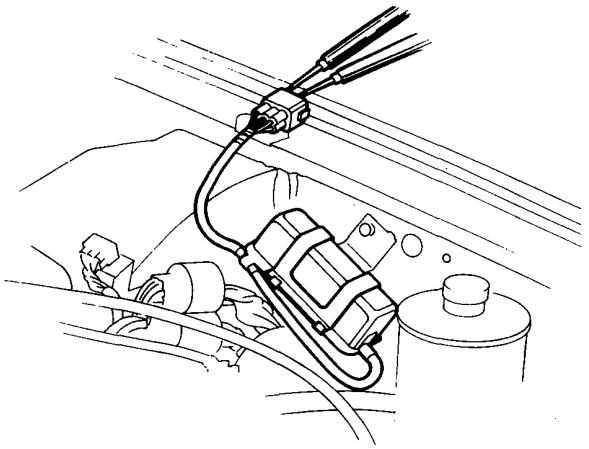


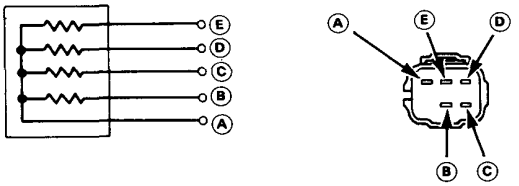
14. Install and tighten the retainer nuts.
15. Connect the vacuum hose and fuel return hose to the pressure regulator.
16. Install the couplers on the injectors.
17. Turn the ignition switch ON but do not operate the starter. After the fuel pump runs for approximately two seconds, the fuel pressure in the fuel line rises. Repeat this two or three times, then check whether there is any fuel leakage.

Fuel System Resistor Testing

1. Disconnect the resistor connector.
2. Check for resistance between each of the resistor terminals (E, D, C and B) and the power terminal (A).

   Resistance should be: 5—7 Ω



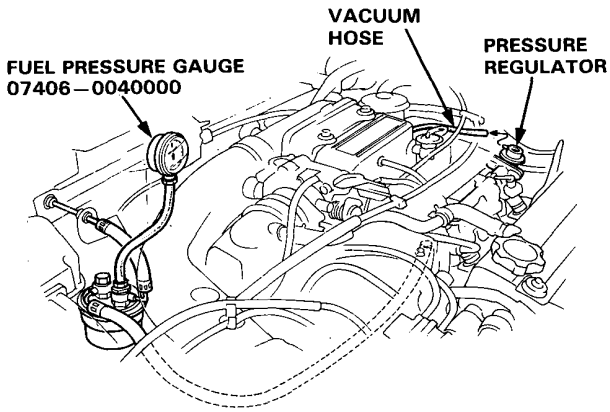


- Replace the resistor with a new one if any of the resistances are outside of the specification.

Fuel Pressure Testing

1. Relieve fuel pressure (page 12-45).
2. Remove the service bolt on the top of the fuel filter while holding the banjo bolt with another wrench and attach the fuel pressure gauge.
3. Start the engine. Measure the fuel pressure with the engine idling and the vacuum hose of the pressure regulator disconnected.

   Pressure should be:
   255 ± 20 kPa (2.55 ± 0.2 kg/cm², 36 ± 3 psi)



- If the fuel pressure is not as specified, first check the fuel pump (page 12-50). If the pump is OK, check the following.

— If the pressure is higher than specified, inspect for:
  - Pinched or clogged fuel return hose or piping.
  - Faulty pressure regulator.

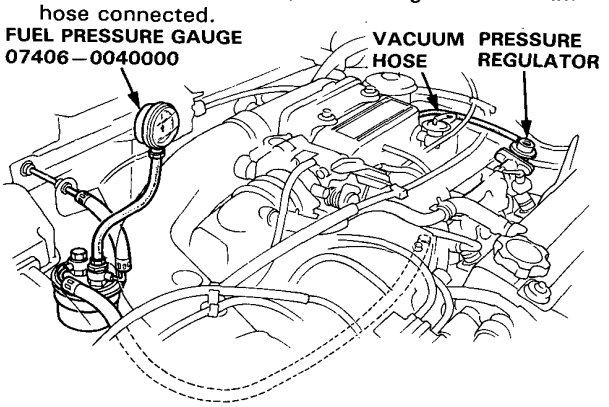
— If the pressure is lower than specified, inspect for:
  - Clogged fuel filter
  - Pinched or clogged fuel hose from the fuel tank to the fuel pump
  - Pressure regulator failure
  - Leakage, in the fuel line
  - Pinched, broken or disconnected regulator vacuum hose

Pressure Regulator

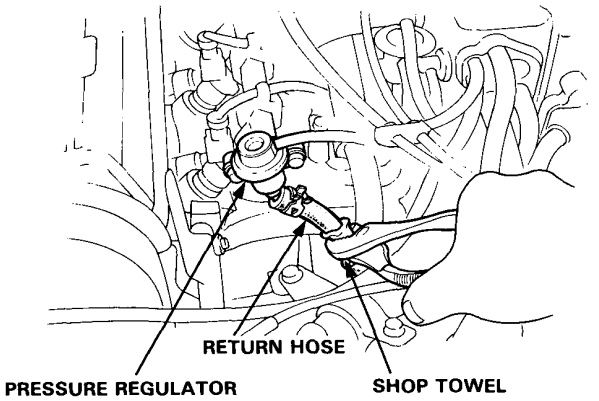
Testing:

WARNING **Do not smoke during the test. Keep open flames away from your work area.**

1. Attach a pressure gauge to the service port of the fuel filter (remove the service bolt first), then start the engine. Leave the pressure regulator vacuum hose connected.



2. Check for pinched or broken vacuum hoses.
3. Check that the fuel pressure rises each time you lightly pinch the return hose. Check that the pressure also rises when you disconnect the vacuum hose from the regulator.



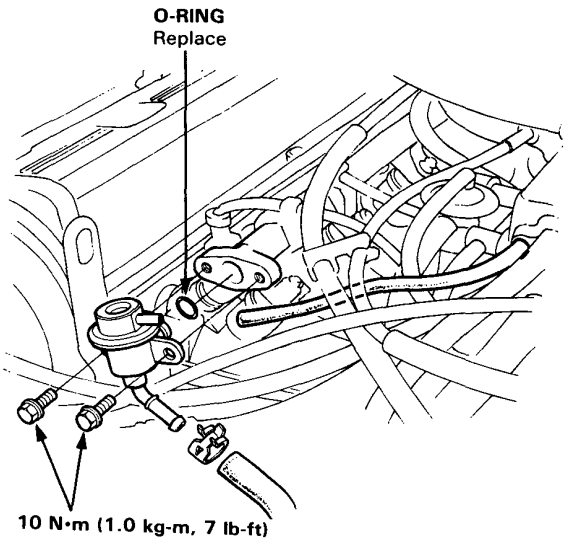
- If the pressure does not rise, replace the regulator and re-test.

Replacement:

WARNING **Do not smoke while working on fuel system. Keep open flame away from work area.**

1. Disconnect the negative terminal of the battery.
2. Place a shop towel under the pressure regulator, then relieve fuel pressure (page 12-45).
3. Disconnect the vacuum hose and fuel return hose.
4. Remove the two 6 mm retainer bolts.

NOTE:
- Replace the O-ring.
- When assembling the regulator, apply clean engine oil to the O-ring and assemble it into its proper position, taking care not to damage the O-ring.

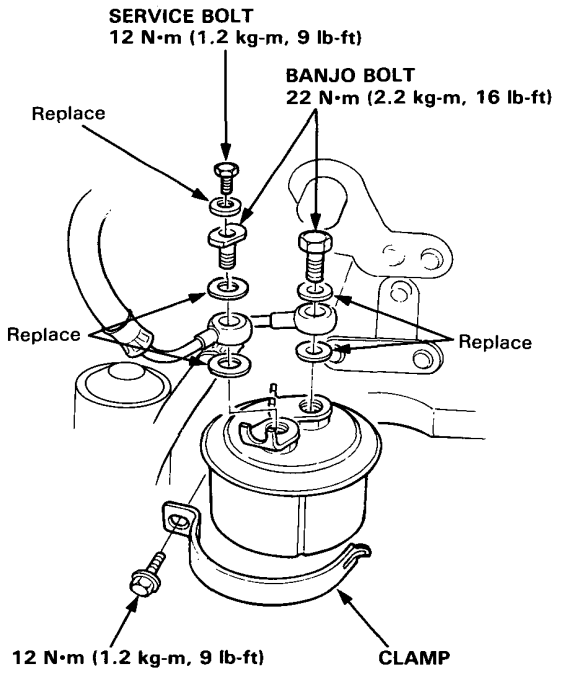


Fuel Filter Replacement

WARNING Do not smoke while working on fuel system. Keep open flame away from work area.

The filter should be replaced: every 40,000 km (24,000 miles), or whenever the fuel pressure drops below the specified value (255 ± 20 kPa, 2.55 ± 0.2 kg/cm², 36 ± 3 psi with the vacuum pressure hose disconnected) after making sure that the fuel pump and the pressure regulator are OK.

1. Disconnect the battery cable from the negative terminal.
2. Place a shop towel under and around the fuel filter.
3. Relieve fuel pressure (page 12-45).
4. Remove the two 12 mm banjo bolts from the filter.
5. Remove the fuel filter clamp and fuel filter.
6. When assembling, use new washers, as shown.

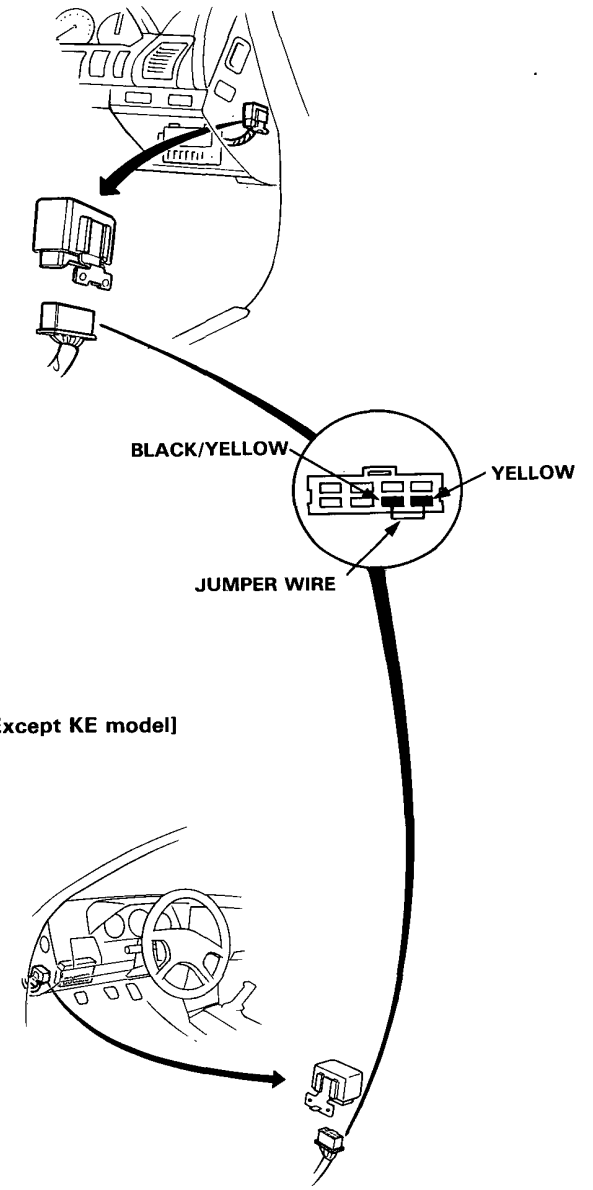


Fuel Pump Inspection

WARNING Do not smoke during the test. Keep open flame away from your work area.

1. With the ignition switch OFF, disconnect the coupler from the main relay behind the fuse box.
2. Connect the Yellow wire and Black/Yellow wire with a jumper wire.

[KE model]



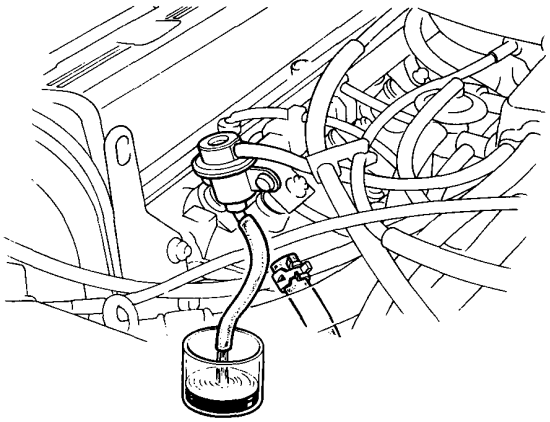
[Except KE model]

3. Relieve fuel pressure as described on page 12-45, then tighten the service bolt.

4. Disconnect the fuel return hose from the regulator.

5. Turn the ignition switch ON for 10 seconds. Then measure the amount of fuel flow.

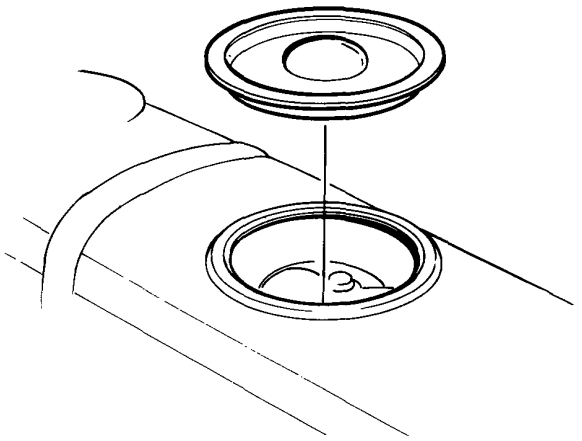
Amount should be:
230 cc (7.8 oz) min. in 10 seconds at 12V



- If fuel flow is less than 230 cm^3 (7.8 oz), or there is no fuel flow, check for:
  - Fuel pump failure
  - Clogged fuel filter
  - Clogged fuel line
  - Pressure regulator failure

If you suspect a problem with the fuel pump, check that the fuel pump actually runs; it should make noise when it is ON. If the pump does not make noise, check as follows.

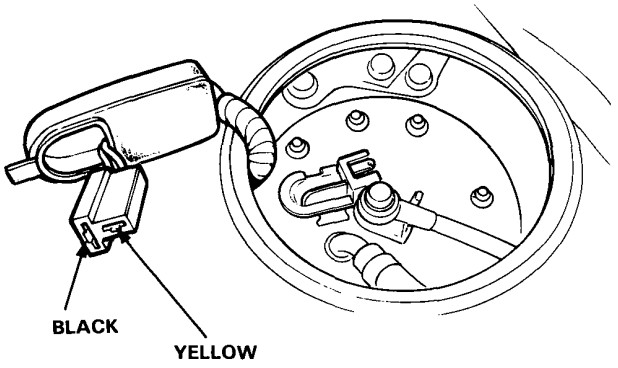
1. Remove the left maintenance access cover in the luggage area.



2. Disconnect the coupler.

CAUTION: Be sure to turn the ignition switch OFF before disconnecting the wires.

3. Check that battery voltage is available at the fuel pump coupler when the ignition switch is turned ON (Positive probe to the Yellow wire, negative probe to the Black wire).



- If battery voltage is available, replace the fuel pump.
- If there is no voltage, check the main relay and wire harness (page 12-52).

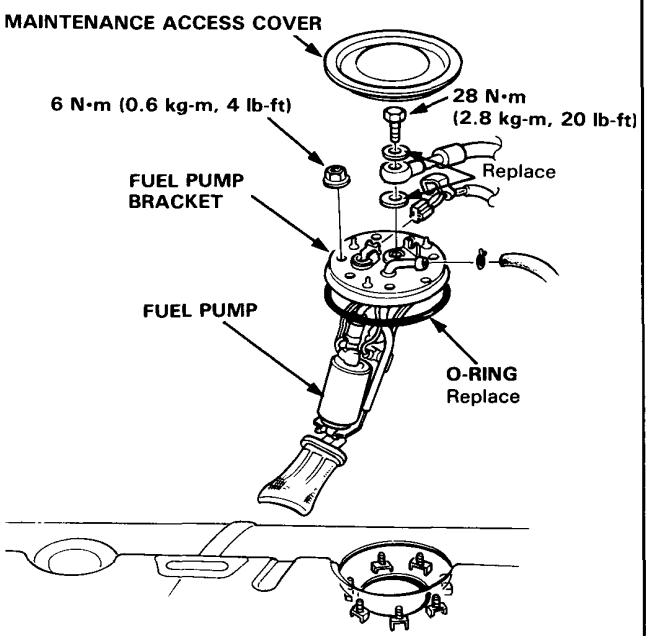
NOTE: When installing the maintenance access cover, make sure the seal is attached to the cover.

Fuel Pump Replacement

WARNING **Do not smoke while working on fuel system. Keep open flames away from your work area.**

1. Relieve fuel pressure (page 12-45).
2. Remove the left maintenance access cover in the luggage area.
3. Disconnect the fuel lines and coupler.
4. Remove the fuel pump mounting nuts.
5. Remove the fuel pump from the fuel tank. (If it is hard to remove, slightly lower the fuel tank by loosening the fuel tank mounting nuts).

   NOTE: When installing the maintenance access cover, make sure the seal is attached to the cover.

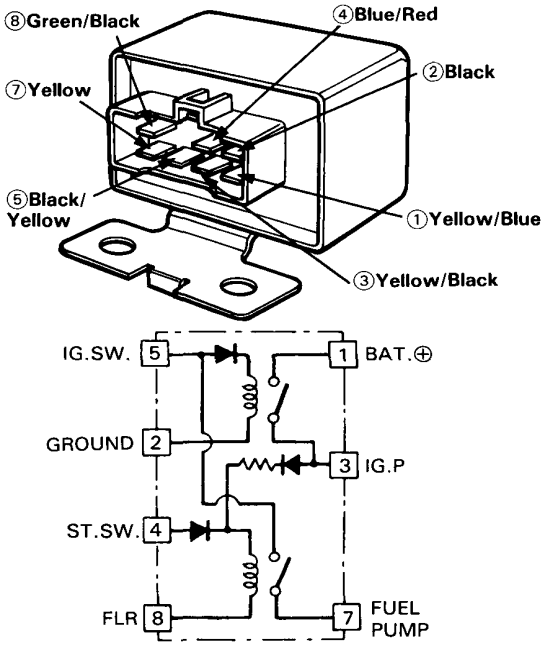


CAUTION: Do not disassemble the pump.

Main Relay Testing

1. Remove the main relay, near the under-dash fuse box.
2. Connect the battery positive terminal to the No. 4 terminal and the battery negative terminal to the No. 8 terminal of the main relay. Then check for continuity between the No. 5 terminal and No. 7 terminal of the main relay.

   - If there is continuity, go on to step 3.
   - If there is no continuity, replace the relay.



3. Connect the battery positive terminal to the No. 5 terminal and the battery negative terminal to the No. 2 terminal of the main relay. Then check that there is continuity between the No. 1 terminal and No. 3 terminal of the main relay.

   - If there is continuity, go on to step 4.
   - If there is no continuity, replace the relay.

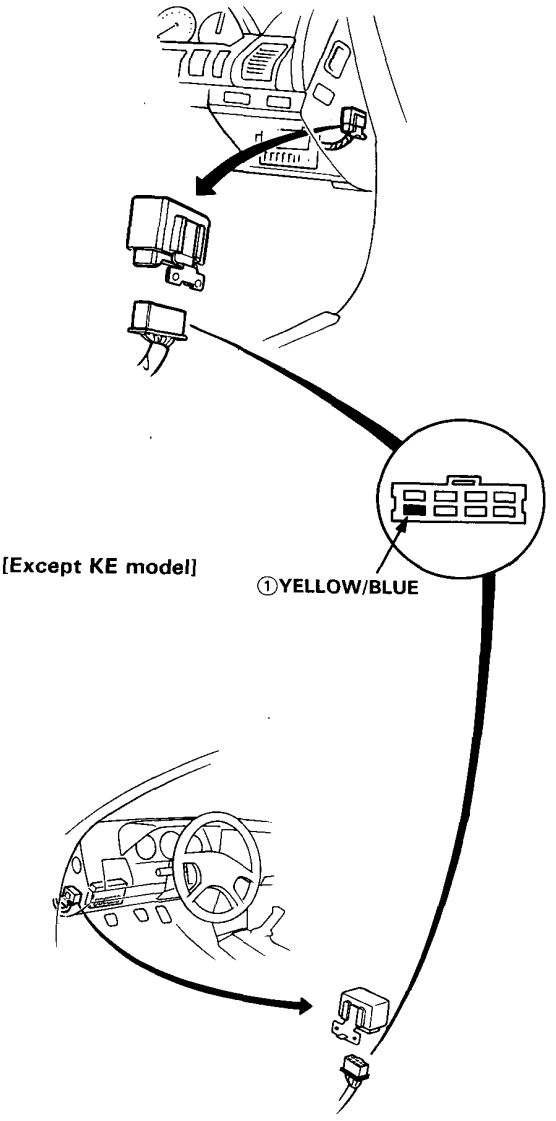
4. Connect the battery positive terminal to the No. 3 terminal and battery negative terminal to the No. 8 terminal of the main relay. Then check that there is continuity between the No. 5 terminal and No. 7 terminal of the main relay.

   - If there is continuity, the relay is OK;
     If the fuel pump still does not work, go to Harness Testing in the next column.
   - If there is no continuity, replace the relay.

Harness Testing

1. Keep the ignition switch in the OFF position.
2. Disconnect the main relay coupler.
3. Connect the positive probe of the circuit tester to the Yellow/Blue wire ① in the coupler and ground the negative probe of the tester to body ground.
   - Battery voltage should be available.
   - — If there is no voltage, check the wiring between the battery and the main relay as well as the No. 1 fuse in the engine compartment.

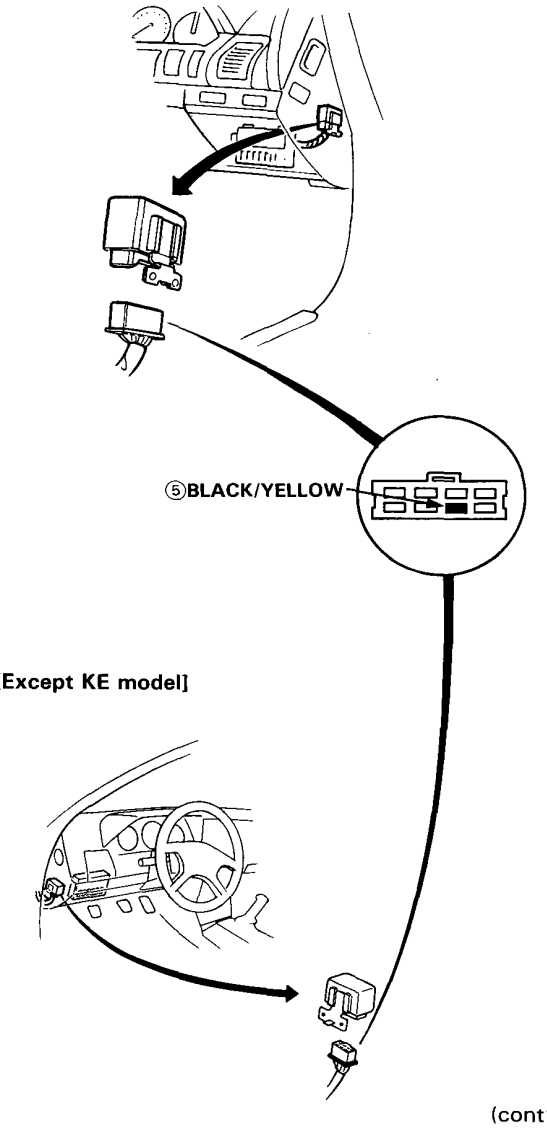
[KE model]



[Except KE model]

4. Connect the positive terminal of the tester to the Black/Yellow wire ⑤ of the coupler and ground the negative teminal of the tester to body ground.
5. Turn the ignition switch ON.
   - The tester should indicate battery voltage.
   - — If there is no voltage, check the wiring from the ignition switch and the main relay as well as No. 1 fuse (15A).

[KE model]



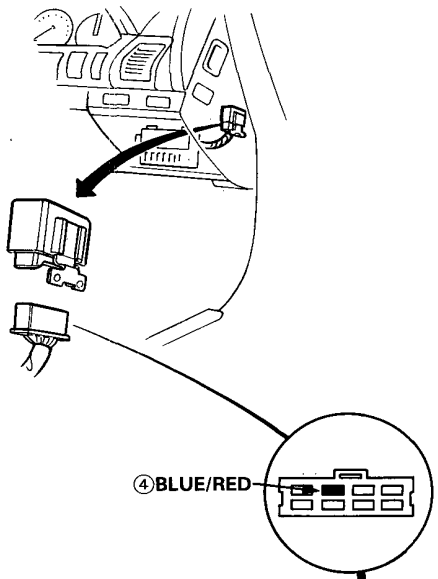
[Except KE model]

(cont'd)

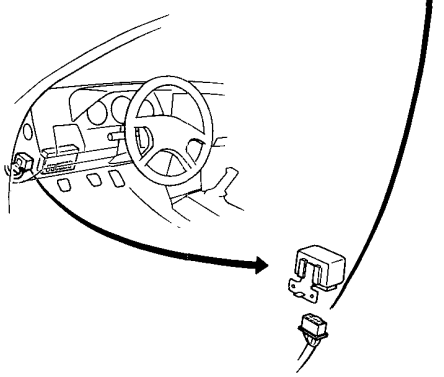
Harness Testing (cont'd)

6. Connect the positive terminal of the tester to the Blue/Red wire ④ in the coupler and ground the negative terminal to the body.

[KE model]



[Except KE model]



7. Turn the ignition switch to START position.
   - The tester should indicate battery voltage.

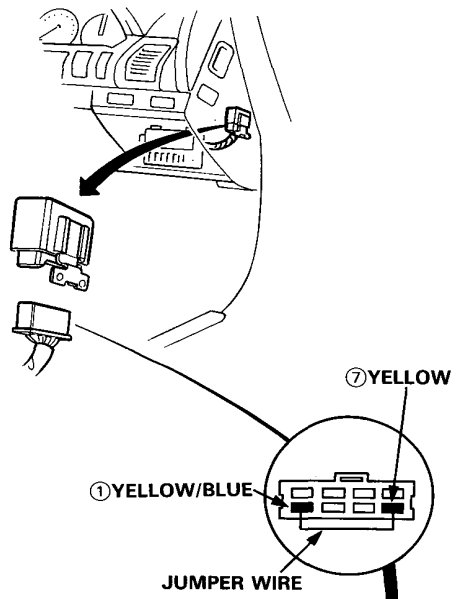
   — If there is no voltage, check the wiring between the ignition switch and main relay as well as No. 10 fuse.

8. Connect a jumper wire between the Yellow/Blue wire ① and Yellow wire ⑦ in the coupler.

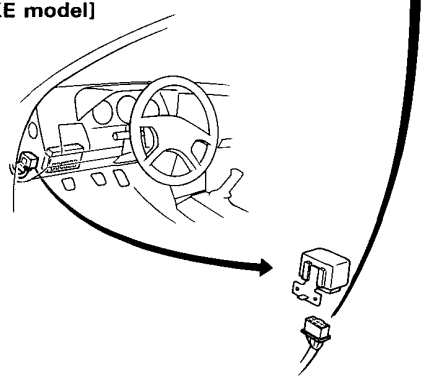
   - The fuel pump should work.

   — If the fuel pump does not work, check the wiring between the battery and fuel pump and the wiring from the fuel pump to the ground (Black wire).

[KE model]

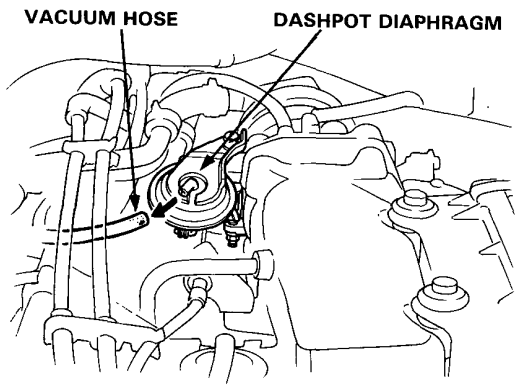


[Except KE model]

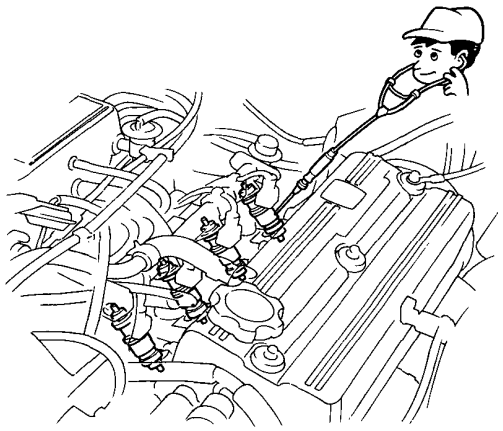


Fuel Cut-Off System

1. Start the engine and warm it up to operating temperature. Check that the engine idles smoothly.
2. On cars equipped with manual transmission: disconnect the vacuum hose from the dashpot of the throttle body.



3. Use a stethoscope to confirm that the injectors are working; they should make a clicking sound.

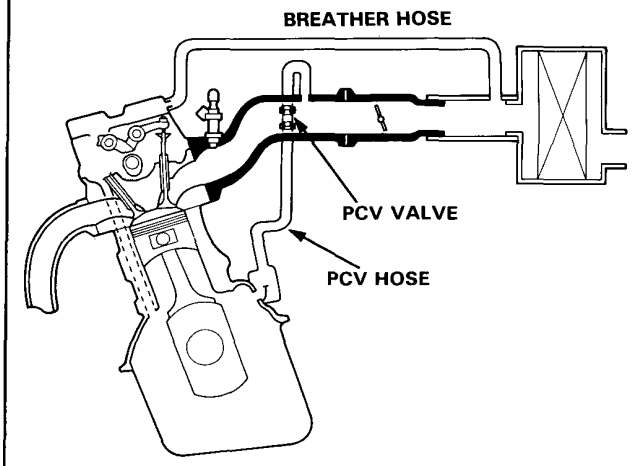


4. While listening to an injector, raise the engine speed to 3,000 min^{-1} (rpm) then release the throttle; the clicking of the injector should cease momentarily when releasing the throttle.
   - If the clicking does not cease, check the ECU, throttle angle sensor, or wiring between the injector and ECU. Consult the Troubleshooting Chart according to the pattern of the self-diagnosis indicator on the ECU (page 12-17).

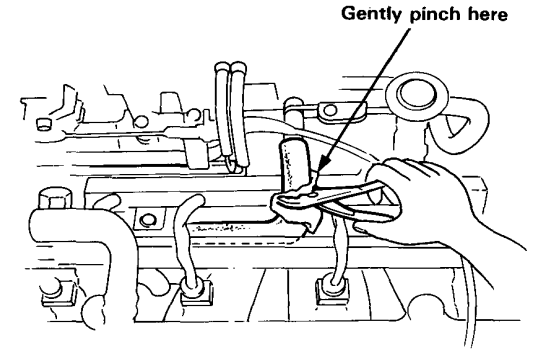
Crankcase Controls

PCV Valve

1. Check the crankcase ventilation hoses and connections for leaks and clogging.



2. At idling, make sure there is a clicking sound from the PCV valve when the hose between PCV valve and intake manifold is lightly pinched, with your fingers or pliers.



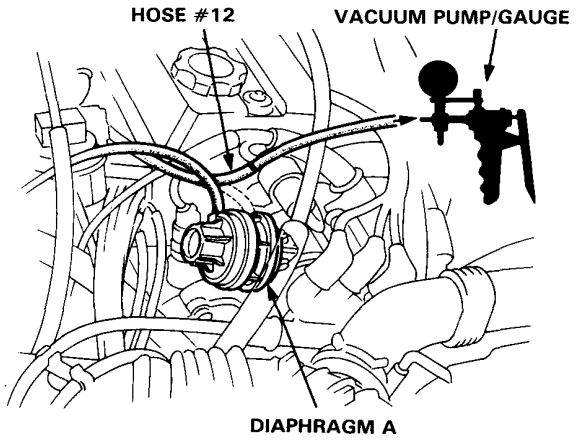
   - If there is no clicking sound, check the PCV valve grommet for cracks or damage.
   - If the grommet is OK, replace the PCV valve and recheck.

Ignition Timing Controls

[KX Model]

NOTE: Engine coolant temperature must be below 60°C (140°F).

1. Disconnect vacuum hose #12 from the vacuum advance diaphragm A on the distributor and connect a vacuum pump/gauge to the hose.

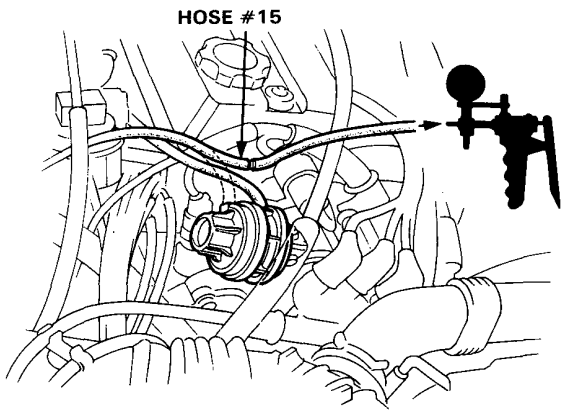


2. Start the engine, allow it to idle and check for vacuum.

   There should be vacuum.

   - If there is no vacuum, check the vacuum line for leaks, blockage or a disconnected hose and retest.
   - If there is vacuum, go on to step 3.

3. Disconnect vacuum hose #15 from the vacuum advance diaphragm B on the distributor and connect a vacuum pump/gauge to the hose.



4. Allow the engine to idle and check for vacuum.

   There should be vacuum.

   - If there is vacuum, go on to step 5.
   - If there is no vacuum, check the vacuum line for leaks, blockage or a disconnected hose.
     If no problem, go on to cold advance solenoid valve inspection (page 12-58).

5. Wait for the engine to warm up (cooling fan comes on).
   Check for vacuum at idle.

   There should be no vacuum.

   - If there is no vacuum, go on to step 6.
   - If there is vacuum, go on to cold advance solenoid valve inspection (page 12-58).

6. Raise engine speed to above 1,500 min^{-1} (rpm) and check for vacuum.

   There should be vacuum.

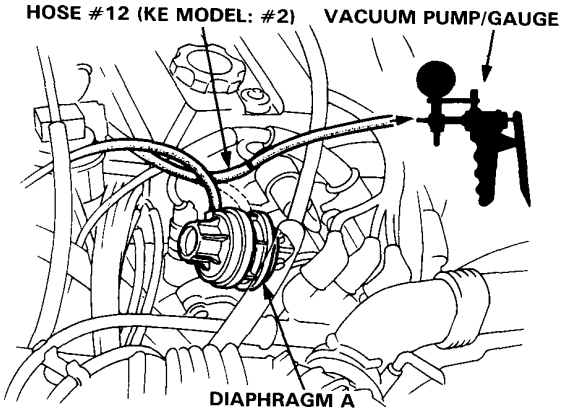
   - If there is vacuum, go on to step 7.
   - If there is no vacuum, go on to cold advance solenoid valve inspection (page 12-58).

7. If there is no abnormality at each test, inspect the vacuum advance diaphragm (page 24-5).

[Except KX Model]

NOTE:
- Engine coolant temperature must be below 60°C (140°F).
- Intake air temperature must be below 20°C (68°F).

1. Disconnect vacuum hose #12 (KE Model: #2) from the vacuum advance diaphragm A on the distributor and connect a vacuum pump/gauge to the hose.

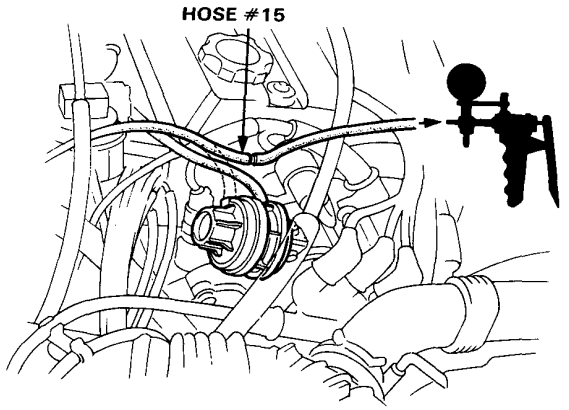


2. Start the engine, allow it to idle and check for vacuum.

   There should be vacuum.

   - If there is no vacuum, check the vacuum line for leaks, blockage or a disconnected hose and retest.
   - If there is vacuum, go on to step 3.

3. Disconnect vacuum hose #15 from the vacuum advance diaphragm B on the distributor and connect a vacuum pump/gauge to the hose.



4. Allow the engine to idle and check for vacuum.

   There should be vacuum.

   - If there is vacuum, go on to step 5.
   - If there is no vacuum, check the vacuum line for leaks, blockage or a disconnected hose.
     If no problem, go on to cold advance solenoid valve inspection (page 12-58).

5. Wait for the engine to warm up (cooling fan comes on).
   Check for vacuum at idle.

   There should be no vacuum.

   - If there is no vacuum, go on to step 6.
   - If there is vacuum, go on to cold advance solenoid valve inspection (page 12-58).

6. If there is no abnormality at each test, inspect the *vacuum advance diaphragm (page 24-5)*.

(cont'd)

Ignition Timing Controls (cont'd)

Cold Advance Solenoid Valve

The cold advance solenoid valve is activated by commands from the ECU. When the solenoid valve opens, this causes vacuum in the #15 vacuum hose and sends vacuum to diaphragm B to improve cold engine performance under the following conditions:

[KX Model]

- Whenever the coolant temperature is below 60°C (140°F).
- When the coolant temperature is 60—100°C (140—212°F), it is operated by the control unit which receives signals from the engine speed and manifold vacuum.

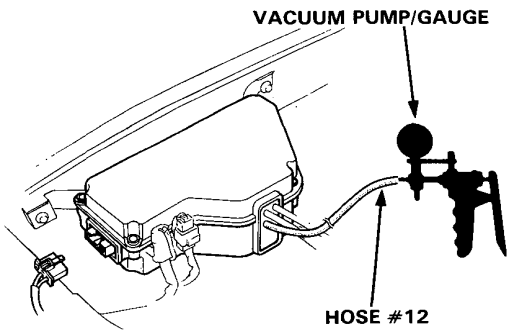
[Except KX Model]

- Whenever the coolant temperature is below 60°C (140°F) and the intake air temperature is below 20°C (68°F).

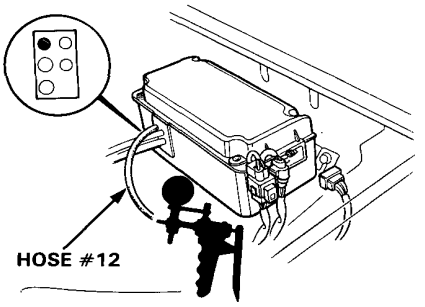
When the valve is open, 9 V or more should be available between the Black/Yellow terminal (+) and White terminal (—) of the main harness at the control box.

1. Disconnect the rectangular connector from the control box.
2. Disconnect the #12 vacuum hose from the vacuum hose manifold.
3. Apply vacuum to the hose.
   If should hold vacuum.
   If it does not hold vacuum, replace the valve.

[Except KE Model]



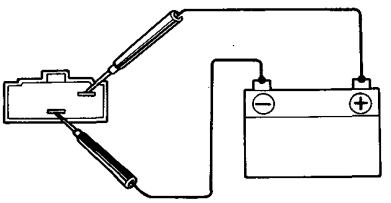
[KE Model]



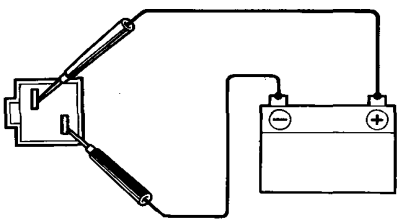
4. Connect the battery positive terminal to the Black/Yellow terminal of the control box coupler, and the battery negative terminal to the Yellow/Green terminal.
5. Apply vacuum to the hose.
   It should not hold vacuum.
   If it holds vacuum, replace the valve.

   NOTE: On KX model, before replacing the cold advance solenoid valve check for the check valve in the control box. If the check valve is OK, repalce the solenoid valve.

[Except KE model]



[KE model]



Transaxle

Clutch

Manual Transmission

Automatic Transmission

Differential

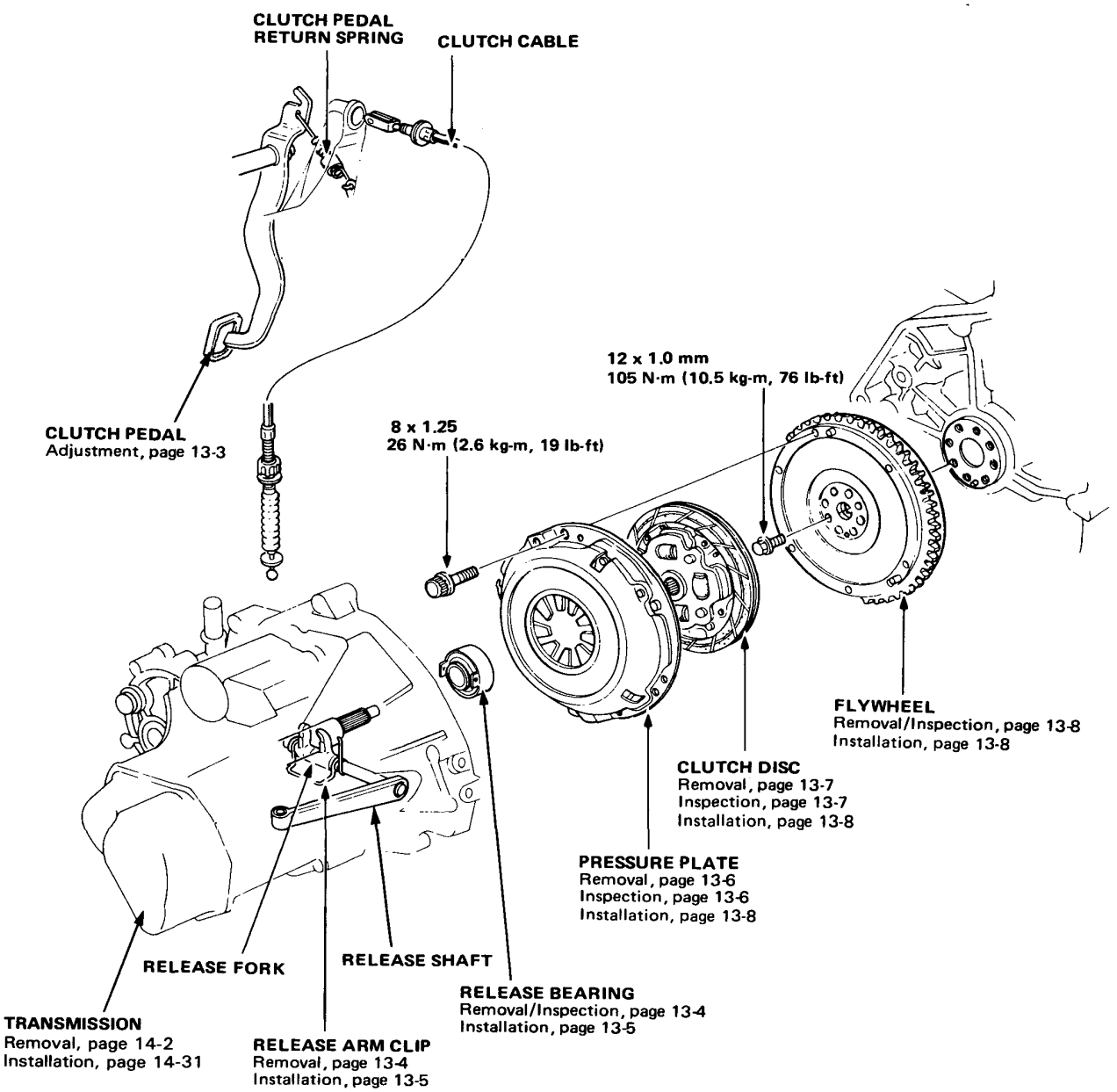
Driveshafts

Clutch

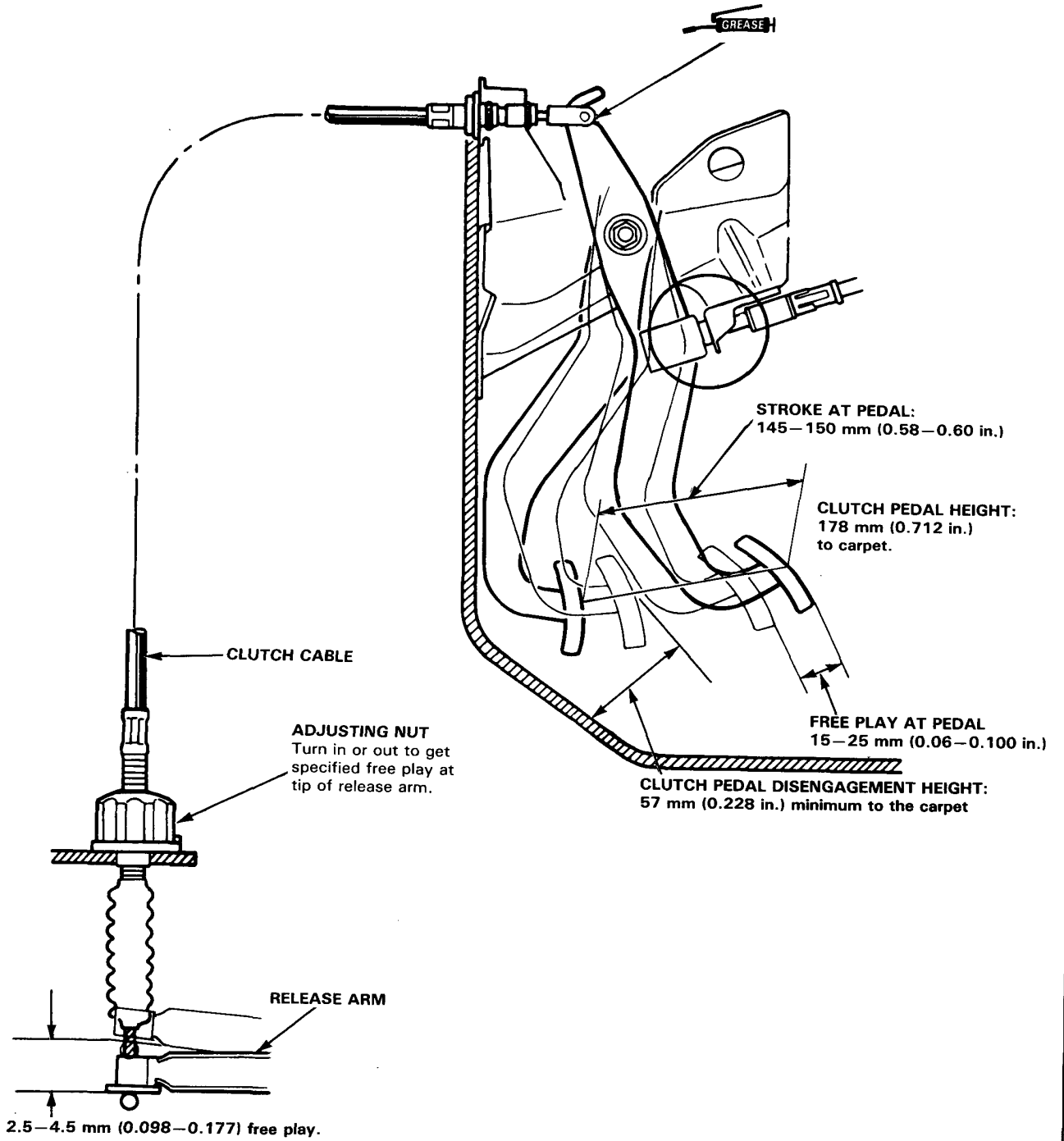
Clutch

Illstrated Index

NOTE: Whenever the transmission is removed, the release bearing sliding surface should be cleaned and greased.



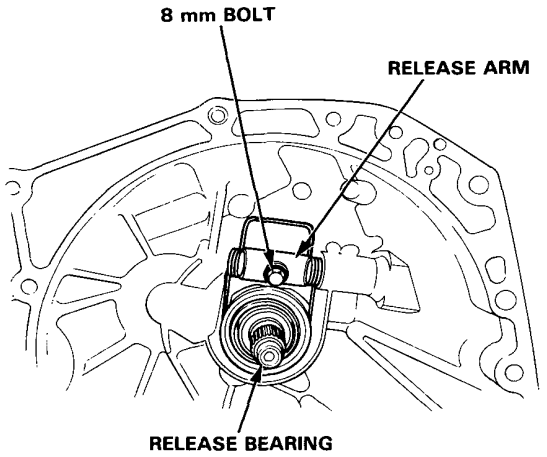
Adjustment


GREASE
STROKE AT PEDAL:
145—150 mm (0.58—0.60 in.)
CLUTCH PEDAL HEIGHT:
178 mm (0.712 in.)
to carpet.
CLUTCH CABLE
ADJUSTING NUT
Turn in or out to get specified free play at tip of release arm.
FREE PLAY AT PEDAL
15—25 mm (0.06—0.100 in.)
CLUTCH PEDAL DISENGAGEMENT HEIGHT:
57 mm (0.228 in.) minimum to the carpet
RELEASE ARM
2.5—4.5 mm (0.098—0.177) free play.

Release Bearing

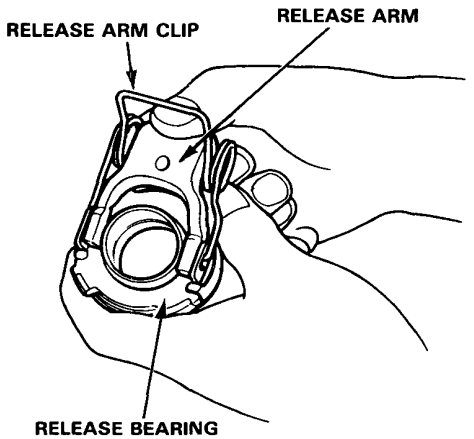
Removal

1. Remove the 8 mm special bolt.

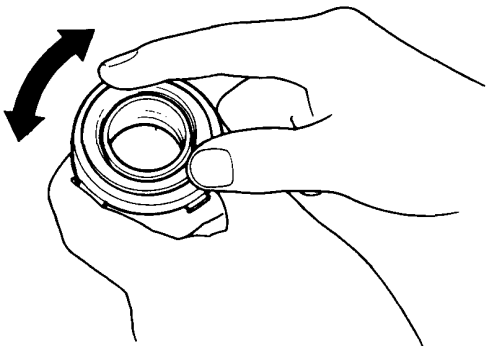


2. Remove the release shaft and release bearing assembly.

3. Separate the release arm from the bearing by removing the clip from the holes in the release bearing.



4. Check the release bearing for excessive play by spinning it by hand.

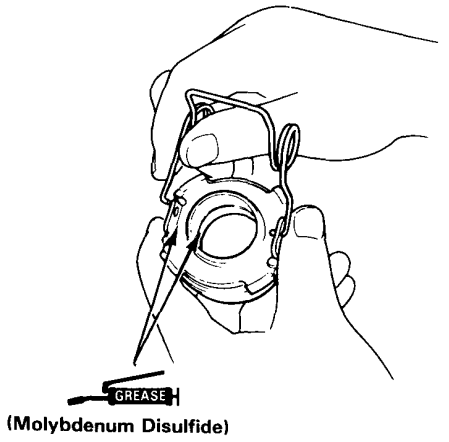


5. Replace the bearing with a new one if there is excessive play.

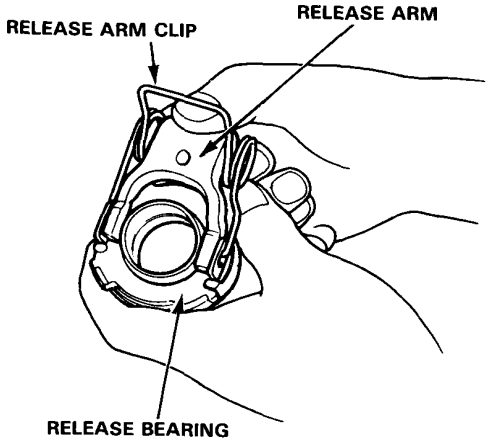
CAUTION: The bearing is packed with grease. Do not wash it in solvent.

Installation

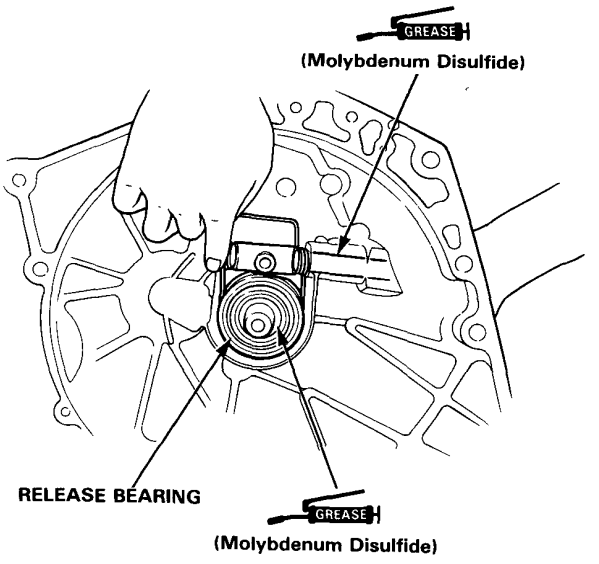
1. Align the release arm with the locating holes of the release bearing.



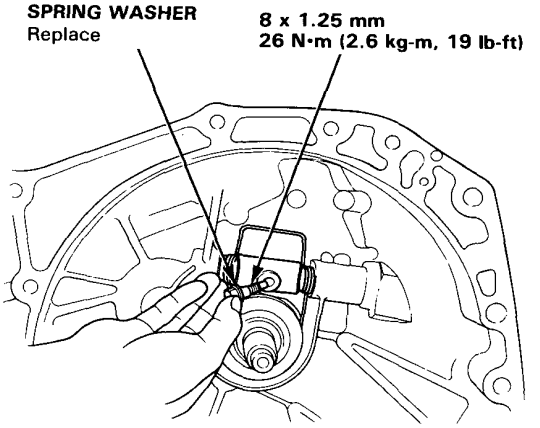
2. Install the release arm clip in the locating holes as shown.



3. Install the release shaft and the release bearing.



4. Align the release shaft and release arm, then install a new spring washer and bolt.



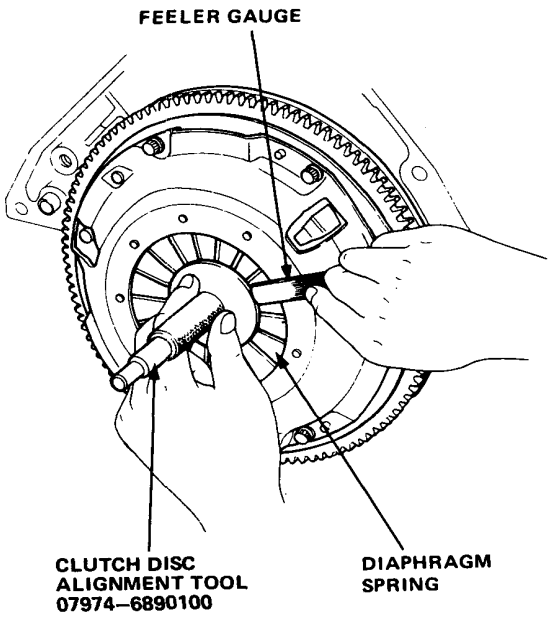
5. Move the release arm up and down to make sure the fork fits properly against the bearing, and that the bearing slides freely.

Pressure Plate

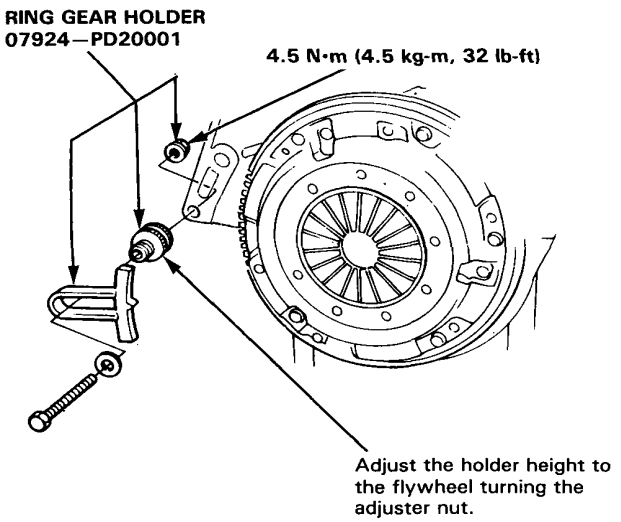
Removal/Inspection

1. Inspect the fingers of the diaphragm spring for wear at the release bearing contact area.
2. Check the diaphragm spring fingers for height using the Clutch Disc Alignment Tool and feeler gauge.

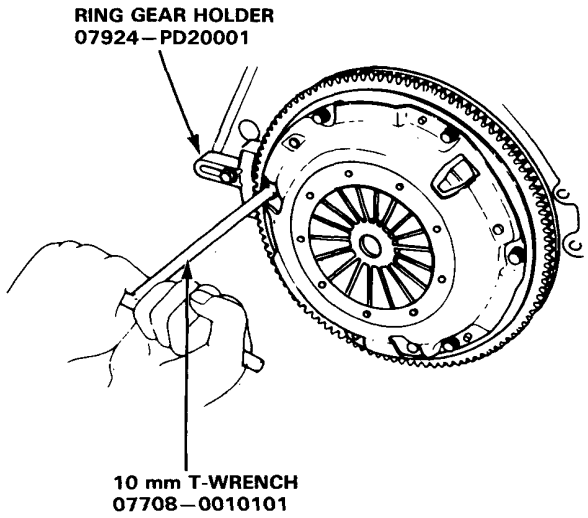
   Service Limit: 1.0 mm (0.04 in.) Max.



3. Install the Ring Gear Holder.

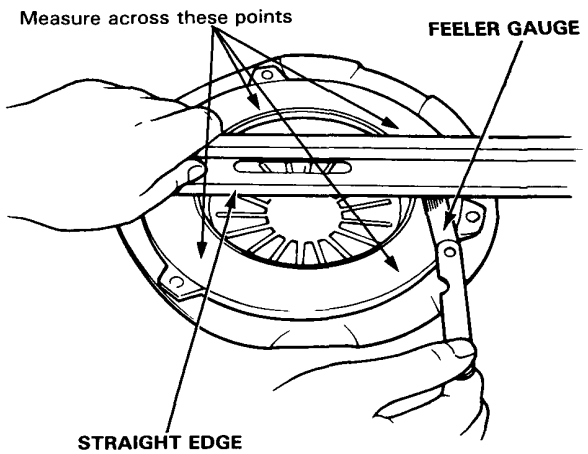


4. To prevent warping, unscrew the pressure plate mounting bolts two turns at a time in a crisscross pattern using a 10 mm T-wrench, then remove the pressure plate and clutch disc.



5. Inspect the pressure plate surface for wear, cracks, or burning.
6. Inspect for warpage using a straight edge and feeler gauge.

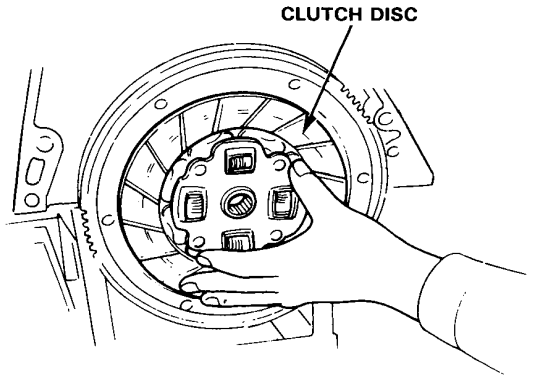
   Service Limit: 0.15 mm (0.006 in.) Max.



Clutch Disc

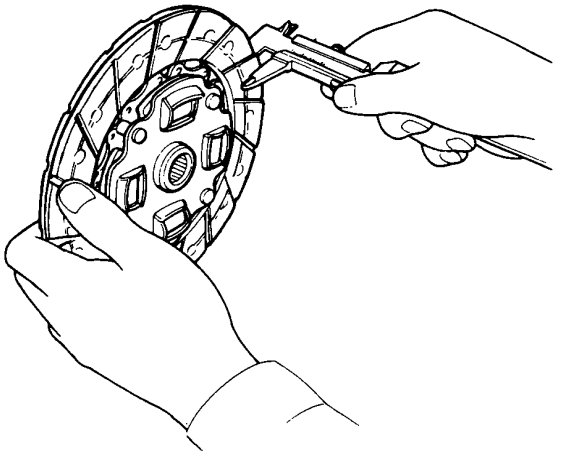
Inspection

1. Inspect lining of the clutch disc for signs of slipping or oil. Replace it if it is burned black or oil soaked.



2. Measure the clutch disc thickness.

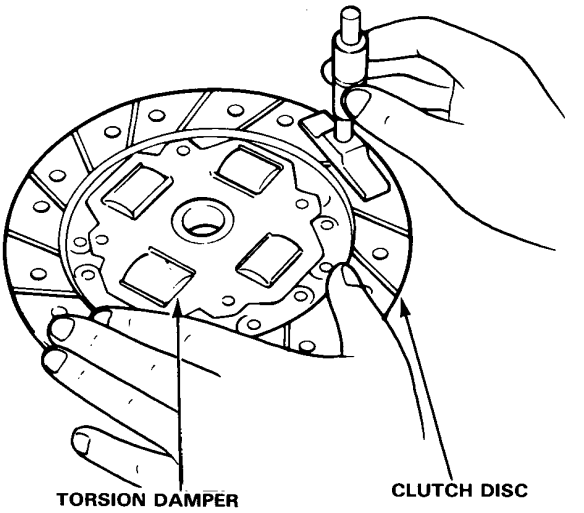
Clutch Disc Thickness:
Standard (New): 8.1—8.8 mm (0.32—0.35 in.)
Service Limit: 5.7 mm (0.22 in.)



3. Check for loose rubber torsion dampers. Replace the clutch disc if any are loose.

4. Measure the depth from the lining surface to the rivets, on both sides.

Rivet Depth:
Standard (New): 1.3 mm (0.051 in.) min.
Service Limit: 0.2 mm (0.008 in.)



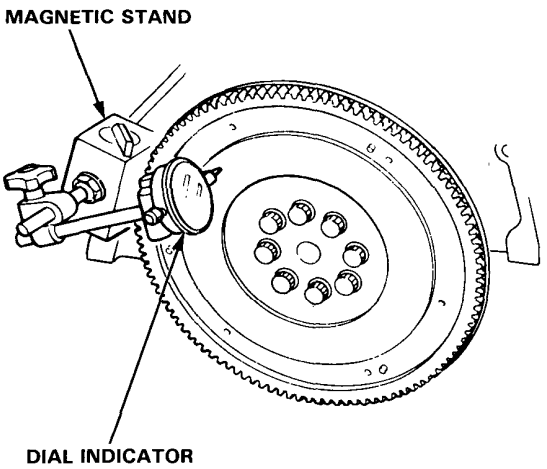
Flywheel

Inspection/Removal

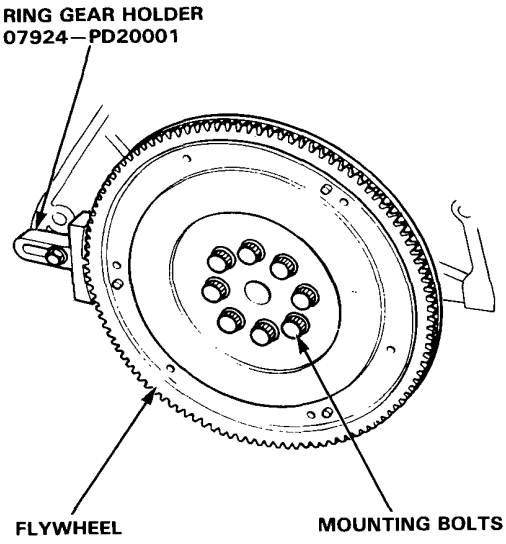
1. Inspect the ring gear teeth for wear or damage.
2. Inspect the clutch disc mating surface on the flywheel for wear, cracks or burning.
3. Measure the flywheel runout using a dial indicator through at least two full turns. Push it against the flywheel each time you turn it to take up the crankshaft thrust washer clearance.

   NOTE: The runout can be measured with engine installed.

   Standard (New): 0.05 mm (0.002 in.) max.
   Service Limit: 0.15 mm (0.006 in.)



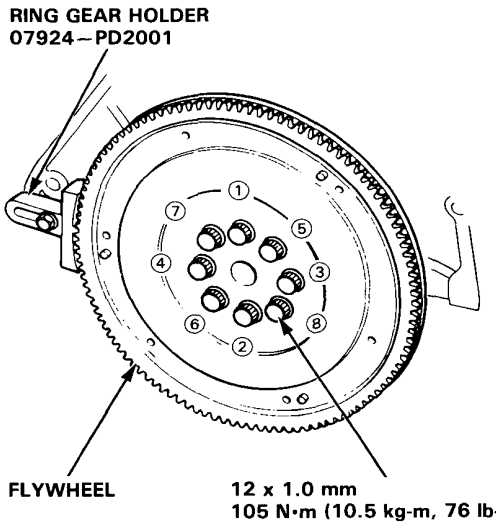
4. Remove the eight flywheel mounting bolts and flywheel.



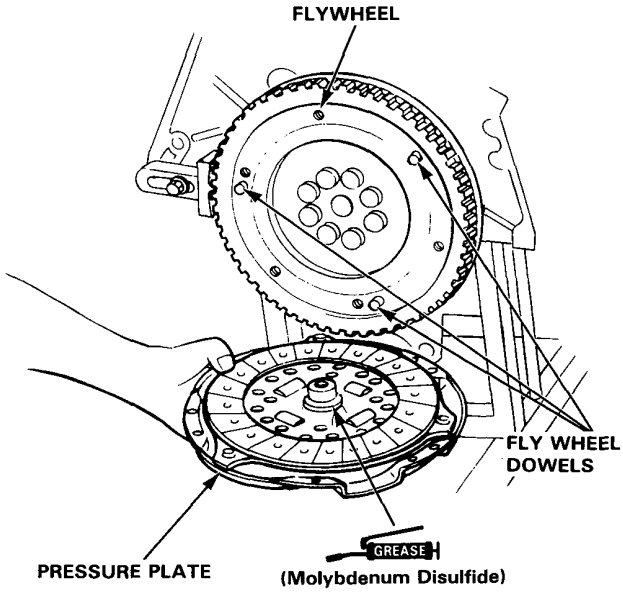
Flywheel and Clutch

Installation

1. Align the hole in flywheel with the crankshaft dowel pin and assemble. Install the bolts only finger tight.
2. Install the Ring Gear Holder, then torque the flywheel bolts in a crisscross pattern, as shown.

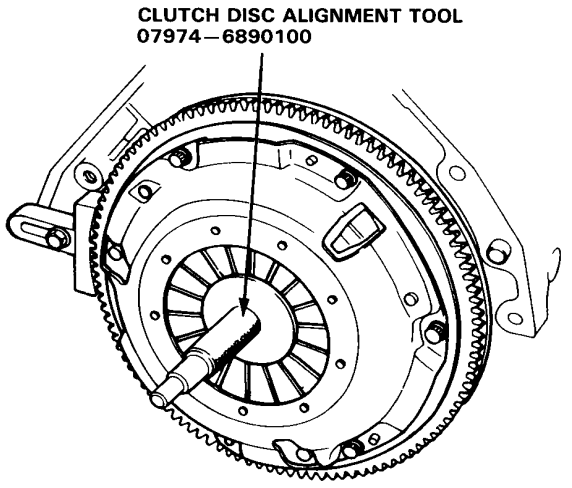


3. Install the clutch disc and pressure plate by aligning the flywheel dowels with dowel holes in the pressure plate.

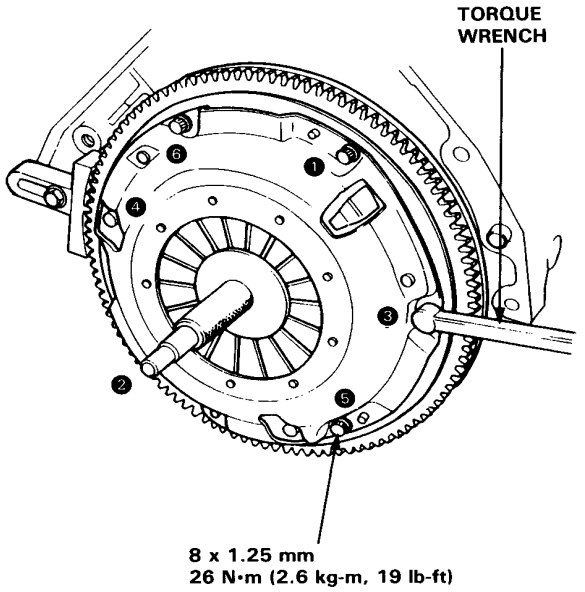


4. Install the attaching bolts finger tight.

5. Insert the Clutch Disc Alignment Tool in the splined hole in the clutch disc.

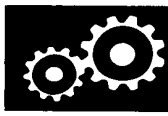


6. Torque the bolts in a crisscross pattern as shown. Tighten them two turns at a time to prevent warping the diaphragm spring.



7. Remove the Alignment Tool and Ring Gear Holder.

Manual Transmission



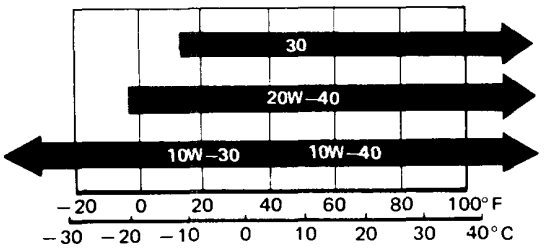
Maintenance

Oil Level Inspection

1. Check with oil at operating temperature, engine OFF, and car on level ground.
2. Remove oil filler plug and check level with finger.
3. Oil level must be up to fill hole. If it is below hole, add oil until it runs out, then reinstall plug.

Oil Change

Change oil every 40,000 km (24,000 miles).
Use only SAE30, 10W-30, 10W-40, or 20W-40 weight oil rated SE or SF grade.

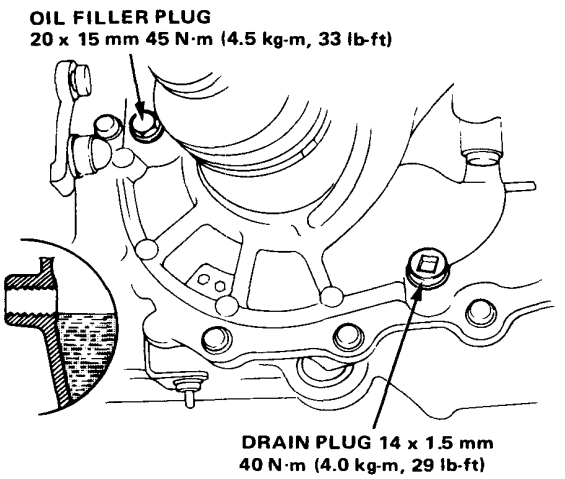


1. With transmission oil at operating temperature, engine OFF, and car on level ground, remove drain plug and drain transmission.
2. Reinstall drain plug with new washer, and refill to proper level.

NOTE: Drain plug washer should be replaced at every oil change.

Oil Capacity

2.5ℓ (2.5 U.S. qt.) after drain.
2.6ℓ (2.6 U.S. qt.) after overhaul.



Transmission Assy

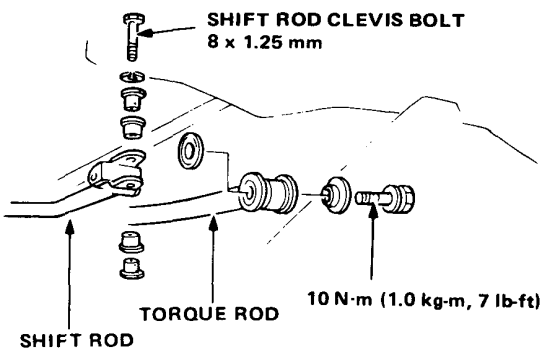
Removal

Car on Ground

1. Disconnect ground cable at battery and at transmission.
2. Release steering lock and place gear selector in neutral position.
3. Disconnect engine compartment wiring as follows:
   - Battery positive cable from starter motor.
   - Black/white wire from starter solenoid.
   - Green/black and yellow wires from back-up light switch.
4. Release engine sub-wire harness from clamp at clutch housing.
5. Disconnect clutch cable at the release arm.
6. Remove the two upper transmission mounting bolts.

Car Raised on Hoist

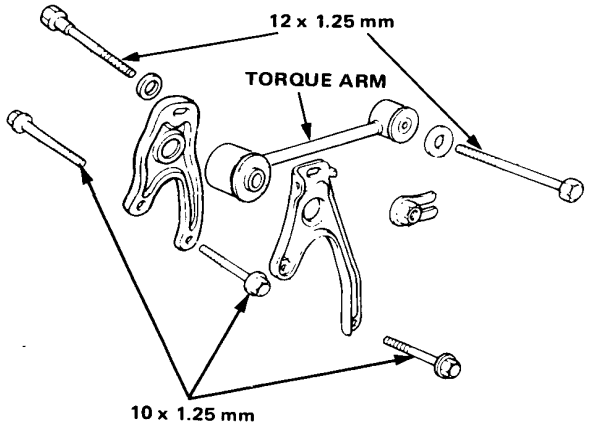
7. Drain transmission oil. Reinstall drain plug and washer.
8. Remove front wheels.
9. Place transmission jack securely beneath transmission.
10. Remove bolt securing speedometer drive holder and pull assembly out of transmission.
11. Disconnect shift lever torque rod from clutch housing.
12. Remove bolt from shift rod clevis.



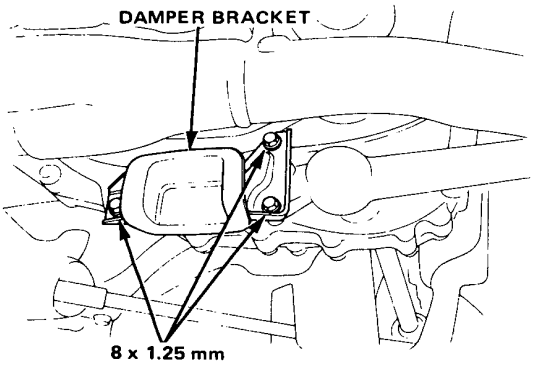
13. Disconnect the tie-rod ball joints and remove using the Ball Joint Remover (page 20-8).
14. Remove the lower arm ball joint bolt from the right-side lower control arm, then use a puller to disconnect the ball joint from the knuckle. Remove the damper fork bolt (page 20-17).

15. Turn each steering knuckle to its most outboard position. With screwdriver, pry right-side CV joint out approximately 1/2", then pull sub-axle out of transmission housing. Repeat on opposite side. Remove the right-side radius rod.

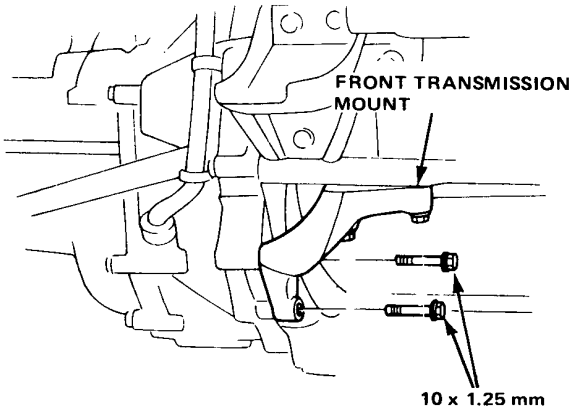
16. Remove the torque arm bracket bolts from the clutch housing.



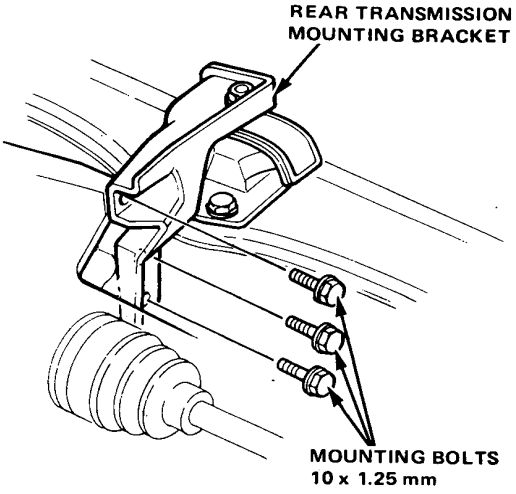
17. Remove the damper bracket from the transmission.



18. Remove the clutch housing bolts from the front transmission mount.



19. Remove the clutch housing bolts from the rear transmission mounting bracket.

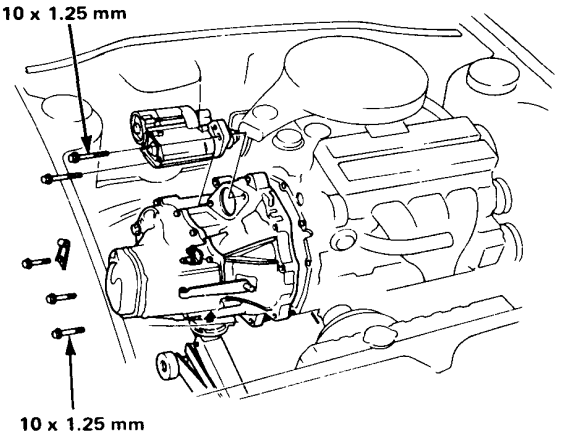


20. Remove the clutch cover.

21. Remove the starter mounting bolts. Detach the starter motor and lower through chassis.

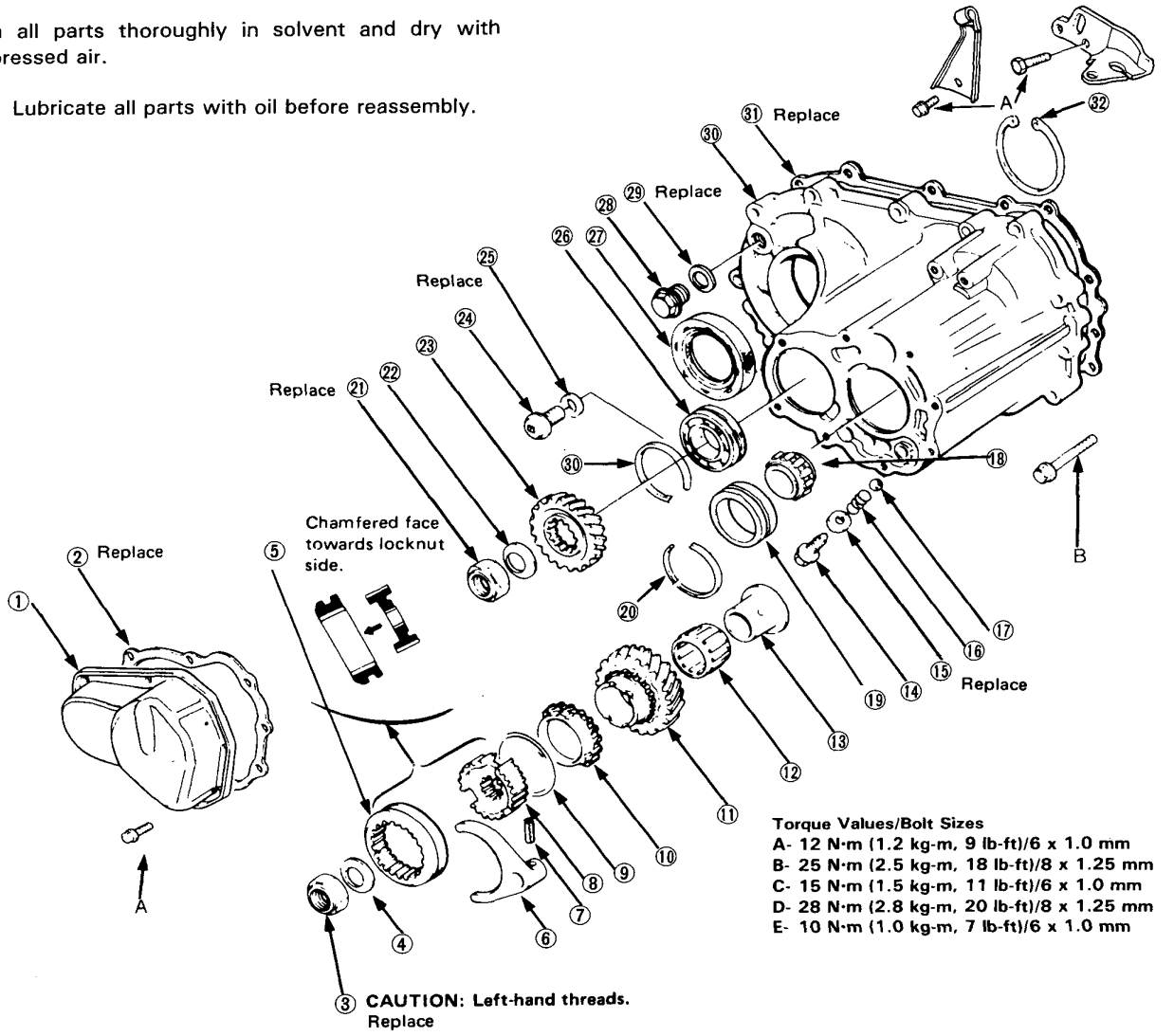
22. Remove the front transmission mounting bolt.

23. Pull transmission away from the engine block to clear the two 14 mm dowel pins and lower on transmission jack.

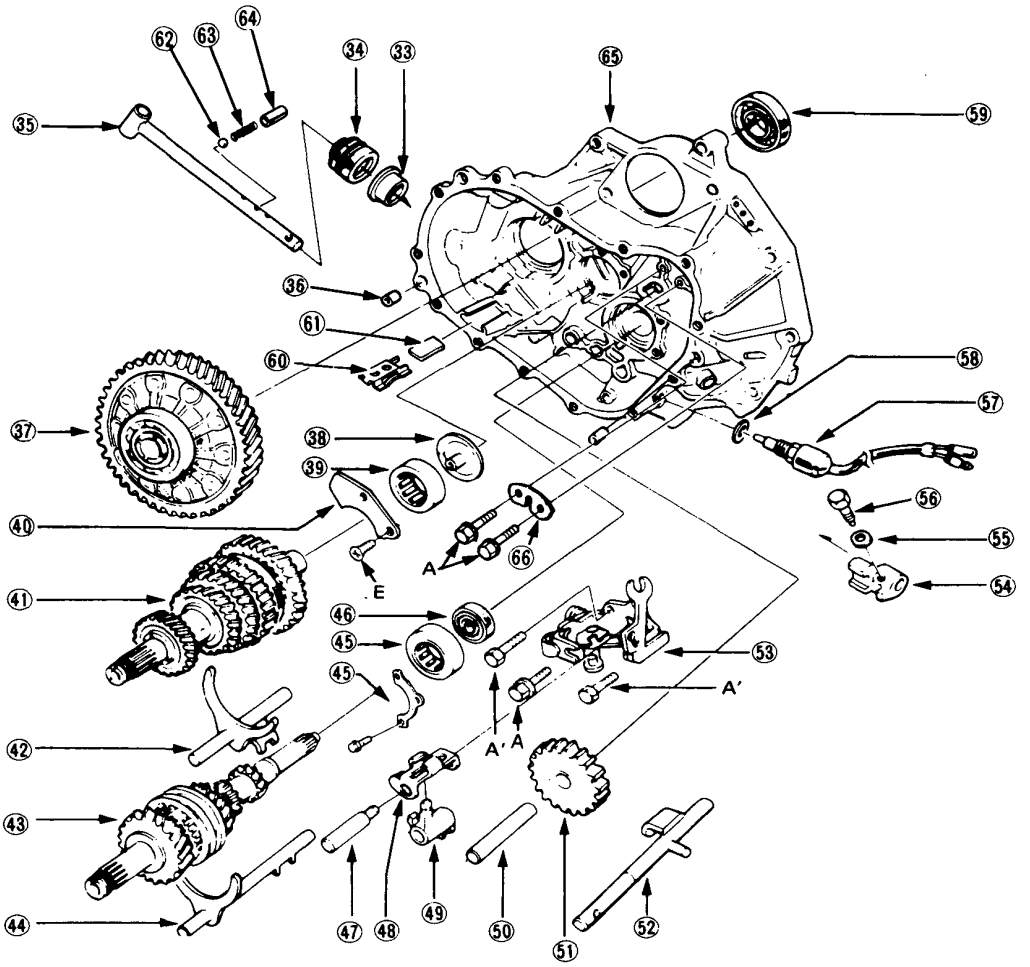


Clean all parts thoroughly in solvent and dry with compressed air.

Lubricate all parts with oil before reassembly.



① **END COVER**
Removal, Page 14-6
Installation, Page 14-29
② **GASKET**
③ **LOCKNUT**
Removal, Page 14-6
Installation, Page 14-29
④ **SPRING WASHER**
⑤ **FIFTH GEAR SYNCHRO SLEEVE**
Removal, Page 14-7
Installation, Page 14-29
⑥ **FIFTH GEAR SHIFT FORK**
Removal, Page 14-7
Installation, Page 14-29
⑦ **SPRING PIN**
⑧ **FIFTH GEAR SYNCRO HUB**
Removal, Page 14-7
Installation, Page 14-28
⑨ **SYNCHRO SPRING**
⑩ **FIFTH GEAR SYNCHRO RING**
Inspection, Page 14-15
⑪ **MAINSHAFT FIFTH GEAR**
Removal, Page 14-7
Installation, Page 14-28
⑫ **NEEDLE BEARING**
⑬ **SPACER COLLAR**
⑭ **RETAINING SCREW**
22 N·m (2.2 kg-m, 16 lb-ft)
⑮ **WASHER 12 mm**
⑯ **SPRING**
⑰ **DETENT BALL**
⑱ **ROLLER BEARING**
⑲ **BEARING OUTER RACE**
Replacement, Page 14-12
⑳ **SNAP RING 60 mm**
㉑ **LOCKNUT**
Removal, Page 14-6
Installation, Page 14-29
㉒ **SPRING WASHER**
㉓ **COUNTERSHAFT FIFTH GEAR**
㉔ **DRAIN PLUG**
40 N·m (4.0 kg-m, 29 lb-ft)
㉕ **WASHER 14 mm**
㉖ **BALL BEARING**
Replacement, Page 14-12
㉗ **OIL SEAL**
Removal, Page 14-10
Installation, Page 14-30
㉘ **OIL FILLER BOLT**
45 N·m (4.5 kg-m, 33 lb-ft)
㉙ **WASHER 20 mm**
㉚ **TRANSMISSION HOUSING**
Disassembly, Page 14-6
Installation, Page 14-27
㉛ **GASKET**
㉜ **SNAP RING 80 mm**



㉝ **OIL SEAL**
㉞ **BOOT**
㉟ **SHIFT ROD**
㊱ **DOWEL PIN 14 x 20 mm**
㊲ **DIFFERENTIAL ASSY**
Removal, Page 14-10
Overhaul, Sec. 17
Installation, Page 14-25
㊳ **OIL BARRIER PLATE**
㊴ **COUNTERSHAFT BEARING**
Replacement, Pages 14-10, 11
㊵ **BEARING RETAINER PLATE**
㊶ **COUNTERSHAFT ASSY**
Removal, Page 14-9
Inspection, Page 14-17
Installation, Page 14-25
Measurements, Page 14-21
㊷ **FIRST & SECOND GEARSHIFT SHAFT**

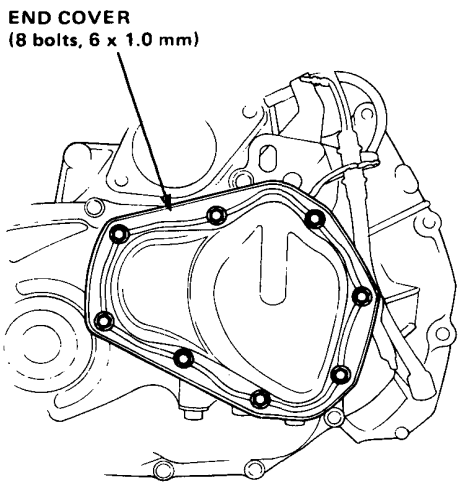
㊸ **MAINSHAFT**
Removal, Page 14-9
Inspection, Page 14-17
Installation, Page 14-25
Measurements, Page 14-20
㊹ **THIRD & FOURTH GEARSHIFT SHAFT**
㊺ **MAINSHAFT BEARING AND BEARING RETAINER PLATE**
Replacement, Pages 14-10, 11
㊻ **OIL SEAL**
Replacement, Page 14-10
㊼ **SHIFT GUIDE SHAFT**
㊽ **INTERLOCK**
㊾ **SHIFT GUIDE**
㊿ **REVERSE IDLER GEAR SHAFT**
Removal, Page 14-8
Installation, Page 14-27
(51) **REVERSE IDLER GEAR**
Removal, Page 14-8
Installation, Page 14-27
(52) **FIFTH & REVERSE GEARSHIFT SHAFT**

(53) **SHIFT ARM HOLDER**
Measurements, Pages 14-22, 23
Removal, Page 14-23
Installation, Page 14-25
A 12 N·m (1.2 kg-m, 9 lb-ft)
A' 15 N·m (1.5 kg-m, 11 lb-ft)
(54) **SHIFT ROD GUIDE**
Measurements, Page 14-24
Installation, Page 14-25
(55) **WASHER 8 mm**
(56) **BOLT, 8 x 1.25 mm**
30 N·m (3.0 kg-m, 22 lb-ft)
(57) **BACK-UP LIGHT SWITCH**
(58) **WASHER 14 mm**
(59) **OIL SEAL**
Removal, Page 14-10
Installation, Page 14-30
(60) **SET PLATE**
(61) **MAGNET**
(62) **DETENT BALL**
(63) **SPRING**
(64) **SPRING COLLAR**
(65) **CLUTCH HOUSING**
(66) **BREATHER CHAMBER PLATE**

Transmission Housing

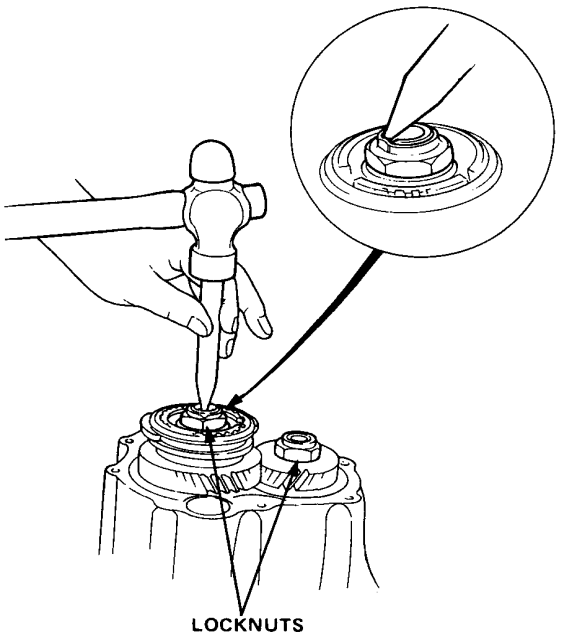
Disassembly

1. Remove transmission end cover.

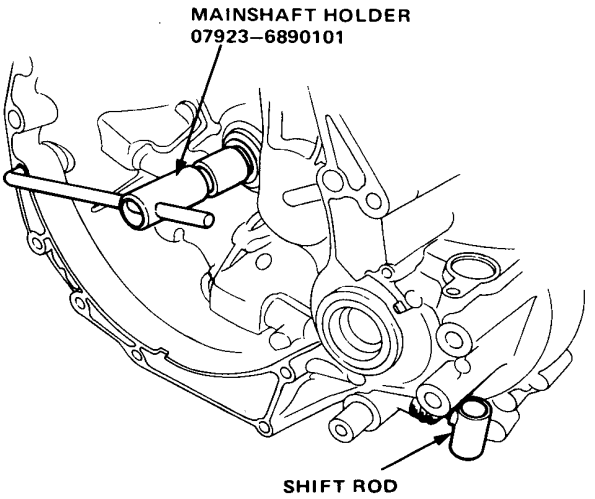


NOTE: Before removing mainshaft/countershaft locknuts, measure clearance between spacer collar and shoulder on fifth gear.

2. Bend locking tab on locknuts out of slots in mainshaft and countershaft.



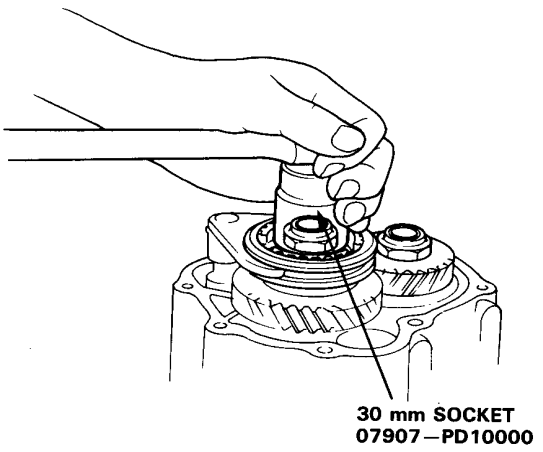
3. Install mainshaft holder.



4. Shift transmission into reverse gear.

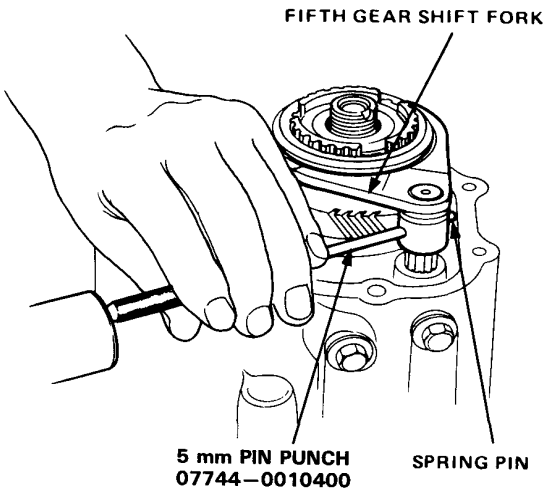
5. Remove locknuts.

CAUTION: The mainshaft locknut has left-hand threads.

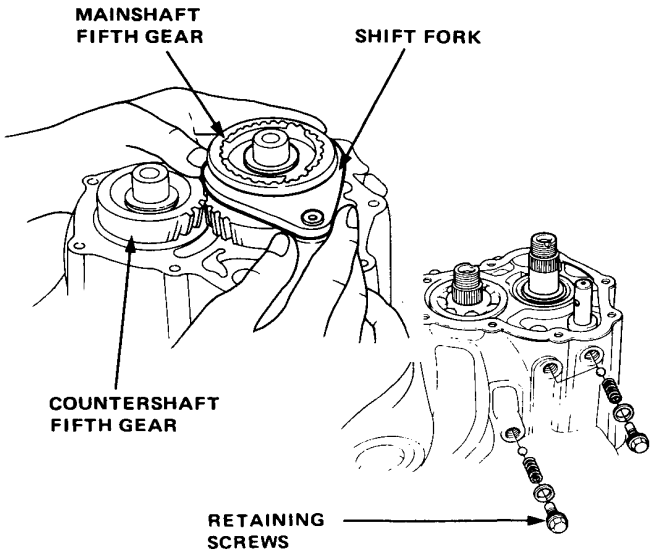


6. Remove mainshaft holder.

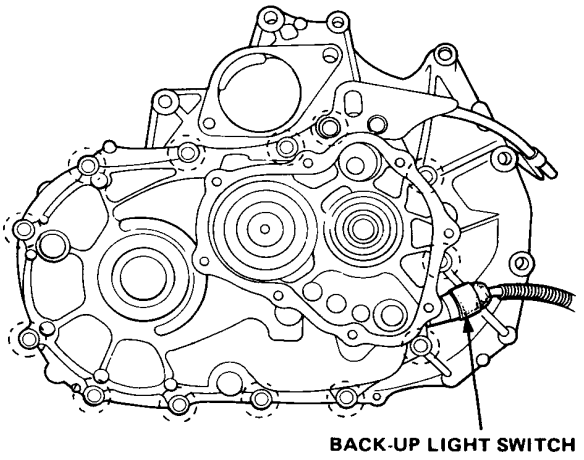
7. Drive out spring pin securing fifth gear shift fork to shaft.



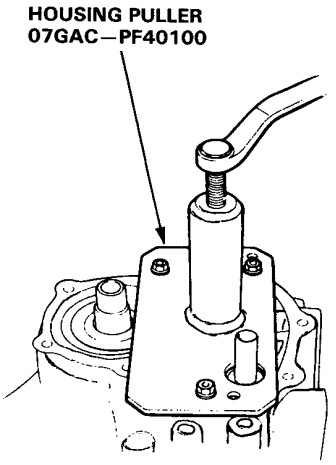
8. Remove mainshaft fifth gear, shift fork, synchronizer sleeve, hub, ring and spring as a unit.
9. Remove countershaft fifth gear.
10. Remove three retaining screws and detent balls.



11. Remove back-up light switch.
12. Remove thirteen housing bolts.



13. Install transmission housing puller with four bolts and tighten securely. Screw the puller bolt against end of countershaft until transmission housing breaks loose.



Reverse Fork

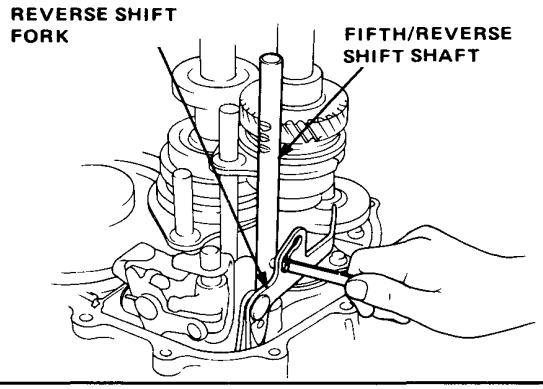
Shift Shaft Clearance

1. Check clearance between fifth/reverse shift shaft pin and reverse shift fork.

   PIN-TO-FORK CLEARANCE
   Standard (New): 0.05—0.35 mm (0.002—0.014 in.)
   Service Limit: 0.5 mm (0.02 in.)

2. If clearance is beyond limit, measure width of slot in reverse shift fork.

   Standard (New): 7.05—7.25 mm (0.278—0.285 in.)



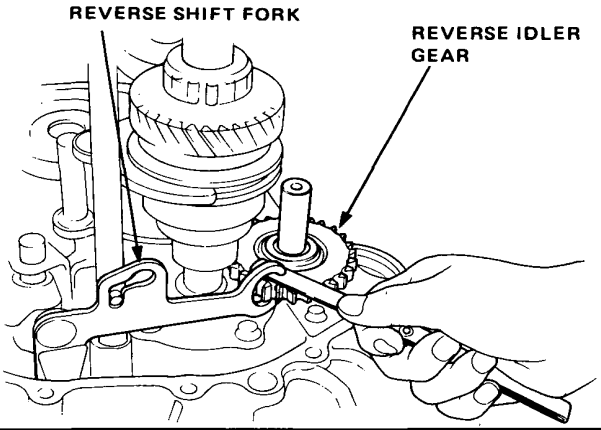
Gear Clearance

1. Check reverse idler gear-to-shift fork clearance.

   GEAR-TO-FORK CLEARANCE
   Standard (New): 0.2—1.0 mm (0.008—0.04 in.)
   Service Limit: 1.7 mm (0.07 in.)

2. Pull out the reverse idler shaft and remove gear. If gear-to fork clearance is beyond limit, measure gap between ends of shift fork fingers.

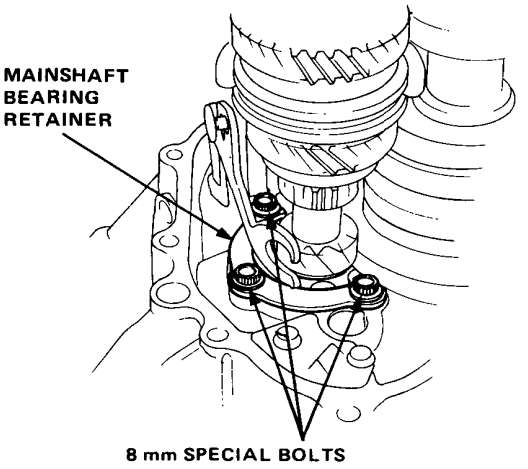
   Standard (New): 11.8—12.1 mm (0.46—0.48 in.)



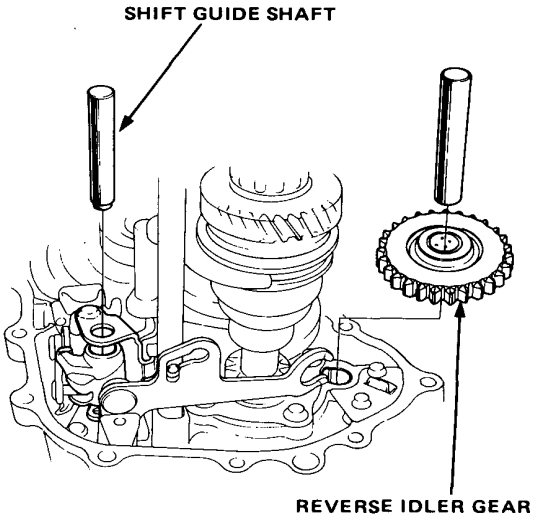
Countershaft/Mainshaft

Removal

1. Shift transmission into neutral.
2. Remove the mainshaft bearing retainer plate.

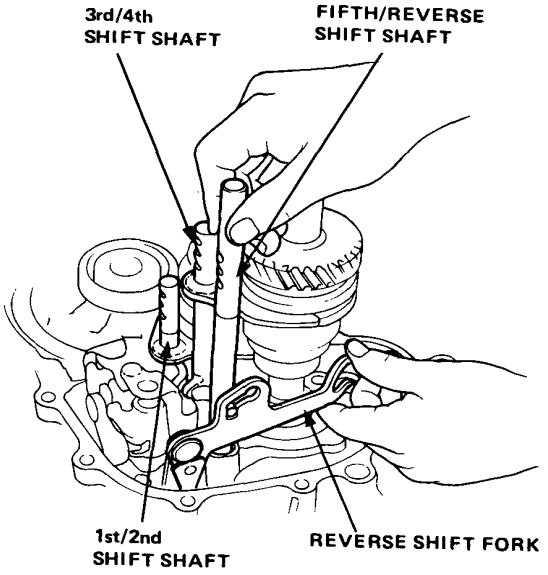


3. Pull out the shift guide shaft.
4. Pull out reverse idler shaft and remove gear.

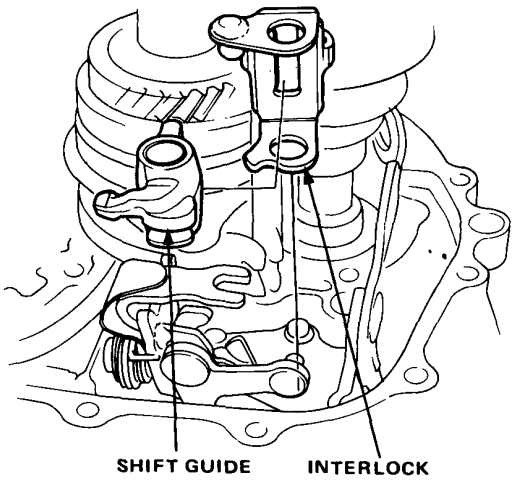


5. Pull the 3rd/4th and 1st/2nd shift shafts up, to shift into fourth and second.

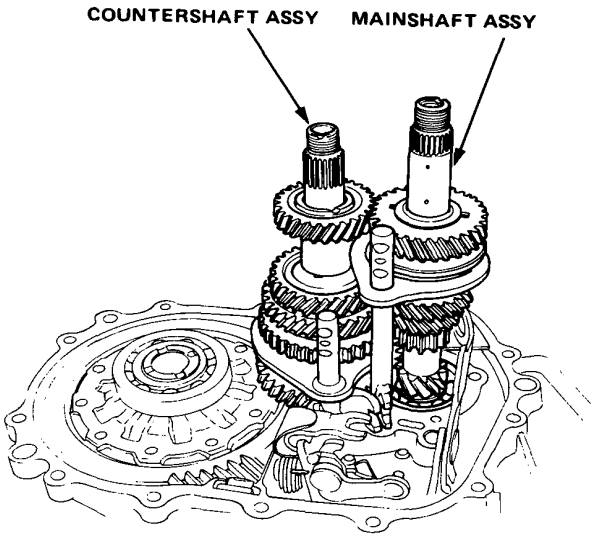
6. Remove the 5th/reverse shift shaft by pulling it up while lifting the reverse shift fork.



7. Tilt interlock and shift guide to the side, then lift them out.



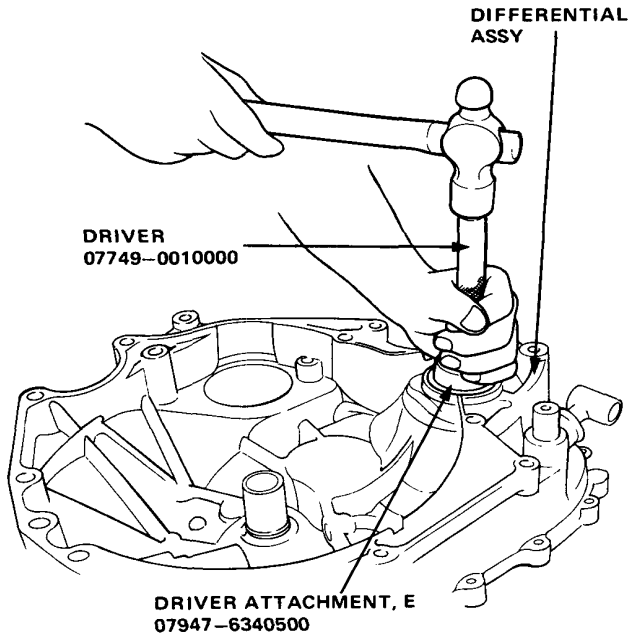
8. Remove countershaft and mainshaft as an assembly, with 1st/2nd & 3rd/4th shift shafts.



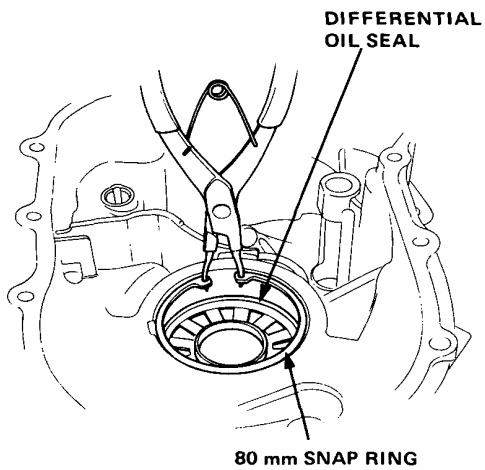
Differential Oil Seal

Removal

1. If seals are to be replaced, or if differential needs repair, remove differential assembly.



2. Drive the differential oil seal out of the clutch housing.
3. Remove 80 mm snap ring in transmission housing.



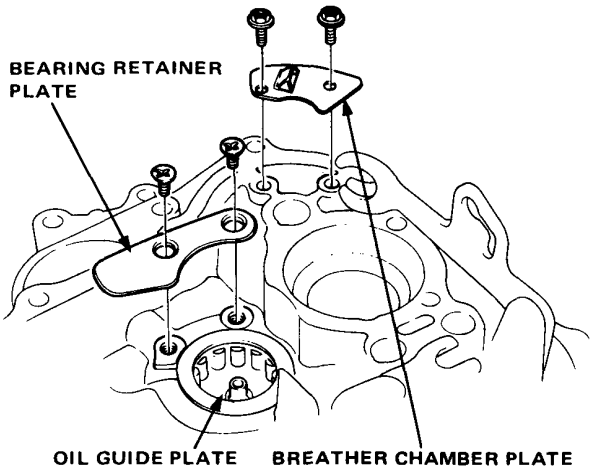
4. Drive the differential oil seal out of the transmission housing.

NOTE: Replace the differential oil seal in the transmission housing whenever disassembled.

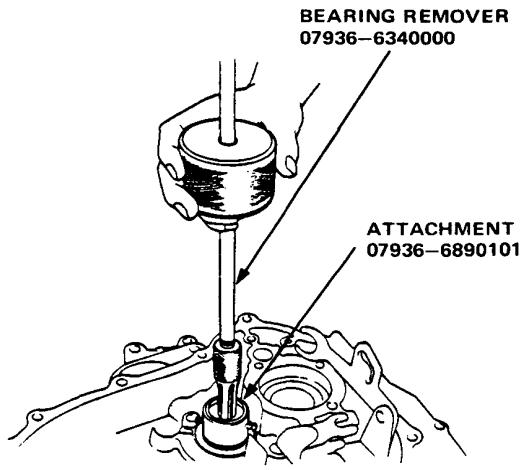
Bearings and Seals

Replacement (Clutch Housing)

1. Remove countershaft bearing retainer plate.
2. Remove the breather chamber plate.

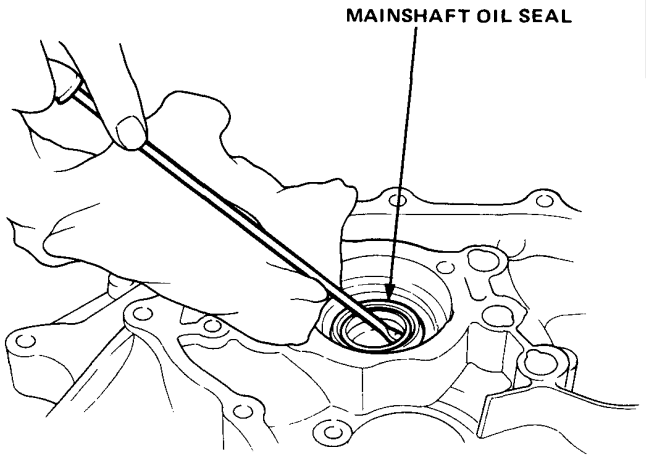


3. Insert Bearing Remover with attachment into countershaft bearing.
4. Raise slide hammer rapidly and strike against handle.
   Repeat several times to remove bearing.



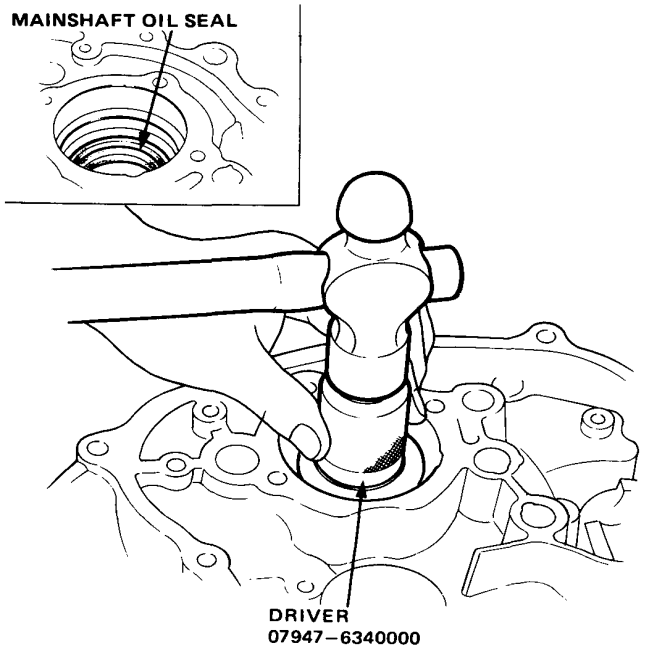
5. Remove mainshaft bearing and oil seal from clutch housing by prying out with a screwdriver.

   NOTE: Always install new oil seal. Do not reinstall old one.

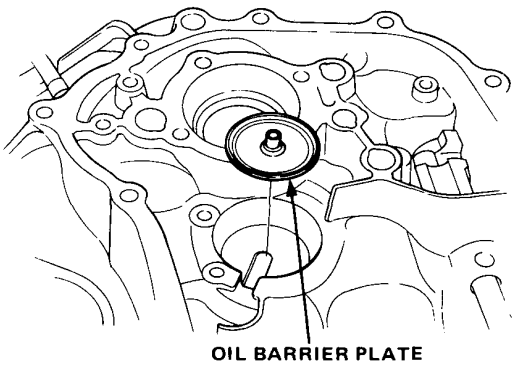


6. Install the mainshaft oil seal.

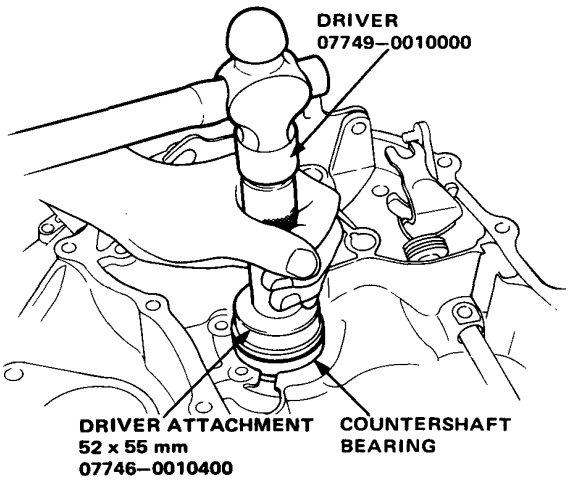
   NOTE: Install the oil seal with the sealing lips facing the mainshaft bearing.



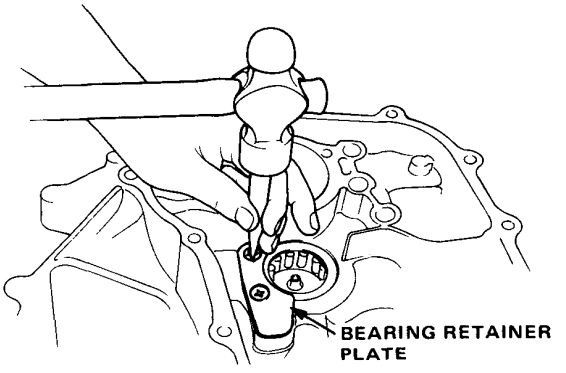
7. Install the countershaft oil barrier plate.



8. Drive in countershaft bearing with support block placed under case to support bearing boss.



9. Reinstall bearing retainer plate. Install screws using impact driver. Stake the screws.



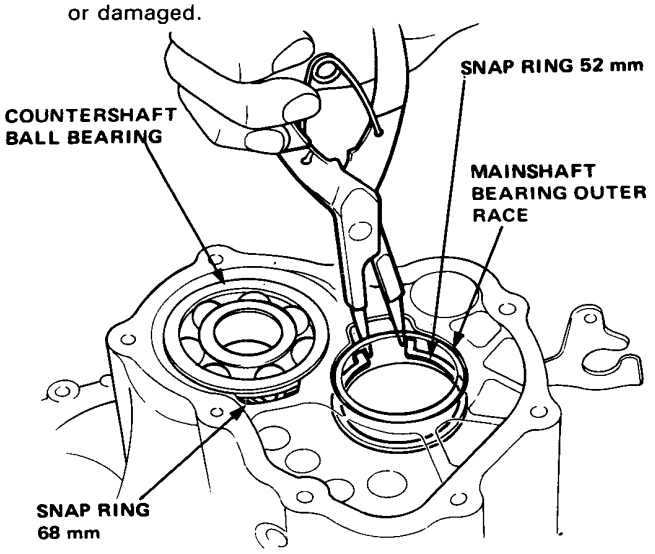
10. Reinstall the breather chamber plate.

Replacement (Trans Housing)

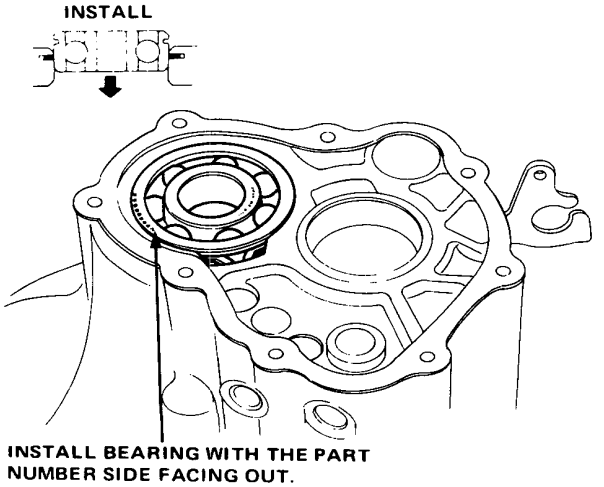
1. Using snap ring pliers, carefully expand the snap ring and press the bearing out into the case.

   CAUTION: Do not expand the ring any wider than to clear the groove in the bearing. Over-expansion or off-angle use of the pliers can damage the snap ring and/or the groove in the trans housing.

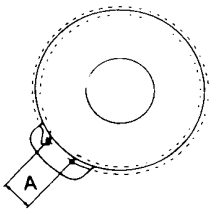
   NOTE: Inspect the snap rings for wear. Replace any snap rings that are worn excessively or damaged.



2. Install the new bearing with the part number facing out. Using snap ring pliers, carefully expand the snap ring, press the bearing into the case, and then seat the snap ring in the bearing groove.
3. After the bearing has entered the snap ring, remove the pliers, and press the bearing into place by hand.



4. Check that the snap ring is securely seated in both the grooves of the bearing and the case.



NOTE: To confirm proper snap ring seating and condition, measure snap ring gap A as installed:

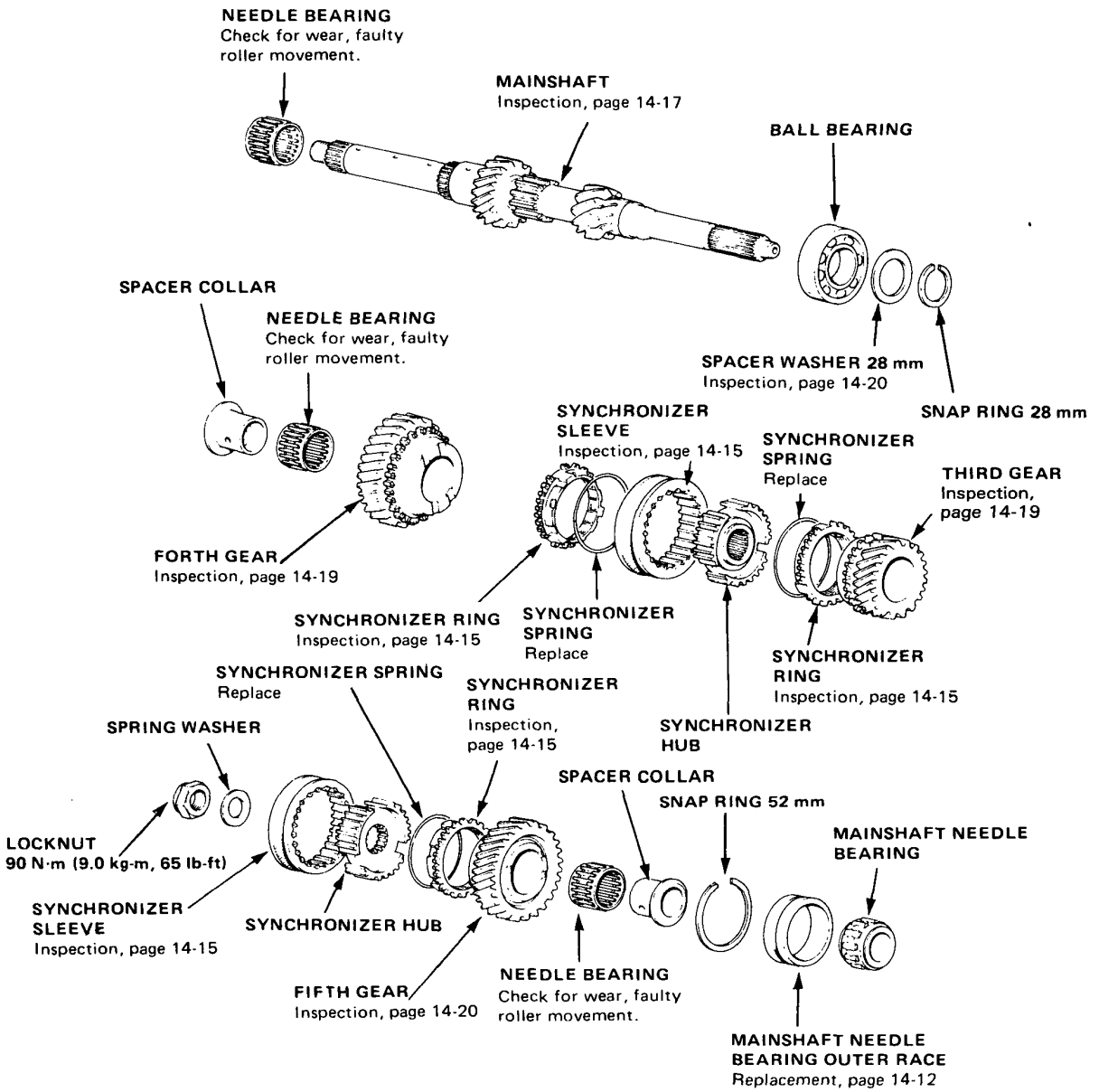
Bearing	Dimension A as installed
Mainshaft	3.0—8.0 mm (0.118—0.314 in)
Countershaft	7.0—7.1 mm (0.276—0.279 in)

Reseat or carefully replace the snap ring if the gap is outside the specification.

Index

NOTE:
- Clean all parts thoroughly in solvent and dry with compressed air.
- Third, fourth and fifth gear needle bearings are identical.

Lubricate all parts with oil before reassembly.

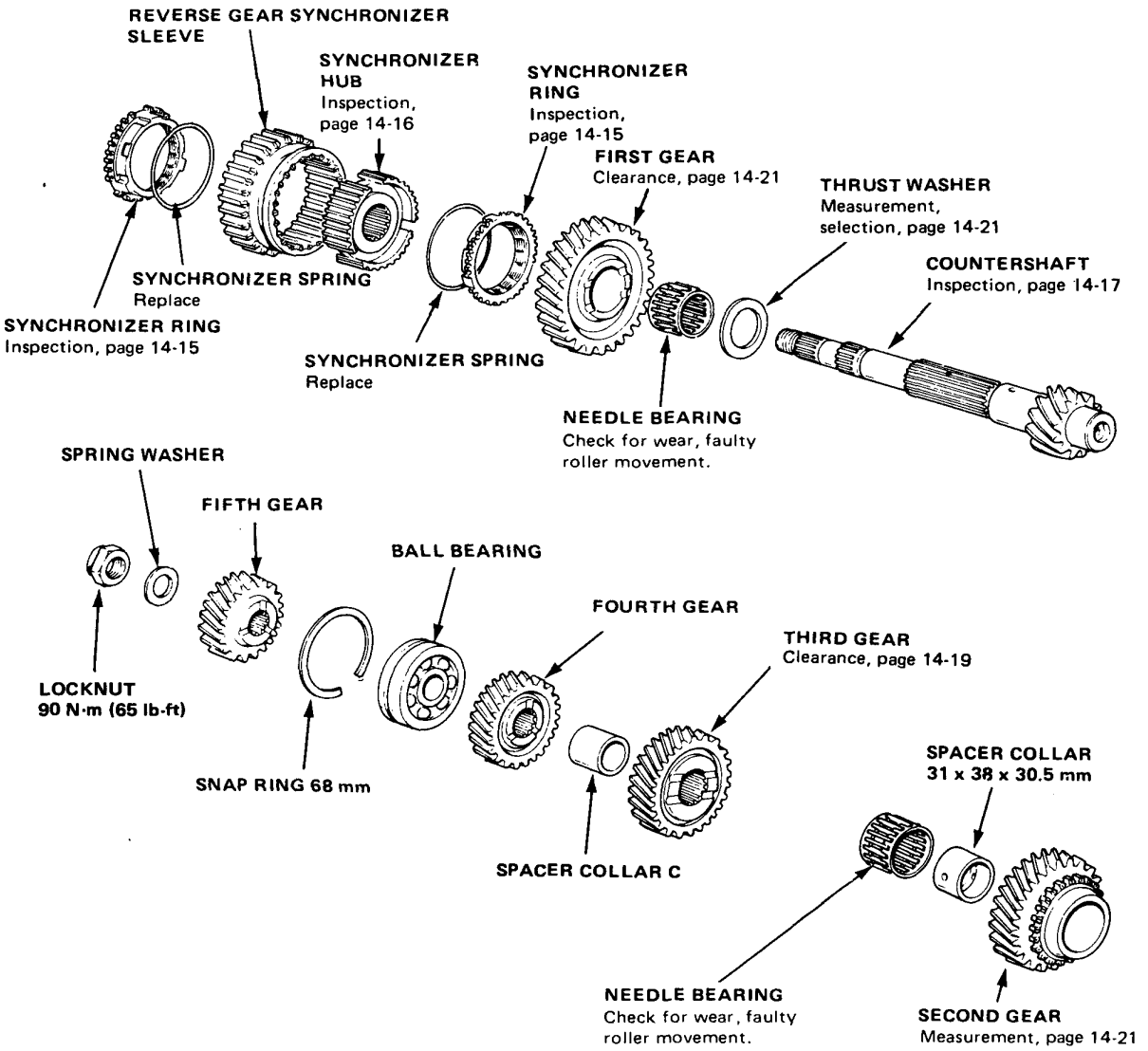


Countershaft

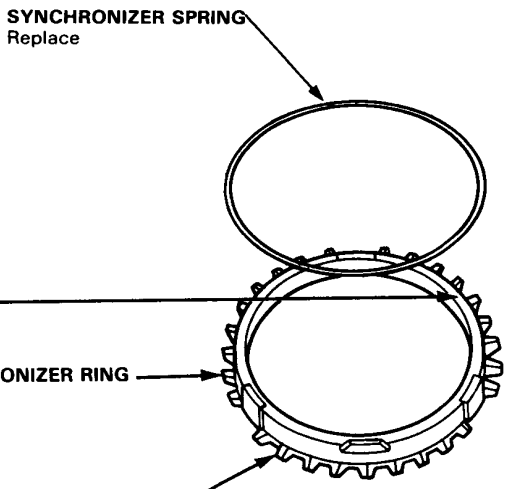
Index

NOTE:
- Clean all parts thoroughly in solvent and dry with compressed air.
- First and second gear needle bearings are not identical.

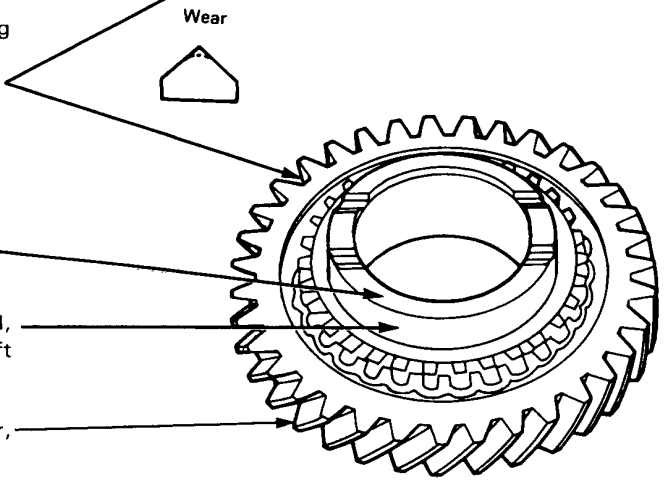
Lubricate all parts with oil before reassembly.



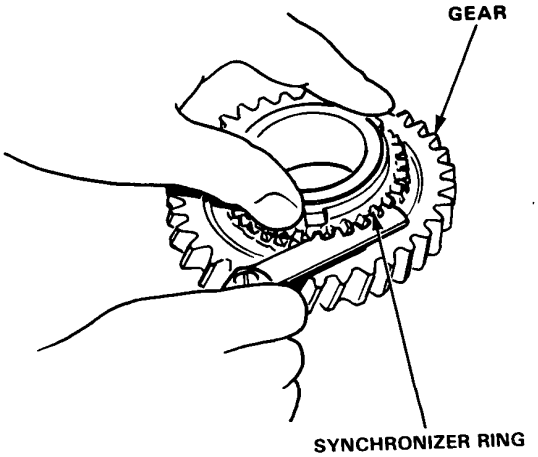
Inspections



1. Inspect the inside of synchronizer ring for wear.



2. Inspect the synchronizer ring teeth and matching teeth on gear for wear (rounded off).
3. Inspect the gear hub thrust surface for wear.
4. Inspect the cone surface for wear on 1st, and 2nd, countershaft gears; 3rd, 4th and 5th mainshaft gears.
5. Inspect the teeth on all gears for uneven wear, scoring, galling, cracks.



6. Place the synchro ring on matching gear cone and rotate until it stops (approx. 10 to 20 degrees), then measure the clearance between ring and gear.

   Ring-to-Gear Clearance:
   Standard (New): 0.73—1.18 mm (0.029—0.047 in.)
   Service Limit: 0.4 mm (0.016 in.)

7. Separate the synchronizer ring and gear, and coat them with oil.
8. Install the synchronizer spring on synchronizer ring.
9. Put the synchro ring on gear cone again, rotate until it stops, then set it aside for later reassembly.

Synchronizer Sleeve, Shift Shaft

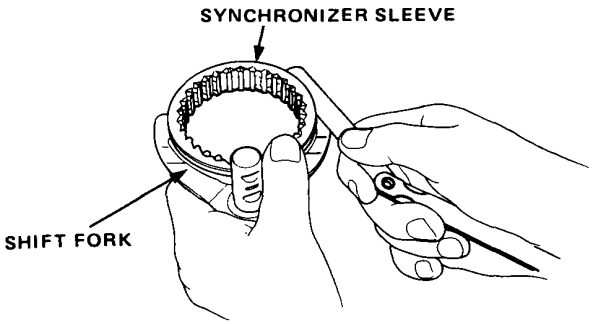
Shift Fork to Synchronizer Sleeve Clearance

1. Check clearance between each shift fork and its matching synchronizer sleeve.

   FORK-TO-SLEEVE CLEARANCE (ALL THREE FORKS & SLEEVES)
   Standard (New): 0.35—0.65 mm (0.014—0.026 in.)
   Service Limit: 1.0 mm (0.039 in.)

2. If fork-to-sleeve clearance is too great, measure width of groove in synchronizer sleeve.

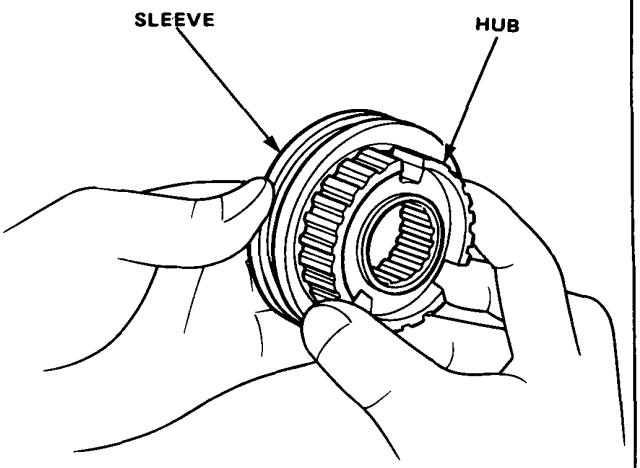
   Standard (New): 6.75—6.85 mm (0.266—0.270 in.)



Synchronizer Sleeve and Hub Inspections

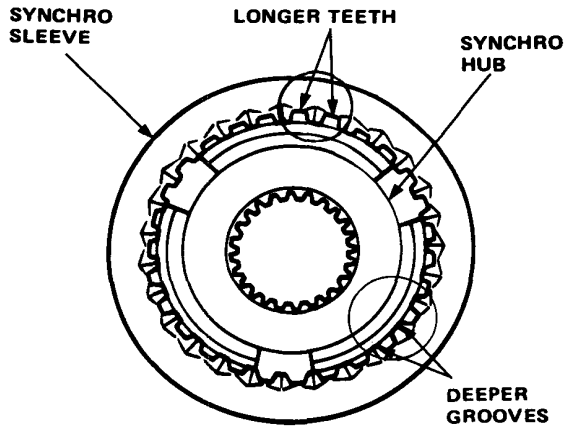
1. Inspect gear teeth on all synchro hubs and sleeves for rounded off corners, indicating wear.

2. Install each hub in its mating sleeve and check for freedom of movement.



Installing Synchronizer Hubs in Sleeves

Each synchronizer sleeve has three sets of longer teeth (120 degrees apart) that must be matched with the three sets of deeper grooves in the hub when assembled.



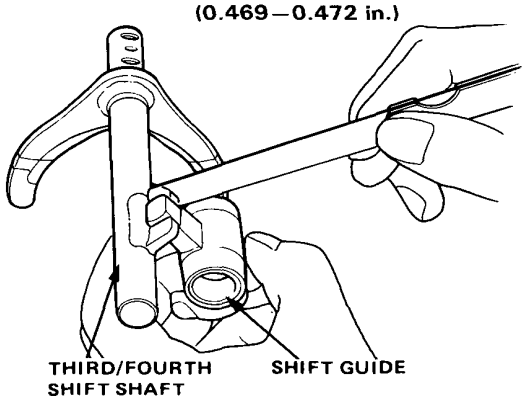
Third/Fourth Shift Shaft to Shift Guide Clearance

1. Check third/fourth shift shaft-to-shift guide clearance as shown.

   SHAFT-TO-GUIDE CLEARANCE
   Standard (New): 0.2—0.5 mm (0.008—0.02 in.)
   Service Limit: 0.8 mm (0.03 in.)

2. If clearance is too great, measure width of shift guide tab.

   Standard (New): 11.9—12.0 mm (0.469—0.472 in.)

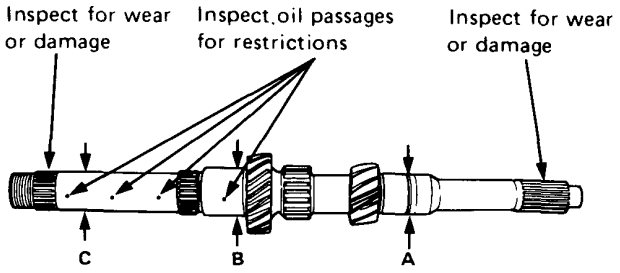


Mainshaft

Inspection

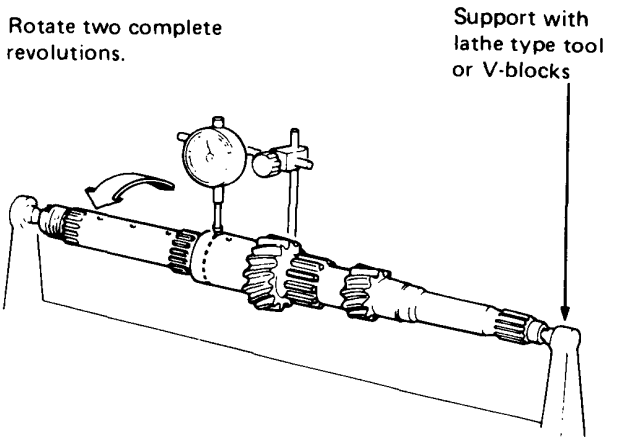
Wear

Outside Diameter:
Standard (New): A: 26.004–26.017 mm (1.0238–1.0243 in.)
B: 31.984–32.000 mm (1.2592–1.2598 in.)
C: 24.980–24.993 mm (0.9835–0.9840 in.)
Service Limit: A: 25.95 mm (1.022 in.)
B: 31.93 mm (1.257 in.)
C: 24.93 mm (0.98 in.)



Runout

Standard (New): 0.04 mm (0.0016 in.)
Service Limit: 0.10 mm (0.004 in.)

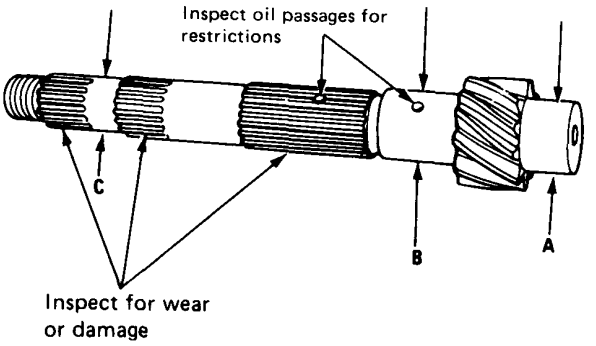


Countershaft

Inspection

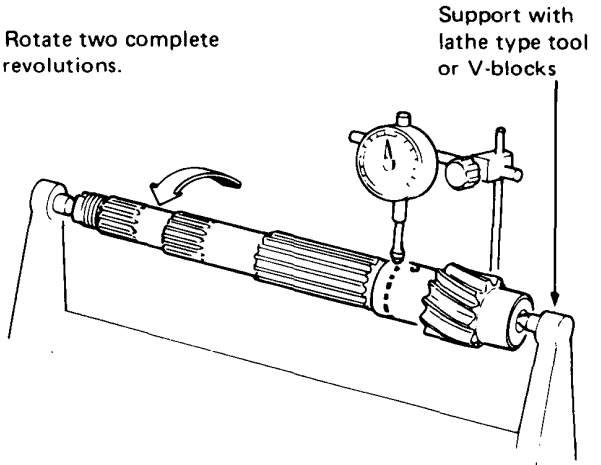
Wear

Outside Diameter:
Standard (New): A: 33.000–33.015 mm (1.2992–1.2998 in.)
B: 33.984–34.000 mm (1.3380–1.3386 in.)
C: 24.980–24.993 mm (0.9835–0.9840 in.)
Service Limit: A: 32.95 mm (1.297 in.)
B: 33.93 mm (1.336 in.)
C: 24.93 mm (0.981 in.)



Runout

Standard (New): 0.04 mm (0.0016 in.)
Service Limit: 0.10 mm (0.004 in.)



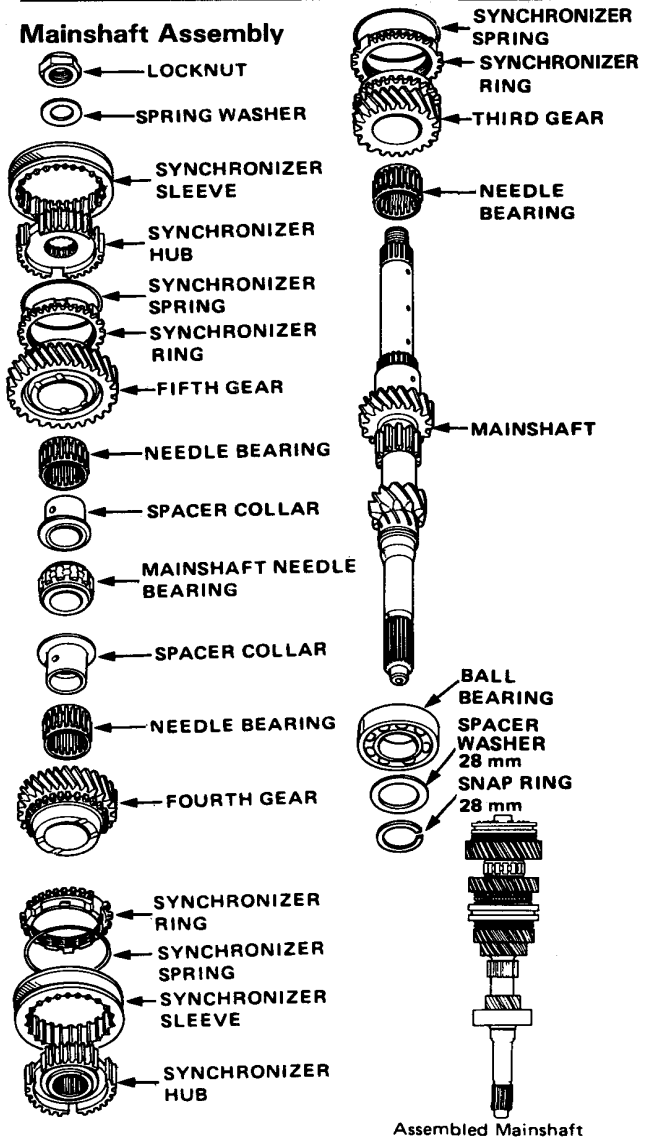
Mainshaft/Countershaft

Reassembly and Measurement

1. Remove both mainshaft and countershaft bearings from transmission housing.
2. Assemble mainshaft and countershaft including bearings and fifth gear components, as shown below. Lubricate all parts with oil before final reassembly.
3. Install mainshaft/countershaft assembly into clutch housing.
4. Install the mainshaft holder to prevent shafts from turning, and shift transmission into gear.
5. Torque the countershaft and mainshaft locknuts to 90 N·m (9.0 kg-m, 65 lb-ft) before checking clearances.

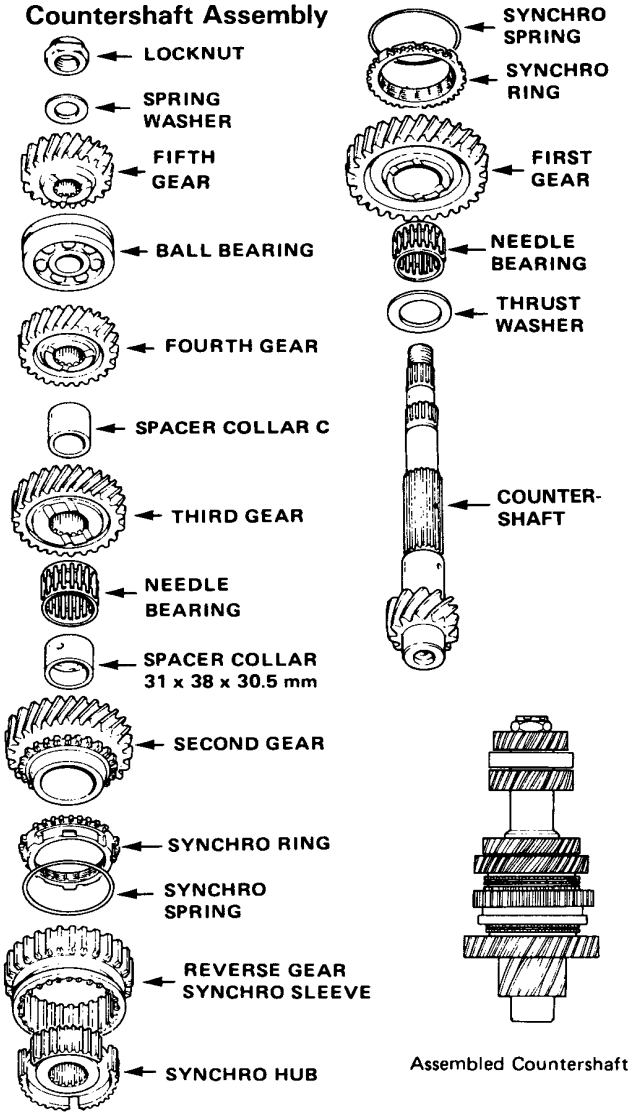
   CAUTION: Incorrect gear clearances can be caused by overtorquing the countershaft or mainshaft locknuts. Whenever locknuts are installed, use an accurately calibrated torque wrench.
6. Remove transmission shafts from clutch housing and measure clearances as described on next two pages.

Mainshaft Assembly



Assembled Mainshaft

Countershaft Assembly

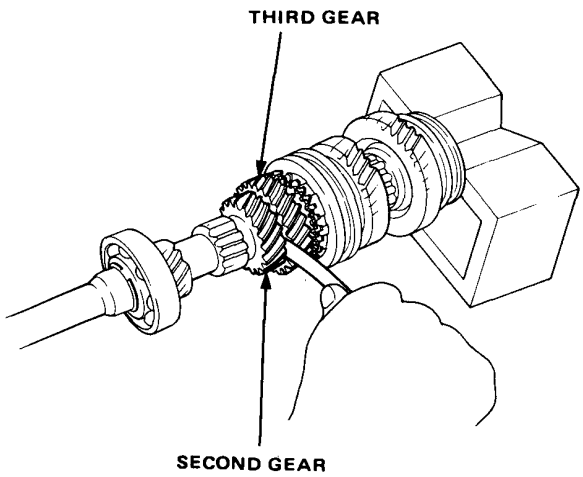


Assembled Countershaft

Mainshaft Measurements

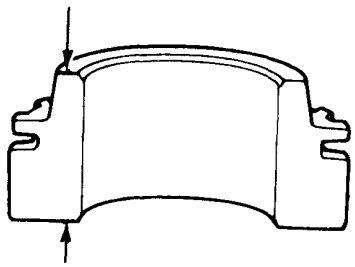
7. Measure clearance between shoulder on third gear and shoulder on second gear.

THIRD GEAR CLEARANCE
Standard (New): 0.03—0.18 mm (0.0012—0.0071 in.)
Service Limit: 0.3 mm (0.012 in.)



8. If out of tolerance, measure thickness of third gear.

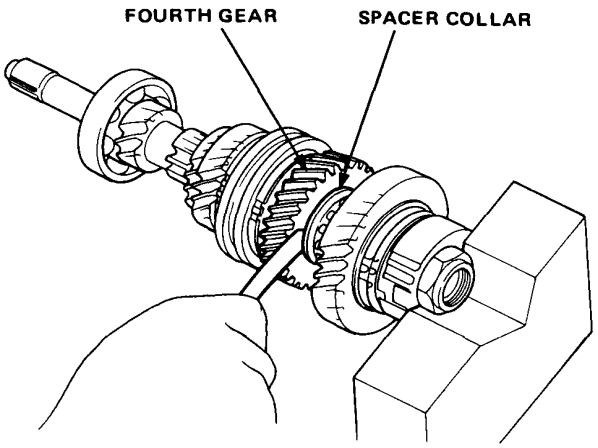
THIRD GEAR THICKNESS
Standard (New): 29.42—29.47 mm (1.158—1.160 in.)
Service Limit: 29.3 mm (1.15 in.)



If third gear is OK, replace synchronizer hub if necessary after all other measurements are complete.

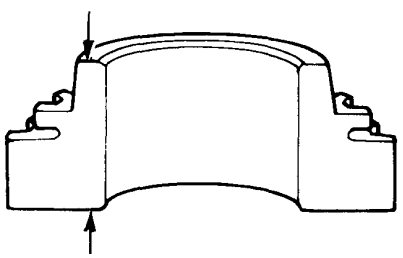
9. Measure clearance between spacer collar and shoulder on fourth gear.

FOURTH GEAR CLEARANCE
Standard (New): 0.03—0.18 mm (0.0012—0.0071 in.)
Service Limit: 0.3 mm (0.012 in.)



10. If out of tolerance, measure thickness of fourth gear.

FOURTH GEAR THICKNESS
Standard (New): 29.42—29.47 mm (1.158—1.160 in.)
Service Limit: 29.3 mm (1.15 in.)



If fourth gear is OK, replace synchronizer hub if necessary after all other measurements are complete.

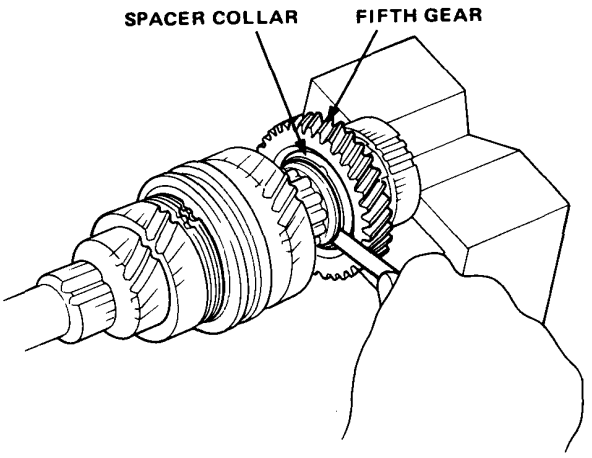
(cont'd)

Reassembly and Measurement

Mainshaft Measurements

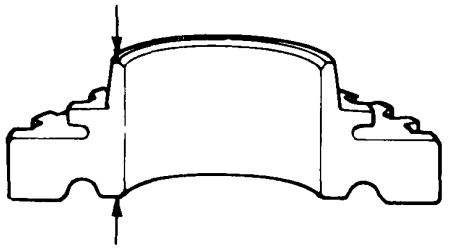
11. Measure clearance between spacer collar and shoulder on fifth gear.

FIFTH GEAR CLEARANCE
Standard (New): 0.03—0.13 mm (0.001—0.005 in.)
Service Limit: 0.25 mm (0.01 in.)



12. If out of tolerance, measure thickness of fifth gear.

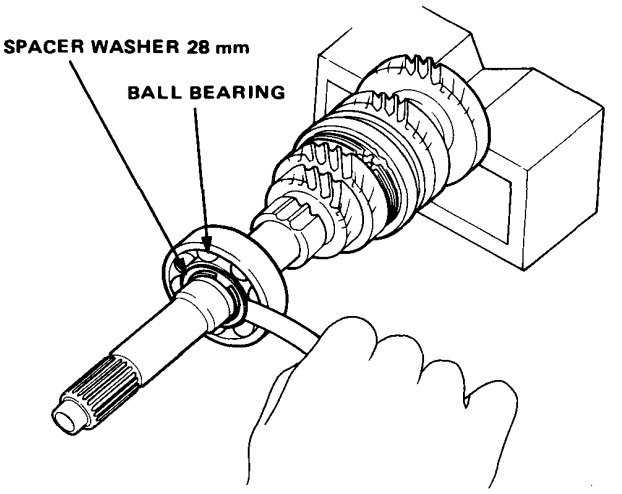
FIFTH GEAR THICKNESS
Standard (New): 26.92—26.97 mm (1.06—1.062 in.)
Service Limit: 26.8 mm (1.055 in.)



If out of limit, replace fifth gear.

13. Measure clearance between 28 mm spacer washer and ball bearing.

BALL BEARING CLEARANCE
Standard (New): 0—0.1 mm (0—0.004 in.)



If out of tolerance, change thickness of 28 mm spacer washer after measuring all other clearances.

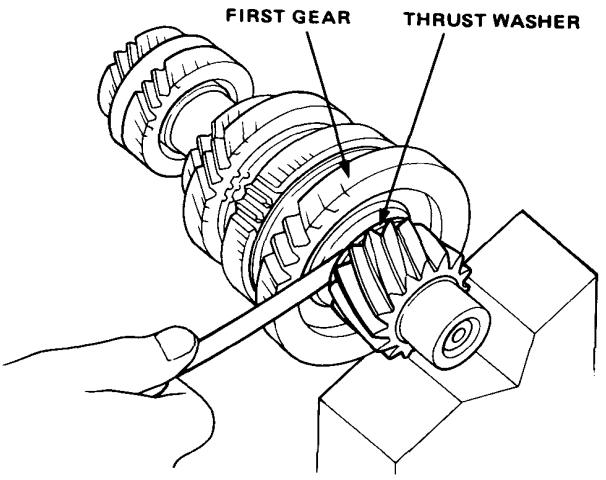
REPLACEMENT SPACER WASHERS

IDENTIFICATION	THICKNESS
A	1.88—1.92 mm (0.074—0.075 in.)
B	1.94—1.98 mm (0.076—0.078 in.)
C	2.00—2.04 mm (0.079—0.080 in.)
D	2.06—2.10 mm (0.081—0.082 in.)
E	2.12—2.16 mm (0.083—0.085 in.)

Countershaft Measurements

14. Measure clearance between first gear thrust washer and shoulder on first gear.

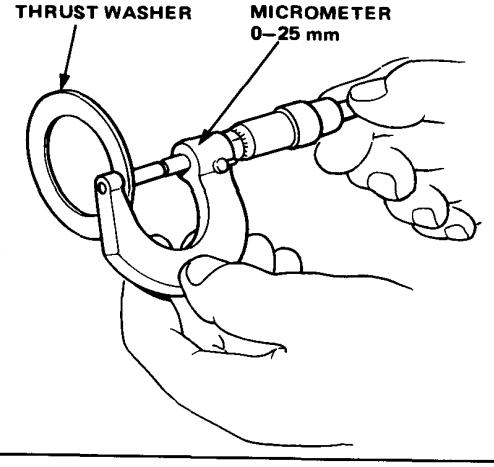
FIRST GEAR CLEARANCE
Standard (New): 0.03—0.08 mm (0.001—0.003 in.)



If out of tolerance, change thickness of first gear thrust washer after measuring all other clearances.

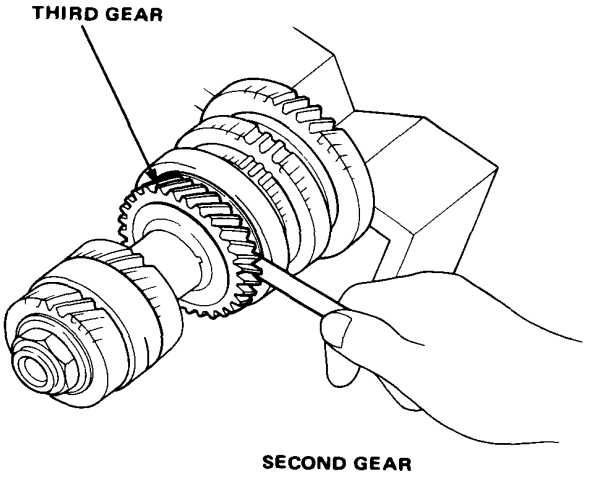
REPLACEMENT THRUST WASHERS

IDENTIFICATION	THICKNESS
A	2.02—2.04 mm (0.080—0.081 in.)
B	2.00—2.02 mm (0.079—0.080 in.)
C	1.98—2.00 mm (0.078—0.079 in.)
D	1.96—1.98 mm (0.077—0.078 in.)



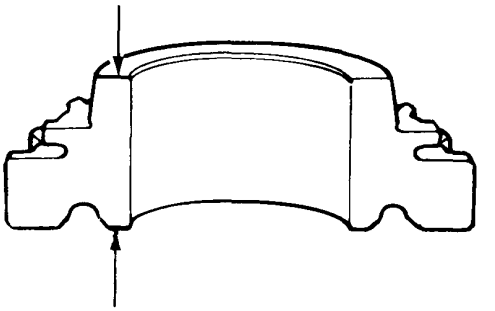
15. Measure clearance between shoulder on third gear and shoulder on second gear.

SECOND GEAR CLEARANCE
Standard (New): 0.03—0.1 mm (0.0012—0.004 in.)
Service Limit: 0.18 mm (0.007 in.)



16. If out of tolerance, measure thickness of second gear.

SECOND GEAR THICKNESS
Standard (New): 30.42—30.47 mm (1.198—1.200 in.)
Service Limit: 30.3 mm (1.192 in.)



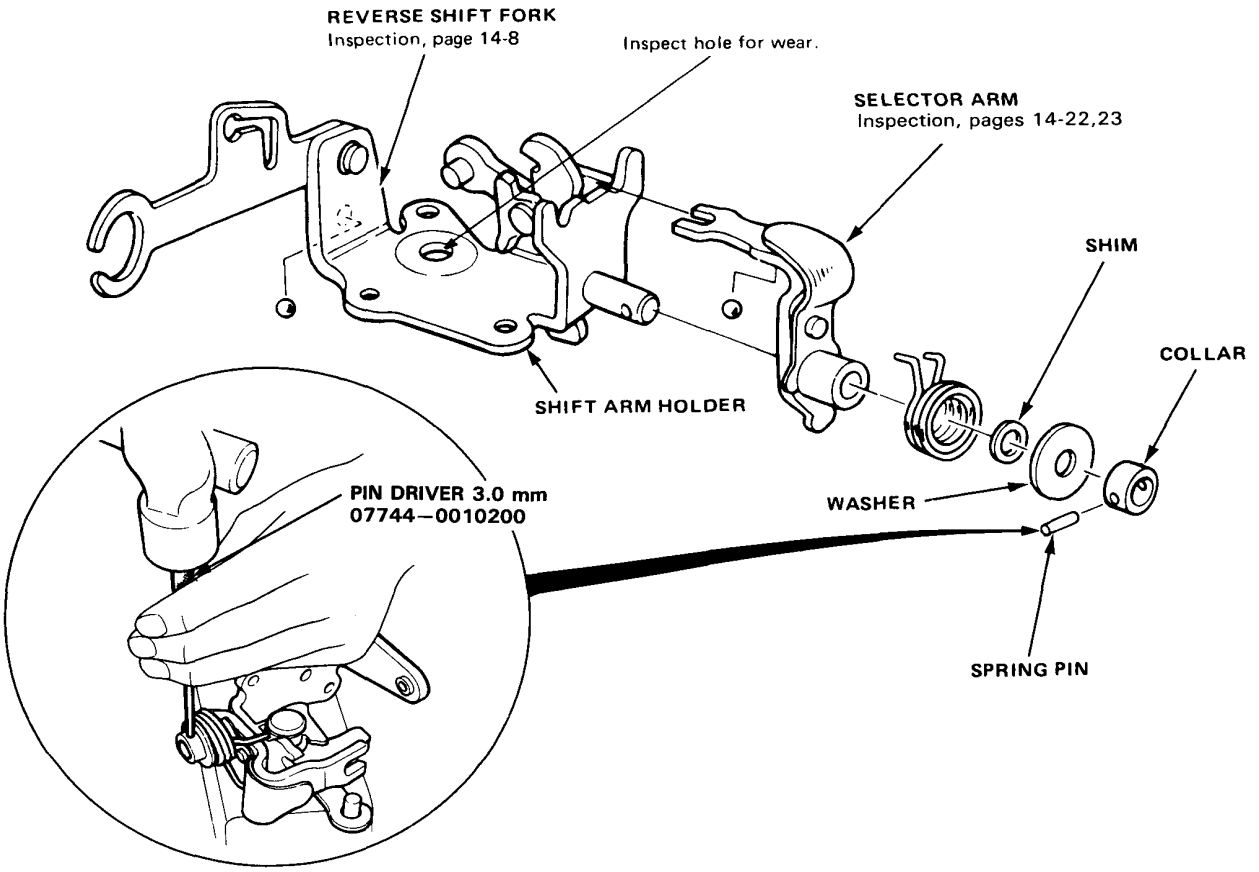
If out of limit, replace second gear.

17. After all clearances have all been checked, and those out of limits corrected, reassemble transmission mainshaft and countershaft and recheck all clearances.
If they are correct, disassemble fifth gear components and reinstall bearings in transmission housing.

Shift Arm Holder

Index

To remove selector arm from holder for shimming or replacement, drive out spring pin with driver.



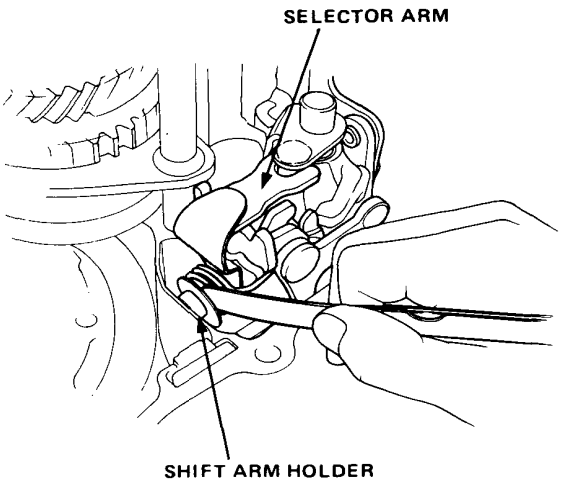
Clearances

1. Measure clearance between collar and shim on shaft of selector arm as shown.

   CLEARANCE
   Standard (New): 0.01–0.2 mm
   (0.0004–0.008 in.)

2. If out of tolerance, select a new shim from following table.

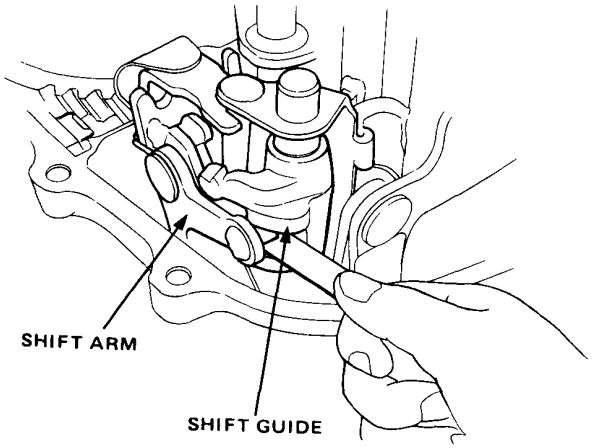
IDENTIFICATION	THICKNESS
A	0.8 mm (0.031 in.)
B	1.0 mm (0.039 in.)
C	1.2 mm (0.047 in.)
D	1.4 mm (0.055 in.)
E	1.6 mm (0.063 in.)



Shift Arm/Selector Arm

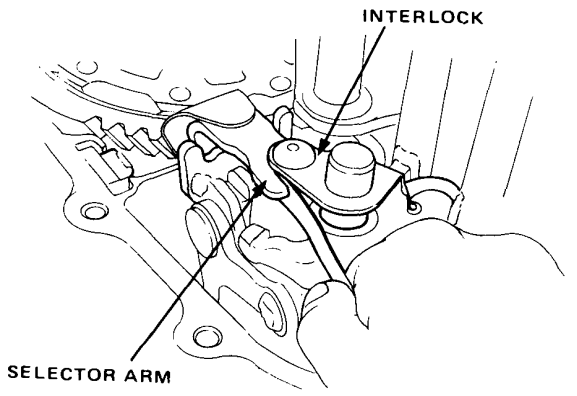
Shift Guide Clearance

1. Check shift arm-to-shift guide clearance.
   Standard (New): 0.1—0.3 mm (0.004—0.012 in.)
   Service Limit: 0.6 mm (0.024 in.)
2. If not within service limit, measure width of slot in shift guide.
   Standard (New): 7.9—8.0 mm (0.311—0.315 in.)
3. If slot is wider than standard, replace shift guide.



Interlock Clearance

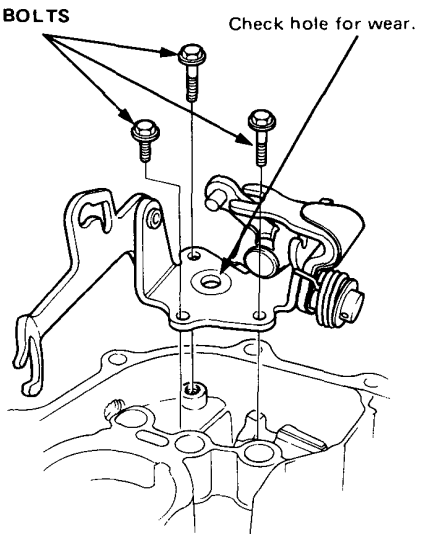
1. Check selector arm-to-interlock clearance.
   Standard (New): 0.05—0.25 mm (0.002—0.01 in.)
   Service Limit: 0.7 mm (0.03 in.)
2. If not within service limit, measure gap between selector arm fingers.
   Standard (New): 10.05—10.15 mm (0.396—0.4 in.)
3. If gap is wider than standard, replace arm.



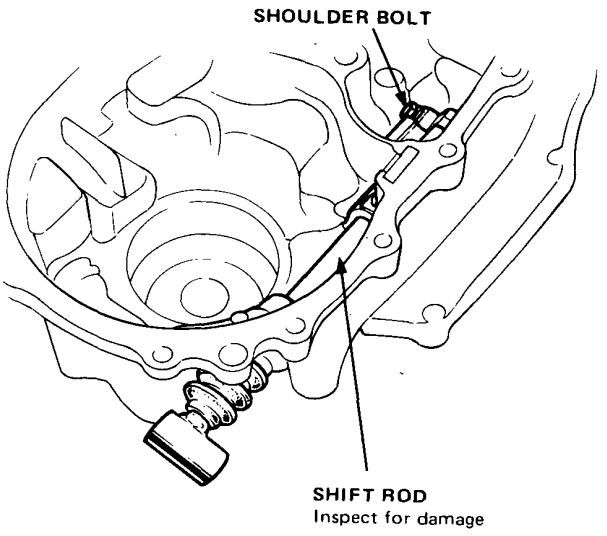
Shift Rod and Shift Arm Holder

Removal

1. Remove shift arm holder (3 bolts).



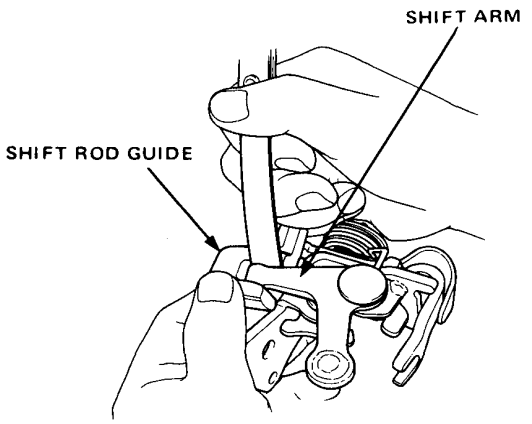
2. Remove shift rod by removing shoulder bolt.



Shift Arm/ Gear Selector Arm

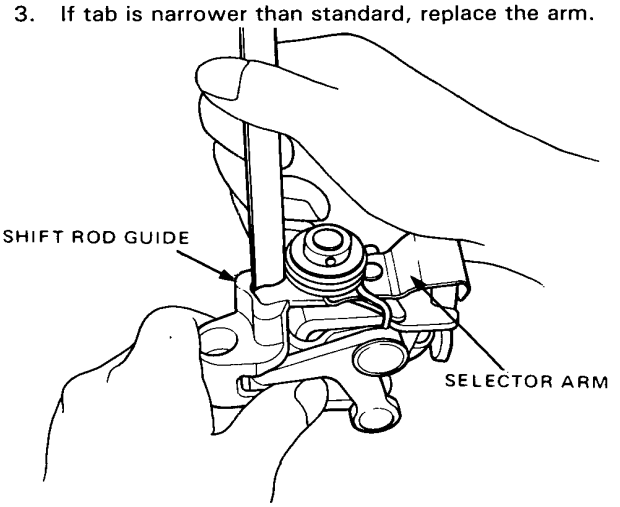
Shift Rod Guide Clearance

1. Check shift arm-to-shift rod guide clearance.
   Standard (New): 0.05—0.35 mm (0.002—0.01 in.)
   Service Limit: 0.8 mm (0.03 in.)
2. If not within service limit, measure width of slot in shift rod guide.
   Standard (New): 11.8—12.0 mm (0.46—0.47 in.)
3. If slot is wider than standard, replace shift rod guide.



Shift Rod Guide Clearance

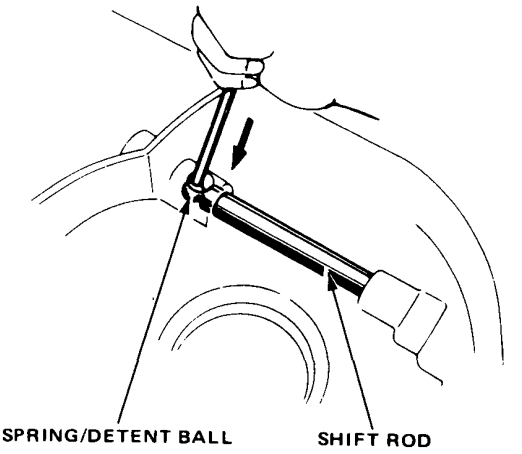
1. Check selector arm-to-shift rod guide clearance.
   Standard (New): 0.05—0.25 mm (0.002—0.01 in.)
   Service Limit: 0.5 mm (0.02 in.)
2. If not within service limit, measure width of tab on selector arm.
   Standard (New): 11.9—12.0 mm (0.469—0.472 in.)
3. If tab is narrower than standard, replace the arm.



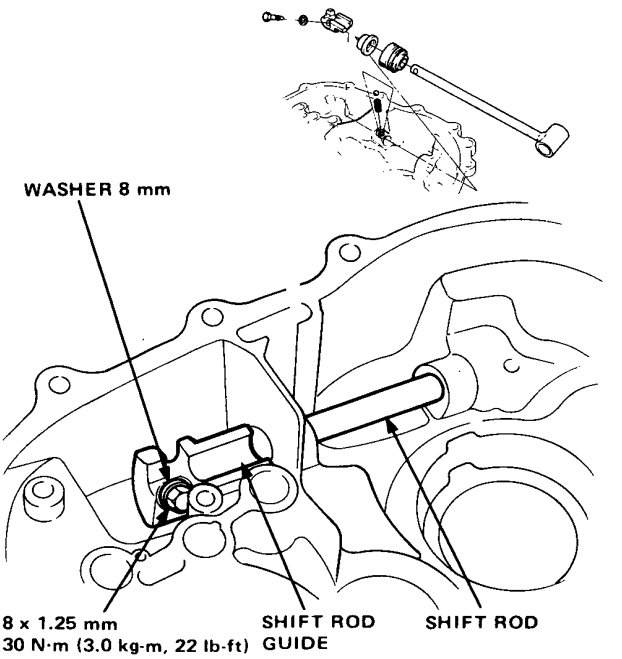
Shift Rod

Installation

1. Install shift rod with detent notches facing downward.
2. Install spring and detent ball. Lubricate spring with molylube.
3. Install shift rod while pushing detent ball in.



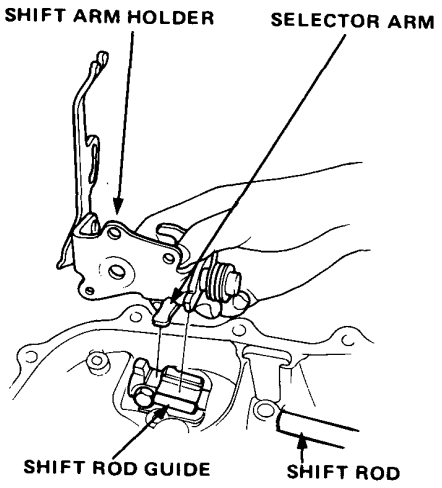
4. Install shift rod guide on shift rod.



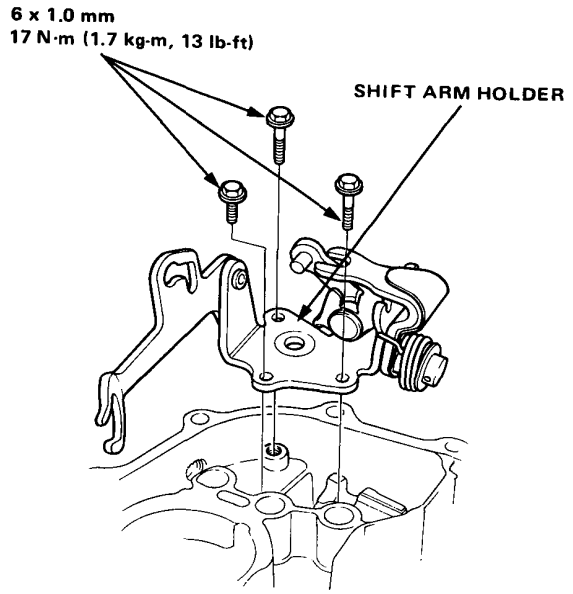
Shift Arm Holder Assy

Installation

1. Hook selector arm and shift arm into shift rod guide.



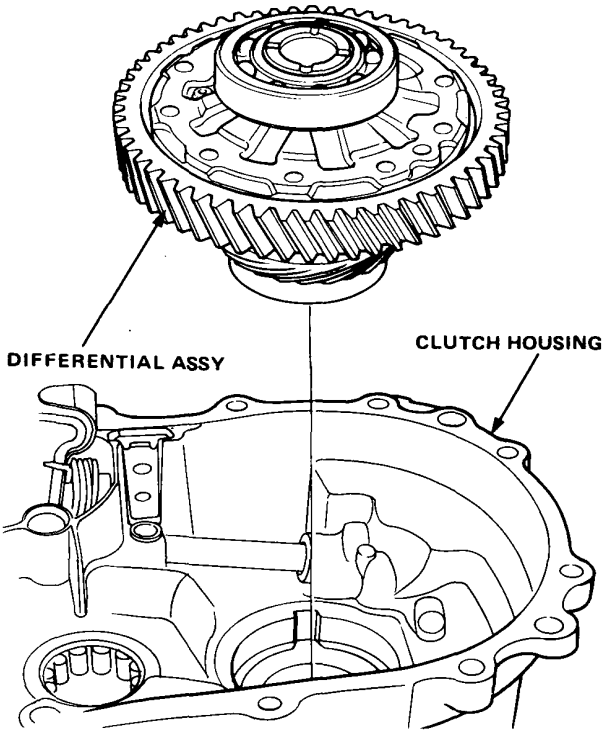
2. Install bolts in shift arm holder.



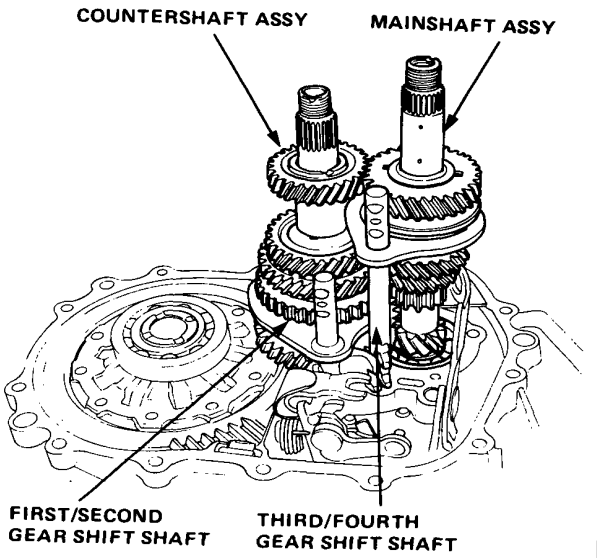
Transmission Assy

Reassembly

1. Install differential assembly in clutch housing.



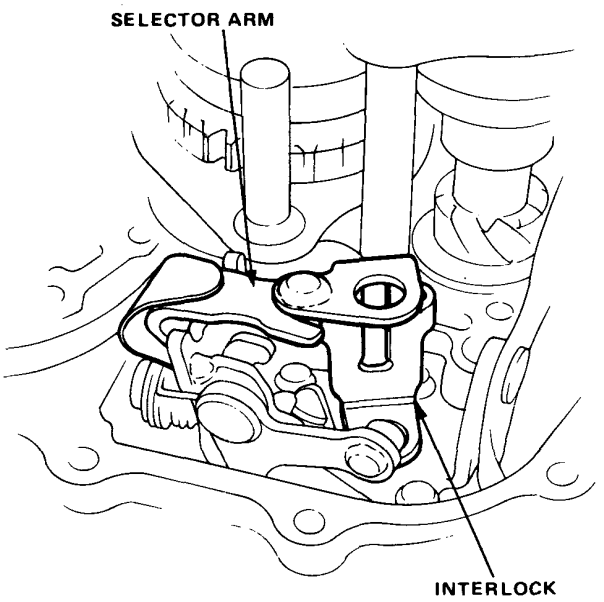
2. Install mainshaft, countershaft, first/second gear shift shaft and third/fourth gear shift shaft together as an assembly. Make sure forks are in fourth and second gear positions to make installation easier.



(cont'd)

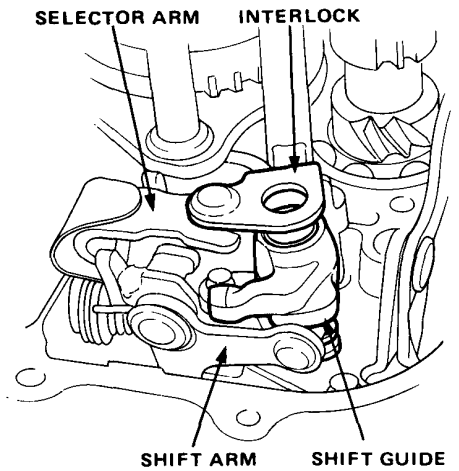
Reassembly (cont'd)

3. Lift mainshaft as shown and install interlock into the selector arm.

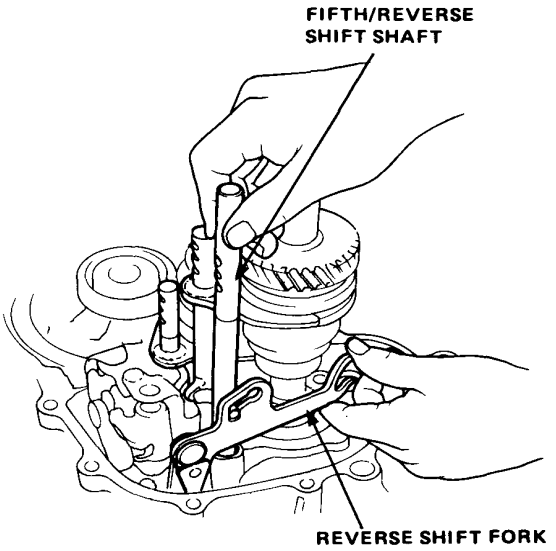


4. Place shift rod in neutral.

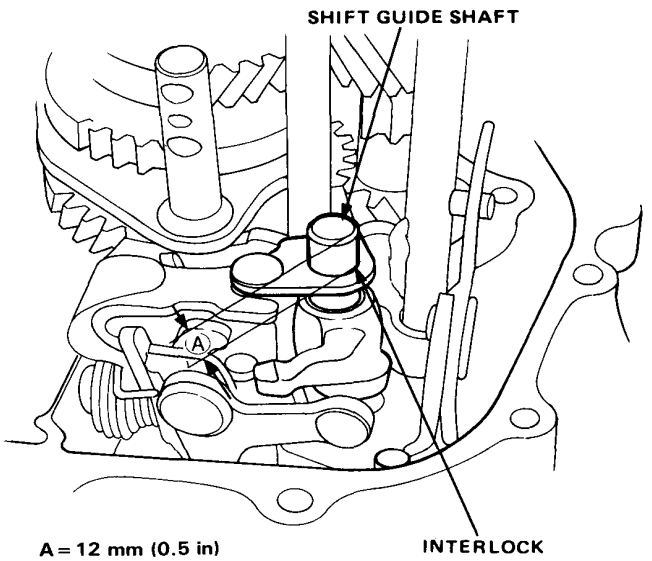
5. Hook interlock into selector arm, first/second gearshift shaft and third/fourth gearshift shaft. Hook shift guide into shift arm.



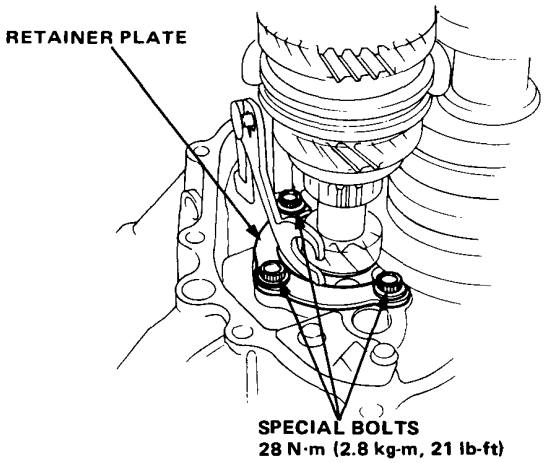
6. Install fifth/reverse shift shaft and hook its pin into reverse shift fork slot.



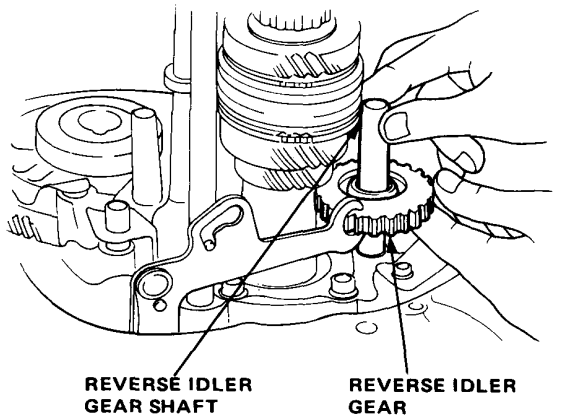
7. Install shift guide shaft so it bottoms securely in clutch housing hole. End of shaft should extend no more than 12 mm (0.5 in.) above interlock as shown.
If not, check installation.



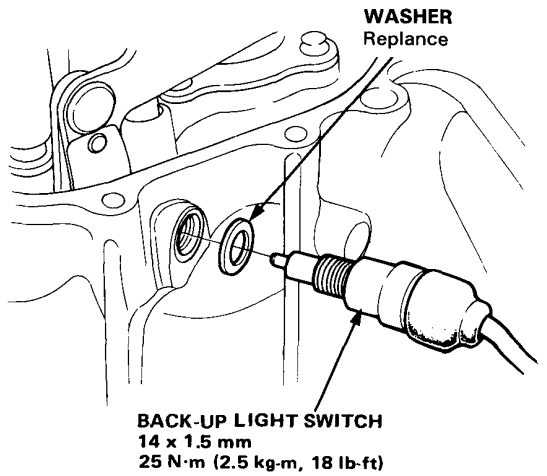
8. Install mainshaft bearing retainer plate.



9. Install reverse idler gear and shaft.



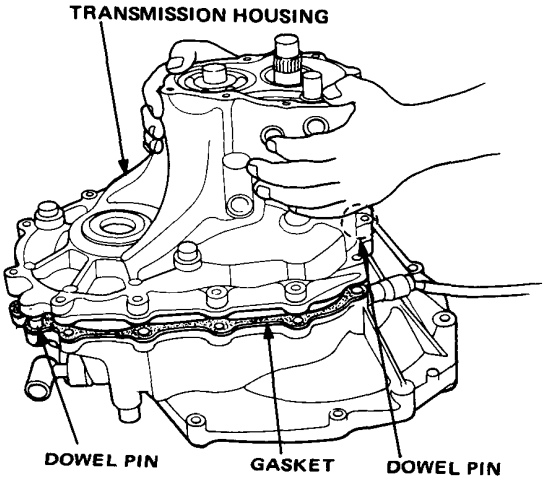
10. Install back-up light switch with new washer.



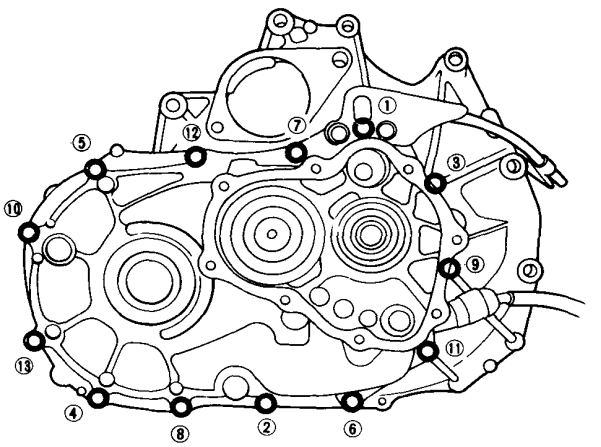
11. Place new gasket on clutch housing.

12. Install dowel pins.

13. Shift transmission into third gear to position shift guide shaft for reassembly. Install transmission housing being careful to line up shafts. Shift guide shaft must seat in blind hole in transmission housing. Do not force installation of housing.



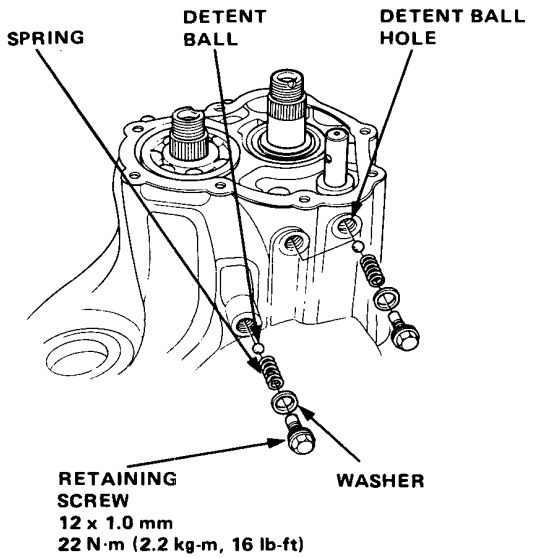
14. Torque bolts (8 x 1.25 mm) in sequence shown, to 28 N·m (2.8 kg-m, 21 lb-ft).



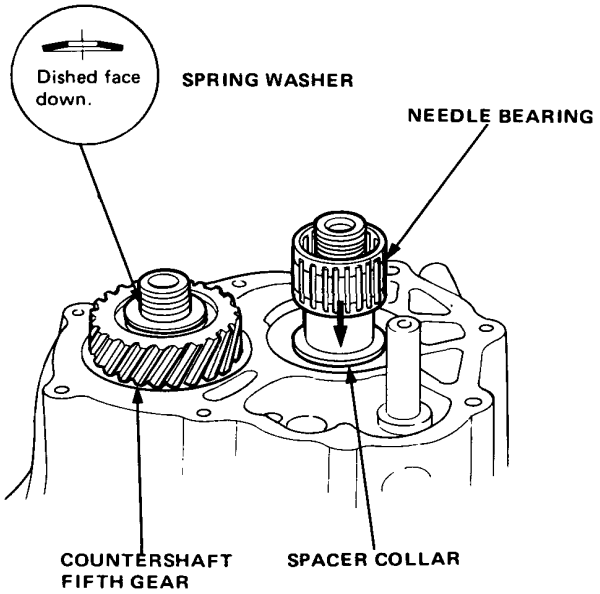
(cont'd)

Reassembly (cont'd)

15. Install three detent balls, washers, and retaining screws.

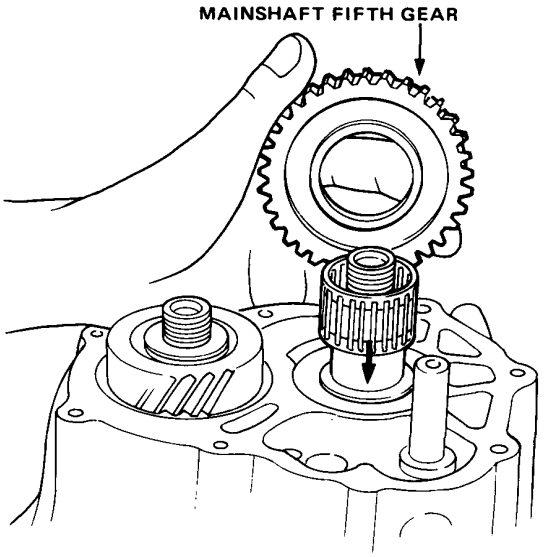


16. Install countershaft fifth gear with high side facing down. Then install spring washer with dished surface facing fifth gear.

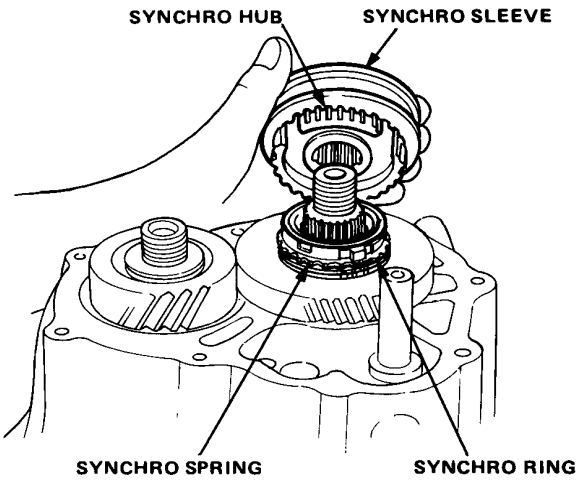


17. Install spacer collar and needle bearing on the mainshaft.

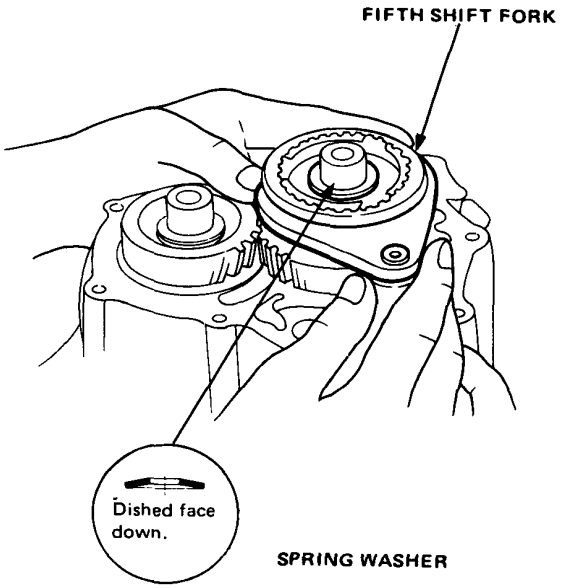
18. Install mainshaft fifth gear.



19. Install synchro ring, synchro spring, synchro hub and synchro sleeve on the mainshaft.

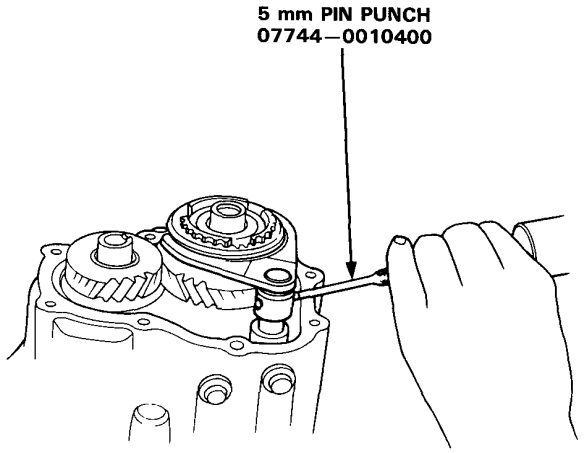


20. Install fifth shift fork into synchro sleeve.



21. Install spring washer with dished (concave) surface facing synchro hub.

22. Drive spring pin into fifth gear shift fork.

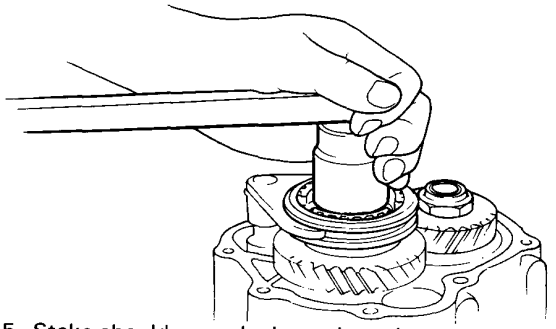


23. Install mainshaft holder 07923—6890101 to prevent shaft from rotating, then shift transmission into reverse gear.

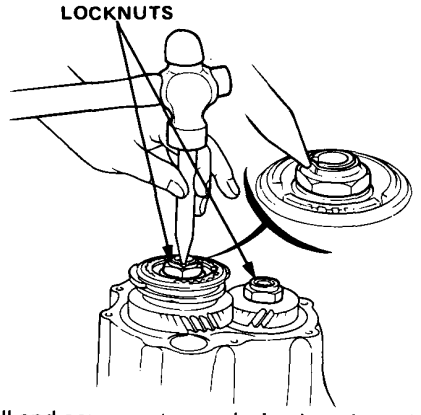
24. Torque mainshaft and countershaft locknuts. Tighten to specified torque, then loosen and retighten to same torque.

    90 N•m (9.0 kg-m, 65 lb-ft) → 0 → 90 N•m (9.0 kg-m, 65 lb-ft)

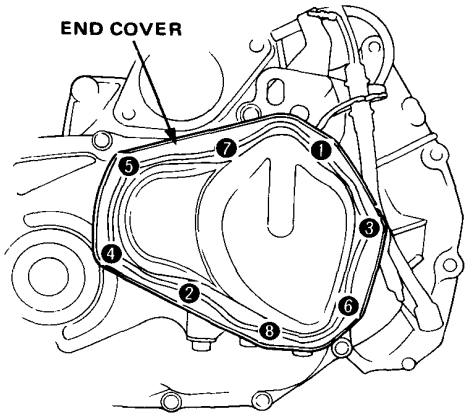
    CAUTION: The mainshaft locknut has left-hand threads.



25. Stake shoulders on locknuts into slots in mainshaft and countershaft.



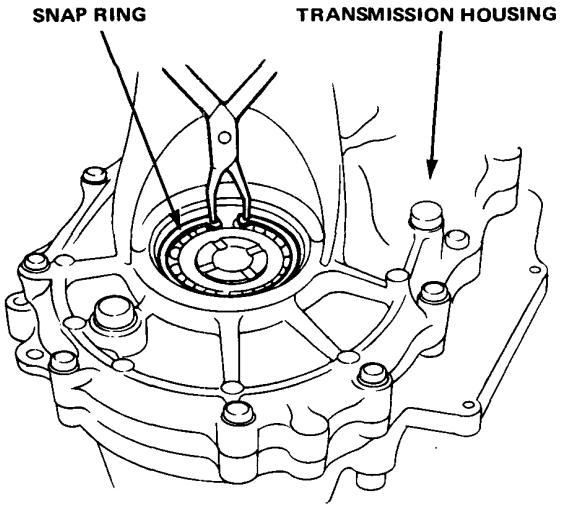
26. Install end cover on transmission housing with new gasket.
27. Torque bolts (6 × 1.0 mm) in sequence shown to 12 N•m (1.2 kg-m, 9 lb-ft).



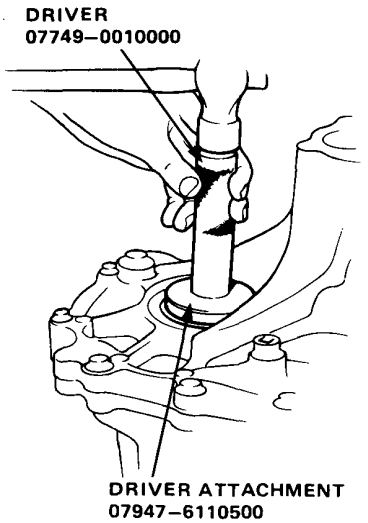
Differential Oil Seal

Installation

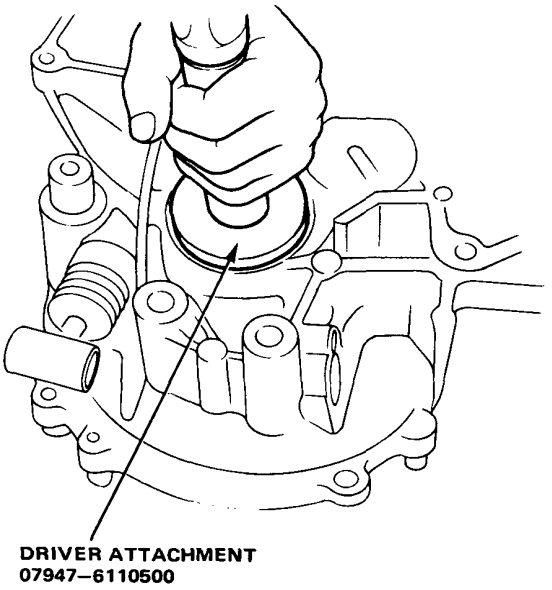
1. Install 80 mm snap ring in transmission housing. If differential bearings or carrier were replaced, select snap ring of correct thickness as shown on page 16-10.



2. Drive oil seal into transmission housing with part number side facing away from snap ring.



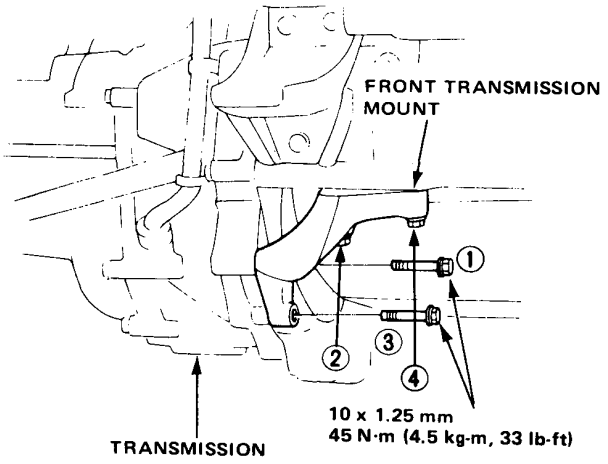
3. Drive differential oil seal into clutch housing with part number side facing away from bearing.

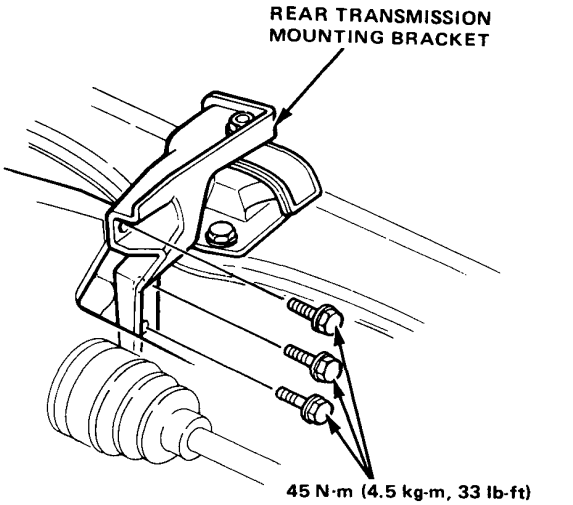


Installation

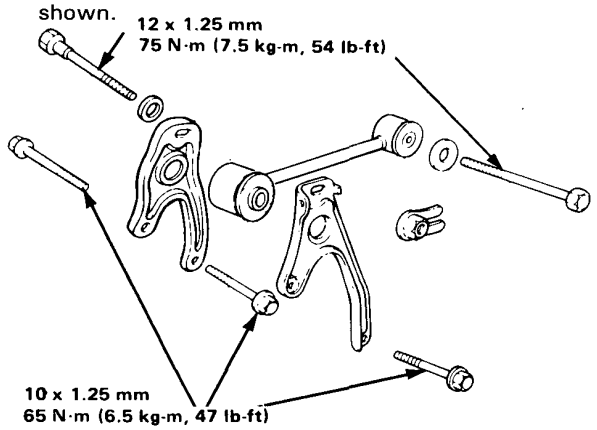
Car Raised on Hoist

1. Place transmission on transmission jack.
   NOTE: Clean and grease the release bearing sliding surface.
2. Check that two 14 mm dowel pins are installed in clutch housing.
3. Raise transmission far enough to align dowel pins with matching holes in block.
4. Roll transmission toward engine and fit mainshaft into clutch disc splines. If driver's side suspension was left in place, install new spring clips on both axles, then carefully insert left axle into differential as you install transmission.
5. Push and wiggle transmission until it fits flush with engine flange.
6. Tighten bolts until clutch housing is seated against block.
7. Loosely install the bolts for the front transmission mount, then torque to 45 N·m (4.5 kg-m, 33 lb-ft) in the sequence shown.





8. Install the upper torque arm and its brackets as shown.



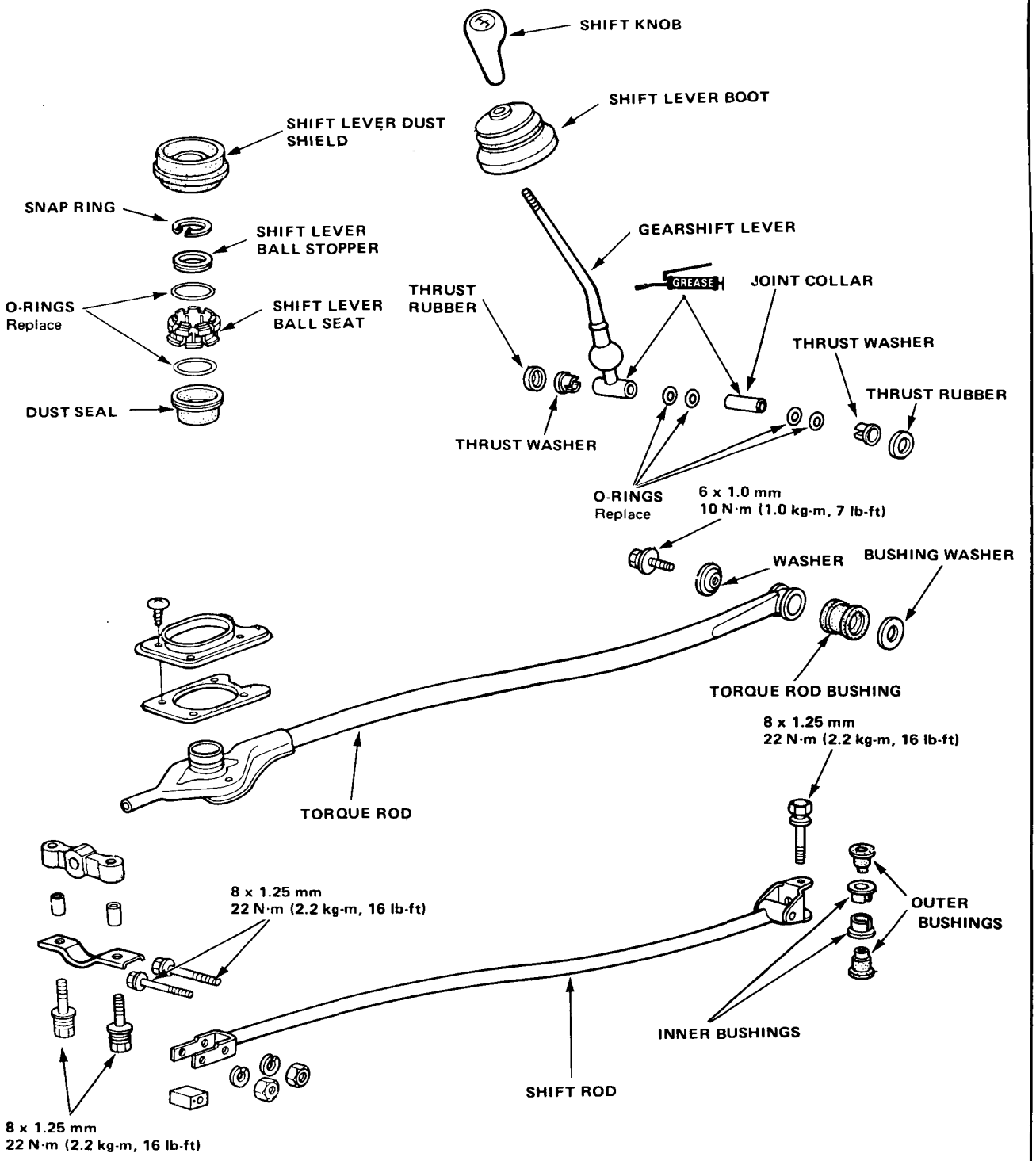
9. Remove the transmission jack.
10. Install the starter with its mounting bolts, 10 x 1.25 mm and torque to 45 N·m (4.5 kg-m, 33 lb-ft).
11. Turn right steering knuckle/axle assembly outward enough to insert free end of axle into transmission. Repeat on opposite side.
    NOTE: New 26 mm spring clips must be used on both axles.
    CAUTION: Make sure that axles fully bottom. Slide axle in until you feel spring clips engage differential.
12. Install lower arm ball joint bolts, tie-rod ball joint nuts and damper fork bolt (see chapter 20).
13. Connect shift linkage.
14. Connect shift lever torque rod to clutch housing and torque 8 x 1.25 mm bolt to 22 N·m (2.2 kg-m, 16 lb-ft).
15. Install front wheels.
16. Torque 14 mm transmission drain plug to 40 N·m (4.0 kg-m, 29 lb-ft).

Car on Ground

17. Install clutch cable at the release arm.
18. Coat new O-ring with oil, put it on speedometer gear holder, then install holder in transmission housing and secure with hold-down tab and bolt.
19. Install engine sub-wire harness in clamp at clutch housing.
20. Connect engine compartment wiring:
    - Battery positive cable to starter.
    - Black/white wire to starter solenoid.
    - Green/black and yellow wires to back-up light switch.
21. With ignition key OFF connect ground cable to battery and transmission.
22. Refill transmission with recommend oil (page 14-2).
23. Check transmission for smooth operation.

Gearshift Mechanism

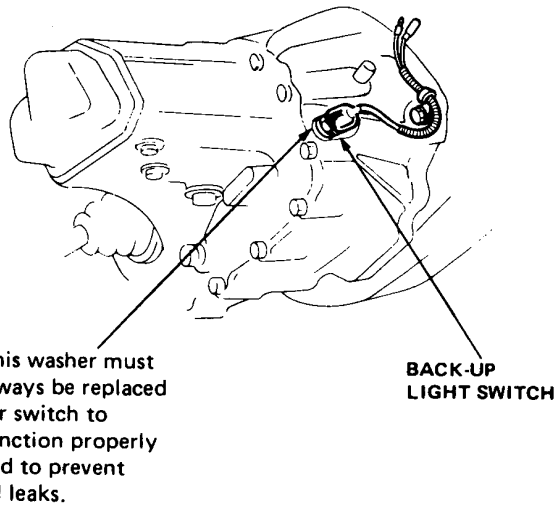
Overhaul



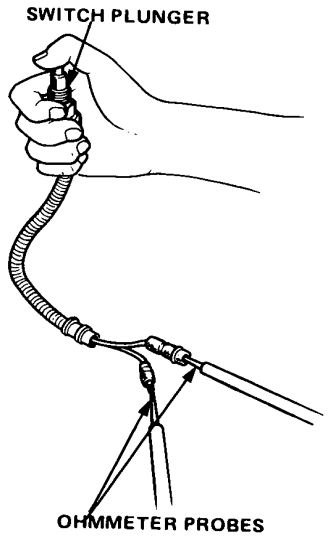
Back-up Light Switch

Testing

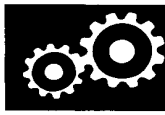
1. Test back-up light switch by placing gearshift lever in reverse and turning ignition switch to ON.
2. If back-up lights do not go on, check the fuse.
3. If the fuse is good, remove the back-up light switch.



4. Using an ohmmeter, check for switch continuity by pressing in on switch plunger. If no continuity, replace switch.



Automatic Transmission



Description

The Honda Automatic Transmission is a combination of a 3-element torque converter and dual-shaft automatic transmission which provides 4 speeds forward and 1 speed reverse. The entire unit is positioned in line with engine.

TORQUE CONVERTER, GEARS, AND CLUTCHES

The torque converter consists of a pump, turbine and stator, assembled in a single unit.
They are connected to the engine crankshaft so they turn together as a unit as the engine turns. Around the outside of the torque converter is a ring gear which meshes with the starter pinion when the engine is being started. The entire torque converter assembly serves as a flywheel while transmitting power to the transmission mainshaft.
The transmission has two parallel shafts, the mainshaft and countershaft. The mainshaft is in line with the engine crankshaft.
The mainshaft includes the clutches for 1st, and 2nd/4th, and gears for 3rd, 2nd, 4th, Reverse and 1st (3rd gear is integral with the mainshaft, while reverse gear is integral with 4th gear).
The countershaft includes 3rd clutch and gears for 3rd, and 4th, Reverse and 1st.
4th and reverse gears can be locked to the countershaft at its center, providing 4th gear or Reverse, depending on which way the selector is moved.
The gears on the mainshaft are in constant mesh with those on the countershaft. When certain combinations of gears in the transmission are engaged by the clutches, power is transmitted from the mainshaft to the countershaft to provide D3 , D4 , 2 or REVERSE.

HYDRAULIC CONTROL

The valve assembly includes the main valve body, secondary valve body, servo valve body, modulator valve body, regulator valve body and lock-up shift valve body, through the respective separator plates.
They are bolted to the torque converter case as an assembly.
The main valve body contains the manual valve, 1-2 shift valve, 2-3 shift valve, 3-4 shift valve, pressure relief valve, 2nd orifice control valve, and oil pump gear.
The secondary valve body includes the CPC valve, REV control valve, lock-up cut valve, kickdown valve, 3-2 timing valve and shift timing valves.

The servo valve body contains the accumulator pistons, 3rd orifice control valve, throttle A and B valves, and the modulator valve. The regulator valve body contains the lock-up timing valves, pressure regulator valve and lock-up control valve. Fluid from the regulator passes through the manual valve to the various control valves.

The lock-up shift valve body contains a lock-up timing valve and lock-up shift valve. The 1st, 3rd and 4th cluches receive oil from their respective feed pipes.

LOCK-UP MECHANISM

In D4, in 2nd, 3rd and 4th, pressurized fluid is drained from the back of the torque converter through an oil passage, causing the lock-up piston to be held against the torque converter cover. As this takes place, the mainshaft rotates at the same speed as the engine crankshaft.

The lock-up shift valve body controls the range of lock-up according to vehicle speed and throttle pressure. The lock-up timing valve controls the flow of oil to the lock-up shift valve in 2nd, 3rd and 4th gears (in D4 range).

The lock-up cut valve is housed in the secondary valve body and prevents lock-up from taking place when the throttle is not opened sufficiently.

GEAR SELECTION

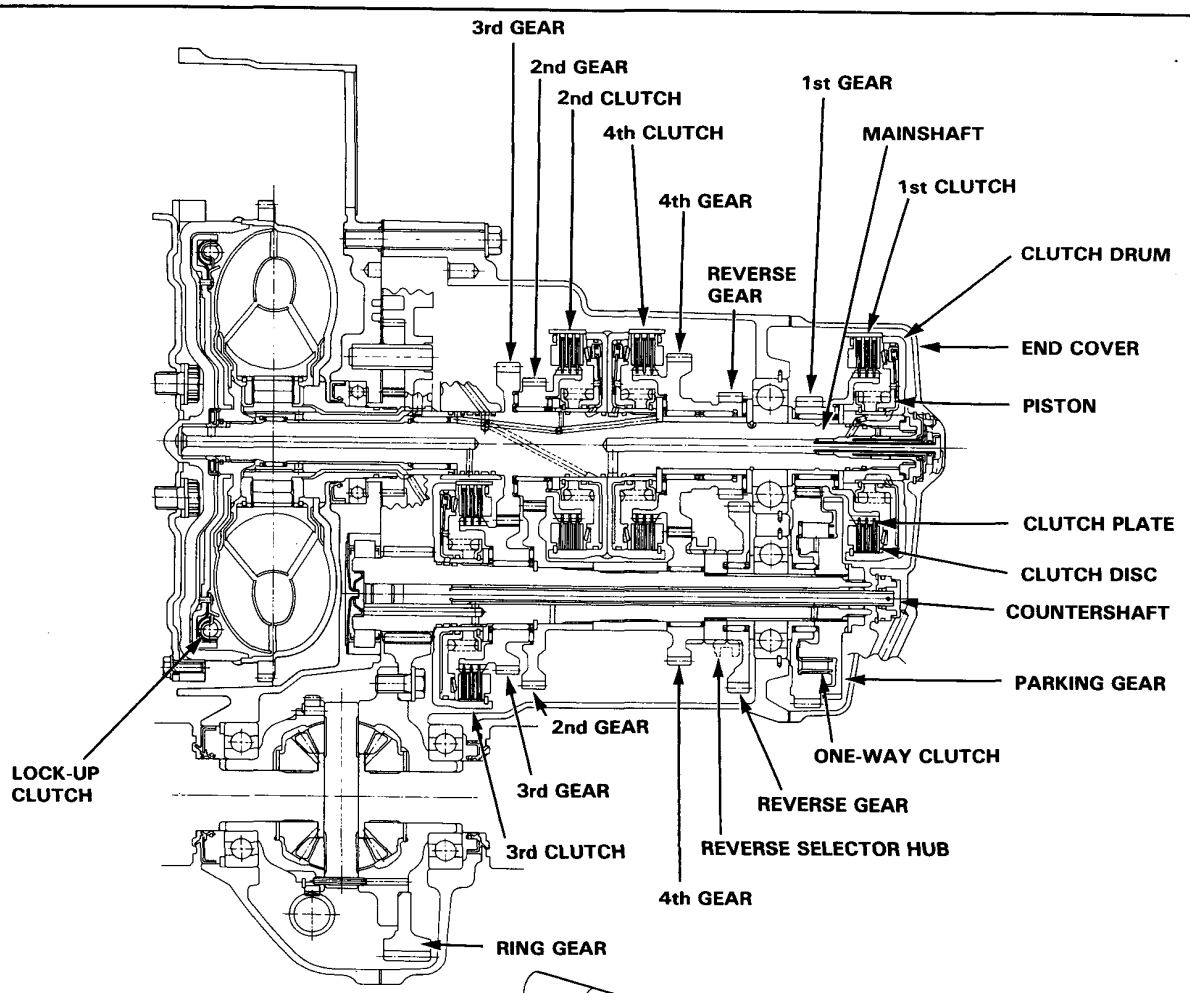
The selector lever has six positions: P PARK, R REVERSE, N NEUTRAL, D4 1st through 4th gear ranges, D3 1st through 3rd gear ranges, and 2 2nd gear.

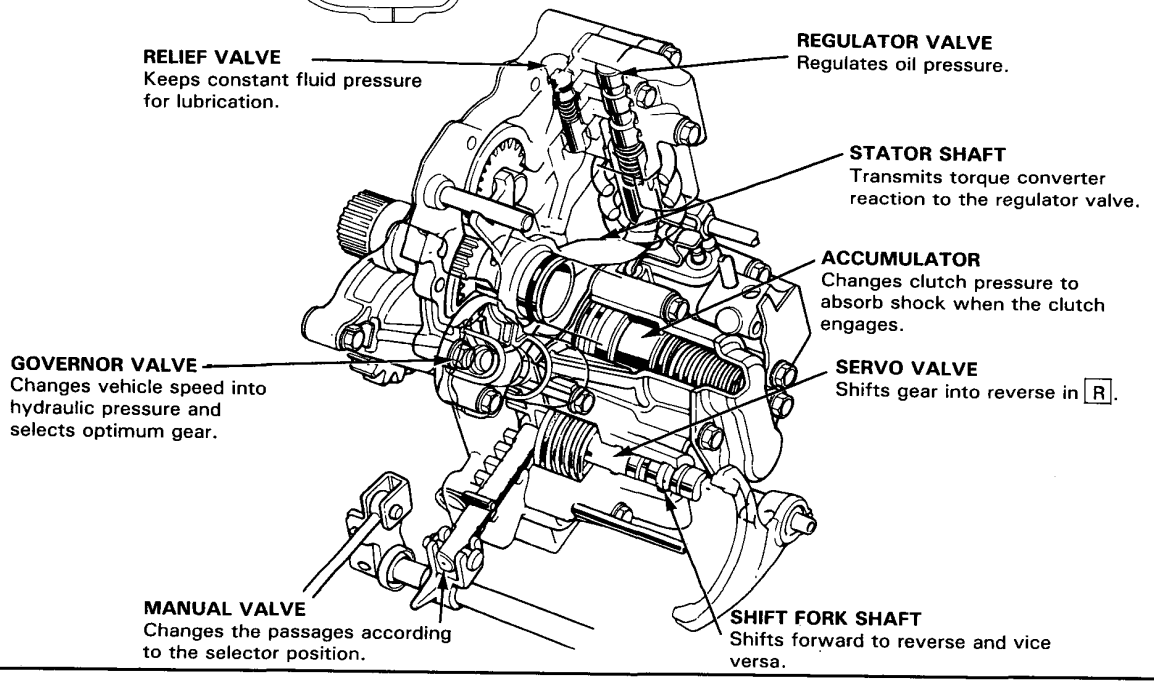
Position	Discription
P PARK	Front wheels locked; parking pawl engaged with parking gear on countershaft. All clutches released.
R REVERSE	Reverse; reverse selector engaged with countershaft reverse gear and 4th gear clutch locked.
N NEUTRAL	All clutches released.
D4 DRIVE (1 through 4)	General driving; starts off in 1st, shifts automatically to 2nd, 3rd, then 4th, depending on vehicle speed and throttle position. Downshifts through 3rd, 2nd and 1st on deceleration to stop. The lock-up mechanism comes into operation in 2nd, 3rd and 4th when the transmission is in D4.
D3 DRIVE (1 through 3)	For rapid acceleration at highway speeds and general driving; starts off in 1st, shifts automatically to 2nd, then 3rd, depending on vehicle speed and throttle position. Downshifts through 2nd to 1st on deceleration to stop.
2 SECOND	For engine braking or better traction starting off on loose or slippery surfaces; stays in 2nd gear, does not shift up or down.

Starting is possible only in P and N trough use of a slide-type, neutral-safety switch.

POSITION INDICATOR

A position indicator in the instrument panel shows what gear has been selected without having to look down at the console.


3rd GEAR
2nd GEAR
2nd CLUTCH
4th CLUTCH
4th GEAR
REVERSE GEAR
1st GEAR
MAINSHAFT
1st CLUTCH
CLUTCH DRUM
END COVER
PISTON
CLUTCH PLATE
CLUTCH DISC
COUNTERSHAFT
PARKING GEAR
ONE-WAY CLUTCH
REVERSE GEAR
REVERSE SELECTOR HUB
4th GEAR
LOCK-UP CLUTCH
2nd GEAR
3rd GEAR
3rd CLUTCH
RING GEAR


RELIEF VALVE
Keeps constant fluid pressure for lubrication.
REGULATOR VALVE
Regulates oil pressure.
STATOR SHAFT
Transmits torque converter reaction to the regulator valve.
ACCUMULATOR
Changes clutch pressure to absorb shock when the clutch engages.
GOVERNOR VALVE
Changes vehicle speed into hydraulic pressure and selects optimum gear.
SERVO VALVE
Shifts gear into reverse in R.
MANUAL VALVE
Changes the passages according to the selector position.
SHIFT FORK SHAFT
Shifts forward to reverse and vice versa.

SYMPTOM	Check these items on PROBABLE CAUSE LIST	Check these items on NOTES PAGE
Engine runs, but car does not move in any gear.	1, 6, 7, 16	K, L, R, S
Car moves in R and 2, but not in D3 or D4.	8, 29, 44, 48	C, M, O
Car moves in D3, D4 and R, but not in 2.	9, 30, 49	C, L
Car moves in D3, D4 and 2, but not in R.	1, 11, 12, 22, 38, 39, 40	C, L, Q
Car moves in N.	1, 8, 9, 10, 11 46, 47	C, D
Excessive idle vibration.	5, 17	B, K, L
Slips in all gear.	6, 7, 16	C, L, U
Slips in low gear.	8, 29, 44, 45, 48	C, N, O, U
Slips in 2nd gear.	9, 20, 23, 30, 45, 49	C, L, U
Slips in 3rd gear.	10, 21, 23, 31, 44, 45	C, L, U
Slips in 4th gear.	11, 23, 32, 45	C, L, U
Slips in reverse gear.	11, 32	C
Slips on 2—3 upshift.	3, 15, 24	E, L, V
Slips on 3—4 upshift.	3, 15, 25	E, L, V
No upshift; trans stays in low gear.	12, 13, 14, 19, 23	E, F, G, L
No downshift to low gear.	12, 19	G, L
Late upshift.	2, 12, 13, 14	E, F, L, V
Early upshift.	3, 13, 14	E, F, L, V
Erratic shifting.	2, 14, 26	E, F, V
Harsh shift (up & down shifts).	2, 4, 15, 23, 24, 25, 27, 47	A, E, H, I, L, V
Harsh shift (1—2).	2, 9	C, D, V
Harsh shift (2—3).	2, 10, 23, 24	C, D, H, L, V
Harsh shift (3—4).	2, 11, 23, 25	C, D, I, L, V
Harsh kickdown shifts.	2, 23, 27	L, V, Q
Harsh kickdown shift (2—1).	48	O
Harsh downshift (3—2) at closed throttle.	15	E, T
Axle(s) slips out of trans on turns.	43, 50	L, P, Q
Axle(s) stuck in trans.	43	L, Q
Ratcheting noise when shifting into R.	6, 7, 38, 39, 40	K, L, Q
Loud popping noise when taking off in R.	38, 39, 40	L, Q
Ratcheting noise when shifting from R to P, or from R to N.	38, 39, 40, 51	L, Q
Noise from trans in all selector lever positions.	6, 17	K, L, Q
Noise from trans only when wheels rolling.	39, 42	L, Q
Gear whine, rpm related (pitch changes with shifts).	6, 41	K, L, Q
Gear whine, speed related (pitch changes with speed).	39, 42	L, Q
Trans will not shift into 4th gear in D4.	1, 21, 28	L
Engine stalls on emergency stops (shift lever in D4 only).	2, 33	L, V
Lockup clutch does not lock up smoothly.	35, 37, 17	L
Lockup clutch does not operate properly.	2, 3, 12, 15, 18, 33, 34, 35, 36, 37	E, L, V
Transmission has multitude of problems shifting, at disassembly large deposits of metal found on magnet.	43	L, Q

The following symptoms can be caused by improper repair or assembly.	Check these items on PROBABLE CAUSE DUE TO IMPROPER REPAIR	Check these ITEMS ON NOTES PAGE
Car creeps in N.	R1, R2	
Car does not move in D3 or D4.	R5	
Trans lock up in R.	R4	
Trans has no park.	R3	
Excessive drag in trans.	R8	R,K
Excessive vibration, rpm related.	R9.	
Noise with wheels moving only.	R7	
Main seal pops out.	R10	S
Various shifting problems.	R11, R12.	
Harsh upshifts.	R13	
In D3 or D4 trans starts in 2nd gear.	R6	

	PROBABLE CAUSE
1.	Shift cable broken/out of adjustment
2.	Throttle cable too short
3.	Throttle cable too long
4.	Wrong type ATF
5.	Idle rpm too low/high
6.	Oil pump worn or seized
7.	Pressure regulator stuck
8.	Low clutch defective
9.	2nd clutch defective
10.	3rd clutch defective
11.	4th clutch defective
12.	Governor valve stuck
13.	Throttle A valve stuck
14.	Modulator valve stuck
15.	Throttle B valve stuck
16.	Oil screen clogged
17.	Torque convertor defective
18.	Torque governor check valve stuck
19.	1—2 shift valve stuck
20.	2—3 shift valve stuck
21.	3—4 shift valve stuck
22.	Reverse control valve stuck
23.	Clutch pressure control valve stuck
24.	2nd oriffice control valve stuck
25.	3rd orifice control valve stuck
26.	3—2 timing valve stuck
27.	Kickdown valve stuck
28.	Shift timing valve/accumulator stuck
29.	Low clutch accumulator defective
30.	2nd clutch accumulator defective
31.	3rd clutch accumulator defective
32.	4rh/reverse accumulator defective
33.	Lockup clutch cut valve stuck
34.	Lockup clutch timing valve A stuck
35.	Lockup clutch timing valve B stuck
36.	Lockup clutch shift valve stuck
37.	Lockup clutch control valve stuck
38.	Shift fork bent
39.	Reverse gears worn/damaged (3 gears)
40.	Reverse selector gear worn
41.	3rd gears worn/damaged (2 gears)
42.	Final gears worn/damaged (2 gears)
43.	Differential pinion shaft worn
44.	Feedpipe O-ring broken

	PROBABLE CAUSE
45.	Servo valve check valve loose
46.	Gear clearance incorrect
47.	Clutch clearance incorrect
48.	Sprag clutch defective
49.	Sealing rings/guide worn
50.	Axle-inboard joint clip missing
51.	4th gears worn/damaged (2 gears)

	PROBABLE CAUSES DUE TO IMPROPER REPAIR
R1	Improper clutch clearance
R2	Improper gear clearance
R3	Parking pawl installed upside down
R4	Parking shift arm installed upside down
R5	Sprag clutch installed upside down
R6	Feed pipe missing in governor shaft
R7	Reverse hub installed upside down
R8	Oil pump binding
R9	Torque converter not fully seated in oil pump
R10	Main seal improperly installed
R11	Springs improperly installed
R12	Valves improperly installed
R13	Ball check valves not installed
R14	Shift fork bolt not installed

	NOTES
A	Flushing procedure (repeat 3 times): 1. Drain the trans. 2. Refill with 3 qts. of Dexron recommended type ATF. 3. Start the engine and shift trans to D4. 4. Let trans shift through gears at least 5 times. 5. Shift to reverse and neutral at least 5 times. 6. Drain and refill.
B	Set idle rpm in gear to specified idle speed. If still no good, adjust the motor mounts as outlined in engine section of service manual.
C	If the large clutch piston O-ring is broken, inspect the piston groove for rough machining.
D	If the clutch pack is seized, or is excessively worn, inspect the other clutches for wear, and check the orifice control valves and throttle valves for free movement.
E	If throttle valve B is stuck, inspect the clutches for wear.
F	If the modulator valve is stuck open (does not modulate line pressure), the trans will shift normally with less than 5/8 throttle but will shift up very late over 5/8 throttle. If the modulator valve is stuck closed, throttle valve A pressure will be zero and result in early upshifts and no forced downshift.
G	If the 1–2 valve is stuck closed, the transmission will not upshift. If stuck open, the transmission has no low gear.
H	If the 2nd orifice control valve is stuck, inspect the 2nd and 3rd clutch packs for wear.
I	If the 3rd orifice control valve is stuck, inspect the 3rd and 4th clutch packs for wear.
J	If the clutch pressure control valve is stuck closed, the transmission will not shift out of low gear.

	NOTES
K	Improper alignment of main valve body and torque converter case may cause oil pump seizure. The symptoms are mostly an rpm related ticking noise high pitched squeak. In severe instances, it may stall the engine. Follow instruction procedure on page 15-52.
L	If the oil screen is clogged with particles of steel or aluminum, inspect the oil pump and differential pinion shaft. If both are OK, and no cause for the contamination is found, replace the torque converter.
M	If the low clutch feedpipe guide in the end cover is scored by the mainshaft, inspect the ball bearing for excessive movement in the transmission housing. If OK, replace the end cover as it is dented. The O-ring under the guide is probably broken.
N	Replace the mainshaft if the bushings for the low-and 4th feedpipe are loose or damaged. If the low feedpipe is damaged or out of round, replace it. If the 4th feedpipe is damaged or out of round, replace the end cover.
O	A worn or damaged sprag clutch is mostly a result of shifting the trans in D3 or D4 while the wheels rotate in reverse, such as rocking the car in snow.
P	Inspect the frame for collision damage.
Q	Inspect for damage or wear: 1. Governor shaft woodruff key 2. Reverse selector gear teeth chamfers 3. Engagement teeth chamfers of countershaft 4th & reverse gear 4. Shift fork, for scuff marks in center 5. Differential pinion shaft for wear under pinion gears 6. Bottom of 3rd clutch for swirl marks Replace items 1, 2, 3 and 4 if worn or damaged. If trans makes clicking, grinding or whirring noise, also replace mainshaft 4th gear and reverse idler gear and counter 4th gear in addition to 1, 2, 3, or 4. If differential pinion shaft is worn, overhaul differential assy and replace oil screen and thoroughly clean trans, flush torque converter and cooler and lines. If bottom of 3rd clutch is swirled and trans makes gear noise, replace countershaft and ring gear.
R	Be very careful not to damage the torque converter case when replacing the main ball bearing. You may also damage the oil pump when you torque down the main valve body; this will result in oil pump seizure if not detected. Use proper tools.
S	Install the main seal flush with the torque converter case. If you push it into the torque converter case until it bottoms out, it will block the oil return passage and result in damage.
T	Harsh downshifts when coasting to a stop with zero throttle may be caused by a bent-in throttle valve retainer/cam stopper. Throttle cable adjustment may clear this problem. See page 15-71.
U	Check if servo valve check valve stopper cap is installed. If it was not installed, the check valve may have been pushed out by hydraulic pressure causing a leak (internal) affecting all forward gears.
V	Throttle cable adjustment is essential for proper operation of the transmission. Not only does it affect the shift points if misadjusted but also the shift quality and lockup clutch operation. A too long adjusted cable will result in throttle pressure being too low for the amount of engine torque input into the transmission, and may cause clutch slippage. A too short adjusted cable will result in too high throttle pressures which may cause harsh shifts, erratic shifts and torque converter hunting.

NOTE: After transmission is installed;
- Make sure the floor mat does not interfere with accelerator pedal travel. Fully depress accelerator pedal and check carburetor to make sure the throttle lever is fully opened.
- Release the accelerator pedal and check both inner control cables to be sure they have slight play.

Warm up the engine to operating temperature.

D3 and D4 Range

1. Apply parking brake and block the wheels. Start the engine, then move the selector to D4 while depressing the brake pedal. Depress the accelerator pedal, and release it suddenly. Engine should not stall.
2. Check that shift points occur at approximate speeds shown. Also check for abnormal noise and clutch slippage.

- **Upshift**

		1st → 2nd	2nd → 3rd	3rd → 4th	LC. ON
Full-throttle Acceleration from a stop (km/h)	EC, KP, KT	51—58	95—102	145—153	128—136
	KS, KX, KQ, KZ, KY	51—60	95—105	146—156	124—135
	1600	55—62	94—101	143—151	126—134
Half-throttle Acceleration from a stop (km/h)	EC, KP, KT	28—34	50—57	75—85	57—64
	KS, KX, KQ, KZ, KY	29—35	60—69	92—103	66—76
	1600	28—34	48—55	74—84	55—62
Closed-throttle Coasting down-hill from a stop (km/h)	EC, KP, KT	15—19	29—33	34—40	24—28
	KS, KX, KQ, KZ, KY	16—19	31—37	42—51	23—29
	1600	14—18	28—33	34—40	24—28

- **Downshift**

		4th → 3rd	3rd → 2nd	2nd → 1st
Full-throttle When car is slowed by increased grade, wind, etc. (km/h)	EC, KP, KT	126—135	83—92	37—45
	KS, KX, KQ, KZ, KY	122—135	89—100	35—45
	1600	124—133	81—90	36—44

		4th → 2nd	2nd → 1st
Closed-throttle Coasting or braking to a stop (km/h)	EC, KP, KT	12—18	7—14
	KS, KX, KQ, KZ, KY	24—31	8—13
	1600	11—17	7—12

3. Accelerate to about 35 mph so the transmission is in 4th, then shift from D4 to 2. The car should immediately begin slowing down from engine braking.

CAUTION: Do not shift from D4 or D3 to 2 at speeds over 60 mph; you may damage the transmission.

2 (2nd Gear)

1. Accelerate from a stop at full throttle. Check that there is no abnormal noise or clutch slippage.
2. Upshifts and downshifts should not occur with the selector in this range.

R (Reverse)

Accelerate from a stop at full throttle, and check for abnormal noise and clutch slippage.

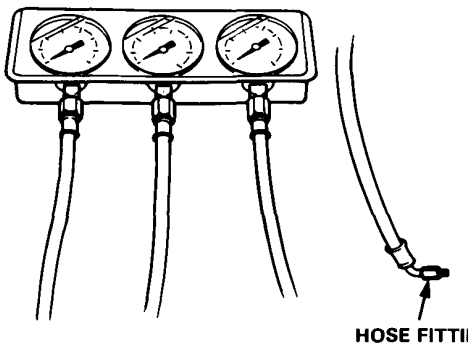
P (Park)

Park car on a slope (approx. 16°), apply the parking brake, and shift into Park. Then release the brake; the car should not move.

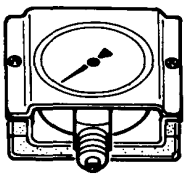
Pressure Test

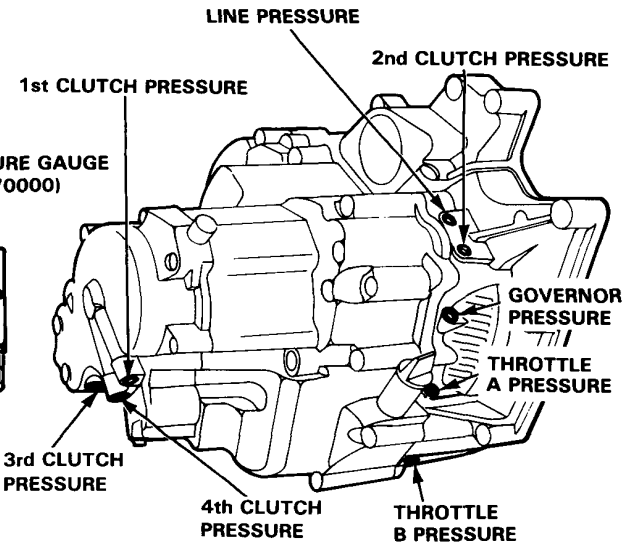
NOTE:
- Stop engine when attaching hoses for pressure tests.
  Torque hose fitting to 18 N·m (1.8 kg-m, 12 lb-ft).
- Do not reuse aluminum washers.
- For throttle and governor test, use Low Pressure Gauge, 07406–0070000.

GAUGE SET 07406–00200002
(Includes pressure hose Assy 07406–0020201)



LOW PRESSURE GAUGE
(07406–0070000)





CAUTION: Before checking, be sure transmission is filled to proper level.

PRESSURE	SELECTOR POSITION	MEASUREMENT	SYMPTOM	PROBABLE CAUSE	FLUID PRESSURE			
					2000 Engine		1600 Engine	
					Standard	Service Limit	Standard	Service Limit
LINE	N or P	• With parking brake applied • Run engine at 2,000 min⁻¹ (rpm).	No (or low) LINE pressure	Torque converter, oil pump pressure regulator, torque converter check valve, oil pump	834–883 kPa (8.5–9.0 kg/cm², 121–128 psi)	785 kPa (8.0 lg/cm², 114 psi)	785–834 kPa (8.0–8.5 kg/cm², 114–121 psi)	736 kPa (7.5 kg/cm², 107 psi)
1st	D3 or D4	MEASUREMENTS • With parking brake applied raise front wheels off ground and support with safety stands. • Run engine at 2,000 min⁻¹ (rpm)	No (or low) FIRST pressure	1st clutch O-rings	785–883 kPa (8.0–9.0 kg/cm², 114–128 psi)	785 kPa (8.0 kg/cm², 114 psi)	736–834 kPa (7.5–8.5 kg/cm², 64–121 psi)	736 kPa (7.5 kg/cm², 107 psi)
2nd	2 D3 or D4		No (or low) SECOND pressure	2nd clutch O-rings	441–883 kPa (4.5–9.0 kg/cm², 64–128 psi) varies with throttle opening.	392 kPa (4.0 kg/cm², 57 psi) with lever released. 785 kPa (8.0 kg/cm², 114 psi) with lever in full throttle.	441–834 kPa (4.5–8.5 kg/cm², 64–121 psi) varies with throttle open.	392 kPa (4.0 kg/cm², 57 psi) with lever released. 736 kPa (7.5 kg/cm², 107 psi) with lever in full throttle.
3rd	D3		No (or low) THIRD pressure	3rd clutch				
4th	D4		No (or low) FOURTH pressure	4th clutch				
	R		No (or low) FOURTH pressure	Servo valve or 4th clutch	785–883 kPa (8.0–9.0 kg/cm², 114–128 psi)	785 kPa (8.0 kg/cm², 114 psi)	736–834 kPa (7.5–8.5 kg/cm², 64–121 psi)	736 kPa (7.5 kg/cm², 107 psi)
THROTTLE	D3 or D4	• With parking brake applied raise front wheels off ground and support with safety stands. • Run engine at 1,000 min⁻¹ (rpm) • Disconnect throttle control cable at throttle lever. • Read pressure with lever released. • Manually push lever up sumulating full throttle. • Read pressure with lever in full throttle position.	No (or low) THROTTLE pressure	Throttle valve A Throttle modulator valve	0 kPa (0 kg/cm², 0 psi) lever is released. 505–520 kPa, (5.15–5.30 kg/cm², 73–75 psi) * 485–515 kPa (4.95–5.25 kg/cm², 70–75 psi) lever in full throttle position.	500 kPa, (5.10 kg/cm², 72.5 psi) * 481 kPa (4.90 kg/cm², 69.7 psi) with lever in full throttle position.	0 kPa (0 kg/cm², 0 psi) with lever released. 495–525 kPa, (5.05–5.35 kg/cm², 72–76 psi) with lever in full throttle position.	490 kPa, (5.00 kg/cm², 71 psi) with lever in full throttle position.
				Throttle valve B	0 kPa (0 kg/cm², 0 psi) with lever released. 834–883 kPa (8.5–9.0 kg/cm², 121–128 psi) lever in full throttle position.	785 kPa (8.0 kg/cm², 114 psi)	0 kPa (0 kg/c m², 0 psi) with lever released. 785–834 kPa (8.0–8.5 kg/cm², 114–121 psi) with lever in full throttle position.	736 kPa (7.5 kg/cm², 107 psi)
GOVERNOR	D3 or D4	• Place vehicle on chassis dynamometer, or jack up front of car, support with safety stands, block rear wheels, and set hand brake. • Run vehicle at 60 km/h (38 mph)	No (or low) GOVERNOR pressure	Governor valve	211–221 kPa (2.15–2.25 kg/cm², 31–32 psi) * 191–201 kPa (1.95–2.05 kg/cm², 27.7–29.2 psi)	206 kPa (2.10 kg/cm², 30 psi) * 186 kPa (1.90 kg/cm², 27.0 psi)	198–208 kPa (2.02–2.12 kg/cm², 28.7–30.1 psi)	193 kPa (1.97 kg/cm², 28.0 psi)

* EC, KP and KT type

Stall Speed

Test

1. Engage parking brake and block front wheels.
2. Connect tachometer, and start engine.
3. After engine has warmed up to normal operating temperature, shift into [D3].
4. Fully depress brake pedal and acceleraror for 6 to 8 seconds, and note engine speed.

   CAUTION: To prevent transmission damage, do not test stall speed for more than 10 seconds at a time.
5. Allow 2 minutes for cooling, then repeat same test in [D4], [2] and [R]

   Stall speed in [D3], [D4], [2], and [R] must be the same, and must also be within limits:

Stall Speed RPM:

	Fuel-Injected Engine	Carbureted Engine
Specification:	2,650 rpm	2,750 rpm
Service Limit:	2,500—2,800 rpm	2,600—2,900 rpm

TROUBLE	PROBABLE CAUSE
Stall rpm high in [2], [D3], [D4] & [R].	Low fluid level or oil pump output, clogged oil strainer, pressure regulator valve stuck closed. Slipping clutch.
Stall rpm high in [D3], [D4] only.	Slippage of 1st clutch
Stall rpm low in [2], [D3], [D4] & [R].	• Engine output low, throttle cable misadjusted at carburetor. • Oil pump seized. • Torque Converter one-way clutch slipping.

Maintenance

Checking/Changing

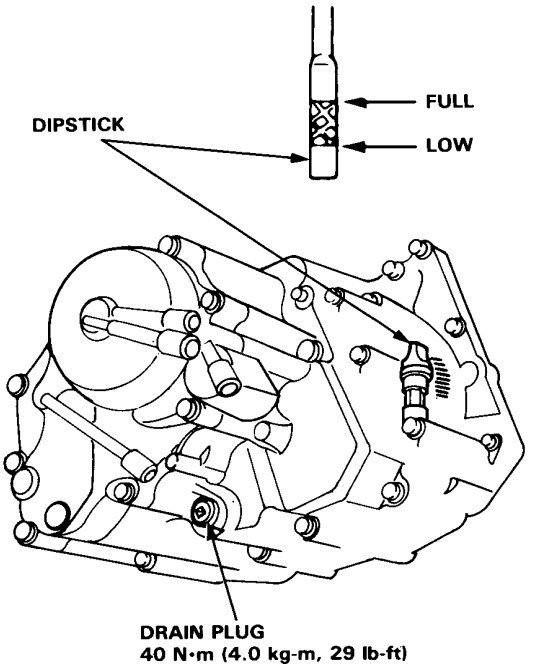
Checking

With the car on level ground, unscrew the transmission dipstick and check the level of fluid immediately after the engine is shut off (within one minute). The fluid level should be between the full and low marks. Do not screw dipstick in to check the fluid level. If the level is at, or below, the low mark, add DEXRONII-type automatic transmission fluid.

Changing

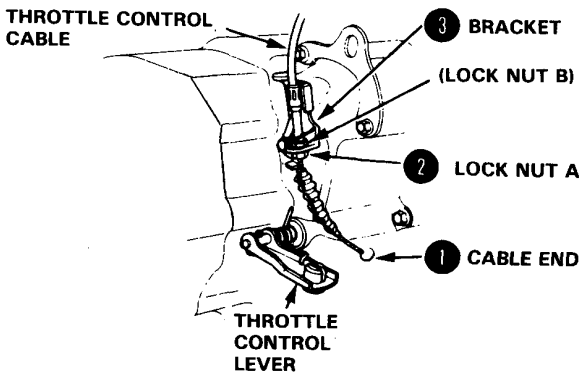
1. Bring the transmission up to operating temperature by driving the car. Park the car on level ground, turn the engine off, then remove drain plug.
2. Reinstall the drain plug with a new washer, then refill the transmission to the full mark on the dipstick.

   Automatic transmission Capacity:
   2000 Engine
   3.0 ℓ (3.2 U.S. qts., 2.6 Imp. qts) at change
   6.0 ℓ (6.3 U.S. qts., 5.3 Imp. qts) after overhaul
   1600 Engine
   2.8 ℓ (3.0 U.S. qts., 2.5 Imp. qts) at change
   5.8 ℓ (6.1 U.S. qts., 5.1 Imp. qts) after overhaul



Removal

1. Disconnect ground cable at battery and transmission.
2. Release steering lock, and shift gear selector to N.
3. Disconnect wiring:
   - Battery positive cable from starter.
   - Black/white wire from starter solenoid.
4. Disconnect cooler hoses, and wire them up next to the radiator so ATF won't drain out.
5. Remove starter mounting bolts and top transmission mounting bolt.
6. Loosen front wheel nuts.
7. Apply parking brake, block rear wheels, then raise front end on jack stands and remove front wheels.
8. Drain transmission. Reinstall drain plug with a new washer.
9. Remove throttle control cable:
   - Remove the cable end from the throttle lever.
   - Loosen the lock nut A only.
   - Remove the cable from bracket.

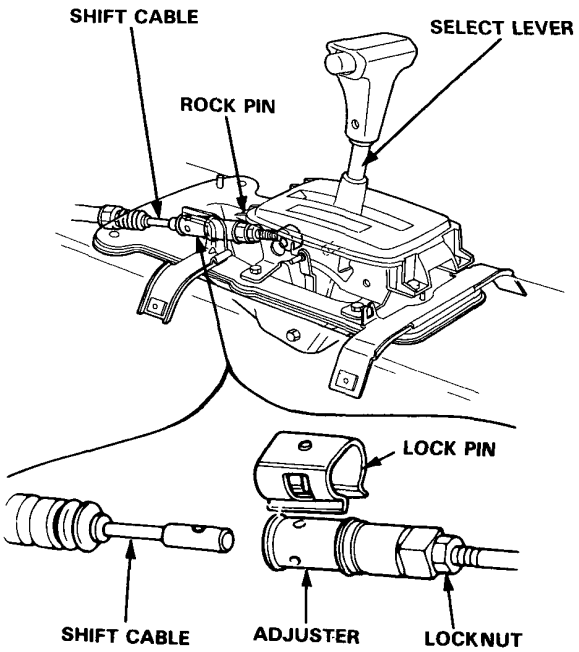


NOTE: For cable adjustment see page 15-71.

10. Remove power steering speed sensor complete with speedometer cable and hoses.
11. Remove two upper transmission mounting bolts.
12. Place transmission jack securely beneath transmission, and hook hanger plate with hoist; make sure hoist chain is tight.
13. Remove subframe center beam and splash pan.
14. Remove the ball joint pinch bolt from the right-side lower control arm, then use a puller to disconnect the ball joint from the knuckle. Removethe damper fork bolt.
15. Turn right side steering knuckle to its most outboard position. With screwdriver, pry CV joint out approximately 1/2", then pull CV joint out of transmission housing.

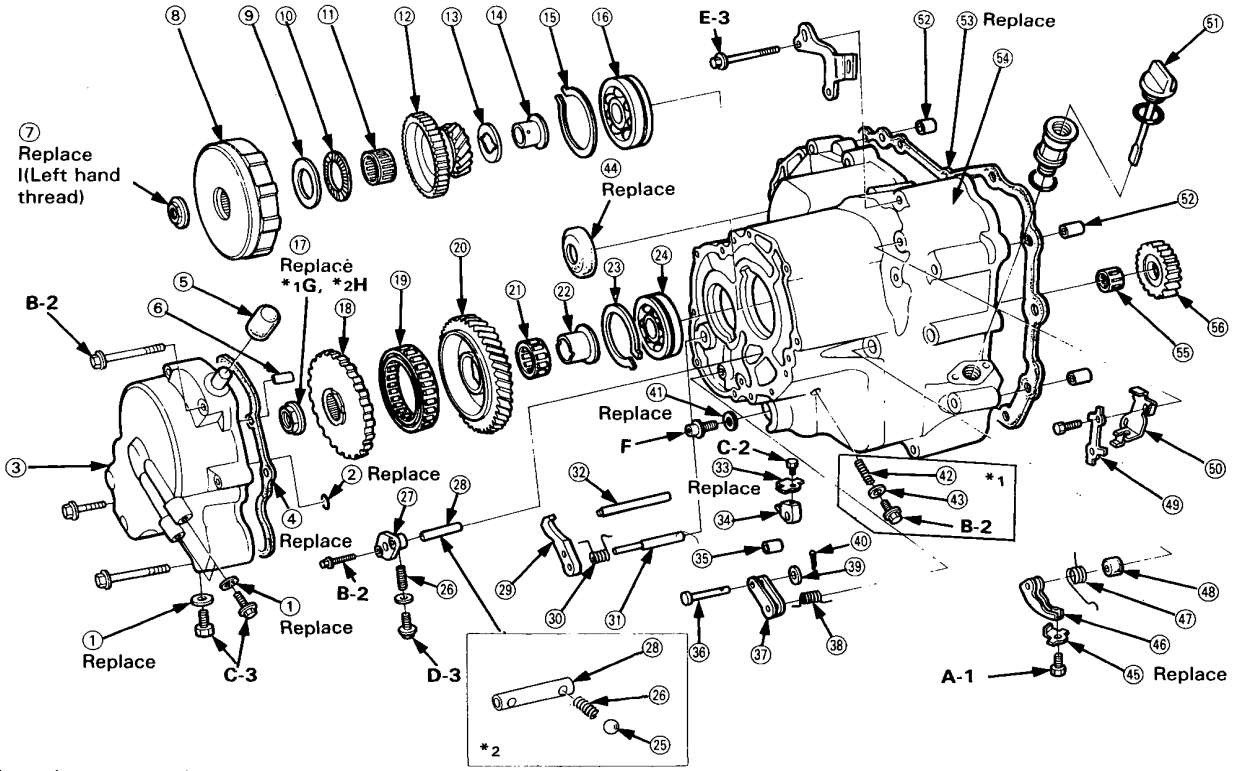
    CAUTION: Do not pull on the driveshaft or knuckle since this may cause the inboard CV joint to separate; pull on the inboard CV joint.

16. Remove transmission damper bracket located in front of torque converter cover plate.
17. Remove torque converter cover plate.
18. Remove center console.



19. Remove lock pin from adjuster and shift cable.
    NOTE: On reassembly, check cable adjustment page 15-70.
20. Remove both bolts and pull shift cable out of housing.
21. Unbolt torque converter assy from drive plate by removing eight bolts.
22. Remove the three rear engine mounting bolts from transmission housing.
    Remove the rear engine mount.
23. Remove the front transmission mount's two bolts.
24. Remove the lower transmission mounting bolt.
25. Pull transmission away from the engine to clear the two 14 mm dowel pins.
    - Pry left-side CV joint out approximately 1/2".
    - Pull transmission out and lower on tansmission jack.
    - Remove torque convertor from transmission.

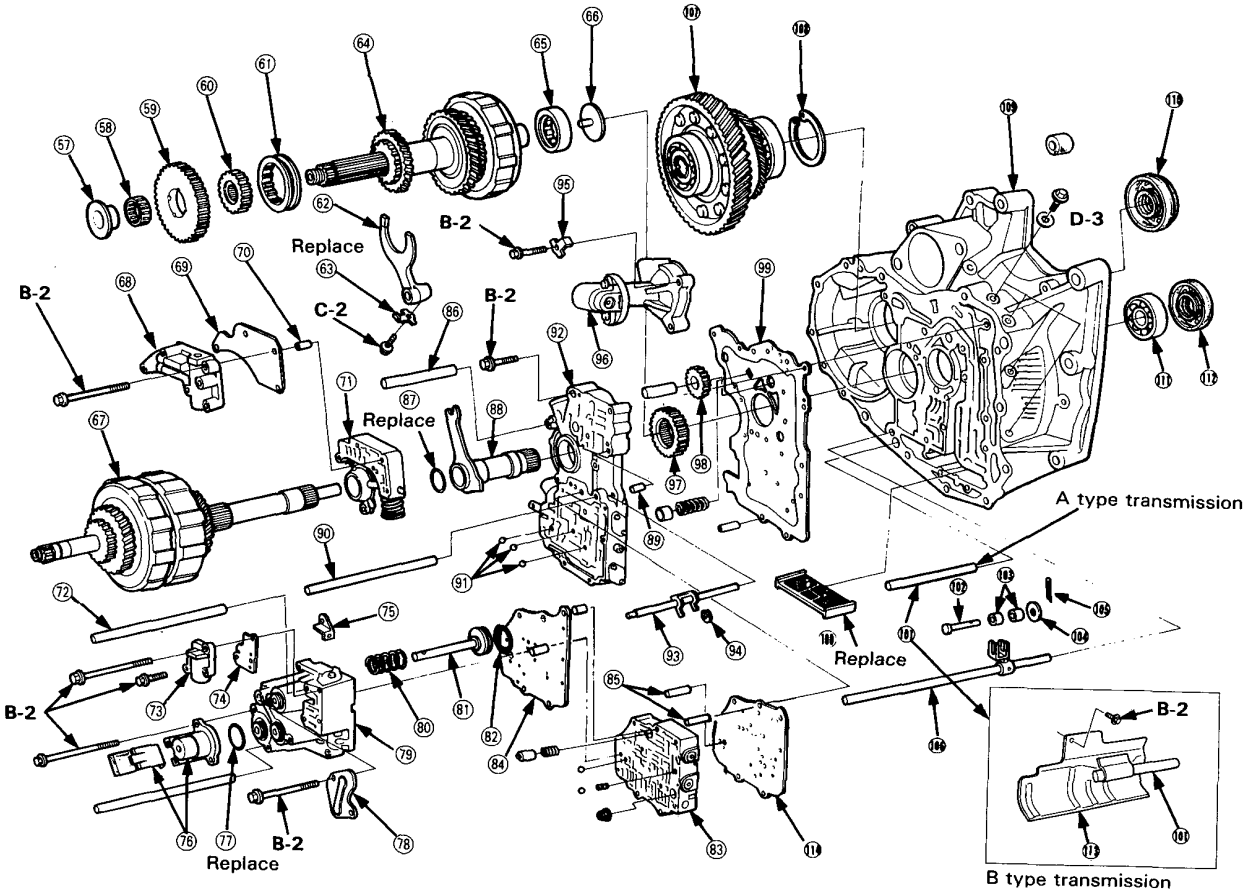
Illustrated Index



*1 = A type transmission
*2 = B type transmission

Torque	Bolt size
A—8 N·m (0.8 kg-m, 6 lb-ft)	1—5 x 0.8 mm
B—12 N·m (1.2 kg-m, 9 lb-ft)	2—6 x 1.0 mm
C—14 N·m (1.4 kg-m, 10 lb-ft)	3—8 x 1.25 mm
D—18 N·m (1.8 kg-m, 12 lb-ft)	
E—27 N·m (2.7 kg-m, 20 lb-ft)	
F—40 N·m (4.0 kg-m, 29 lb-ft)	
*1G—110→0→110 N·m (11.0→0→11.0 kg-m, 80→0→80 lb-ft)	
*2H—140→0→140 N·m (14.0→0→14.0 kg-m, 102→0→102 lb-ft)	
I—95→0→95 N·m (9.5→0→9.5 kg-m, 70→0→70 lb-ft)	

① **WASHER**
② **O-RING 6 x 2.3 mm**
③ **END COVER**
Disassembly/Inspection, page 15-49
④ **GASKET**
⑤ **BREATHER CAP**
⑥ **DOWEL PIN 8 x 14 mm**
⑦ **LOCK NUT**
Removal, page 15-12
Installation, page 15-62
⑧ **1st CLUTCH**
Removal, page 15-13
Disassembly, page 15-37
Reassembly, page 15-42
⑨ **THRUST WASHER 26 mm**
⑩ **THRUST NEEDLE BEARING 31 x 47 x 2 mm**
⑪ **NEEDLE BEARING 31 x 36 x 18.5 mm**
⑫ **MAINSHAFT 1st GEAR**
⑬ **THRUST WASHER**
⑭ **COLLAR 26 mm**
⑮ **SNAP RING 75 mm (2000 Engine)**
SNAP RING 68 mm (1600 Engine)
⑯ **MAINSHAFT BEARING**
Replacement, page 15-47
⑰ **LOCK NUT**
Removal, page 15-13
Installation, page 15-61
⑱ **PARKING GEAR**
⑲ **ONE-WAY CLUTCH**
⑳ **COUNTERSHAFT 1st GEAR**
Disassembly/Inspection, page 15-22
㉑ **NEEDLE BEARING**
㉒ **1st GEAR COLLAR**
㉓ **SNAP RING 68 mm (2000 Engine)**
SNAP RING 62 mm (1600 Engine)
㉔ **COUNTERSHAFT BEARING**
㉕ **STEEL BALL**
㉖ **SPRING**
㉗ **REVERSE IDLER BEARING HOLDER**
Removal, page 15-14
㉘ **REVERSE GEAR SHAFT**
㉙ **PARKING PAWL**
㉚ **PARKING PAWL SPRING**
㉛ **PARKING PAWL SHAFT**
㉜ **STOP PIN**
㉝ **LOCK PLATE**
㉞ **PARKING LEVER**
㉟ **PARKING PAWL ROLLER**
㊱ **ROLLER PIN**
㊲ **PARKING SHIFT ARM**
㊳ **RETURN SPRING**
㊴ **WASHER 5 mm**
㊵ **COTTER PIN**
㊶ **WASHER 14 mm**
㊷ **SPRING**
㊸ **WASHER 6 mm**
㊹ **DIFFERENTIAL OIL SEAL**
Installation, page 15-46
㊺ **LOCK PLATE**
㊻ **THROTTLE CONTROL LEVER**
㊼ **THROTTLE CONTROL SHAFT SPRING**
Removal, page 15-15
Installation, page 15-59
㊽ **THROTTLE CONTROL SHAFT SEAL**
㊾ **LOCK PLATE**
㊿ **THROTTLE CONTROL CABLE BRACKET**
(51) **DIPSTICK**
(52) **DOWEL PIN 14 x 25 mm**
(53) **GASKET**
(54) **TRANSMISSION HOUSING**
(55) **NEEDLE BEARING**
(56) **REVERSE IDLER GEAR**
Replacement, page 15-58

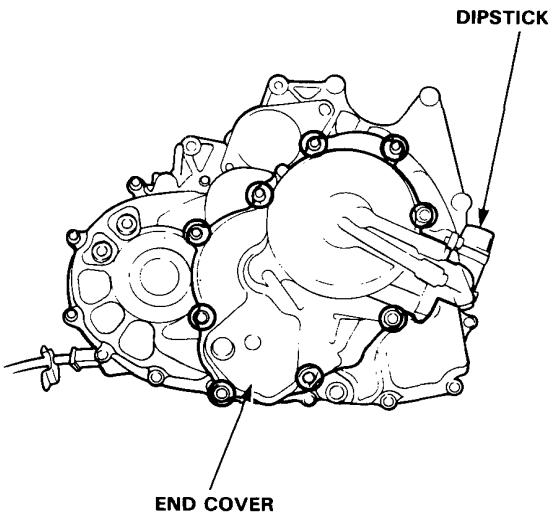


⑤⑦ **REVERSE GEAR COLLAR**
⑤⑧ **NEEDLE BEARING**
⑤⑨ **COUNTERSHAFT REVERSE GEAR**
⑥⓪ **SELECTOR HUB**
⑥① **REVERSE GEAR SELECTOR**
⑥② **REVERSE SHIFT FORK**
⑥③ **LOCK PLATE**
⑥④ **COUNTERSHAFT ASSY**
Disassembly/Inspection, page 15-33
⑥⑤ **COUNTERSHAFT NEEDLE BEARING**
⑥⑥ **OIL GUIDE PLATE**
⑥⑦ **MAINSHAFT ASSY**
Disassembly/Inspection page15-32
⑥⑧ **LOCK UP SHIFT VALVE BODY**
Removal, page 15-18
Disassembly, page 15-29
⑥⑨ ***SEPARATOR PLATE***
⑦⓪ **DOWEL PIN**
⑦① **REGULATOR VALVE BODY**
Removal, page 15-19
Repair, page 15-25
Disassembly, page 15-28
⑦② **4th CLUTCH PIPE**
⑦③ **MODULATOR VALVE BODY**
Removal, page 15-17
⑦④ **SEPARATOR PLATE**
⑦⑤ **CHECK VALVE STOP PLATE**
⑦⑥ **4th ACCUMULATOR COVER**
⑦⑦ ***O-RING***
⑦⑧ **2nd/3rd ACCUMULATOR COVER**
⑦⑨ **SERVO VALVE BODY ASSY**
Removal, 15-17
Disassembly, 15-30
⑧⓪ **RETURN SPRING**
⑧① **SERVO VALVE**
⑧② **O-RING 31 x 2.7 mm**
⑧③ **SECONDARY VALVE BODY ASSY**
Removal, 15-18
Disassembly/Inspect, 15-24
⑧④ **SERVO SEPARATOR PLATE**
⑧⑤ **DOWEL PIN**
⑧⑥ **STOP PIN**
⑧⑦ **O-RING**
⑧⑧ **STATOR SHAFT**
⑧⑨ **DOWEL PIN**
⑨⓪ **1st CLUTCH PIPE**
⑨① **STEEL BALLS**
⑨② **MAIN VALVE BODY ASSY**
Remove, 15-19
Disassembly, 15-23
⑨③ **THROTTLE CONTROL SHAFT**
⑨④ **E-CLIP**
⑨⑤ **LOCK PLATE**
⑨⑥ **GOVERNOR VALVE**
Removal, 15-16
Disassembly/Inspection, 15-31
⑨⑦ **PUMP DRIVE GEAR**
⑨⑧ **PUMP DRIVEN GEAR**
⑨⑨ **MAIN VALVE SEPARATOR PLATE**
⑩⓪ **FILTER SCREEN**
⑩① **SUCTION PIPE**
⑩② **MANUAL VALVE PIN**
⑩③ **ROLLERS**
⑩④ **WASHER 5 mm**
⑩⑤ **COTTER PIN**
⑩⑥ **CONTROL SHAFT**
⑩⑦ **DIFFERENTIAL**
⑩⑧ **SNAP RING 80 mm**
⑩⑨ **TORQUE CONVERTER HOUSING**
⑪⓪ **DIFFERENTIAL OIL SEAL**
⑪① **MAINSHAFT BEARING**
⑪② **MAINSHAFT OIL SEAL**
⑪③ ***BAFFLE PLATE***
B type transmission only
⑪④ **SECONDARY SEPARATOR PLATE**

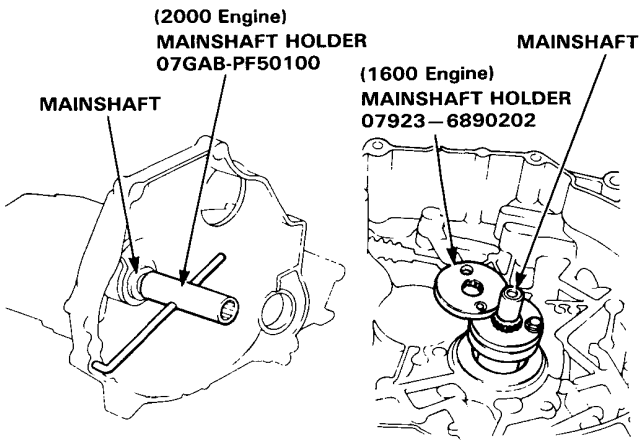
Transmission Housing

Removal

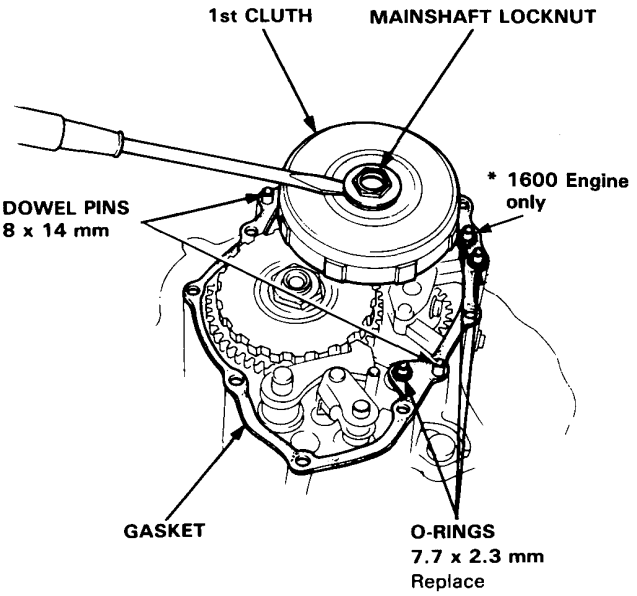
1. Remove the dipstick.
2. Remove the nine bolts from the end cover, then remove the cover.



3. Shift the transmission to PARK.
4. Lock the mainshaft using the mainshaft holder.

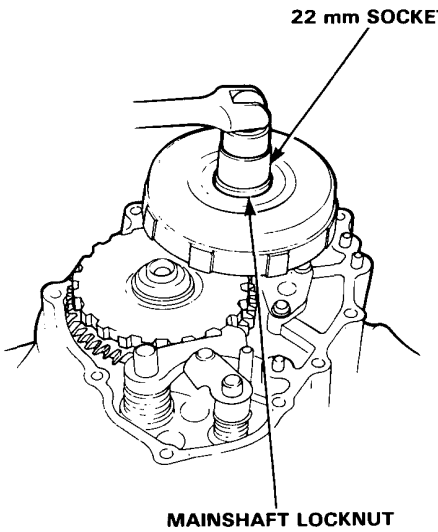


5. Remove the end cover gasket, dowel pins, and O-rings.
6. Pry the staked edge of the locknut flange out of the notch in the 1st clutch.



7. Remove the mainshaft locknut.

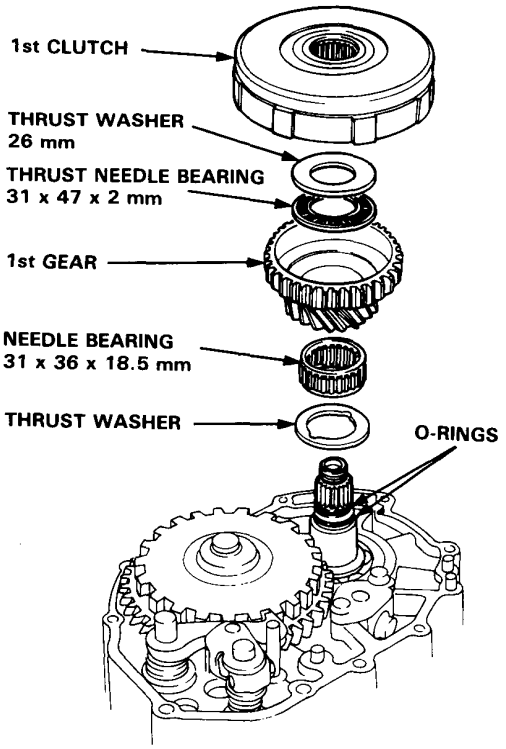
CAUTION: The mainshaft locknut has left-hand threads.



8. Remove the 1st clutch.

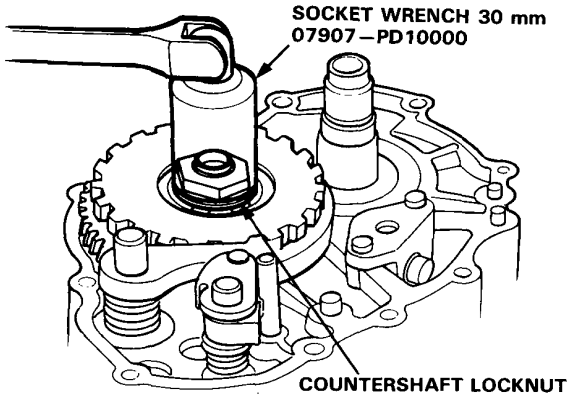
9. Remove the needle bearing and thrust washer from the mainshaft.

10. Remove the O-rings and first gear from the mainshaft.

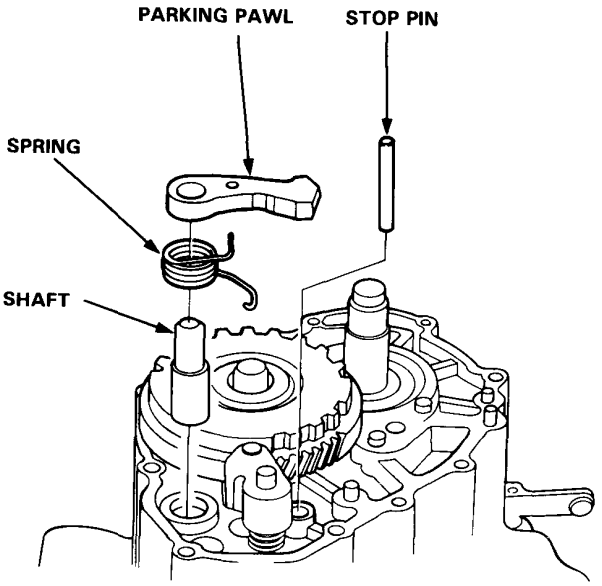


11. Pry the staked edge of the locknut out of the notch in the parking gear.

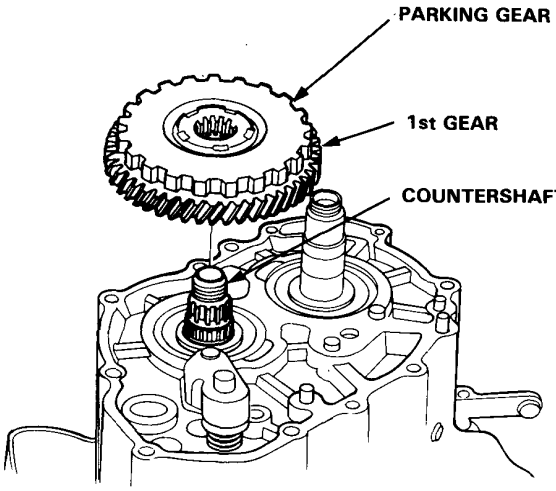
12. Remove the countershaft locknut.



13. Remove the parking pawl, shaft, stop pin and spring.



14. Remove the parking gear and countershaft 1st gear as a unit.



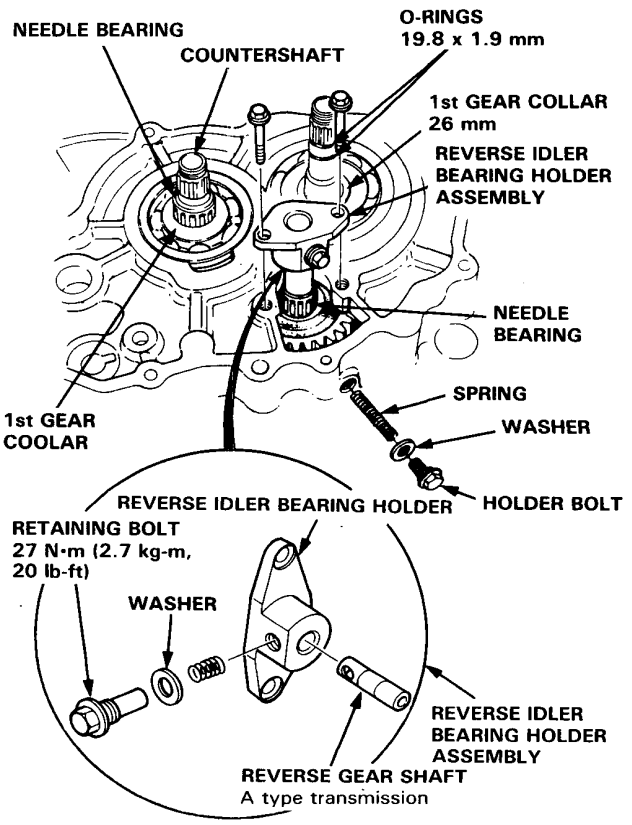
(cont'd)

Removal (cont'd)

15. From the countershaft, remove the needle bearing and 1st gear collar. From the mainshaft, remove the 1st gear collar.

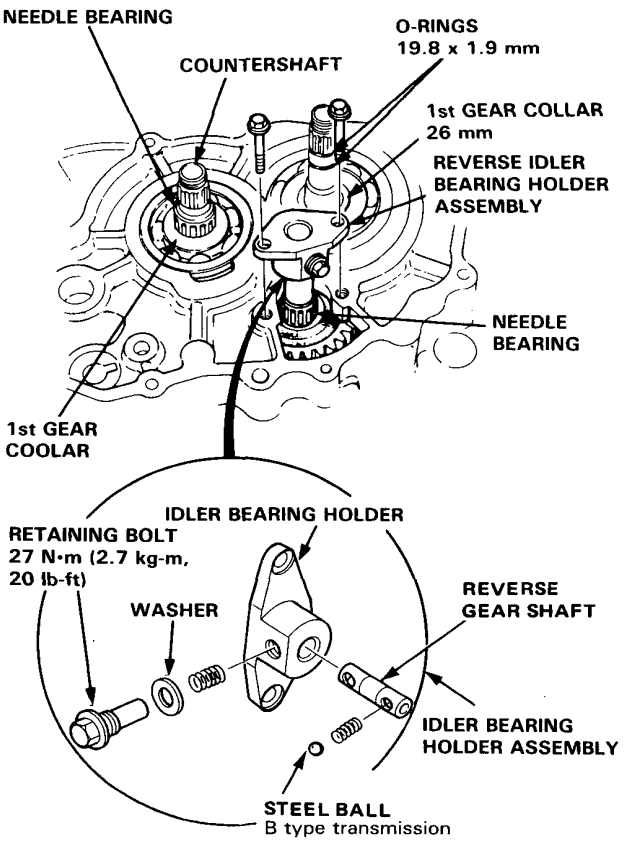
16. Remove the reverse idler bearing holder assembly.

A type transmission



A type transmission

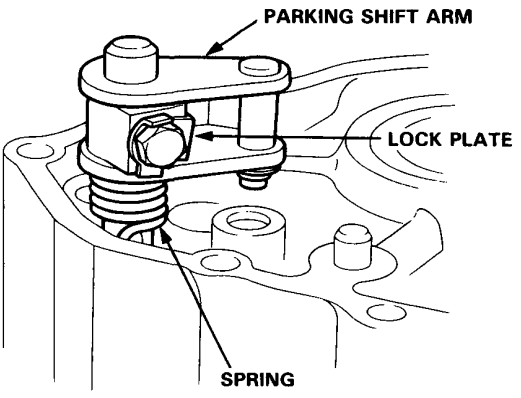
B type transmission



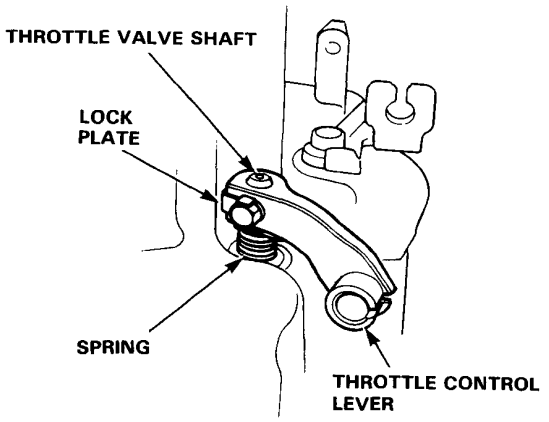
B type transmission

17. Bend down the tab on the lock plate under the parking shift arm bolt.

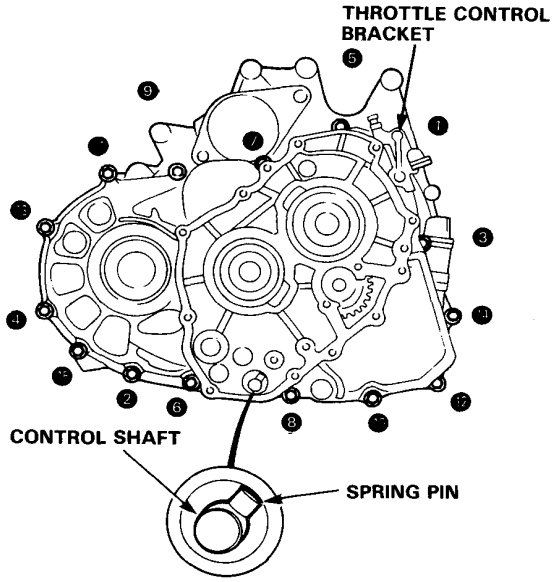
18. Remove the bolt, then remove the parking shift arm.



19. Bend down the tab on the throttle control lever bolt lock plate, then remove the bolt. Remove the throttle control lever and spring from the throttle valve shaft.

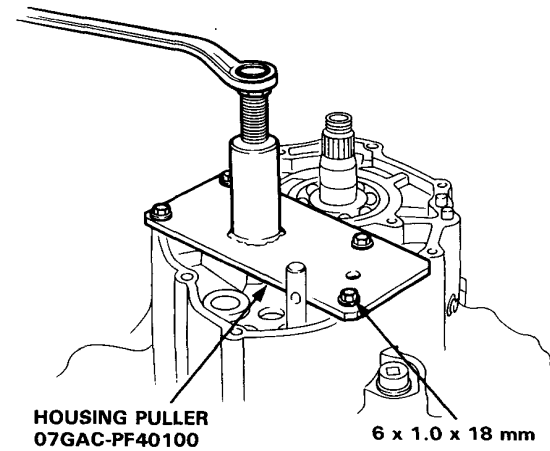


20. Remove the transmission bolts, (1) thru (15), in the sequence shown.



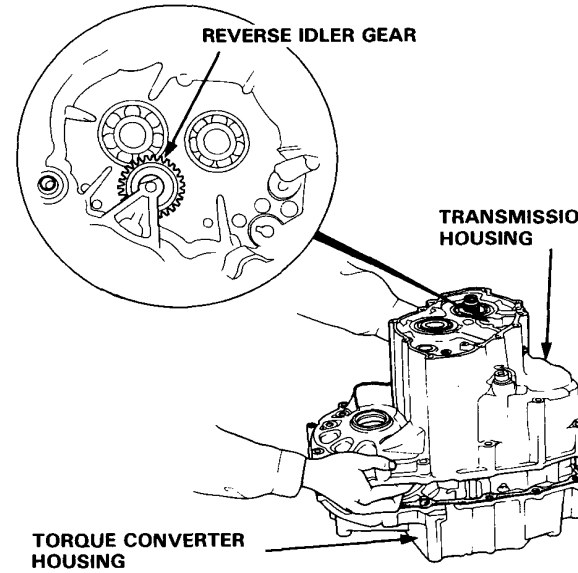
21. Align the control shaft spring pin with the cutout in the transmission housing.

22. Install the transmission housing puller over the countershaft with four bolts and tighten securely. Screw in the puller bolt against the end of the countershaft until the transmission housing comes loose.



23. Remove the puller and separate the housings. Remove the reverse idler gear and needle bearing from the transmission housing.

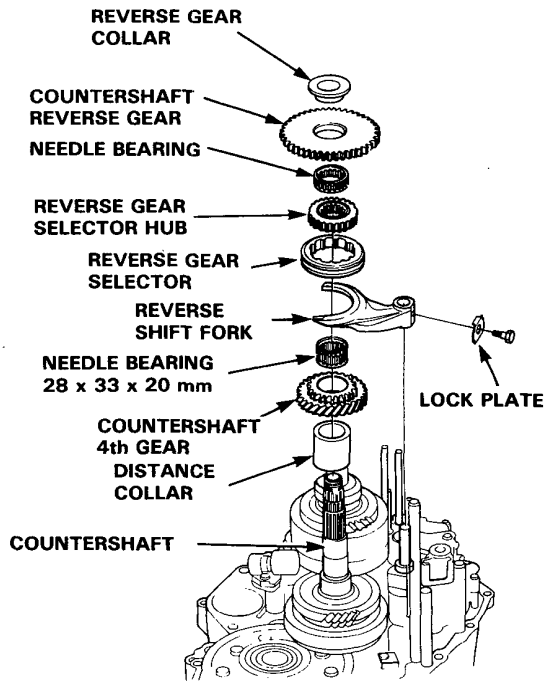
24. Remove the gasket and the dowel pins.



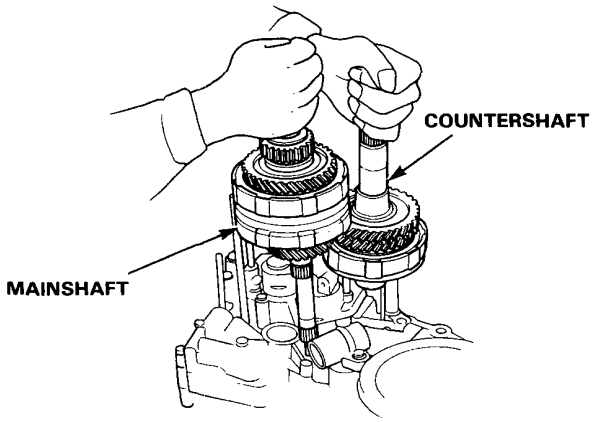
Mainshaft/ Countershaft

Removal

1. Remove the reverse gear collar, countershaft reverse gear and needle bearing.



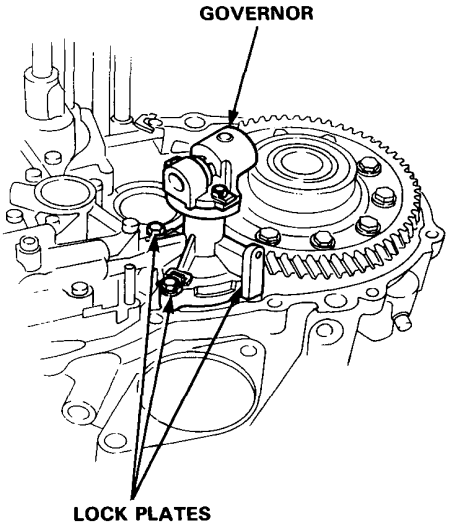
2. Bend down the tab on the lock plate and remove the bolt from the reverse shift fork.
3. Remove the reverse shift fork and reverse gear selector as a unit.
4. Remove the selector hub, countershaft 4th gear, needle bearing and distance collar.
5. Remove the mainshaft and countershaft together. NOTE: It will be necessary to pull up the countershaft at a slight angle to clear the governor.



Governor Valve

Removal

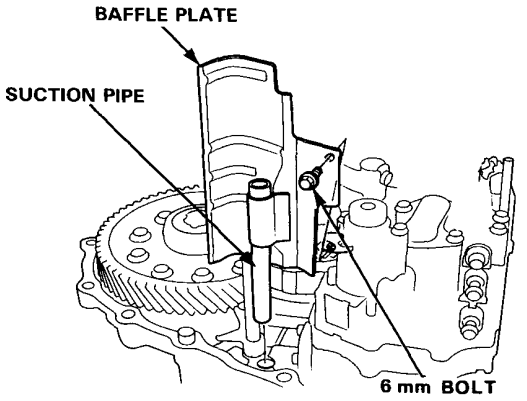
Bend down the tabs on the lock plates, remove the bolts holding the governor to the torque converter housing, and remove the governor.



Main Valve Body

Removal

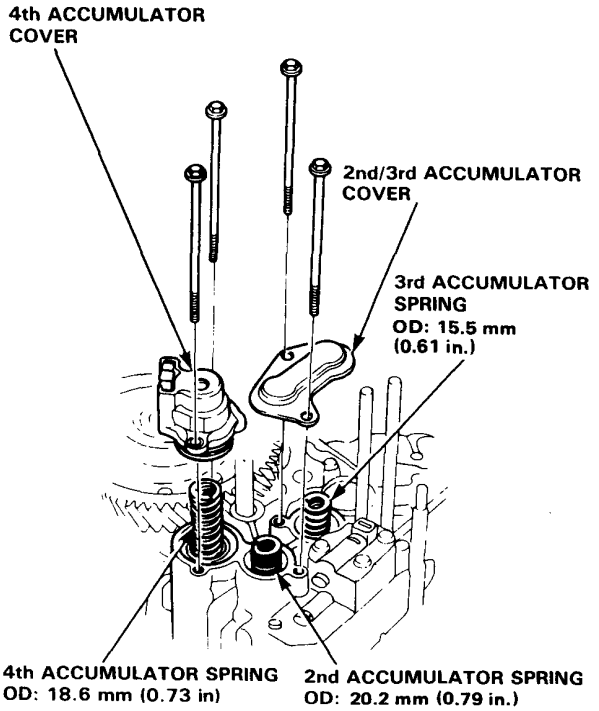
1. Remove the baffle plate with the suction pipe (baffle plate is applied from B type transmission).



2. Remove the accumulator covers.

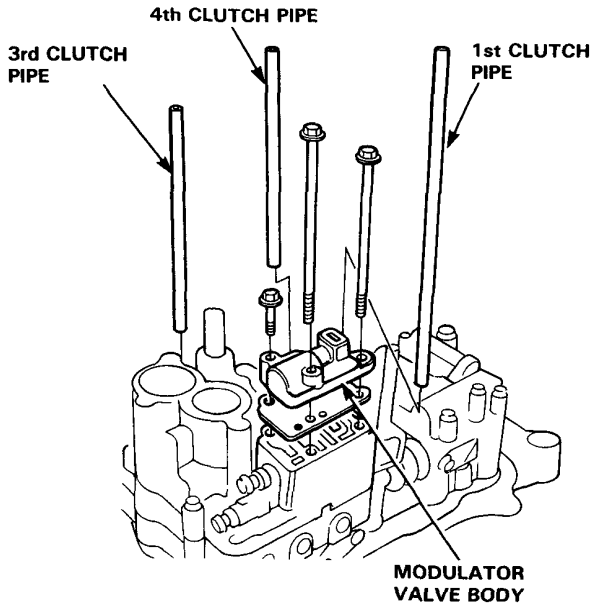
   CAUTION: Accumulator covers are spring loaded; to prevent stripping the threads in the torque converter housing, press down on the accumulator covers while unscrewing the bolts in a crisscross pattern.

3. Remove the accumulator springs.

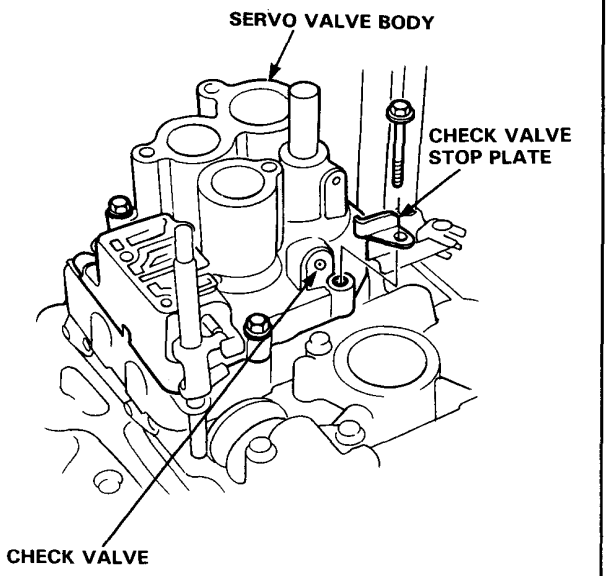


4. Remove the three bolts attaching the modulalor valve body.

5. Remove the 1st, 4th and 3rd clutch pipes.



6. Remove the servo valve body (3 bolts).
7. Remove the check valve stop plate.

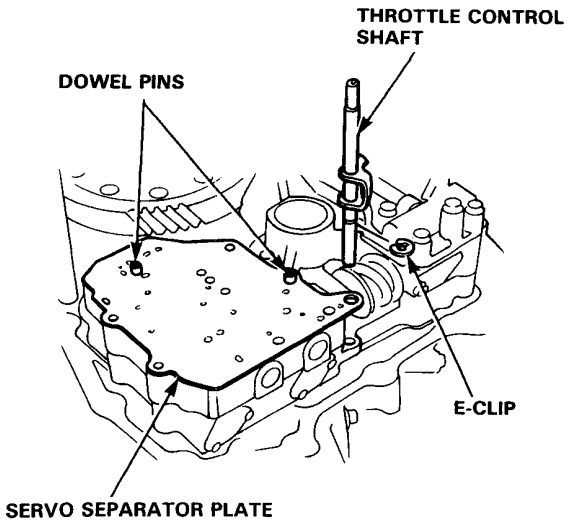


(cont'd)

Removal (cont'd)

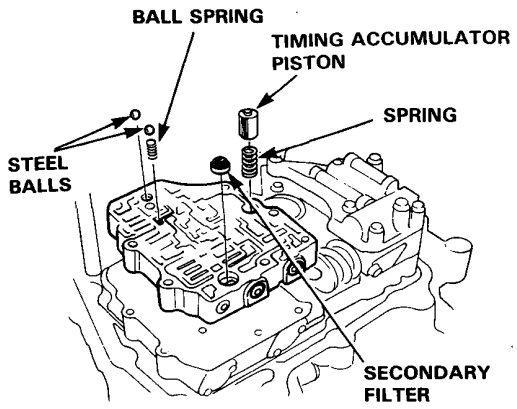
8. Remove the E-clip. Then remove the thottle control shaft from the separator plate.

9. Remove the separator plate and dowel pins.

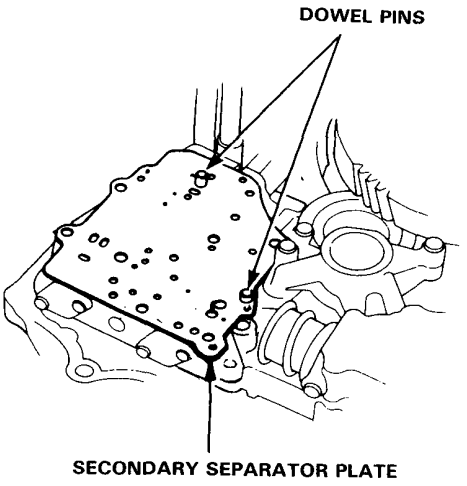


10. Remove the secondary valve body, being careful not to lose the 2 steel balls, ball spring, check valve and spring, secondary filter.

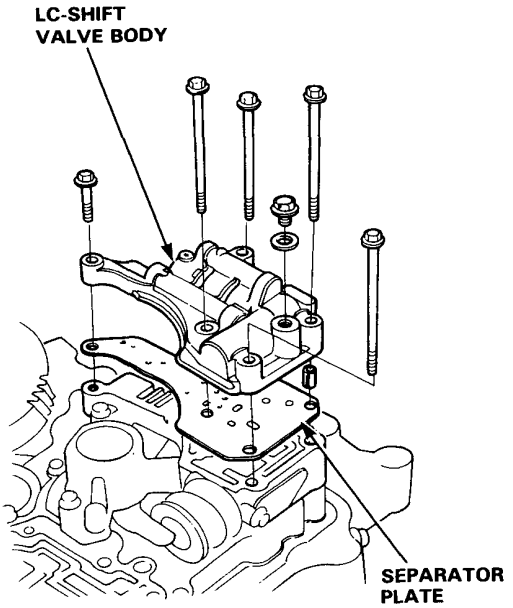
CAUTION: Do not use a magnet to remove the steel balls; it may magnetize the balls.



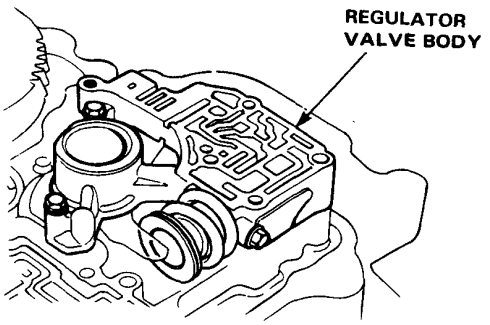
11. Remove the separator plate and dowel pins.



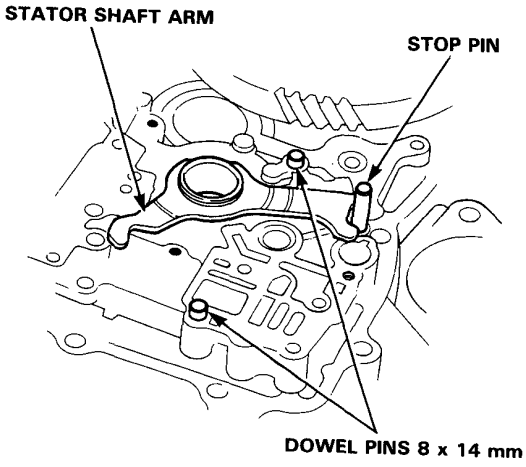
12. Remove the LC-Shift valve body and separator plate (5 bolts).



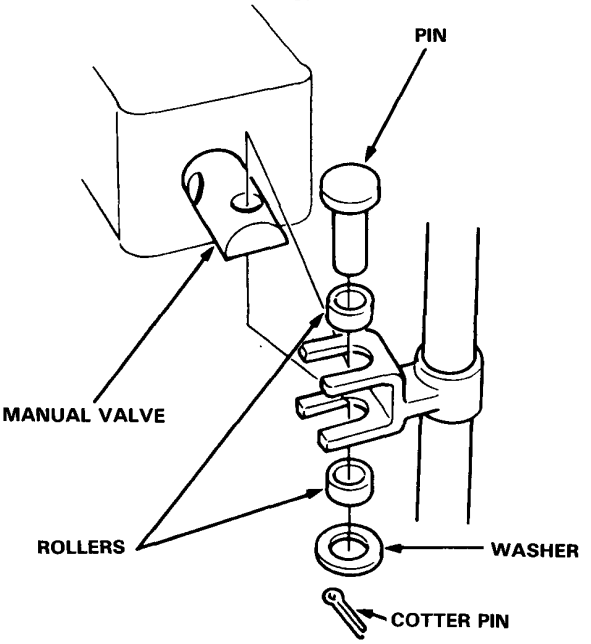
13. Remove the regulator valve body.



14. Remove the stator shaft arm, dowel pins and stop pin.

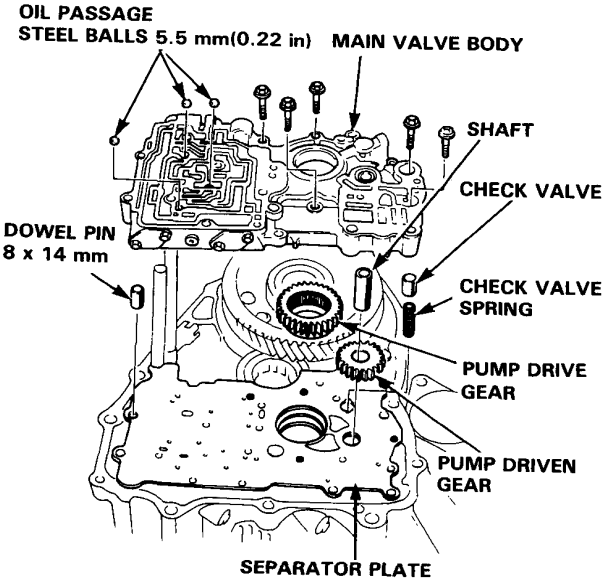


15. Remove the cotter key, washer, rollers, and pin from the manual valve.



16. Remove the main valve body being careful not to lose the 3 steel balls, check ball spring, torque converter check valve and spring.

CAUTION: Do not use a magnet to remove the steel balls; it may magnetize the balls.



(cont'd)

Main Valve Body

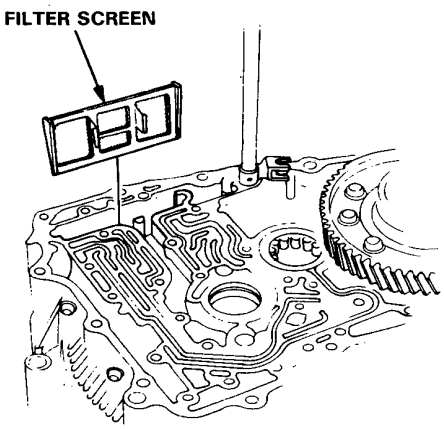
Removal (cont'd)

17. Remove the pump gears and shaft.

18. Remove the separator plate, dowel pins, check valve, and spring.

19. Remove the filter screen.

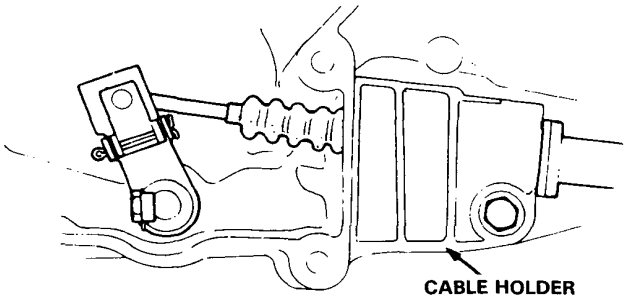
    NOTE: Do not reuse filter screen; install a new one on reassembly.



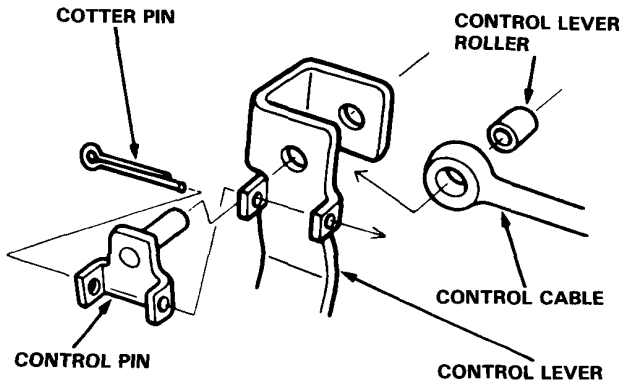
Control Shaft

Removal

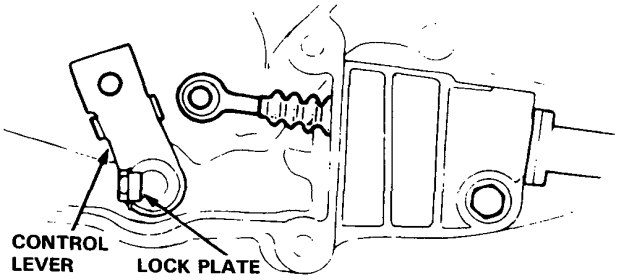
1. Remove the cable holder.



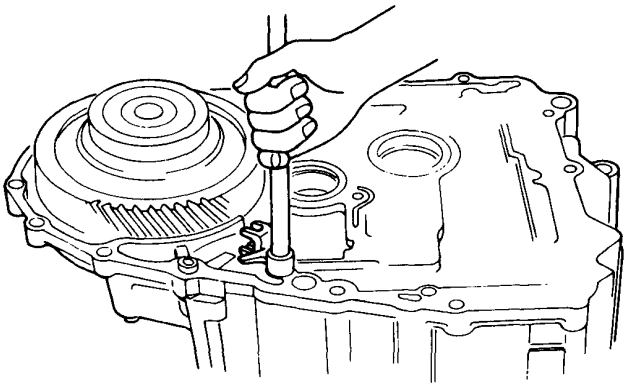
2. Remove the cotter pin, control pin, and control lever roller from the control lever.



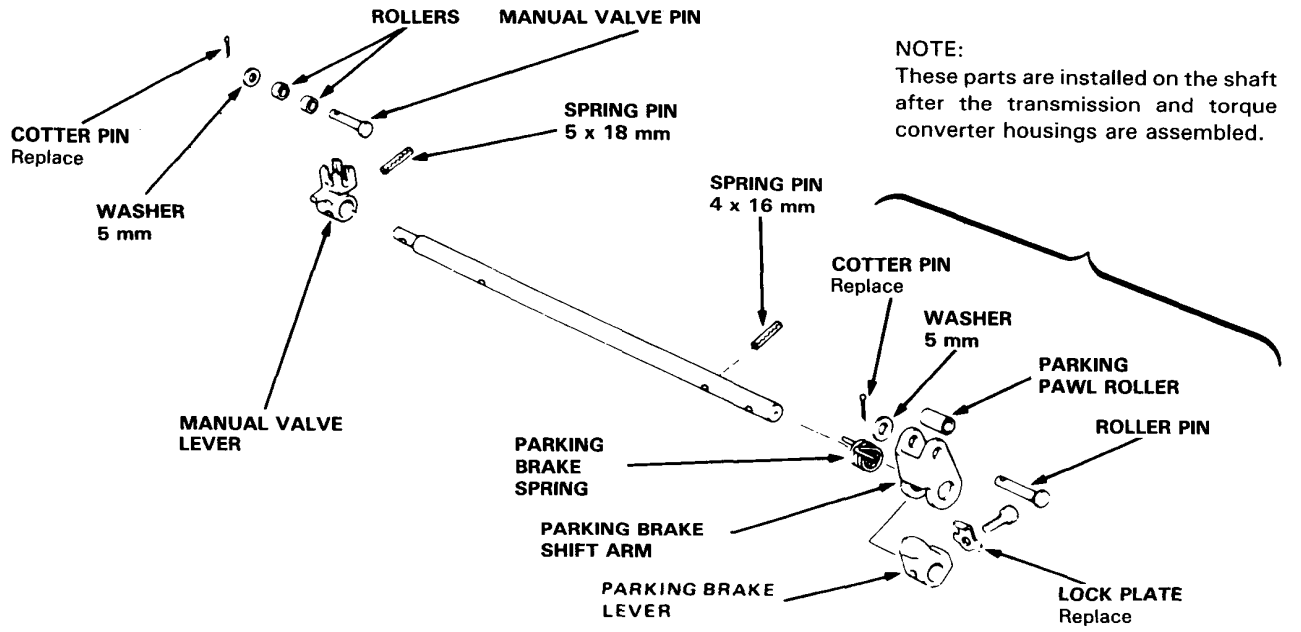
3. Bend down the tab on the lock plate under the bolt in the control lever. Then remove the bolt and lever.



4. Turn the torque converter housing over and remove the control shaft.



Disassembly/Reassembly

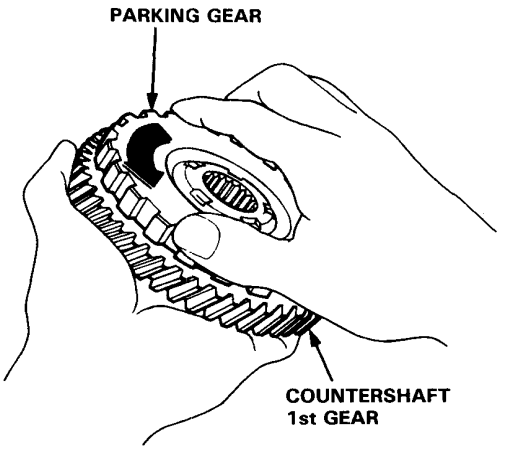


NOTE:
These parts are installed on the shaft after the transmission and torque converter housings are assembled.

One-Way Clutch/Parking Gear

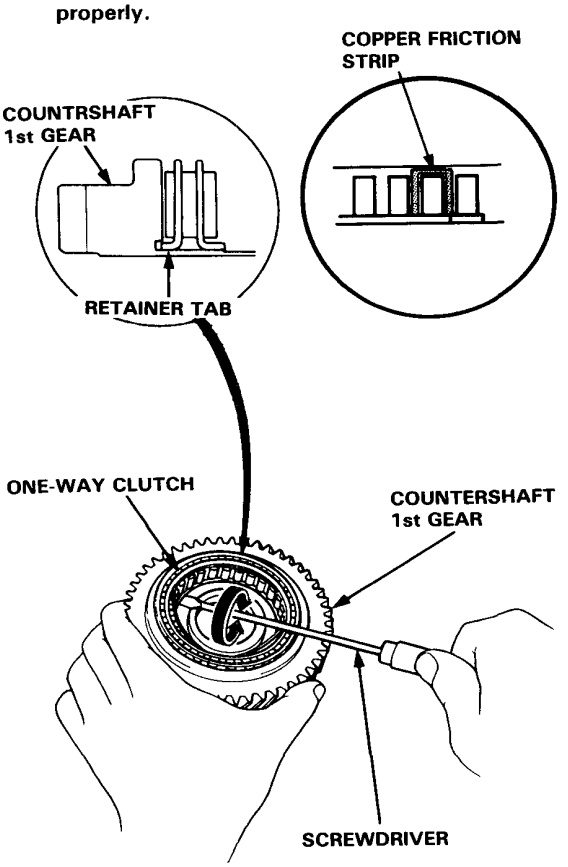
Disassembly and Inspecion

1. Separate the countershaft 1st gear from the parking gear by turning the parking gear in the direction shown.



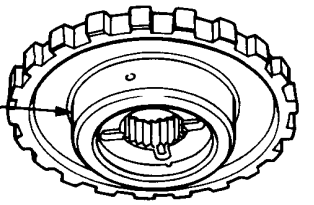
2. Remove the one-way clutch by prying it up with the end of a screwdriver.

CAUTION: Do not pry on the three copper friction strips; if you break a strip, the clutch will not work properly.

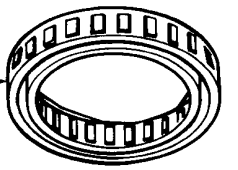


Inspect the parts as follows:

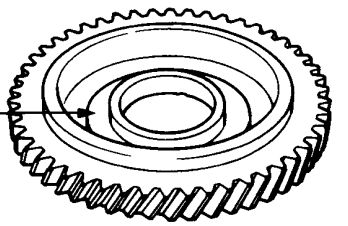
Inspect the parking gear for wear or scoring



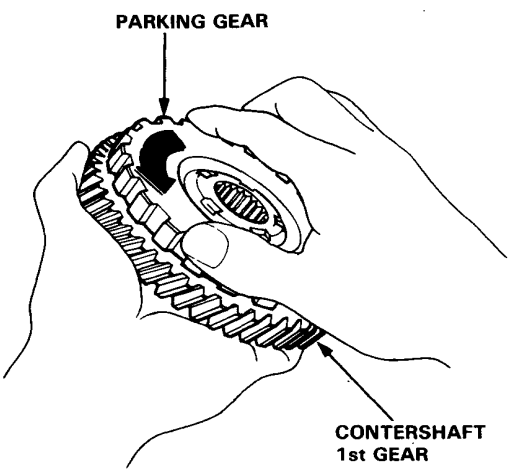
Inspect the one-way clutch for damage or faulty movement



Inspect the counter-shaft 1st gear for wear or scoring



After the parts are assembled, hold the countershaft 1st gear and turn the parking gear in direction shown to be sure it turns freely.

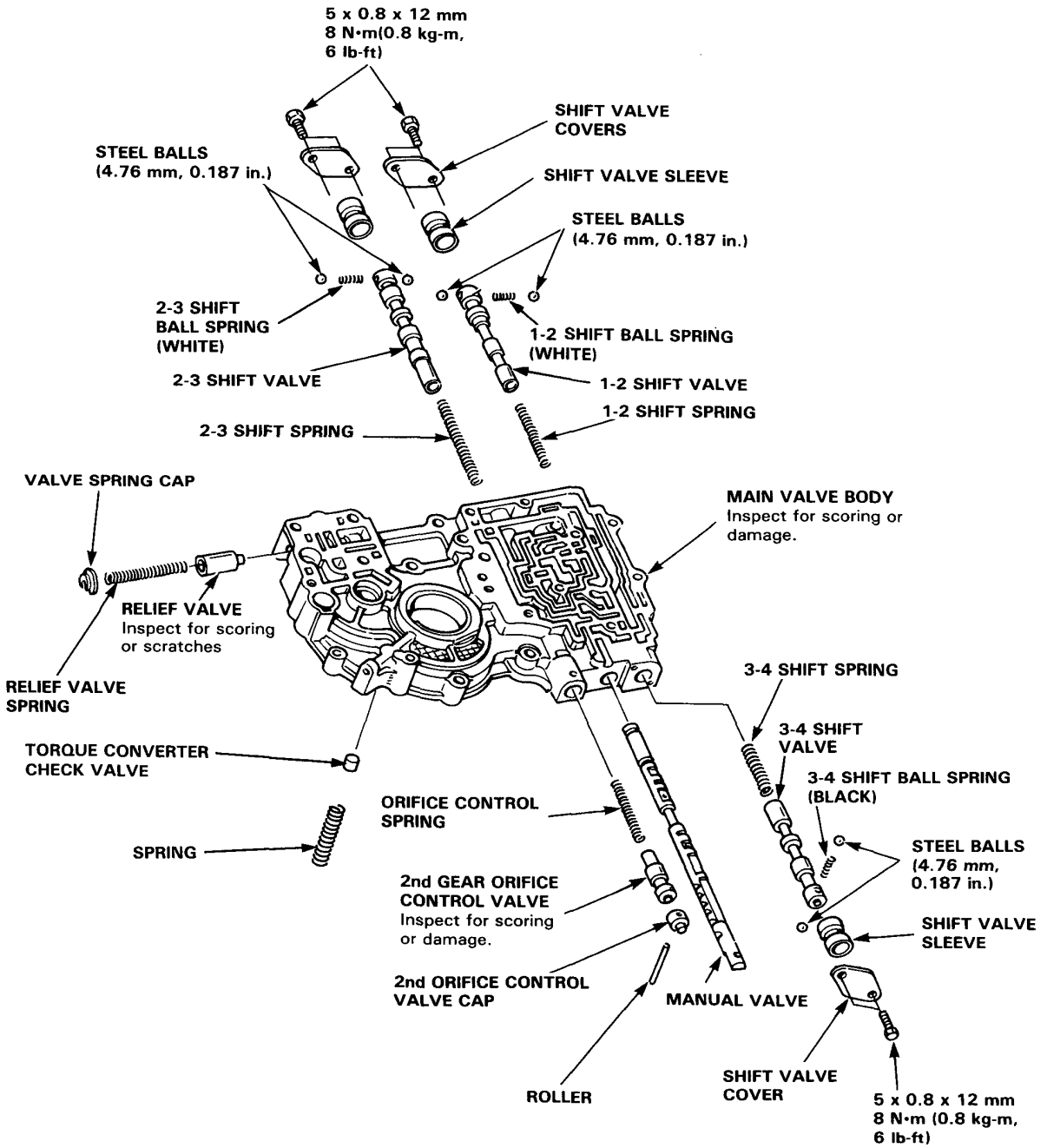


Main Valve Body

Disassembly

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air. Blow out all passages.
- Replace valve body as an assembly if any parts are worn or damaged.
- Check all valves for free movement. If any fail to slide freely, see Valve Body Repair on page 15-25.
- Coat all parts with ATF before reassembly.

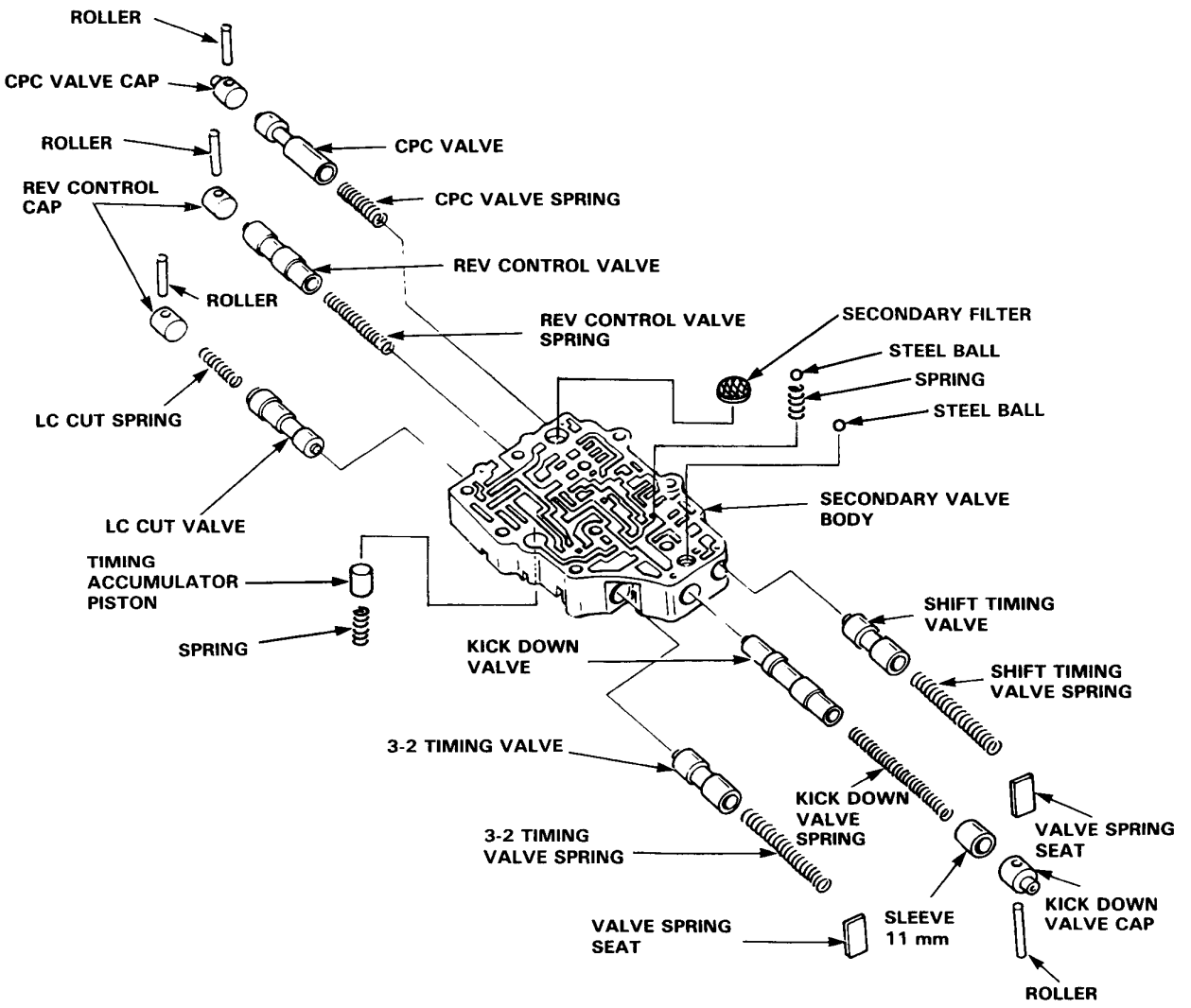


Secondary Valve

Disassembly/Inspection/Reassembly

NOTE:

- Clean all parts thoroughly is solvent or carburetor cleaner, and dry with compressed air. Blow out all passages.
- Check all valves for free movement. If any fail to slide freely, see Valve Body Repair on page 15-25.



Repair

NOTE: This repair is only necessary if one or more of the valves in a valve body do not slide smoothly in their bores. You may use this procedure to free the valves in the main valve body, regulator valve body, lock-up shift valve body, and servo valve body. DO NOT use this procedure to free the valves in the governor; if any governor valves are stuck, the governor must be replaced as an assembly.

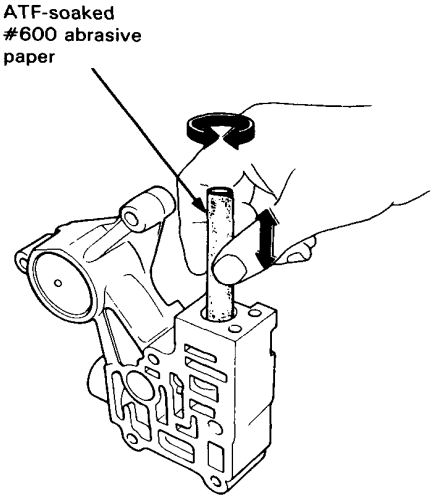
1. Soak a sheet of #600 abrasive paper in ATF for about 30 minutes.
2. Carefully tap the valve body so the sticking valve drops out of its bore.

CAUTION: It may be necessary to use a small screwdriver to pry the valve free. Be careful not to scratch the bore with the screwdriver.

3. Inspect the valve for any scuff marks. Use the ATF-soaked #600 paper to polish off any burrs that are on the valve, then wash the valve in solvent and dry it with compressed air.

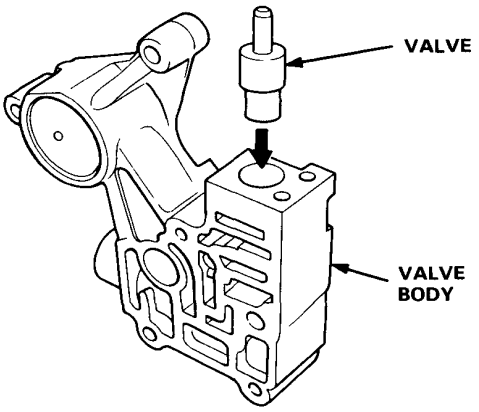
4. Roll up half a sheet of ATF-soaked paper and insert it in the valve bore of the sticking valve. Twist the paper slightly, so that it unrolls and fits the bore tightly, then polish the bore by twisting the paper as you push it in and out.

CAUTION: The valve body is aluminum and doesn't require much polishing to remove any burrs.



5. Remove the #600 paper and thoroughly wash the entire valve body in solvent, then dry with compressed air.

6. Coat the valve with ATF then drop it into its bore. It should drop to the bottom of the bore under its own weight. If not, repeat step 4, then retest.



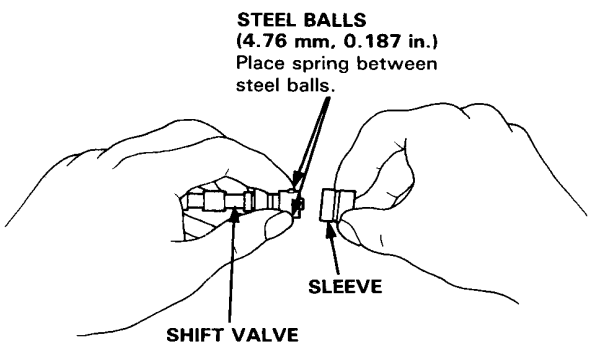
7. Remove the valve and thoroughly clean it and the valve body with solvent. Dry all parts with compressed air, then reassemble using ATF as a lubricant.

Main Valve Body

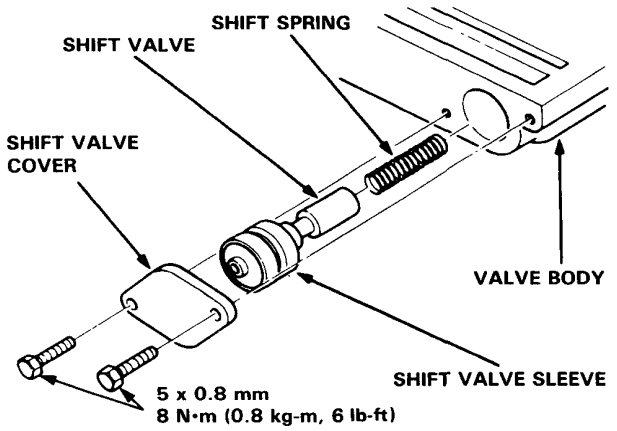
Reassembly

NOTE: Coat all parts with ATF before assembling.

1. Slide the spring into the hole in the big end of the shift valve.
   While holding the steel balls with the tips of your fingers, put the sleeve over valve.

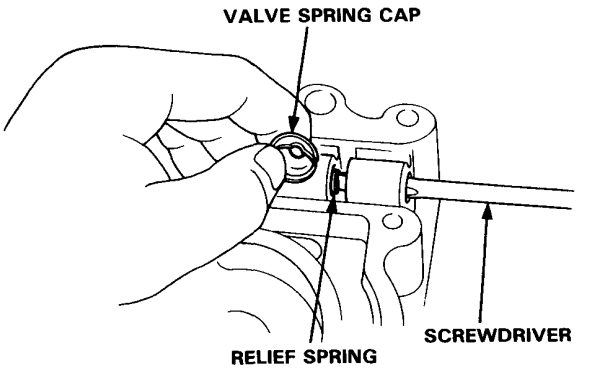


2. Place the shift spring in the valve, then slip it into the valve body and install the valve cover.

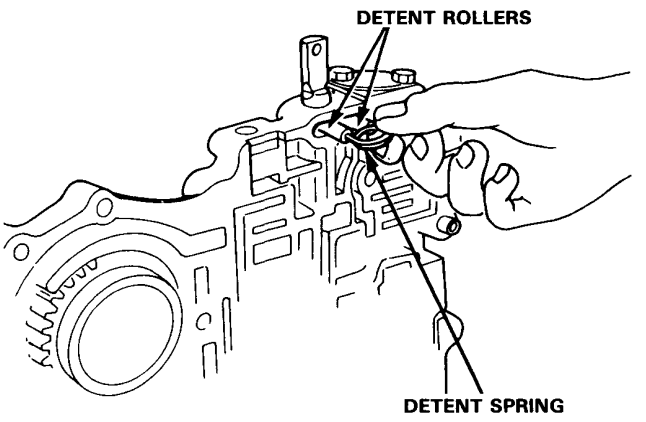


3. Set the relief spring in the relief valve and install it in the main valve body.

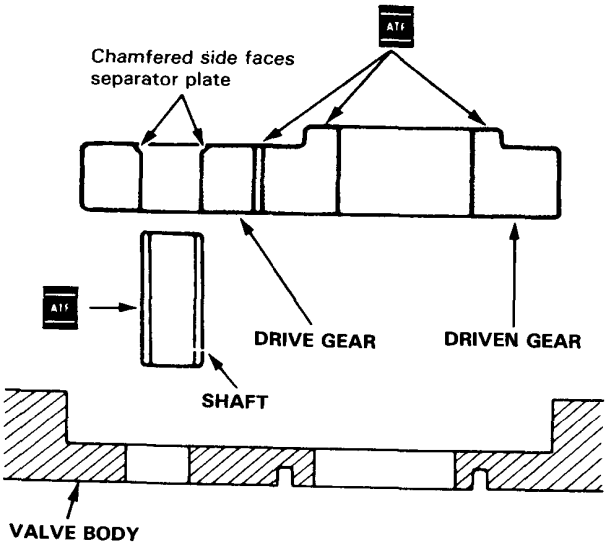
4. Install the spring with a screwdriver, then install the check valve cap with the cutout aligned with the screwdriver.



5. Install the manual valve, detent rollers and spring.

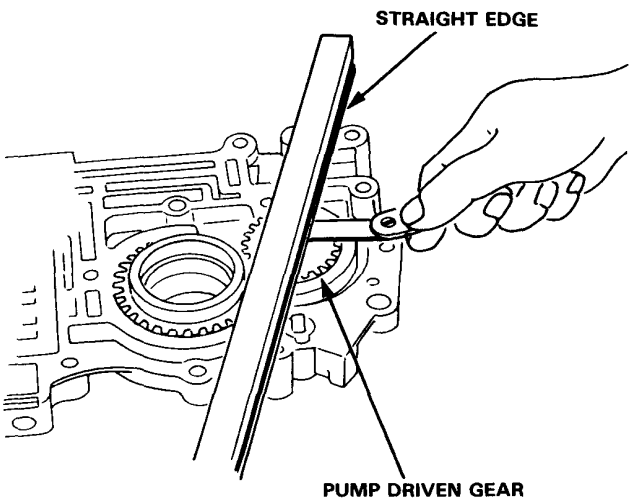


6. Install the pump gears and shaft in the main valve body.



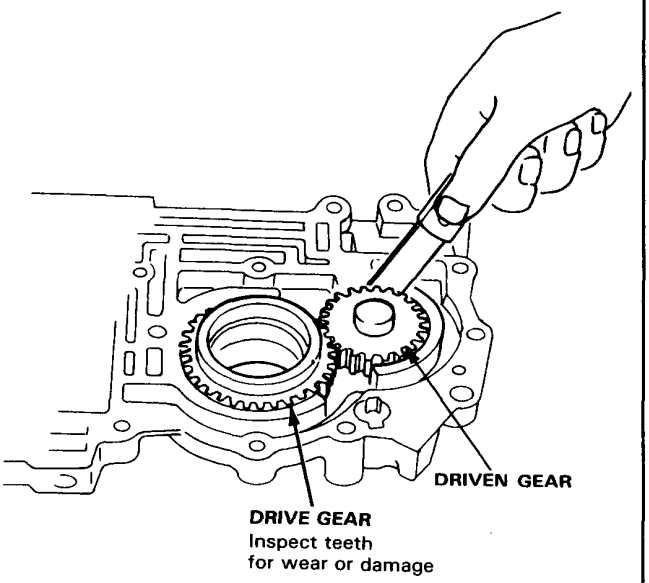
7. Measure the thrust clearance of the driven gear-to-valve body.

Drive/Driven Gear thrust (Axial) Clearance:
Standard (New): 0.03—0.05 mm (0.001—0.002 in.)
Service Limit: 0.07 mm (0.0028 in.)



8. Install the oil pump shaft and measure the side clearance of the drive and driven gears.

Pump Gears Side Clearance:
Standard (New):
Drive gear (Diameter) 0.240—0.265 mm (0.0094—0.0104 in.)
Driven gear (Radial) 0.063—0.088 mm (0.0025—0.0035 in.)

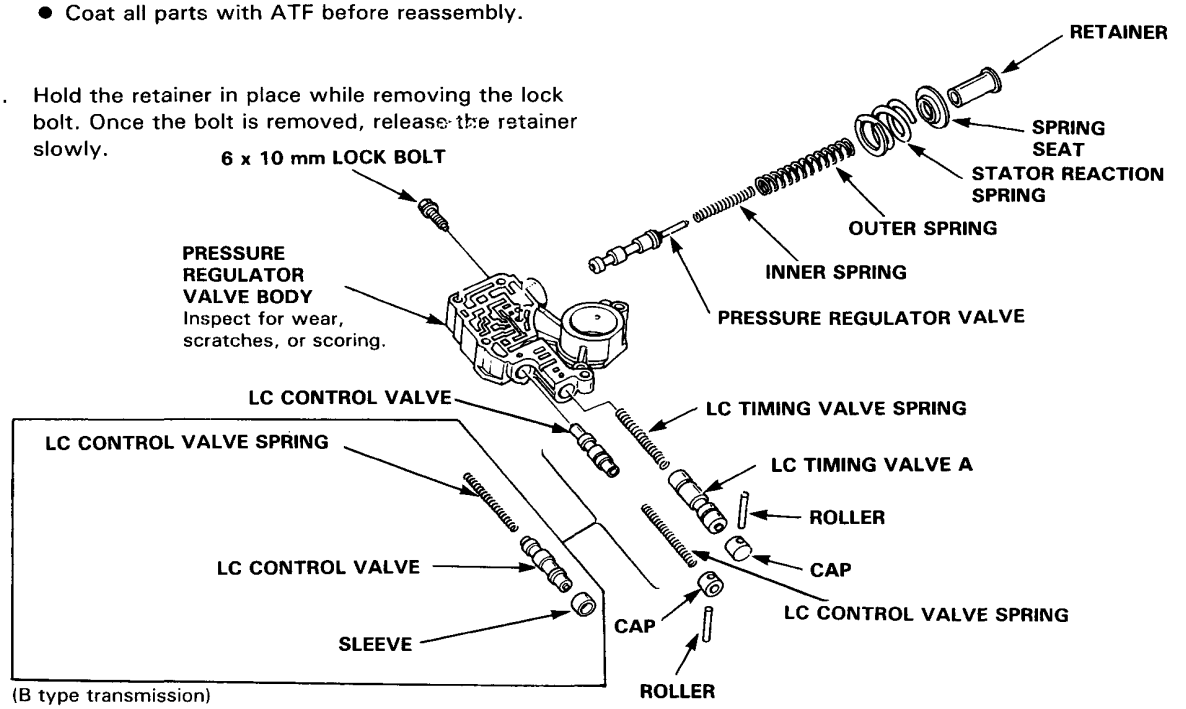


Regulator Valve Body

Disassembly/Inspection

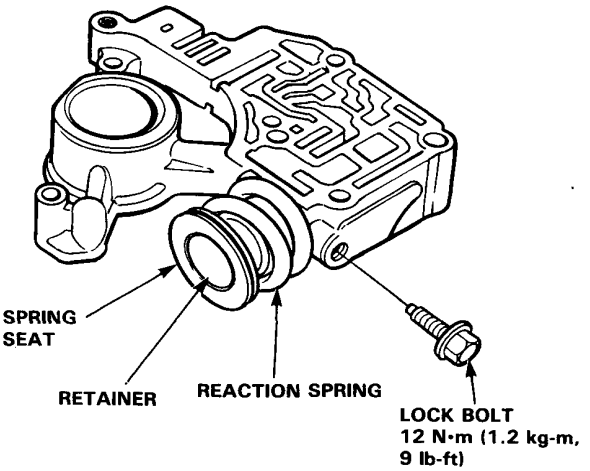
NOTE:
- Clean all parts thoroughly in solvent or carburetor cleaner.
- Replace valve body as assembly if any parts are worn or damaged.
- Check all valves for free movement, if any fail to slide freely, see Valve Body Repair on page 15-25
- Coat all parts with ATF before reassembly.

1. Hold the retainer in place while removing the lock bolt. Once the bolt is removed, release the retainer slowly.



Reassembly

1. Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air. Blow out all passages.
2. Coat all valves with ATF.
3. Install the pressure regulator valve, and the inner and outer springs.
4. Install the reaction spring, spring seat, and retainer. Align the hole in the retainer with the hole in the valve body, then press the retainer into the valve body and tighten the lock bolt.

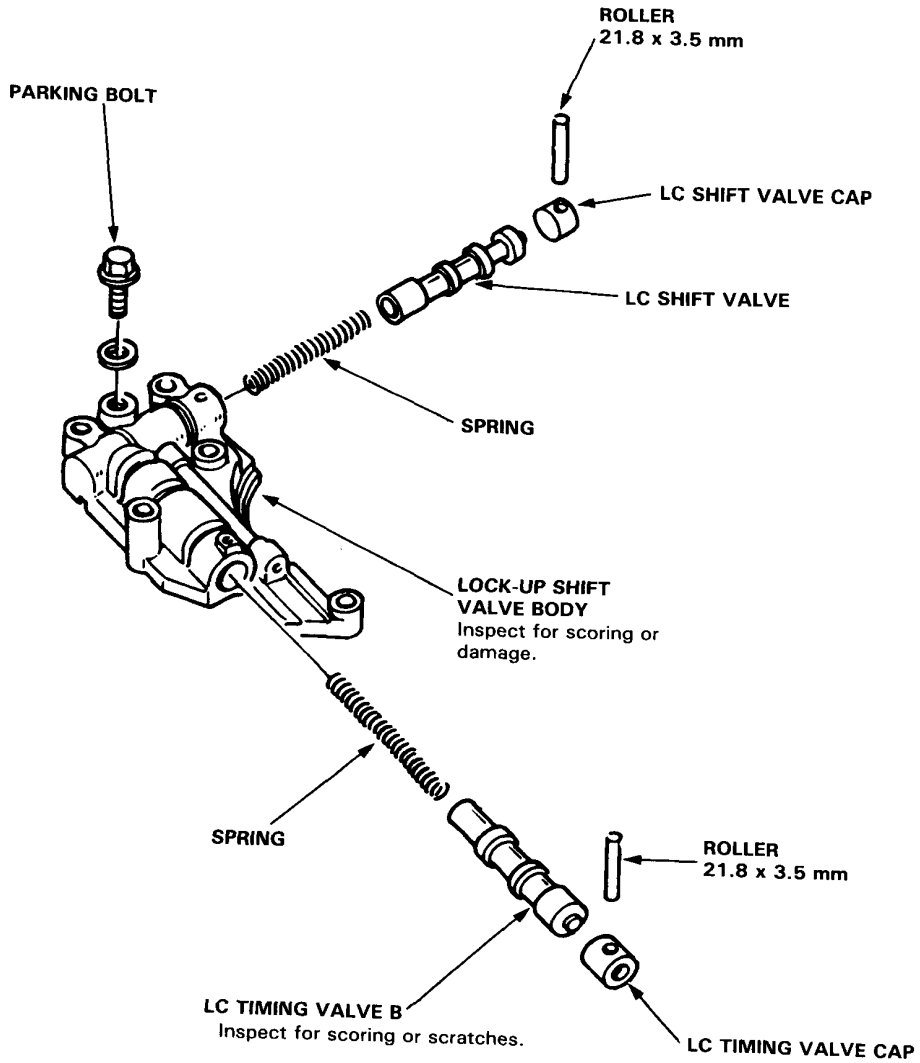


Lock-Up Shift Valve Body

Disassembly/Inspection

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner.
- Replace valve body as assembly if any parts are worm or damaged.
- Check all valves for free movement, if any fail to slide freely, see Valve Body Repair on page 15-25.
- Coat all parts with ATF before reassembly.

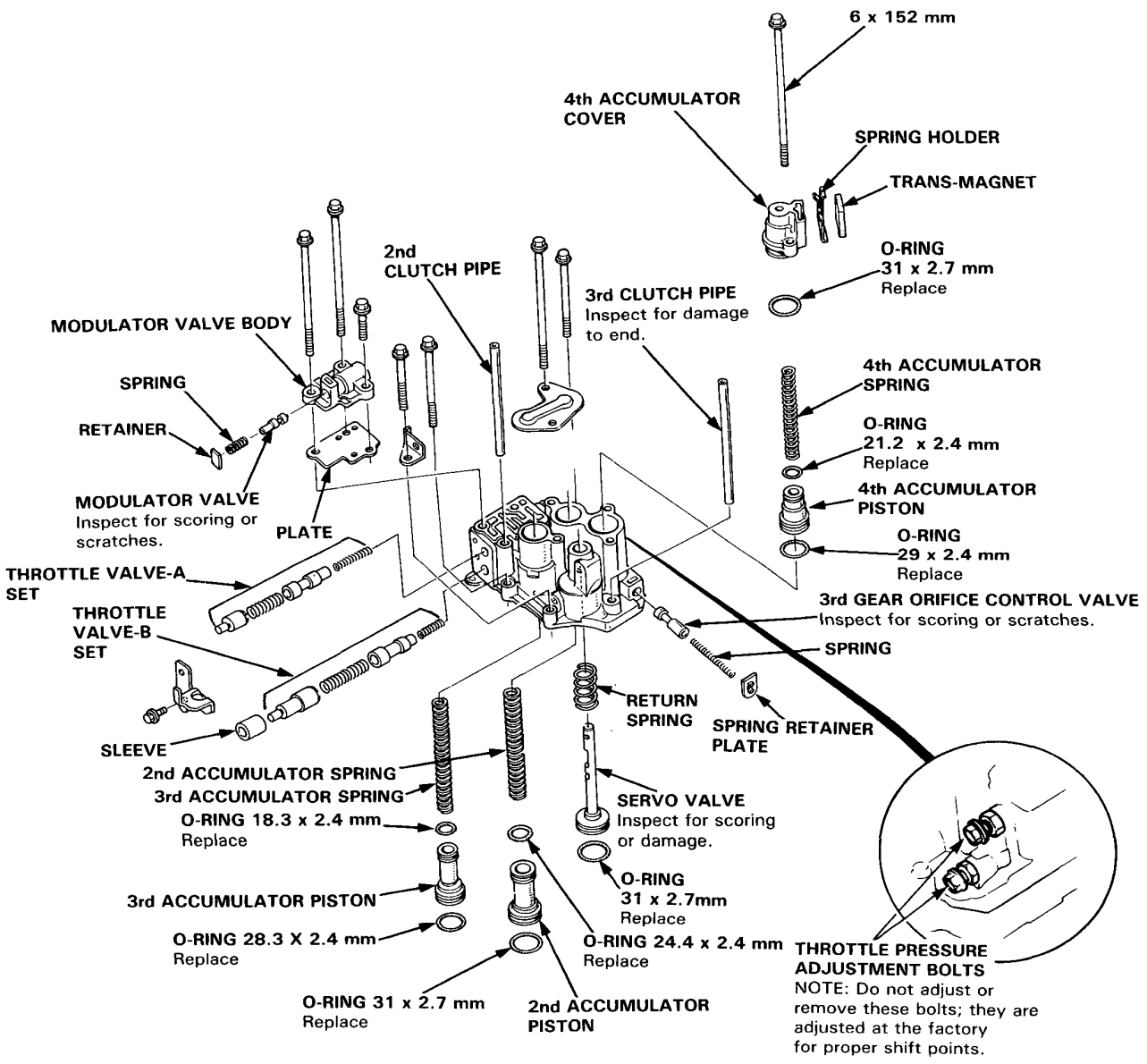


Servo Valve Body

Disassembly/Inspection/Reassembly

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air. Blow out all passages.
- Check all valves for free movement. If any fail to slide freely, see Valve Body Repair on page 15-25.

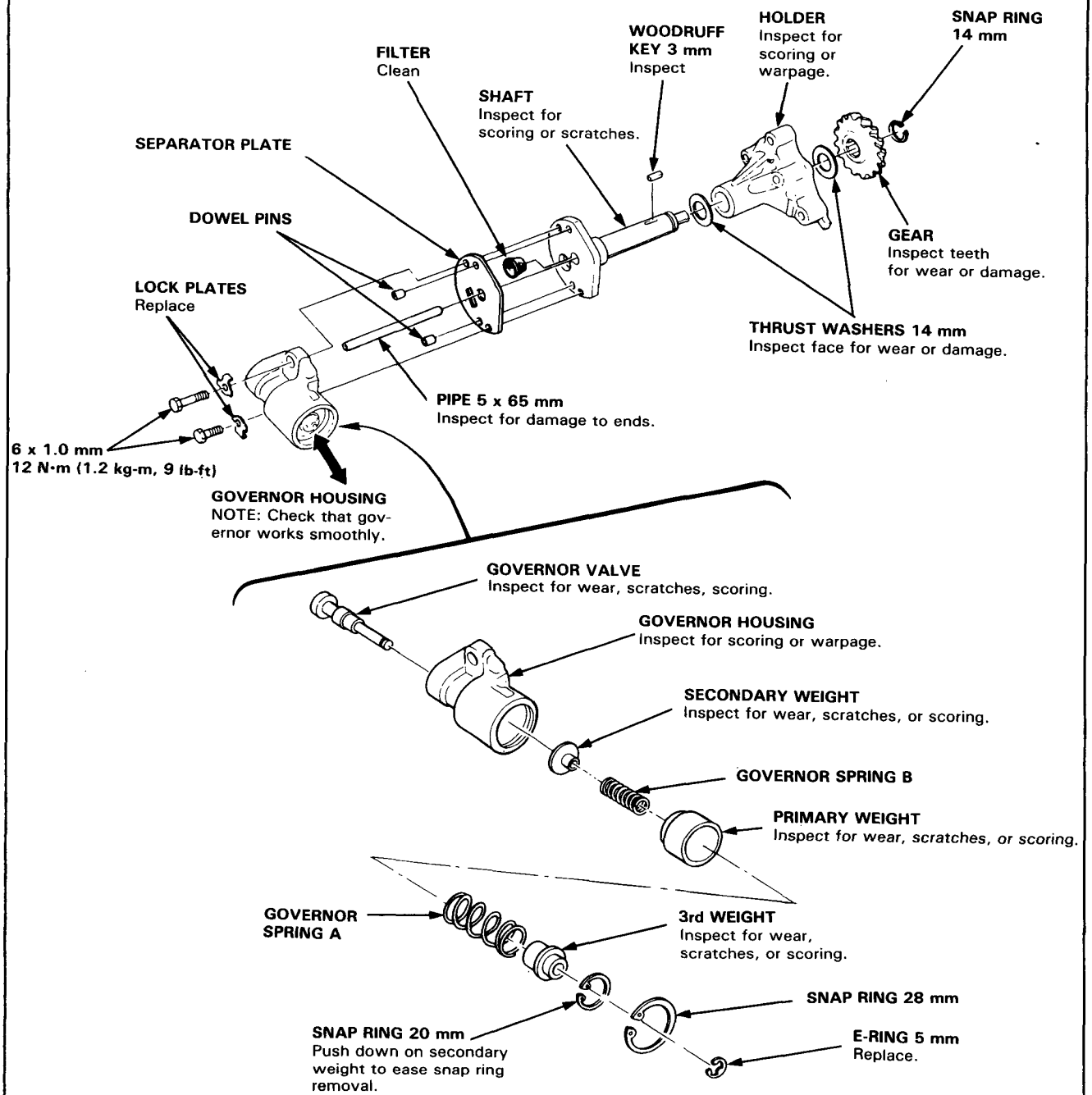


Governor Valve

Disassembly/Inspection/Reassembly

NOTE:

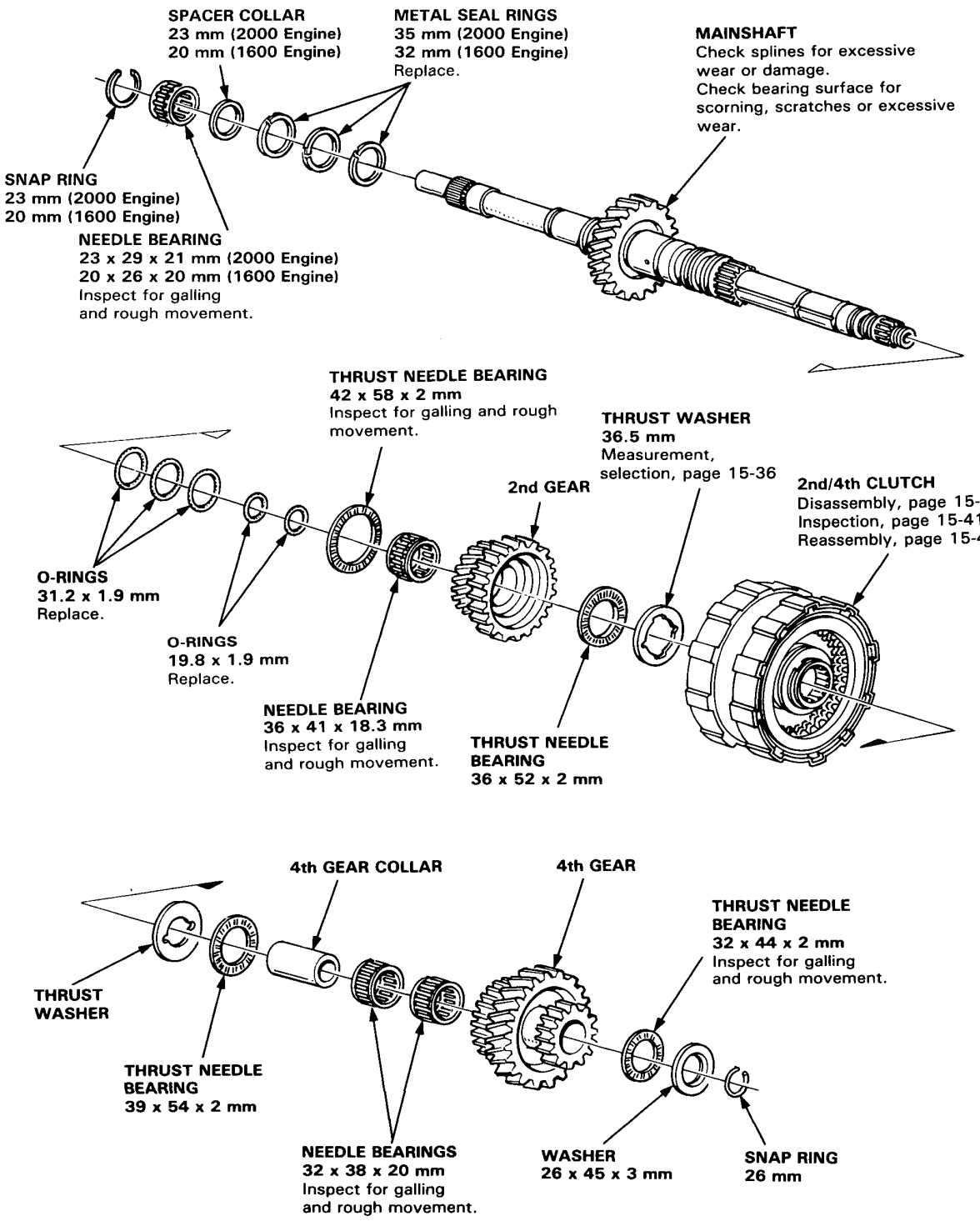
- Clean all parts thoroughly solvent or carburetor cleaner, and dry with compressed air. Blow out all passages.
- Check that the governor works smoothly; replace it if it does not.
- Coat all parts with ATF before reassembly.



Mainshaft

Disassembly/Inspection/Reassembly

NOTE:
- Lubricate all parts with ATF during reassembly.
- Install thrust needle bearings with unrolled edge of bearing retainer facing washer.

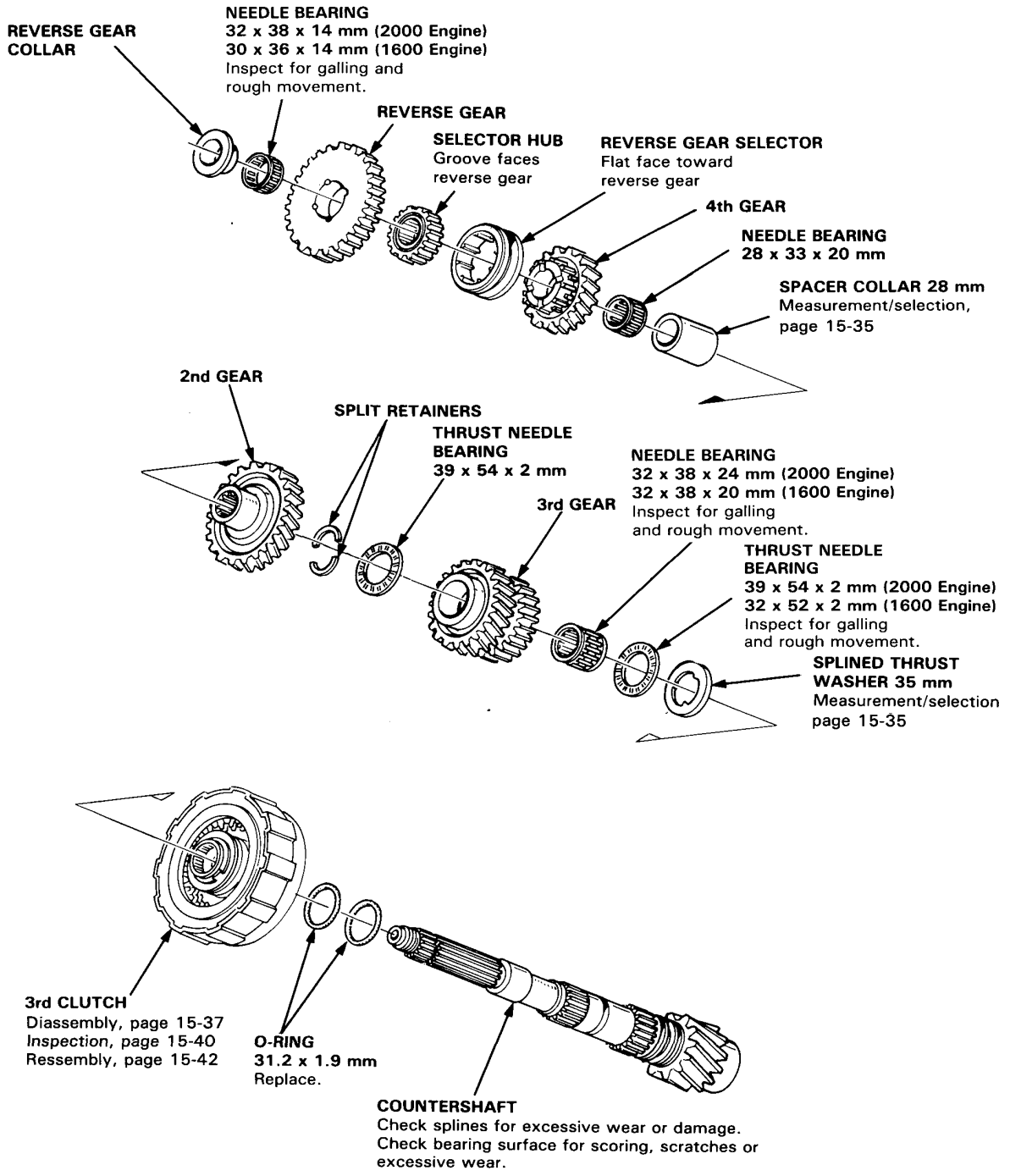


Countershaft

Disassembly/Inspection/Reassembly

NOTE:

- Lubricate all parts with ATF during reassembly.
- Install thrust needle bearing with unrolled edge of bearing retainer facing washer.



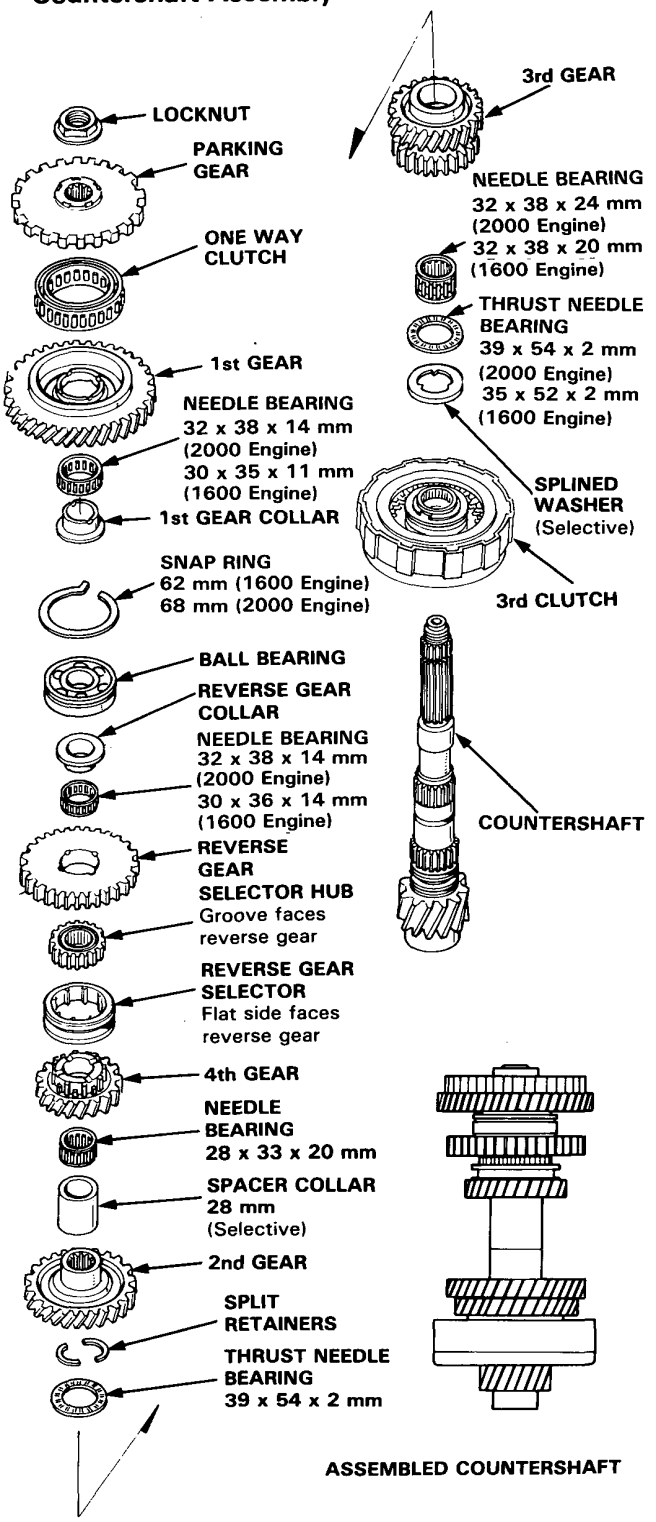
Countershaft/Mainshaft

Clearance Measurements

1. *Remove* both the mainshaft and countershaft bearings from the transmission housing.
2. Assemble the mainshaft and the countershaft including bearings and all parts shown below.
3. Install the mainshaft and countershaft assemblies into the torque converter housing.
4. Install the mainshaft holder to prevent the shafts from turning.
5. Torque the mainshaft locknut to 35 N·m (3.5 kg-m, 25 lb-ft). (Left-hand threads).
6. Hold the parking gear on the countershaft with your hand and torque the countershaft locknut to 35 N·m (3.5 kg-m, 25 lb-ft).
7. Measure clearances as described on the next page.

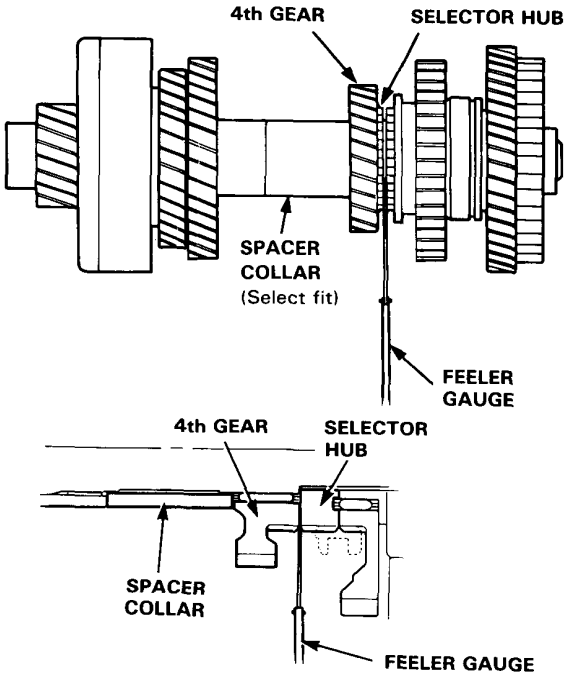
ATF Lubricate all parts with ATF before final reassembly.

Countershaft Assembly



8. On the countershaft, measure the clearance between the shoulder on the selector hub and the shoulder on 4th gear.

Countershaft 4th Gear Clearance:
Standard: 0.07—0.15 mm (0.003—0.006 in.)



If clearance exceeds the service limit, measure the thickness of the spacer collar and select one which gives correct clearance.

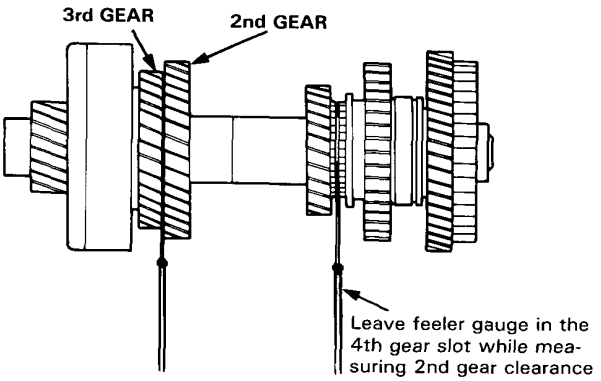
Replacement spacer collars:

CLASS	P/N	THICKNESS
A	90503—PC9—000	38.97—39.00 mm (1.534—1.535 in.)
B	90504—PC9—000	39.02—39.05 mm (1.536—1.537 in.)
C	90505—PC9—000	39.07—39.10 mm (1.538—1.539 in.)
D	90507—PC9—000	39.12—39.15 mm (1.540—1.541 in.)
E	90508—PC9—000	39.17—39.20 mm (1.542—1.543 in.)
F	90509—PC9—000	39.22—39.25 mm (1.544—1.545 in.)
G	90510—PC9—000	39.27—39.30 mm (1.546—1.547 in.)

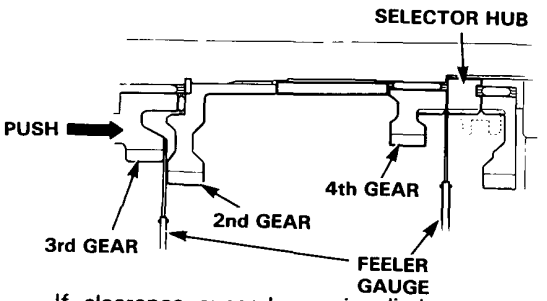
NOTE: Leave feeler gauge in place (4th gear) while measuring 2nd gear clearance.

Countershaft 2nd Gear Clearance:
Standard: 0.07—0.15 mm (0.003—0.006 in.)

9. Slide the 3rd gear out fully. Measure and record the clearance between the 2nd and 3rd gears with a feeler gauge.



- Slide the 3rd gear in fully and again measure the clearance between the 2nd and 3rd gears with another feeler gauge.
- Calculate the difference between the two readings to determine the actual clearance between the two gears.



If clearance exceeds service limit, measure the thickness of the splined thrust washer (35 mm I.D.) and select one which gives the proper clearance.

Replacement splined thrust washers:

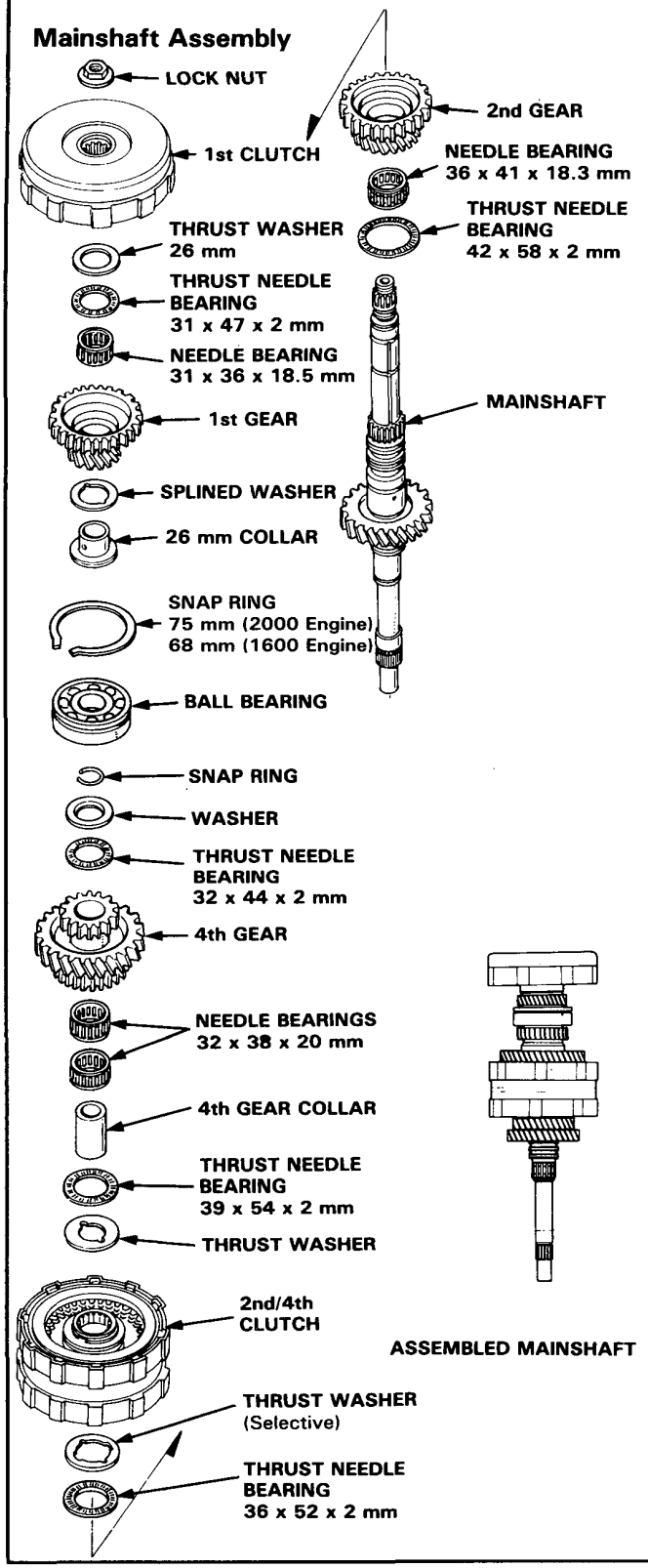
CLASS	P/N	THICKNESS
A	90411—PF4—010 *90411—PA9—010	2.97—3.00 mm (0.117—0.118 in.)
B	90412—PF4—010 *90412—PA9—010	3.02—3.05 mm (0.119—0.120 in.)
C	90413—PF4—010 *90413—PA9—010	3.07—3.10 mm (0.121—0.122 in.)
D	90414—PF4—010 *90414—PA9—010	3.12—3.15 mm (0.123—0.124 in.)
E	90415—PF4—010 *90415—PA9—010	3.17—3.20 mm (0.125—0.126 in.)
F	90416—PF4—010 *90418—PA9—000	3.22—3.25 mm (0.127—0.128 in.)
G	90417—PF4—010 *90419—PA9—000	3.27—3.30 mm (0.129—0.130 in.)
H	90418—PF4—010 *90420—PA9—000	3.32—3.35 mm (0.131—0.132 in.)
I	90419—PF4—010 *90421—PA9—000	3.37—3.40 mm (0.133—0.134 in.)

*1600 Engine

(cont'd)

Clearance Measurement (cont'd)

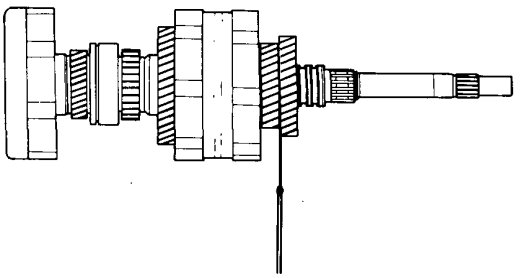
Mainshaft Assembly



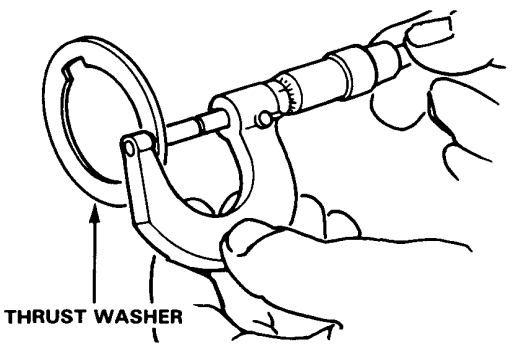
NOTE: Make all measurements before changing the thrust washers. Recheck after making the adjustments.

10. On the mainshaft measure the clearance between the shoulder of 2nd gear and main 3rd gear, the same way you did on the countershaft in step 9.

Mainshaft 2nd Gear Clearance:
Standard (New): 0.07—0.15 mm (0.003—0.006 in.)



If the clearance exceeds the service limit, measure the thickness of the 2nd clutch thrust washer (36 mm I.D.) and select one which gives the correct clearance.



Replacement washers (36 mm I.D.)

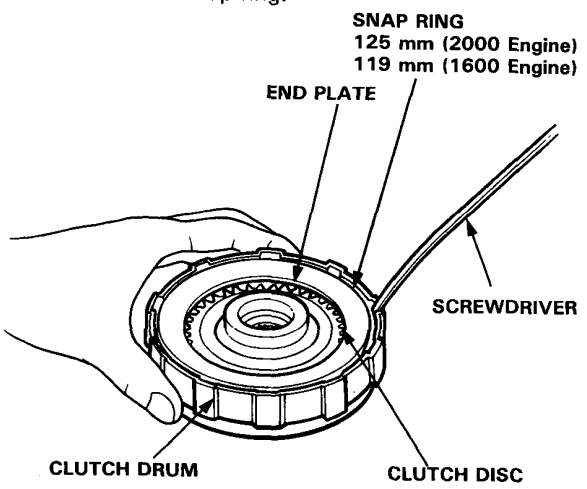
CLASS	P/N	THICKNESS
A	90441—PF4—000	3.97—4.00 mm
	*90441—PC9—010	3.47—3.50 mm
B	90442—PF4—000	4.02—4.05 mm
	*90442—PC9—010	3.52—3.55 mm
C	90443—PF4—000	4.07—4.10 mm
	*90443—PC9—010	3.57—3.60 mm
D	90444—PF4—000	4.12—4.15 mm
	*90444—PC9—010	3.62—3.65 mm
E	90445—PF4—000	4.17—4.20 mm
	*90445—PC9—010	3.67—3.70 mm
F	90446—PF4—000	4.22—4.25 mm
	*90446—PC9—010	3.72—3.75 mm
G	90447—PF4—000	4.27—4.30 mm
	*90447—PC9—010	3.77—3.80 mm
H	90448—PF4—000	4.32—4.35 mm
	*90448—PC9—010	3.82—3.85 mm
I	90449—PF4—000	4.37—4.40 mm
	*90449—PC9—010	3.87—3.90 mm

*1600 Engine

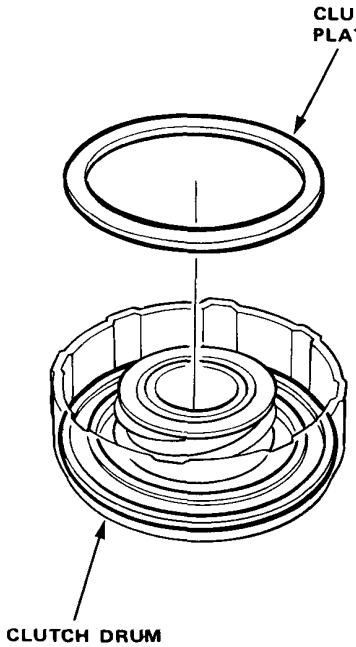
Disassembly

NOTE:
- The 1st and 3rd clutches are identical except for the piston plate installed in the 1st clutch.
- To disassemble the 2nd/4th clutch, use the special tool in Step 3 in the same manner as for the 1st and 3rd clutches.

1. Remove the snap ring.

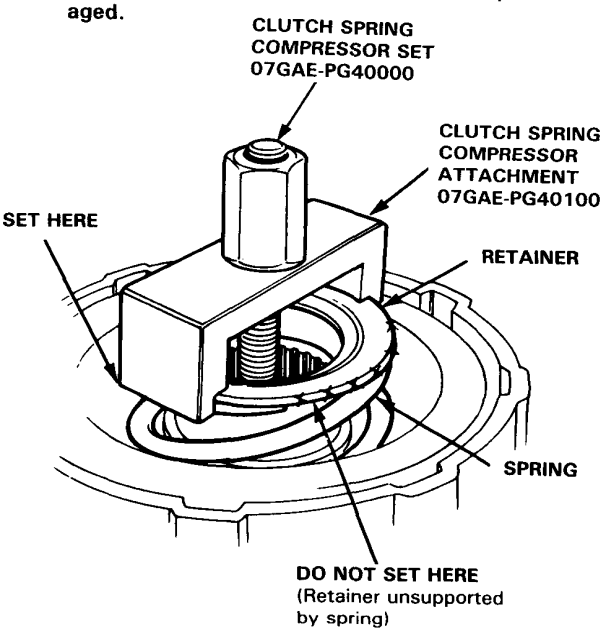


2. Remove the end plate, clutch discs and plates. 1st clutch only: Also remove the clutch piston plate (applied from 2000 Engine B type transmission).

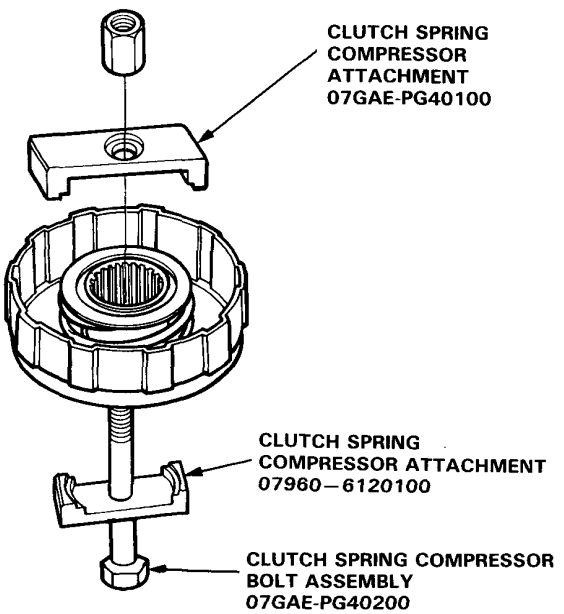


3. Install the clutch spring compressor as shown.

CAUTION: If either end of the compressor attachment is set over an area of the retainer which is unsupported by the spring, the retainer may be damaged.



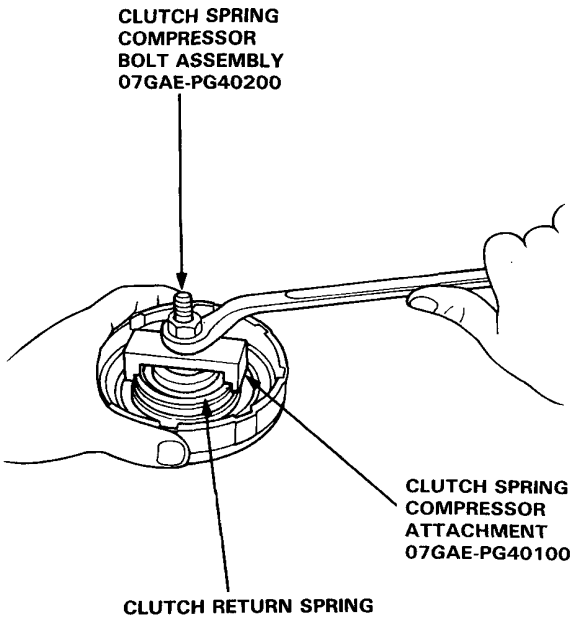
1st and 3rd Clutches



(cont'd)

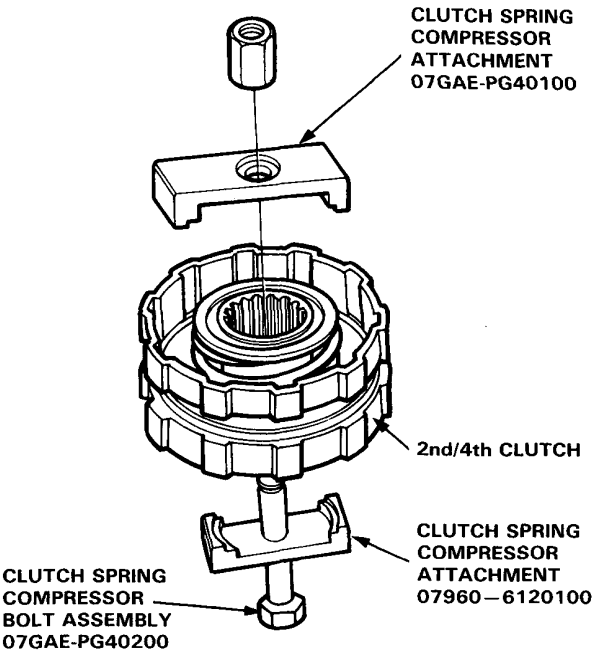
Disassembly (cont'd)

- Compress the clutch return spring.

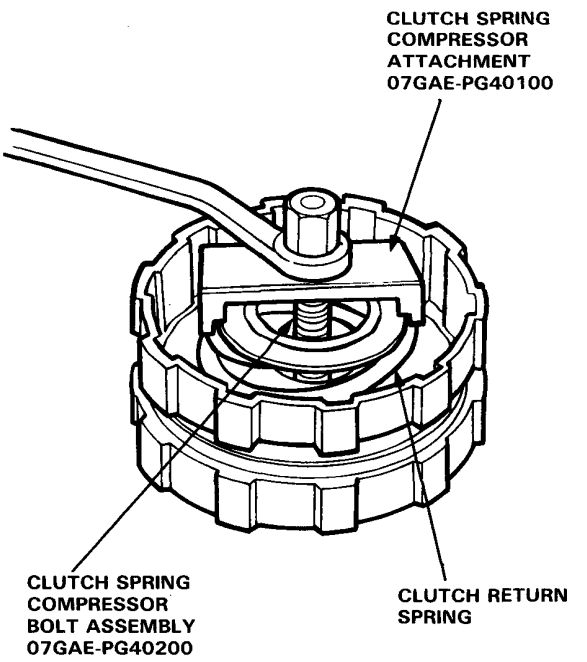


2nd/4th Clutch

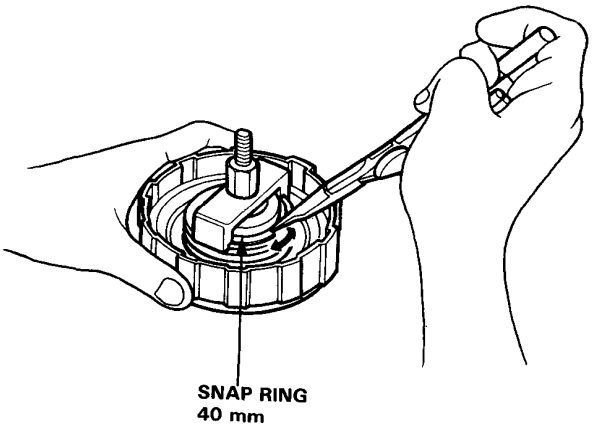
- Assemble the spring compressor on the clutch drum.



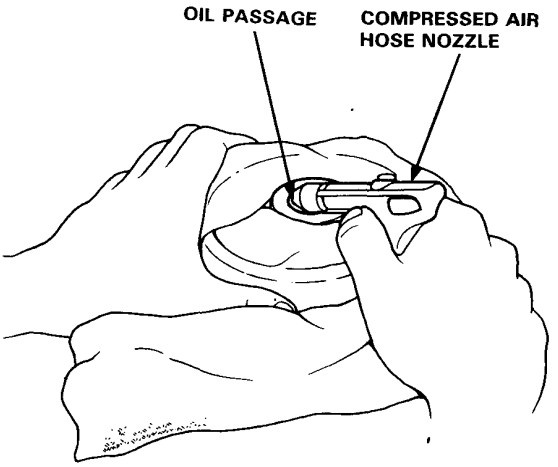
- Compress the clutch return spring.



4. Remove the snap ring, then remove the clutch spring compressor, spring retainer and spring.



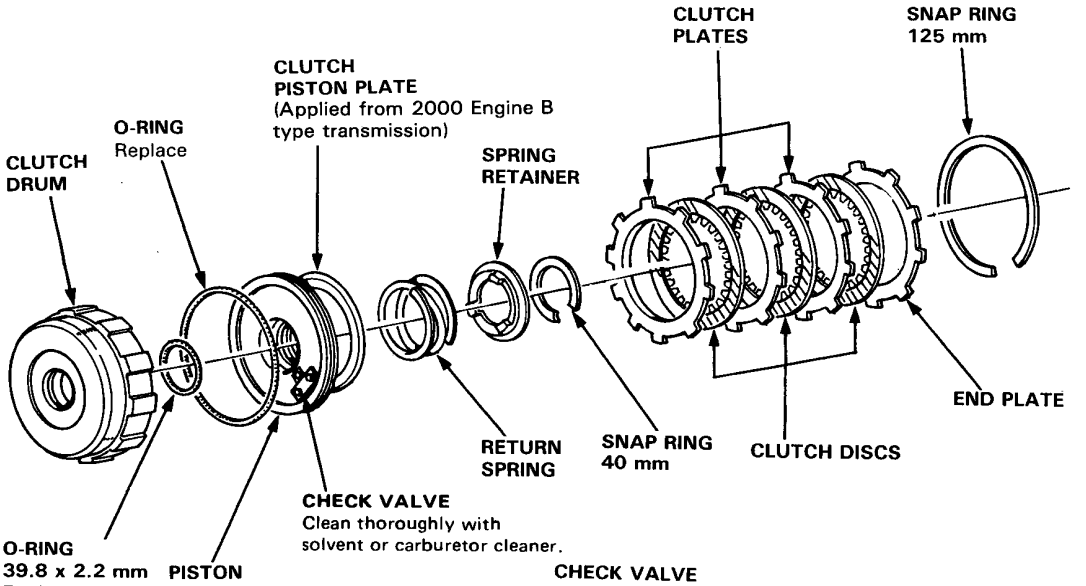
5. Wrap a shop rag around the clutch drum and apply air pressure to the oil passage to remove the piston. Place a finger tip on the other end while applying air pressure.



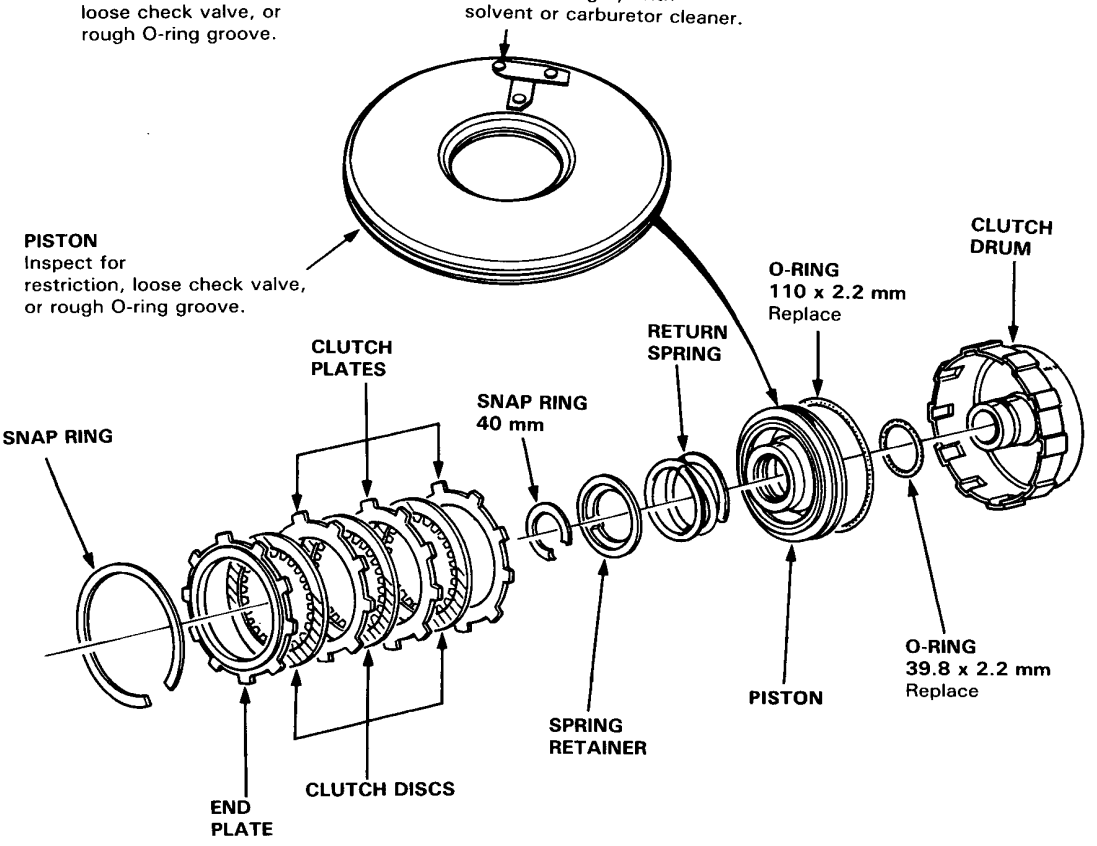
Disassembly/Inspection

1st Clutch

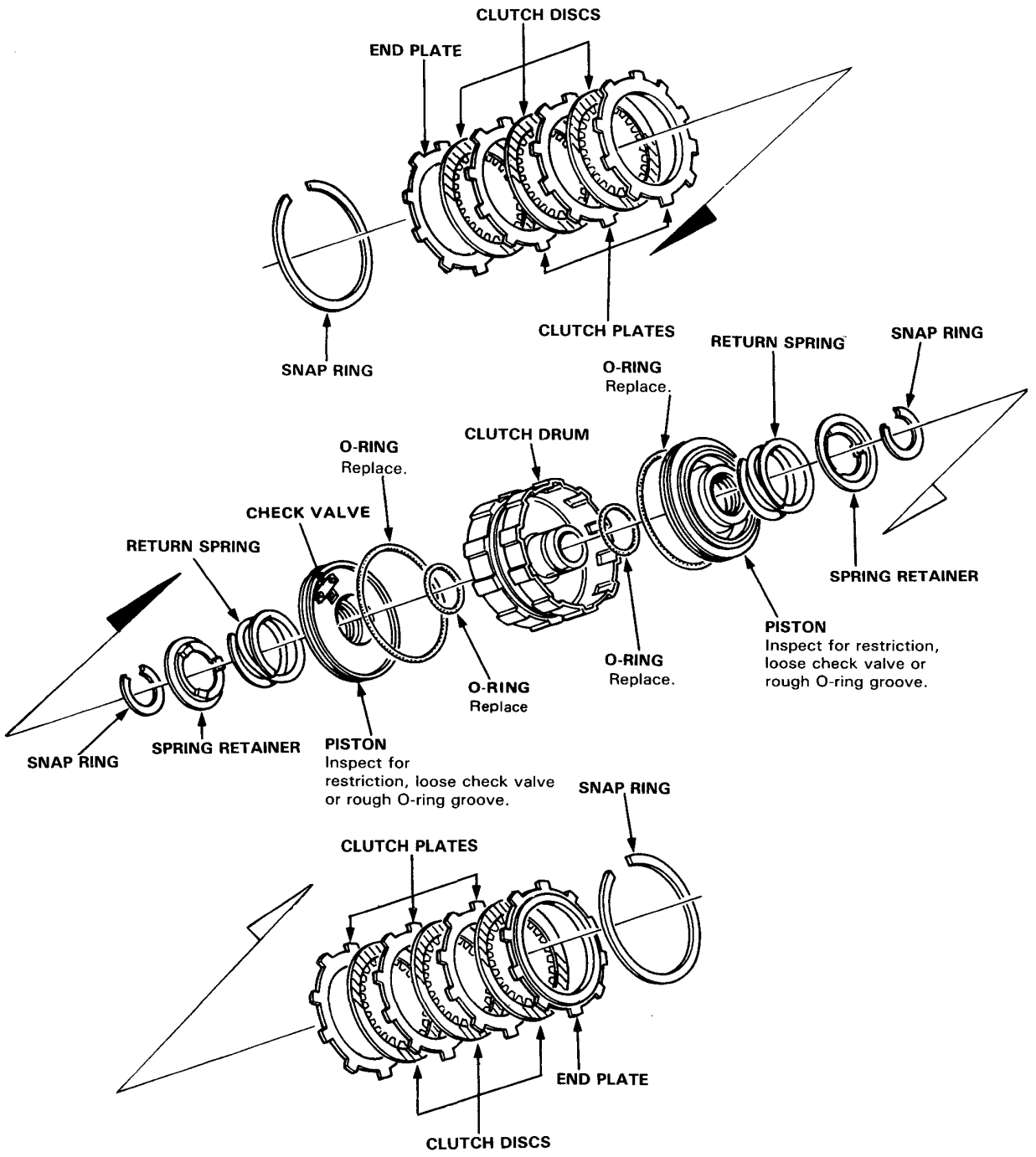
NOTE: Piston plate (applied from 2000 Engine B type transmission) is installed in the 1st clutch.



3rd Clutch



2nd/4th Clutch

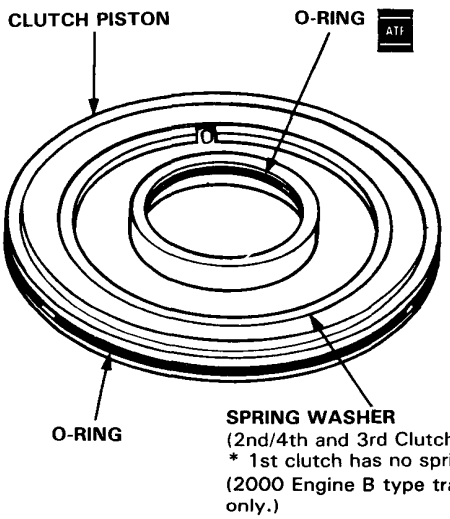


Reassembly

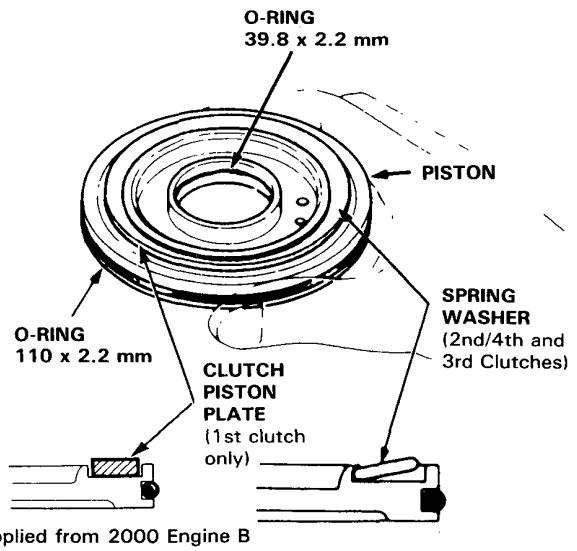
NOTE:
- The 1st and 3rd clutch assemblies are identical except installing the clutch piston plate in the 1st clutch.
- To reassemble the 2nd/4th clutch, use the special tool in Step 7 in the same manner as for the 1st and 3rd clutches.

1. Clean all parts thoroughly in solvent, and dry with compressed air. Blow out all passages.

2. Lubricate all parts with ATF before reassembly.



3. Install new O-ring on clutch piston.
   2nd/4th and 3rd Clutches:
   Make sure the spring washer is properly positioned as shown.

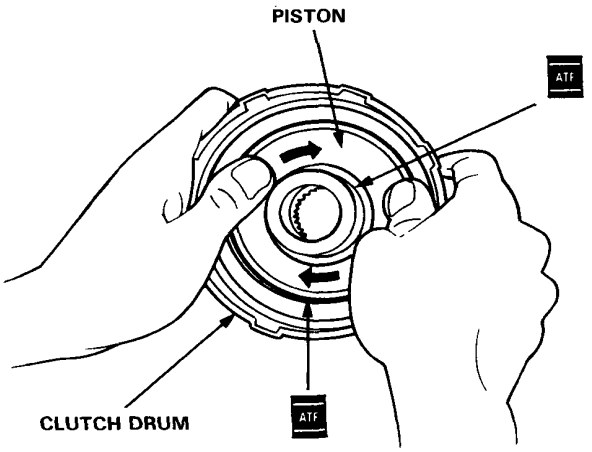


(Applied from 2000 Engine B type transmission)

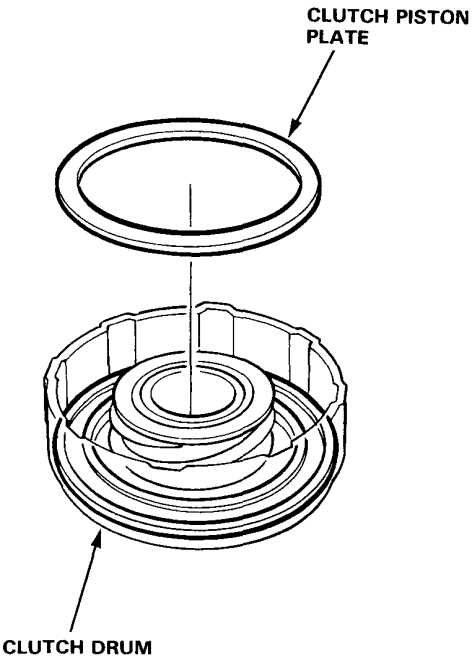
4. Install the piston in the clutch drum. Apply pressure and rotate to ensure proper seating.

   NOTE: Lubricate the piston O-ring with ATF before installing.

   CAUTION: Do not pinch O-ring by forcing piston installation.

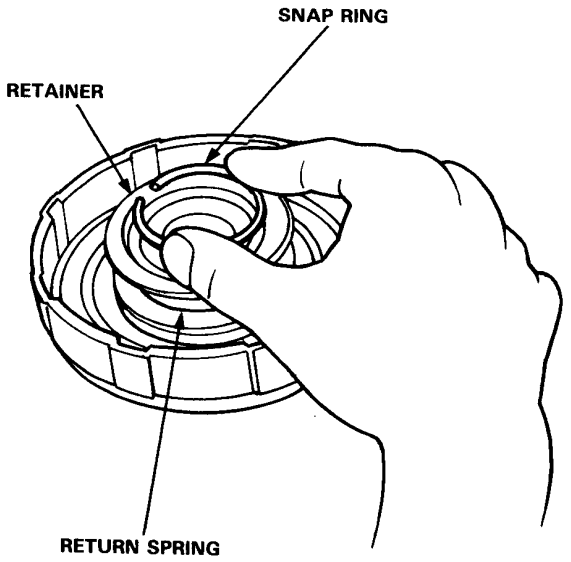


- 1st clutch only:
  Install the clutch piston plate (applied from 2000 Engine B type transmission).



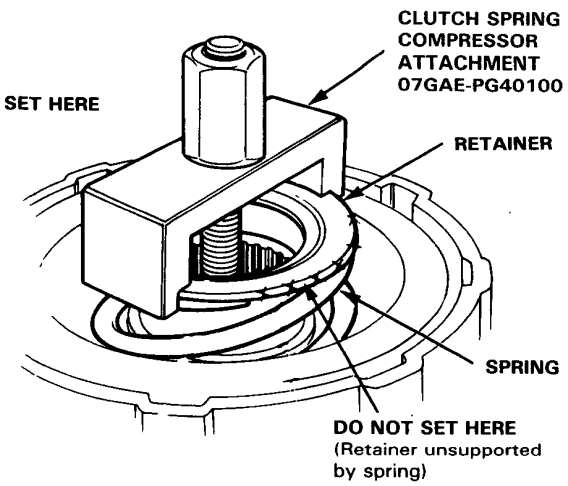
5. Install the return spring and retainer.

6. Position the snap ring on the spring re-tainer.



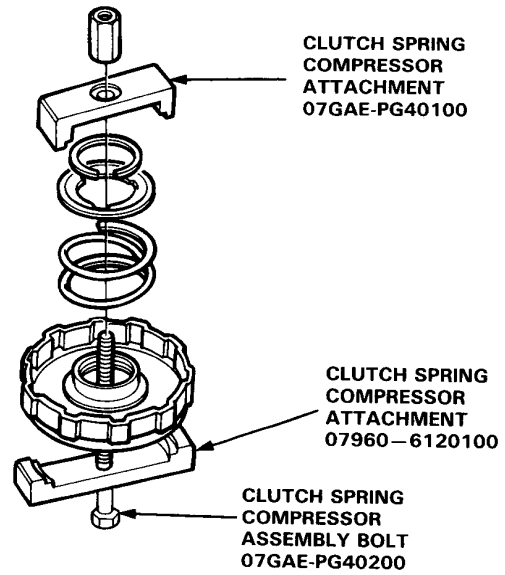
7. Assemble the spring compressor on the clutch drum.

CAUTION: If either end of the compressor attachment is set over an area of the retainer which is unsupported by the spring, the retainer may be damaged.

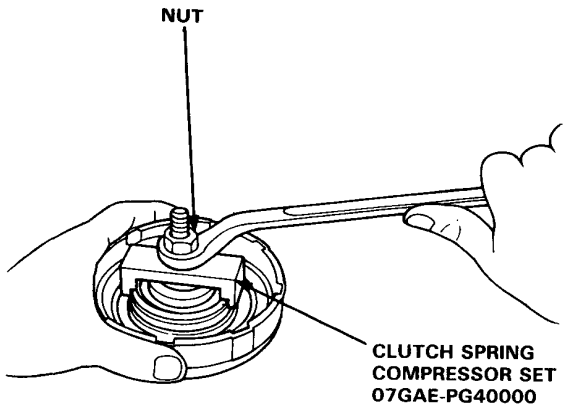


1st and 3rd clutches

- Assemble the spring compressor on the clutch drum.



8. Compress the spring until the retainer is below the snap ring groove in the hub.

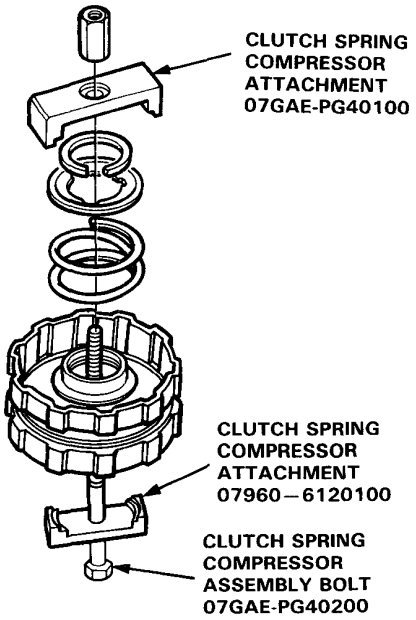


(cont'd)

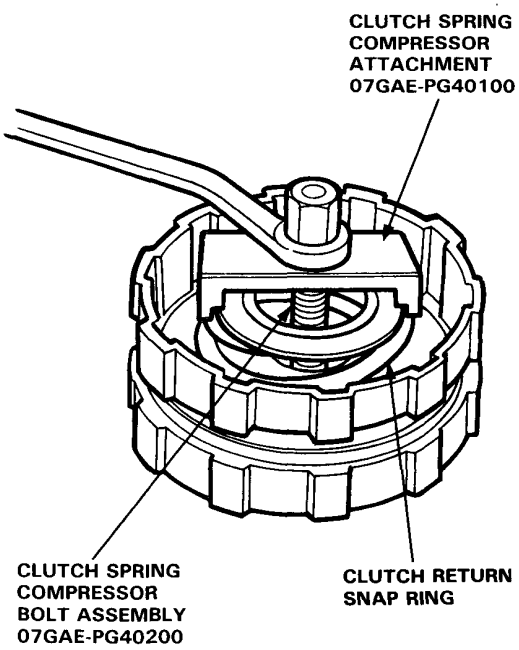
Reassembly (cont'd)

2nd/4th Clutch

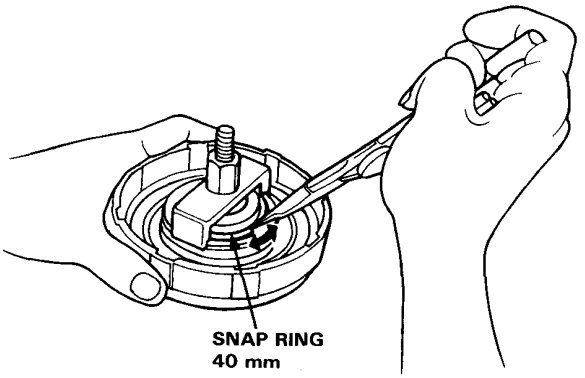
- Assemble the spring compressor on the clutch drum.



- Compress the clutch return spring.



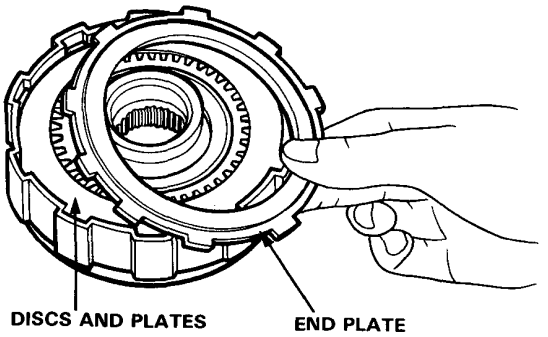
9. Install the snap ring (with its rounded edge facing in) in the hub groove and remove the spring compressor.



10. Soak the clutch discs thoroughly in automatic transmission fluid for a minimum of 30 minutes.

11. Starting with a clutch plate, alternately install the clutch plates and discs. Install the clutch end plate with flat side toward the disc.

    NOTE: Before installing the plates and discs, make sure the inside of the clutch drum is free of grit or other foreign matter.



13. Using bent feeler gauges, carefully measure the clearance between the clutch end plate and the top disc. Do not damage the disc.

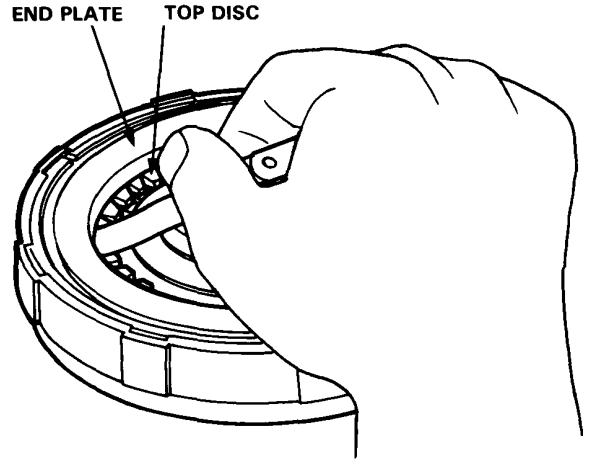
End Plate-to-Top Disc Clearance:

(1600 Engine)

	Service Limit mm (in.)	
1ST	0.4—0.7	(0.016—0.028)
2ND	0.65—0.8	(0.026—0.031)
3RD	0.4—0.6	(0.016—0.023)
4TH	0.4—0.6	(0.016—0.023)

(2000 Engine)

	Service Limit mm (in.)	
1ST	0.65—0.85	(0.026—0.033)
2ND	0.40—0.60	(0.016—0.024)
3RD	0.40—0.60	(0.016—0.024)
4TH	0.40—0.60	(0.016—0.024)



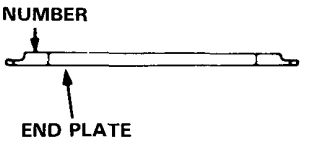
14. If not within service limit, select a new clutch end plate from following table.

Replacement clutch end plates:
(2000 Engine)

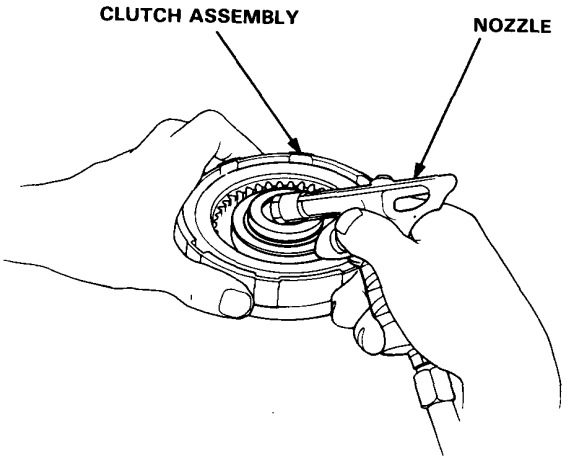
P/N	PLATE NO.	THICKNESS
22551—PF4—000	1	2.1 mm (0.082 in.)
22552—PF4—000	2	2.2 mm (0.086 in.)
22553—PF4—000	3	2.3 mm (0.090 in.)
22554—PF4—000	4	2.4 mm (0.094 in.)
22555—PF4—000	5	2.5 mm (0.098 in.)
22556—PF4—000	6	2.6 mm (0.102 in.)
22557—PF4—000	7	2.7 mm (0.106 in.)
22558—PF4—000	8	2.8 mm (0.110 in.)
22559—PF4—000	9	2.9 mm (0.114 in.)
22560—PF4—000	10	3.0 mm (0.118 in.)

(1600 Engine)

P/N	PLATE NO.	THICKNESS
22551—PC9—000	1	2.4 mm (0.094 in)
22552—PC9—000	2	2.5 mm (0.098 in)
22553—PC9—000	3	2.6 mm (0.102 in)
22554—PC9—000	4	2.7 mm (0.106 in)
22555—PC9—000	5	2.8 mm (0.110 in)
22556—PC9—000	6	2.9 mm (0.114 in)
22557—PC9—000	7	3.0 mm (0.118 in)
22558—PC9—000	8	3.1 mm (0.122 in)
22559—PC9—000	9	3.2 mm (0.126 in)
22560—PC9—000	10	3.3 mm (0.130 in)



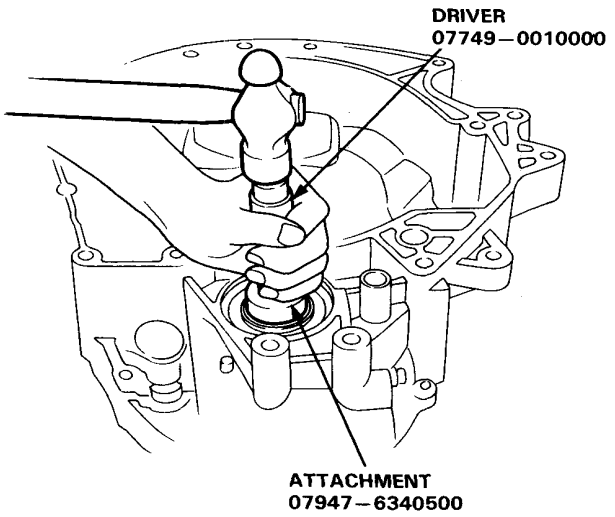
15. Check the clutch engagement by blowing air into the oil passage in the clutch drum hub. Remove the air pressure and check that the clutch releases.



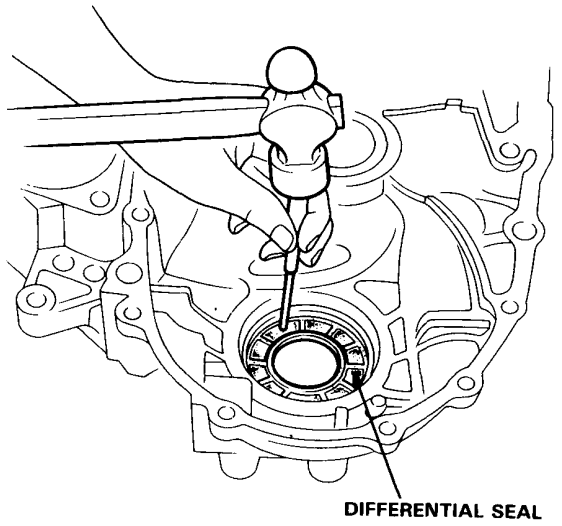
Differential and Seal

Replacement

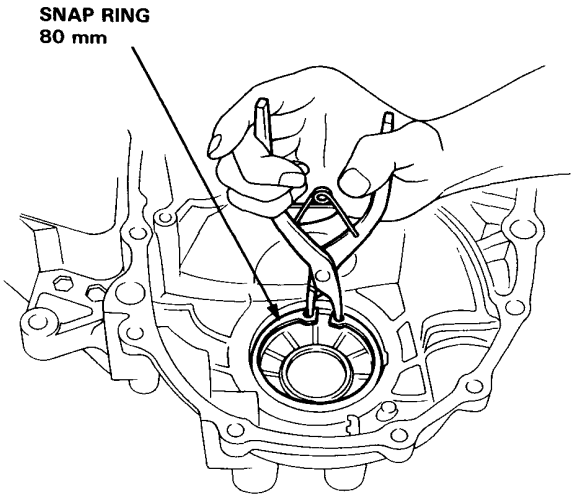
1. If seals are to be replaced, or if differential needs repair, remove the differential.



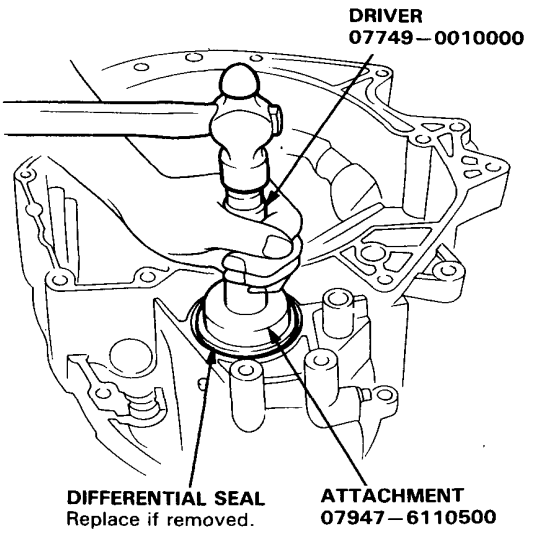
2. On the torque converter housing, remove the 80 mm snap ring, then drive out the seal as shown.
3. Remove the differential seal from the transmission housing in the same way.



4. On the torque converter housing, install the differential 80 mm snap ring if removed.



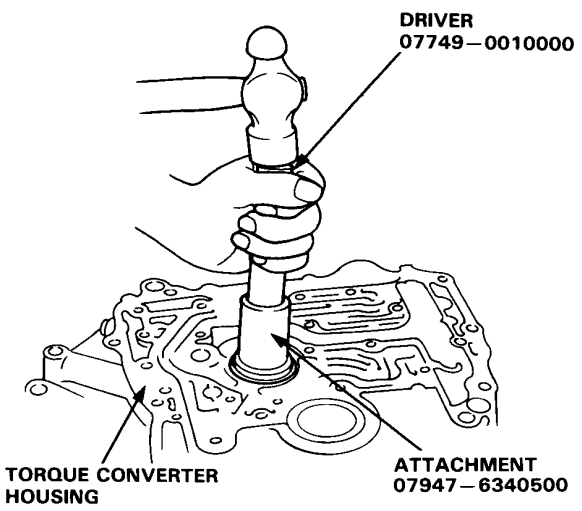
5. Install the differential seals into the torque converter housing and transmission housing.



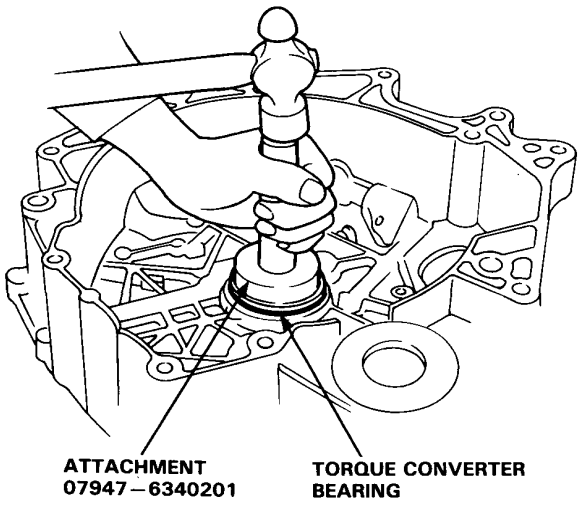
Replacement

Torque converter housing

1. Remove the mainshaft bearing and seal from the torque converter housing.

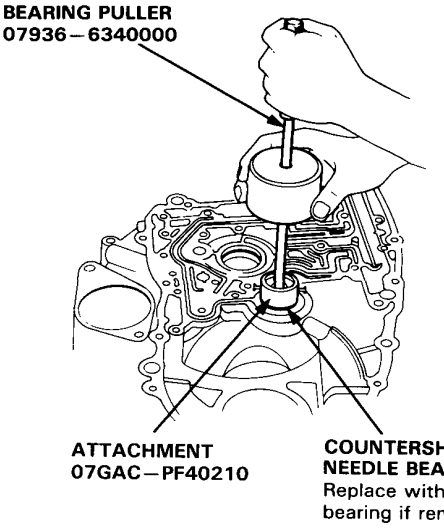


2. Drive in the new mainshaft bearing until it bottoms in housing.



3. Then install the new mainshaft seal flush with the housing, using attachment 07947–6340201.

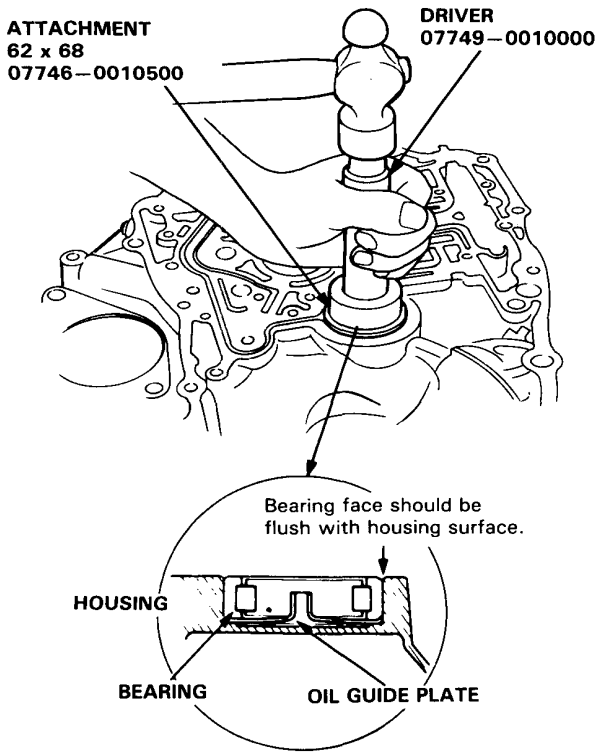
4. Turn the torque converter housing over and remove the countershaft bearing.



5. Make sure the oil guide plate is installed in the bearing hole, then install a new countershaft bearing flush with the housing.

(cont'd)

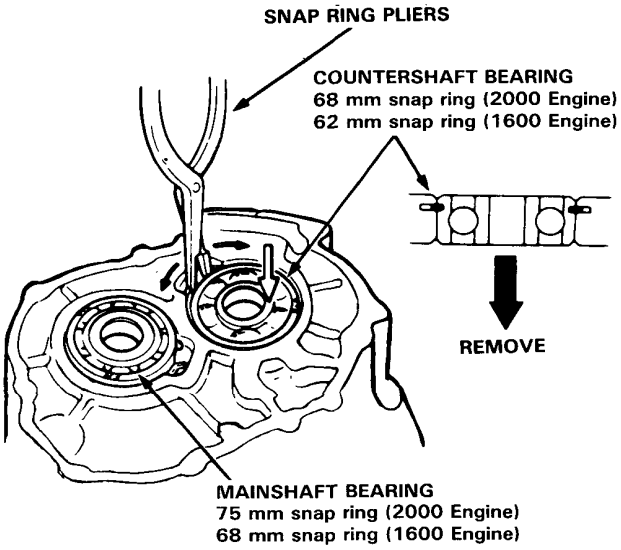
Replacement (cont'd)



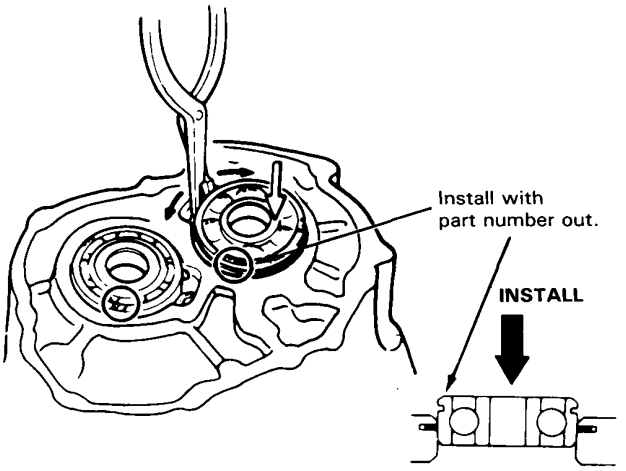
Transmission housing

1. To remove the mainshaft and countershaft bearings from the transmission housing, expand each snap ring with snap ring pliers, then push the bearing out by hand.

   NOTE: Do not remove the snap rings unless it's necessary to clean the grooves in the housing.



2. Expand each snap ring with snap ring pliers, insert the new bearing part-way into it, then release the pliers. Push the bearing down into the transmission until the ring snaps in place around it.

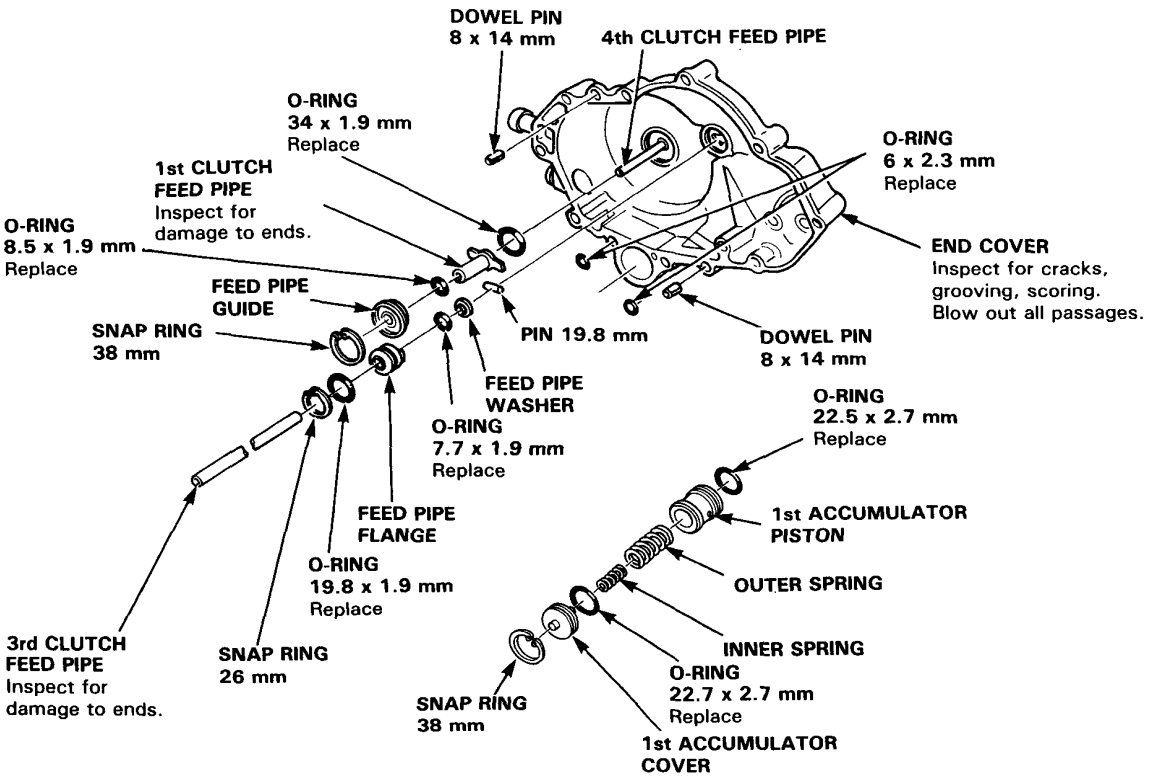


3. Make sure the snap rings are seated in the bearing and housing grooves.

End Cover

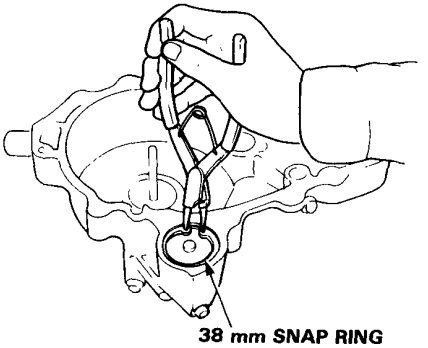
Disassembly/Inspection

CAUTION: Remove and install parts carefully to avoid damaging them.

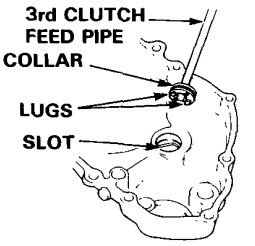


Reassembly

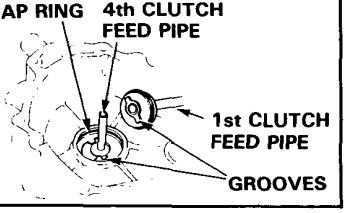
1. Seat the O-ring in the groove of the 1st accumulator piston, and slide the accumulator piston into the right side transmission cover. Install the outer spring, inner spring, another O-ring and accumulator cover, in that order.
2. Install the 38 mm snap ring.



3. With feed pipes assembled, align lugs on the collars with slot in end cover.
4. Install the snap ring.

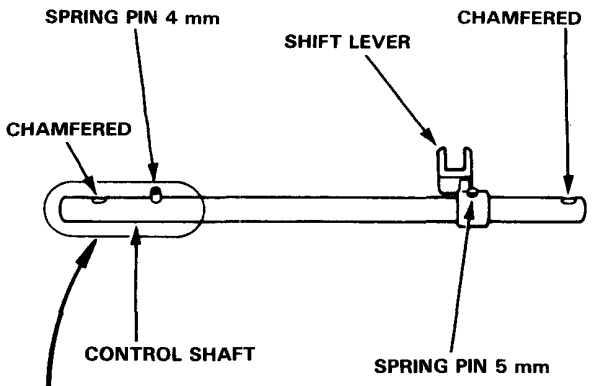


5. Install the feed pipes in the end cover, aligning the lugs of the 1st clutch feed pipe with the grooves of the end cover.
6. Install the snap ring.

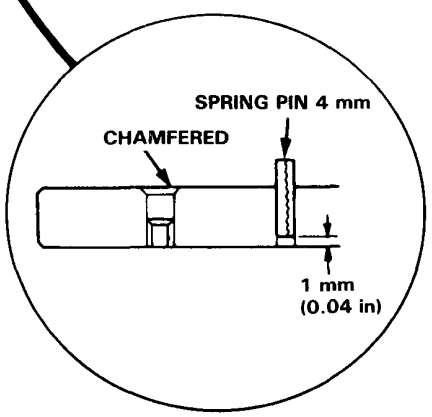


Throttle Control Shaft

Installation



Drive the 4 mm spring pin to a depth 1 mm in from the side that is opposite the chamfer in the threaded hole.



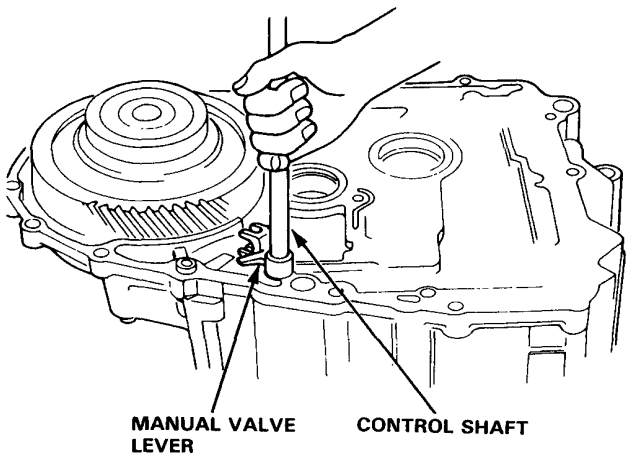
Transmission

Reassembly

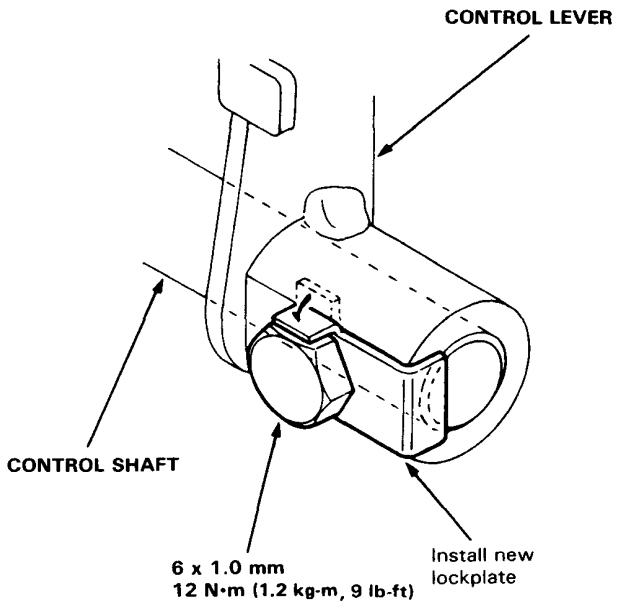
NOTE: Lubricate all parts with ATF during reassembly.

1. Install the differential assembly. If the torque converter housing, transmission housing and/or differential side bearings were replaced, the differential side clearance must be checked as shown in section 16.

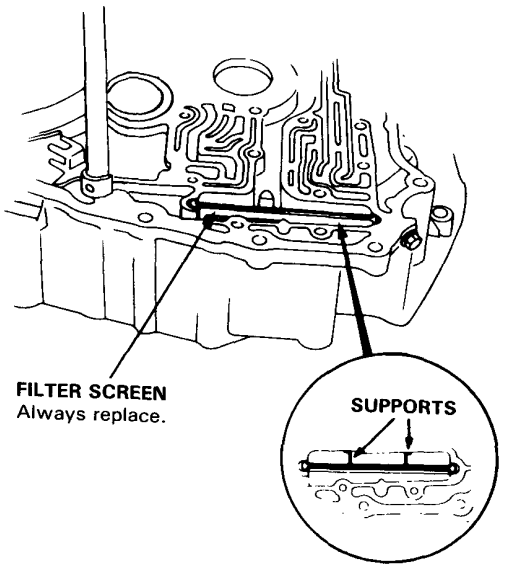
2. Assemble the manual valve lever on the control shaft, then install in the torque converter housing as shown.



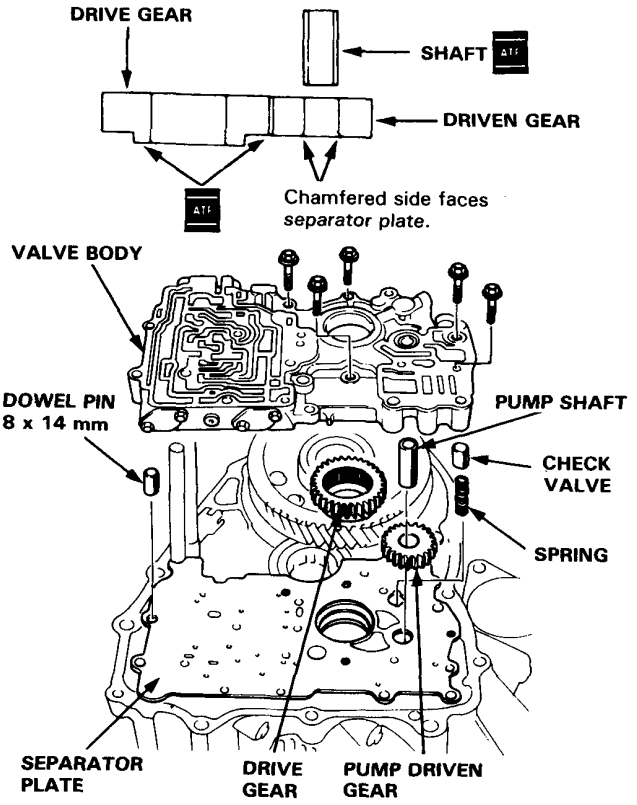
3. Install the control lever and new lock plate on the other end of the shaft. Tighten the bolt to the torque shown, then bend the tab over against the bolt head.



4. Install a new filter screen.



5. Install the separator plate, dowel pin, pump gears and shaft.
6. Install the check valve and spring, then install the main valve body on the torque converter housing.



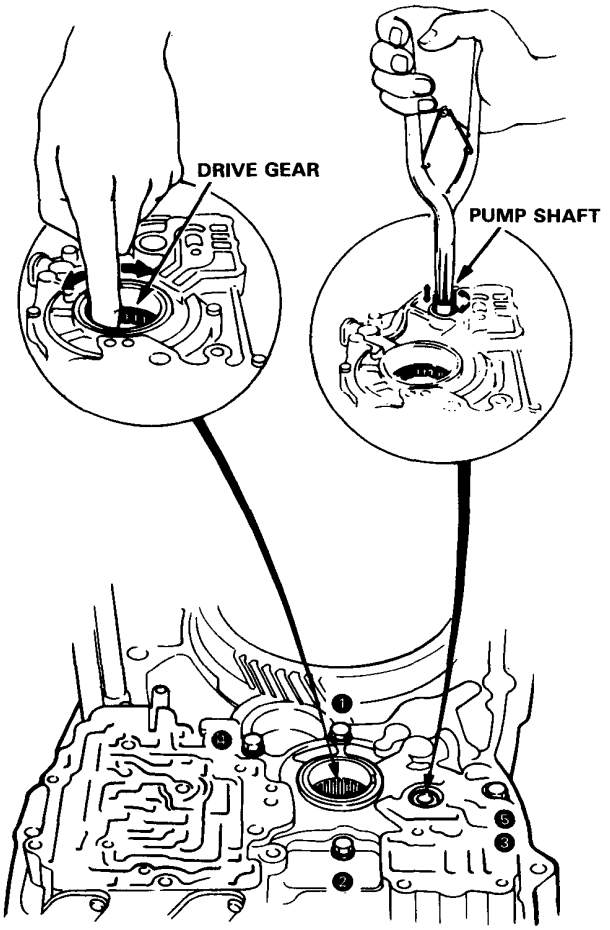
(cont'd)

Reassembly (cont'd)

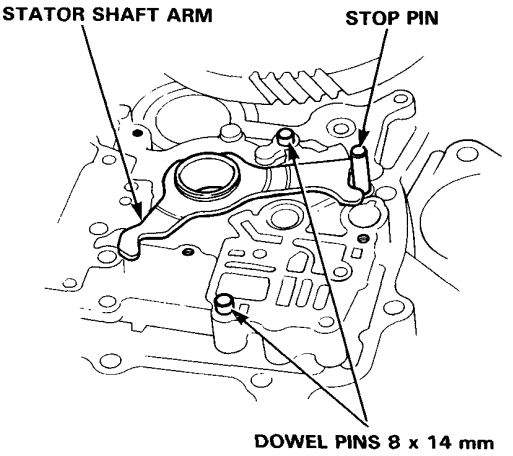
7. Tighten the 4 valve body bolts in the sequence shown. Make sure the pump drive gear rotates smoothly in the normal operating direction and the pump shaft moves smoothly in both the axial and normal operating directions.

8. Torque the valve body bolts to 12 N·m (1.2 kg-m, 9 ft-lb), and again check that the pump gear and pump shaft move freely.

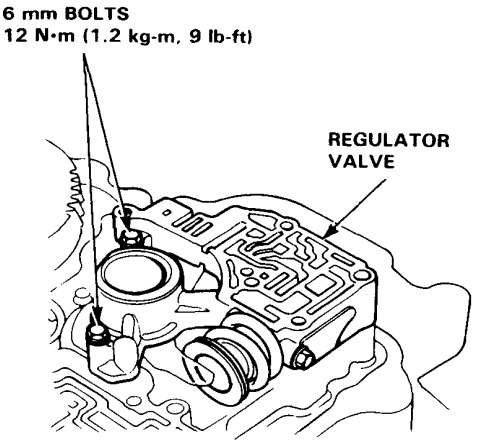
   CAUTION: If the pump gear and pump shaft do not move freely, loosen the valve body bolts, realign the shaft, and then retighten to the specified torque. Failure to align the pump shaft correctly will result in seized pump gear or pump shaft.



9. Install the stator shaft arm, stop pin and dowel pins.

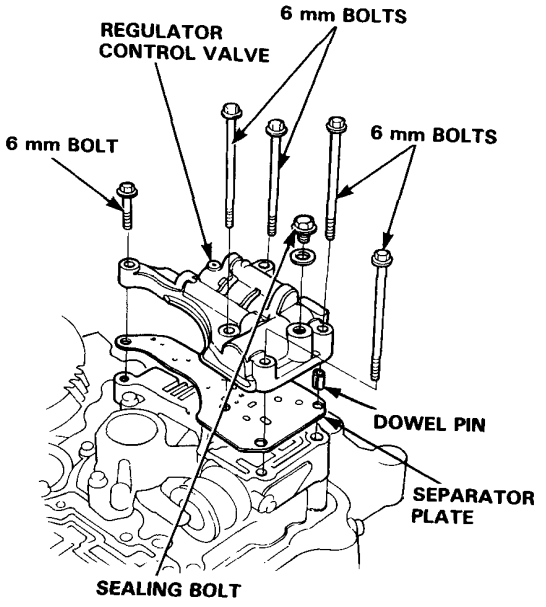


10. Install the regulator valve and torque its 2 bolts to 12 N·m (1.2 kg-m, 9 lb-ft).

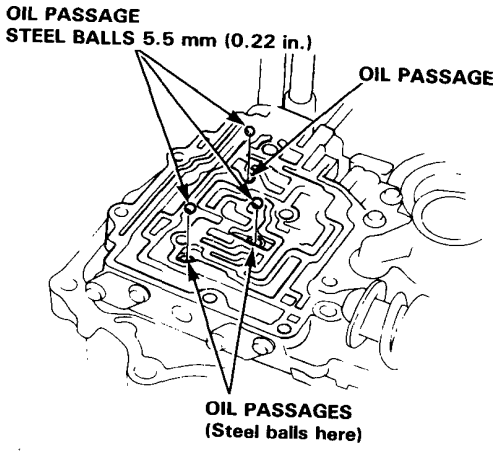


11. Install the dowel pin, and separator plate.

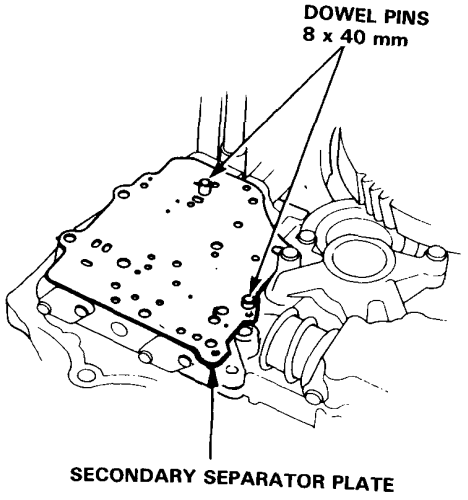
12. Install the regulator control valve body bolts as shown, and torque to 12 N·m (1.2 kg-m, 9 lb-ft).



13. Install the 3 steel balls in main valve body oil passages.



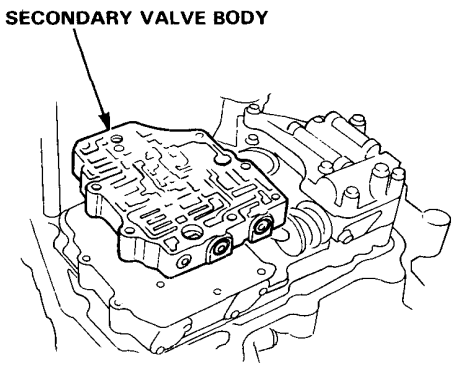
14. Install the separator plate and dowel pins.



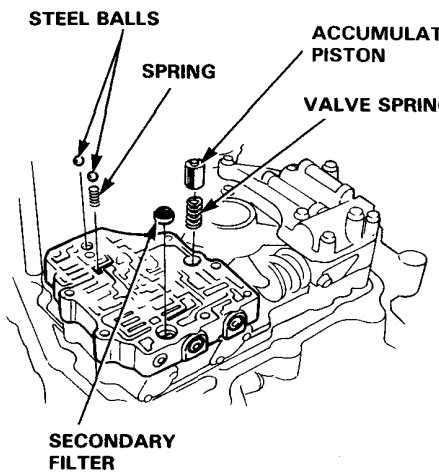
(cont'd)

Reassembly (cont'd)

15. Install the secondary valve body.

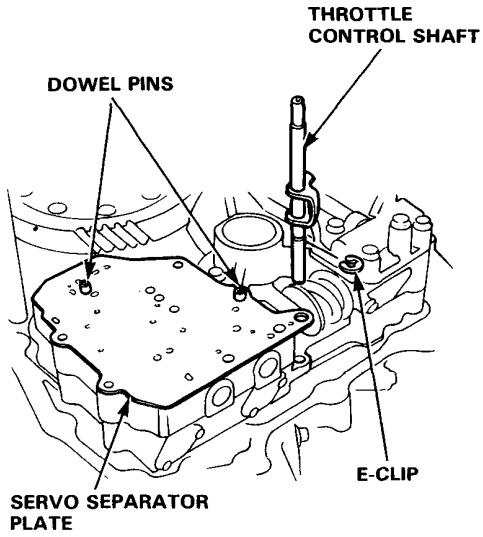


16. Install the steel balls, ball spring, shift timing accumulator piston, valve spring and secondary filter in the secondary valve body.

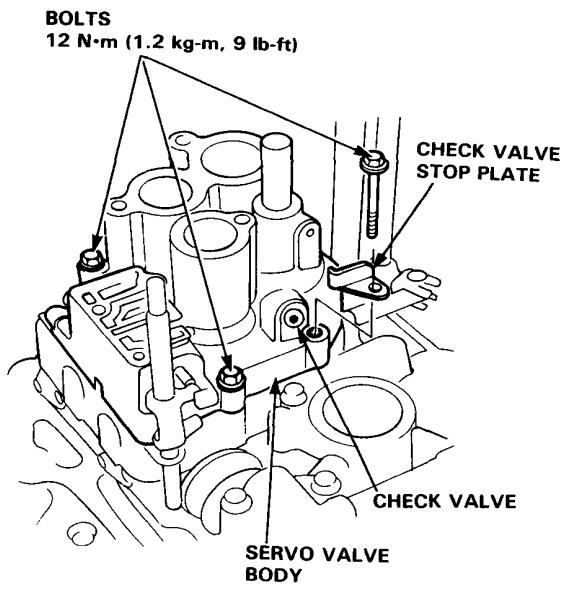


NOTE: The ball for the top oil passage has a spring to press the ball against the separator plate.

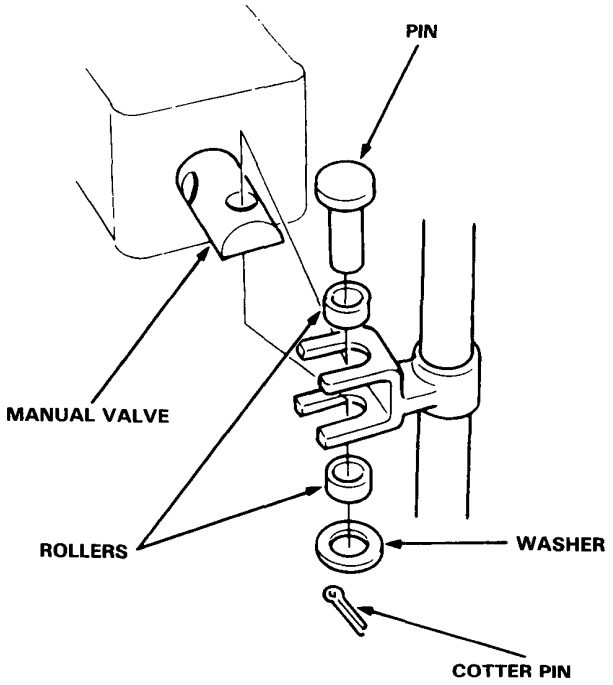
17. Install the separator plate and dowel pins, then install the throttle control shaft.



18. Install the servo valve body (2 bolts) and check valve stop plate (1 bolt) as shown.

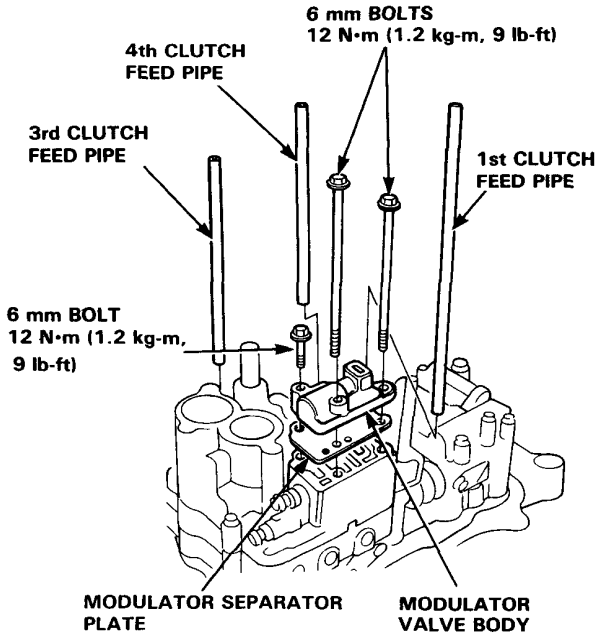


19. Put the rollers on each side of the manual valve stem, then attach the valve to the lever with the pin. Secure with the lock pin.



20. Install the separator plate.

21. Install the 1st, 3rd and 4th clutch feed pipes.

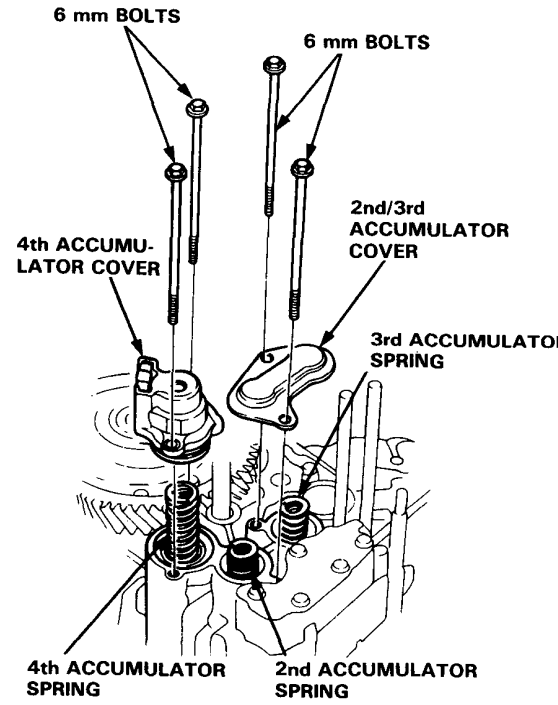


22. Install the accumulator springs.

23. Install the 2nd/3rd accumulator cover, and torque the bolts to 12 N·m (1.2 kg-m, 9 lb-ft) in a criss-cross pattern.

24. Install the 4th accumulator cover, and torque the bolts to 12 N·m (1.2 kg-m, 9 lb-ft) in a criss-cross pattern.

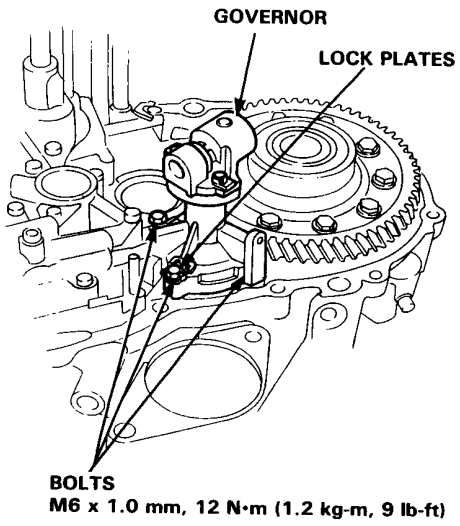
CAUTION: To prevent stripping the threads, press down on accumulator cover, then install the bolts.



(cont'd)

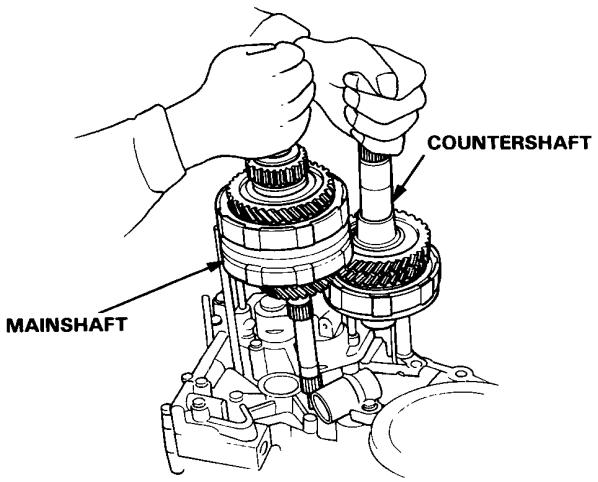
Reassembly (cont'd)

25. Install the governor valve using new lock plates, and the thrree 6 mm bolts.



26. Set the countershaft and mainshaft in place as an assembly.

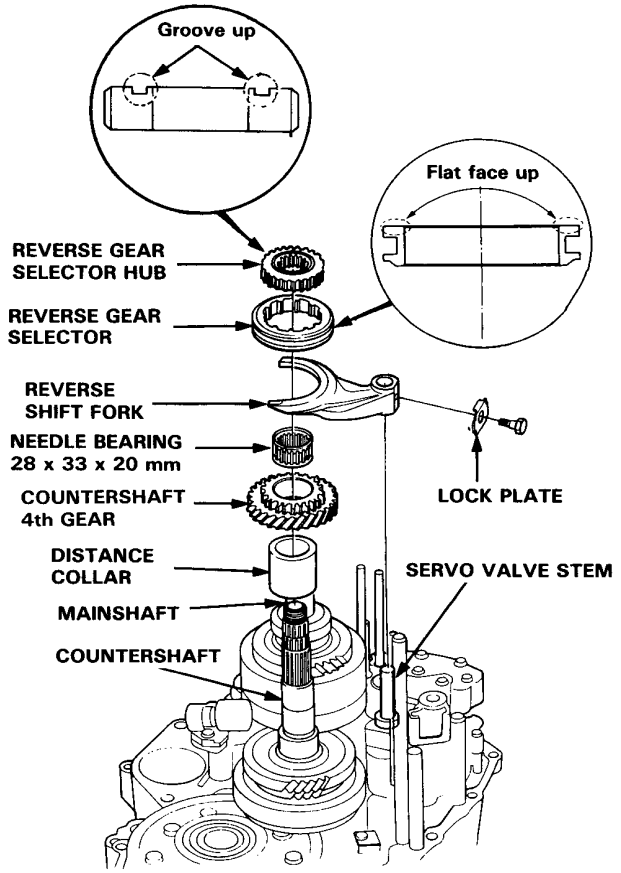
NOTE: Do not tap on the shafts with a hammer to drive in.



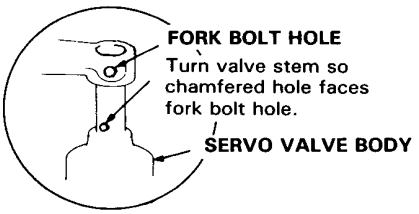
27. Install 4th gear and its needle bearing, and the countershaft 4th gear and its selector hub.

28. Assemble the reverse shift fork and selector sleeve, then install them as an assembly on the countershaft.

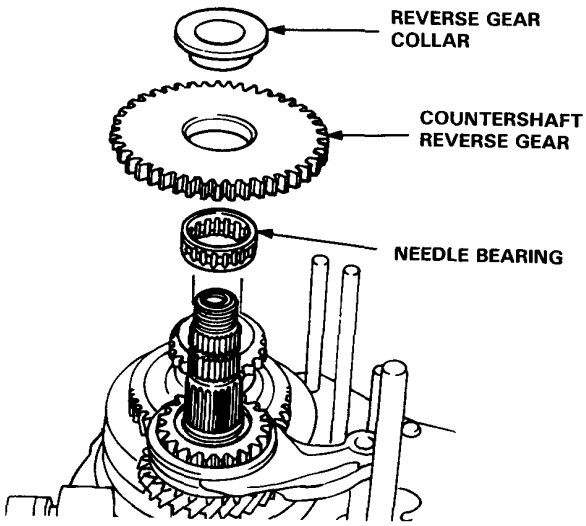
NOTE:
- Install the sleeve with its flat face up.
- Install the reverse gear selector hub with the groove facing up.



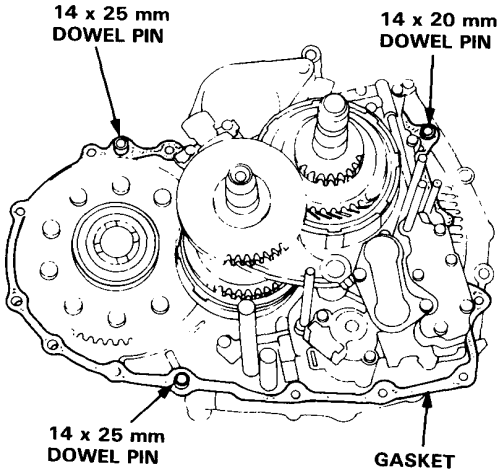
29. Install the reverse shift fork over the servo valve stem. Align the hole in the stem with hole in fork as shown, and install the bolt and new lock plate. Bend the lock tab against the bolt head.



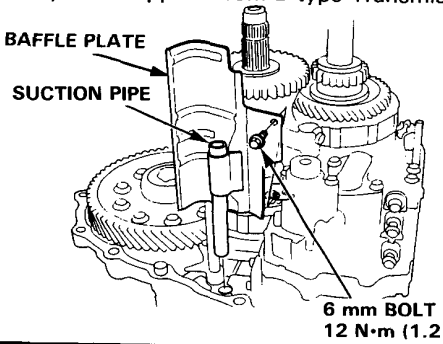
30. Install the countershaft reverse gear, needle bearing, and reverse gear collar.



31. Install the new gasket and three dowel pins in the torque converter housing.



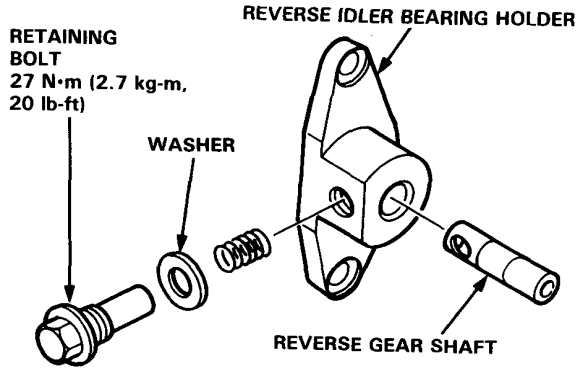
32. Install the baffle plate with the suction pipe (baffle plate is applied from B type Transmission).



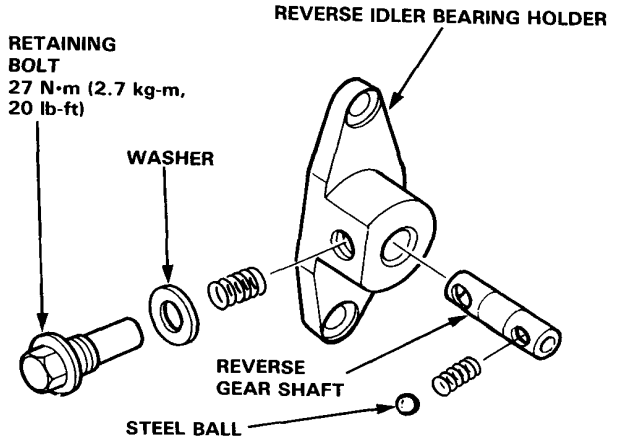
33. Assemble the idler bearing holder.

NOTE: Align the hole in the shaft with the spring.

(A type transmission)



(B type transmission)

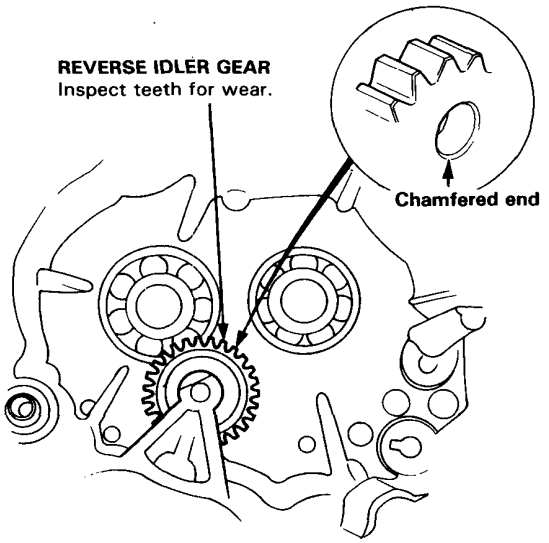


(cont'd)

Reassembly (cont'd)

34. Install the reverse idler gear.

    NOTE: Install the reverse idler gear so that the larger chamfer on the shaft bore faces the torque converter housing.

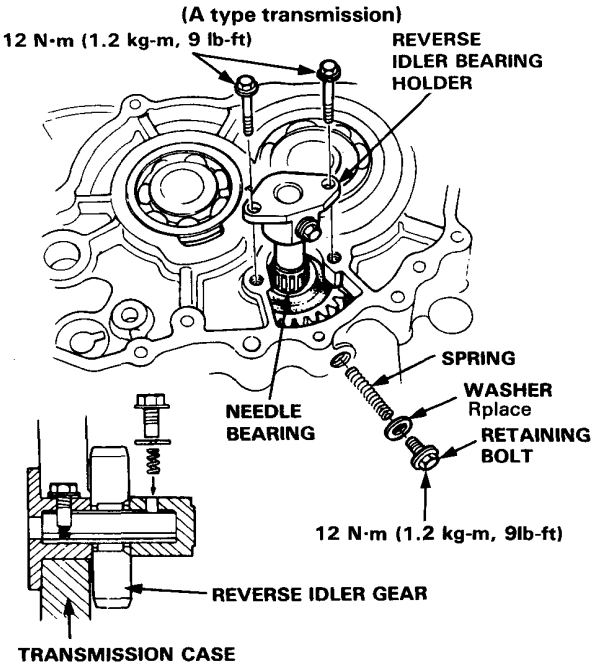


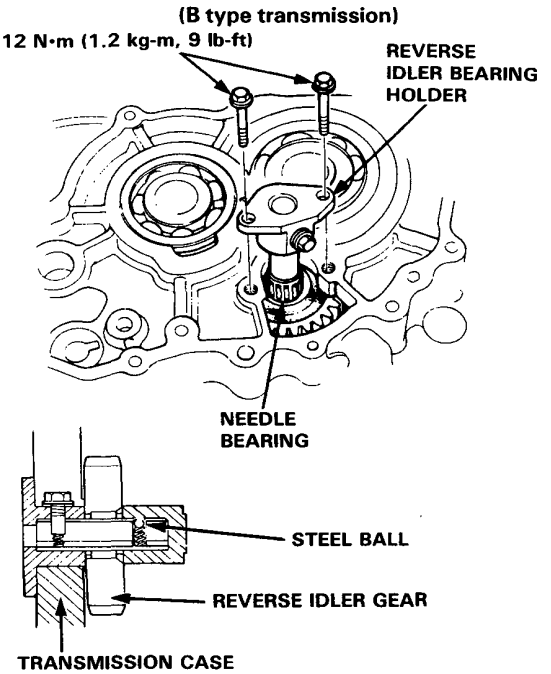
35. Install the needle bearing into the idler gear.

36. Install the idler bearing holder into the transmission housing.

37. Tighten the reverse idler bearing holder bolts.

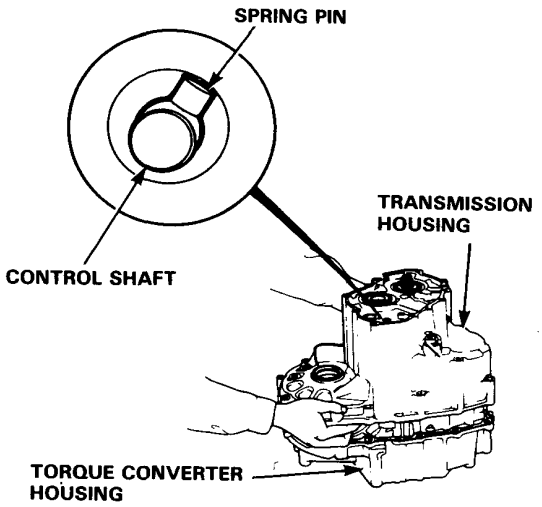
38. Install the spring and then tighten the retaining bolt with sealed washer.





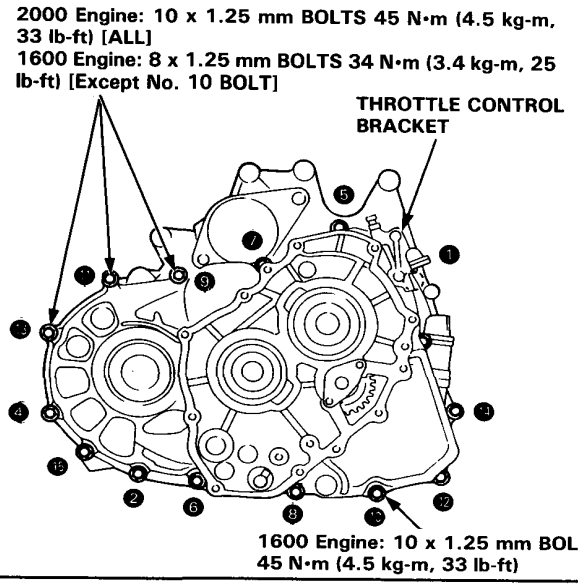
39. Place the transmission housing on the torque converter housing.

NOTE: Be sure the main valve control shaft lines up with the hole in the housing and that the reverse idler gear meshes with the mainshaft and countershaft, or the housing will not go on.



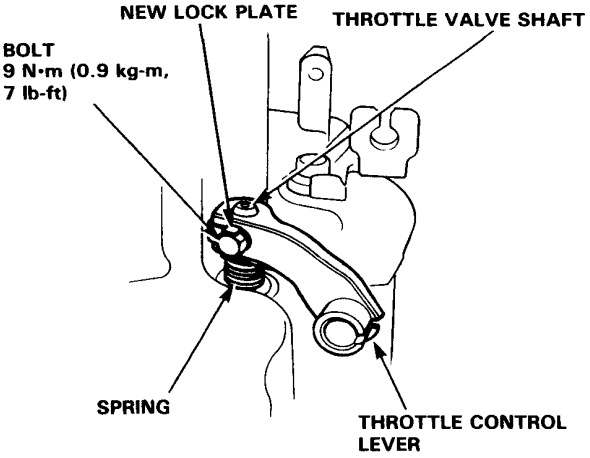
40. Install bolts in order of (1) thru (15) in two or more steps.

NOTE: When tightening the transmission housing bolts, take care that you do not distort or damage the throttle control bracket; distortion or damage to the bracket will change transmission shift points.



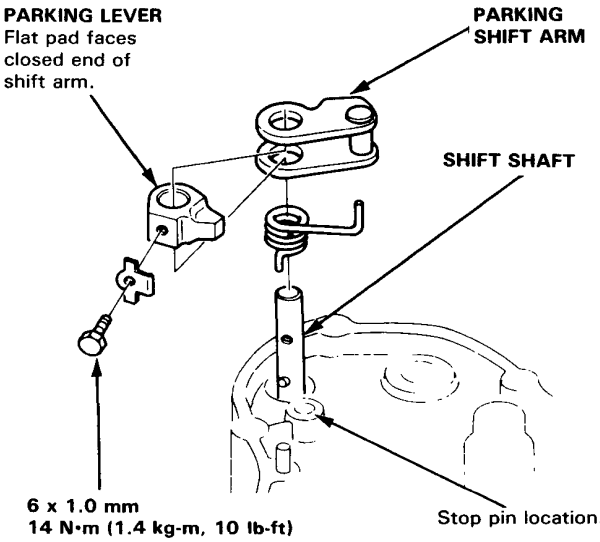
41. Install the throttle control lever and spring on the throttle control shaft.

42. Install the bolt and new lock plate. Bend the lock tab against the bolt head.



43. Install the parking shift arm and spring on the shift shaft with the bolt and a new lock plate. Bend the lock tab against the bolt head.

NOTE: The spring should put clockwise tension on the shift arm, forcing it against the stop pin.

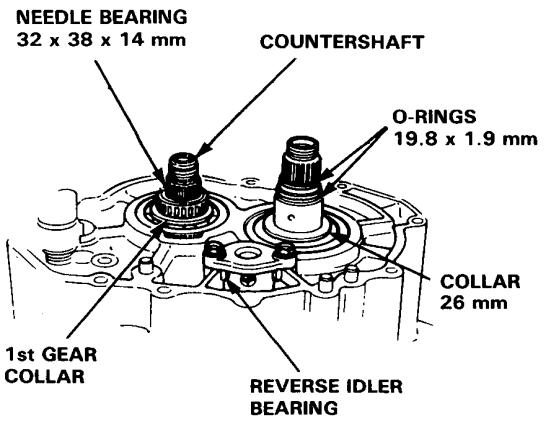


(cont'd)

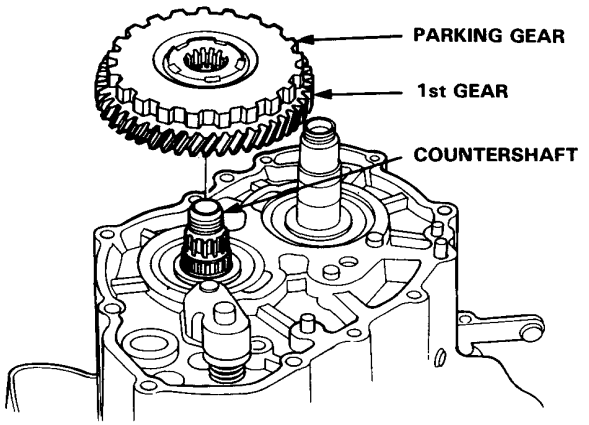
Reassembly (cont'd)

44. Install the 1st gear collar and needle bearing on the countershaft. Install the 26 mm collar on the mainshaft.

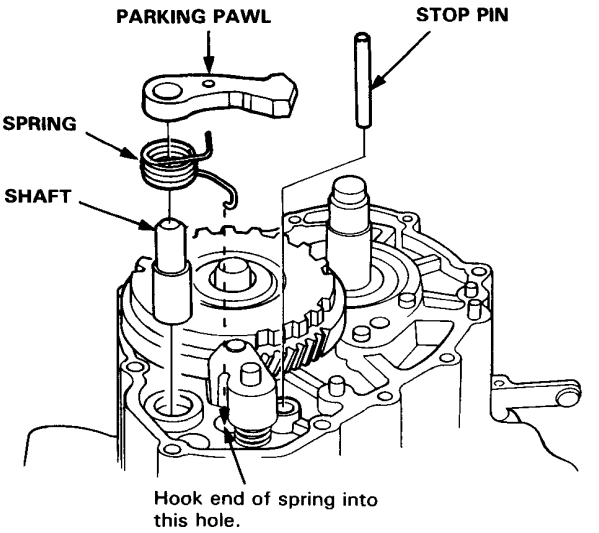
45. Install new 19.8 x 1.9 mm O-rings on the mainshaft.



46. Install the countershaft 1st gear and parking gear on the countershaft.



47. Install the stop pin, parking pawl shaft, parking pawl, and pawl release spring.

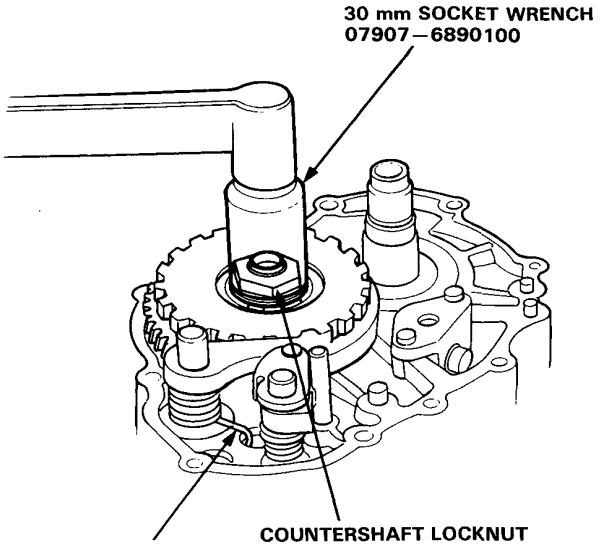


NOTE:

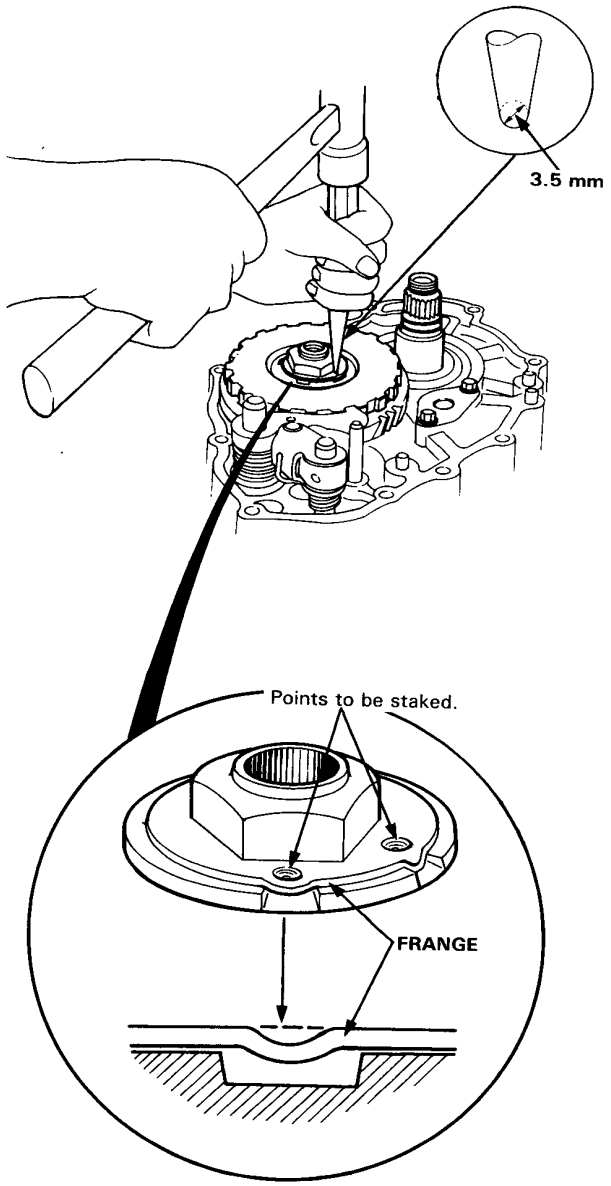
- One end of the parking pawl release spring fits into the hole in the parking pawl, the other end into the hole in the transmission housing as shown.
- The release spring should put clockwise tension on the pawl, forcing it away from the parking gear.

48. Shift to PARK and install the mainshaft holder.

49. Install and torque the new countershaft locknut.



50. Stake the locknut flange at two places into the gear grooves using a 3.5 mm punch.

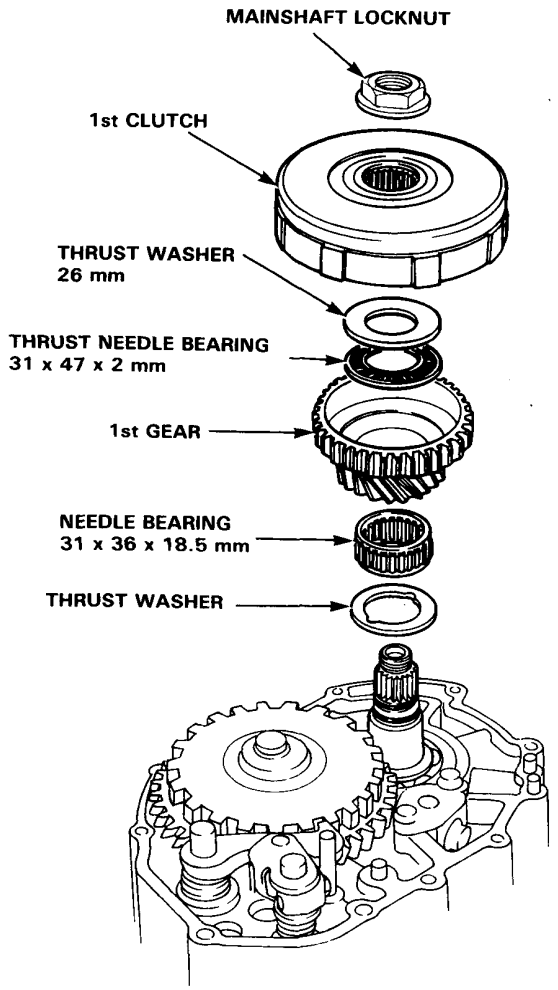


(cont'd)

Reassembly (cont'd)

51. Install 31 x 36 x 18.5 mm needle bearing and thrust washer on the mainshaft.

52. Install 1st gear, thrust needle bearing, and the thrust washer on the mainshaft.

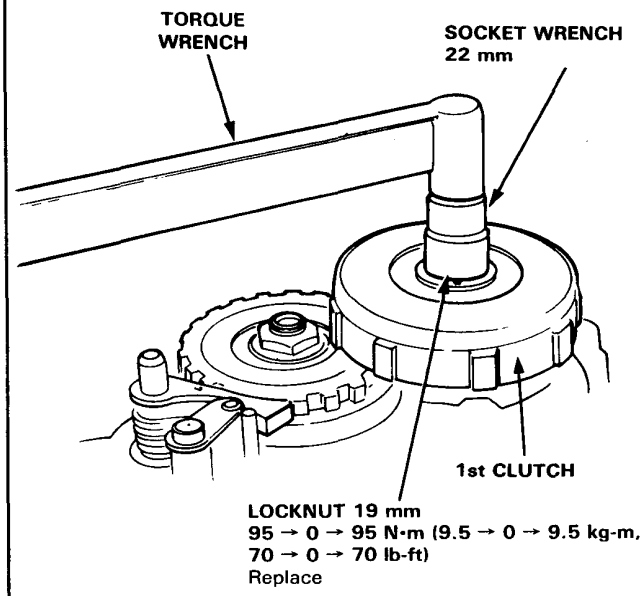


53. Install the 1st clutch on the mainshaft.

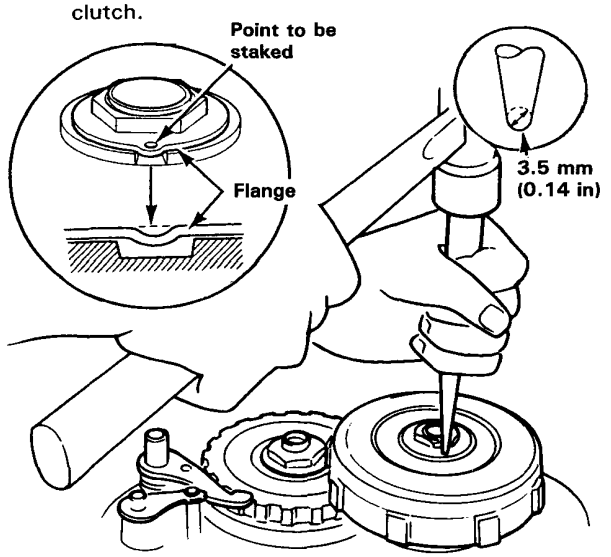
54. Attach the mainshaft holder from the underside of the torque converter case.

55. Install and torque the new mainshaft locknut.

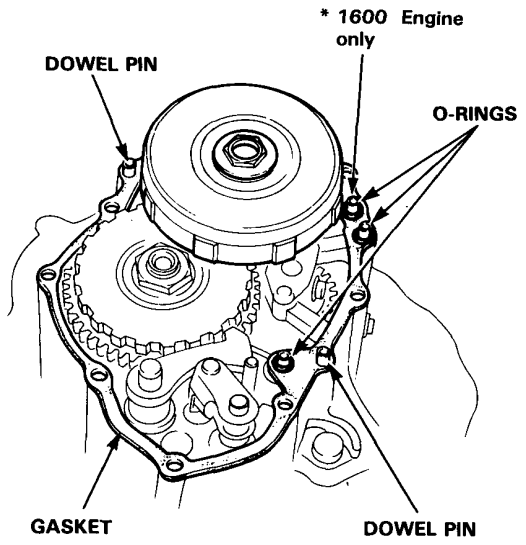
CAUTION: Locknut has left-hand threads.



56. Stake the locknut flange into the groove in the 1st clutch.



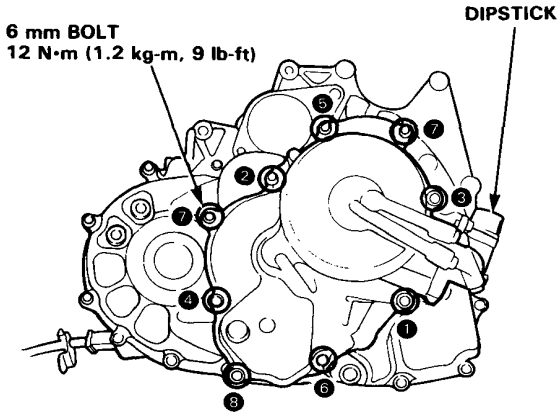
57. Install the gasket, dowel pins, and O-rings on the transmission housing.



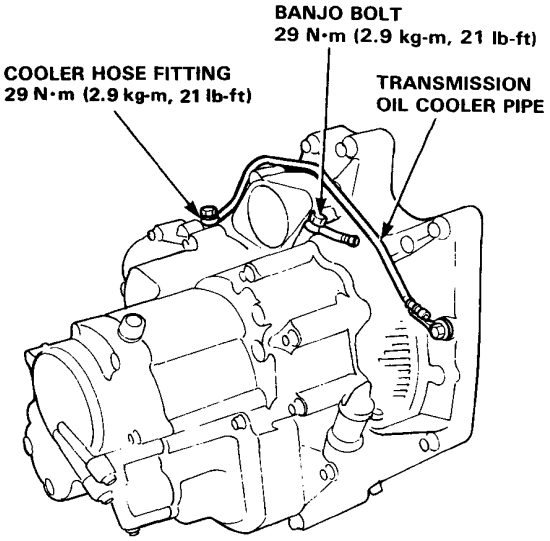
58. Install the end cover and torque all bolts (9) to 12 N•m (1.2 kg-m. 9 lb-ft).

59. Install the dipstick.

60. Install the transmission cooler banjo fitting, but do not tighten until the transmission is installed in the car and the hose is positioned properly.

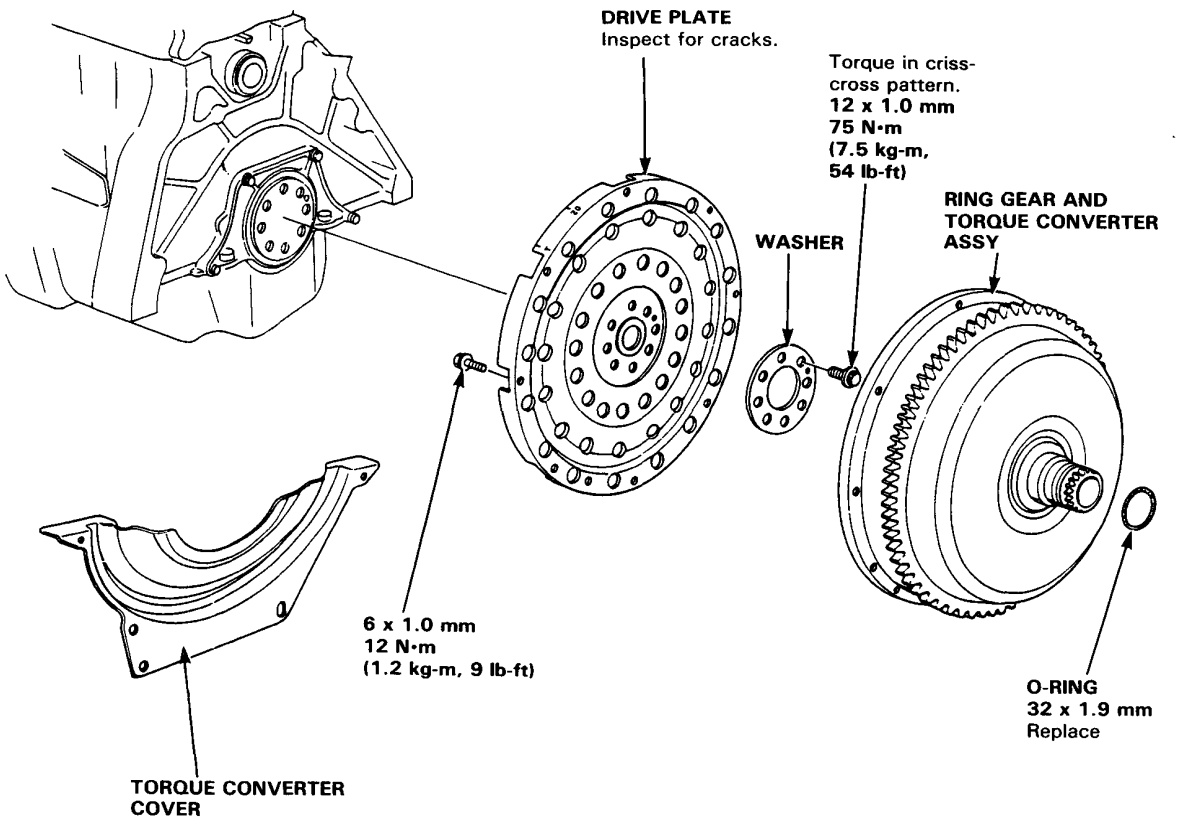


61. Install the transmission cooler hose fitting and torque to 29 N•m (2.9 kg-m, 21 lb-ft).



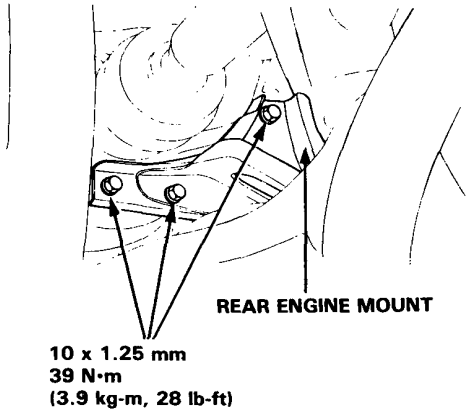
Torque Converter

Disassembly

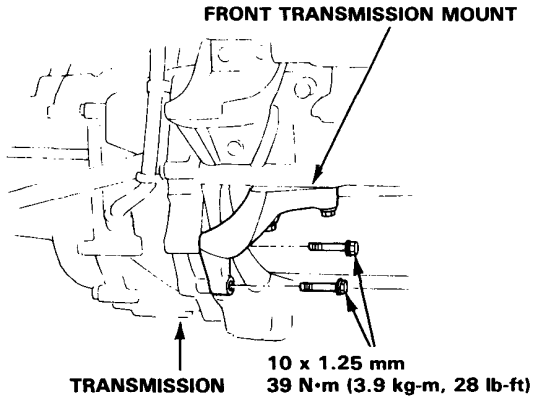


Installation

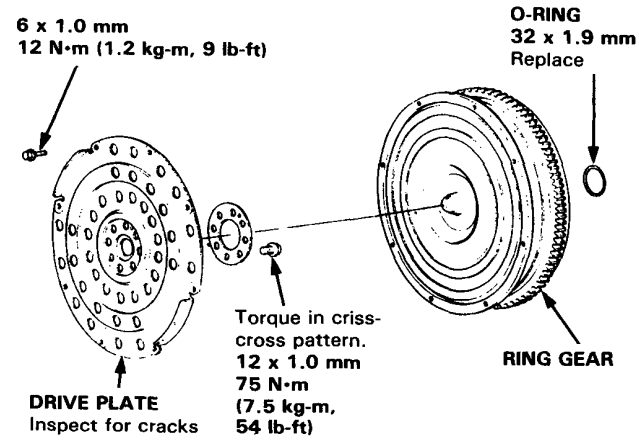
1. Attach shift cable to shift arm with pin, then secure cable to edge of housing with cable holder and bolt, and torque to 12 N·m (1.2 kg-m, 9 lb-ft).
2. Install torque converter on transmission.
3. Place transmission on transmission jack, and raise to engine level.
4. Hook hanger plate with hoist and make hoist chain tight.
5. Check that the two 14 mm dowel pins are installed in transmission housing.
6. Install new 26 mm spring clips on the end of each axle.
7. Align the dowel pins with holes in block; align torque converter bolt head with holes in drive plate.
8. Fit the left axle into the differential as you raise the transmission to the engine.
9. Secure transmission to engine with two (10 x 1.25 x 90 mm) lower mounting bolts, torque bolts when others are installed in step 23.
10. Install rear engine mounts on transmission housing; torque to 39 N·m (3.9 kg-m, 28 lb-ft).



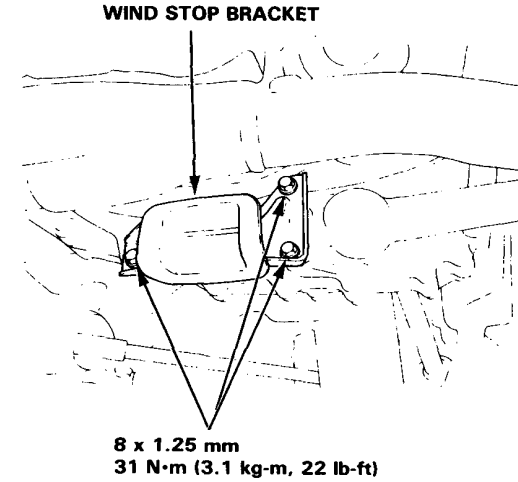
11. Install the front transmission mount bolts and torque to 39 N·m (3.9 kg-m, 28 lb-ft).



12. Attach torque converter to drive plate with eight (6 x 1.0 x 12 mm) bolts, and torque to 12 N·m (1.2 kg-m, 9 lb-ft). Rotate crank as necessary to tighten bolts to 1/2 torque, then the final torque, in a crisscross pattern. Check for free rotation after tightening the last bolt.



13. Remove the transmission jack.
14. Install torque converter cover plate, torque two 6 x 1.0 mm bolts (in oil pan flange) to 12N·m (1.2 kg-m, 9 lb-ft).
15. Install the wind stop rubber on the center beam, torque 10 x 1.25 mm nuts to 55 N·m (5.5 kg-m, 40 lb-ft), and install wind stop bracket on the transmission housing , torque three 8 x 1.25 mm bolts to 31 N·m (3.1 kg-m, 22 lb-ft).

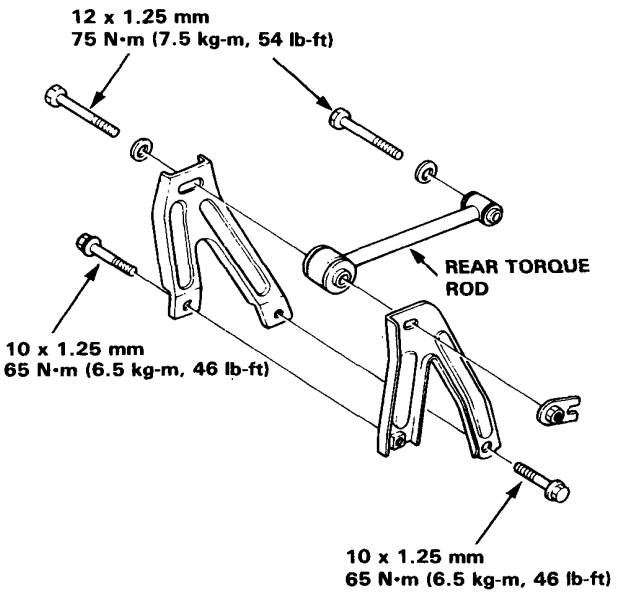


16. Remove hoist from transmission.
17. Install starter mount bolts (10 x 1.25 x 125 mm) and torque to 45 N·m (4.5 kg-m, 33 lb-ft).

(cont'd)

Installation (cont'd)

18. Install the rear torque rod and brackets as shown.

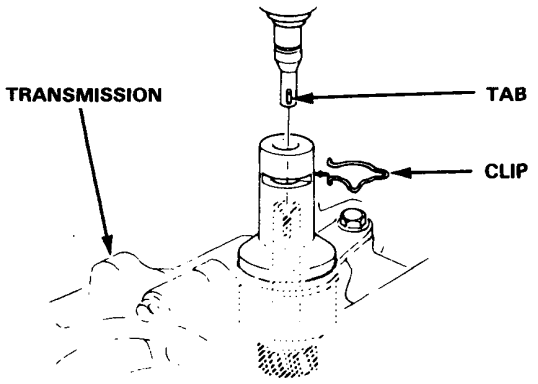


19. Turn right steering knuckle fully outward, and slide axle into differential until you feel its spring clip engage the side gear.

20. Reconnect ball joint to knuckle, then torque its bolt to 55 N·m (5.5 kg-m, 40 lb-ft).
Reinstall the damper fork and torque its bolt to 44 N·m (4.4 kg-m, 32 lb-ft).

21. Install speedometer cable.

- Align tab on cable end with slot in holder.
- Install clip so bent leg is on groove side.



NOTE: After installing, pull speedometer cable to see that it is secure.

22. Install front wheels, lower car to ground, and torque nuts to 110 N·m (11.0 kg-m, 80 lb-ft).

23. Install transmission mounting bolt (10 x 1.25 x 90 mm), and torque all bolts to 45 N·m (4.5 kg-m, 33 lb-ft).

24. Connect cooler hoses, and torque banjo bolts to 29 N·m (2.9 kg-m, 21 lb-ft).

25. Connect wiring:

- Battery positive cable to starter.
- Black/white wire to starter solenoid.
- Yellow/green wire to water temperature sending unit.
- Black/yellow and yellow wires to ignition timing thermosensor.

26. With ignition key in 0 position, connect ground cable to battery and transmission.

27. Unscrew the dipstick from top of transmission end cover and add 3.2 quarts Dexron® ATF through the hole. Reinstall dipstick.

NOTE: If transmission and torque converter have been disassembled, add a total of 6.0 ℓ (6.3 US. qts, 5.3 Imp. qt).

28. Install and reconnect shift cable (page 15-70).

29. Install console.

30. Start engine, set parking brake, and shift transmission through all gears three times. Check for proper shift cable adjustment (page 15-70).

31. Let engine reach operating temperature with transmission in Neutral or Park, then turn it off and check fluid level.

32. Install throttle control cable and adjust.

33. Road test as described on page 15-6.

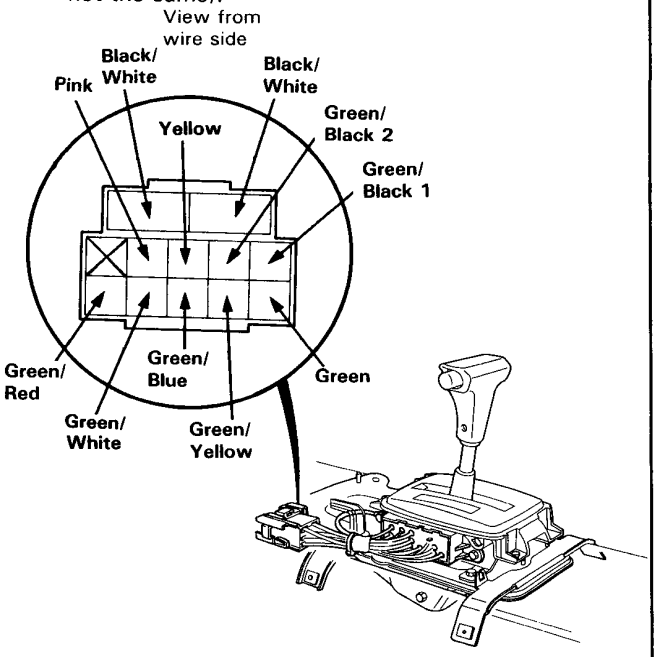
Console Switch

Test/Replacement

1. Remove the front console and disconnect the 12-P connector from the console switch.

2. Check for continuity between the terminals in each switch position according to the tables.

   NOTE: Several different wires have the same color. They have been given a number suffix to distinguish them (for example G/Bl[1] and G/Bl[2] are not the same).

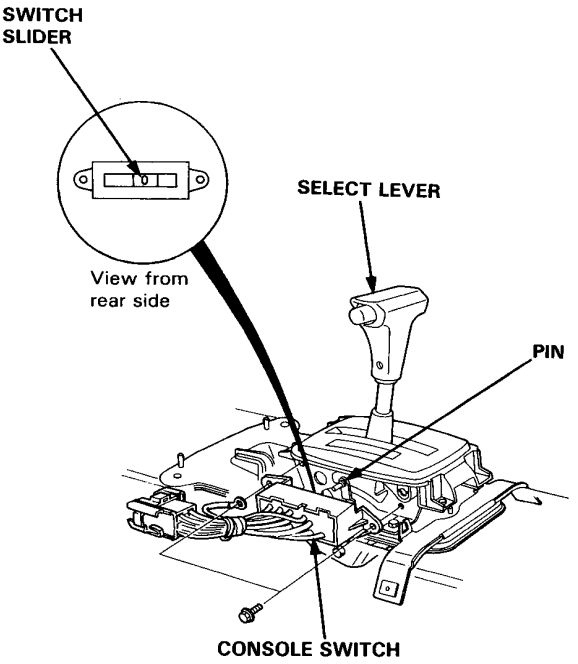


Wire color	2	D3	D4	N	R	P
Pink (cruise control)	○	○	○			
GND	○	○	○	○	○	○
Green/ Yellow	○					
Green/ Blue		○				
Green/ Black 1			○			
Green				○		
Green/ Red					○	
Green/ White						○

INHIBITER SWITCH

Wire color	N	R	P
Black/ White	○		○
Yellow		○	
Black/ White	○		○
Green/ Black 2		○	

3. Remove the center console and the 2 bolts to replace the console switch.



4. Position the switch slider to "Neutral" as shown above.

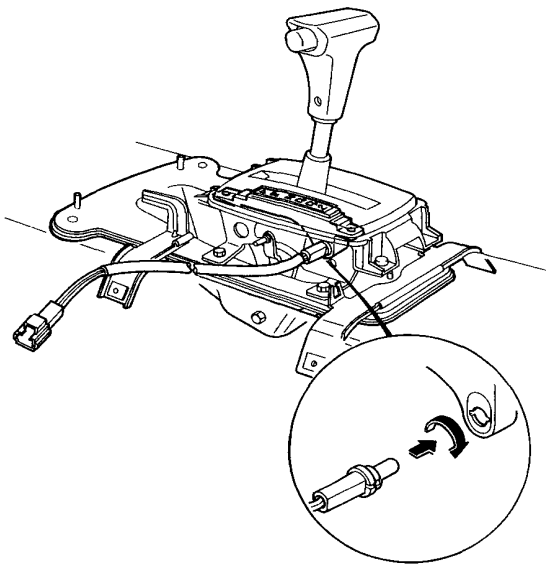
5. Shift the select lever to "Neutral", then slip the console switch into position.

6. Tighten the switch with the 2 bolts.

Shift Indicator Light

Check and Installation

1. Check for continuity between indicator light connector terminals as shown. If there is no continuity, check for burned out bulb or open circuit.
2. Install the indicator bulb in the bulb housing. Insert the bulb housing into in escutcheon, then turn 90° to bulb housing.

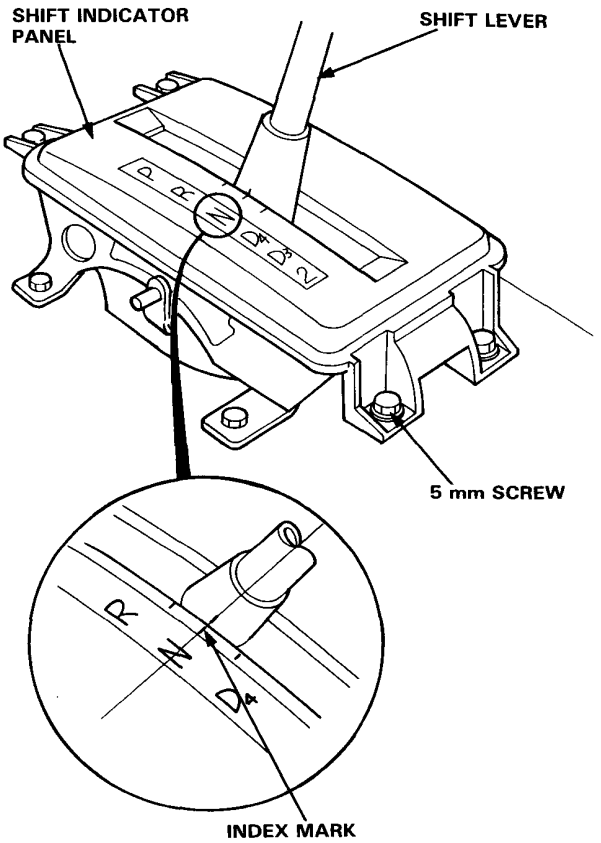


Shift Indicator Panel

Adjustment

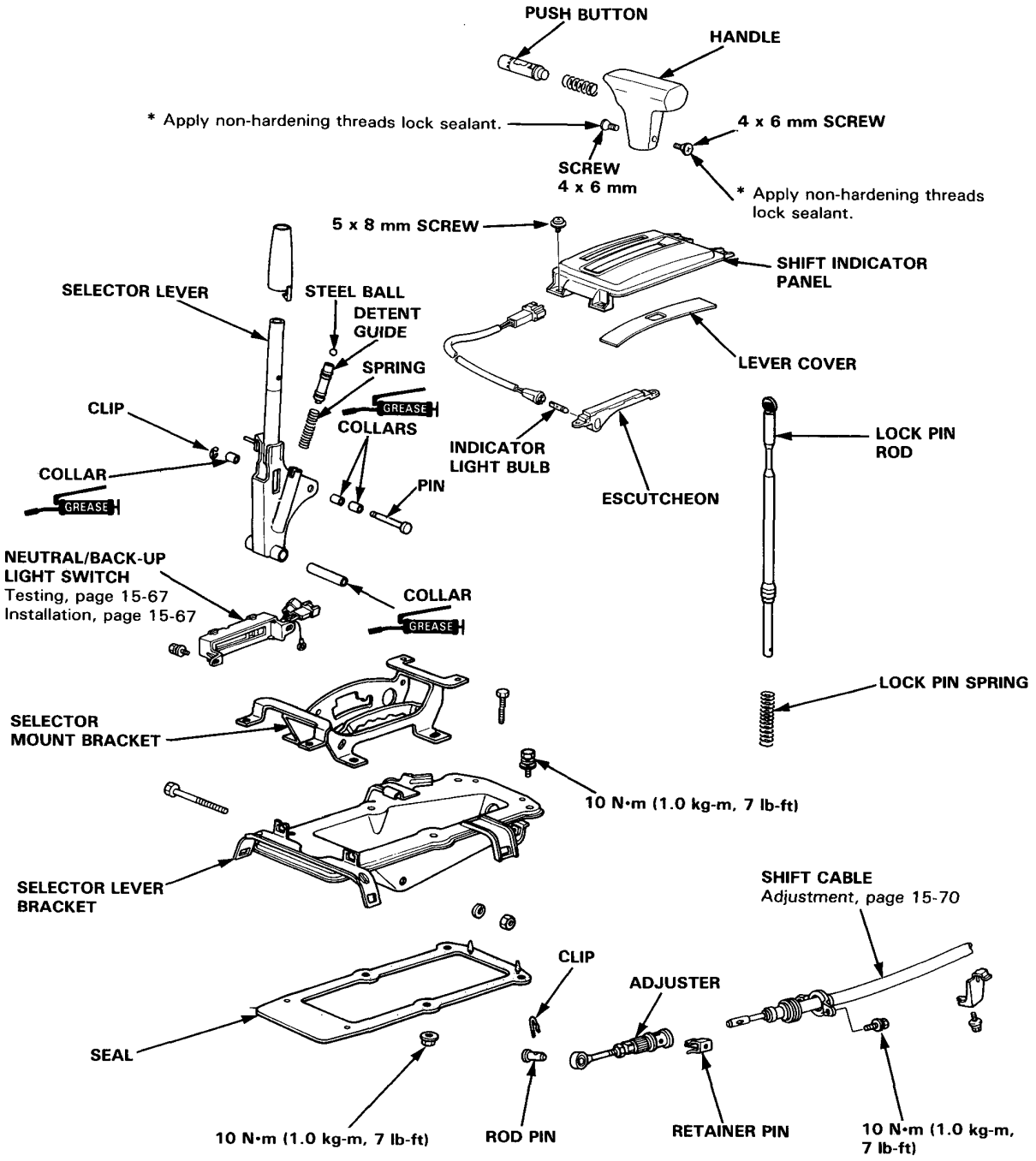
1. Check that the index mark of the indicator aligns with the N mark of the shift indicator panel with the transmission in NEUTRAL.
2. If not aligned, remove the panel mounting screws and adjust by moving panel.

   NOTE: Whenever escutcheon is removed for indicator bulb replacement etc., reinstall the panel as described above.



Gearshift Selector

Overhaul

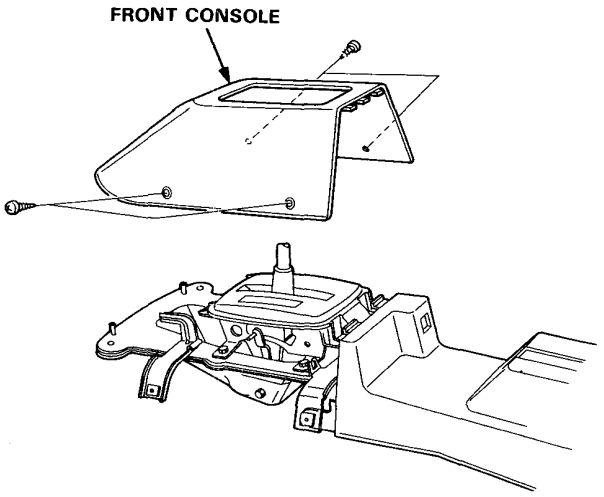


Shift Cable

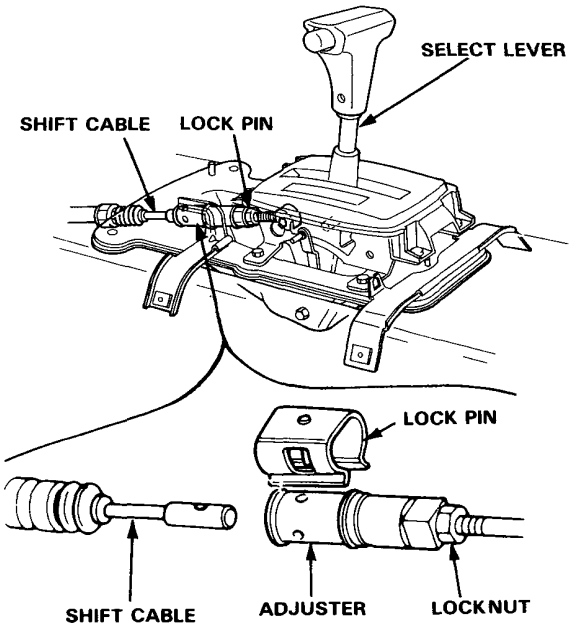
Adjustment

1. Start the engine. Shift to reverse to see if the reverse gear engages.If not, refer to trouble-shooting on page 15-4.

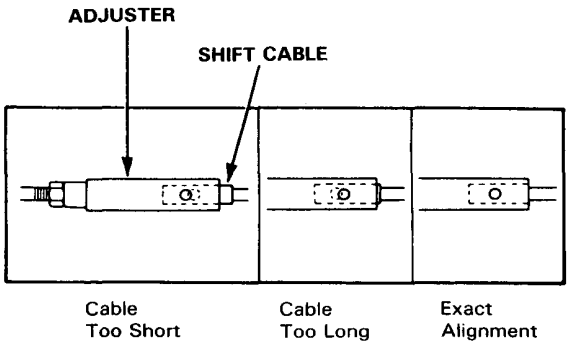
2. With the engine off, remove the front console.



3. Shift to Drive, then remove the lock pin from the cable adjuster.



4. Check that the hole in the adjuster is perfectly aligned with the hole in the shift cable.



NOTE: There are two holes in the end of the shift cable. They are positioned 90° apart to allow cable adjustments in 1/4 turn increments.

5. If not perfectly aligned, loosen the locknut on shift cable and adjust as required.

6. Tighten the locknut.

7. Install the lock pin on the adjuster.

NOTE: If you feel the lock pin binding as you reinstall it, the cable is still out of adjustment and must be readjusted again.

8. Start the engine and check the shift lever in all gears. If any gear does not work properly, refer to troubleshooting on page 15-4.

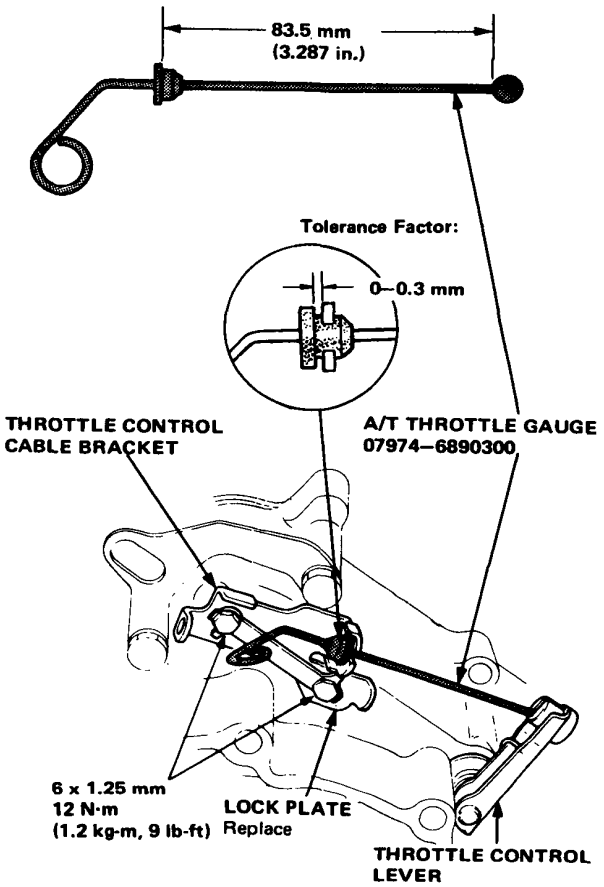
Throttle Control Cable Bracket

Adjustment (Carbureted Engine)

1. Disconnect the throttle control cable from the throttle control lever.
2. Bend down the lock tabs of the lock plate and remove the two 6 mm bolts to free the bracket.
3. Loosely install a new lock plate.
4. Position the special tool between the throttle control lever and the bracket as shown.

   NOTE: The special tool is designed so that the distance between the lever and the bracket is 83.5 mm (3.287 in.) when it is installed.
5. Position the bracket so that there is no binding between the bracket and the special tool (tolerance 0 to + 0.3 mm).
   Then tighten the two 6 mm bolts, bend up the lock plate tabs against the bolts heads.

   CAUTION: Make sure the control lever doesn't get pulled toward the bracket side as you tighten the bolts.



Throttle Control Cable

Adjustment/Inspection (Carbureted Engine)

NOTE: Perform the following inspections before adjusting the throttle control cable.

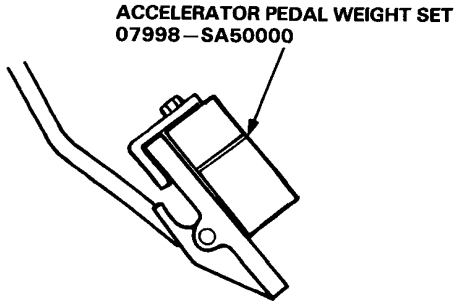
- The carburetor throttle cable play is correct. See Fuel Section.
- The engine is warmed-up to operating temperature.

NOTE: The cooling fan should come on twice or more.

- The idle speed is correct.

  700 ± 50 min^{-1} (rpm)
- The automatic choke operation is correct. See "Throttle Control Cable Bracket Adjustment."
- Disconnect the vacuum tube from the dash pot. connect the vaccum pump and keep vacuum applied.
  This simulates a normal operating amount of pull by the dash pot as if the engine were running.
- The distance between the throttle control lever and the throttle control bracket is correct. See "Throttle Control Cable Bracket Adjustment."

1. Attach a weight of about 1.5 kg (3 lbs) to the accelerator pedal. Raise the pedal, then release it, this will allow the weight to remove the normal free play from the throttle cable.



(cont'd)

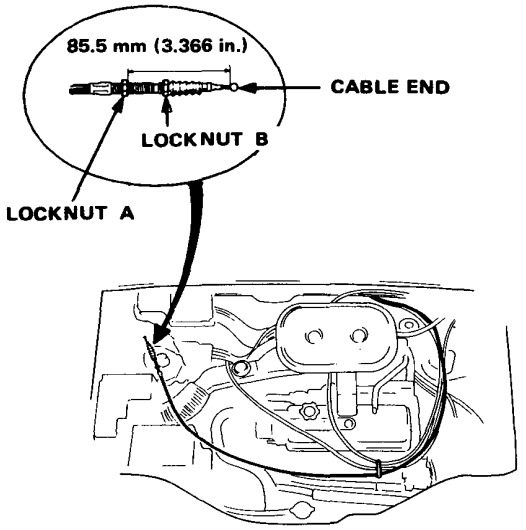
Throttle Control Cable

Adjustment/Inspection (cont'd) (Carbureted Engine)

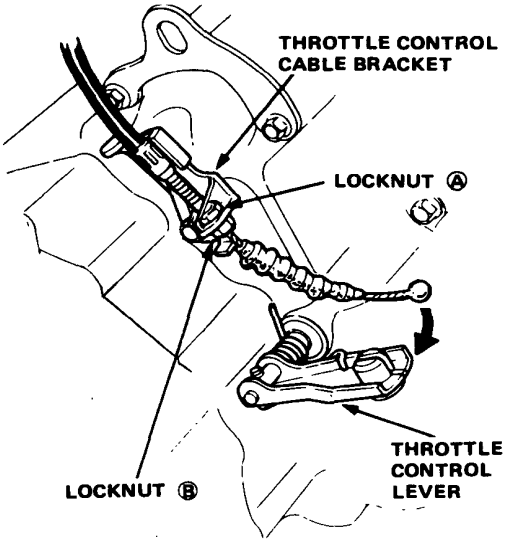
2. Secure the throttle control cable with clamps as shown.

3. Lay the end of the throttle control cable on the shock tower.

4. Adjust the distance between the throttle control cable end and nut (A) to 85.5 mm (3.366 in.).



5. Insert the end of throttle control cable in the groove of the throttle control lever.

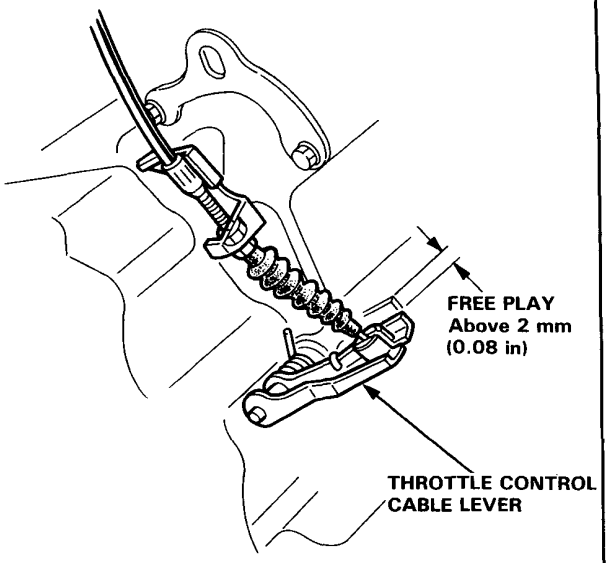


6. Insert the throttle control cable in the bracket and secure with locknut (B).

   NOTE: Make sure the cable is not kinked or twisted.

7. Check that the cable moves freely by depressing the accelerator.

8. Remove the weight on the accelerator pedal and push the pedal to make sure that there is the specified play at the throttle control lever.



9. Start the engine and check the synchronization between the carburetor and the throttle control cable.

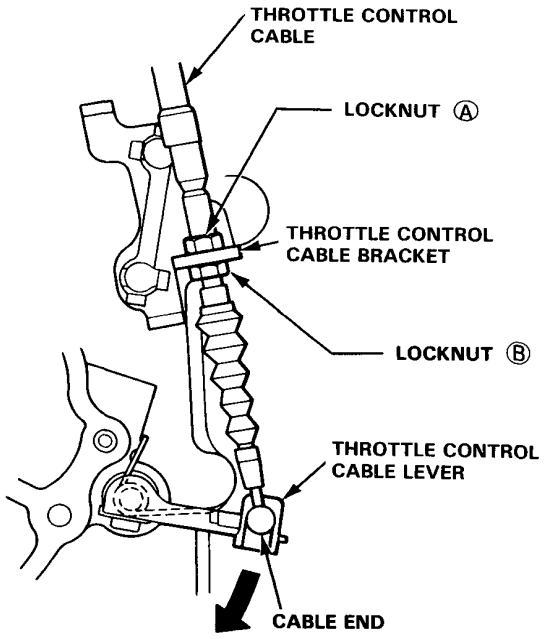
   NOTE: The throttle control lever should start to move as engine speed increases.

   - If the throttle control lever moves before engine speed increases, turn the cable locknut A counter clockwise and tighten locknut B.
   - If the throttle control lever moves after engine speed increases, loosen locknut B, turn locknut A clockwise and tighten the locknut B.

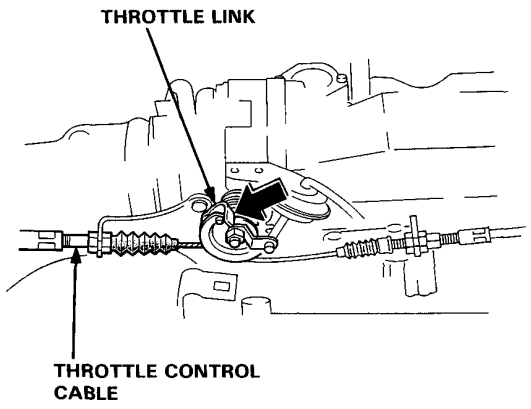
Adjustment/Inspection (Fuel-Injected Engine)

1. Loosen locknuts (A) and (B) on the throttle control cable.

2. Press down as shown on the throttle control lever until it stops.



3. While pressing down on the throttle control lever, pull on the throttle link to check the amount of throttle control cable free play.



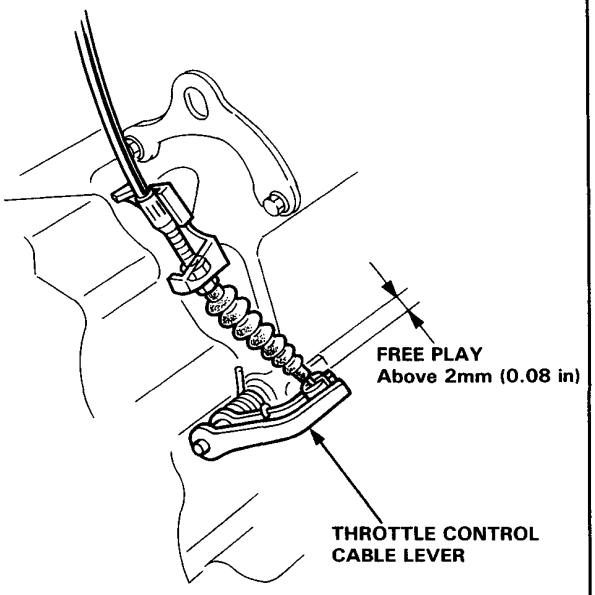
Remove all throttle control cable free play by gradually turning lock nut "A".

Until no movement can be felt in the throttle link, while continuing to press down on the throttle control lever, pull open the throttle link.
The control lever should begin to move at precisely the same time as the link.

NOTE: Correct "Fine Tune" adjustment of the throttle control cable is critical for proper operation of the transmission and lock-up torque convertor.

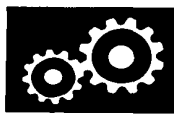
4. Check the following items before starting the engine:

   Depress the accelerator to the floor. While its depresse, check that there is play in the throttle control lever.



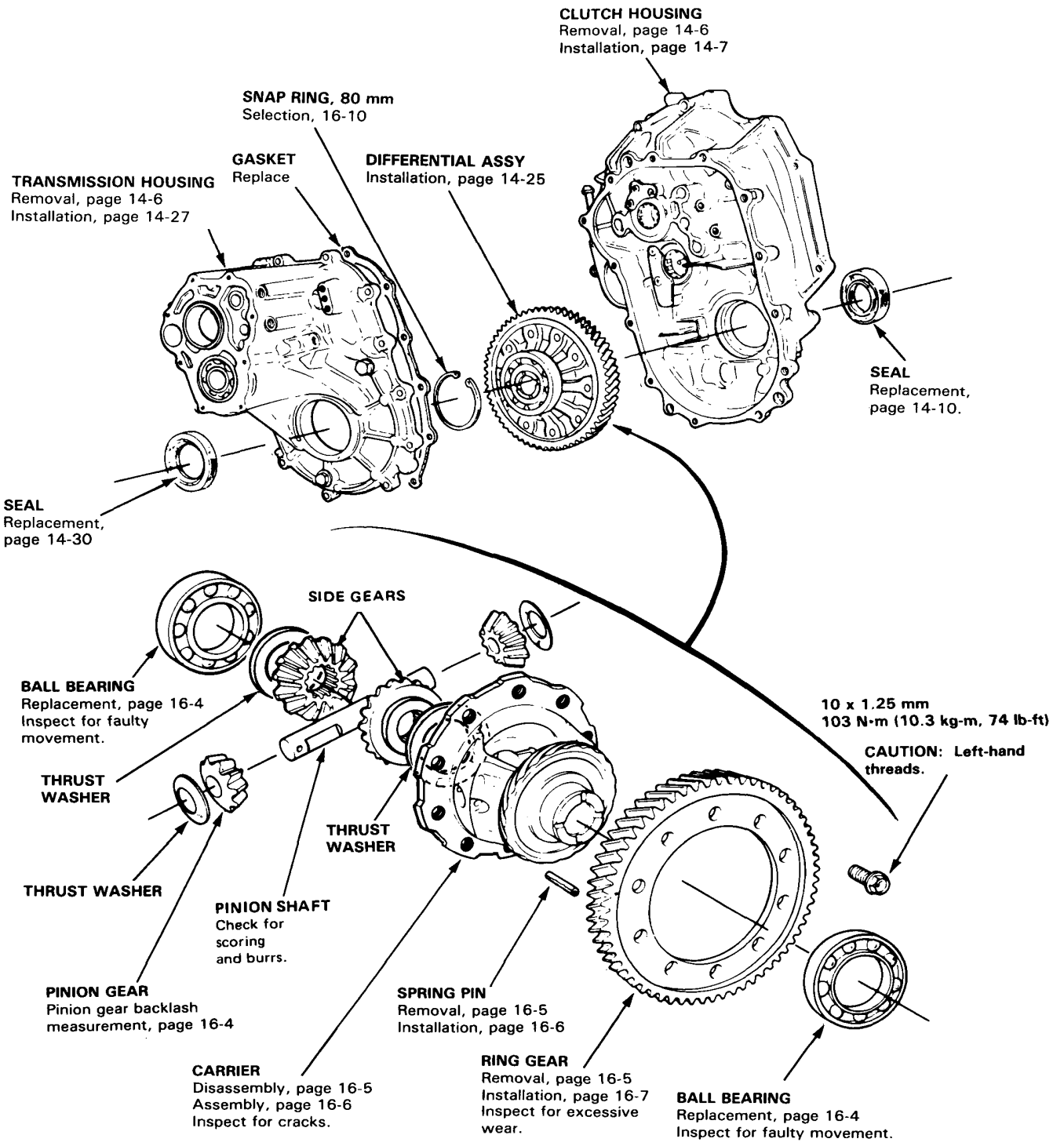
- Check that the cable moves freely by depressing the accelerator.

Differential



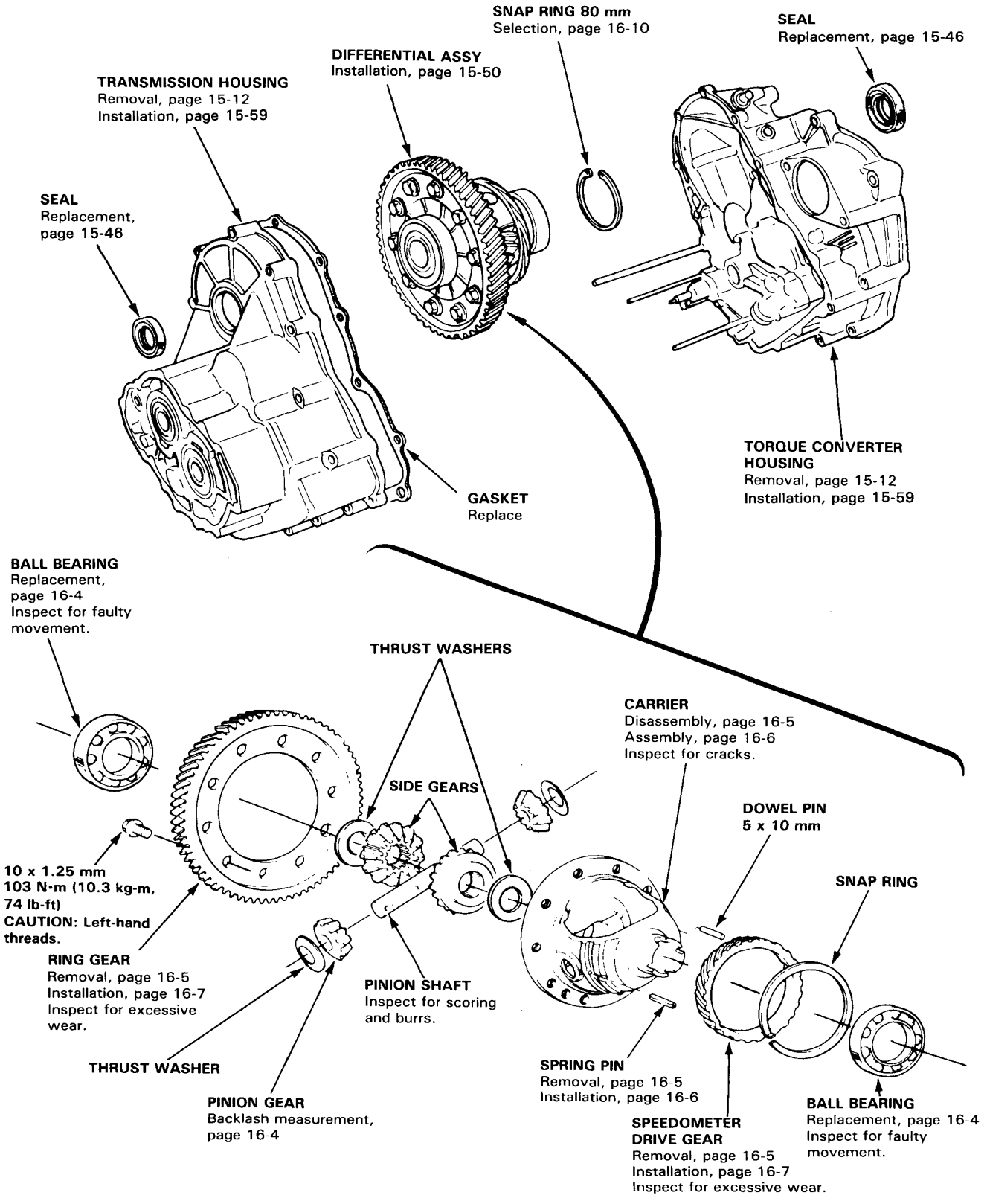
Differential (Manual Transmission)

Illustrated Index



Differential (Automatic Transmission)

Illustrated Index

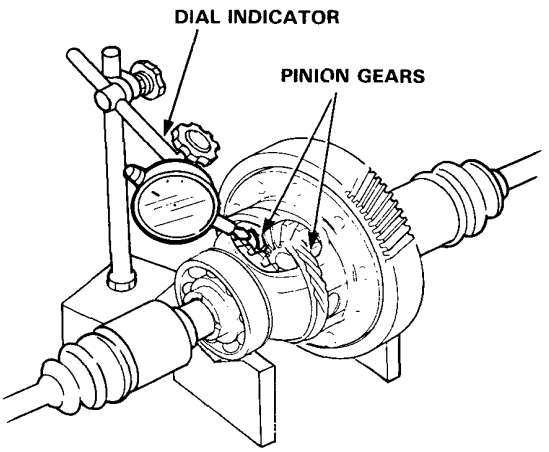


Differential

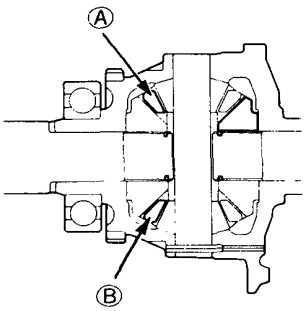
Backlash Inspection

1. Place differential assembly on V-blocks and install both axles.
2. Check backlash of both pinion gears.

Standard (New): 0.05—0.15 mm (0.002—0.006 in.)



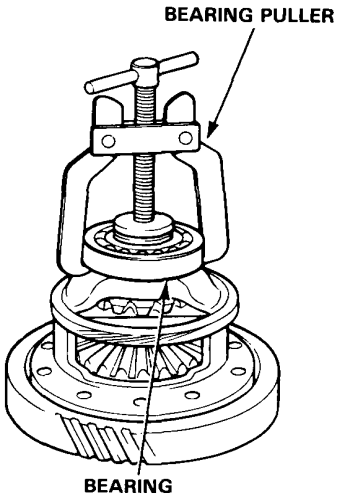
3. If out of tolerance, disassemble differential and select new thrust washers as shown on page 16-6.
4. Measure clearances in the A and B position of the drive pinion.



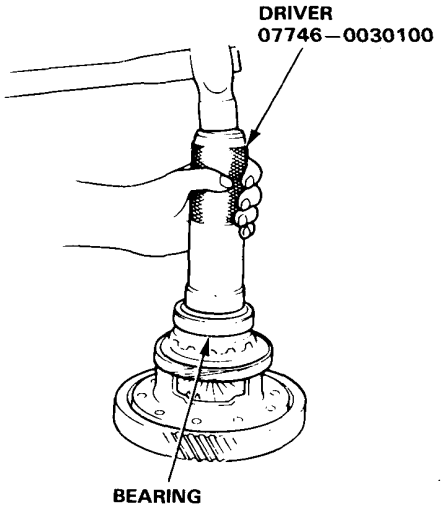
Bearing Replacement

NOTE: Check bearings for wear and rough rotation. If bearings are OK, removal is not necessary.

1. Remove bearings using a standard bearing puller.



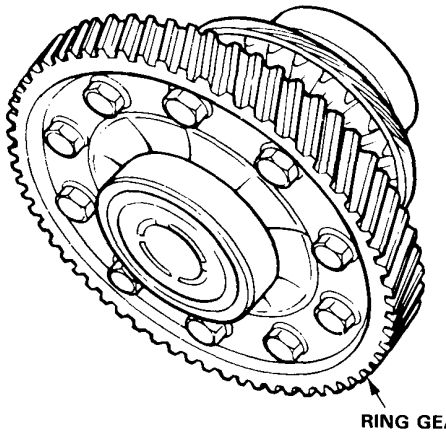
2. Install new bearings.



Inspection/Disassembly

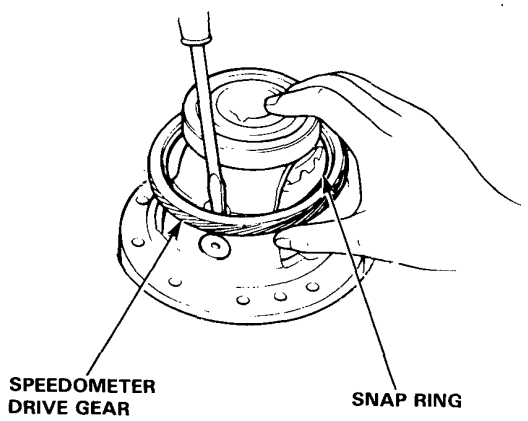
1. Remove ring gear and inspect teeth for wear or damage.

   CAUTION: The ring gear bolts have left-hand threads.

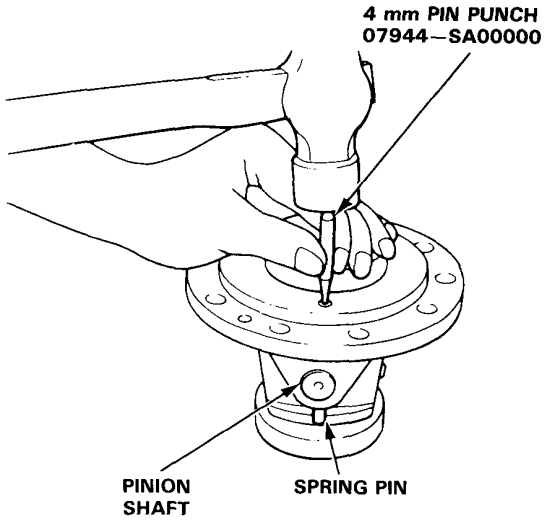


2. Automatic Only:
   Pry snap ring off carrier, then remove speedometer drive gear and dowel pin.

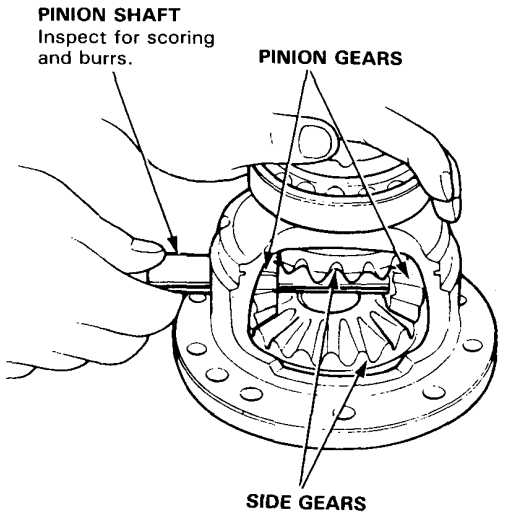
   CAUTION: The speedometer drive gear has sharp edges; use care when handling it.



3. Drive out spring pin with pin punch.



4. Remove pinion shaft, pinion gears, and thrust washers.

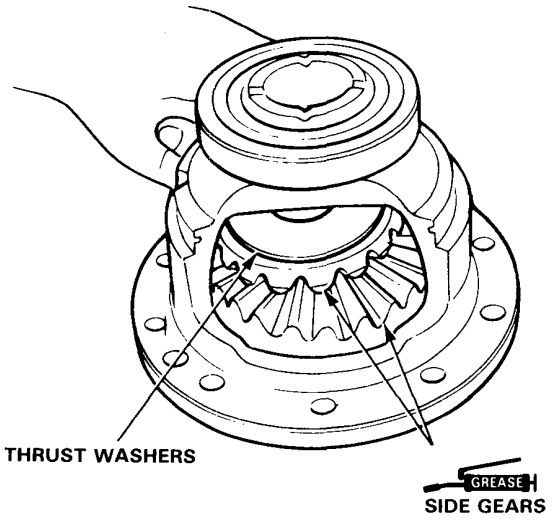


5. Wash parts thoroughly in solvent and dry with compressed air. Inspect all parts for wear or damage and replace any that are defective.

Reassembly

1. Install the side gears in differential carrier.

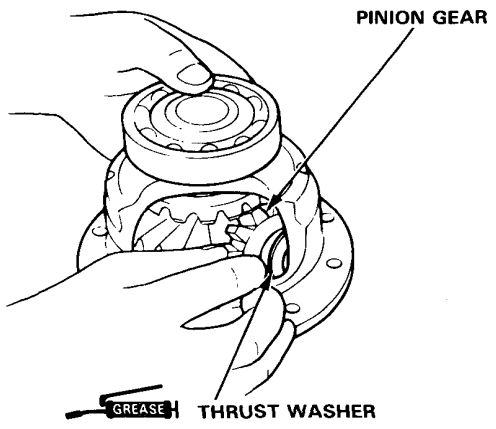
   CAUTION: Coat all gears with molybdenum disulfide grease on all sides.



2. Set pinion gears in place exactly opposite each other in mesh with side gears, then install a thrust washer behind each one. Washers must be of equal thickness.

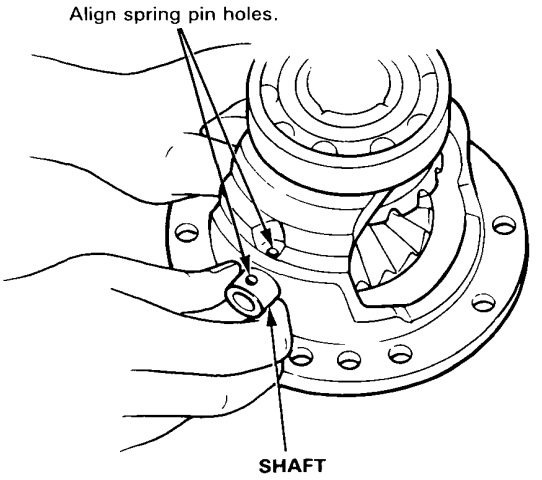
Thrust Washers

PART NUMBER	THICKNESS
41351-689-000	0.7 (0.028 in)
41355-PC8-000	0.75 (0.029 in)
41352-689-000	0.8 (0.031 in)
41356-PC8-000	0.85 (0.032 in)
41353-689-000	0.9 (0.035 in)
41357-PC8-000	0.95 (0.036 in)
41354-689-000	1.0 (0.039 in)

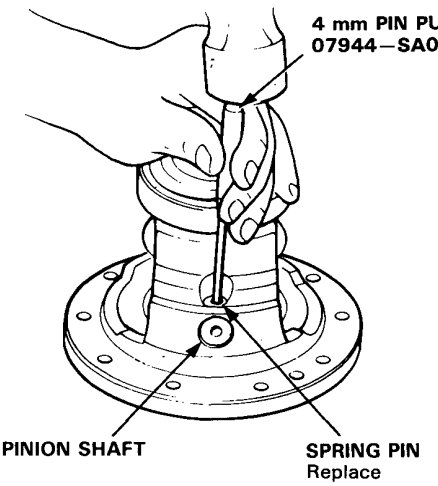


3. Rotate gears as shown until shaft holes in pinion gears line up with shaft holes in carrier.

4. Insert pinion shaft and align spring pin holes in one end with matching hole in carrier.



5. Drive in spring pin with pin punch.



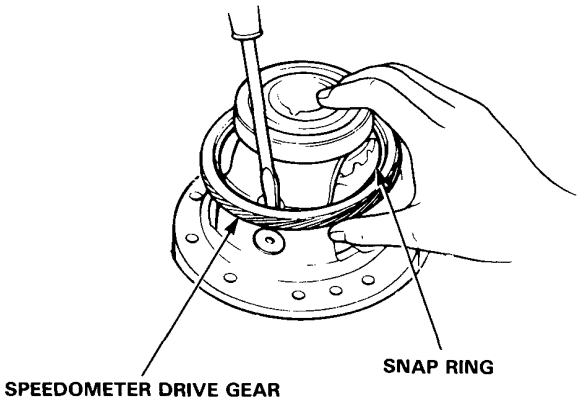
6. Check backlash of both pinion gears again.

   Standard (New): 0.05-0.15 mm (0.002-0.006 in.)

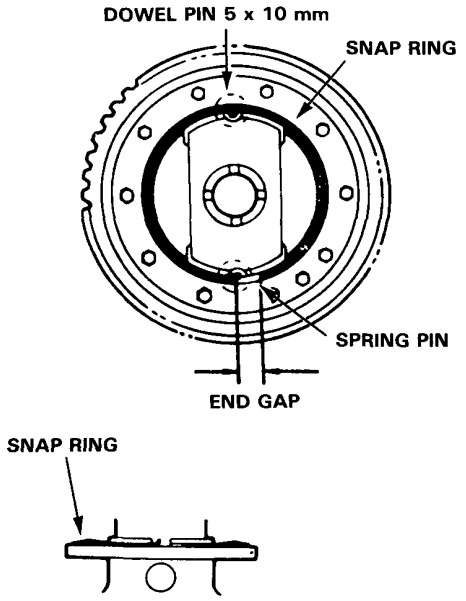
   - If still out of tolerance, replace both pinion gears, then recheck backlash.
   - If still out of tolerance, replace side gears, and recheck backlash.
   - If still out of tolerance, replace carrier assembly.

7. Automatic Only:
Install speedometer drive gear with its chamfer (on inside diameter) facing carrier and secure with snap ring.

CAUTION: The speedometer drive gear has sharp edges; use care when handling it.



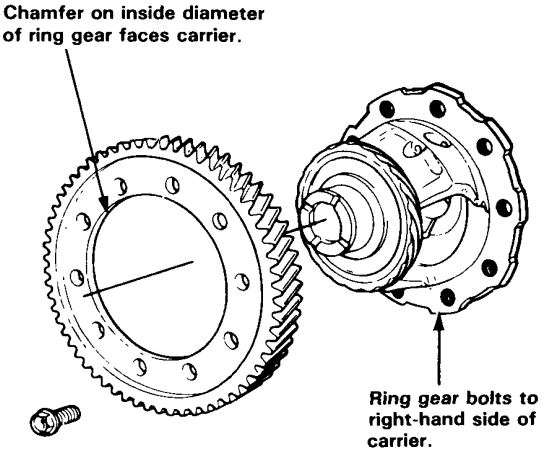
8. Automatic Only:
Align snap ring on carrier as shown.



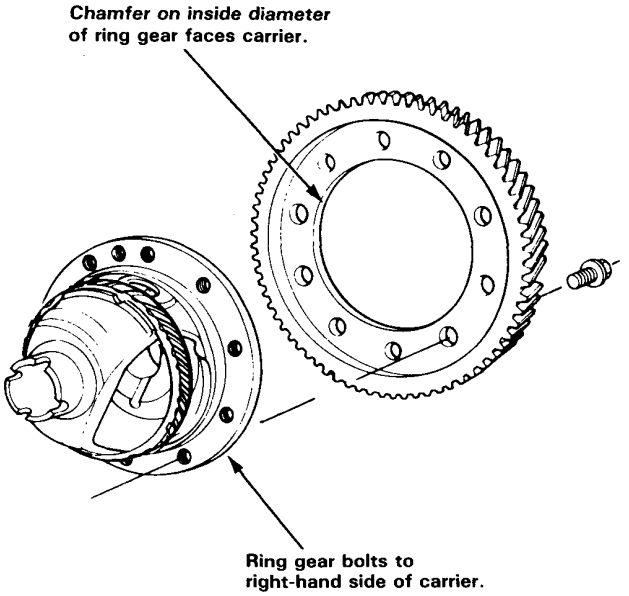
9. Install ring gear. Torque bolts to 103 N•m (10.3 kg-m, 74 lb-ft).

CAUTION: Ring gear bolts have left-hand threads.

Manual

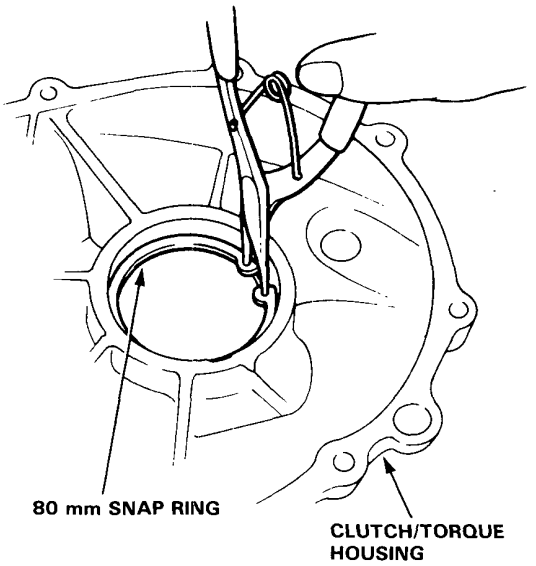


Automatic

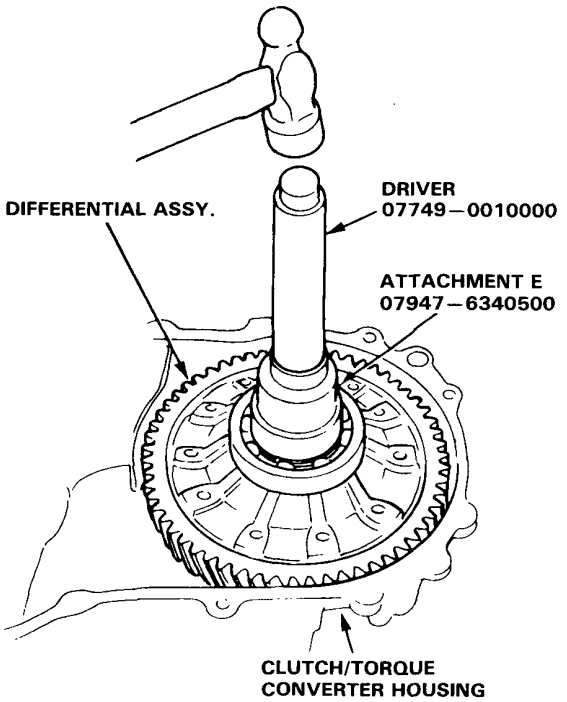


Installation

1. Automatic Only:
   Install 80 mm snap ring in clutch/torque converter housing. Do not install oil seal yet.



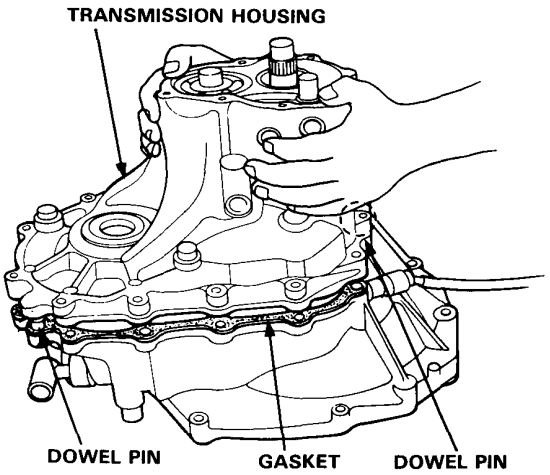
2. Install differential assembly in clutch/torque converter housing using driver. Tap on differential with driver and attachment to seat the snap ring in clutch/ torque converter housing.



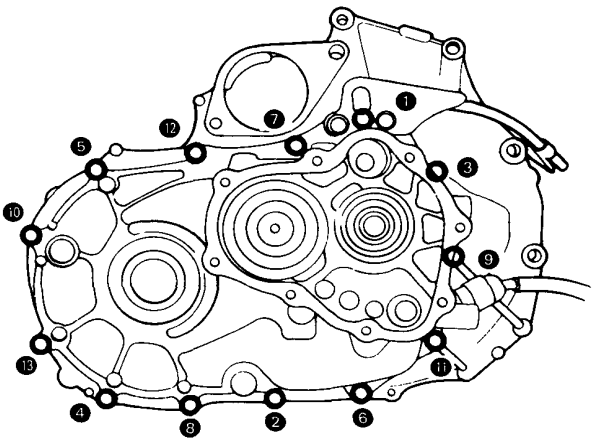
3. Install all transmission gear assemblies in clutch/ torque converter housing. Refer to Page 14-27 (Manual) or Page 15-59 (Automatic).

4. Manual Only:
   Shift transmission into 3rd gear to position shift guide shaft for reassembly.

5. Place new gasket on clutch/torque converter housing and install both dowel pins, then carefully lower the transmission housing into place.

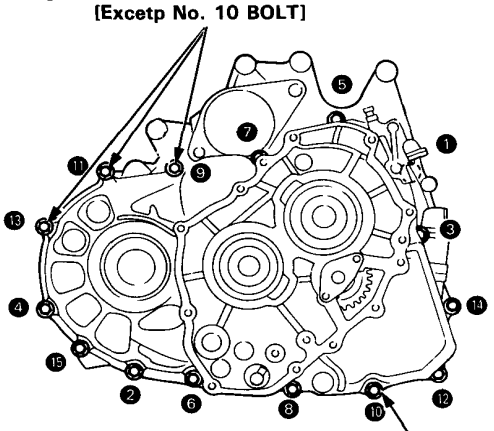


6. Manual Only:
   Bolt housings together and torque all thirteen bolts to 27 N•m (2.7 kg-m, 20 lb-ft) in sequence shown.



7. Automatic Only:
Install bolts in order of (1) thru (15) in two or more steps.

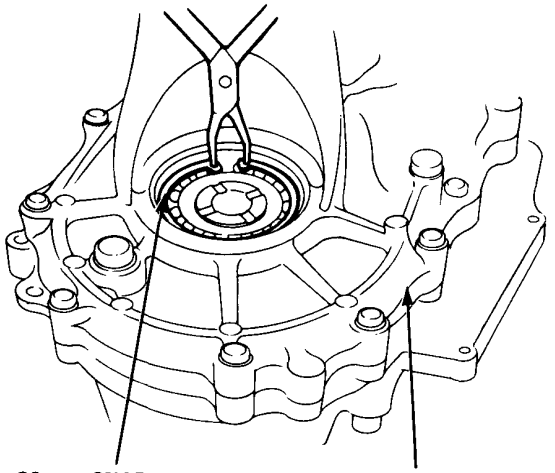
2000 Engine: 10 x 1.25 mm BOLTS 45 N·m (4.5 kg-m, 33 lb-ft) [ALL]
1600 Engine: 8 x 1.25 mm BOLTS 34 N·m (3.4 kg-m, 25 lb-ft) [Excetp No. 10 BOLT]



*** 1600 Engine: 10 x 1.25 mm BOLT 45 N·m (4.5 kg-m, 33 lb-ft)**

NOTE: When tightening transmission housing bolts, take care that you do not distort or damage the throttle control bracket; distortion or damage to bracket will change transmission shift points.

8. Manual Only:
Install 80 mm snap ring in transmission housing.



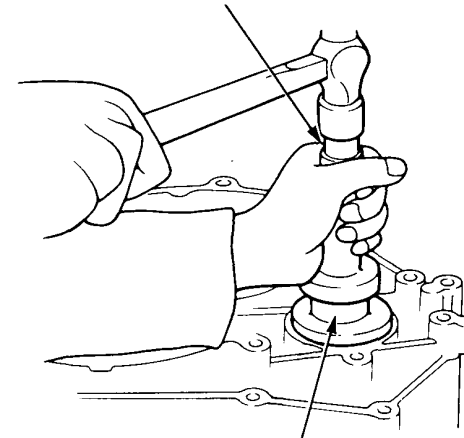
80 mm SNAP RING **TRANSMISSION HOUSING**

Side Clearance Measurement:

NOTE: If torque converter housing, transmission housing, differential carrier, or differential bearings were replaced, the differential side clearance must be measured.

9. Use driver and attachment to bottom differential assembly in transmission housing.

DRIVER
07749—0010000

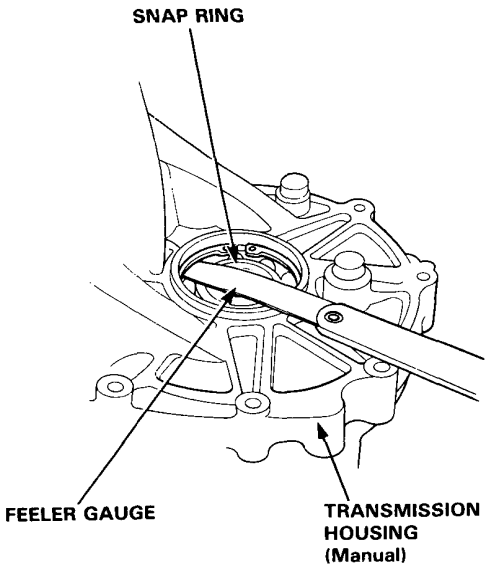


DRIVER ATTACHMENT
07947—6340500

(cont'd)

Installation (cont'd)

10. Measure clearance between snap ring and outer race of bearing in transmission housing (Manual), or torque converter housing (Automatic).



If out of limits, select new snap ring from following table and install:

Side Clearance: 0.15 mm (0.006 in.) Max.

Manual only:

Part Number	Thickness
90414—PC8—000	2.50 mm (0.098 in.)
90415—PC8—000	2.60 mm (0.102 in.)
90416—PC8—000	2.70 mm (0.106 in.)
90417—PC8—000	2.80 mm (0.110 in.)
90418—PC8—000	2.90 mm (0.114 in.)

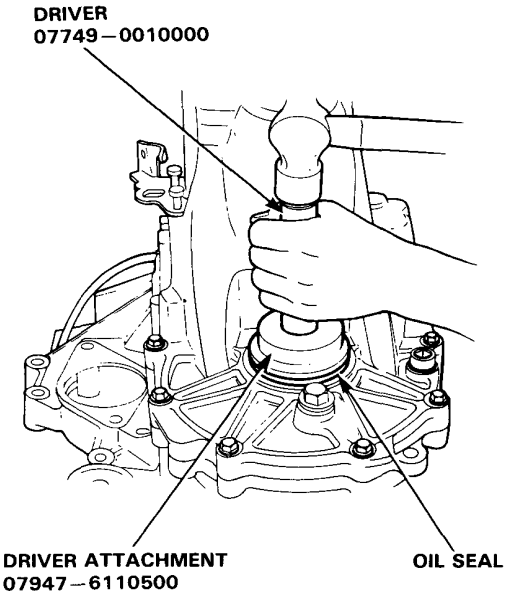
Automatic only:

Part Number	Thickness
90414—689—000	2.50 mm (0.098 in.)
90415—689—000	2.60 mm (0.102 in.)
90416—689—000	2.70 mm (0.106 in.)
90417—689—000	2.80 mm (0.110 in.)
90418—689—000	2.90 mm (0.114 in.)

11. Turn transmission over and seat new snap ring against the clutch/torque converter housing as shown in step 1.

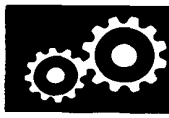
12. Then turn transmission back over, seat differential again as shown in step 9, and recheck bearing-to-snap ring clearance.

13. Apply oil to new differential seals and install them in clutch/torque converter housing and transmission housing with special tools as shown.



Rever to page 14-30 (Manuall) or page 15-46. (Automatic) for assembly of remaining parts.

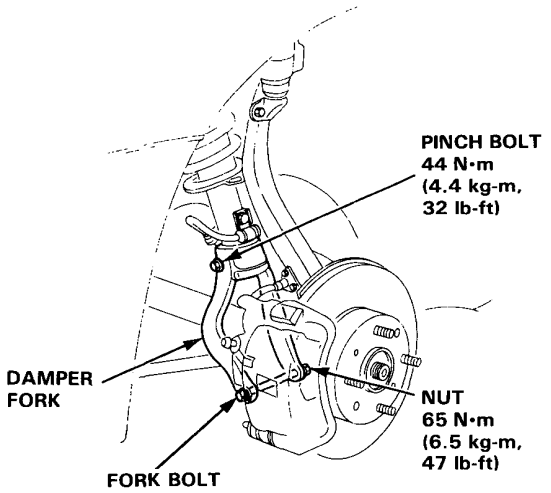
Driveshafts



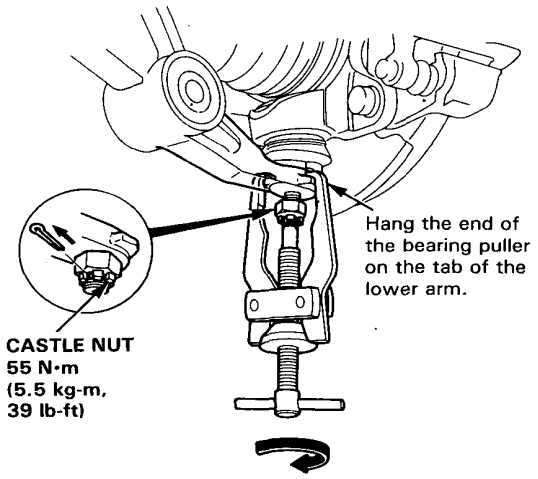
Driveshafts

Removal

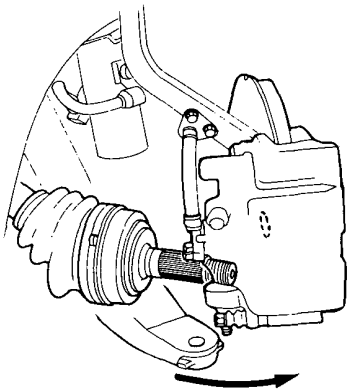
1. Loosen the front wheel lug nuts.
2. Raise the front end of the car and place safety stands in the proper locations. Remove the front wheels.
3. Drain the transmission oil.
4. Raise the locking tab on the spindle nut and remove it with a 32 mm(1.25 in.) socket wrench.
5. Remove the damper fork bolt and damper pinch bolt. Remove the damper fork.



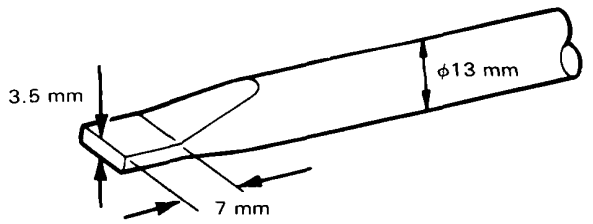
6. Remove the knuckle-to-lower arm castle nut, and separate the lower arm from the knuckle using a commercially available bearing puller.

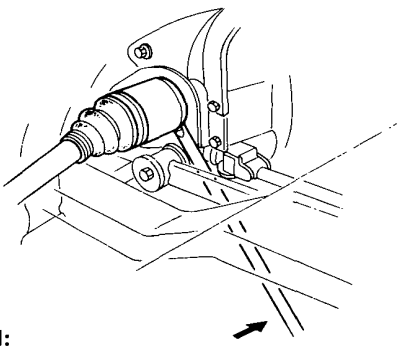


7. Pull the knuckle outward and remove the driveshaft outboard joint from the knuckle using a plastic hammer.



8. Pry the driveshaft assembly with a screwdriver as shown to force the set ring at the driveshaft end past the groove.
9. Pull the inboard joint and remove the driveshaft and CV joint out of the differential case as an assembly.





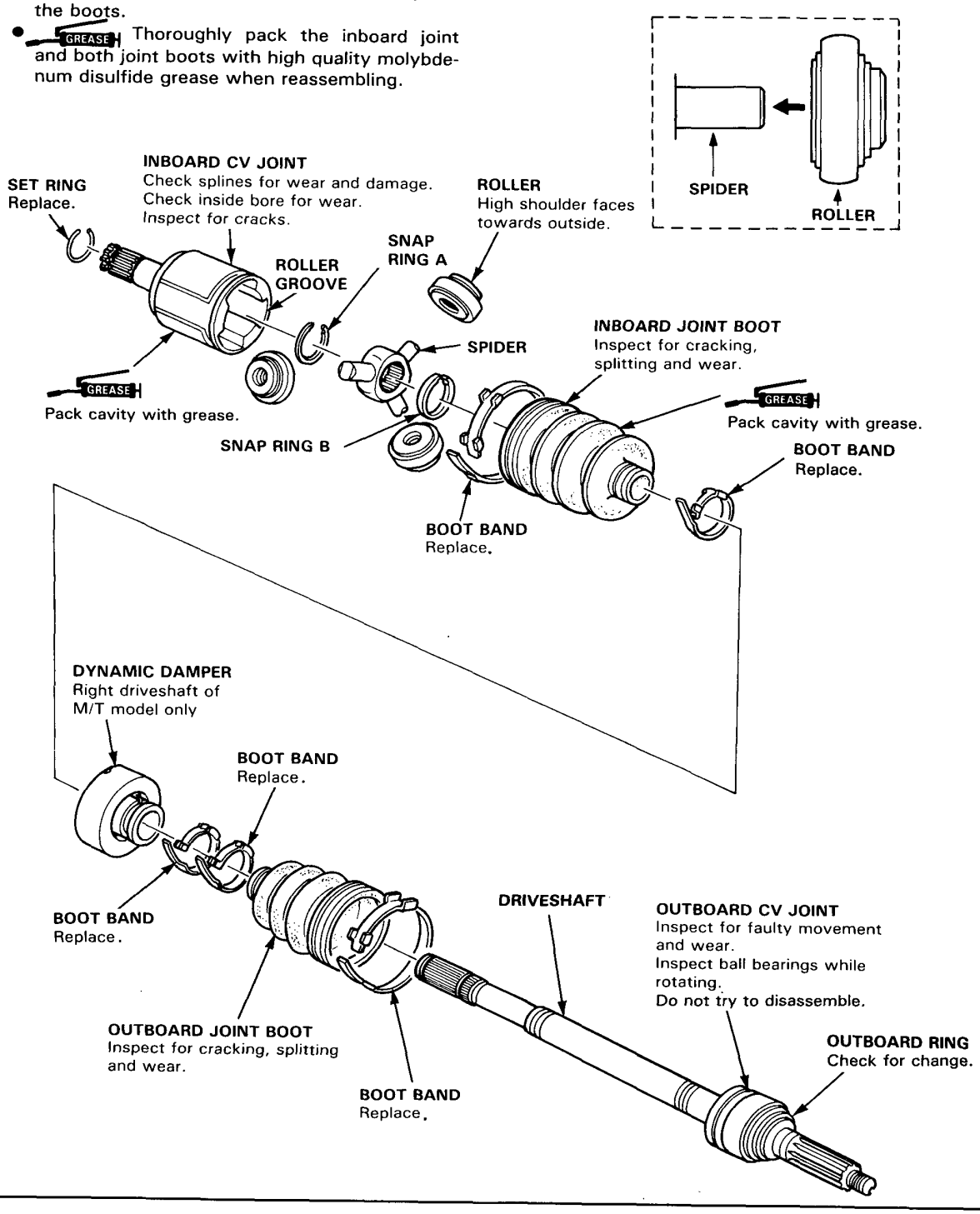
CAUTION:

- **Do not pull on the driveshaft, the CV joint may come apart.**
- **Use care when prying out the assembly and pull it straight to avoid damaging the differential oil seal.**

Disassembly/Inspection

NOTE:

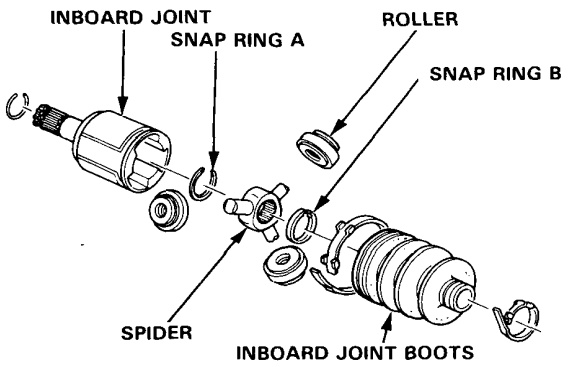
- Mark the rollers and roller grooves during disassembly to ensure proper positioning during reassembly.
- The inboard joint must be removed to replace the boots.
- GREASE Thoroughly pack the inboard joint and both joint boots with high quality molybdenum disulfide grease when reassembling.



Reassembly

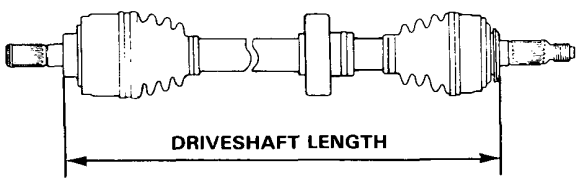
1. Install the outboard boot, dynamic damper (M/T right driveshaft only) and inboard boot to the drive shaft.
2. Install snap ring B into the driveshaft groove.
3. Install the spider on the driveshaft and secure with snap ring A.
4. Install the rollers to the spider with high shoulders facing outward.
5. Thoroughly pack the boots and inboard joint with molybdenum disulfide grease.
6. Install the driveshaft on the inboard joint.

CAUTION:
- **Reinstall the rollers to their original positions on the spider.**
- **Hold the driveshaft assembly so the inboard joint points up, to prevent it from falling off.**

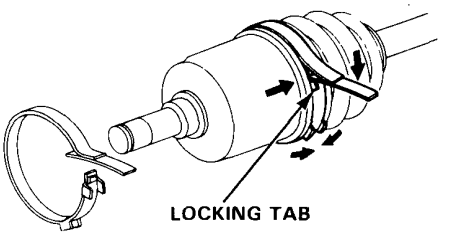


7. Adjust the length of the driveshafts to the figures given below, then adjust the boots to halfway between full compression and full extension.

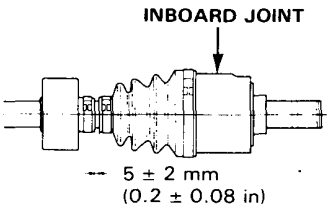
LEFT DRIVE SHAFT
M/T: 805–809.5 mm (31.7–31.9 in)
A/T: 812–816.5 mm (32.0–32.1 in)
RIGHT DRIVESHAFT
506–510.5 mm (19.9–20.1 in)



8. Install new boot bands on the boot and bend both sets of locking tabs.
9. Lightly tap on the doubled-over portions to reduce their height.

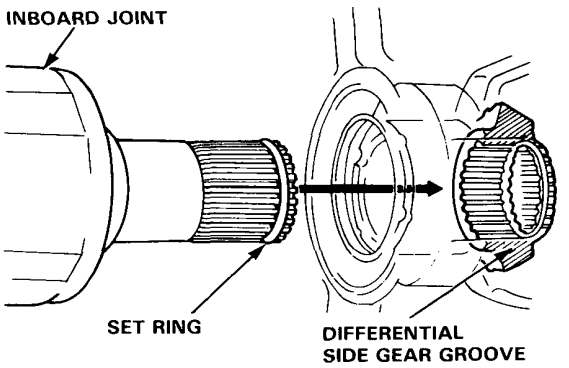


10. Position the dynamic damper as shown below (M/T right driveshaft only).



11. Install a new spring clip in the driveshaft groove.
12. Install the inboard end of the driveshaft into the differential.

CAUTION:
- **Always use a new spring clip whenever the driveshaft is being installed.**
- **Make sure the driveshaft locks in the differential side gear groove, and the CV joint subaxle bottoms in the differential.**



13. Top off the transmission oil to replace what leaked out during driveshaft removal.

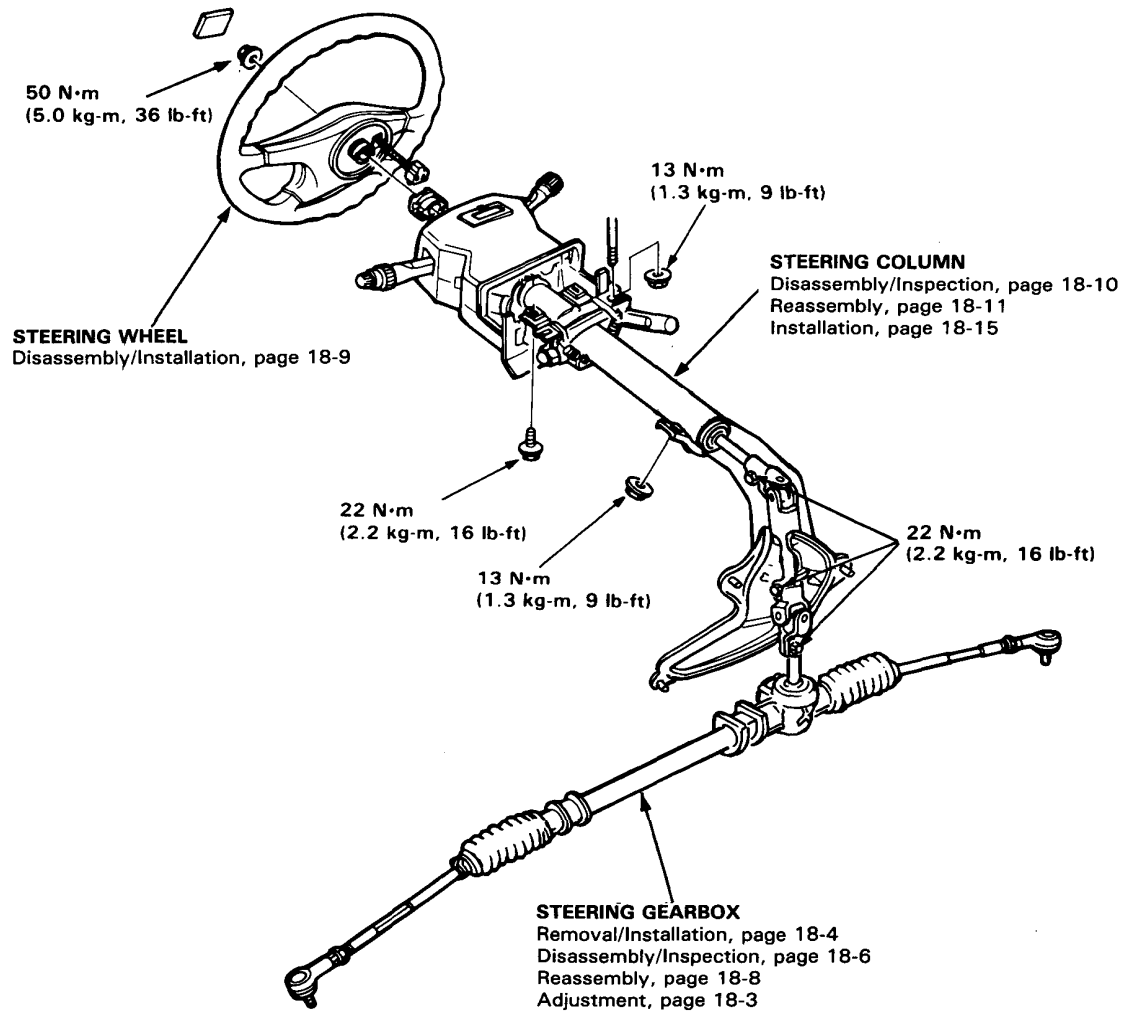
Steering

Manual Steering

Power Steering

Manual Steering

Index

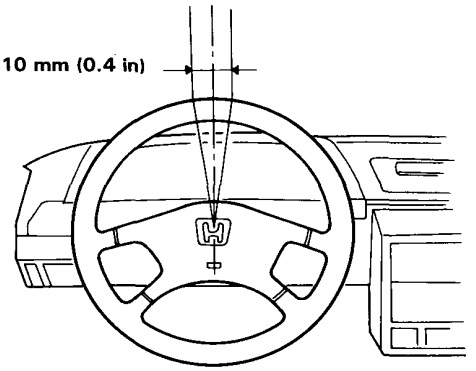


Inspection

Steering Wheel Rotational Play

1. Place the front wheels in a straight ahead position and measure the distance the steering wheel can be turned without moving the front wheels.
2. If the play exceeds the service limit, check all steering components.

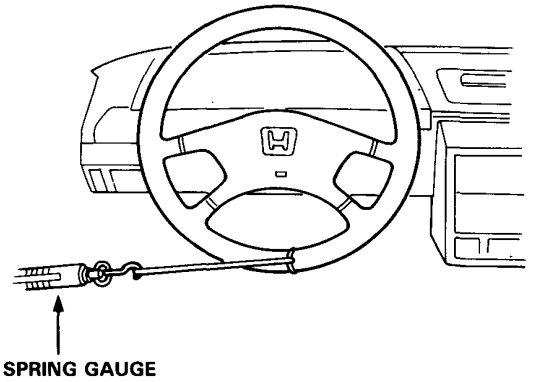
   Service Limit: 10 mm (0.4 in.)



Steering Effort Check

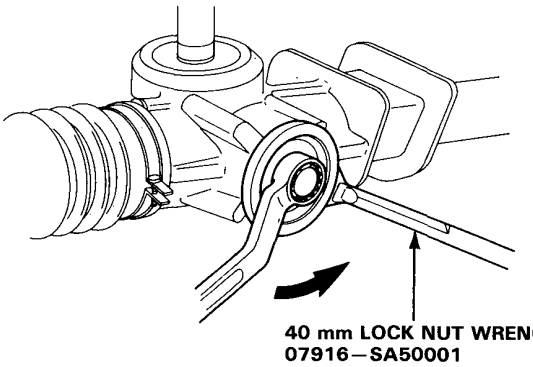
1. Raise the front wheels off the ground.
2. Turn the steering wheel with a spring gauge and check its reading.
3. If the reading exceeds the service limit, adjust the steering gearbox as shown below.

   Service Limit: 15 N (1.5 kg, 3.3 lbs)



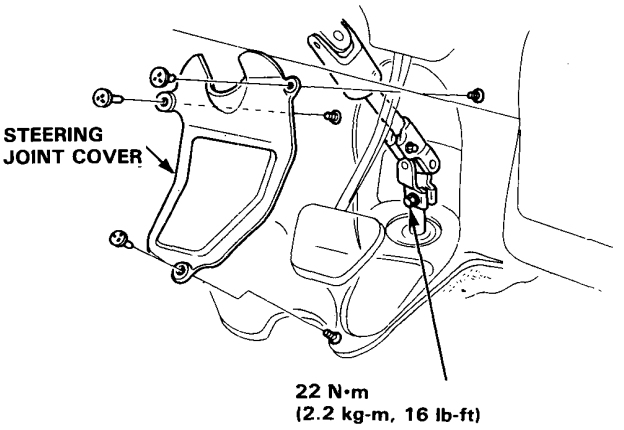
Rack Guide Adjustment

1. Loosen the locknut on the rack guide screw with the special wrench as shown.
2. Tighten the guide screw until it compresses the spring and seats against the guide, then loosen it.
3. Retighten it to about 4 N·m (0.4 kg-m, 2.9 lb-ft) and back it off about 50°.
4. Tighten the locknut to about 25 N·m (2.5 kg-m, 18 lb-ft) while preventing the guide screw from turning.
5. Check for tight or loose steering by turning front wheels through complete travel.
6. Recheck steering effort as shown above.

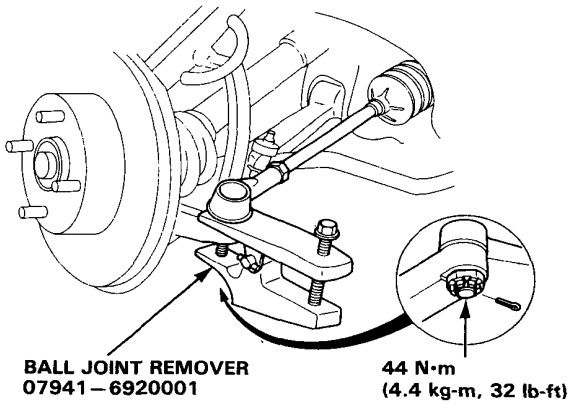


Removal/Installation

1. Remove the steering joint cover and disconnect the steering shaft from the gearbox.

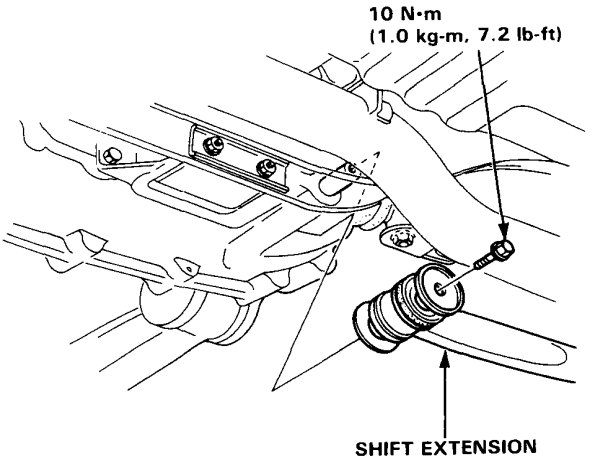


2. Jack up the front of car and support with safety stands in the proper locations.
3. Remove the gearbox shield and wash any dirt or oil off the gearbox using a so lvent and brush. Blow dry with compressed air.
4. Remove the front wheels.
5. Disconnect the tie-rods from the steering knuckles using the special tool as shown.

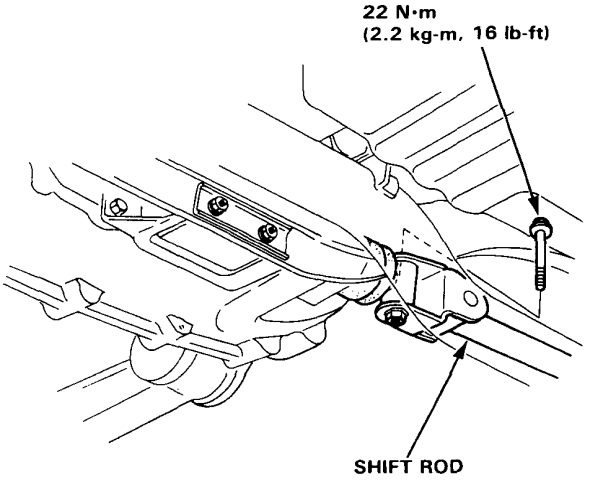


6-1 (Manual transmission model only)

- Remove the shift extension from the transmission case.

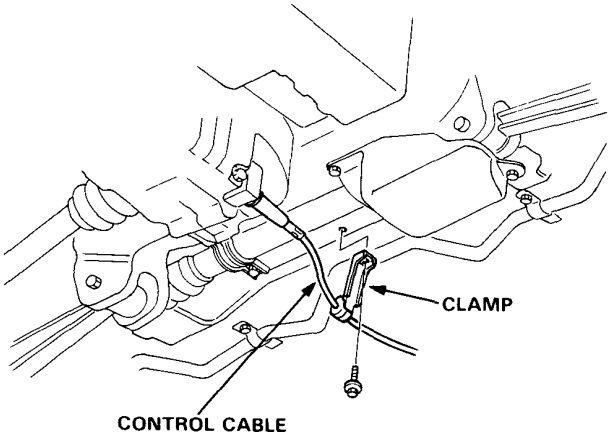


- Disconnect the gear shift rod from the transmission case by removing the 8 mm bolt.

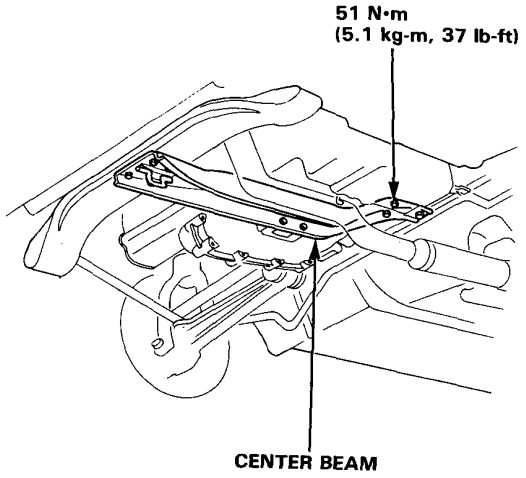


6-2 (Automatic Transmission Only)

- Remove the control cable clamp from the transmission housing.



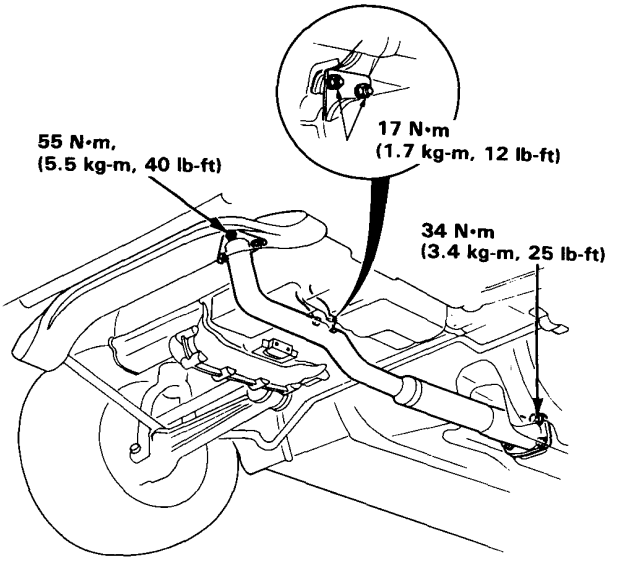
7. Remove the center beam bolts and center beam.



8. Disconnect the exhaust header pipe at the manufold.

CAUTION: Replace the exhaust gasket and selflocking nuts when you reinstall the pipe.

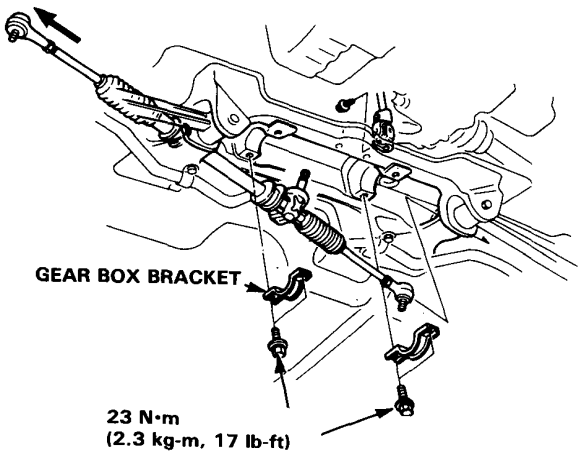
9. *Remove the exhaust header pipe joint nuts.*



10. Slide the tie rod all the way to the right (:LHD, left: RHD) side.

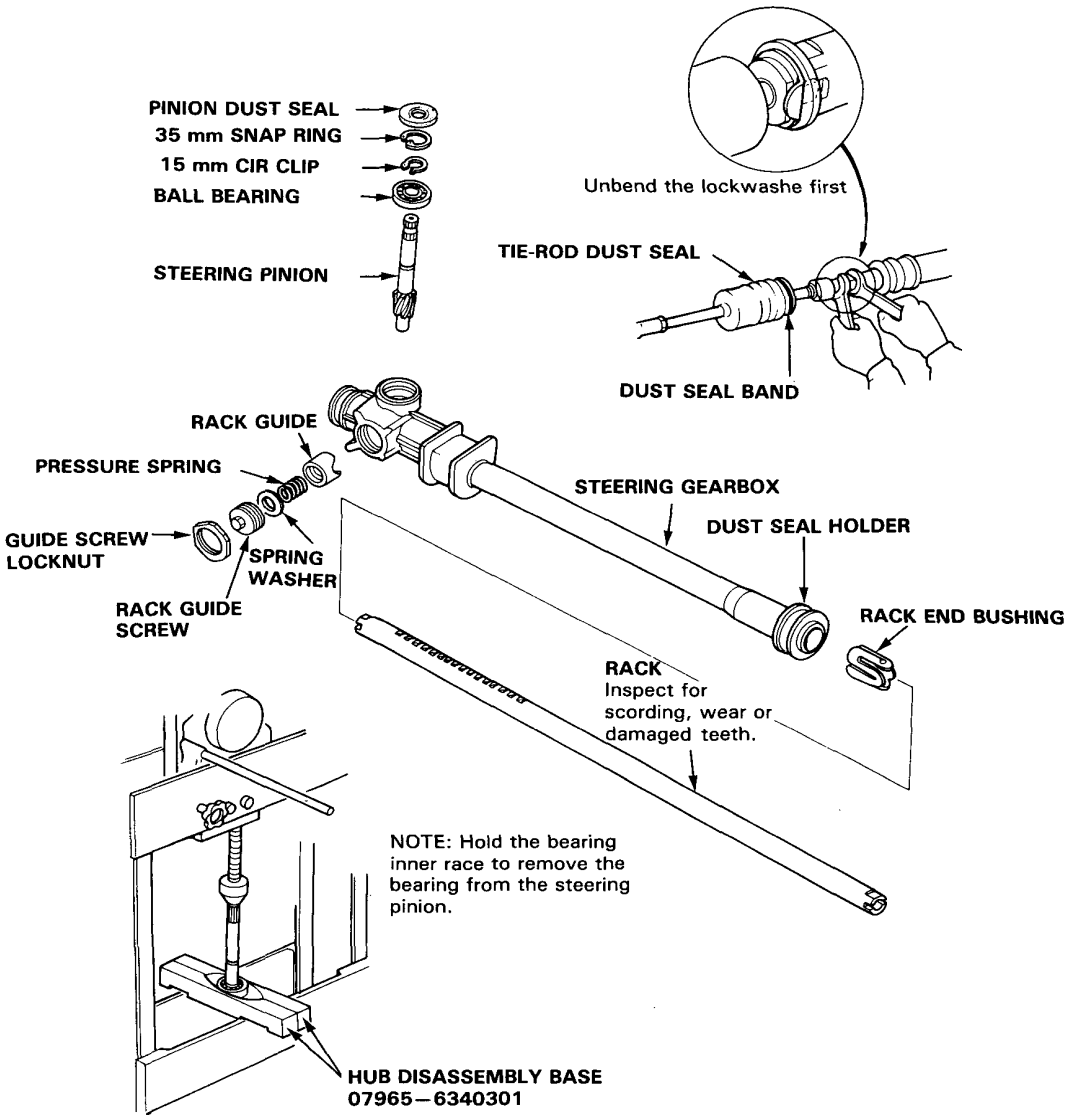
11. Remove the steering gearbox bracket bolts and gearbox bracket.

12. Slide the gearbox right (:LHD, left: RHD) so that the left (:LHD, right: RHD) tie-rod clears the bottom of the rear beam, then remove the gearbox.



Disassembly/Inspection

1. Carefully clamp the gearbox in a vise.
2. Loosen the dust seal bands, then pull the boots away from the ends of the gearbox and unbend the tie rod lock-washers.
3. Hold the rack and unscrew the tie-rods.
4. Remove the rack guide components from the gearbox.
5. Remove the pinion boot, pinion dust seal and 35 mm snap ring, then pull the pinion out of the gearbox.
6. Slide the rack out of the gearbox.

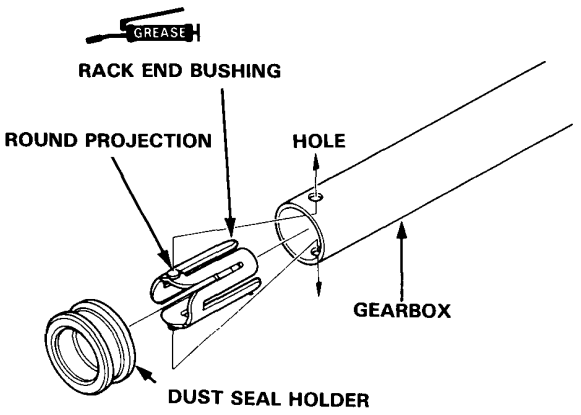


Rack End Bushing Installation

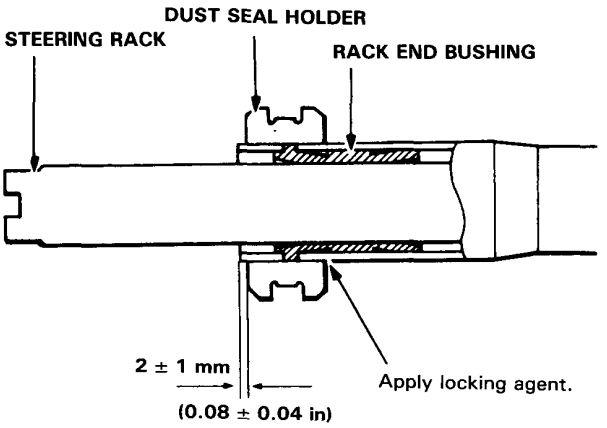
1. Apply 1—3 g of grease to the rack end bushing inner.

   CAUTION: Do not fill the slots with grease; they must remain open to serve as air passage.

2. Install the rack end bushing into the gearbox by aligning the round projections on the bushing with the holes in the gearbox.

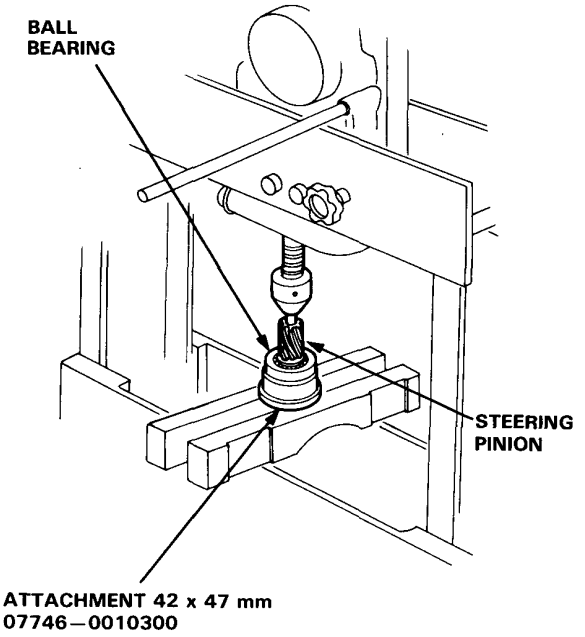


3. Install the dust seal holder on the gearbox as shown.



Pinion Bearing Installation

1. Press the steering pinion into the bearing using the attachment and hydraulic press.

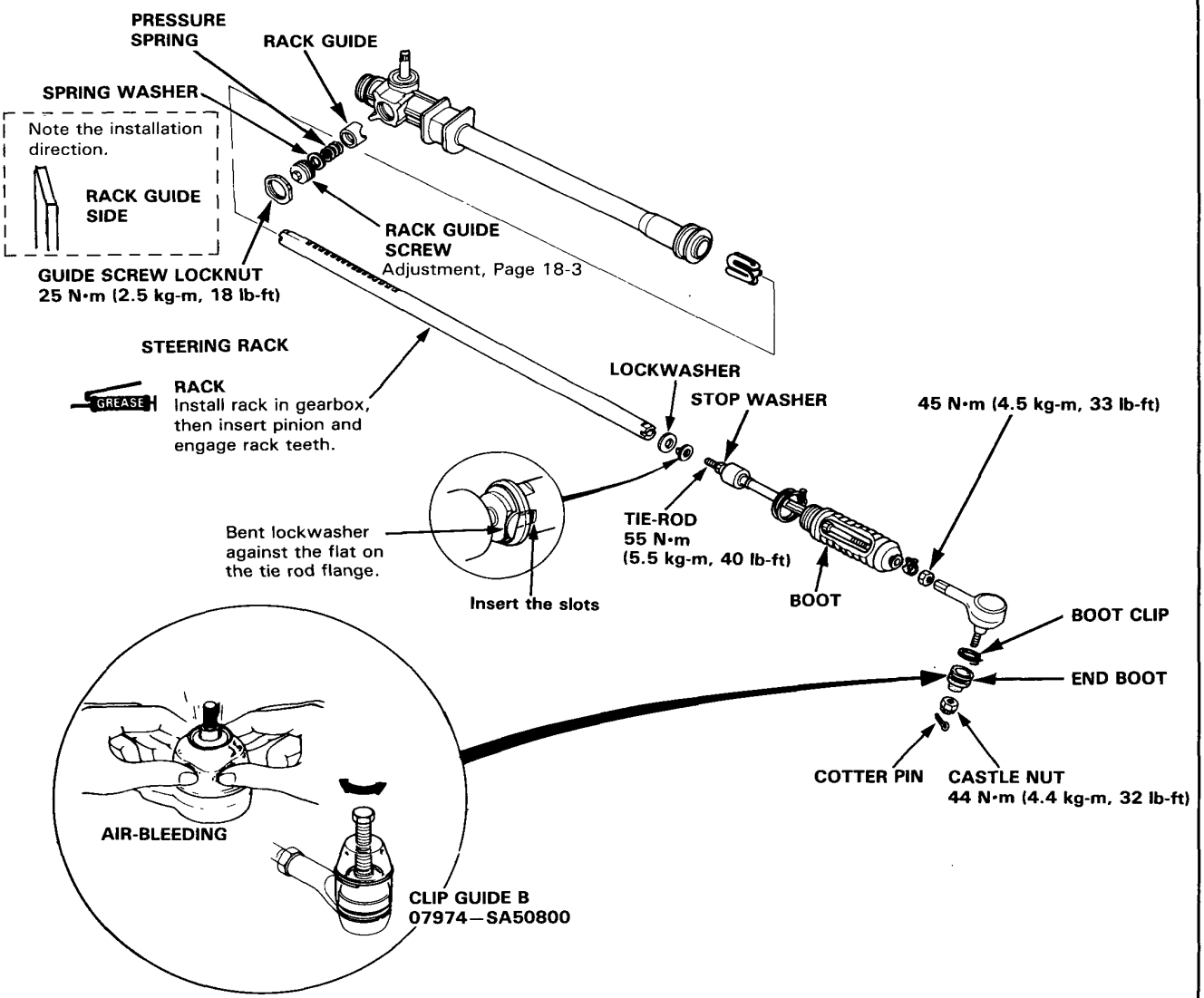


Reassembly

Reassemble the gearbox in the reverse order of disassembly, then:

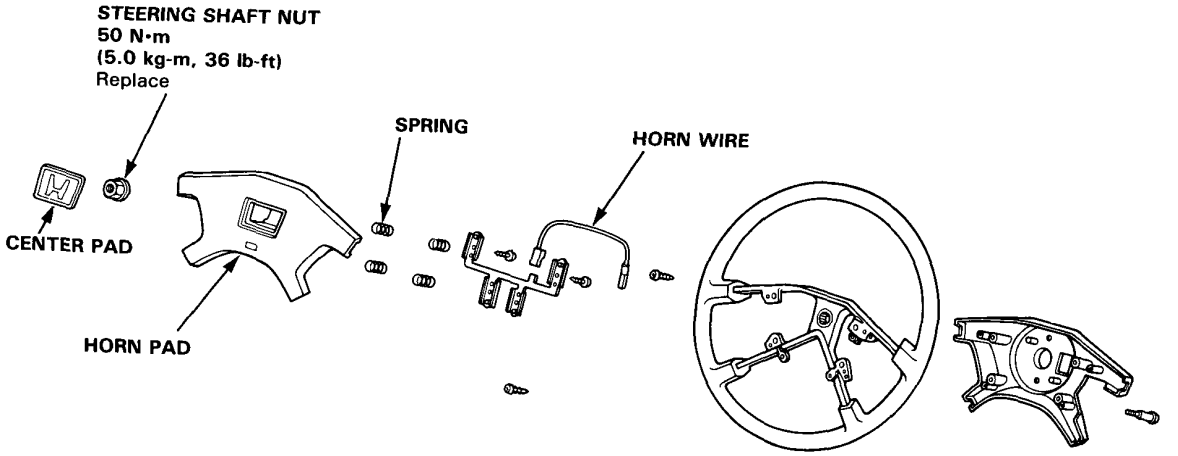
1. Put a new lockwasher and stop washer on the both tie rods.
2. Screw each tie-rod into the rack while holding the lockwasher so the tabs are in slots in the rack end. Tighten the tie-rod securely, then bend the lockwasher back against the flat as shown.
3. Install the boots and secure with the bands.
4. Pack the tie-rod ends with grease, them install on the tie-rods. Do not tighten the locknuts until the tie-rod has been adjusted (page 19-4).
5. Fill the tie-rod end boots with grease and install as shown; Replace the boots if they are cut or split.
6. Bleed air from the boots by gently squeezing them from the bottom up.
7. Install the boot clip on the special tool, then install the clip adjusting the boot depth by turning the adjuster bolt as shown.
8. Reinstall the gearbox (page 18-4).
9. Adjust the rack guide (page 18-3) and wheel alignment (page 19-4).

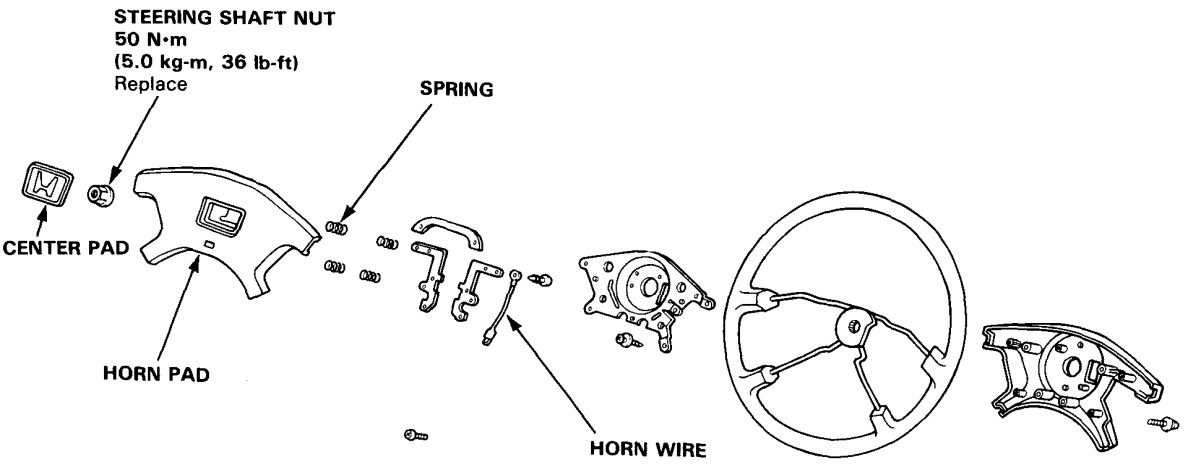
NOTE: Apply locking agent to the rack guide screw threads.



Steering Wheel

Disassembly/Reassembly



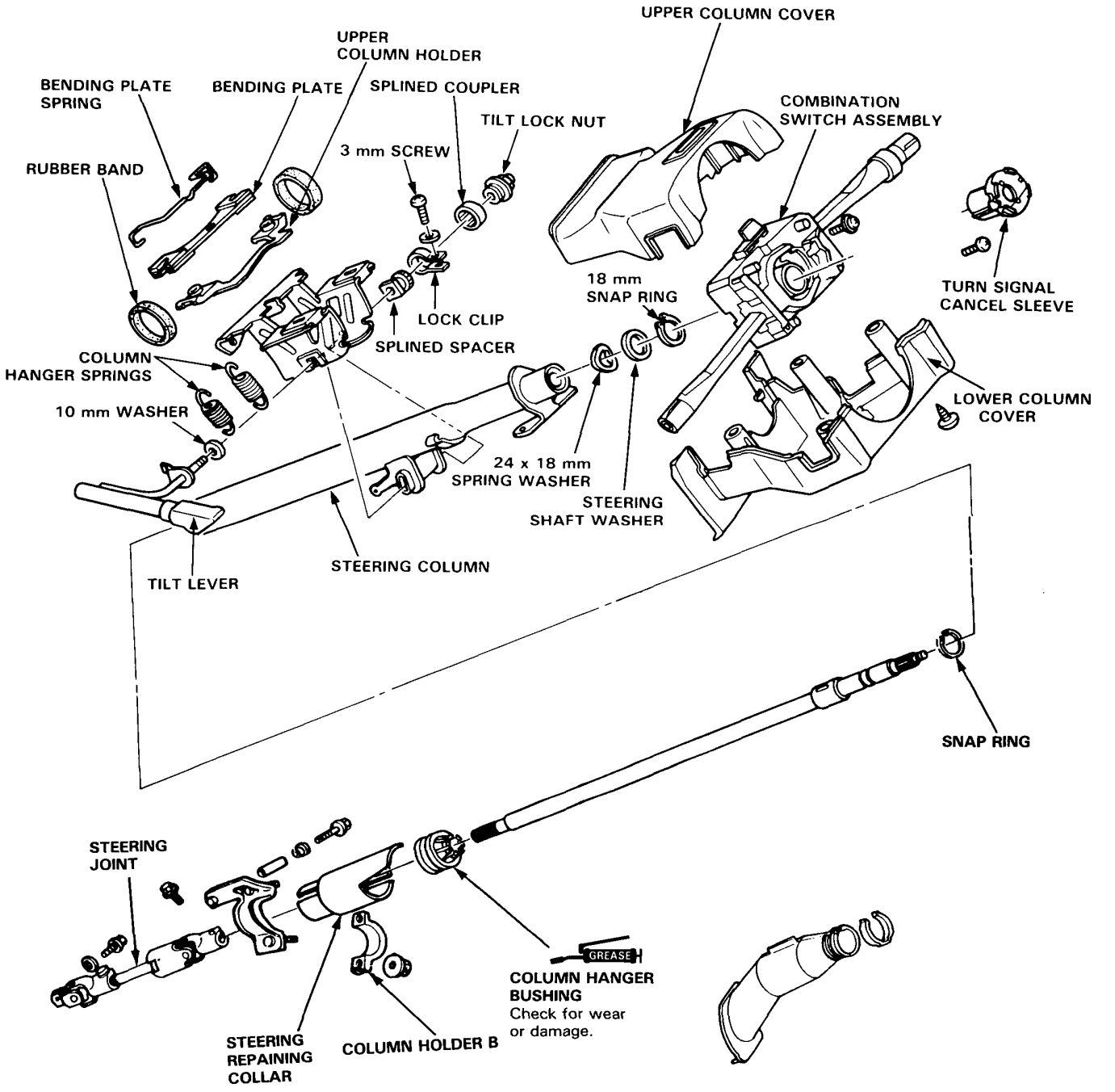


Column

Disassembly/Inspection

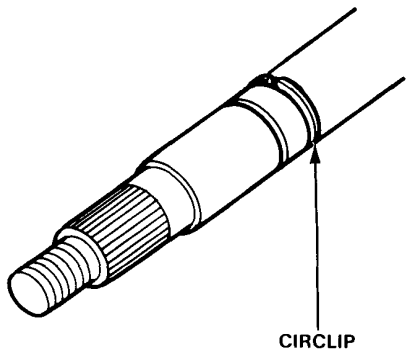
CAUTION: Do not drop the steering shaft; the impact may break the shear pin in the steering shaft.

1. Remove the upper and lower column covers.
2. Remove the turn signal cancel sleeve and combination switch assembly.
3. Remove the upper column holder, bending plate and bending plate spring by removing the rubber band.
4. Position the ignition switch in ACC.
5. Remove the 18 mm external circlip, then remove the steering shaft from bottom of the column.



Reassembly

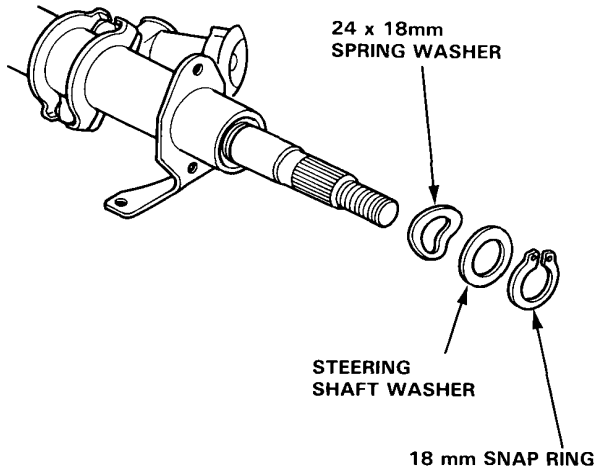
1. Install the circlip on the steering shaft.



2. Insert the steering shaft into the steering column from the bottom.

3. Install the 24 x 18 mm spring washer and steering washer on the steering shaft and secure with the 18 mm snap ring.

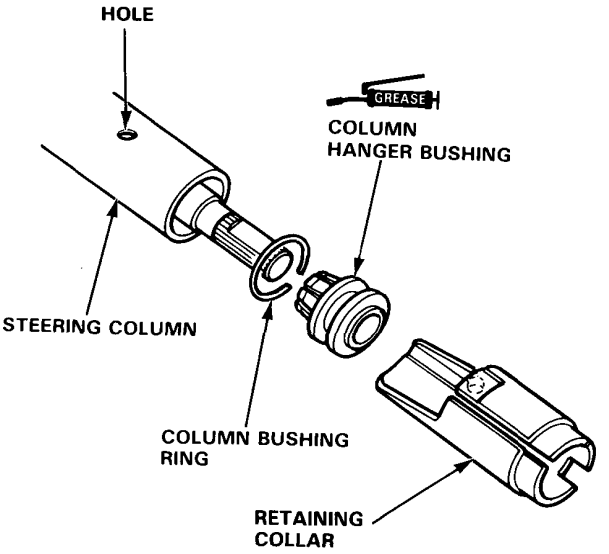
   NOTE: Install the spring washer as shown.



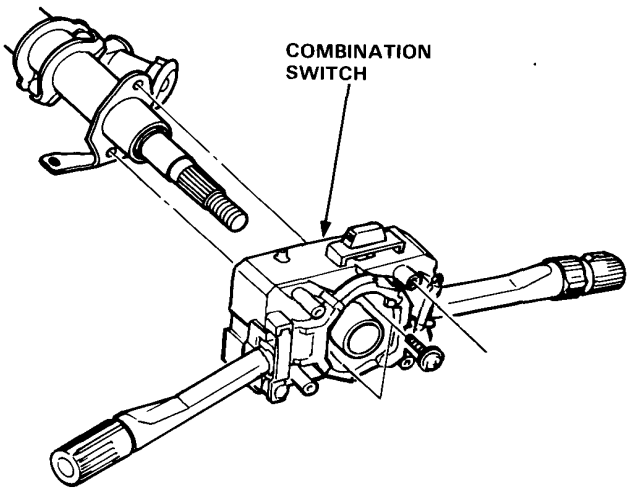
4. Install the column bushing ring on the column hanger bushing.

5. Install the column hanger bushing.

6. Install the retaining collar on the steering column aligning the hole in the column with tab on the retaining collar.



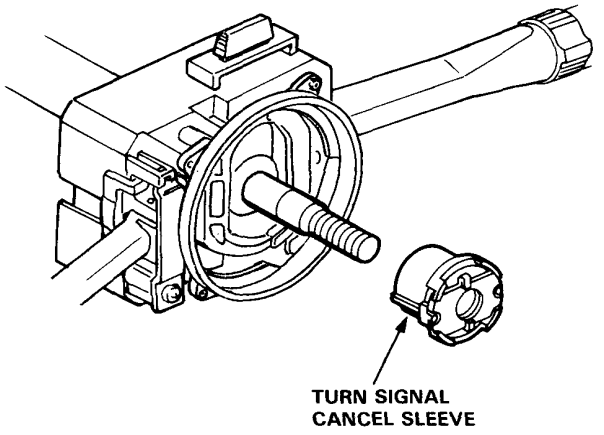
7. Install the combination switch assembly.



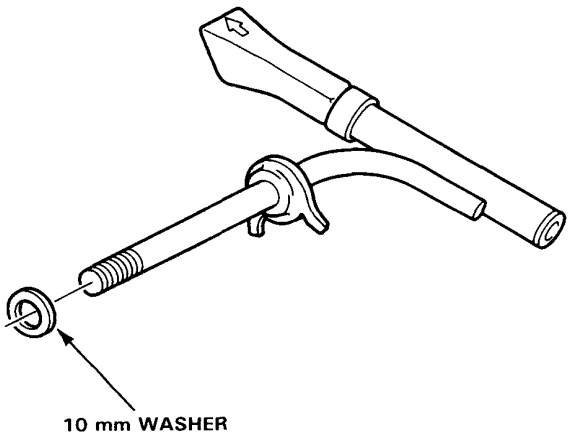
(cont'd)

Reassembly (cont'd)

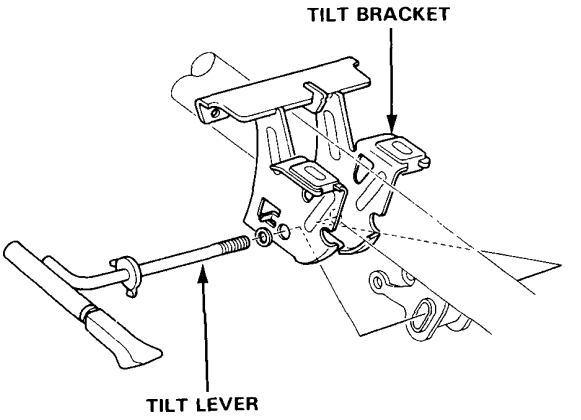
8. Install the turn signal cancel sleeve.



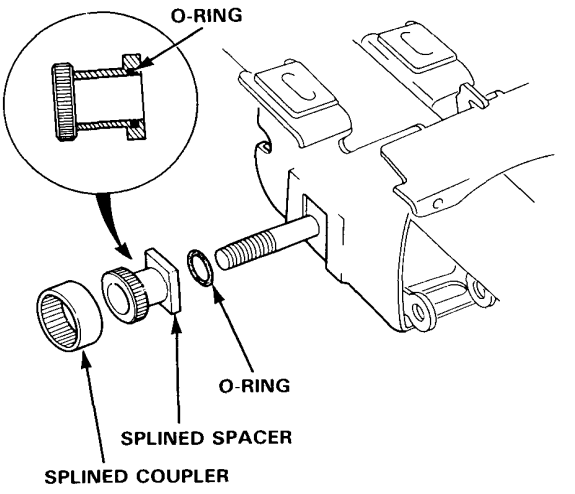
9. Fit the 10 mm washer on the tilt lever.



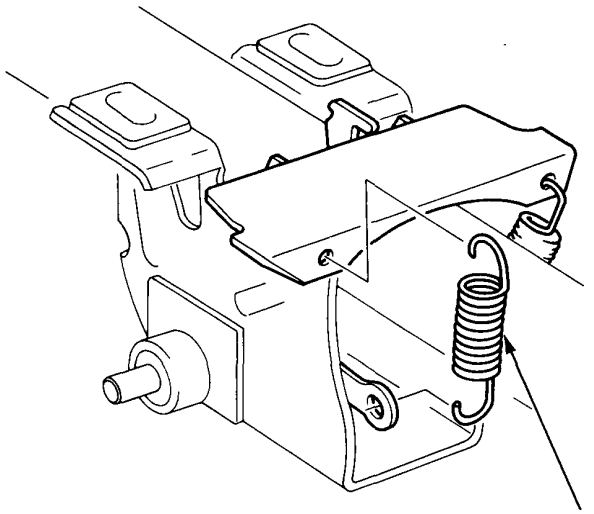
10. Fit the tilt bracket on the steering column and insert the tilt lever shaft.



11. Install the O-ring in the splined spacer.
12. Apply grease to the sliding surface and install the splined spacer to the tilt shaft.
13. Install the splined coupler onto the splined spacer.

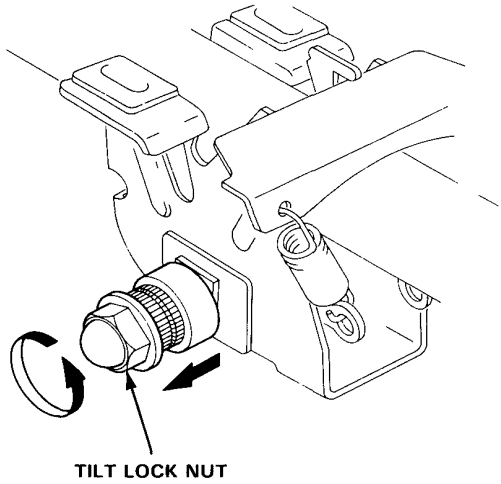


14. Install the column hanger springs between the tilt bracket and the steering column as shown.



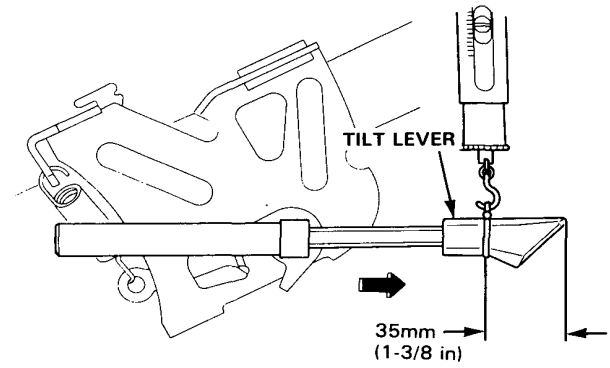
15. Tighten the tilt lock nut to 17 N•m (1.7 kg-m, 12 lb-ft), then slide the splined coupler toward the tilt lock nut until it stops.

NOTE:
- The tilt lock nut has left hand threads.
- If necessary, align the splines on the lock nut and spacer by turning the tilt shaft slightly.

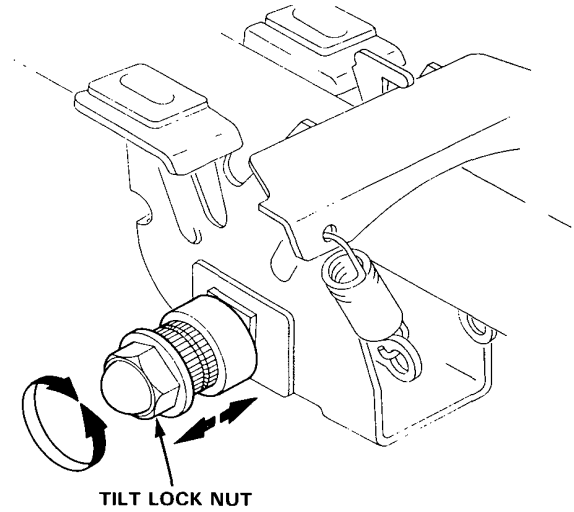


16. Pull the tilt lever out fully and attach a spring scale 35 mm (1-3/8 in) from the end of the knob. Measure the force required to move the lever.

PRELOAD:
98–147N (10.0–15.0 kg, 4.5–6.8 lb)



17. If the force measured is not within the specification, slide the splined coupler toward the splined spacer, and tighten or loosen the tilt lock nut until the correct force is obtained.

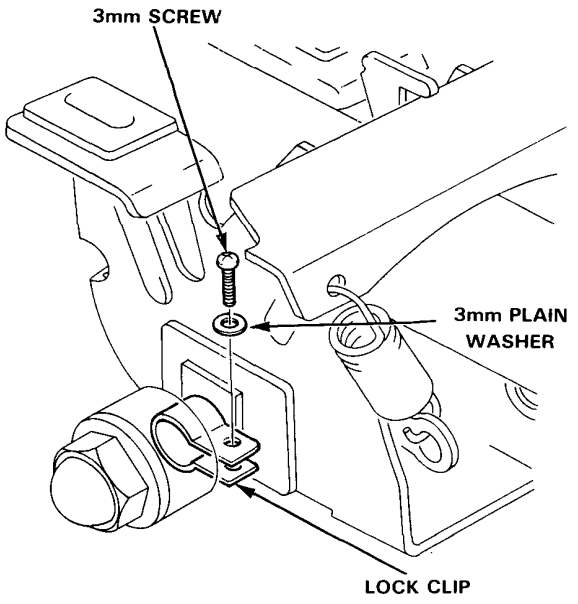


(cont'd)

Reassembly (cont'd)

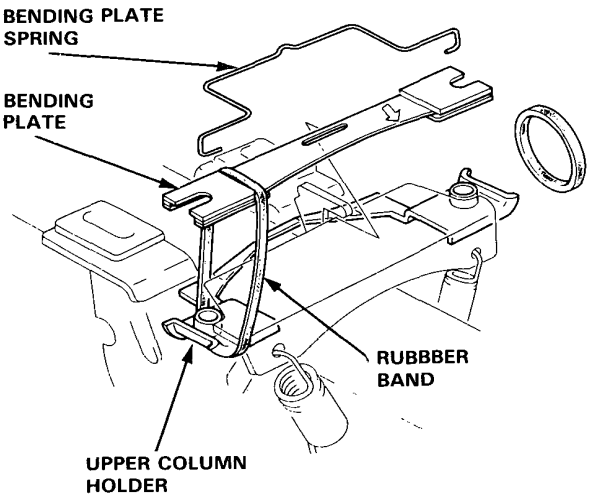
18. Slide the splined coupler toward tilt lock nut.

19. Install the lock clip between the splined coupler and splined spacer and tighten the screw.



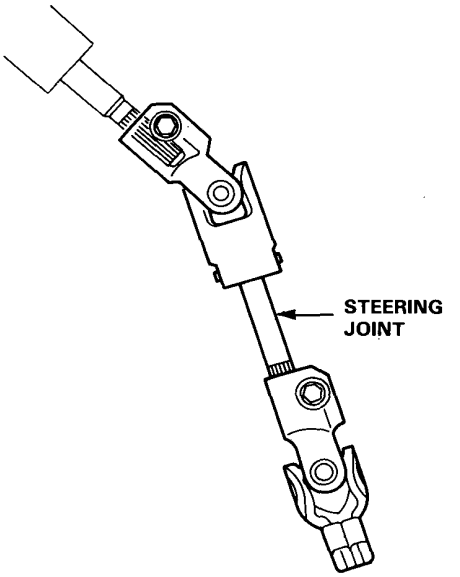
20. Install the upper column holder and bending plate on the steering column with the rubber bands.

    NOTE: Install the bending plate with arrow mark facing the steering gear box.



21. Install the bending plate spring.

22. Loosely install the steering joint on the steering shaft.

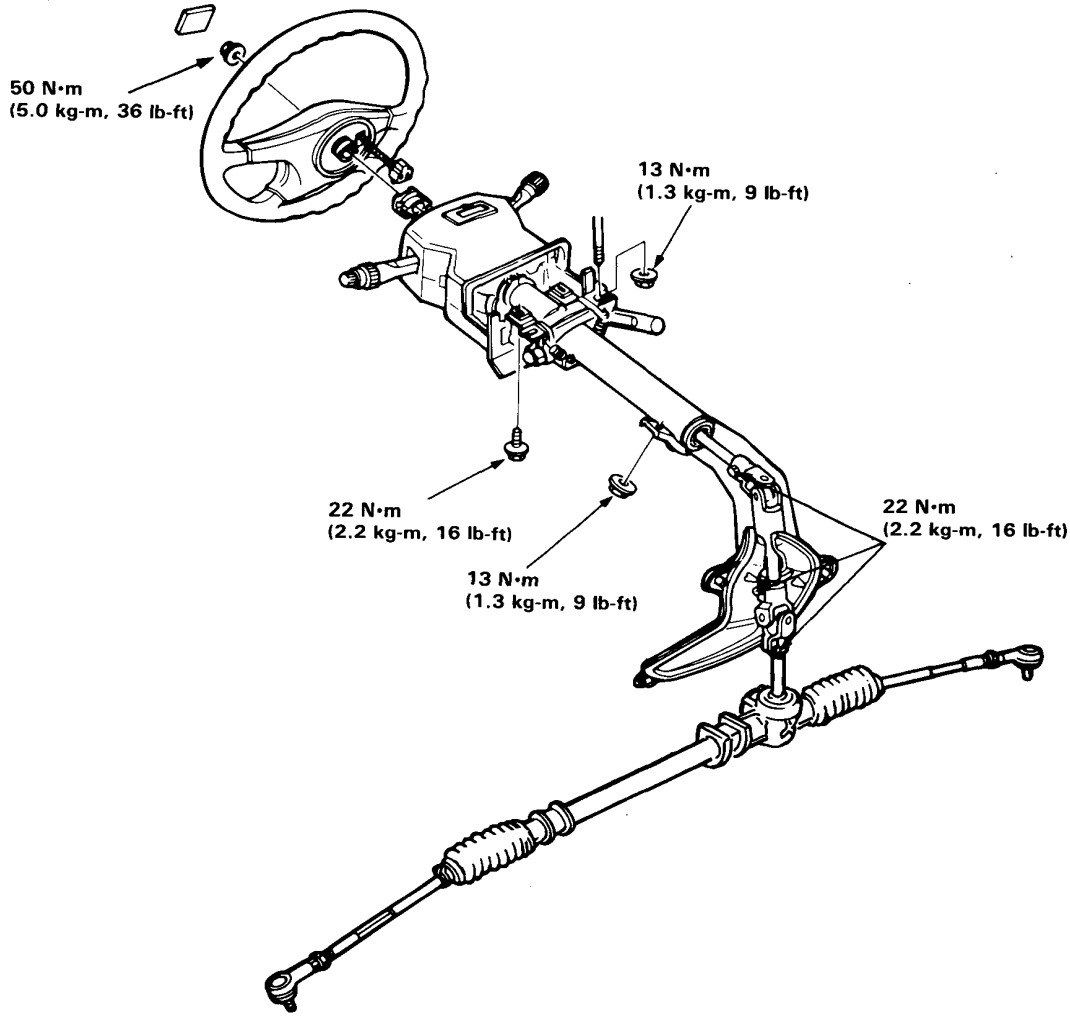


Installation

1. Install the steering joint in the steering pinion and loosely tighten the bolts.
2. Connect the combination switch couplers.
3. Install the upper and lower column covers.
4. Install and tighten the bending plate nuts and column mounting bolts.
5. Tighten the column holder B mounting nuts.

CAUTION: Make sure that the lower steering joint is not removed out when the lower steering joint is pulled up.

6. Tighten the steering pinion joint bolt.
7. Tighten the steering joint bolts.
8. Install the steering joint cover.
9. Install the steering column lower panel.
10. Install the steering wheel and tighten the nut.

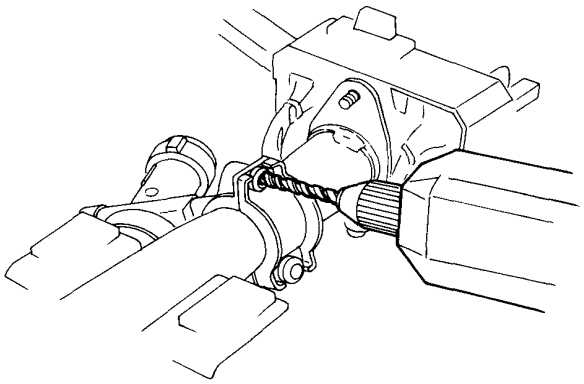


Steering Lock

Steering Lock Replacement

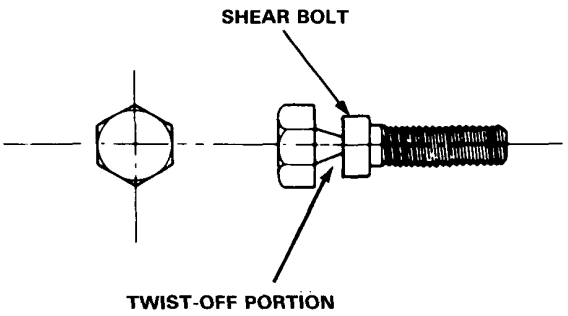
1. Remove the steering column covers.
2. Center punch each of 2 shear bolts and drill their heads off with a 3/8 in. drill bit.

   CAUTION: Do not damage the switch body when removing the shear bolt heads.
3. Remove the shear bolts from the switch body.



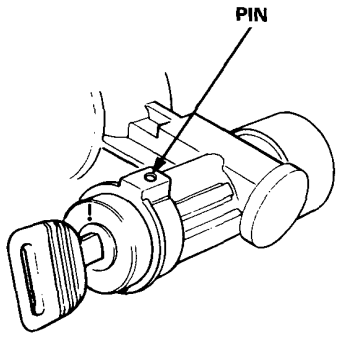
4. Install the new ignition switch without the key inserted.
5. Loosely tighten the new shear bolts.

   NOTE: Make sure the projection on the ignition switch is aligned with the hole in the steering column.
6. Insert the ignition key and check for proper operation of the steering wheel lock and that the ignition key turns freely.
7. Tighten the shear bolts until the hex heads twist off.

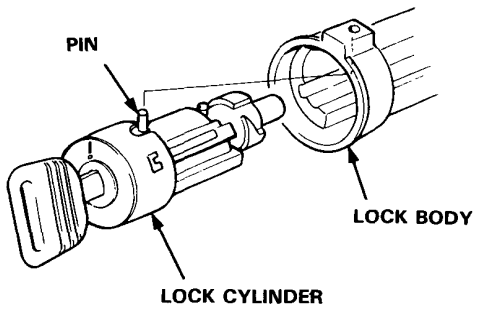


Lock Cylinder Replacement

1. Remove the ignition switch.
2. Turn the ignition key to "I"
3. Push the pin in and remove the lock cylinder from the lock body.

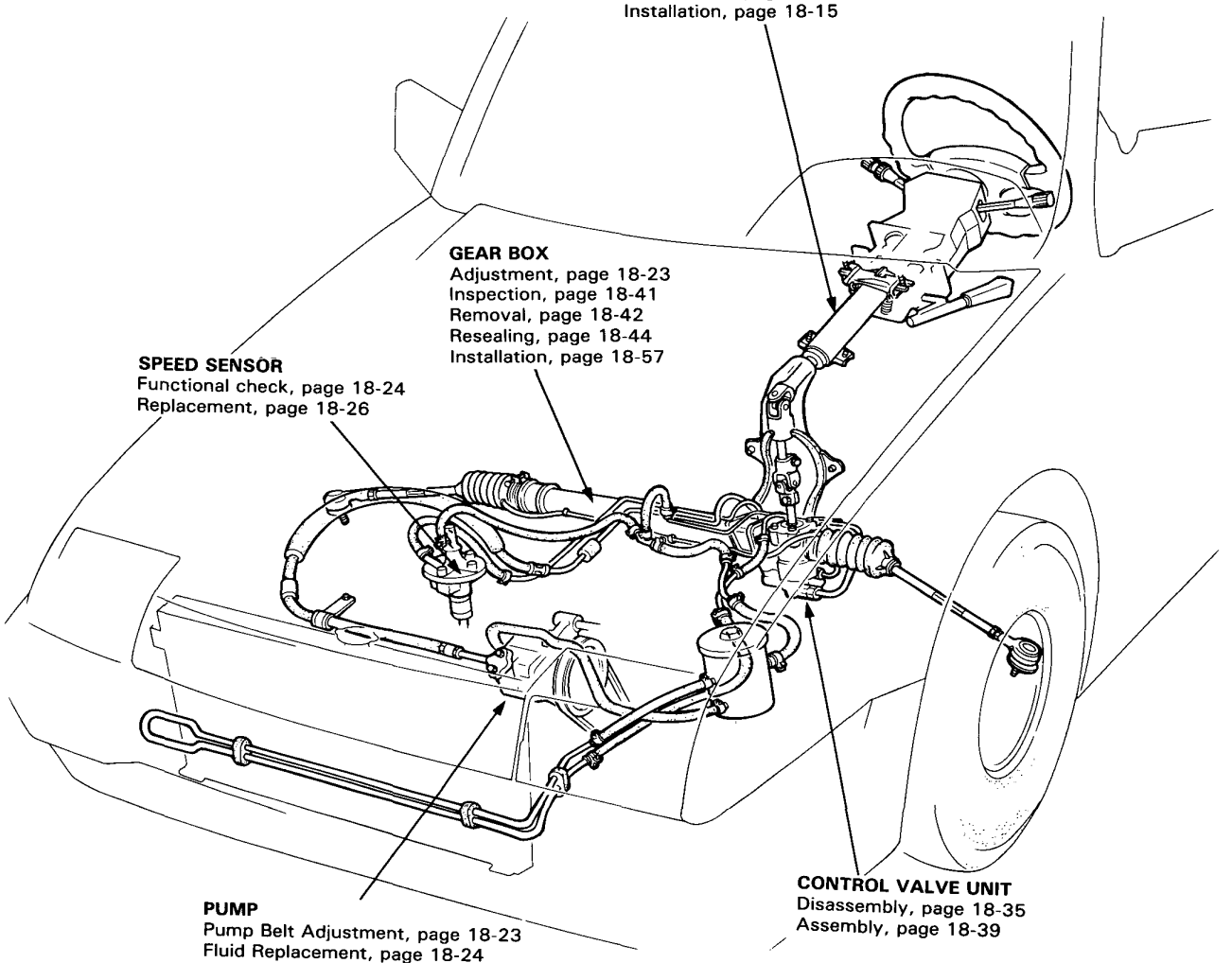


4. Turn the key to "O" and align the lock cylinder with the lock body.
5. Turn slightly the key almost to "I" and insert the lock cylinder until the pin touches the body.
6. Turn the key to the "I", push the pin and insert the lock cylinder into the lock body until the pin clicks into place.



7. Install the ignition switch.

Index

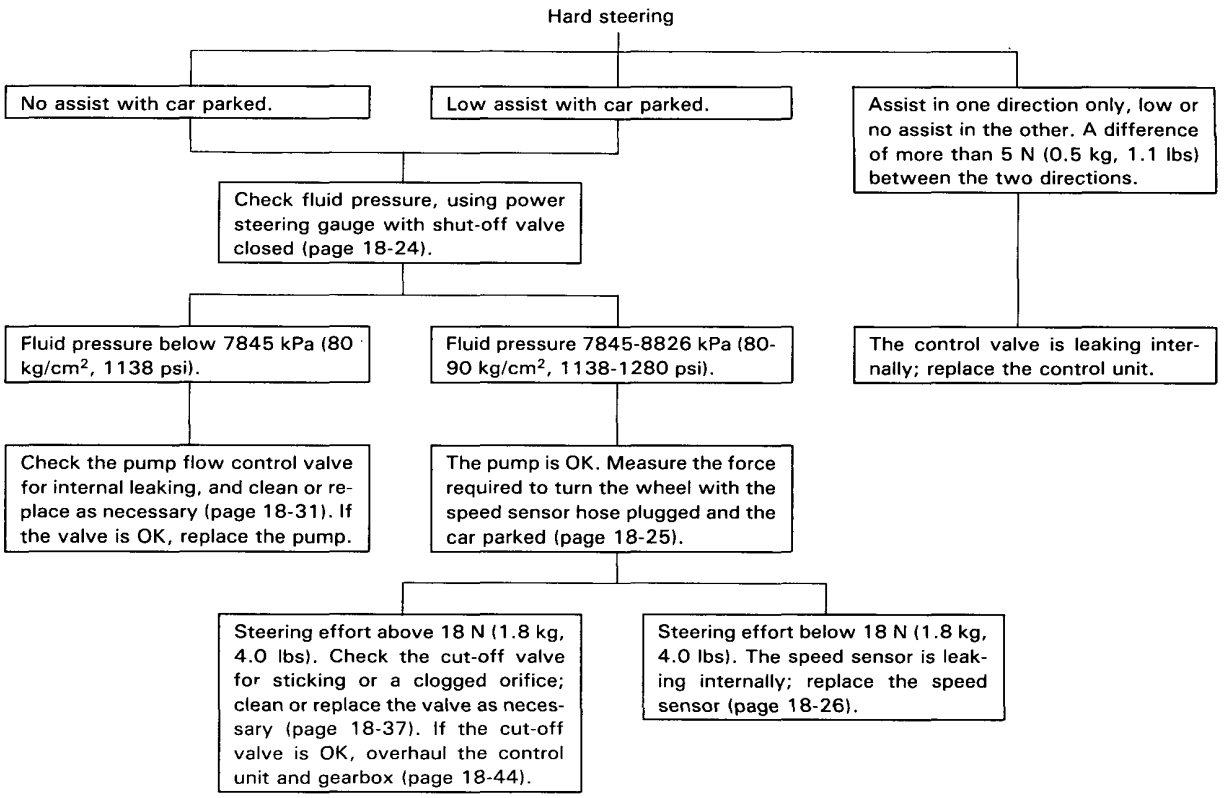

COLUMN
Disassembly/Inspection, page 18-10
Reassembly, page 18-11
Installation, page 18-15
GEAR BOX
Adjustment, page 18-23
Inspection, page 18-41
Removal, page 18-42
Resealing, page 18-44
Installation, page 18-57
SPEED SENSOR
Functional check, page 18-24
Replacement, page 18-26
PUMP
Pump Belt Adjustment, page 18-23
Fluid Replacement, page 18-24
Pump Pressure Check, page 18-24
Inspection, page 18-27
Pump Replacement, page 18-28
Control Valve Inspection and Replacement, page 18-29
Resealing, page 18-32
CONTROL VALVE UNIT
Disassembly, page 18-35
Assembly, page 18-39

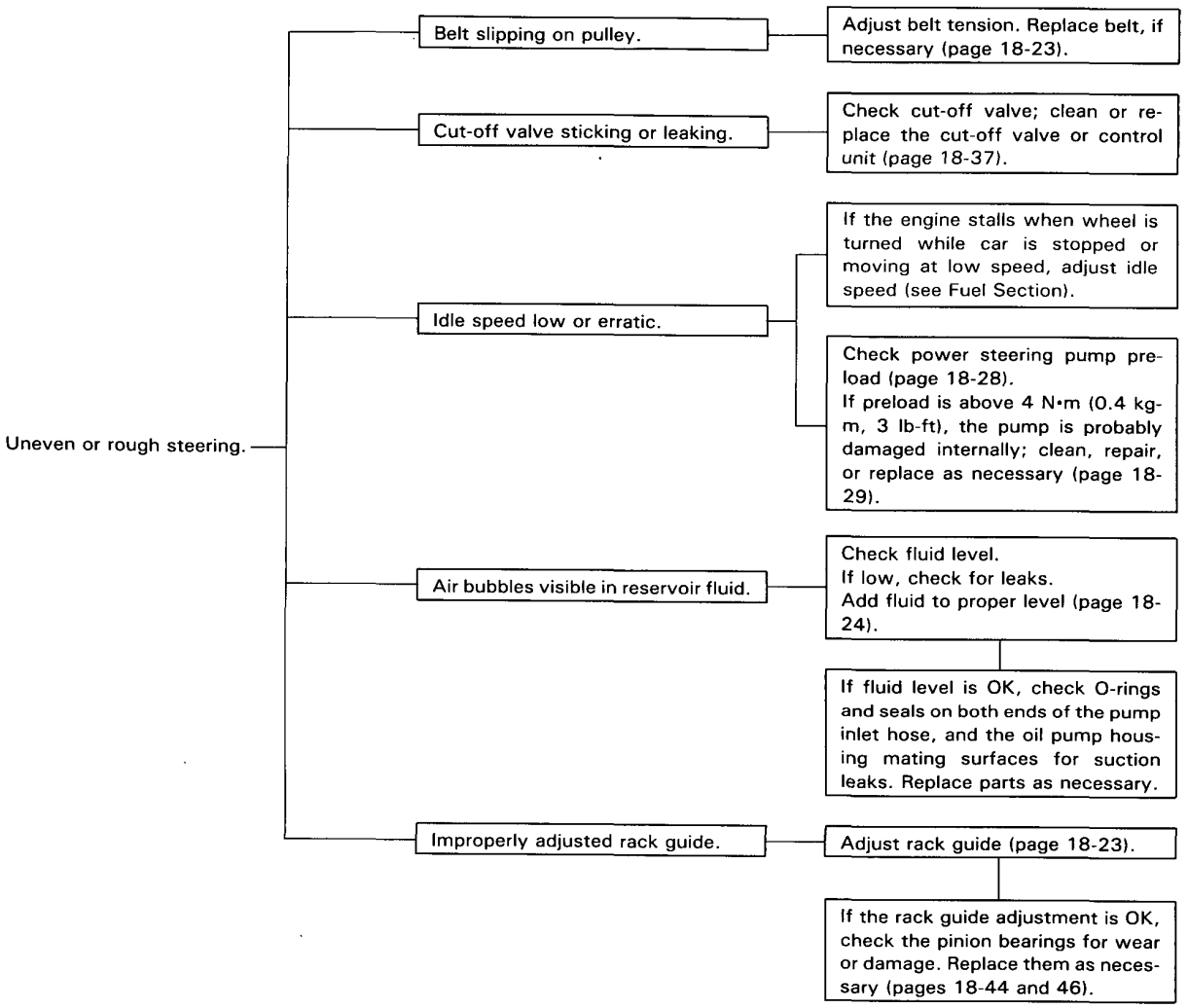
Troubleshooting

General

Check the following before you begin:

- Has the suspension been modified in a way that would affect steering?
- Are tire sizes and air pressure correct?
- Is the steering wheel original equipment or equivalent?
- Is the power steering pump belt properly adjusted?
- Is steering fluid reservoir filled to proper level?
- Is the engine idle speed correct and steady?




Uneven or rough steering.
Belt slipping on pulley.
Adjust belt tension. Replace belt, if necessary (page 18-23).
Cut-off valve sticking or leaking.
Check cut-off valve; clean or replace the cut-off valve or control unit (page 18-37).
Idle speed low or erratic.
If the engine stalls when wheel is turned while car is stopped or moving at low speed, adjust idle speed (see Fuel Section).
Check power steering pump preload (page 18-28).
If preload is above 4 N•m (0.4 kg-m, 3 lb-ft), the pump is probably damaged internally; clean, repair, or replace as necessary (page 18-29).
Air bubbles visible in reservoir fluid.
Check fluid level.
If low, check for leaks.
Add fluid to proper level (page 18-24).
If fluid level is OK, check O-rings and seals on both ends of the pump inlet hose, and the oil pump housing mating surfaces for suction leaks. Replace parts as necessary.
Improperly adjusted rack guide.
Adjust rack guide (page 18-23).
If the rack guide adjustment is OK, check the pinion bearings for wear or damage. Replace them as necessary (pages 18-44 and 46).

(cont'd)

General (cont'd)

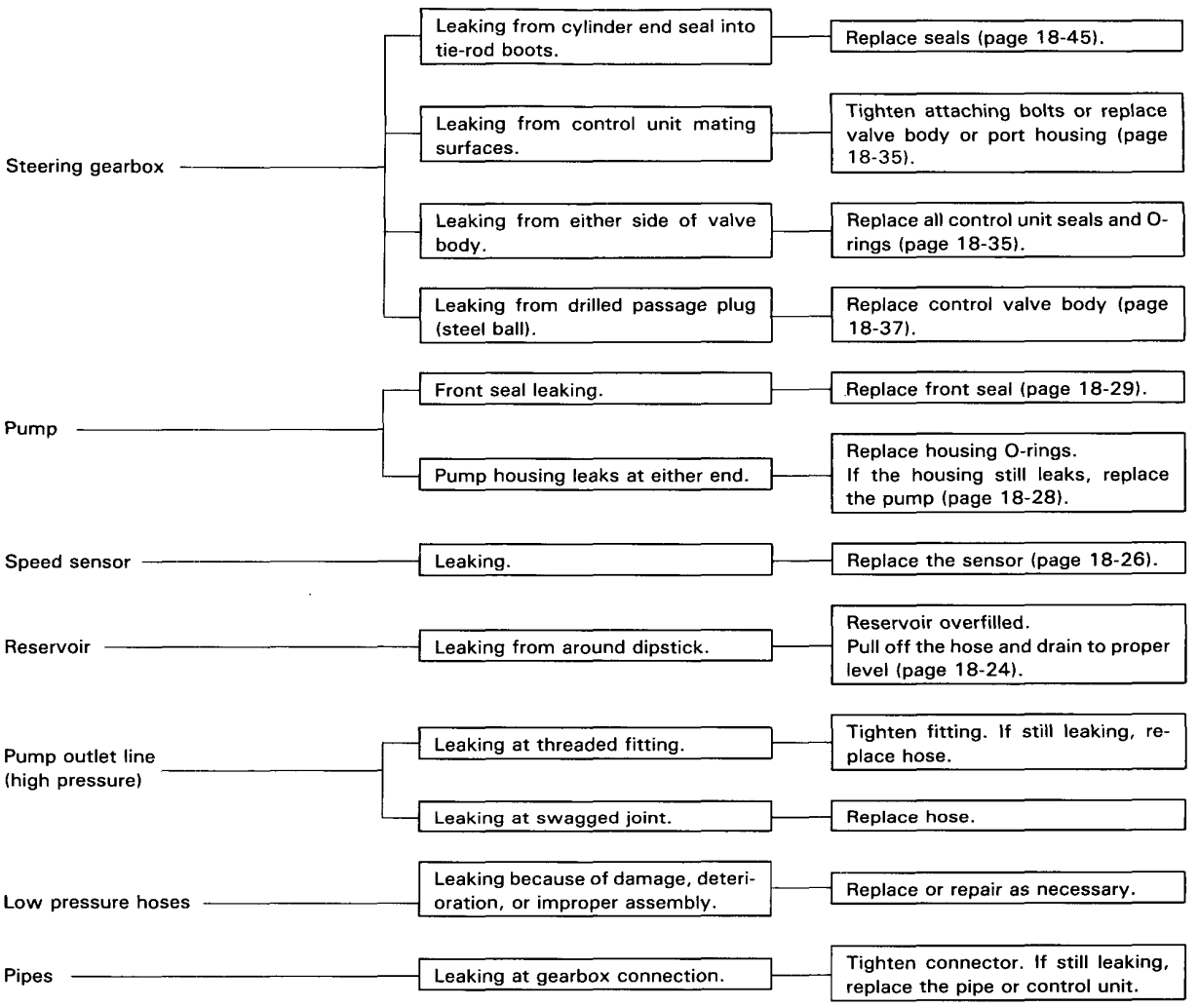
Shock or vibration when wheel is turned to full lock.	Pump belt slipping on pulley (pump stops momentarily).	Adjust belt tension (page 18-23) or replace belt.
	Sticking relief valve; pulsation exceeds 980 kPa (10 kg/cm^2, 142 psi).	Check flow control valve (page 18-31); clean or replace as necessary. If the flow control valve is OK, replace the pump.
Assist (excessively light steering) at high speed.	Measure force required to turn wheel with bypass tube installed, and car parked on dry paved surface (page 18-26).	If below 50 N (5.0 kg, 11 lbs), check cut-off valve and control unit and replace parts as necessary.
Steering kicks back during wide turns.	Pump belt slipping.	Adjust belt tension (page 18-23) or replace belt.
	Sticking cut-off valve or control valve.	Replace cut-off valve or control unit.
	Rack guide adjusted too loose.	Adjust rack guide (page 18-23).
Wheel will not return smoothly.	Tire pressure too low.	Inflate to correct pressure.
	Improper front wheel alignment.	Readjust front wheel alignment or replace parts as necessary.
	Improperly adjusted rack guide.	Adjust rack guide (page 18-23).

Noise and Vibration

NOTE: Pump noise within 2—3 minutes after starting in cold weather (– 20°C, – 4°F or colder) is normal.

Humming	Humming, due to pulsation of fluid, is normal, particularly when wheel is turned with car stopped.	
	If equipped with Automatic transmission, the hum could be torque converter or pump noise.	Confirm by temporarily removing pump belt.
	High pressure line touching the frame.	Reposition the line.
Squeaking	Belt slipping.	Tighten or replace belt.
	Pinion shaft seal not lubricated.	Grease it.
	Horn contact not lubricated, or under too much pressure.	Grease the contact, or bend it to reduce the pressure.
	Burrs on the pinion gear.	Remove pinion and file burrs smooth.
Rattle or chattering	NOTE: A single "clunk" may be a normal amount of linkage clearance. To distinguish this type of clunk, turn the wheel back and forth with the engine OFF.	
	Loose pump pulley.	Tighten or replace pulley. If shaft is loose, replace the pump.
	Loose steering shaft connector, tie-rod, or ball joint.	Check and tighten, or replace parts as necessary.
	Lower column hanger bushing damaged.	Replace bushing.
Hissing	Lines or hoses from the control unit touching each other.	Reposition lines so they don't touch.
	Noise from control valve.	Replace the control unit.
Pump gear noise	NOTE: Pump noise up to 2-3 minutes after starting in cold weather (–20°C, –4°F or colder) is normal. Compare pump noise at operating temperature to another car.	If pump noise is abnormally loud, check the pump drive and driven gears (page 18-32)
Grating noise from pump	Cavitation caused by air bubbles in fluid.	Check fluid level. If low, fill reservoir to proper level, and check for leaks. Tighten or replace as necessary.
		Check for crushed suction hose or a loose hose clamp allowing air into the system. Tighten or replace as necessary.

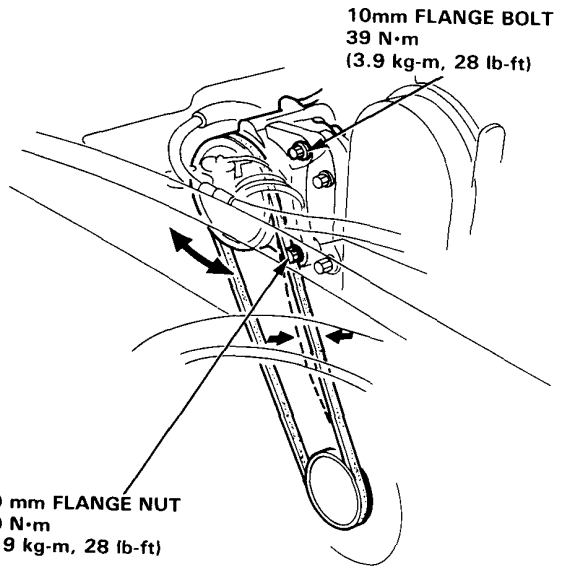
Fluid Leaks

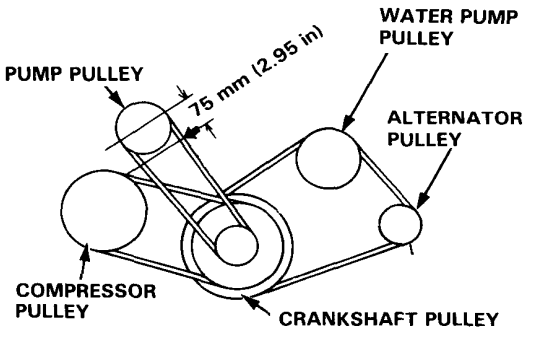

Steering gearbox
Leaking from cylinder end seal into tie-rod boots.
Replace seals (page 18-45).
Leaking from control unit mating surfaces.
Tighten attaching bolts or replace valve body or port housing (page 18-35).
Leaking from either side of valve body.
Replace all control unit seals and O-rings (page 18-35).
Leaking from drilled passage plug (steel ball).
Replace control valve body (page 18-37).
Pump
Front seal leaking.
Replace front seal (page 18-29).
Pump housing leaks at either end.
Replace housing O-rings. If the housing still leaks, replace the pump (page 18-28).
Speed sensor
Leaking.
Replace the sensor (page 18-26).
Reservoir
Leaking from around dipstick.
Reservoir overfilled. Pull off the hose and drain to proper level (page 18-24).
Pump outlet line (high pressure)
Leaking at threaded fitting.
Tighten fitting. If still leaking, replace hose.
Leaking at swagged joint.
Replace hose.
Low pressure hoses
Leaking because of damage, deterioration, or improper assembly.
Replace or repair as necessary.
Pipes
Leaking at gearbox connection.
Tighten connector. If still leaking, replace the pipe or control unit.

Pump Belt Adjustment

Measure the pump belt tension by pushing on it 75 mm (2.95 in) from the center of the pump pulley with a force of about 100 N (10 kg, 22 lbs).
Pump belt should deflect about 14—17 mm (1/2—3/4 in).

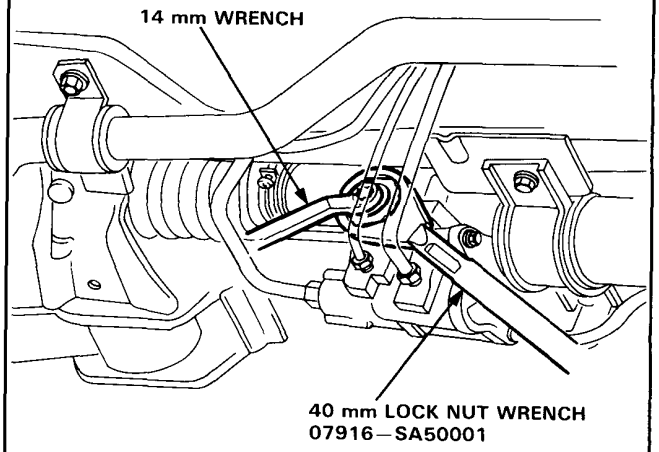
1. Loosen the pump adjusting nut, and pivot bolt.
2. Pry the pump away from the engine to get the proper tension, then retighten the adjusting nut, and pivot bolt.





Rack Guide Adjustment

1. Loosen the lock nut on the rack guide screw with the special wrench as shown.



2. Tighten the guide screw until it compresses the spring and seats against the guide, then loosen it. Retighten it to about 4 N·m (0.4 kg-m, 2.9 lb-ft) and back it off about 25°.
   Tighten the lock nut to about 25 N·m (2.5 kg-cm, 18 lb-ft) while preventing the guide screw from turning.
3. Check the steering effort as described on page 18-25.

Maintenance

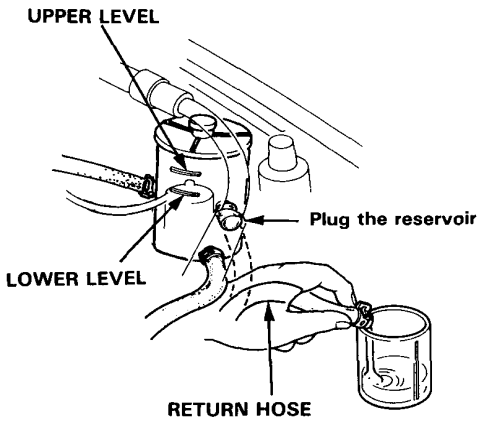
Fluid Replacement

Check the reservoir at regular intervals, and add fluid as necessary.

CAUTION: Use only GENUINE HONDA Power Steering Fluid. Using other fluids such as ATF or *other manufacturer's* power steering fluid will damage the system.

The fluid should be replaced whenever the system is opened for repairs or if the fluid gets water or dirt in it.

1. Disconnect the return hose from the gearbox at the reservoir, and put the end in a suitable container.
2. Start the engine, let it run at idle, and turn the steering wheel from lock-to-lock several times. When fluid stops running out of the hose, shut off the engine. Discard the fluid.



3. Refit the return hose on the reservoir.
4. Fill the reservoir to the upper level mark.
5. Start the engine and run it at fast idle, then turn the steering from lock-to-lock several times to bleed air from the system.
6. Recheck the fluid level and add some if necessary.

CAUTION: Do not fill the reservoir beyond the upper level mark.

On-Car Checks

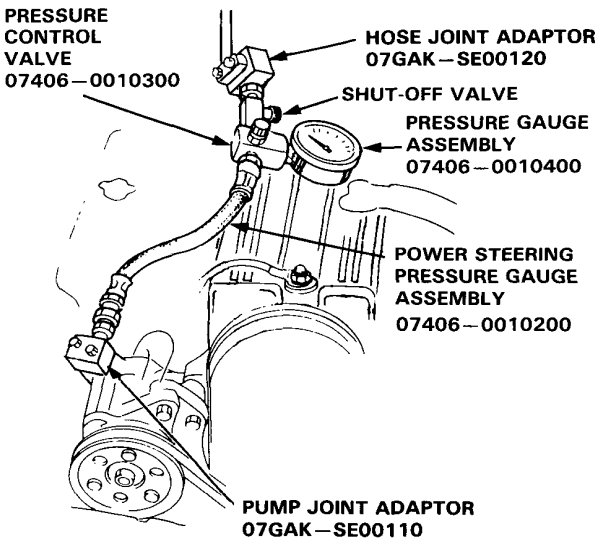
Pump Pressure Check

Check the fluid pressure as follows to determine whether the trouble is in the pump or gearbox.

NOTE: First check the power steering fluid level and pump belt tension.

1. Disconnect the outlet hose from the pump outlet fitting, and install the hose joint adaptor on the outlet hose.
2. Install the pump joint adaptor to the pump outlet fitting.
3. Install the power steering pressure gauge between the pump and pump joint adaptors as shown.

NOTE: If power steering gauge (07406—0010000) is used, the pressure control valve (07406—0010300) and pressure gauge (07406—0010400) must be installed as shown.



4. Open the shut-off valve fully.
5. Open the pressure control valve fully.

6. Start the engine and let it idle.

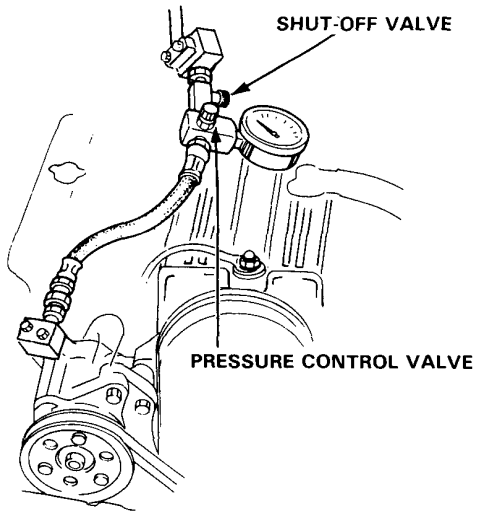
7. Turn the steering wheel from lock-to-lock several times to warm the fluid to operating temperature.

8. Close the shut-off valve, then, close the pressure control valve gradually until the pressure gauge needle is stable. Read pressure.

9. Immediately open the shut-off valve fully.

   CAUTION: Do not keep the shut-off valve closed more then 5 seconds or the pump could be damaged by over-heating.

   If the pump is in good condition, the gauge should read at least 7845—8421 kPa (80—90 kg/cm², 1137—1280 psi). A low reading means pump output is too low for full assist. Repair or replace the pump.

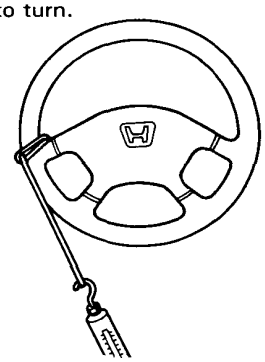


Assist Check with Car Parked

1. Check the power steering fluid level and pump belt tension.

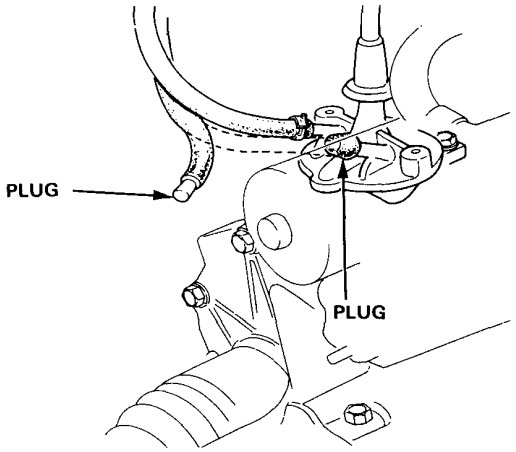
2. Start the engine, allow to idle, and turn the steering wheel from lock-to-lock several times to warm up the fluid.

3. Attach a spring scale to the steering wheel. With *the engine idling and the car on a clean, dry floor,* pull the scale as shown and read it as soon as the tires begin to turn.



   The scale should read no more than 18 N (1.8 kg, 4 lb).
   If it reads more, go on step 4.

4. Stop the engine. Disconnect the hose from the speed sensor and plug the hose and the sensor fitting as shown.

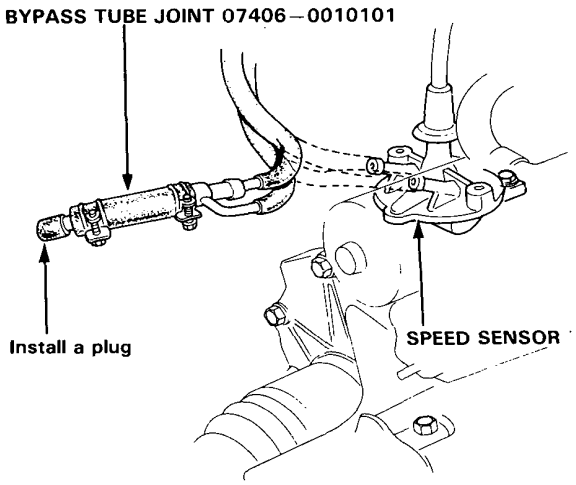


5. Start the engine and let it idle.

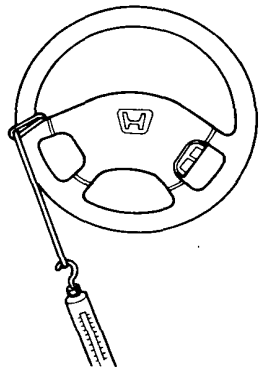
   - If *the reading is now* 18 N (1.8 kg, 4 lbs) *or less,* replace the speed sensor, see page 18-26.
   - If the reading is still more than 18 N (1.8 kg, 4 lbs), *check the gearbox and pump.*

Assist Check

1. Check the power steering fluid level and pump belt tension.
2. Start the engine, let it warm up to normal temperature, and turn the steering wheel lock-to-lock a few times to warm up the fluid.
3. Stop the engine. To simulate speeds above 50 km/h (30 mph), disconnect the hoses from the speed sensor and connect them to the Bypass Tube Joint.



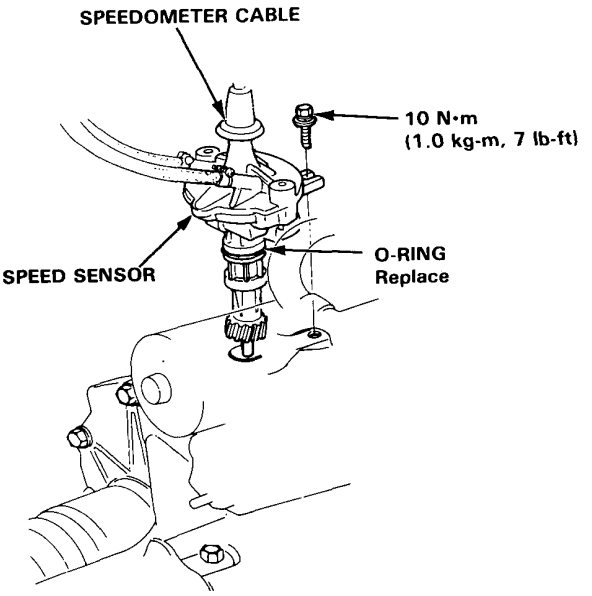
4. Attach the spring scale to the steering wheel. With the engine idling and the car on the clean, dry floor, pull the scale as shown and read it as soon as the tires begin to turn.



- If the scale reads a normal 50 N (5.0 kg, 11 lbs), or more, the assist at high speeds is being caused by reduced speed sensor output. Replace the sensor.
- If the scale reads less than 50 N (5.0 kg, 11 lbs), the sensor is OK, and the problem is in the sensor feed line, the pump, or the control unit. See if the feed line is pinched or bent then check pump.

Speed Sensor Replacement

1. Remove the speed sensor mounting bolt and pull the speed sensor from the transmission housing.



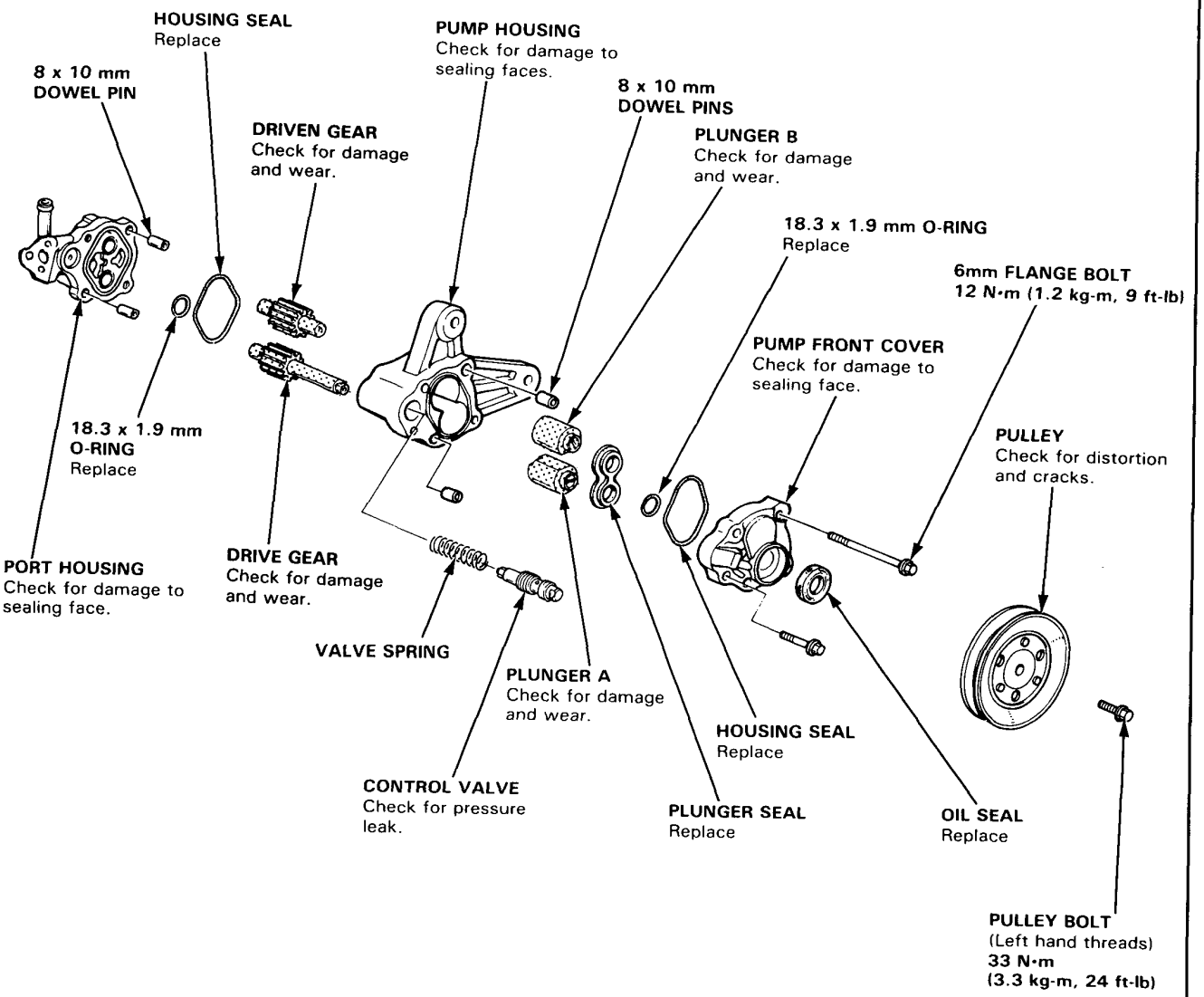
2. Pull up the speedometer cable boot, remove the clip, and pull out the speedometer cable.
3. Disconnect the speed sensor hoses and plug the fittings.
4. After installing a new sensor, turn the steering wheel lock-to-lock with the engine idling to bleed air from the system.
5. Check the reservoir and add fluid if necessary.

Pump

Inspection

CAUTION: Pump components are made of aluminum. Be careful not to damage them when servicing.

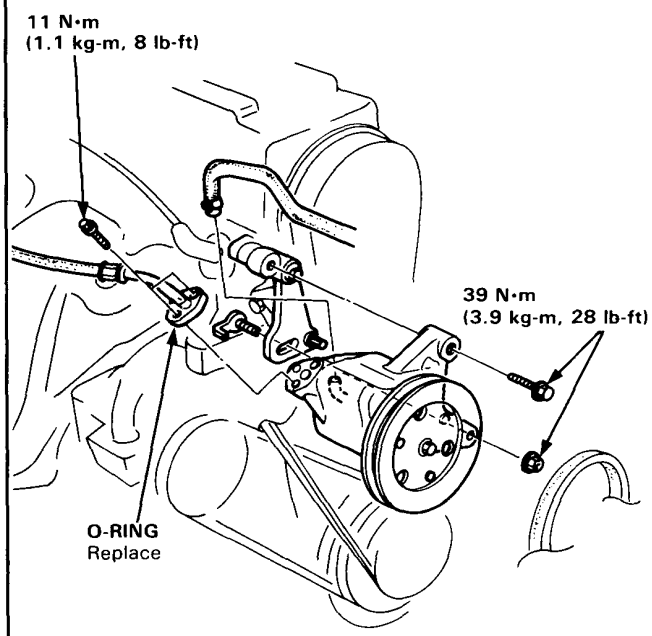
- Clean all the disassembled parts thoroughly.
- Replace all O-rings and seals. Do not dip new O-rings and seals in solvent; coat O-rings with steering grease before installation, and make sure they stay in place during reassembly.
- The shaded parts are selectively fitted, and should not be disassembled except to replace seals. If any one of them is faulty, replace the whole pump as an assembly.



Pump

Replacement

1. Drain the fluid from the system (page 18-24).
2. Disconnect the inlet and outlet hoses from the pump and plug them.
3. Remove the belt by loosening the pump pivot bolt and adjusting nut.
4. Remove the bolts, then remove the pump.

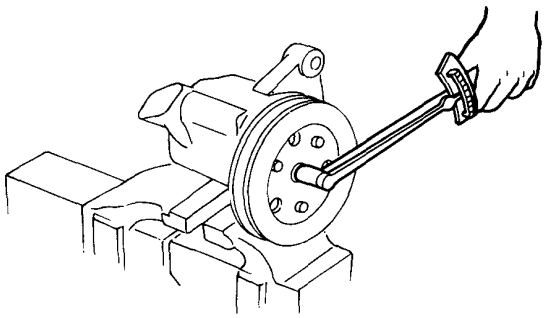


5. Loosely install the new pump on the bracket.
6. Connect the inlet and outlet hoses to the pump.
7. Install and adjust the belt (page 18-23).
8. Fill the reservoir with new fluid to the UPPER level on the reservoir.
9. Start the engine and let it run at fast idle while turning the steering wheel lock-to-lock several times to bleed air from the system.
10. Check the reservoir and add fluid if necessary.

Preload Inspection

Check the pump preload with a torque wrench.

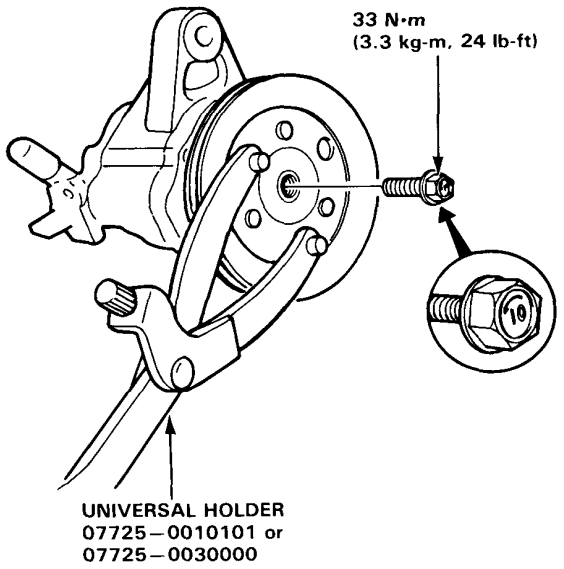
Preload: 4 N·m (0.4 kg-m, 3 lb-ft) max.



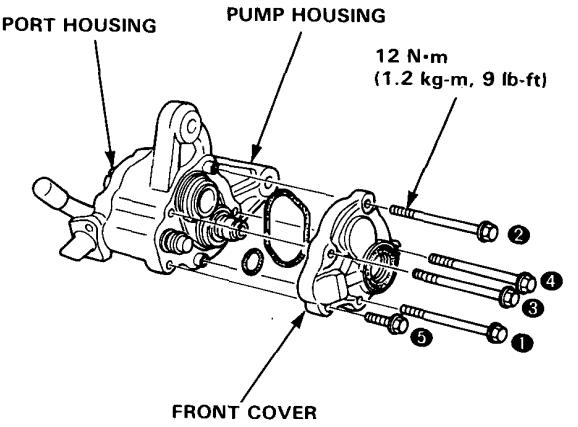
Control Valve Inspection and Replacement

1. Hold the pulley with Universal holder, remove the pully bolt, then remove the pulley.

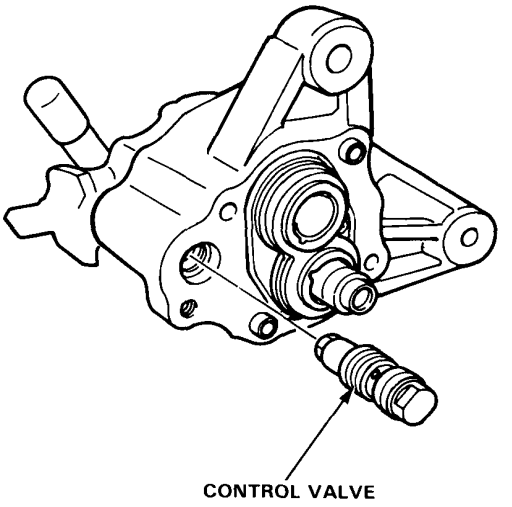
   CAUTION: The pulley bolt has left hand threads.



2. Remove the five 6 mm bolts in the order shown, then separate the pump front cover, pump housing and port housing.



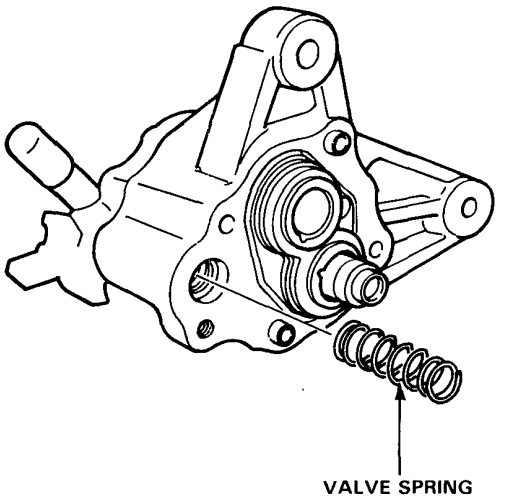
3. Remove the control valve from the pump housing.



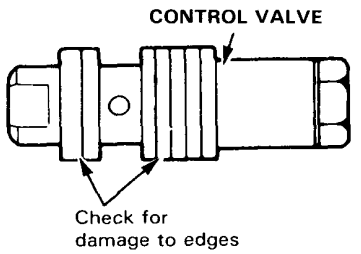
(cont'd)

Control Valve Inspection and Replacement (cont'd)

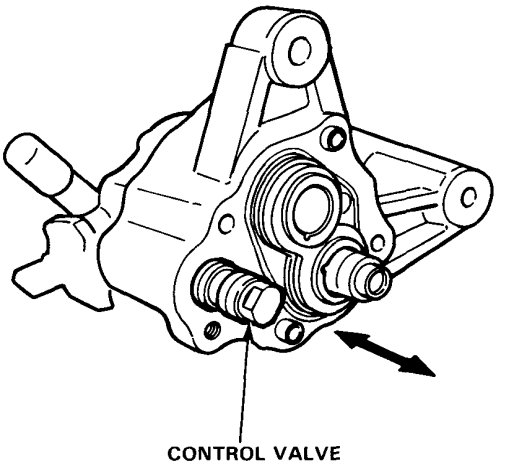
4. Remove the valve spring from the pump housing.



5. Check for wear, burrs, and other damage to the edges of the grooves in the valve.

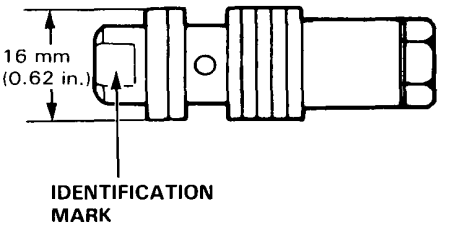


6. Slip the valve back in the pump and check that it moves in and out smoothly.



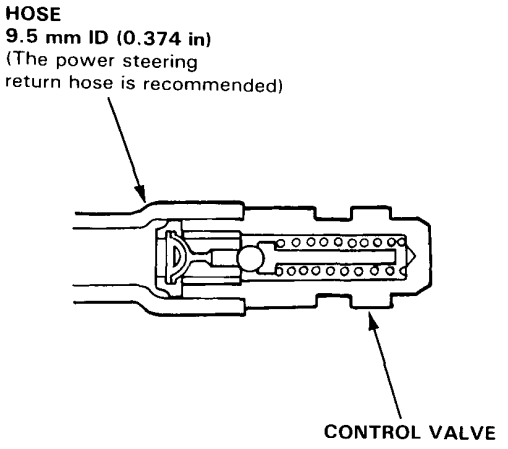
If OK, go on to step 7, if not, replace the valve:

- The original valve was selected for a precise fit in the pump housing bore, so make sure the new one has the same identification mark.

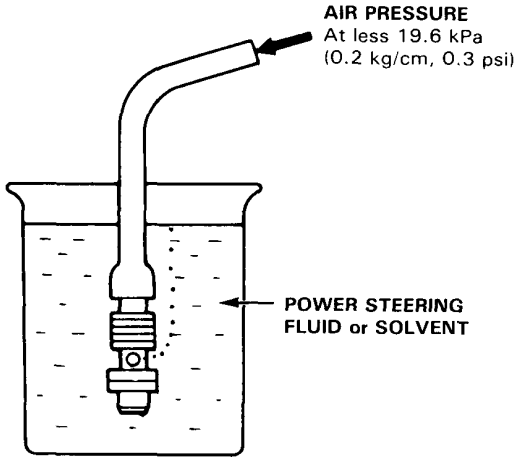


Mark	Part Number	Part Name	Size mm(in)
A	56350—PC1—010	CONTROL VALVE A	15.995—16.000 (0.6297—0.6299)
Without mark	56360—PC1—010	CONTROL VALVE B	16.000—16.006 (0.6299—0.6302)

7. Attach a hose to the end of the valve as shown.

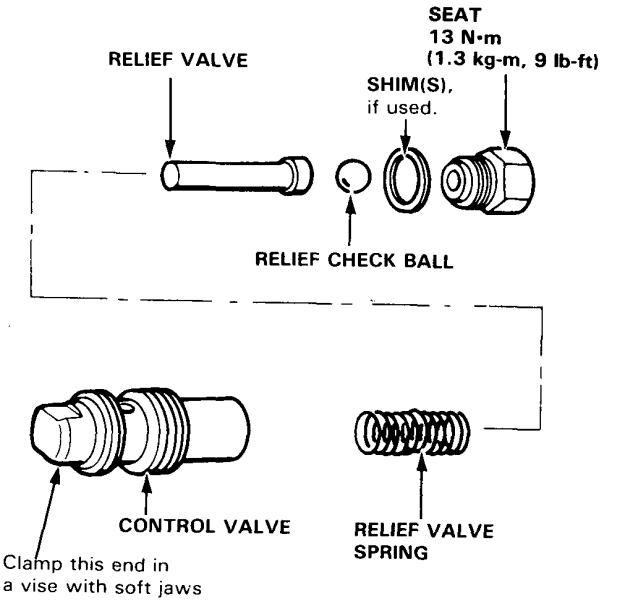


8. Then submerge the valve in a container of power steering fluid or solvent, and blow on the hose. If air bubbles leak through the valve, replace or repair it as follows.



9. Clamp the bottom end of the valve in a vise with soft jaws.

10. Unscrew the seat in the top end of the valve, and remove any shims, the relief check ball, relief valve and relief valve spring.



11. Clean all the parts in solvent, dry them off, then re-assemble and re-test the valve.

NOTE: If necessary, relief pressure is adjusted at the factory by adding shims under the check ball seat. If you found shims in your valve, be sure you reinstall as many as you took out.

12. Install the control valve in the reverse order of removal.

- Apply steering grease (Honda P/N 08740—99969) to new O-rings.
- Coat the control valve with power steering fluid then install it and its spring.

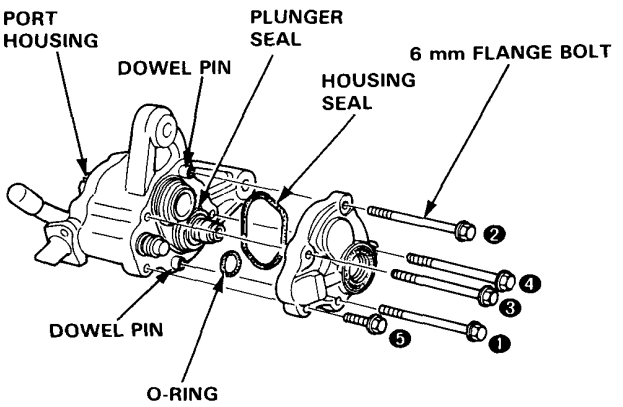
Pump

Resealing

CAUTION: The pump components are made of alminum. Be careful not to damage them when servicing.

1. Remove the pump from car (page 18-28), and remove the pulley and pump front cover (page18-29).

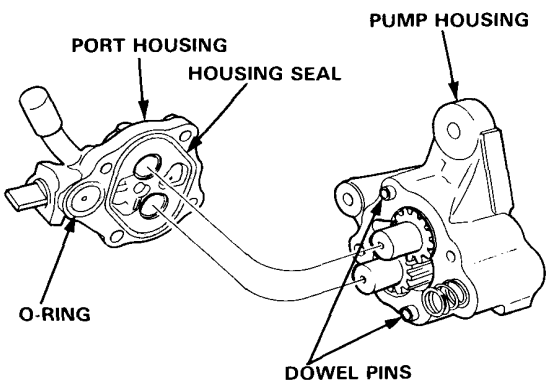
   NOTE: Remove the front cover bolts in the sequence shown.



2. Remove the housing seal from the pump housing.

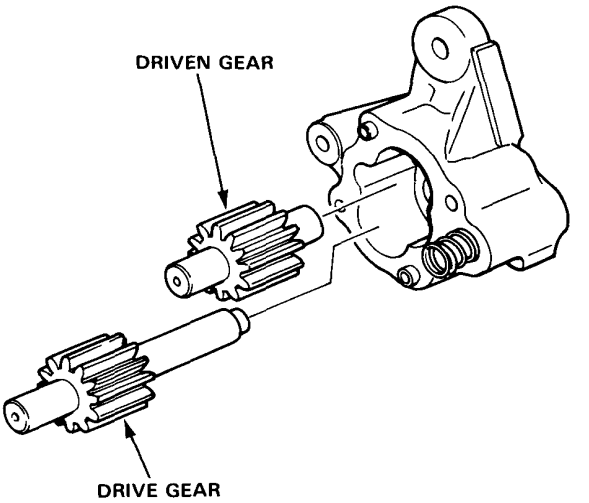
3. Remove the dowel pins, plunger seal and O-ring from the pump housing.

4. Separate the port housing from the pump housing.



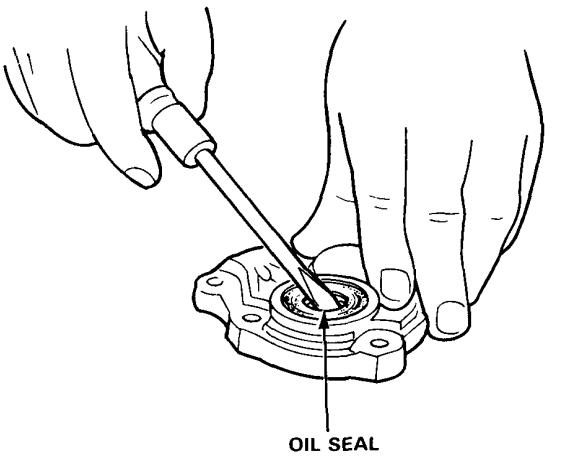
5. Remove the dowel pins from the pump housing and remove the housing seal and O-ring from the port housing.

6. Remove the pump drive and driven gears from the pump housing.

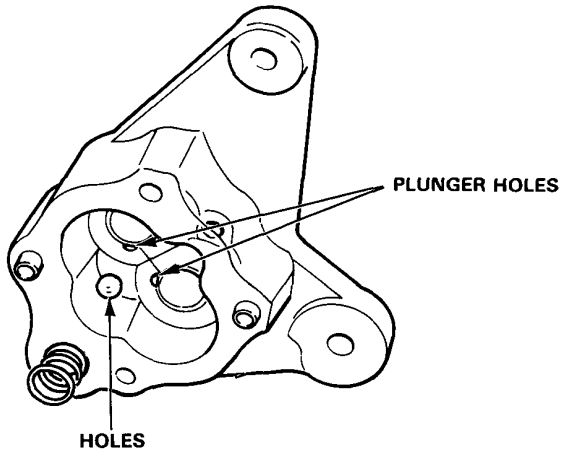


7. Remove the plungers from the pump housing.

8. Pry the seal out of the pump front cover.

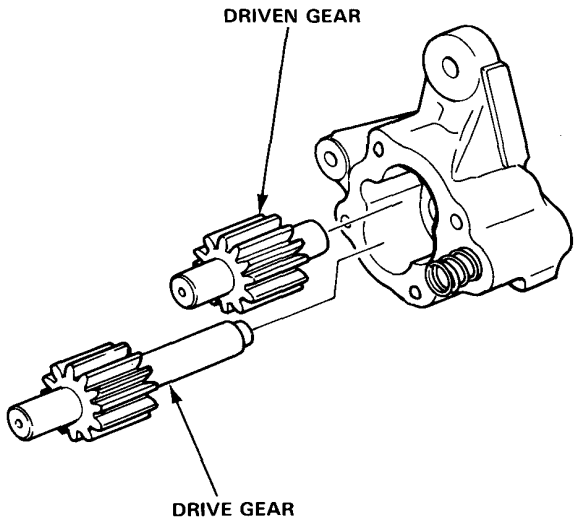


9. Coat the outer surfaces of the plungers with power steering fluid, then install them in the pump housing. Make sure the plunger holes are positioned as shown below.



10. Coat the inside of the plungers with power steering fluid.

11. Install the pump drive and driven gears in the pump housing.

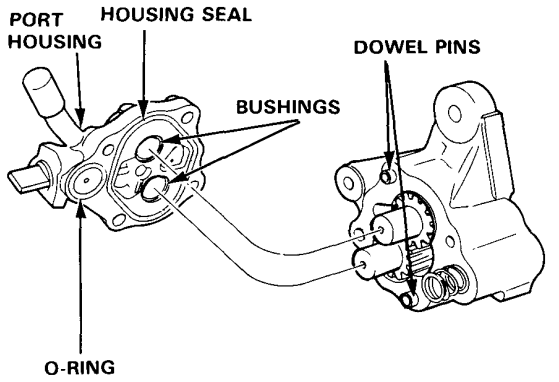


12. Coat the bushings on the port housing with power steering fluid.

13. Install the dowel pins in the pump housing, then install the new housing seal and O-ring in the port housing.

NOTE: Coat the new housing seal and O-ring with grease.

14. Install the port housing on the pump housing.



15. Grease the new plunger seal and install it over the plungers.

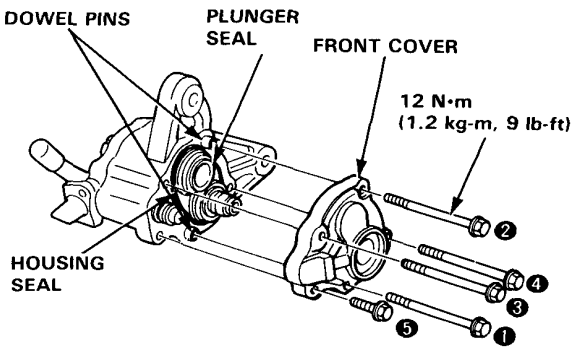
16. Install the dowel pins.

17. Fill the groove of the pump housing with grease and install the new housing seal in the pump housing.

18. Grease the new O-ring and install it in the pump housing.

19. Install the pump front cover.

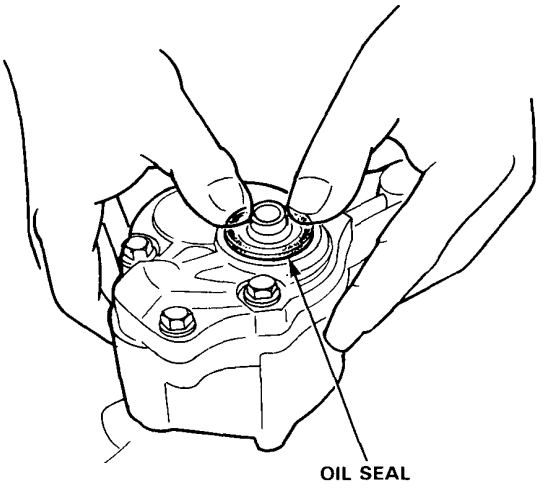
NOTE: Tighten the front cover bolts in the order shown.



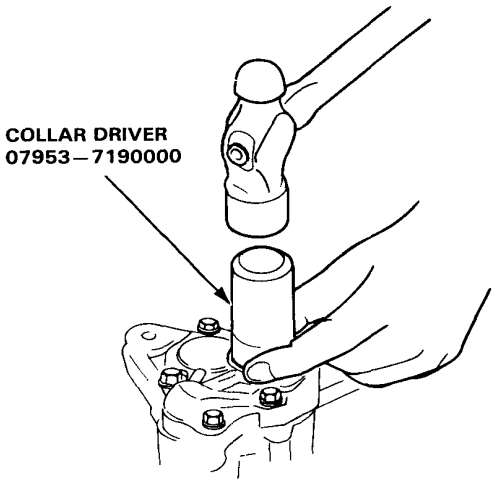
(cont'd)

Resealing (cont'd)

20. Loosely install the new oil seal in the pump front cover.



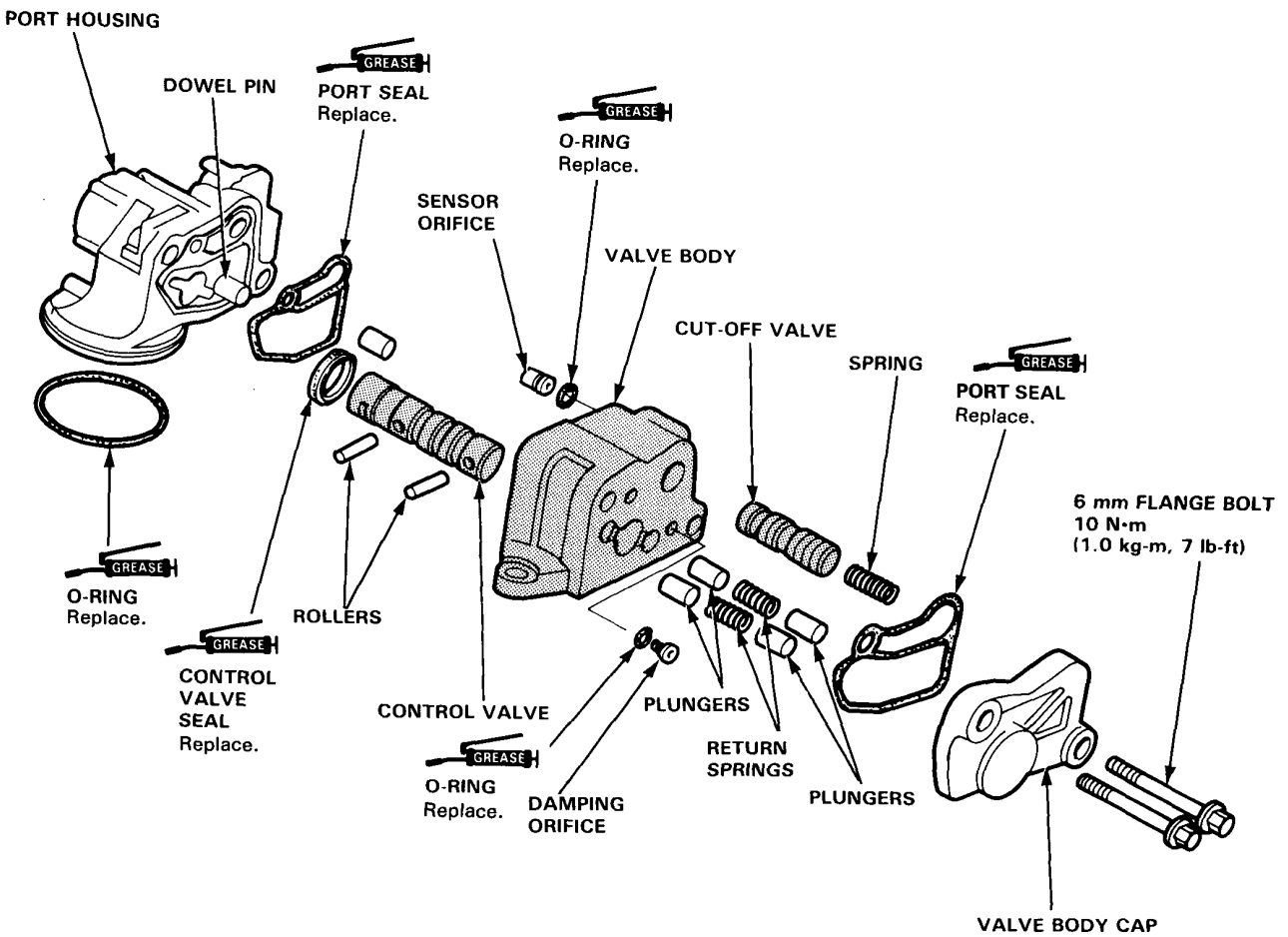
21. Install the new oil seal in the pump front cover; get it started by hand, then use the special tool to push it in the rest of the way.



Control Unit

Disassembly

- Before disassembling the control unit, clean it thoroughly with solvent.
- *Thoroughly clean all disassembled parts.*
- Always replace O-rings and seals with new ones.
- Replace the parts that have damaged sliding surfaces.
- Do not dip the seals and O-rings in solvent; coat O-rings with grease, and make sure they stay in position during reassembly.
- The shaded parts (valve body, control valve, cut-off valve) are a matched set; if any of them are faulty, replace all of them.
- GREASE STEERING GREASE ..... Honda P/N 08733—B070E

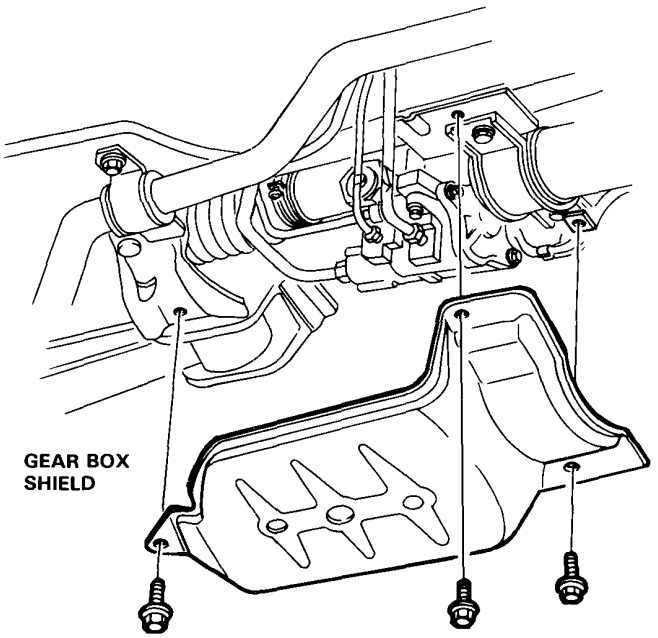


(cont'd)

Control Unit

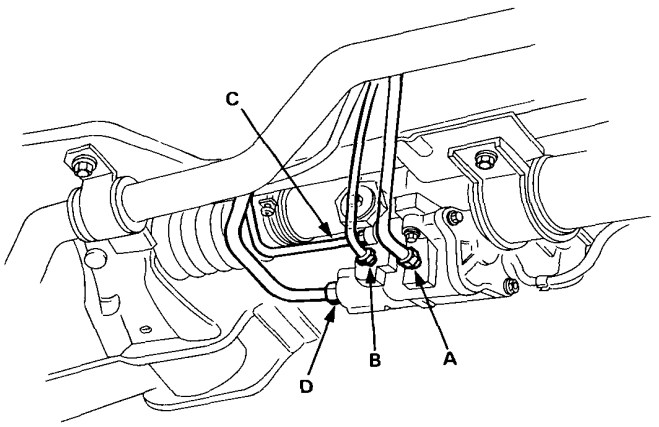
Disassembly (cont'd)

1. Drain the power steering fluid (page 18-24).
2. Remove the gearbox shield.
3. Using solvent and a brush, wash any oil and dirt off the control unit, its lines, and that end of the gearbox. Blow dry with compressed air.

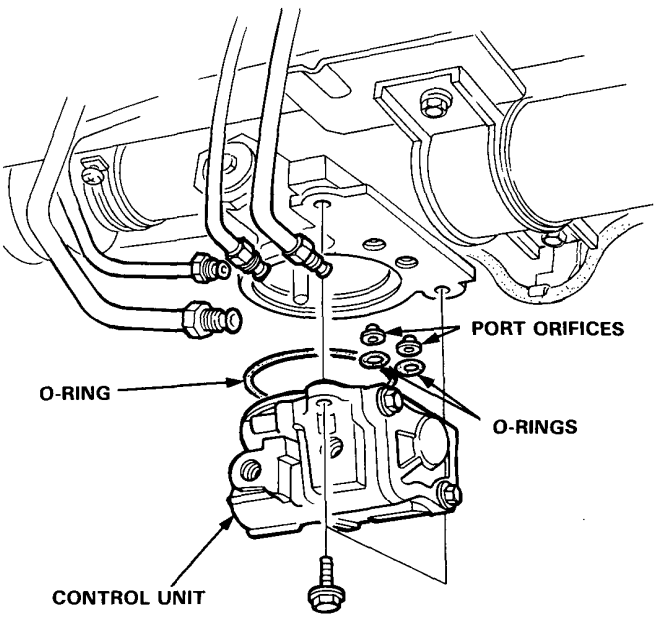


4. Using flare nut wrenches, disconnect the four lines from the control unit.

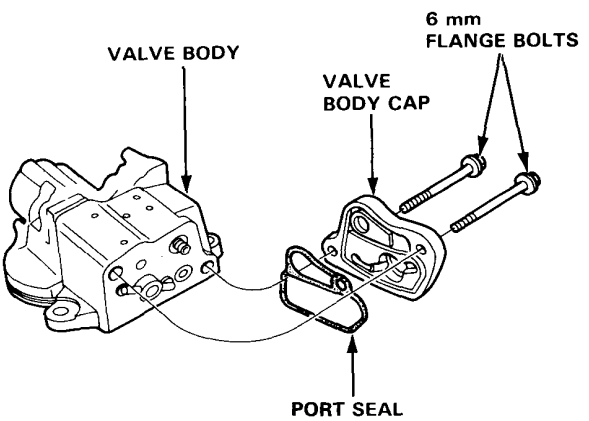
A: From pump	14 mm wrench
B: To speed sensor	12 mm wrench
C: From speed sensor	12 mm wrench
D: To reservoir	17 mm wrench



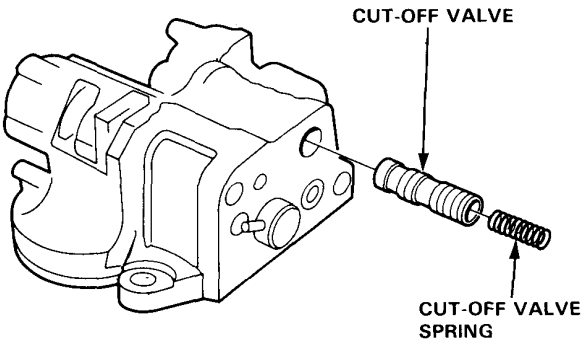
5. Remove the two 6 mm flange bolts and remove the control unit from the gear box.
6. Remove the O-rings and port orifices from the gear box.
7. Remove the O-ring from the control unit.



8. Remove the two 6 mm flange bolts, and remove the cap from the valve body.
9. Remove the port seal from the cap.



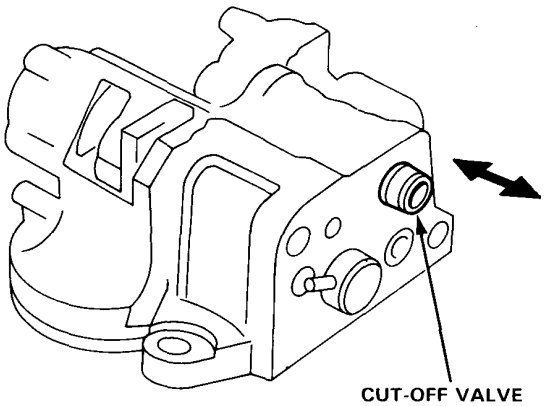
10. Remove the cut-off valve and spring from the valve body.

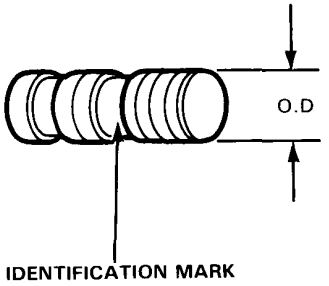


11. Check the cut-off valve:

- Inspect its surface for scoring or scratches.
- Slip it back into the valve body, and make sure it slides smoothly without drag and without side play.

NOTE:
- The cut-off valve is sized to fit the valve body, so, if you replace it, make sure the new valve has the same identification mark on it.
- If the valve body is damaged, replace all three parts (valve body, cut-off valve and control valve) as a set.

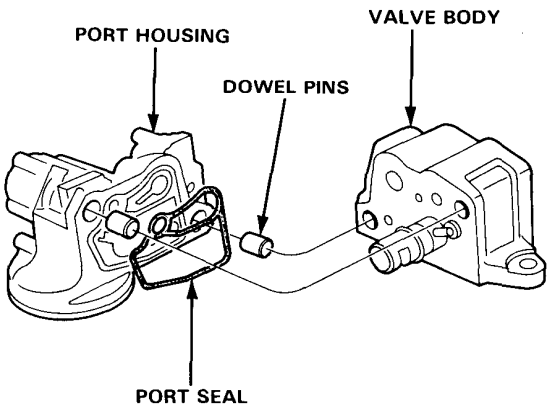




Identification mark	Outside diameter	Part number
A	10.000–10.005 mm (0.3937–0.3939 in.)	53650–SEO–9500
B	9.995–10.000 mm (0.3935–0.3937 in.)	53651–SEO–9500
C	9.990–9.995 mm (0.3933–0.3935 in.)	53652–SEO–9500

12. Separate the valve body and port housing.

13. Remove the seal and dowel pins from the valve port housing.

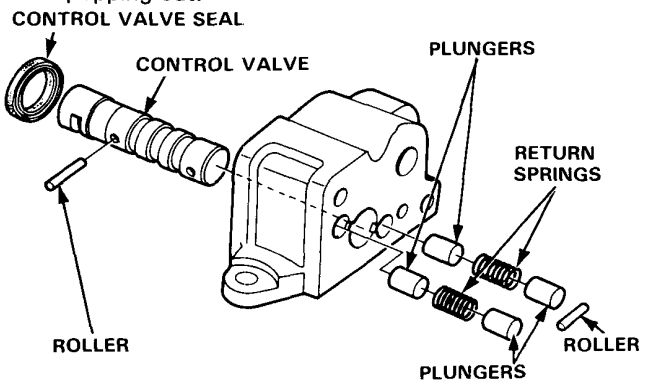


(cont'd)

Disassembly (cont'd)

14. Remove the rollers from the control valve by pushing the valve out one side of the valve body, and then the other.

    NOTE: When removing the rollers, hold the plungers with your fingers to keep them from popping out.



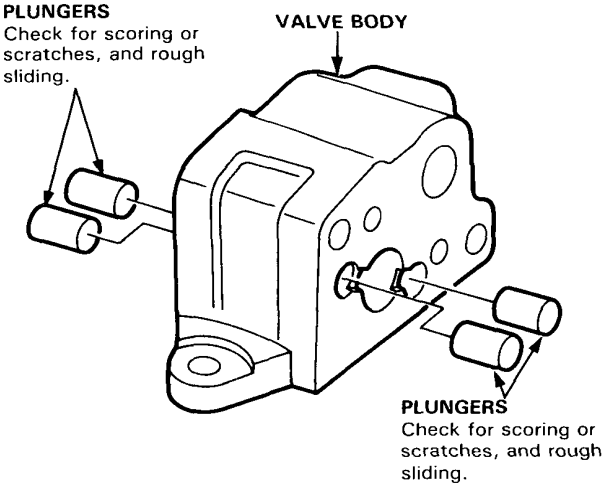
15. Remove the plungers, return springs and control valve from the valve body.

16. Remove the control valve seal from the control valve.

17. Check the plungers.

    - Inspect their surface for scoring or scratches.
    - Slip each plunger into the valve body, and make sure it slides smoothly, without drag or side play.
      If any plunger is damaged, replace it.

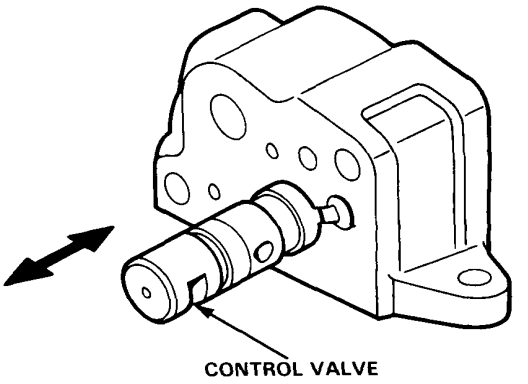
    NOTE: If the valve body is damaged , replace all three parts (valve body, cut-off valve and control valve) as a set.

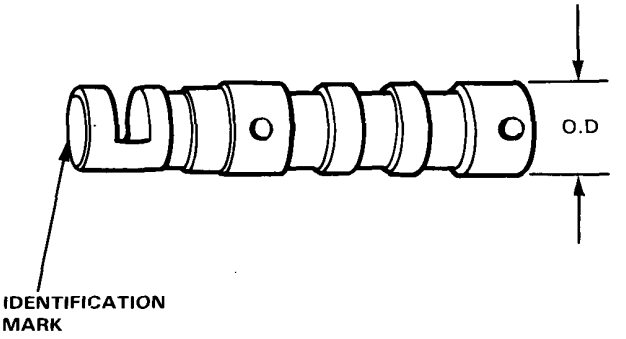


18. Check the control valve.

    - Inspect its surface for scoring or scratches.
    - Slip it into the valve body, and make sure it slides smoothly, without drag or side play.

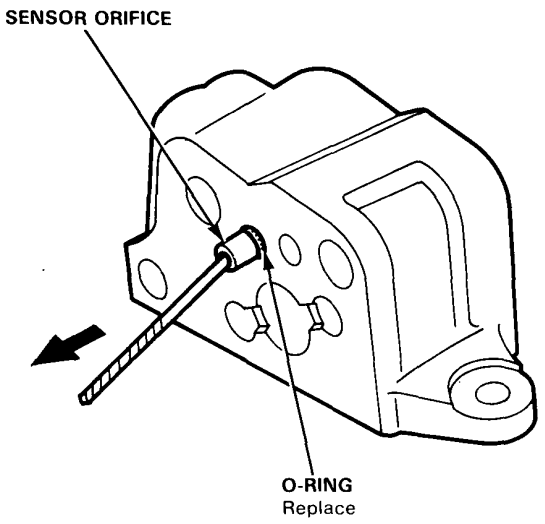
    NOTE:
    - The control valve is sized to fit the valve body, so, if you replace it, make sure the new valve has the same identification mark on it.
    - If the valve body is damaged, replace all three parts (valve body, control valve and cut-off valve) as a set.





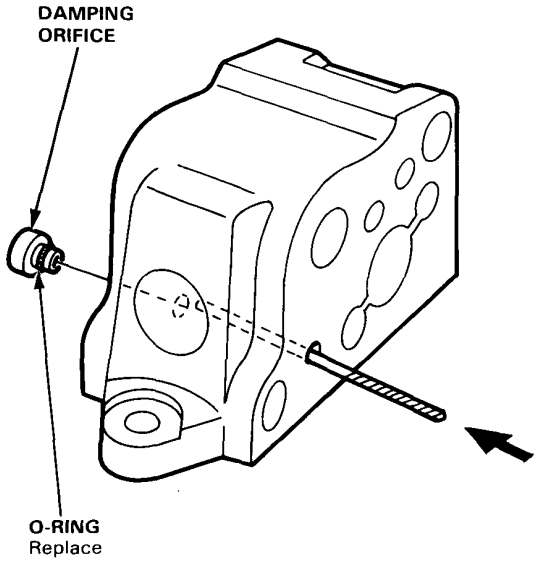
Identification mark	Outside diameter	Part number
X	13.998–14.003 mm (0.5511–0.5513 in.)	53646–SEO–9511
Y	13.993–13.998 mm (0.5509–0.5511 in.)	53647–SEO–9511
Z	13.988–13.993 mm (0.5507–0.5509 in.)	53648–SEO–9511

19. Using a 1.5 mm (1/16") drill bit, remove the sensor orifice and 3.4 mm O-ring.



20. Using a 1.5 mm (1/16") drill bit, push the damping orifice and 3.4 mm O-ring out of the valve body.

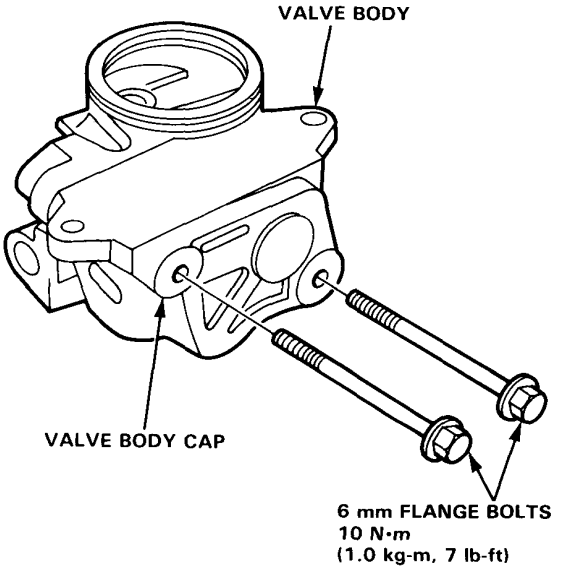
CAUTION: Grind the shank end of the drill bit flat before using.



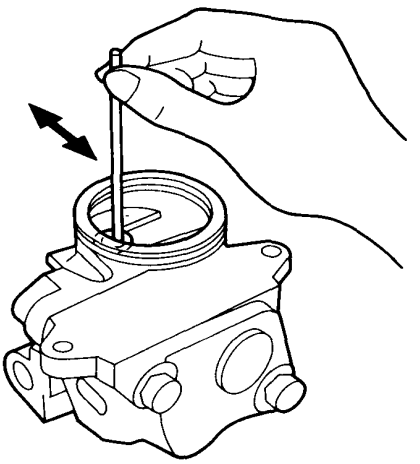
Assembly

1. Thoroughly clean all disassembled parts.
2. Coat the plungers, cut-off valve and control valve surfaces with power steering fluid.
3. Install the parts by refering page 18-35.
4. Install and tighten the 6 mm flange bolts in the control valve unit.

CAUTION: Make sure the mating surface of the valve body and cap are flush at the upper side.



4. Make sure the control valve moves smoothly, and returns to neutral position.



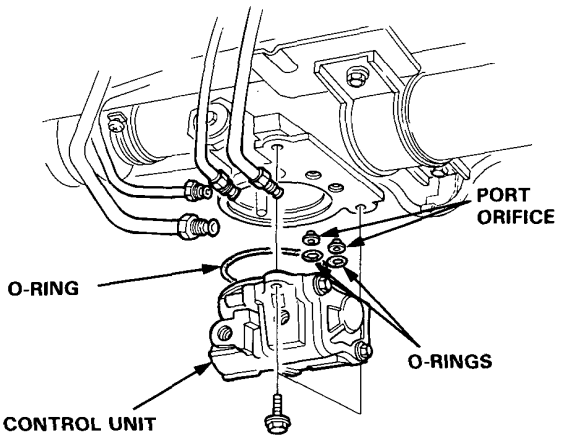
(cont'd)

Assembly (cont'd)

5. Coat the 7.8 x 1.9 mm O-rings with grease, and install them together with orifices.

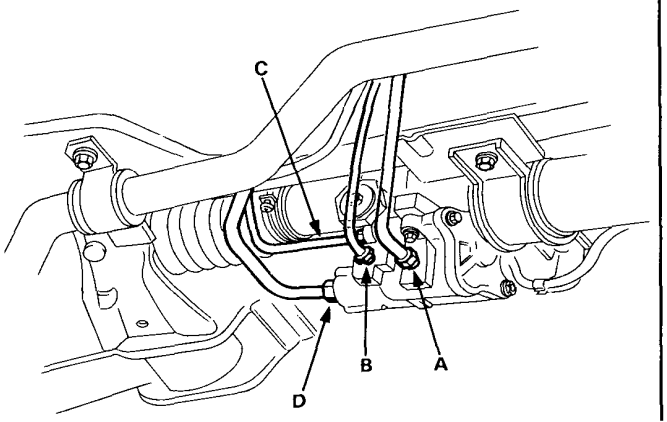
6. Install the control unit on the gear housing with the two 6 mm bolts.

   CAUTION:
   - **When installing, be careful not to hit the pinion holder pin.**
   - **Make sure the O-rings are in place and not pinched.**



7. Connect the four lines to the control unit, using flare nut wrenches.

   A: From pump — 14 mm wrench
   35—45 N·m (3.5—4.5 kg-m, 25—33 lb-ft)
   B: To speed sensor — 12 mm wrench
   11—15 N·m (1.1—1.5 kg-m, 8—11 lb-ft)
   C: From speed sensor — 12 mm wrench
   11—15 N·m (1.1—1.5 kg-m, 8—11 lb-ft)
   D: To reservoir — 17 mm wrench
   26—32 N·m (2.6—3.2 kg-m, 19—23 lb-ft)



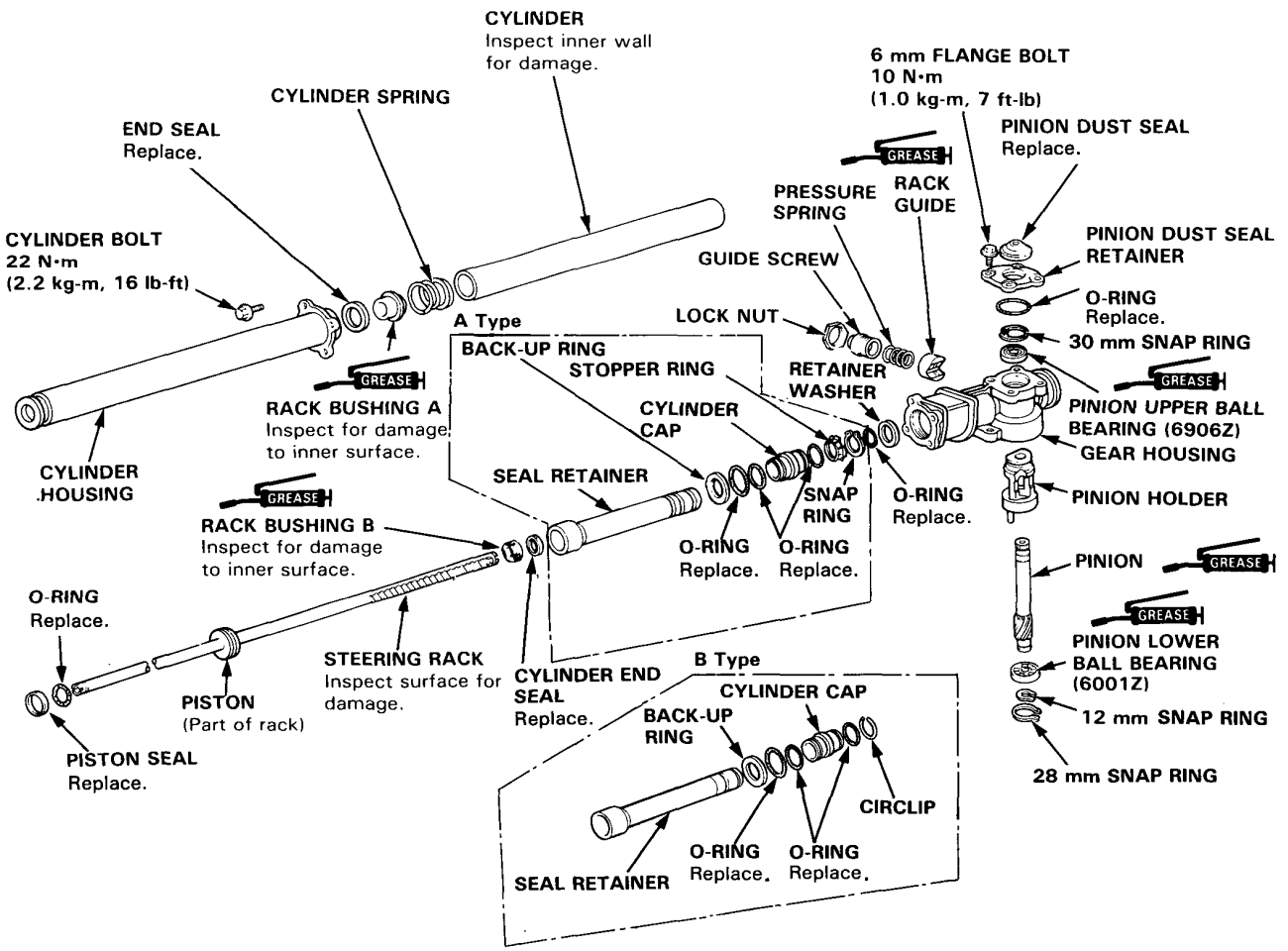
8. Fill the reservoir with power steering fluid and bleed air from the system by turning the steering wheel from lock to lock several times with the engine warm.

9. Make sure there are no fluid leaks, then install the shield.

10. Recheck the fluid level in the reservoir.

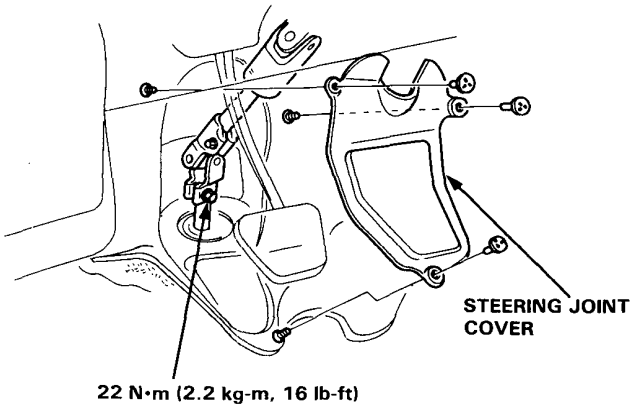
Inspection

- Before disassembling the gearbox, wash it off with solvent and a brush.
- Thoroughly clean all disassembled parts.
- Always replace O-rings and seals.
- Replace parts with damaged sliding surfaces.
- Do not dip seals and O-rings in solvent; coat O-rings with grease, and make sure they stay in position during re-assembly.
- GREASE STEERING GREASE ..... Honda parts number 08733—B070E

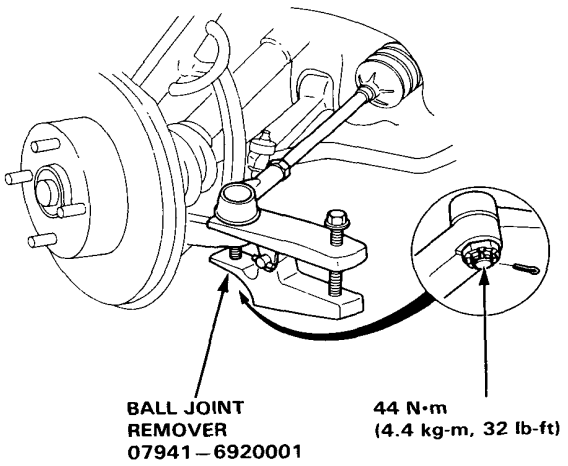


Removal

1. Remove the steering joint cover, and disconnect the steering shaft from the gear box.

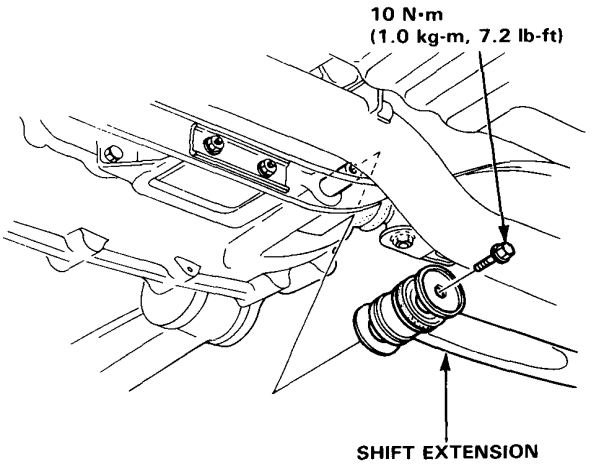


2. Drain the power steering fluid as described on page 18-24.
3. Remove the gearbox shield.
4. Using solvent and a brush, wash any oil and dirt off the control unit, its lines, and that end of the gearbox. Blow dry with compressed air.
5. Raise the front of car and support on safety stands in the proper locations.
6. Remove the front wheels.
7. Disconnect the tie rods form the steering knuckles using the special tool shown.

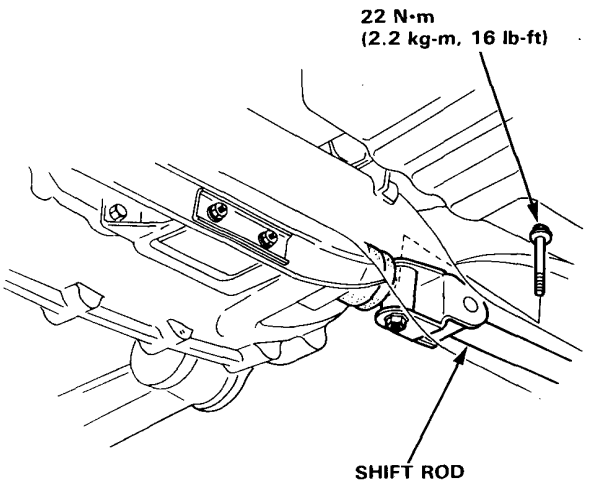


8-1. (Manual transmission model only)

- Remove the shift extension from the transmission case.

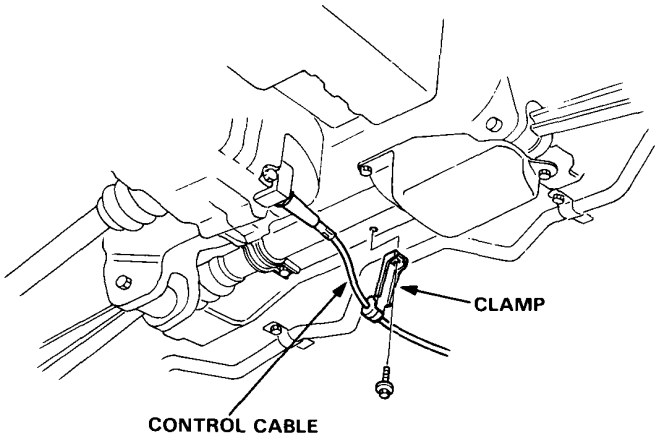


- Disconnect the gear shift rod from the transmission case by removing the 8 mm bolt.

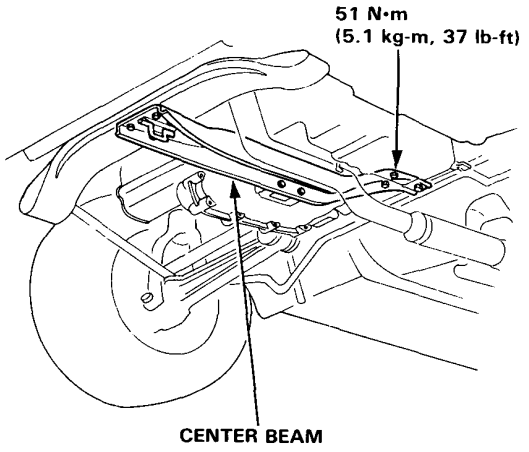


8-2. (Automatic transmission only)

- Remove the control cable clamp.



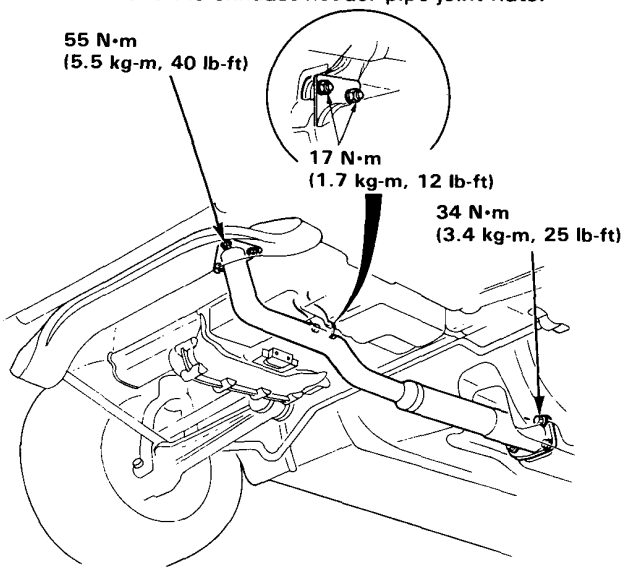
9. Remove the center beam bolts and center beam.



10. Disconnect the exhaust header pipe at the manifold.

CAUTION: *Replace the exhaust gasket and* selflocking nuts when you reinstall the pipe.

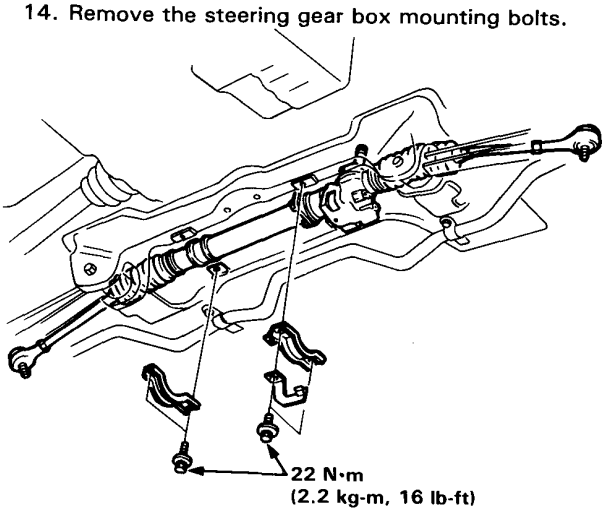
11. Remove the exhaust header pipe joint nuts.



12. Disconnect the four lines from the control unit (page 18-36).

13. Slide the tie rod all the way to the right (:LHD, left: RHD) side.

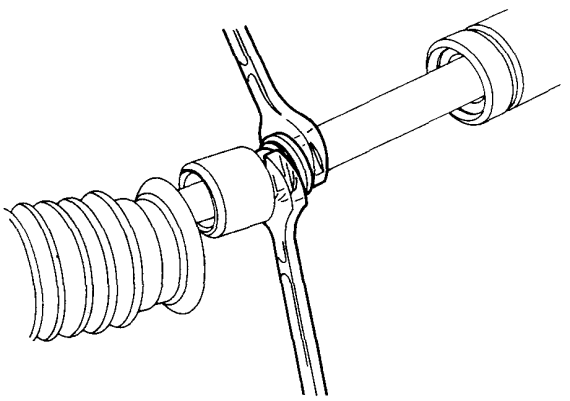
14. Remove the steering gear box mounting bolts.



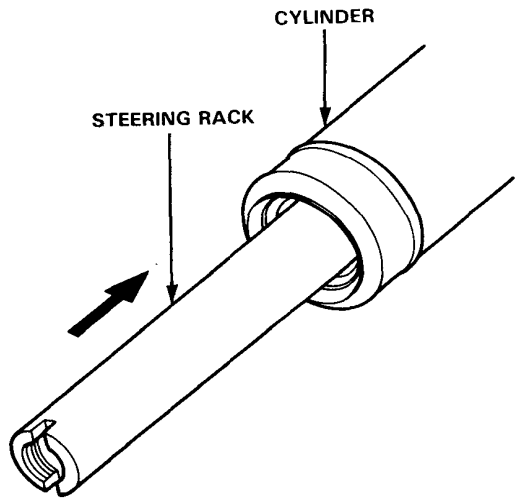
15. Slide the gear box right (:LHD, left: RHD) so that the left (:LHD, right: RHD) tie rod clears the bottom of the rear beam, then remove the gear box.

Resealing

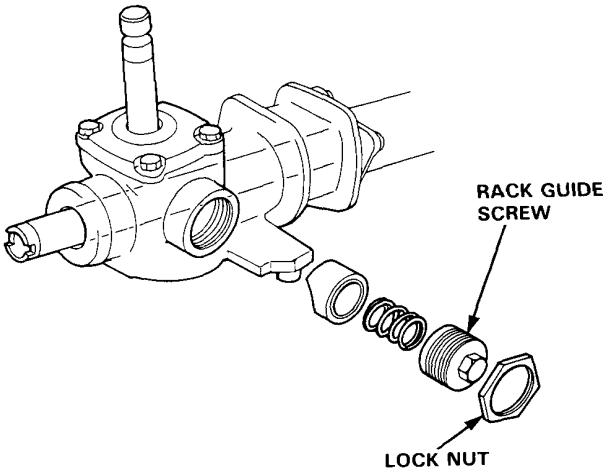
1. Remove the control unit as described on page 18-36.
2. Carefully clamp the gearbox in a vise.
3. Loosen the bands, pull the boots away from the ends of the gearbox, and unbend the tie-rod lock washers.
   Hold the rack with a 19 mm wrench, and unscrew the tie-rods with a 17 mm wrench.



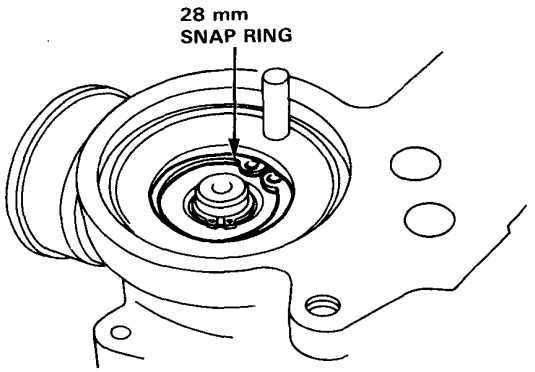
4. Push the right end of the rack back into the cylinder housing so the smooth surface that rides against the seal won't be damaged.



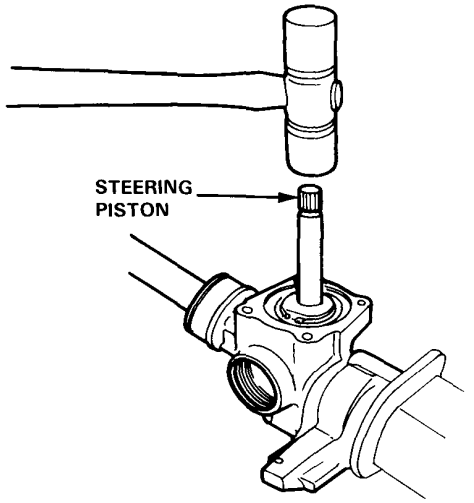
5. Loosen the rack screw lock nut, and remove the rack guide screw.



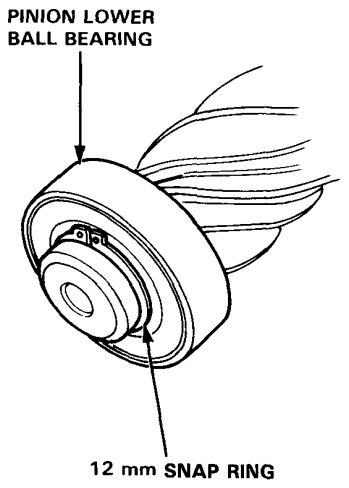
6. Remove the 28 mm snap ring from the bottom of the gear housing.



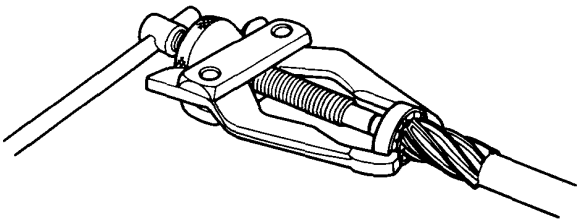
7. Remove the pinion from the gear housing by tapping it lightly.



8. Check the pinion lower ball bearing for play.

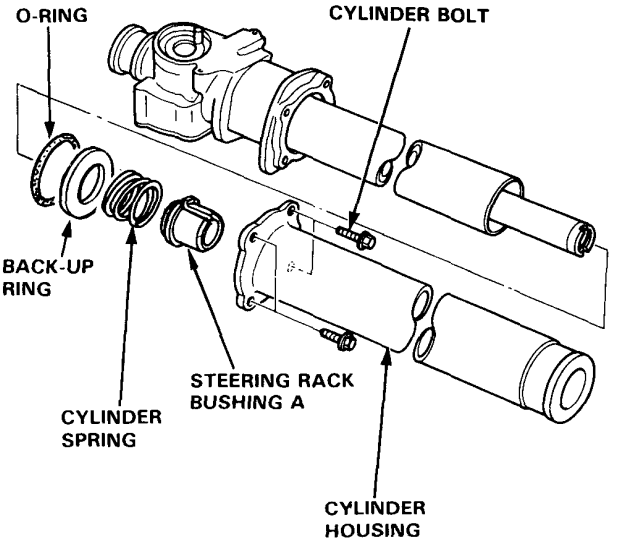


9. If the bearing is noisy or has excessive play, remove the 12 mm extemal snap ring and remove the bearing using a commercially availbale bearing puller.



10. Remove the four bolts from the end of cylinder housing, then slide the housing off the rack.

11. Remove the cylinder housing.

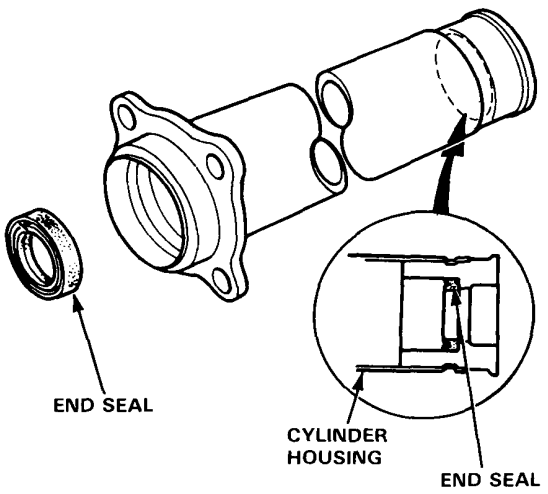


12. Remove the O-ring, back-up ring, steering rack bushing A and cylinder spring.

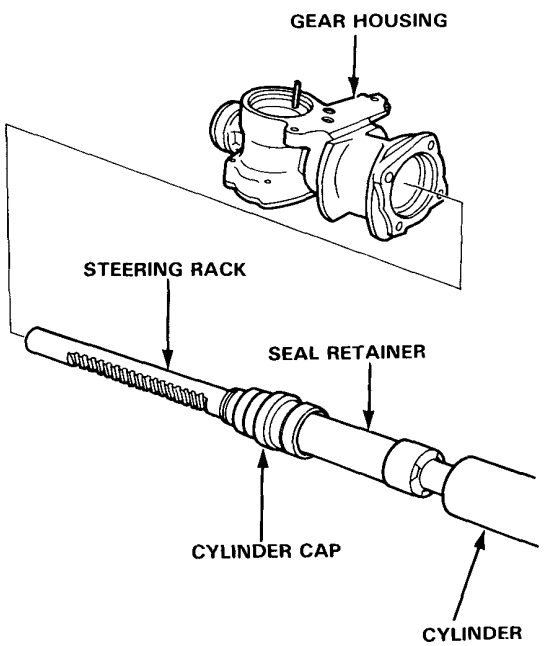
(cont'd)

Resealing (cont'd)

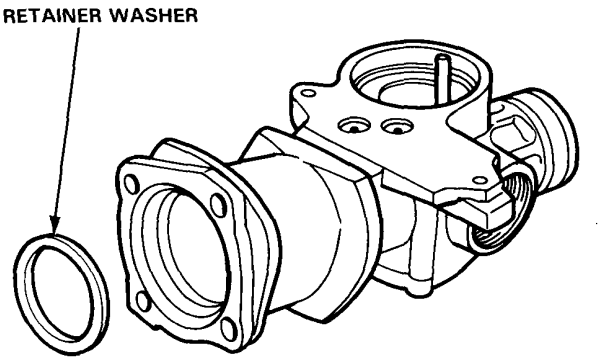
13. Remove the cylinder end seal from the cylinder housing.
    Use your fingers or a wooden stick to avoid damaging the housing.



14. Remove the cylinder, cylinder seal retainer, cylinder cap and steering rack from the gear housing.

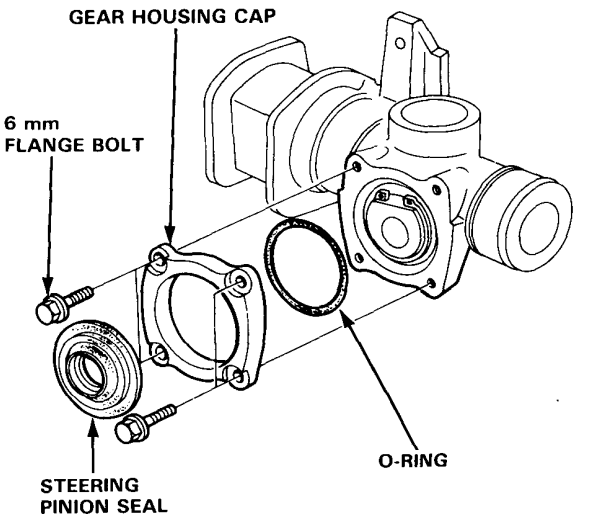


15. Remove the retainer washer from the gear housing.



16. Remove the gear housing cap from the gear housing by removing the four 6 mm flange bolts.

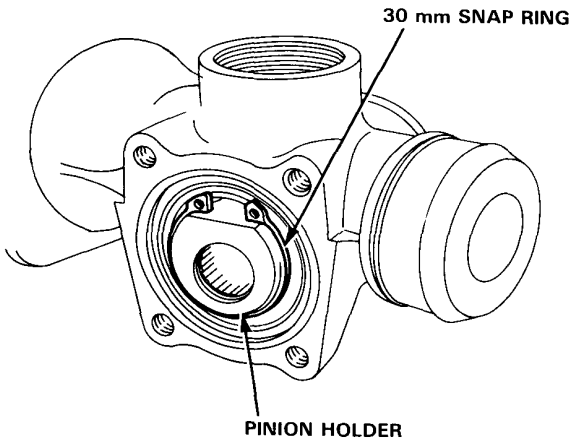
17. Remove the steering pinion seal from the gear housing cap.



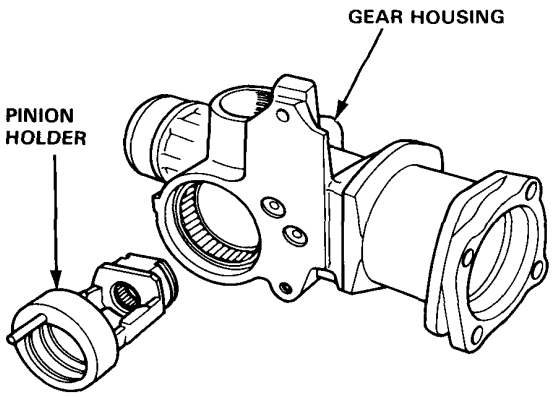
18. Remove the O-ring from the gear housing.

19. Check the upper bearing for free movement and excessive play; if it is good and the grease in it is clean, go on step 20.
If it is damaged, or if dirt has gone past the seal into the grease, replace the bearing.

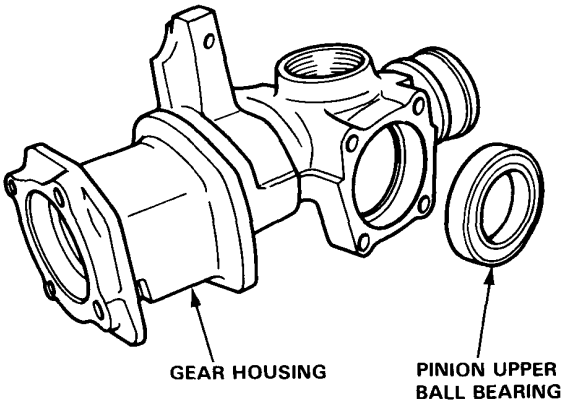
- Remove the 30 mm snap ring from the pinion holder.



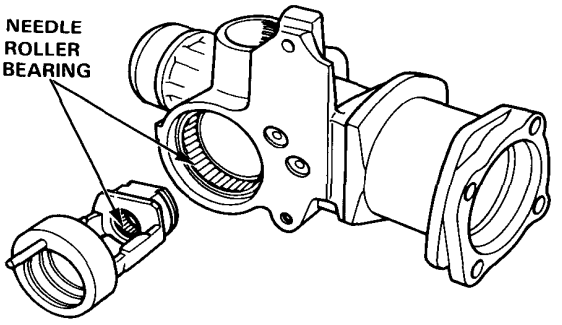
- Remove the pinion holder from the gear housing.



- Remove the pinion upper ball bearing from the gear housing.



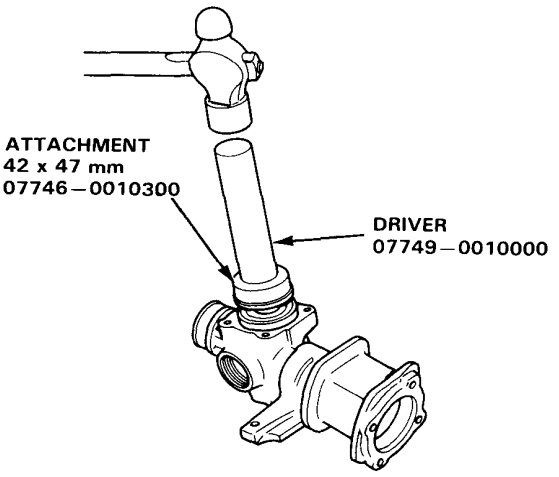
- Check the needle roller bearings in the pinion holder and in the gear housing for damage; if they are OK, pack them with grease. If the bearings are damaged, replace them as a set.



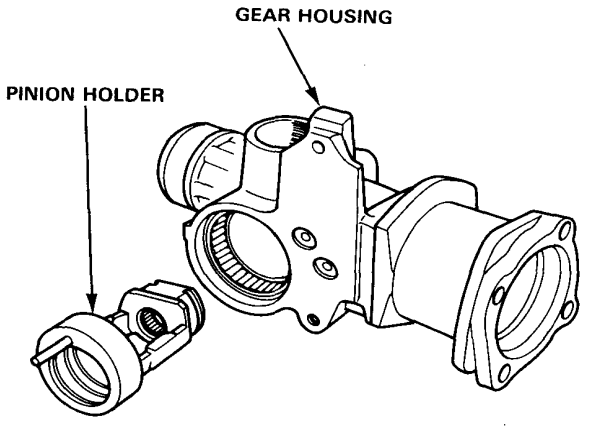
(cont'd)

Resealing (cont'd)

- Pack a new upper bearing with grease, then drive the bearing into the gear housing with its sealed side facing out.

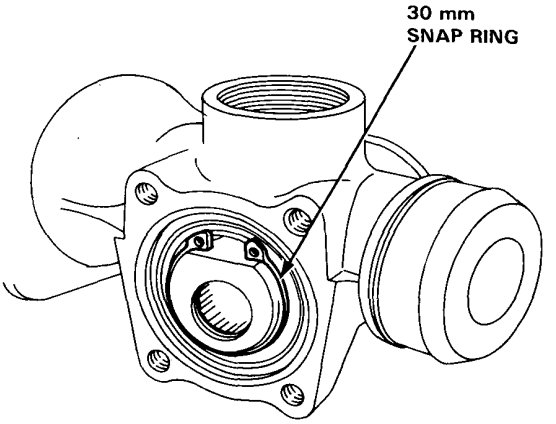


- Install the pinion holder in the gear housing.

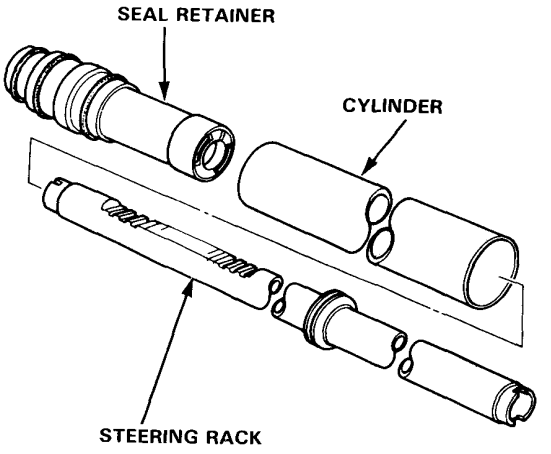


- Reinstall the 30 mm snap ring with its tapered side facing out.

NOTE: The snapring ends must be aligned with the flat area of the pinion holder.

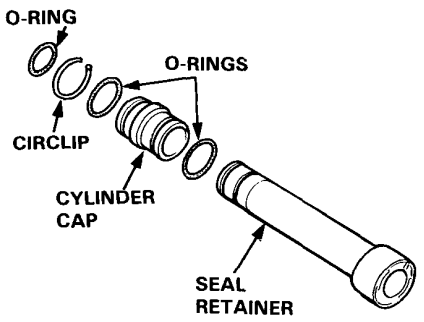


20. Remove the cylinder and seal retainer from the steering rack.



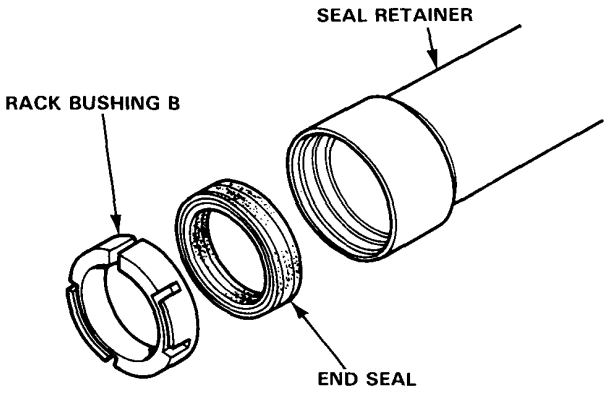
21. Remove the O-ring and circlip from the seal retainer, then remove the cylinder cap from the seal retainer.

22. Remove the O-rings from the cylinder cap.

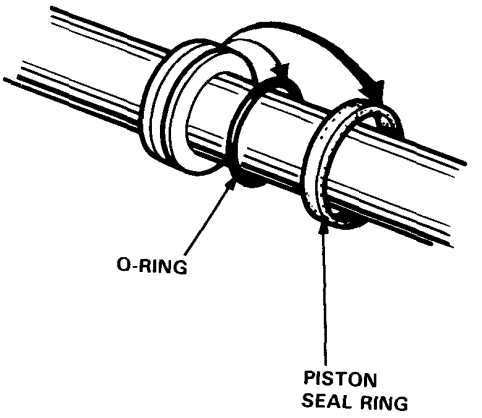


23. Remove the steering rack bushing B from the seal retainer.

24. Remove the cylinder end seal.

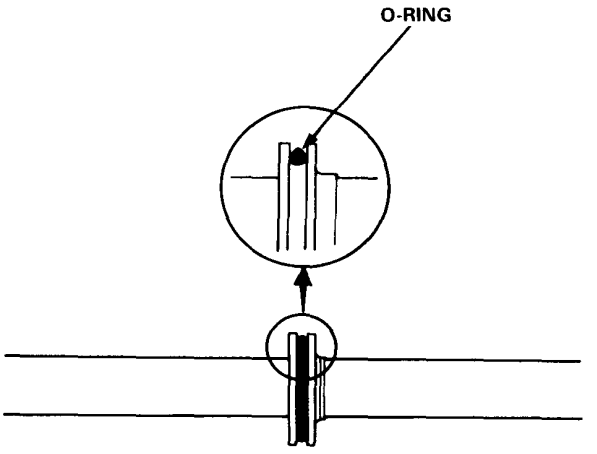


25. Carefully pry the piston seal ring and O-ring off the rack.



NOTE: Before reassembling any parts, inspect them as described on page 18-32, and make sure they are clean. Replace worn or damaged parts.

26. Install a new O-ring on the rack with its narrow edge facing out.

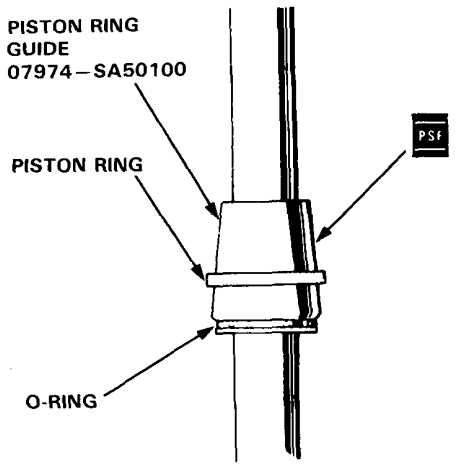


(cont'd)

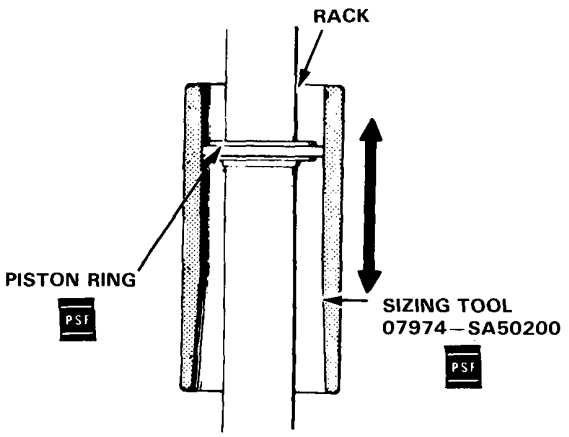
Resealing (cont'd)

27. Coat the pinion seal ring guide with power steering fluid, and slide it onto the rack, big end first.

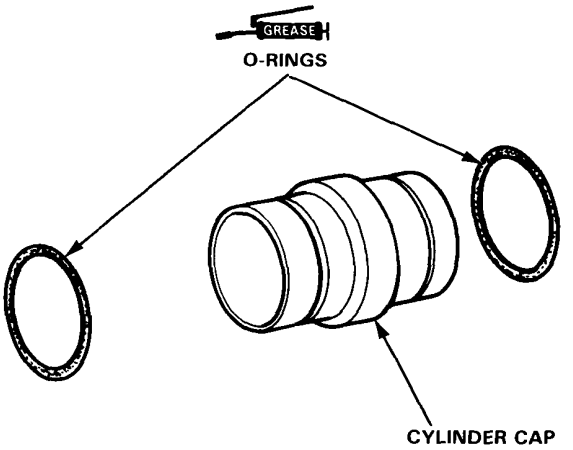
28. Position the new piston seal ring on the guide tool, slide it down to the big end of the tool, and then pull it off into the piston groove on top of the O-ring.



29. Coat the piston seal ring and inside of the sizing tool with power steering fluid.
Carefully slide the tool onto the rack and over the piston ring, then rotate the tool as you move it up and down to seat the piston ring.

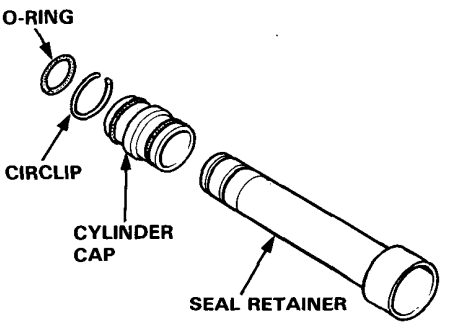


30. Coat new O-rings with grease and install them on the cylinder cap.

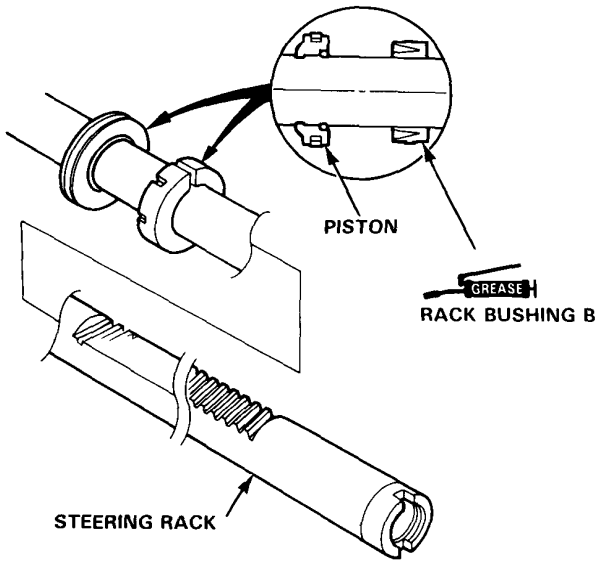


31. Install the back up ring, then slide the cylinder cap onto the seal retainer.

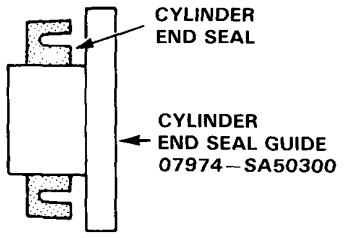
32. Install the circlip and O-ring on the seal retainer.



33. Grease the sliding surface of the steering rack bushing B, and install it on the steering rack with its groove side facing the steering rack piston.

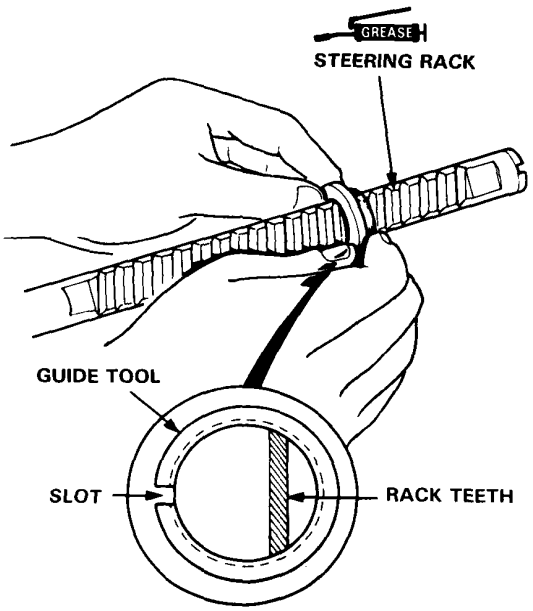


34. Grease the sliding surface of a new cylinder end seal, and the cylinder end seal guide, then set the seal on the seal guide with its grooved side facing the tool.

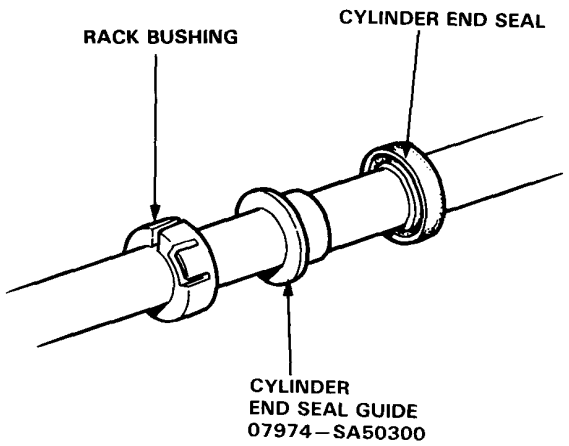


35. Grease the steering rack, and install the cylinder end seal.

CAUTION: Make sure the rack teeth do not face the slot in the guide tool.



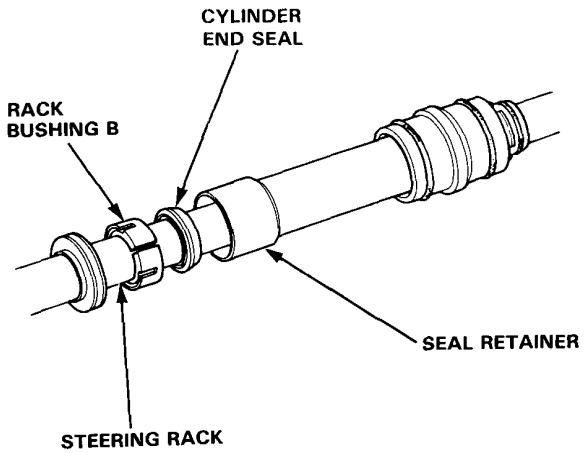
36. Remove the guide tool from the cylinder end seal, then separate ends of the tool and remove it from the rack.



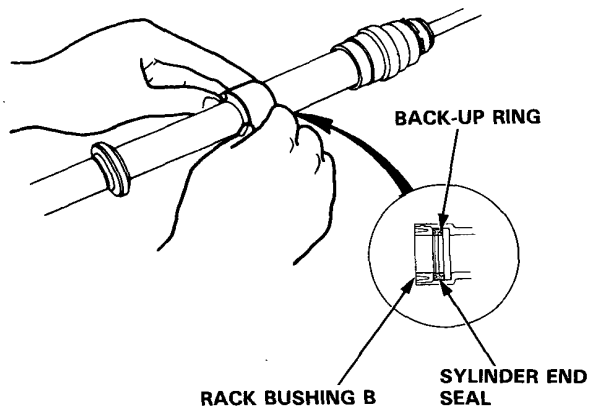
(cont'd)

Resealing (cont'd)

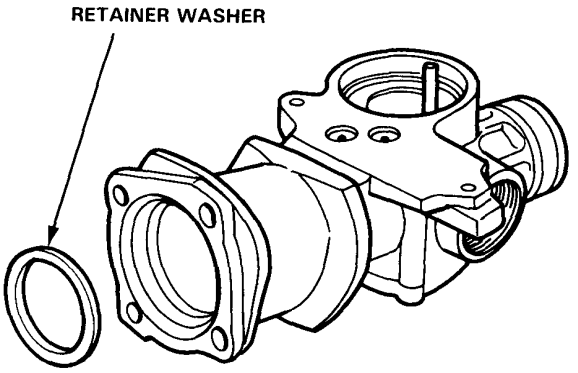
37. Fit the seal retainer on the steering rack.



38. Push the steering bushing B toward the seal retainer by hand until the bushing and end seal are as shown.

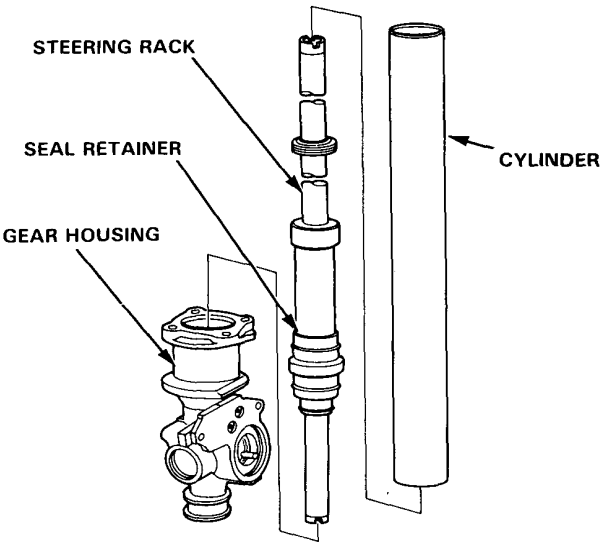


39. Install the retainer washer on the gear housing.



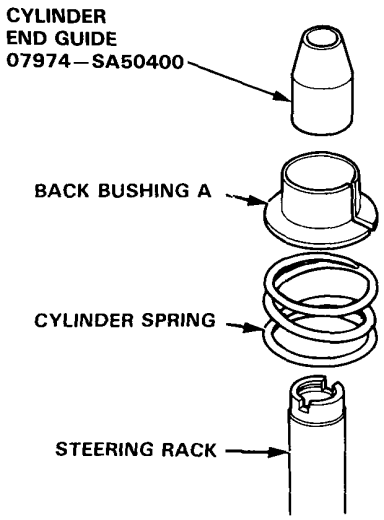
40. Place the gear housing on the work bench and insert the seal retainer and steering rack into the gear housing.

41. Coat the inside surface of the cylinder with power steering fluid, slide it over the rack and into the gear housing; press it in to the housing until it seats.

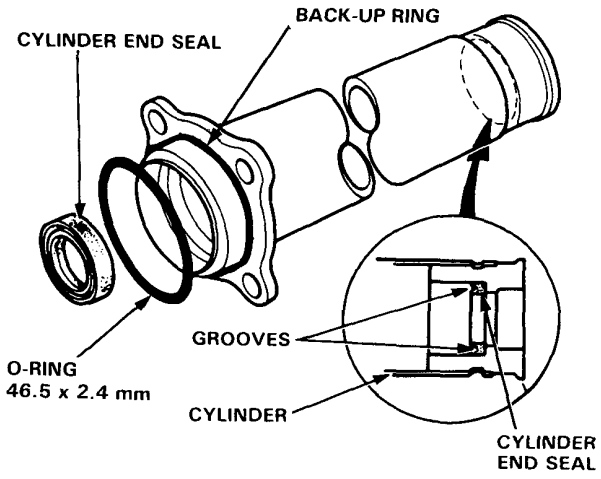


42. Install the cylinder spring over the rack, then coat the rack bushing A with power steering fluid and install it on the spring.

43. Grease the end guide and slip it onto the end of the steering rack.



44. Coat the inside surface of the cylinder with power steering fluid and install the cylinder end seal with its groove side facing out.

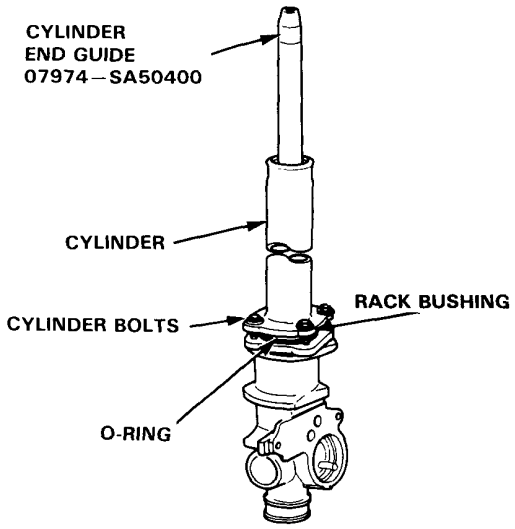


45. Install the back-up ring then install the O-ring on the cylinder.

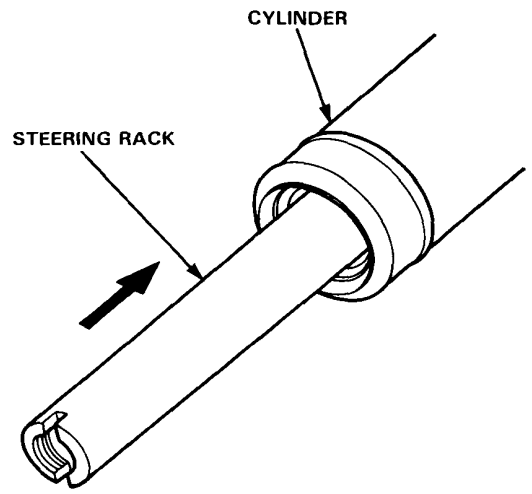
46. Carefully install the cylinder on the gear housing and loosely install with four bolts.

CAUTION: Be careful not to damage the end seal in the housing.

47. Remove the cylinder end guide from the steering rack.



48. Insert the steering rack into the cylinder, being careful not to damage the steering rack sliding surface.

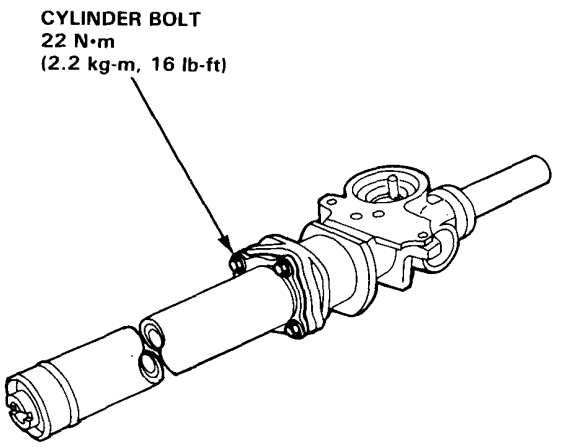


(cont'd)

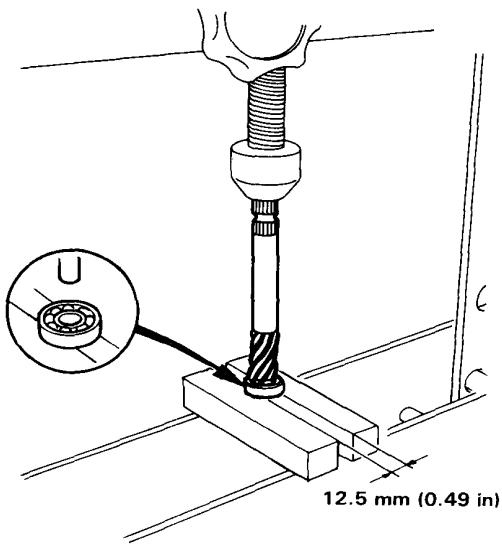
Resealing (cont'd)

49. Tighten the cylinder housing to the gear housing with four bolts.

    NOTE: Before tightening the bolts, make sure the mating surfaces of the cylinder and gear housings fit properly by pushing them together; hold them together while tightening the bolts.

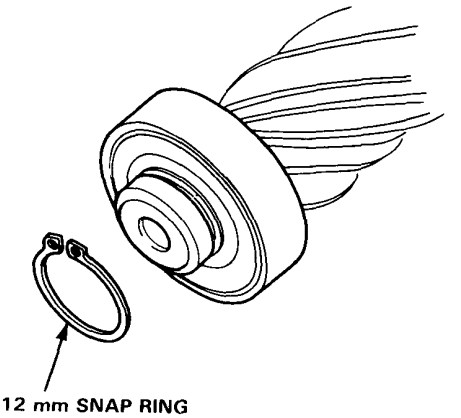


50. Press the lower ball bearing onto the pinion with its shielded side facing down.

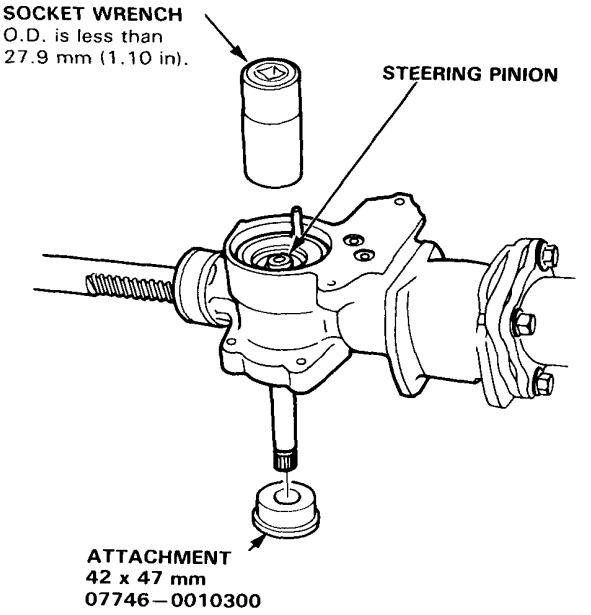


51. Install the 12 mm snap ring on the steering pinion.

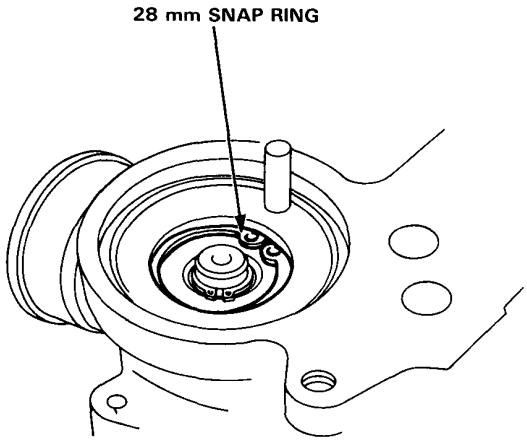
52. Apply grease to the lower ball bearing and check for smooth operation.



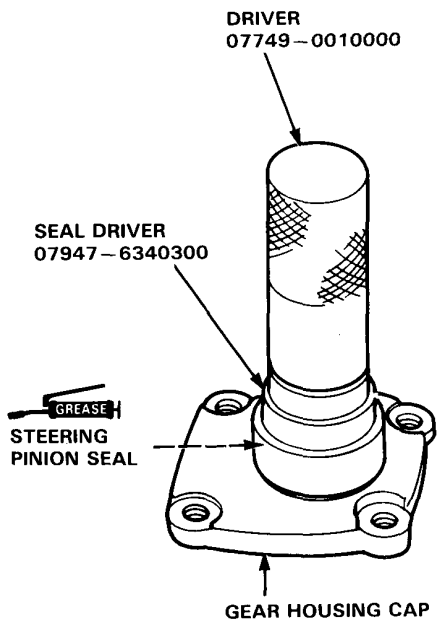
53. Install the steering pinion in the pinion holder.



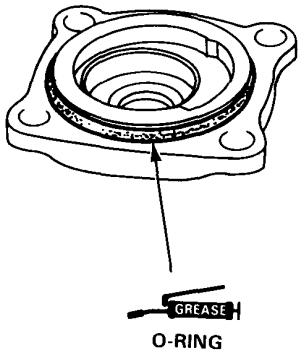
54. Install the 28 mm snap ring securely in the pinion holder groove.



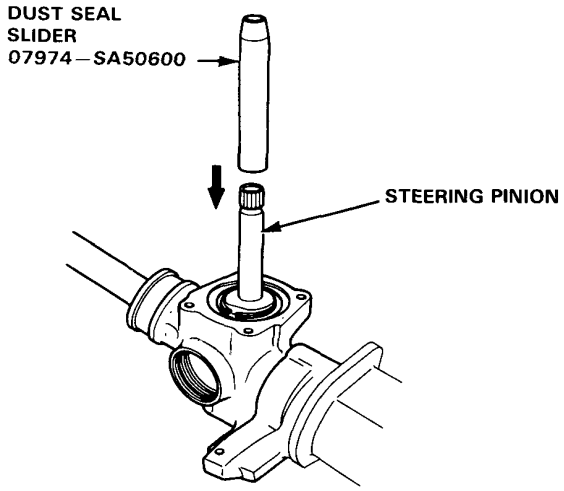
55. Grease the steering pinion seal, and install it on the gear housing using the special tools.



56. Grease the new 46 x 1.5 mm O-ring and install it in the groove in the gear housing cap.



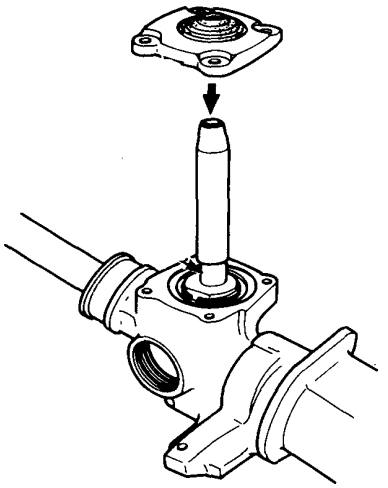
57. Grease the special tool and fit it over the steering pinion.



(cont'd)

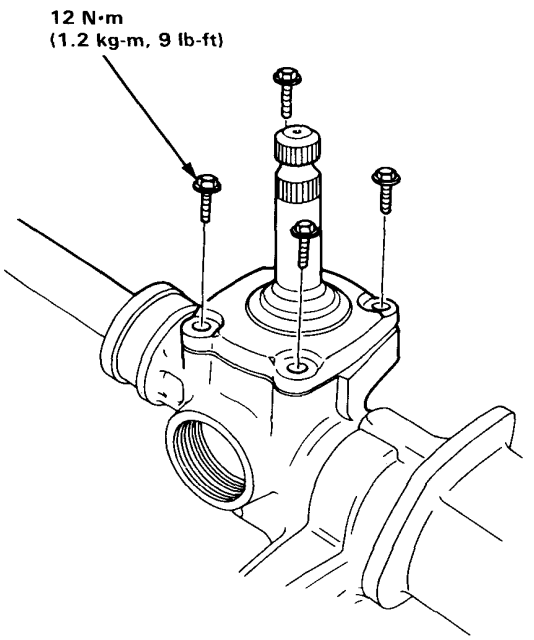
Resealing (cont'd)

58. Install the gear housing cap being careful not to damage or distort the lip of the seal, or dislodge the seal spring.



59. Remove the special tool.

60. Tighten the four gear housing cap bolts.

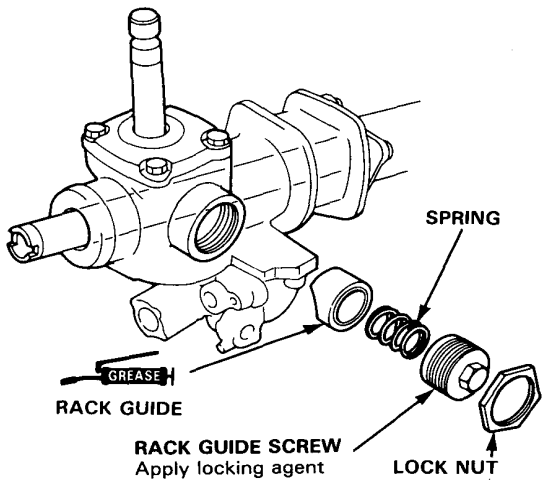


61. Install the control valve unit on the gear housing (page 18-32).

62. Coat the rack guide with grease.

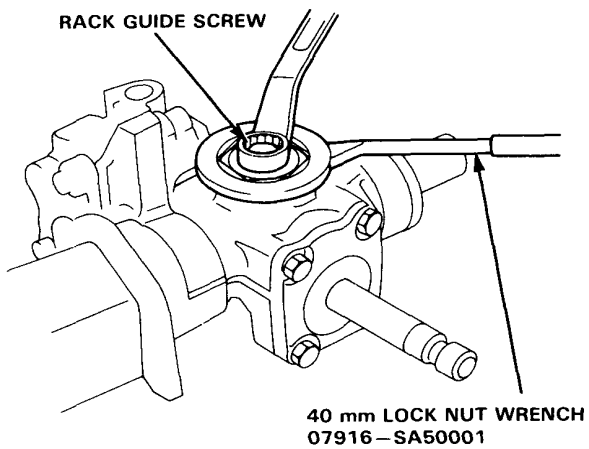
63. Install the rack guide, spring and rack guide screw on the gear housing.

NOTE: Apply locking agent to the rack guide screw threads.



64. Tighten the rack guide screw until it compresses the spring and seats against the rack guide, then loosen it.
Retighten it to 4 N·m (0.4 kg-m, 2.9 lb-ft), back off about 25° and install the lock nut on the rack guide screw.

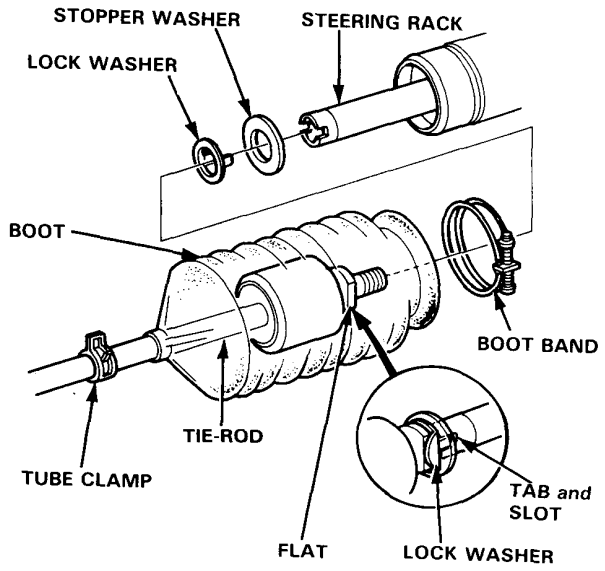
65. Tighten the lock nut while holding the rack guide screw with the lock nut wrench.



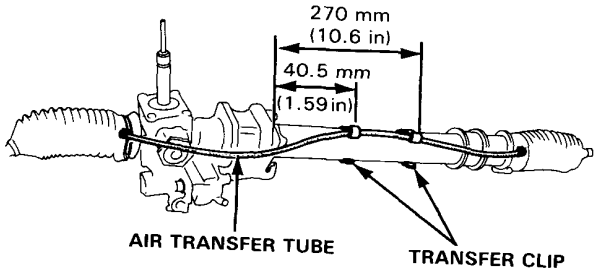
66. Screw each tie rod into the rack while holding the lock washer so its tabs are in the slots in the rack end.

67. Tighten the tie rod securely, then bend the lock washer back against the flat on the flange as shown.

68. Install the boots and secure with boot band and tube clamp.



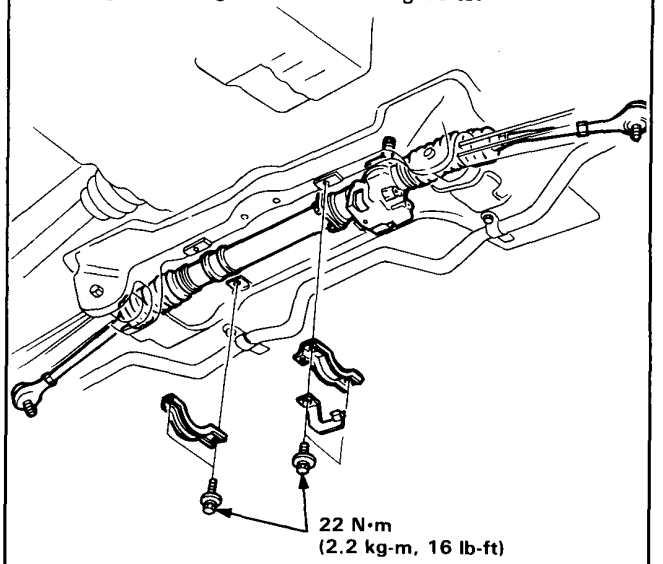
69. Install the air transfer tube and clamp with transfer clips as shown.



Installation

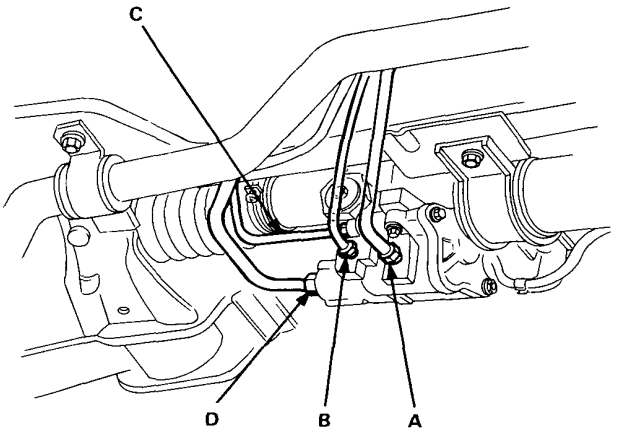
1. Reinstall the gear box in the reverse order of removal.

2. Tighten the gear box mounting bolts.



3. Connect the fluid lines to the control unit (page 18-31).

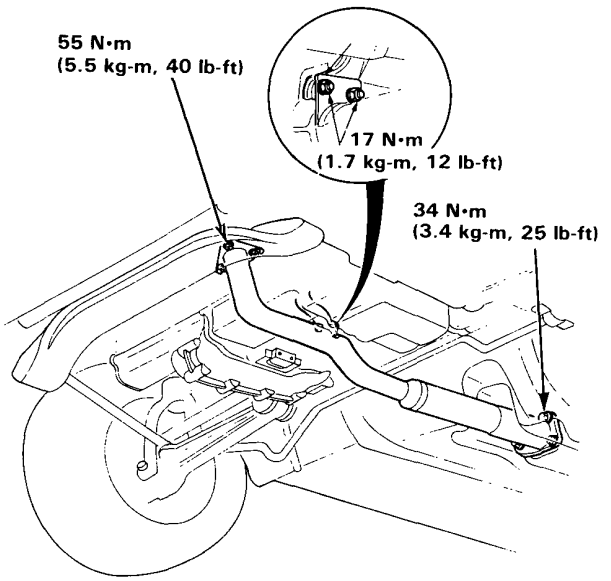
A: From pump 14 mm wrench
35—45 N·m (3.5—4.5 kg-m, 25—33 lb-ft)
B: To speed sensor 12 mm wrench
11—15 N·m (1.1—1.5 kg-m, 8—11 lb-ft)
C: From speed sensor 12 mm wrench
11—15 N·m (1.1—1.5 kg-m, 8—11 lb-ft)
D: To reservoir 17 mm wrench
26—32 N·m (2.6—3.2 kg-m, 19—23 lb-ft)



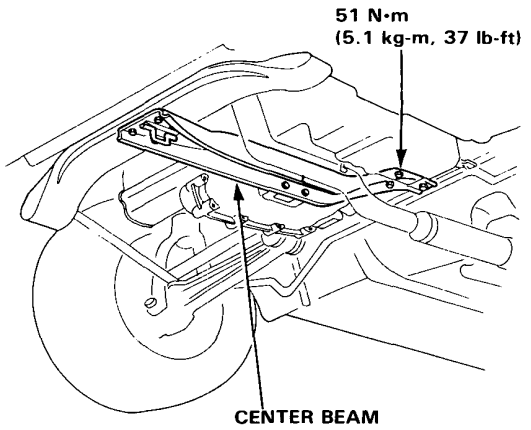
(cont'd)

Installation (cont'd)

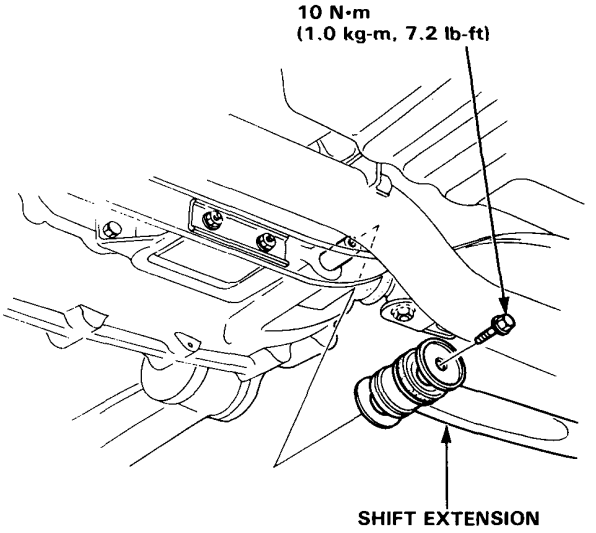
4. Install the header pipe with new gasket, and tighten the bolts and nuts.



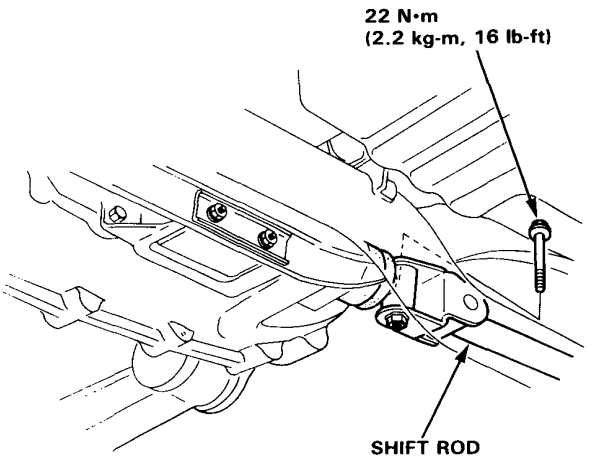
5. Install the center beam and tighten the bolts.



6-1. (Manual transmission model only)
- Install the shift extension to the transmission case.

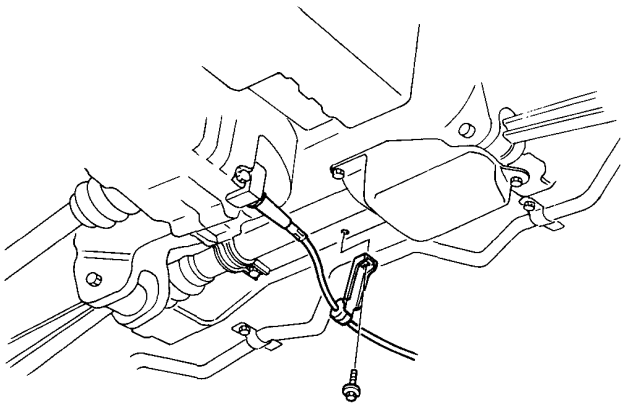


- Connect the shift rod to the transmission case using the 8 mm bolt.

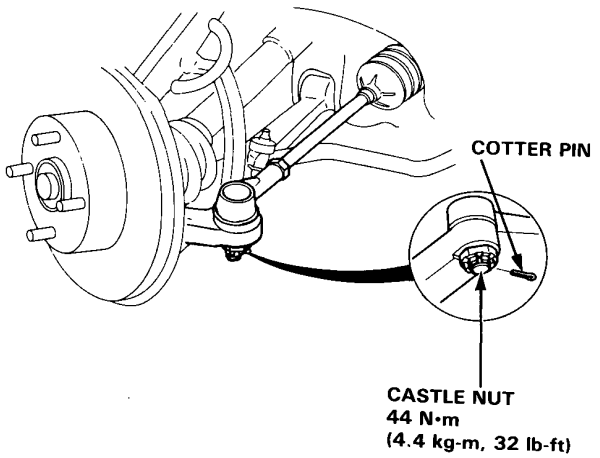


6-2. (Automatic transmission model only)

- Install the cable clamp.

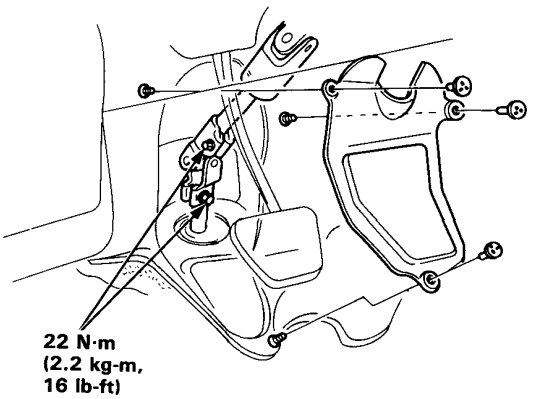


7. Reconnect the tie rods to the steering knuckles, tighten the castle nut to specified torque, and install new cotter pins.



8. Reconnect the steering shaft to the gear box.

9. Install the steering joint cover.



10. Fill the system:

- Fill the reservoir with new Honda Power Steering Fluid.
- Start the engine and let it run at fast idle, then turn the steering wheel from lock-to-lock several times to bleed air from the system.
- Check the fluid again, and add more if necessary.

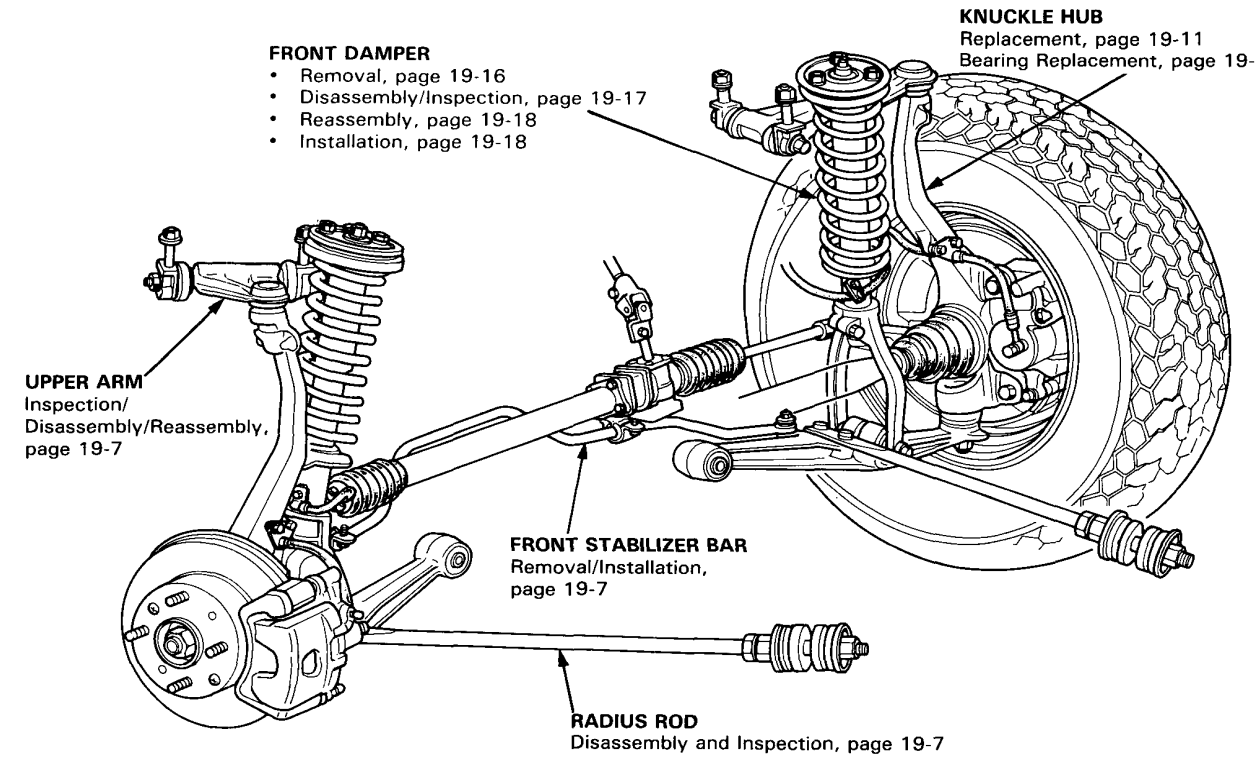
11. Check the gearbox for leaks, then reinstall the shield.

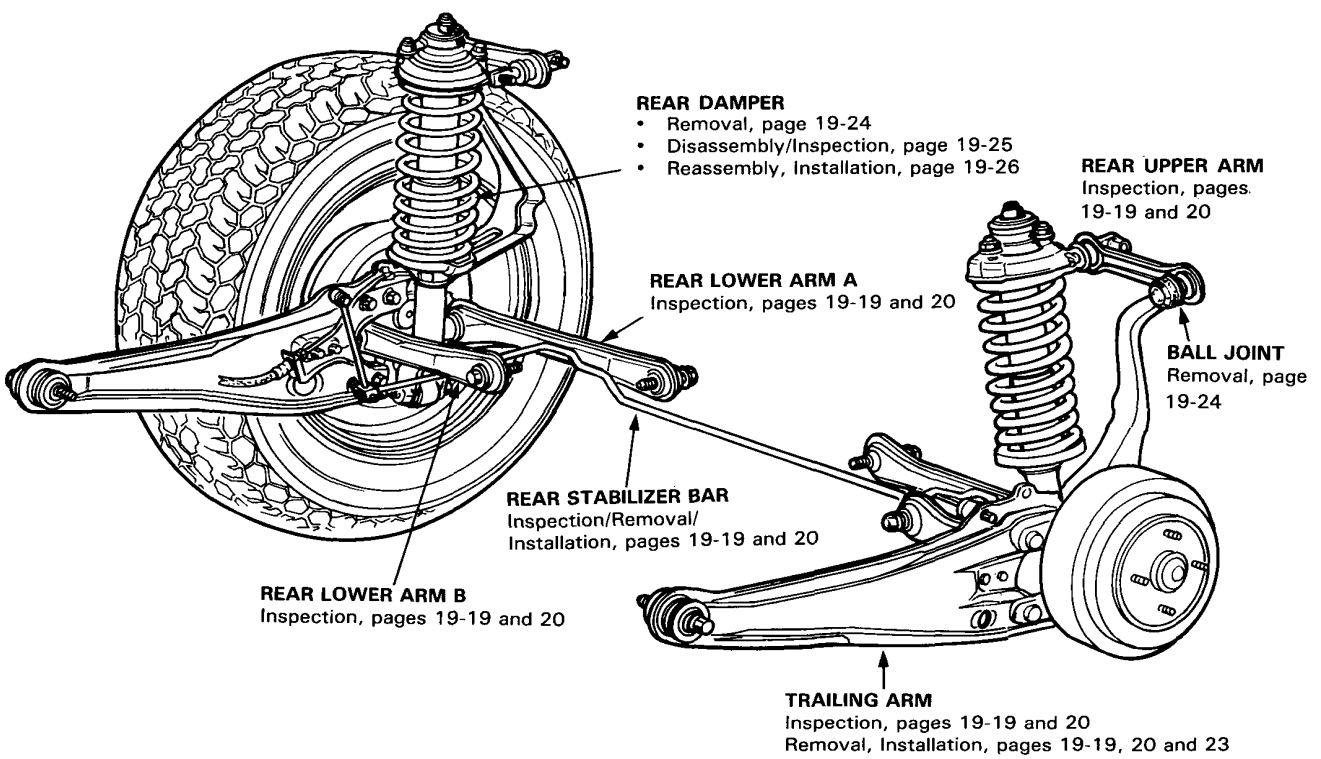
12. Reinstall the front wheels.

Suspension

Suspension

Index





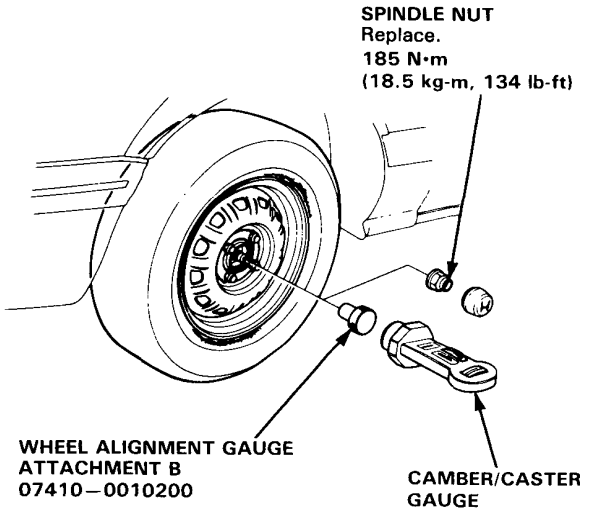
Wheel Alignment

Camber Inspection

NOTE: Check tire pressure before inspection.

1. With the wheels in a straight ahead position, remove the spindle nut and install the special tool on the spindle as shown.
2. Set up the camber/caster gauge.
3. Read the camber on the gauge with the bubble at the center of the gauge.

Camber angle: Front: 0°00′ ± 1°
Rear: 0°00′ ± 1°

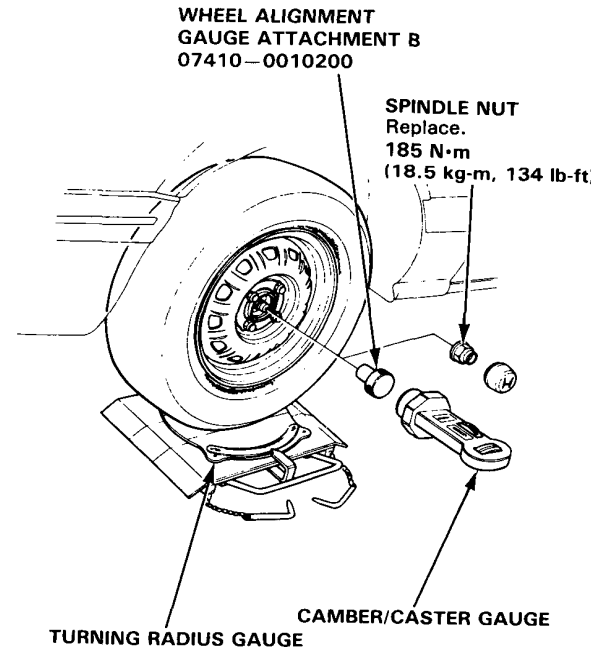


Caster Inspection/Adjustment

NOTE: Check tire pressure before inspection.

1. Jack up the front of the car and set the turning radius gauges beneath the front wheels, then lower the car.
2. Remove the spindle nut and install special tool Wheel Alignment Gauge Attachment B.
3. Install Camber/Caster Gauge on the Attachment and apply the front brake. Turn the wheel 20° inward.
4. Turn the adjust screw so that the bubble in the caster gauge is at 0°.
5. Turn the wheel 20° outward and read the caster on the gauge with the bubble at the center of the gauge.

Caster Angle: 0°30′ ± 1°



6. If adjustment is required, record the caster reading, then go to step 7. If adjustment is not required, remove alignment equipment.

(cont'd)

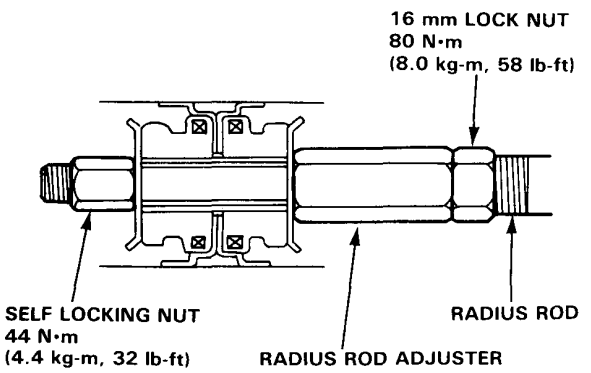
Caster Inspection/Adjustment (cont'd)

7. Loosen the radius rod adjuster lock nut, and the self locking nut on the end of the radius rod.

8. Adjust the caster by turning the radius rod adjuster as required.

   To increase .....Turn the adjuster in.
   To decrease .....Turn the adjuster out.

   NOTE: Turning the adjuster one full turn moves the radius rod 1.25 mm, and changes the caster 0°8'.



9. Tighten the radius rod adjuster lock nut, then tighten the self locking nut.

10. Recheck the caster adjustment.

Front Wheel Toe Inspection/ Adjustment

NOTE: Check the tire pressure before inspection.

1. Center steering wheel spokes.

   NOTE: Measure difference in toe measurements with the wheels pointed straight ahead.

   Front toe-in: 0 ± 3 mm (0 ± 0.118 in)

   — If adjustment is required, go on to step 2.

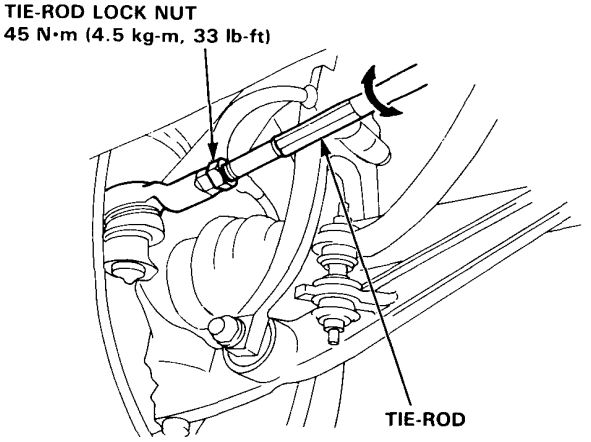
   — If no adjustment is required, remove alignment equipment.

2. Loosen the tie-rod locknuts and turn both tie-rods in the same direction until the front wheels are in straight ahead position.

3. Turn both tie-rods equally until the toe reading on the turning radius gauge is correct.

4. After adjusting, tighten the tie-rod locknuts.

   NOTE: Reposition the tie-rod boot if twisted or displaced after adjustment has been made.



Rear Wheel Toe Adjustment

1. Release parking brake.

   NOTE: If the parking brake is engaged, you may get an incorrect reading.

   Rear toe in: 0 ± 2 mm (0 ± 0.08 in)

   — If adjustment is required, go to step 2.

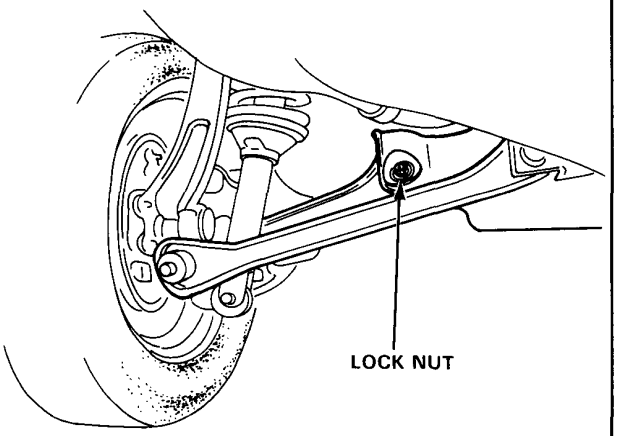
   — If no adjustment is required, remove alignment equipment.

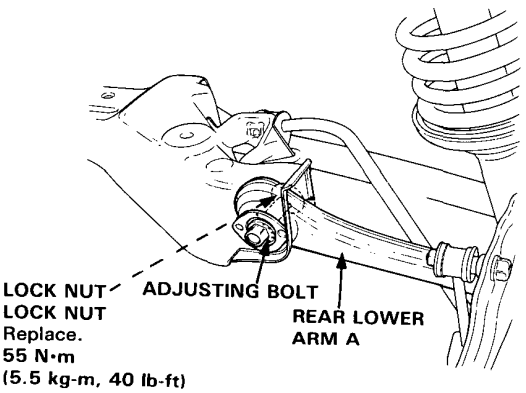
2. Hold the adjusting bolt on the rear lower arm A and loosen the lock nut.

3. Adjust the rear toe by turning the adjusting bolt until toe is correct.

   NOTE: Turning the adjusting bolt one graduation changes toe 4 mm (0.16 in) in each wheel.

4. Install a new lock nut and tighten while holding the adjusting bolt.





Turning Angle Inspection/ Adjustment

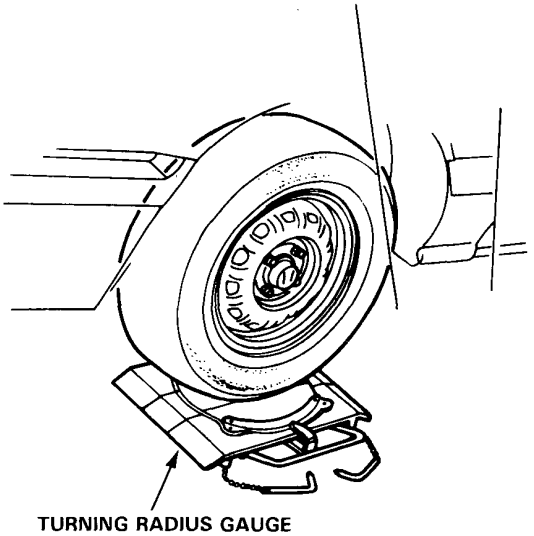
1. Jack up the front of the car, set the turning radius gauge beneath the front wheels, then lower the car.

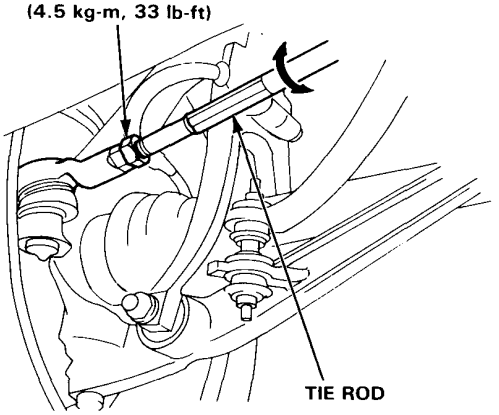
2. Turn the wheel right and left while applying the brake, and measure the turning angle of both wheels.

   Turning angle:
   Inward wheel: 39°30′ ± 2
   Outward wheel: 30°30′ ± 2

3. If the measurements are not within the specifications, adjust as required by turning the tie rod.

   NOTE: After adjustments, recheck the front wheel toe and readjust if necessary.
   Reposition the tie rod boot if twisted or displaced after adjustment has been made.



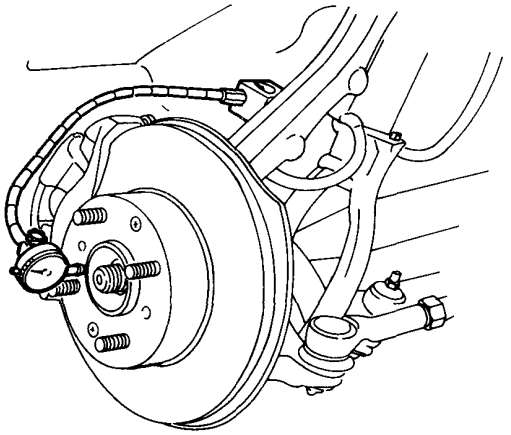


Wheel Measurement

Bearing End Play

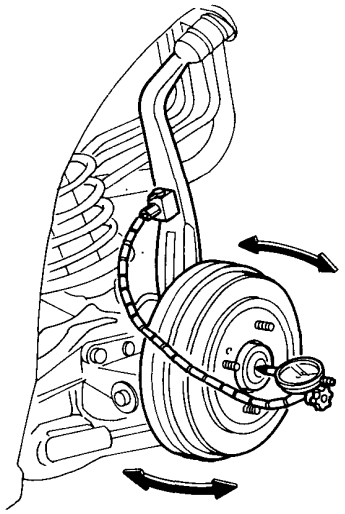
Front Wheel End Play

Standard: 0—0.05 mm (0—0.002 in)



Rear Wheel End Play

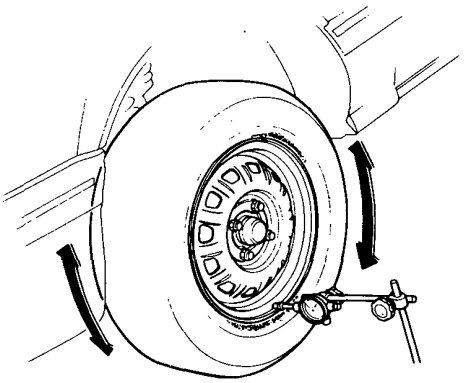
Standard 0—0.05 mm (0—0.002 in)



Runout

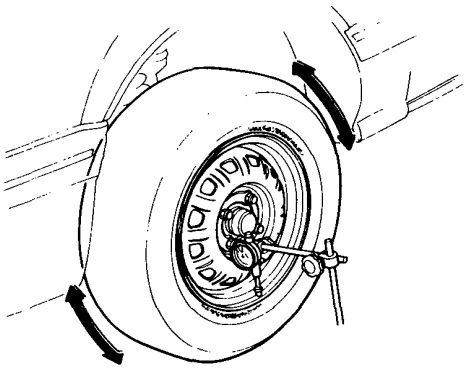
Front and Rear Wheel
Axial Runout

Standard:
Steel Wheel: 0—0.1 mm (0—0.04 in)
Aluminum Wheel: 0—0.7 mm (0—0.03 in)

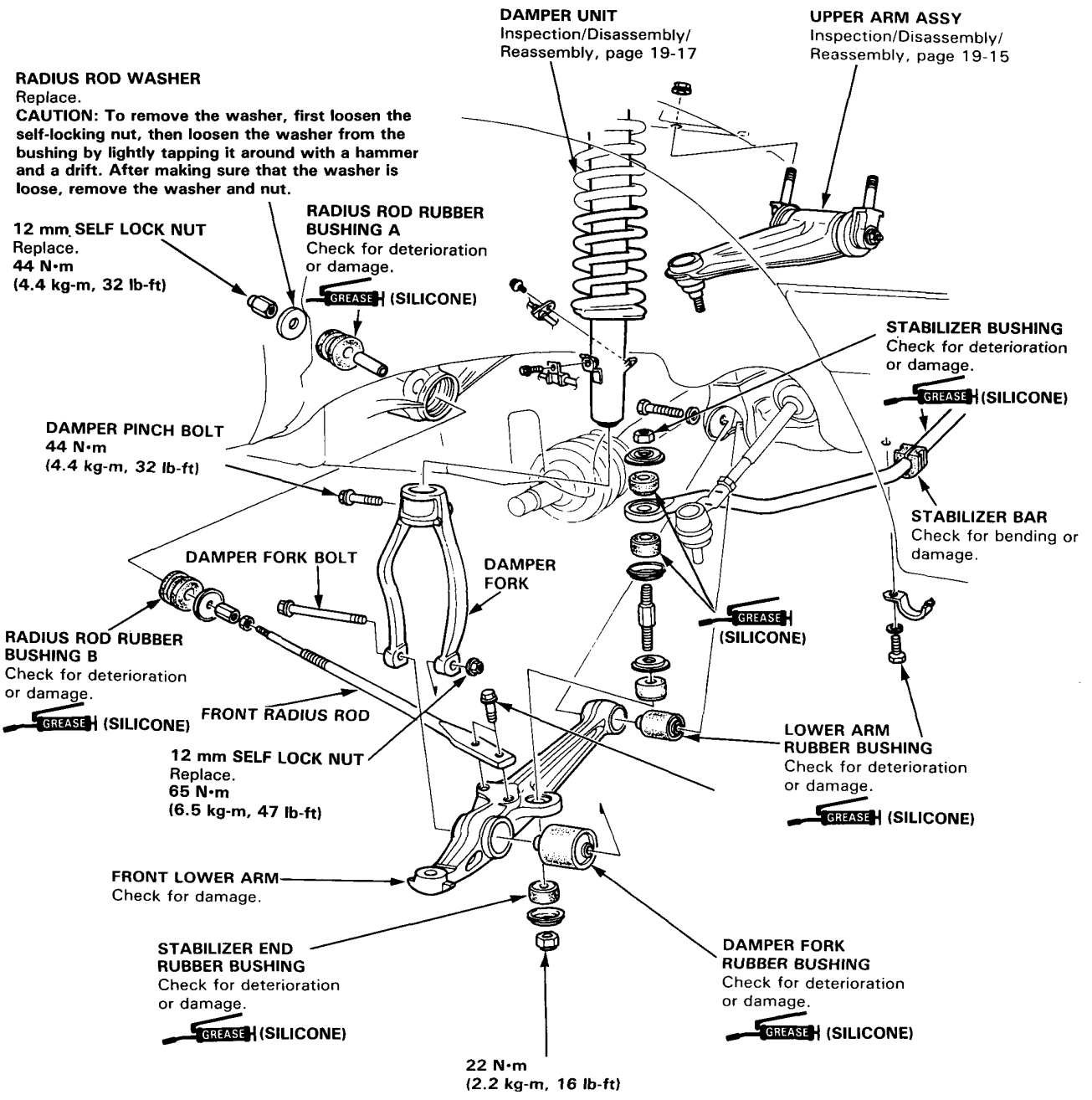


Front and Rear Wheel
Radial Runout

Standard:
Steel Wheel: 0—0.1 mm (0—0.04 in)
Aluminum Wheel: 0—0.7 mm (0—0.03 in)



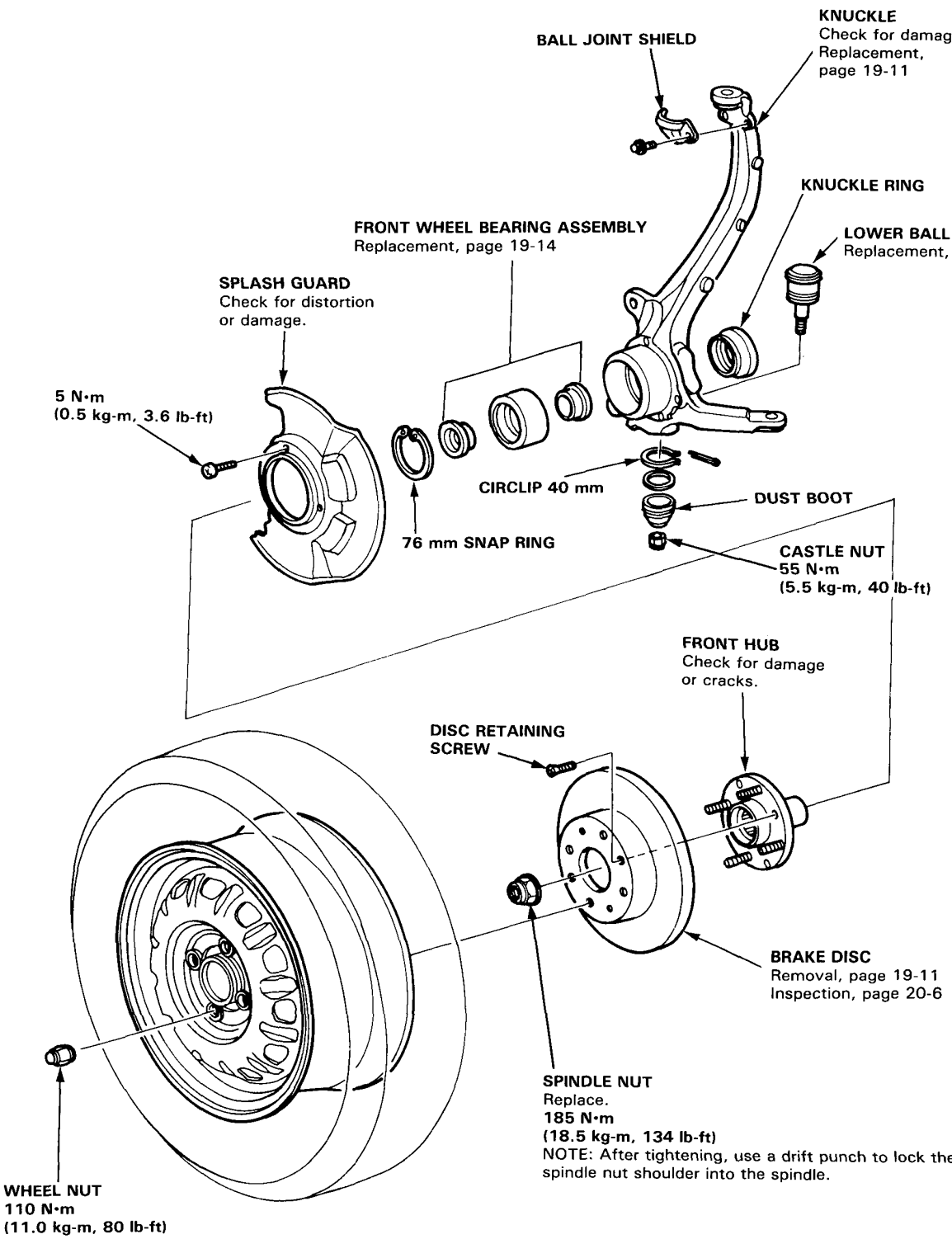
Disassembly and Inspection



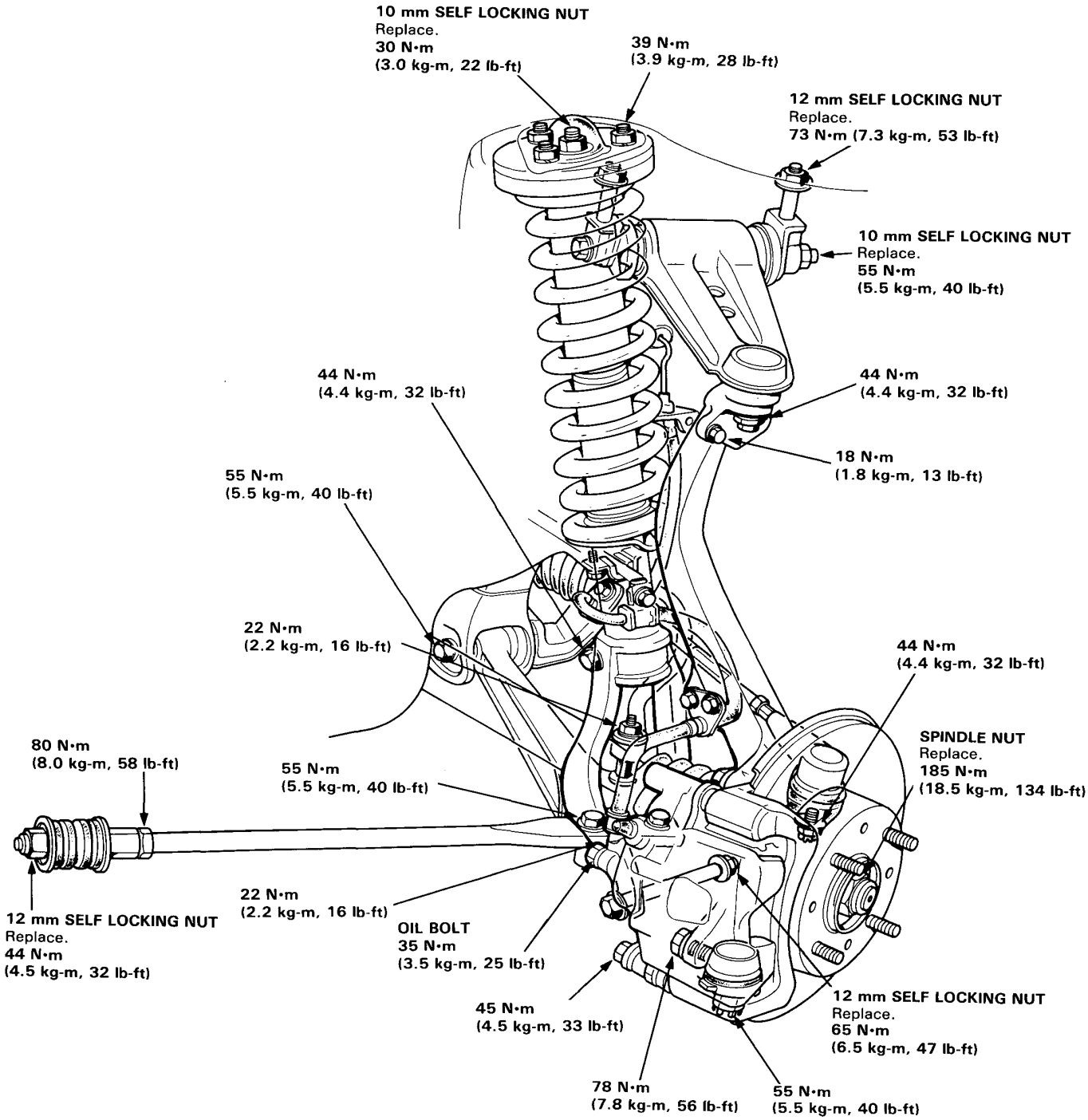
NOTE: The radius rod bushings can be installed for each other. However, the thick bushing should be installed in front position.

(cont'd)

Disassembly and Inspection (cont'd)



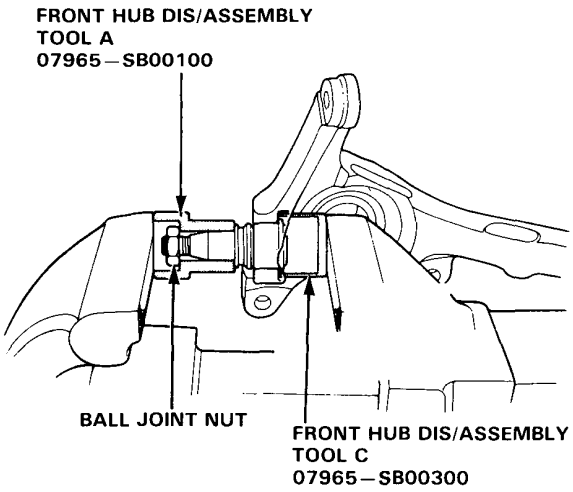
Torque Specification



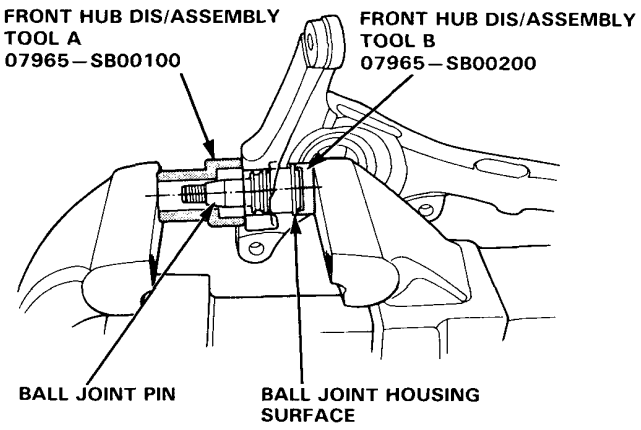
NOTE: Before tightening the bolts or nuts connected to the rubber mounts or bushings, the vehicle weight must be loated.

Lower Ball Joint Replacement

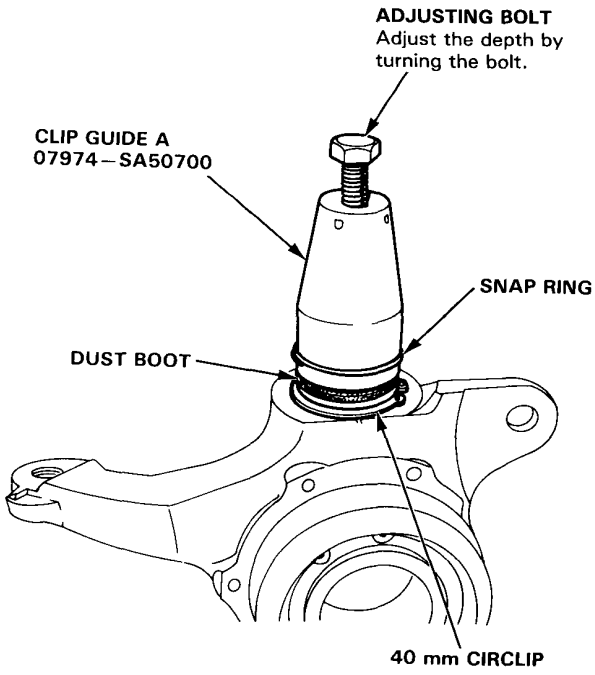
1. Remove the knuckle (page 19-11).
2. Remove the boot by prying the snap ring off.
3. Remove the 40 mm circlip.
4. Install the special tool on the ball joint and tighten the ball joint nut.
5. Position the special tool over the ball joint as shown then set the assembly in a vise. Press the ball joint out of the knuckle.



6. Place the ball joint in position by hand.
7. Install the special tool over the ball joint as shown, then press the ball joint in.

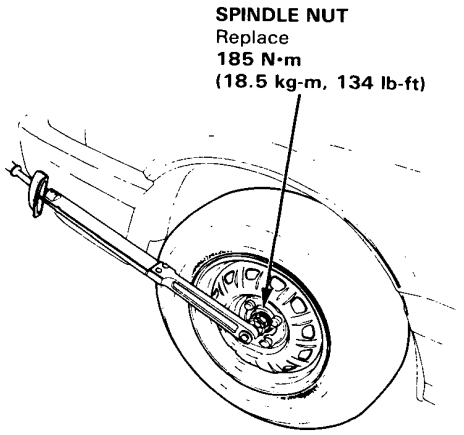


8. Install the 40 mm circlip.
9. Install the boot and snap ring using the special tool.



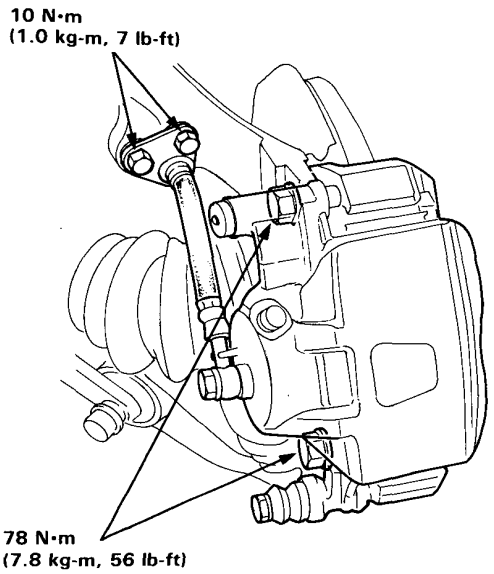
Knuckle/Hub Replacement

1. Pry the spindle nut lock tab away from the spindle, then loosen the nut using a 32 mm socket.



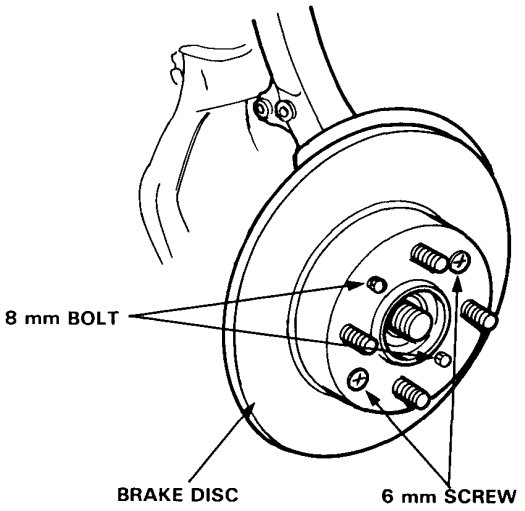
2. Loosen the lug nuts slightly.
3. Raise the front of car and support on safety stands in proper locations.
4. Remove the lug nuts, wheel, and spindle nut.
5. Remove the caliper mounting bolts and hang the caliper assembly to one side.

   CAUTION: To prevent accidental damage to the caliper assembly or brake hose, use a short piece of wire to hang the caliper assembly from the undercarriage.

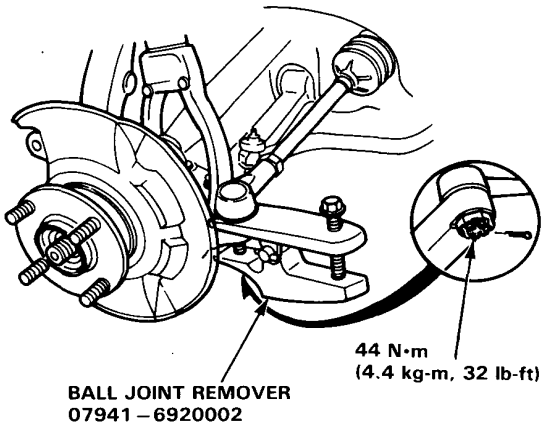


6. Remove the 6 mm brake disc retaining screws.
7. Screw two 8 x 12 mm bolts into the disc to push it away from the hub.

   NOTE: Turn each bolt two turns at a time to prevent cocking disc excessively.



8. Remove the cotter pin from the tie-rod end and remove the castle nut.
9. Break loose the tie-rod ball joint using the Ball Joint Remover, then lift the tie-rod out of the knuckle.



(cont'd)

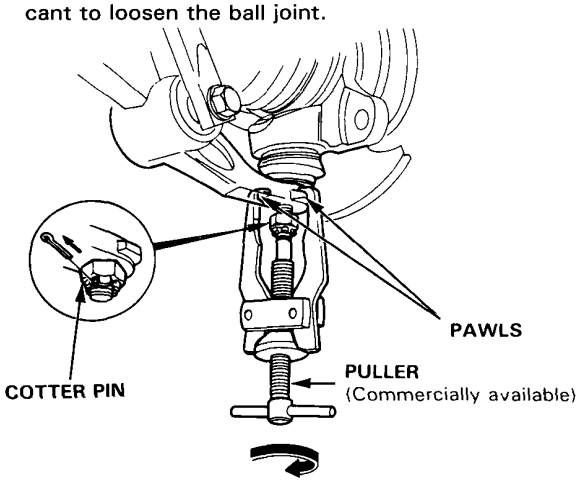
Knuckle/Hub Replacement (cont'd)

10. Pry the cotter pin off and loosen the lower arm ball joint nut half the length of the joint threads.

11. Separate the ball joint and lower arm using a puller with the pawls applied to the lower arm.

    CAUTION: Avoid damaging the ball joint boot.

    NOTE: If necessary, apply penetrating type lubricant to loosen the ball joint.

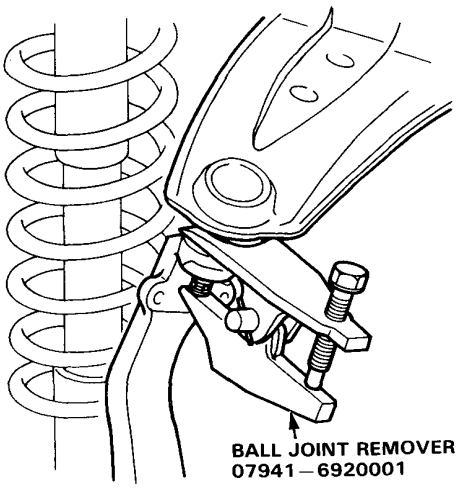


12. Remove the upper ball joint shield.

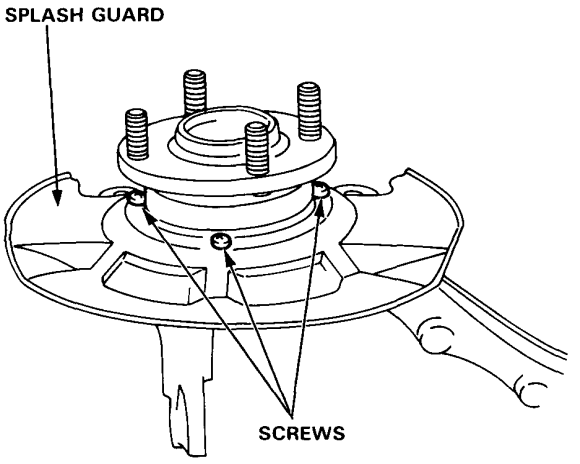
13. Pry off the cotter pin and remove the upper arm ball joint nut.

14. Separate the upper ball joint and knuckle using the Ball Joint Remover.

15. Remove the knuckle and hub by sliding them off the drive shaft.

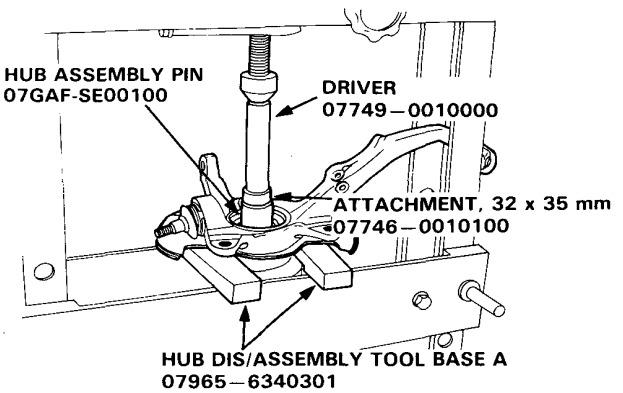


16. Remove the splash guard screws from the knuckle.



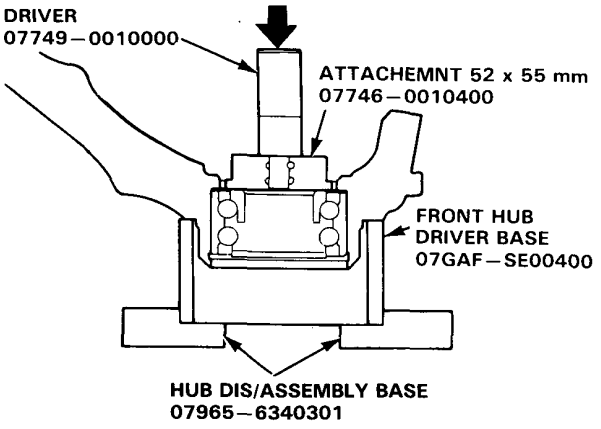
17. Separate the hub from the knuckle using the special tools and a hydraulic press.

    CAUTION:
    - **Take care not to distort the splash guard.**
    - **Hold onto the hub to keep it from falling when pressed clear.**

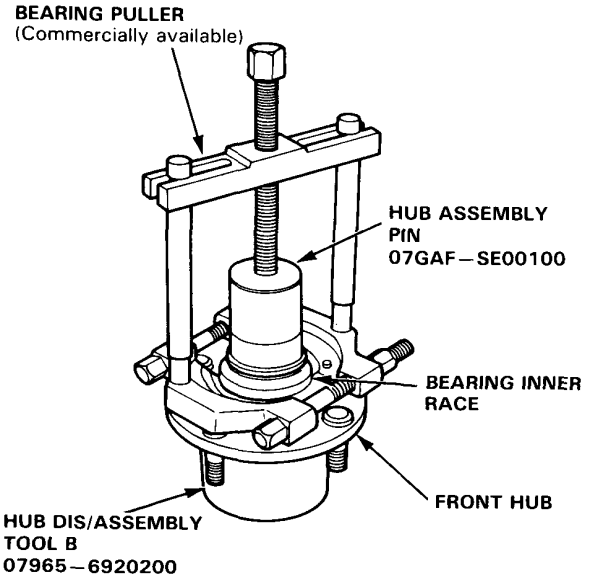


18. Remove the 76 mm snap ring and knuckle ring from the knuckle.

19. Press the wheel bearing out of the knuckle using the special tools shown and a hydraulic press.

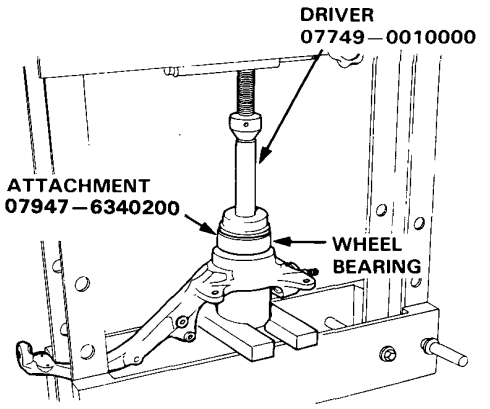


20. Remove the outboard bearing inner race from the hub using the special tools shown and a bearing puller.

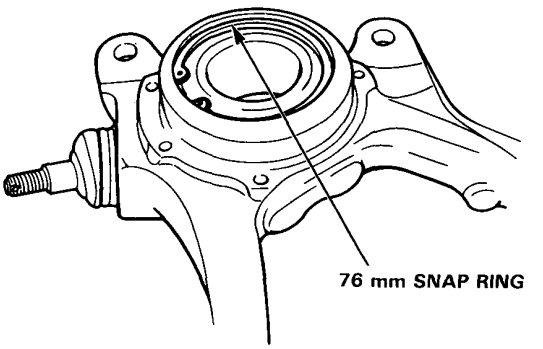


NOTE: Wash the knuckle and hub thoroughly before reassembly.

21. Press a new wheel bearing into the hub using the special tools shown and a hydraulic press.



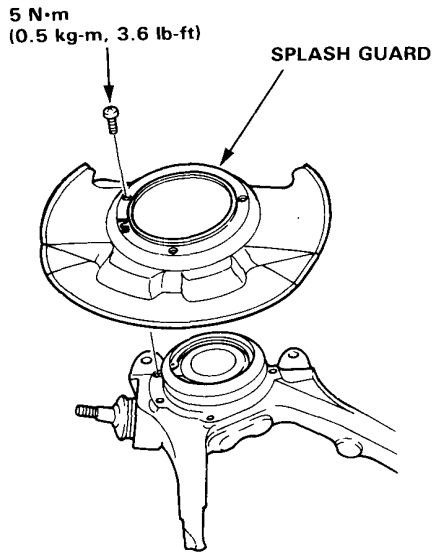
22. Install the 76 mm snap ring securely in the knuckle groove.



(cont'd)

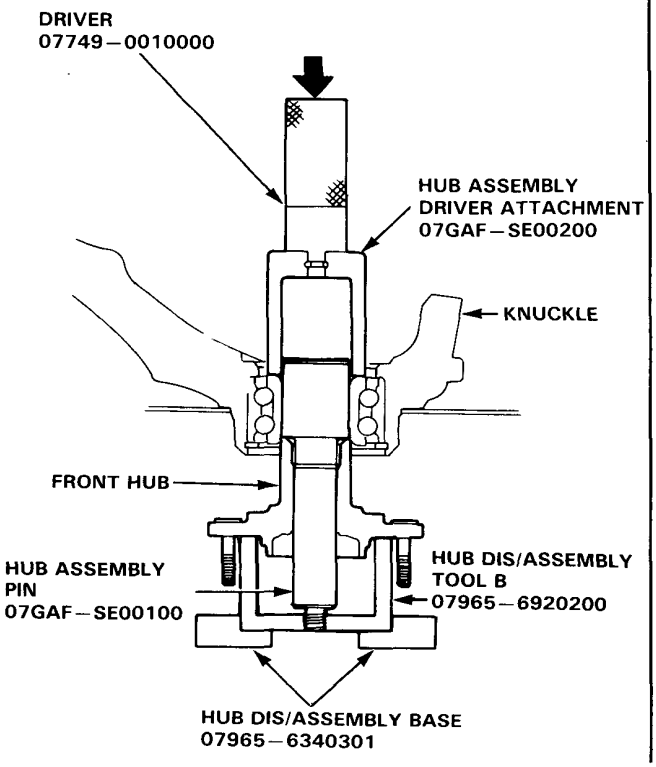
Knuckle/Hub Replacement (cont'd)

23. Install the splash guard and tighten the screws.

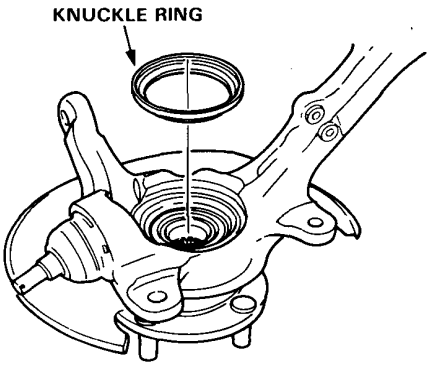


24. Place the front hub in special tool fixture, then set the knuckle in position and apply downward pressure with a hydraulic press.

CAUTION: Maximum press load: 2 tons.

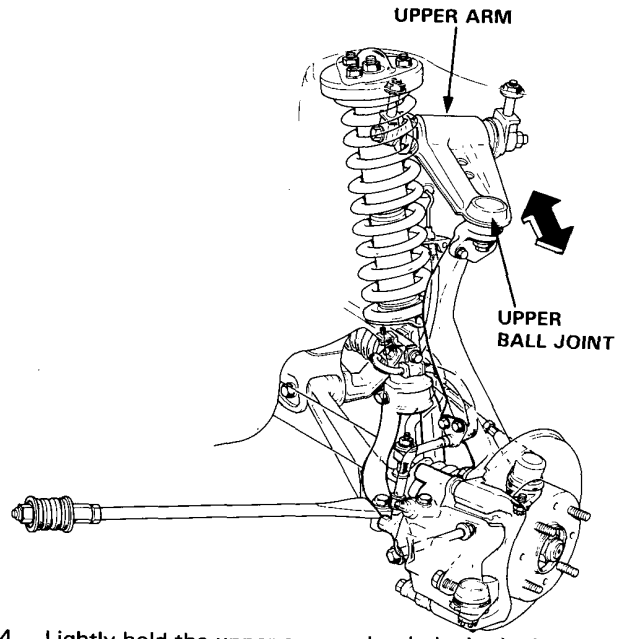


25. Install the front knuckle ring on the knuckle.

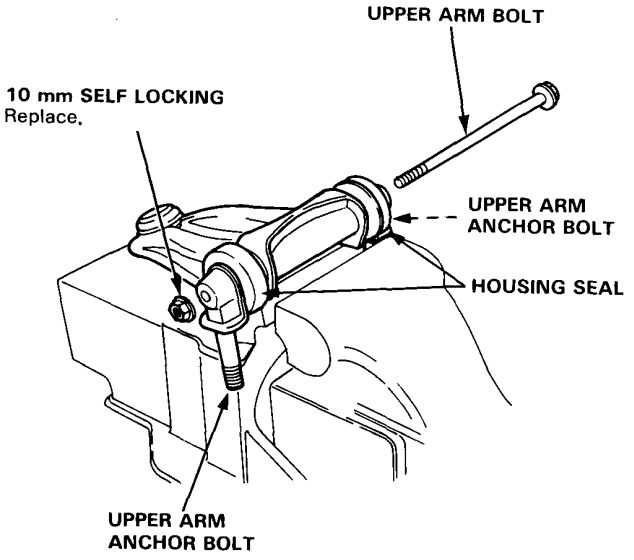


Upper Arm Bushing Replacement

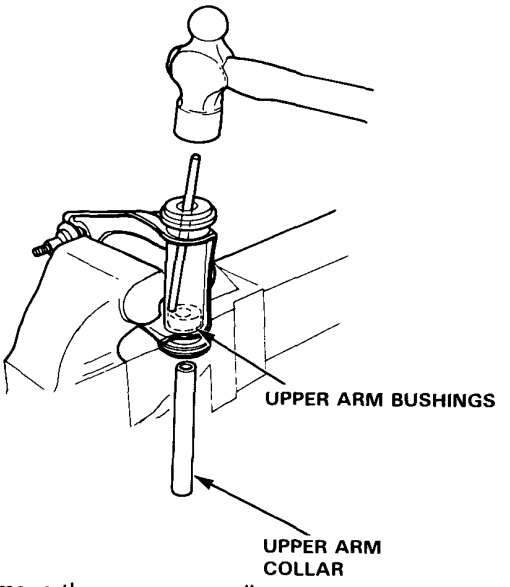
1. Remove the front wheels.
2. Rock the upper ball joint front-to-back.
3. Replace the upper arm bushings as follows if there is any play.



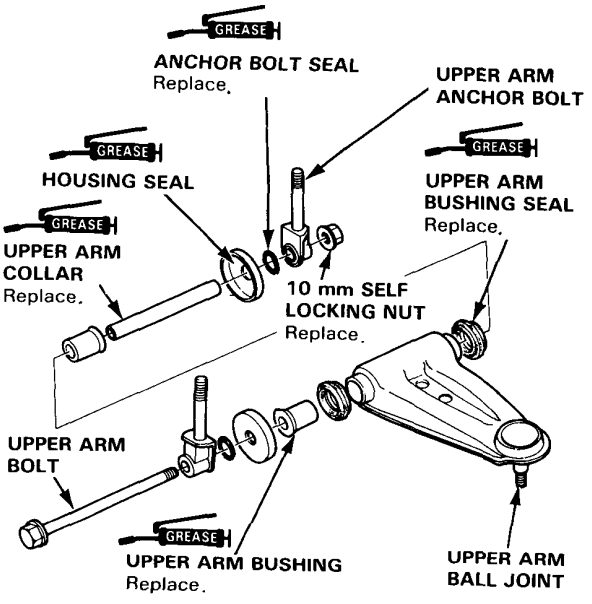
4. Lightly hold the upper arm anchor bolts in the jaws of a vise as shown.



5. Remove the 10 mm self locking nut, upper arm bolt, upper arm anchor bolts and housing seals.
6. Install the upper arm in a vice.



7. Remove the upper arm collar.
8. Drive out the upper arm bushings with a dirft.
9. Replace the upper arm bushings, upper arm bushing seals and upper arm collar with new ones.
10. Coat the ends and insides of the upper arm bushings, and the sealing lips of the upper arm bushing seals with grease.

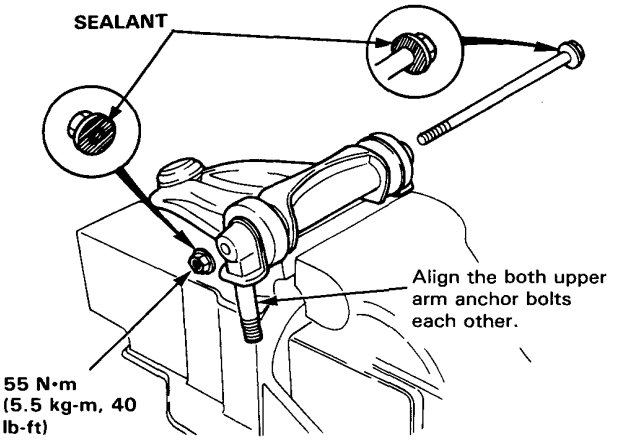


(cont'd)

Upper Arm Bushing Replacement (cont'd)

11. Lightly hold the upper arm anchor bolts in a vise.
12. Apply sealant to the threads and underside of the upper arm bolt heads and self-locking nut. Install the upper arm bolt and tighten the self-locking nut.

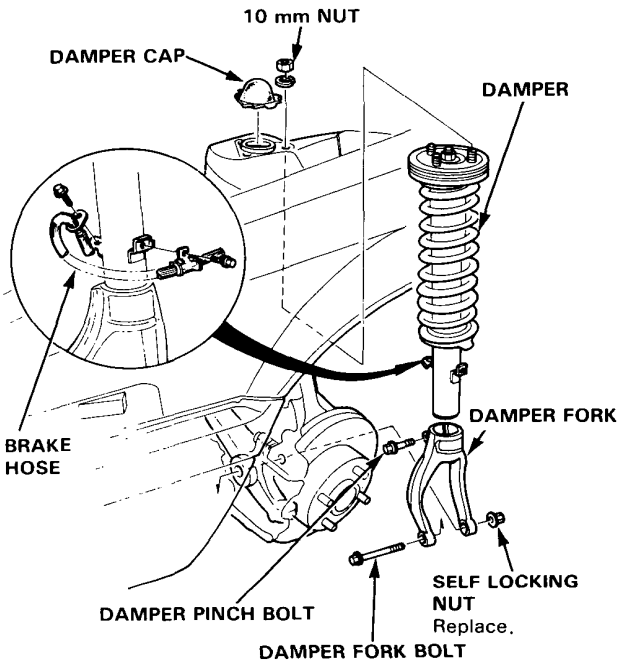
    NOTE: Do not apply sealant to the areas other than specified.



13. After installation, check the camber (page19-3).

Damper Removal

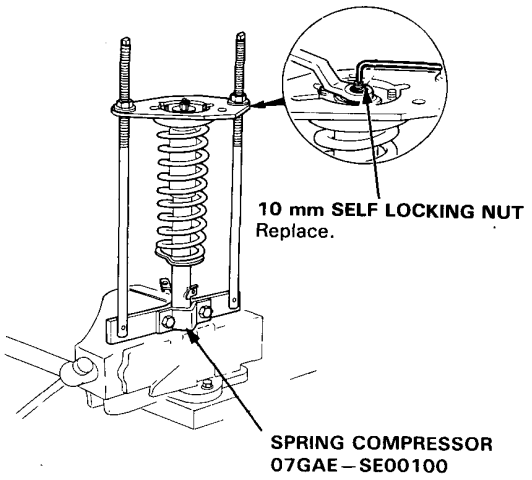
1. Remove the brake hose clamps from the damper.
2. Remove the damper pinch bolt.
3. Remove the damper fork bolt and remove the damper fork.
4. Remove the damper by removing the three 10 mm nuts.



Damper Disassembly and Inspection

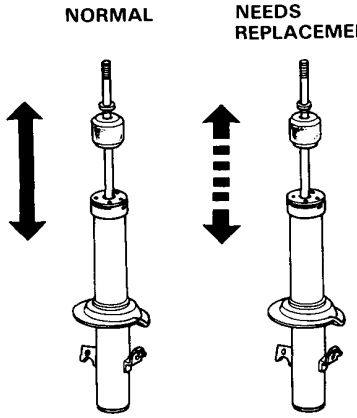
1. Compress the damper spring using the spring compressor, then remove the self locking nut.

   CAUTION: Do not compress the spring more than necessary to remove the nut.



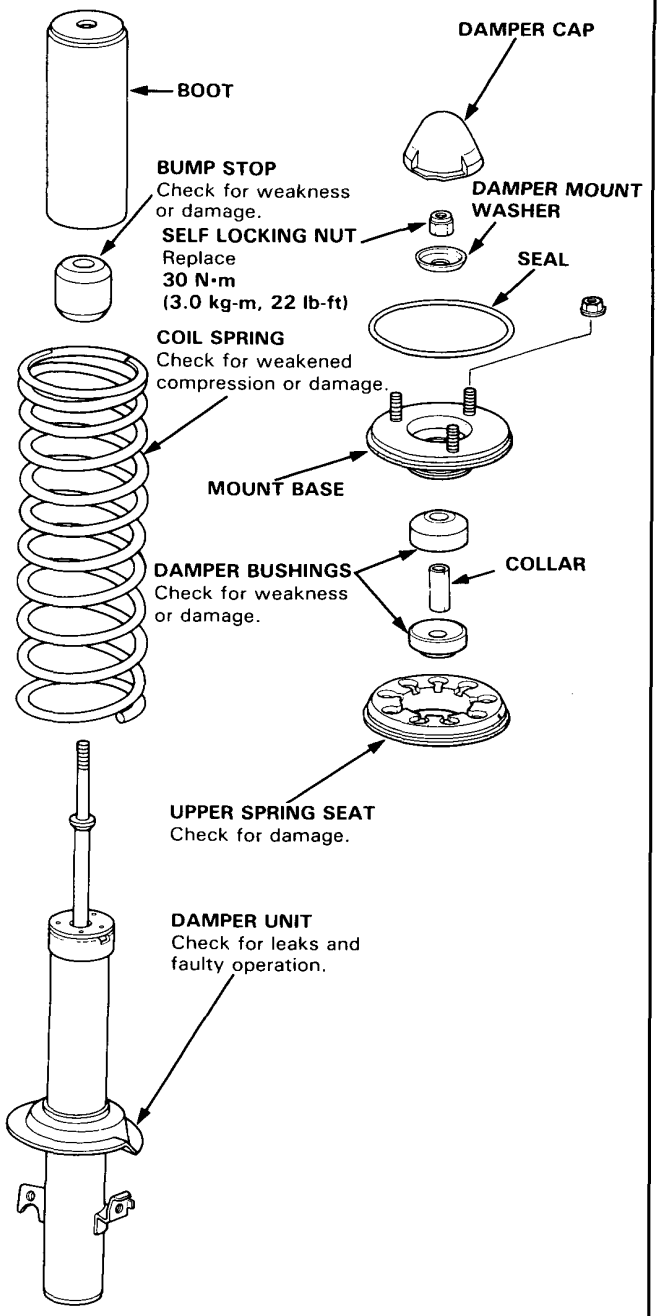
2. Remove the spring compressor then disassemble the damper as shown in the next column.

3. Check for smooth operation through a full stroke, both compression and extension.



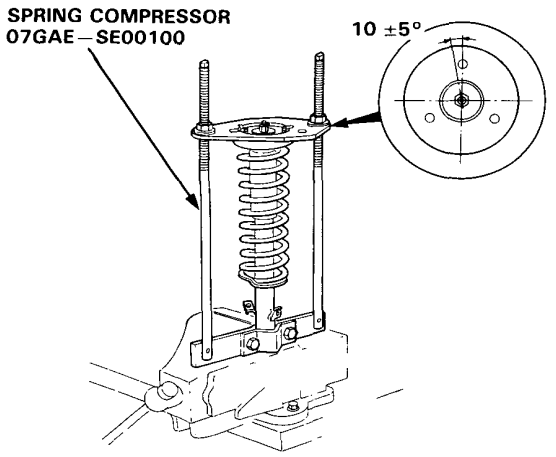
4. Also check for smooth operation in short strokes of 5–10 cm (2–4 in). Replace the damper if resistance is uneven or jerky.

5. Check for oil leaks abnormal noises or binding during these tests.



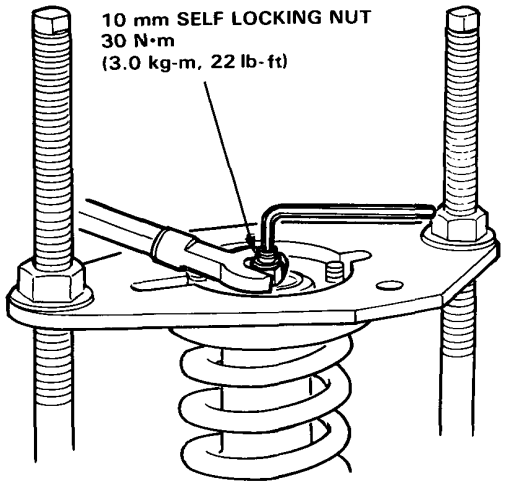
Damper Reassembly

1. Install the damper unit, coil spring, bump stop, boot, upper spring seat, damper bushings, and collar on the spring compressor.
2. Install the mount base on the damper unit as shown.



NOTE: Left side shown, right side antithesis.

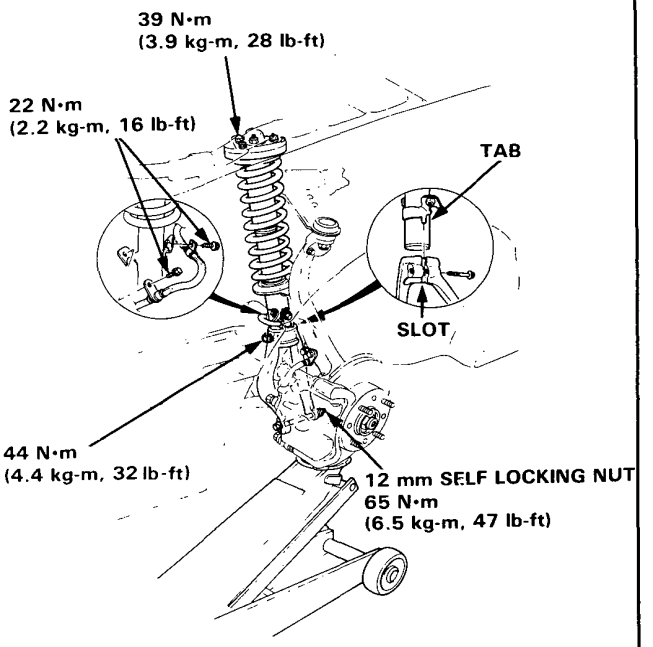
3. Compress the coil spring.
4. Install the damper mount washer and new 10 mm self locking nut.
5. Hold the damper shaft and tighten the 10 mm self locking nut.



Damper Installation

1. Loosely install the damper on the frame with the aligning mark facing inside.
2. Install the damper fork on the driveshaft and lower arm. Install the damper in the damper fork so the aligning tab is aligned with the slot in the damper fork.
3. Hand tighten the damper fork bolt, damper pinch bolt and 10 mm nuts.
4. Raise the knuckle with a floor jack until the car just lifts off the safety stand.

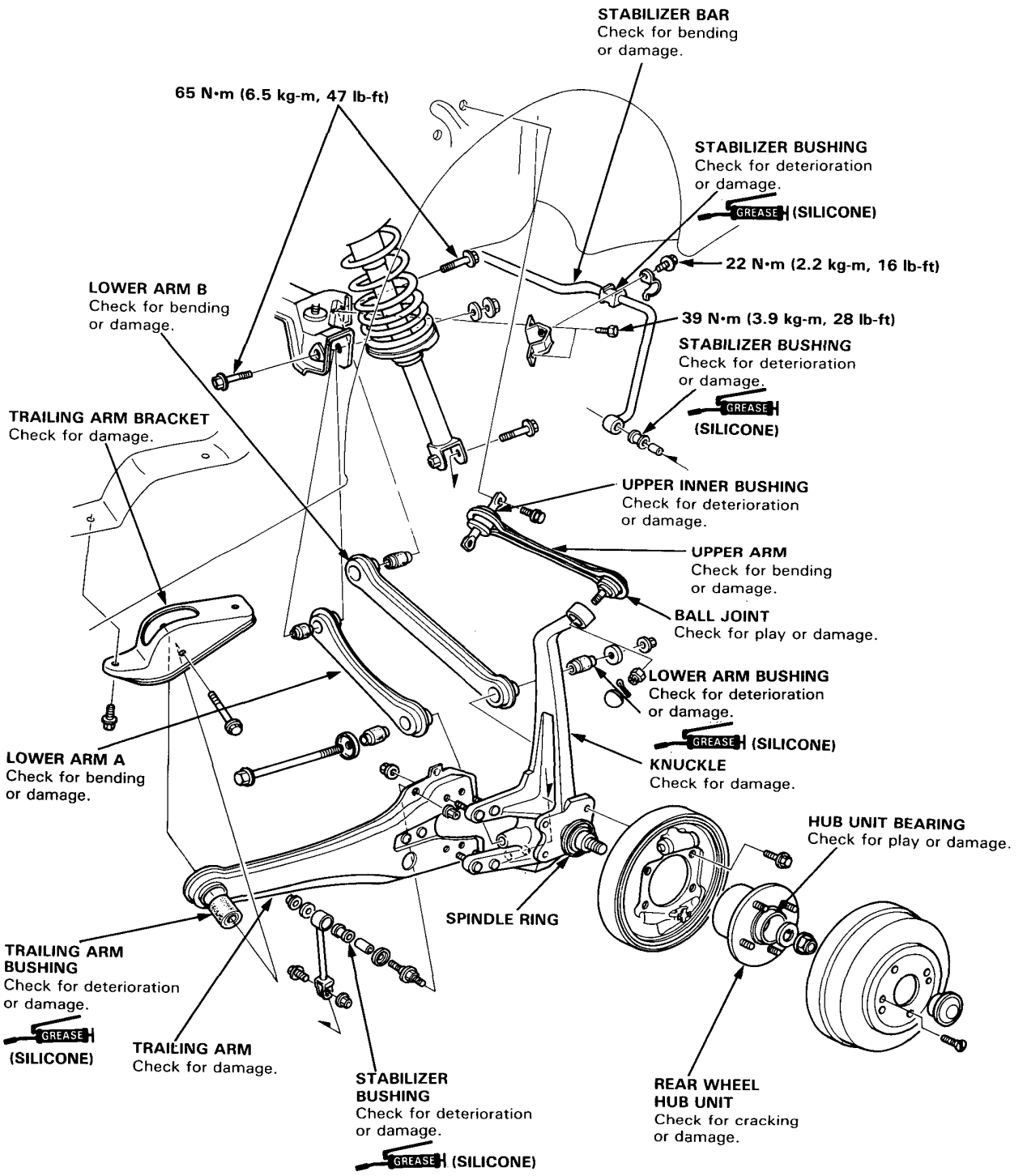
   NOTE: The damper fork bolts should be tightened with the damper under vehicle load.



5. Tighten the damper pinch bolt.
6. Secure the damper fork bolt with a new 12 mm self locking nut.
7. Secure the damper assembly to the frame with the 10 mm mount nuts.
8. Install the brake hose clamps with the two bolts.

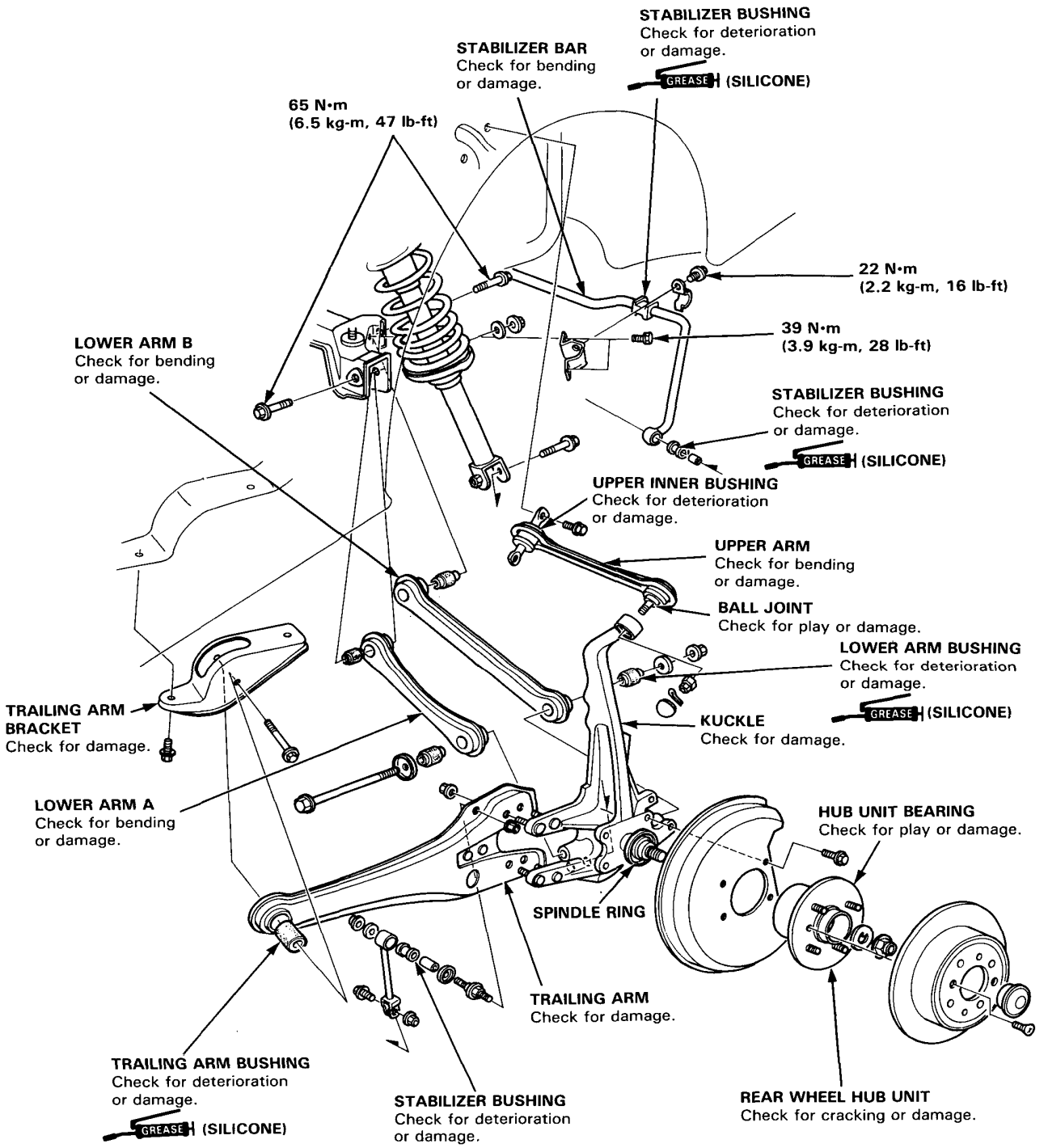
Inspection

(Drum Brake Model)



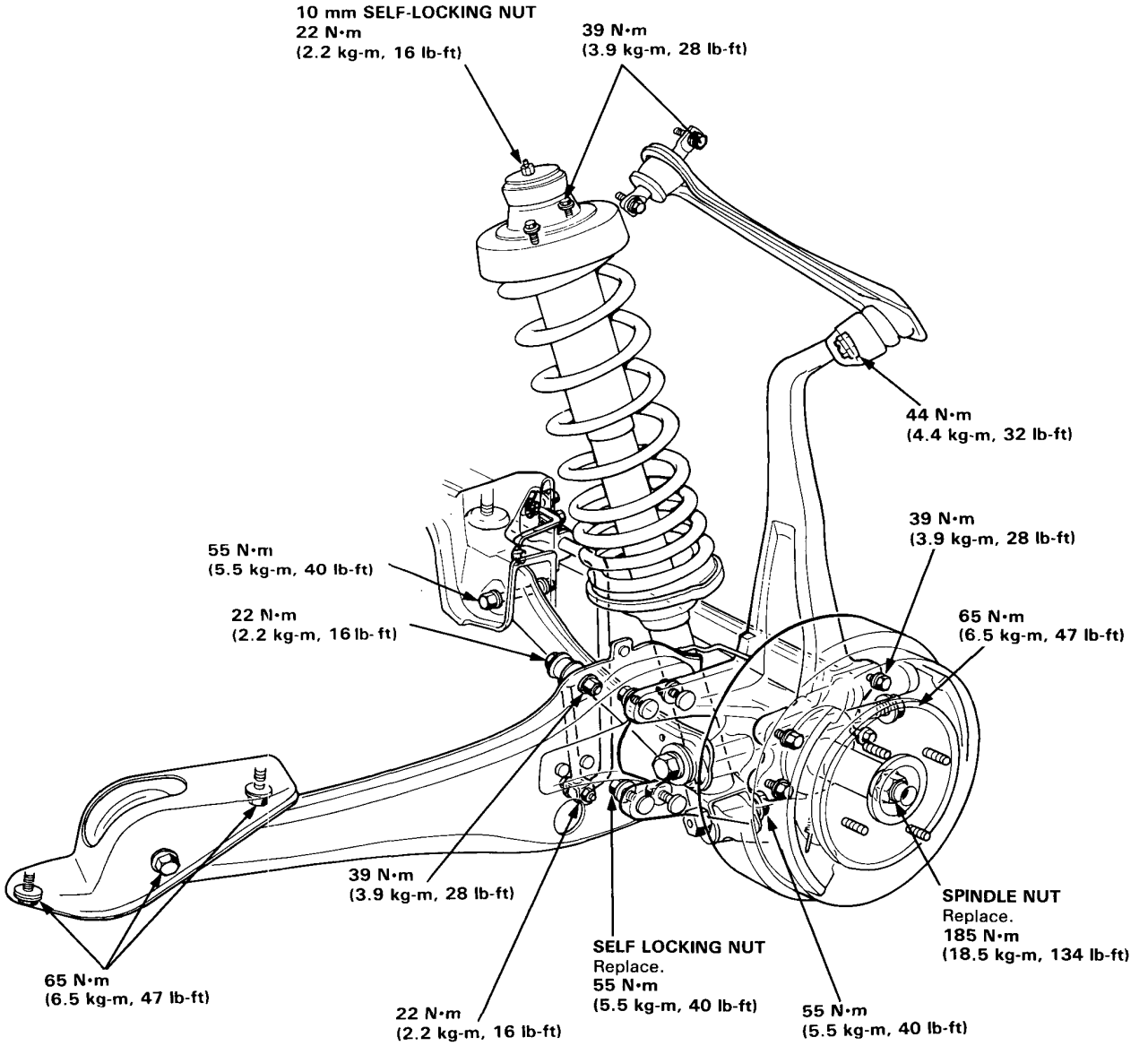
Inspection

(Disc Brake Model)



Torque Spec

(Drum Brake Model)

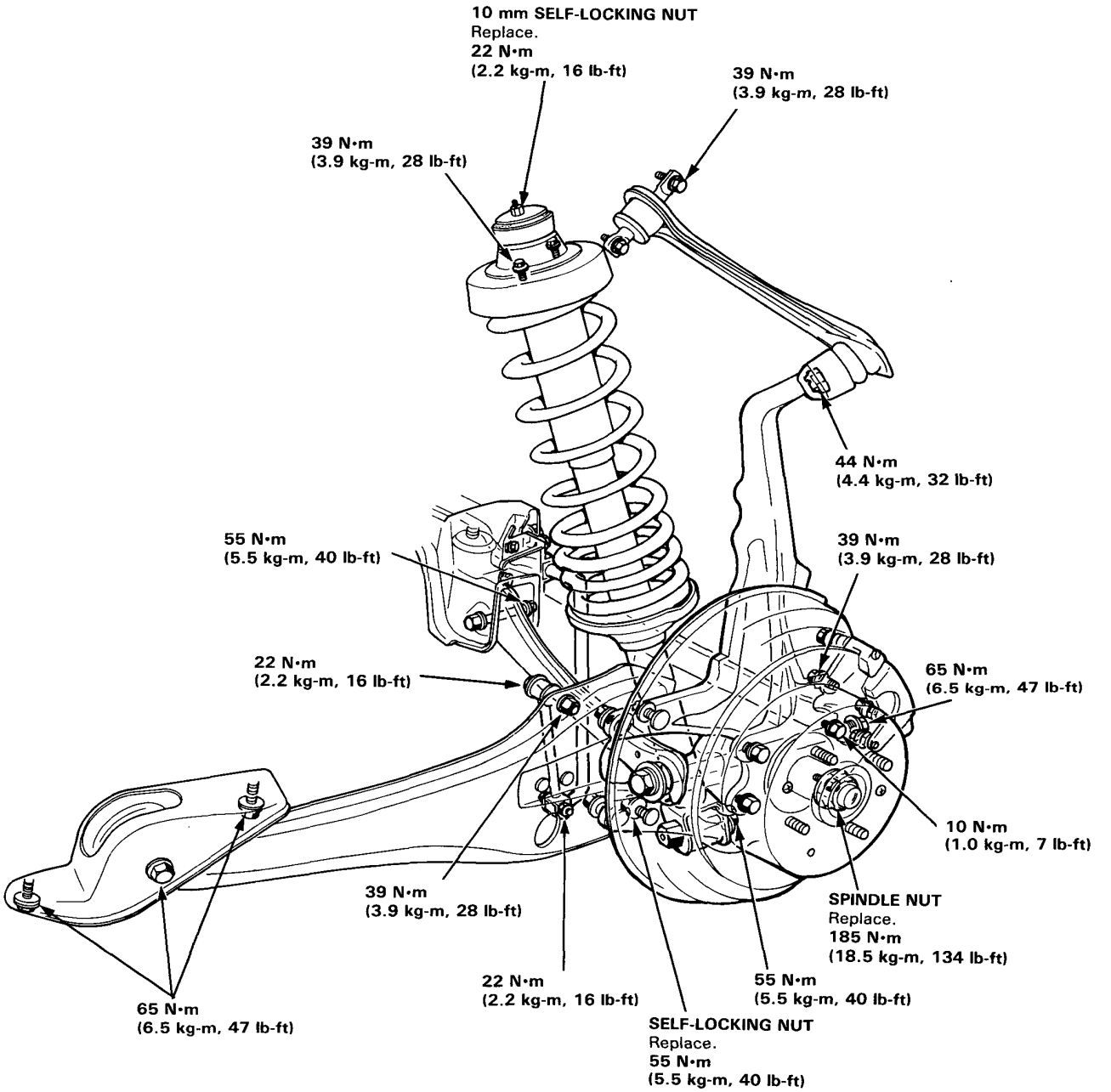


NOTE: Before tightening the bolts or the nuts connected to the rubber mounts or bushings, the vehicle weight must be loaded.

Rear Suspension

Torque Spec

(Disc Brake Model)



NOTE: Before tightening the bolts or nuts connected to the rubber mounts or bushings, the vehicle weight must be loaded.

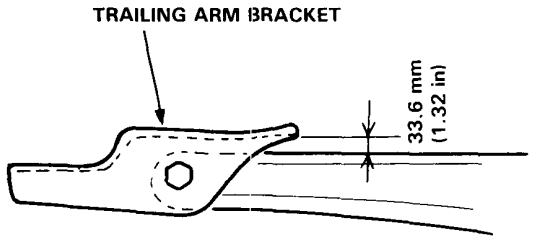
Dis/Assembly Precautions

WARNING Block the front wheels before jacking up the rear of the car.

Check all rubber parts for deterioration or damage before assembly.

Adjust wheel alignment when any of these parts are removed and reinstalled or replaced.

If tighten the trailing arm bracket bolt before installing on the frame, tighten the bracket bolt with a trailing arm to bracket end clearance of 33.6 mm (1.32 in).

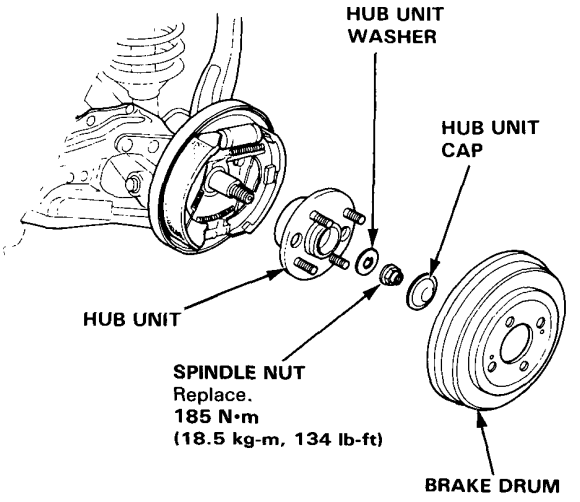


Install the trailing arm bushing with its FR mark facing forward.

The lower arms A and B are interchangeable from side to side. Make sure their left and right side marks (⇧ L.UP, ⇧ R.UP) are facing up for assembly.

Hub Unit Bearing Replacement

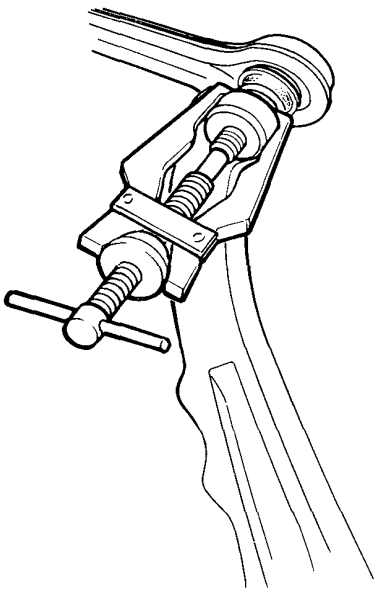
1. Jack up the rear of car and support on safety stands in proper location.
2. Remove the rear wheel and brake drum.
3. Remove the hub unit cap and pry the spindle nut tab away, then loosen the spindle nut.
4. Remove the hub unit bearing.



5. Install in the reverse order of removal and tighten a new spindle nut to specified torque, then stake the nut.

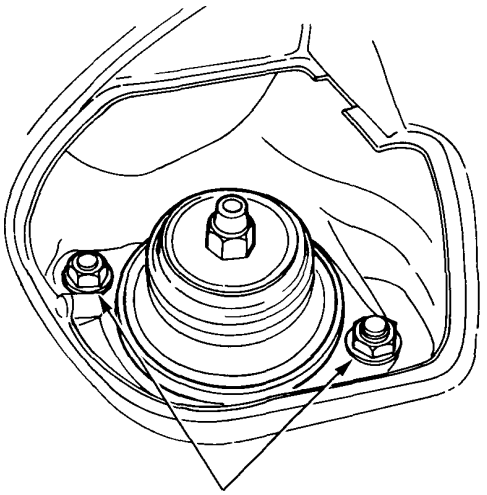
Ball Joint Removal

1. Remove the upper arm ball joint cap.
2. Remove the cotter pin and ball joint nut.
3. Position the bearing puller between the knuckle and upper arm as shown and remove the knuckle from the upper arm.



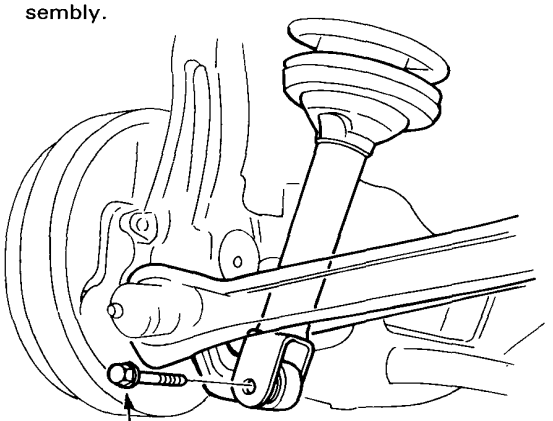
Damper Removal

1. Jack up the rear of car and support on safety stands in proper locations.
2. Remove the damper upper cover at the rear seat lining.
3. Remove the stabilizer bar from the lower arm.
4. Remove the damper upper mounting base nuts.



MOUNTING BASE NUTS

5. Remove the damper mounting bolt.
6. Lower the lower arms and remove the damper assembly.



DAMPER MOUNTING BOLT

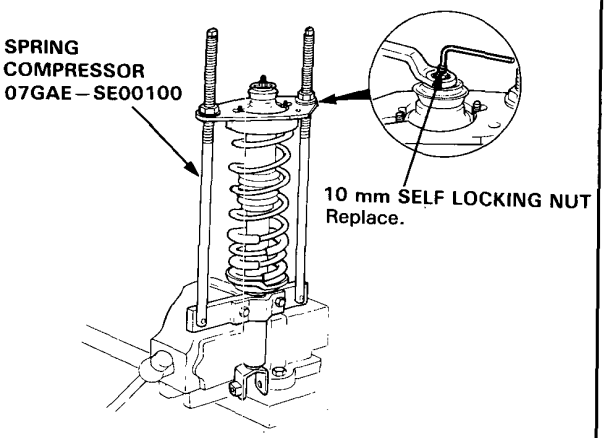
NOTE: On the car with the rear disc brake, remove the parking brake clamp at the trailing arm. Push the rear suspension downword and move the damper in front of lower arm A, then remove the damper.

Damper Disassembly/Inspection

1. *Compress the damper spring using the spring compressor.*

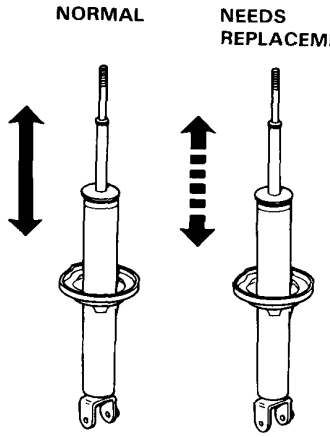
   CAUTION: Do not compress the spring more than necessary to remove the 10 mm self locking nut.

2. Remove the 10 mm self locking nut from the damper assembly.



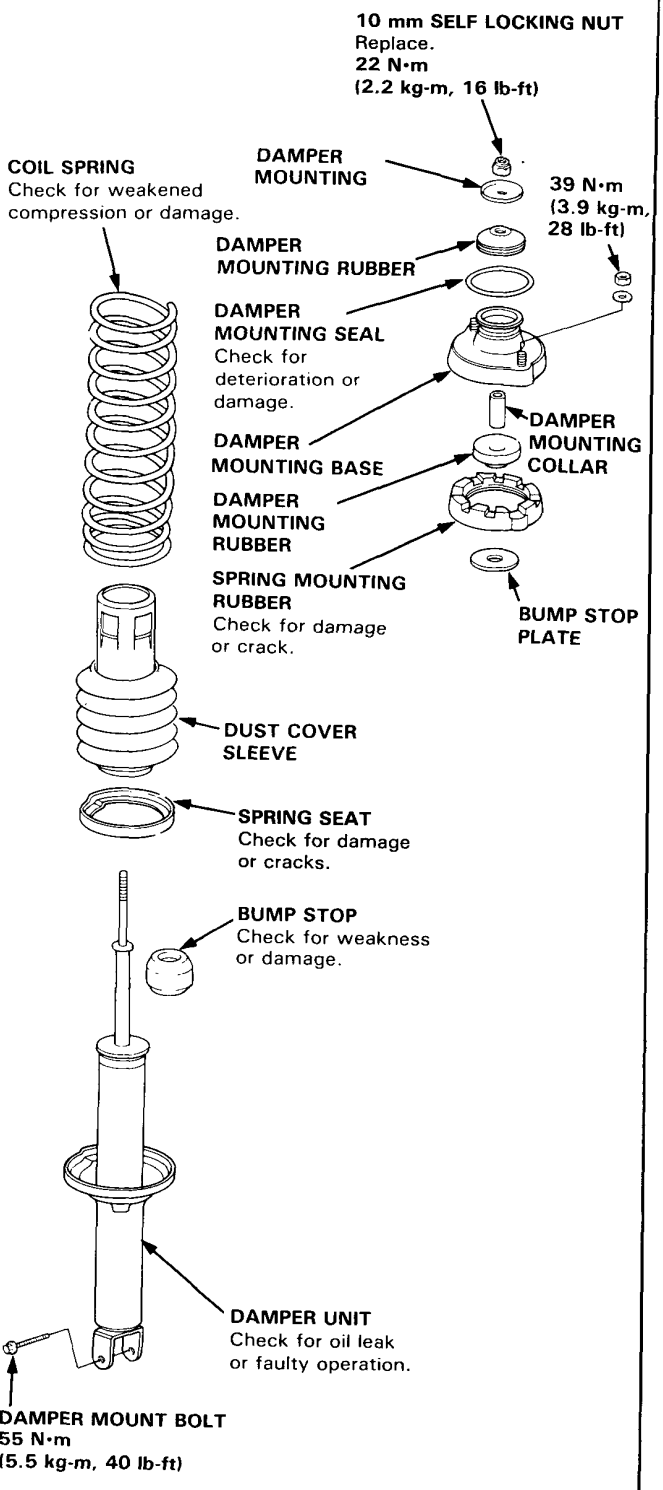
3. Remove the spring compressor and disassemble the damper as shown in the next column.

4. Check for smooth operation through a full stroke, both compression and extension.



5. Also check for smooth operation in soft strokes of 5–10 cm (2–4 in). Replace the damper if resistance is uneven or jerky.

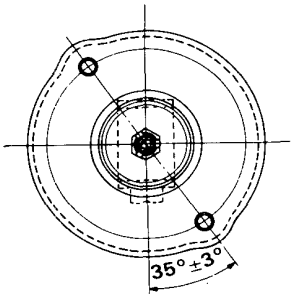
6. Check for oil leaks, abnormal noises or binding during these tests.



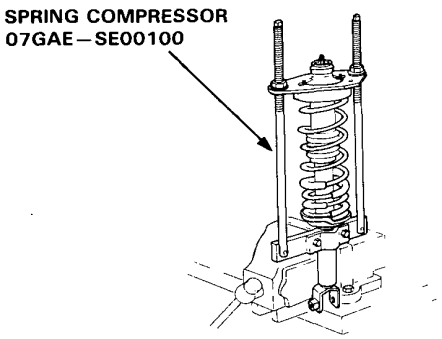
Damper Reassembly

1. Install the spring seat on the damper unit.
2. Install the damper unit, dust cover, coil spring, bump stop plate, damper mounting collar, spring mounting rubber damper mounting rubber and damper mounting base on the special tool.
3. Install the damper mounting base on the damper unit so that the angle of the bolts is as shown.

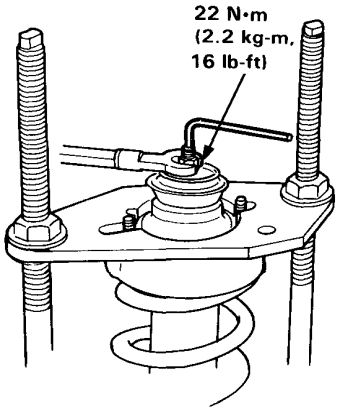
   NOTE: Left side shown, right side antithesis.



4. Compress the coil spring.

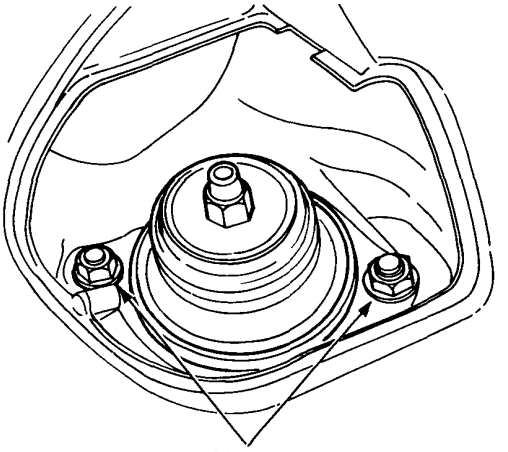


5. Install the damper mounting rubber and damper mounting washer, and loosely install a new 10 mm self locking nut.
6. Hold the damper shaft and tighten the 10 mm self locking nut.



Damper Installation

1. Lower the rear suspension and set the damper unit in its original position.
2. Loosely install the damper unit mounting bolt.
3. Install the damper upper base mounting nuts and tighten them.

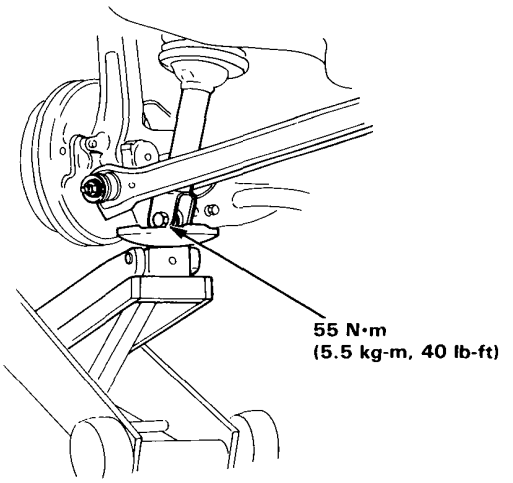


4. Raise the rear suspension with a floor jack until the weight of the car is on the damper.

   NOTE: The damper mounting bolts should be tightened with the damper under vehicle load.

5. Tighten the damper mounting bolt.
6. Install the stabilizer bar on the lower arm.

   NOTE: Tighten the stabilizer bolts and nuts with the damper under vehicle load.



Brakes

Without 4W-ALB

4W-ALB

Without 4W-ALB

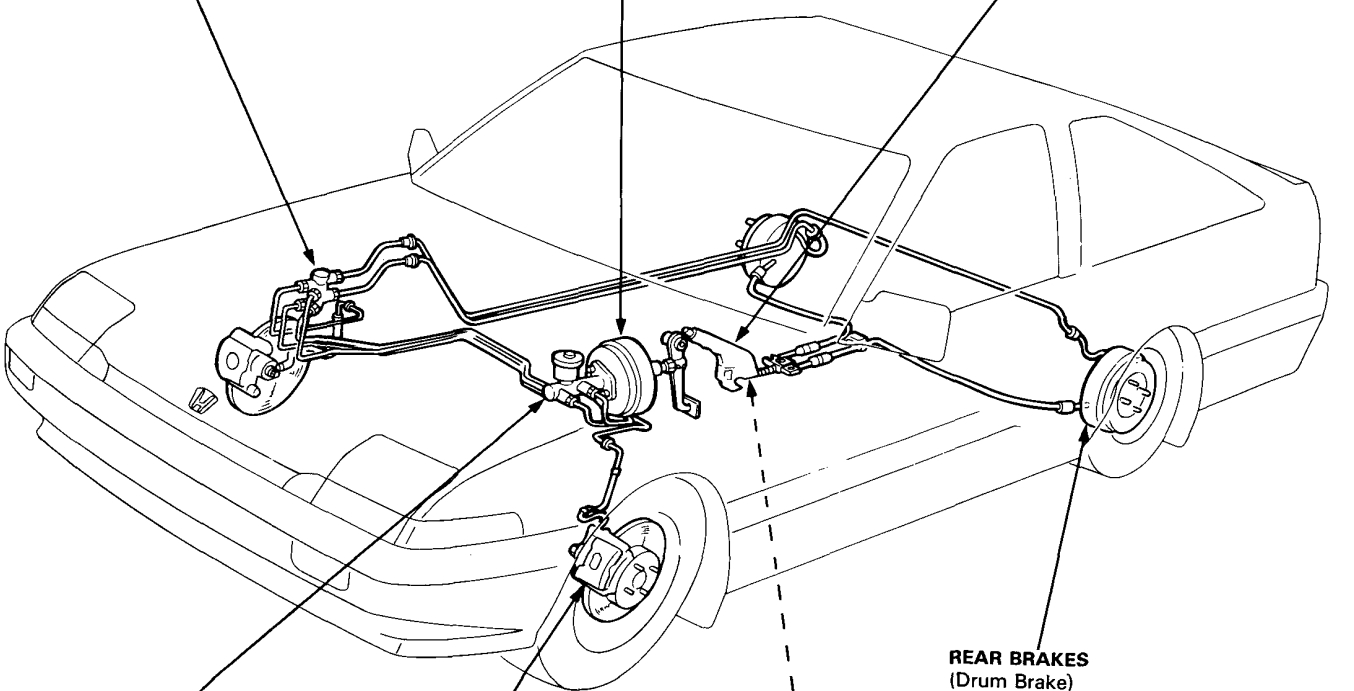
Index

Brake system bleeding, page 20-3.

BRAKE BOOSTER
(8'' Booster)
Index and Inspection, page 20-16.
Disassembly, page 20-18 thru 20.
Rebuild Kit, page 20-20.
Reassembly, page 20-21 thru 20-23.
(9'' Booster)
Index and Inspection, page 20-17.
Disassembly, page 20-25 thru 28.
Rebuild kit, page 20-28.
Reassembly, page 20-29 thru 33.
Pushrod Adjustment, page 20-33.

DUAL PROPORTIONING VALVE
Removal and installation, page 20-12.
Description, page 20-35.

PARKING BRAKE
Adjustment, page 20-6.
Disassembly/reassembly, page 20-51
Switch test, page 20-52.



MASTER CYLINDER
Overhaul/Inspection page 20-13.
Disassembly, page 20-14.
Reassembly, page 20-15.

FRONT BRAKES
Disc inspection, page 20-6.
Inspection, page 20-8.
Brake pad, page 20-9.
Caliper, 20-10.

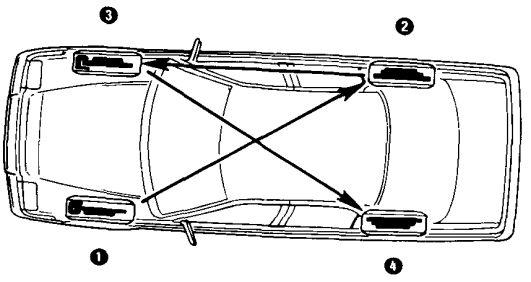
PARKING BRAKE
Adjustment, page 20-6.
Testing, page 20-52.

REAR BRAKES
(Drum Brake)
Index and Inspection, page 20-36.
Disassembly, page 20-38.
Reassembly, page 20-39.
Wheel cylinder, page 20-40.
(Disc Brake)
Inspection, page 20-41
Brake Pad, Disc, page 20-42
Caliper, page 20-44

CAUTION:
- **Use only clean brake fluid.**
- **Do not allow dirt or other foreign matter to contaminate the brake fluid.**
- **Do not mix different brands of brake fluid.**
- **Avoid spilling brake fluid on painted, plastic or rubber surfaces as it can damage the finish; Wash spilled brake fluid off immediately with clean water.**

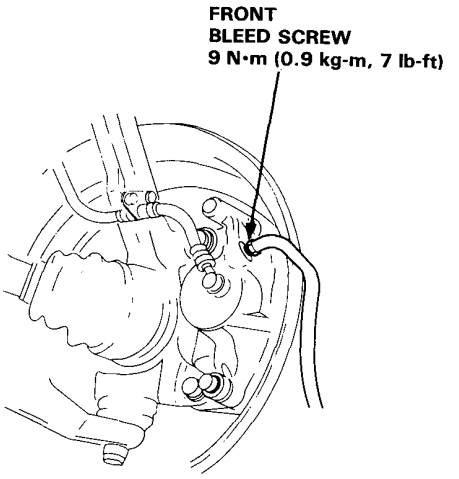
NOTE: The reservoir on the master cylinder must be full at the start of bleeding procedure, and checked after bleeding each wheel cylinder. Add fluid as required. Use only DOT 3 brake fluid.

Bleeding Sequence

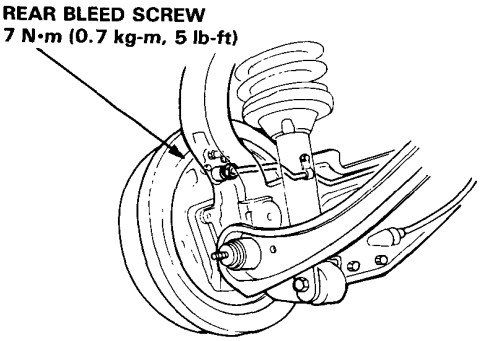


1. Have someone slowly pump the brake pedal several times, then apply steady pressure.
2. Loosen the brake bleed screw to allow air to escape from the system. Then tighten the bleed screw securely.
3. Repeat the procedure for each wheel in the sequence shown above, until air bubbles no longer appear in the fluid.

FRONT



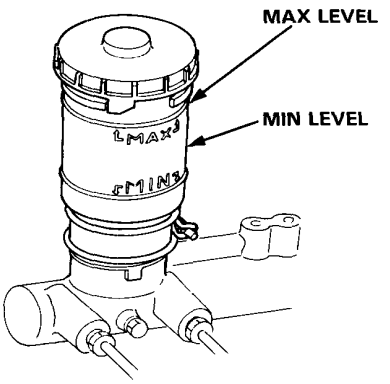
REAR



NOTE: Torque of bleed screw of rear disc brake: 9 N·m (0.9 kg-m, 7 lb-ft)

Brake Fluid Level

1. Check the brake fluid reservoir level.



2. If the brake fluid level nears the MIN level, check the brake pads and linings for wear, or the entire system for leaks.

3. Remove the reservoir cap and fill the reservoir up to the MAX level line.

CAUTION:
- **Use only new clean brake fluid.**
- **Do not allow dirt or other foreign matter to contaminate the brake fluid.**
- **Do not mix different brands of brake fluid.**
- **Avoid spilling brake fluid on painted, plastic or rubber surface as its can damage the finish. Place the rag over the parts whenever the system is serviced; Wash spilled brake fluid off immediately with clean water.**

Booster Test

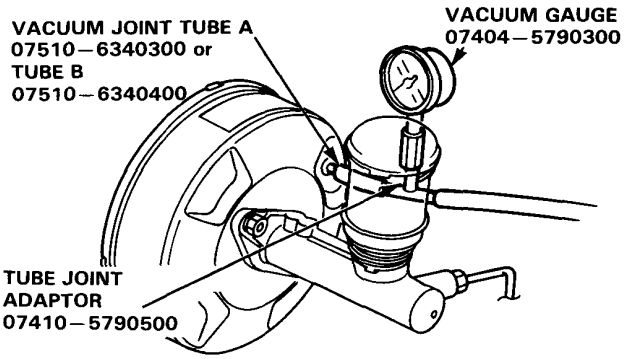
Leak Test

1. Install the Brake Power Kit (07504—6340100) as shown.

2. Start the engine. adjust the engine speed with the accelerator pedal so that the vacuum gauge readings show 300—500 mmHg, then stop the engine.

3. Read the vacuum gauge.

   If the vacuum readings decreases 20 mmHg or more after 30 seconds, check following parts for leaks.
   - Check valve
   - Vacuum hose
   - Seals
   - Diaphragm
   - Master cylinder rod seal and secondary cup



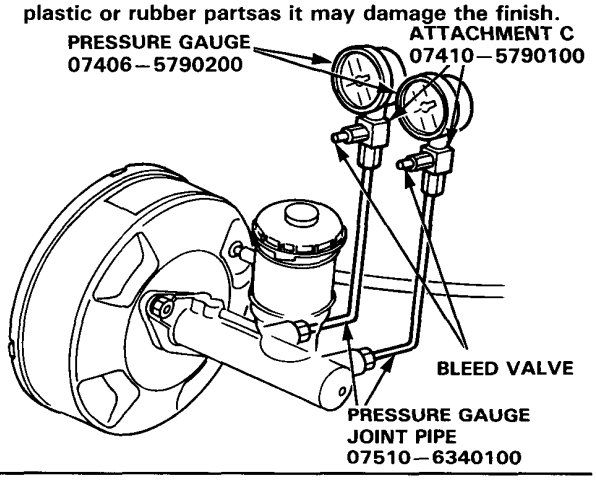
Function Test

1. Install the vacuum gauge as same the leak test.

2. Connect the oil pressure gauges to the master cylinder using the attachments as shown.

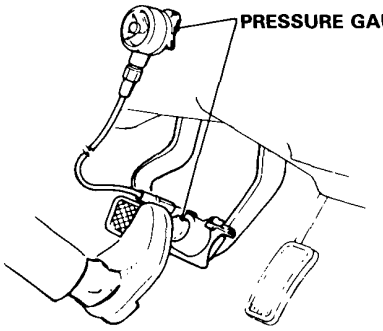
3. Bleed air through the valves.

CAUTION: Avoil spilling brake fluid on painted, plastic or rubber partsas it may damage the finish.



4. *Start the engine.*

5. Depress the brake pedal with a 200 N (20 kg, 44 lbs) of pressure. The following pressures should be observed at the pressure gauges in each vacuum.

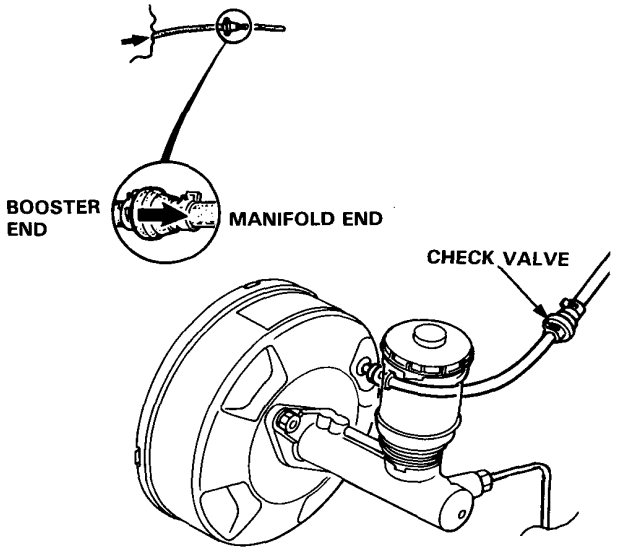


	Vacuum mmHg	Line pressure kpa (kg/cm², psi)
8" Booster	0	1,304 (13.3, 189.1)
	300	4,501 (45.9, 652.7)
	500	6,629 (67.6, 961.3)
9" Booster	0	1,177 (12.0, 170.6)
	300	4,766 (48.6, 691.1)
	500	7,149 (72.9, 1,036.6)

6. Inspect the master cylinder pistons and cups in the readings do not fall within the limits shown above.

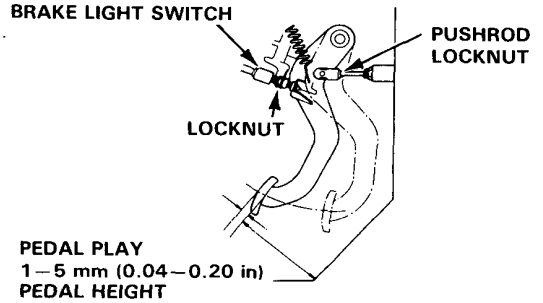
Check Valve Test

1. Remove the check valve, blow on one end of the hose and then the other; if you can blow through the booster end, but not through the manifold end, the check valve is OK.



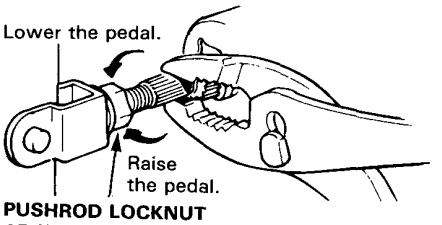
Pedal Height Adjustment

1. Loosen brake light switch locknut and back off brake light switch until it is no longer touching brake pedal.



PEDAL PLAY
1—5 mm (0.04—0.20 in)
PEDAL HEIGHT
205 mm (8.07 in.)
Measure without floormat.

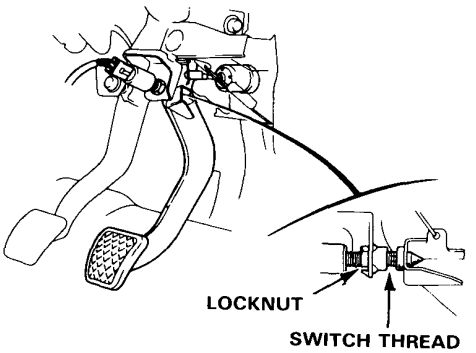
2. Loosen pushrod locknut and screw pushrod in or out with pliers until pedal is 205 mm (8.07 in.) from floor. After adjustment, tighten locknut firmly.



PUSHROD LOCKNUT
15 N·m
(1.5 kg-m, 11 lb-ft)

3. Screw in the brake light switch until its plunger is fully depressed (threaded end touching pad on pedal arm). Then back off switch 1/2 turn and tighten locknut firmly.

CAUTION: Check that brake lights go off when pedal is released.

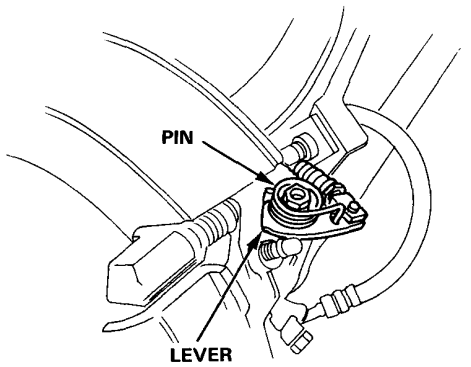


Parking Brake Adjustment

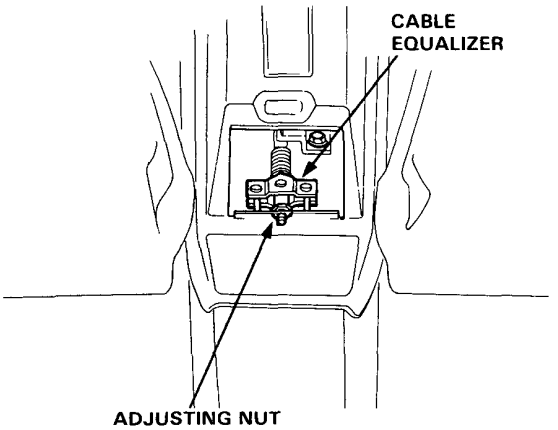
NOTE: When the brake drum or rear brake caliper has been removed, loosen the parking brake adjusting nut, start the engine and depress the brake pedal several times to set self-adjusting brakes before adjusting parking brake cable.

WARNING Block the front wheels before jacking up the rear of the car.

1. Raise the rear wheels off the ground and place the safety stands in proper locations.
2. With the rear disc brake model, make sure that the lever on the caliper touches to the pin.



3. Pull parking brake lever up one notch.
4. Tighten equalizer adjusting nut until rear wheels drag slightly when turned.
5. Release brake lever and check that rear wheels do not drag when turned. Readjust if necessary.
6. With the equalizer properly adjusted, the rear brakes should be fully applied when the parking brake lever is pulled up 7 to 11 clicks.

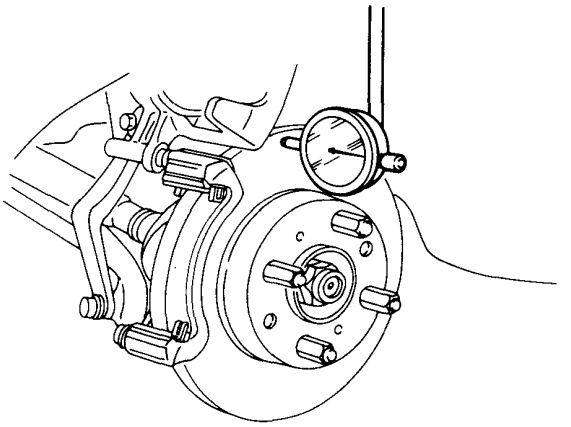


Run-Out

1. Remove the front wheels, and support the front of the car on safety stands.
2. Remove caliper pin bolt, then pivot the caliper up out of the way on the caliper pin, and remove the pads and pad retainers (page 20-8).
3. Inspect the disc surface for grooves, cracks, and rust. Clean the disc thoroughly and remove all rust.
4. Use the lug nuts to hold the disc securely against the hub, then mount a dial indicator as shown.

   Brake Disc Runout:
   Service Limit: 0.10 mm (0.004 in.)

5. If the disc is beyond the service limit, refer to the Honda Brake Disc Grinder Manual to see if it can be ground. If it can't be ground, remove it and install a new one.

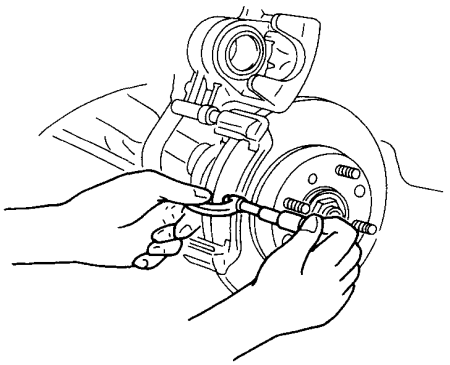


Thickness and Parallelism

1. Remove the front wheels, and support the front of car on safety stands.

2. Move the caliper and pads out of the way as described in the preceding column.

3. Using a micrometer, measure disc thickness at eight points, approximately 45° apart and 10 mm (0.39 in.) in from the outer edge of the disc.



Brake Disc Thickness:
Standard: 19 mm (0.75 in.)
Max. Refinishing Limit: 17 mm (0.67 in.)

Brake Disc Parallelism:
The difference between any thickness measurements should not be more than 0.015 mm (0.0006 in.).

4. If the disc is beyond the limits for thickness or parallelism, refer to the Honda Brake Disc Grinder Manual to see if it can be ground. If it can't be ground, remove it and install a new one.

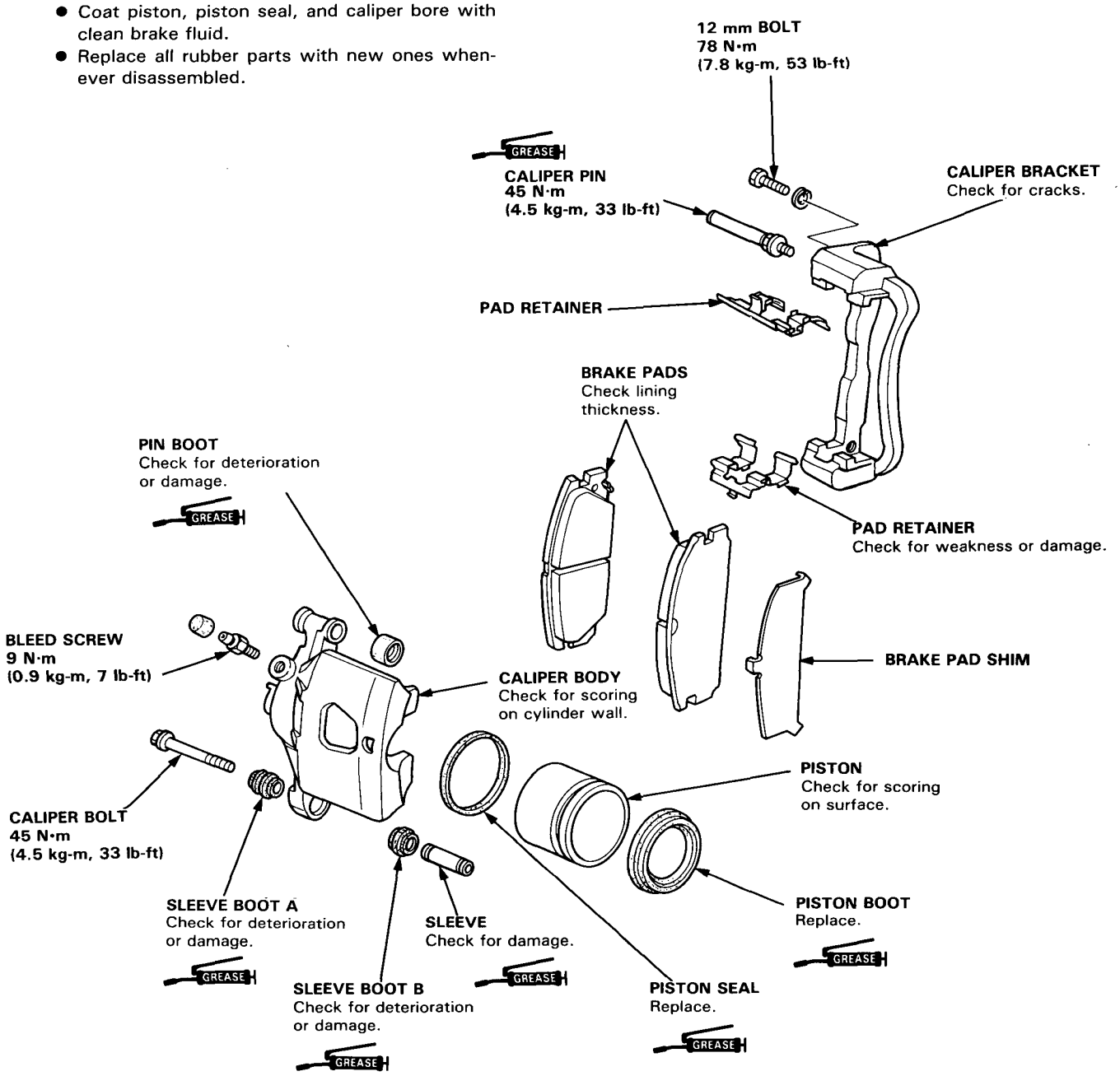
   NOTE: A new disc should be grounded if its run-out is greater than 0.10 mm (0.004 in.).

Front Brakes

Inspection

WARNING **Do not use an air hose to blow the brake assembly clean.**

NOTE:
- Coat piston, piston seal, and caliper bore with clean brake fluid.
- Replace all rubber parts with new ones whenever disassembled.

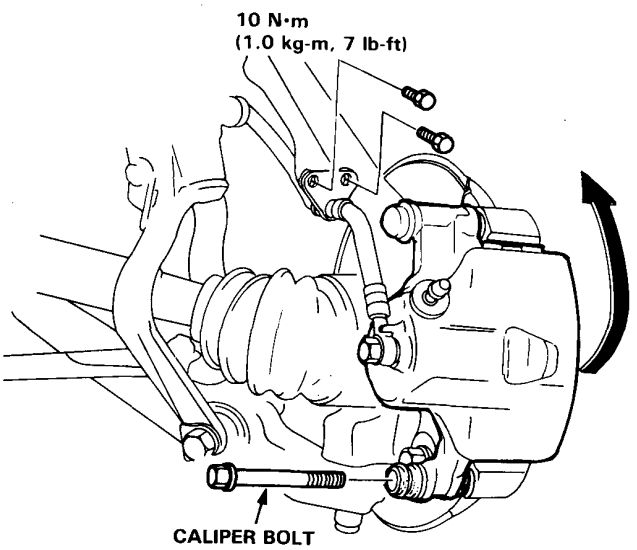


Brake Pad

Inspection/Replacement

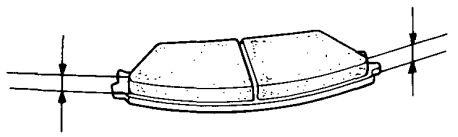
WARNING **Do not use an air hose to blow the brake assembly clean.**

1. Remove the front wheels and support the front of car on safety stands.
2. Separate the brake hose clamp from the knuckle by removing the bolts.
3. Remove caliper pin bolt and pivot caliper up out of the way.



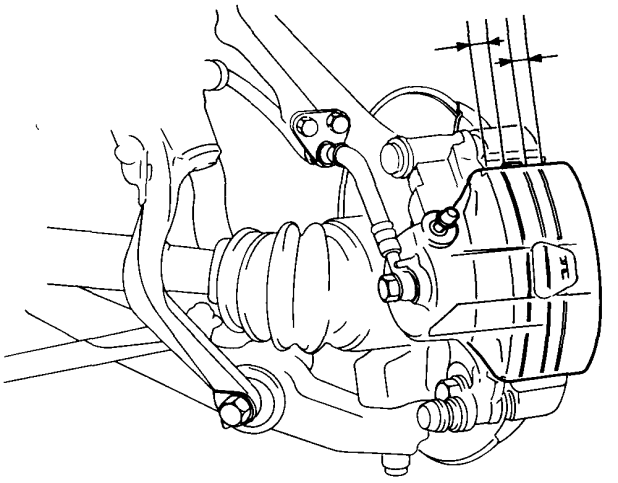
4. Remove the pad shim, pad retainers and pads.
5. Using a vernier caliper, measure the thickness of each brake pad lining.

Brake Pad Thickness:
Standard: 11 mm (0.43 in)
Service Limit: 3 mm (0.12 in)

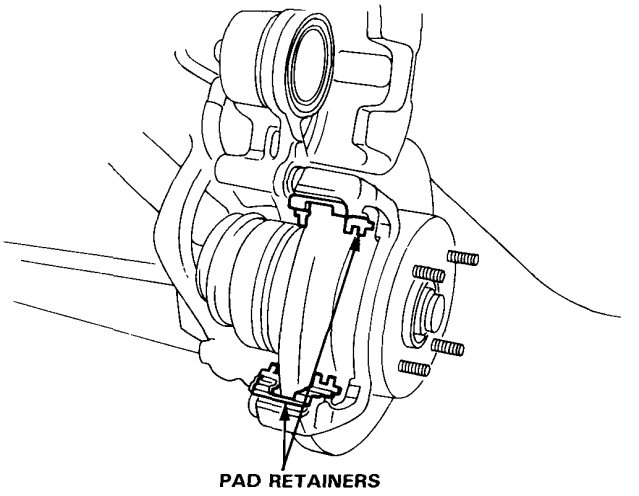


NOTE: Measurement does not include pad backing thickness.

6. If lining thickness is less than service limit, replace both pads as a set.



7. Clean the caliper thoroughly; remove any rust, and check for grooves or cracks.
8. Install the pad retainers.



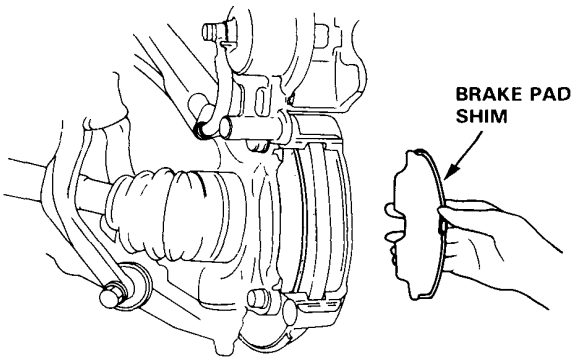
(cont'd)

Brake Pad

Inspection/Replacement (cont'd)

9. Apply anti-seize compound to both surfaces of the shim.

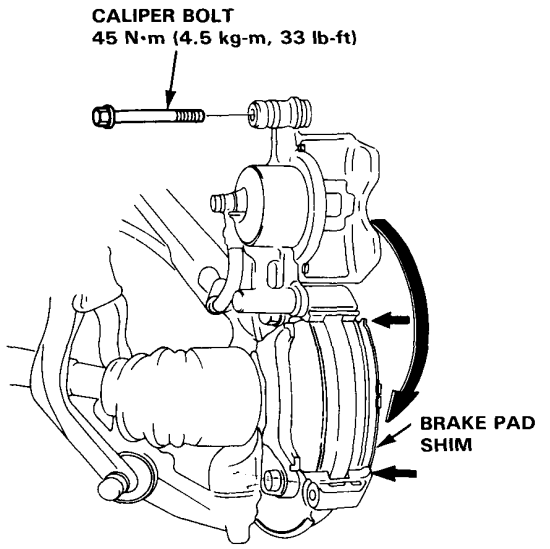
10. Install the brake pad and shim with the shim on the outside.



11. Push in the piston so that the caliper will fit over the pads.

12. Pivot the caliper down into position, then install the caliper pin bolt and tighten to 45 N·m (4.5 kg-m, 33 lb-ft).

NOTE: Install the pad with the wear indicator on the inside.



13. Depress the brake pedal several times to make sure the brakes work, then road-test.

Brake Caliper

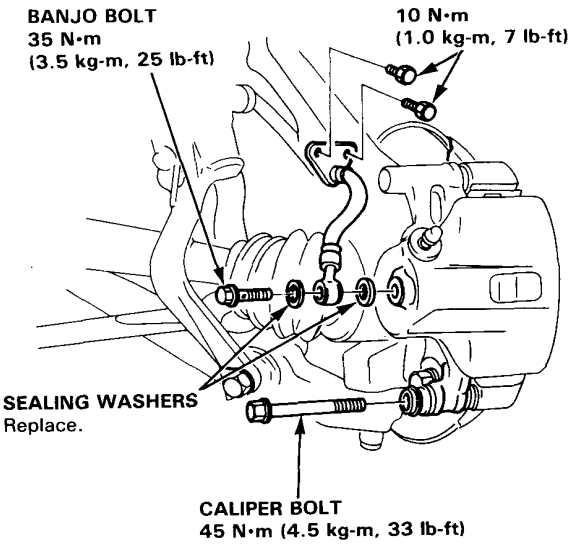
Disassembly

CAUTION:
- **Make sure all parts are clean before reassembly.**
- **Use only new replacement parts.**
- **Use only clean brake fluid.**
- **Do not allow dirt or other foreign matter to contaminate the brake fluid.**
- **Do not mix different brands of brake fluid.**
- **Avoid spilling brake fluid on painted, plastic or rubber surfaces as it can damage the finish; Wash spilled brake fluid off immediately with clean water.**

1. Remove the banjo bolt and disconnect the brake hose from the caliper.

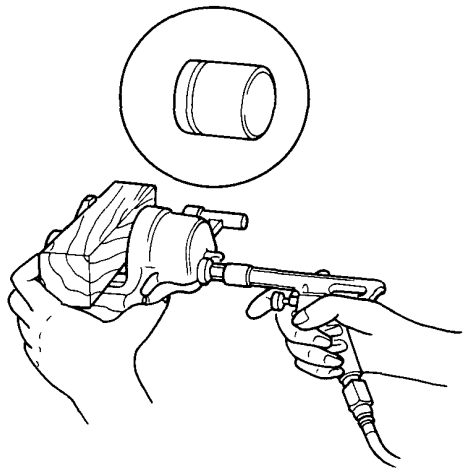
2. Remove the caliper pin bolt, then remove the caliper.

NOTE: Avoid damaging the splash guard.



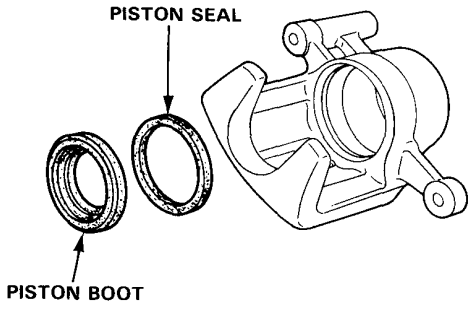
3. Place a wooden block or shop rag in the caliper opposite the piston, then carefully remove the piston from the caliper by applying air pressure through the brake line hole.

WARNING Do not place your fingers in front of the piston.



4. Remove the piston boot and piston seal.

CAUTION: Take care not to damage the cylinder.



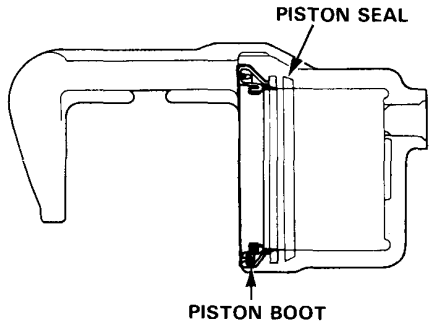
Reassembly

CAUTION:
- **Make sure all parts are clean before reassembly.**
- **Use only new replacement parts.**
- **Use only celan brake fluid.**
- **Do not allow dirt or other foreign matters to contaminate the brake fluid.**
- **Do not mixture different brands of brake fluid.**
- **Avoid spilling brake fluid on painted, plastic or rubber surfaces as it can damage the finish.**
- **Wash spilling brake fluid off immediately with clean water.**

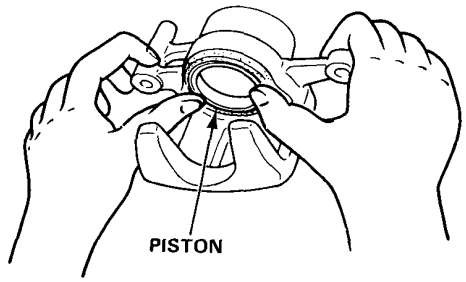
1. Clean the piston and caliper bore with brake fluid and inspect for wear or damgage.

2. Apply brake cylinder grease a new piston seal, then install the piston seal in the cylinder groove.

3. Install the piston boot.



4. Lubricate the caliper cylinder and piston with brake fluid, then install the piston in the cylinder with the dished end facing in .

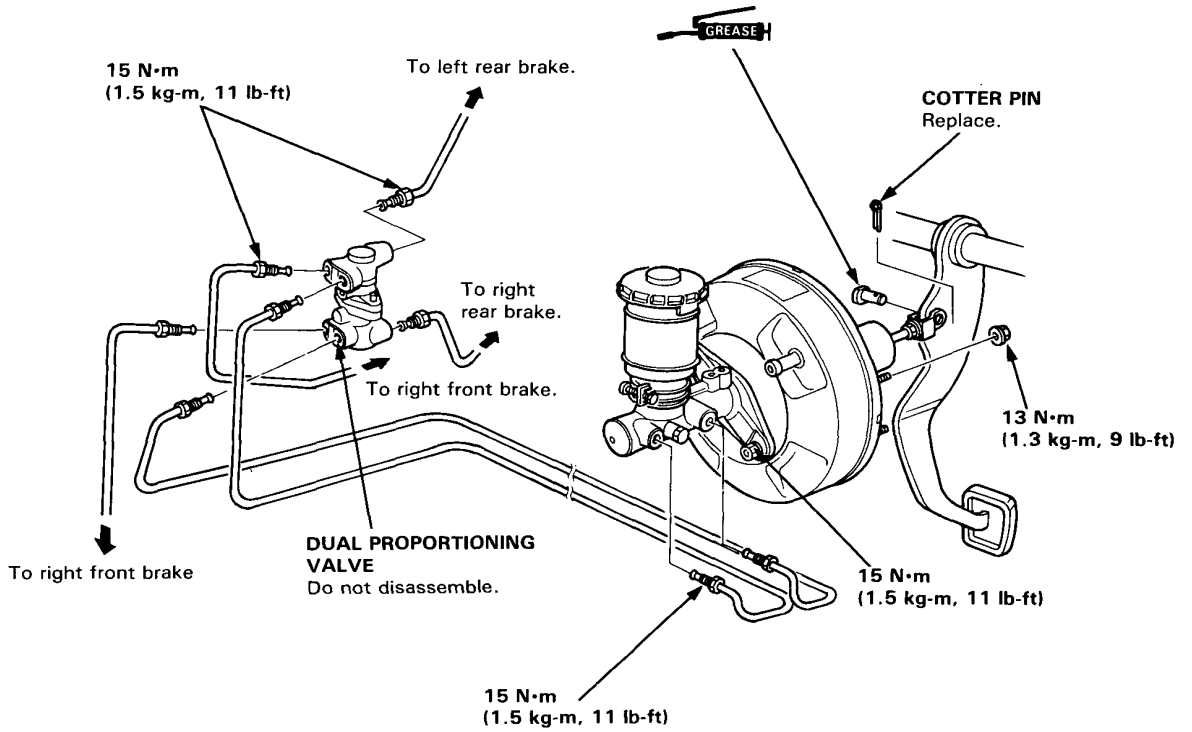


5. Reinstall the caliper in the reverse order of removal.

6. Fill the brake reservoir up and bleed the brake system (page 20-3).

Master Cylinder, Booster and Proportioning Valve

Index



Master Cylinder

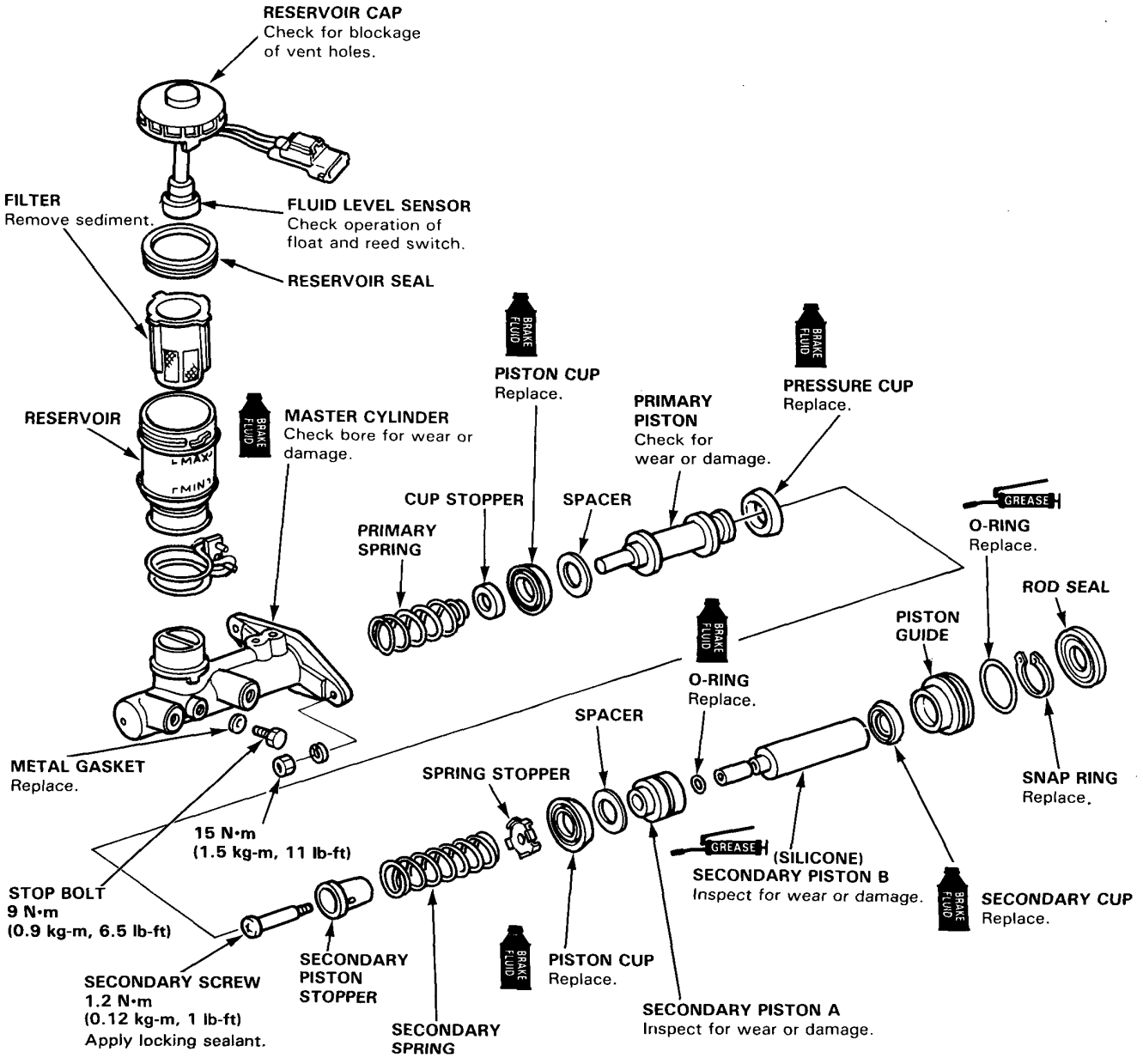
Overhaul/Inspection

CAUTION:

- **Avoid spilling brake fluid on painted surfaces as severe damage can result. Wipe up spilled fluid at once and rinse well with clean water.**
- **This symbol represents brake fluid. Use only DOT 3 branke flid.**

NOTE:

- Wash all removed parts in brake fluid and blow dry with compressed air. Blow open all passages and fluid ports.
- Replace all rubber parts with new ones whenever the cylinder is disassembled.
- To prevent damage, liberally apply clean brake fluid to the piston cups before installation. Use special tool to install the cups.

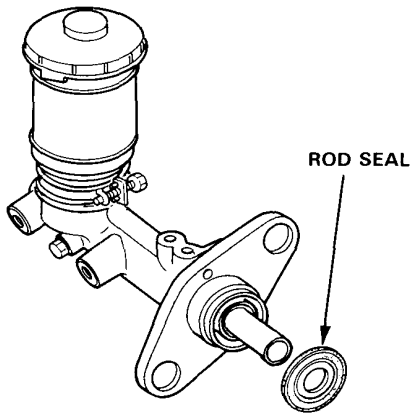


Master Cylinder

Disassembly

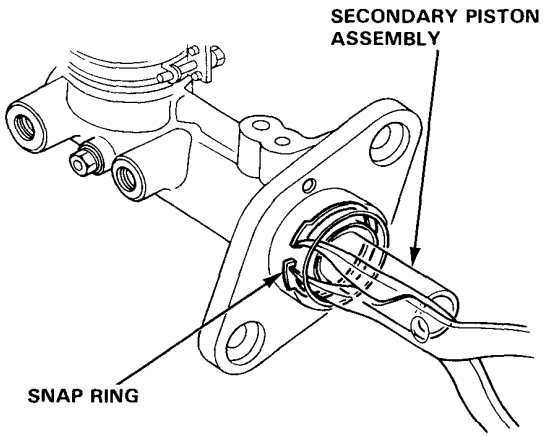
CAUTION:
- **Avoid spilling fluid on painted, plastic or rubber parts as it may damage the finish.**
- **Plug the end of the brake hose with a shop rag to prevent brake fluid from flowing out of the brake hose after disconnecting.**
- **Use only new clean brake fluid.**
- **Clean all parts thoroughly with brake fluid. Blow out all passages with compressed air.**
- **Do not allow foreign matter to enter the system.**
- **Be careful not to bend or damage the brake pipe when removing the master cylinder.**

1. Remove the rod seal.

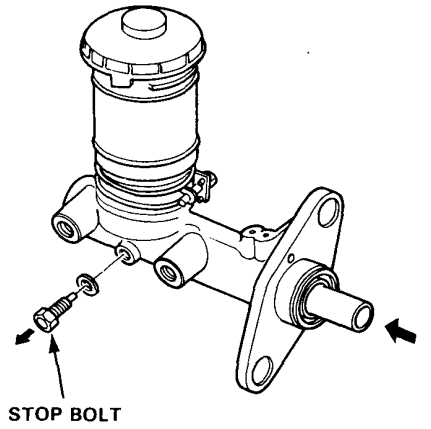


2. Push the secondary piston assembly, then remove the snap ring.

   CAUTION: Avoid damaging the master cylinder wall.



3. Remove the stop bolt while pushing in the secondary piston assembly.

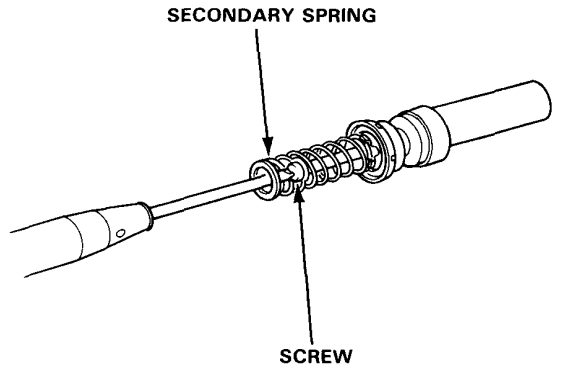


4. Remove the piston guide, secondary piston assembly and primary piston assembly.

   NOTE: If the primary piston assembly is difficult to remove, apply compressed air from the primary piston side outlet.

   CAUTION:
   - **Do not use high pressure air or bring the nozzle too close to the inlet.**
   - **Place a shop rag over the master cylinder to prevent the primary piston from becoming a projectile.**

5. Remove the screw from the secondary piston assembly, then remove the secondary spring.



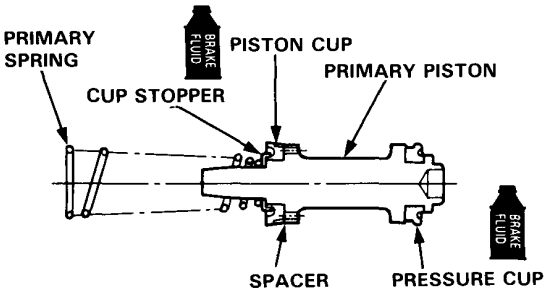
6. Clean all parts with brake fluid.

Reassembly

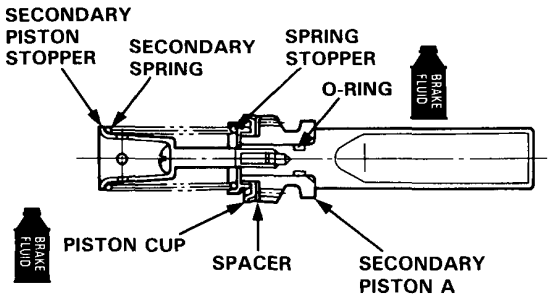
CAUTION:
- **Make sure all parts are clean before reassembly.**
- **Use only new replacement parts.**
- **Use only clean brake fluid.**
- **Do not allow dirt or other foreign matter to contaminate the brake fluid.**
- **Do not mix different brands of brake fluid.**
- **Avoid spilling brake fluid on painted, plastic or rubber surfaces as it can damage the finish. Wash spilled brake fluid off immediately with clean water.**

1. Lubricate new piston assemblies with brake fluid, then fit them together.

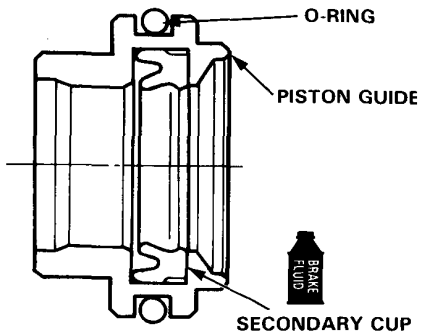
PRIMARY PISTON ASSEMBLY



SECONDARY PISTON ASSEMBLY



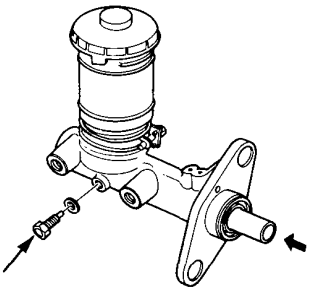
PISTON GUIDE ASSEMBLY



2. Install the piston assemblies in the master cylinder.

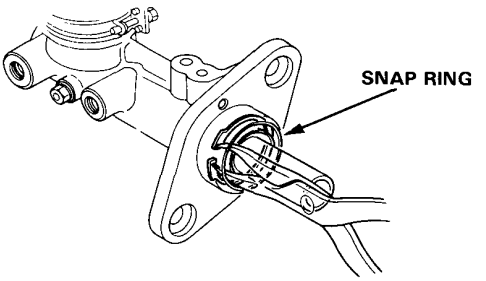
   NOTE: To ease assembly, rotate the pistons while inserting.

3. Install the stop bolt and new sealing washer while pushing in the secondary piston assembly, then tighten the stop bolt.

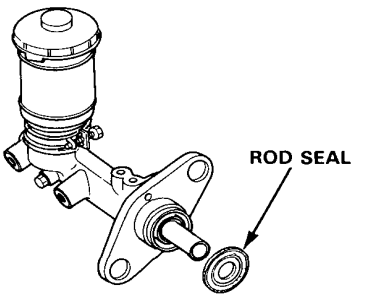


9 N·m (0.9 kg-m, 6.5 lb-ft)

4. Install the snap ring after pushing in the secondary piston assembly.



5. Install a new rod seal.



Brake Booster

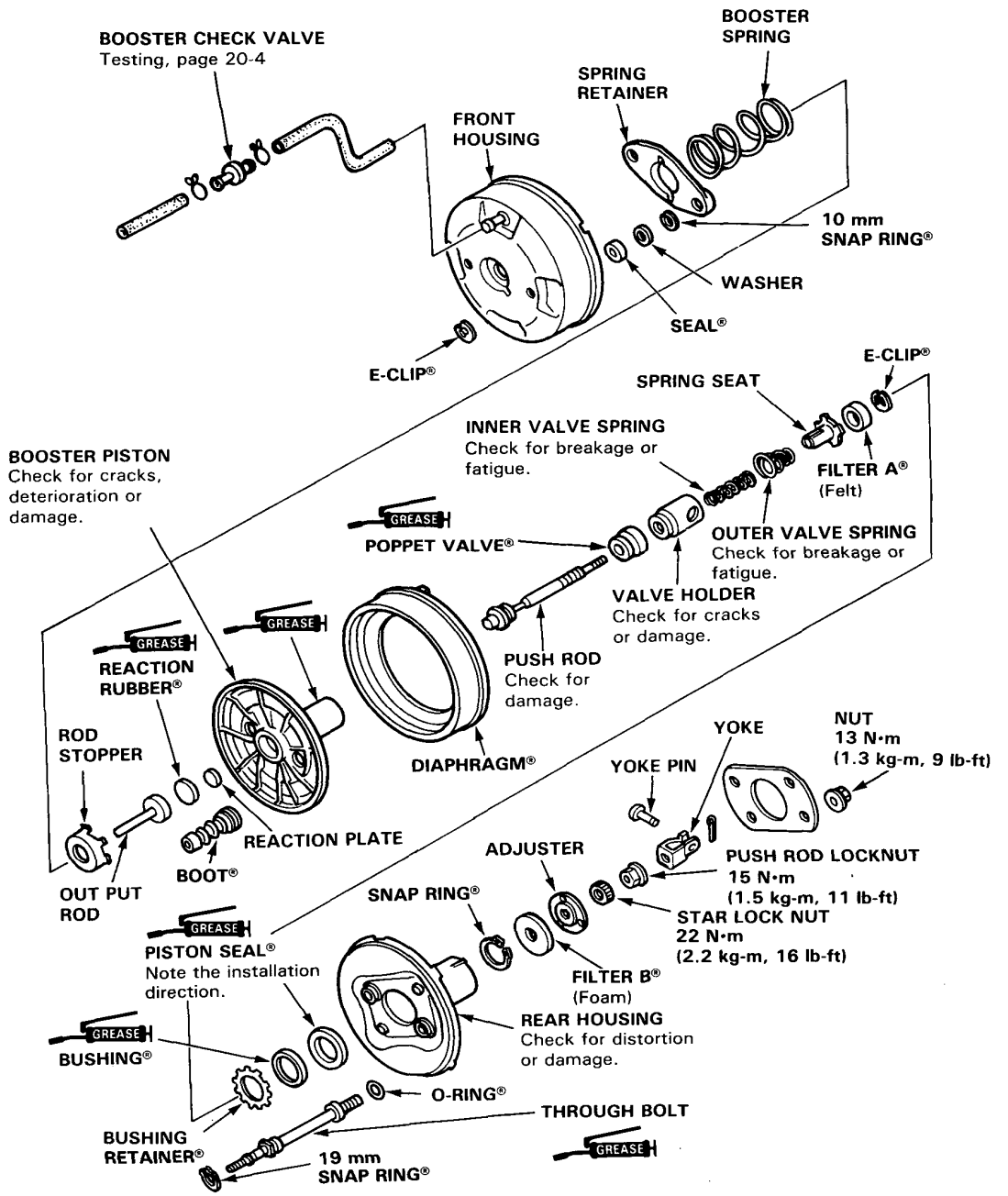
Index and Inspection

8'' Booster

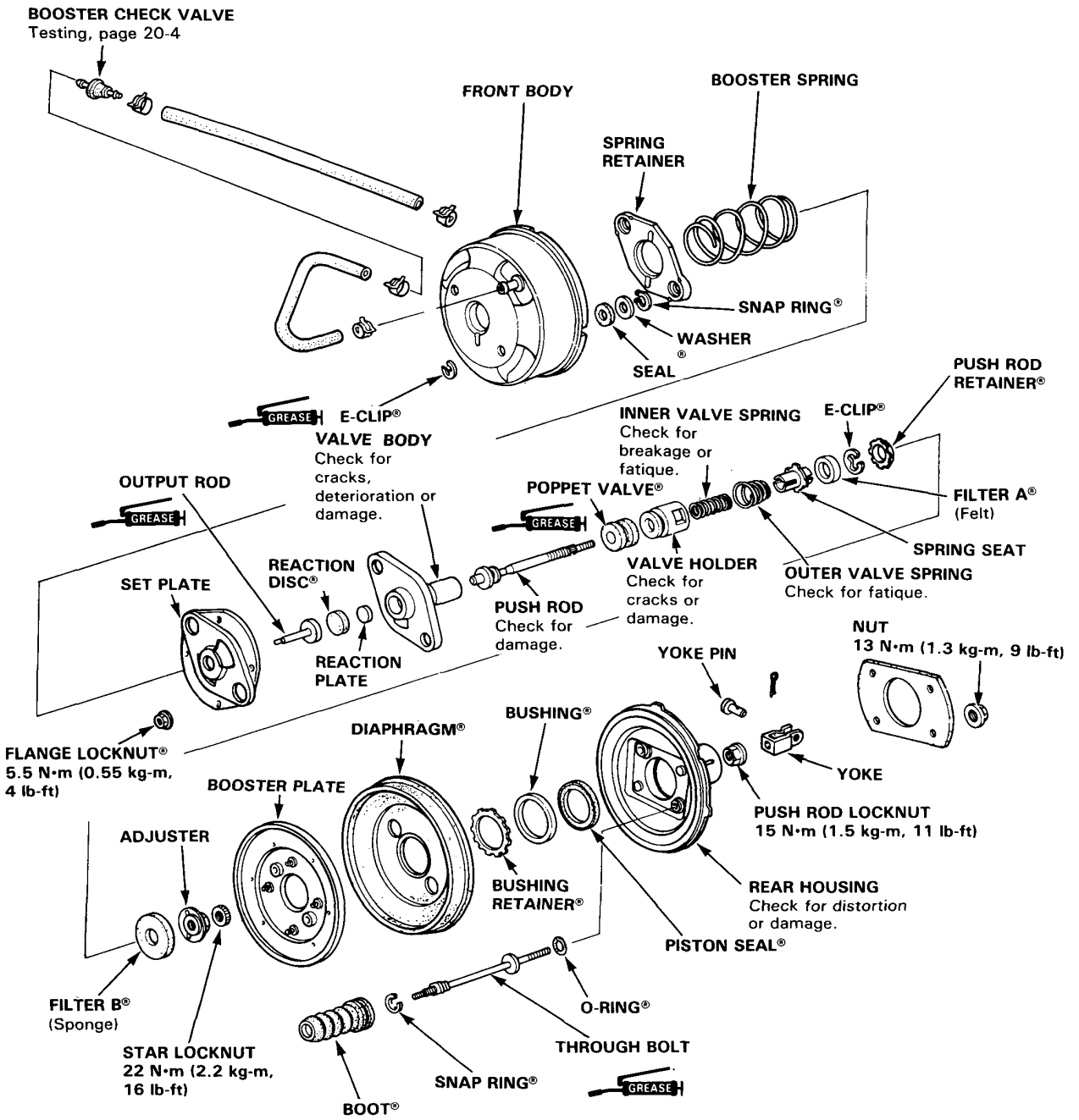
Booster testing is on the page 20-4.

NOTE:

- Parts marked® are available with rebuild kit and must be replaced whenever disassembled.
- GREASE on this page refers to silicone grease.
- Scribe an aligning mark across the front and rear housings so you can reassemble in their original positions (page 20-18 and 20-25).



9'' Booster

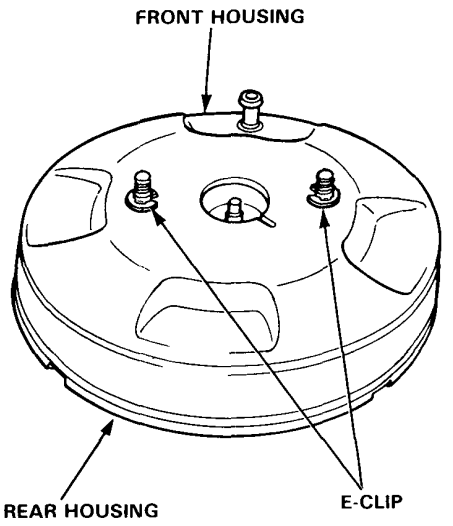

BOOSTER CHECK VALVE
Testing, page 20-4
FRONT BODY
BOOSTER SPRING
SPRING RETAINER
SNAP RING®
WASHER®
SEAL
GREASE
E-CLIP®
VALVE BODY
Check for cracks, deterioration or damage.
PUSH ROD RETAINER®
INNER VALVE SPRING
Check for breakage or fatique.
E-CLIP®
FILTER A®
(Felt)
SPRING SEAT
OUTER VALVE SPRING
Check for fatique.
OUTPUT ROD
GREASE
POPPET VALVE®
GREASE
VALVE HOLDER
Check for cracks or damage.
SET PLATE
REACTION DISC®
REACTION PLATE
PUSH ROD
Check for damage.
NUT
13 N·m (1.3 kg-m, 9 lb-ft)
YOKE PIN
FLANGE LOCKNUT®
5.5 N·m (0.55 kg-m, 4 lb-ft)
DIAPHRAGM®
BUSHING®
YOKE
BOOSTER PLATE
PUSH ROD LOCKNUT
15 N·m (1.5 kg-m, 11 lb-ft)
ADJUSTER
BUSHING RETAINER®
REAR HOUSING
Check for distortion or damage.
PISTON SEAL®
FILTER B®
(Sponge)
O-RING®
STAR LOCKNUT
22 N·m (2.2 kg-m, 16 lb-ft)
THROUGH BOLT
SNAP RING®
GREASE
BOOT®

Brake Booster

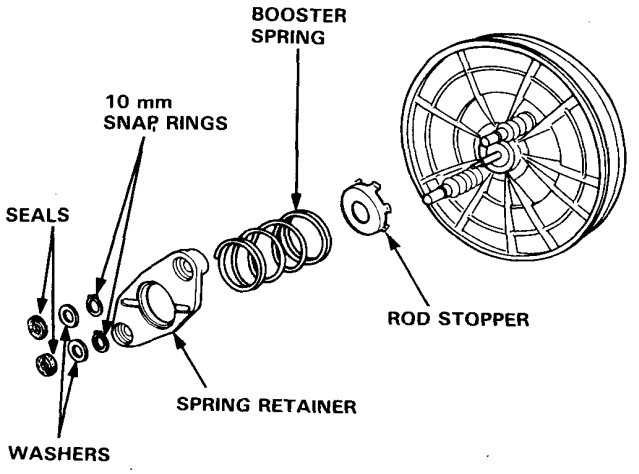
Disassembly

8" Booster

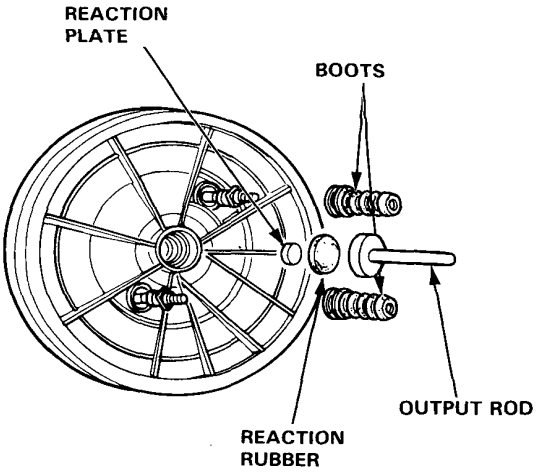
1. Scribe an aligning mark across the front and rear booster housings to ensure proper positioning of parts on reassembly.
2. Remove the E-clips, and separate the front booster housing and the rear booster housing.



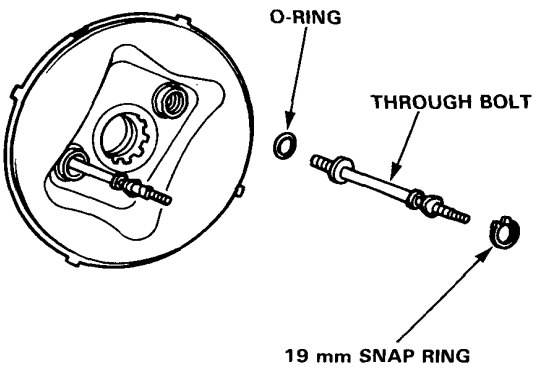
3. Remove the seals and washers from the spring retainer, then remove the spring retainer, booster spring and rod stopper by removing the 10 mm snap rings.



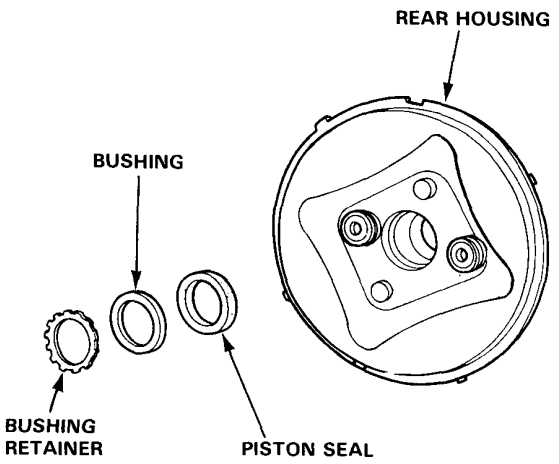
4. Remove the output rod, reaction rubber and reaction plate.
5. Remove the boots.



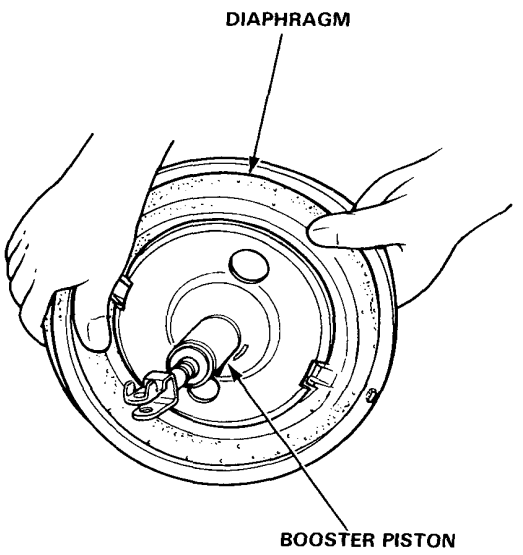
6. Separate the booster piston from the housing.
7. Remove the 19 mm snap ring and remove the through bolt with O-ring from the rear housing.



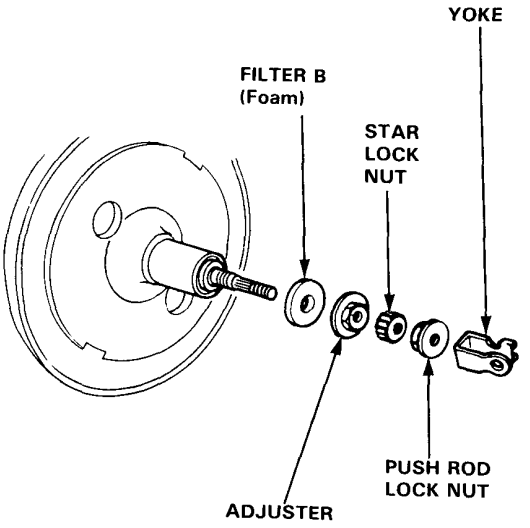
8. Remove the bushing retainer, bushing and piston seal from the rear housing.



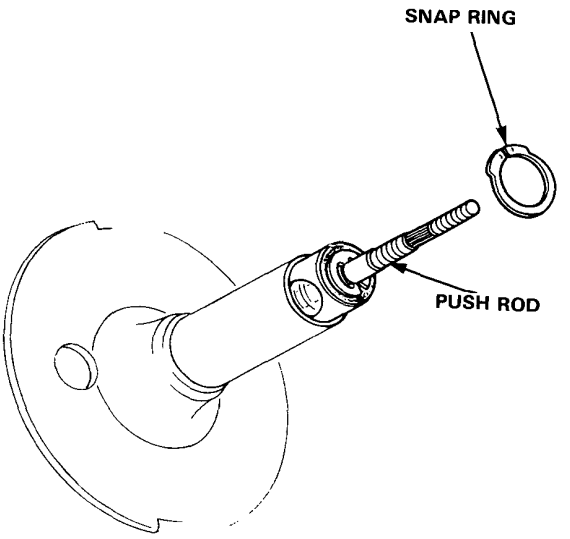
9. Remove the diaphragm from the booster piston.



10. Remove the push rod yoke, push rod lock nut, star lock nut, adjuster and filter B (foam) from the booster piston.



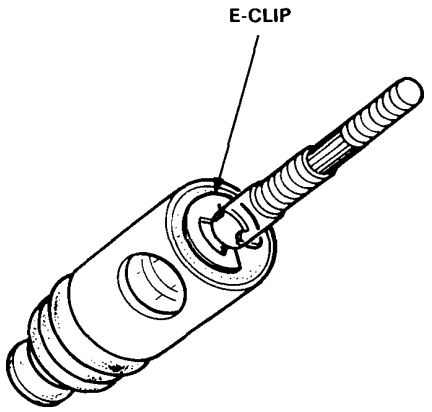
11. Remove the push rod by removing the snap ring.



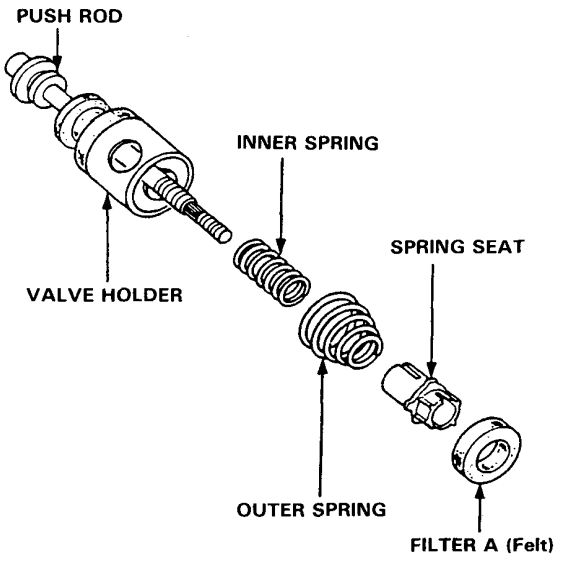
(cont'd)

Disassembly (cont'd)

12. Remove the E-clip from the push rod.

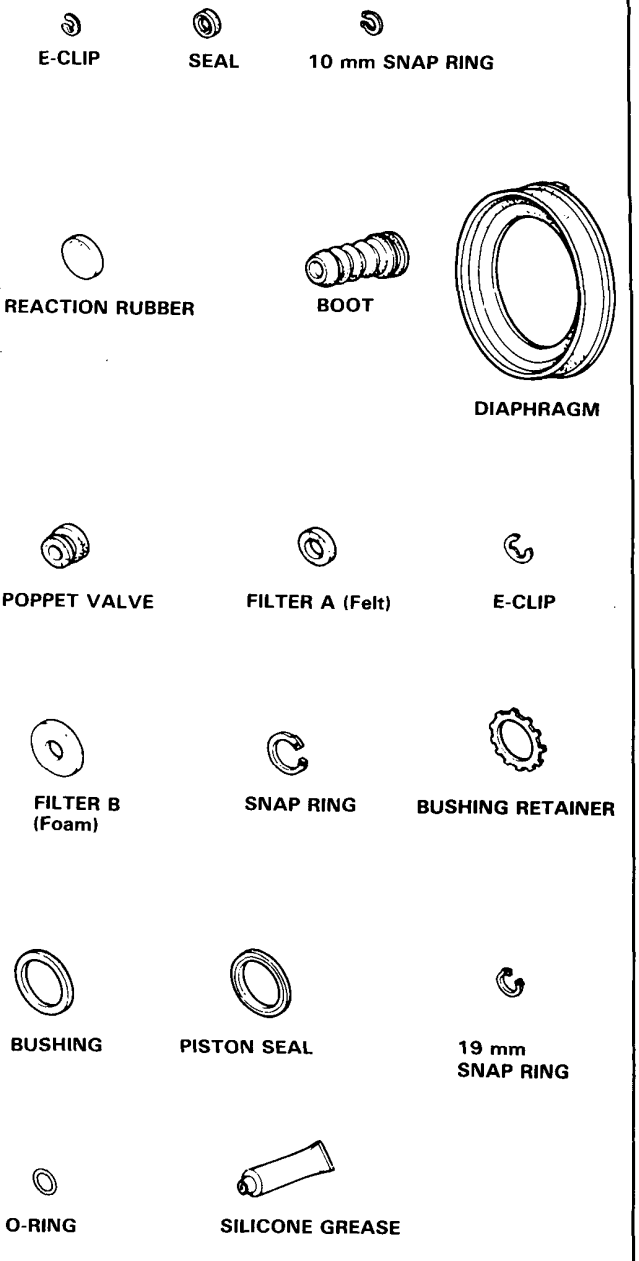


13. Remove filter A (Felt), spring seat, outer valve spring, inner valve spring, valve holder, poppet valve and push rod.



Rebuild Kit

8" Booster

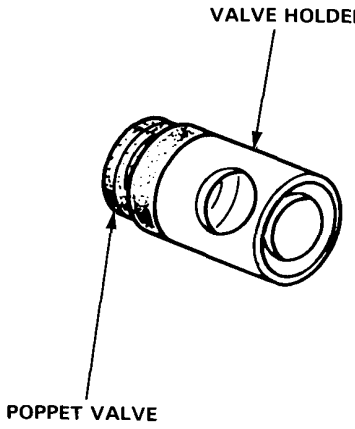


Reassembly

8'' Booster

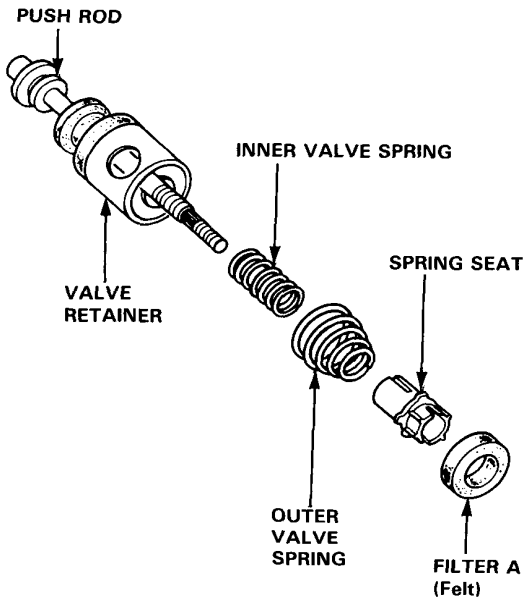
NOTE: Clean all parts before reassembly.

1. Install the poppet valve on the valve holder.

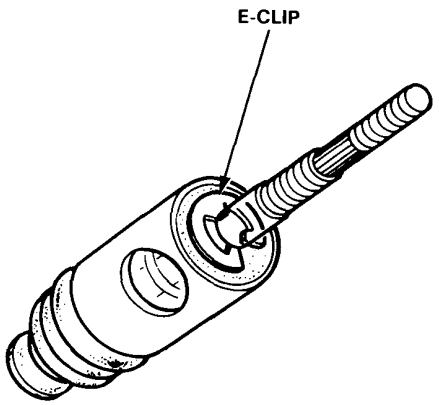


2. Install the valve holder, inner valve spring, outer valve spring and spring seat on the push rod.

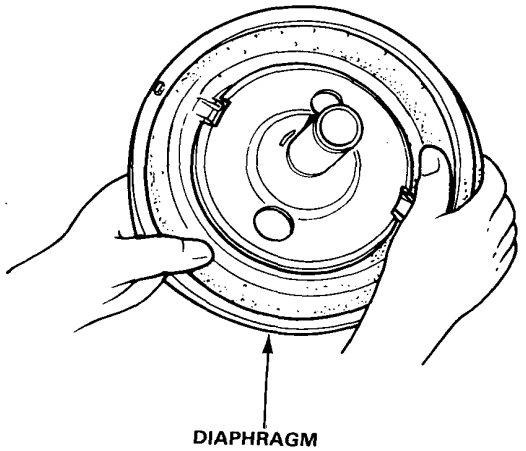
NOTE: Install the spring seat with its short end facing the filter side.



3. Install a new filter A (felt) on the push rod and secure with a new E-clip.



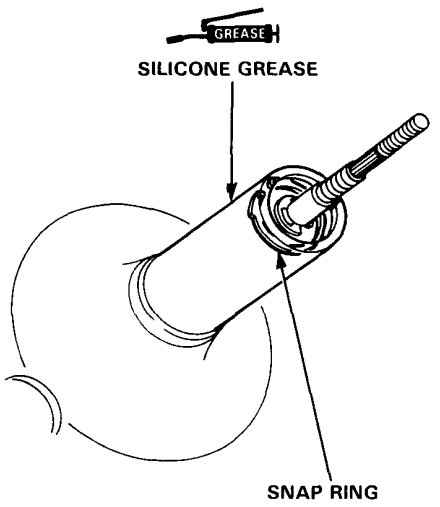
4. Install the diaphragm on the booster piston.



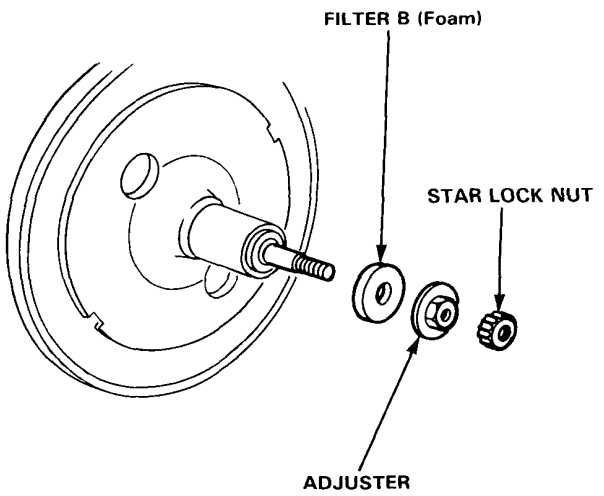
(cont'd)

Reassembly (cont'd)

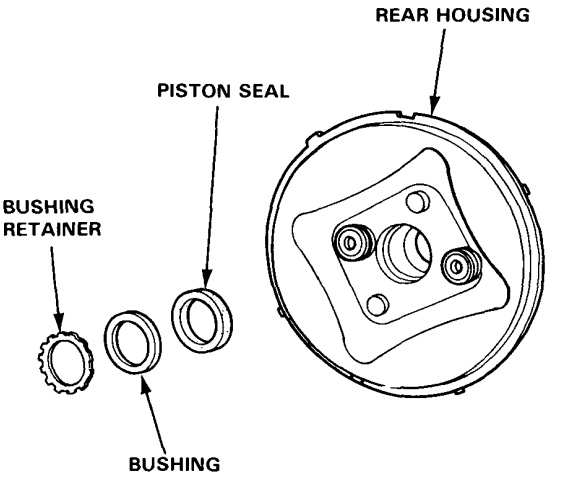
5. Apply silicone grease to the inner and outer surface of the booster piston tube.
6. Install the push rod assembly and secure with the snap ring.



7. Install filter B (foam) on the push rod, then loosely install the adjuster and start lock nut.



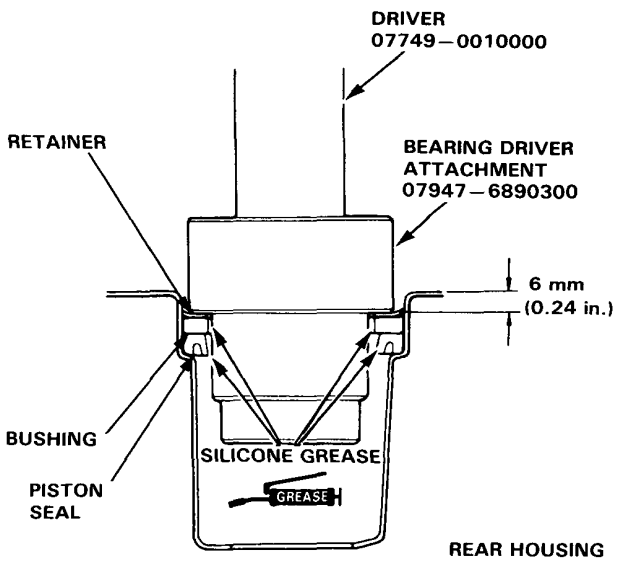
8. Apply silicone grease to the piston seal.
9. Position the piston seal, bushing and bushing retainer on the rear housing.



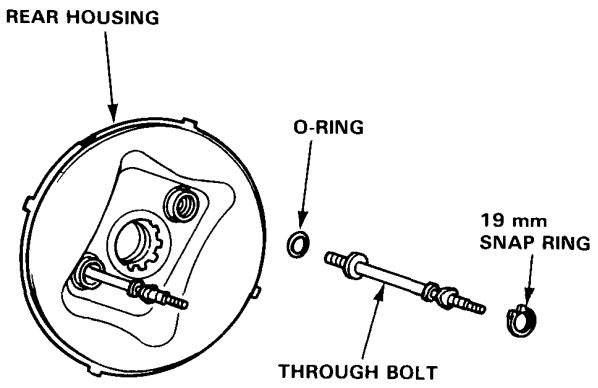
NOTE: Make sure the lip of the seal is facing in, as shown in drawing below.

10. Drive the bushing retainer in until it is 6 mm below the edge of the rear housing.

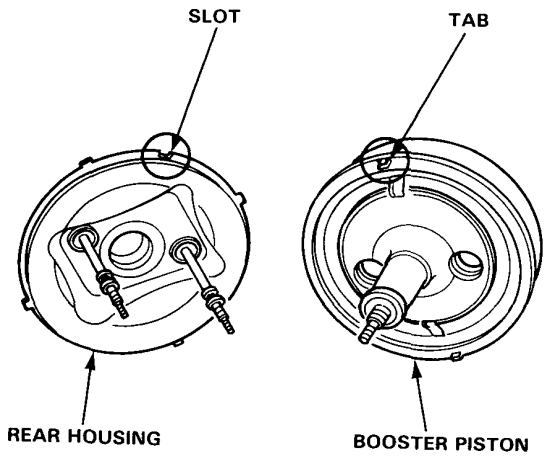
CAUTION: If you drive the retainer more than 6 mm, the piston seal may distort.



11. Install the O-rings and through bolts on the rear housing and secure with 19 mm snap ring.

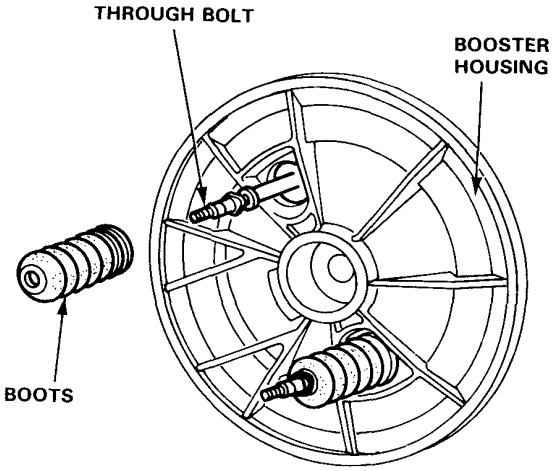


12. Install the booster piston on the rear housing aligning their tabs and slots.



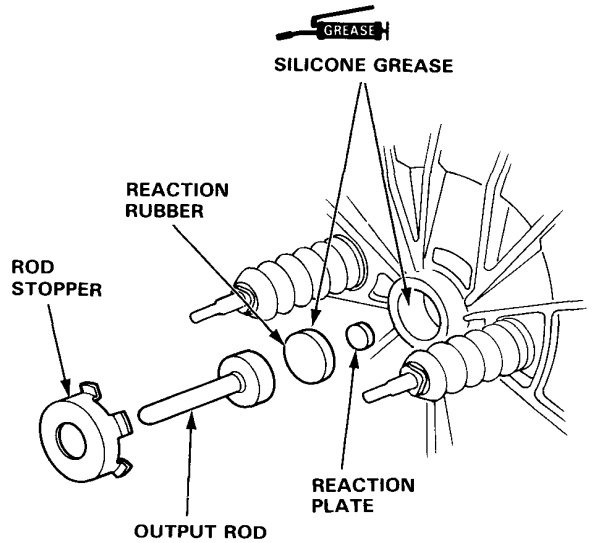
13. Install the boots on the through bolts.

NOTE: Make sure not to damage the boots when installing.



14. Apply silicone grease to the bore of the booster piston and reaction rubber.

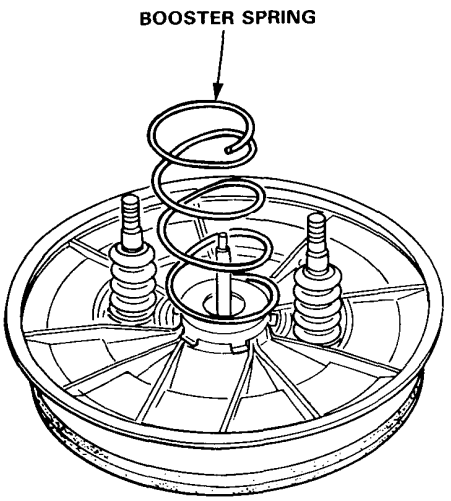
15. Install the reaction plate, reaction rubber, output rod and rod stopper on the booster piston.



(cont'd)

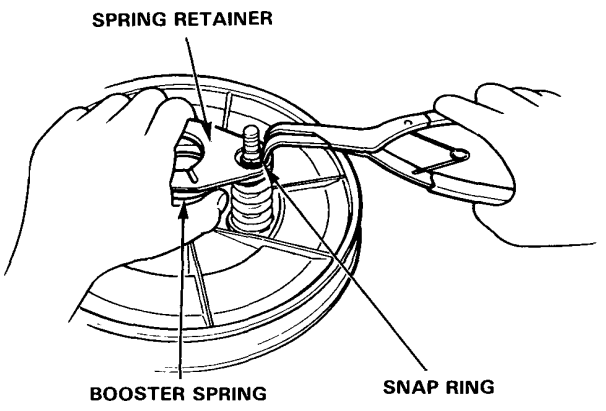
Reassembly (cont'd)

16. Install the booster sping.



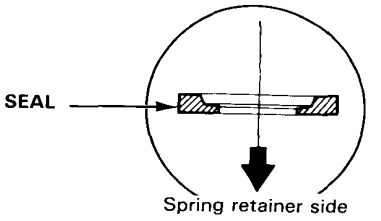
17. Install the spring retainer on the through bolts aligning the square portions of the bolts and retainer.

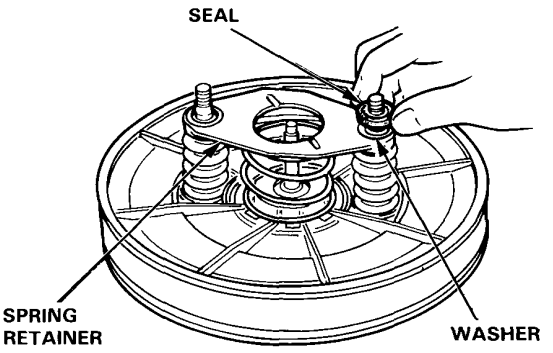
18. Compress the booster spring, then install the 10 mm snap ring on the through bolts.



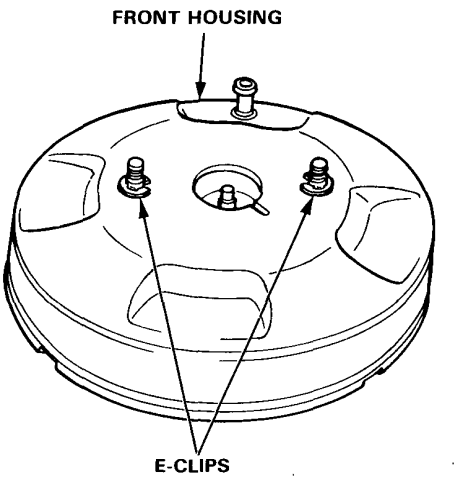
19. Install the washers and seals on the through bolts.

NOTE: Install the seals with the flat sides facing the spring retainer side as shown.





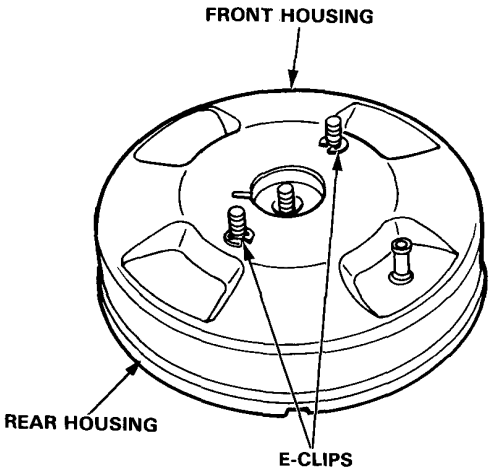
20. Install the front housing and secure with E-clips.



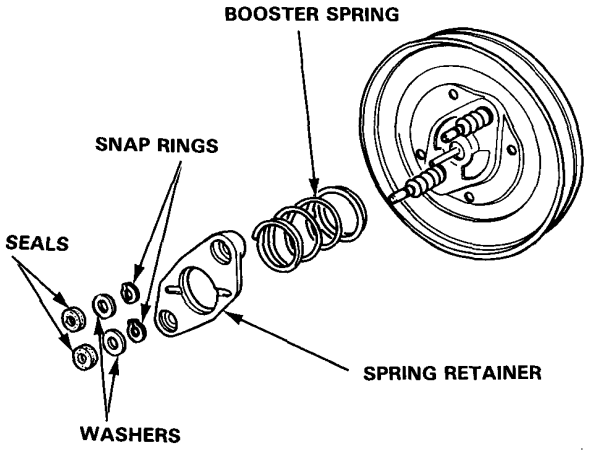
Disassembly

9'' Booster

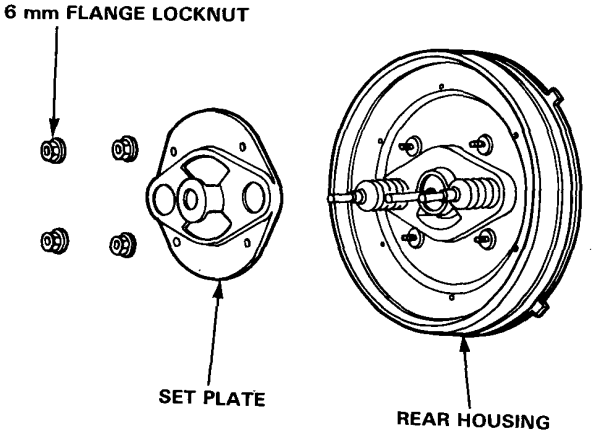
1. Scribe an aligning mark across the front and rear booster housings to ensure proper positioning of parts on reassembly.
2. Remove the E-clips, and separate the front booster housing and the rear booster housing.



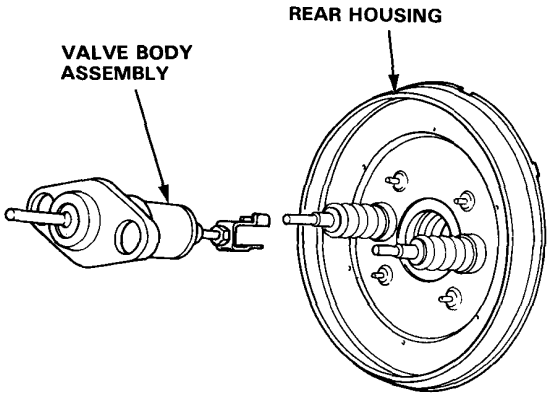
3. Remove the seals and washers from the spring retainer then remove the snap rings.



4. Remove the spring retainer and booster spring.
5. Remove the 6 mm flange locknuts and set plate.



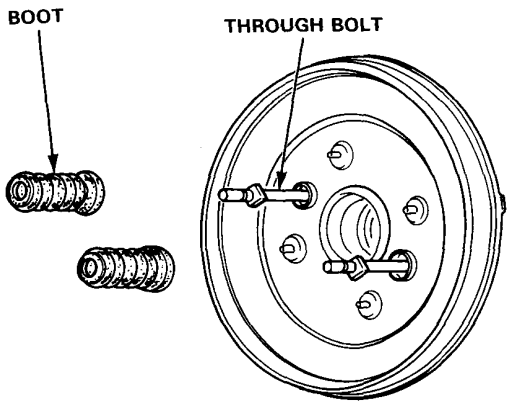
6. Remove the valve body assembly from the rear housing.



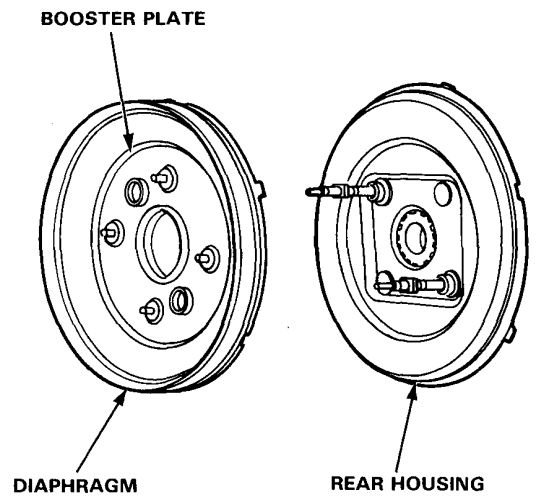
(cont'd)

Disassembly (cont'd)

7. Remove the boots from the through bolts.

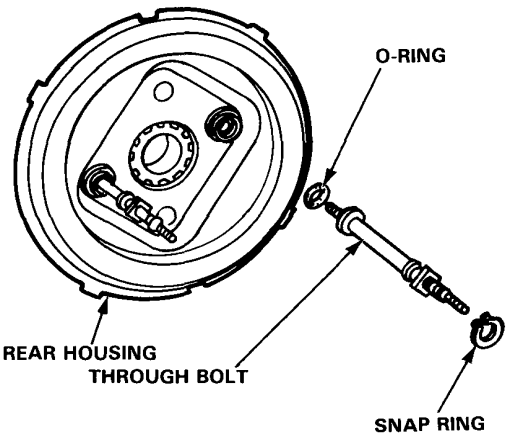


8. Remove the booster plate and diaphragm together from the rear housing.

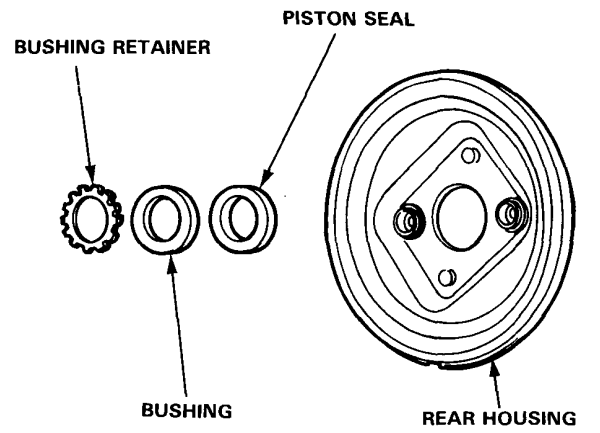


9. Remove the diaphragm from the booster plate.

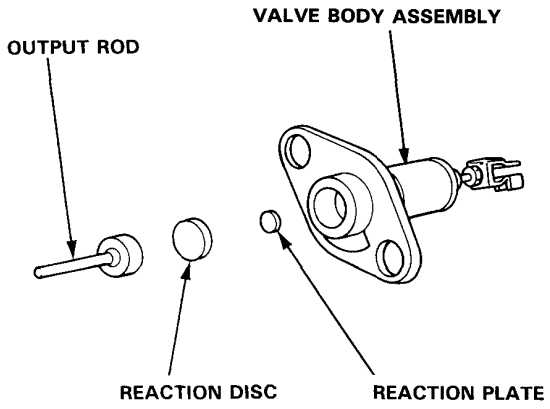
10. Remove the snap rings, then remove the through bolts and O-rings from the rear housing.



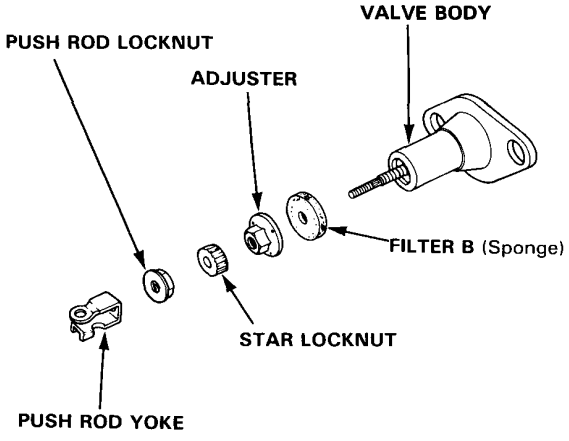
11. Remove the bushing retainer, bushing and piston seal from the rear housing.



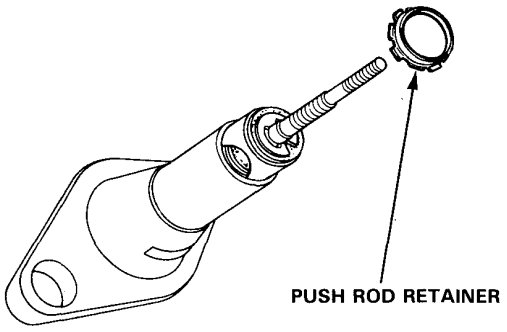
12. Remove the output rod, reaction disc and reaction plate from the valve body assembly.



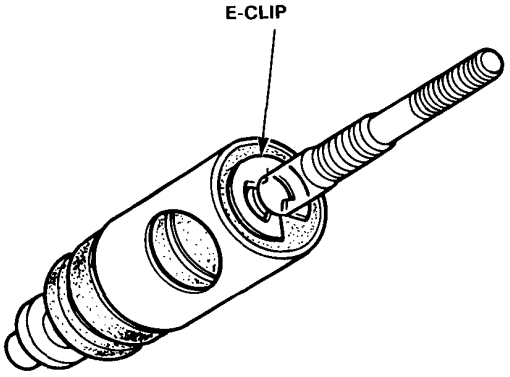
13. Remove the push rod yoke, locknut, star lock nut, adjuster and filter B from the valve body.



14. Remove the push rod retainer, then remove the push rod from the valve body assembly.



15. Remove the E-clip from the push rod.

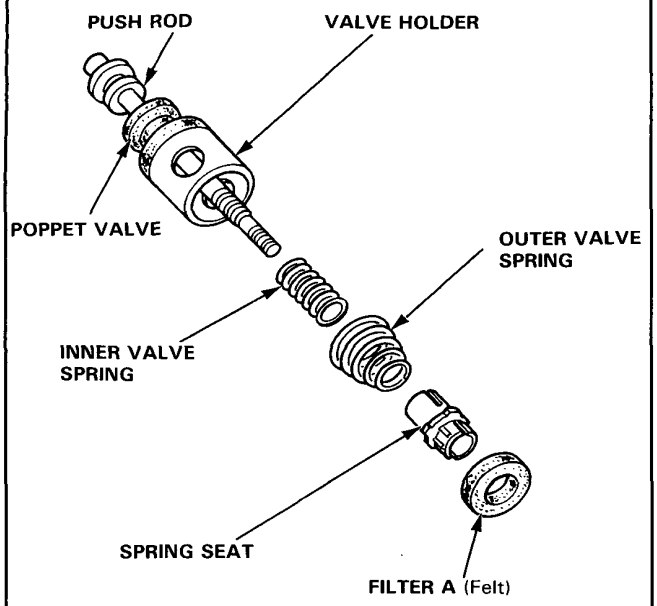


(cont'd)

Brake Booster

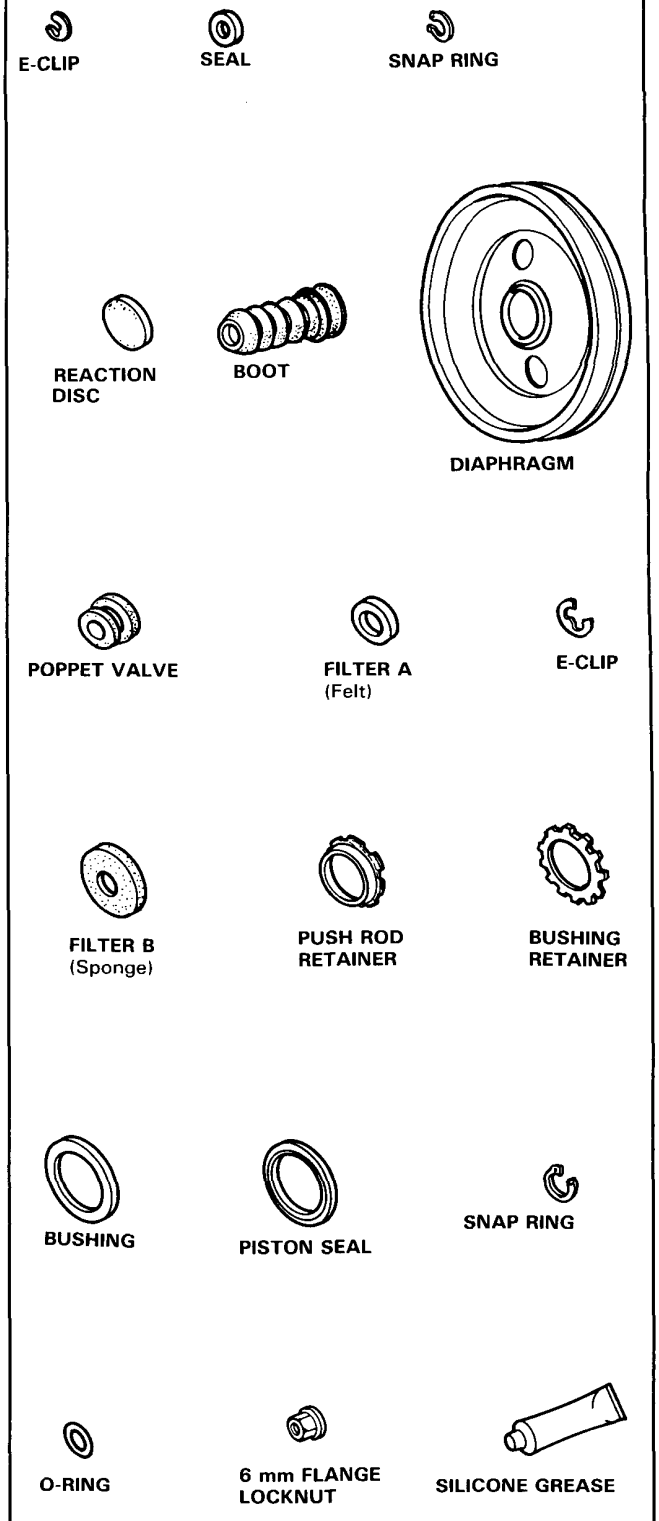
Disassembly (cont'd)

16. Remove filter A, the spring seat, valve springs, valve holder and poppet valve from the push rod.



Rebuild Kit

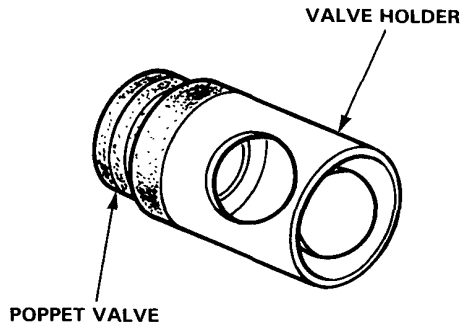
9'' Booster



Reassembly

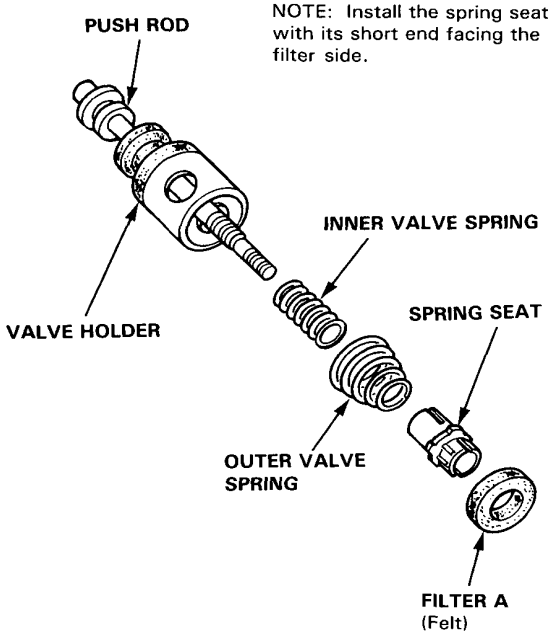
9'' Booster

1. Install the poppet valve on the valve holder.

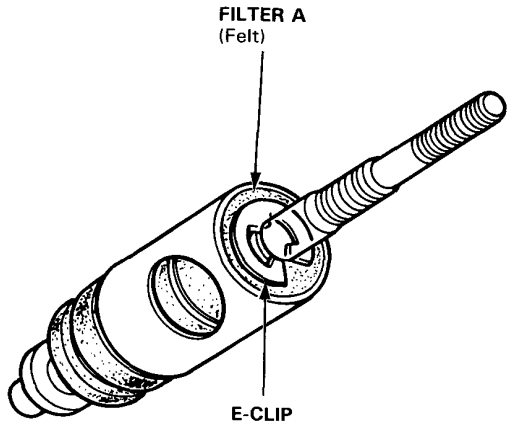


2. Install the valve holder, inner valve spring, outer valve spring and spring seat on the push rod.

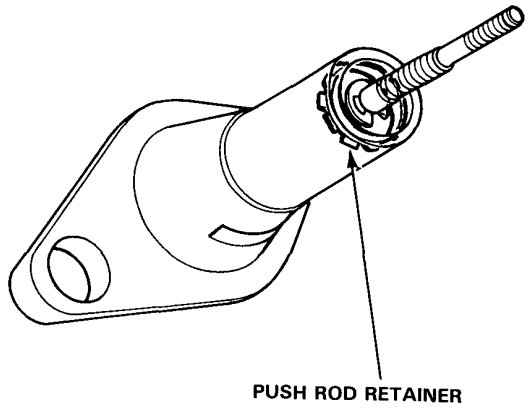
NOTE: Install the spring seat with its short end facing the filter side.



3. Install filter A and the E-clip on the push rod.



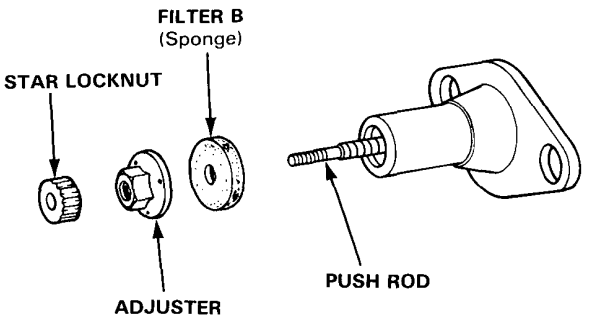
4. Apply silicone grease to the inner and outer surfaces of the tube of valve body, Press the push rod assembly into the tube of valve body, and install the push rod retainer.



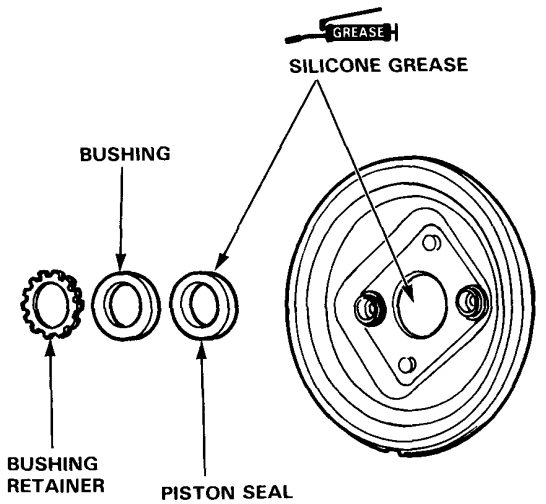
(cont'd)

Reassembly (cont'd)

5. Slip filter B (sponge) over the end of the push rod. Thread the adjuster and star locknut onto the push rod but do not tighten.



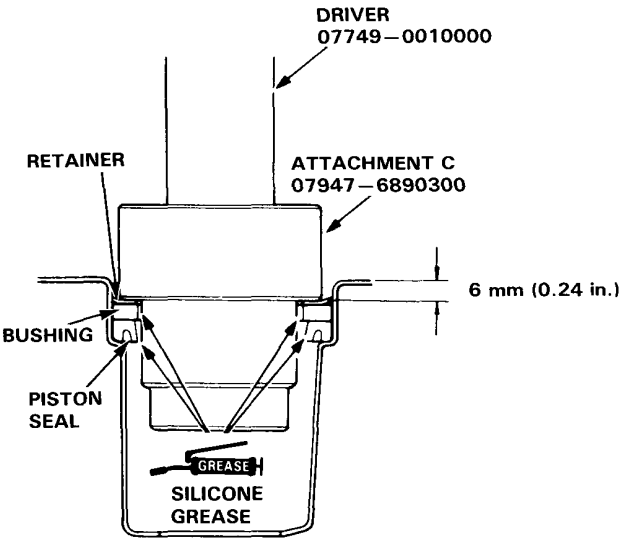
6. Apply silicone grease to piston seal, then set the seal in position on the housing.



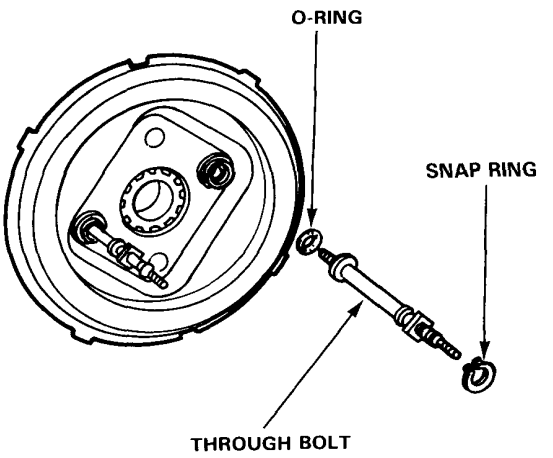
NOTE: Make sure the lip of the seal is facing in, as shown in drawing below.

7. Install the piston seal and bushing in the rear housing, and gently drive the retainer in until it is 6 mm below the edge of the rear housing.

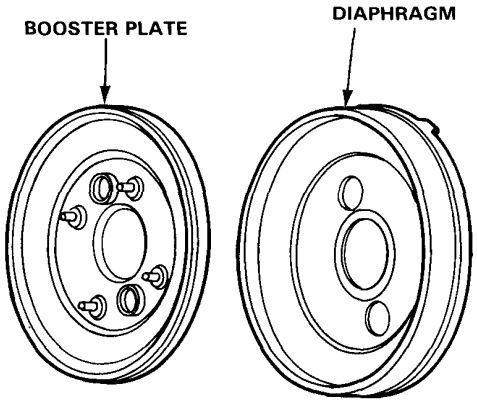
CAUTION: If you drive in the retainer more than 6 mm, you may distort the piston seal.



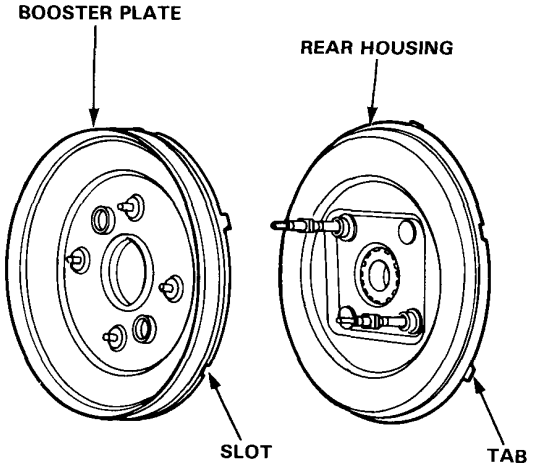
8. Install both through bolts, using the O-rings and snap rings.



9. Install the diaphragm on the booster plate.

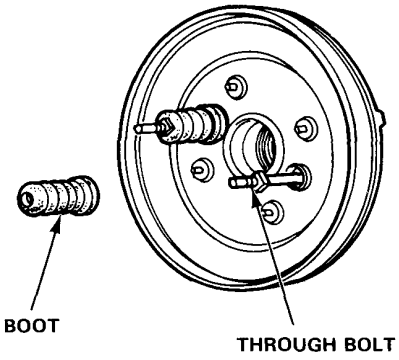


10. Attach the booster plate to the rear housing, aligning their tabs and slots.

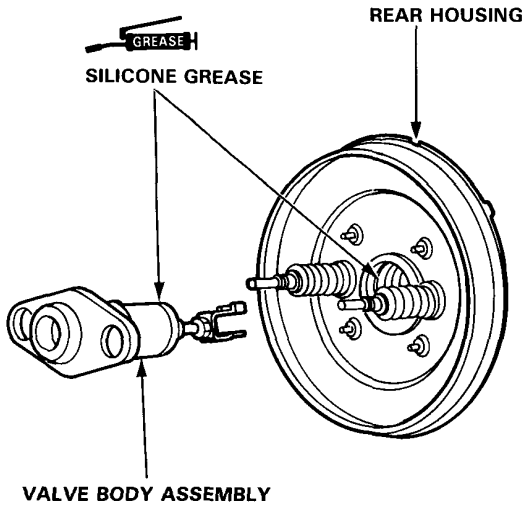


11. Install the boots on the through bolts.

CAUTION: Make sure not to damage the boots when installing.



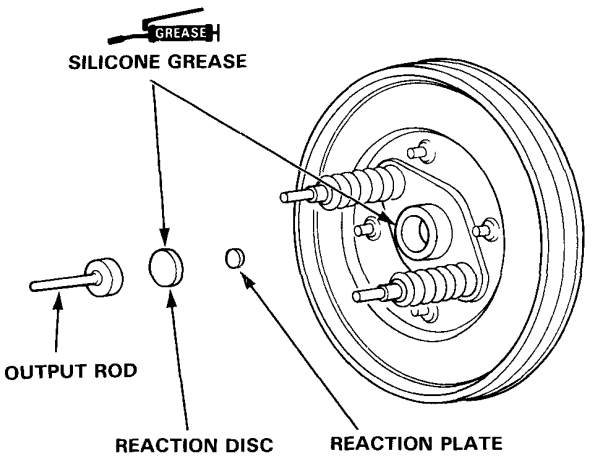
12. Apply silicone grease to the bore of the rear housing and the outer surface of the valve body assembly. Install the valve body assembly in the rear housing.



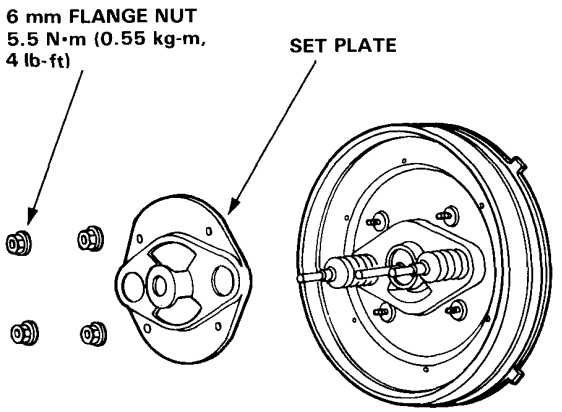
(cont'd)

Reassembly (cont'd)

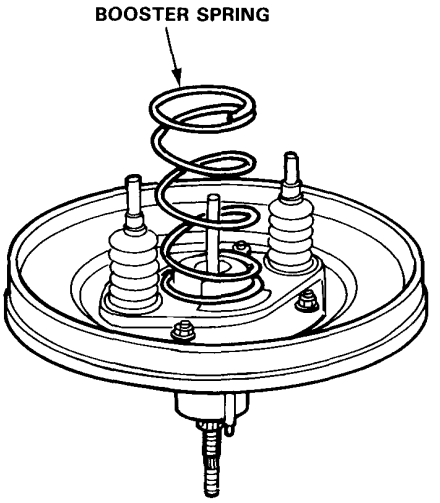
13. Apply silicone grease to the bore of the valve body, then install the reaction plate, reaction disc and output rod.



14. Install the set plate, and tighten the four 6 mm flange nuts.

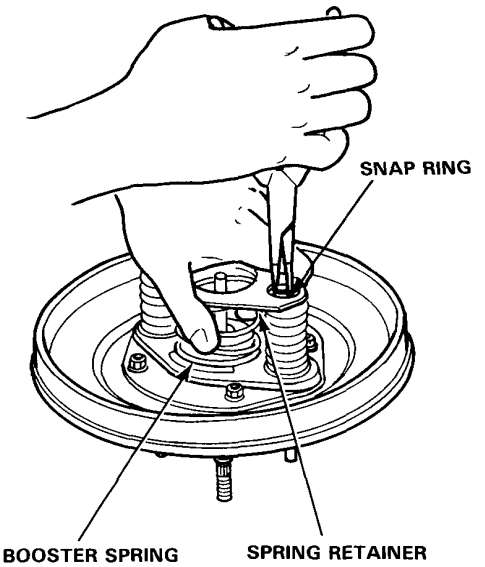


15. Install the booster spring.

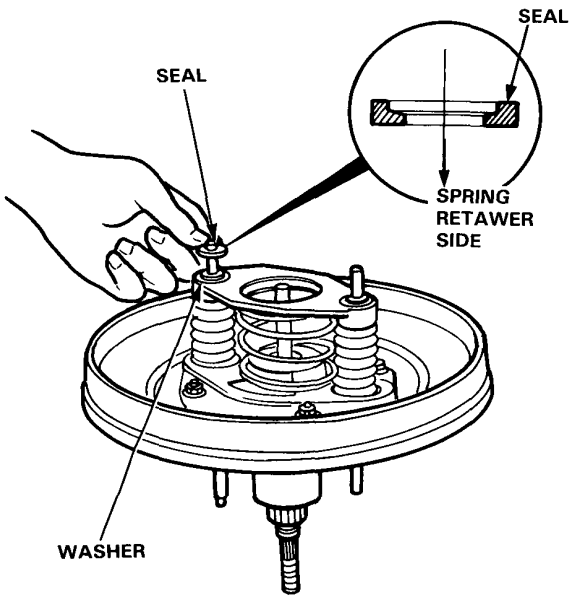


16. Install the spring retainer on the through bolts aligning the square portions of the bolts and retainer.

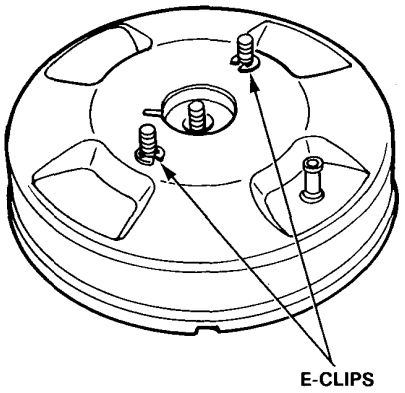
17. Secure the spring retainer by compressing the booster spring, and installing the snap rings on the through bolts.



18. Install the washers and seals.



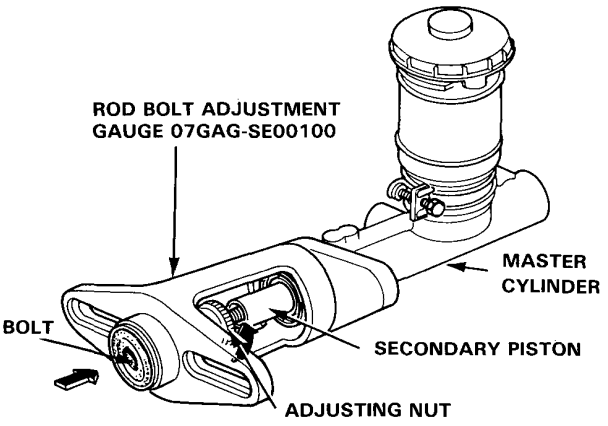
19. Assemble the front and rear housings.
20. Press down on the front housing, then install the E-clips on the through bolts.



Pushrod Clearance Adjustment

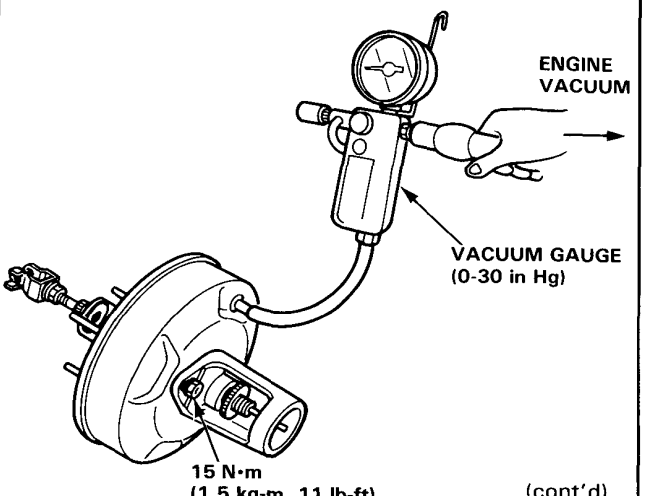
NOTE: *Master cylinder pushrod-to-piston clearance must be checked and adjustments made, if necessary, before installing master cylinder.*

1. Using the Rod Bolt Adjustment Gauge, adjust bolt so the top of it is flush with end of master cylinder piston.



2. Without disturbing the adjusting bolt's position, install the master cylinder rod seal on the adjustment gauge and put the gauge upside down on the booster.
3. Install the master cylinder nuts and tighten to the specified torque.
4. Connect the booster in-line with a vacuum gauge (0—30 in Hg) to the booster's engine vacuum supply, and maintain an engine speed that will deliver 500 mm Hg (20 in Hg) vacuum.
5. With a feeler gauge, measure the clearance between the gauge body and the adjusting nut as shown.

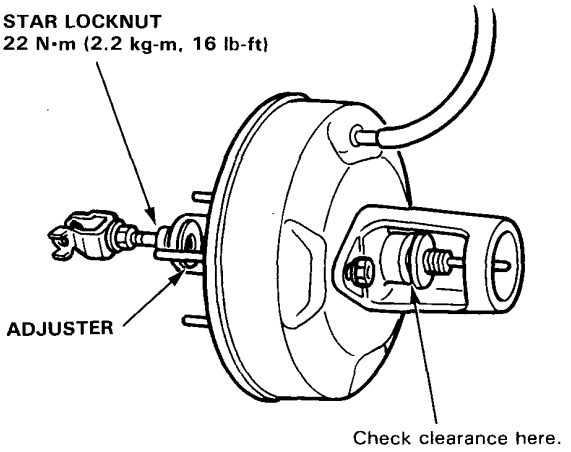
CLEARANCE: 0—0.4 mm (0—0.016 in.)



(cont'd)

Pushrod Clearance Adjustment (cont'd)

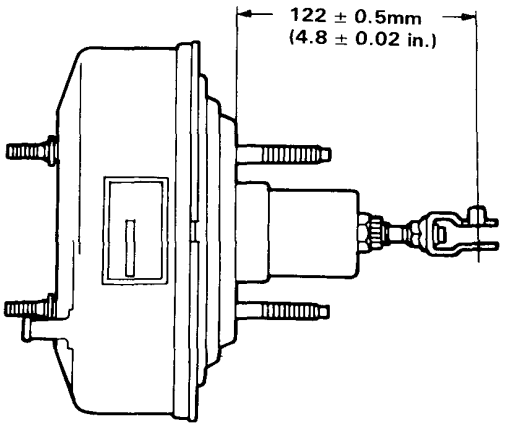
6. If clearance is incorrect, loosen star locknut and turn adjuster in or out to adjust.
7. Tighten locknut securely.



NOTE: If the clearance between the gange body and the adjusting nut is 0 mm, the push rod-to-piston clearance is adjusted to 0.4 mm. If the clearance is 0.4 mm, the push rod-to-piston clearance is adjusted to 0 mm.

Pushrod Adjustment

Install the locknut and pushrod yoke on the Pushrod, adjust the pushrod length as shown.



NOTE: Adjust the brake pedal height after installing the brake booster.

Proportioning Valve

Description

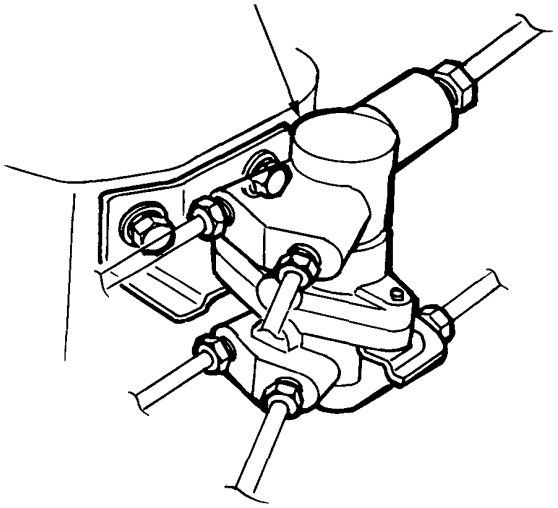
Two proportioning valves are included in the dual diagonal braking system to provide two functions:

To distribute brake fluid pressure diagonally to the right front and left rear, and to the left front and right rear. This prevents the loss of pressure to both wheels on the same side of the car in the event of a brake failure.

The proportioning valves also reduce fluid pressure to the rear brake cylinders under heavy braking conditions.

NOTE: The proportioning valves are not repairable. If you suspect a failure, replace the valve as an assembly.

DUAL PROPORTIONING VALVE



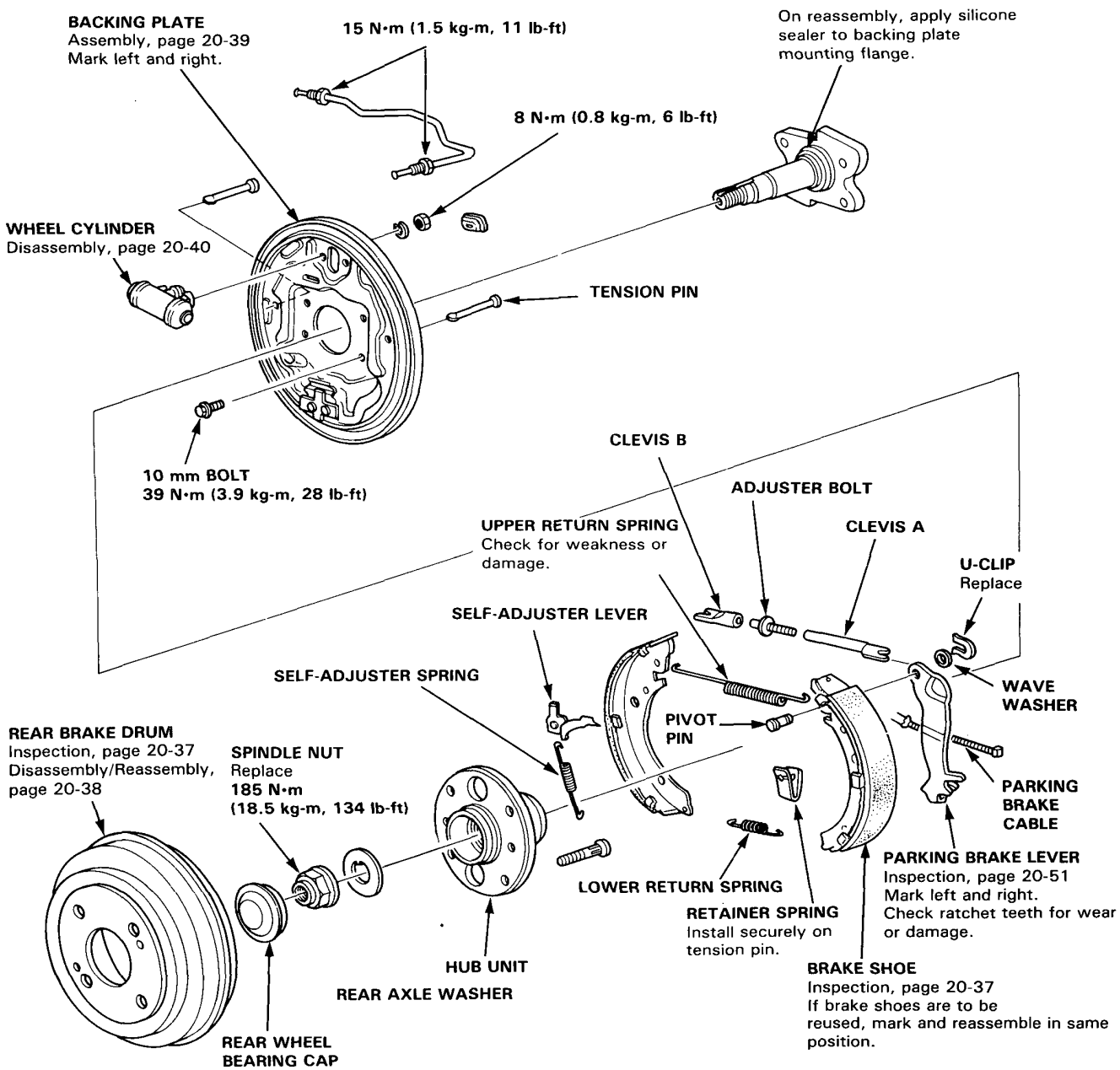
Rear Drum Brake

Index and Inspection

WARNING **Block the front wheels before jacking up the rear of the car.**

1. Raise the rear of car and support with safety stands in proper locations.
2. Loosen the parking brake.
3. Remove the rear wheels and rear brake drum .

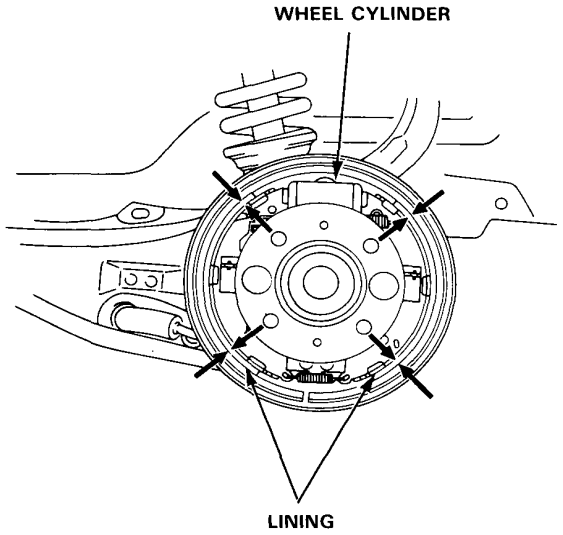
WARNING **Do not use an air hose to blow the brake assembly clean.**



Inspection

1. Inspect wheel cylinders for leakage.
2. Inspect brake linings for cracking, glazing, wear or contamination.
3. Measure brake lining thickness.

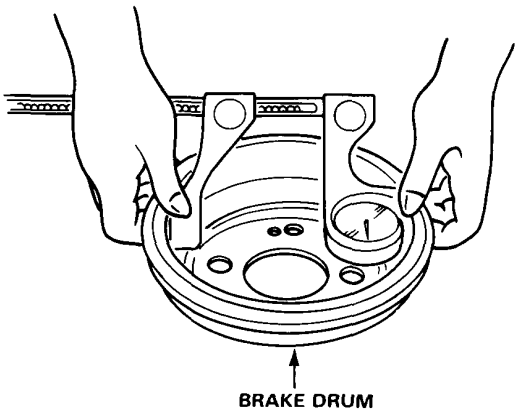
Lining Thickness
(Does not include brake shoe thickness)
Standard: 4.5 mm (0.177 in.)
Service Limit: 2.0 mm (0.079 in.)



4. Inspect bearings in hub unit for smooth operation. If defective, refer to page 19-23.
5. Measure inside diameter of brake drum.

Drum Inside Diameter:
Standard: 200 mm (7.87 in.)
Service Limit: 201 mm (7.91 in.)

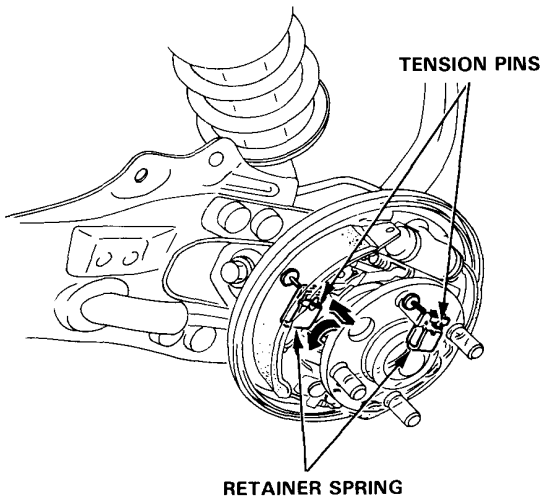
NOTE: If the refinishing limit stamped on the drum does not match the one listed above, use the one on the drum.



6. Inspect brake drum for scoring, grooving, cracks.

Disassembly

1. Remove the tension pins by pushing the retainer spring and turning them.



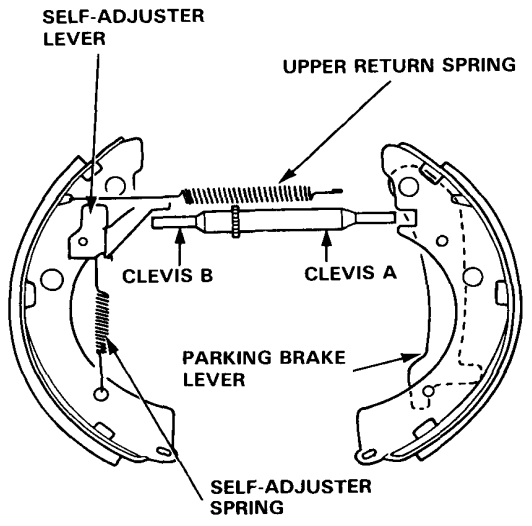
2. Lower the brake shoe assembly and remove the lower return spring.

   NOTE: Make sure not to damage the dust cover on the wheel cylinder.

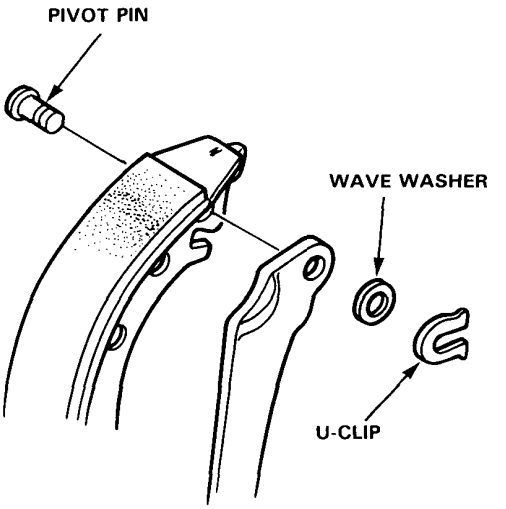
3. Remove the brake shoe assembly.

4. Disconnect the parking brake cable from the parking brake lever.

5. Remove the upper return spring, self-adjuster lever and self-adjuster spring, and separate the brake shoes.



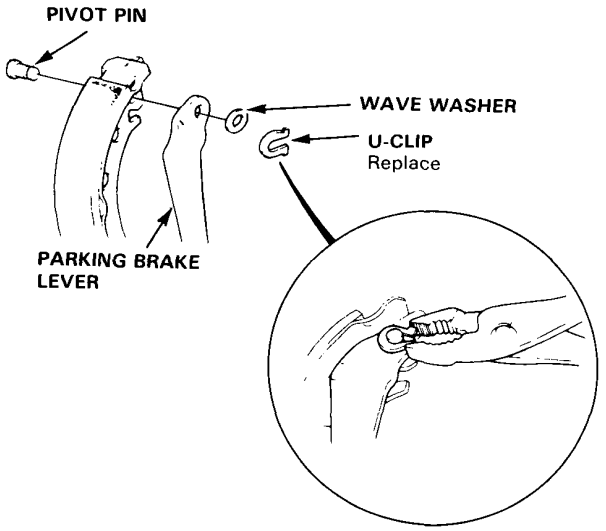
6. Remove the wave wahser, parking brake lever and pivot pin from the brake shoe by removing the U-clip.



Reassembly

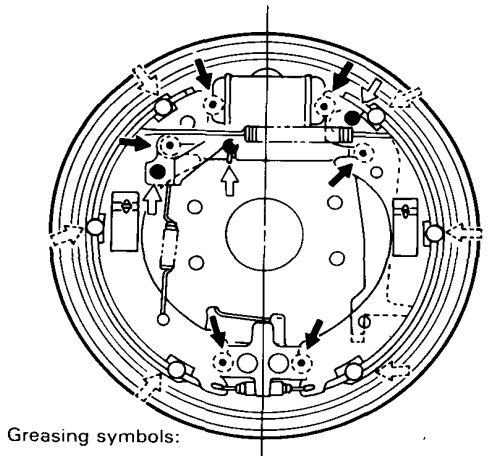
1. Apply rubber grease to the sliding surface of the pivot pin, and insert the pin into the brake shoe.
2. Install the parking brake lever and wave washer on the pivot pin and secure with U-clip.

   NOTE: Pinch the U-clip securely to prevent the pivot pin from coming out of the brake shoe.



3. Connect the parking brake cable to the parking brake lever.
4. Apply grease on each sliding surfaces.

   CAUTION: Contaminated brake linings reduce stopping power. Keep grease or oil off the brake linings. Wipe any excess grease off the parts.



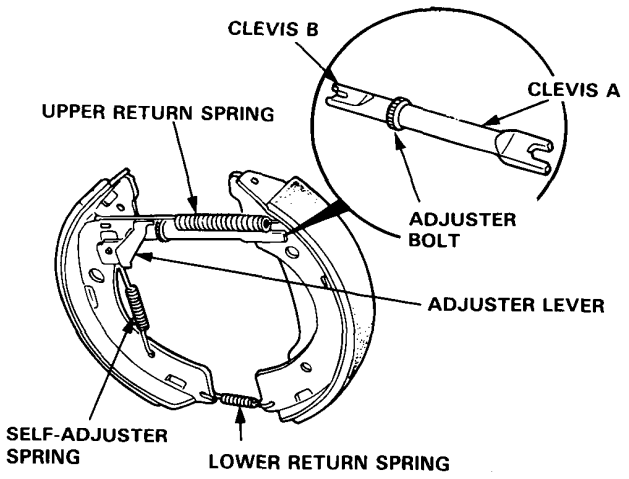
Greasing symbols:

- Brake shoe ends
- Opposite the edge of the shoe,
- Sliding surface

5. Clean and coat the grease to the threaded portions of clevises A and B.
   To shorten the clevises, turn the adjuster bolt.
6. Hook the adjuster spring to the adjuster lever first, then to the brake shoe.
7. Install the clevises and upper return spring noting the intallation direction.
8. Install the brake shoe assembly on the backing plate.

   NOTE: Make sure not to damage the dust seal.

9. Install the lower return spring.
10. Install the tension pins and retaining springs.



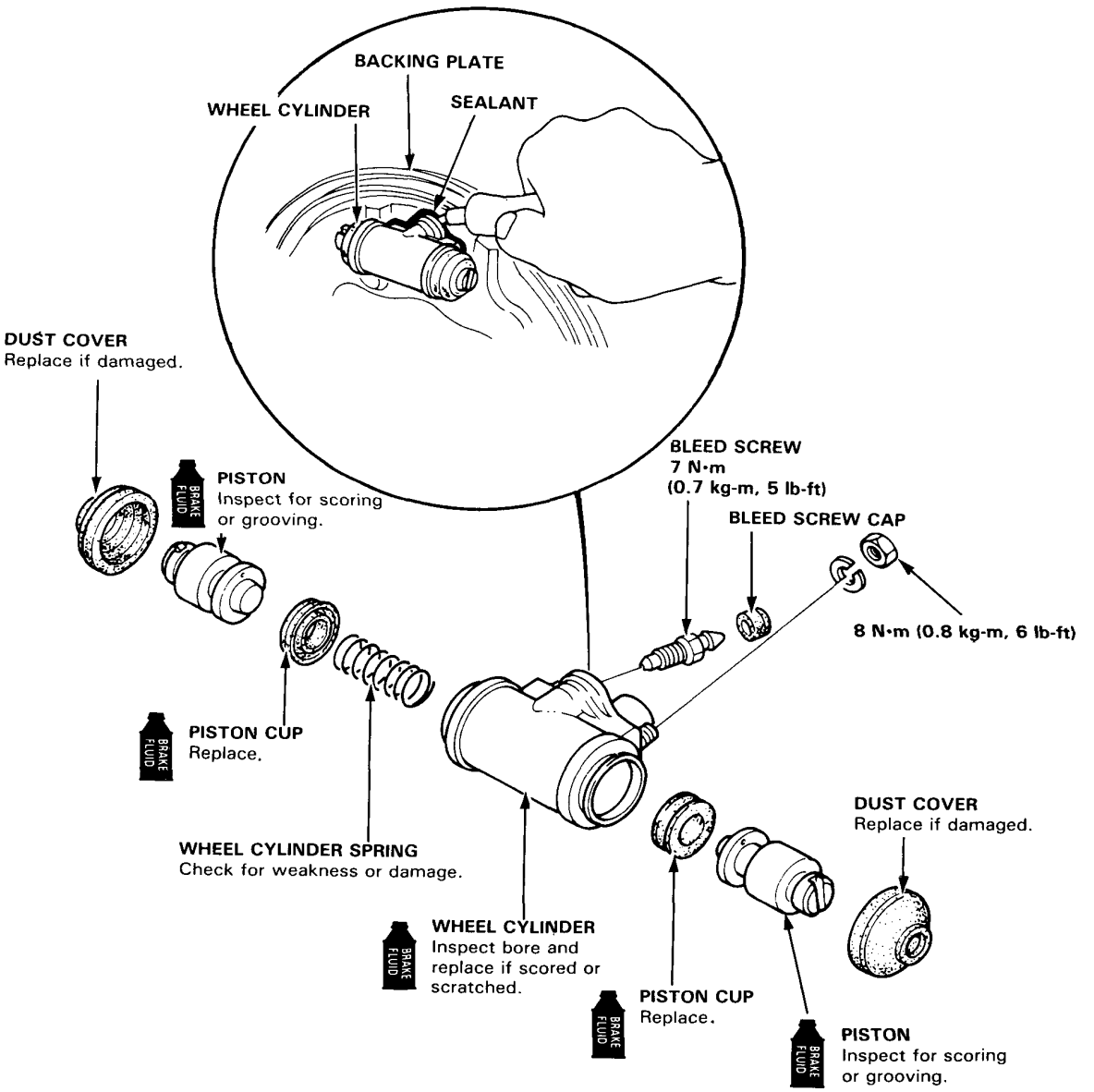
11. Install the brake drum.
12. If the wheel cylinder has been removed, bleed the brake system (page 20-3).
13. Depress the brake pedal several times to set the self-adjusting brakes.
14. Adjust the parking brake (page 20-6).

Wheel Cylinder

Disassembly and Inspection

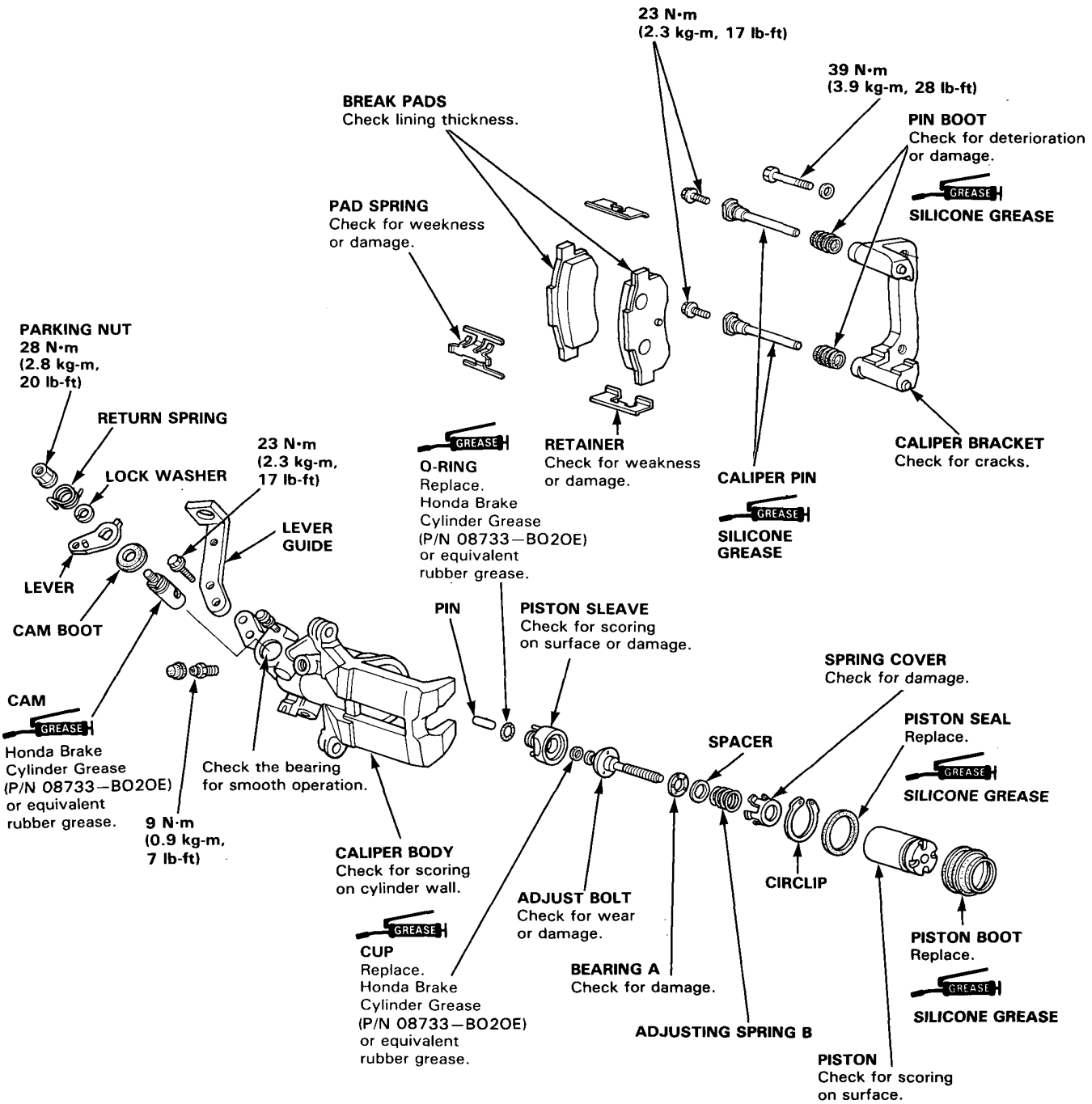
CAUTION:

- Use only clean brake fluid.
- Use only new replacement parts.
- Brake fluid will damage the painted, plustic and rubber parts. Whenever handling brake fluid, protect the painted, plastic or rubber parts by covering with a rag. If fluid does get on these parts, wipe it off with a clean cloth.
- Blow all passages with compressed air before reassembling.
- Clean all parts thoroughly with the clean brake fluid.
- Do not allow dirt or other foreign metter to contaminate the brake fluid.
- Do not mix different types of fluid. They are not compatible.
- Never reuse the brake fluid once has been drained.
- Lubricate all parts with clean brake fluid during reassembly.
- Apply sealant between the wheel cylinder and backing plate whenever the wheel cylinder has been removed.



Inspection

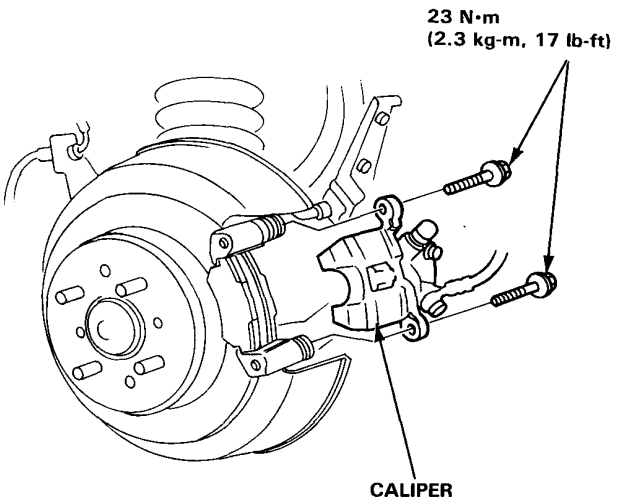
WARNING **Do not use air hose to blow brake assembly clean.**



Rear Brake Pad/Disc

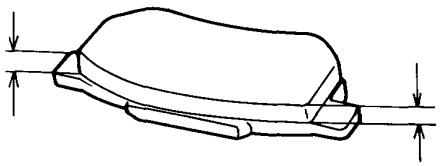
Inspection and Replacement

1. Block the front wheels, support the rear of car on safety stands, then remove the rear wheels.
2. Remove the two caliper mounting bolts and the caliper from the bracket.

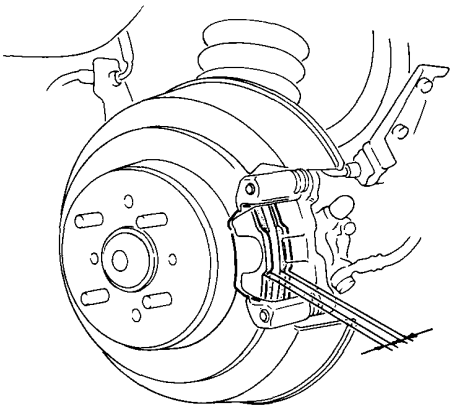


3. Remove the pads and measure the thickness of each brake pad lining using a vernier caliper.

Brake Pad Thickness:
Standard: 8.0 mm (0.31 in)
Service limit: 1.6 mm (0.06 in)



4. If the lining thickness is less than service limit, replace the brake pads as a set.

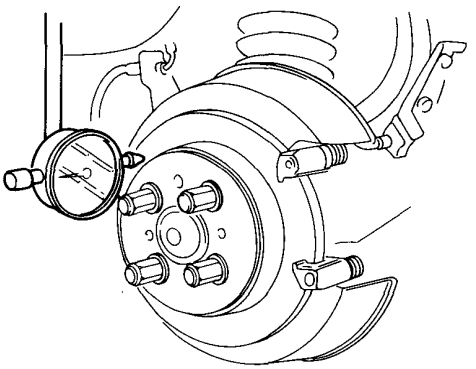


5. Inspect the disc surface for grooves, cracks, and rust. Clean the disc thoroughly and remove all rust.
6. Mount dial indicator as shown and measure the run-out at 10 mm (0.39 in) from the outer edge of the disc.

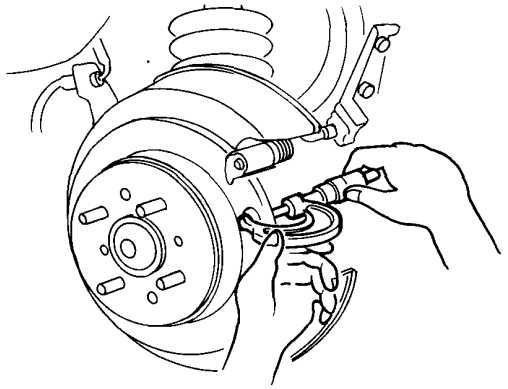
CAUTION: Use wheel nuts and 3 mm thickness washers to hold the disc securely.

Brake Disc Run-out:
Service Limit: 0.15 mm (0.006 in)

Replace the brake disc if beyond the service limit.



7. Using a micrometer, measure the rear brake disc thickness at eight points, approximately 45 apart and 10 mm (0.39 in) from the outer edge of the disc.



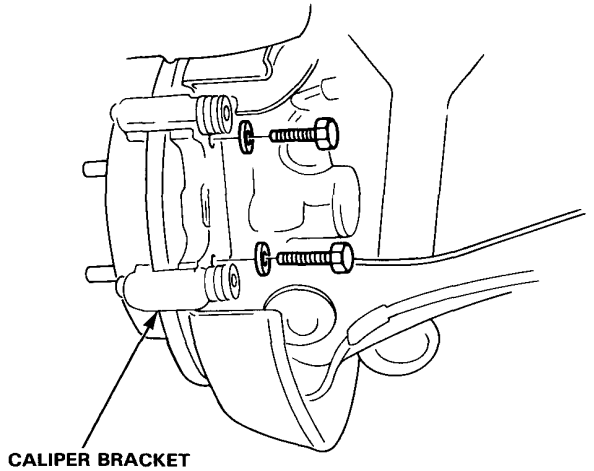
8. Replace the disc if its esceeds the following service limits;

Brake Disc Thickness:
Standard: 10.0 mm (0.39 in)
Service limit: 8.0 mm (0.31 in)

Brake Disc Parallelism:
The difference between any thickness measurements should not be more than 0.015 mm (0.0006 in).

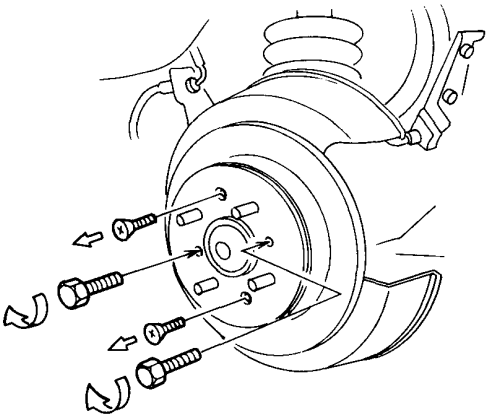
9. Replace the brake disc if beyond the limits.

10. Remove the two caliper bracket mounting bolts and caliper bracket.



11. Remove the two 6 mm screws and brake disc.

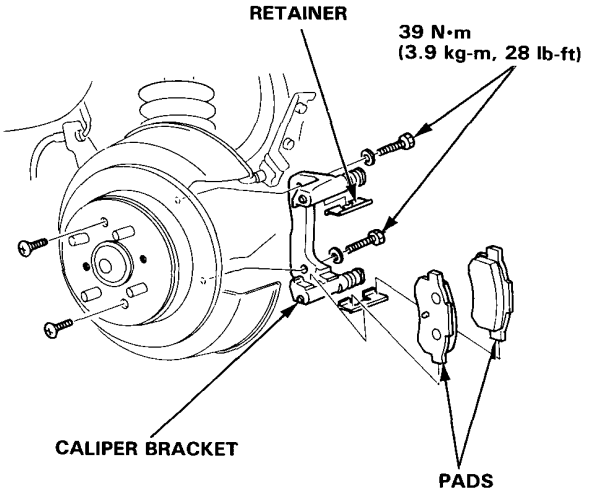
NOTE: If the brake disc is difficult to remove, install 8 mm bolts to the disc and tighten them.



12. Install the new brake disc.

13. Clean the caliper bracket and retainers, then install the caliper bracket with two bolts and retainers.

14. Install the new brake pads onto the caliper bracket.



(cont'd)

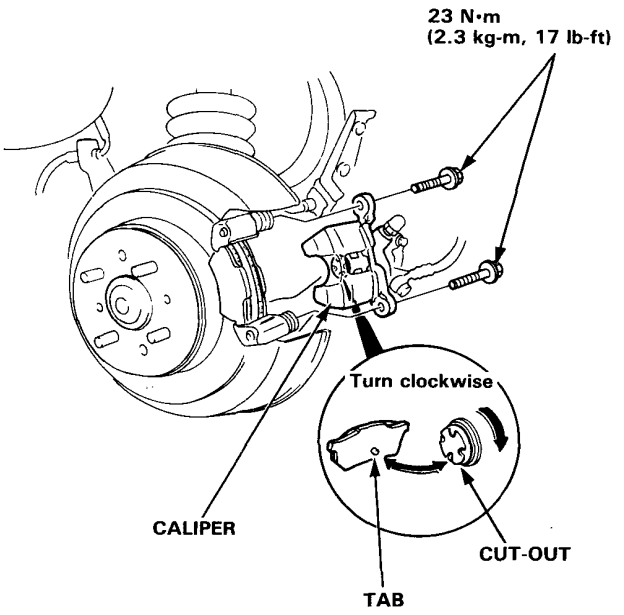
Rear Brake Pad/Disc

Inspection and Replacement (cont'd)

15. Rotate the caliper piston clockwise into place in the cylinder, then align the cutout in the piston with the tab on the inner pad by turning back the piston back.

    CAUTION: Avoid twisting the piston boot. If the piston boot is twisted, back it out so it sits properly.

16. Install the brake caliper.



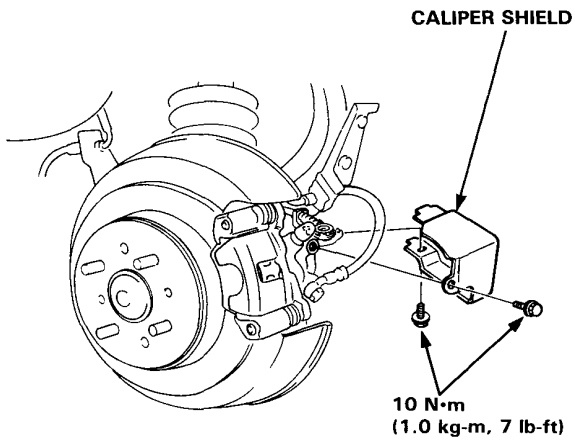
Rear Caliper

Disassembly

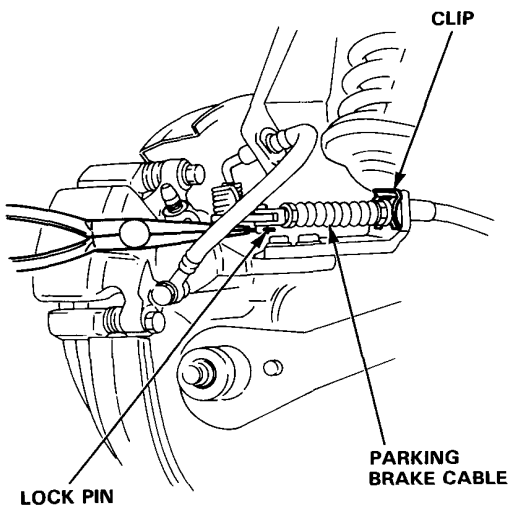
CAUTION:

- **Make sure all parts are clean before reassembly.**
- **Use only new repacement parts.**
- **Use only new clean brake fluid.**
- **Do not allow dirt or other foreign matter to contaminate the brake fluid.**
- **Do not mix different brands of brake fluid.**
- **Avoid spilling brake fluid on painted, plastic or rubber surfaces as its can damage the finish. Wash spilled brake fluid off immediately with clean water.**

1. Remove the caliper shield.



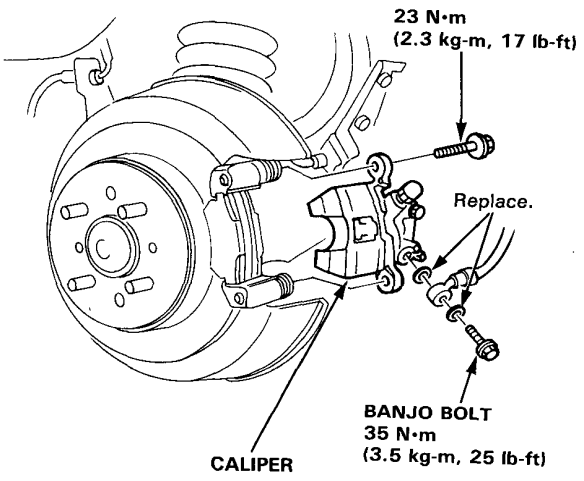
2. Disconnect the parking brake cable from the lever on the caliper by removing the lock pin.



3. Remove the banjo bolt and disconnect the brake hose from the caliper.

4. Remove the two caliper mounting bolts and the caliper from the bracket.

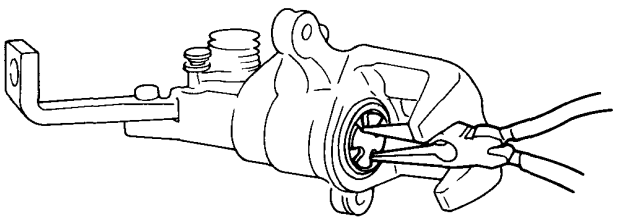
CAUTION: Thoroughly clean the outside of the caliper to prevent dust and dirt from entering inside.
Plug the end of the brake hose to prevent brake flowing out.



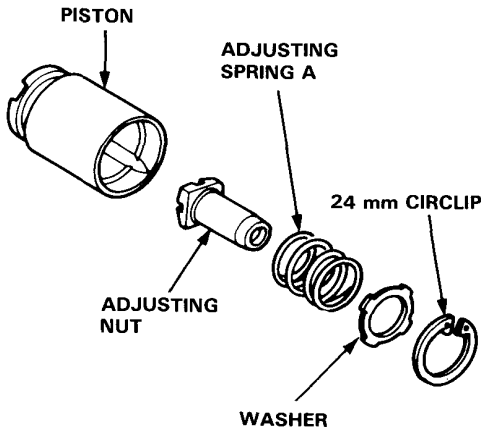
5. Remove the pad spring from the caliper.

6. Remove the piston and piston boot while rotating the piston.

CAUTION: Avoid damaging the piston and piston boot.

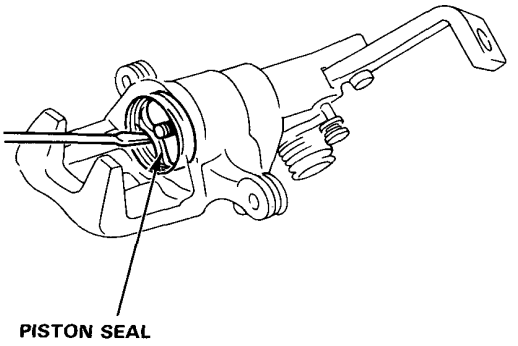


7. Remove the circlip, then washer, adjusting spring A, and the adjusting nut from the piston.



8. Remove the piston seal.

CAUTION: Take care not to damage the cylinder bore.

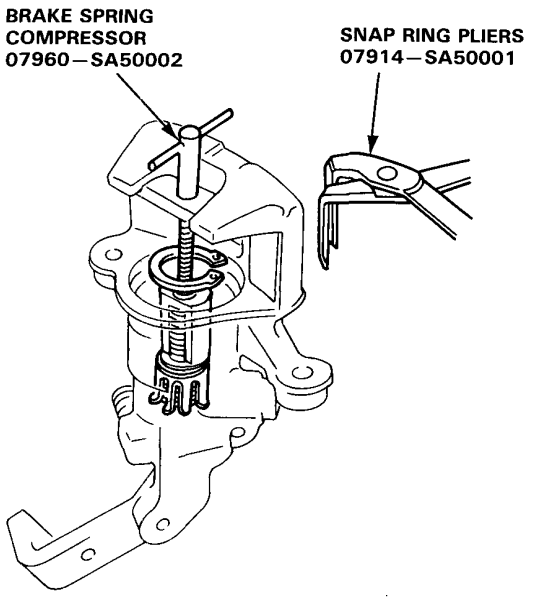


(cont'd)

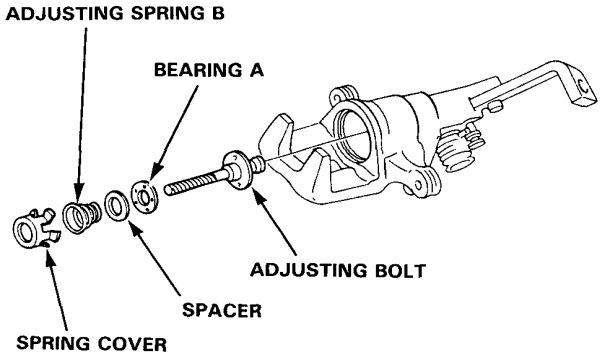
Disassembly (cont'd)

9. Install the special tool between the caliper body and spring guide as shown.

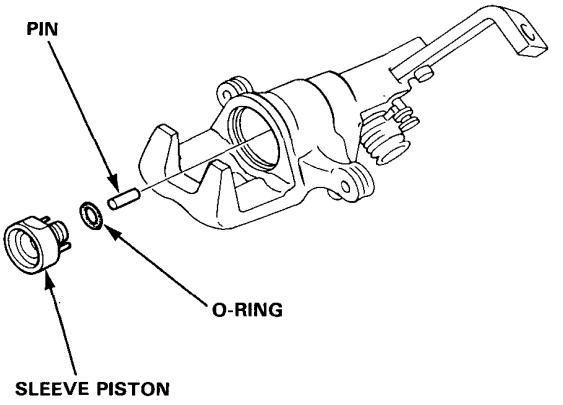
10. Compress the adjusting spring B by turning the shaft of the special tool, then remove the circlip with snap ring pliers.



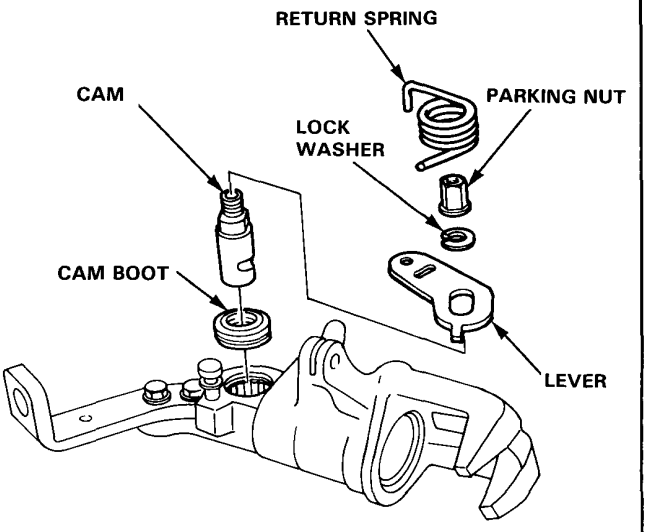
11. Remove the spring cover, adjusting spring B, spacer, bearing A and adjusting bolt.



12. Remove the sleeve piston, and remove the pin from the cam.



13. Remove the return spring, parking nut, lock washer, lever, cam and cam boot.

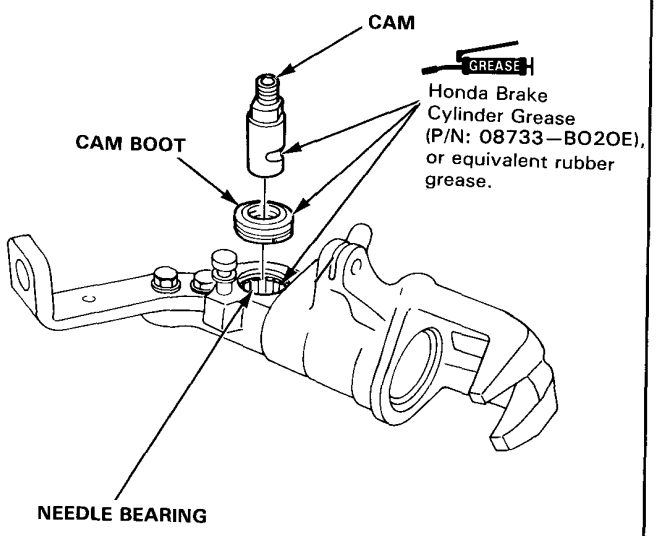


Reassembly

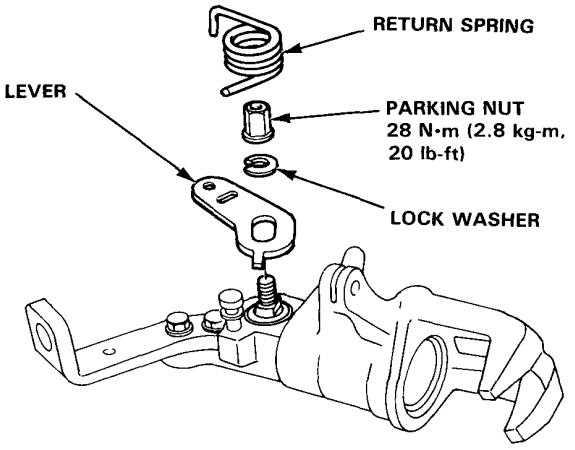
CAUTION:
- **Make sure all parts are clean before ressembly.**
- **Use only new replacement parts.**
- **Use only new clean brake fluid.**
- **Do not allow dirt or other foreign matter to contaminate the brake fluid.**
- **Do not mix different brands of brake fluid.**
- **Avoid spilling brake fluid on painted, plastic or rubber surfaces as its can damage the finish. Wash spilled brake fluid off immediately with clean water.**

1. Pack all cavities of the needle bearing with Honda Brake Cylinder Grease (P/N: 08733—BO2OE), or equivalent rubber grease.
2. Coat the new cam boot with Honda Brake Cylinder Grease (P/N: 08733—BO2OE), or equivalent rubber grease and install in the caliper.
3. Install the cam with the hole toward the cylinder.

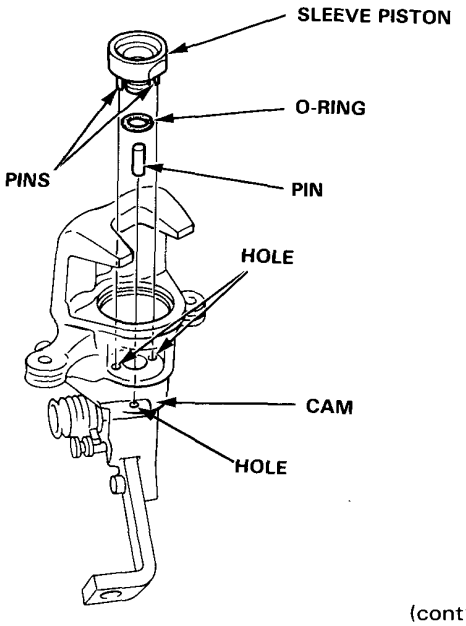
   CAUTION: Avoid damaging the cam boot since it must be installed before the cam.



4. Install the lever, lock washer and parking nut, then tighten the parking nut.
5. Install the return spring.



6. Install the pin in the cam.
7. Install a new O-ring on the sleeve piston.
8. Install the sleeve piston so the hole in the bottom of the piston is aligned with the pin in the cam, and two pins on the piston are aligned with the holes in the caliper.

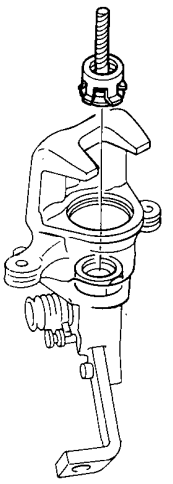


(cont'd)

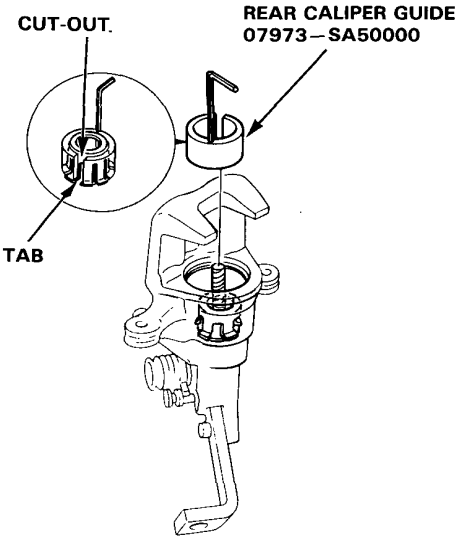
Reassembly (cont'd)

9. Install a new cup with its groove facing the bearing A side on the adjusting bolt.

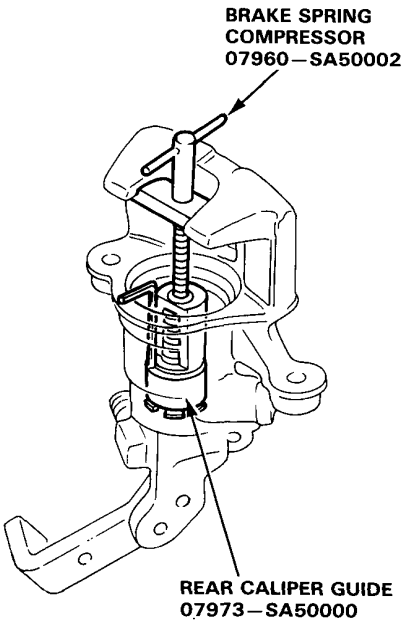
10. Fit the bearing A, spacer, adjusting spring B and spring cover on the adjusting bolt, and install in the caliper cylinder.



11. Install the rear caliper guide (special tool) in the cylinder aligning, the cutout on the tool with the tab on the spring cover.



12. Install the brake spring compressor (special tool) as shown.



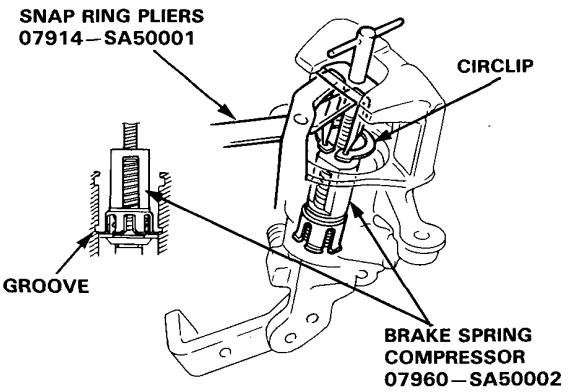
13. Compress the spring until it bottom out.

    NOTE: Check that the rear caliper guide is sinking while the spring is compressed.

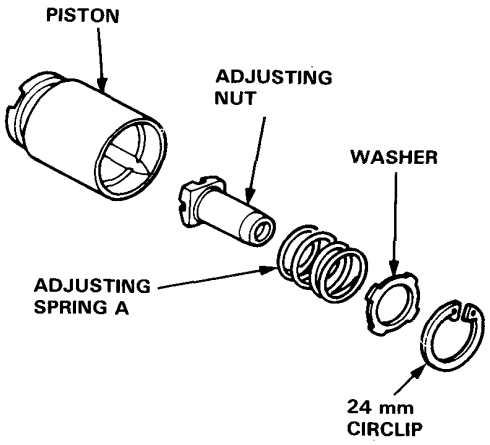
14. Remove the rear caliper guide. Check that the flared end of the spring cover is below the circlip groove.

15. Install the circlip then remove the brake spring compressor.

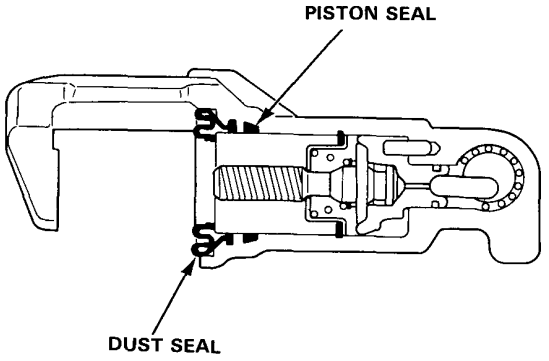
    NOTE: Check that the circlip is seated in the groove properly.



16. Install the adjusting nut, adjusting spring A, and washer, and secure with the circlip.

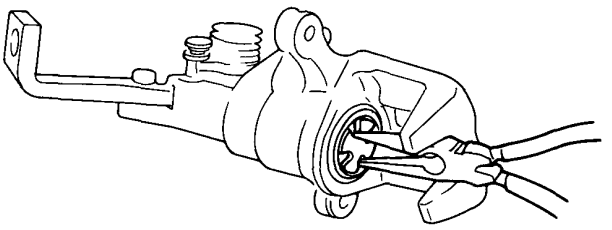


17. Coat the new piston seal and piston boot with silicone grease and install them in the caliper.



18. Coat the outside of the piston with silicone grease, and install it on the adjusting bolt while rotating it clockwise.

CAUTION: Avoid damaging the piston boot.



19. Install the brake pad retainers and brake pads.
20. Install the pad springs on the caliper.
21. Install the caliper on the caliper bracket and tighten the caliper mounting bolts.
22. Connect the brake hose to the caliper with new sealing washers and tighten the banjo bolt.
23. Connect the perking brake cable to the arm on the caliper.
24. Fill the brake reservoir up and bleed the brake system (page 20-3).
25. Operate the brake pedal several times, then adjust the parking brake lever.

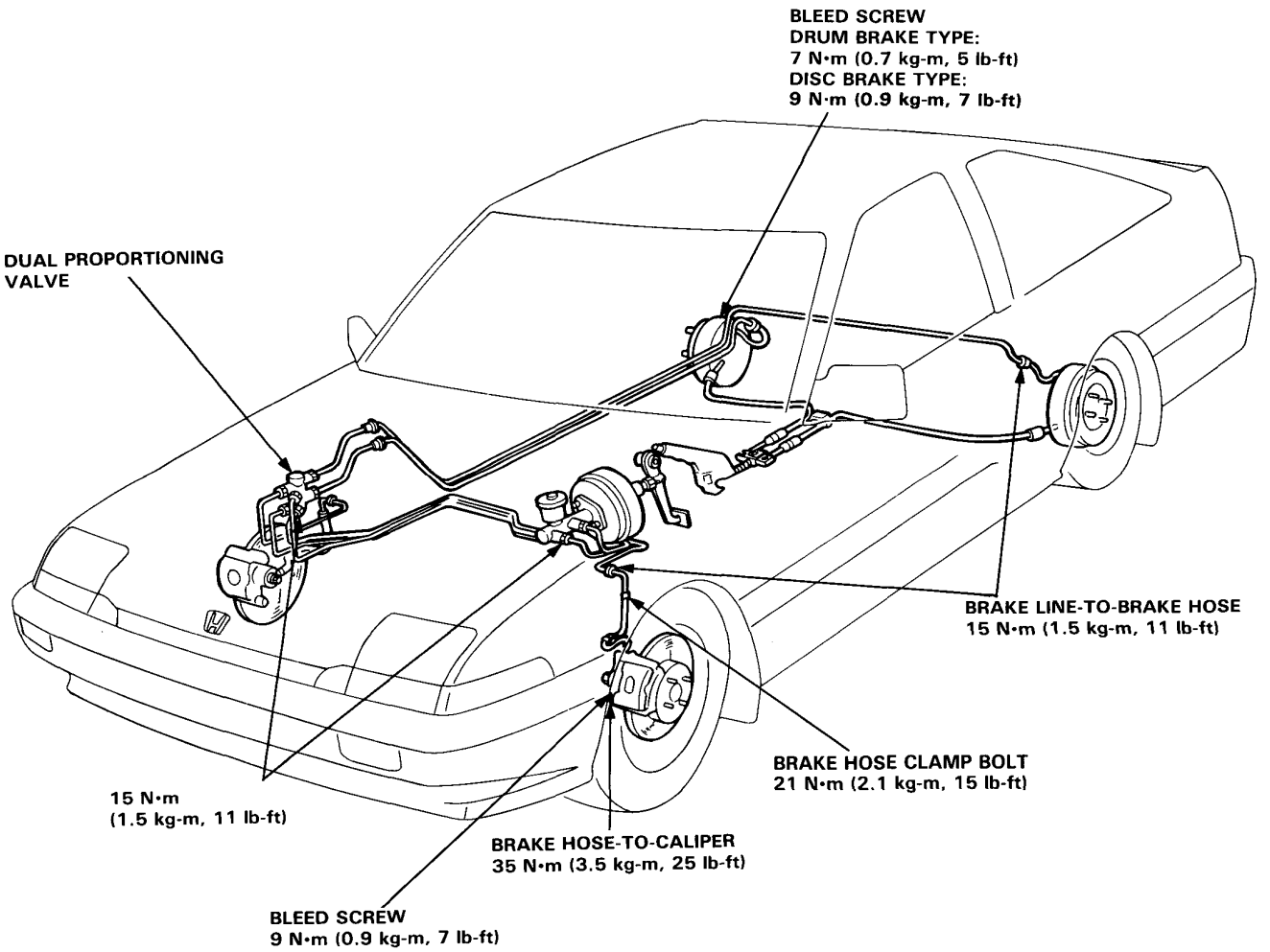
    NOTE: Before adjustments, make sure the parking brake arm on the caliper touches with the pin.

26. Install the caliper shield and tighten the bolts.

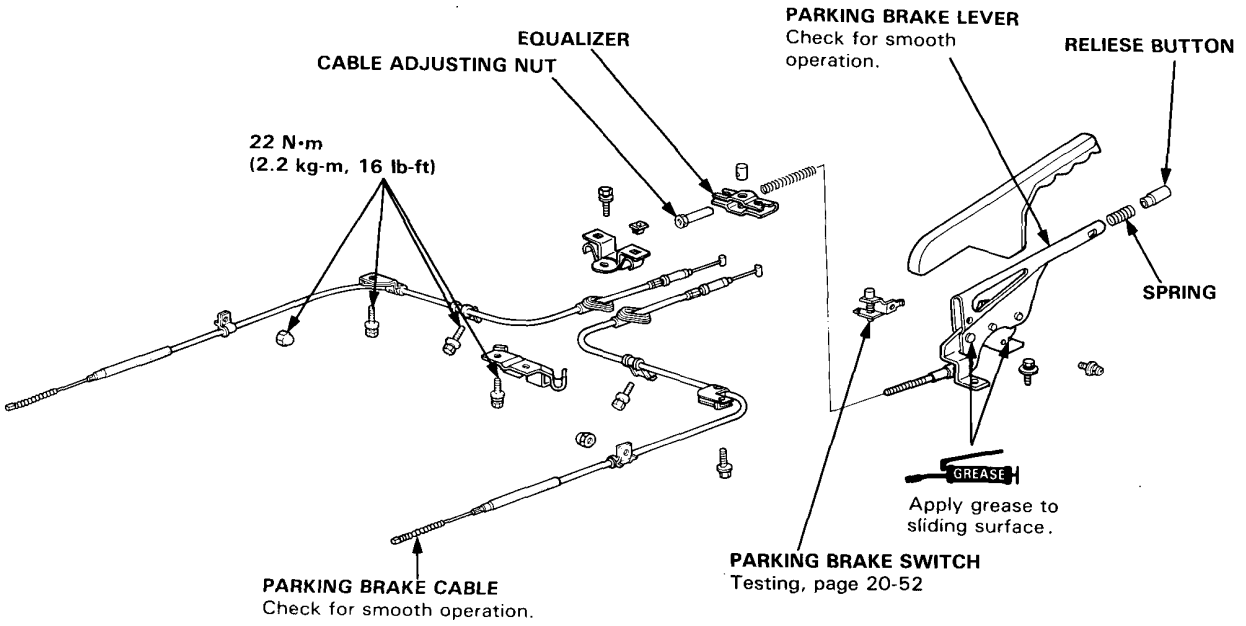
Brake Hoses/Pipes

Inspection

1. Inspect the brake hoses for damage, leaks, interference or twisting.
2. Check the brake lines for damage, rusting or leakage. Also check for bent brake lines.
3. Check for leaks at hose and line joints or connections, and retighten if necessary.

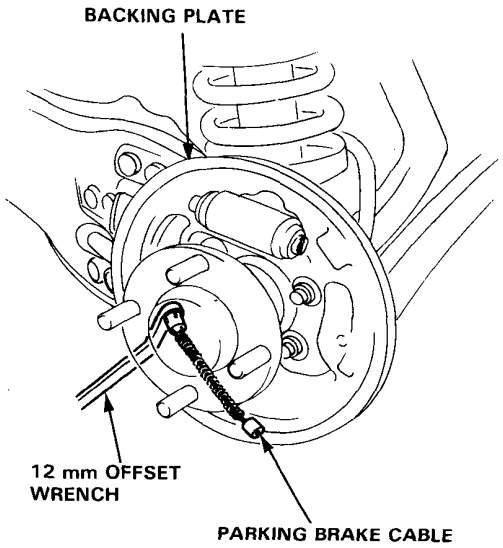


Disassembly and Reassembly



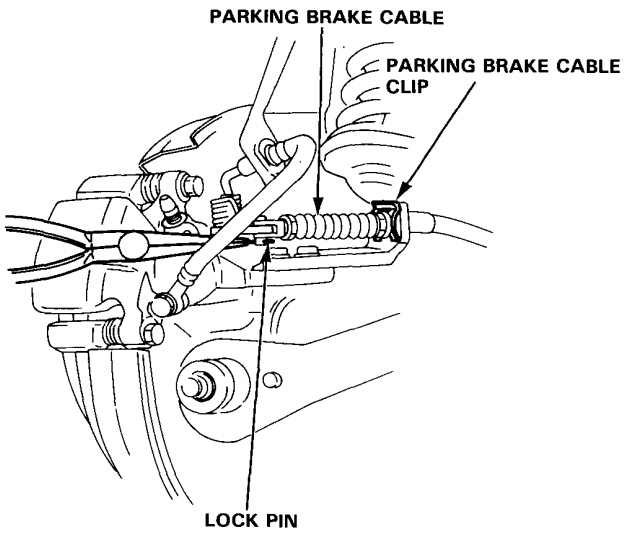
Drum Brake model

Remove the parking brake cable from the backing plate using a 12 mm offset wrench as shown.



Disc Brake model

Remove the lock pin and disconnect the parking brake cable from the lever, then remove the clip.

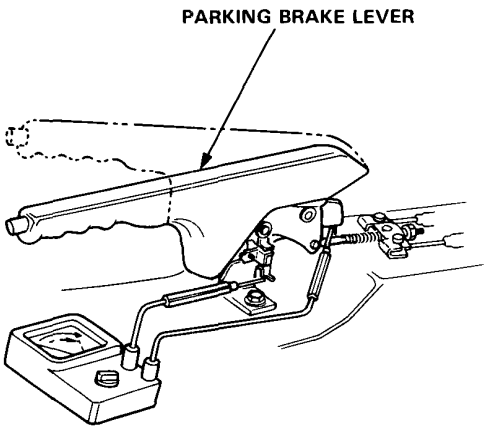


Switches

Parking Brake Switch Test

Attach one test probe of an ohmmeter to the switch, and the other to the body.

- With the brake lever up, there should be continuity.
- With the brake lever down, there should be no continuity.



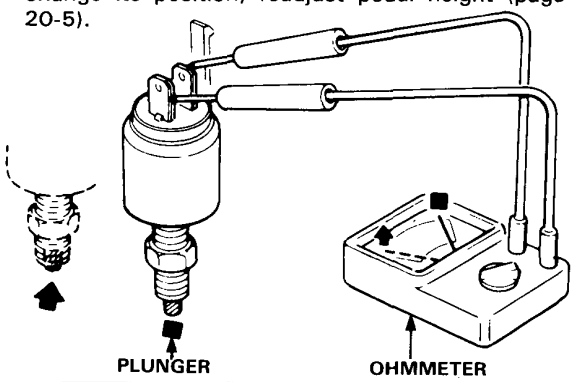
Brake Light Switch test

Check for continuity between both terminals with an ohmmeter.

- With the switch plunger pushed in, there should be no continuity.
- With the switch plunger released, there should be continuity.

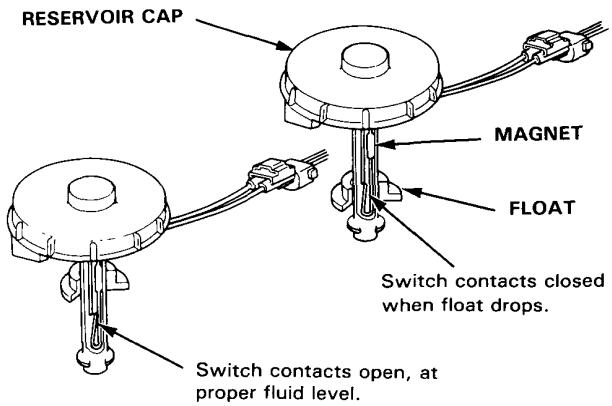
If no continuity, replace switch.

NOTE: If you replace the brake light switch, or change its position, readjust pedal height (page 20-5).



Test

1. Remove the reservoir cap. Check that the float moves up and down freely.
   Replace the reservoir cap assembly if the float does not move freely.
2. Check for continuity between the terminals with the float up and down.
   There should be continuity with the float down and no continuity with the float up.
   Replace the reservoir cap assembly if necessary.

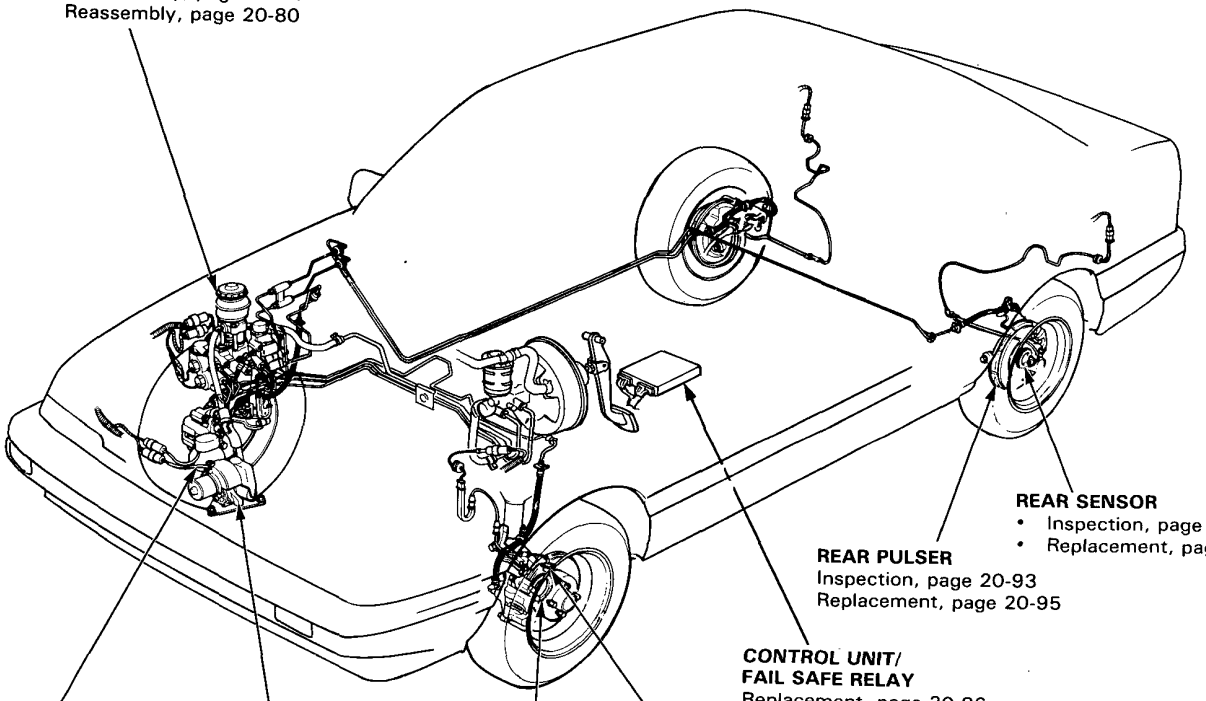


4W-ALB (4-Wheel Anti-Lock Brake) System

Index

MODULATOR ASSY
- Index/Inspection, page 20-74
- Solenoid Assy:
- Removal, page 20-76
  Inspection/Assembly, page 20-77
- Stroke switch:
  Removal, page 20-78
  Inspection, page 20-79
  Installation, page 20-81
- Piston comp:
  Removal, page 20-78
  Disassembly, page 20-79
  Reassembly, page 20-80

MASTER CYLINDER
- Index/Inspection, page 20-68
- Disassembly, page 20-69
- Reassembly, page 20-70
- Pushrod clearance
  adjustment, page 20-72



REAR SENSOR
- Inspection, page 20-93
- Replacement, page 20-94

REAR PULSER
Inspection, page 20-93
Replacement, page 20-95

CONTROL UNIT/
FAIL SAFE RELAY
Replacement, page 20-86

ACCUMULATOR/
PRESSURE SWITCH
Index/Inspection, page 20-85
Disassembly/
Reassembly, page 20-86

FRONT PULSER
Inspection, page 20-93
Replacement, page 20-95

FRONT SENSOR
Inspection, page 20-93
Replacement, page 20-94

PUMP
Index/Inspection, page 20-82
Disassembly, page 20-83
Reassembly, page 20-85

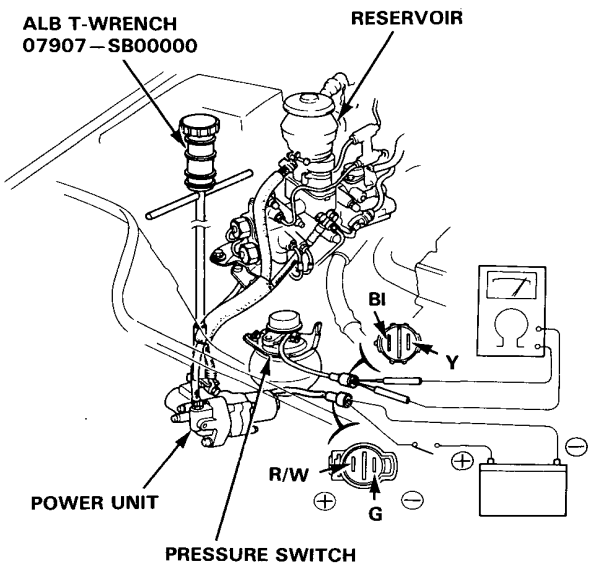
Power Unit Accumulator

Fluid Delivery

NOTE: Perform the following checks should the [ALB] light go on due to faults in the high pressure circuits.

Pump delivery

1. Remove the red cap from the bleeder on the pump body.
2. Apply the ALB T-wrench to the bleeder and turn out the bleeder slowly about 90° to let the high pressure brake fluid go up into the wrench reservoir. Turn out the bleeder further one complete turn to aid in complete fluid recovery into the wrench reservoir.
3. Retighten the bleeder screw. Discard the brake fluid in the reservoir.
4. Check that the brake fluid reservoir tank is filled to the proper level.



5. Connect the probes of an ohmmeter to the Black and Yellow terminals of the accumulator pressure switch coupler (pink).
6. Attach the positive (+) lead of a fully charged 12 V battery to the Red/ White terminal of the power unit motor wire coupler (yellow), and negative (—) lead to the Green terminal. Hook up a switch between the battery positive terminal and Red/White terminal as shown.

   NOTE: Use only a fully charged 12 V battery.

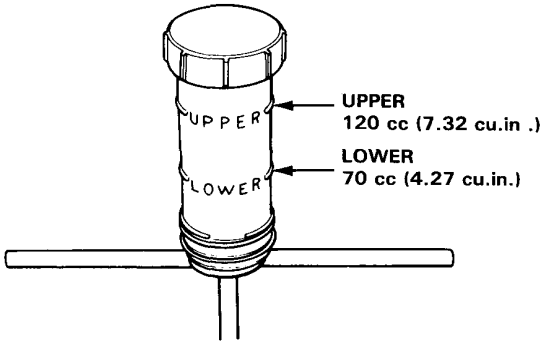
7. turn the switch on and measure time before the tester shows continuity.

   NOTE: Turn the switch off immediately, after the tester shows continuity.

30—60 seconds approx.:	Normal
Less than 30 seconds:	Abnormal Replace pressure switch.
Over 60 seconds:	Abnormal (See troubleshooting.)

Accumulator delivery

1. If the pump is normal, operate it further for 4 seconds.
2. Using the ALB T-wrench, again loosen the bleeder.

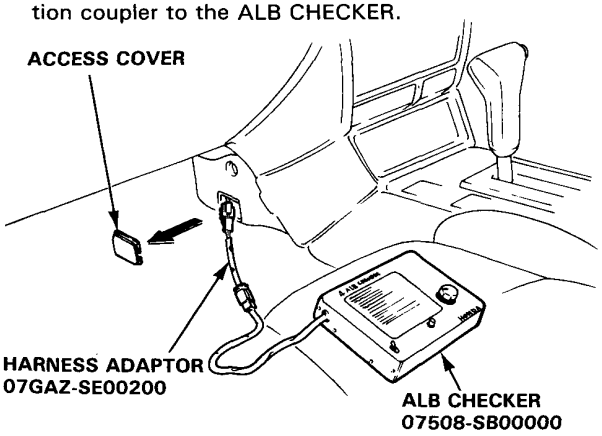


Between UPPER (120 cc, 7.32 cu.in.) and LOWER (70 cc, 4.27 cu.in.):	Normal
Over UPPER level:	Abnormal Replace accumulator.
Below LOWER level:	Abnormal (See troubleshooting.)

Functional Test

NOTE: Perform the following inspections. The procedures described below are to test each individual function of the system by simulating actual operating conditions.

1. Remove the access cover from the center console on the passenger side and connect the 6-P inspection coupler to the ALB CHECKER.

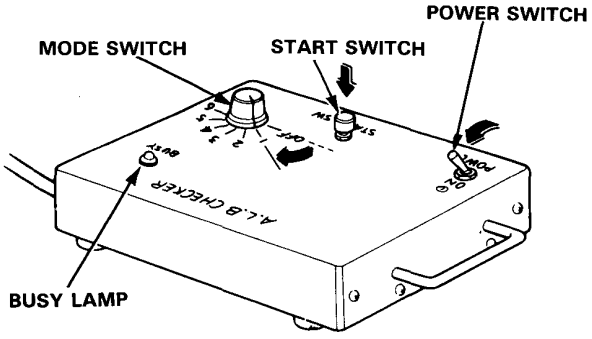


NOTE: Place the veicle upright on level ground with the wheels blocked. Put the transmission in neutral for manual transmission models, and in P for automatic transmission models.

2. Start the engine, release the parking brake.

3. Depress the brake pedal to go off [ALB] lamp and release the brake pedal.

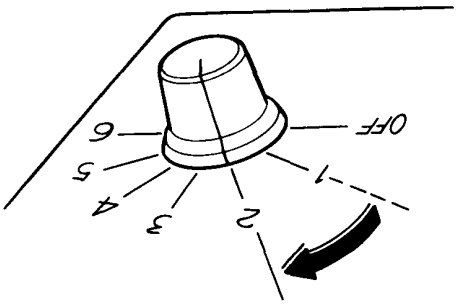
4. Operate the ALB CHECKER as follows:
   1) Turn the power switch ON.



   2) Turn the mode switch to "1".
   3) Push the start switch.
      The [ALB], [(O)] or [BRAKE] lamp should not go on while the BUSY lamp is ON.
      If the [ALB], [(O)] or [BRAKE] lamp goes on, follow the steps described in troubleshooting.
   4) Lightly pull the parking brake lever until the [(O)] or [BRAKE] lamp is ON.

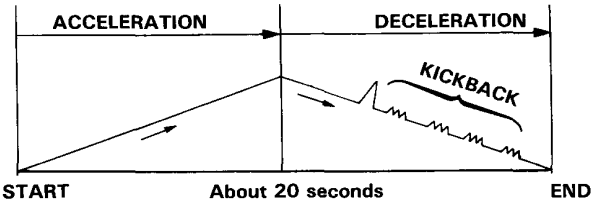
NOTE: If the parking brake lever fully pulled, the kickback may be misunderstand.

   5) Turn the mode switch further to "2".



   6) Depress the brake pedal and push the start switch.
      The [ALB] lamp should not go ON while the BUSY lamp is ON. There should be kickback on the brake pedal.
      If otherwise, follow the steps described in troubleshooting.

NOTE: Modes 2,3,6 are as follows.



   7) Turn the mode switch to "3" and perform the step 6).
   8) Turn the mode switch to "4".
   9) Depress the brake pedal and push the start switch.

The [ALB] lamp should not go on and there should be no kickback on the brake pedal. (Slight kickback is normal.)

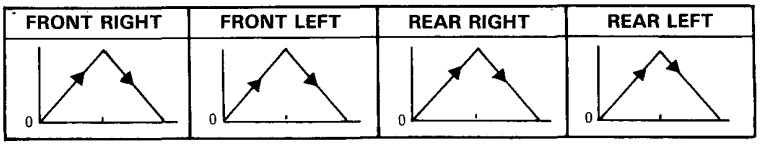
   10) Turn the mode switch to "5" and perform the step 9.
   11) Turn the mode switch to "6".
   12) Depress the brake pedal and push the start switch.
      The [ALB] lamp should not go on and there should be kickback on the brake pedal.

(cont'd)

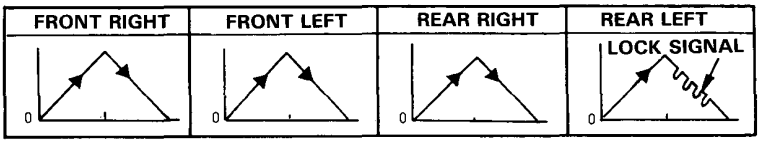
Function Test (cont'd)

ALB Checker Operation

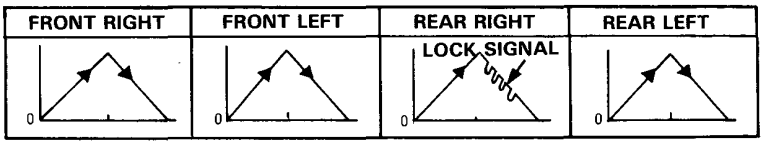
Mode 1: Send the driving signal simulated 0 km/h → approxi. 180 km/h → 0 km/h of each wheels to the control unit to check the control unit self diagnosis circuit. The ALB lamp should not go ON.



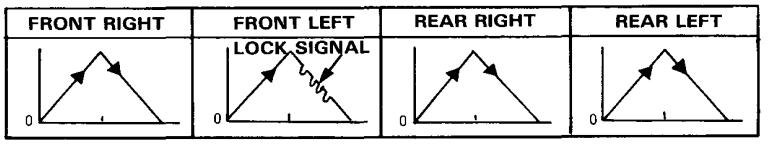
Mode 2: Send the driving signal of each wheels, then send lock signal of the rear left wheel to the control unit. The ALB lamp should not go ON and there should be kickback.



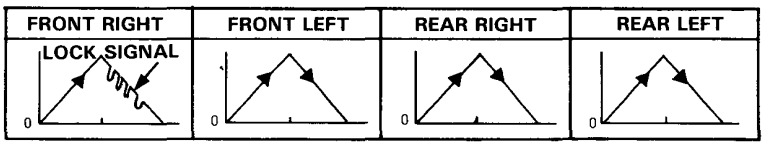
Mode 3: Send the driving signal of each wheels, then send the lock signal of the rear right wheel to the control unit. The ALB lamp should not go ON and there should be kickback.



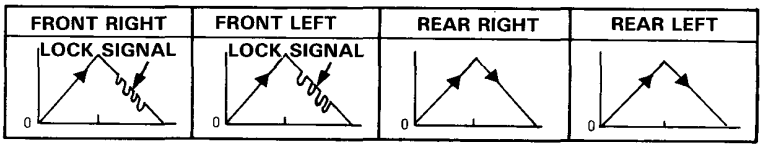
Mode 4: Send the driving signal of each wheels, then send the locking signal of the front left wheel to the control unit. The ALB lamp should not go ON and there should be no kickback.



Mode 5: Send the driving signal of each wheels, then send the locking signal of the front right wheel to the control unit. The ALB lamp should not go ON and there should be no kickback.



Mode 6: Send the driving signal of each wheels, then send the locking signal of the front wheels to the control unit. The ALB lamp should not go ON and there should be kickback.



Inspection points:

1. The [ALB] lamp go ON in mode 1.
   Check the wiring, if there is good condition, the control unit is faulty.

2. There are no kickback in mode 2, 3 and 6.

   Faulty pressure switch (remains ON)
   Shorted wires
   Faulty or disconneted power unit coupler
   Faulty power unit relay

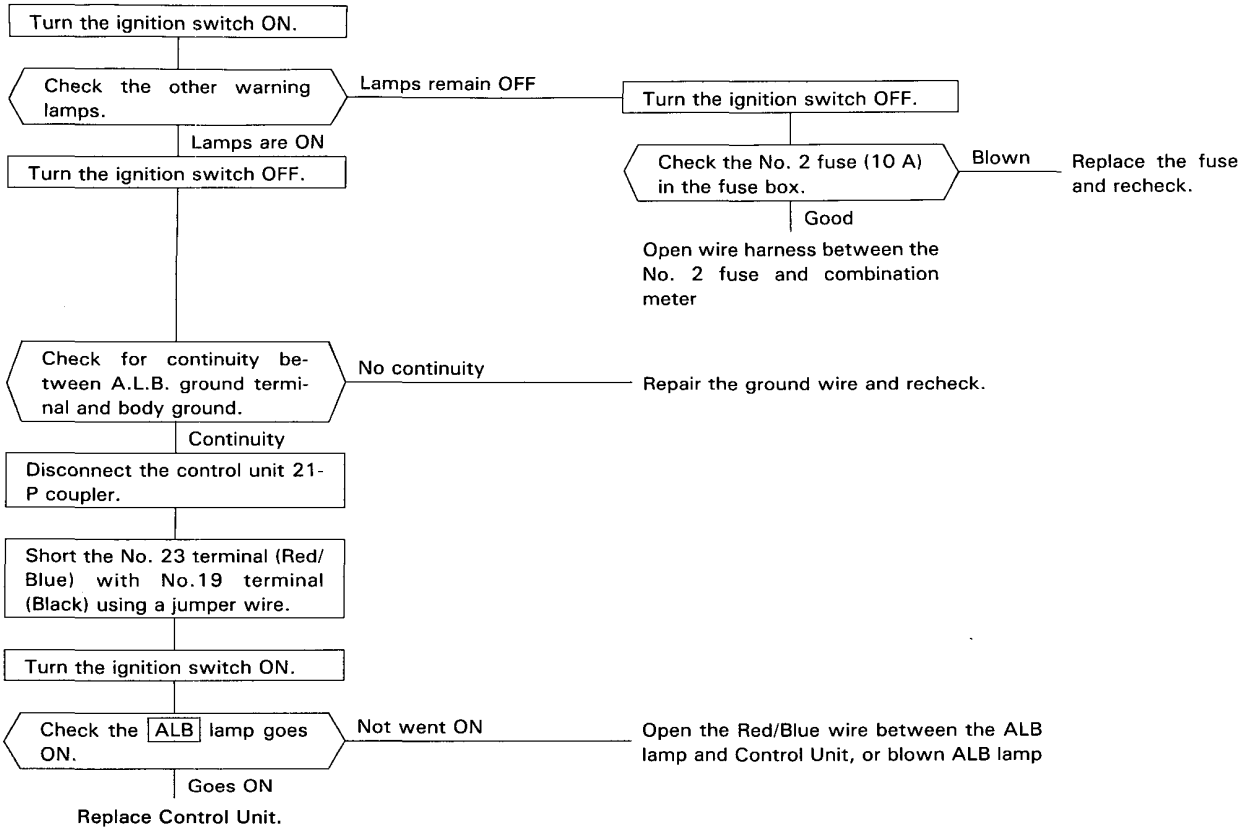
3. Weak kickback in mode 2. 3 and 6.
   Bleed high pressure circuits.

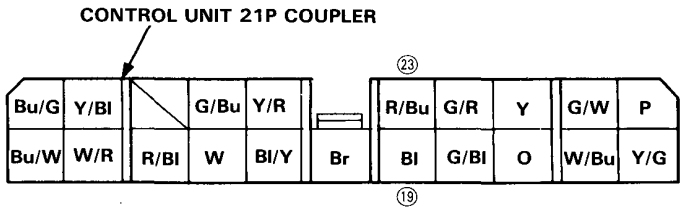
4. Power unit does not stop in modes 1 to 6 and there are no kickback in modes 2, 3 and 6.
   Brake fluid leakage
   Bleed power unit.
   Clogged power unit outlet
   Clogged or deteriorated power unit hose

5. Power unit does not stop in modes 1 to 6 and there are kickback in modes 2, 3 and 6.
   Faulty pressure switch (remains OFF)
   Open circuit in pressure switch circuit
   Disconnected pressure switch coupler

Troubleshooting

1. *The [ALB] lamp does not go on when the engine starting (The lamp should go on when the ignition switch turned on).*



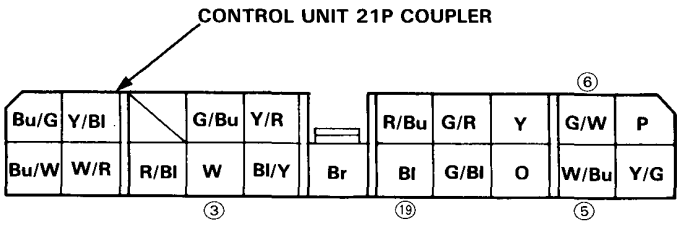


View from wire side.

2. The [ALB] lamp remains ON when the brake pedal is depressed after the engine is started.

- Check the [CHG] lamp goes OFF.
  - NO → Check the charging circuit
  - YES ↓
- Stop the engine and disconnect the 21-P control unit coupler.
- Check for continuity between the No. 5 terminal (White/Blue) of the control unit 21-P coupler and alternator.
  - No continuity → Open wire harness
  - Continuity ↓
- Depress the brake pedal and check the stoplights come ON.
  - Remain OFF → Check the BRAKELIGHT, HORN fuse (20 A).
    - Blown → Replace and recheck
    - Good → Blown brakelight bulb, or open Green/White or White/Yellow wires
  - Come ON ↓
- Check for continuity between the No. 6 terminal (Green/White) and Brake switch.
  - No continuity → Open wire harness
  - Continuity ↓
- Check the voltage between the No. 3 (White: Positive) and No. 19 (Black: Negative) terminals.
  - No voltage → Blown ALB fuse; Open White wire between ALB fuse and Control Unit
  - Battery voltage ↓
- Disconnect the 11-P coupler from the Control Unit.
- Check the voltage between the No. 4 (White: Positive) and No. 25 (Black: Negative) terminals.
  - No voltage → Blown ALB B2 fuse; Open White wire between the ALB B2 fuse and Control Unit
  - Battery voltage ↓
- Turn the ignition switch ON.

(cont'd to next page)



View from wire side.

(cont'd)

Troubleshooting (cont'd)

Check voltage between the No. 2 (Black/Yellow: Positive) and No. 19 (Black: Negative) terminals of the 21-P coupler.

- No voltage →
  - Blown No. 1 fuse
  - Open Black/Yellow wire between the No.1 fuse and Control Unit

Battery voltage

Check voltage between the No. 1 (Black/Yellow: positive) and No. 25 (Black: Negative) terminals of the 11-P coupler.

- No voltage →
  - Blown No. 12 fuse
  - Open Black/Yellow wire between the No. 12 fuse and Control Unit

Battery voltage

Turn the ignition switch OFF.

Short the No. 31 (Pink) and No. 19 (Black) wires of the 21-P coupler, then turn the ignition switch ON.

Check voltage between the No. 30 (White/Red: Positive) and No. 19 (Black: Negative) terminals of the 21-P coupler.

- No voltage →
  - Blown ALB B1 fuse
  - Open white wire between the ALB B1 fuse and indoors Fail Safe Relay
  - Open White/Red wire between ALB B1 fuse and Control Unit
  - Faulty indoors Fail Safe Relay
  - Open Black/Yellow wire between the No. 1 fuse and Indoors Fail Safe Relay
  - Open Pink wire between the indoors Fail Safe Relay and Control Unit

Battery voltage

Measure the resistance between the No. 15 (Red/Black) and No. 19 (Black) terminals.

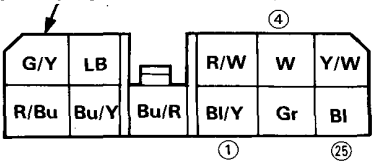
There are 2.5—10 ohms

- No →
  - If there is 0 ohm;
    - Shorted Red/Black wire between front solenoid and control unit.
    - Shorted front solenoid
    - Shorted Green wire between the engine room Fail Safe Relay and Front Solenoid
  - If there is no continuity;
    - Open Red/Black wire between the front solenoid and control unit
    - Faulty Front Solenoid
    - Open Green wire between the engine room Fail Safe Relay and Front Solenoid
    - Open Black wire between engine room Fail Safe Relay and body ground
  - Faulty engine room Fail Safe Relay
  - Open Black/Yellow wire between No. 1 Fuse and engine room Fail Safe Relay
  - Open Pink wire between the engine room Fail Safe Relay and Control Unit

Yes

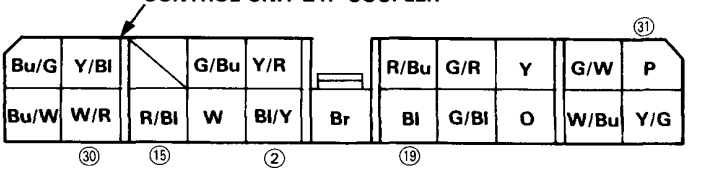
(cont'd to next page)

CONTROL UNIT 11P COUPLER



View from wire side.

CONTROL UNIT 21P COUPLER



View from wire side.

Measure the resistance between the No. 16 (Yellow/Black) and No. 19 (Black) terminals of the 21-P coupler.

There is 2.5—10 ohms. — No

- If there is 0 ohm:
  - Shorted Yellow/Black wire between the front solenoid and control unit
  - Shorted Front Solenoid
  - Shorted Green wire between the engine room Fail Safe Relay and Front Solenoid
- If there is no continuity;
  - Open Yellow/Black wire between the front solenoid and control unit
  - Faulty Front Solenoid
  - Open Green wire between the engine room Fail Safe Relay and front Solenoid
  - Open Black wire between the Fail Safe Relay and Ground in the engine room
- Faulty engine room Fail Safe Relay
- Open Black/Yellow wire between the No. 1 fuse and engine room Fail Safe Relay
- Open Pink wire between the engine room Fail Safe Relay and front solenoid

Yes

Turn the ignition switch OFF.

Measure the resistance between the No. 17 (Red/White) and NO. 25 (Black) terminals of the 11-P coupler.

There is 2.5—10 ohms. — No

- If there is 0 ohm;
  - Shorted Rear Solenoid
  - Shorted Red/White wire between the Rear Solenoid and Control Unit
- If there is no continuity;
  - Faulty Rear Solenoid
  - Open Red/White wire between Rear Solenoid and Control Unit
- Open Black wire between the Rear Solenoid and body ground

Measure the resistance between the No. 18 (Yellow/White) and No. 25 (Black) terminals of the 11-P coupler.

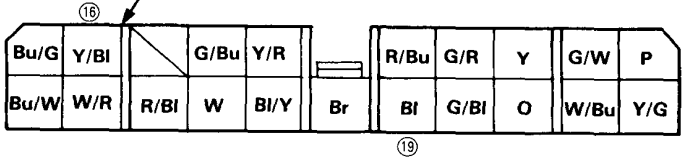
There is 2.5—10 ohms — No

- If there is 0 ohm;
  - Shorted Rear Solenoid
  - Shorted Yellow/White wire between the Rear Solenoid and Control Unit
- If there is no continuity;
  - Faulty Rear Solenoid
  - Open Yellow/White wire between the Rear solenoid and Control Unit
- Open Black wire between the Rear Solenoid and body ground

Yes

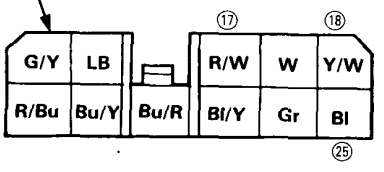
Faulty Control Unit

CONTROL UNIT 21P COUPLER



View from wire side.

CONTROL UNIT 11P COUPLER



View from wire side.

(cont'd)

Troubleshooting (cont'd)

3. (O) or BRAKE lamp won't go OFF, if the parking brake is released.

Check the fluid lever in the Master Cylinder Reservoir.
- No → Fill the Master Cylinder Reservoir up to the Max level.
- Normal

Check the (O) or BRAKE lamp go off.
- No

Stop the engine.

With the parking lever and brake pedal released, start the engine to check the lamp go off.
- No

Check the Stroke Switch and wire harness connection.
- Loose → Reconnect and recheck.
- Normal

Stop the engine and disconnect the stroke switch wire harness, then start the engine.

Check for continuity between the stroke switch and ground with the brake pedal depressed.
- No Continuity → Stop the engine and bleed air from callper related with stroke switch having no continuity, then recheck.
  - No continuity → Faulty Stroke Switch; Faulty Modulator Piston
  - Continuity
- Continuity

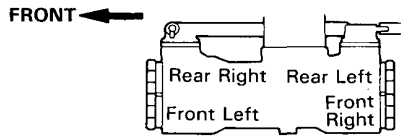
Stop the engine.

Reconnect the Stroke Switch to the wire harness.

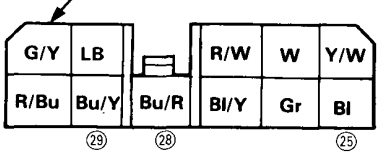
Disconnect the couplers from the Control Unit.

Check for continuity between the No. 22 (Blue/White) and No. 19 (Black) terminals of the 21-P coupler.
- No continuity → Open Blue/White wire between Stroke Switch and Control Unit
- Continuity

(cont'd to next page)

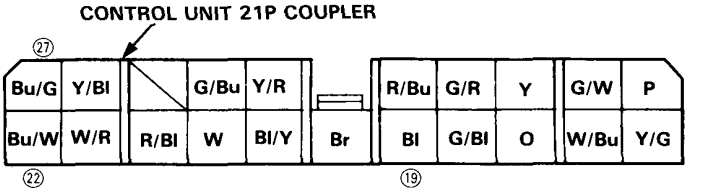


CONTROL UNIT 11P COUPLER



View from wire side.

CONTROL UNIT 21P COUPLER



View from wire side.

Check for continuity between the No. 27 (Blue/Green) and No. 19 (Black) terminals of the 21-P coupler.
- No Continuity → Open Blue/Green wire between the Stroke Switch and Control Unit
- Continuity ↓

Check for continuity between the No. 28 (Blue/Red) and No. 25 (Black) terminals of the 11-P coupler.
- No Continuity → Open Blue/Red wire between the Stroke Switch and Control Unit
- Continuity ↓

Check for continuity between the No. 29 (Blue/Yellow) and No. 25 (Black) terminals of the 11-P coupler.
- No Continuity → Open Blue/Yellow wire between the Stroke Switch and Control Unit
- Continuity ↓

Faulty Control Unit

4. The [ALB] lamp comes on or remains on (Remains on or comes on frequently.....ABNORMAL).

NOTE: Do not disconnect the coupler from the control unit.

Check that the pump has been rotated for about 15 seconds before [ALB] lamp comes on.
- No (About 2 minutes) → Proceed to step 5.
- Yes ↓

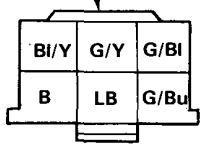
Stop the engine and jack up the car.

Start the engine and turn the front wheel.

Measure the voltage at maintenance coupler between Black (negative) and Green/Black: Front right, Green/Blue: Front left, Green/Yellow: Rear right, or Light blue: Rear left (positives) using AC voltage range of a circuit tester.
- No output → (cont'd to next page)
- 60 mV at 1 turn/second. ↓

(cont'd to next page)

MAINTENANCE COUPLER



View from wire side.

(cont'd)

Troubleshooting (cont'd)

Stop the engine.

Disconnect the 21-P coupler from the Control Unit.

Short the No. 20 (Yellow/Red) and No. 19 (Black) terminals and turn the ignition switch to on.

The pump should turn.
- No → Turn the ignition switch off.
- Yes → Turn the ignition switch off.

Check for continuity between the No. 21 (Yellow) and No. 19 (Black) terminals.
- No continuity → Disconnect the pressure switch connections.
- Continuity → Faulty Control Unit

Check for continuity of the Yellow wire terminals between the wire harness and No. 21 terminal (Yellow) of the 21-P coupler.
- No continuity → Open Yellow wire
- Continuity → (cont'd to next page)

Stop the engine and disconnect the speed sensor wire.

Measure the resistance of the speed sensor.

There is 500—1000 ohms.
- No → Faulty speed sensor
- Yes → Reconnect the speed sensor.

Install the ALB checker to the maintenance coupler and check the function.
- Abnormal → Faulty sensor gap / Faulty Control Unit
- Normal → Open wire harness between the Speed Sensor and Control Unit

Turn the ignition switch off.

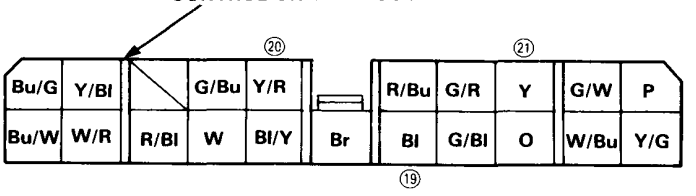
Check the motor relay.
- Faulty → Replace and recheck.
- Normal →

Measure the voltage between the White (positive) terminal for the relay coupler and No. 19 (Black: Negative) terminal of the 21-P coupler.
- No voltage → Open White wire between the ALB fuse and motor relay
- Battery voltage →

Check for continuity of the Yellow/Red wire terminals between the No. 20 terminal of the 21-P coupler and the relay coupler.
- No continuity → Open Yellow/Red wire
- Continuity → Turn the ignition switch on.

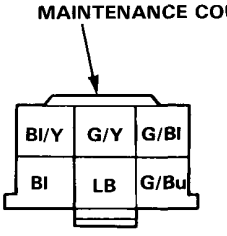
(cont'd to next page)

CONTROL UNIT 21P COUPLER



View from wire side.

MAINTENANCE COUPLER



View from wire side.

Check for continuity of the Black wire between the wire harness and No. 19 terminal of the 21-P coupler.
- No continuity → Open Black wire
- Continuity → Proceed step 5.

Measure the voltage between the Black/Yellow (positive) of relay coupler and No. 19 (Black: Negative) terminal of 21-P coupler.
- No voltage → Open Black/Yellow wire
- Battery voltage → Proceed step 5.

5. Too frequent pump rotation; ALB lamp also comes on (Pump may rotate when the ALB system is operated. The system is normal if pump is rotated for about 15 seconds, 1—2 times/day when car is used every day).

Check fluid level in the modulator reservoir tank.
- Below MIN level → Fill the reservoir up to the MAX level. Inspect leaky joint or connections and retighten if necessary, then recheck.
- Normal

Check accumulator pressure switch for loose or disconnected terminals.
- Loose or disconnected → Reconnect and recheck.
- Normal

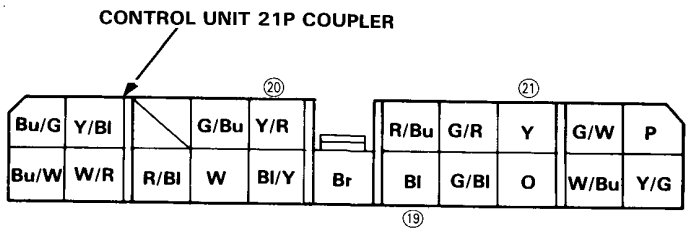
Disconnect the pressure switch connector and short Black wire with Yellow wire at the harness side.

Jack up the front of the car and pull the parking brake lever.

Start the engine at 50 km/h to see if pump rotates.
- Not rotated → Proceed step 6.
- Rotated

Stop the engine and disconnect the 21-P coupler from the Control Unit.

Check for continuity between No. 21 (Yellow) and No. 19 (Black).
- No continuity → Open wire harness
- Continuity → Replace Control Unit.

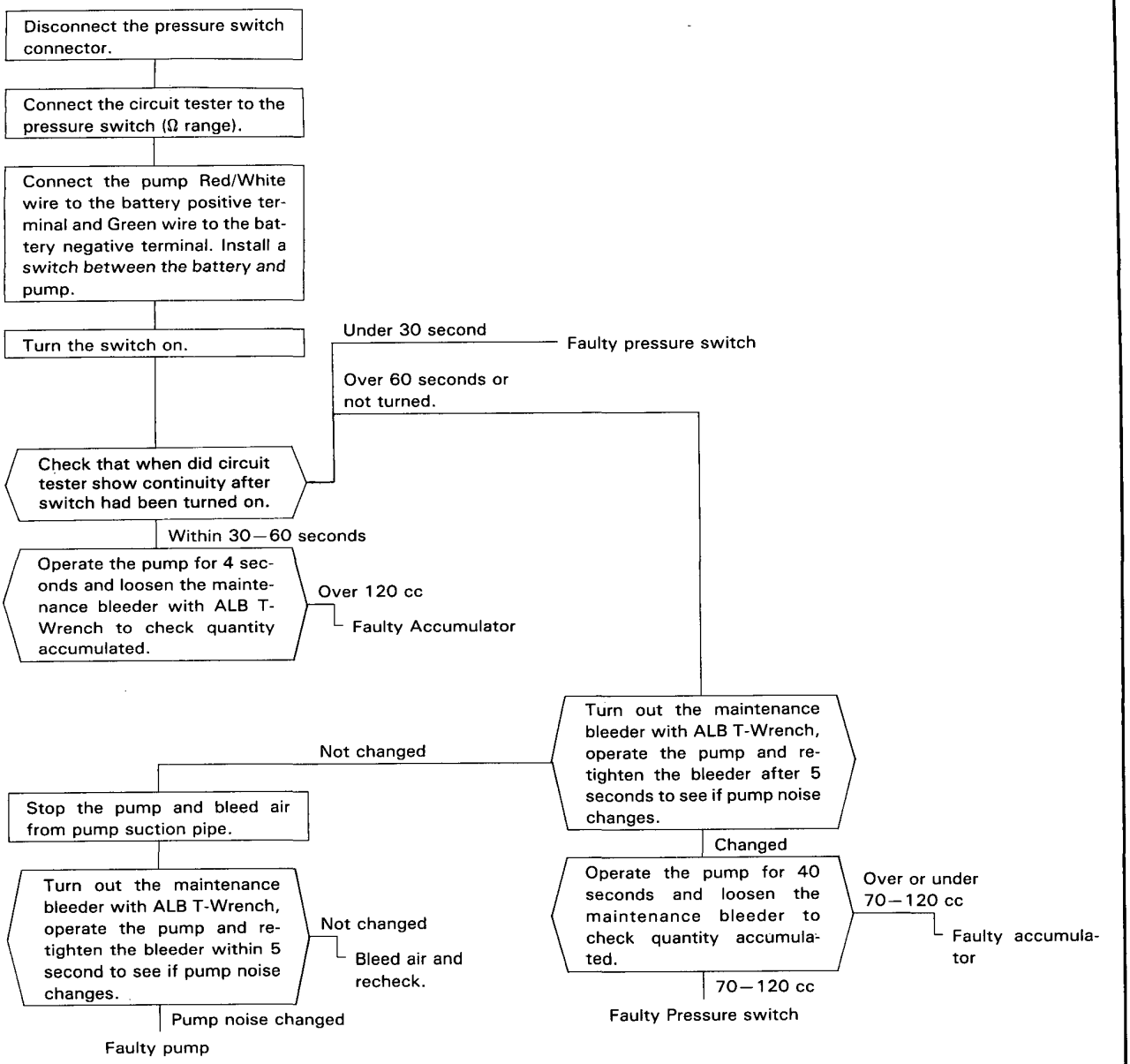


View from wire side.

(cont'd)

Troubleshooting (cont'd)

6. Accumlator, pump and pressure switch inspection



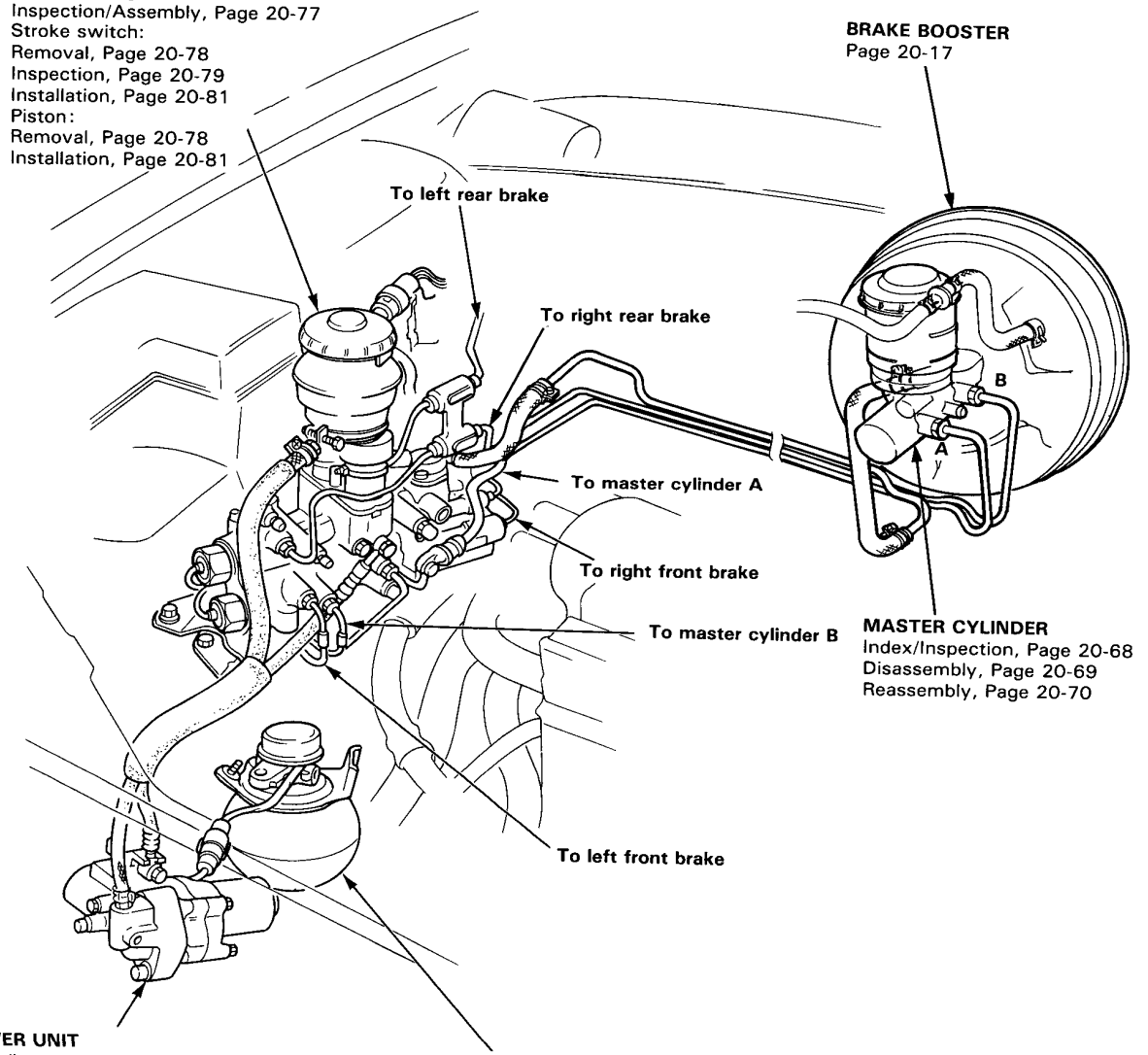
Brake Booster/Master Cylinder/Modulator/ Power Unit/Accumulator

Index

CAUTION:

- **Avoid spilling brake fluid on painted surfaces or instruments as severe damage can result. Wipe up spilled fluid at once and rinse well with clean water.**
- **The flare nuts should be tightened to 15 N·m (1.5 kg-m, 11 lb-ft).**
- **The brake pipes and modulator pipe fittings are color coded.**

MODULATOR
Index/Inspection, Page 20-74
Solenoid:
Removal, Page 20-76
Inspection/Assembly, Page 20-77
Stroke switch:
Removal, Page 20-78
Inspection, Page 20-79
Installation, Page 20-81
Piston:
Removal, Page 20-78
Installation, Page 20-81



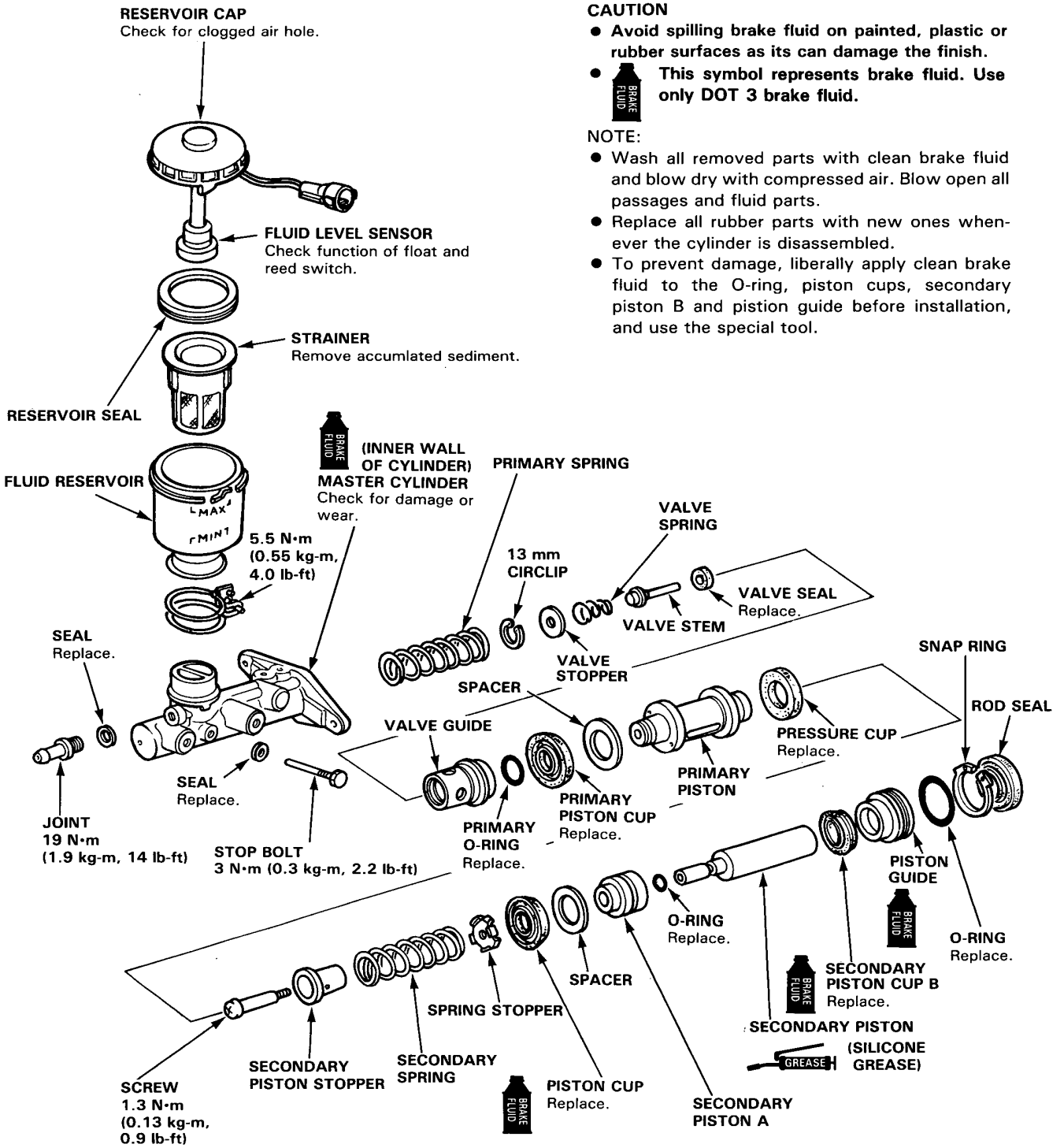
MASTER CYLINDER
Index/Inspection, Page 20-68
Disassembly, Page 20-69
Reassembly, Page 20-70

POWER UNIT
Index/Inspection, Page 20-82
Disassembly, Page 20-83
Reassembly, Page 20-84

ACCUMULATOR/PRESSURE SWITCH
Index, page 20-85
Disassembly/Reassembly Page 20-86

Master Cylinder

Index/Inspection



CAUTION

- **Avoid spilling brake fluid on painted, plastic or rubber surfaces as its can damage the finish.**
- **This symbol represents brake fluid. Use only DOT 3 brake fluid.**

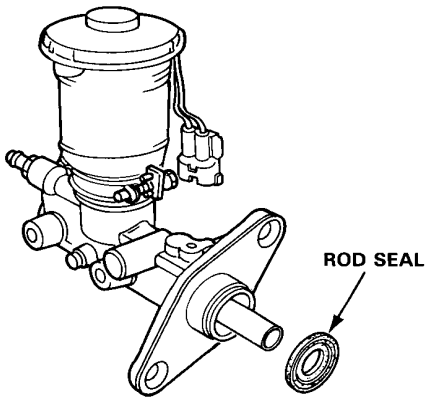
NOTE:

- Wash all removed parts with clean brake fluid and blow dry with compressed air. Blow open all passages and fluid parts.
- Replace all rubber parts with new ones whenever the cylinder is disassembled.
- To prevent damage, liberally apply clean brake fluid to the O-ring, piston cups, secondary piston B and pistion guide before installation, and use the special tool.

Disassembly

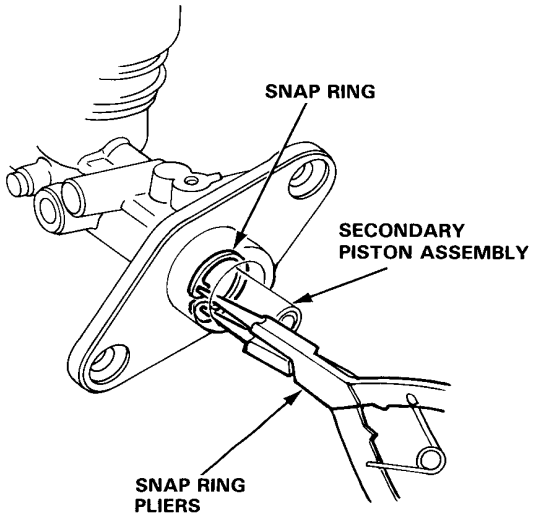
CAUTION:
- **Avoid spilling brake fluid on painted, plastic or rubber surfaces as its can damage the finish; Wash spilled brake fluid off immediately with clean water.**
- **Make sure all parts are clean before reassembly and blow dry with compressed air. Blow open all passages and fluid parts.**
- **Use only new clean brake fluid.**
- **Use only new replacement parts.**
- **Do not allow dirt or other foreign metter to contaminate the brake fluid.**
- **Do not mix different brand of brake fluid.**
- **Do not bend or damage the brake pipes when dis/connecting.**

1. Remove the rod seal.

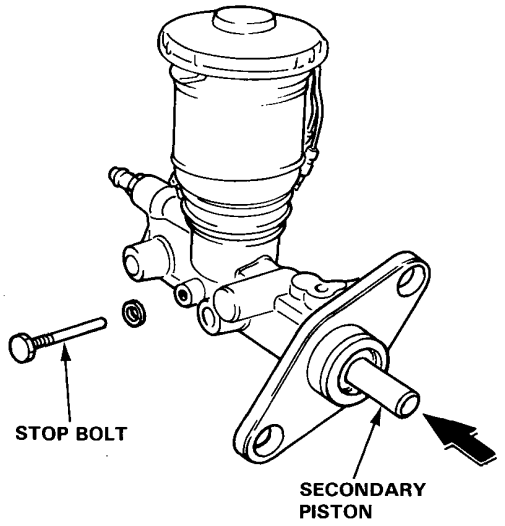


2. Press the secondary piston assembly in, then remove the snap ring.

CAUTION: Avoid scratching or scoring the inner wall of the master cylinder and outside of the secondary piston.



3. Remove the stop bolt while pushing the secondary piston assembly.

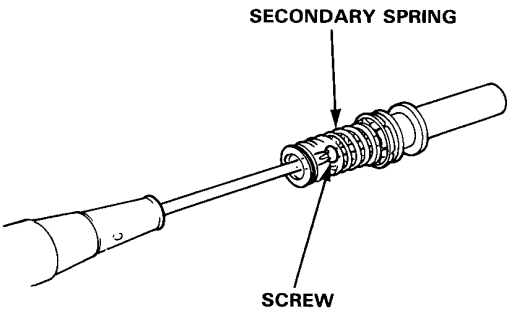


4. Remove the piston guide assembly, secondary piston assembly and primary piston assembly.

NOTE: If the primary piston assembly is difficult to remove, apply compressed air from the primary piston side outlet.

CAUTION
- **Do not use high pressure air or bring the nozzle too close to the inlet.**
- **Place a shop rag over the master cylinder to prevent the primary piston from becoming a projectile.**

5. Remove the screw from the secondary piston assembly, then remove the secondary spring.



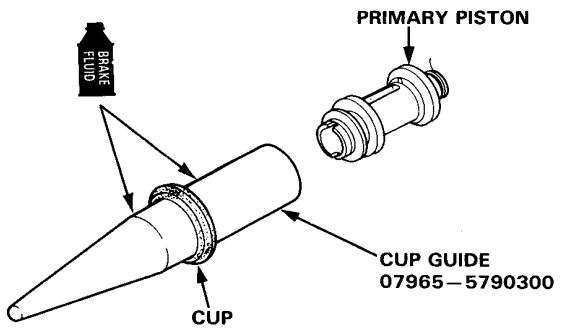
6. Clean all parts with brake fluid.

Master Cylinder

Reassembly

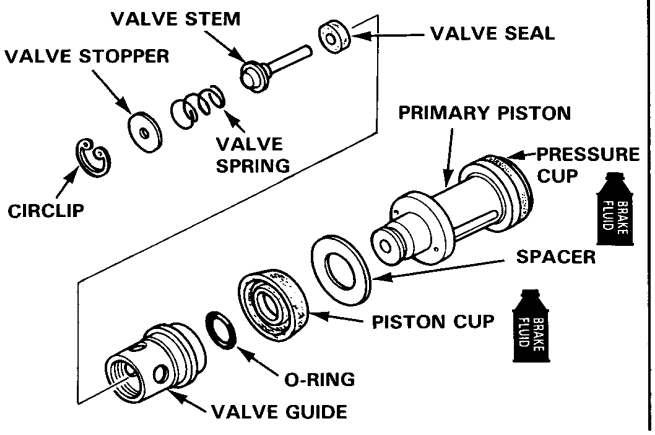
CAUTION:
- **Avoid spilling brake fluid on painted, plastic or rubber surfaces as its can damage the finish; Wash spilled brake fluid off immediately with clean water.**
- **Make sure all parts are clean before reassembly and blow dry with compressed air. Blow open all passages and fluid parts.**
- **Use only new clean brake fluid.**
- **Use only new replacement parts.**
- **Do not allow dirt or other foreign metter to contaminate the brake fluid.**
- **Do not mix different brand of brake fluid.**

1. Coat the cup guide (special tool) with brake fluid, install the cup over the cup guide, then slide the cup to the primary piston.

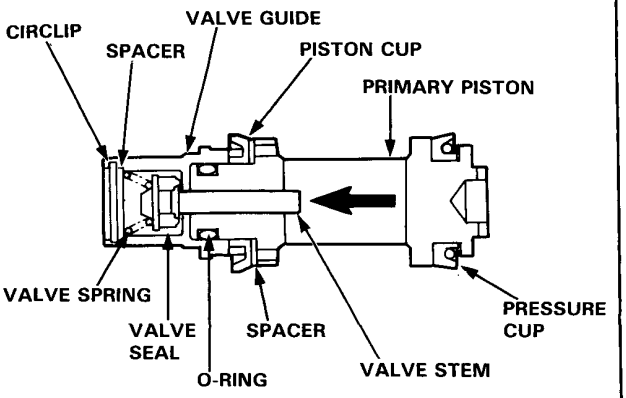


2. Install the spacer, piston cup and O-ring to the primary piston.

3. Install the valve seal, valve stem, valve spring and valve stopper on the valve guide and secure with circlip.

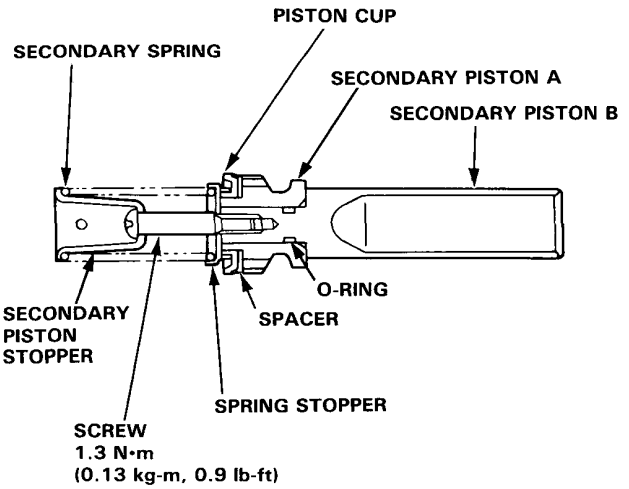


4. Install the valve guide to the primary piston.



NOTE: Reaching through the primary piston stop bolt hole, lightly press on the valve stem to see if its moves smoothly.

5. Install the O-ring, secondary piston A, spacer, piston cup, spring stopper, secondary spring, secondary piston stopper to the secondary piston B and secure with the screw.

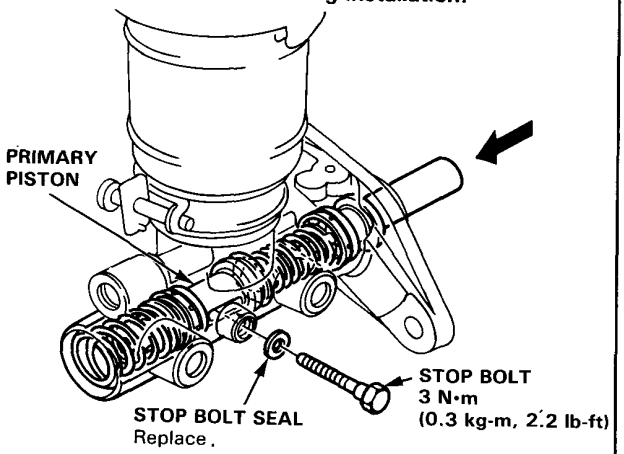


6. Assemble the primary piston assembly, secondary piston assembly and piston guide assembly in the master cylinder body.

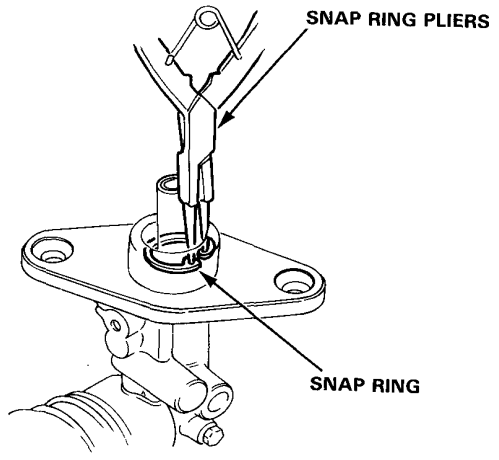
   NOTE: Install the primary piston with the slot on the cylinder stop bolt hole side.

7. Push the secondary piston in until slot aligns with the stop bolt hole, then install and tighten the stop bolt.

   CAUTION:
   - **Replace the stop bolt seal with a new one when ever disassembled.**
   - **Apply brake fluid to the inner wall of the cylinder and piston cups, being careful that they are not inverted inside out during installation.**

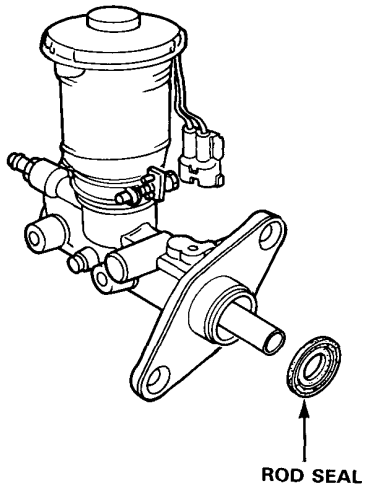


8. Press the secondary piston and install the snap ring.



CAUTION: Avoid damaging the sliding surface of the secondary piston when installing the snap ring.

9. Install the rod seal.

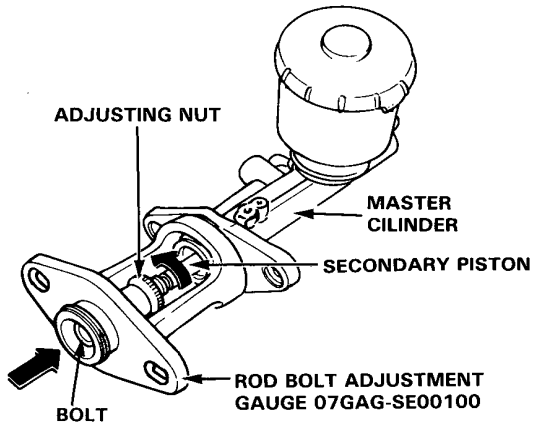


CAUTION: Make sure there is no difference between the brake pipes and the other parts when installing.

Pushrod Clearance Adjustment

NOTE: Master cylinder pushrod-to-piston clearance must be checked and adjustments made, if necessary, before installing master cylinder.

1. Using the Rod Bolt Adjustment Gauge, adjust bolt so the top of it is flush with end of master cylinder piston.



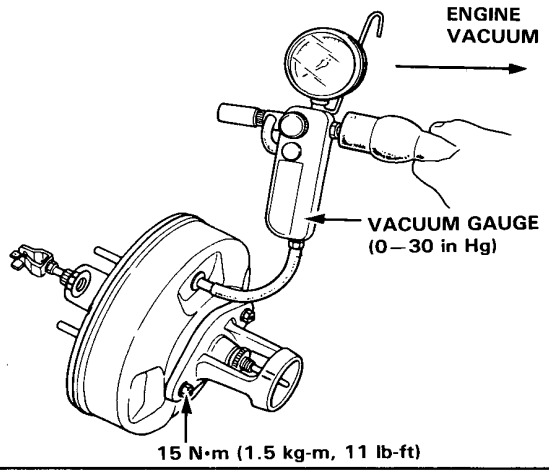
2. Without disturbing the adjusting bolt's position, install the master cylinder rod seal on the adjustment gauge and put the gauge upside down on the booster.

3. Install the master cylinder nuts and tighten to the specified torque.

4. Connect the booster in-line with a vacuum gauge (0—30 in Hg) to the booster's engine vacuum supply, and maintain an engine speed that will deliver 500 mm Hg (20 in Hg) vacuum.

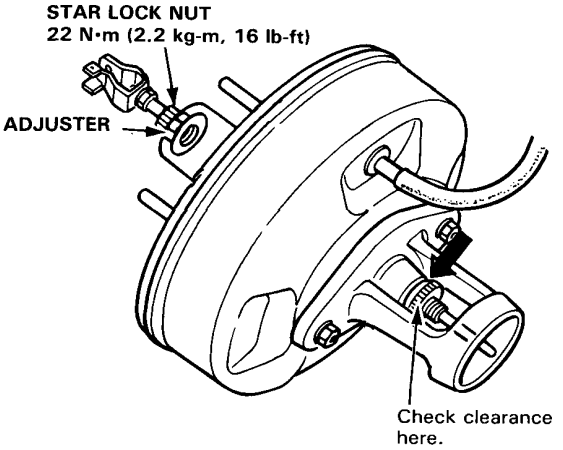
5. With a feeler gauge, measure the clearance between the gauge body and the adjusting nut.

CLEARANCE: 0—0.2 mm (0—0.008 in)



6. If clearance is incorrect, loosen star locknut and turn adjuster in or out to adjust. Hold the clevis while adjusting.

7. Tighten locknut securely.



NOTE: If the clearance between the adjustment gauge and locknut is 0 mm, the pushrod clearance between the master cylinder and brake booster is 0.4 mm (0.016 in). If the clearance between the adjustment gauge and lock nut is 0.2 mm, the pushrod clearance is 0.2 mm.

PUSHROD CLEARANCE:
0.2—0.6 mm (0.008—0.024 in)

Draining High Pressure Brake Fluid

WARNING USE the ALB T-WRENCH before disassembling the parts shadowed in the illustration.

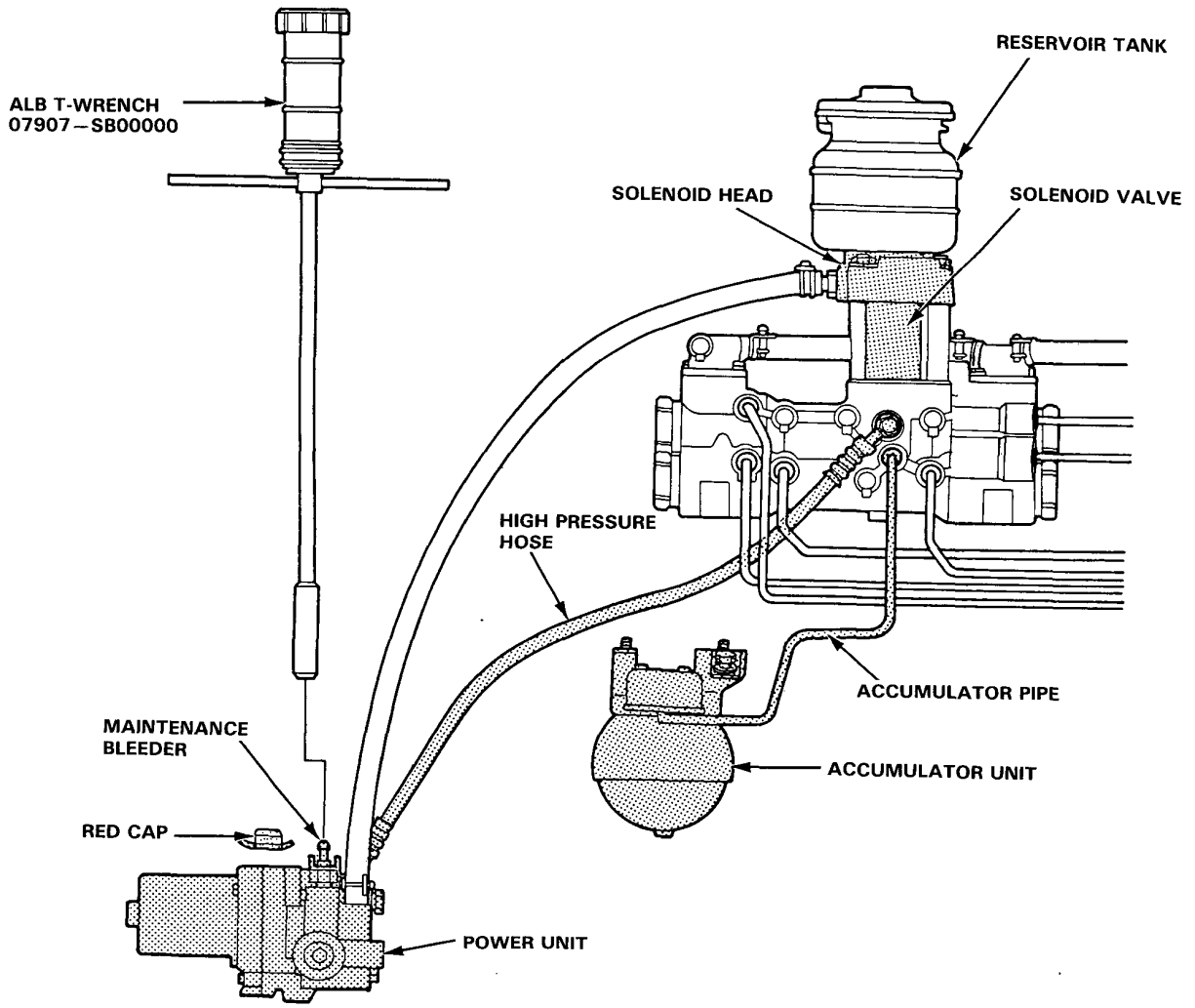
(1) Drain the brake fluid from the master cylinder modulator reservoir thoroughly.

(2) Remove the red cap from the bleeder on the top of the power unit.

(3) Install the ALB T-WRENCH on the bleeder screw and turn it out slowly 90° to collect high pressure fluid into reservoir. Turn the T-WRENCH out one complete turn to drain the brake fluid thoroughly.

(4) Retighten the bleeder screw and discard the fluid.

(5) Reinstall the red cap.

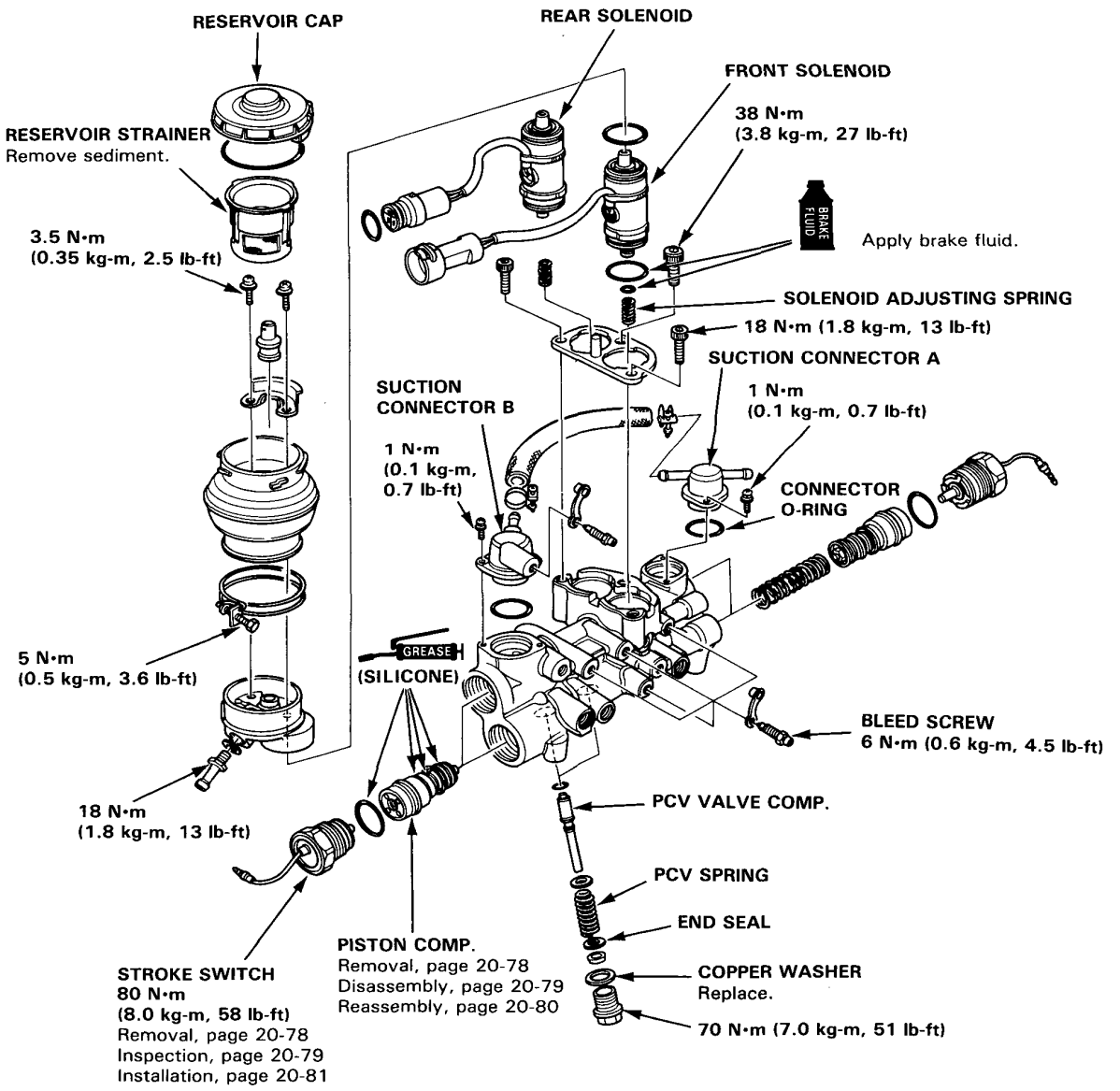


Modulator Assy

Index/Inspection

CAUTION:

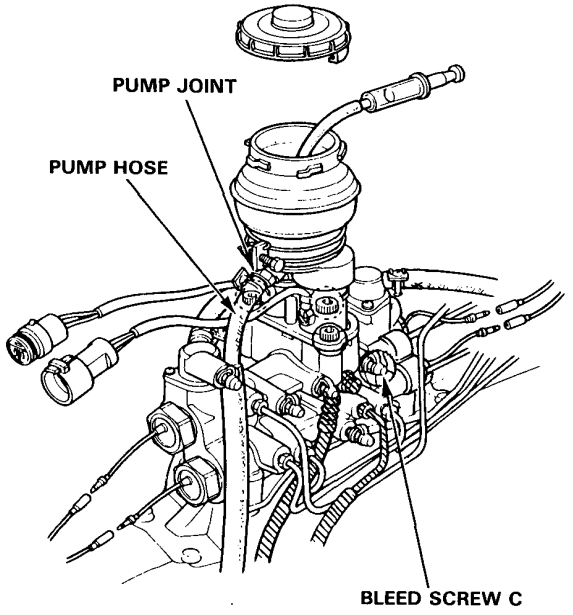
- Avoid spilling brake fluid on painted, plastic or rubber surfaces as its can damage the finish;
- Wash spilled brake fluid off immediately with clean water.
- Make sure all parts are clean before reassembly and blow dry with compressed air. Blow open all passages and fluid parts.
- Use only new clean brake fluid.
- Use only new replacement parts.
- Do not allow dirt or other foreign matter to contaminate the brake fluid.
- Do not mix different brands of brake fluid.



Reservoir

Brake Fluid Draining

1. Draining brake fluid from modulator tank.
   The brake fluid may be sucked out through the top of the modulator tank with a syringe. It may also be drained through the pump joint after disconnecting the pump hose.



2. Draining brake fluid from master cylinder:
   Loosen the bleed screw C and pump the brake pedal to drain the brake fluid from the master cylinder.

WARNING

- **High pressure fluid will be squirted out if the tube shadowed is removed or solenoid head 8 mm and 10 mm bolts are loosened.**
- **To drain high pressure brake fluid, follow the procedure under Draining of High Pressure Brake Fluid on Page 20-73.**

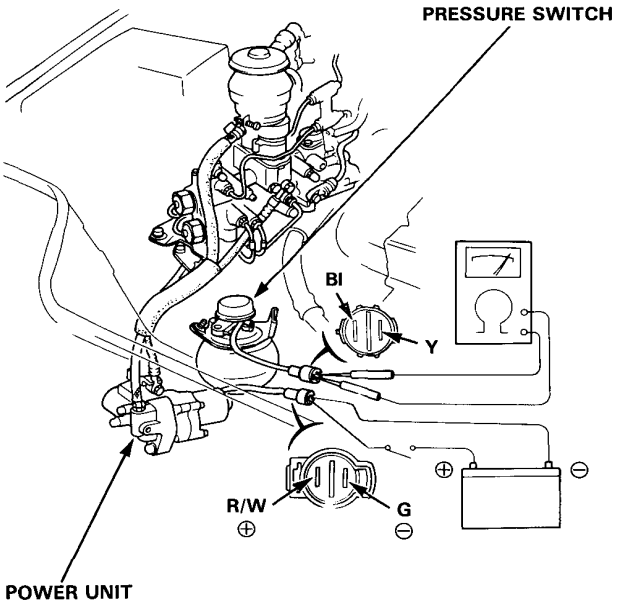
Solenoid

Leak Test

1. Connect circuit tester (Ω range) between the Black and Yellow terminals of the accumulator pressure switch coupler (pink).

2. Attach the positive (+) lead of a fully charged 12 V battery to the Red/White terminal of the power unit motor coupler (yellow) and negative (−) lead to the Green terminal, and install a switch in between as shown.

3. Turn the switch on to allow sufficient pressure to build up within the accumulator and check for continuity shown in the circuit tester. If the circuit tester shows continuity (pressure switch turned on), rotate the power unit for 4 seconds further, then turn the switch off.



- Check for continuity 1 minute after switch is turned off.

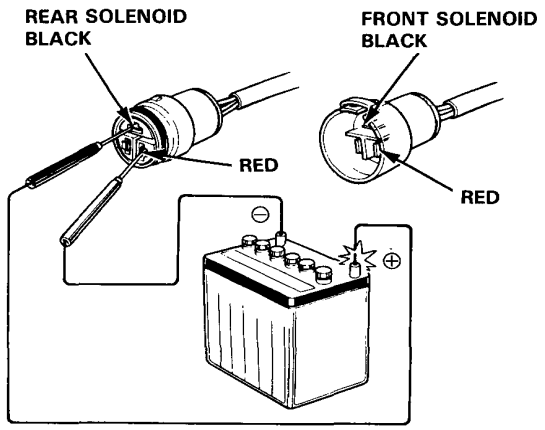
No continuity.....Leaky solenoid (if the pipe joint is tight) or faulty divider O-ring

(cont'd)

Solenoid

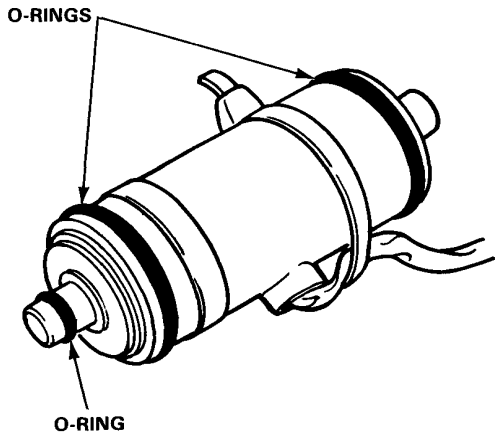
Leak Test (cont'd)

4. Apply a 12 V across the Black and Red terminals of the solenoid coupler (pink) momentarily.



- Check if the solenoid hisses or squeaks. Replace the solenoid with a new one if it hisses or squeaks.
- Make sure that the solenoid does not hiss or squeak after it has clicked into position. Replace with a new one if it hisses or squeaks.
- Check the pressure switch for continuity within one minute. It is normal if there is continuity. If there is no continuity, solenoid is faulty and must be replaced.

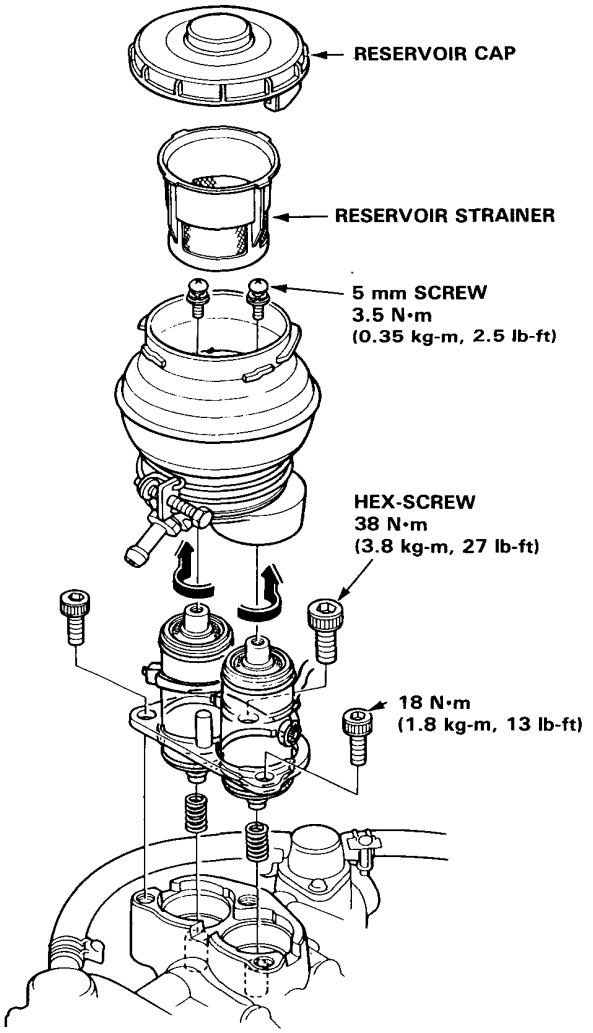
  NOTE: The solenoid must be replaced with a new one as a unit except when the O-ring is faulty.



Removal

1. Drain the brake fluid from the modulator tank.
2. Drain the high pressure brake hose (page 20-73).
3. Disconnect the inlet hose.
4. Remove the reservoir strainer.
5. Remove the 5 mm screws and remove the reservoir with the solenoid head.
6. Remove the hex-screws and solenoid set plate.
7. Remove the solenoids aligning the groove in the plate with the tab on the solenoids by turning the solenoid as shown.

   CAUTION: Be careful not to drop or damage the solenoid.

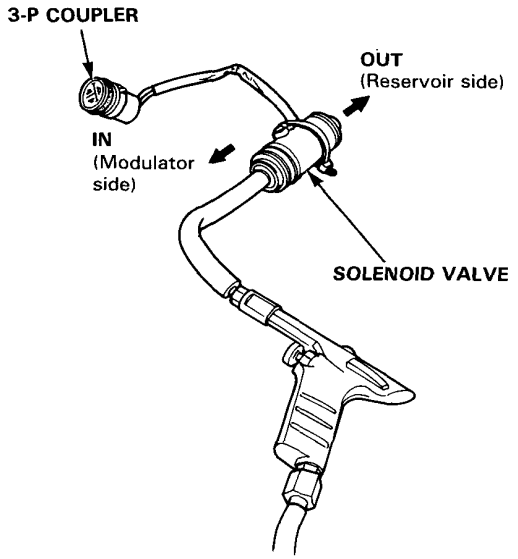


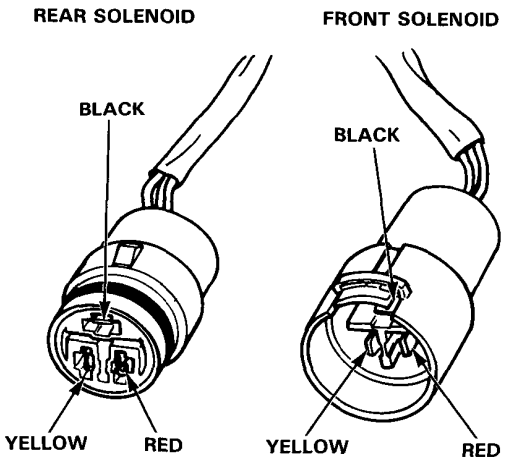
Inspection

1. Connect a tube to the inlet of the solenoid valve. Apply compressed air to the solenoid valve through the tube.

2. Check the solenoid valve for proper operation by connecting a 12 V fully charged battery to the 3-P coupler terminals:

   Voltage not applied: •There should be no air flow.
   Black — Red: •There should be air flow through IN and OUT.
   Black — Red: •There should be air flow
   Black — Yellow: through IN.





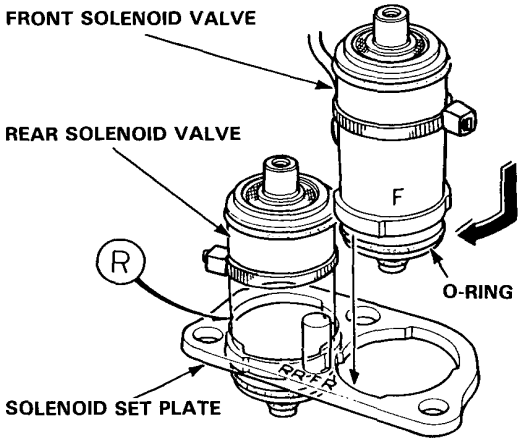
NOTE: Handle the solenoid valve with care as it may be damaged if dropped.

Reassembly

1. Coat the O-ring with the clean brake fluid and install the O-ring onto the solenoid valve.

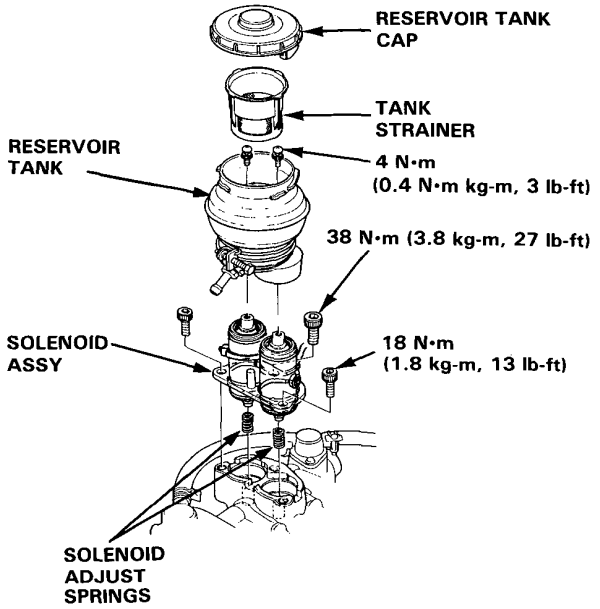
2. Install the solenoid valves on the set plate as shown.

   WARNING **The front and rear solenoid valves are not interchangeable or the system will not work properly. Make sure that the solenoid valves are installed in correct positions as shown.**



3. Install the solenoid adjust springs on the modulator.

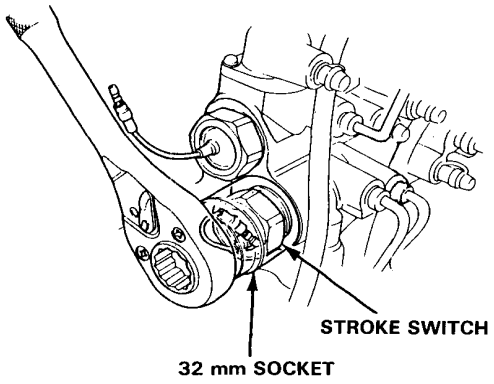
4. Install the solenoid assy, reservor tank and connect the inlet hose.



Piston/Stroke Switch

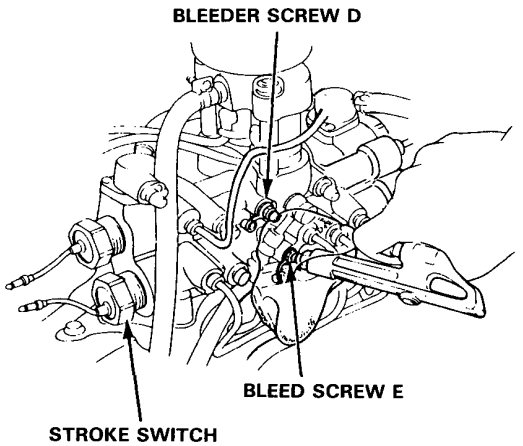
Removal

1. Remove the terminal from each stroke switch, and tuck it into the recess of a 32 mm socket out of way. Loosen off the switch using the socket.



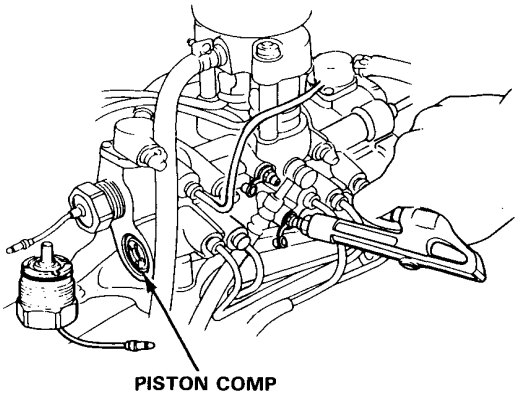
NOTE: Place a pan or shop rag under the switch to receive the brake fluid drained.

2. Screw the stroke switch into the modulator two complete turns.
3. Apply the same procedure to the remaining stroke switches.
4. Loosen the bleeder screws D and E.
5. Blow air through the holes in the bleeder screws D and E for a few seconds.



NOTE: Place a shop towel around the holes as brake fluid will be blown out by the compressed air.

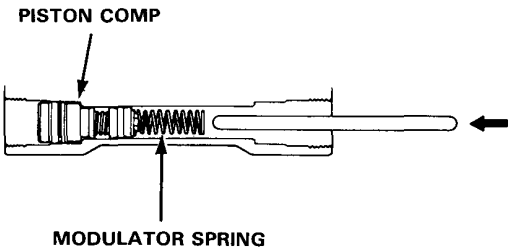
6. Remove the stroke switches and pry the pistons out with the help of the special tool Snap Ring Pliers.



NOTE: Should difficulty be encountered in removing the piston, further blow air for several seconds.

CAUTION: Place the piston end of the switch with a shop rag as the piston can be a projectile.

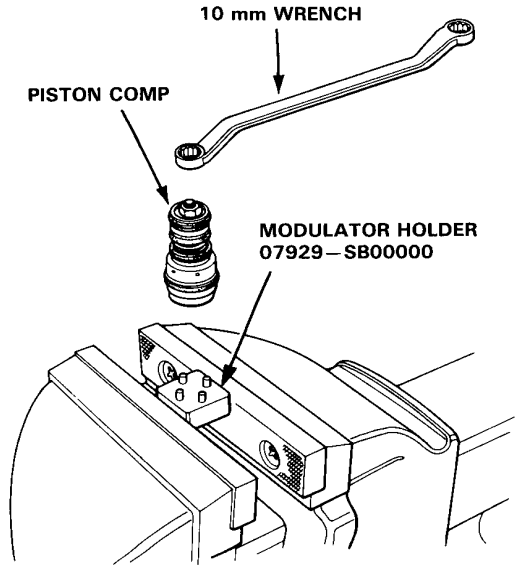
7. Remove the modulator spring from the cylinder.
8. Press the remaining piston out using a bar with a round end as shown.



CAUTION: Take care not to damage the cylinder wall.

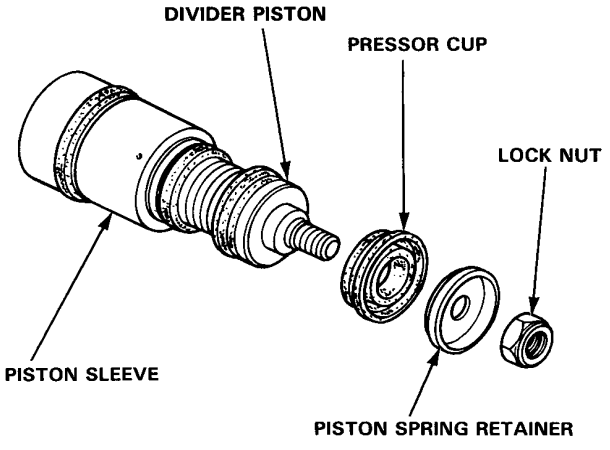
Piston Disassembly

1. Place the modulator holder in a vise as shown. Install the piston aligning the holes in the piston bottom surface with the lugs on the modulator holder.
2. Hold the piston by hand and remove the divider lock nut.



3. Carefull remove the parts.

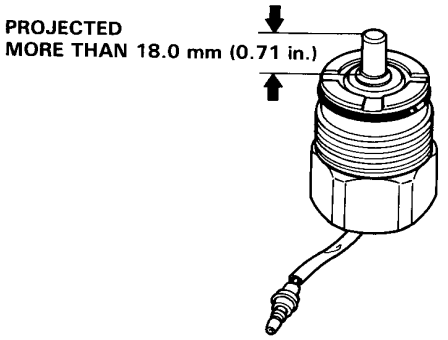
CAUTION: The spring can pop out when removing the divider piston.



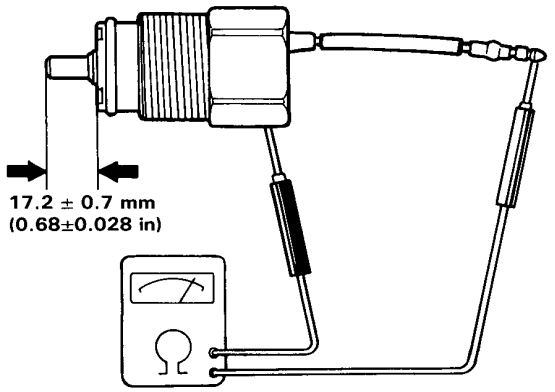
4. Clean the parts with clean brake fluid. Blow the piston sleeve and divider piston with compressed air.

Stroke Switch Inspection

1. Press down on the end of the piston with a finger pressure (1 kg, 7 lb). The piston should come out more than 18.0 mm (0.71 in) when released.

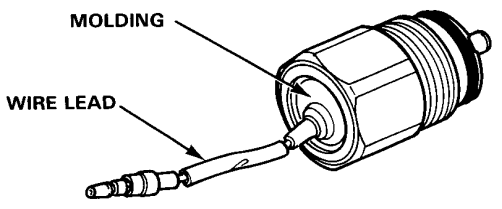


2. Check for continuity between the switch lead and body ground.
   There should be no continuity when the projected height of the piston is above 17.2 ± 0.7 mm (0.68 ± 0.028 in.). There should be continuity when the height is below 17.2 ± 0.7 mm (0.68 ± 0.028 in.).



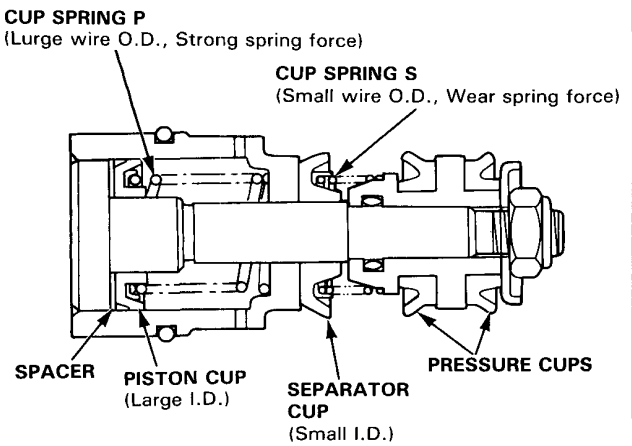
3. Check the wire lead, body (threads) and molding for damage, cracks or other faults.

   NOTE: Do not let the switch fall.

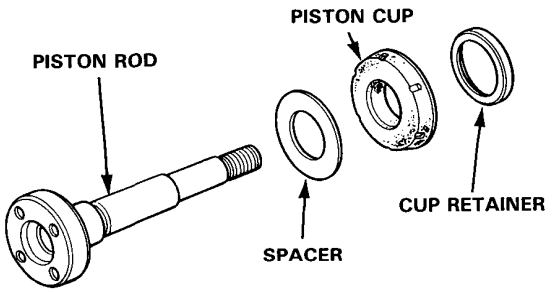


Piston Assembly

NOTE: Replace the cups and O-rings with new ones. Apply clean brake fluid when installing.

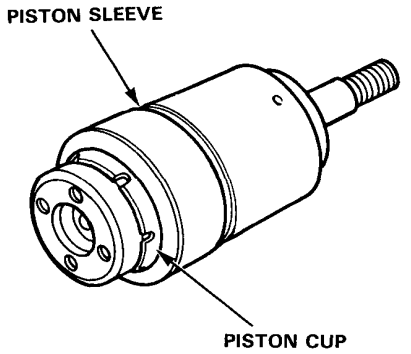


1. Install the spacer, piston cup and cup retainer on the piston rod.

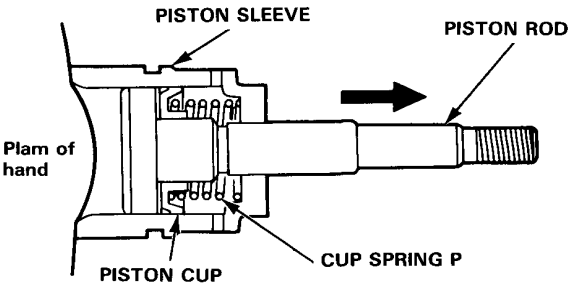


2. Install the cup spring P on the cup retainer, then install the piston sleeve over them.

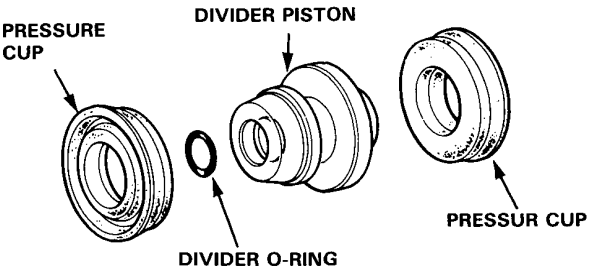
3. Install the piston cup into the piston sleeve being carefull not to allow the lip of the cup to turn inside out.



4. Put the piston sleeve on the plam of your hand, pull the piston rod, and check that the plam is sucked.

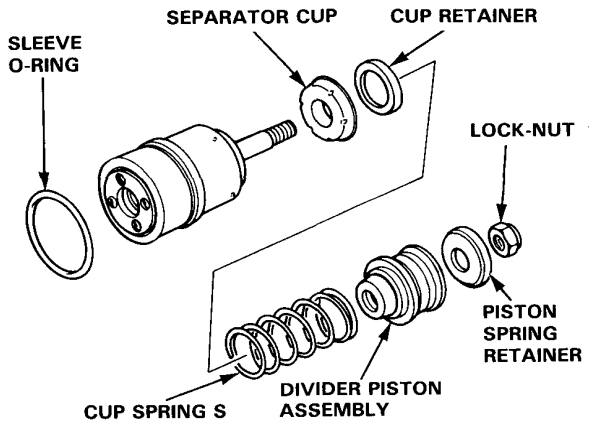


5. Install the divider O-ring and pressure cups on the divider piston.



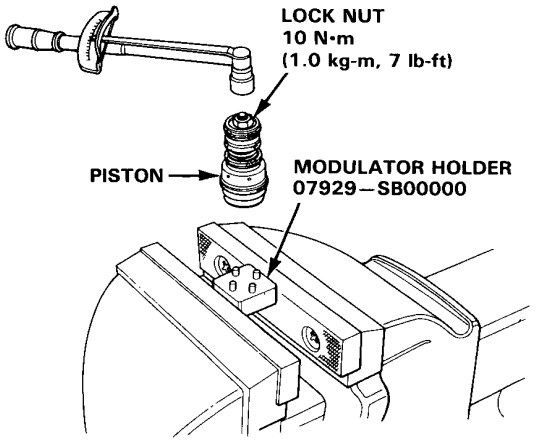
6. Position the separator cup, cup retainer, cup spring S, divider piston assembly and piston spring retainer on the piston sleeve, and loosely install the locknut.

7. Install the sleeve O-ring on the piston sleeve.

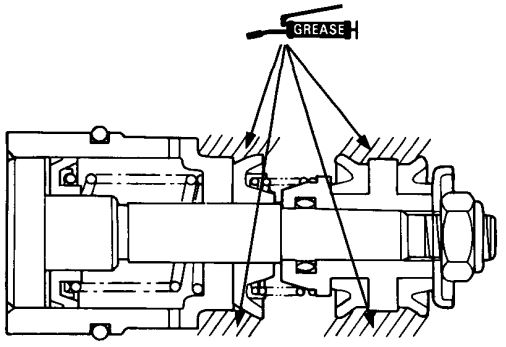


8. Hold the modulator holder (special tool) in a vise and set the piston rod on the holder aligning the four tabs on the holder with the four piston rod holes.

9. Tighten the lock-nut.



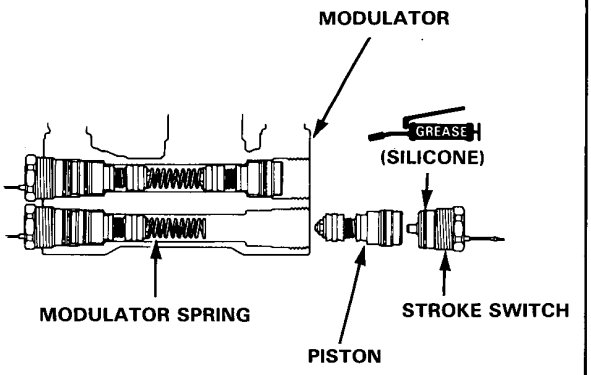
10. Apply Honda Cylinder Grease (P/N 08733—BOZOE) or equivalent rubber grease onto the shaded portion of the piston.



Installation

1. Insert the modulator pistons into the modulator and install the pistons being carefull not to allow the lips of the cup to turn inside out.

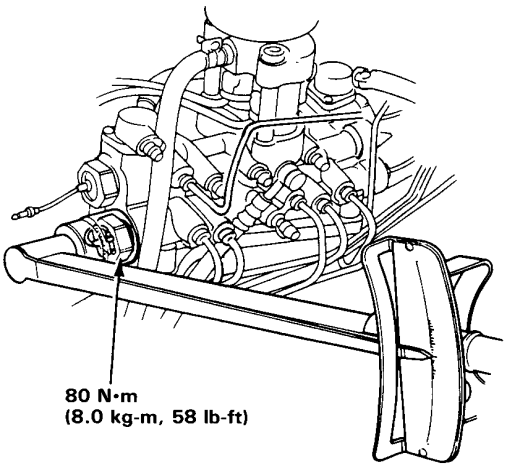
   NOTE: Note the piston installation direction.



2. Loosely tighten the stroke switches using a 32 mm socket wrench.

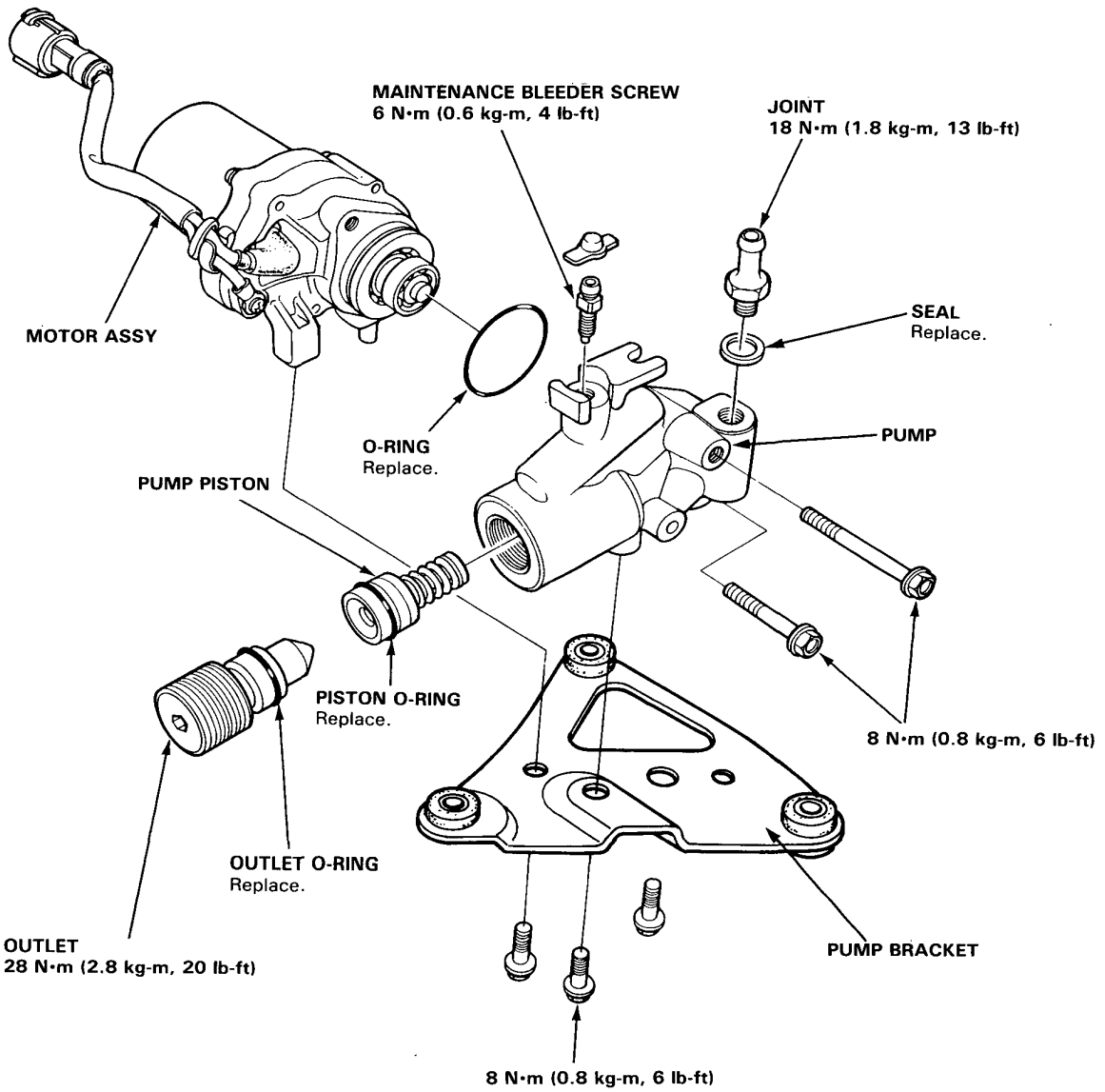
   CAUTION: Never use a inpact wrench.

3. Tighten the stroke switches.



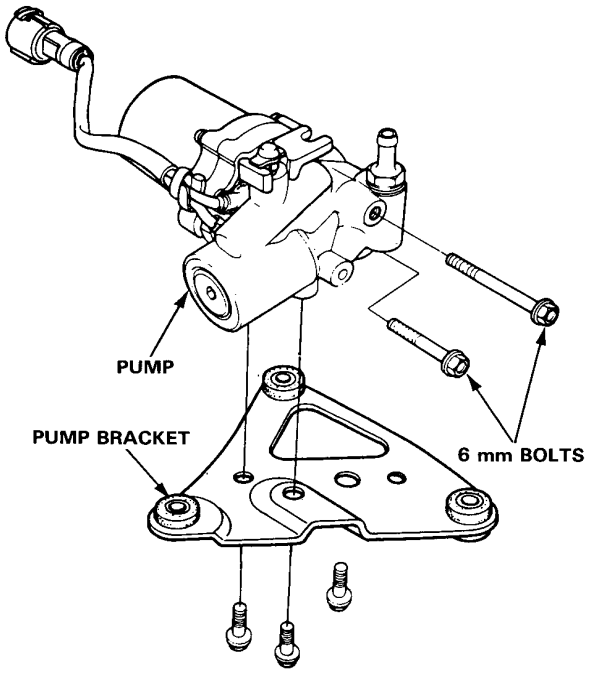
Index/Inspection

CAUTION: Do not attempt to disassemble the power unit parts except for those shown exploded in this illustration.

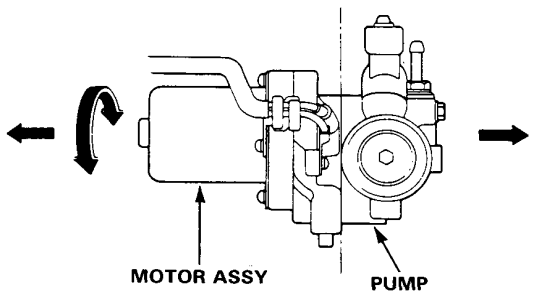


Disassembly

1. Remove the pump bracket.
2. Remove the 6 mm bolts attaching the pump to the pump motor.

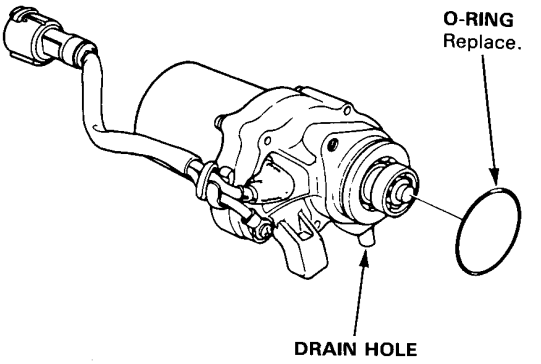


3. Separate the motor from the pump while rotating the pump right and left.



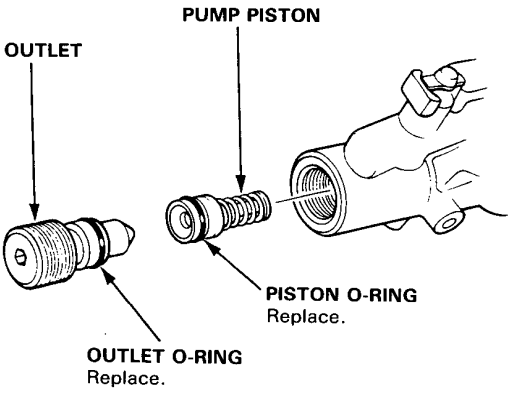
NOTE: An about 10 cc (0.6 cu-in) of brake fluid will flow out when the motor is removed from the pump.

4. Wash the motor with clean brake fluid only on the exposed end and blow dry with compressed air.



NOTE: Do not wash or dip the motor in brake fluid. Also be careful not to allow oil or water to enter the inside through the water drain hole.

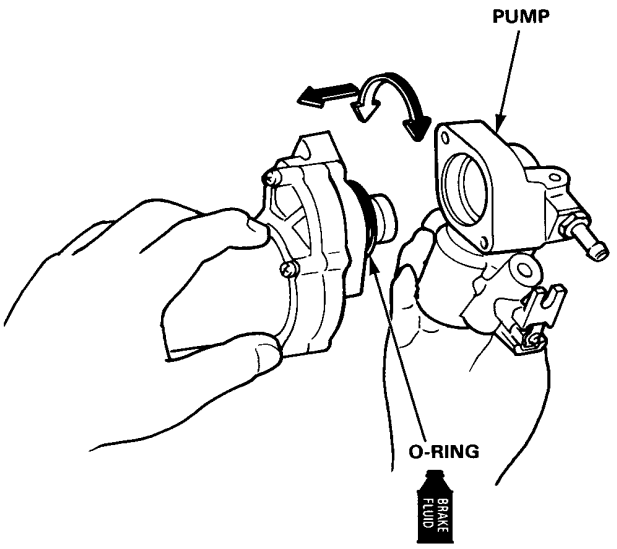
5. Remove the outlet from the pump.
6. Remove the pump piston by pushing its from inside of the pump body.



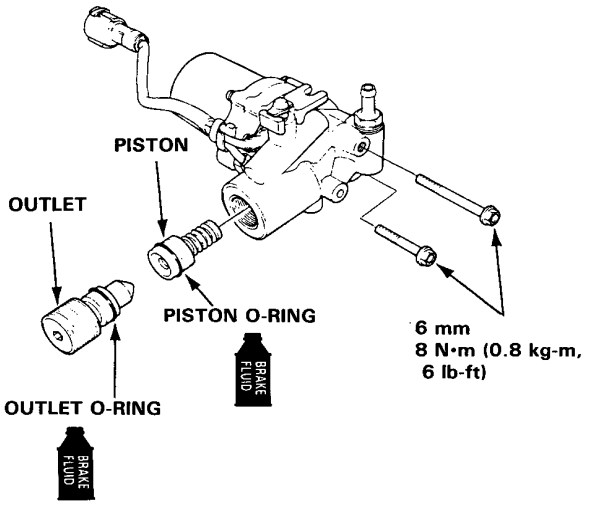
Pump Assy

Reassembly

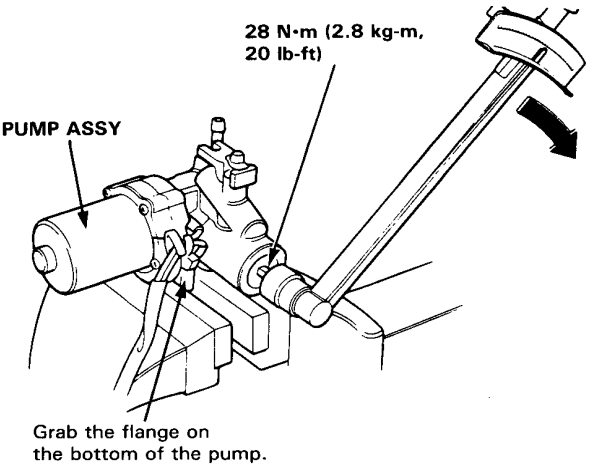
1. Install a new O-ring on the pump motor.
2. Coat the O-ring with clean brake fluid and install the pump on the motor while rotating it right and left by hand.



3. Install the 6 mm bolts and tighten.
4. Coat a new pump piston O-ring with the clean brake fluid and insert the pump piston into the pump.
5. Coat a new outlet O-ring with the clean brake fluid and loosely install the outlet into the pump.

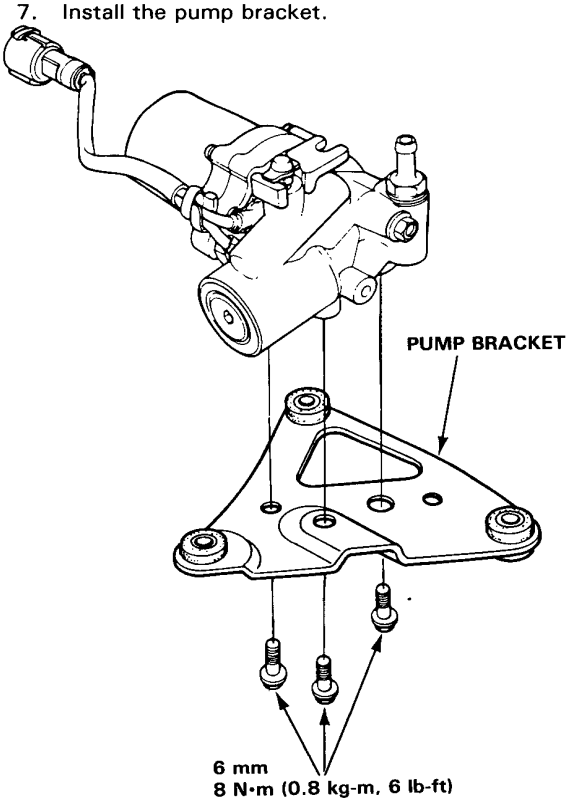


6. Place the motor in a vise as shown and tighten the outlet.



NOTE: Do not place the pump in a vise at locations other than shown above.

7. Install the pump bracket.

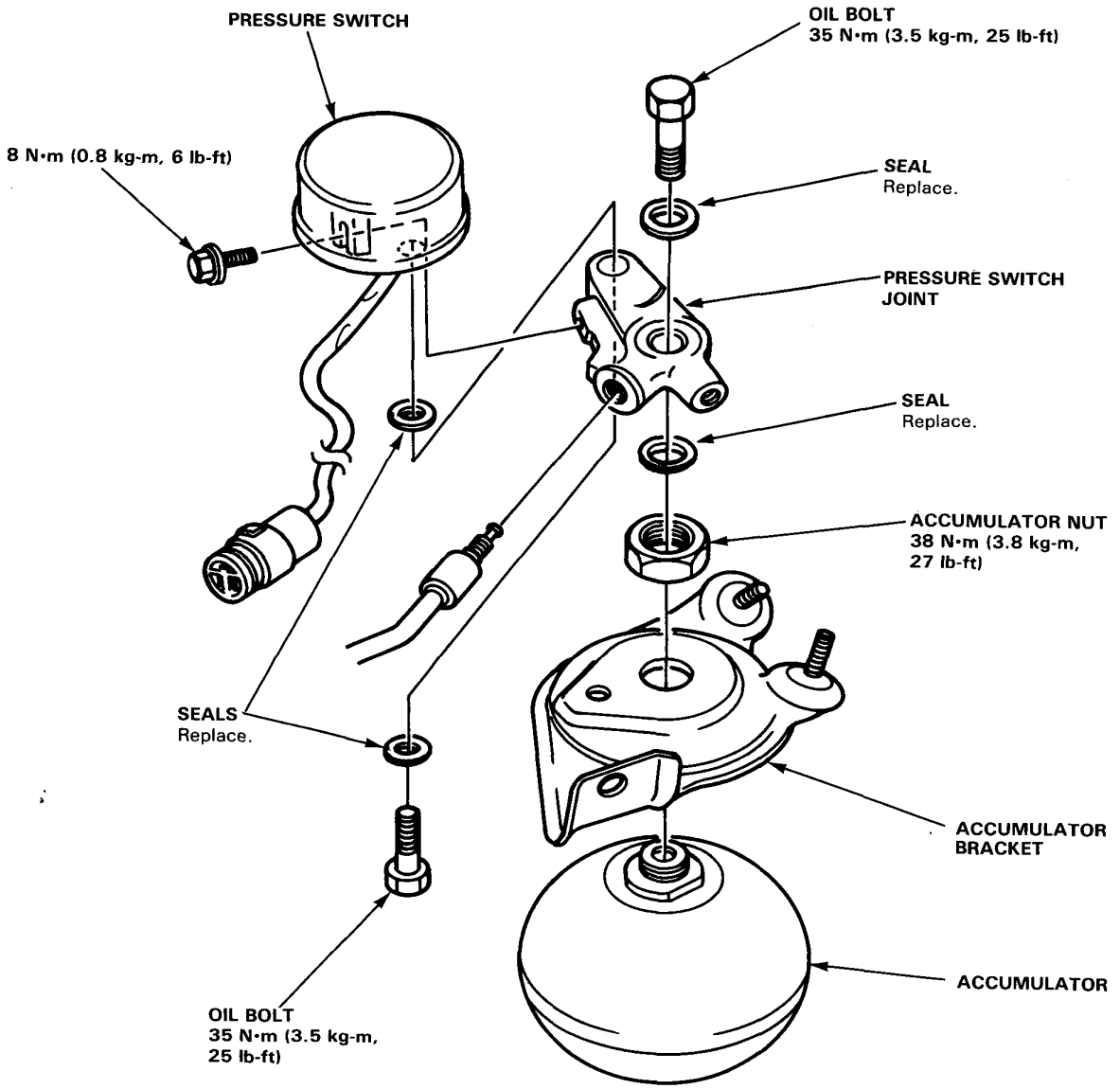


Accumulator

Index/Inspection

CAUTION:

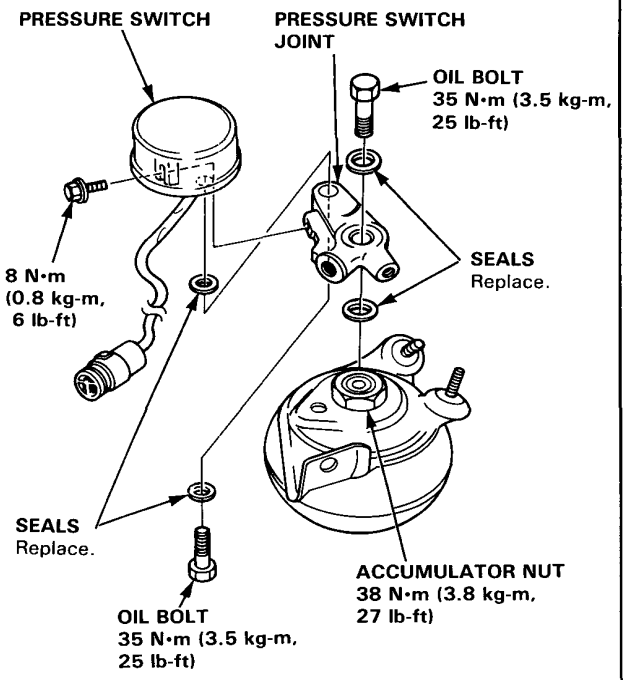
- Avoid spilling brake fluid on painted, plastic or rubber surfaces as its can damage the finish; Wash spilled brake fluid off immediately with clean water.
- Make sure all parts are clean before reassembly and blow dry with compressed air. Blow open all passages and fluid parts.
- Use only new clean brake fluid.
- Use only new replacement parts.
- Do not allow dirt or other foreign metter to contaminate the brake fluid.
- Do not mix different brand of brake fluid.



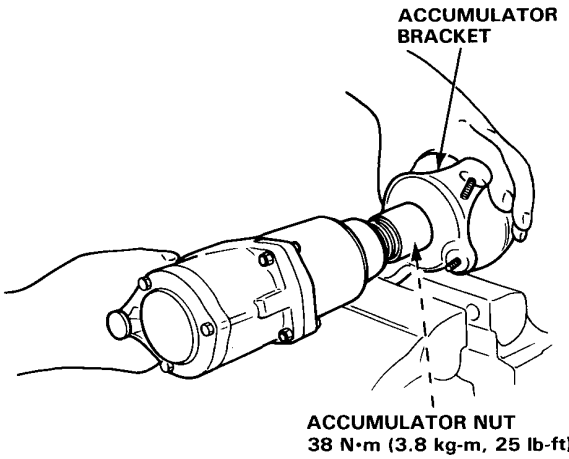
Accumulator

Disassembly/Assembly

1. Remove the oil bolt from the accumulator.
2. Remove the pressure switch from the pressure switch joint by removing the oil bolt.



3. Place the accumulator in a vise on its bracket and remove the accumulator nut from the accumulator with an impact wrench and a 27 mm socket.



NOTE:
- Hold the accumulator by hand while removing the nut.
- Do not overtighten the vise jaws or the accumulator bracket will be distorted.
- Use a torque wrench to tighten the nut.

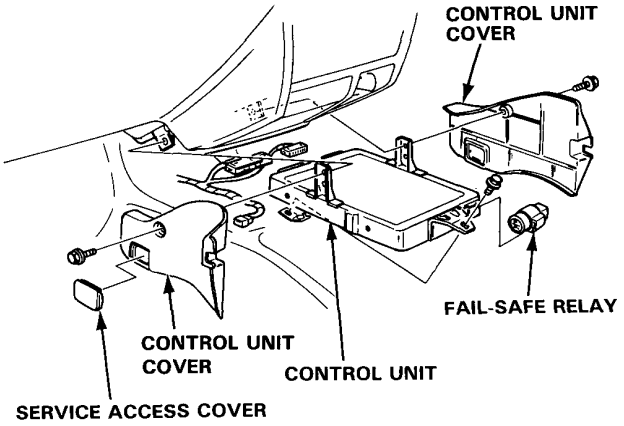
Control Unit/Fail Safe Relay

Replacement

1. Remove the control unit covers.

   NOTE: Before removing the control unit cover, disconnect the ALB checker in coupler from the service access cover.

2. Remove the fail-safe relay and control unit.



   NOTE: Handle the control unit with care.

3. Installation is essentially the reverse order of removal.

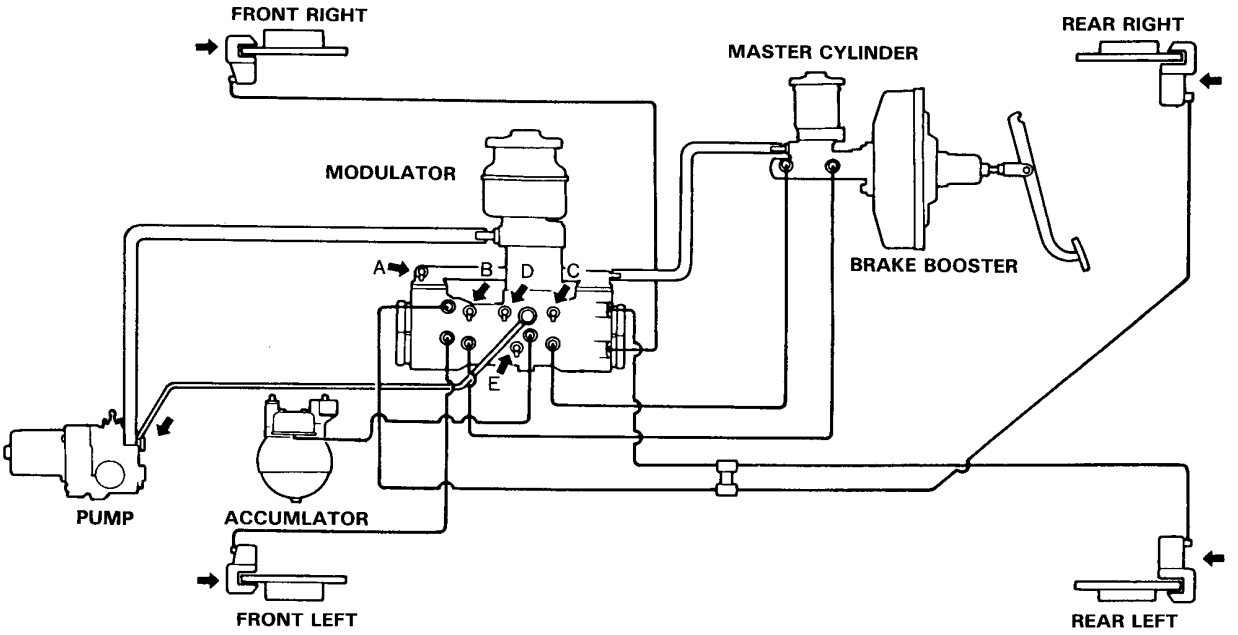
   NOTE: Do not forget to install the ALB checker 6-P coupler to the service access cover.

Air Bleeding

Air Bleeding (General)

The air must be bleed from the two hydraulic systems.
1. Main hydraulic brake system
2. ALB control hydraulic system

Arrows indicate bleed screw locations and A to E are bleed screw names in this manual.

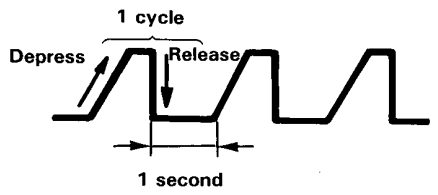


NOTE: The ALB equipped models have a modulator inserted in the circuit between the master cylinder and individual brake calipers in place of the proportioning valve. To bleed air from the system, it is essential have a five bleed screws on the modulator be loosed in the specific orders.

The description which follows relates mainly to manual bleeding, with added notes and explanations on Hondaline vacuum changer (07468—0010001) and pressure type changer which is commercially available for the purpose.

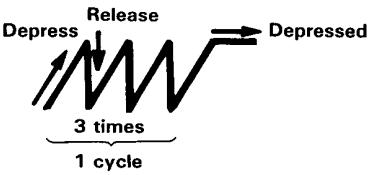
There are two pedal pumping procedures in air bleeding for cars equipped with 4W-ALB. They are indicated by mode 1 and mode 2 in this manual.

Mode 1



Bleed screw: OPEN

Mode 2



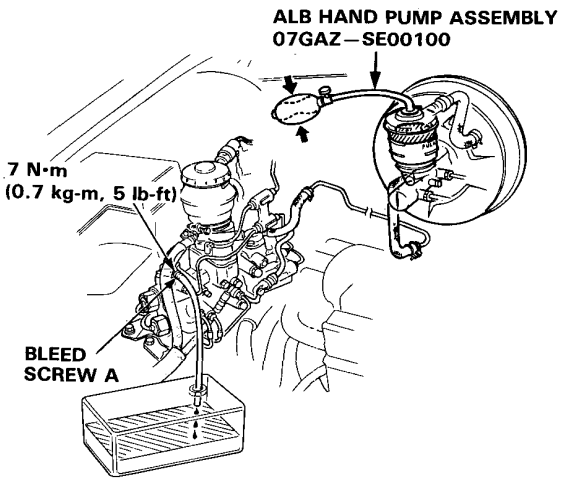
Bleed screw: OPEN → CLOSE

Air Bleeding

Manual Bleeding

Main Hydraulic Brake System:

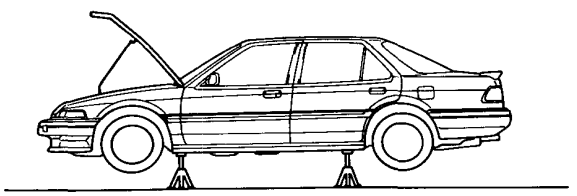
1. Fill the master cylinder reservoir with recommended brake fluid up to the MAX level.
2. Install the ALB hand pump assembly onto the master cylinder as shown.
3. Loosen the bleed screw A on the modulator.



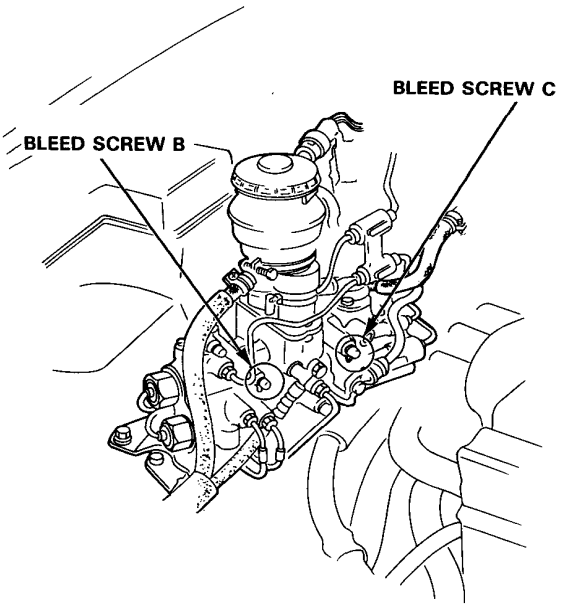
4. Pump the ALB Hand Pump until the brake fluid flows out from the bleed screw A.

   NOTE: Check the fluid level often while bleeding the brakes to prevent air from being pumped into the system.

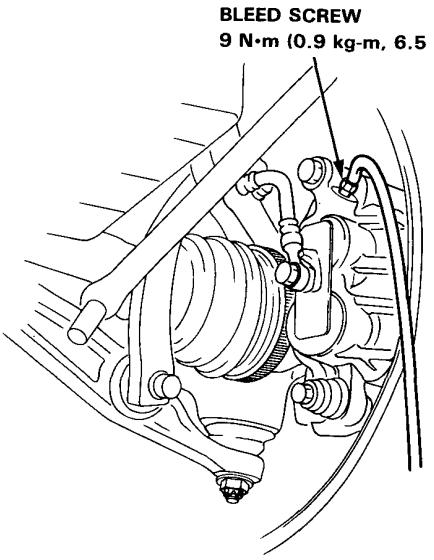
5. Retighten the bleed screw A after being sure that there is no air from the bleed screw A.
6. Raise the car and support with safety stands in proper locations.



7. Loosen the bleed screw B.
8. Have someone get in the car and pump the brake pedal in mode 2 until fluid flows out that almost free of air bubbles.
9. Bleed the bleed screw C as same as steps 7 to 8.



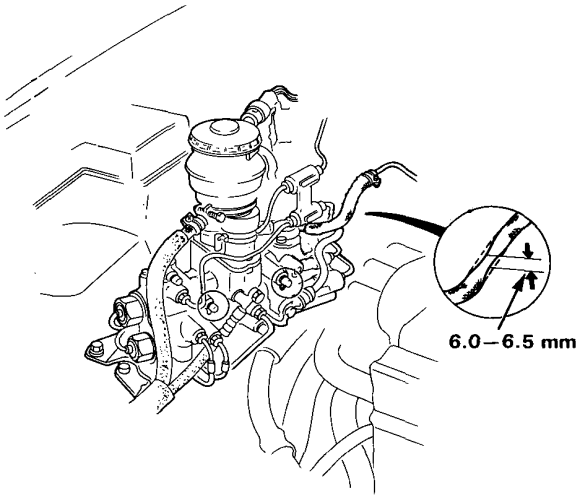
10. Loosen the bleed screw on the left front caliper about two turns.



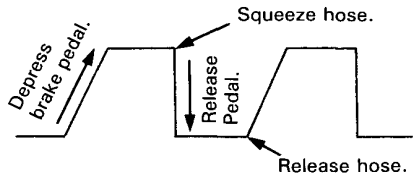
11. Pump the brake pedal in mode 1 about 30 times until air bobbles do not appear from the bleed screws.

12. Pump the brake pedal in mode 2 for 5—6 times.

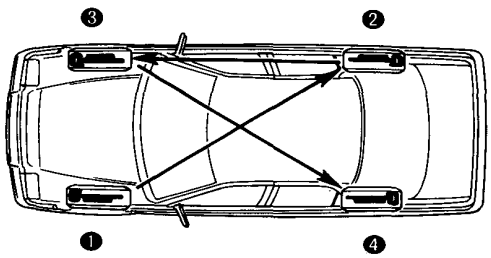
NOTE:
- In the new parts are installed or the brake fluid does not flow in mode 1, narrow the hose between the master cylinder and modulator to 6.0—6.5 mm (0.24—0.25 in) as shown.



- Or, repeat the following steps for 5—6 times.

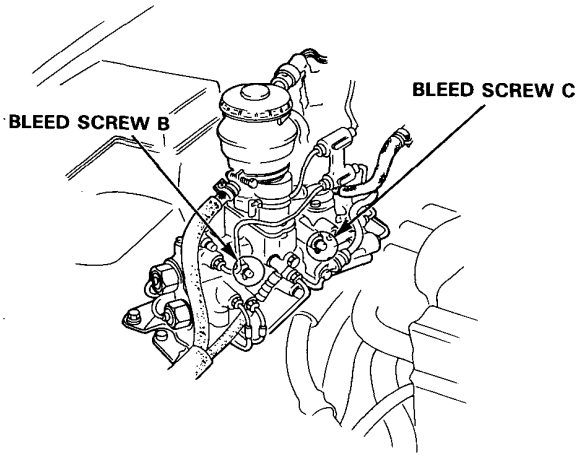


13. Bleed air from each wheel caliper as order shown below until air bubbles do not appear from the bleed screws.



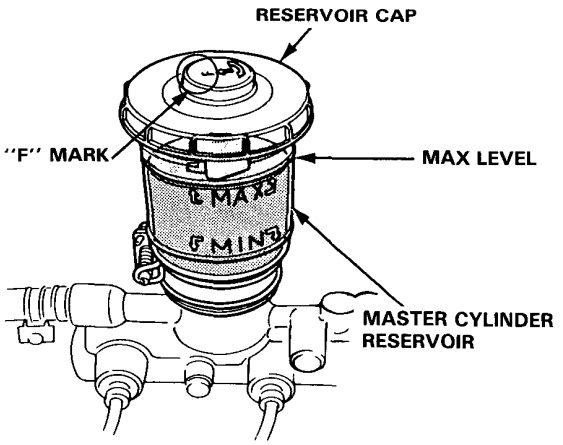
14. Rebleed the bleed screws B and C on the modulator.

15. Tighten the bleed screws B and C when the fluid flows in a solid stream that is free of air bubbles.



16. *Fill the master cylinder reservoir up to the* MAX level.

17. Install the reservoir cap with its F mark facing forward.



NOTE:
- If the (O) or BRAKE comes on, the main hydraulic brake system is improper.
- Start the engine, release the parking brake and depress the brake pedal fully, the (O) or BRAKE lamp should not come on.

18. Road test to see if the brakes are operating properly.

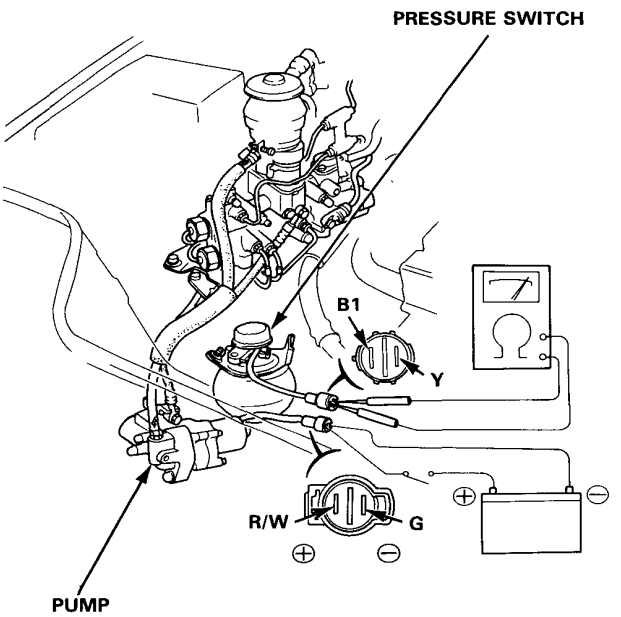
CAUTION: The ALB system may still not function properly in this time.

(cont'd)

Manual Bleeding (cont'd)

ALB Control Hydraulic Brake System:

1. Fill the modulator reservoir up to the MAX level with recommended brake fluid.
2. Connect the probes of an ohmmeter to the Black and Yellow terminals of the accumulator pressure switch coupler (Pink).
3. Connect the positive wire of a fully charged battery to the Red/White terminal of the power unit motor coupler (Yellow), and negative wire to the Green terminal, with a battery switch next to the battery positive terminal as shown.



5. Turn on the switch and check for continuity. If the continuity is shown, turn off the switch after 4 seconds.
6. Bleed air from the circuit between the accumulator and the modulator.

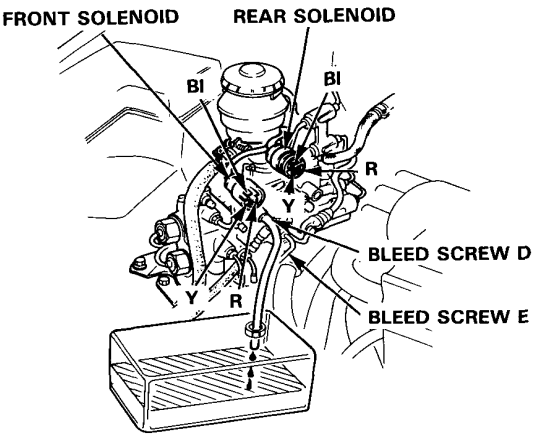
   NOTE: The air can be bleed by operating the solenoids, or by loosening the bleed screw D and E.

Bleeding with solenoids:

1) Apply 12 V battery across the Red (positive) and Black (negative) terminals of the solenoid coupler (Pink) (front or rear) momentarily.

2) Wait until the fluid coming up into the reservoir and is free of air bubbles (about 4-5 minutes).

3) Repeat the steps 5, 1) and 2) three times.



Bleeding with bleed screw D and E:

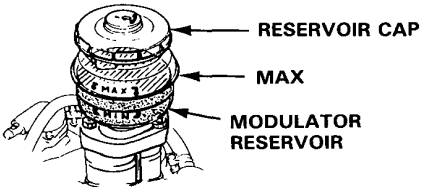
1) Connect the positive wire of a fully charged 12 V battery to the Red and Yellow terminals of the solenoid coupler, and negative wire to the black terminal.

2) Loosen the bleed screw slightly.

   Front solenoid ..... Bleed screw E
   Rear solenoid ..... Bleed screw D

3) Tighten the bleed screw when there is no air in the fluid flowing out from the bleed screw.

7. Perform the step 5. and reconnect the coupler.
8. Fill the modulator reservoir up to the MAX level.
9. Install the reservoir cap with its F mark facing forward.
10. Check the operation of the ALB system using the ALB checker (page 20-55).



Air Bleeding (with a pressure changer)

The number ❶ thru ❼ indicate the bleeding sequence.

Main brake system:

1. Fill the master cylinder reservoir up until the fluid does not flow out of the reservoir while install the changer adaptor.
2. Install the changer.

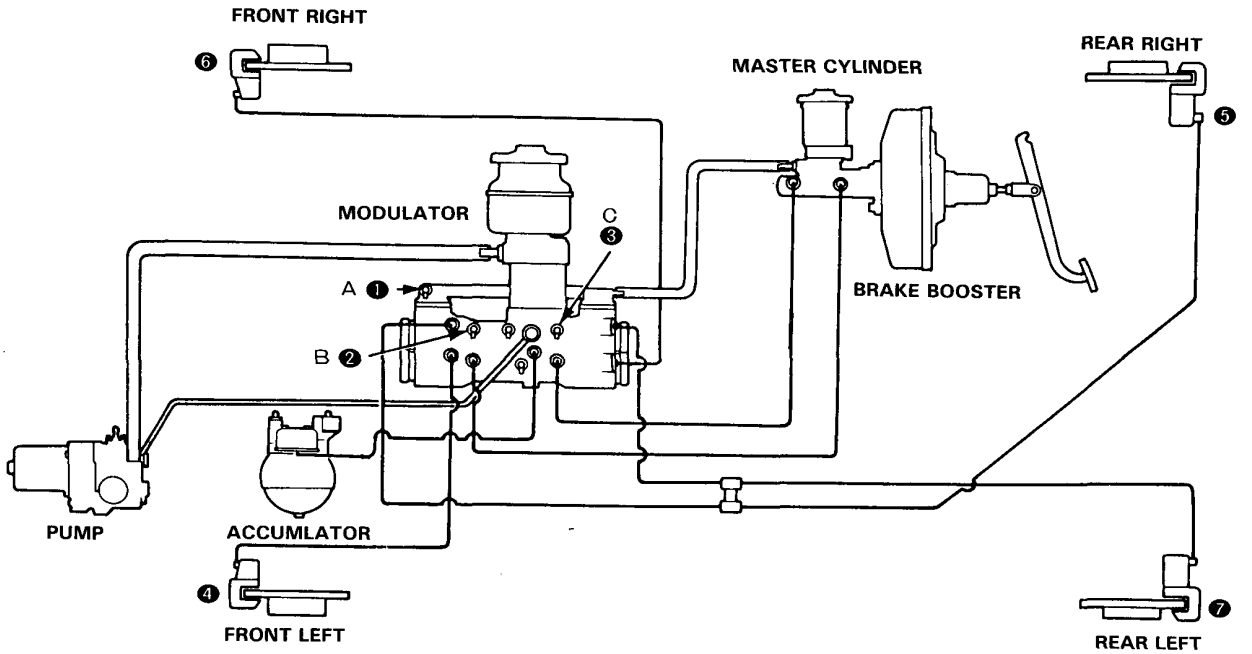
   NOTE:
   Follow the changer manufacture's instructions. Make sure that there are not fluid leaks past the pipe joints or connections by operating the changer.

3. Bleed air from bleed screw A (❶).
4. Bleed air from bleed screw B and C (❷ and ❸).
5. Bleed air from bleed screw of each wheels in order ❹, ❺, ❻, ❼.
6. Repeat step 4.

   NOTE:
   - Recommended changer pressure:
     294–392 kPa (3–4 kg/cm^2, 43–57 psi)
   - When the changer is used, open and close the bleed screw quickly.

ALB control system:

1. Install the changer on the modulator reservoir.
2. Follow the steps described on the manual bleeding on page 20-90.



Air Bleeding

Air Bleeding (with a vacuum changer)

The numbers ❶ thru ❼ indicate the bleeding sequence.

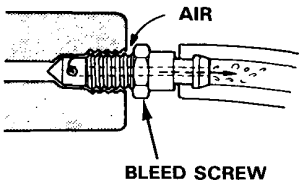
Main Brake system:

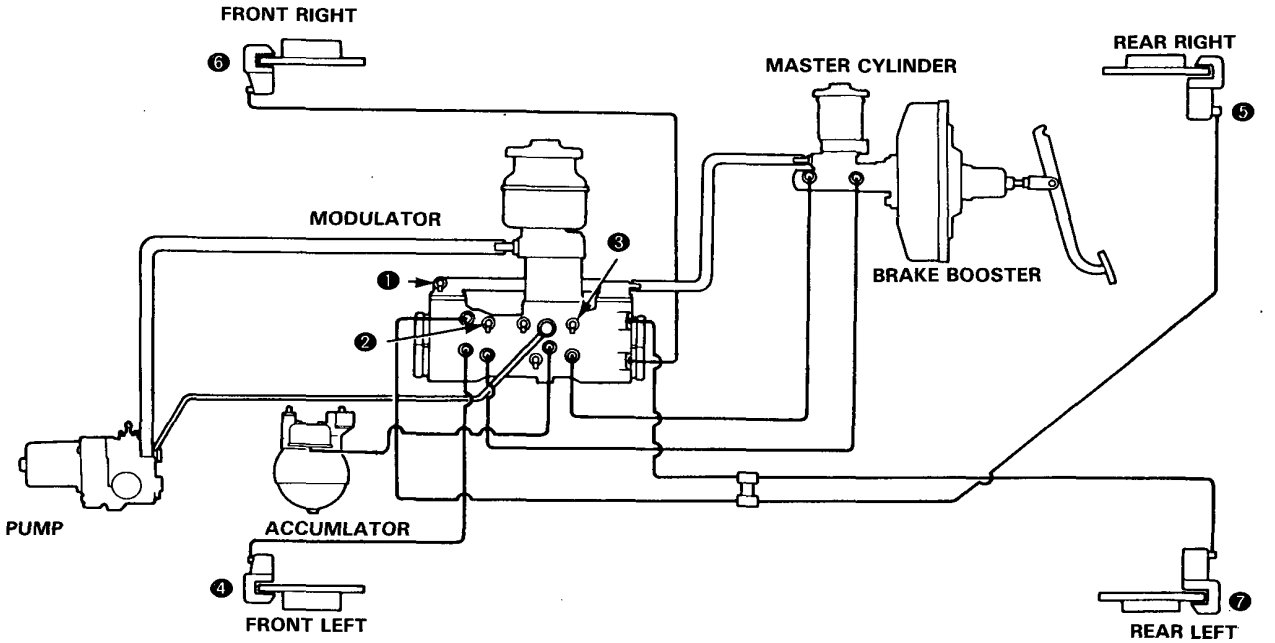
1. *Fill the master cylinder reservoir up to the MAX level.*
2. Install the changer.
3. Close the changer valve when the level of the fluid in the reservoir falls 10 mm (0.4 in).

   NOTE: Air will be sucked in through the bleed screw when the vacuum valve is opened. To cope with this, after the bleeding with the valve fully opened, open the valve slightly so that the least possible amount of fluid is sucked in by the changer. Before closing, have someone pump the brake pedal to make sure there is no air in the system.

ALB control system:

Follow the steps for manual bleeding on page 20-90.

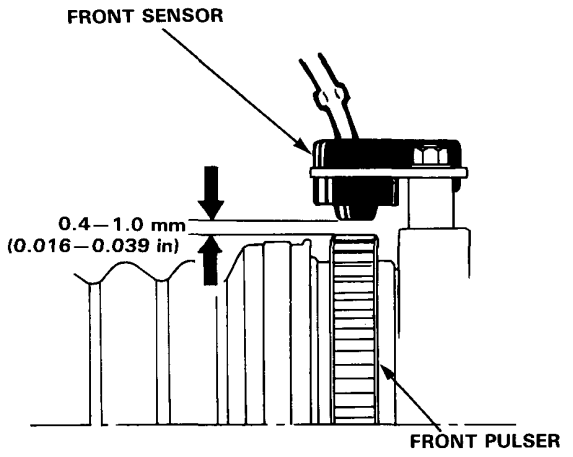




Inspection

Front

1. Check the pulser for chipped or damaged teeth and replace if necessary (page 20-95).



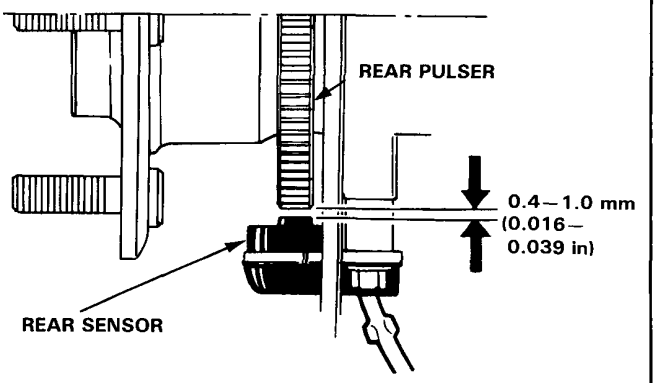
2. Measure air gap between the sensor and pulser all the way around while rotating the driveshaft by hand.

   STANDARD: 0.4—1.0 mm (0.016—0.039 in.)

   NOTE: If the gap exceeds 1.0 mm (0.039 in.), the probability is a distorted knuckle which should be replaced.

Rear

1. Check the rear pulser for chipped or damaged teeth and replace if necessary (page 20-95).



2. Measure the air gap between the sensor and pulser all the way around while rotating the hub until by hand.

   Standard: 0.4—1.0 mm (0.016—0.039 in)

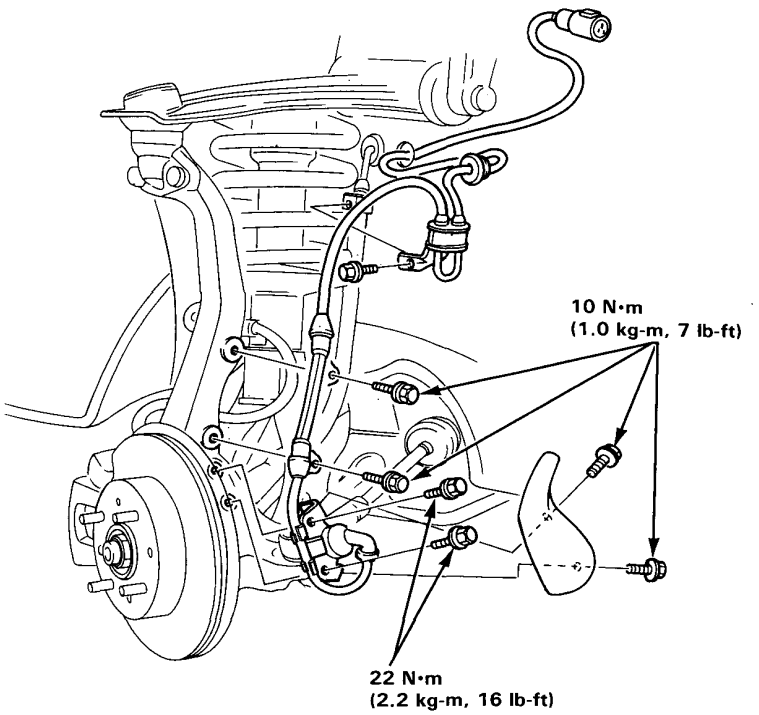
   NOTE: If the gap exceeds 1.0 mm (0.039 in.), the probability is a distorted knuckle which should be replaced.

Sensor

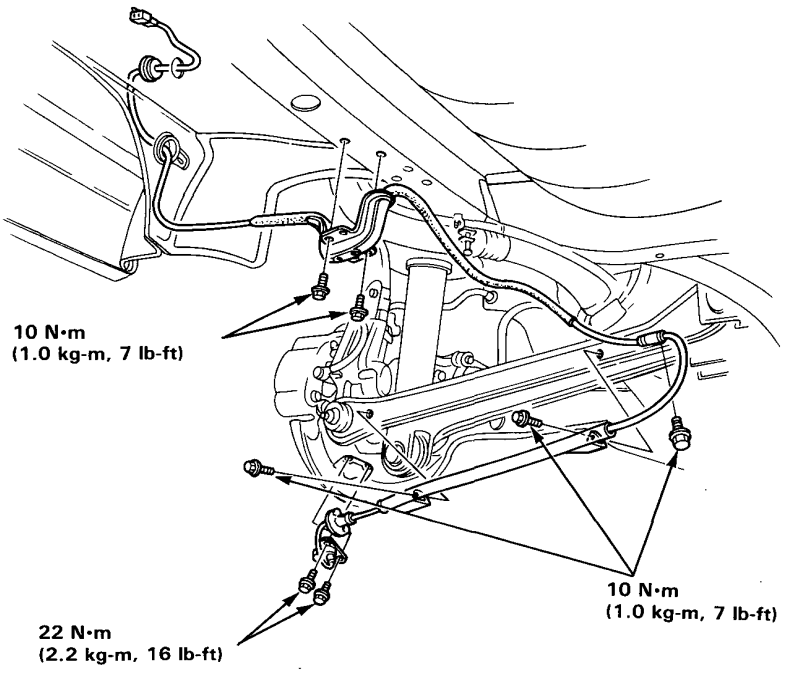
Replacement

NOTE: Be careful when installing the sensors to avoid twisting the wires using the white line on the wires as a guide.

FRONT



REAR



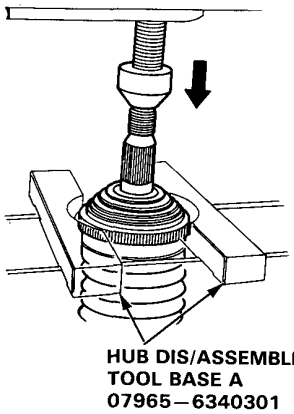
Pulser

Replacement

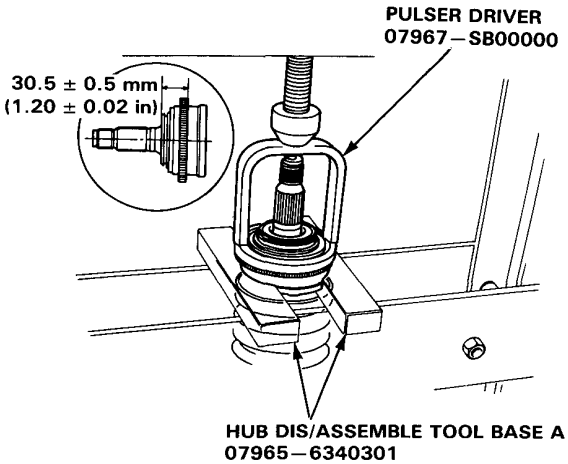
Front

1. Remove the driveshaft.
2. Remove the outboard CV joint boot band and slide the boot.
3. Press the pulser off the driveshaft using the hub dis/assembly tool base A (special tool) and hydraulic press.

CAUTION: The driveshaft will drop when it clears of the pulser.



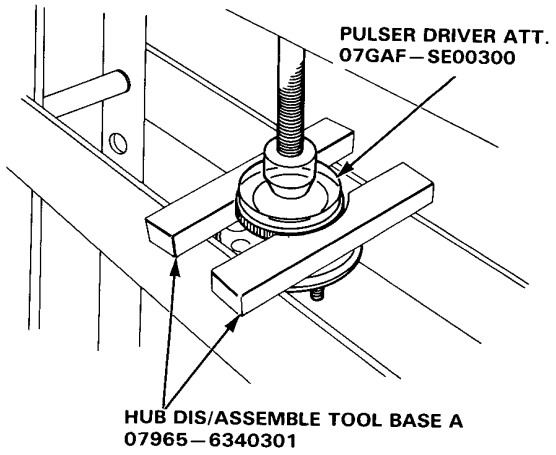
4. Clean the pulser attaching surface thoroughly.
5. Support the outboard joint with the hub dis/assemble tool base A.
6. Press a new pulser onto the outboard joint using the pulser driver (special tool) and a hydraulic press.



Rear

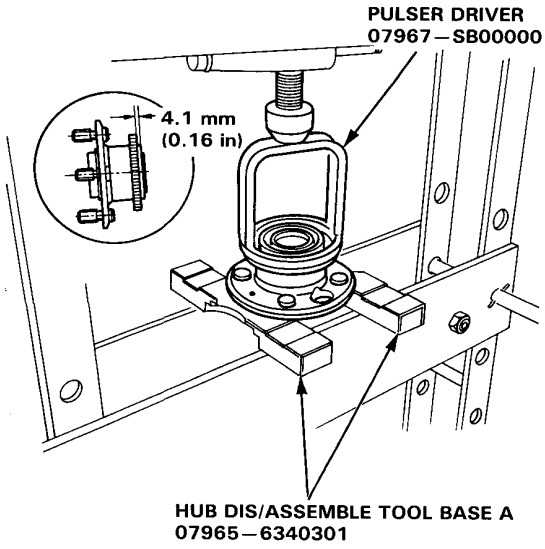
1. Remove the hub unit bearing.
2. Press the pulser off the hub unit using the pulser driver attachment and hub dis/assemble tool base A (special tools).

NOTE: Press the hub unit bearing outer race.



Clean the pulser attaching surface thoroughly.

3. Clean the pulser attaching surface thoroughly.
4. Support the hub unit bearing with the hub dis/assemble tool base A.
5. Press a new pulser onto the hub unit bearing using the pulser driver and hydraulic press.

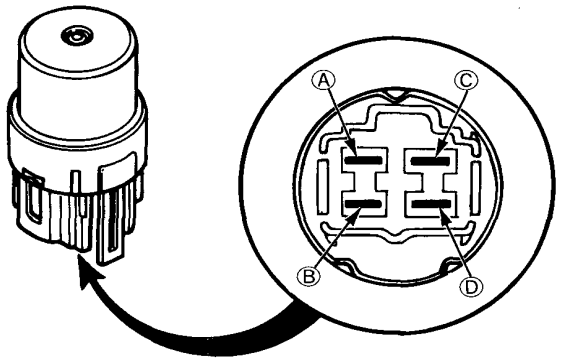


Relay

Inspection

There should be continuity between the A and B terminals when the battery positive cable is connected to the C terminal and negative cable to the D terminal.

There should be no continuity when the battery is disconnected.

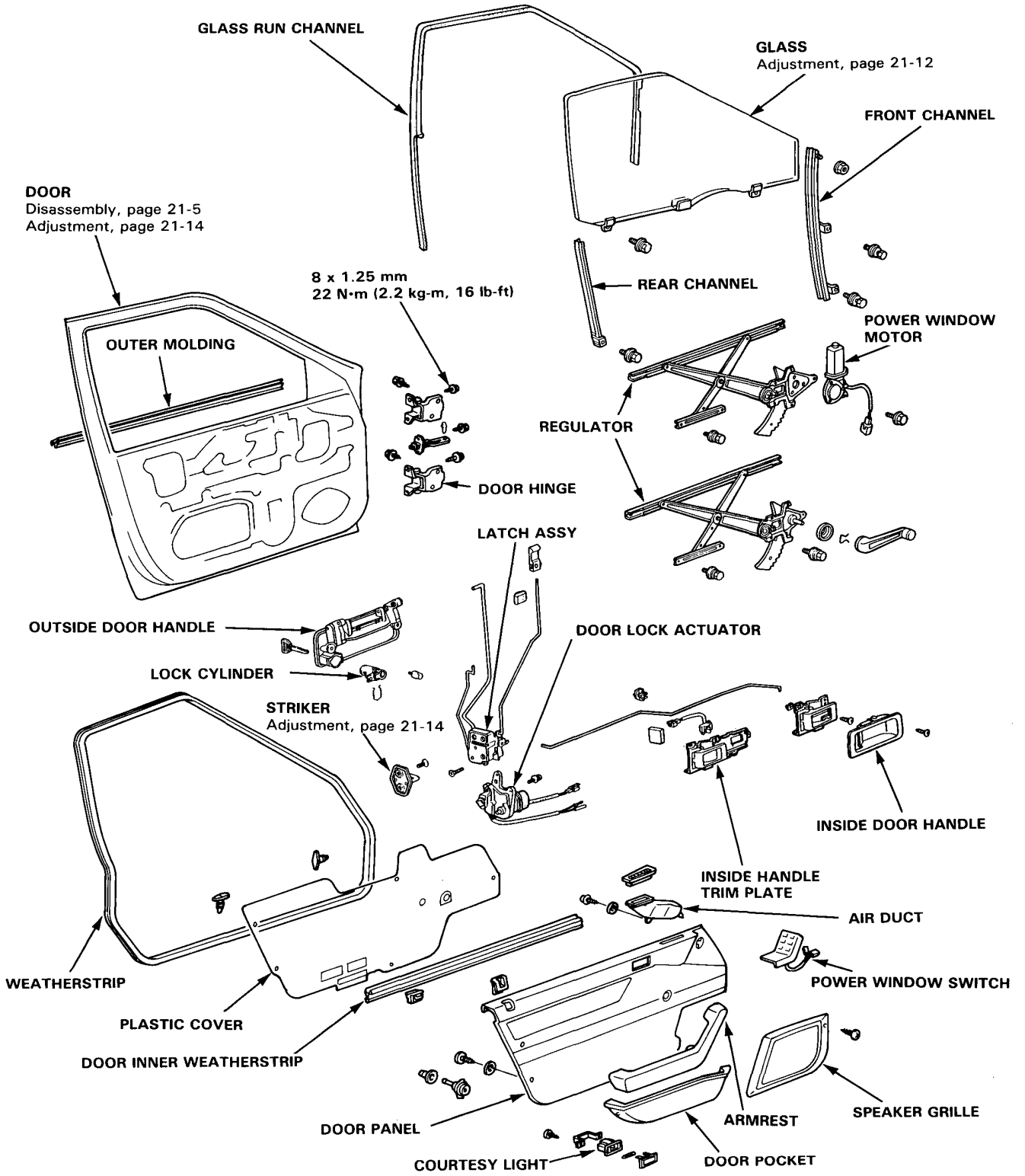


Body

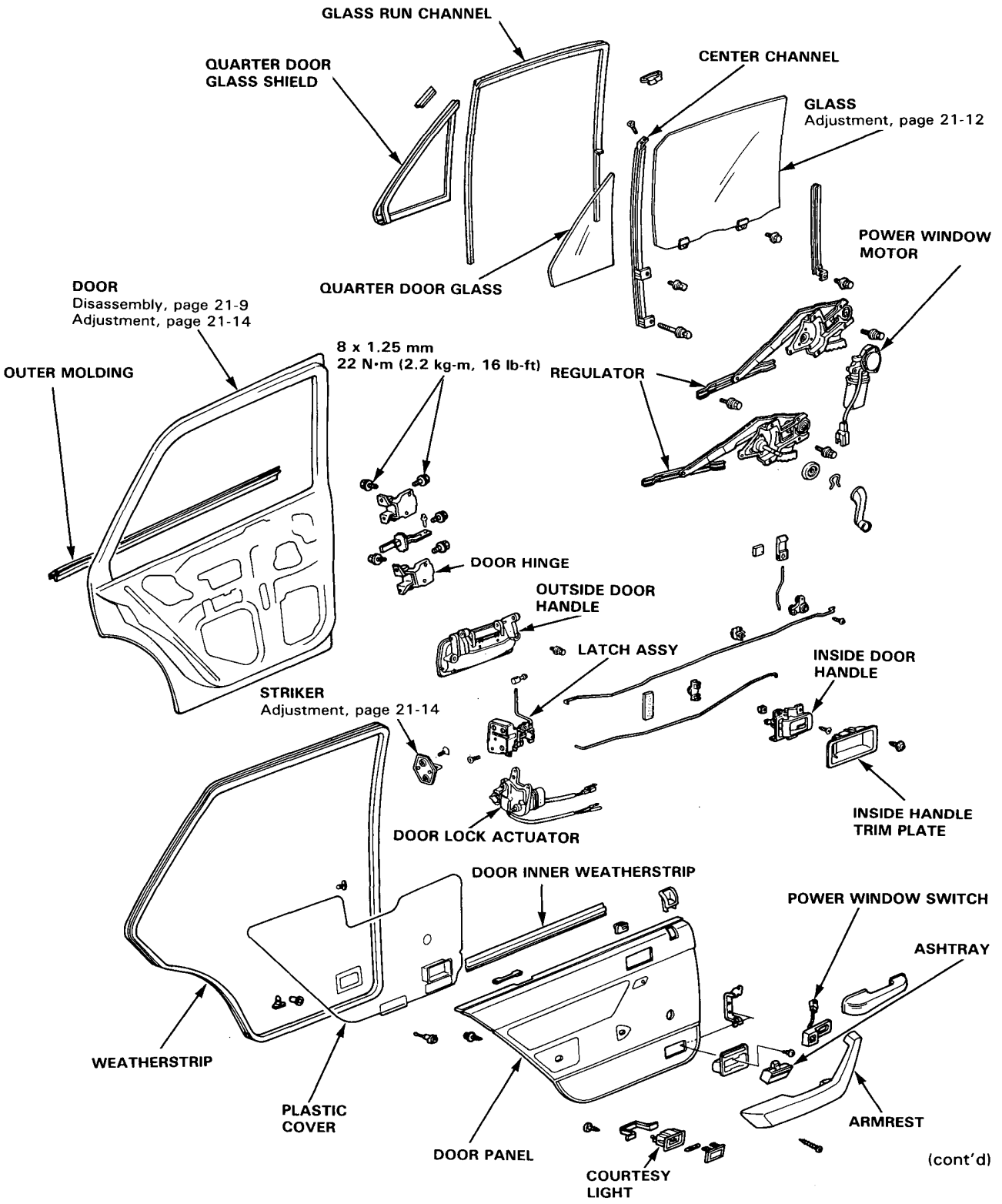
Doors

Index

Sedan Front



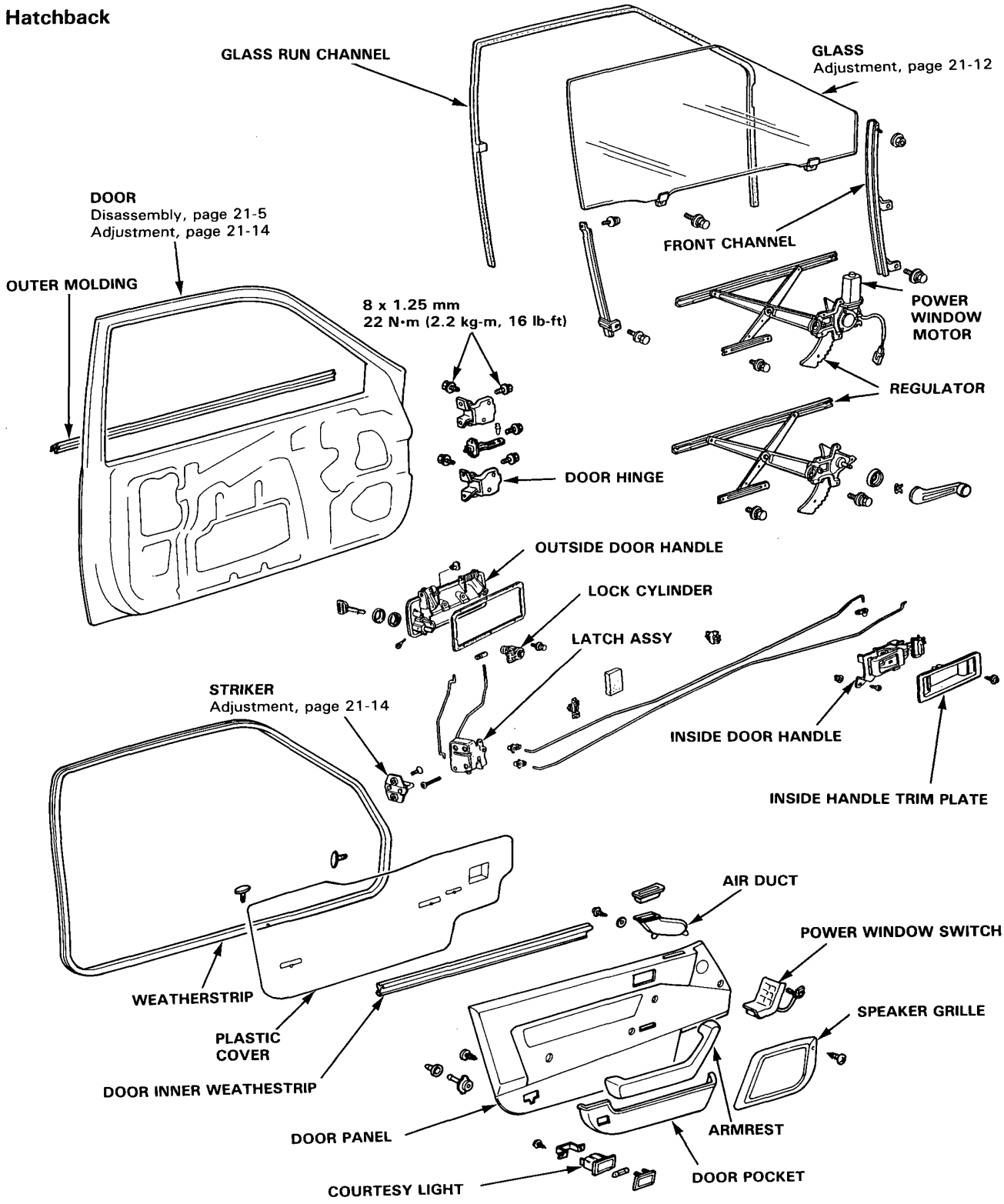
Sedan Rear



(cont'd)

Index (cont'd)

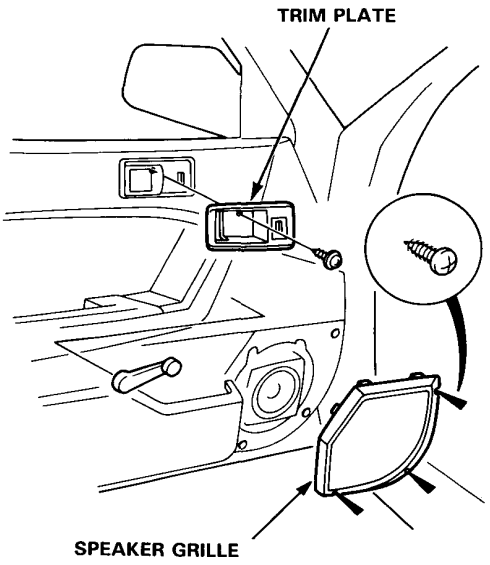
Hatchback



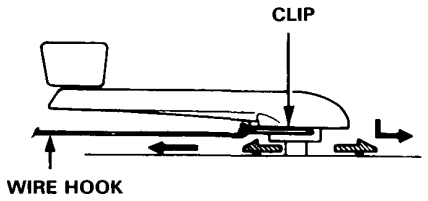
Front Door Disassembly

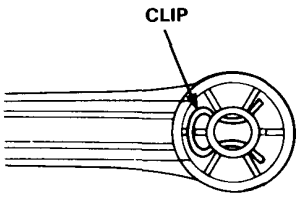
1. Remove the trim plate screw, then carefully remove the trim plate.

2. Remove the speaker grille.



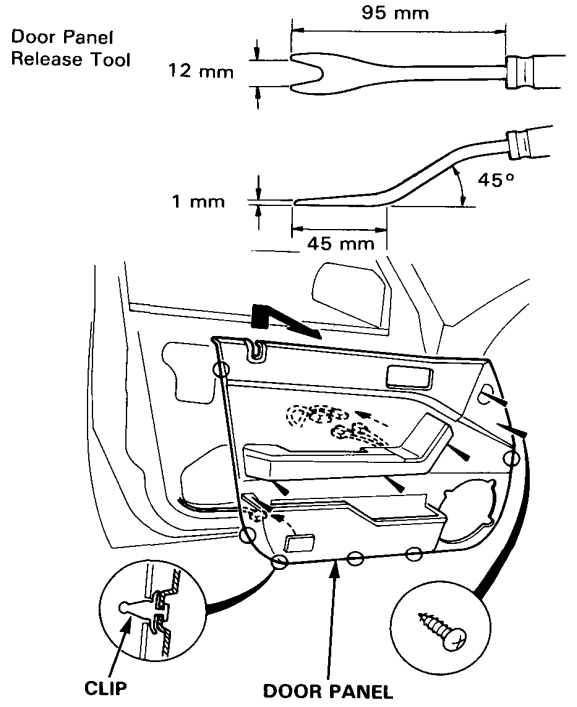
3. If applicable, remove the regulator handle by pulling the clip out with a wire hook.



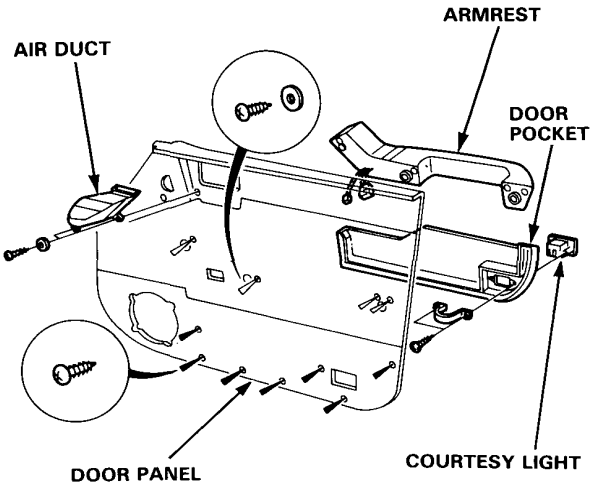


4. Remove the 3 armrest screws and 4 door panel screws, then pry apart the door panel clips. Lift the door panel straight up off the sill, and disconnect the courtesy light and power window wires.

   NOTE: The armrest and courtesy light are removed with the door panel.



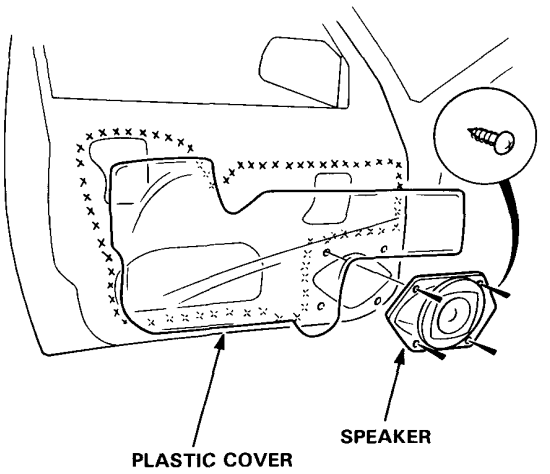
5. Remove the armrest, door pocket and courtesy light, from the door panel as required.



(cont'd)

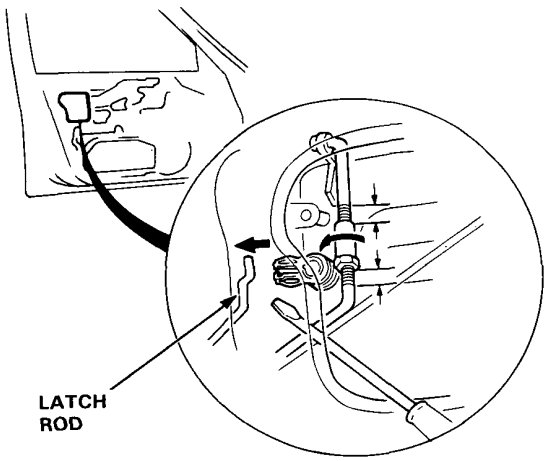
Front Door Disassembly (cont'd)

6. Remove the speaker, then carefully remove the plastic cover.



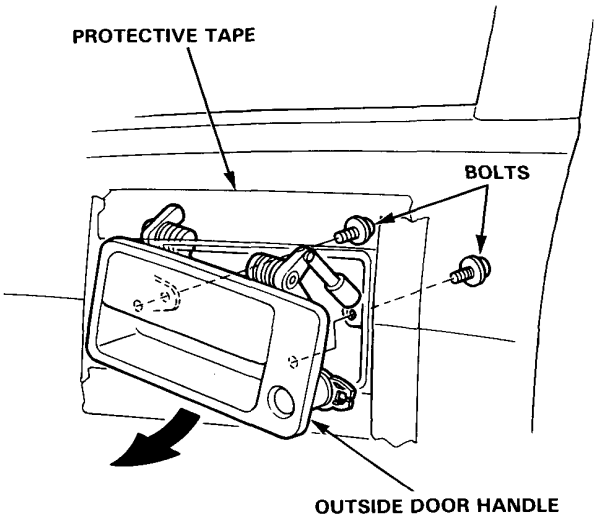
7. With the window glass rolled up fully, pry the door handle latch rod out of its joint using a flat screwdriver. Turn the joint as shown.

NOTE:
- To ease reassembly, note the location of the rod on the joint before disconnecting it.
- On power window equipped models, re-connect the window switch or a 12V battery to operate the window regulator.

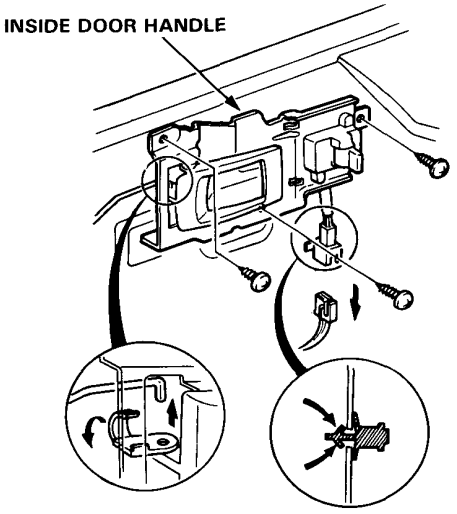


8. Remove the 2 bolts, then remove the door handle.

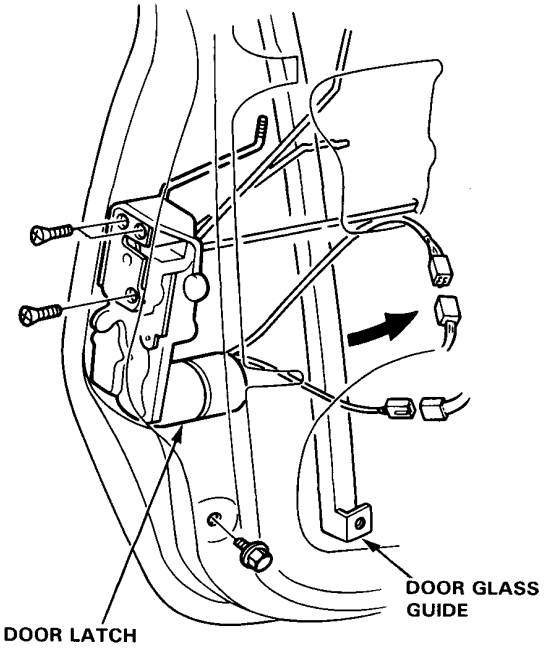
NOTE: Use protective tape around the edge of the door handle to prevent scratching the paint.



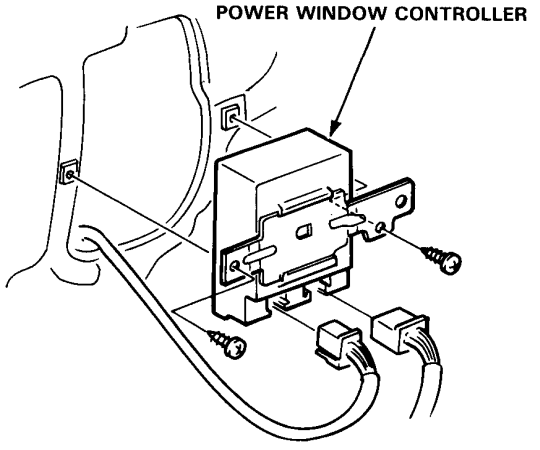
9. Remove the 3 screws and disconnect the wire harness and the rod, then remove the inside door handle.



10. Remove the lower bolt of the door glass guide and slide the door glass guide.
Remove the screws and take the door latch off the door, then push the door latch and rod inside the door.

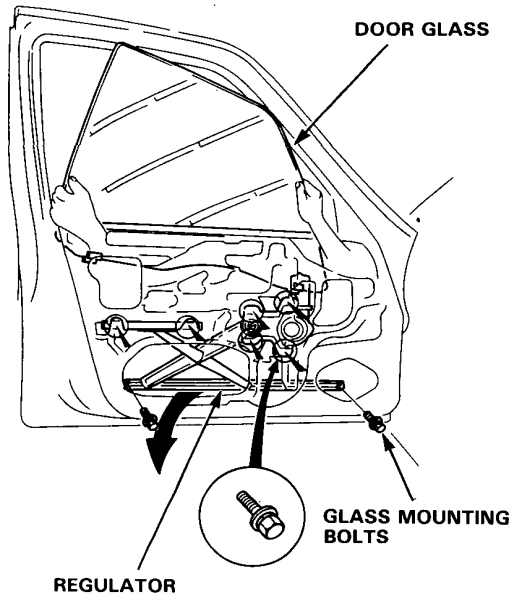


Disconnect the wire harness and remove the 2 screws, then remove the power window controller.

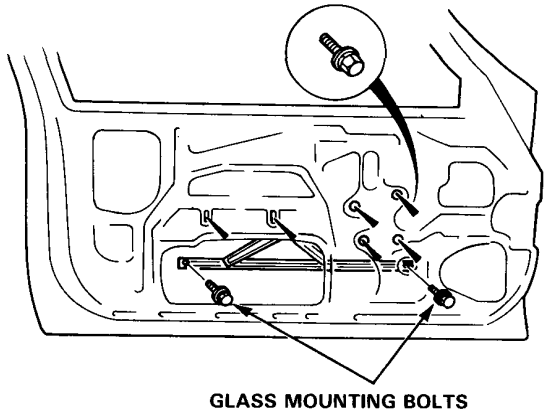


11. Carefully lower the door glass until you can see its mounting bolts. Loosen the bolts and pull the door glass out through the window slot.
Remove the regulator mounting bolts, then take out the regulator assembly through the lower hole in the door.

Sedan



Hatchback



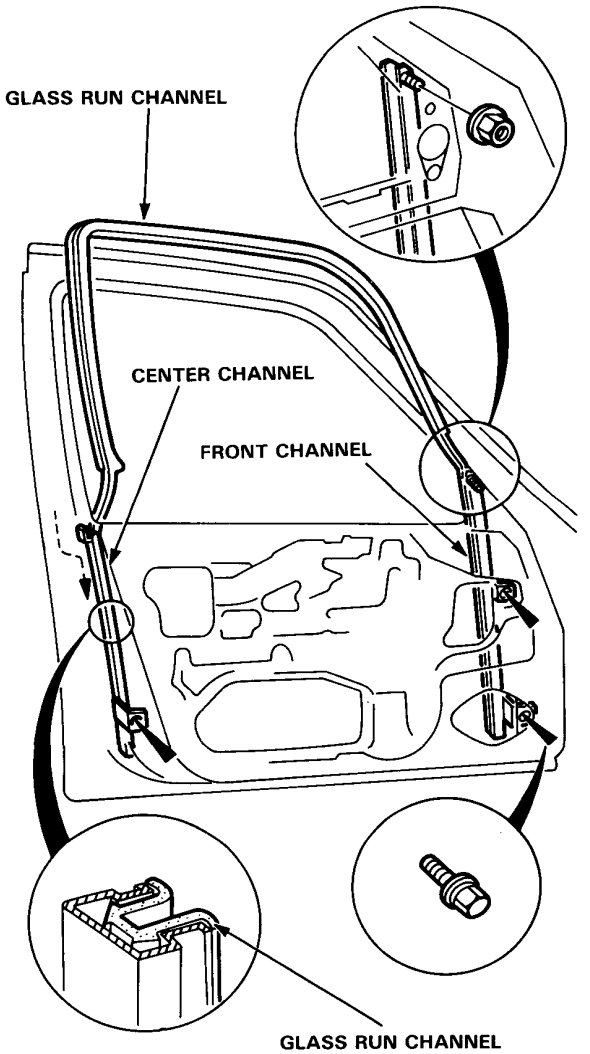
(cont'd)

Front Door Disassembly (cont'd)

12. Remove the glass run channel.
13. Remove the front channel by removing the 2 bolts and the nut.
14. Remove the bolt and the upper hook, then remove the center channel.

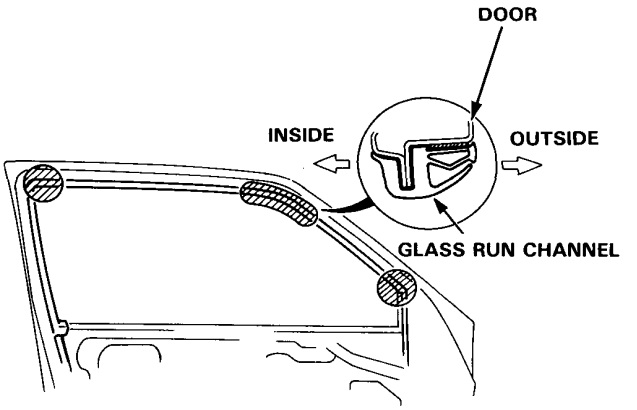
    NOTE: Before installation insert the glass run channel into the front and the center channel.

Sedan



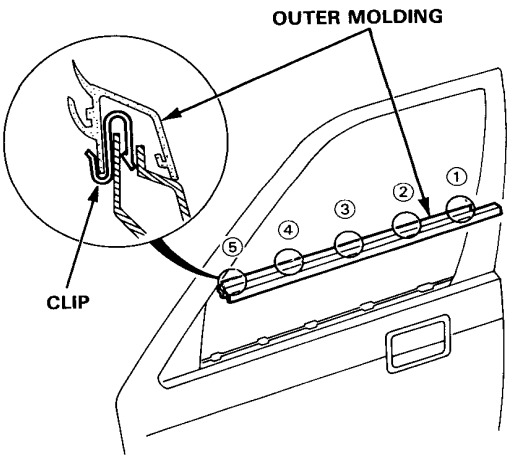
Hatchback

- Attach three patches of dual-face adhesive tape to the run channel as shown.

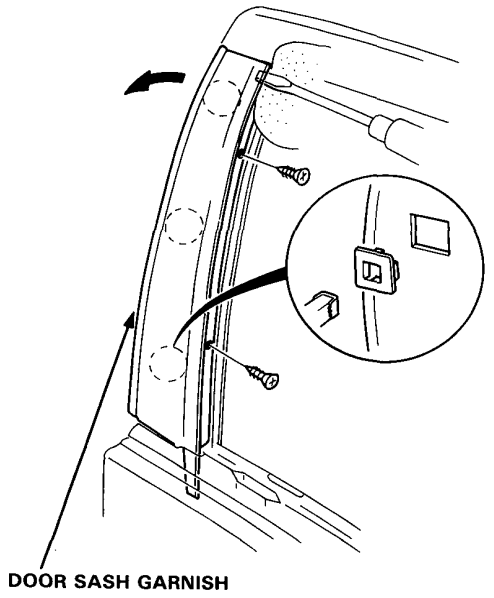


15. Remove the door mirror. (pages 21-15, 16)
    Remove the outer molding prying up on molding starting at the rear.

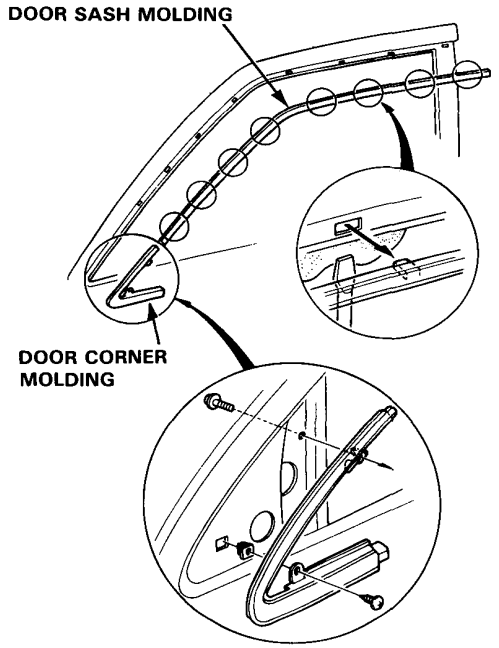
    NOTE: The outer molding can be replaced without door disassembly.



16. Remove the 2 screws and the 3 clips, then remove the door sash garnish by prying as shown, starting of the top.



17. Remove the door sash molding by pulling it by hand, starting at the top rear corner.

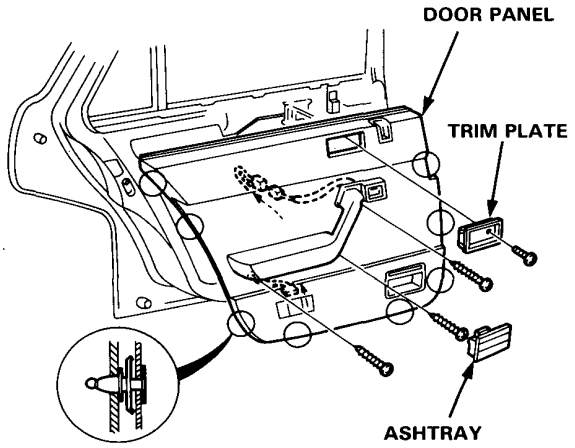


Rear Door Disassembly

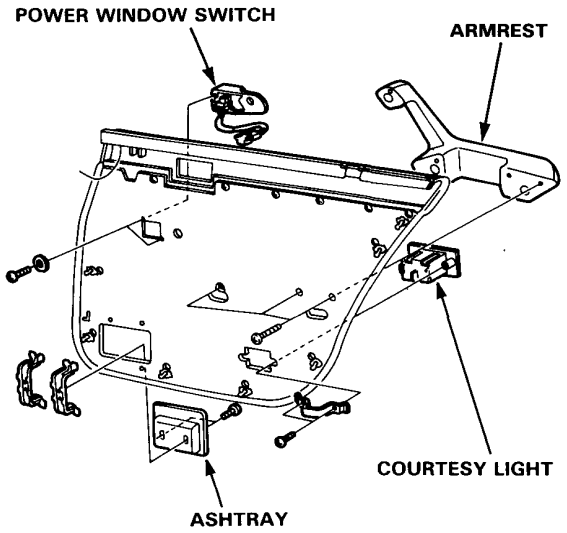
1. Remove the trim plate by removing the screw and remove the screws of armrest.

   NOTE:
   - The armrest and courtesy light stay on the door panel.
   - The regulator is removed by the same way of the front door.

2. Pry apart the 8 clips and lift the door panel straight up off the window sill. Disconnect the wire connector of the power window and courtesy light.



3. Remove the ashtray by removing the 2 screws. Remove the armrest and courtesy light and power window switch by removing the mounting screws.

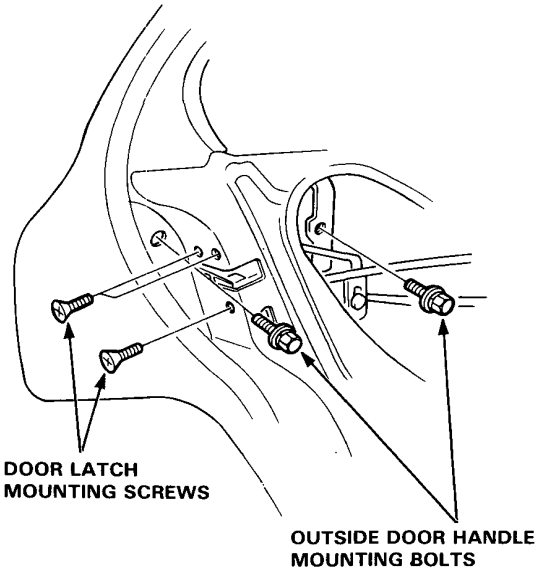


4. Peel off the plastic cover without tearing it.

(cont'd)

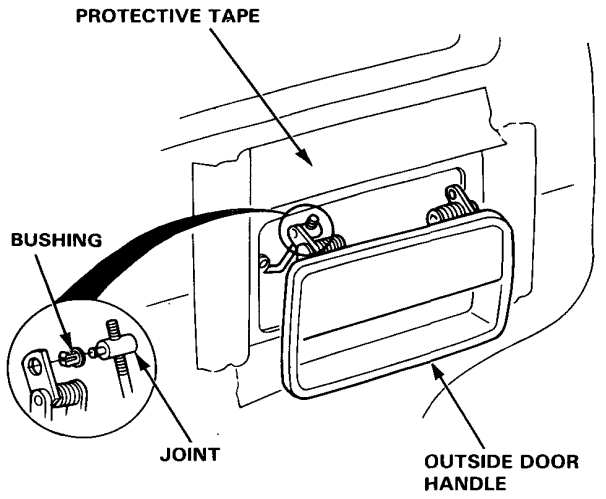
Rear Door Disassembly (cont'd)

5. Remove the 3 screws of the door latch, and remove the 2 bolts of the outside door handle.

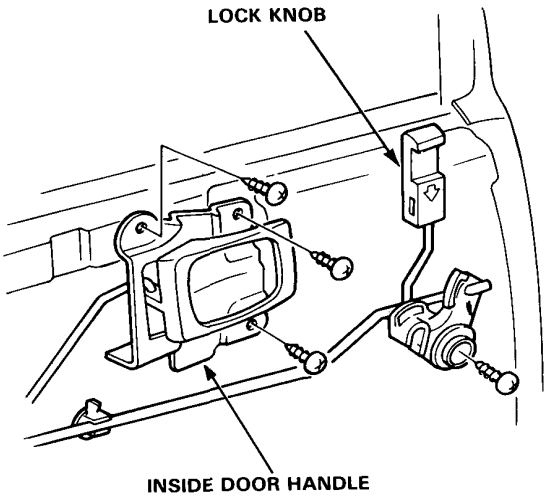


6. Pull the outside door handle out, and pry the joint off the handle with a flat screwdriver. Remove the handle from the rod.

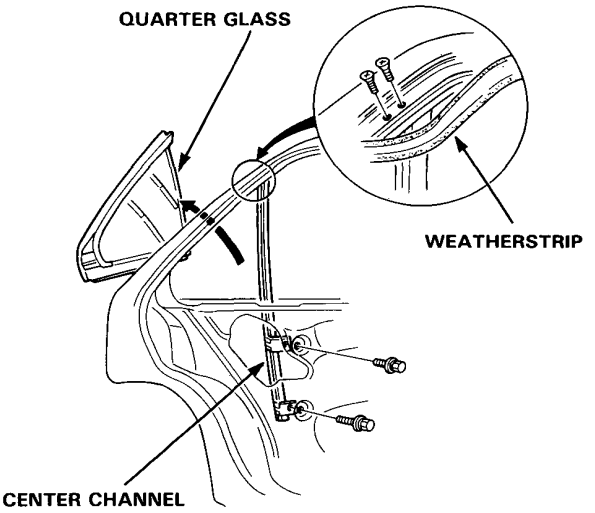
   NOTE: To prevent damage to the door finish, attach protective tape to the door surface around the door handle.



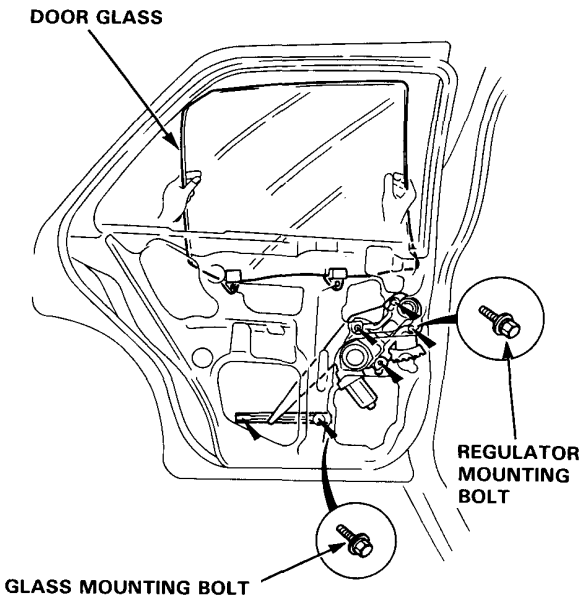
7. Remove the 2 screws of the inside door handle and the screw of the lock knob, then remove it from the door.



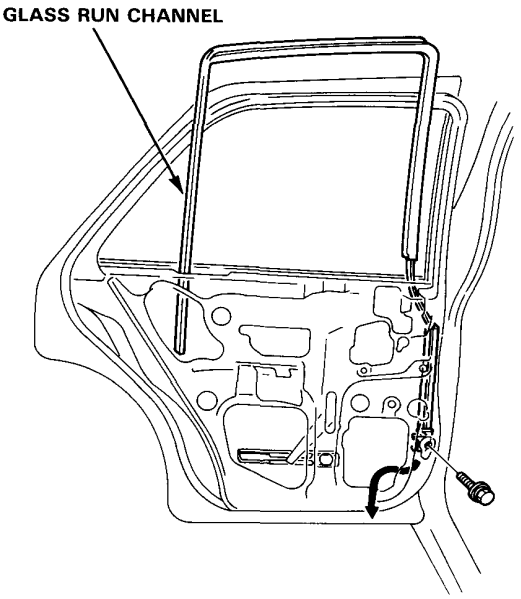
8. Peel the weatherstrip off and remove the 2 screws as shown. Remove the 2 channel bolts, then remove the center channel. Remove the quarter glass.



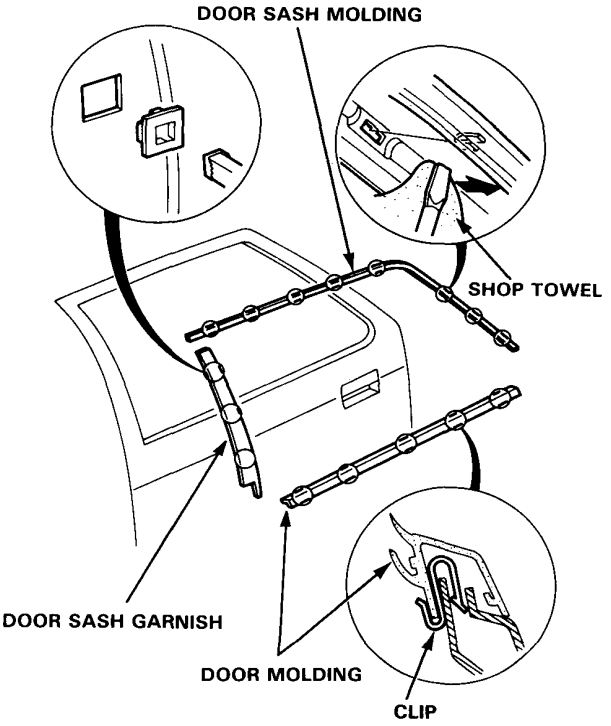
9. Caretully lower the door glass until you can see its mounting bolts, then loosen the bolts. Pull the door glass out through the window slot.



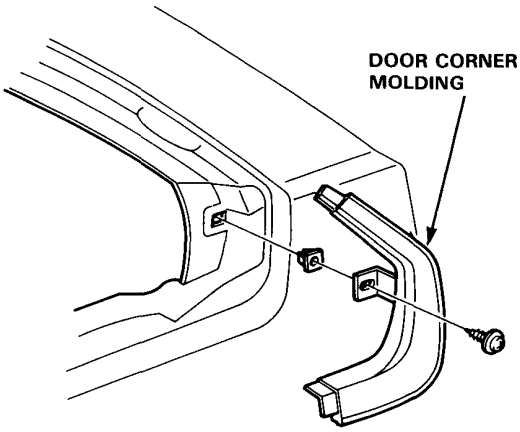
10. Remove the glass run channel and the bolt, then remove the rear channel.



11. Remove the door sash molding, door molding and door sash garnish in the same way as the front door (page 21-9).



12. Remove the door corner molding by removing the screw.

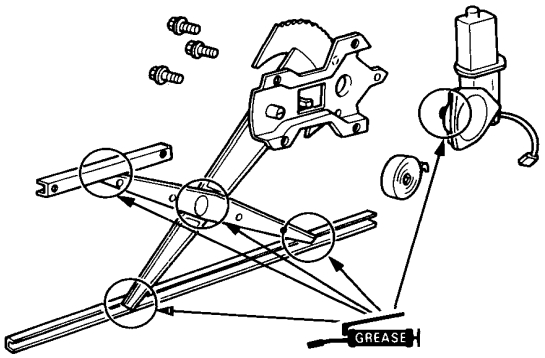


Assembly

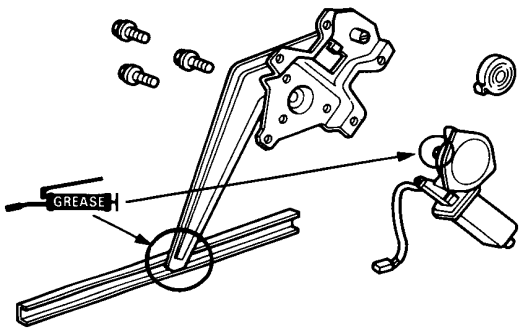
Assemble the door in the reverse order of disassembly, and also:

1. Grease all the sliding surfaces of the window regulator where shown.

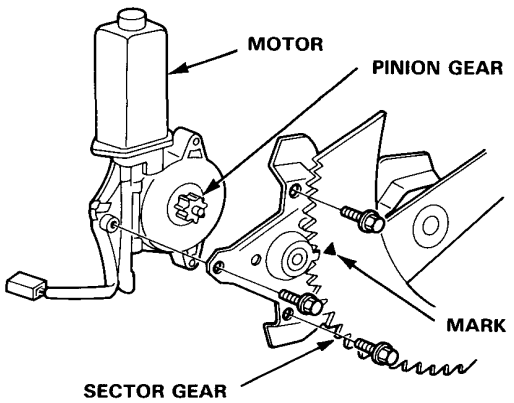
Front



Rear

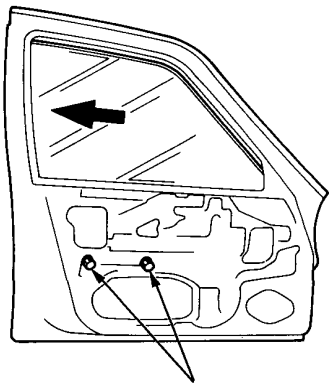


2. Position the motor on its mount by aligning the pinion with the sector, and install using the three mount bolts. Move the window regulator to the original position by connecting a 12V battery to the motor.

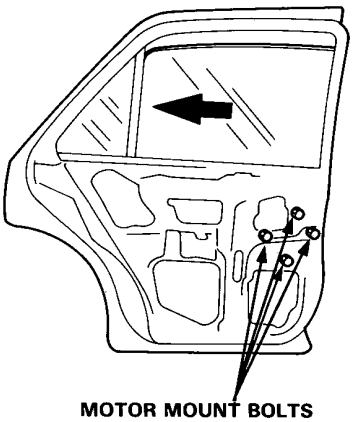


3. To adjust glass fit in the door, raise the glass as far up as possible and hold it against the door sash. Then, tighten the roller guide bolts or motor mount bolts.

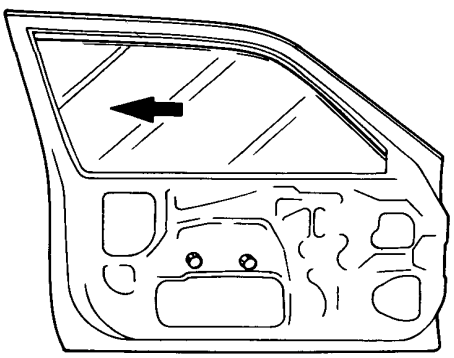
Sedan Front



Sedan Rear

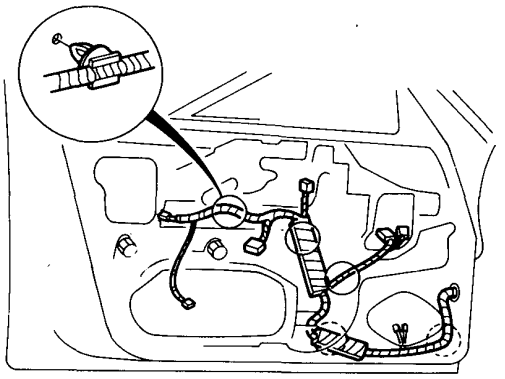


Hatchback

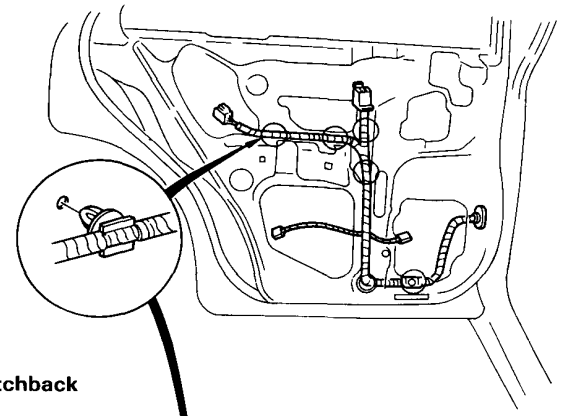


4. Fix the wire harness correctly on the door.

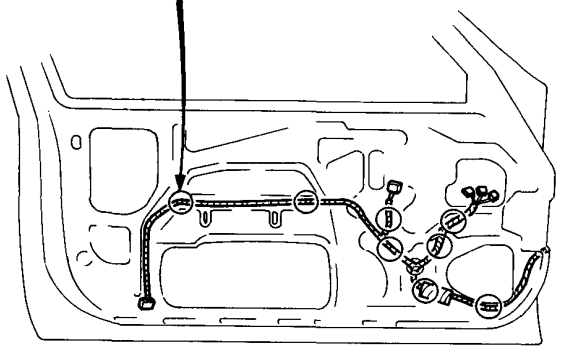
Sedan Front



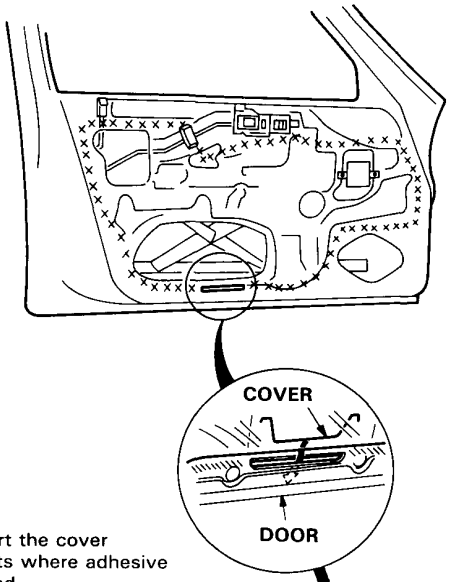
Sedan Rear



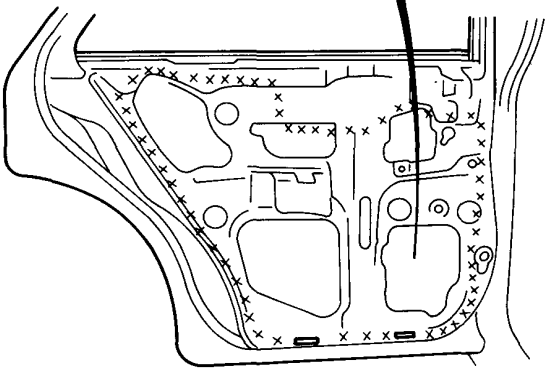
Hatchback



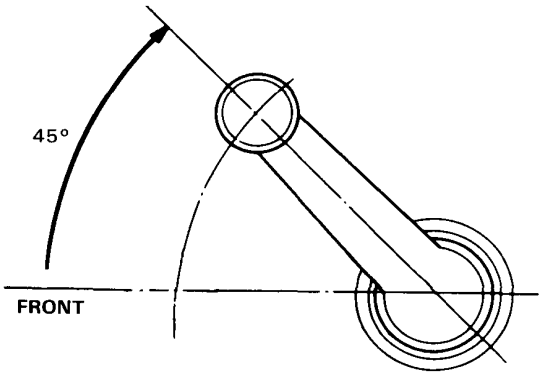
5. When reinstalling the plastic cover, apply adhesive along the edge where necessary to maintain a continuous seal and prevent air/water leaks.



NOTE: Insert the cover into the slots where adhesive is not applied.



6. Install the regulator handle so it points forward, and up at a 45 degree angle with the window closed.

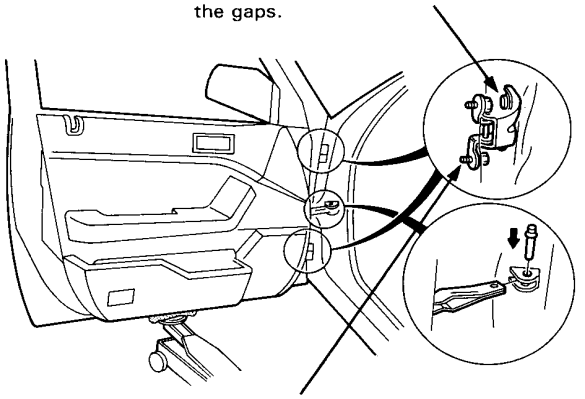


Door Position Adjustment

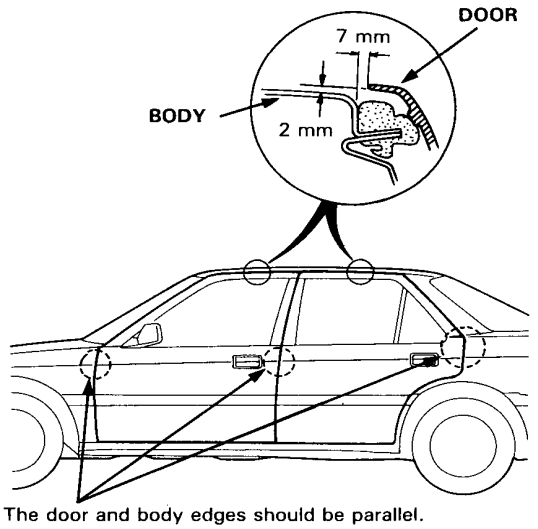
After installing the door, check for a flush fit with the body, then check for equal gap between the front and rear, and top and bottom door edges and the body. The door and body edges should also be parallel. Adjust at the hinges as shown.

CAUTION: Place a rag or shop towel on the jack to prevent damage to the door when the hinge bolts are loosened for adjustment.

HINGE MOUNTING BOLTS
Loosen the bolts, and move the door BACKWARD or FORWARD, UP or DOWN as necessary to equalize the gaps.



DOOR MOUNTING BOLTS
Loosen the bolts slightly to move the door IN or OUT until flush with the body. If necessary, you can install a shim behind one hinge to make the door edges PARALLEL with the body.

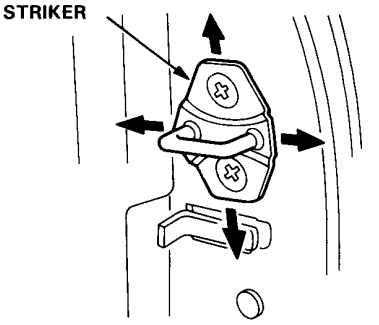


The door and body edges should be parallel.

Door Striker Adjustment

Make sure the door is not loose, and latches securely without slamming. If it needs adjustment:

1. Draw a line around the striker plate for reference.
2. Loosen the striker screws, and move the striker IN or OUT to make the latch fit tighter or looser. Move the striker UP or DOWN to align it with the latch opening. Then lightly tighten the screws and re-check.



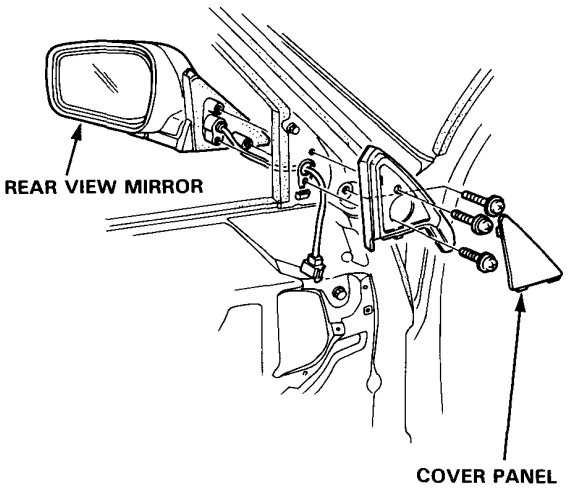
NOTE: Hold the outside handle out and push the door against the body to be sure the striker allows a flush fit.

3. If the door latches properly, tighten the screws and recheck.

Power Door Mirror

Removal

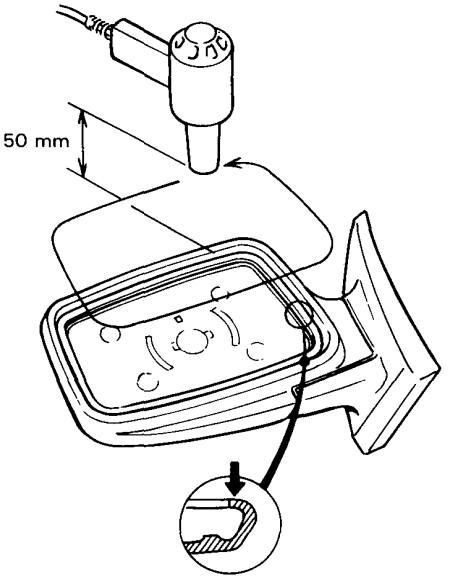
1. Remove the door panel and disconnect the power mirror wires.
2. Pry out the cover panel with a flat screwdriver.



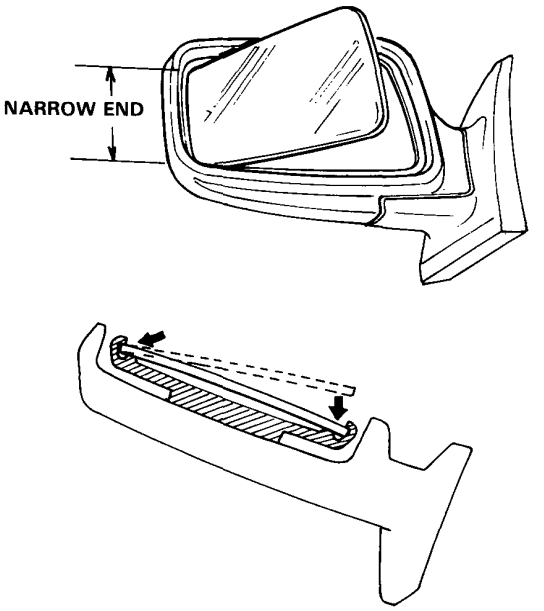
3. Remove the mirror mounting screws while holding the mirror.

Mirror Glass Replacement

1. Heat the edge of the glass with a low powered heat gun for several minutes, then remove the glass.



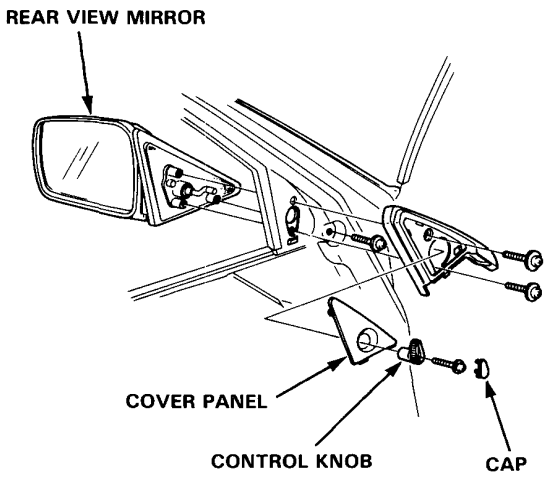
2. Install the glass in the mirror case, narrow end first.



Door Mirror

Removal

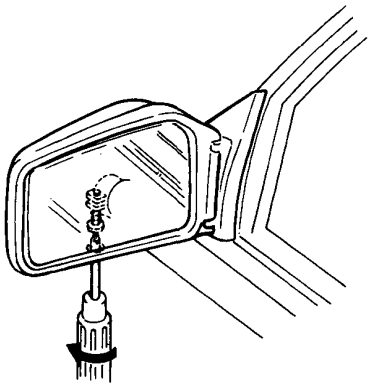
1. Remove the cap and the screw, then remove the control knob.



2. Remove the cover panel.
3. Remove the mirror mounting screws while holding the mirror.

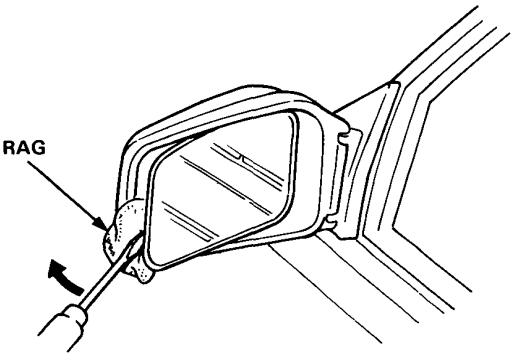
Mirror Glass Replacement

1. Insert a screwdriver in the mirror through the service hole, and loosen the glass retaining screw.

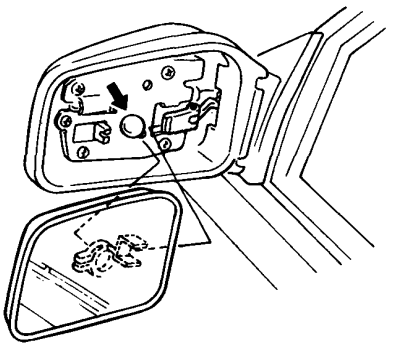


2. Carefully pry out the mirror with a screwdriver as shown.

CAUTION: To prevent damage to the mirror, wrap the end of the screwdriver with a rag or shop towel.

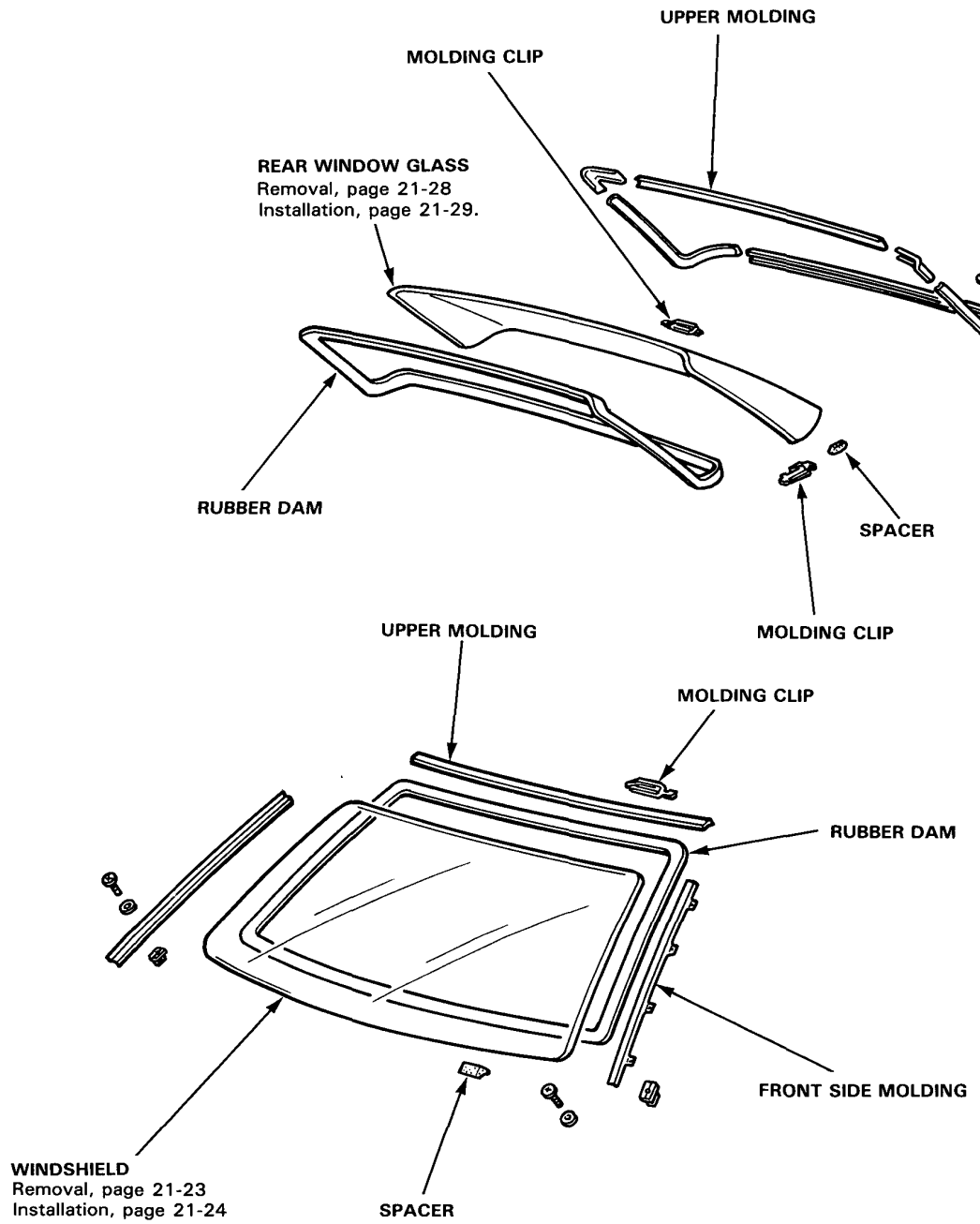


3. Install the mirror in the reverse order of removal, and also apply grease to the location indicated by the arrow.



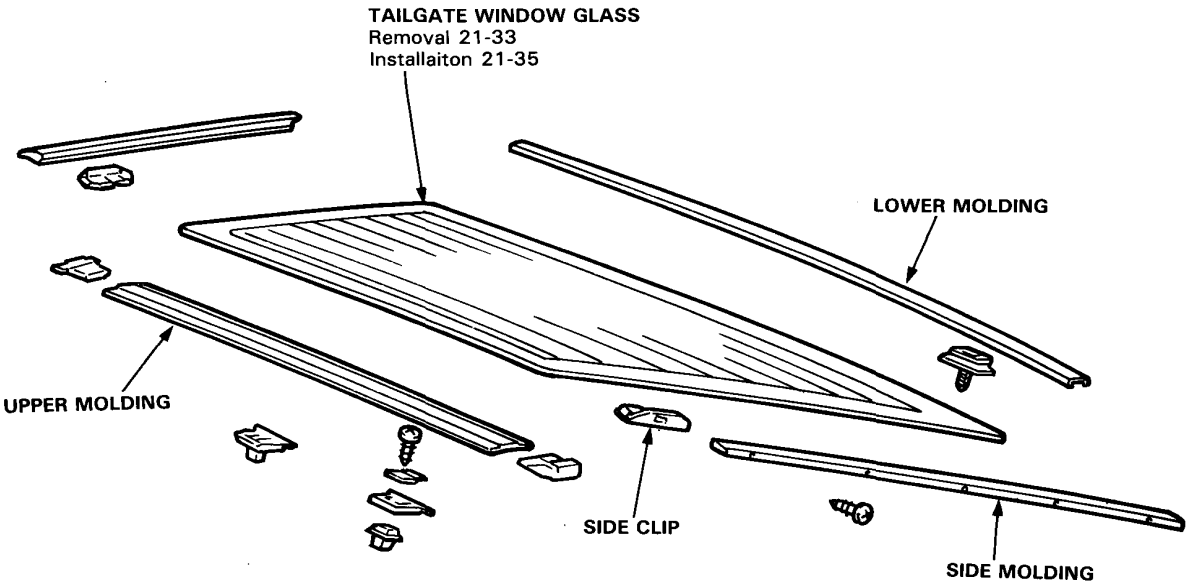
Index

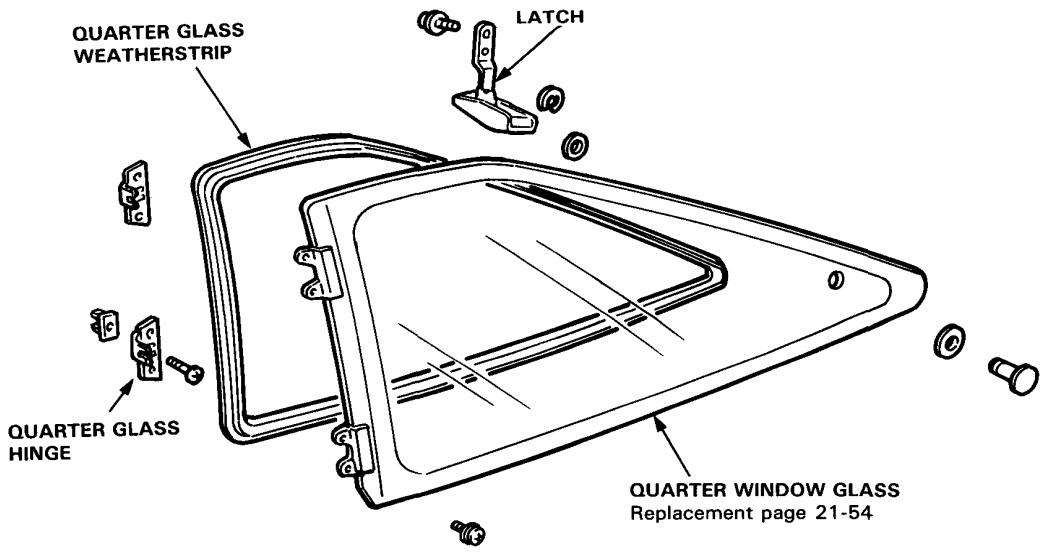
Sedan



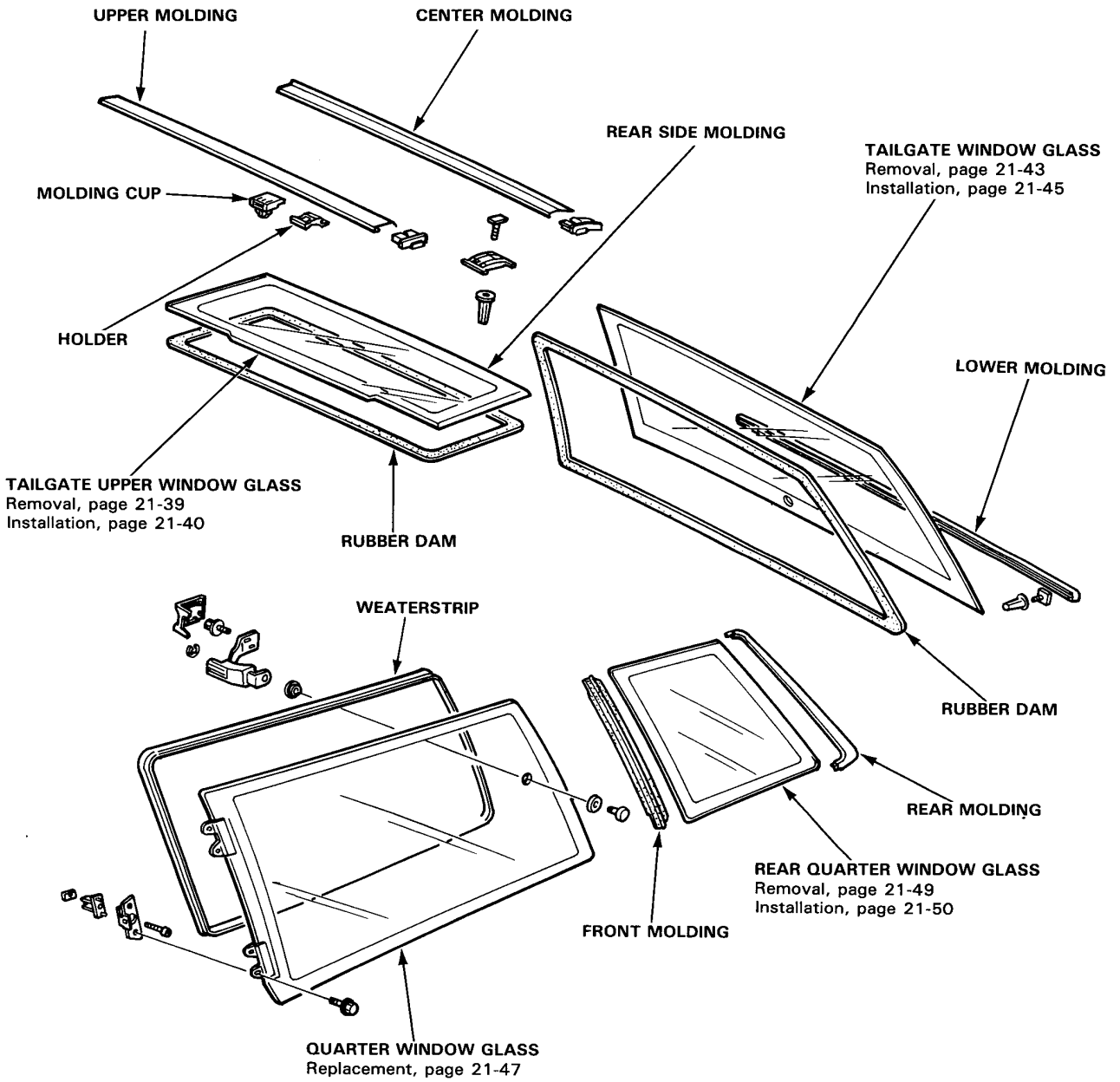
(cont'd)

Glass Back


TAILGATE WINDOW GLASS
Removal 21-33
Installaiton 21-35
LOWER MOLDING
UPPER MOLDING
SIDE CLIP
SIDE MOLDING

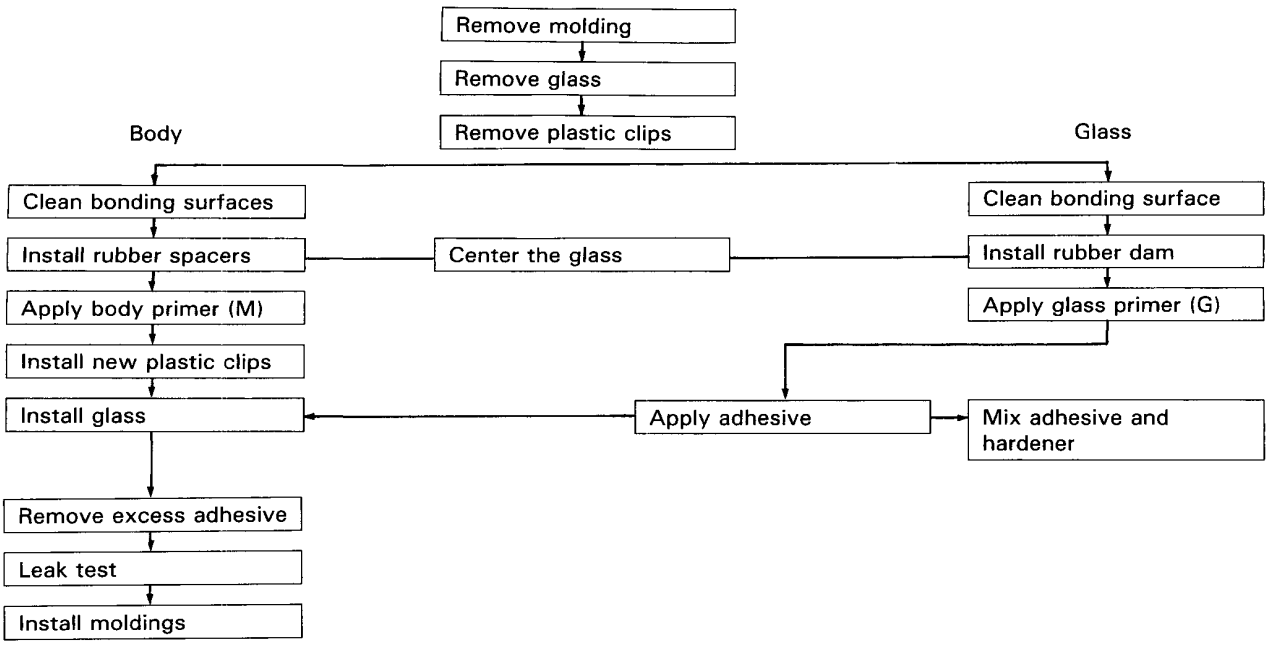

QUARTER GLASS
WEATHERSTRIP
LATCH
QUARTER GLASS
HINGE
QUARTER WINDOW GLASS
Replacement page 21-54

Aerodeck


UPPER MOLDING
CENTER MOLDING
REAR SIDE MOLDING
TAILGATE WINDOW GLASS
Removal, page 21-43
Installation, page 21-45
MOLDING CUP
HOLDER
LOWER MOLDING
TAILGATE UPPER WINDOW GLASS
Removal, page 21-39
Installation, page 21-40
RUBBER DAM
WEATERSTRIP
RUBBER DAM
REAR MOLDING
REAR QUARTER WINDOW GLASS
Removal, page 21-49
Installation, page 21-50
FRONT MOLDING
QUARTER WINDOW GLASS
Replacement, page 21-47

Windshield, Rear and Quarter Window Glass

Installtion



Parts

Part Number	Contents	Comment
Adhesive kit — Low temperature 08718—99960 High temperature 08718—99961	Adhesive sealant (500 g) Hardener (75 g) Glass primer G (20 g) Body primer M (20 g) Piano wire (0.6ϕ x 1 m (3f)) Gauze Cartridge Sponge	 For glass primer (G) For applying primers

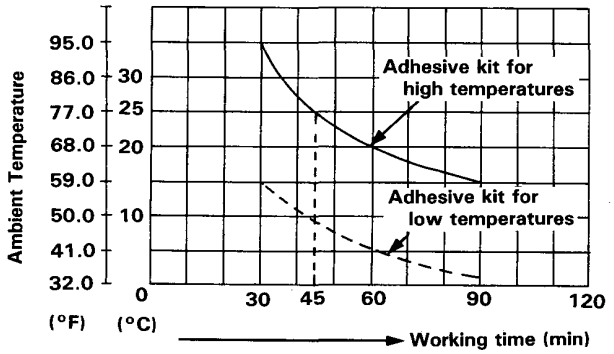
Tools

Tool/Material	Remarks
Glass or steel plate	To mix adhesive and hardener on
Putty knife	To mix adhesive and remove excess
Caulking gun	To apply bead of adhesive to windshield
Suction cups	To install windshield
Knife	To scrape bonding surface around window opening
Awl	To make hole through existing adhesive for piano wire
Two wood sticks	To hold piano wire
Toluene or alcohol	To clean bonding surfaces

Workable Time

Adhesive workable time varies widely according to temperature, so choose the correct adhesive kit for the temperature range you will be working in.
After mixing and applying adhesive, you should install the windshield within the time shown on the chart.

For example, when the ambient temperature is 25°C (77°F), the glass should be installed within 45 minutes using the high temperature type adhesive.
Kit part numbers and contents are listed on the page before.



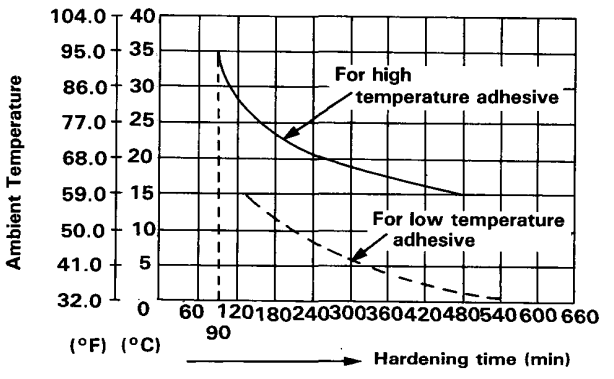
Notes

- Both kits have two types of adhesive primer: one for the body (metal), and one for glass.
- Always use new genuine Honda adhesive, or equivalent.
- Do not use the adhesive if 6 months have elapsed since date of manufacture.
- Store adhesive in a cool, dry place.
- Open only immediately before you are going to use it.

Hardening Time

Hardening time can be shortened by heating with infrared light.

For example, the adhesive will start to harden within 270 minutes mixing at 20°C (63°F). If however, it is heated to 35°C (95°F), it will start to harden within 90 minutes.



Windshield

Broken Glass Removal

Windshield:

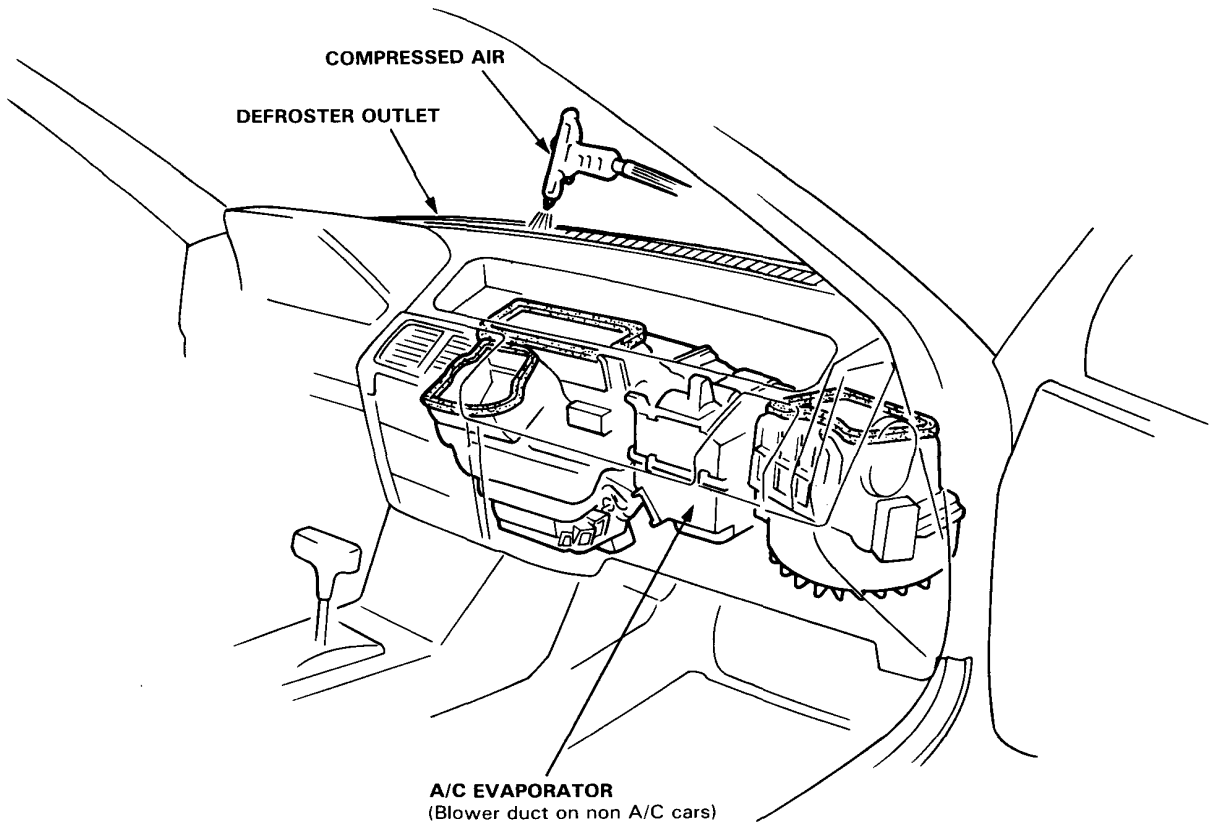
Remove as much broken glass as possible with a vacuum cleaner.

Blow out the glass in the heater and behind the dashboard with low pressure compressed air:

WARNING **Wear eye protection while using the air gun.**

1. Set the temperature control lever to COLD.
2. Push the HEAT button on the function panel.
3. Make sure the recirculation button is out (OFF).
4. Blow compressed air through the defroster center vent outlet.
5. Remove the blower duct, or A/C evaporator and remove any glass from the air mix chamber.
6. Remove any glass from the top of the vent/defrost door.
7. Remove any glass from the top and bottom of the carpet and seats with a vacuum cleaner

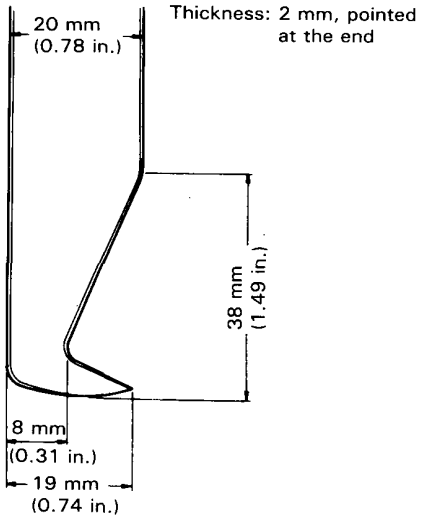
   NOTE: You should remove the seats and shake them to remove any glass.



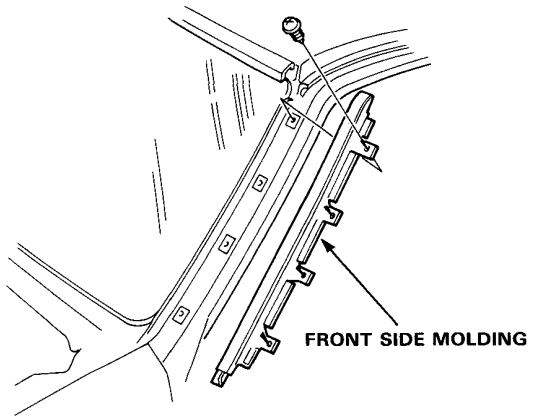
Removal

NOTE: You will need a molding clip release tool to remove some moldings. If necessary, make one that has the dimensions shown.

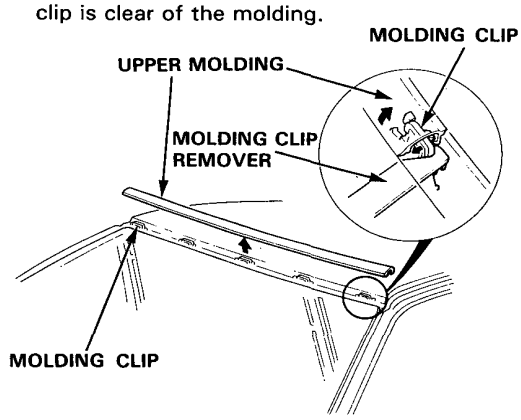
Molding Clip Release Tool



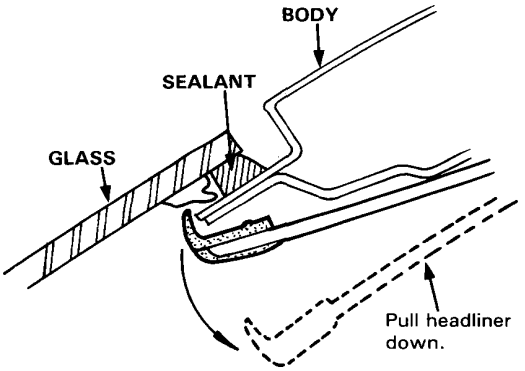
1. To remove the windshield, first remove the:
   - Inside rear view mirror (page 21-81).
   - Sun visor.
   - Front pillar garnish (pages 21-63 to 65).
   - Front wiper and air scoop.
2. Remove the front side molding.



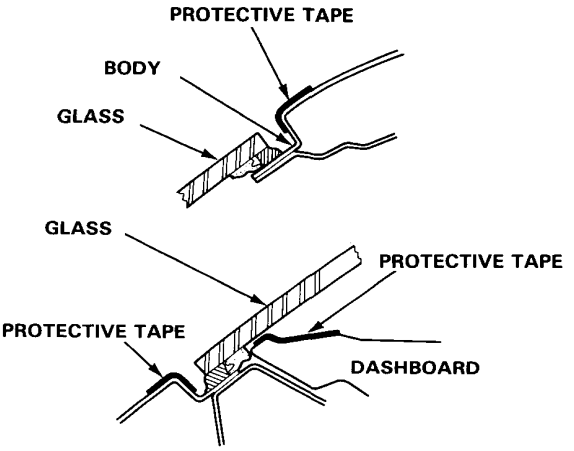
3. Raise the upper molding a little away from the windshield at the locations where the molding clips are used, then apply the end of the molding clip remover to each clip, and pull it toward you until the clip is clear of the molding.



4. Then pull down the front or rear edge of the headliner so it will not interfere with the glass removal.



5. Apply protective tape along the edge of the dashboard and body next to the glass as shown.

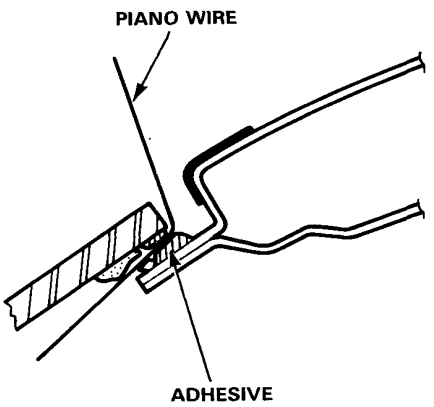


(cont'd)

Windshield

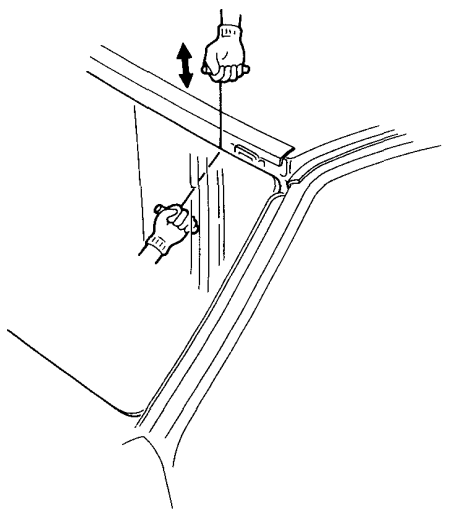
Removal (cont'd)

6. Using an awl, make a hole through the adhesive from inside the car. Push piano wire through the hole and wrap each end around a piece of wood.



7. With a helper on the outside, pull the wire back and forth in a sawing motion and carefully cut through the adhesive around the entire glass.

   CAUTION: Hold the piano wire as close to the glass as possible to prevent damage to the body and dashboard.



8. Remove the molding clips and the rubber dam.

Installation

1. Scrape the old adhesive smooth with a knife, to a thickness of about 2 mm (0.08 in.) on the bonding surface around the entire glass flange.

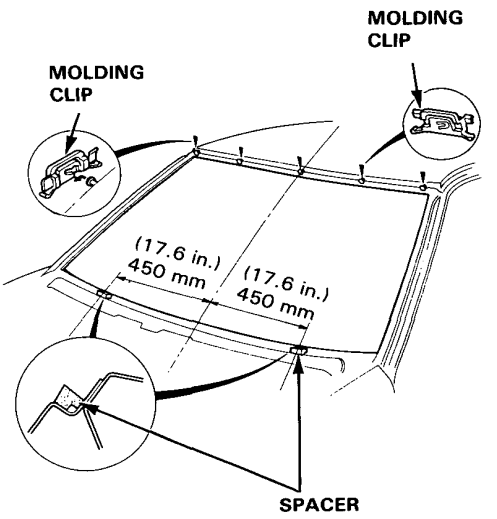
   NOTE:
   - Do not scrape down to the painted surface of the body; damaged paint will interfere with proper bonding.
   - Remove all traces of the rubber spacer material from the body.
   - Mask off surrounding surfaces before applying primer.

2. Clean the body bonding surface with a sponge dampened in alcohol.

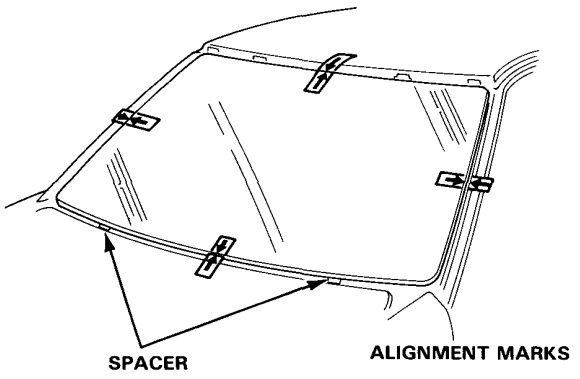
   NOTE: After cleaning, keep oil, grease or water from getting on the surface.

3. Peel the backing off each spacer, then install the spacers by pressing them firmly into place at the locations shown.

4. Install the molding clips as shown.

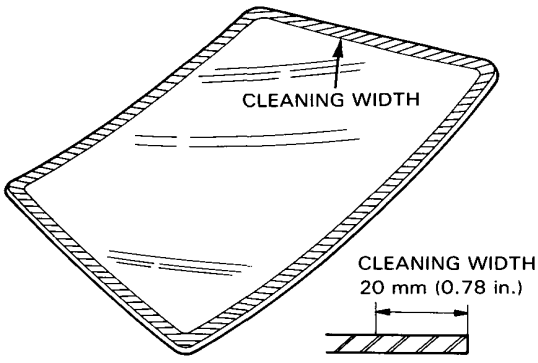


5. Set the glass upright on the spacers, and center it in the opening. Mark the location by marking lines across the glass and body with a grease pencil at the four points shown.



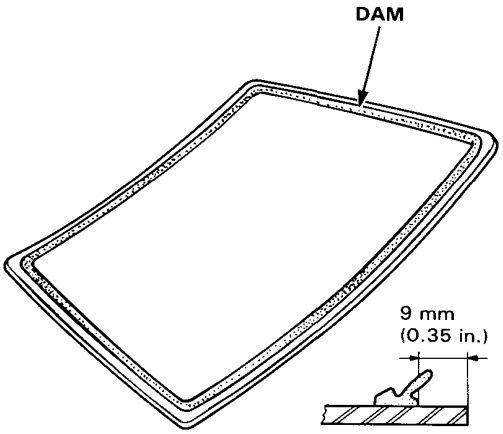
6. If the glass is to be reinstalled, use a putty knife to scrape off all traces of old adhesive, then clean the glass surface with alcohol to a width of about 20 mm.

NOTE: Make sure the bonding surface is kept free of water, oil and grease.



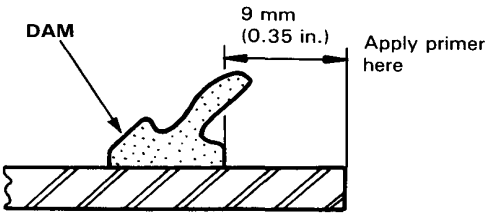
7. Glue the rubber dam to the inside face of the windshield as shown, to contain the adhesive during installation.

NOTE: Be careful not to touch the glass where adhesive will be applied.



8. With a sponge, apply a light coat of glass primer around the edge of the glass, then lightly wipe it off with gauze or cheesecloth.

NOTE:
- Do not apply body primer to the glass, and do not get body and glass primer sponges mixed up.
- Never touch the primed surfaces with your hands. If you do, the adhesive may not bond to the glass properly, causing a leak after the glass is installed.
- Keep water, dust, and abrasive materials away from the primed surface.

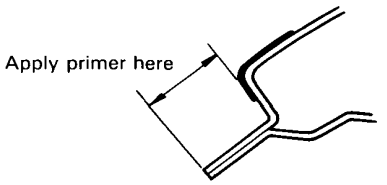


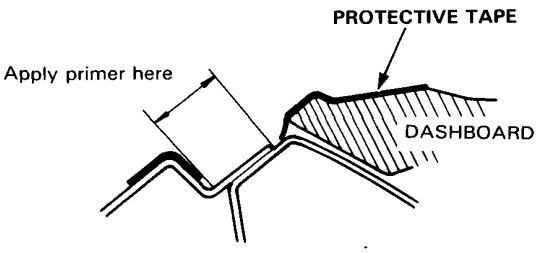
(cont'd)

Installation (cont'd)

9. With a sponge, apply a light coat of body primer to the original adhesive remaining around the window opening flange. The glass should be installed 10 minutes after you apply the primer.

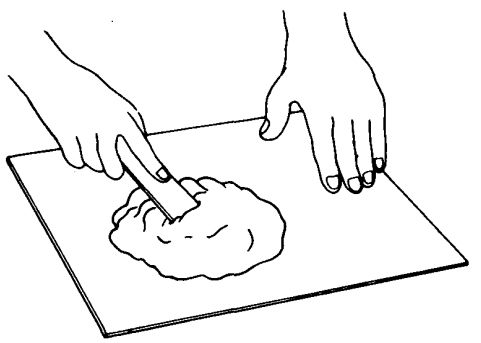
   NOTE:
   - Do not apply glass primer to the body, and be careful not to mix up glass and body primer sponges.
   - Never touch the primed surfaces with your hands.
   - Mask off the dashboard before painting the flange.



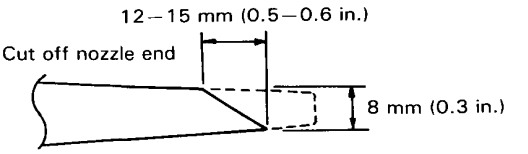


10. Thoroughly mix all the adhesive and hardener together on a glass or metal plate.

    NOTE:
    - Clean the plate with a sponge and alcohol before mixing.
    - Follow the instructions that come with the adhesive.

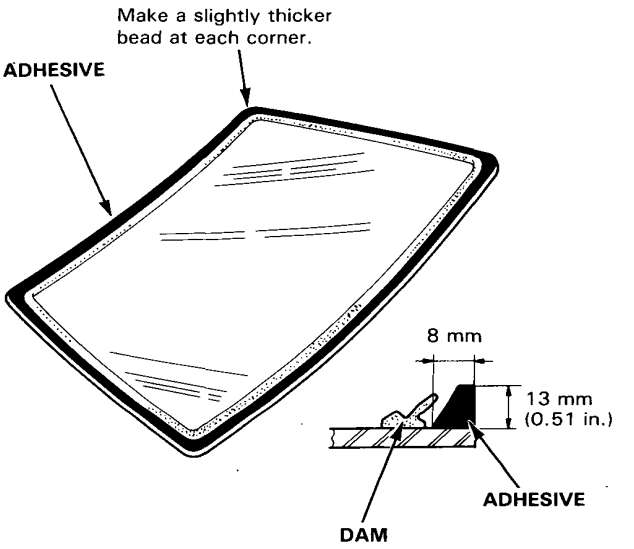


11. Before filling a cartridge, cut off the end of the nozzle at the angle shown.

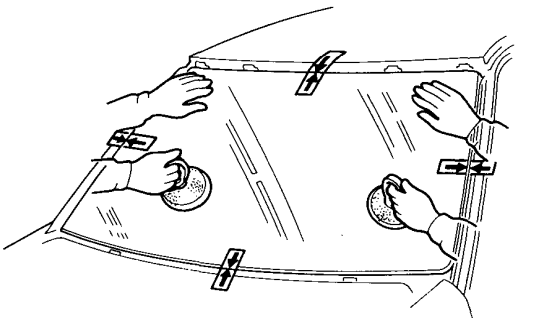


12. Pack adhesive into the cartridge without air pockets, to ensure continuous delivery. Put the cartridge in a caulking gun, and run a bead of adhesive around the edge of the glass as shown.

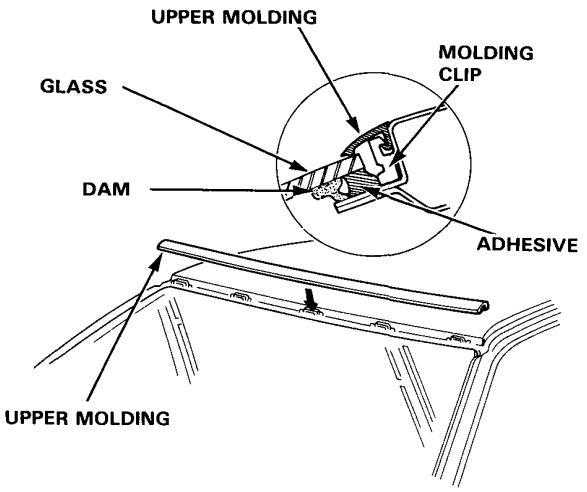
    NOTE: Apply the adhesive within 30 minutes after applying the glass primer.



13. Use suction cups to hold the glass over the opening, align it with the marks made in step 5 and set it down on the adhesive. Lightly push on the glass until its edge is fully seated on the adhesive all the way around.



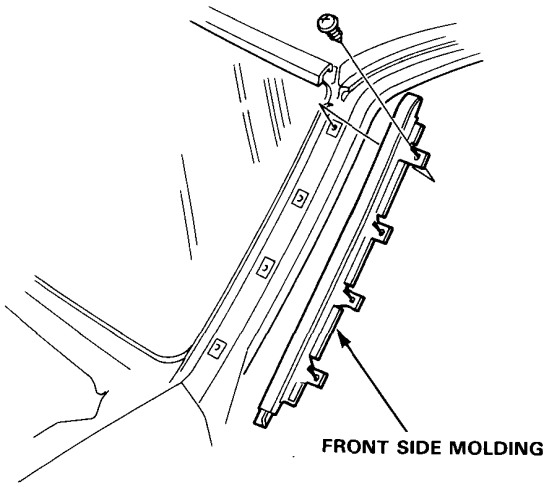
14. Install the upper molding.



15. Scrape or wipe the excess adhesive off with a putty knife or gauze.

    NOTE: Wipe with a soft rag or towel dampened with unleaded gasoline to remove adhesive from a painted surface or glass.

16. Install the front side molding.



17. Let the adhesive for dry at least 1 hour, then spray water over the glass and check for leaks. Mark leaking areas and let the glass dry, then seal with sealant (08718—99964).

    NOTE:
    - Let the car stand for dry at least 4 hours after glass installation. If the car has to be used within the first 4 hours, it must be driven slowly.
    - Keep the glass dry within the first hour after installation.

18. Fix the headliner back into position, then install:
    - Air scoop and front wiper.
    - Front pillar garnish.
    - Sunvisor.
    - Inside rear view mirror.

Sedan Rear Window

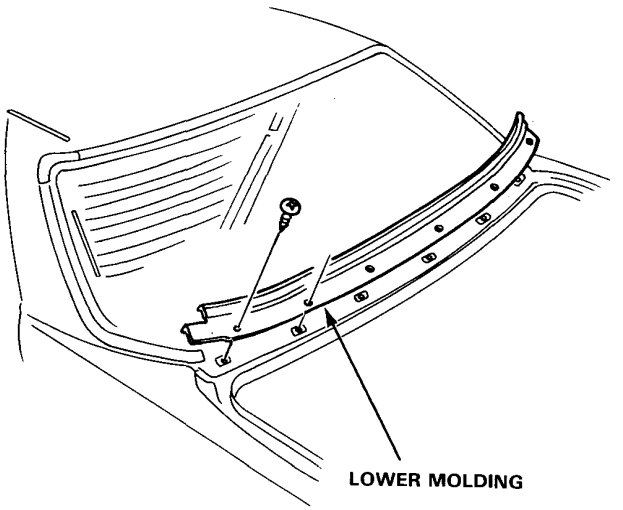
Removal

CAUTION:
- **Wear gloves to remove and install the glass.**
- **Do not damage the defroster printed circuit.**

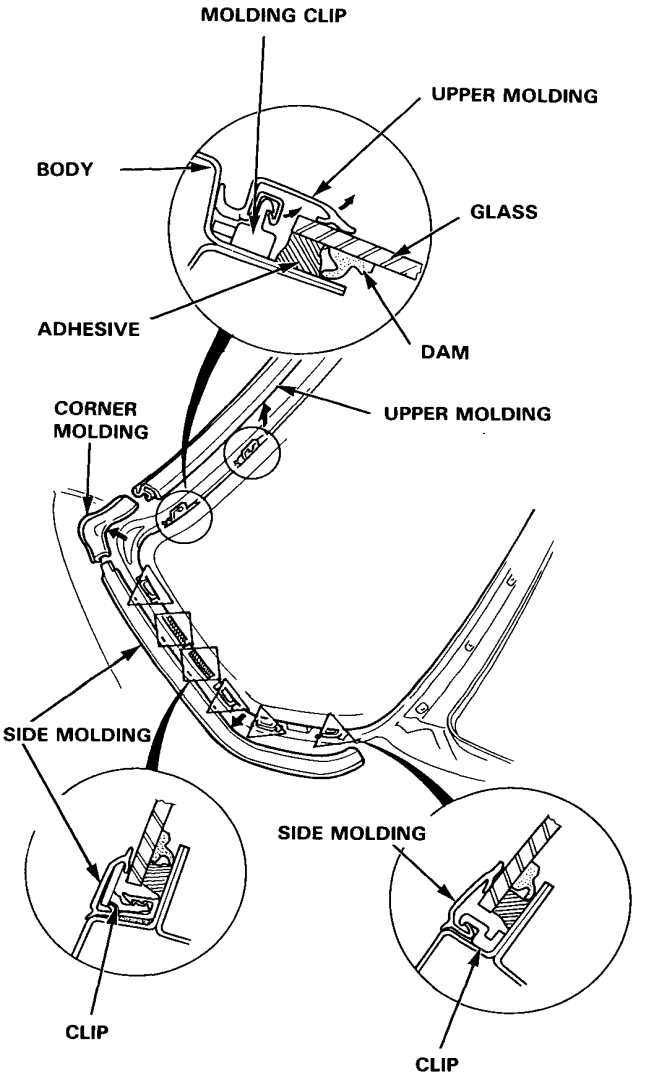
NOTE: You will need a molding clip release tool to remove some moldings. If necessary, make one that has the dimensions shown on page 21-23.

1. To remove the rear glass, first remove:
   - Trunk lid.
   - Rear shelf (page 21-63).
   - Rear pillar trim panel (page 21-63).
2. Disconnect the defroster leads. and remove their holders.

   NOTE: Take care not scratch or score the glass with the cutter blade.
3. Remove the lower molding.



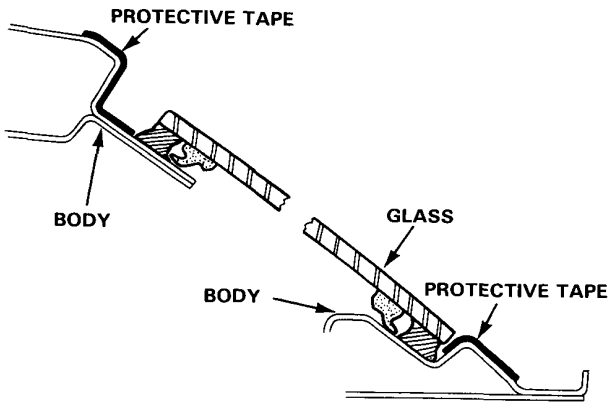
4. Remove the corner molding of each side.
5. Remove the upper and side molding with a molding clip release tool.



6. Lower the rear of the headliner.

   NOTE: Take care not to bend the headliner excessively.

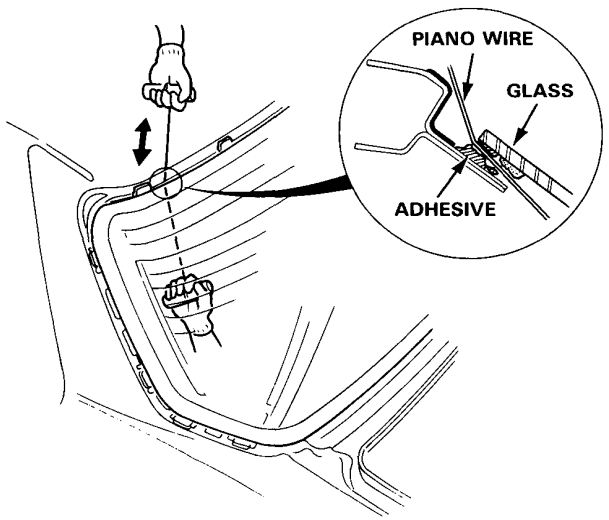
7. Apply protective tape along the edge of the body next to the glass as shown.



8. Using an awl, make a hole through the glass adhesive from inside the car. Push piano wire through the hole and wrap each end around a piece of wood.

9. With a helper on the outside, pull the wire back and forth in a sawing motion and carefully cut through the adhesive around the entire glass.

   CAUTION: Hold the piano wire as close to the glass as possible to prevent damage to the body.



Installation

1. Scrape the old adhesive smooth with a knife, to a thickness of about 2 mm (0.08 in.) on the bonding surface around the entire glass flange.

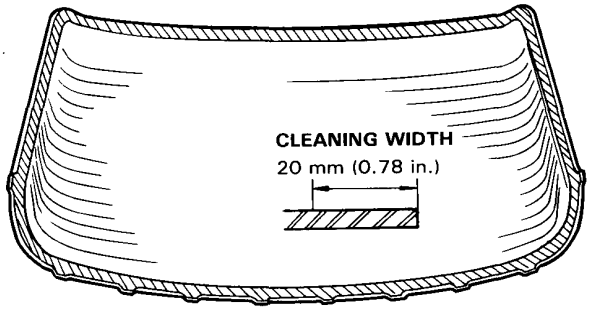
   NOTE:
   - Do not scrape down to the painted surface of the body; damaged paint will interfere with proper bonding.
   - Remove all traces of the rubber spacer material from the body.
   - Mask off surrounding surfaces before painting.

2. Clean the body bonding surface with a sponge dampened in alcohol.

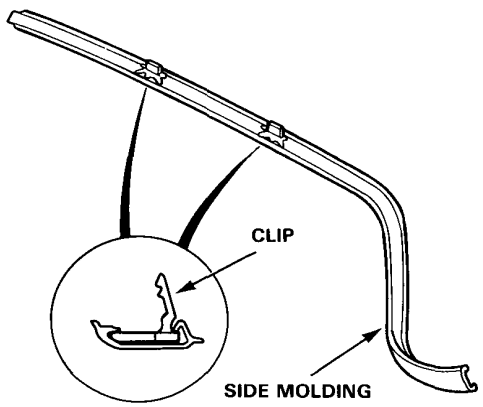
   NOTE: After cleaning, keep oil, grease or water from getting on the surface.

3. If the glass is to be reinstalled, use a putty knife to scrape off all traces of old adhesive, then clean the glass surface with alcohol where new adhesive is to be applied.

   NOTE: Make sure the bonding surface is kept free of water, oil and grease.



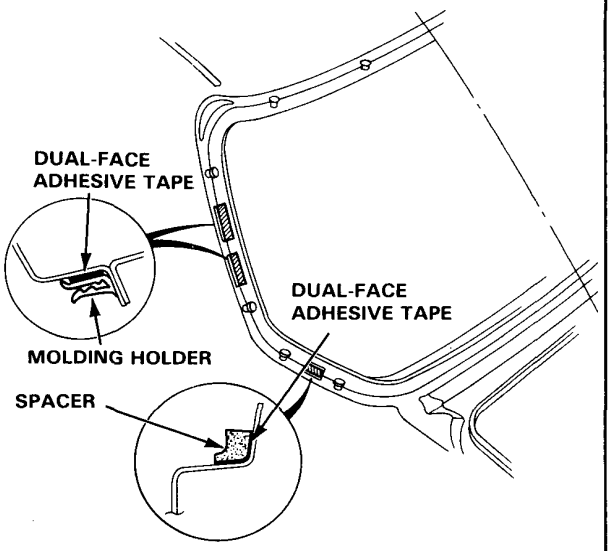
4. Attach the 2 side clips to the side molding.



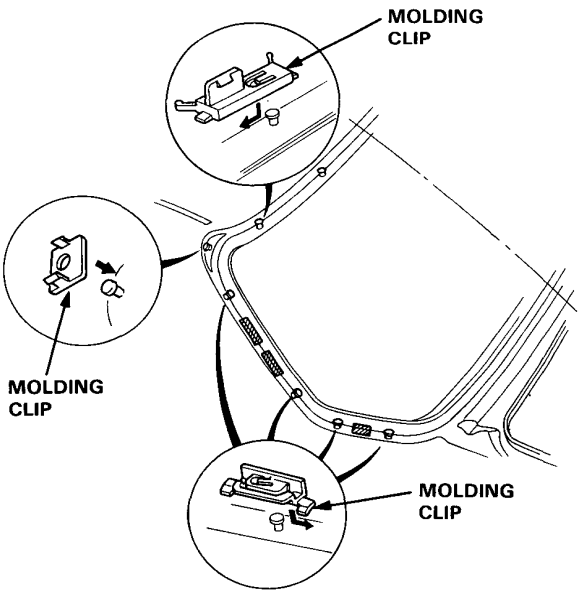
(cont'd)

Installation (cont'd)

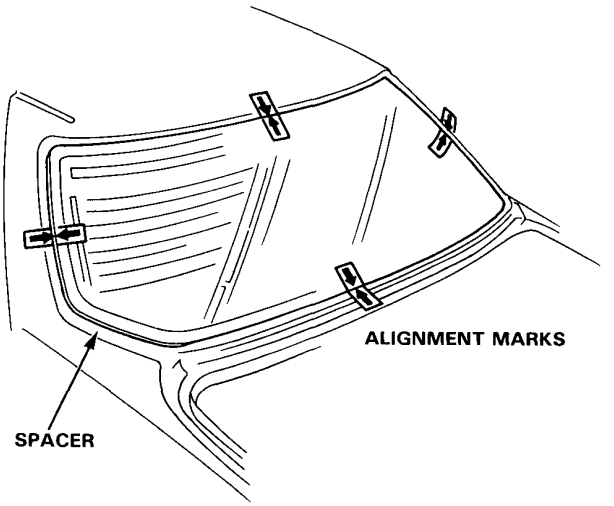
5. Peel the backing of each spacer and molding holder, then install the spacers and holders by pressing them firmly into place at the locations shown.



6. Install the molding clips on the pins on the body.

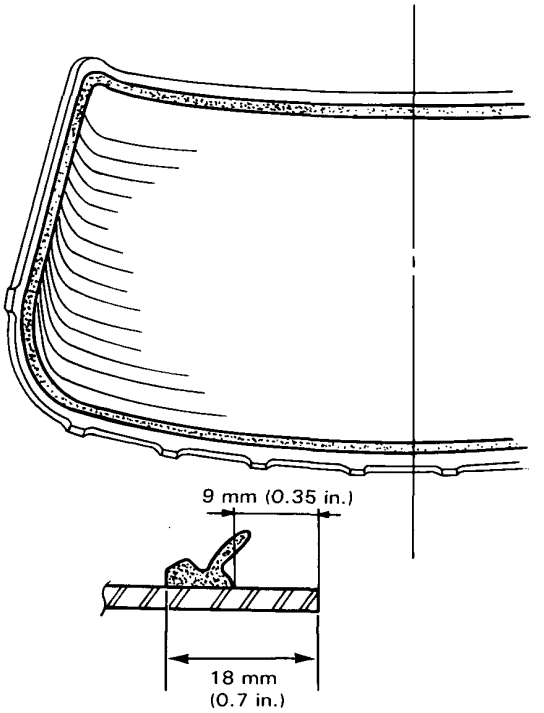


7. Set the glass upright on the spacers, and center it in the opening. Mark the location by marking lines across the glass and body with a grease pencil at the four points shown.



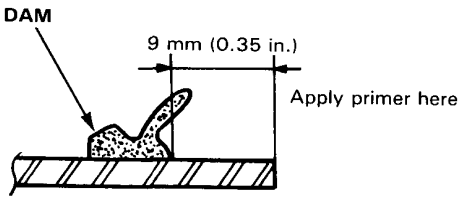
8. Glue the rubber dam to the inside face of the glass as shown, to contain the adhesive during installation.

   NOTE: Be careful not to touch the glass where adhesive will be applied.



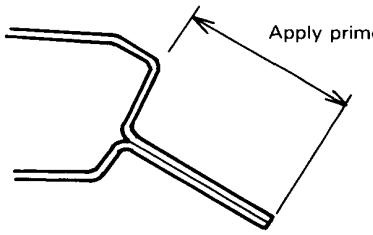
9. With a sponge, apply a light coat of glass primer around the edge of the glass as shown, then lightly wipe it off with gauze or cheesecloth.

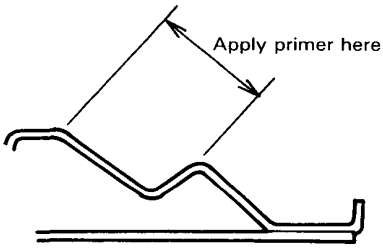
NOTE:
- Do not apply body primer to the glass, and do not get body and glass primer sponges mixed up.
- Never touch the primed surfaces with your hands. If you do, the adhesive may not bond to the glass properly, causing a leak after the glass is installed.
- Keep water, dust, and abrasive materials away from the primed surface.



10. With a sponge, apply a light coat of body primer to the original adhesive remaining around the window opening flange. The glass should be installed 10 minutes after you apply the primer.

NOTE:
- Do not apply glass primer to the body, and be careful not to mix up glass and body primer sponges.
- Never touch the primed surfaces with your hands.

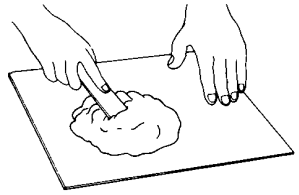




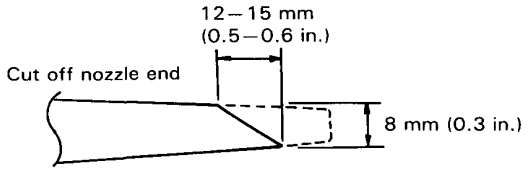
11. Thoroughly mix all the adhesive and hardener together on a glass or metal plate with a putty knife.

NOTE: Clean the plate with a sponge and alcohol before mixing.

12. Follow the instructions that come with the adhesive.

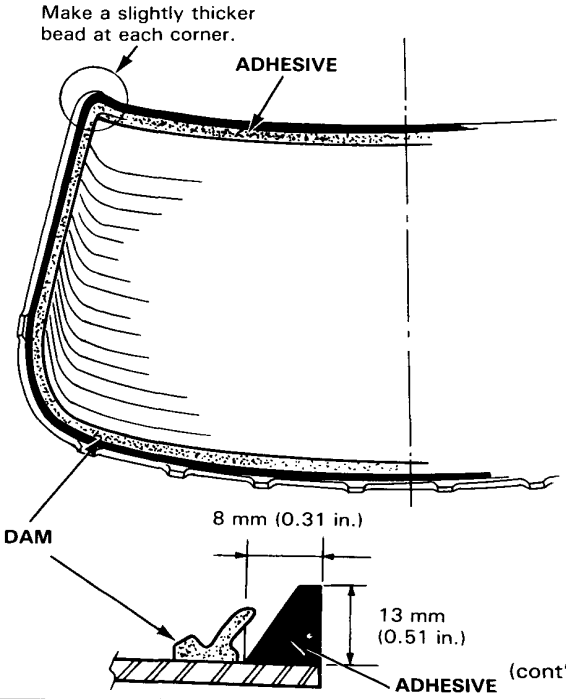


13. Before filling a cartridge, cut off the end of the nozzle at the angle shown.



14. Pack adhesive into the cartridge without air pockets, to ensure continuous delivery. Put the cartridge in a caulking gun, and run a bead of adhesive around the edge of the glass as shown.

NOTE: Apply the adhesive within 30 minutes after applying the glass primer.



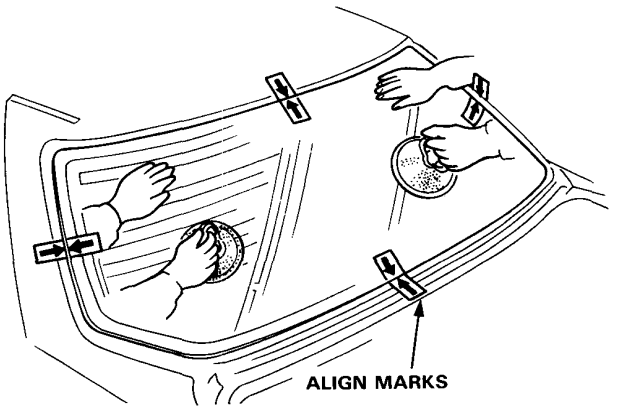
(cont'd)

Sedan Rear Window

Installation (cont'd)

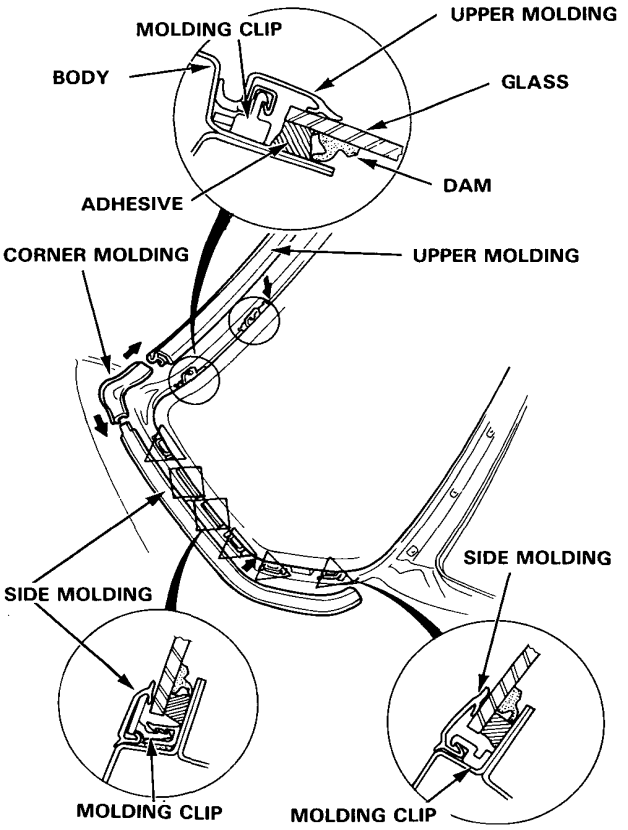
15. Use suction cups to hold the glass over the opening, align it with the marks made in step 7 and set it down on the adhesive. Lightly push on the glass until its edge is fully seated on the adhesive all the way around.

    NOTE: Do not close or open the doors until window adhesive is dry.



16. Install the upper molding and side molding.

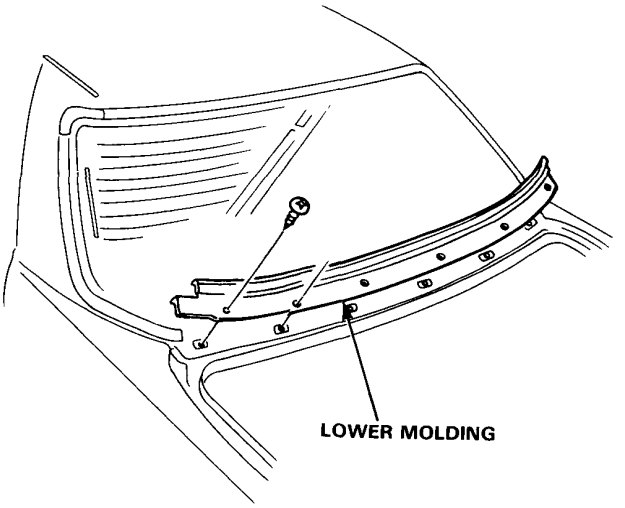
17. Insert the corner molding and secure it.



18. Scrape or wipe the excess adhesive off with a putty knife or gauze.

    NOTE: Wipe with a soft rag or towel dampened with unleaded gasoline to remove adhesive from a painted surface or glass.

19. Install the lower molding.



20. Let the adhesive dry for at least 1 hour, then spray water over the glass and check for leaks. Mark leaking areas and let the glass dry, then seal with sealant (08718—99964).

    NOTE:
    - Let the car stand for at least 4 hours after glass installation. If the car has to be used within the first 4 hours, it must be driven slowly.
    - Keep the glass dry within the first hour after installation.

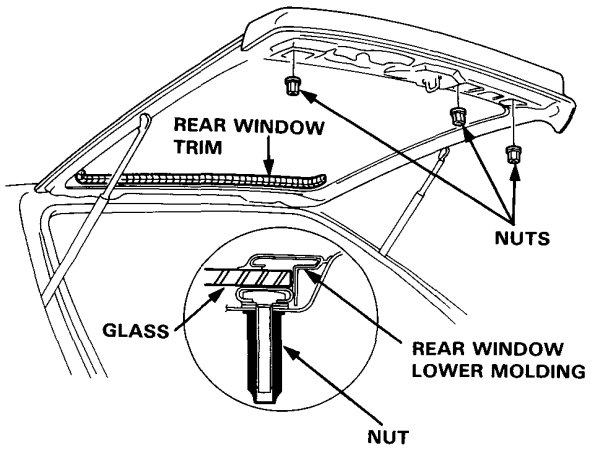
21. Fix the headliner back into position, then install:
    - Rear tray.
    - Rear pillar lining.

Removal

Glass Back

CAUTION:
- **Wear gloves to remove and install the glass.**
- **Do not damage the defroster printed circuit.**

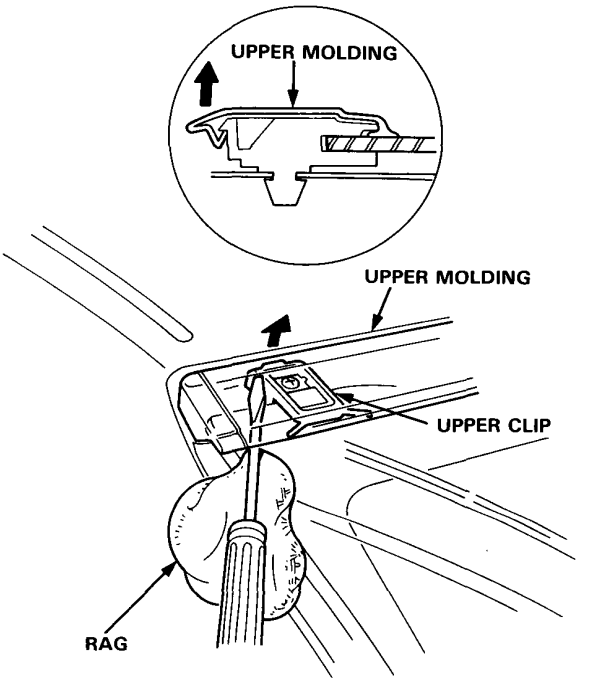
1. Remove the tailgate trim panel and side molding (page 21-93).
2. Remove the rear shelf and the rear wiper.
3. Remove the rear widow trim.
4. Remove the rear window lower molding by removing the 3 nuts.



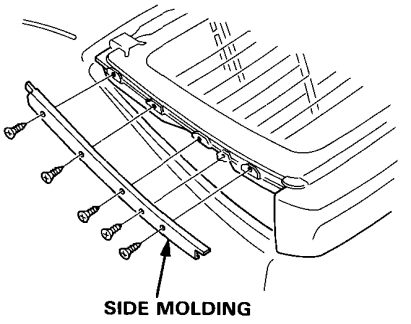
5. Disconnect the defroster leads, and remove their holders.

6. Lift the inside edge of the molding slightly, then slip a flat screwdriver to the side of clip and push the edge of molding with the end of screwdriver, to release the moldings.

CAUTION: Be careful not to damage the body and glass with the tool.



7. Remove the side molding.

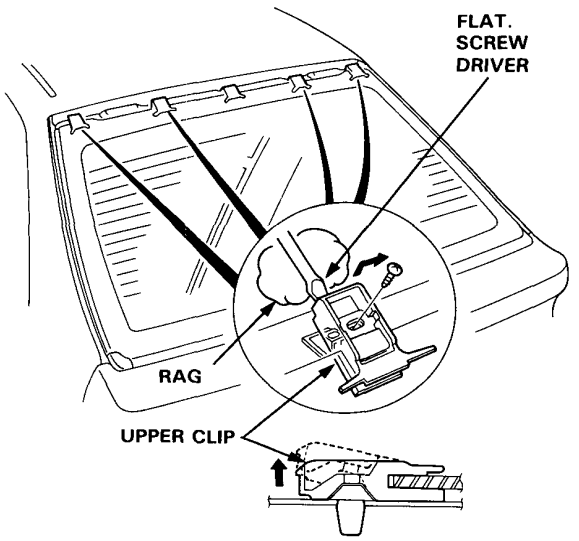


(cont'd)

Tailgate Window

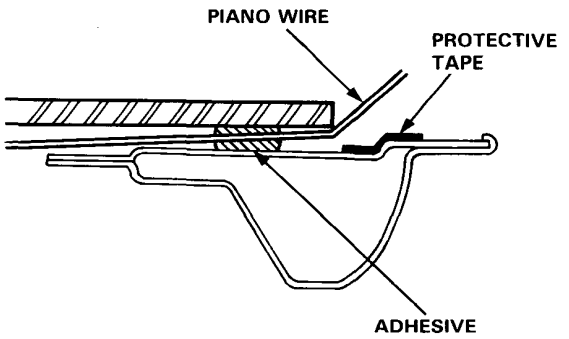
Removal (cont'd)

8. Remove the screws, then remove *all* the upper clips as shown.



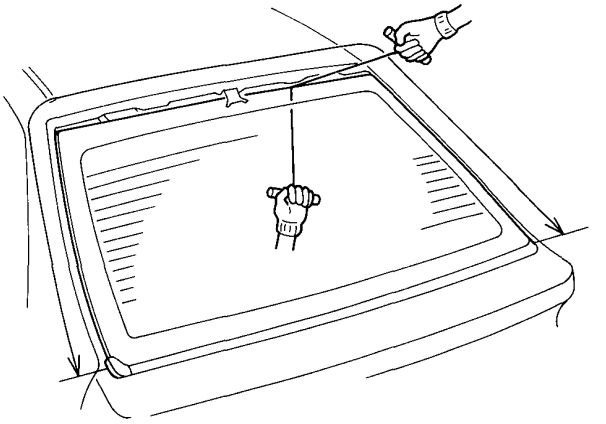
9. Apply protective tape along the edge of the body next to the glass as shown.

10. Using an awl, make a hole through the glass adhesive from inside the car. Push piano wire through the hole and wrap each end around a piece of wood.

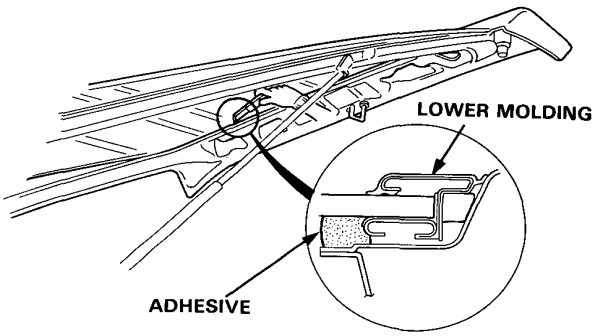


11. With a helper on the outside, pull the wire back and forth in a sawing motion and carefully cut through the adhesive around the entire glass.

CAUTION: Hold the piano wire as close to the glass as possible to prevent damage to the body.

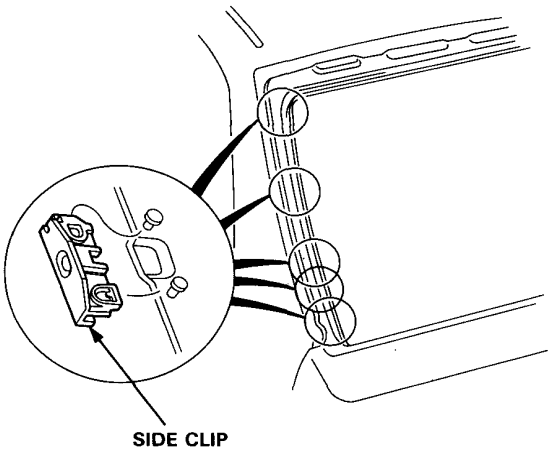


12. Using a cutter, cut the adhesive between the bottom of the tailgate and glass from inside the car, then remove the glass.



13. When reinstalling the glass, remove the lower molding.

14. Remove the side clips from each side.



Installation

Glass Back

1. Scrape the old adhesive smooth with a knife, to a thickness of about 2 mm (0.08 in) on the bonding surface around the entire window flange.

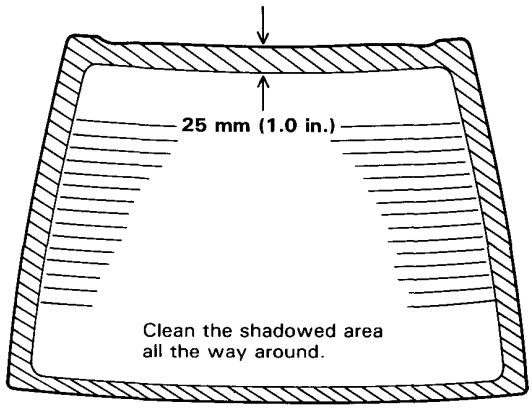
   NOTE:
   - Do not scrape down to the painted surface of the body; damaged paint will interfere with proper bonding.
   - Remove all traces of the rubber spacer material from the body.
   - Mask off surrounding surfaces before painting.

2. Clean the body bonding surface with a sponge dampened in alcohol.

   NOTE: After cleaning, keep oil, grease or water from getting on the surface.

3. If the glass is to be reinstalled, use a putty knife to scrape off all traces of old adhesive, then clean the glass surface with alcohol where new adhesive is to be applied.

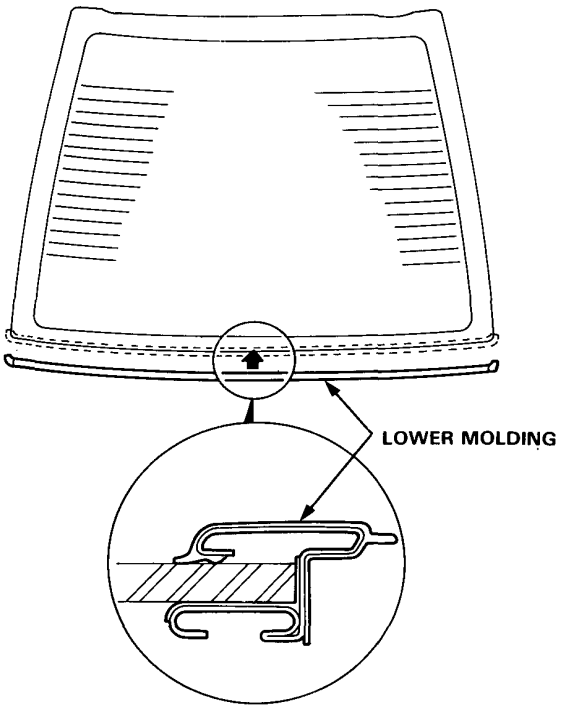
   NOTE: Make sure the bonding surface is kept free of water, oil and grease.



(cont'd)

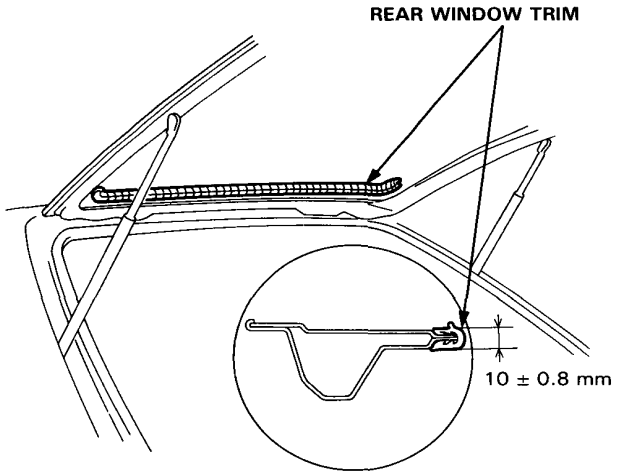
Installation (cont'd)

4. Install the lower molding on to the glass.



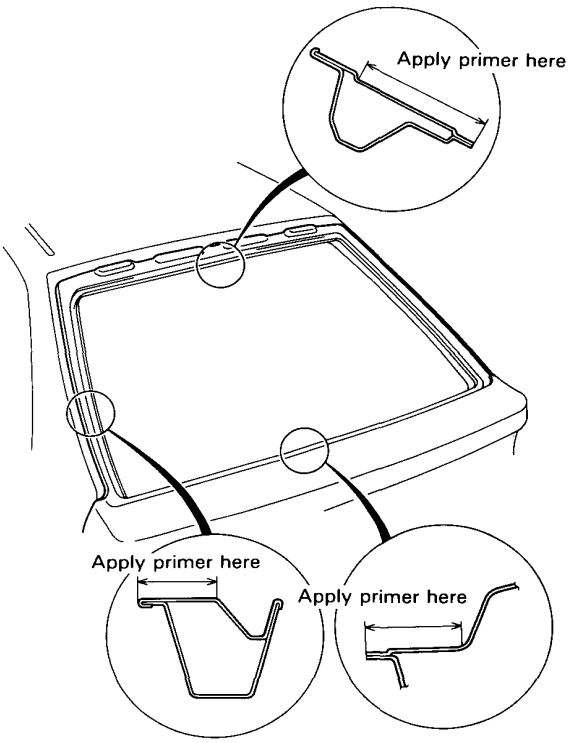
5. Install the rear window trim in the frame.

NOTE:
- Install the rear window trim with the wide end on the interior side.
- When attaching the rear window trim, make sure the thickness is even all the way around.

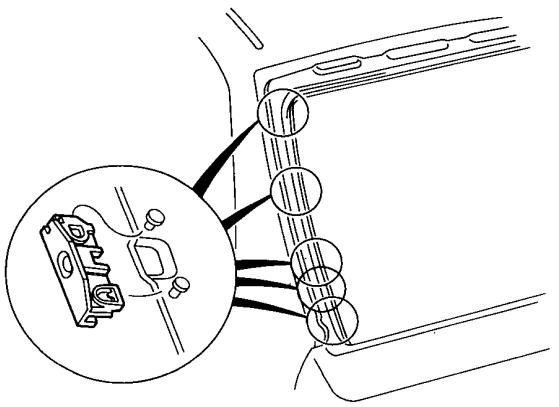


6. With a sponge, apply a light coat of body primer to the original adhesive remaining around the window opening flange. The glass should be installed 10 minutes after you apply the primer.

NOTE:
- Do not apply glass primer to the body, and be careful not to mix up glass and body primer sponges.
- Never touch the primed surfaces with your hands.



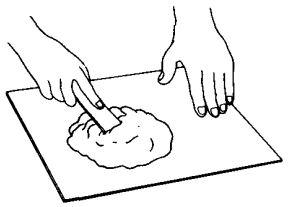
7. Install the side clips to the tailgate.



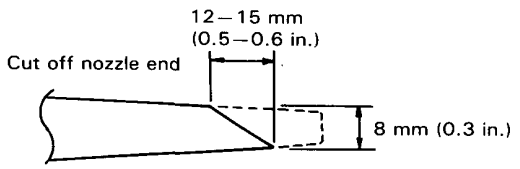
8. Thoroughly mix all the adhesive and hardener together on a glass or metal plate with a putty knife.

   NOTE: Clean the plate with a sponge and alcohol before mixing.

9. Follow the instructions that come with the adhesive.

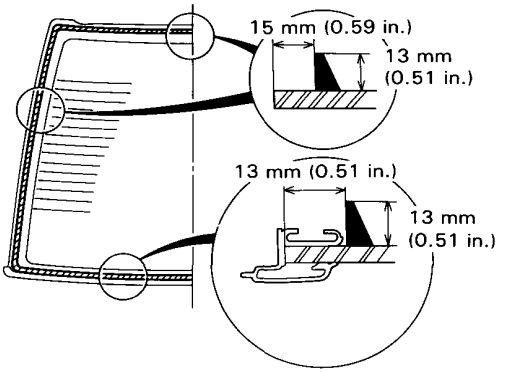


10. Before filling a cartridge, cut off the end of the nozzle at the angle shown.



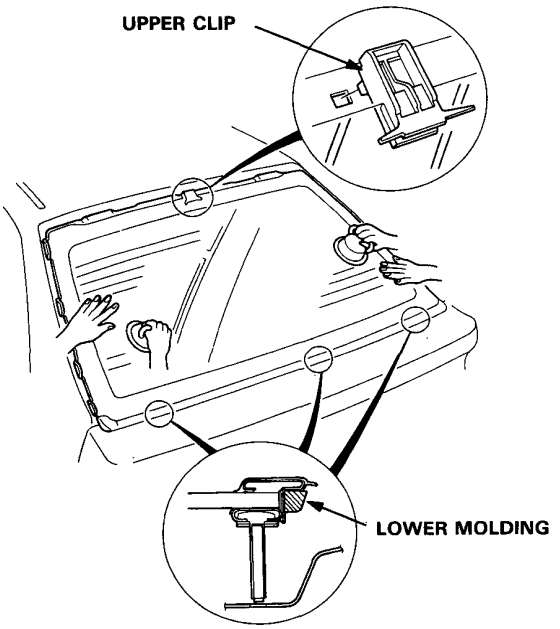
11. Pack adhesive into the cartridge without air pockets, to ensure continuous delivery. Put the cartridge in a caulking gun, and run a bead of adhesive around the edge of the glass as shown.

    NOTE: Apply the adhesive within 30 minutes after applying the glass primer.



12. Install the upper clip B on to the glass and holding the glass with suction cups as shown, install the glass on the tailgate while inserting the three bolts on the lower molding into the holes in the tailgate. After making sure that the center upper clip is aligned properly, apply light pressure to the glass all the way around.

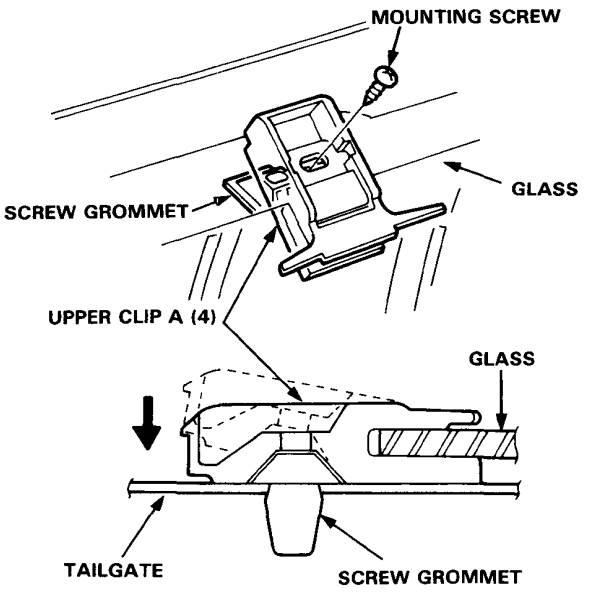
NOTE: Do not open and close the tailgate or doors until the adhesive has dried thoroughly.



13. Tighten the lower molding mounting nuts.

Installation (cont'd)

14. Position the screw grommets on the tailgate and the upper clip A on the glass.

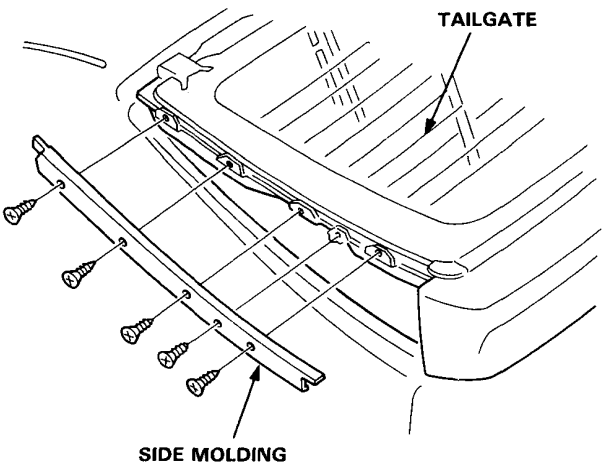


15. Tighten the upper clip A mounting screw.

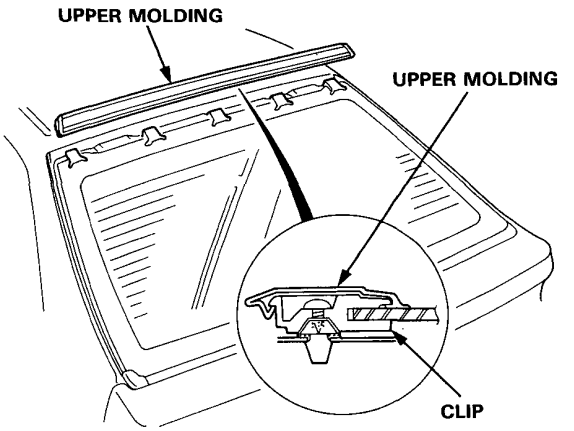
16. Scrape or wipe the excess adhesive off with a putty knife or gauze.

    NOTE: Wipe with a soft shop towel dampened with unleaded gasoline to remove adhesive from a painted surface or glass.

17. Install the side molding.



18. Install the upper molding as shown.



19. After the adhesive is dry, spray water over the glass and check for leaks. Mark leaking areas. When the glass is dry, seal with sealant (08718—99964).

    NOTE: Let the car stand for at least 4 hours after glass installation. If the car has to be used within the first 4 hours, it must be driven slowly.

20. Reassemble all removed parts.

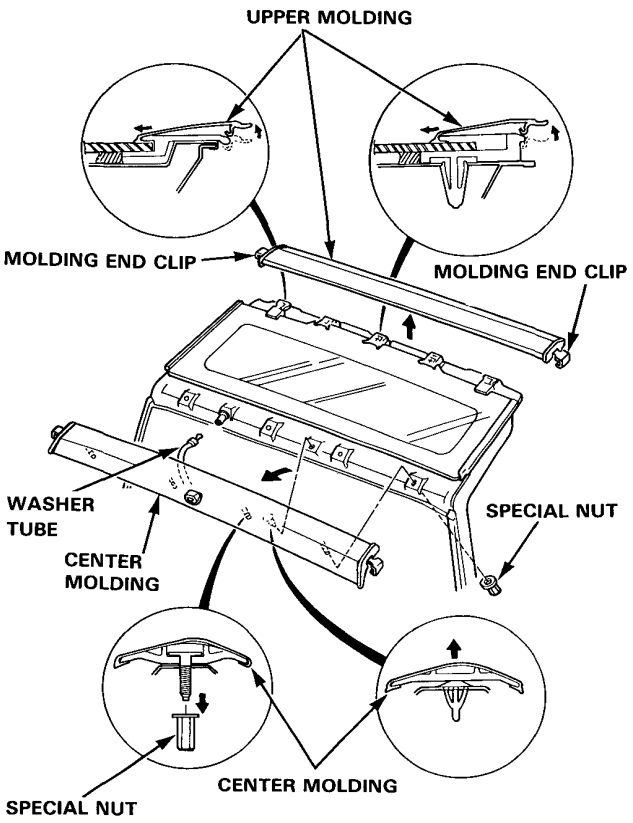
Tailgate Upper Window

Removal

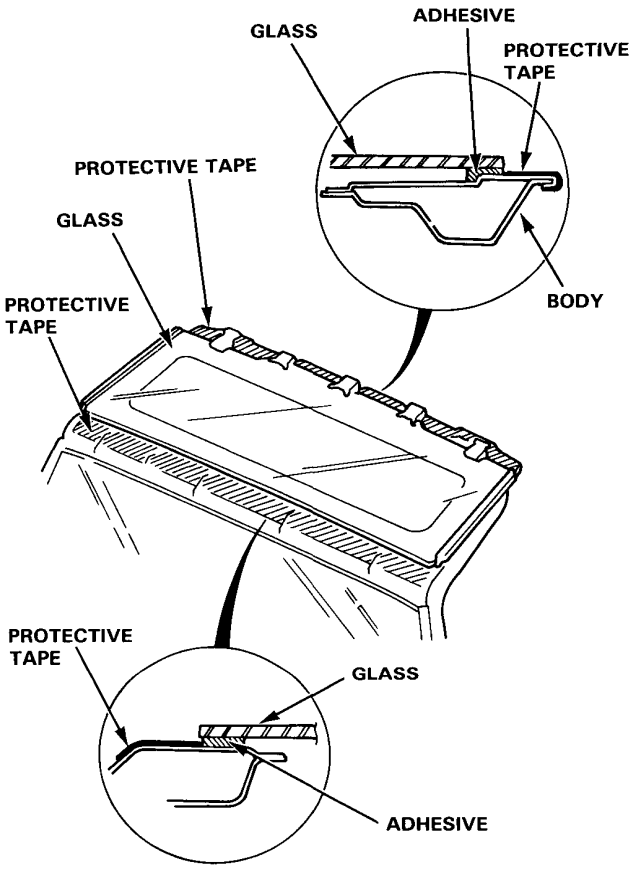
Aerodeck

CAUTION: Wear gloves to remove and install the glass.

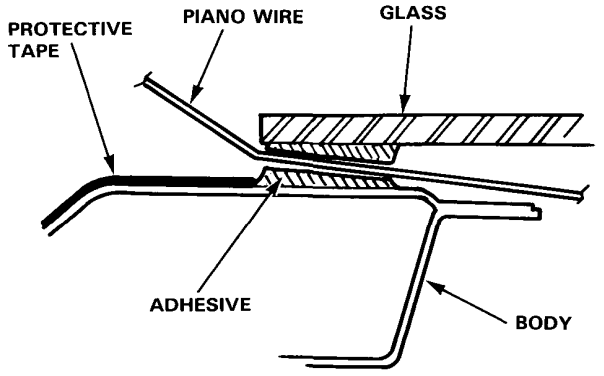
1. Remove the tailgate upper trim panels (page 21-64).
2. Slide the molding end clips, then remove the upper molding and center molding.



3. Apply protective tape along the edge of the body next to the glass as shown.



4. Using an awl, make a hole through the glass adhesive from inside the car. Push piano wire through the hole and wrap end around a piece of wood.

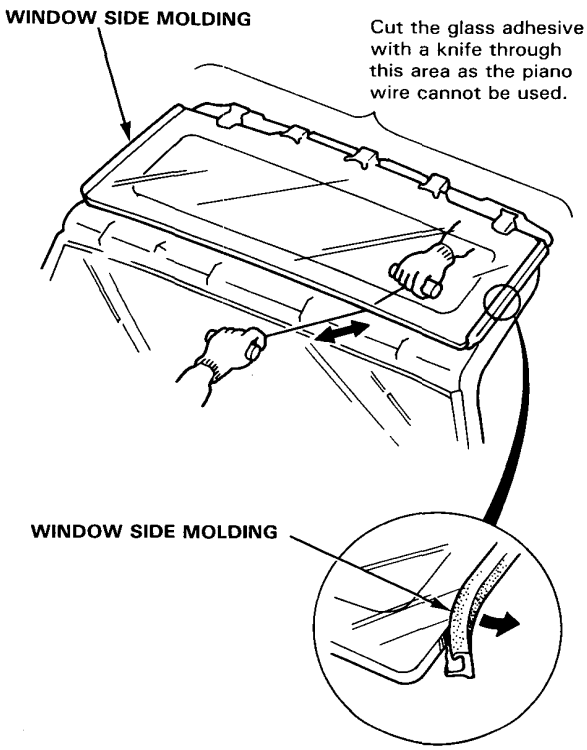


(cont'd)

Tailgate Upper Window

Removal (cont'd)

6. With a helper on the outside, pull the wire back and forth in a sawing motion and carefully cut through the adhesive.



7. Using a cutter, cut the adhesive between the front edge of the glass and tailgate, then remove the tailgate upper window glass.

8. If the glass is reinstalled, remove the window side molding.

Installation

Aerodeck

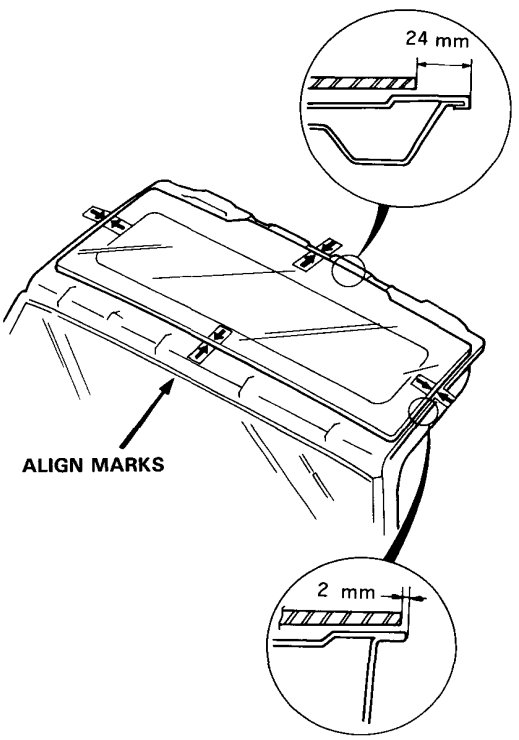
1. Scrape the old adhesive smooth with a knife, to a thickness of about 2 mm (0.08 in) on the bonding surface around the entire window flange.

   NOTE:
   - Do not scrape down to the painted surface of the body; damaged paint will interfere with proper bonding.
   - Remove all traces of the rubber spacer material from the body.
   - Mask off surrounding surfaces before painting.

2. Clean the body bonding surface with a sponge dampened in alcohol.

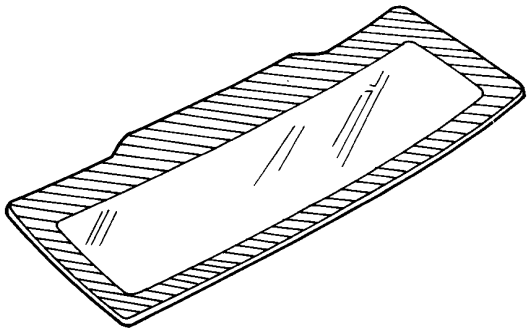
   NOTE: After cleaning, keep oil, grease or water from getting on the surface.

3. Set the glass center in the opening. Mark the location by marking lines across the glass and body with a grease pencil at the four points shown.

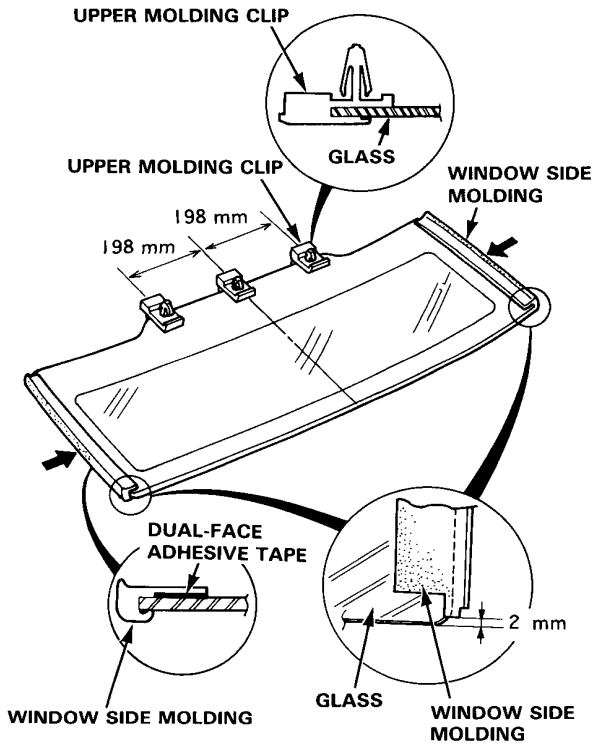


4. If the glass is to be reinstalled, use a putty knife to scrape off all traces of old adhesive, then clean the glass surface with alcohol where new adhesive is to be applied.

   NOTE: Make sure the bonding surface is kept free of water, oil and grease.

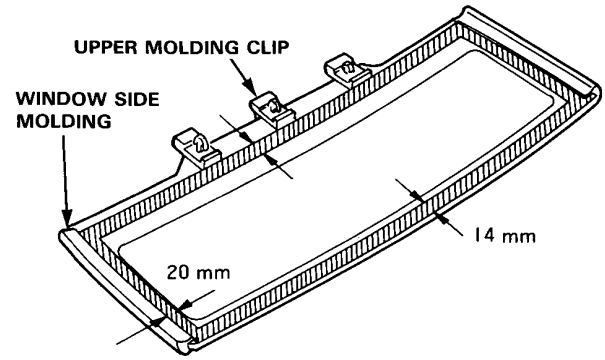


5. After allowing the glass to dry, remove the backing paper and attach the window side molding.



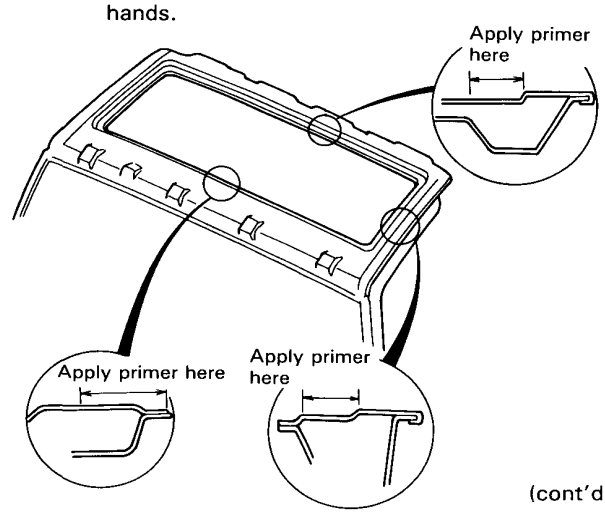
6. With a sponge, apply a light coat of glass primer around the edge of the glass as shown, then lightly wipe it off with gauze or cheesecloth.

   NOTE:
   - Do not apply body primer to the glass, and do not get body and glass primer sponges mixed up.
   - Never touch the primed surfaces with your hands. If you do, the adhesive may not bond to the glass properly, causing a leak after the glass is installed.
   - Keep water, dust, and adhesive materials away from the primed surface.



7. With a sponge, apply a light coat of body primer to the original adhesive remaining around the window opening flange. The glass should be installed 10 minutes after you apply the primer.

   NOTE:
   - Do not apply glass primer to the body, and be careful not to mix up glass and body primer sponges.
   - Never touch the primed surfaces with your hands.



(cont'd)

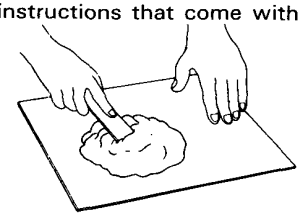
Tailgate Upper Window

Installation (cont'd)

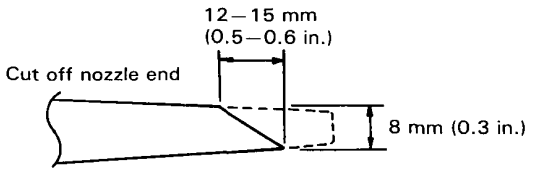
8. Thoroughly mix all the adhesive and hardener together on a glass or metal plate with a putty knife.

   NOTE: Clean the plate with a sponge and alcohol before mixing.

9. Follow the instructions that come with the adhesive.

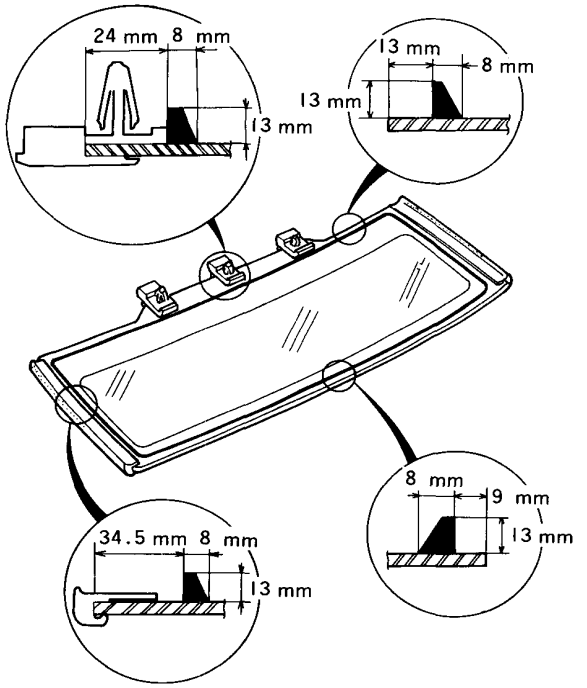


10. Before filling a cartridge, cut off the end of the nozzle at the angle shown.



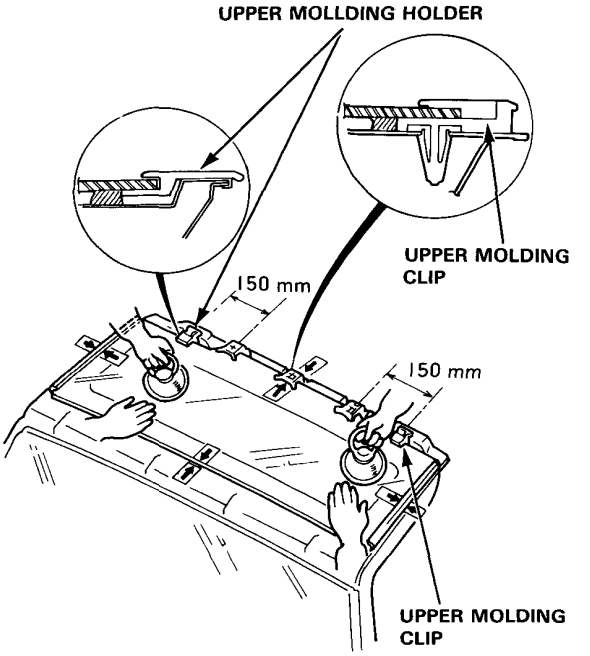
11. Pack adhesive into the cartridge without air pockets, to ensure continuous delivery. Put the cartridge in a caulking gun, and run a bead of adhesive around the edge of the glass as shown.

    NOTE: Apply the adhesive within 30 minutes after applying the glass primer.



12. Hold the glass with rubber suction cups and set the upper molding holder in position. Align the glass with the installation marks and fit the upper clip into the hole in the body. Press the circumference of the glass lightly and make sure it adheres firmly.

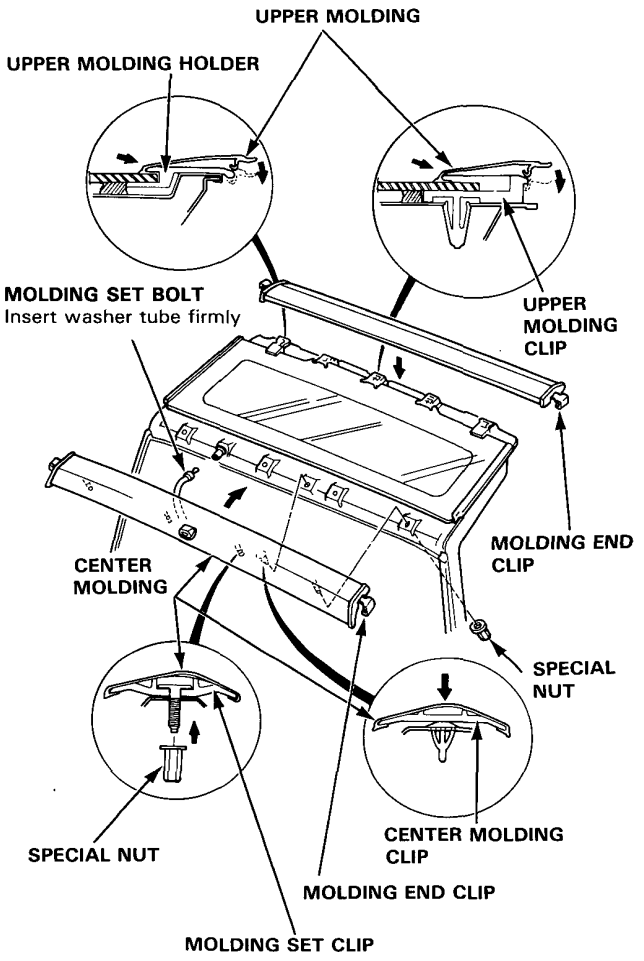
    - Do not open or close the tailgate or doors until the adhesive has set completely.



13. Scrape or wipe the excess adhesive off with a putty knife or gauze.

    NOTE: Wipe with a soft rag or towel dampened with unleaded gasoline to remove adhesive from a painted surface or glass.

14. Install the upper molding and center molding, set the molding end clips correctly.



15. Let the adhesive for at least 1 hour, then spray water over the glass and check for leaks. Mark leaking areas and let the glass dry, then seal with sealant (08718—99964).

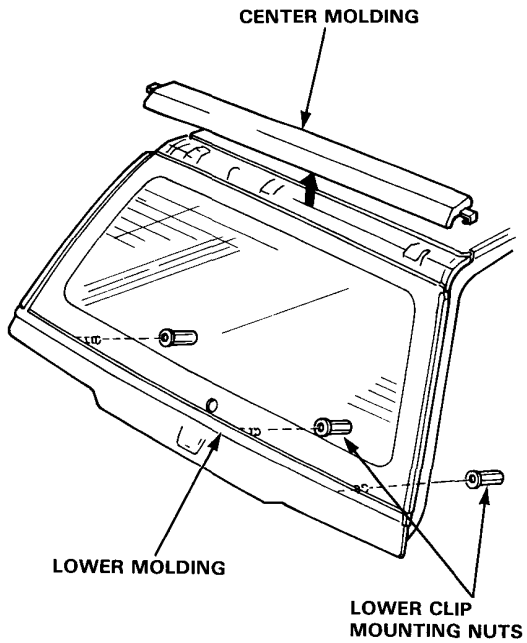
NOTE:
- Let the car stand for at least 4 hours after glass installation. If the car has to be used within the first 4 hours, it must be driven slowly.
- Keep the glass dry within the first hour after installation.

Removal

CAUTION:
- **Wear gloves to remove and install the glass.**
- **Do not damage the defroster printed circuit.**

1. To remove the tailgate window galss, first remove the:
   - Tailgate trim panels.
   - Rear shelf.
   - Rear wiper.
2. Disconnect the defroster leads and remove their holders. If the holders are fixed, scrape them with the cutter blade.

   NOTE: Take care not scratch or score the glass with the cutter blade.
3. Remove the center molding (page 21-39).
4. Remove the 3 lower clip mounting nuts.

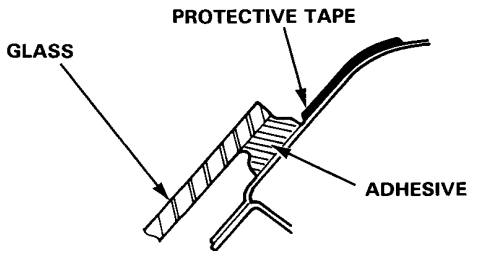


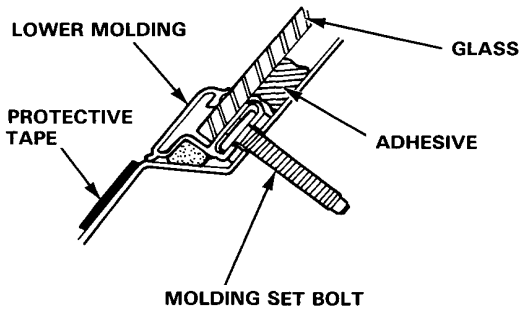
(cont'd)

Tailgate Window Glass

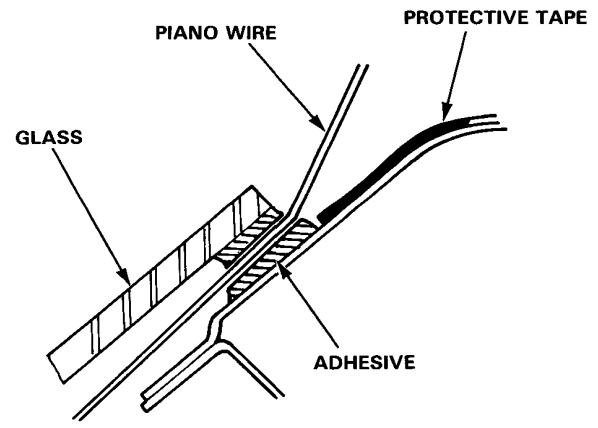
Removal (cont'd)

5. Apply protective tape along the edge of the body next to the glass as shown.

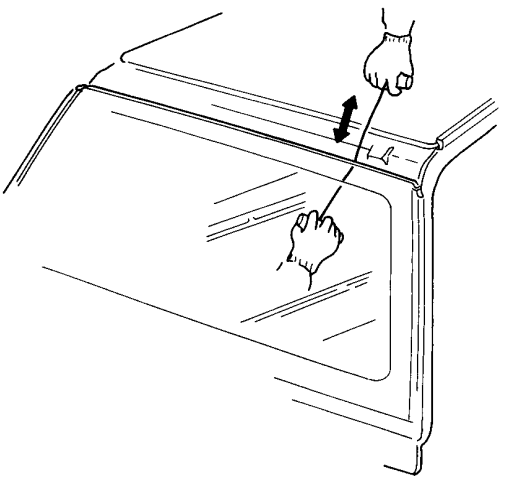




6. Using an awl, make a hole through the glass adhesive from inside the car. Push piano wire through the hole and wrap end around a piece of wood.



7. With a helper on the outside, pull the wire back and forth in a sawing motion and carefully cut through the adhesive.



8. Using a cutter, cut the adhesive between the lower edge of the glass and tailgate, then remove the tailgate window glass.

9. If the glass is reinstalled, the window side molding and lower molding.

Installation

Aerodeck

1. Scrape the old adhesive smooth with a knife, to a thickness of about 2 mm (0.08 in.) on the bonding surface around the entire window flange.

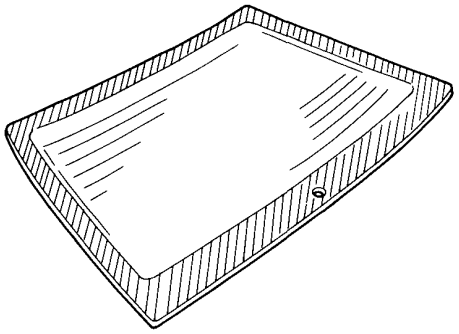
   NOTE:
   - Do not scrape down to the painted surface of the body; damaged paint will interfere with proper bonding.
   - Remove all traces of the rubber spacer material from the body.
   - Mask off surrounding surfaces before painting.

2. Clean the body bonding surface with a sponge dampened in alcohol.

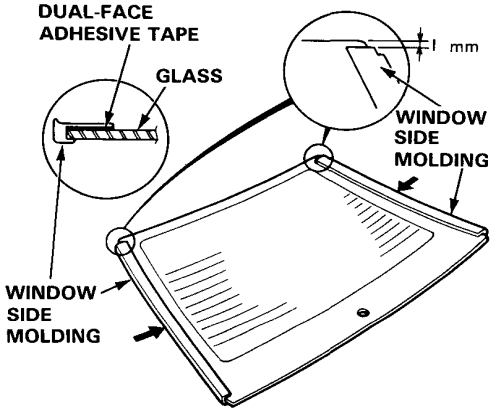
   NOTE: After cleaning, keep oil, grease or water from getting on the surface.

3. If the glass is to be reinstalled, use a putty knife to scrape off all traces of old adhesive, then clean the glass surface with alcohol where new adhesive is to be applied.

   NOTE: Make sure the bonding surface is kept free of water, oil and grease.

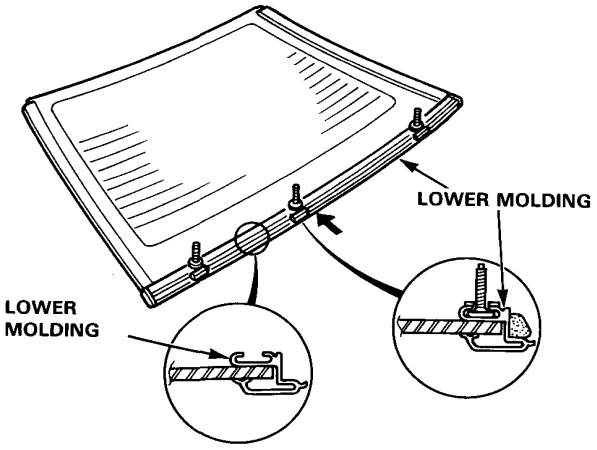


4. After allowing the glass to dry, remove the backing paper and attach the window side molding.



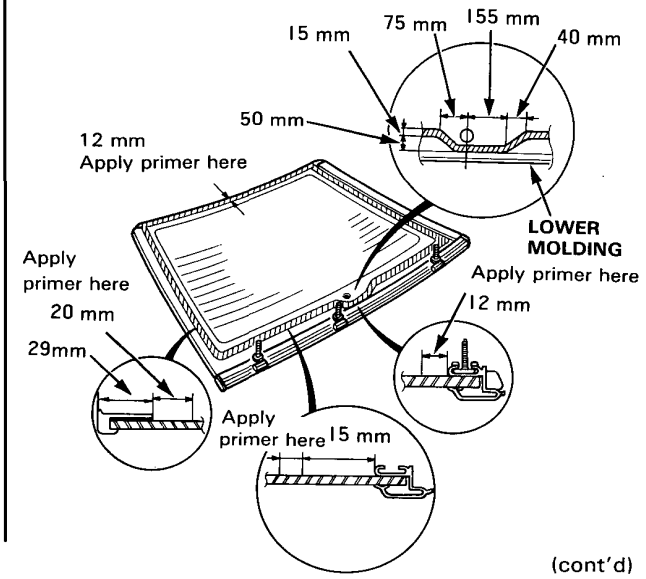
5. If the glass is to be reinstalled, set the lower molding on the glass.

   NOTE: Never touch the cleaning surface with your hands.



6. With a sponge, apply a light coat of glass primer around the edge of the glass as shown, then lightly wipe it off with gauze or cheesecloth.

   NOTE:
   - Do not apply body primer to the glass, and do not get body and glass primer sponges mixed up.
   - Never touch the primed surfaces with your hands. If you do, the adhesive may not bond to the glass properly, causing a leak after the glass is installed.
   - Keep water, dust, and adhesive materials away from the primed surface.



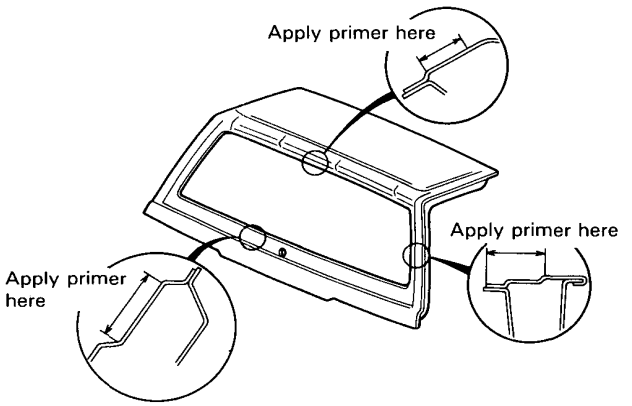
(cont'd)

Tailgate Window Glass

Installation (cont'd)

7. With a sponge, apply a light coat of body primer to the original adhesive remaining around the window opening flange. The glass should be installed 10 minutes after you apply the primer.

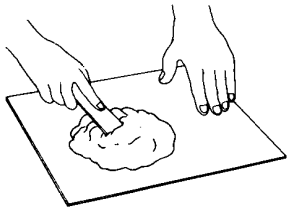
   NOTE:
   - Do not apply glass primer to the body, and be careful not to mix up glass and body primer sponges.
   - Never touch the primed surfaces with your hands.



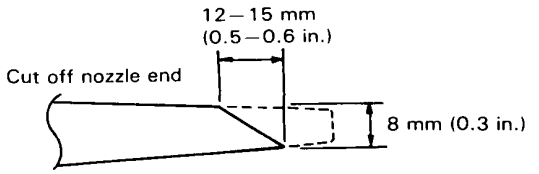
8. Thoroughly mix all the adhesive and hardener together on a glass or metal plate with a putty knife.

   NOTE: Clean the plate with a sponge and alcohol before mixing.

9. Follow the instructions that come with the adhesive.

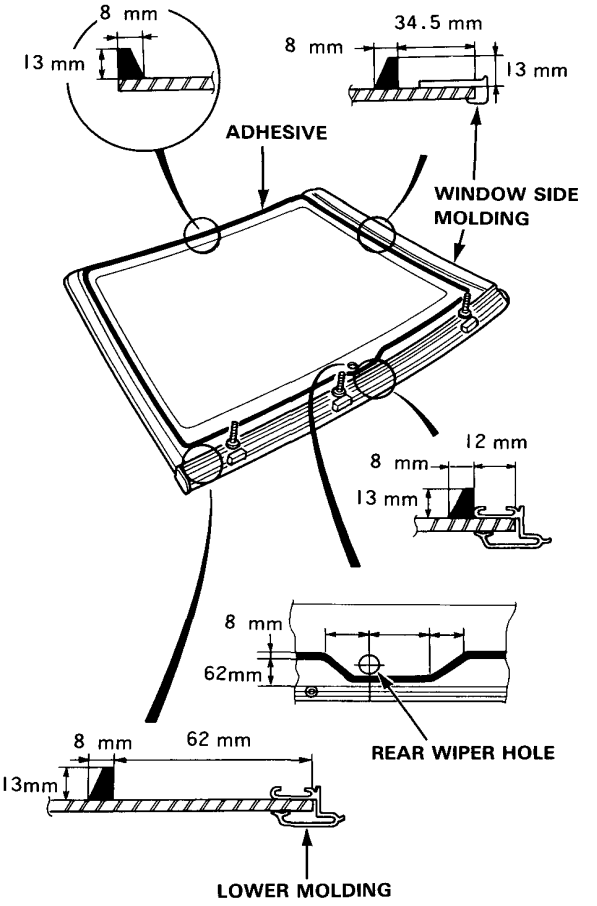


10. Before filling a cartridge, cut off the end of the nozzle at the angle shown.



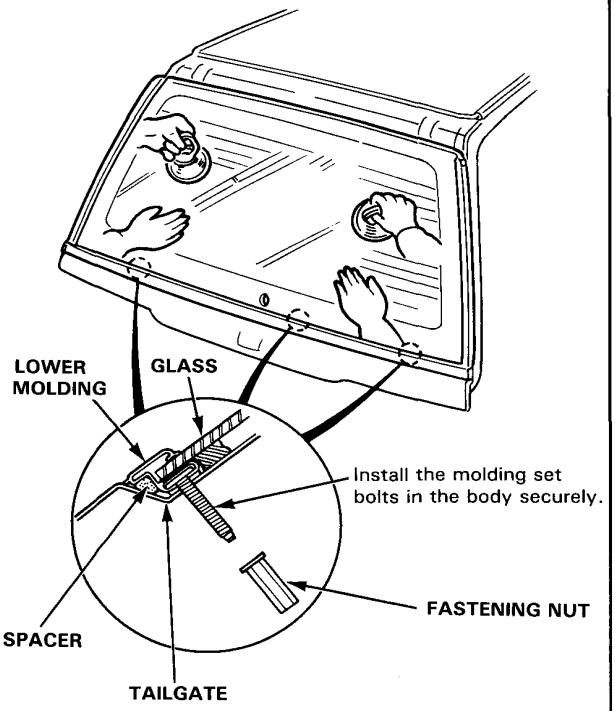
11. Pack adhesive into the cartridge without air pockets, to ensure continuous delivery. Put the cartridge in a caulking gun, and run a bead of adhesive around the edge of the glass as shown.

    NOTE: Apply the adhesive within 30 minutes after applying the glass primer.



12. Hold the glass with rubber suction cups and set the molding set bolts in position in the tailgate. Press the circumference of the glass lightly and make sure it adheres firmly.

    - Do not open or close the tailgate or doors until the adhesive has set completely.



13. Tighten the lower clip mounting nuts.

14. Scrape or wipe the excess adhesive off with a putty knife or gauze.

    NOTE: Wipe with a soft rag or towel dampened with unleaded gasoline to remove adhesive from a painted surface or glass.

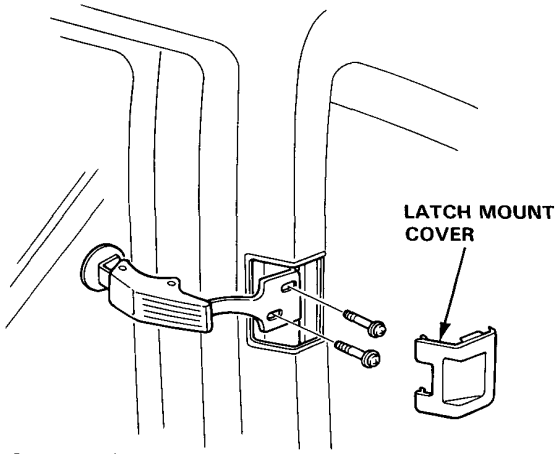
15. Let the adhesive dry for at least 1 hour, then spray water over the glass and check for leaks. Mark leaking areas and let the glass dry, then seal with sealant (08718—99964).

    NOTE:
    - Let the car stand for at least 4 hours after glass installation. If the car has to be used within the first 4 hours, it must be driven slowly.
    - Keep the glass dry within the first hour after installation.

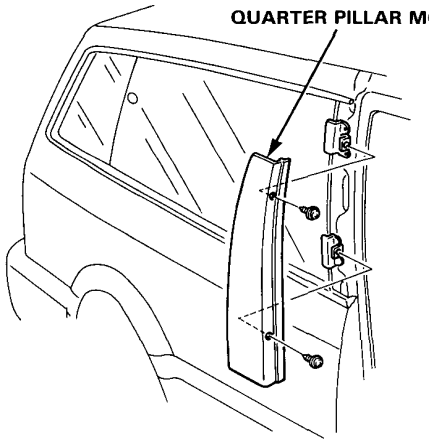
Replacement

Aerodeck

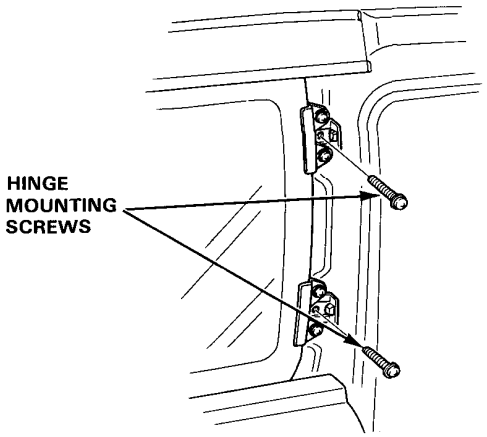
1. Pry the latch mount cover out and then remove the screws.



2. Remove the screws and the quarter pillar molding.



3. Remove the quarter glass hinge mounting screws, and then the glass.

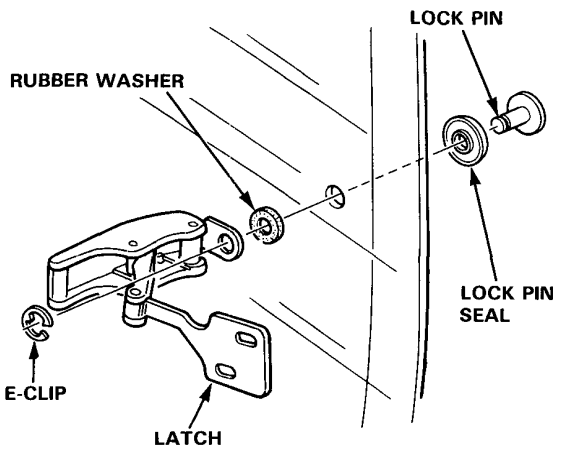


(cont'd)

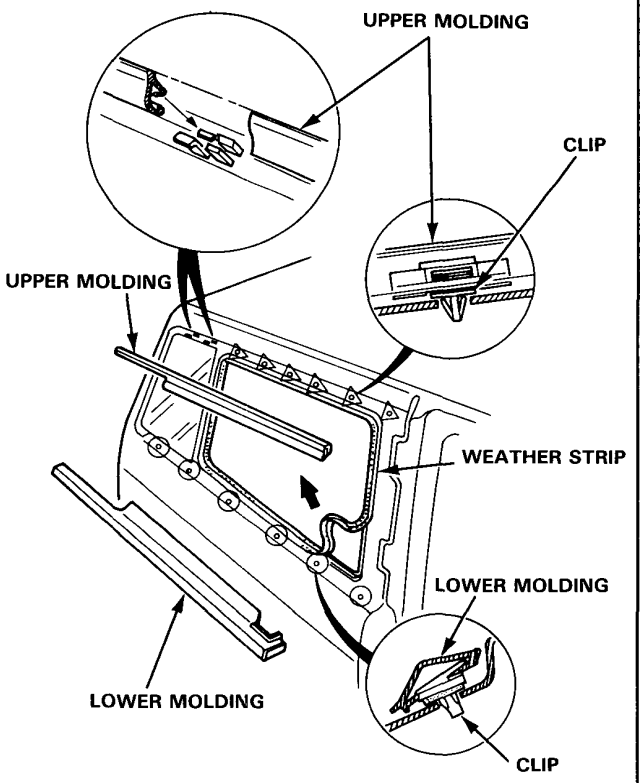
Quarter Glass

Replacement (cont'd)

4. Remove the E-clip with a screwdriver, then remove the latch.



5. If necessary, pull off the weatherstrip and remove the upper molding and the lower molding.

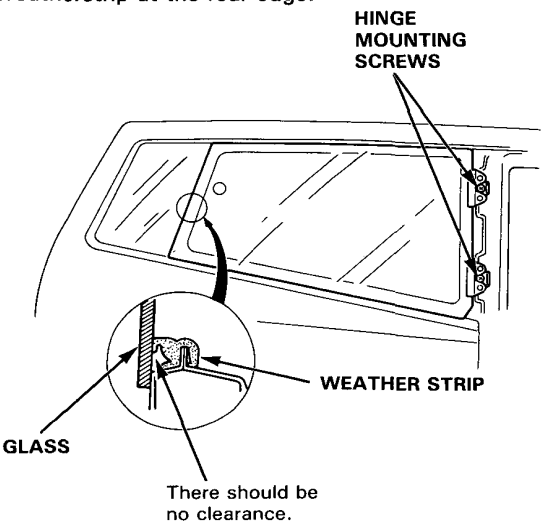


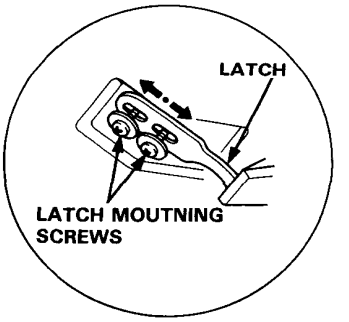
6. Install in the reverse order of removal. Check for proper glass fit when closed after installation.

Adjustment

Aerodeck

Install in the reverse of removal. Check for proper glass fit when closed after installation.
To adjust, loosen the latch mounting screws and move the latch back and forth. Adjust so that the latch works smoothly, and the glass closes securely.
Check for proper contact between the glass and weatherstrip at the rear edge.





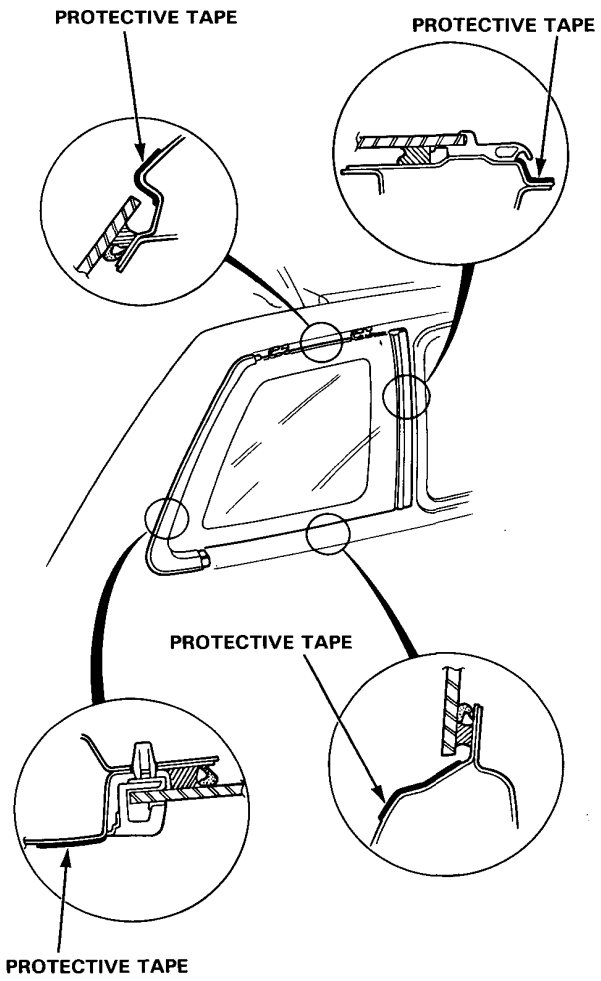
Rear Quarter Window Glass

Removal

Aerodeck

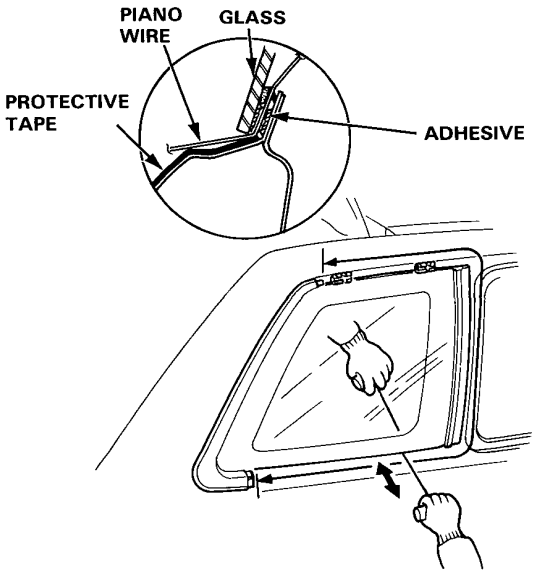
CAUTION: Wear gloves to remove and install the glass.

1. Remove the quarter window trim panel (page 21-64).
2. Remove the quarter upper molding, the quarter lower molding (page 21-48).
3. Apply protective tape along the edge of the body next to the glass as shown.

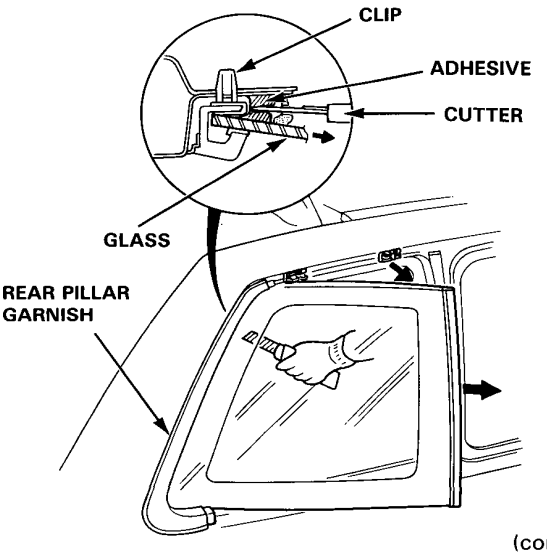


4. Using an awl, make a hole through the glass adhesive from inside the car. Push piano wire through the hole and wrap each end around a piece of wood.
5. With a helper on the outside, pull the wire back and forth in a sawing motion and carefully cut through the adhesive.

CAUTION: Hold the piano wire as close to the glass as possible to prevent damage to the body.



6. From inside, cut away the remaining side with a cutter and remove the window glass from the rear pillar garnish by sliding it forwards.

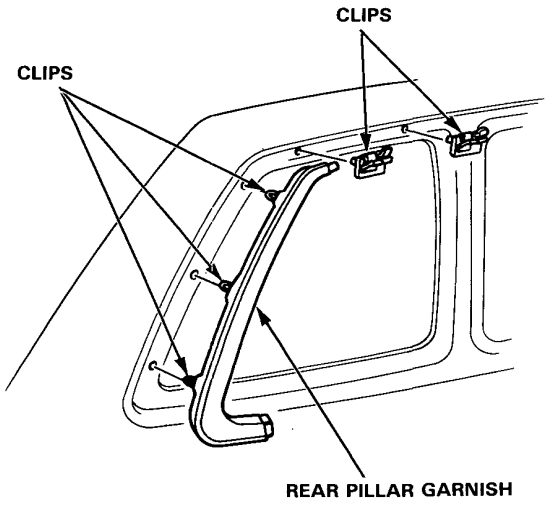


(cont'd)

Rear Quarter Window Glass

Removal (cont'd)

7. Remove the clips taking care not to drop them inside the body and remove the rear pillar garnish.



Installation

Aerodeck

1. Scrape the old adhesive smooth with a knife, to a thickness of about 2 mm (0.08 in.) on the bonding surface around the entire glass flange.

   NOTE:
   Do not scrape down to the painted surface of the body; damaged paint will interfere with proper bonding.

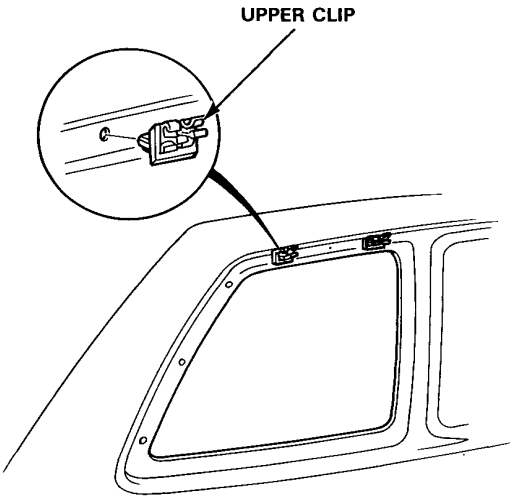
   Remove all traces of the rubber spacer material from the body.

   Mask off surrounding surfaces before painting.

2. Clean the body bonding surface with a sponge dampened in alcohol.

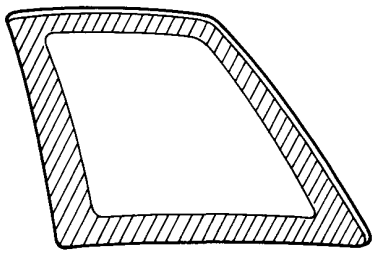
   NOTE: After cleaning, keep oil, grease or water form getting on the surface.

3. Set the upper clips to the body.



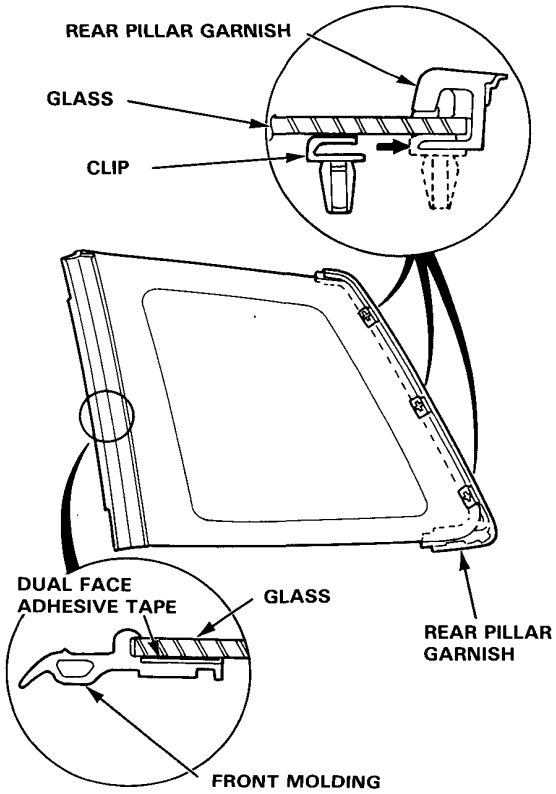
4. If the glass is to be reinstalled, peel the front molding and use a putty knife to scrape off all traces of old adhesive, then clean the glass surface with alcohol where new adhesive is to be applied.

   NOTE: Make sure the bonding surface is kept free of water, oil and grease.



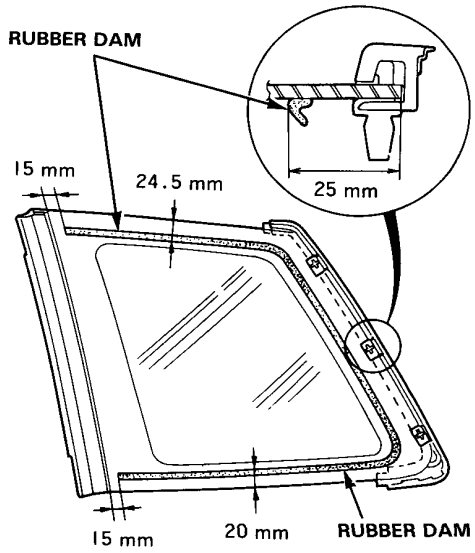
5. Install the front molding and the rear pillar garnish to the glass.

6. Set the clips to the glass at the point shown.



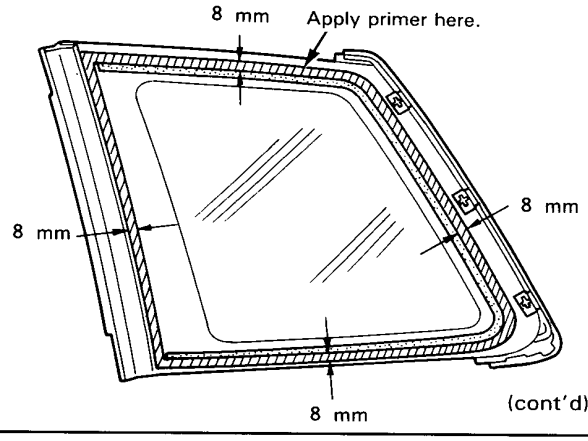
7. Glue the rubber dam to the inside face of the glass as shown, to contain the adhesive during installation.

   NOTE: Be careful not to touch the glass where adhesive will be applied.



8. With a sponge, apply a light coat of glass primer around the edge of the glass as shown, then lightly wipe it off with gauze or cheesecloth.

   NOTE:
   - Do not apply body primer to the glass, and do not get body and glass primer sponges mixed up.
   - Never touch the primed surfaces with your hands. If you do, the adhesive may not bond to the glass properly, causing a leak after the glass is installed.
   - Keep water, dust, and adhesive materials away from the primed surface.

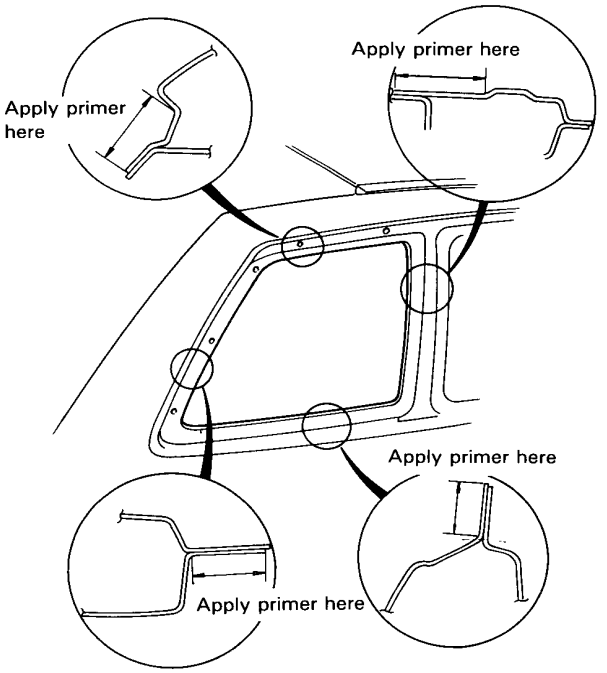


(cont'd)

Installation (cont'd)

9. With a sponge, apply a light coat of body primer to the original adhesive remaining around the window opening flange. The glass should be installed 10 minutes after you apply the primer.

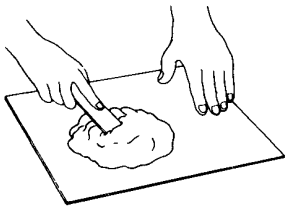
   NOTE:
   - Do not apply glass primer to the body, and be careful not to mix up glass and body primer sponges.
   - Never touch the primed surfaces with your hands.



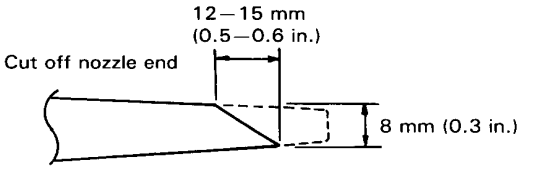
10. Thoroughly mix all the adhesive and hardener together on a glass or metal plate with a putty knife.

    NOTE: Clean the plate with a sponge and alcohol before mixing.

11. Follow the instructions that come with the adhesive.

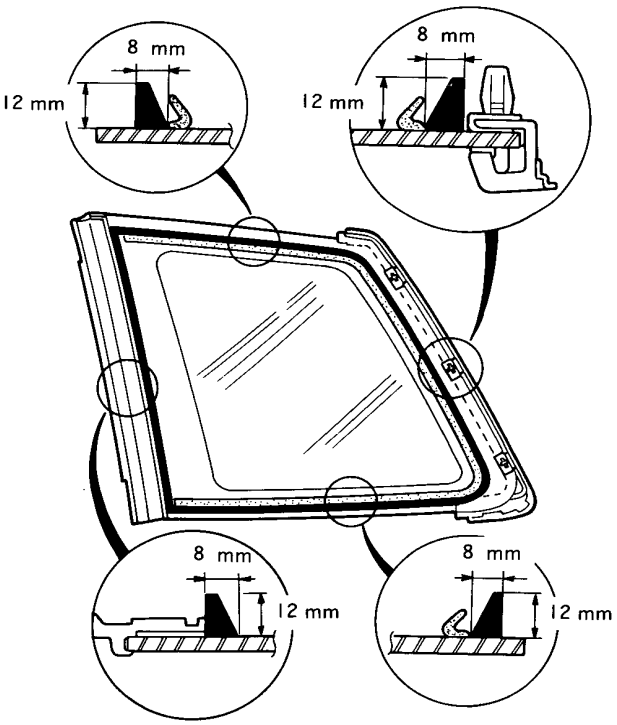


12. Before filling a cartridge, cut off the end of the nozzle at the angle shown.



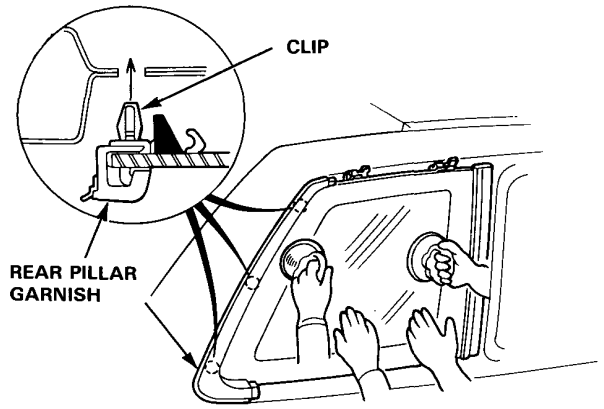
13. Pack adhesive into the cartridge without air pockets, to ensure continuous delivery. Put the cartridge in a caulking gun, and run a bead of adhesive around the edge of the glass as shown.

    NOTE:
    - Apply the adhesive within 30 minutes after applying the glass primer.
    - Make a slightly thicker bead at each corner.



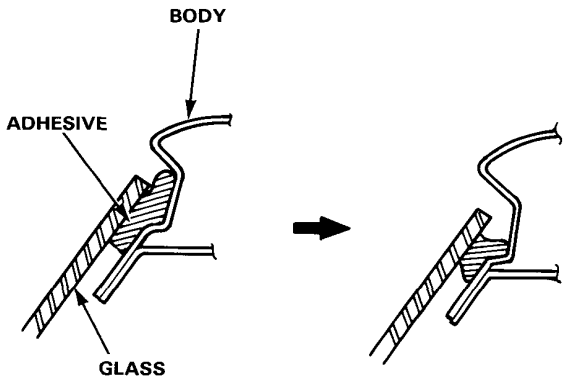
14. Holding the glass using rubber suction cups, align the rear pillar garnish clips with the corresponding positions in the body. Press the circumference of the glass lightly and make sure it adheres firmly.

    - Do not open or close the tail gate or doors until the adhesive has set completely.



15. Scrape or wipe the excess adhesive off with a putty knife or gauze.

    NOTE: Wipe with a soft rag or towel dampened with unleaded gasoline to remove adhesive from a painted surface or glass.



16. Let the adhesive for at least 1 hour,then spray water over the glass and check for leaks. Mark leaking areas and let the glass dry, then seal with sealant (08718—99964).

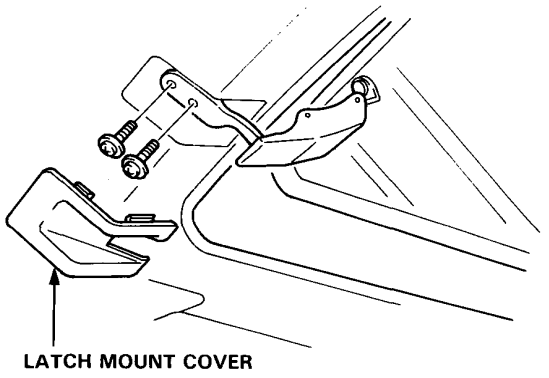
    NOTE:
    - Let the car stand for at least 4 hours after glass installation. If the car has to be used within the first 4 hours, it must be driven slowly.
    - Keep the glass dry within the first hour after installation.

Quarter Glass

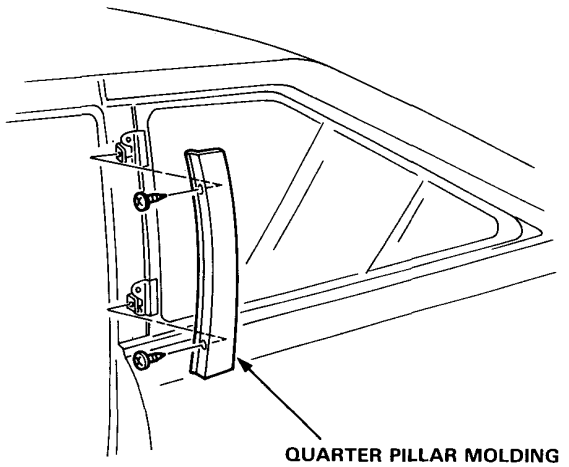
Replacement

Glass Back

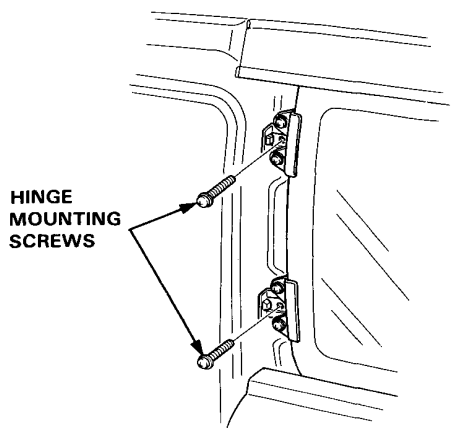
1. Pry the latch mount cover out and then remove the screws.



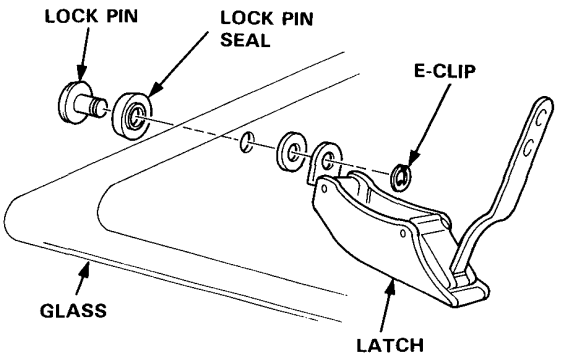
2. Remove the screws and the quarter pillar molding.



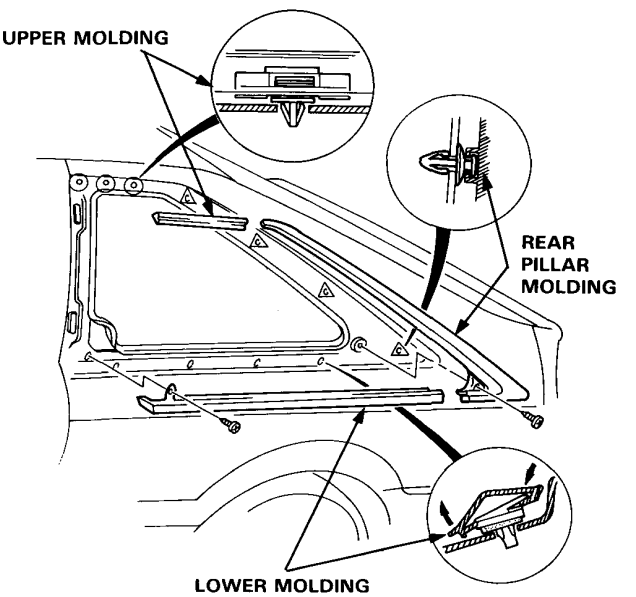
3. Remove the quarter glass hinge mounting screws, and then the glass.



4. Remove the E-clip with a screwdriver, then remove the latch.



5. If necessary, pull off the weatherstrip and remove the upper molding, the lower molding and the rear pillar molding.

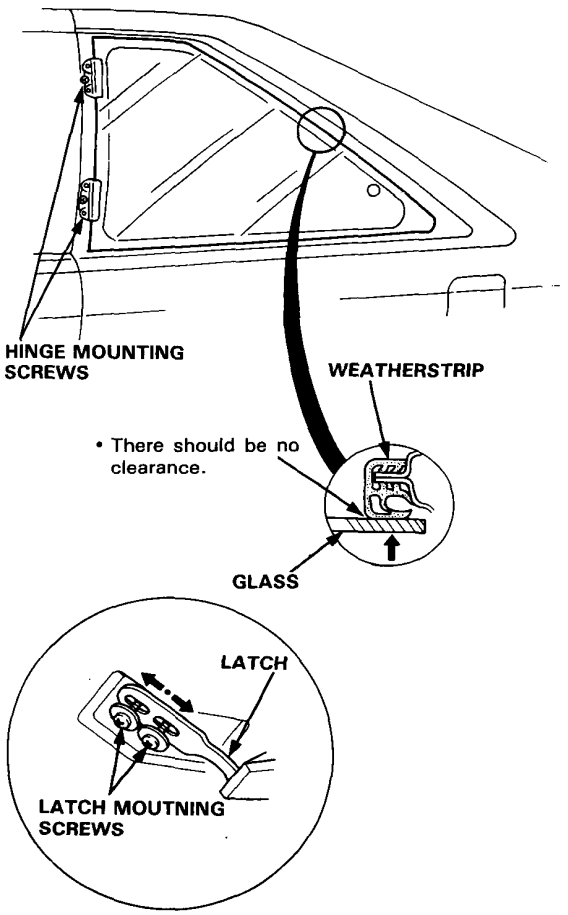


6. Install in the reverse of removal. Check for proper glass fit when closed after installation.

Adjustment

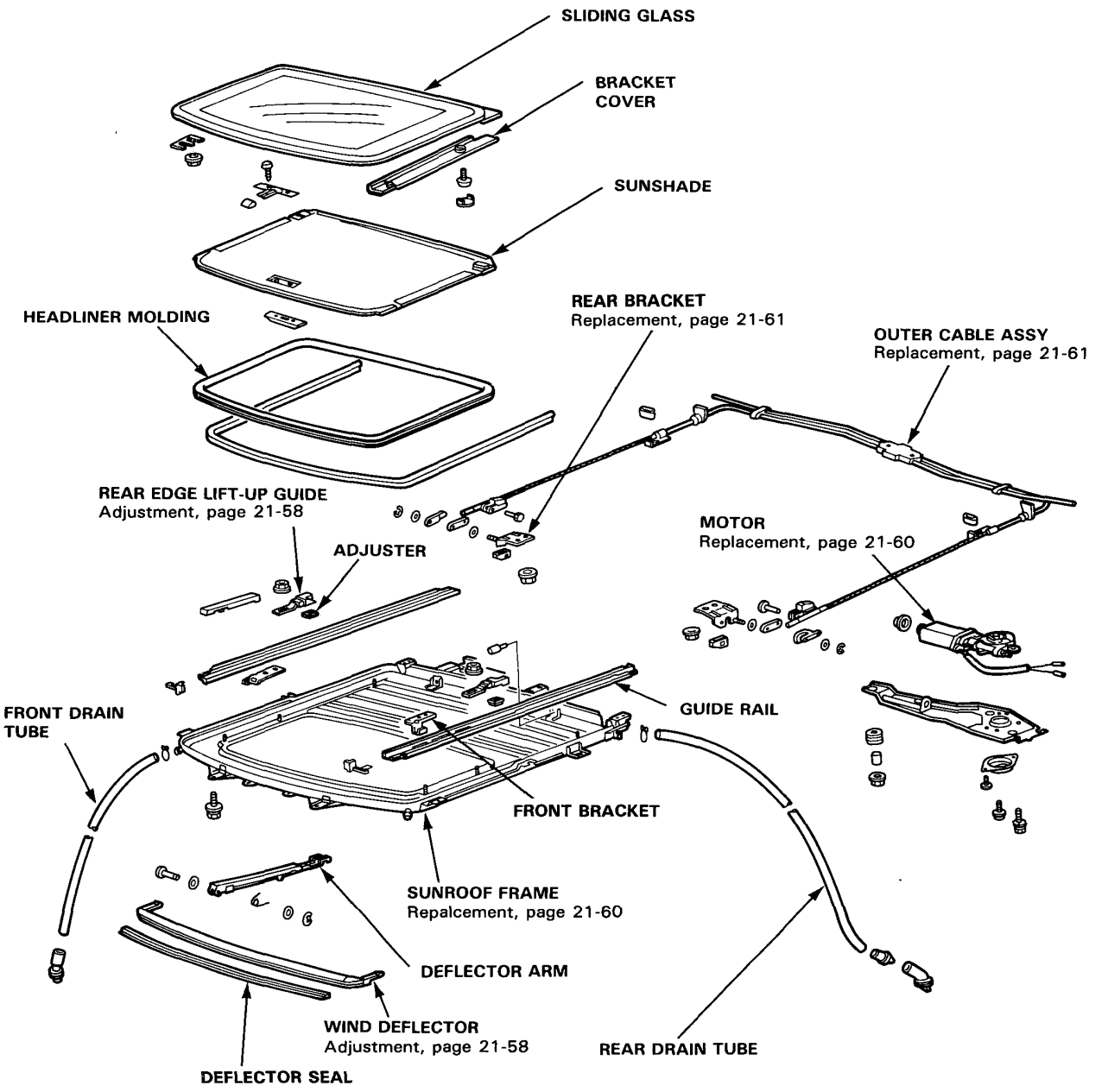
Glass Back

Install in the reverse of removal. Check for proper glass fit when closed after installation.
To adjust, loosen the latch mounting screws and move the latch back and forth. Adjust so that the latch works smoothly, and the glass closes securely.
Check for proper contact between the glass and weatherstrip at the rear edge.



Sunroof

Index



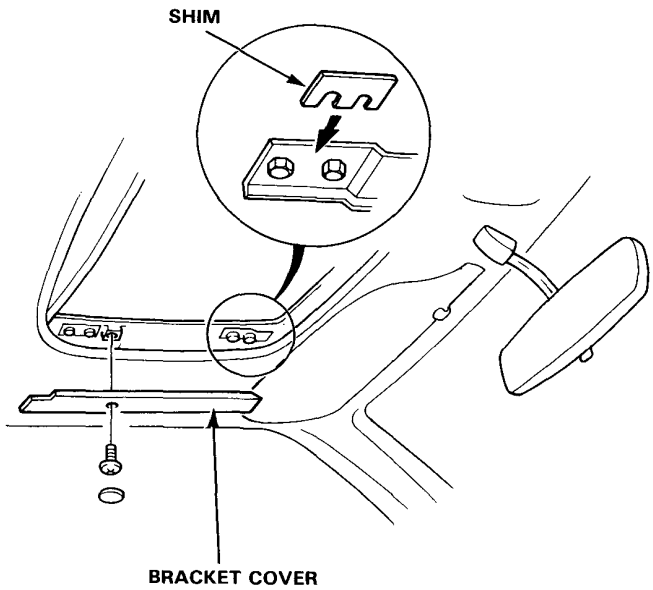
Troubleshooting

Symptom	Probable Cause
Water leak	1. Clogged drain tube. 2. Gap between glass weatherstrip and roof panel. 3. Defective or improperly installed glass weatherstrip.
Wind noise	1. Excessive clearance between glass weatherstrip and roof panel.
Deflector noise	1. Improper clearance between deflector seal and roof panel. 2. Insufficient deflector extension. 3. Deformed deflector.
Motor noise	1. Loose motor. 2. Worn gear or bearing. 3. Outer cable deformed.
Sliding glass does not move, but motor turns	1. Clutch out of adjustment. 2. Foreign matter stuck between guide rail and sliding glass. 3. Outer cable loose. 4. Outer cable not attached properly.
Sliding glass does not move and moitor does not turn (Sliding glass can be moved with sunroof wrench)	1. Blown fuse. 2. Faulty switch. 3. Battery run down. 4. Defective motor.

Glass Height Adjustment

Roof panel should be even with the glass weatherstrip, to within 1 ± 1.5 mm (0.04 ± 0.06 in.) all the way around. If not, slide sunshade back, and:

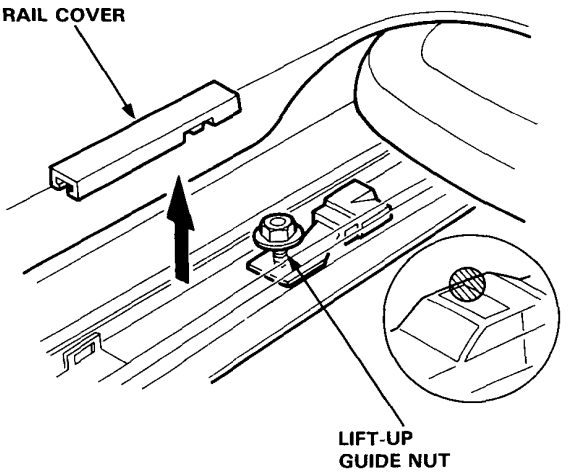
1. Pry plug out of the bracket cover, remove screw, then slide cover off to the rear.
2. Loosen bracket mounting nuts and install shims between glass frame and bracket as shown.
3. Repeat on opposite side if necessary.



Rear Edge Closing Adjustment

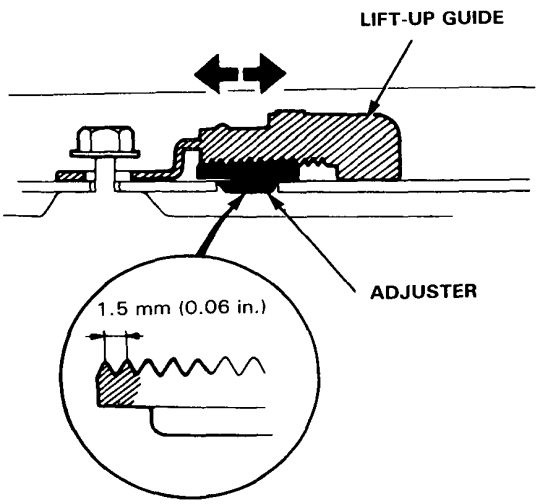
Open the glass about a foot then close it to check where rear edge begins to rise. If it rises too soon and seats too tightly against roof panel or too late and does not seat tightly enough, adjust it.

1. Open the glass fully.
2. Remove the rail covers from both sides, and loosen lift-up guide nuts.



3. Move the guides forward or backward, then tighten nuts and re-check roof closing.

   The guides have pitches of 1.5 mm (0.06 in.) each and can be adjusted 2 pitches forward or backward.

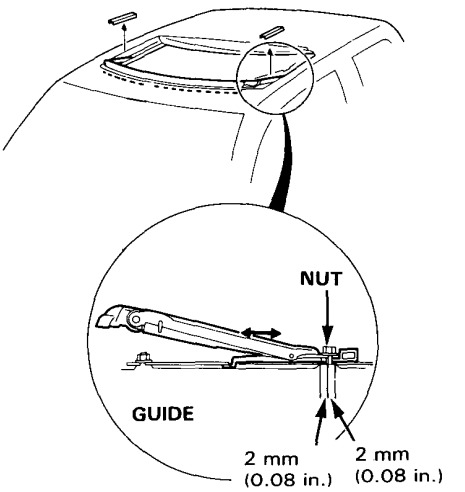


Wind Deflector Adjustment

NOTE: A gap between deflector seal and roof panel will cause wind noise when driving at high speed with the sunroof open.

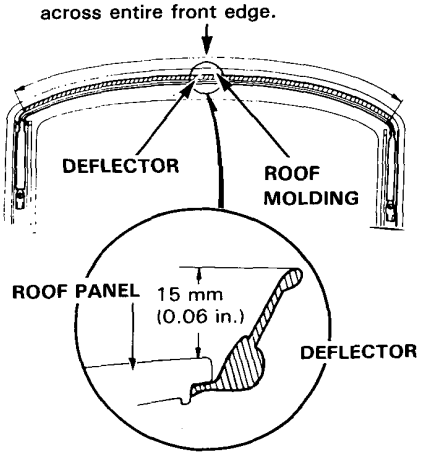
1. Open the sunroof and pry the rail covers off both sides.
2. Loosen deflector mounting nuts.

   NOTE: Wind deflector can be adjusted 2 mm (0.08 in.) forward backward.



3. Adjust deflector forward or backward so the edge of its seal touches the roof panel evenly.

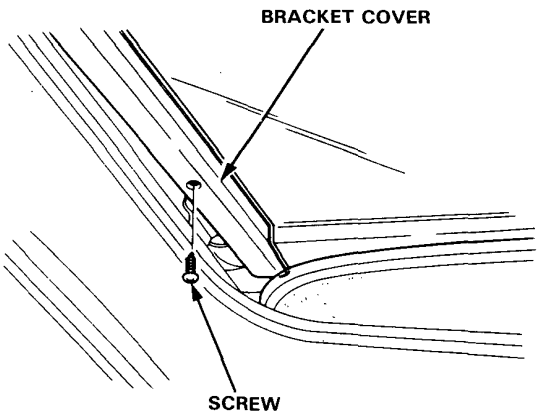
   Deflector seal should touch the roof panel across entire front edge.



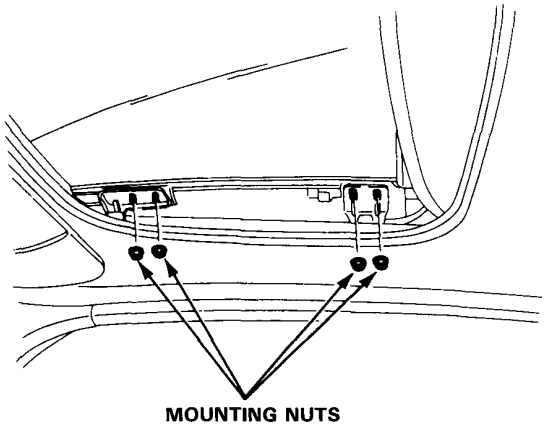
NOTE: The height of the deflector when open can not be adjusted. If damaged or deformed, replace it.

Glass and Sunshade Replacement

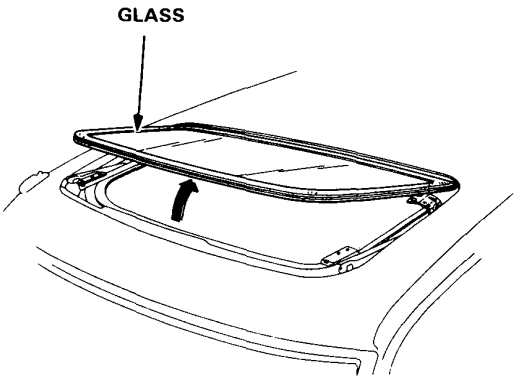
1. Slide sunshade all the way back.
2. Pry plug out of each bracket cover, remove screw, and slide cover off to the rear.



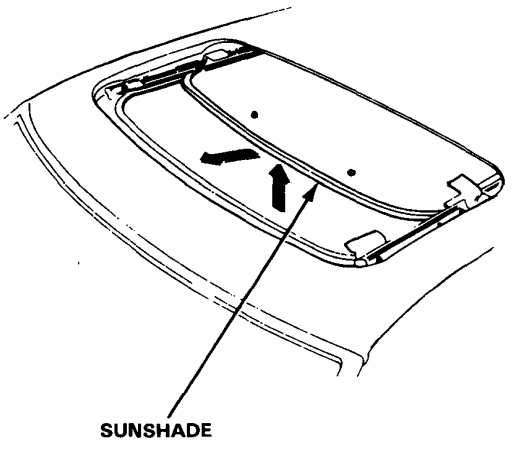
3. Close the glass fully.
4. Remove the mounting nuts from front and rear brackets both sides.



5. Remove the glass by lifting up and pulling forward as shown.



6. Remove the sunshade as shown.



NOTE: The sunshade may be bent slightly to ease removal.

Motor, Drain Tube and Frame Replacement

1. Remove the headliner (page 21-66).

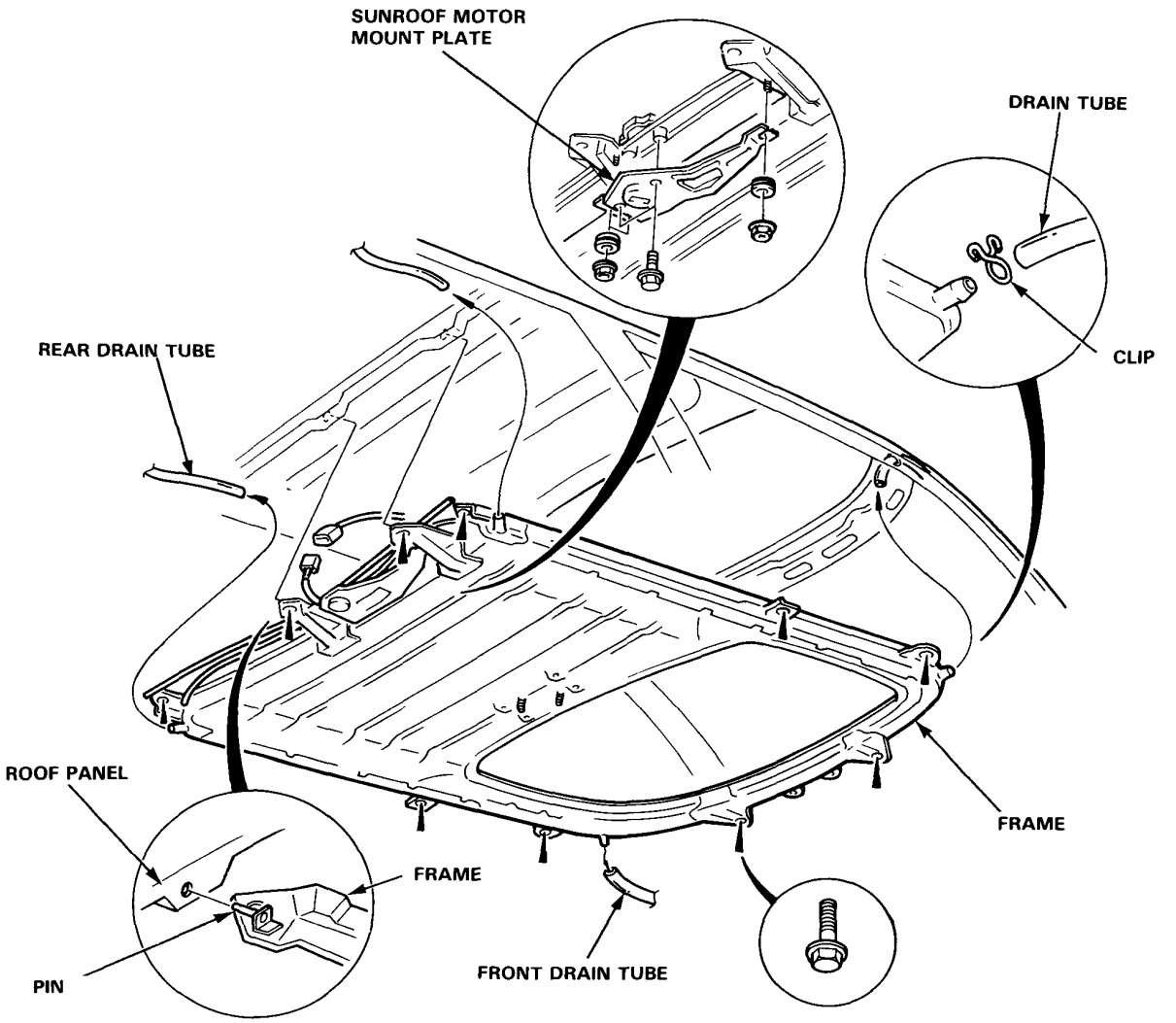
   NOTE:
   - To remove the sunroof motor only, remove the clips at the rear of the roof lining, then pull the lining down.
   - Do not pull the lining down more than necessary to remove the sunroof motor.

2. Disconnect the wire harness at the connector.

3. Remove the sunroof motor by removing the two bolts and three nuts from the bottom of the motor mount plate.

4. Disconnect the drain tubes.

5. Remove the ten 6 x 16 mm mounting bolts from the frame, and remove the frame from the car. (May require use of a helper. Be careful not to cut away interior part of the car.)

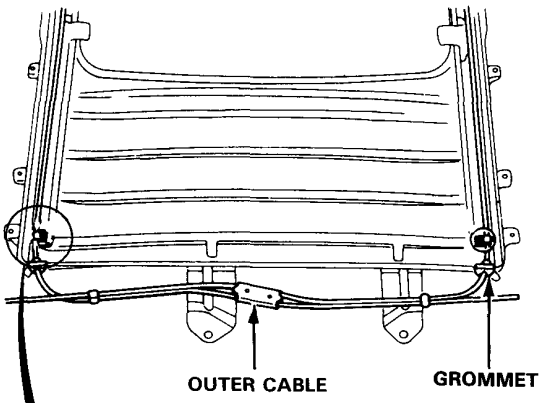


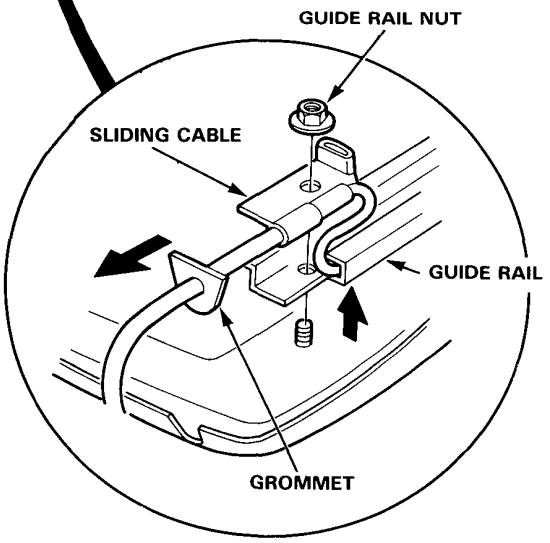
6. To install, insert the frame's rear pins into the body holes, then install parts in the reverse order of removal.

Cable Replacement

With sunroof out of the car, remove the guide rail mounting nuts, lift off the guide rails, and remove the cables with rear brackets attached.

NOTE: Fill the groove in each grommet with sealant and apply molybdenum grease to the inner cable.



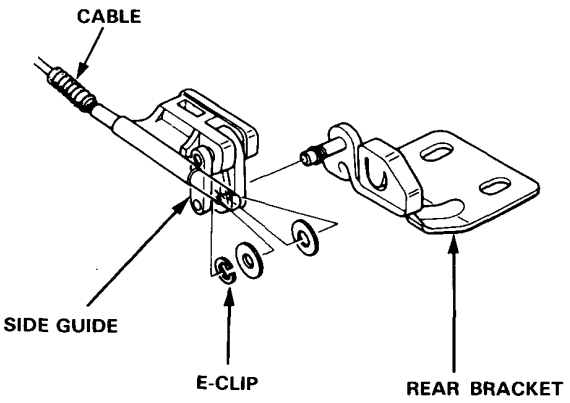


Rear Bracket Disassembly

1. Remove the side guides from the rear brackets.

   NOTE: Replace the guides with new ones whenever they are disassembled.

2. Pry the E-clip off the pin, and remove the rear bracket from the cable.

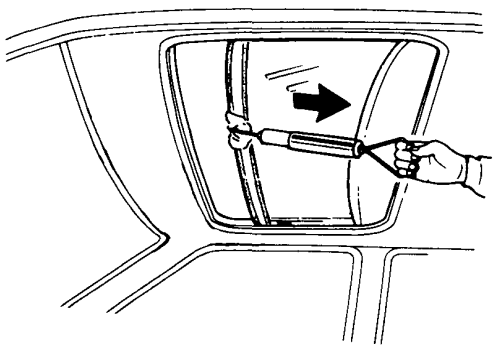


Closing Drag Check (Motor Removed)

Before installing the sunroof motor, measure effort required to open sliding glass using a spring scale as shown.

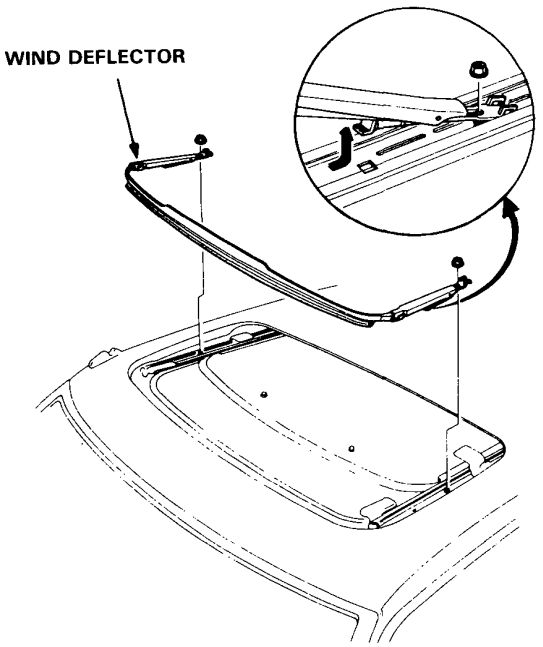
CAUTION: When using the spring scale, protect the leading edge of the sunroof with a shop rag.

If load over 98 N (10 kg, 22 lb), check side clearance and glass height adjustment (page 21-57).



Wind Deflector Installation

Installation is done in the reverse order of removal. When installing, make sure to insert the deflector ends tightly into the guide rails and arrange the deflector and rails in parallel.

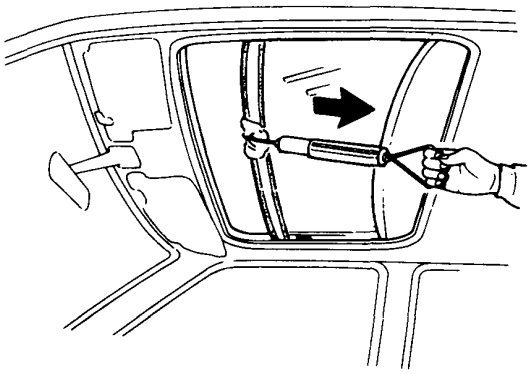


Closing Force Check (Motor Installed)

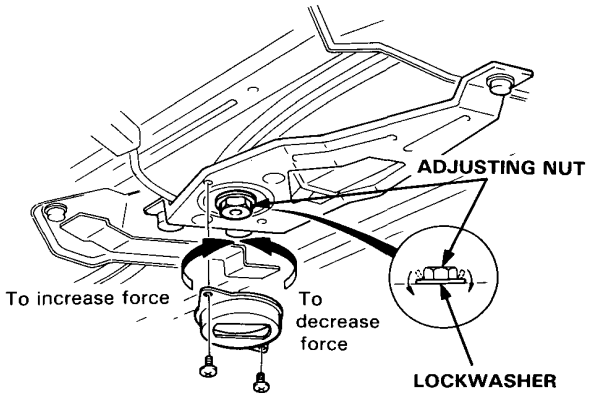
1. After installing all removed parts, have a helper hold the switch to close the sunroof while you measure force required to stop it. Attach spring scale as shown. Read force as soon as glass stops moving, then immediately release the switch and spring scale.

   CAUTION: When using the spring scale, protect the leading edge of the sunroof with a shop rag.

   Closing Force: 196—245 N (20—30 kg, 44—55 lb)



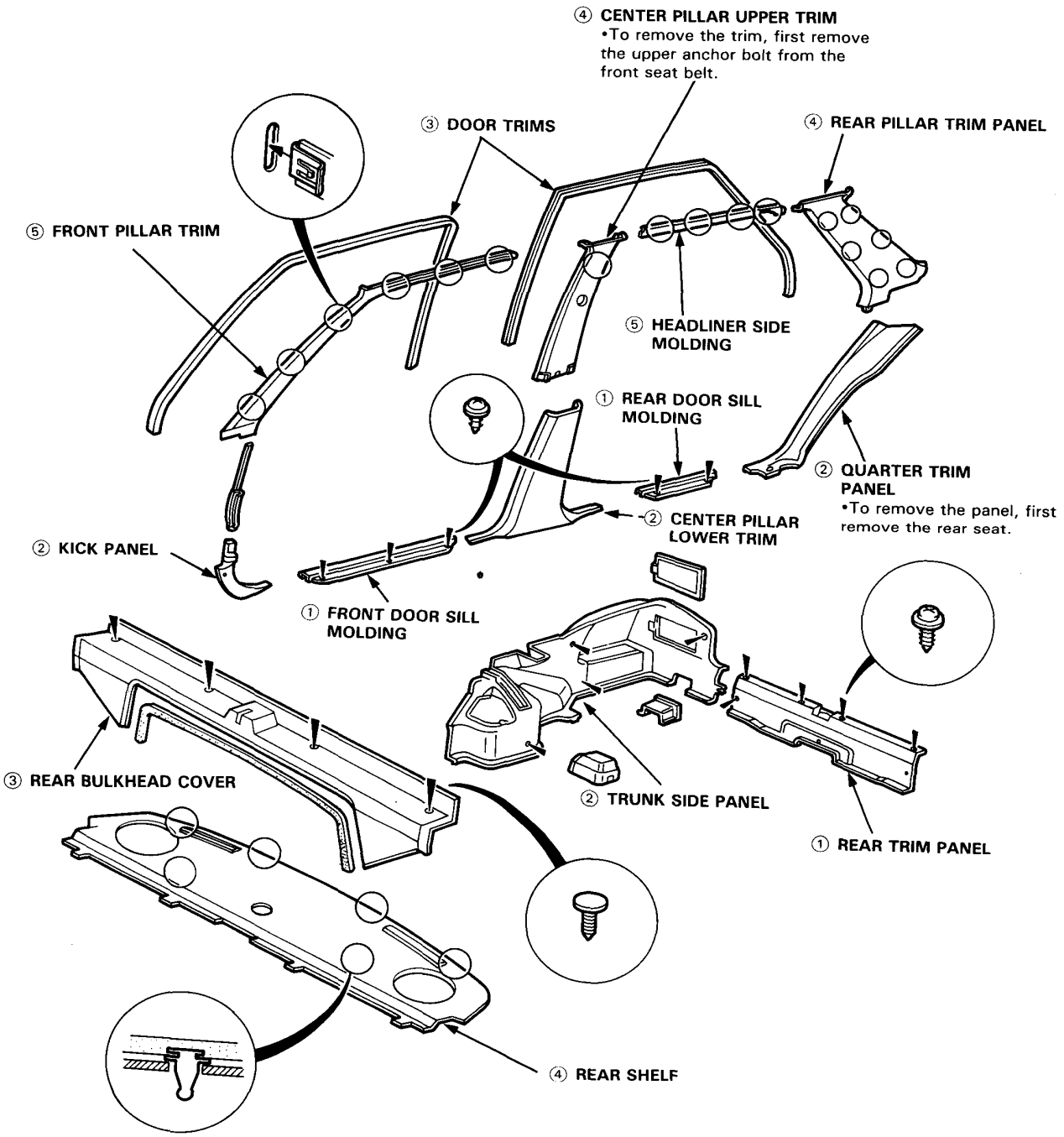
2. If force is not within specification, install a new lockwasher, adjust the tension by turning the sunroof motor clutch adjusting nut, and bend the lockwasher against the adjusting nut.



Replacement

Sedan

Disassemble in numbered sequence.

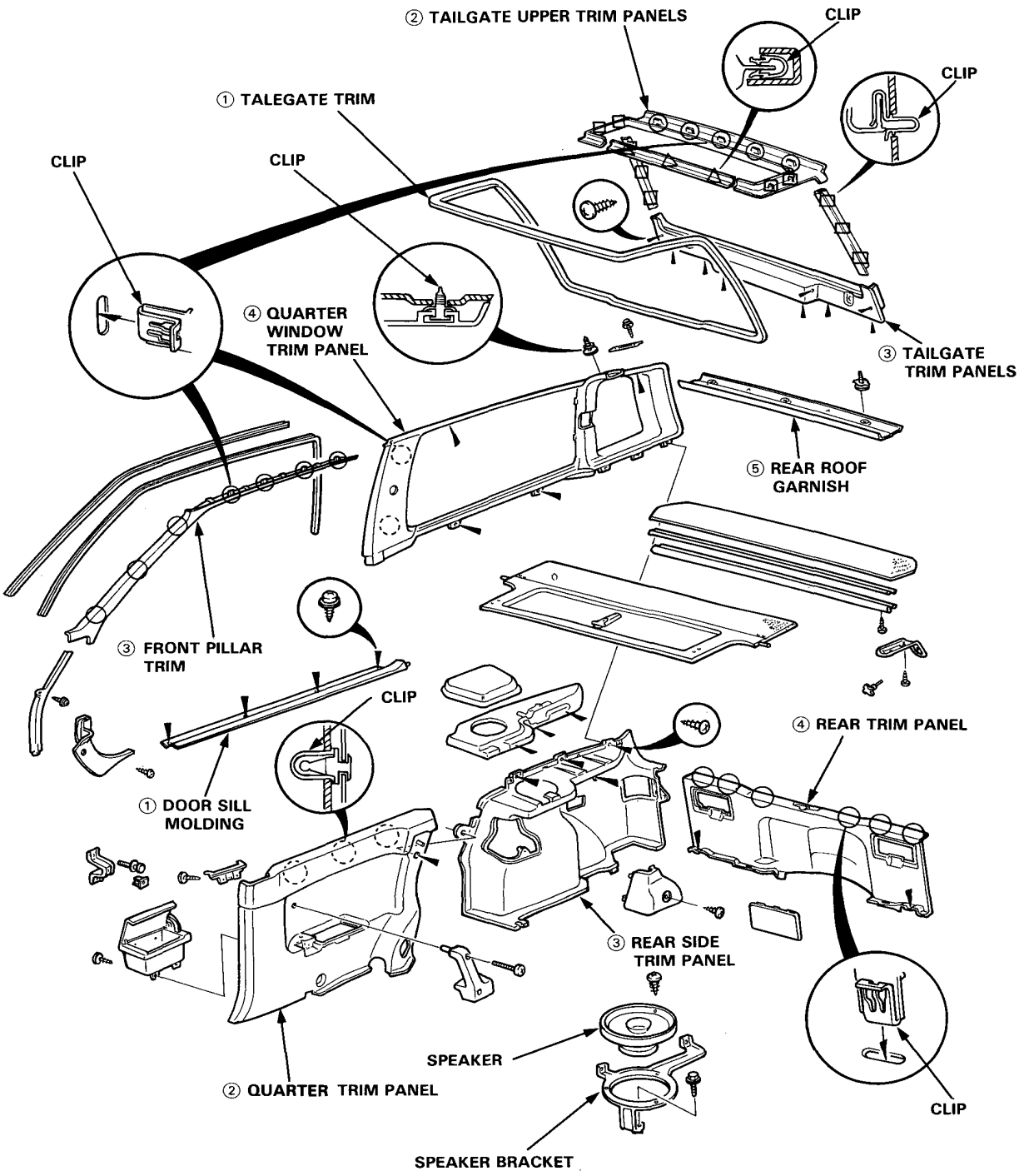


(cont'd)

Replacement (cont'd)

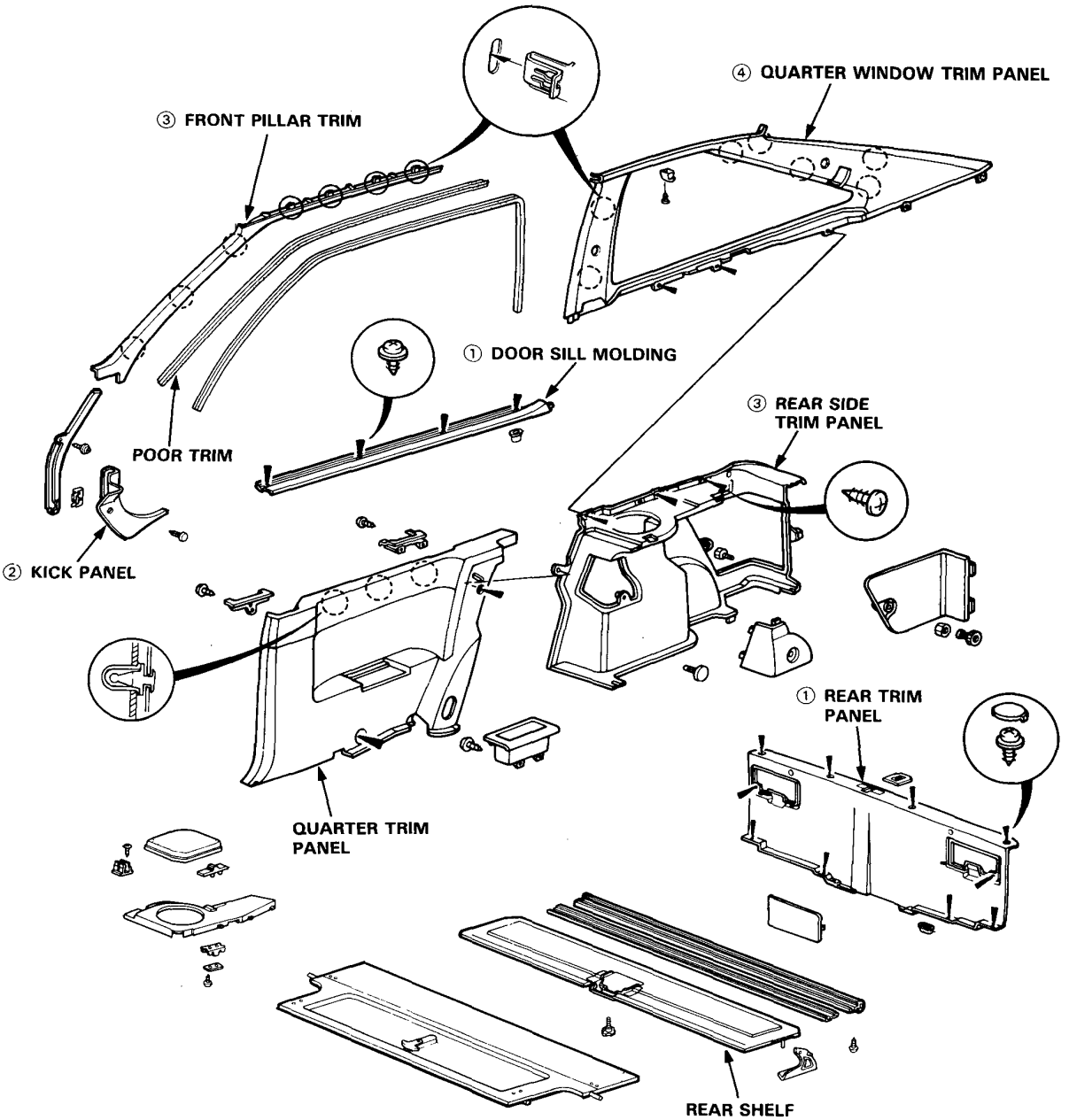
Aerodeck

Disassemble in numbered sequence.



Glass Back

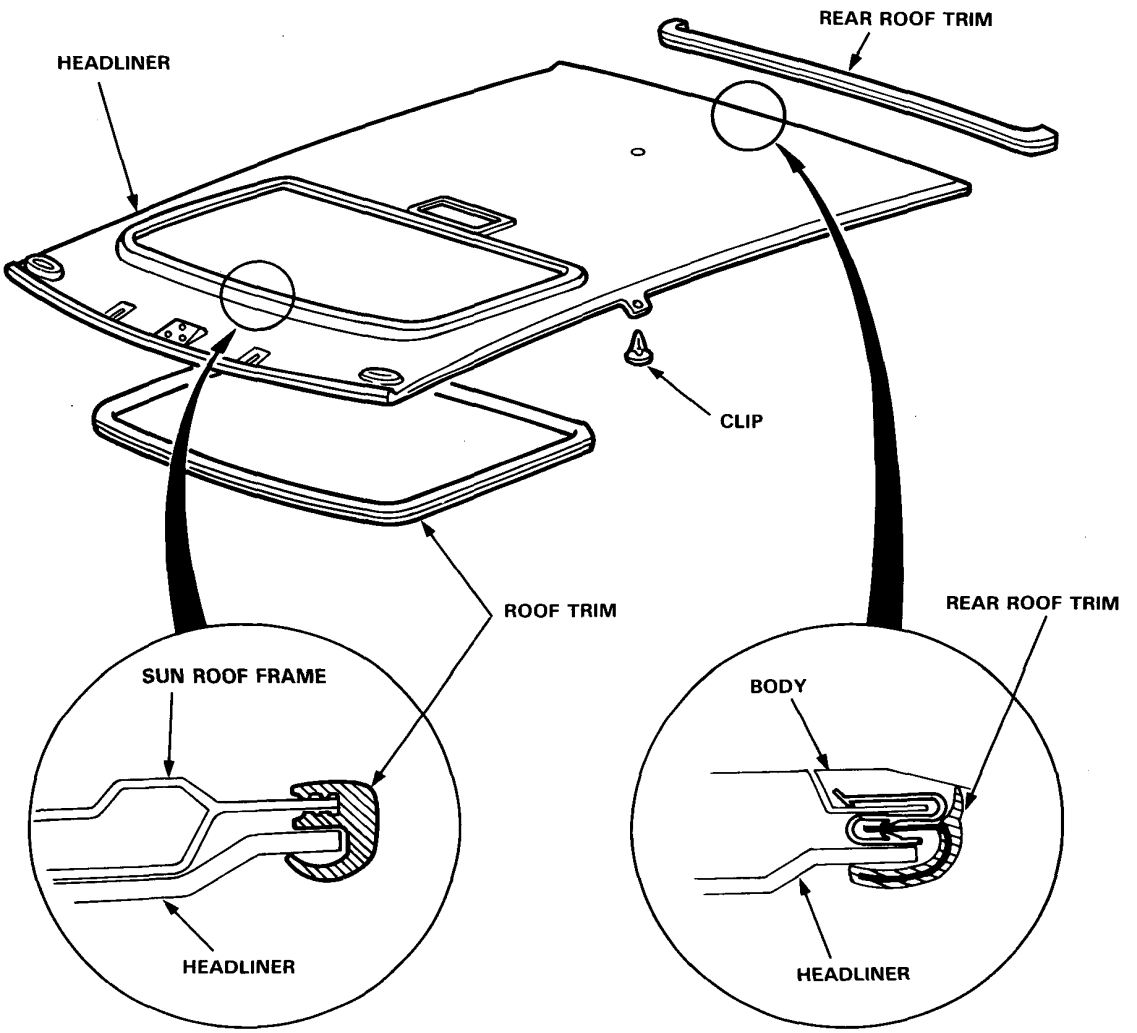
Disassemble in numbered sequence.



Headliner

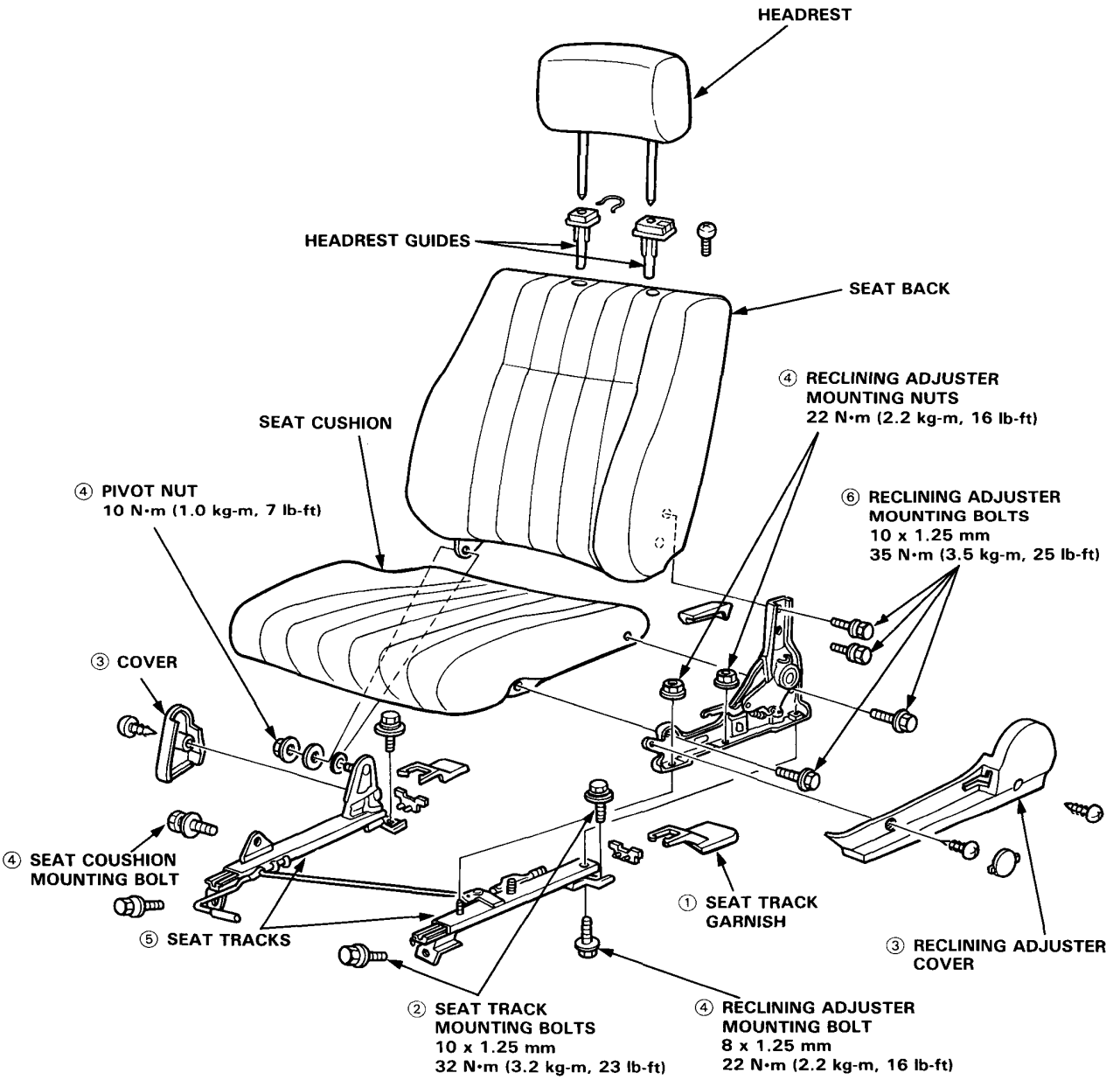
Replacement

1. Remove:
   - Sunvisors.
   - Rear view mirror and base.
   - Front pillar garnishes.
   - Interior light.
   - Quarter window trim (Hatchback).
   - Rear roof trim.
   - Roof trim (sun roof model only).
2. Remove the rear roof trim and the clips, then remove the headliner.



Exploded View

Disassemble in numbered sequence.

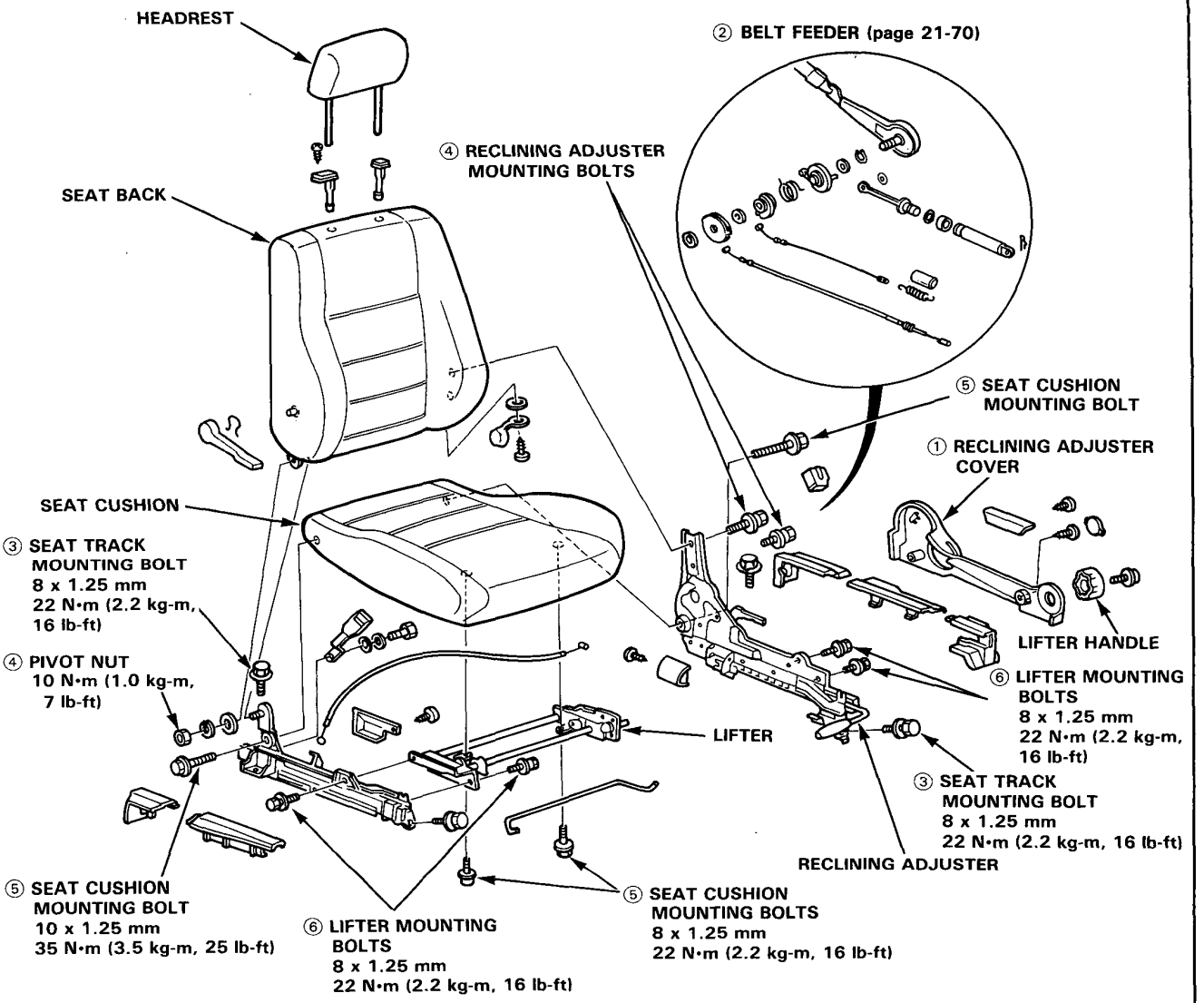


(cont'd)

Exploded View (cont'd)

With Belt Feeder:

Disassemble in numbered sequence.

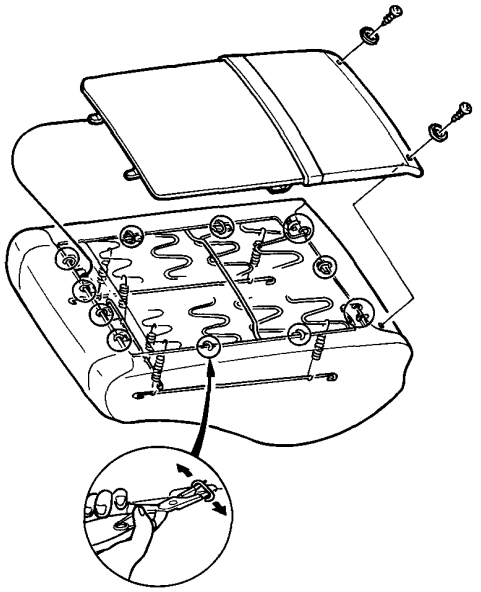


Seat Cover

Replacement

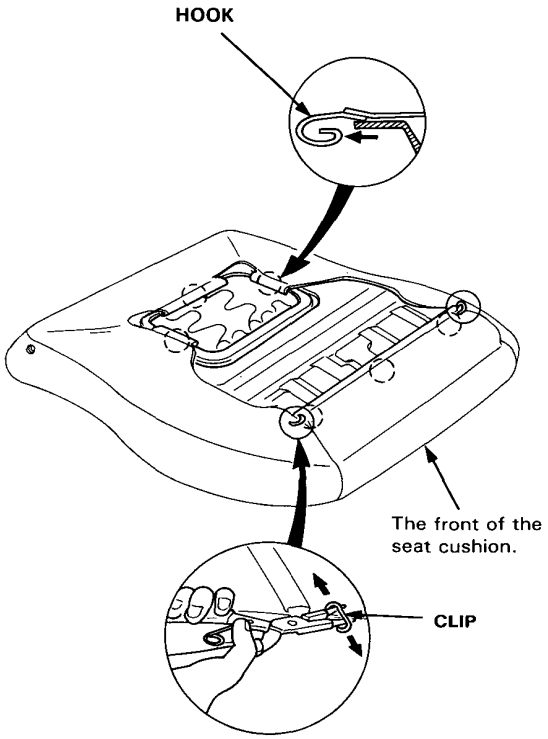
Front Seat Back:

1. Separate the seat cushion and back.
2. Remove the caps and the screws, then remove the cover.
3. Remove all the clips of the seat back.
4. Remove the 6 springs, then remove the trim cover.



Front Seat Cushion:

5. Remove the 2 clips and the 6 hooks under the seat cushion, then remove the cover from the seat.



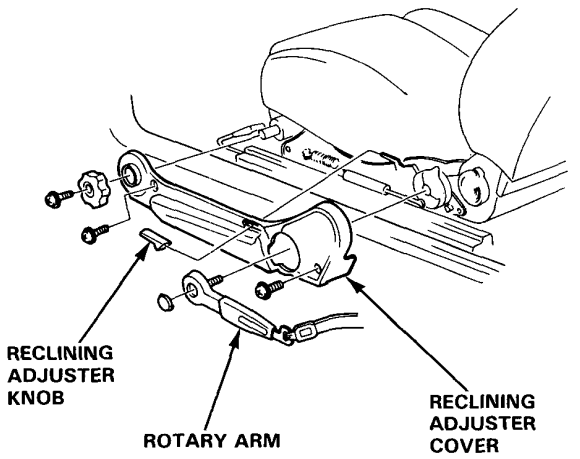
6. Remove the rear seat cover by same method.

   NOTE: To prevent wrinkles when installing a seat cover, make sure the material is stretched evenly over the frame before securing all the clips.

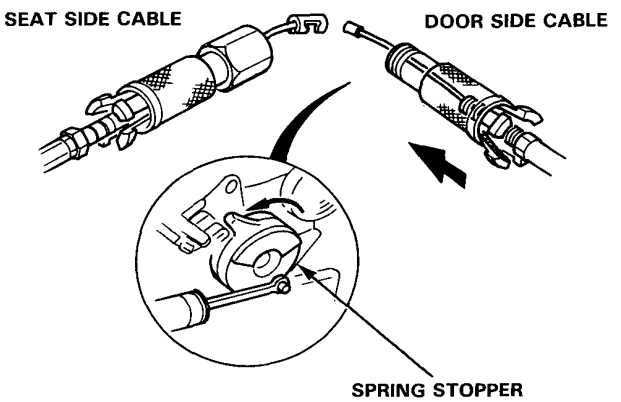
Belt Feeder

Removal

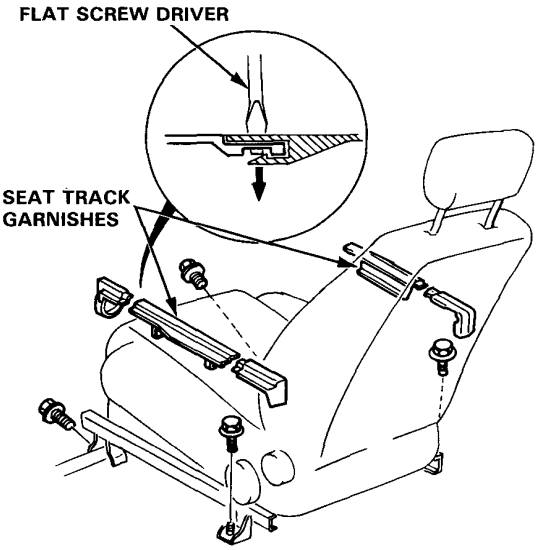
1. Remove the reclining adjuster knob and 2 screws, then remove the reclining adjuster cover.



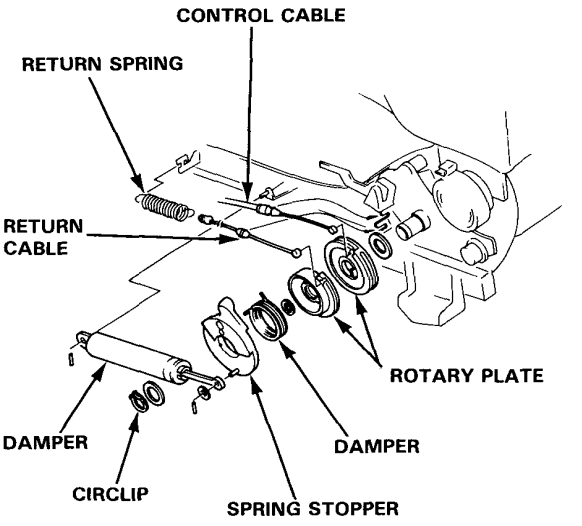
2. Pull the control cable intermediate joint out from under the seat. Dismantle the intermediate joint, push the door side cable into the joint, turn the spring stopper in the rotary unit in the direction of the arrow, pull out the cable connector and disconnect.



3. Using a flat screw driver, remove the seat track garnishes. Remove the front seat by removing the 4 mounting bolts.



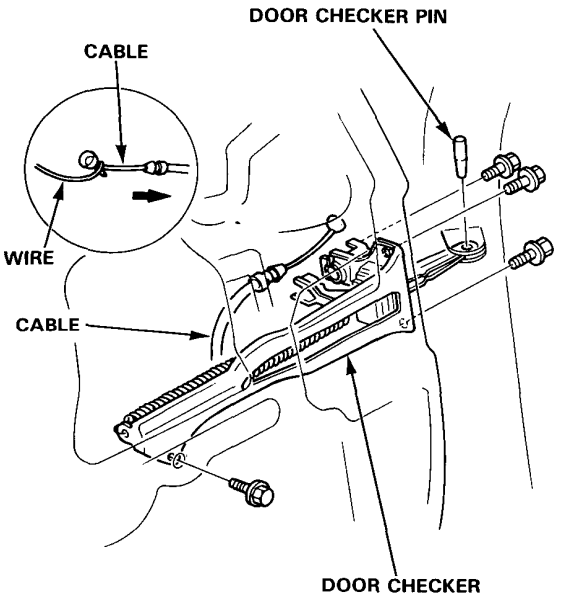
4. Remove the circlip, disconnect the damper joint and dismantle the rotary unit.



5. Shut the window glass fully, then remove the :

   - Door panel.
   - Speaker.
   - Plastic shield.
   - Power window controller.
   - Lower bolts of the front sash.

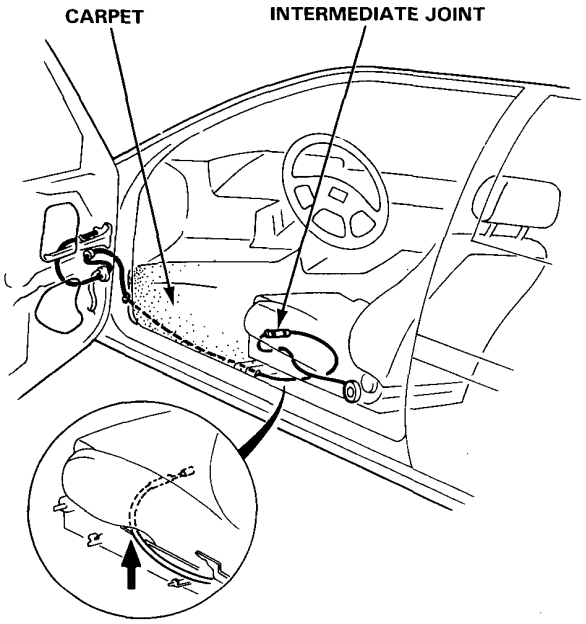
6. Remove the four bolts holding the door checker, then remove the door checker pin and disconnect the cable. Attaching a fairly long piece of wire to the cable before extracting it helps when refitting.



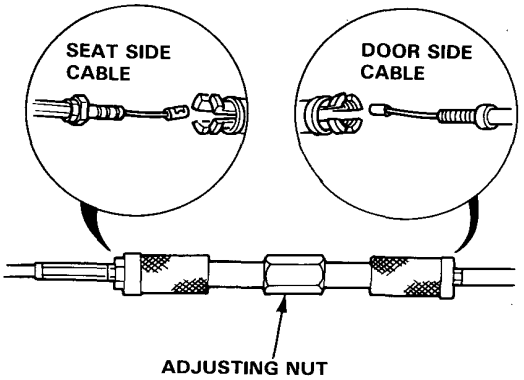
Installation

To install, reverse the removal procedure.

1. When installing the cable, give it as big a curvature as possible since the angle through which it bends has a major effect on operating efficiency.



2. As shown in the diagram, assemble the intermediate joint so that there is no unnecessary gap. Be careful not to mistake the cable and joint combination.
   Adjust by turning the adjusting nut so that the rotary arm rotates from when the door is one-third open to closed.

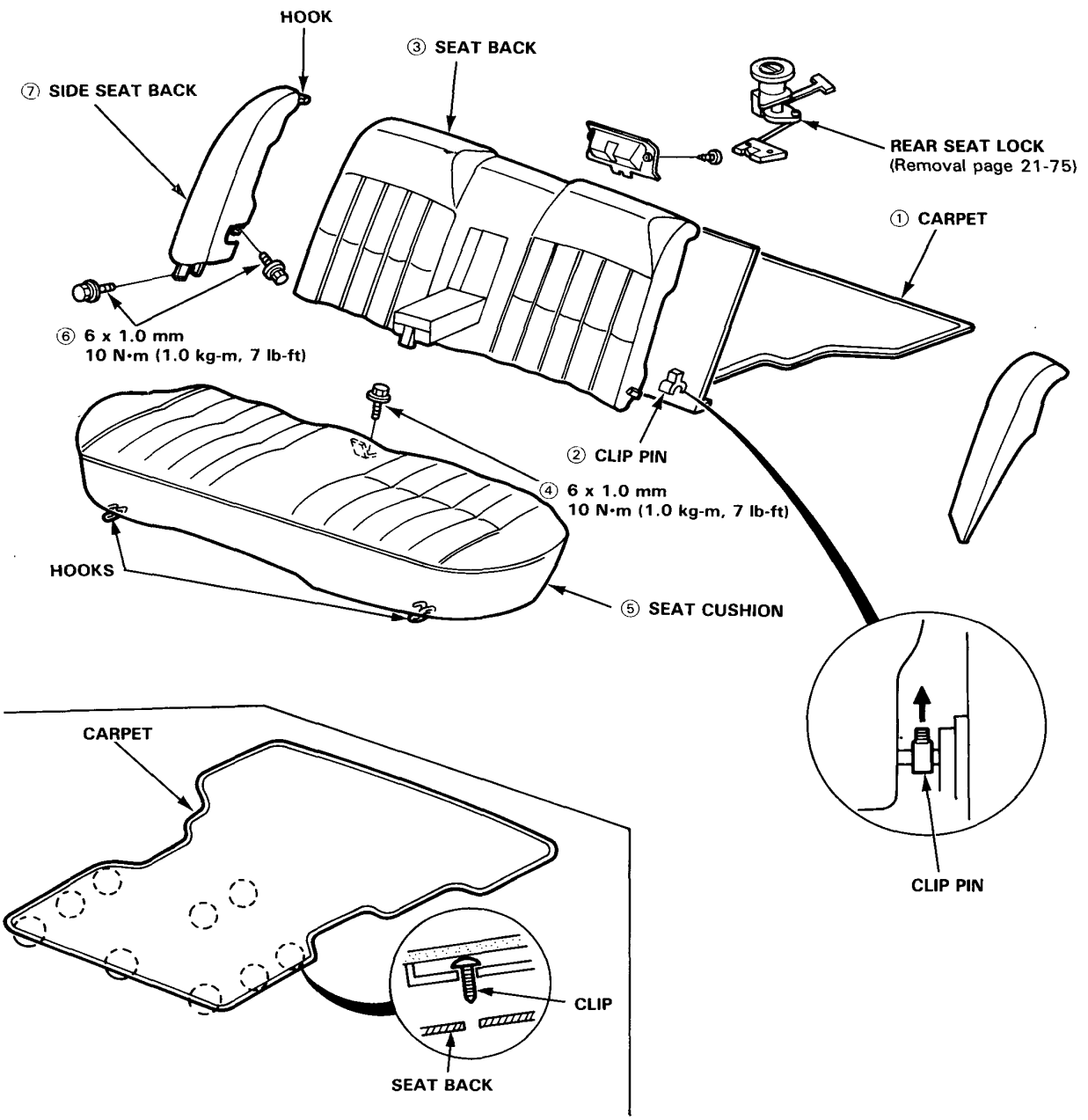


Rear Seat

Replacement

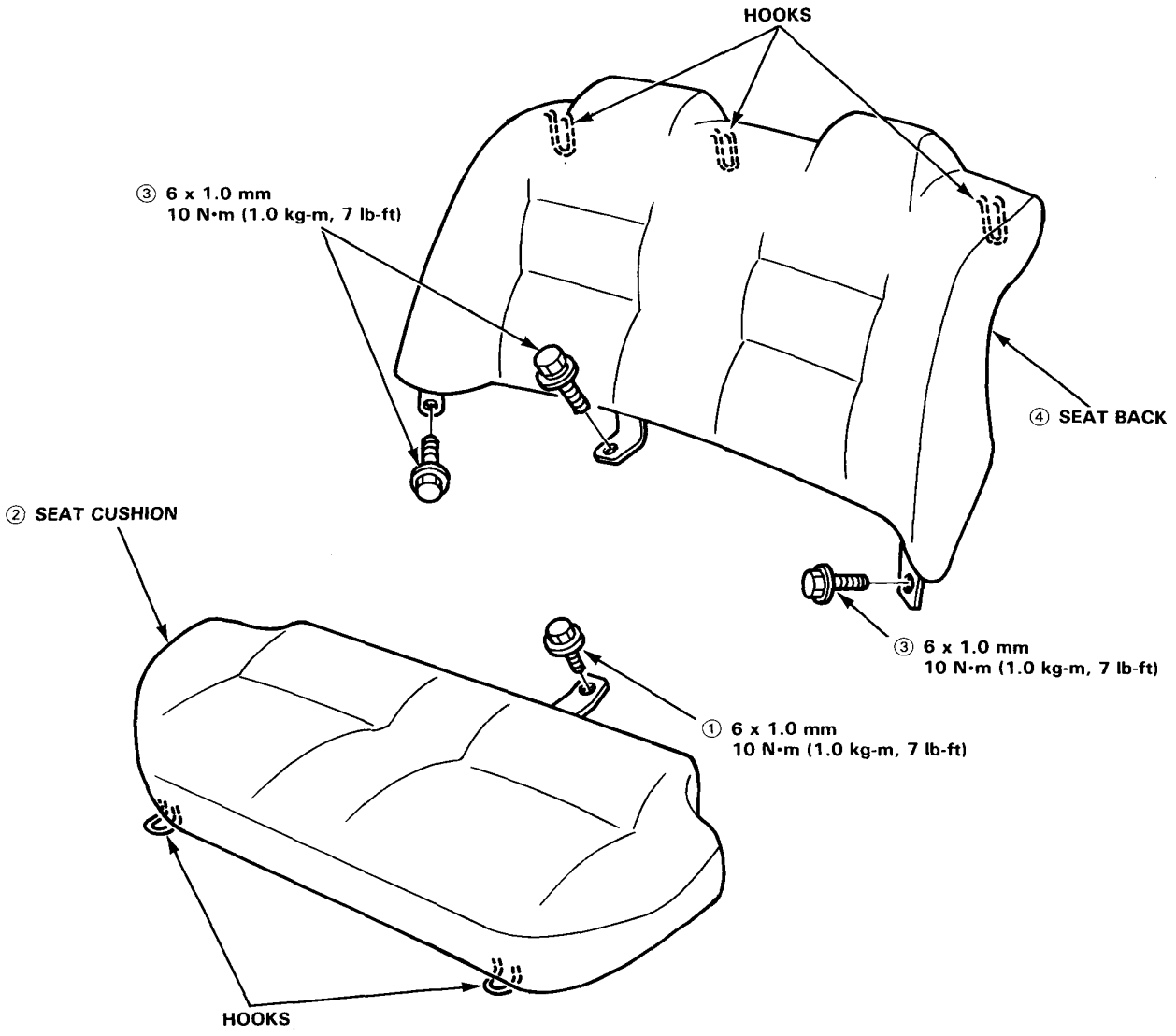
Sedan (TYPE I)

Disassemble in numbered sequence.



Sedan (TYPE II)

Disassemble in numbered sequence.

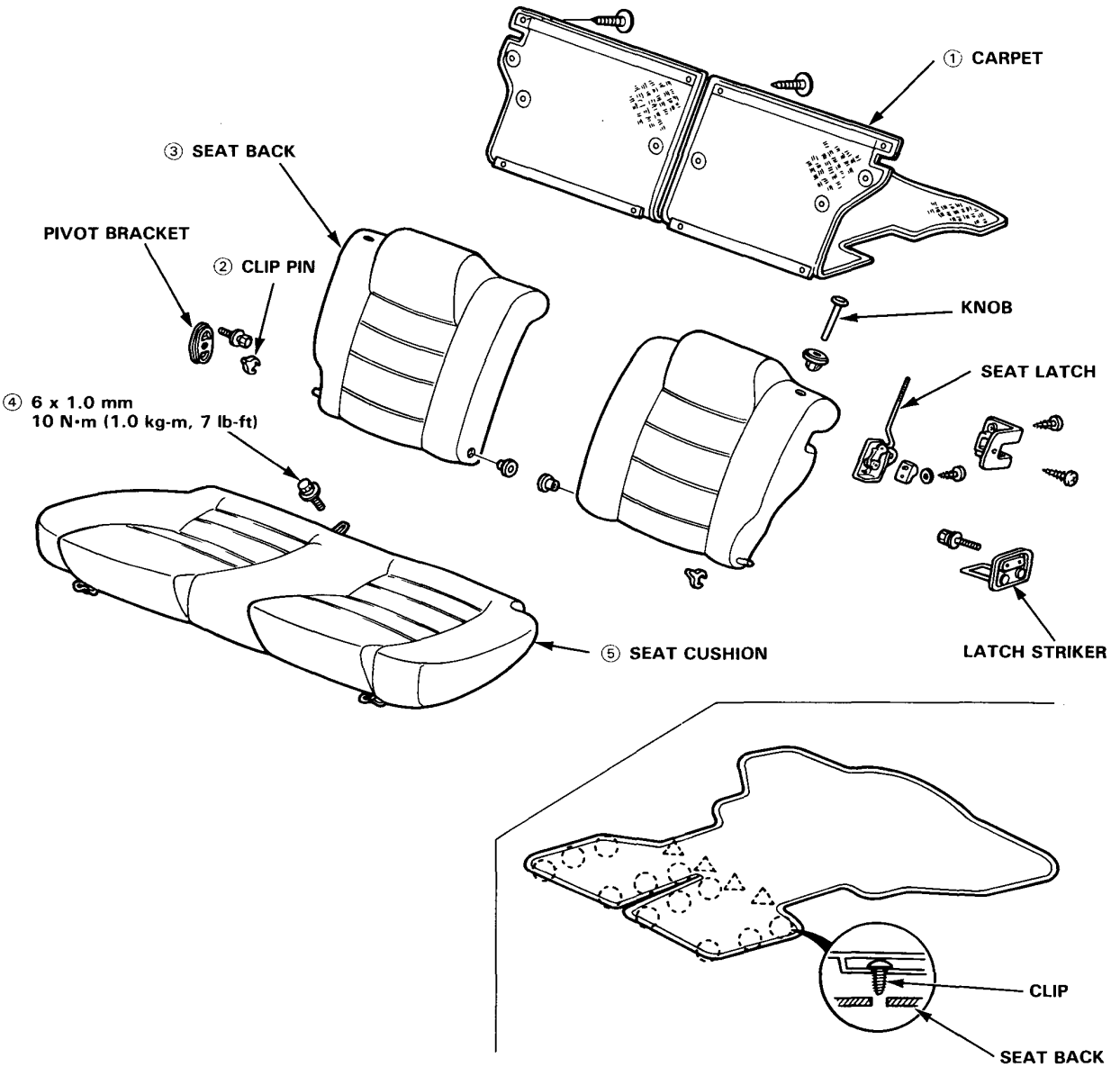


(cont'd)

Replacement (cont'd)

Hatchback

Disassemble in numbered sequence.

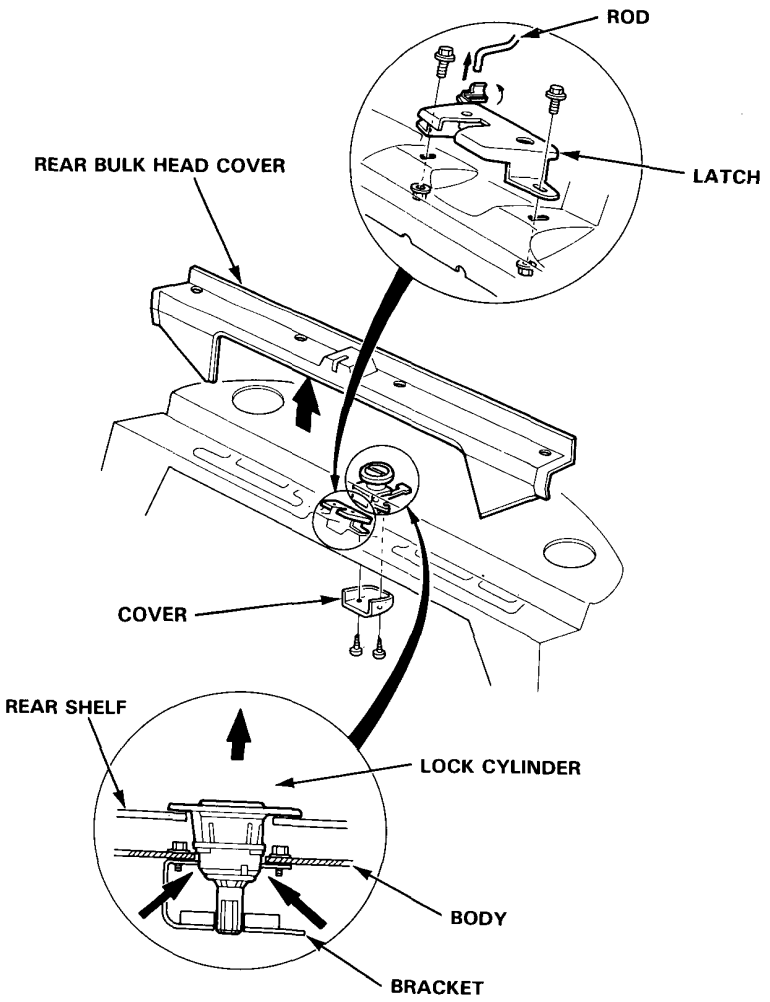


Rear Seat Lock

Replacement

Sedan (TYPE I)

1. Remove the rear bulkhead cover.
2. Remove the 2 bolts and disconnect the rod, then remove the latch.
3. Remove the 2 lower screws, then remove the lock cylinder cover.
4. Push the position indicated by the arrow with the flat screwdriver, then remove the lock cylinder assy.

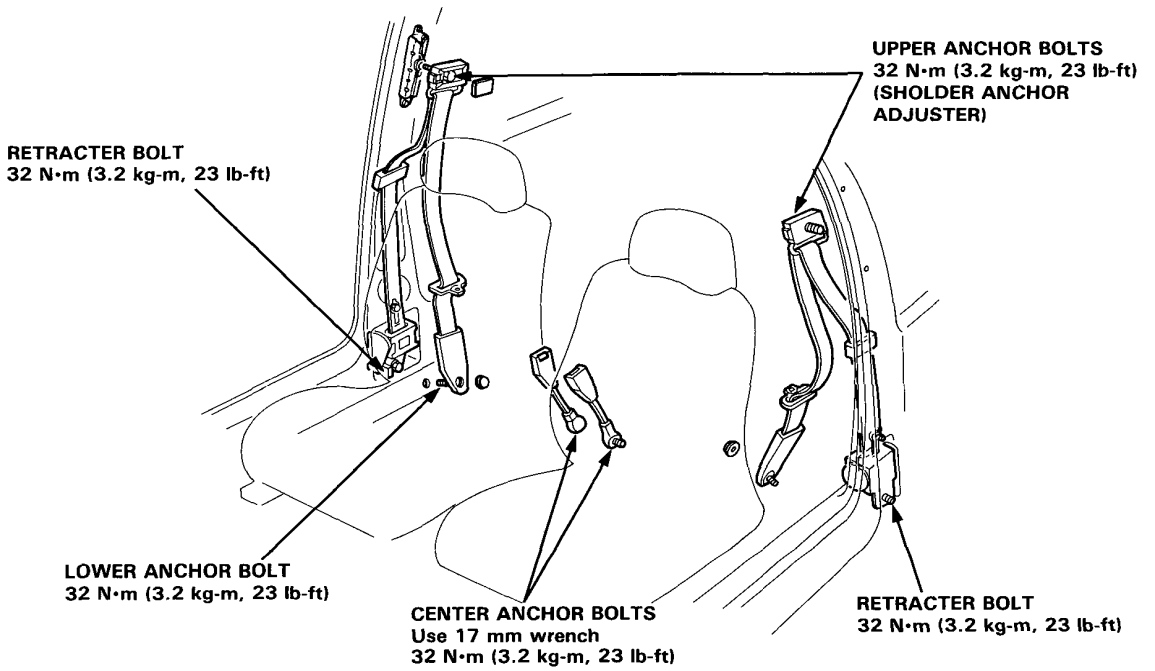


Front Seat Belts

Replacement

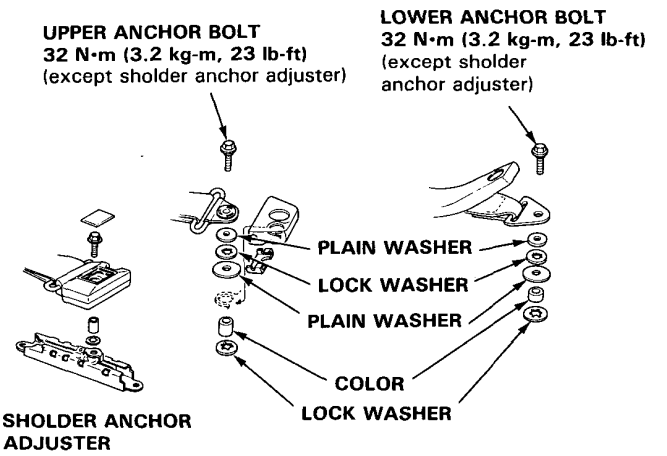
CAUTION: Check the seat belts for damage and replace them if necessary. Be careful not to damage them during removal and installation.

1. Remove the quarter trim panel (for Hatchback), or the center pillar lower trim (for Sedan).
2. Remove the upper anchor bolt, lower anchor bolt and retractor bolt with a 17 mm socket or box end wrench.
3. Slide the front seat foward until the seat belt center anchor bolt is accessible, then remove the bolt and the center anchor.



4. Check that the retractor locking mechanism function as described on paged 21-78.
5. Install the seat belt in the reverse of removal. Make sure you assemble the washer and collars on the upper and lower anchor bolts.

   NOTE: Before attaching the quarter trim panel, make sure there are no twists in the belt.

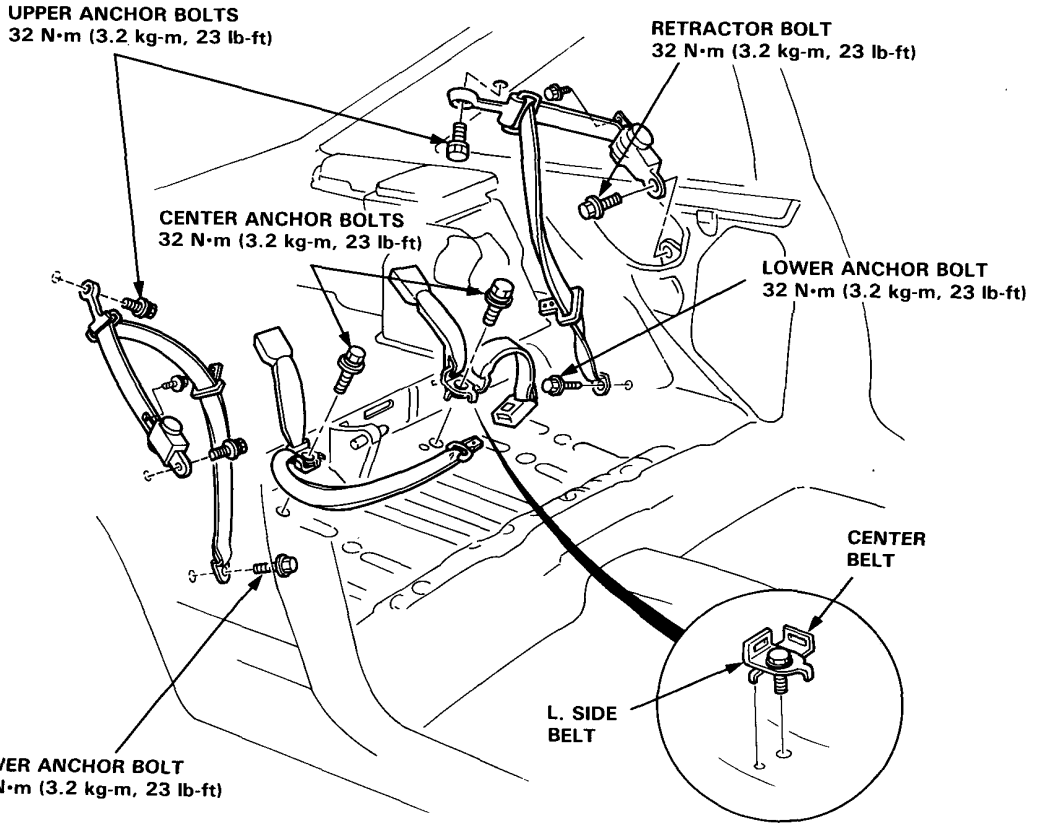


Rear Seat Belts

Replacement

CAUTION: Check the seat belts for damage and replace them if necessary. Be careful not to damage them during removal and installation.

1. Remove the rear seat.
2. Remove the rear side trim panels.
3. Remove the upper anchor bolt, the lower anchor bolt and retractor bolt with a 17 mm socket or box-end wrench.

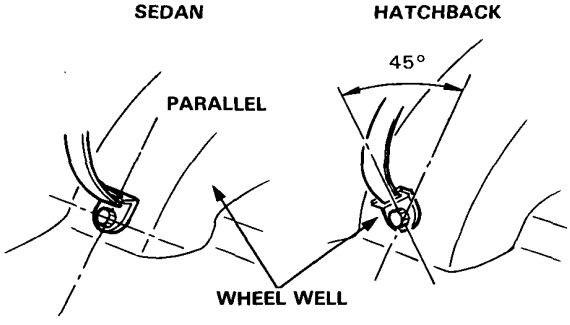


4. Check that the retractor locking mechanism function as described on page 21-78.

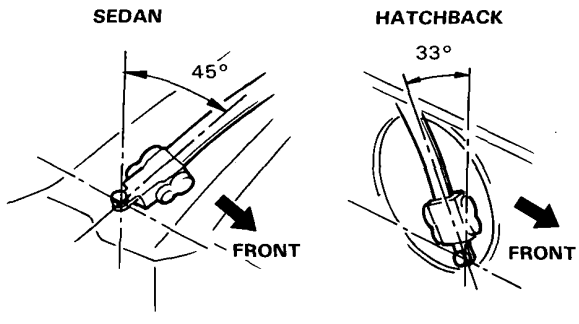
5. Install the seat belt in the reverse order of removal.

NOTE: When installing each belt, make sure it is not twisted behind the seat, and that it is secured at the Proper Angle:

LOWER ANCHOR BOLT



RETRACTOR BOLT



Inspection

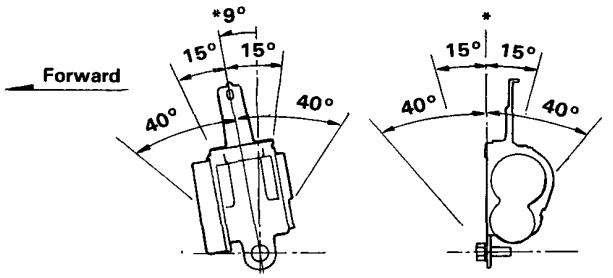
Retractor Inspection

1. With the retractor installed, check that the belt can be pulled out freely.
2. Make sure that the belt does not lock when the retractor is leaned slowly up to 15° from the mounted position. The belt should lock when the retractor is leaned over 40°.

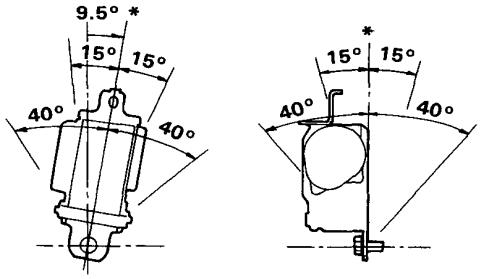
   CAUTION: Do not attempt to disassemble the retractor.

***: Mounted Position.**

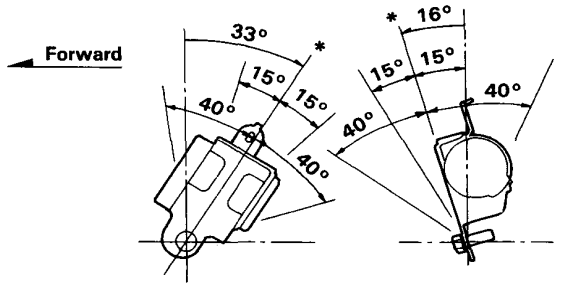
Glass Back, Aerodeck Front:



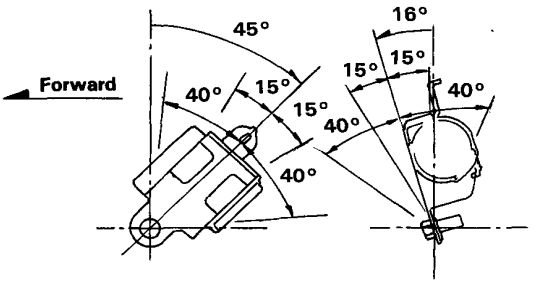
Sedan Front:



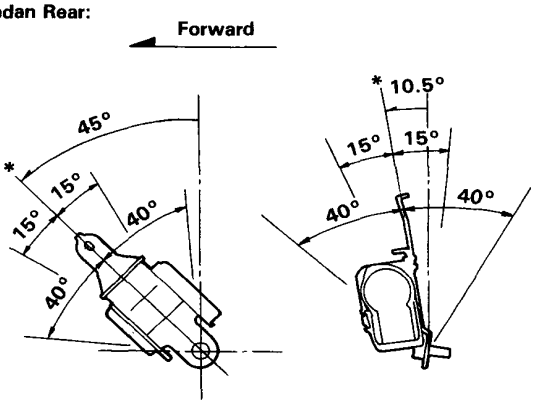
Glass Back Rear:



Aerodeck Rear:



Sedan Rear:



3. Replace the belt with a new one if there is any abnormality.

On-the-Car Belt Inspection

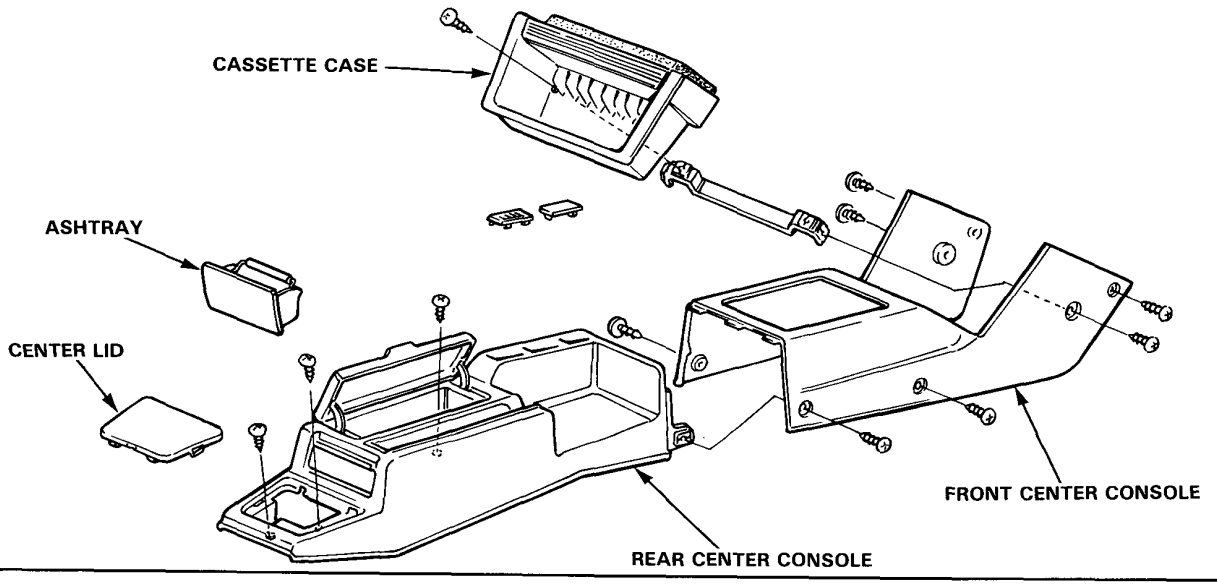
1. Check that the belt is not twisted or caught on anything.
2. After installing an anchor, check for free movement on its retaining bolt. If necessary, remove the bolt and check that the washers and other parts are not damaged and are installed properly.
3. Check the belts for fouling, damage or discoloration. Clean with a shop towel if fouled.

   CAUTION: Use only soap and water to clean.
4. Check that the belt does not lock when pulled out slowly. The belt is designed to lock only during a sudden stop or impact.
5. Make sure that the belt will retract automatically when released.
6. Replace the belt with a new one if there is any abnormality.

Center Console

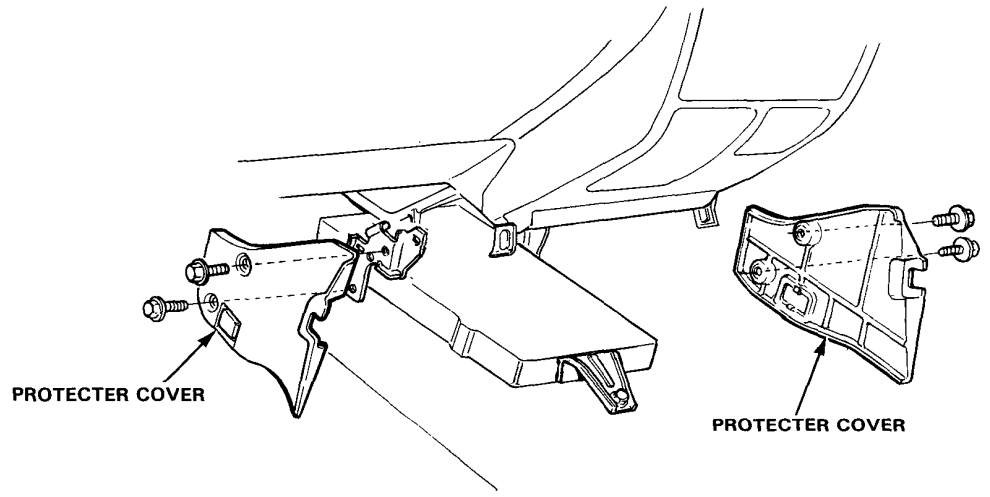
Replacement

1. Remove the shift lever (Automatic only).
2. Remove the center lid.
3. Remove the console by removing the screws.
4. Remove the two screws at the front of the center console and remove the cassette case and center console unit. (When replacing the cassette case only, remove the two screws at the back of the case and pull the cassette case away from the stay.)
5. Install the console in the reverse order of removal, make sure the direction of the shift lever knob.



Protecter Cover Replacement

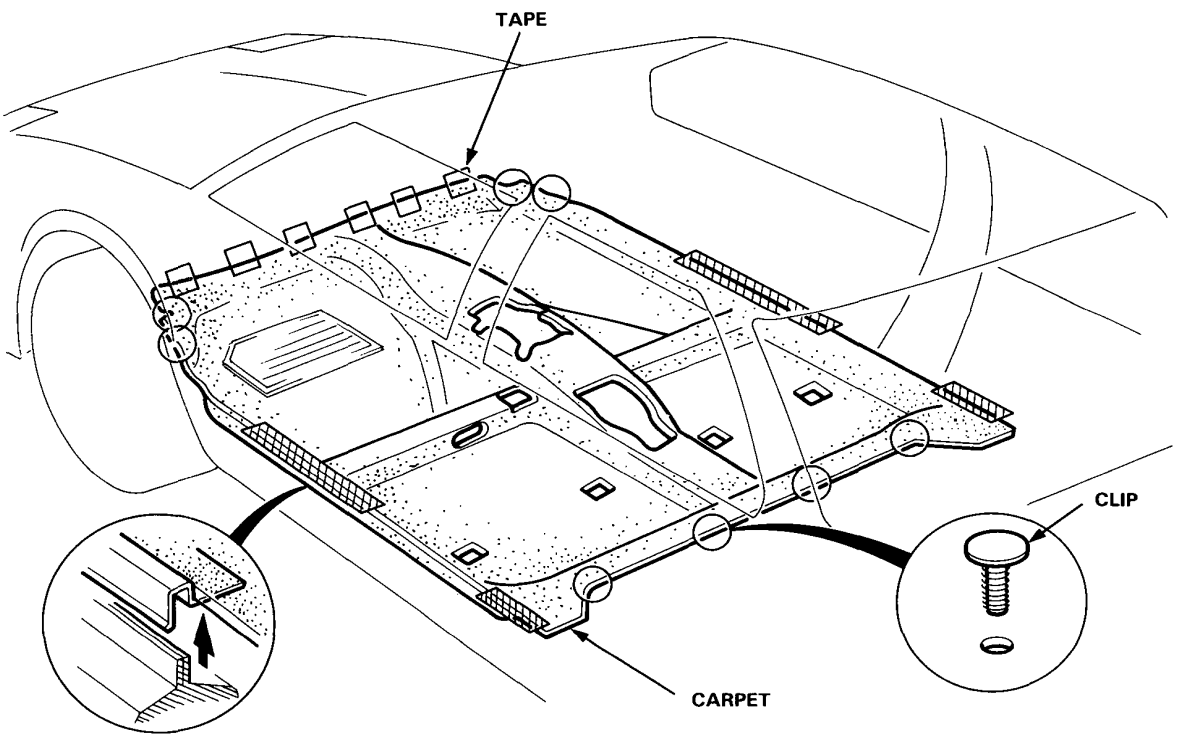
Remove the protecter cover by removing the bolts.



Carpet

Replacement

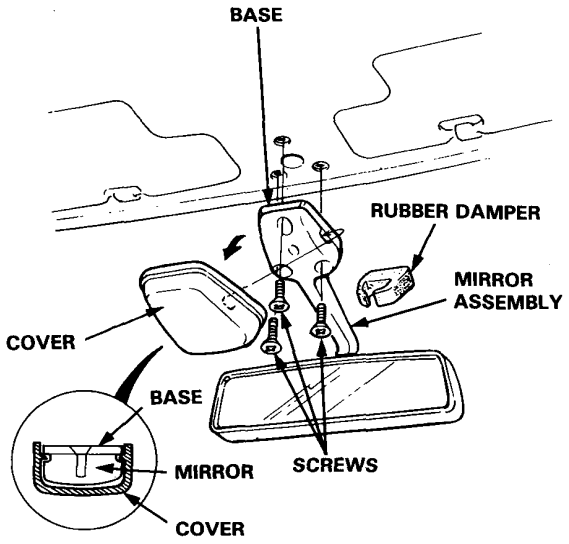
1. Remove:
   - Front seats.
   - Rear seat cushion.
   - Center console.
   - Right and left kick panels.
   - Door sill moldings.
   - Trunk lid opener.
   - Right and left quarter trim panels (Hatchback).
   - Front seat belt lower anchor bolts.
   - Right and left center pillar lower trim (Sedan).
2. Pry out the clips at the rear edge and under the dashboard, peel off the tapes, pry off the retainers on each side and remove the carpet.



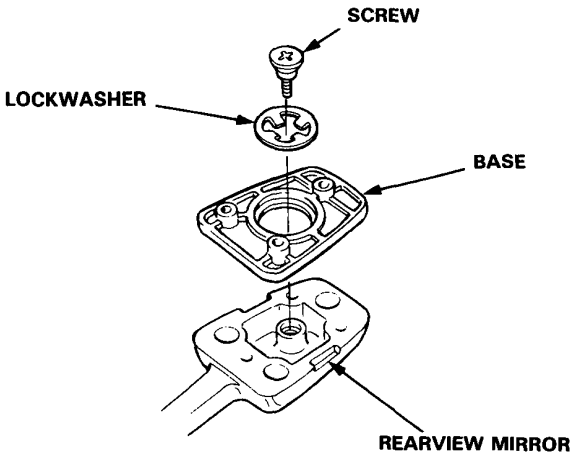
Rearview Mirror

Replacement

1. Remove the rubber damper.
2. Pry the cover off using the end of a flat-tip screwdriver.



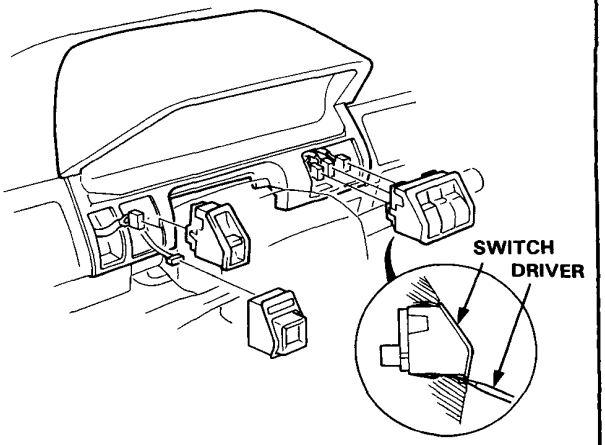
3. Remove the 3 mounting screws from the mirror base, then remove the mirror assembly.
4. Remove the base from the bracket by removing the screw.



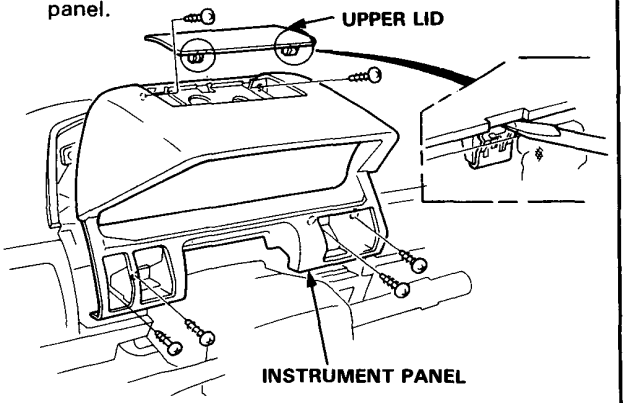
Instrument Panel

Replacement

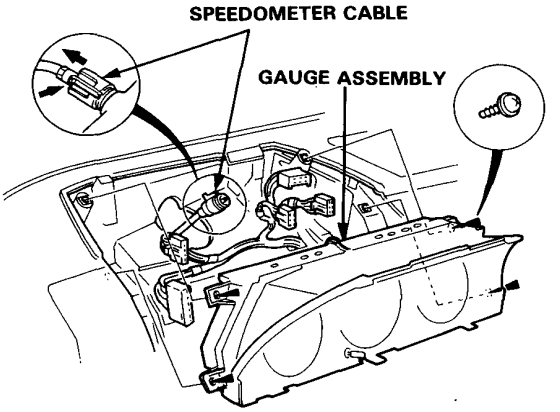
1. Remove each switch from the instrument panel by inserting a thin flat-tip screwdriver under the bottom center of the switch and prying it loose. Then pull the switches straight back and disconnect the wire connectors.



2. Remove the upper lid and the 2 screws.
3. Remove the 4 screws, then remove the instrument panel.



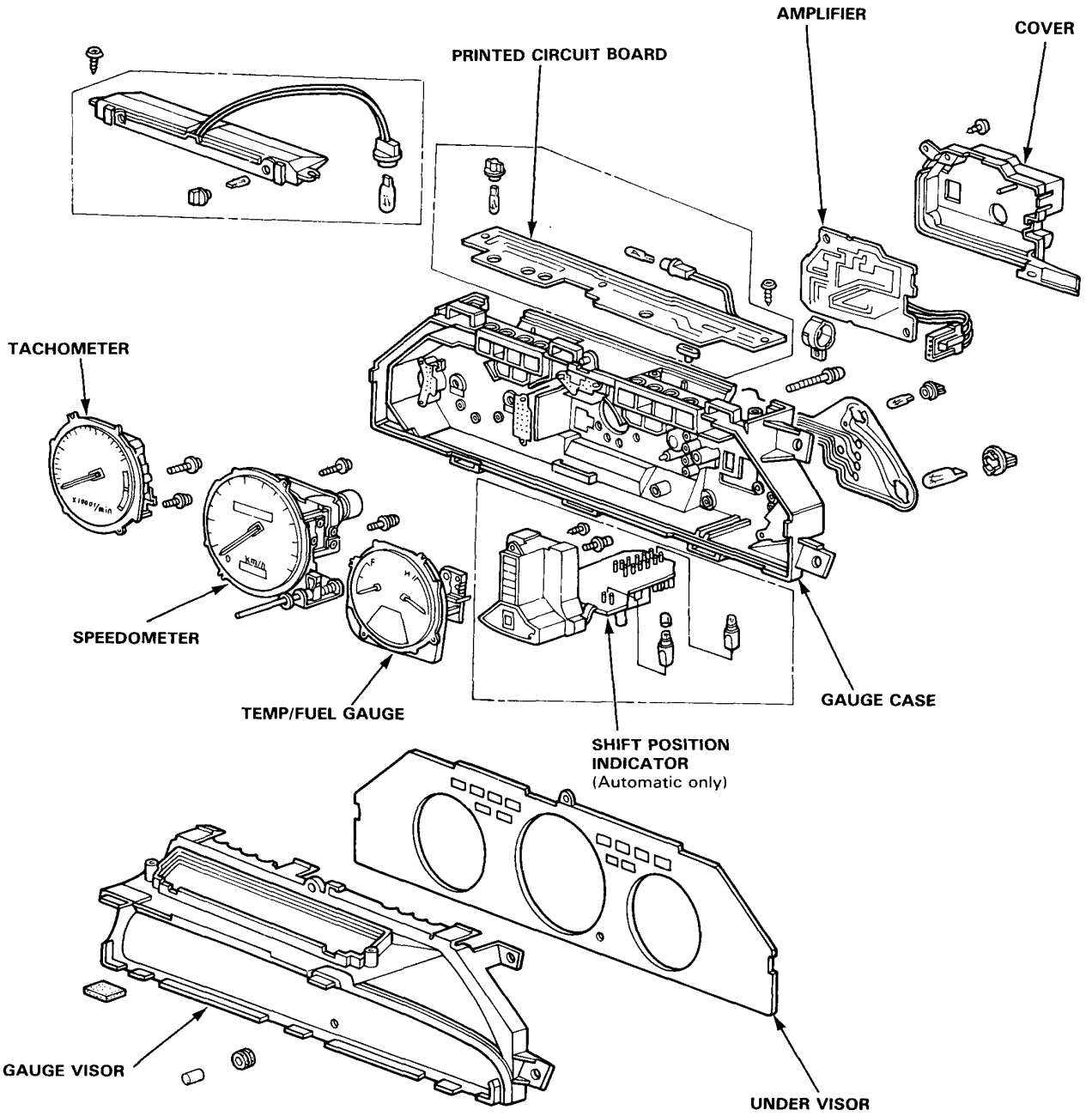
4. Remove the 4 screws, then remove the gauge assembly by disconnecting the speedometer cable and wire harness.



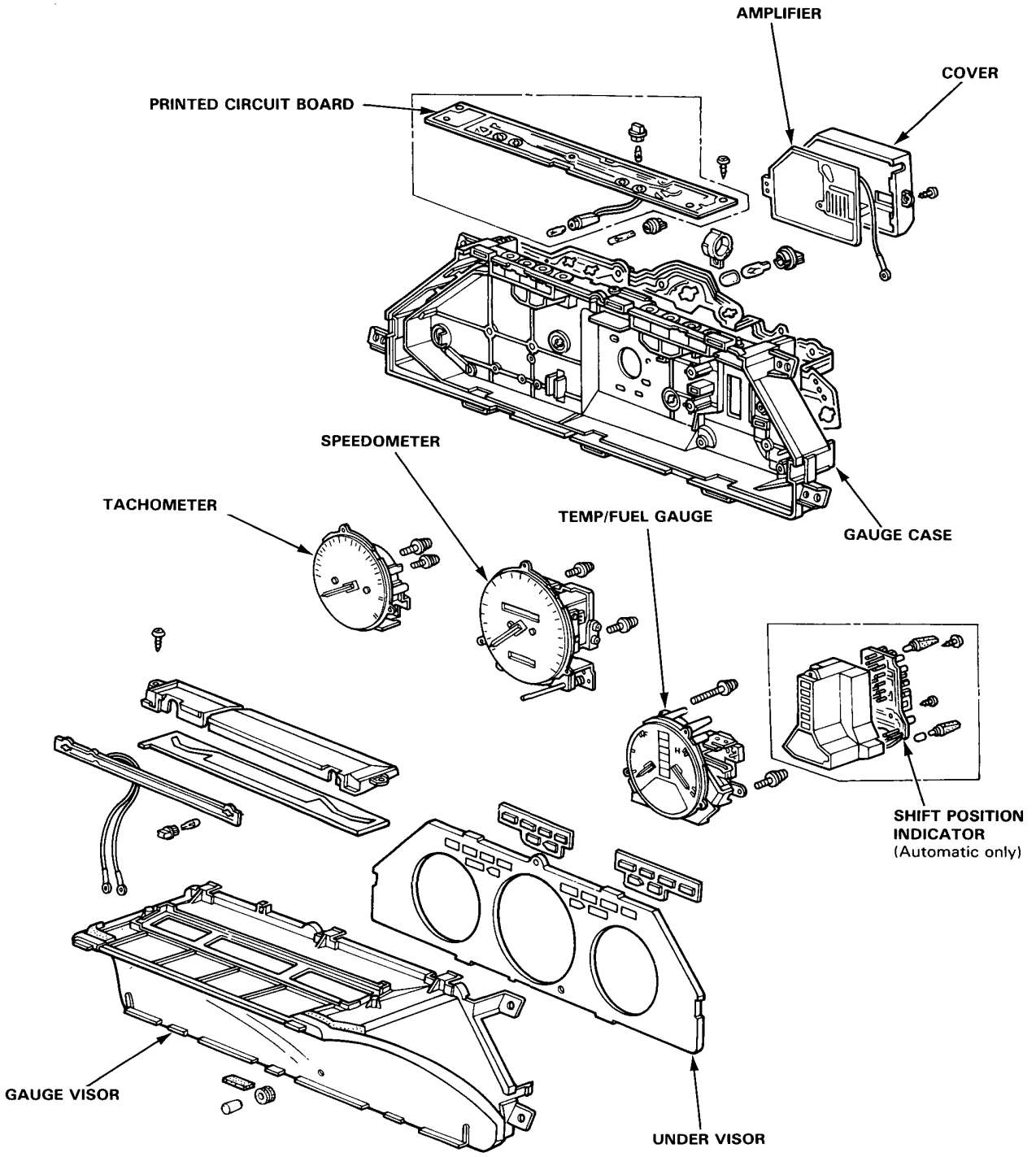
Replacement

(NIPPON SEIKI)

NOTE: Avoid damaging terminals and printed circuit.



(ND)

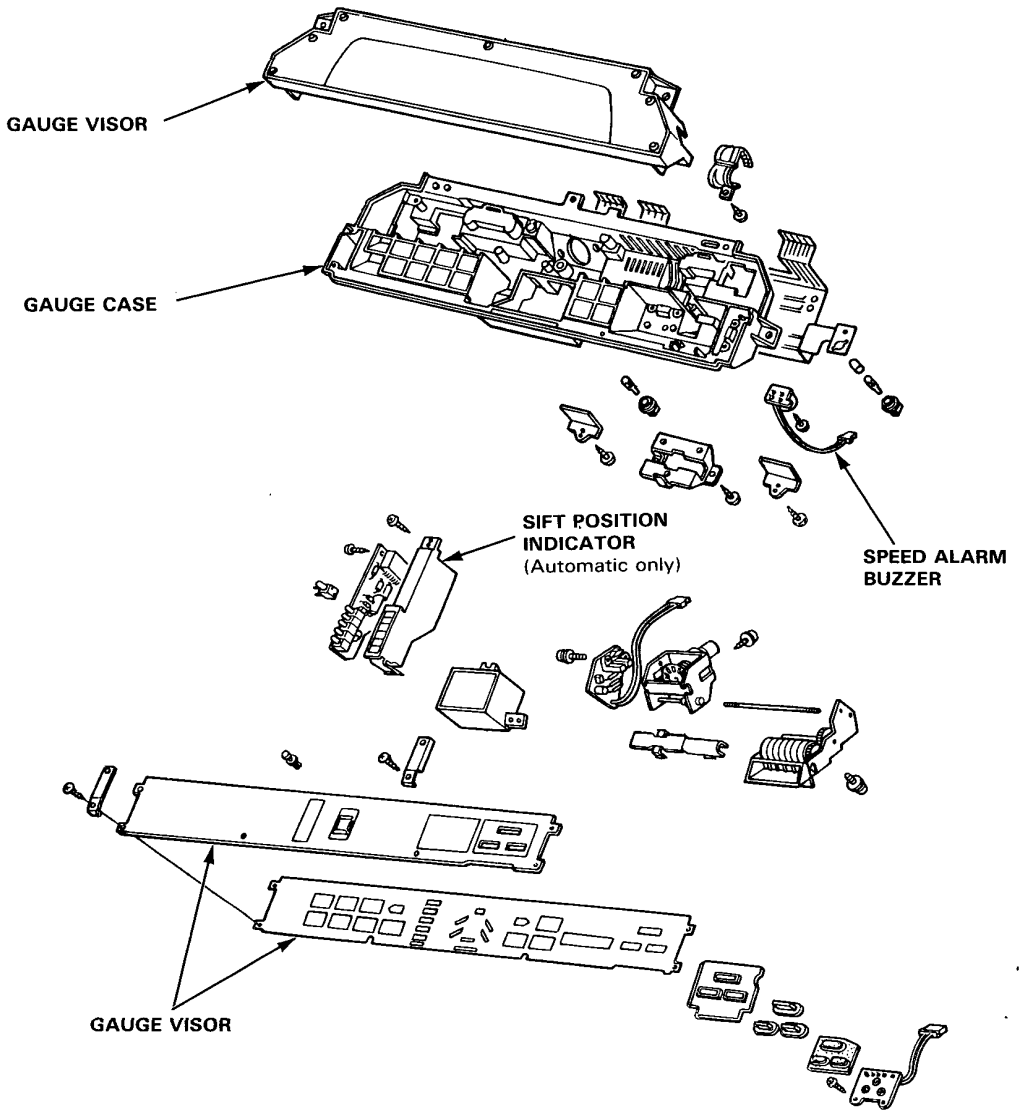

AMPLIFIER
COVER
PRINTED CIRCUIT BOARD
SPEEDOMETER
TACHOMETER
TEMP/FUEL GAUGE
GAUGE CASE
SHIFT POSITION INDICATOR
(Automatic only)
GAUGE VISOR
UNDER VISOR

(cont'd)

Replacement (cont'd)

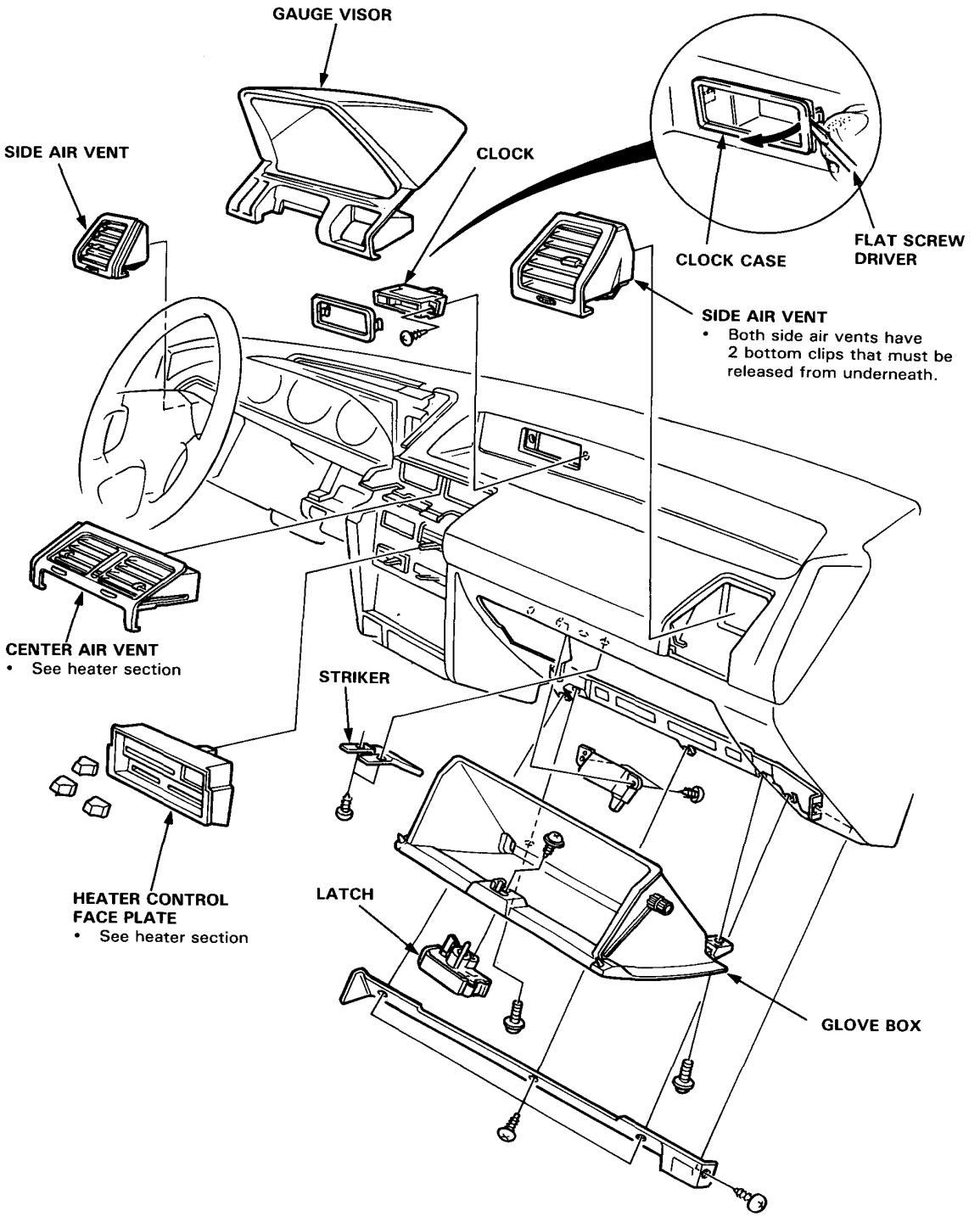
(DIGTAL GAUGE)

NOTE: Avoid damaging terminals and printed circuit.



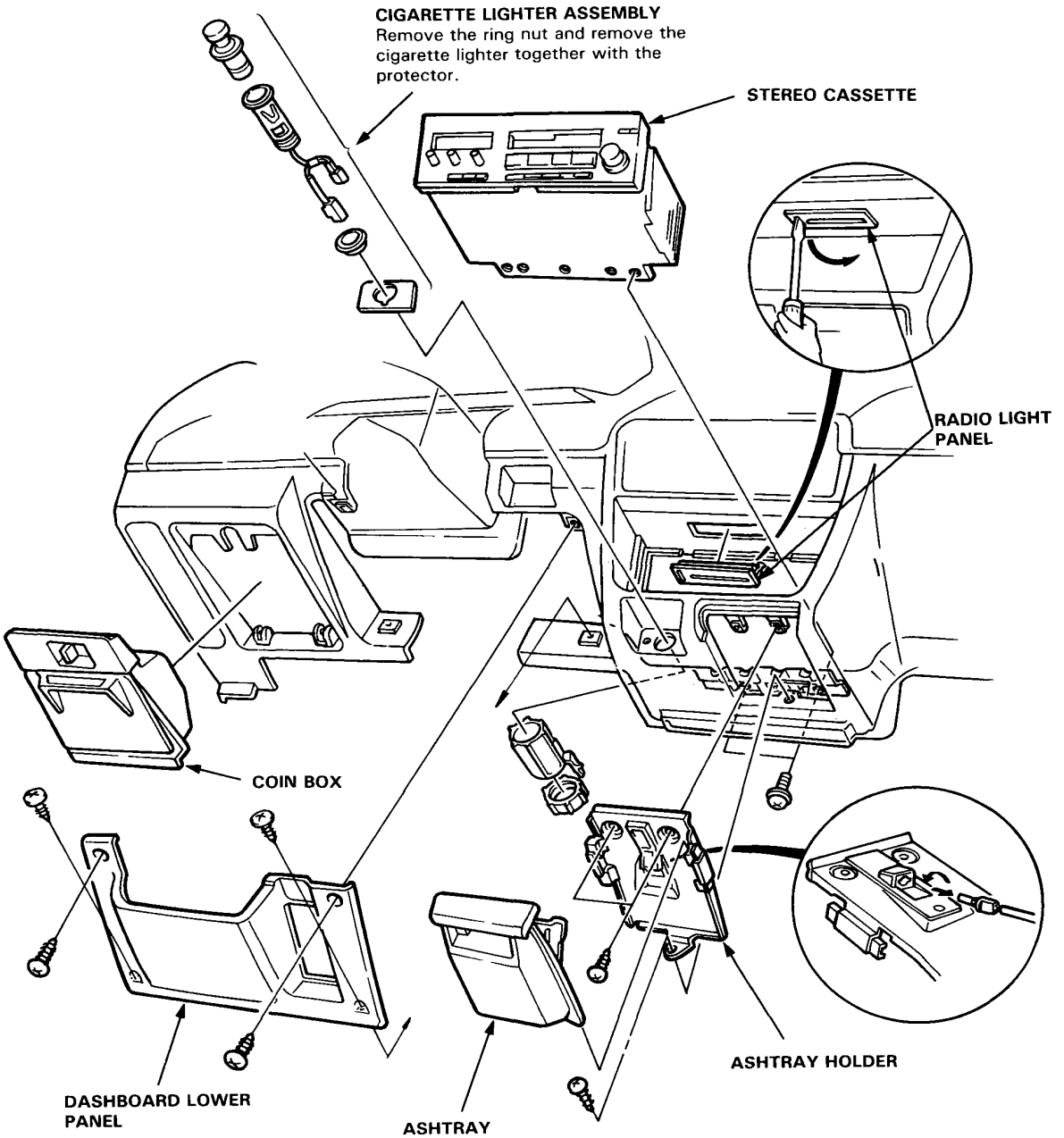
Dashboard Components

Removal/Installation



(cont'd)

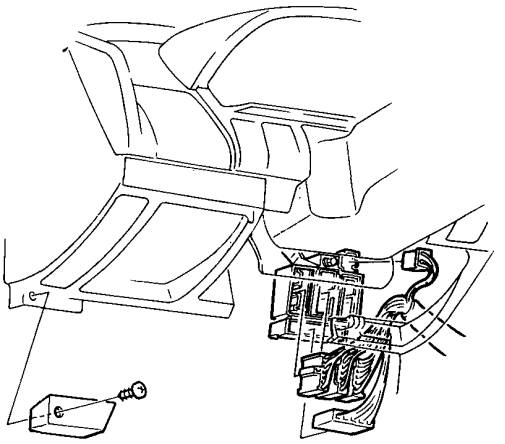
Removal/Installation (cont'd)



Replacement

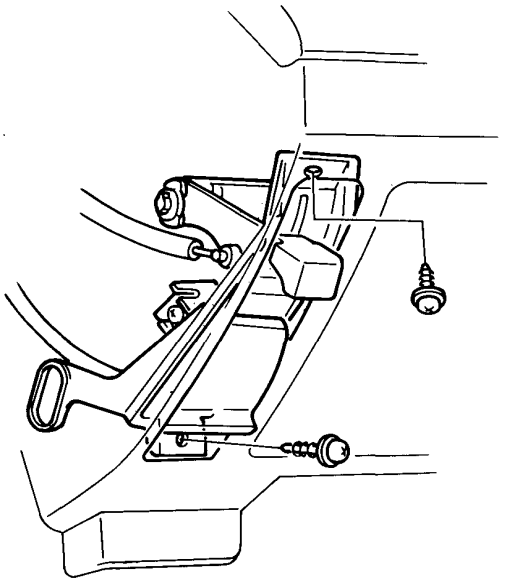
1. To remove the dashboard, first remove the:
   - Steering wheel.
   - Dashboard lower panel.
   - Steering column cover.
   - Turn signal cancel sleeve.
   - Combination switches.
   - Ashtray holder.

2. Disconnect the wire harnesses from the connector holder and fuse area.



3. Remove the hood opener.

   CAUTION: Don't disconnect the cable.



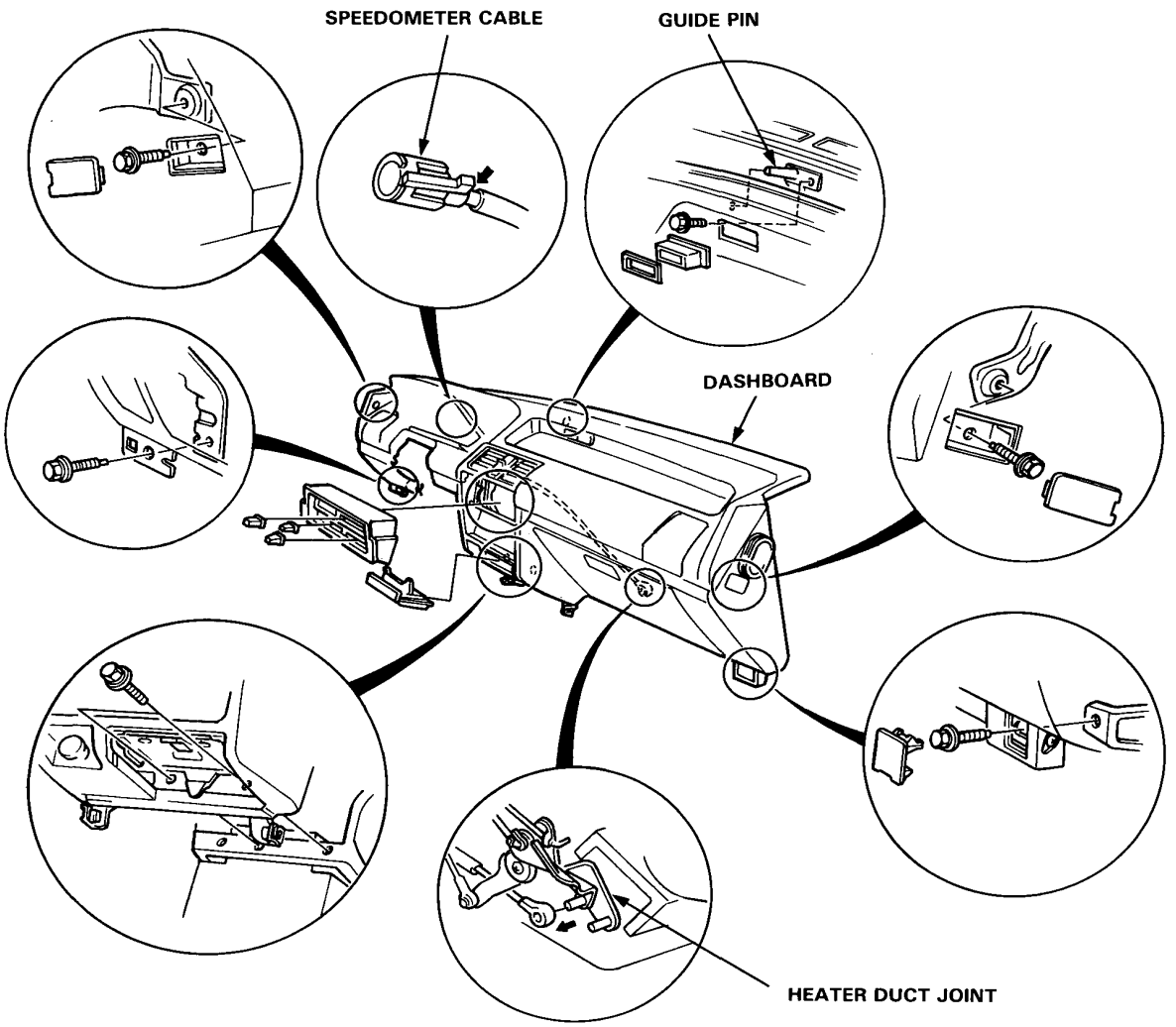
(cont'd)

Replacement (cont'd)

5. Disconnect the cables of the center outlet from the heater duct.
6. Remove the dashboard mounting bolts.
7. Disconnect the antenna cable.
8. Lift the dashboard as you pull so it will slide up and off the guide pin at the middle; hold it from underneath so it won't fall when it comes off the pin.

Reassembly NOTE:

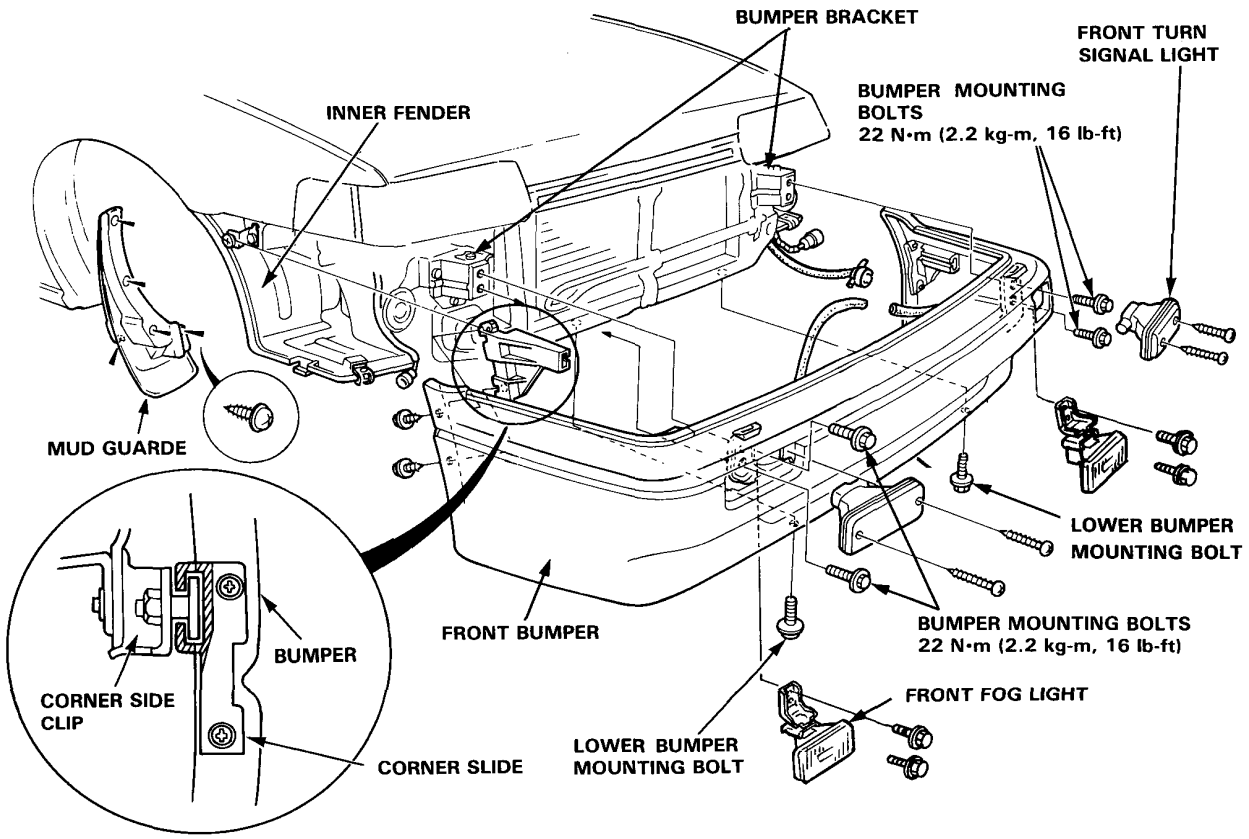
- Make sure the dashboard fits onto the guide pin correctly.
- Reconnect the antenna cable before lifting the dashboard onto the guide pin.
- Before tightening the dashboard bolts, make sure the instrument wires are not pinched, and that dashboard is not interferring with the heater control lever or cable.



Front Bumper

Replacement

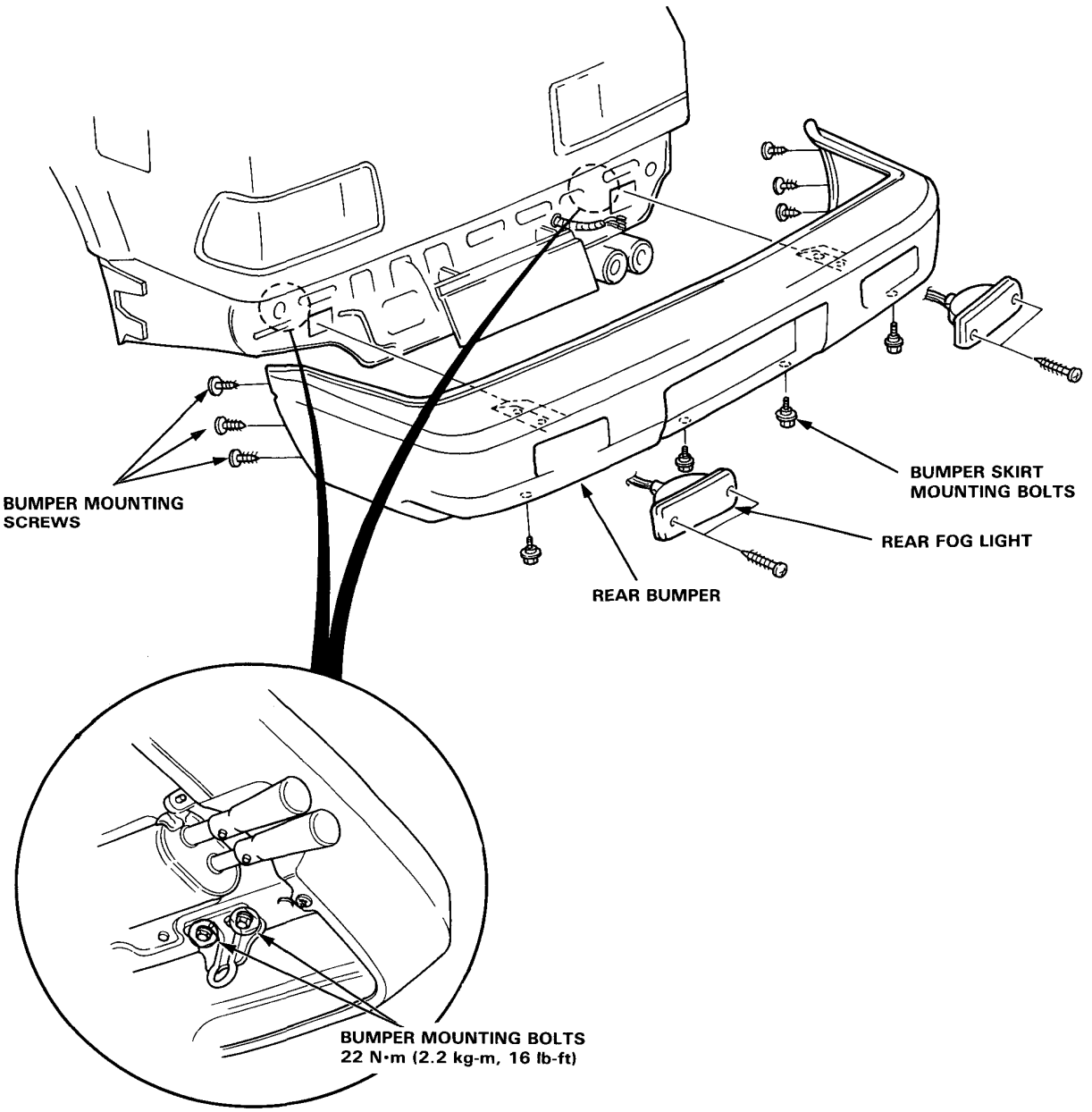
1. Remove the front turn signal lights, then disconnect the wire harness.
2. Remove the front fog lights, then disconnect the wire harness.
3. Remove the 2 bumper mounting screws on each side at the bumper rear edge.
4. Remove the 2 lower bumper mounting bolts.
5. Remove the 4 bumper mounting bolts, then slide the bumper to the front and disconnect the washer tubes as shown.
6. Remove the bumper bracket by removing the bolts.
7. Remove the mud guardes by removing the screws.



Rear Bumper

Replacement

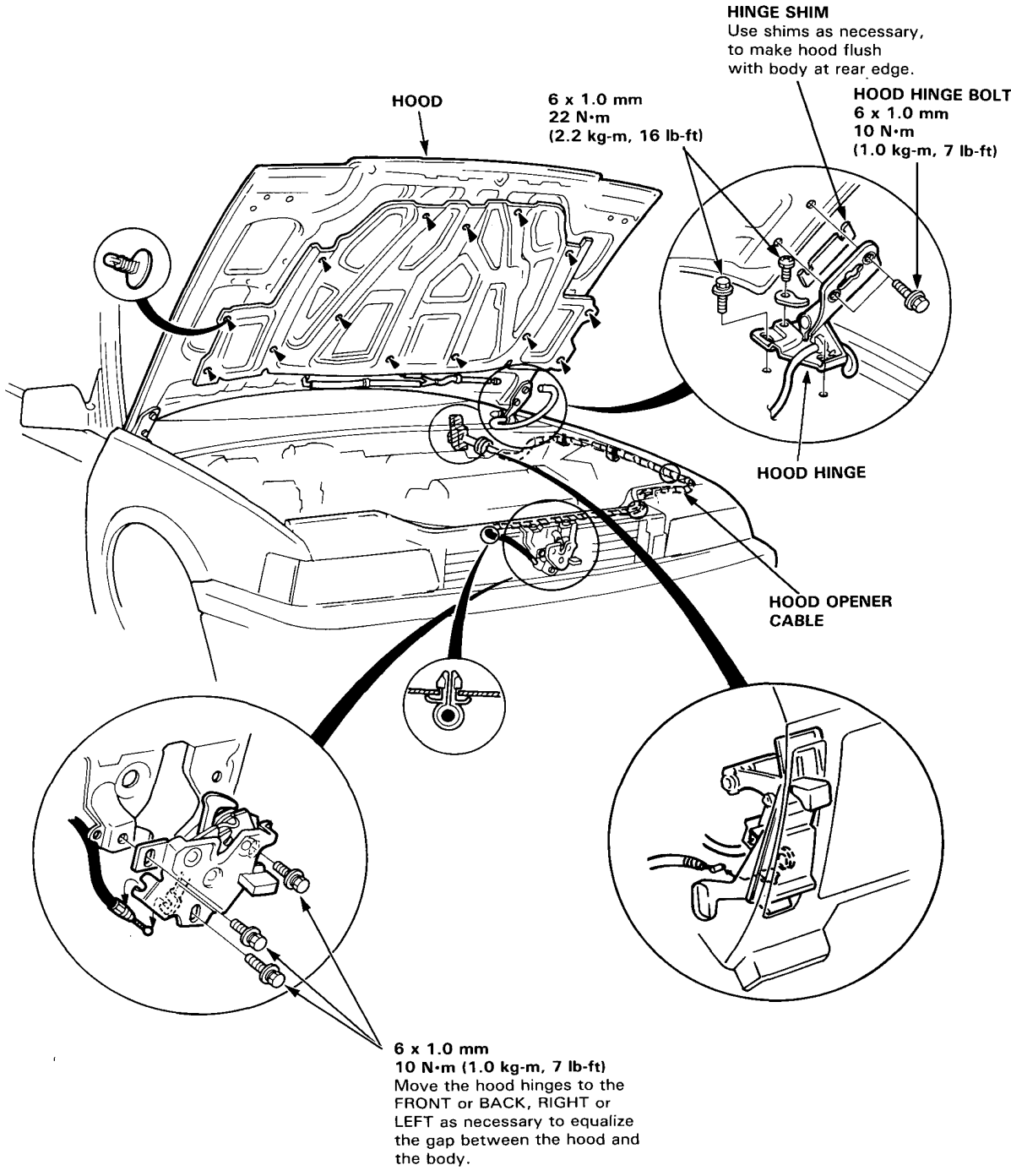
1. Remove the rear fog lights (page 21-103).
2. Remove the 3 bumper mounting screws on each sides.
3. Remove the 4 skirt mounting bolts.
4. Remove the 4 bumper mounting bolts.
5. Disconnect the wire harness of the license light.
6. Remove the bumper by sliding it to the rear.



Hood

Replacement/Adjustment

1. Pull the windshield washer hose out of the hood.
2. Remove the hood by removing the hood hinge bolts.
3. When installing the hood, don't tighten the hinge bolts until you've checked adjustments shown below.



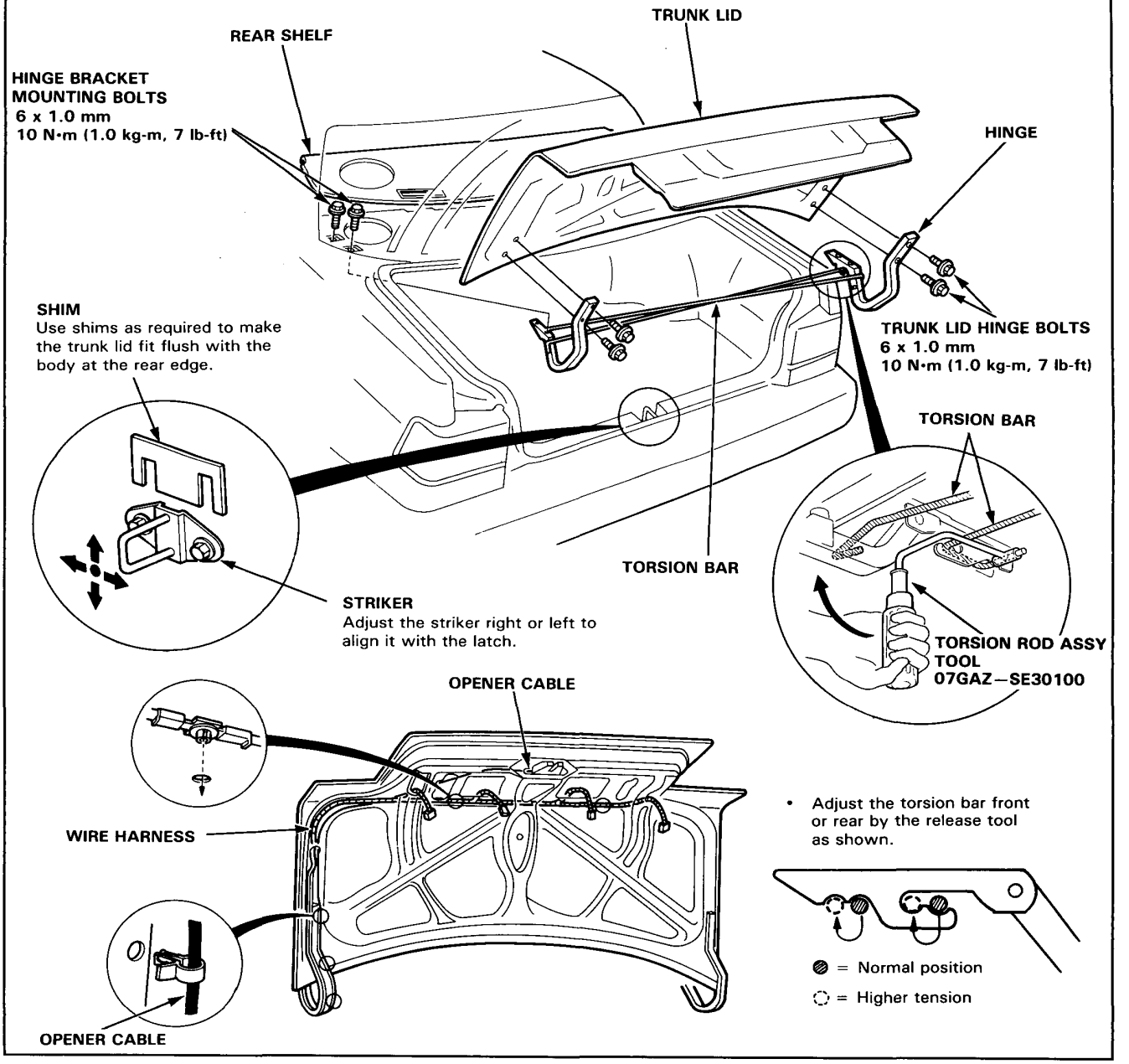
Trunk Lid

Replacement/Adjustment

1. Pull the harness and opener cable out of the trunk lid.

   NOTE: Before pulling out the wire harness, tie a string to the end of it so you can pull it back in when the trunk lid is reinstalled.

2. Remove the trunk lid hinge bolts, then lift off the lid.
3. Remove the torsion bar using a release tool.
4. Remove the rear shelf.
5. Remove the hinge bracket mounting bolts, then remove the hinges from the trunk.
6. Assemble in the reverse order.
   NOTE: Before tightening the hinge bolts, check the adjustments shown below:



Tailgate

Replacement/Adjustment

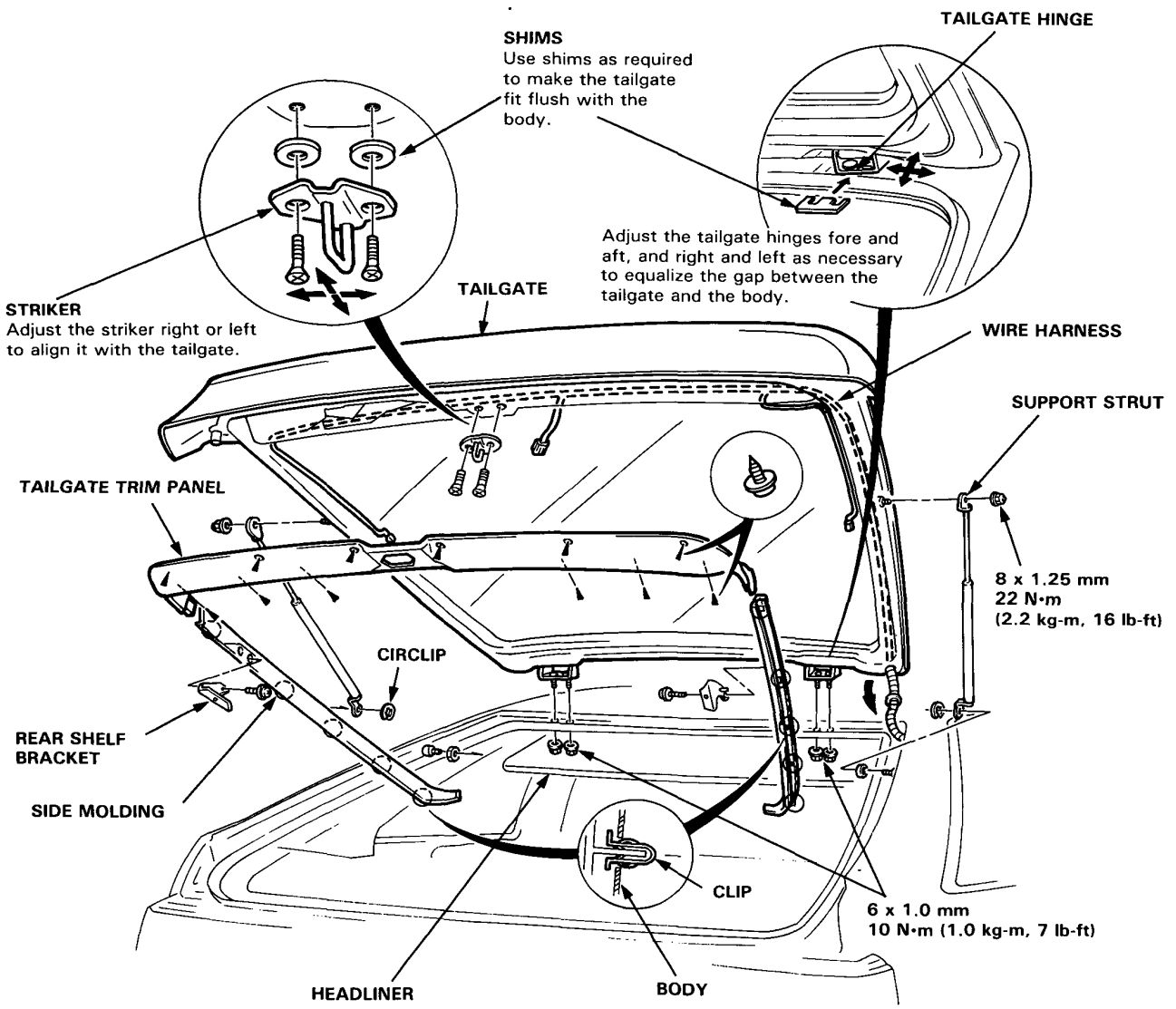
Glass Back

1. Lower the rear of the headliner.
2. Remove the tailgate trim panel and side molding.
3. Disconnect the wire harness, then pull the wire harness out of the tailgate as shown.

   NOTE: Before pulling out the wire harness, tie a string to the end of it so you can pull it back in when the tailgate is reinstalled.

4. Hold the tailgate up and remove the nuts from both support strut mounts.
5. Remove the hinge mounting nuts, then remove the tailgate.
6. Reinstall in the reverse order.

   NOTE: Before tightening the hinge nuts, check the adjustments shown below.



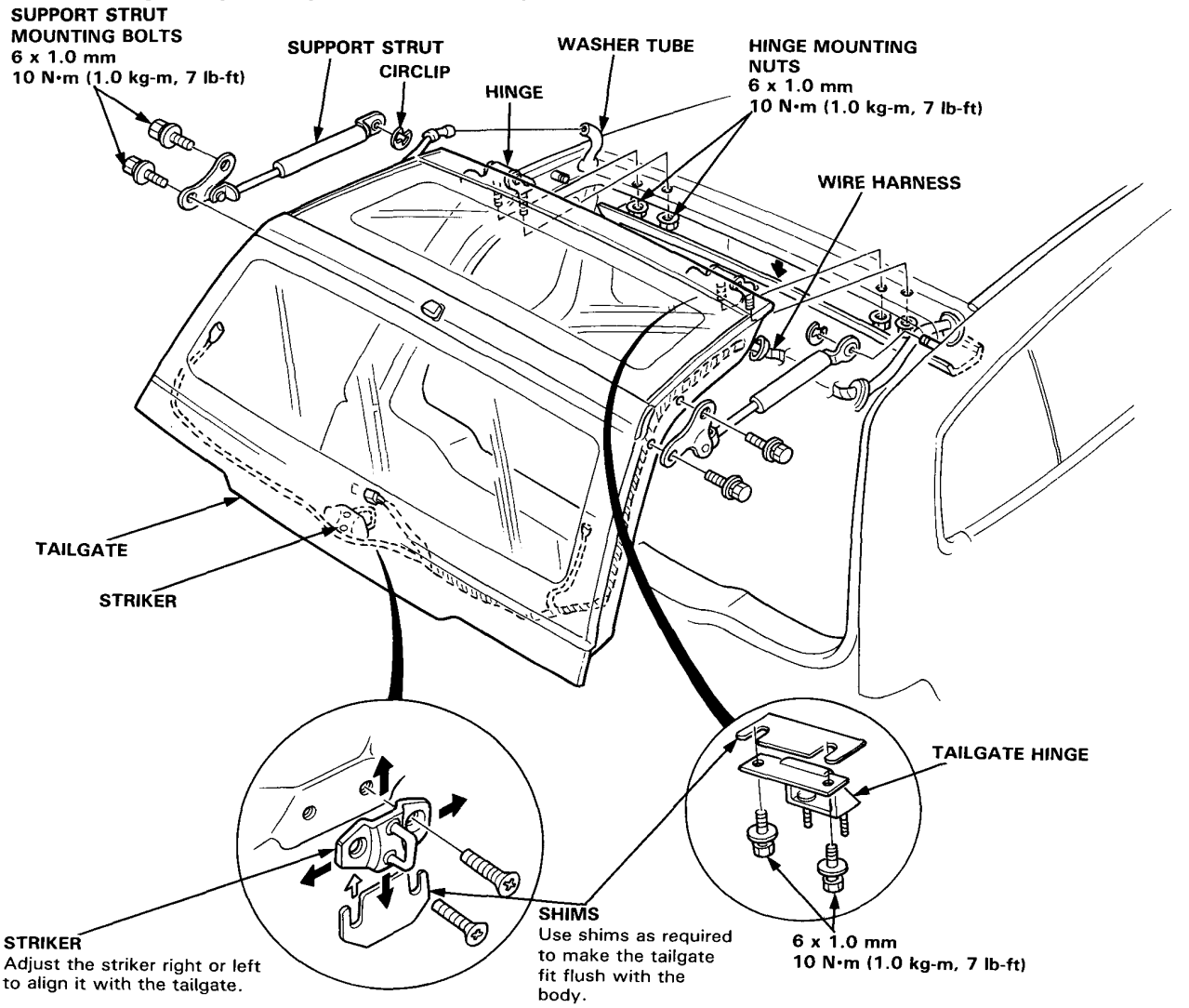
Tailgate

Replacement/Adjuster

Aerodeck

1. Remove the rear shelf and tailgate trim panels (page 22-64).
2. Disconnect the wire harness, then pull the wire harness out of the tailgate as shown.

   NOTE: Before pulling out the wire harness, tie a string to the end of it so you can pull it back in when the tailgate is reinstalled.
3. Disconnect the washer tube.
4. Hold the tailgate up and remove the bolts from both support strut mounts.
5. Remove the rear roof garnish, then remove the hinge mounting bolts.
6. Remove the tailgate.
7. Before tightening the hinge nuts, check the adjustment shown below.

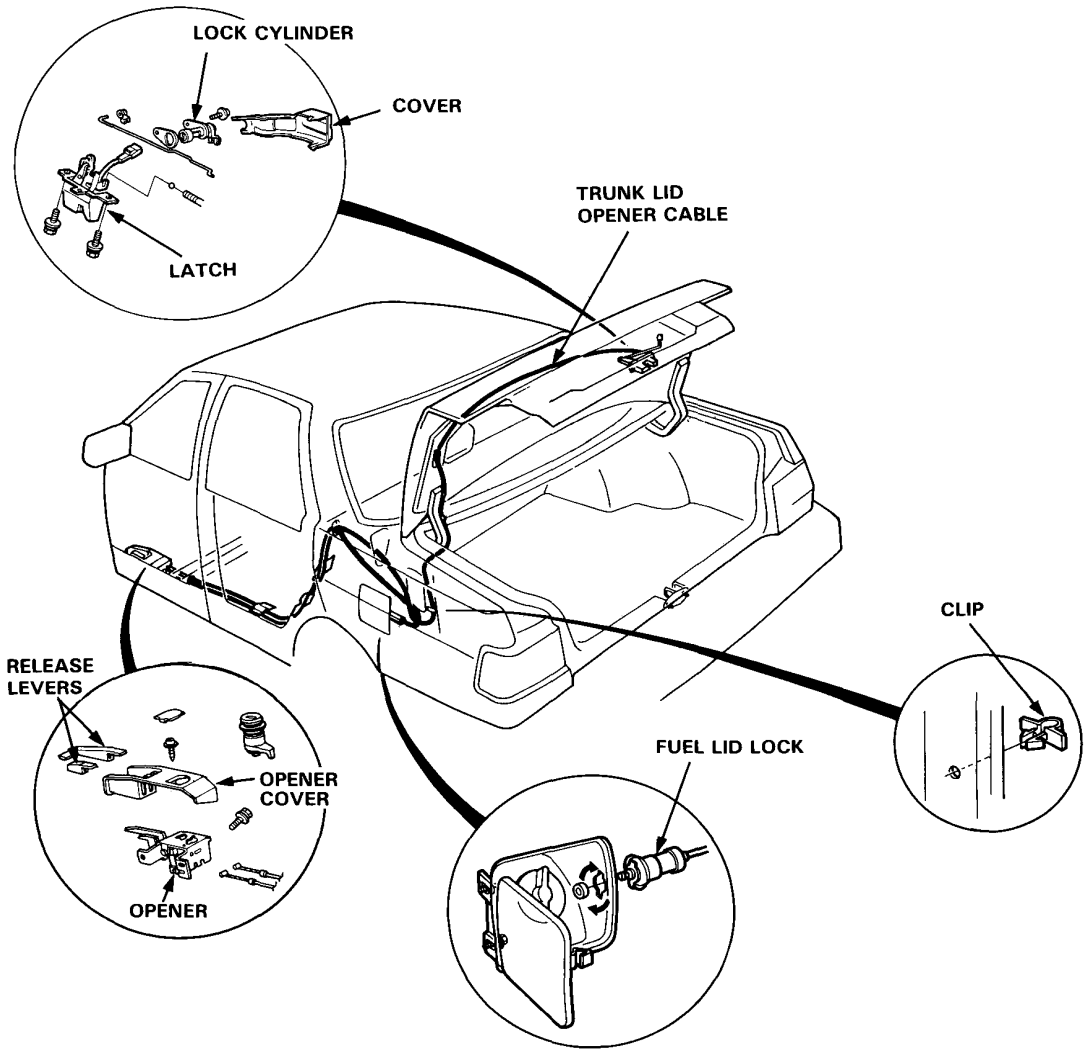


Opener and Latch

Replacement

Sedan

1. Remove the trunk side panel (page 21-63).
2. Disconnect the rod and the opener cable, then remove the latch by removing the 2 bolts.
3. Remove the screw, then remove the lock cylinder.
4. Remove the screw and the release levers, then remove the opener cover. Remove the opener by removing the 2 bolts.
5. To remove the trunk and fuel lid opener cables, remove the following parts:
   - Left door sillmoldings, left half of carpet.
   - Left quarter trim panel, and left trunk side panel.
6. Remove the fuel lid lock by turning it 90°.
7. To install, reverse the removal procedure. Check that the trunk and fuel lid opener cables are routed and connected properly.

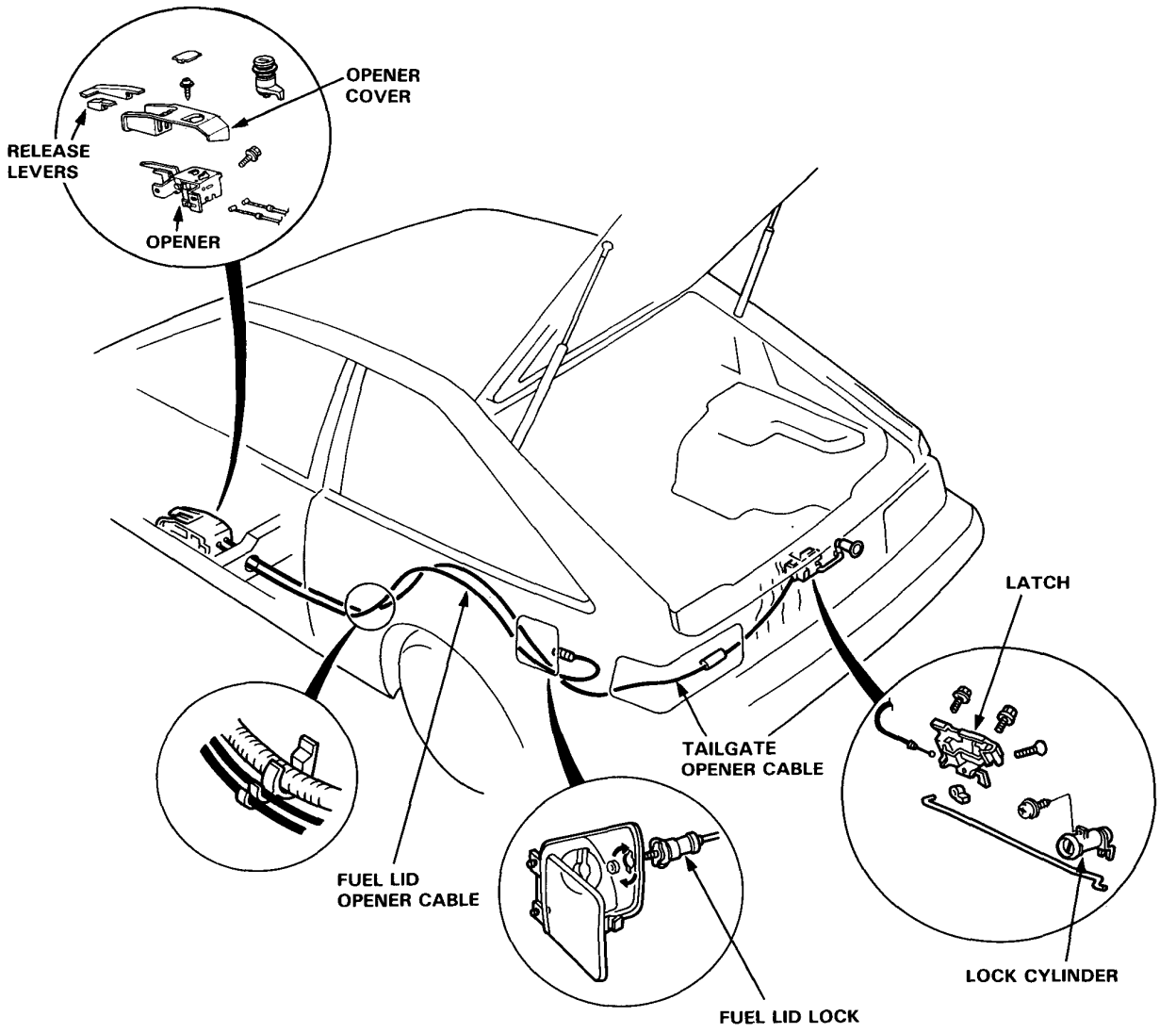


(cont'd)

Replacement (cont'd)

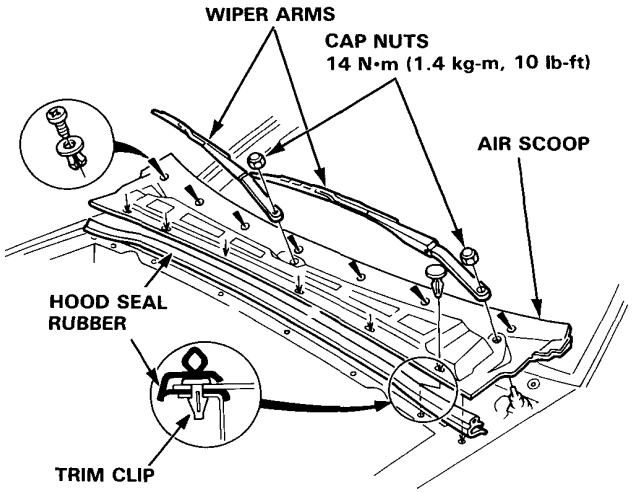
Hatchback

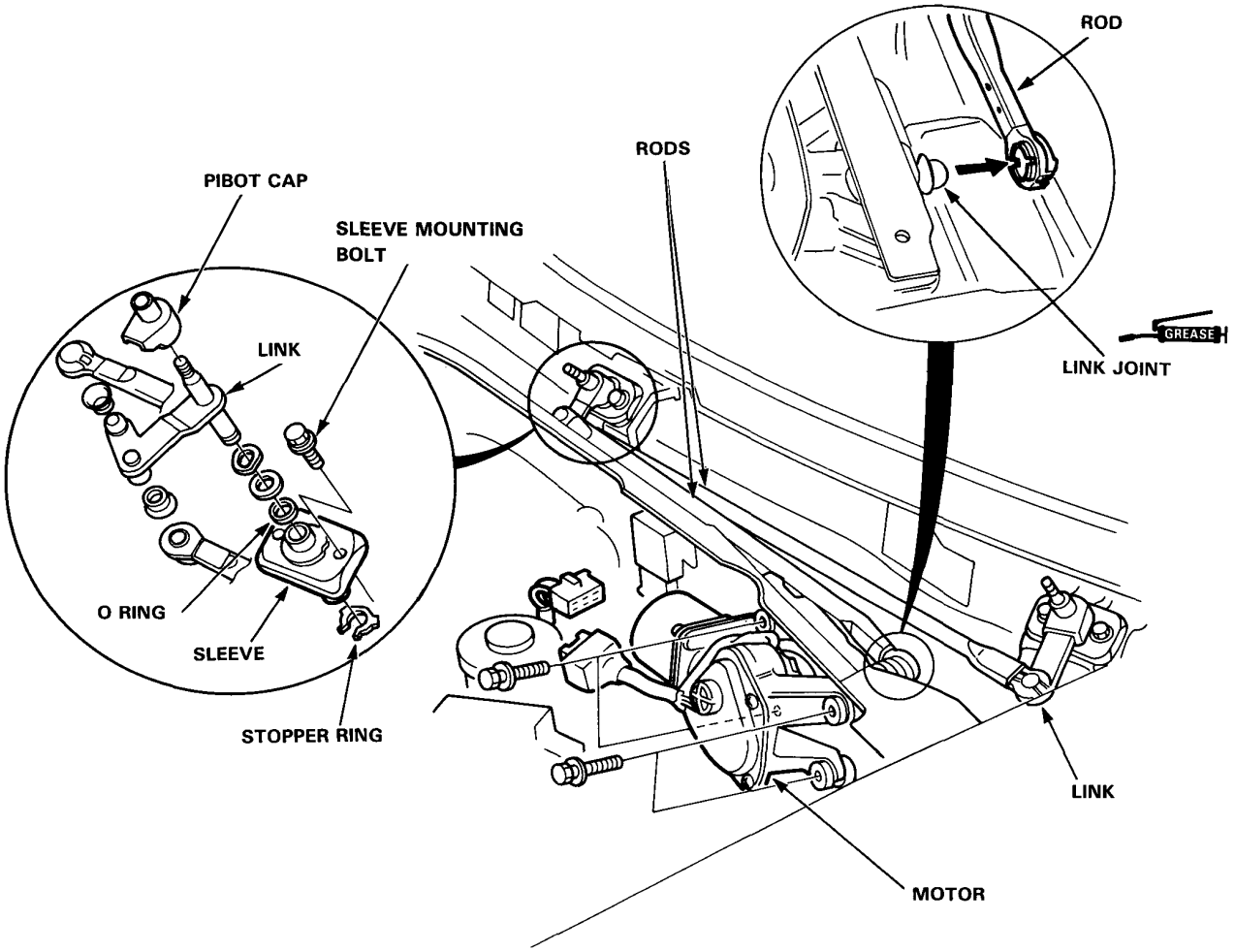
1. Remove the rear trim panel (page 21-65).
2. Disconnect the rod and the opener cable, then remove the latch by removing the 3 bolts.
3. Remove the screw, then remove the lock cylinder.
4. Remove the screw and the release levers, then remove the opener cover. Remove the opener by removing the 2 bolts.
5. To remove the tailgate and fuel lid opener cables, remove the floowing parts:
   - Left door sillmolding, left half of carpet, left side quarter trim panel.
   - Left rear side trim panel and rear trim panel.
6. Remove the fuel lid lock by turning it 90°.
7. To install, reverse the removal procedure. Check that the tailgate and fuel lid opener cables are routed and connected properly.



Front Wiper and Motor Replacement

1. Remove the cap nuts and remove the wiper arms.
2. Remove the trim clips, then remove the air scoope.
3. Disconnect the joint of the link.
4. Disconnect the wire harness of the motor.
5. Remove the mounting bolts, then remove the motor.
6. Remove the sleeve by removing the bolts and the stopper ring.





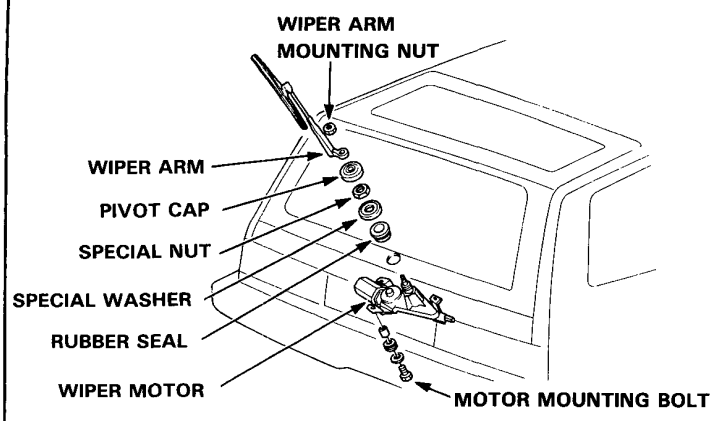
7. Install in the reverse order of removal. Coat the joints with grease and make sure the linkages move smoothly.

Wiper

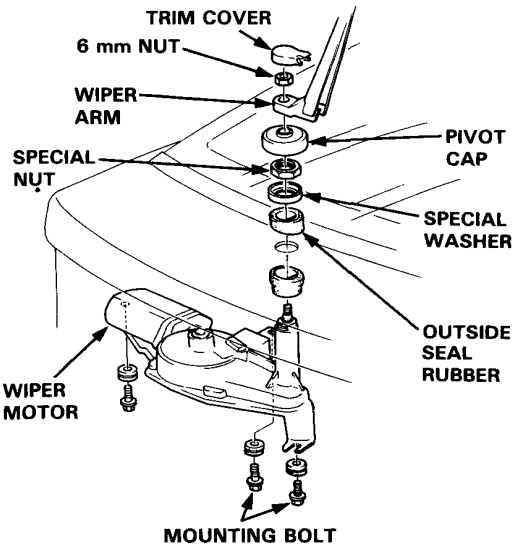
Rear Wiper and Motor Replacement

1. Remove the tailgate trim panels. (pages 21-64 or 93)
2. Disconnect the wire harness of the motor.
3. Remove the cap and the nut, then remove the 3 bolts from inside and remove the motor.
4. Separate the wiper and the arm by pushing the.

Aerodeck



Glass Back



Wiper Arm Installation and Travel

Adjust the wipers so the tips are 20—30 mm (0.8—1.2 in.) from the air scoop at rest.

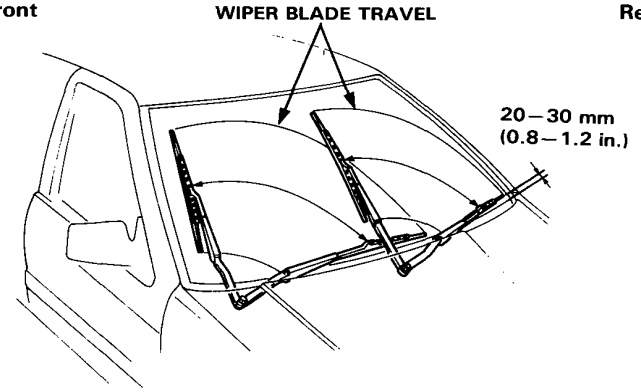
Wiper Blade Travel

Front: 80°±2° on driver side
92°±2° on passenger side

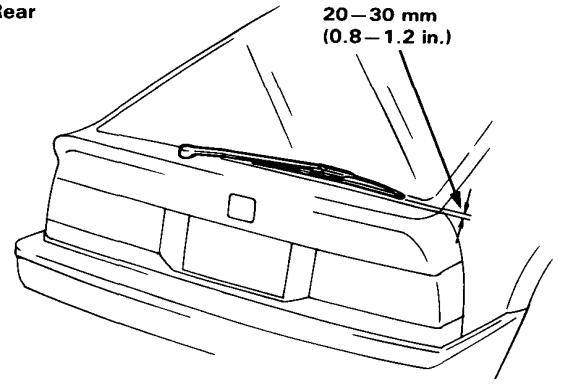
Rear: 170°30'±3° Glass Back
108°±5° Aerodeck

Headlight: 160°±3°

Front



Rear



Replacement

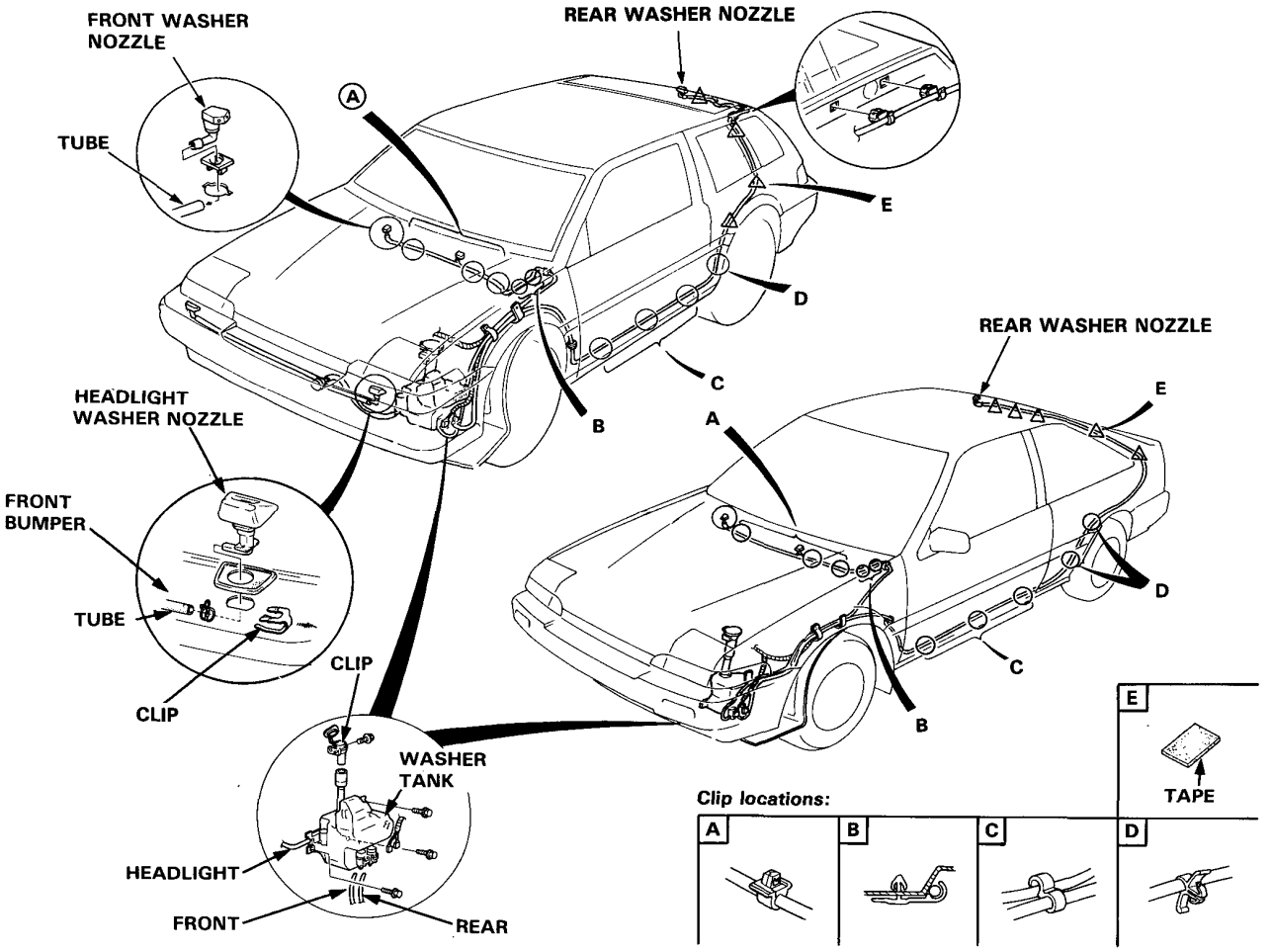
1. Remove the front bumper (page 21-89), then remove the wahser tank by removing the cap and the 3 mounting bolts.

2. Disconnect the tubes and wire harness from the washer motor.

3. Remove the front washer nozzle by releasing the retaining pawls and pushing them out from behind the engine hood. To remove the rear washer nozzle, twist and pull it out from the outside. To remove the head light washer nozzle, pull the clip off inside the front bumper.

4. To remove the rear washer tube, first remove the:

   - left half of carpet. (page 21-80)
   - left side of interior trims (pages 21-64, 65)



5. Install the washer in the reverse order of removal.

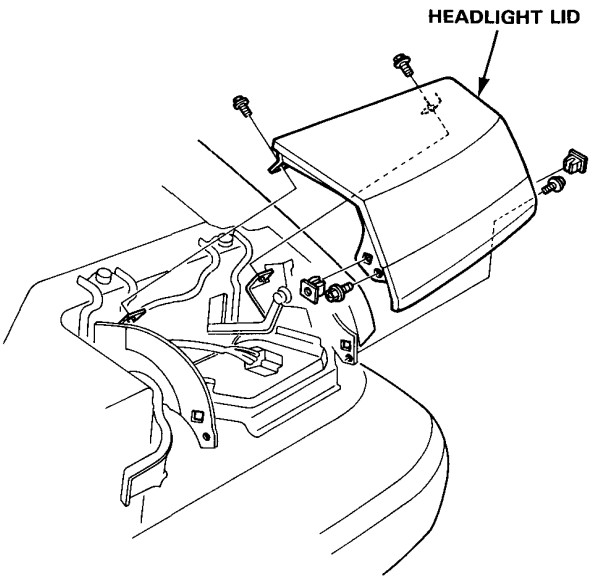
NOTE:

- Install the tubes with the washer motor wire harness and cabin harness.
- When reinstalling the inner parts, take care not to pitch the tubes.
- Install the gromets firmly.
- Attach the tube inside the engine room firmly.
- After installation, check the position of washer nozzle.

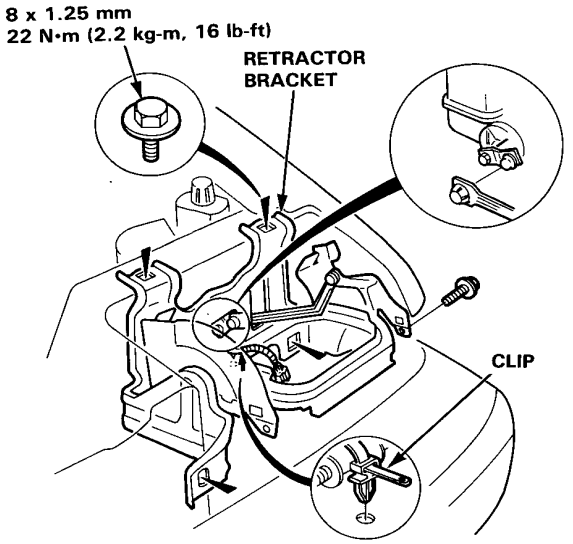
Retractor Motor

Replacement

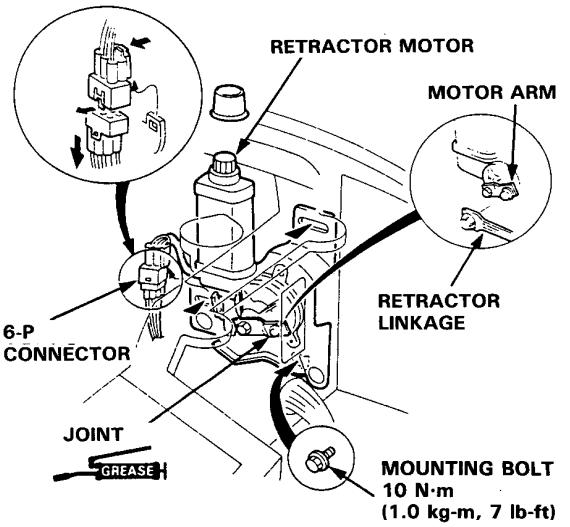
1. Remove the headlights (page 21-101).
2. Remove the position lights (page 21-104).
3. Shut the retractable light, then remove the 4 bolts and 2 clips, then remove the Headlight lid.



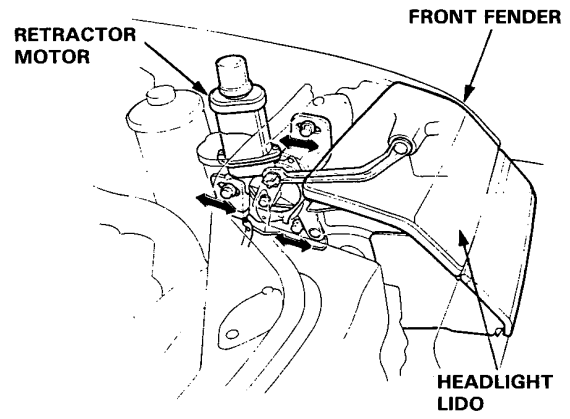
4. Remove the 2 clips, then disconnect the joint of the motor and link and remove the 5 bolts, then remove the retractable bracket.



5. Remove the No. 6 (15A) and No. 7 (15A) fuses in the relay box.
6. Pry the retractor linkage off the motor arm.
7. Disconnect the 6-P connector.
8. Remove the 3 mounting bolts and the retractor motor.



9. Install in the reverse order of removal, and:
   - Make sure there is no interference between the wire harness and linkage.
   - Coat the joints with grease and make sure the linkage moves smoothly.
   - Adjust the retractor motor fore or aft until the headlight lids fit flush with the front fender when the headlights are closed.

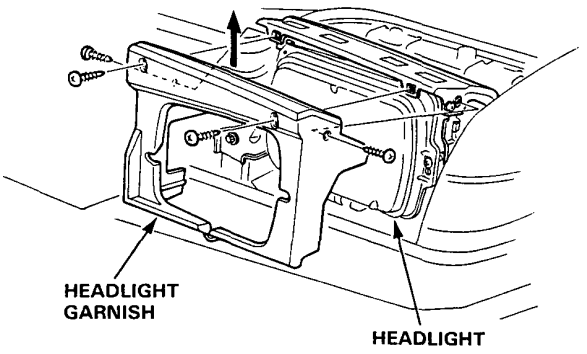


Headlights

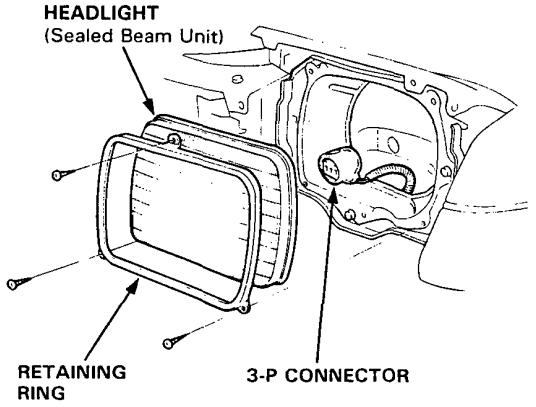
Replacement (Retractable Headlight)

CAUTION:
- **Halogen headlights can become very hot in use; do not touch them or the attaching hardware imediately after they have been turned off.**
- **Do not try to replace or clean the units with the lights on.**

1. Raise the headlights with retractor switch ON.
2. Remove the 4 screws and slide the headlight garnish upward to remove it.



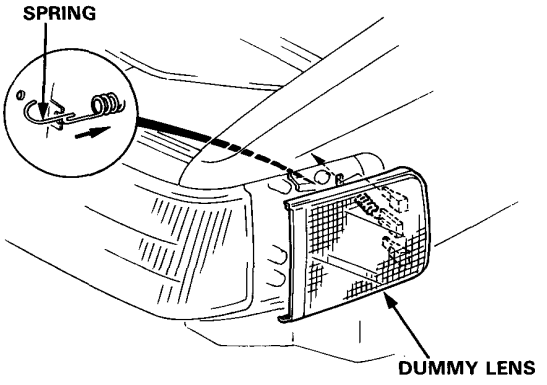
3. Remove the retaining ring by removing the 3 screws, then disconnect the 3-P connector from behind the unit to remove the headlight.



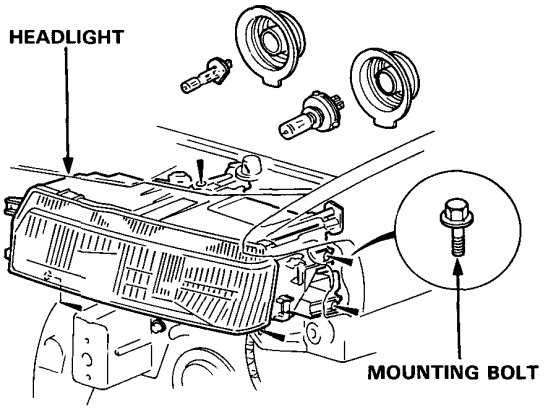
Replacement (Other Headlight)

CAUTION:
- **Halogen headlights can become very hot in use; do not touch them or the attaching hardware imediately after they have been turned off.**
- **Do not try to replace or clean the units with the lights on.**

1. Remove the front bumper and front grille.
2. Disconnect the spring inside the engine room, then remove the dummy lens.



3. Remove the 5 bolts, then disconnect the connectors from behind the unit to remove the headlight.

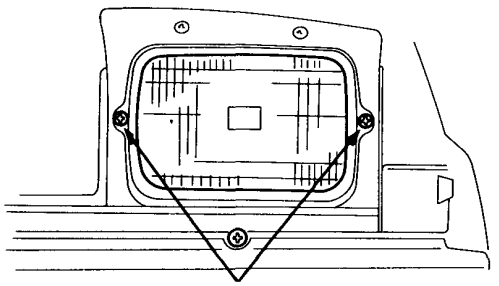


Headlights

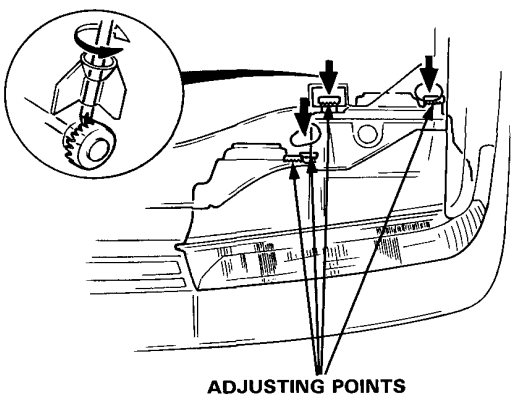
Adjustment

NOTE: Adjust headlight to local requirements.

Retractable model:

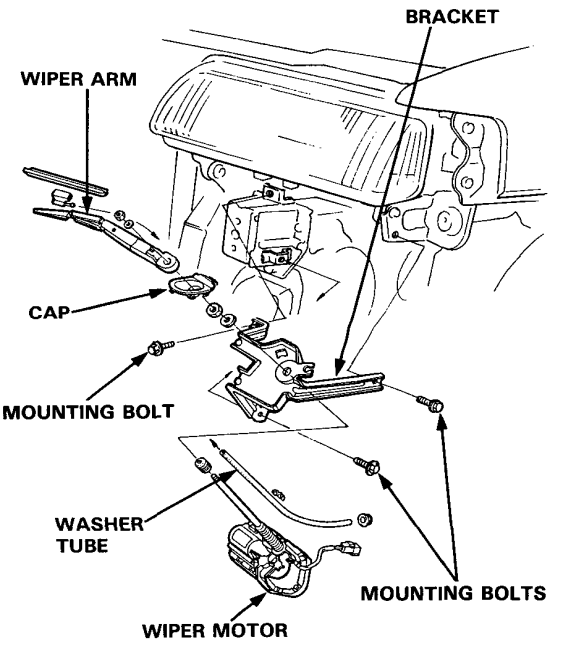


Other models:



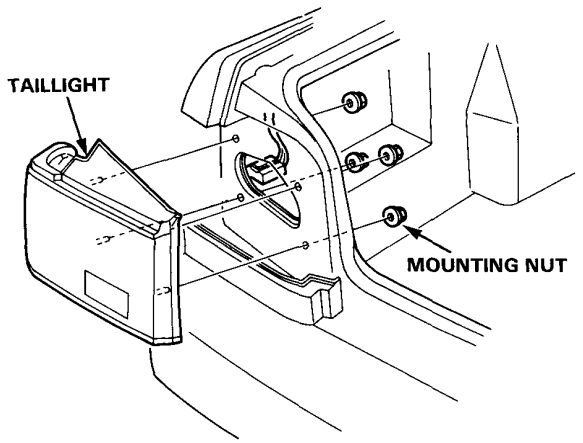
Headlight Wiper Motor Replacement

1. Remove the nut and disconnect the washer tube then remove the wiper arm.
2. Remove the cap, then remove the bumper not to damage the motor shaft.
3. Disconnect the wireharness and the washer tube, then remove the nut and the washer motor.
4. Remove the 3 mounting bolts and the bracket.

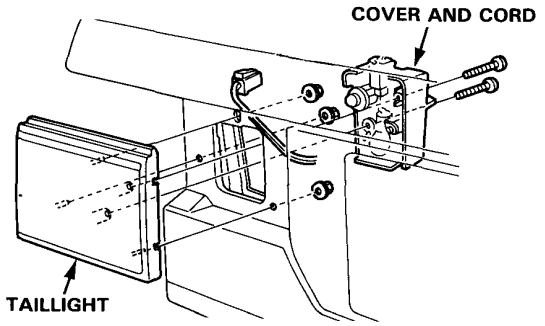


Taillights Replacement

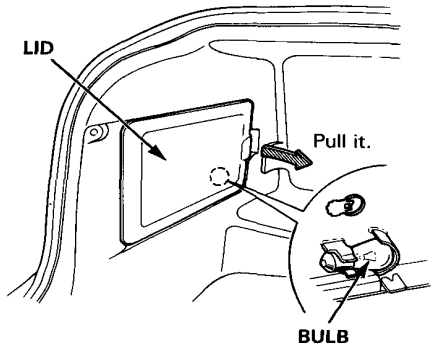
1. Remove the rear trim panel (pages 21-63, 64 and 65).
2. Remove the trank side panel or rear side trim panel (pages 21-63, 64 and 65).
3. Disconnect the wire harness and remove the 4 nuts, then remove the taillight.



4. Disconnect the wire harness and remove the 2 screws, then remove the cover and cord.
5. Remove the taillight by removing the 3 nuts.

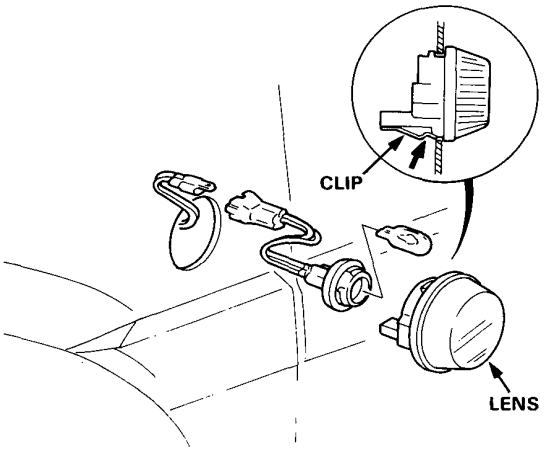


6. If necessary, replace the bulb by removing the tail-light lid.



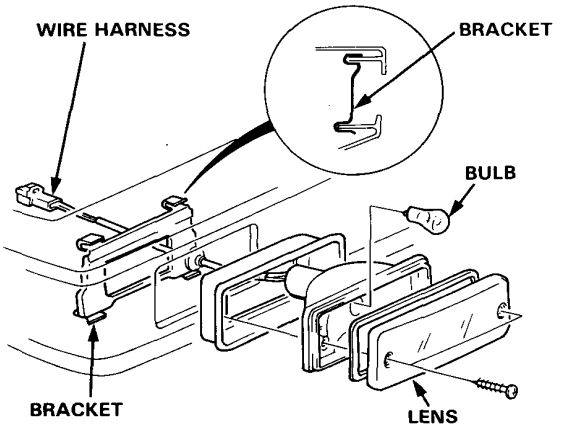
Side Turn Light Replacement

1. Remove the inner fender (page 21-89).
2. Remove the clip from inside, then remove the side turn light.
3. Disconnect the wire harness.



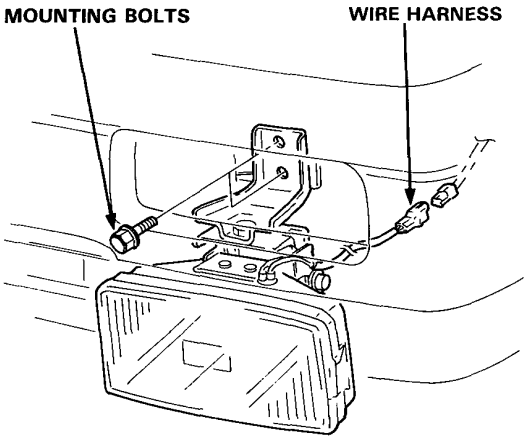
Rear Fog Light Replacement

1. Disconnect the wire harness from taillight lid.
2. Remove the 2 screws then remove the rear fog light.



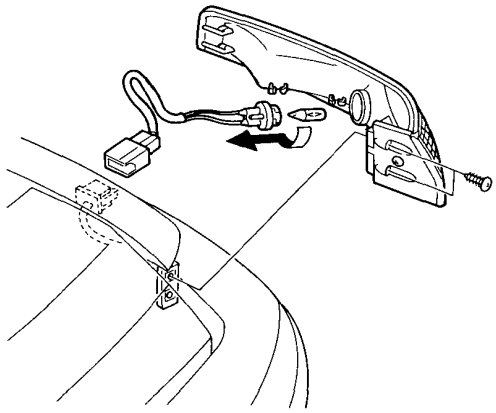
Day Light System Replacement

1. Disconnect the wire harness.
2. Remove the 2 bolts, then remove the day light system.



Position Light Replacement

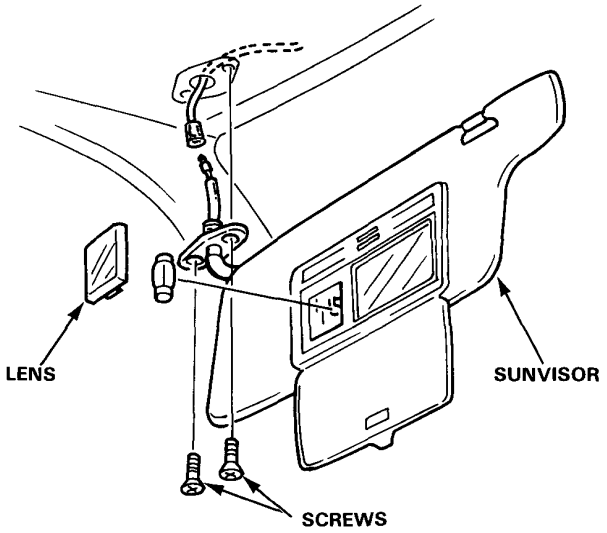
1. Remove the 2 screws and slide the position light to the front, then remove it.
2. Disconnect the wire harness.



Interior Light Replacement

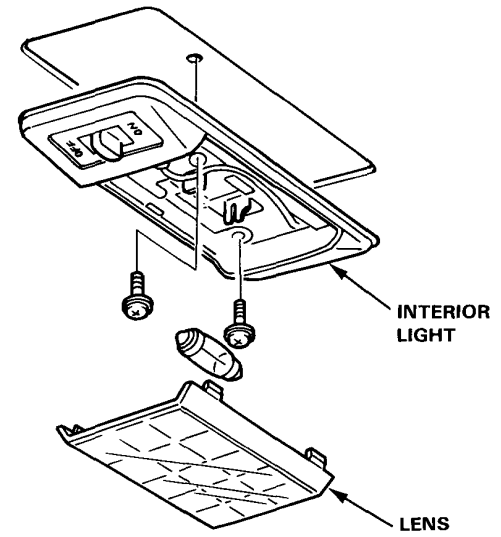
VANITY MIRROR LIGHT

1. Remove the 2 screws on the sunvisor stay.
2. Disconnect the terminal and remove the sunvisor.



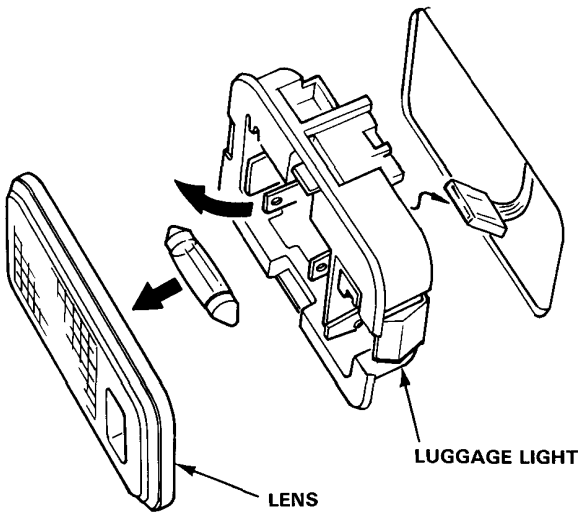
INTERIOR LIGHT

1. Turn the light switch OFF.
2. Pry off the lens.
3. Remove the 2 screws and the housing.
4. Disconnect the 2-P connector from the housing.



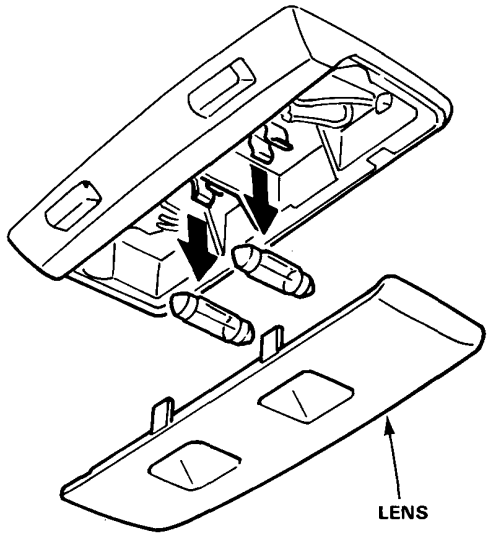
LUGGAGE LIGHT

1. Pry off the luggage light lens from either side.
2. Pry off the light assembly from either end.
3. Disconnect the 2-P connector from the housing.



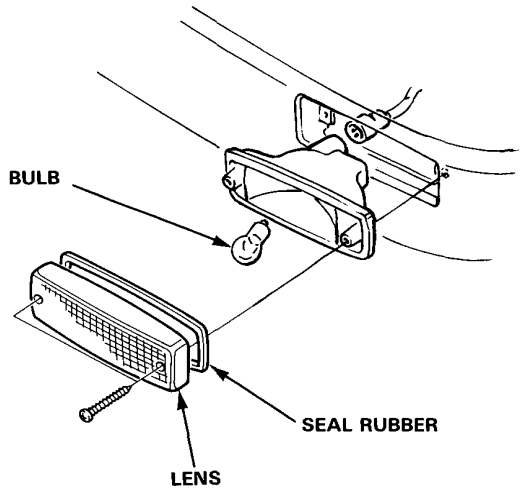
SPOT LIGHT

1. Pry off the spot light lens.
2. Remove the screws and the housing.
3. Disconnect the 2-P connector from the housing.



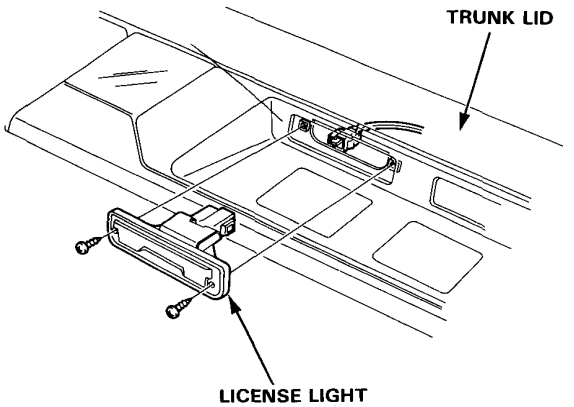
Front Turn/Position Light Replacement

Remove the 2 screws and disconnect the wire harness, then remove the front turn/position light.

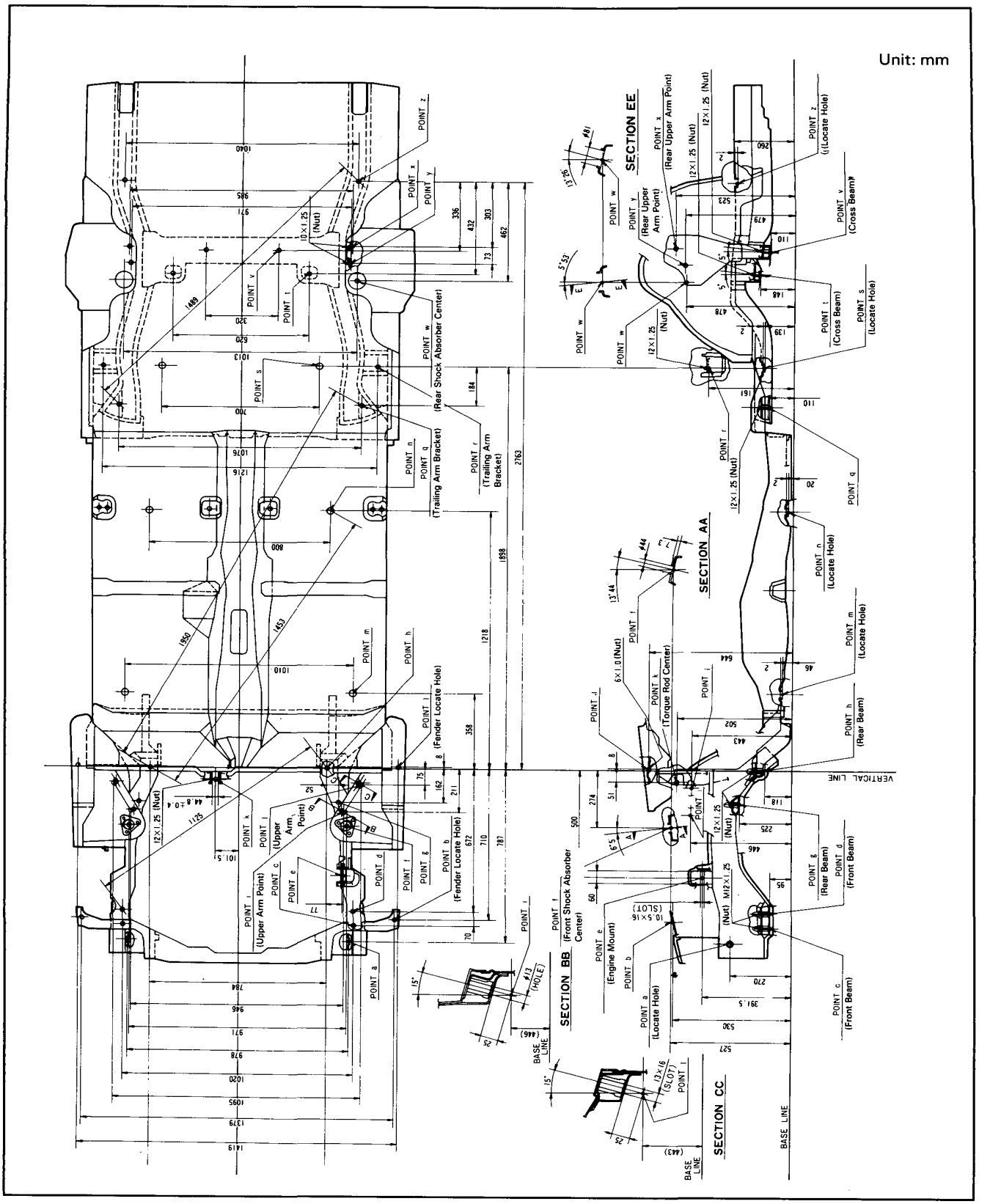


License Light Replacement

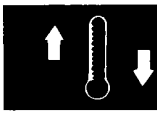
Remove the 2 screws and disconnect the wire harness, then remove the license light.



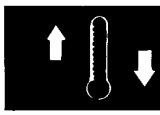
Frame Repair Chart



Heater and Air Conditioner



Heater



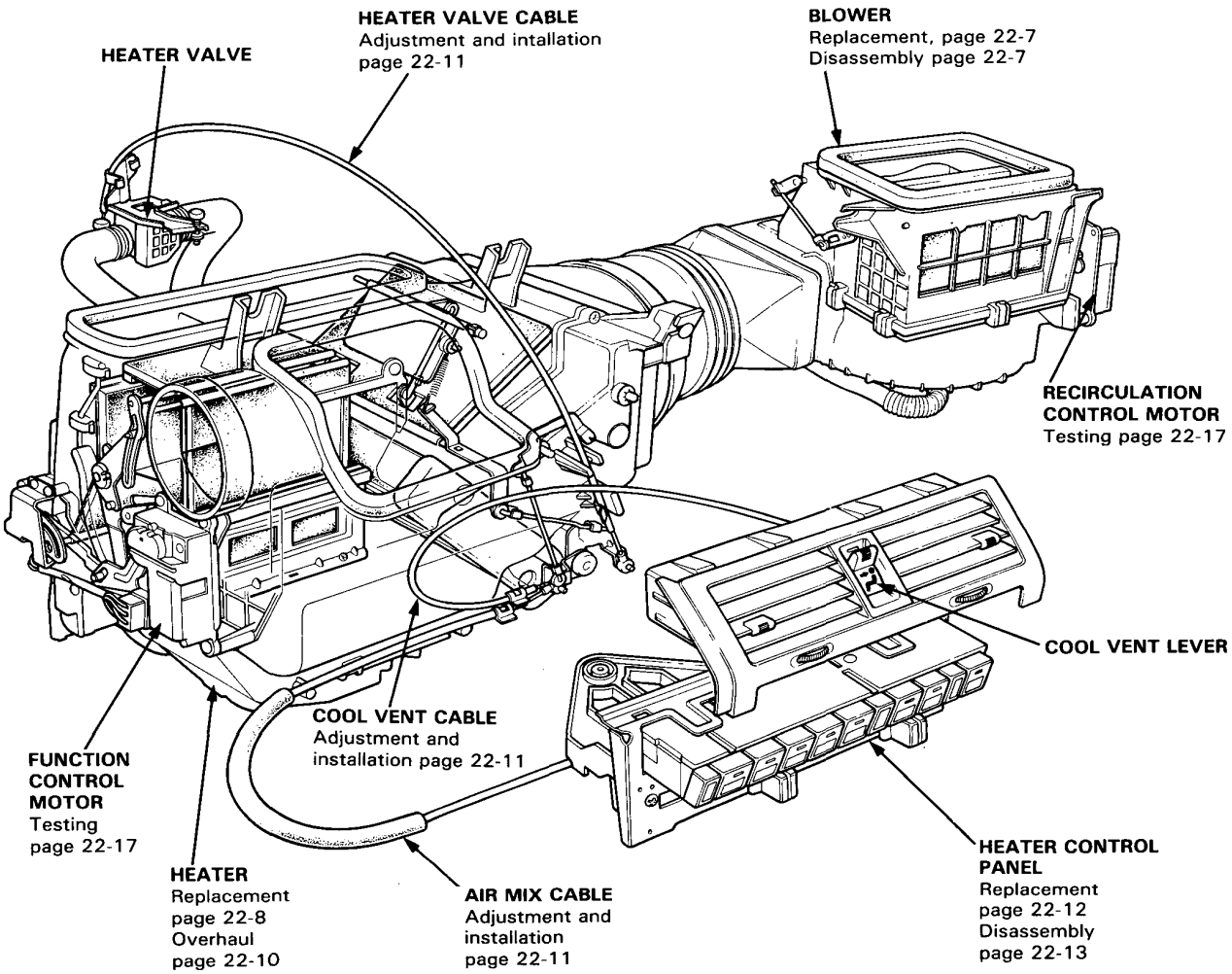
Heater

Illustrated Index

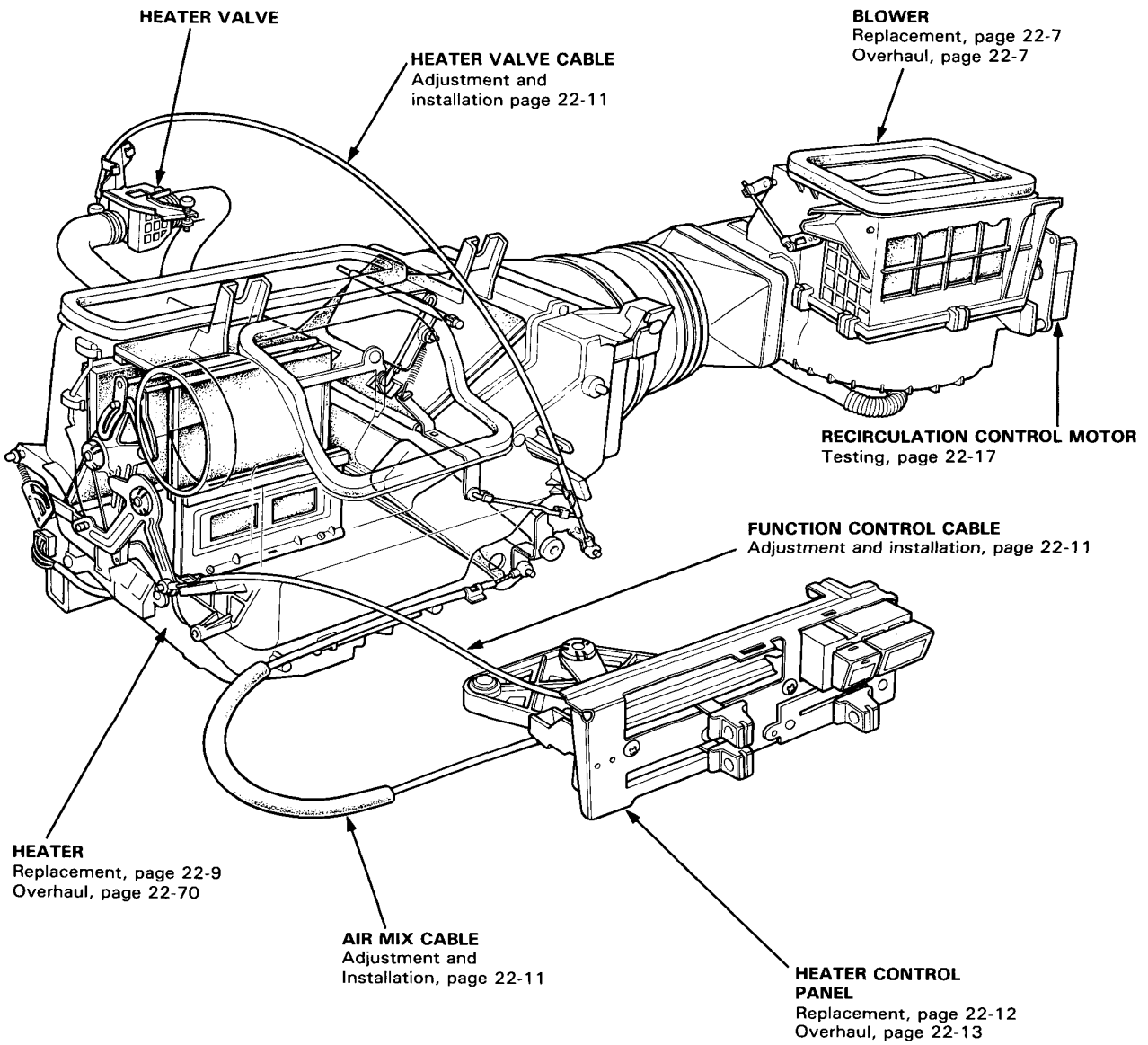
Button Type:

NOTE:

- These illustrations show the L.H. Drive car. The R.H. Drive car is, with a particial exception, contrast to this illustration.



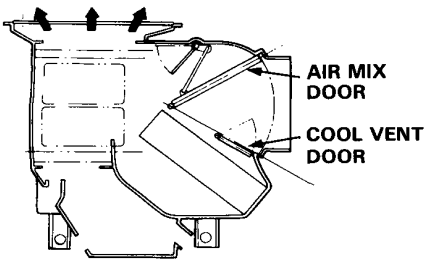
Lever Type:

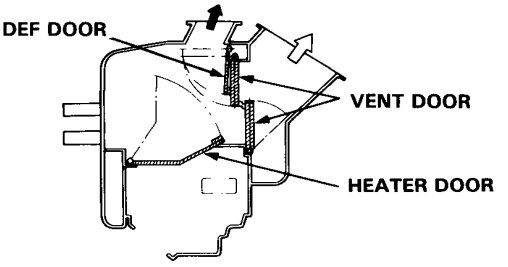

HEATER VALVE
HEATER VALVE CABLE
Adjustment and
installation page 22-11
BLOWER
Replacement, page 22-7
Overhaul, page 22-7
RECIRCULATION CONTROL MOTOR
Testing, page 22-17
FUNCTION CONTROL CABLE
Adjustment and installation, page 22-11
HEATER
Replacement, page 22-9
Overhaul, page 22-70
AIR MIX CABLE
Adjustment and
Installation, page 22-11
HEATER CONTROL
PANEL
Replacement, page 22-12
Overhaul, page 22-13

Heater Door Positions

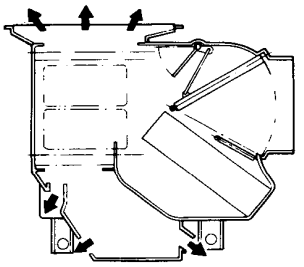
Front View

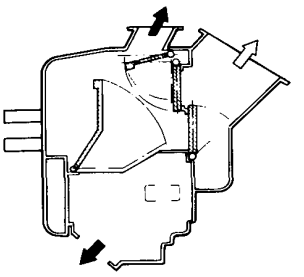
Side View



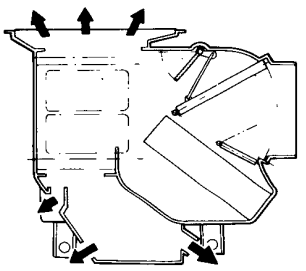


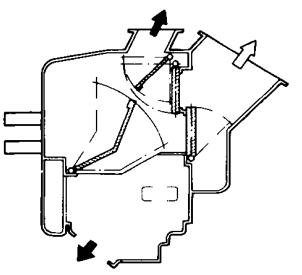
H/DEF



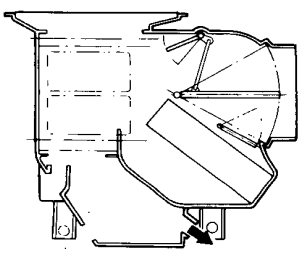


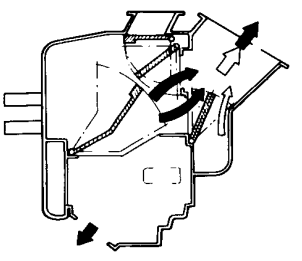
HEAT



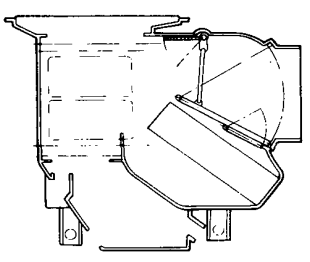


HI-LO

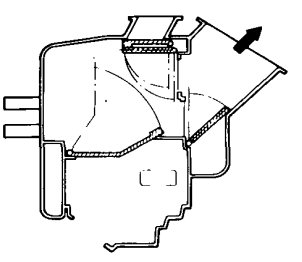




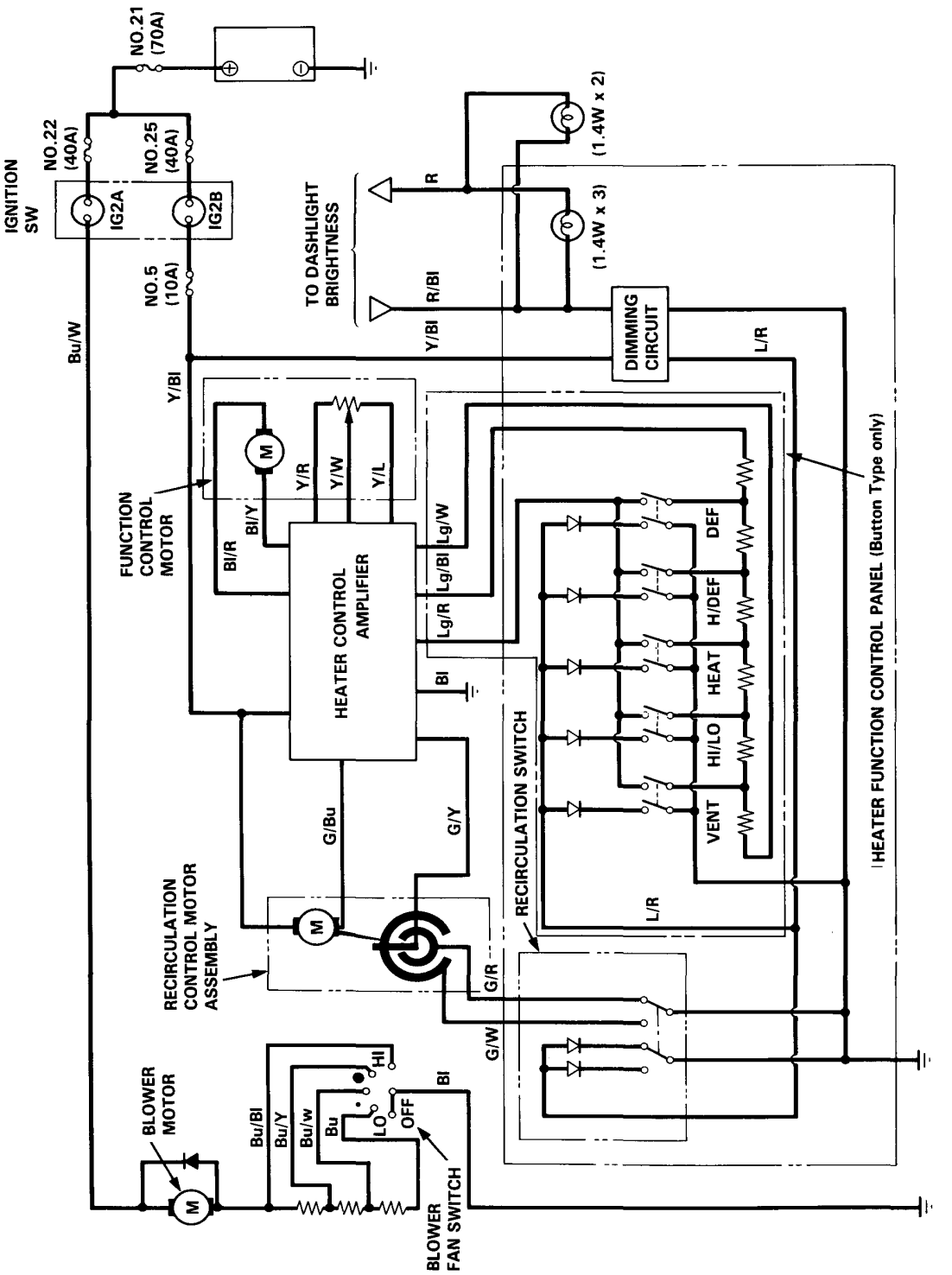
VENT



Cool VENT open only



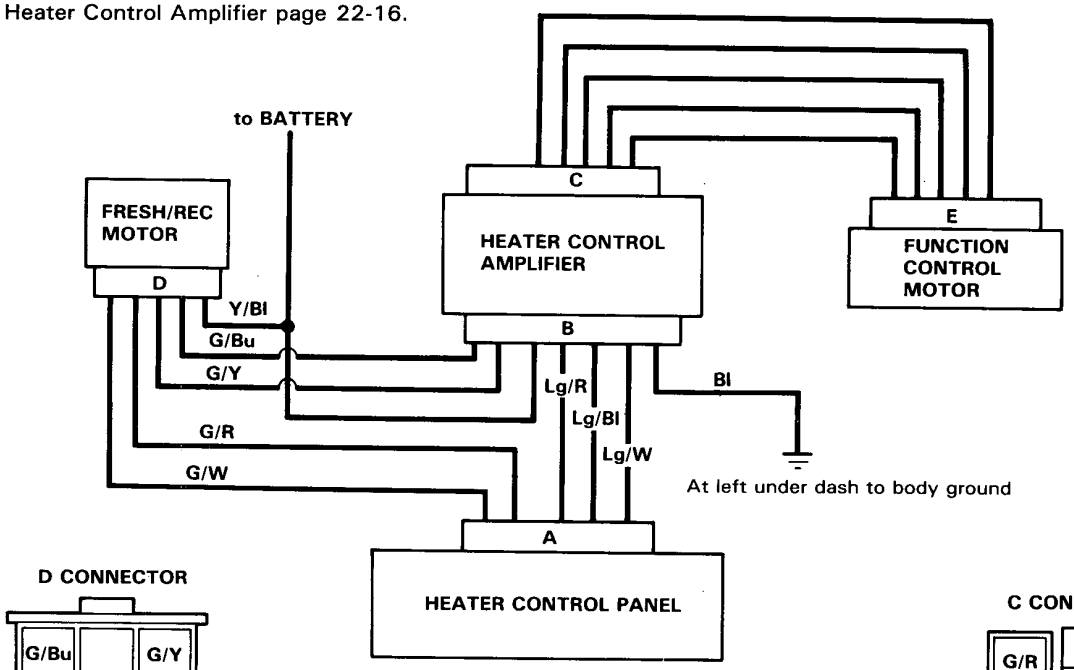
Circuit Diagram

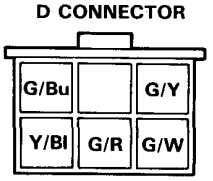


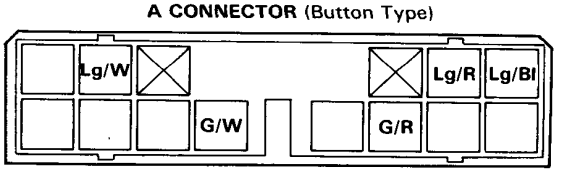
Troubleshooting/Connector Information

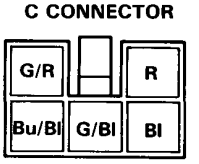
If air flows abnormally, test follows:

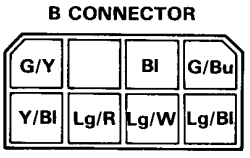
1. Motor Test:
   - Function control motor page 22-17.
   - Recirculation control motor page 22-17.
2. Control Panel Switch Test:
   - Function Switch page 22-15.
   - Fan Switch page 22-14.
   - REC Switch (Lever type only) page 22-14.
3. Wire Harness Test.
   - Check for continuity between the same color terminals of two connectors.
4. Heater Control Amplifier page 22-16.

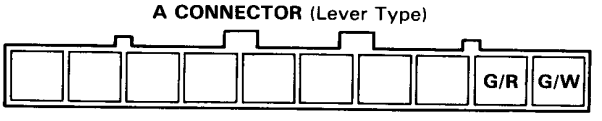


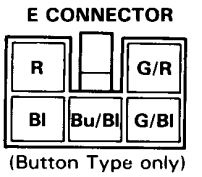








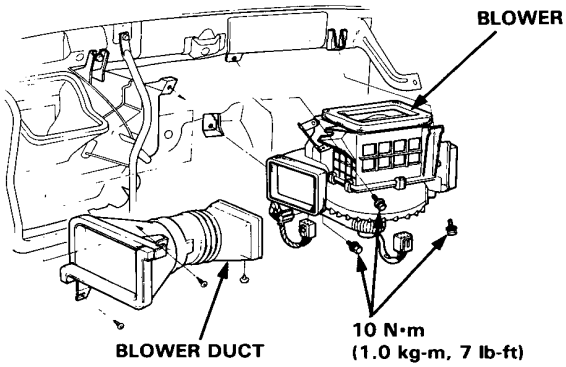




View from wire side

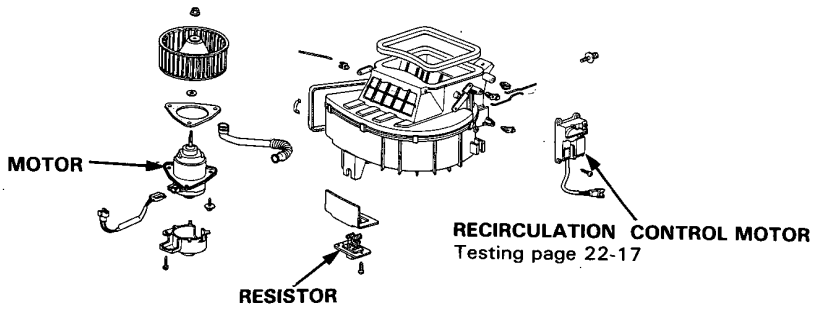
Blower Replacement

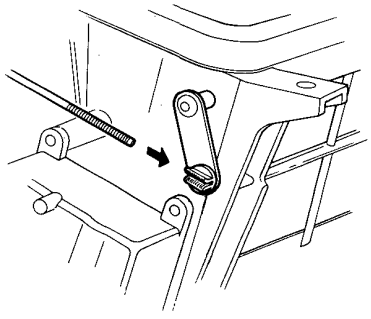
1. Remove the glove box.
2. Remove the blower duct.
3. Disconnect the wire connections from the blower.
4. Remove three mounting bolts from blower.
5. Remove the blower.
6. Install the blower in reverse order of removal and make sure that there is no air leakage.



L.H. Drive shown, R.H. Drive similar.

Blower Overhaul





R.H. Drive shown, L.H. Drive is similar.

NOTE:

- Before reassembly, make sure that the air door and linkage move smoothly without binding.
- When re-attaching the actuator, make sure its positioning will not allow the air door to be pulled too far. Attach the actuator and all linkage, then apply battery voltage and watch the door movement. If necessary, loosen the holding screw and move the actuator up or down.

To adjust the control rod:
Connect the REC control motor coupler to the main wire harness and turn the FRE/REC switch to "REC" and open the air door, then connect the control rod to the arm while holding the air door open.

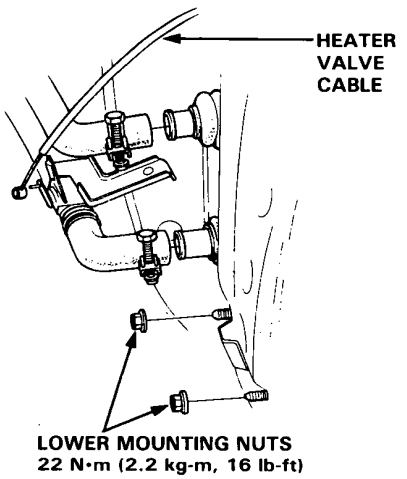
Heater Assembly Replacement

Button Type:

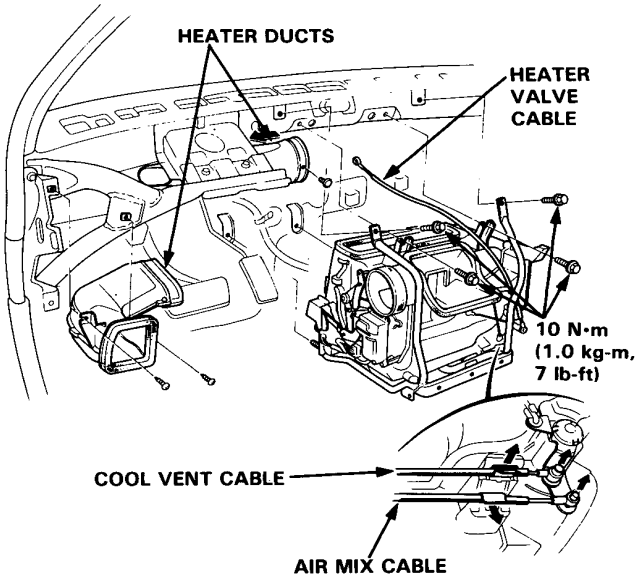
1. Drain coolant at the radiator.
2. Disconnect heater hoses at the firewall.

   NOTE: Coolant will run out when the hoses are disconnected, drain it into a clean drip pan.

3. Disconnect the heater valve cable from the heater valve.



4. Remove the heater lower mounting nuts (2).
5. Disconnect the cool vent cable from the heater.
6. Remove the dashboard.
7. Remove heater ducts.
8. Disconnect the air mix cable from the heater.
9. Disconnect the wire harness at the connecter.
10. Remove the heater mounting bolts (4), then pull the heater away from the body.



Install in reverse order of removal, and:

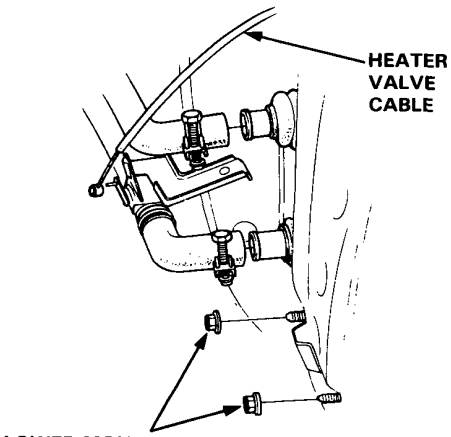
- Apply a sealant to the grommets.
- Do not interchange the inlet and outlet hoses. Make sure that the hose clamps are secure.
- Loosen the bleed bolt on the engine and refill the radiator and reservoir tank with the proper coolant mixture.
  Tighten the bleed bolt when all the trapped air has escaped and coolant begins to flow from it.
- Connect all cables and make sure they are properly adjusted (page 22-11).

Lever Type:

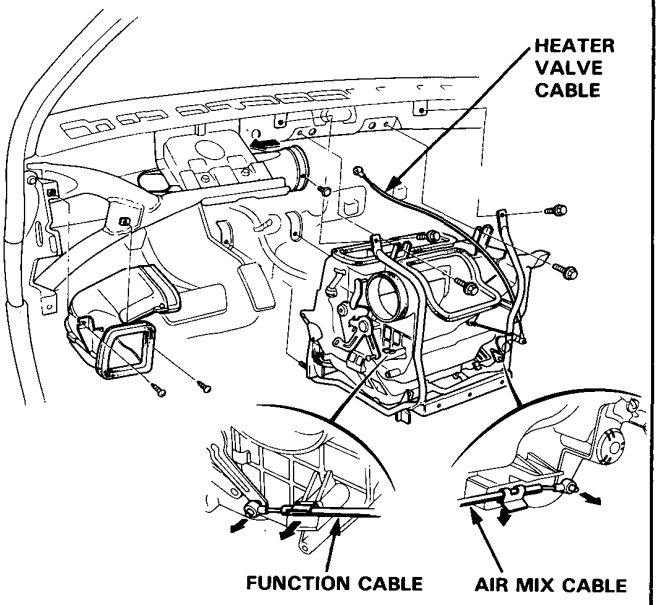
1. Drain coolant at the radiator.
2. Disconnect the heater hoses at the firewall.

   NOTE: Coolant will run out when the hoses are disconnected, drain it into a clean drip pan.

3. Disconnect the heater valve cable from the heater valve.



4. Remove the heater lower mounting nuts. (2)
5. Disconnect the heater function cable from the heater.
6. Disconnect the air mix cable from the heater.
7. Remove the dashboard.
8. Remove the heater duct.
9. Remove the heater mounting bolts (4), then pull the heater away from the body.



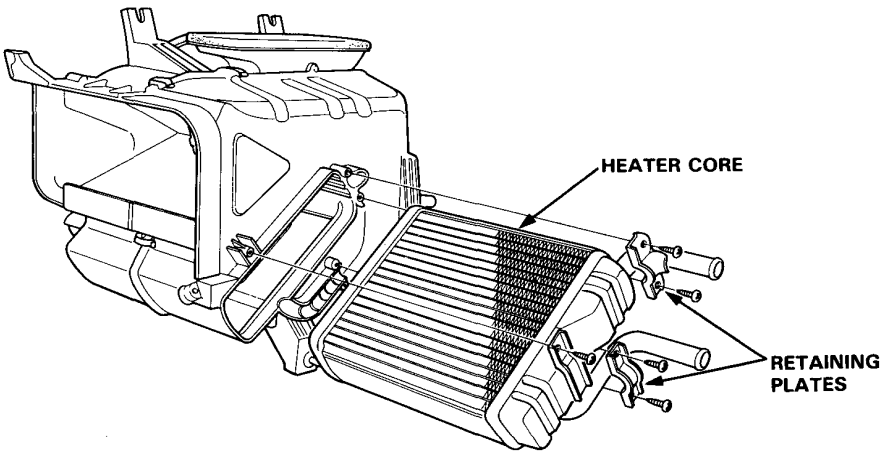
Install in reverse order of removal and:

- Apply a sealant to the grommets.
- Do not interchange the inlet and outlet hoses. Make sure that the hose clamps are secure.
- Loosen the bleed bolt on the engine and refill the radiator and reservoir tank with the proper coolant mixture.
  Tighten the bleed bolt when all the trapped air has escaped and coolant begins to flow from it.
- Connect all cables and make sure they are properly adjusted (page 22-11).

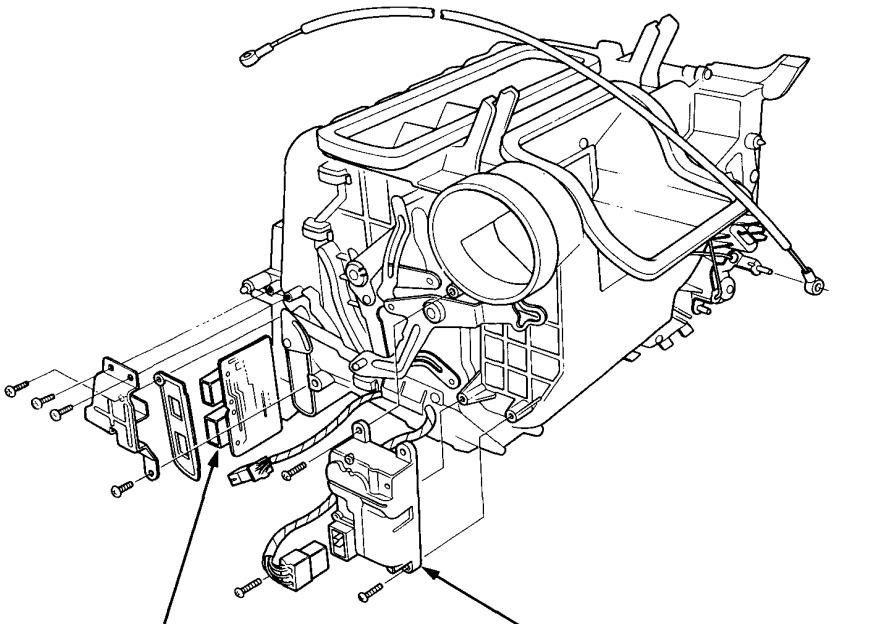
Heater Core Replacement/Overhaul

1. Remove the heater assembly (page 22-8 or 9).
2. Remove the set tapping screws and retaining plates.
3. Pull out the heater core from the heater housing.

Install in reverse order of removal and:
Loosen the bleed bolt on the engine and refill the radiator and reservoir tank with the proper coolant mixture. Tighten the bleed bolt when all the trapped air has escaped and coolant begins to flow from it.



Overhaul

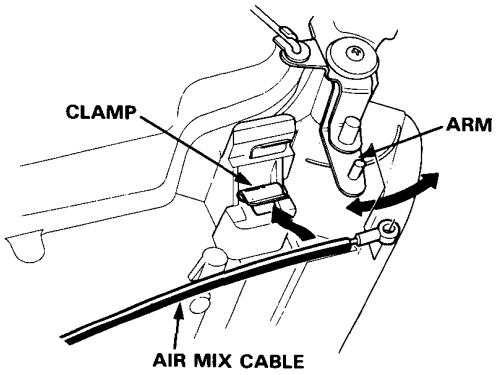


Control Cable Adjustment and Installation

NOTE: L.H. Drive car shown, R.H. Drive car is similar.

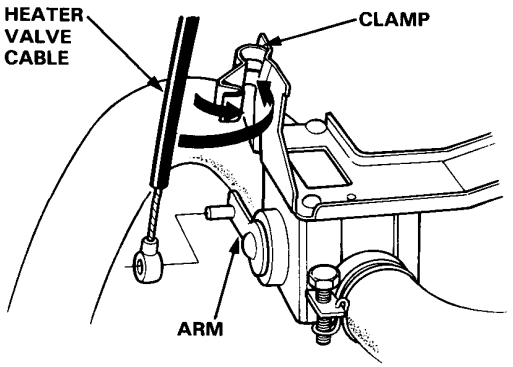
Air Mix Cable

1. Slide temperature control lever to HOT.
2. Open the air mix door in front of heater core, then connect the end of the cable to the arm. Gently slide the cable housing back from the end - enough to take up any slack in the cable, but not enough to make the dashboard lever move - then snap the cable housing into the clamp.
3. After adjustment, make sure that the heater valve cable is adjusted properly.



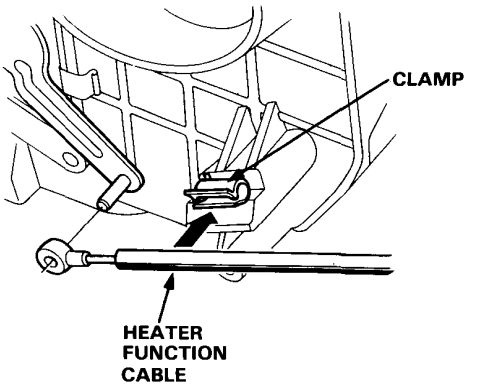
Heater Valve Cable

1. Slide the temperature control lever to COLD.
2. Close the heater valve fully, then connect the end of the heater cable to the valve arm, and secure the cable housing with the clamp.



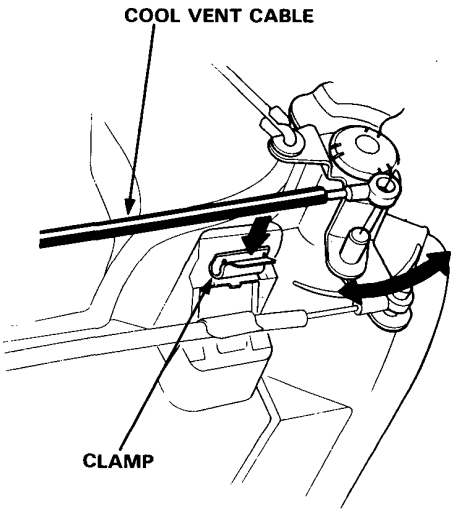
Heater Function Cable (Lever Type only)

1. Slide function control lever to DEF.
2. Open the DEF door, then connect the end of the cable to the arm, and secure the cable housing with the clamp.



Cool Vent Cable (Button Type only)

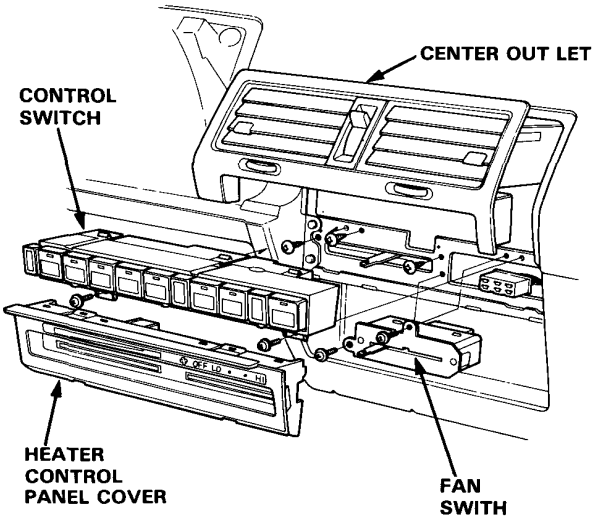
1. Slide the cool Vent control lever to shut.
2. Close the cool Vent door fully, then connect the end of the cool Vent cable to the door arm, and secure the cable housing with the clamp.



Heater Control Removal

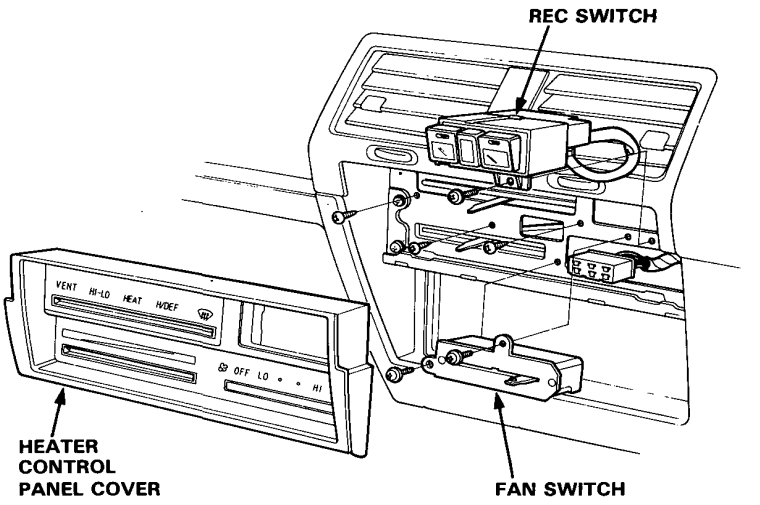
Button Type:

1. Remove the heater control panel cover.
2. Remove the gauge visor.
3. Remove the center outlet.
4. Remove the screws (4).
5. Disconnect the switch wires, and remove the control switch.
6. Remove the radio and Air Mix Lever if necessary.



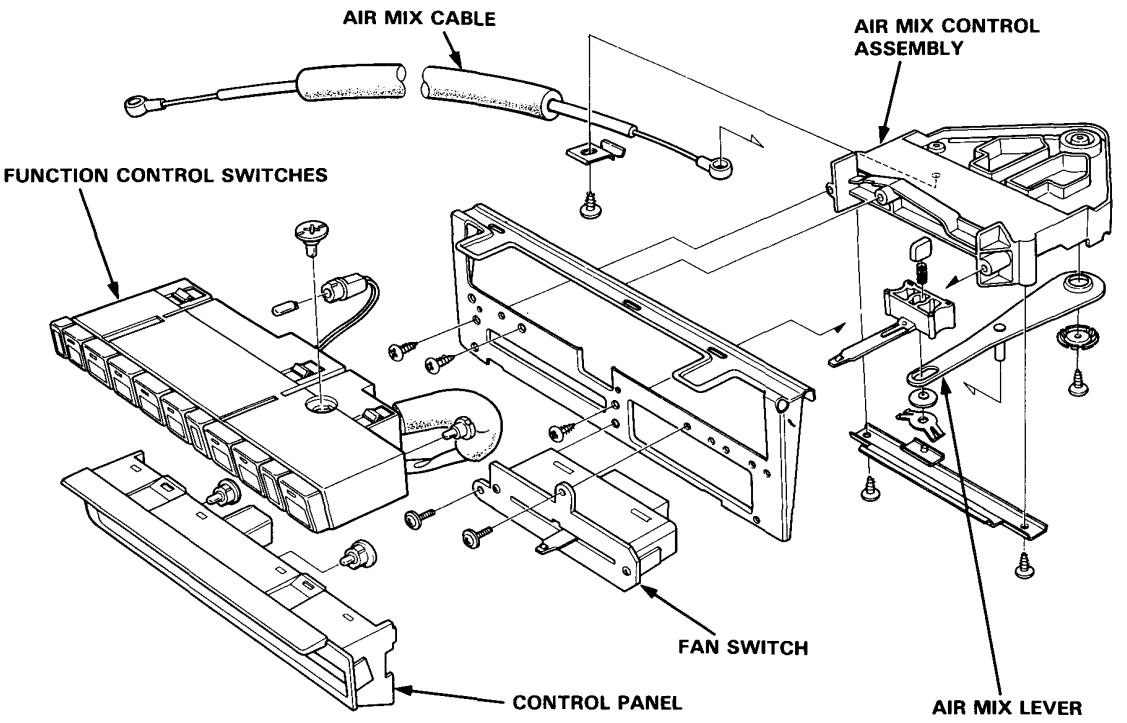
Lever Type:

1. Remove the heater control panel cover.
2. Remove the radio.
3. Remove the screws (6).
4. Disconnect the air mix cable from the heater.
5. Disconnect the function cable from the heater.
6. Disconnect the switch wires, and remove the control panel.

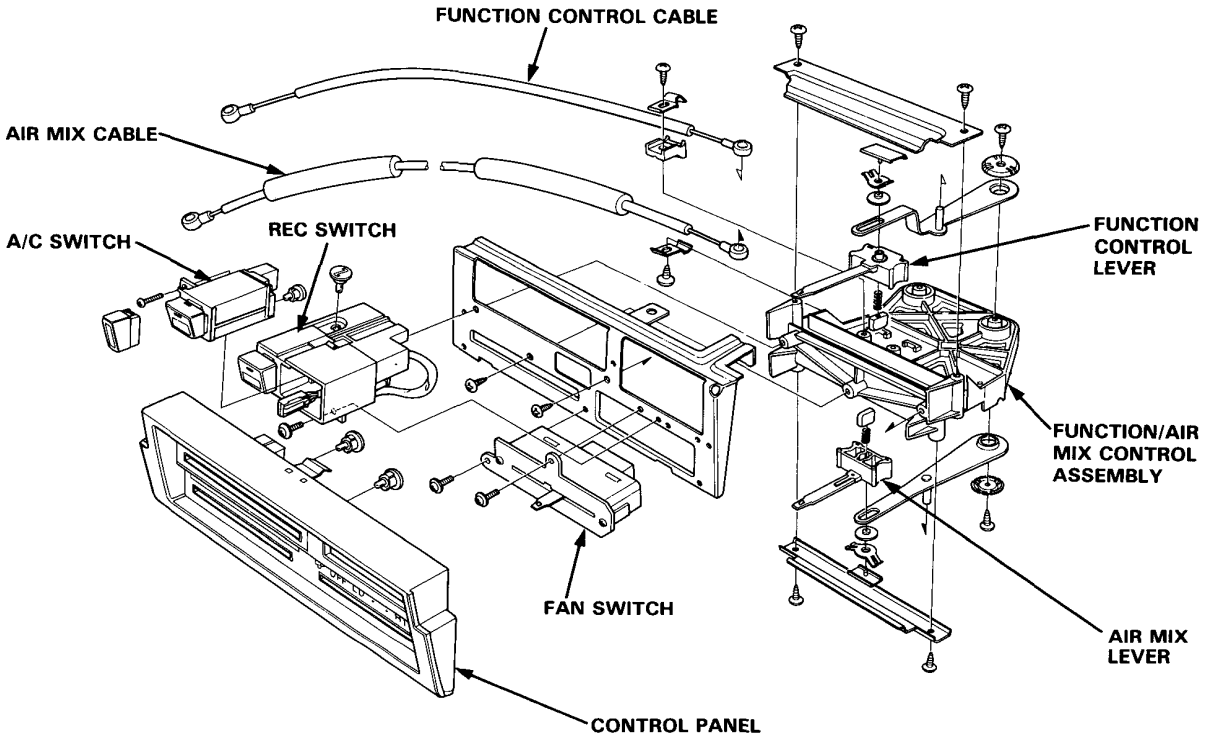


Heater Control Disassembly

Button Type:



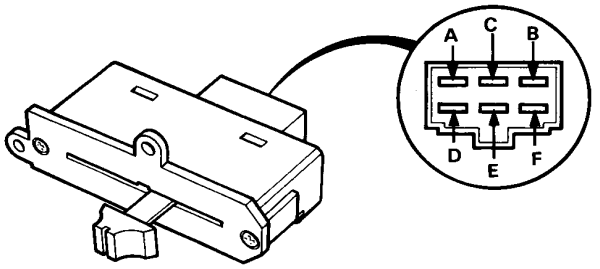
Lever Type:



Fan Switch Test

Check for continuity between the terminals as shown in the chart:

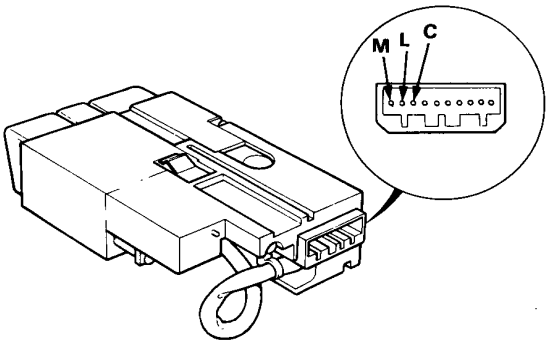
Terminal / Position	A	B	C	D	E	F
OFF						
LO	○	○	○			
•	○	○		○		
●	○	○			○	
HI	○	○				○



REC Switch Test (Lever Type)

Check for continuity between the terminals, as shown in the chart:

		L	C	M
REC	inside air	○	○	
	outside air		○	○

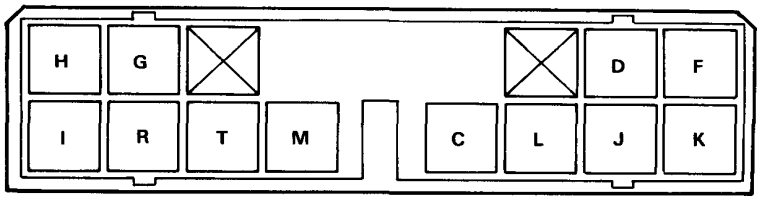


Control Panel Test (Butlon Type)

FRESH/REC Switch

Check for continuity between the terminals, as shown in the chart:

Terminal / Position	L	C	M
REC	○———	———○	
FRESH		○———	———○



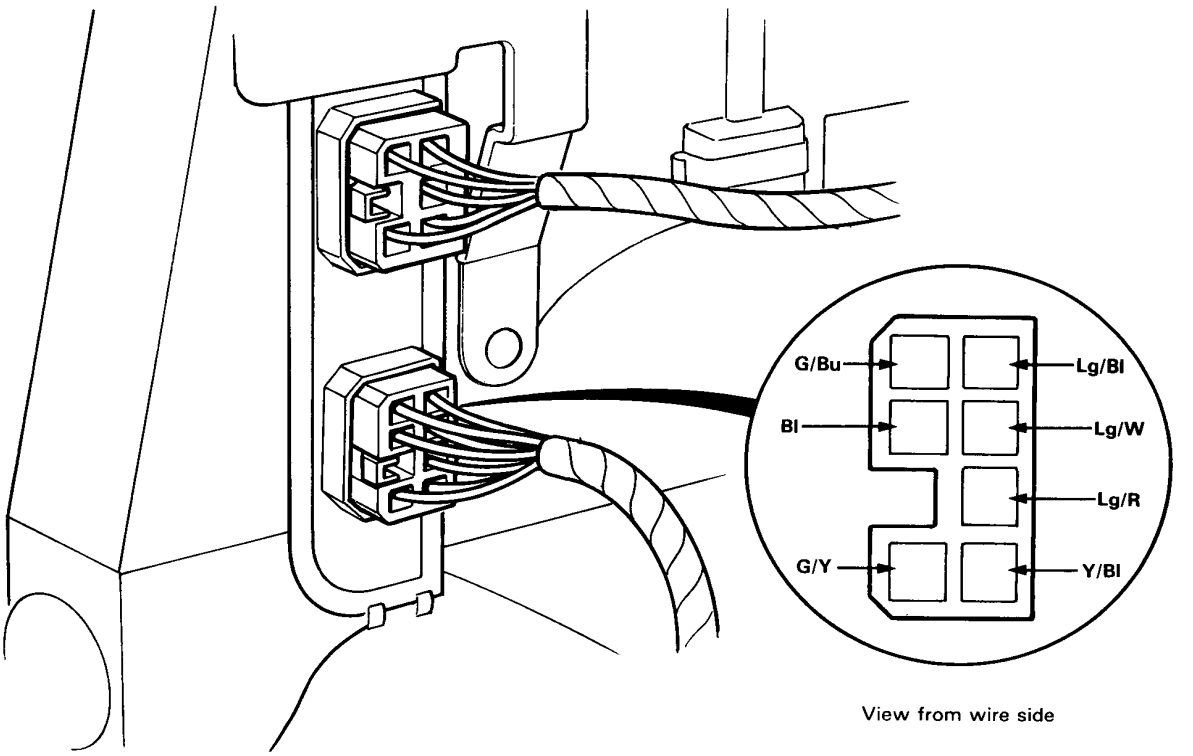
Function Switch

Check resistance between the terminals, as shown in the chart:

Termianl / Position	Terminal G to D	Terminal G to F
VENT	Approx: 2.0KΩ	Approx: 5.9KΩ
HI-LO	Approx: 3.2KΩ	Approx: 5.9KΩ
HEAT	Approx: 4.2KΩ	Approx: 5.9KΩ
H/DEF	Approx: 4.8KΩ	Approx: 5.9KΩ
	Approx: 5.9KΩ	Approx: 5.9KΩ

Heater Control Troubleshooting

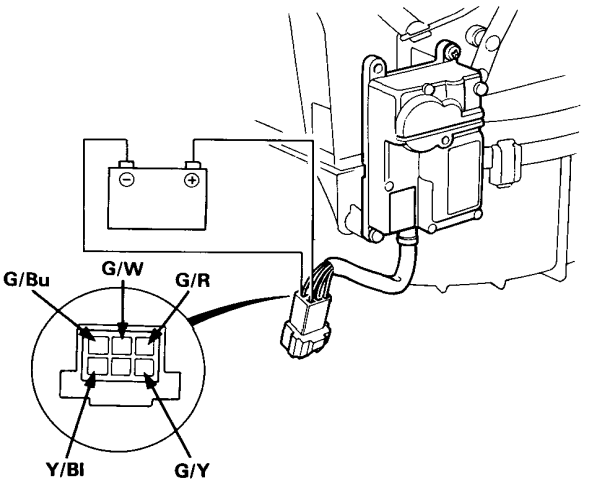
No.	Wire: test condition	Test: desired result	Actual result: possible cause
1	Yellow/Black (Y/Bl): Ignition switch ON.	Check voltage: should have 12 volts.	• If not, there is an open in Y/Bl. • If there are 12 volts: proceed to No.2
2	Green/Blue (G/Bu): • Ignition switch ON. • Ground to the G/Bu wire.	Check REC motor: it should run.	• If not there is an open in G/Bu or motor. • If it runs: proceed to No. 3.
3	Light Green/Red (Lg/R) & Light Green/White (Lg/W): • Ignition Switch ON.	Check voltage: should have VENT: Approx 1.9V Hi-Lo: Approx 3.0V HEAT: Approx 3.8V H/DEF: Approx 4.6V : Approx 5.7V	• If there is 0 volt: there is an open in Lg/R or Lg/W. • If voltage is other than specified: there is an open in the function switch.



View from wire side

Recirculation Control Motor Testing

1. Connect a battery positive lead to Y/Bl terminal of the recirculation control motor, and negative lead to the G/Bu terminal.
   The motor should run.
2. Connect the ohm meter probes to the G/Y and G/R terminals.
   - The ohm meter should constantly cycle between indicating continuity and no continuity.
3. Then connect the ohm meter to terminals G/Y and G/W.
   - The ohm meter should continue to cycle back and forth but hesitate slightly longer when indicating continuity.



View from wire side

Function Control Motor Testing

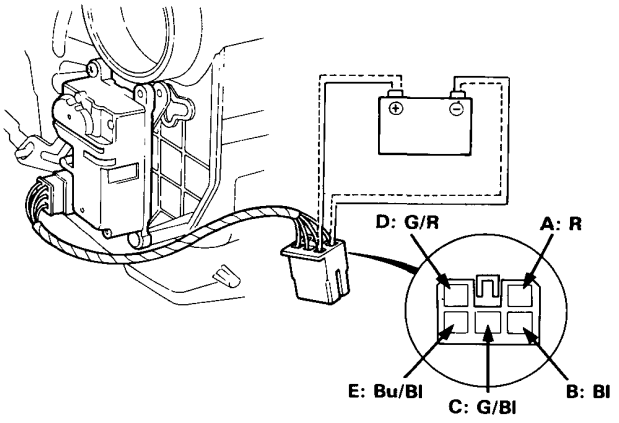
1. Measure the resistance between the D (G/R) and E (Bu/Bl) terminals.

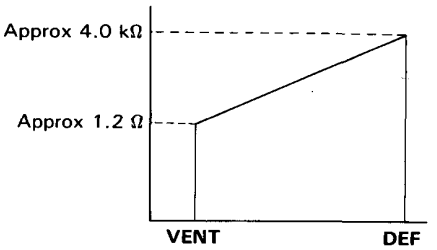
   Resistance : 4KΩ

2. Check motor operation by connectiong a wire from the battery positive terminal to the A (R) terminal, *and a negative to the B (Bl) terminal.*
3. Reverse the wires to be sure the motor will run in both directions.

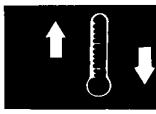
   CAUTION: Besure to disconnect the battery from the motor as soon as the motor has started. Failure to do so will damage the motor.

4. Hook up a battery to the motor terminals (positive to A and negative to B), and measure the resistance between the terminals C (G/Bl) and D (G/R). The motor is normal if the resistances agree with those shown in the table on the right.
   Also check the resistances with the battery polarity reversed.



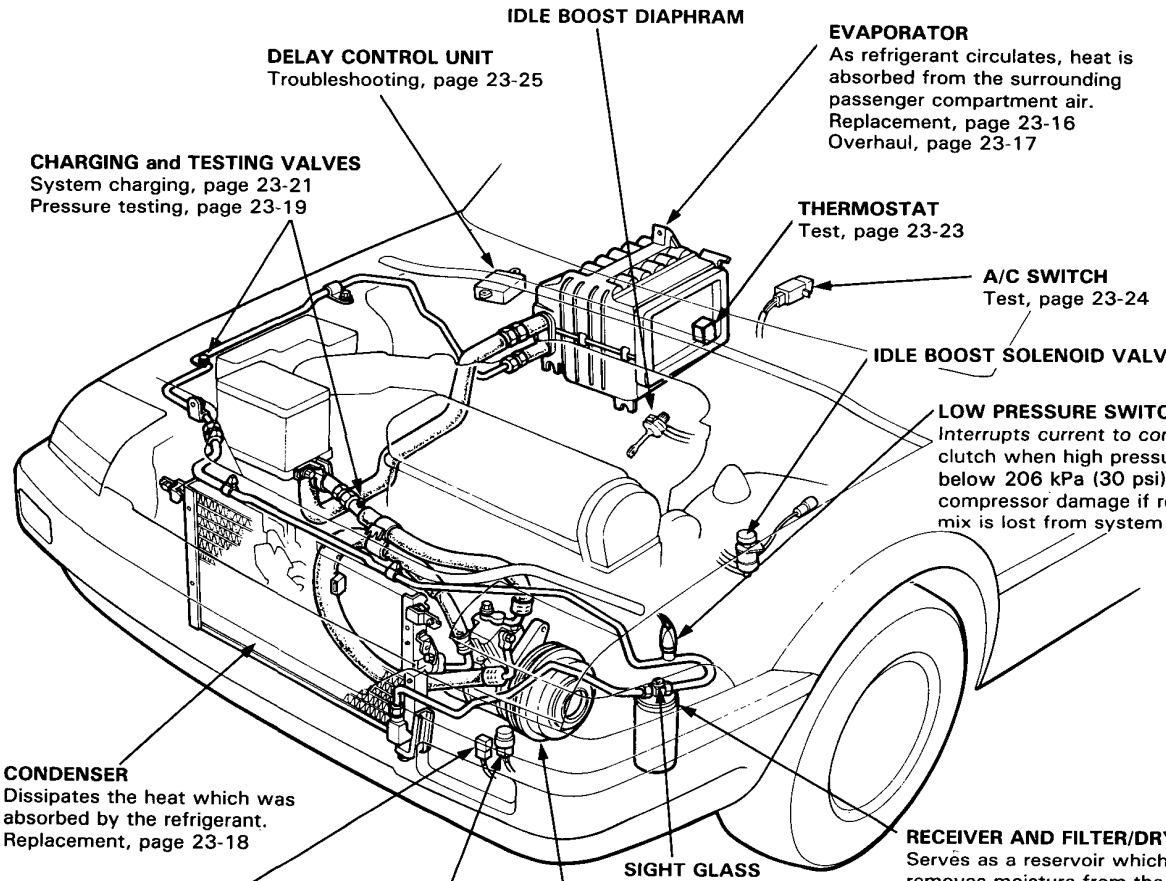


Air Conditioner

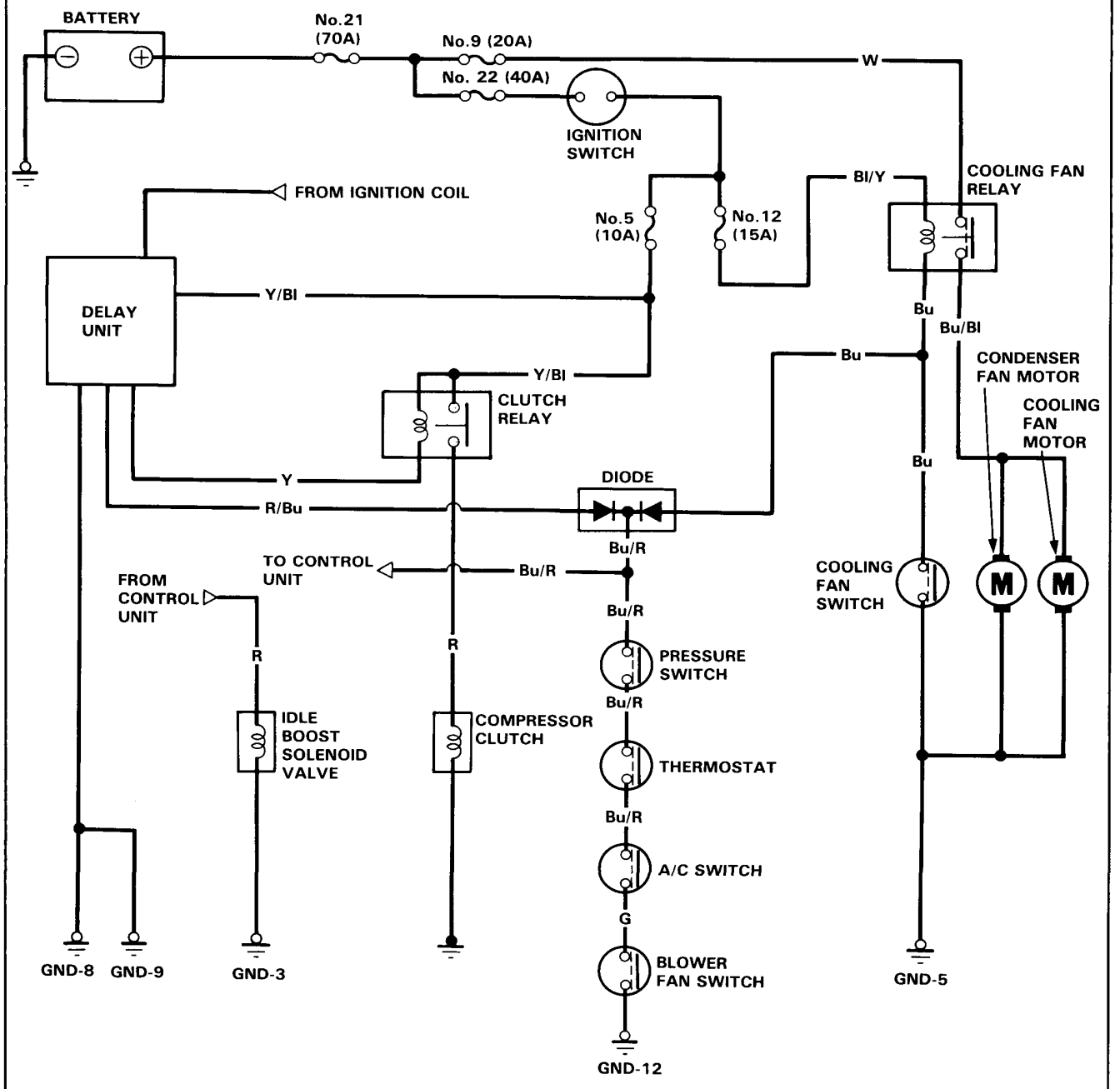


Air Conditioner

Illustrated Index

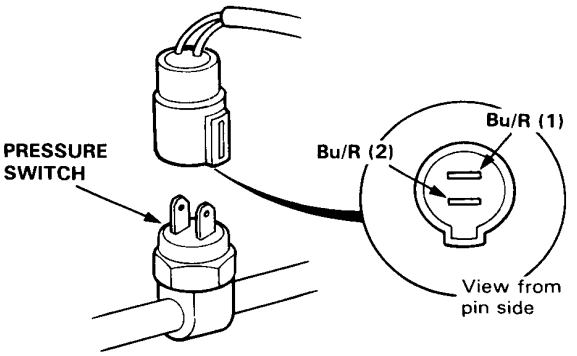


Wiring Diagram



Electrical Troubleshooting

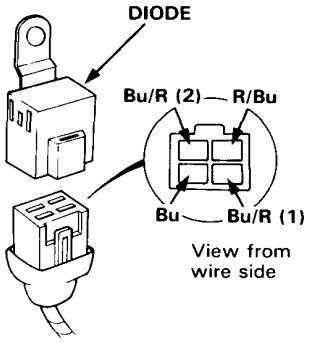
1. Check the fuses No. 21, 22, 9, 5, and 12 first.
2. Disconnect the pressure switch connector, then connect the Bu/R (1) terminal to ground.



Turn the ignition switch ON, the cooling condenser fans should start turning and compressor clutch should engage.

If both fans and compressor come on, go to step 6.

3. If the fan motors do not come on, disconnect the diode connector and connect the Bu terminal to ground.



The fan motors should start.

- If the motors do not start, replace the cooling fan relay with new one and retest.
- If the motors turn, there is an open in the Bu wire.

4. If the compressor clutch does not engage. Disconnect the diode coupler and connect the R/Bu terminal to ground.

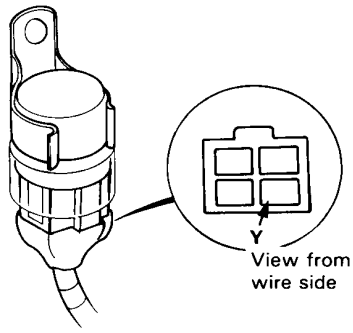
Turn the ignition switch ON, the compressor clutch should engage.

- If the clutch works, check the diodes (page 23-23).

– If the diodes are ok, there is an open in Bu/R wire.

- If the clutch does not engage, go to step 5.

5. Connect the Y terminal at the clutch relay connector to ground with the connector connected.



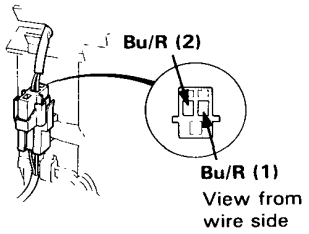
Turn the ignition switch ON, the clutch should work.

- If not, check the clutch relay (page 23-23).

– If the clutch is ok, check compressor clutch and/or R wire.

- If the clutch works, check the delay unit (page 23-25).

6. Connect the pressure switch and diode connectors.
Connect the Bu/R (1) terminal to ground with the thermostat connector connected.



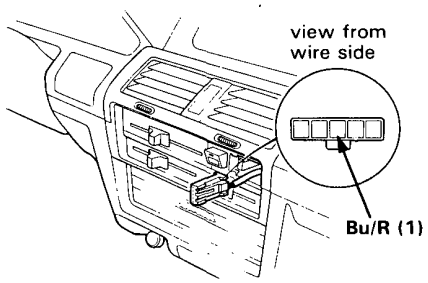
Turn the ignition switch ON, the compressor clutch should come on.

If not, there is an open in Bu/R wire between the pressure switch and thermostat.

If the clutch works, connect the Bu/R (2) wire to ground.

The clutch should come on. If not, replace the thermostat.

7. Remove the A/C switch (page 23-30).
Connect the Bu/R terminal to ground.

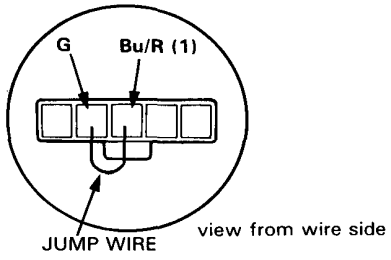


Turn the ignition switch ON, the clutch should come on.

- If not, there is an open in Bu/R wire between the A/C switch and thermostat.

— If ok, go to step 8.

8. Connect the jump wire to the Bu/R (1) and G terminals.



Turn the ignition switch ON, the clutch should come on.

- If not, check the blower fan switch (page 22-14).

— If the blower switch is ok, there is an open in G wire between the A/C switch and blower switch or in Bl between the GND-12 and blower switch.

Air Conditioner

Performance Test

NOTE: The graph (Inspection data) below shows humidity between 20% and 80%, divided into intervals of 10%.

Tolerance is ± 10% when taking a reading.
This means that if humidity is 40%, 30-50% is the tolerance range.

1. Connect gauges as shown.

2. Insert a dry bulb thermometer in the cold air outlet, and place the psychrometer (dry and wet bulb thermometer) close to the inlet of blower. Do not spill wet bulb water.

3. Test conditions:
   - Avoid direct sunlight.
   - Open engine hood.
   - Open front doors and windows.
   - Set the temperature control lever to COLD. Push the VENT and Recirculation buttons.
   - Turn the fan switch to HI.
   - Run the engine at 1,500 rpm.
   - No driver and passengers in car.

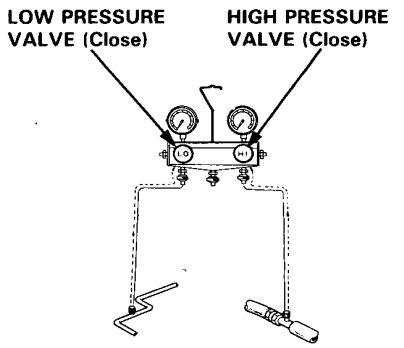
4. After running the system for about 10 minutes under the above conditions, read the thermometer and pressure valve.

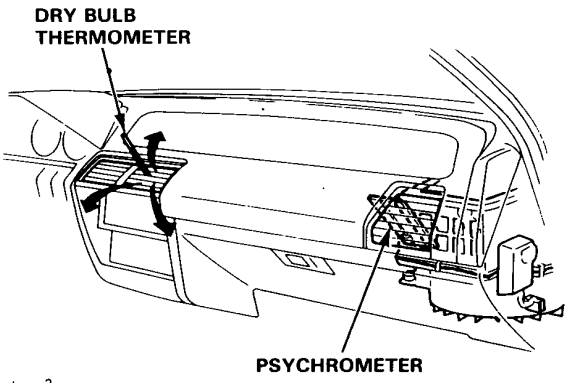
5. *The performance of the system is satisfactory if* the measurements are within the range bands shown on the Performance Chart.

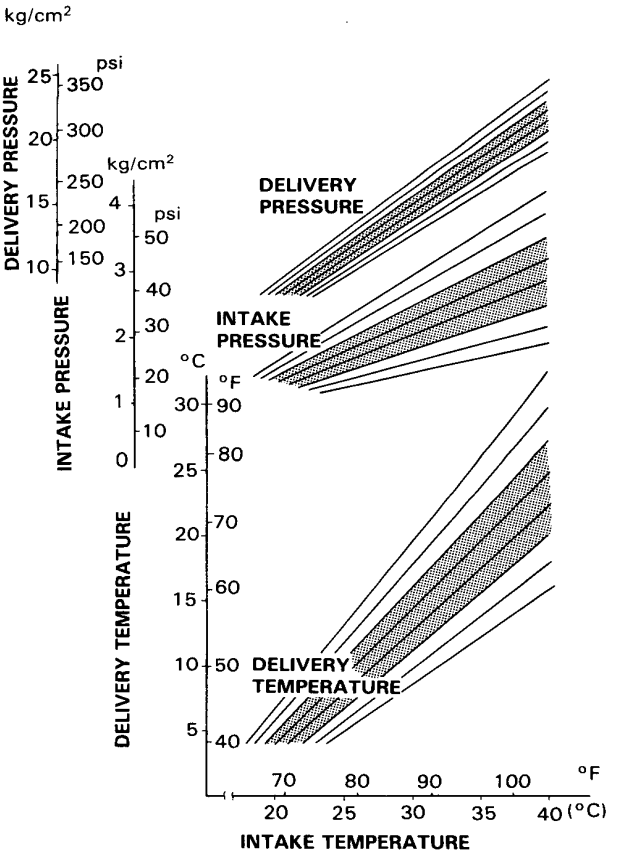
Examples

Measurements:
Intake tamperature
(Wet bulb): 75°F (24°C)
(Dry bulb): 86°F (30°C) 50% humidity
Delivery temperature: 52.7°F (11.5°C)
Delivery pressure: 1600 kPa (232 lbs/in²)
Intake pressure: 170 kPa (25 lbs/in²)

Proper intake/delivery pressure, and temperature ranges are shown on the chart at right.
Find your intake temperature across the bottom, and the relative intake and delivery pressures up the side: Lines down at right angles to your measurements should cross within the range bands on the graph.







Service Tips

CAUTION:

1. Always disconnect the negative cable from the battery whenever replacing air conditioner parts.
2. Keep moisture and dust out of the system. When disconnecting any lines, plug or cap the fittings immediately; don't remove the caps or plugs until just before the lines are reconnected.
3. Before connecting any hose or line, apply a few drops of refrigerant oil to the seat of the O-ring or flare nut.
4. When tightening or loosening a fitting, use a second wrench to support the matching fitting.
5. When discharging the system, don't let refrigerant escape too fast; it will draw the compressor oil out of the system.
6. Add refrigerant oil after replacing the following parts:
   - Condenser ..... 30 cc (1 fl oz)
   - Evaporator ..... 60 cc (2 fl oz)
   - Line or hose ..... 10 cc (1/3 fl oz)
   - Receiver ..... 10 cc (1/3 fl oz)
   - Compressor ..... When a new compressor is installed, drain 30 cc (1 fl oz) of refrigerant oil the suction fitting on the compressor, unless you are also replacing any of the above parts. Then pro-rate the amount you drain by the amount you should add for the other part(s).
7. Tighten nuts to the following torque:

Line hose or bolt dia. in (mm)		Torque N·m (lb-ft)	Application
Line or hose	5/8 (15.88)	32 (23)	• Suction pipe
	3/8 (9.53)	16 (12)	• Receiver pipe • Condenser pipe
Bolt	8 x 45	16 (12)	• Discharge hose (Condenser side)
	8 x 25	25 (18)	• Discharge hose (Compressor side) • Suction hose

WARNING When handling refrigerant (R-12):

- Always wear eye protection.
- Do not let refrigerant get on your skin or in your eyes. If it does:
  - Do not rub your eyes or skin.
  - Splash large quantities of cool water in your eyes or on your skin.
  - Rush to a physician or hospital for immediate treatment. Do not attempt to treat it yourself.
- Keep refrigerant containers (cans of R-12) stored below 40°C (100°F).
- Do not handle or discharge refrigerant in an enclosed area near an open flame: it may ignite and produce a poisonous gas.

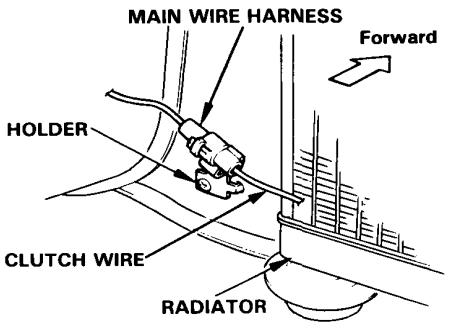
Compressor Troubleshooting

TEST RESULTS	RELATED SYMPTOMS	PROBABLE CAUSE	REMEDY
Discharge (high) pressure abnormally high (Test on page 23-19)	After stopping compressor, pressure drops to about 195 kPa (28 psi) quickly, and then falls gradually	Air in system	Evacuate system; then recharge Evacuation: page 23-19 Recharging: page 23-21
	No bubbles in sight glass when condenser is cooled by water	Excessive refrigerant in system	Discharge refrigerant as required
	Reduced air flow through condenser	• Clogged condenser or radiator fins • Condenser fan not working properly.	• Clean • Check voltage and fan rpm
	Line to condenser is excessively hot	Restricted flow of refrigerant in system	Repair
Discharge pressure abnormally low (Test on page 23-19)	Excessive bubbles in sight glass; condenser is not hot	Insufficient refrigerant	Charge system
	High and low pressures are balanced soon after stopping compressor	• Faulty compressor discharge or inlet valve. • Faulty compressor seal	Replace compressor Repair
	Outlet of expansion valve is not frosted, low pressure gauge indicates vacuum.	• Leaking thermostat • Frozen expansion valve • Faulty expansion valve	Repair or replace
Suction (low) pressure abnormally low (Test on page 23-19)	Excessive bubbles in sight glass; condenser is not hot	Insufficient refrigerant	Check for leaks. Charge as required.
	Expansion valve is not frosted and low pressure line is not cold. Low pressure gauge indicates vacuum	Frozen evaporator	Run the fan with compressor off
	Expansion valve frosted	Clogged expansion valve	Clean or replace
	Low pressure hose is cold near compressor.	Collapsed or restricted low pressure hose	Clean, repair or replace
Suction pressure abnormally high (Test on page 23-19)	Low pressure hose and check joint are cooler than around evaporator	• Expansion valve open too long • Loose thermostat (poor contact)	Repair or replace
	Suction pressure is lowered when condenser is cooled by water (High pressure side also heated)	Excessive refrigerant in system	Discharge refrigerant as necessary
	High and low pressures are balanced too early when compressor is stopped	• Faulty gasket • Faulty high pressure valve • Foreign particle stuck in high pressure valve	Replace compressor
Suction and discharge pressures abnormally high (Test on page 23-19)	Reduced air flow through condenser	• Clogged condenser fins • Condenser fan not working properly	• Clean condenser. • Check voltage and fan rpm.
	No bubbles in sight glass when condenser is cooled by water	Excessive refrigerant in system	Discharge refrigerant as necessary.
Suction and discharge pressures abnormally low (Test on page 23-19)	Low pressure hose and metal ends area are cooler than evaporator	Clogged or kinked low pressure hose parts	Repair or replace
	Temperature around expansion valve is too low compared with that around receiver-dryer.	Clogged high pressure hose	Repair or replace
Refrigerant leaks (Test on page 23-19)	Refrigerant evaporates too soon; receiver-dryer is dirty	Compressor shaft seal leaking	Replace compressor
	Compressor bolt(s) are dirty	Bolt(s) leaking	Replace compressor
	Compressor gasket is wet with oil	Gasket leaking	Replace compressor

Compressor Replacement

Removal

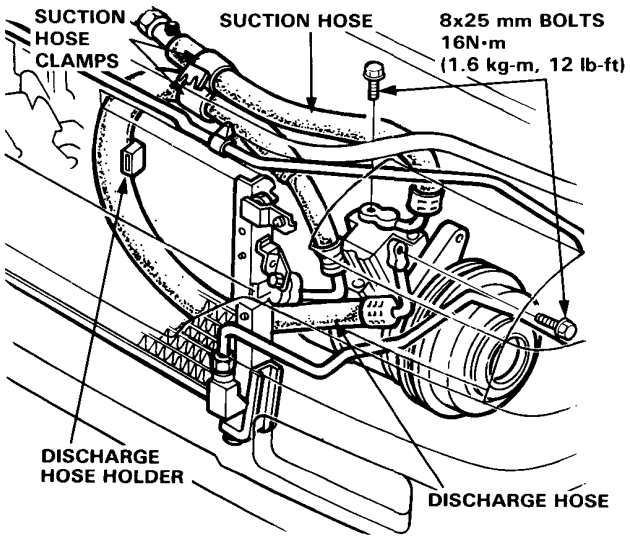
1. Run the engine at idle speed and turn on the air conditioner for a few minutes.
2. Shut the engine off and disconnect the battery negative terminal.
3. Disconnect the compressor clutch wire and remove the connector from the holder.



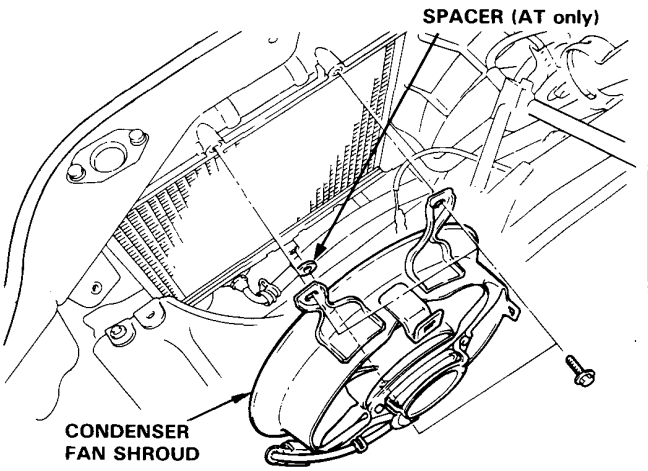
4. Discharge the refrigerant very slowly from the system.
5. On a car with power steering, loosen the steering pump adjusting and mounting bolts.
6. Lift the power steering belt off the pulley.
7. Remove the power steering oil pump.
8. Disconnect the suction and discharge hoses from the compressor.

CAUTION: Cap the open fittings immediately to keep moisture and dirt out of the system.

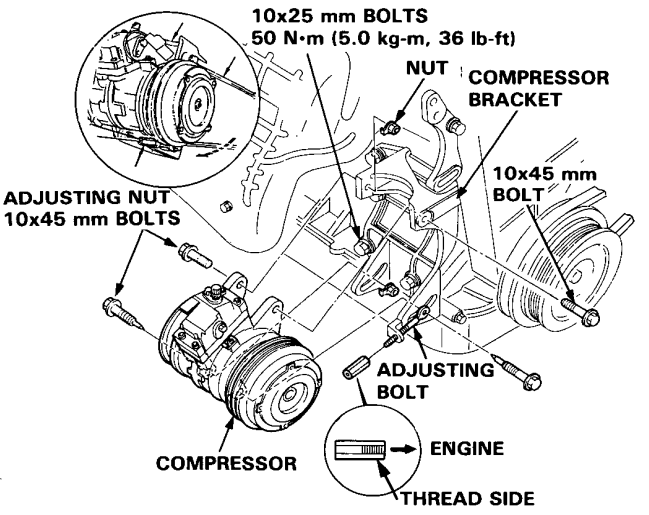
9. Remove the suction hose clamps (2).
10. Remove the discharge hose holder.



11. Disconnect the condenser fan motor connector.
12. Remove the condenser fan shroud.



13. Loosen the compressor mounting bolts (4).
14. Loosen the compressor belt adjusting nut and remove the compressor belt.
15. Remove the compressor mounting bolts (4), nuts (2) and compressor.



16. Remove the mount bolts (6) and compressor bracket if necessary.

(cont'd)

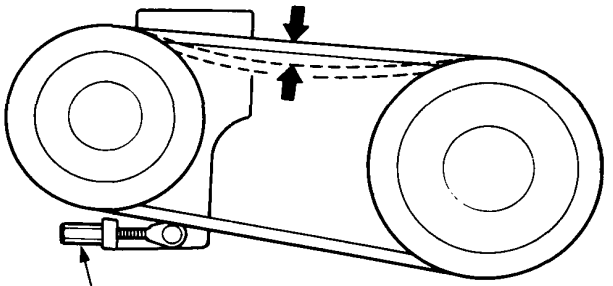
Compressor Replacement (cont'd)

Installation

Install the compressor in reverse order of removal and;

- If a new compressor is installed, drain 30 cm^3 (1 fl oz) of refrigerant oil through the suction fitting on the compressor.
- Adjust the belt.

  BELT TENSION: 10—12 mm (3/8—1/2 in) defrection when 98 N (10 kg, 22 lb) force is applied between the pulleys.



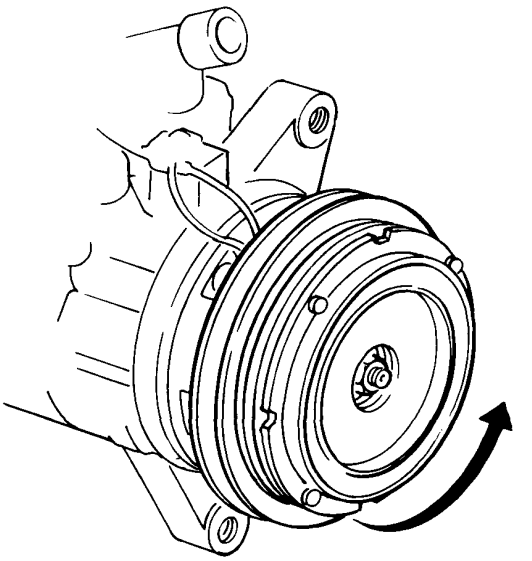
ADJUSTING NUT

- Charge the system.
- Test the performance.

CAUTION: Do not loosen the cylinder cover bolts on the compressor.

Clutch Inspection

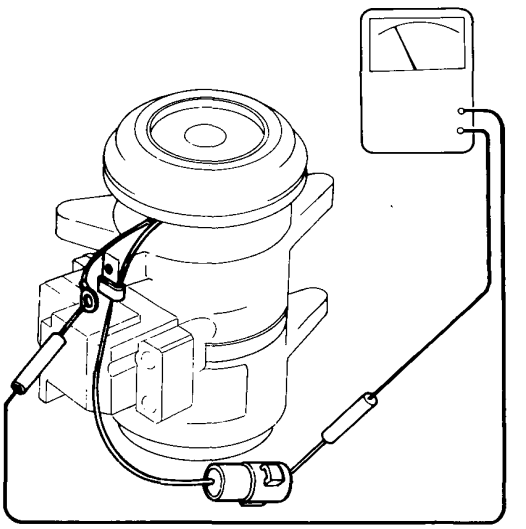
- Check pulley bearing play and drag by rotating the pulley by hand. Replace the pulley with a new one if it is noisy or has excessive play and drag.



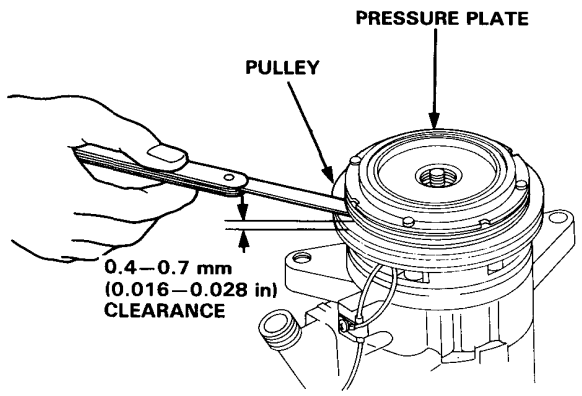
- Check resistance of the stator coil:

  Stator Coil Resistance: 3.75 ± 0.2 ohm at 20°C (68°F)

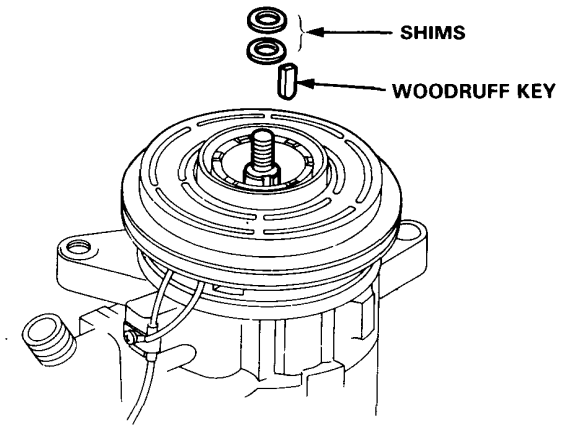
If resistance is not within specifications replace the coil.



- Tighten the hub not to 15—17.5 N•m (1.5—1.75 kg-m, 11—12.7 lb-ft) and measure the clearance between the pulley and pressure plate all the way around, if the clearance is not within specified limits, the pressure plate must be removed and shims added or removed as required.

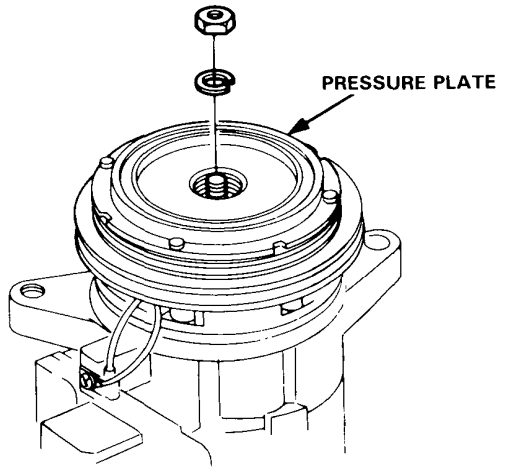


NOTE: The shims are available in six sizes: 0.1 mm and 0.2 mm of thickness. 0.1 mm shim is used for minor adjustment.

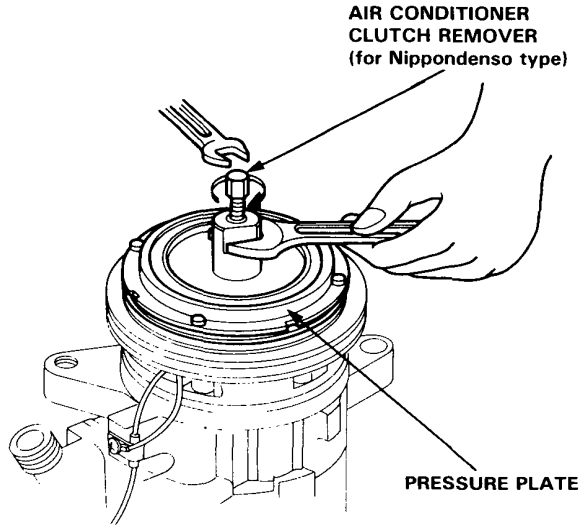


Compressor Clutch Overhaul

1. Remove the nut while holding the pressure plate.



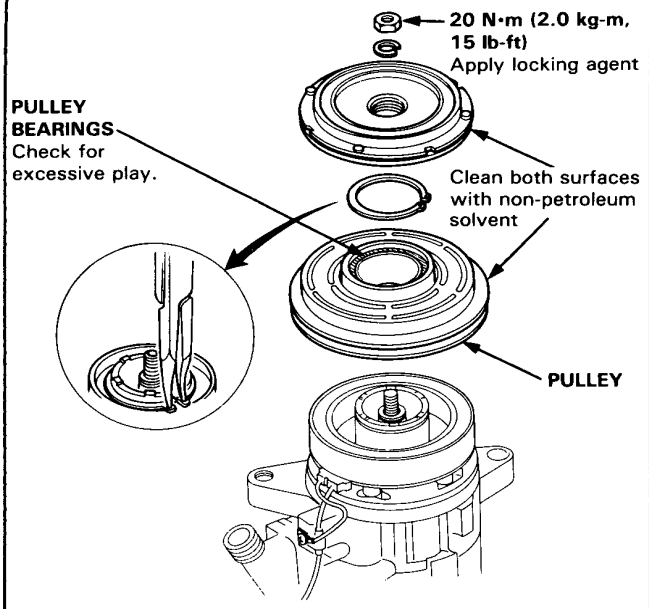
2. Thread the air conditioner clutch remover tool into the pressure plate and remove the pressure plate by screwing in the center bolt.



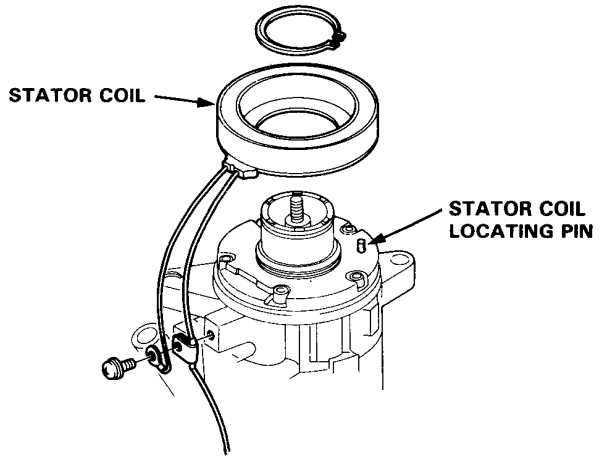
(cont'd)

Compressor Clutch Overhaul (cont'd)

3. Use circlip pliers to take the circlip off and remove the pulley from the shaft with a 2 or 3 jaw puller.



4. Remove the stator coil by removing the large circlip.



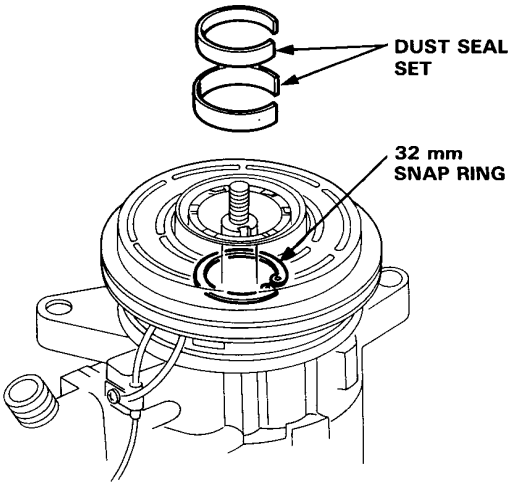
Shaft Seal Removal

NOTE: Make sure the suction and discharge joints are plugged with caps.

1. Remove the pressure plate (page 23-11).

   NOTE: Removal of the clutch pulley and coil is not necessary.

2. Remove the dust seal set.
   Remove the 32 mm snap ring.

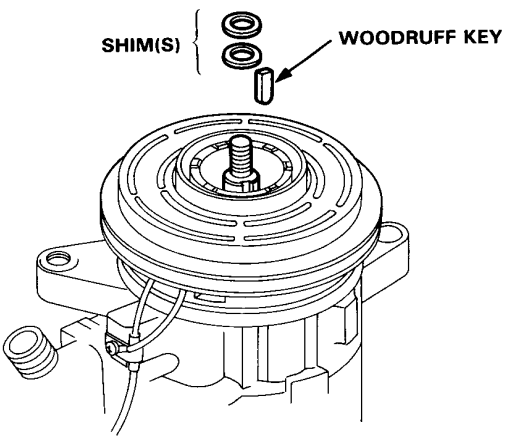


3. Remove the woodruff key from the key way.

   NOTE: If the woodruff key is to be reused, be careful not to damage it.

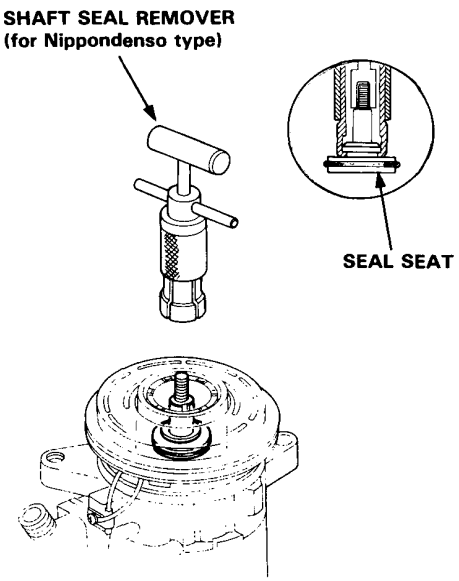
4. Remove the shim(s).

   NOTE: After removing, store shim(s) safely in a parts rack.



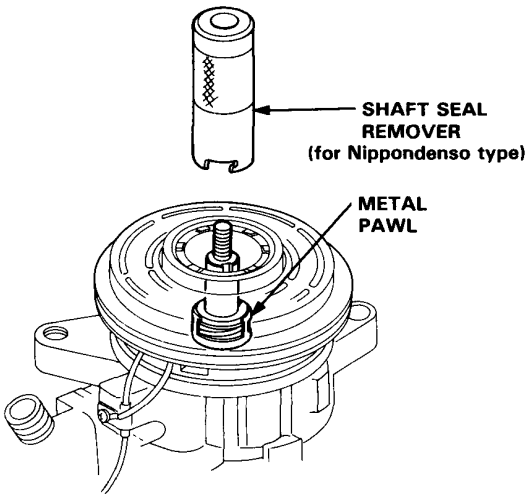
5. Seat the seal plate into the groove of the shaft seal remover.

6. Pull out the seal seat.



7. Insert the shaft seal remover into the compressor aligning the cutout of the remover with the metal pawl of the seal case.

8. Rotate the Shaft Seal Remover clockwise or counterclockwise to make sure that the cutout is engage with the metal pawl.



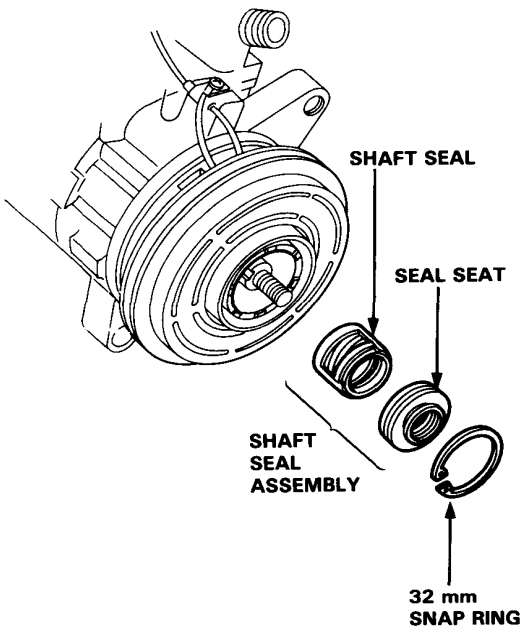
9. Press the remover until bottoms, then turn it counterclockwise as far as it will go.

10. Withdraw the remover.

11. Lay down the compressor and clean the shaft seal contacting face of the compressor with cleaning solvent.

CAUTION:
- **Keep the cleaning solvent and dirt out of the compressor.**
- **Use only a lint free cloth for cleaning.**
- **Do not spill the refrigerant oil from the compressor. Refill the same amount of the oil if the oil is spilled out.**

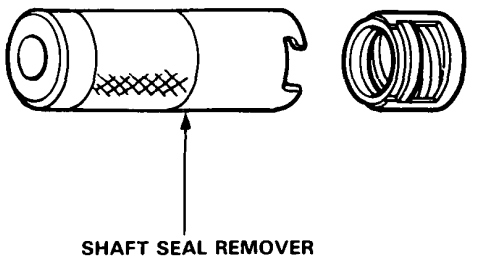
NOTE: Install the shaft seal assembly after the cleaning solvent is dried out.



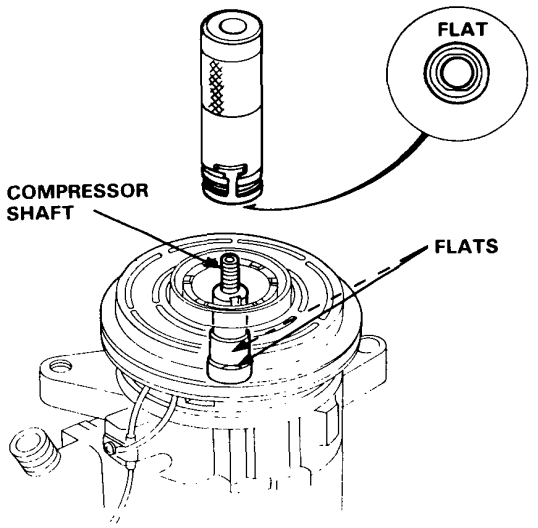
Shaft Seal Installation

1. Clean the new shaft seal thoroughly with cleaning solvent.
2. Lubricate the shaft seal with refrigerant oil (SUNISO 5GS or equivalent) and install it on the shaft seal remover.

   NOTE:
   - Use only clean refrigerant oil.
   - Do not touch the sealing surfaces of the shaft seal after lubricating.



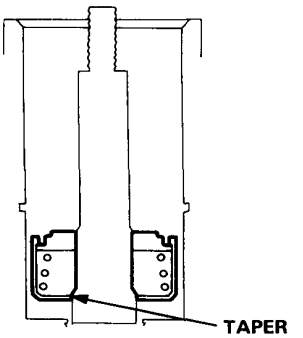
3. Liberally lubricate the compressor shaft with refrigerant oil.
4. Install the shaft seal onto the compressor shaft aligning the seal case flats with the shaft flats.



5. Press the remover until bottoms, then turn it counterclockwise as far as it will go.

   NOTE: The remover will go lower when the flats are aligned.

6. Turn the remover clockwise, then pull it out.
7. Slide the shaft seal onto the shaft until it seats on the shaft taper as shown.

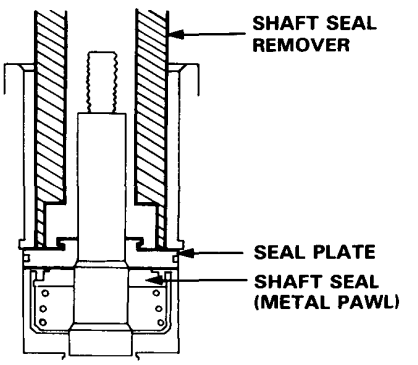


8. Check the inside diameter of the compressor for score marks or foreign particles.
9. Clean the seal seat with cleaning solvent, then lubricate the seal seat with refrigerant oil (SUNISO 5GS or equivalent).

   NOTE:
   - Use only clean refrigerant oil.
   - Do not touch the sealing surface of the seal plate after lubricated.

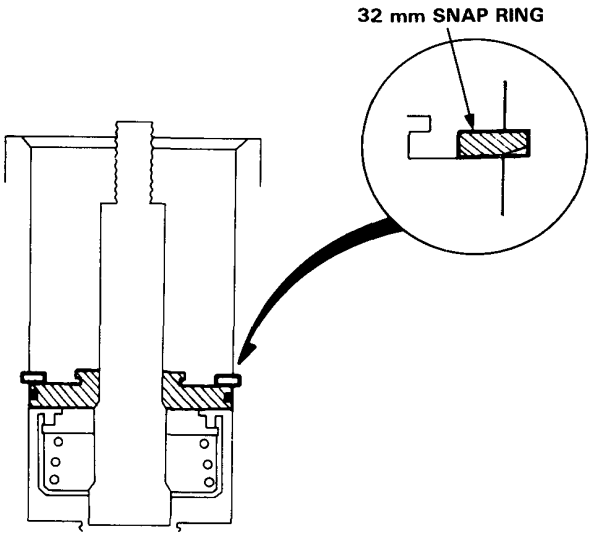
10. First slide the seal plate into the compressor by hand as far as possible.
11. Press the seal plate with the grip side of the remover.

    CAUTION: Be careful not to damage the compressor.

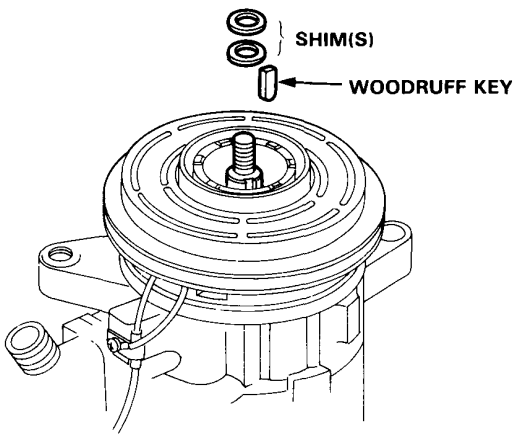


12. Install the 32 mm snap ring with its chamfered edge inside.

13. Press the snap ring with the grip side of the remover.



14. Install the shim(s) and woodruff key.



15. Evacuate and charge the compressor and then perform a leak test.

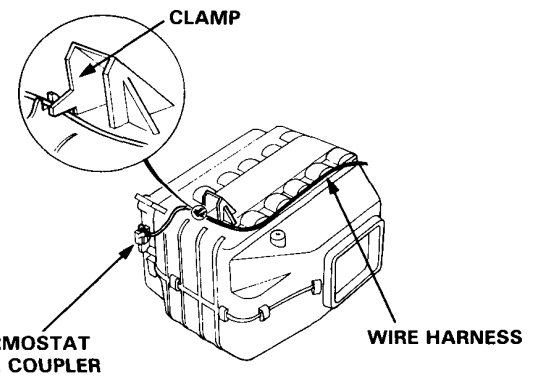
16. Install the pressure plate. Measure the clearance between the pulley and pressure plate all the way around. If the clearance is not within the specified limits, [0.4—0.7 mm (0.016—0.028 in.)] the shims must be added or removed as required.

Evaporator Replacement

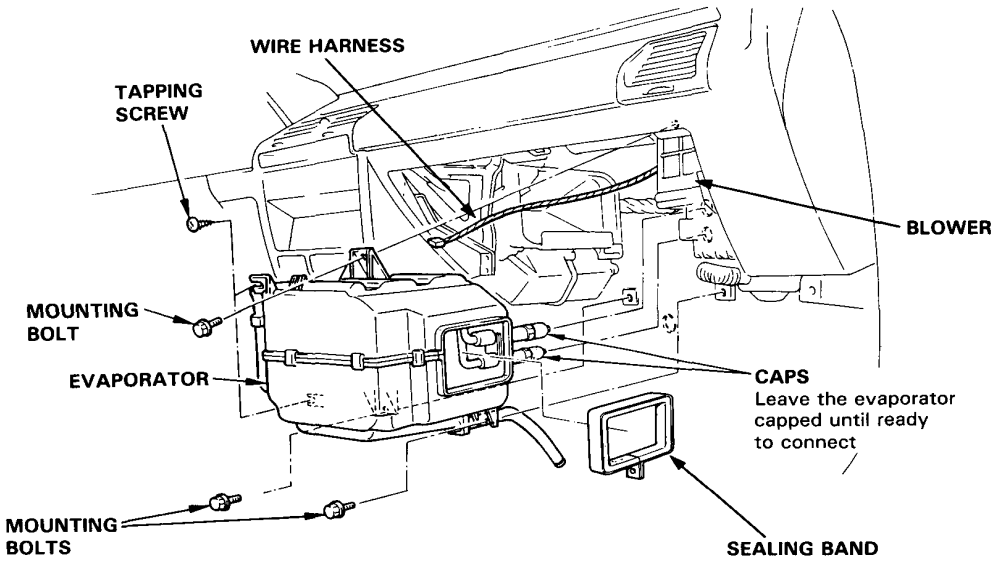
1. Disconnect the battery negative terminal.
2. Discharge the refrigerant (page 23-19).
3. Disconnect the receiver line and suction hose from the evaporator.

   CAUTION: Cap the open fittings immediately to keep moisture and dirt out of the system.

4. Remove the tapping screws (4) and glove box lower cover.
5. Remove the screws (2) and glove box.
6. Remove the screws (4), bolt (1) and glove box frame.
7. Disconnect the drain hose from the evaporator lower housing.
8. Loosen the sealing band and slide it toward blower.
9. Disconnect the thermostat wire, and pull the wire out of the clamp at the top of the evaporator.
10. Remove the evaporator by removing the three bolts and two tapping screws.



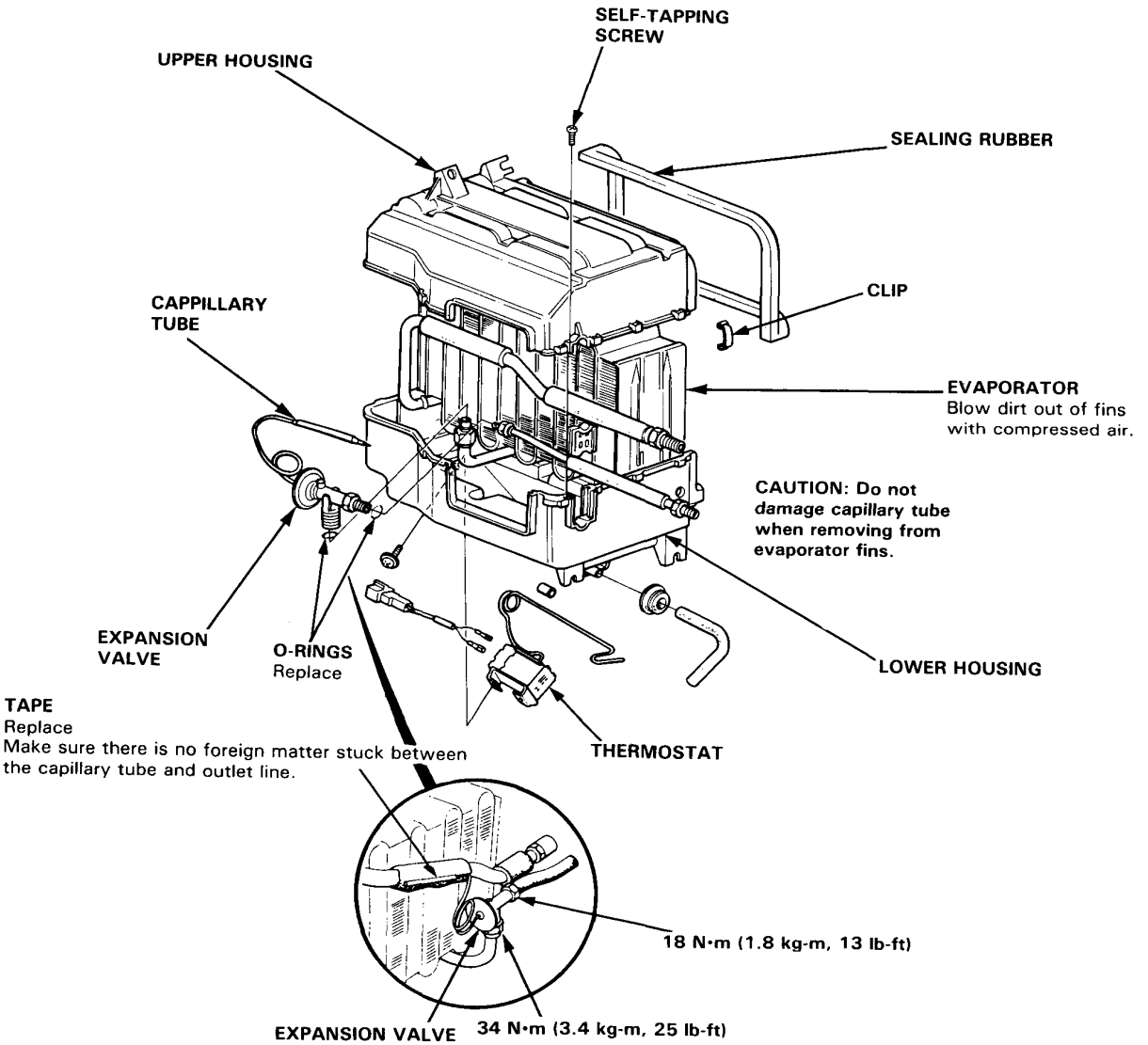
11. Remove the sealing band from the blower if necessary.
12. Install the evaporator in the reverse order of removal.
13. Charge the system (page 23-21), test performance (page 23-6).



Evaporator Overhaul

1. Remove the self-tapping screw and clip from the housing.
2. Carefully separate the housings as required to obtain access to the capillary tube in the housing.
3. Pull out the capillary tube of the thermostat from the evaporator fins.
4. Separate the housings and remove the evaporator cover.
5. Remove the expansion valve if necessary.

Assemble the evaporator in the reverse order of disassembly, and;
Install the expansion cover capillary tube against the suction line, and wrap it with tape.
Reinstall the thermostat capillary tube in its original location.
Reassemble the upper and lower housings with clips, make sure there are no gaps between them.



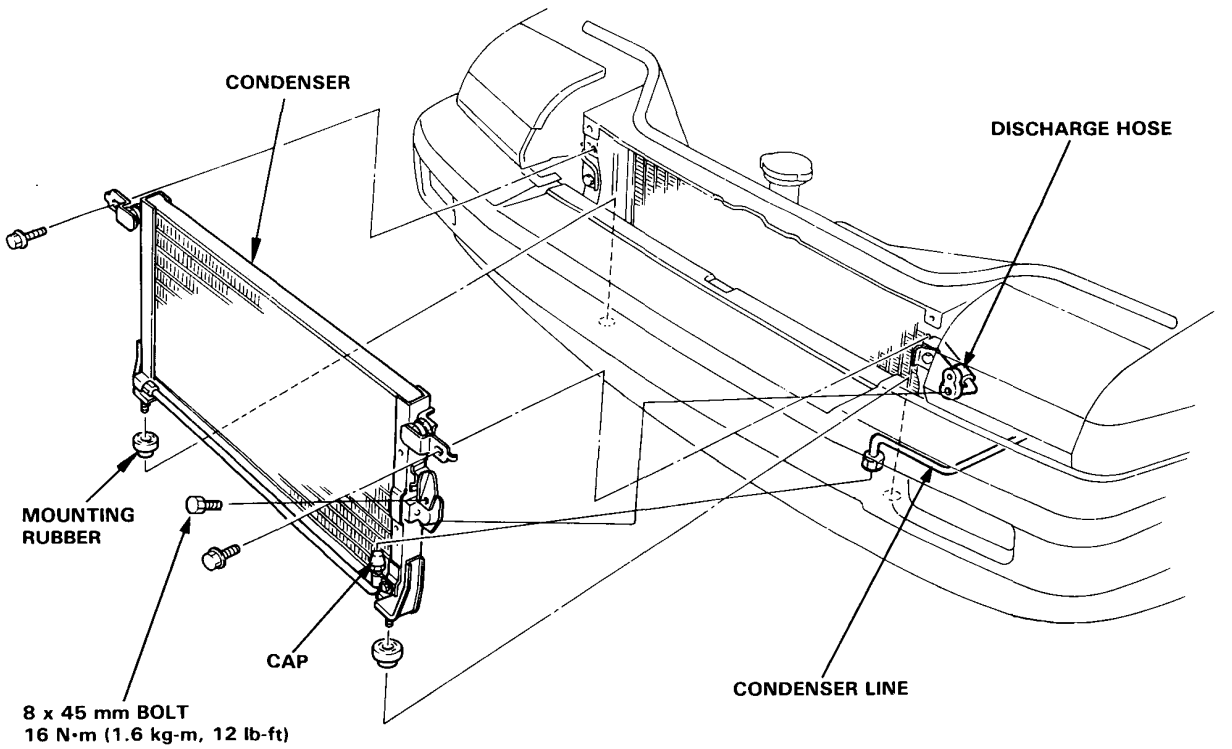
Condenser Replacement

1. Disconnect the battery negative terminal.
2. Remove the front bamper and one of the left or right headlight.

   NOTE: It is not required to remove the front bamper and headlight on retractable headlight cars.
3. Remove the hood lock brace by removing four bolts and set the hood lock brace on the engine.

   NOTE: Don't disconnect the hood opener cable from the hood lock.
4. Discharge the refrigerant (page 23-24).
5. Disconnect the condenser line and discharge hose from the condenser.

   CAUTION: Cap the open fittings immediately to keep moisture and dirt out of system.
6. Remove the condenser mount bolts, then lift the condenser up from the car.

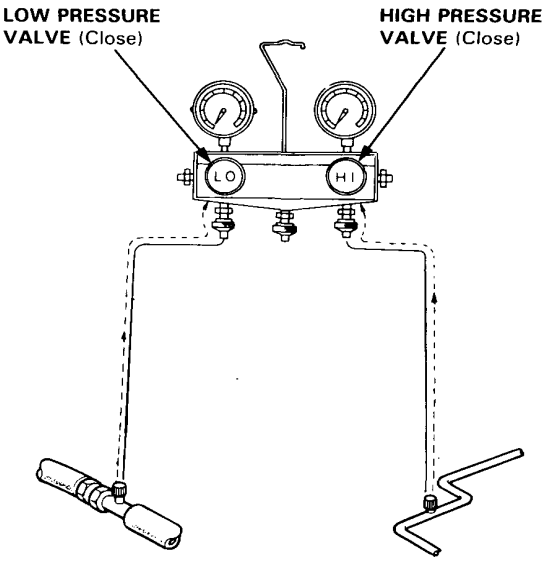


Pressure Test

1. Connect the gauges as shown.
2. Close both high and low pressure valves.
3. Test with the hood up, doors and windows open, temperature lever on COLD, function button on VENT and fan at high speed.
4. Leave the air conditioner on about 10 min. The sight glass should be free of bubbles.

   NOTE: Run the engine at 1,500 rpm.
5. The high pressure reading should be about 1,400 kPa (200 psi).

   NOTE:
   - Refer to the chart on page 23-6 for effects of ambient temperature on pressure reading.
   - If the readings are not correct, refer to the troubleshooting chart on page 23-8.



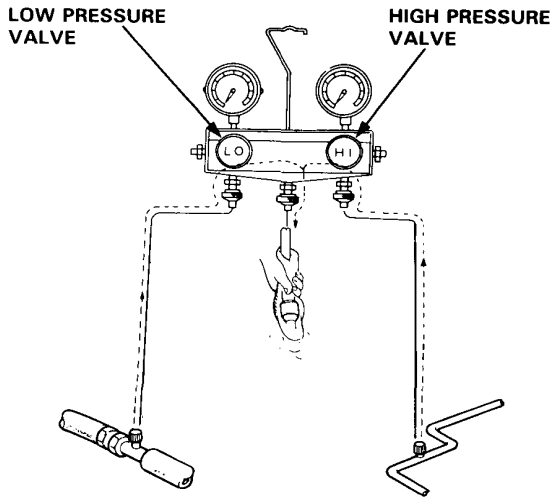
Discharge Procedure

WARNING

- **Keep away from open flames. The refrigerant, although nonflammable, will produce a poisonous gas if burned.**
- **Work in a well-ventilated area. Refrigerant evaporates quickly, and can force all the air out of a small enclosed area.**

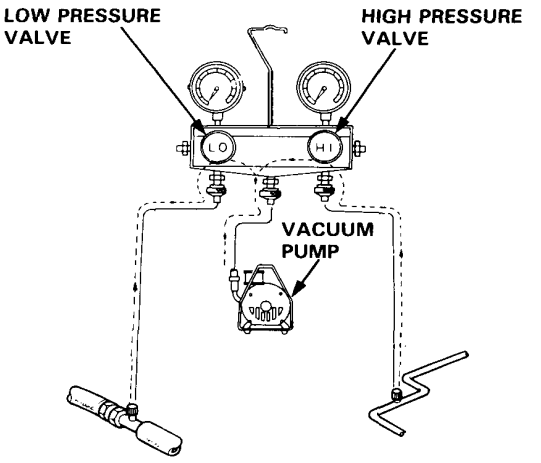
1. Connect the gauges as shown.
2. Disconnect the center hose of the gauge set and place the free end in a shop towel.
3. Slowly open the high side manifold valve slightly to let refrigerant flow from the center hose only. Do not open the valve too wide. Check the shop towel to make sure no oil is being discharged with the refrigerant.

   CAUTION: If refrigerant is allowed to escape too *fast, compressor oil will be drawn out of the system.*
4. After the high pressure gauge reading has dropped below 1000 kPa (142 psi), open the low side valve to discharge both high and low sides of the system.
5. Note the gauge readings and, as system pressure drops, gradually open both high and low side valves fully until both gauges indicate 0 kPa (0 psi).



System Evacuation

1. When an A/C System has been opened to the atmosphere, such as during installation or repair, it must be evacuated using a vacuum pump. (If the system has been open for several days, the receiver/dryer should be replaced).
2. Attach a gauge set and pump as shown, connecting the center charging hose to the pump inlet.
3. Start the pump, then open both gauge valves. Run the pump for about 15 minutes. Close the valves and stop the pump. The low gauge should indicate above 700 mm Hg (27 in-Hg) and remain steady with the valves closed.
   NOTE: If low pressure does not reach more than 700 mm Hg (27 in-Hg) in 15 minutes, there is probably a leak in the system. Check for leaks, and repair (see Leak Test below).
4. If there are no leaks, open the valves and continue pumping for at least another 15 minutes, then close both valves, stop the pump and disconnect it from the center charging hose.

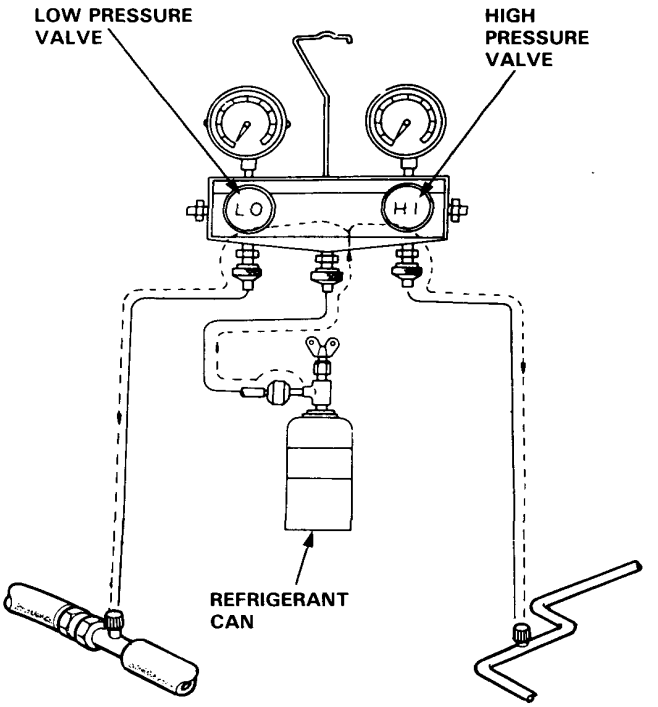


Leak Test

WARNING When handling refrigrant (R-12):

- **Always wear eye protection.**
- **Do not let refrigerant get on your skin or in your eyes. If it does:**
  - **Do not rub your eyes or skin.**
  - **Splash large quantities of cool water in your eyes or on your skin.**
  - **Rush to a physician or hospital for immediate treatment. Do not attempt to treat it yourself.**
- **Keep refrigerant containers (cans of R-12) stored below 40°C (100°F).**
- **Keep away from open flame. Refrigerant, although non-flammable, will produce poisonous gas if burned.**
- **Work in well-ventilated area. Refrigerant evaporates quickly, and can force all the air out of a small, enclosed area.**

1. Attach a refrigerant supply and gauge set as shown, with all valves closed. Then open the refrigerant supply valve on the can.
2. Loosen the center charging hose fitting at the gauge to purge any air from the hose, until it hisses for a few seconds, then tighten it again.
3. Open both gauge valves to charge the system to about 100 kPa (14 psi), then close the supply valve.
4. Check the system for leaks using a leak detector.
5. If you find leaks that require the system to be opened (to repair or replace hoses, fittings, etc.), release any charge in the system according to the Discharge Procedure on the previous page.
6. After checking and repairing leaks, the system must be evacuated (see System Evacuation above).



System Charging

WARNING **Always wear eye protection when charging the system.**

The A/C system may be charged with refrigerant by either Vapor or Liquid method:

CAUTION: Do not overcharge the system; the compressor will be damaged.

VAPOR CHARGING, through the low side:

1. Connect a gauge set and refrigerant can (right side up) as shown, with the gauge valves closed. Purge air from the charging hose by opening the refrigerant valve, then, loosening the center connector at the gauge, letting it hiss for a few seconds, and tightening it.
2. Open the low gauge valve [adjust it as necessary so pressure does not exceed 415 kPa (60 psi) while charging].
3. Start the engine and switch the air conditioner fan on high.

   NOTE: Run the engine below 1,500 rpm.
4. Keep the refrigerant can right side-up. Charge the system with 650—750 g (23—26 oz.) of refrigerant (one can of R-12 contains 14 ounces-437 grams) until sight glass is free of any bubbles, indicating a full charge.
5. When fully charged, close the gauge valves, then the valve on the can. Slowly disconnect the refrigerant hose from the center gauge connection to allow excess refrigerant to escape. Quickly remove the gauges from the system to minimize refrigerant loss.

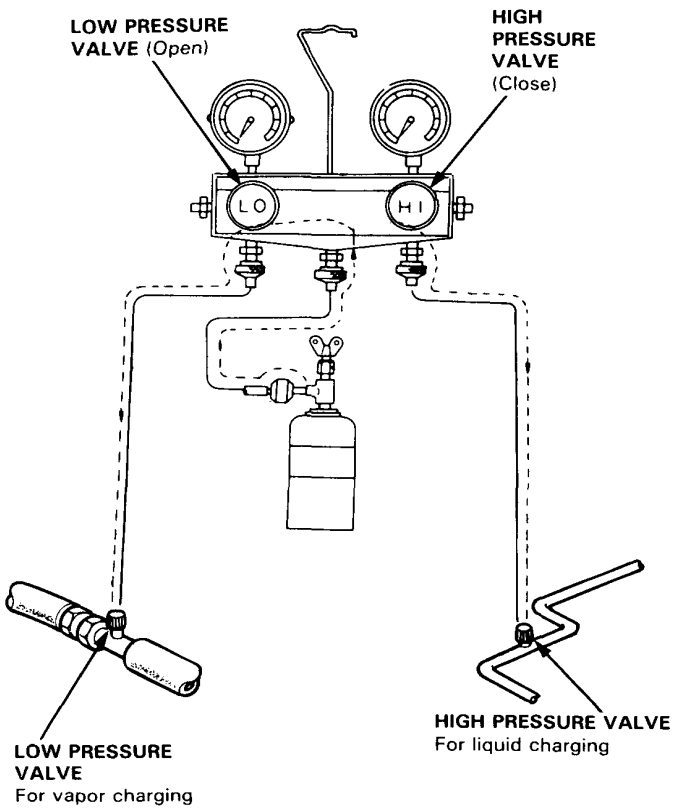
LIQUID CHARGE through the high pressure side:

Following the charging station manufacturer's instructions, charge the system with 650—750 g (23—26 oz.) of refrigerant.

WARNING

- **Do not use disposable cans to charge through the high pressure side of the system. System pressure could transfer into the can causing it to explode. Use only the bulk supply of refrigerant from the charging station.**
- **Do not run the engine during liquid charge; the compressor will be damaged.**

Vapor Charging



Idle Adjustment

① Before turning the A/C switch ON, check that the idle speed (no load) is adjusted properly (section 11).

IDLE SPEED, A/C OFF:

MODEL		A/C OFF
Carbureted Engine	KS only	M/T 750 ± 50 rpm (in neutral) A/T 750 ± 50 rpm (N or P range)
	Except KS	M/T 750 ± 50 rpm (in neutral) A/T 700 ± 50 rpm (N or P range)
Fuel-Injected Engine	KX only	M/T 750 ± 50 rpm (in neutral) A/T 750 ± 50 rpm (N or p range)
	Except KX	M/T 800 ± 50 rpm (in neutral) A/T 800 ± 50 rpm (N or P range)

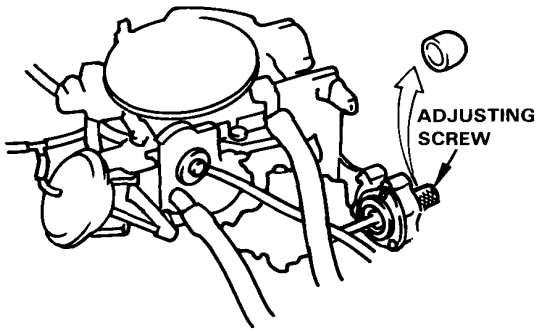
② After charging, adjust the idle speed with the air conditioner ON.
- Apply the parking brake and block the wheels.
- Headlights ..... OFF
- A/C temperature lever ..... COLD
- Vent and recirc buttons ..... ON
- Fan switch ..... HI

③ Adjust the idle speed by turning the idle adjusting screw in or out as required.

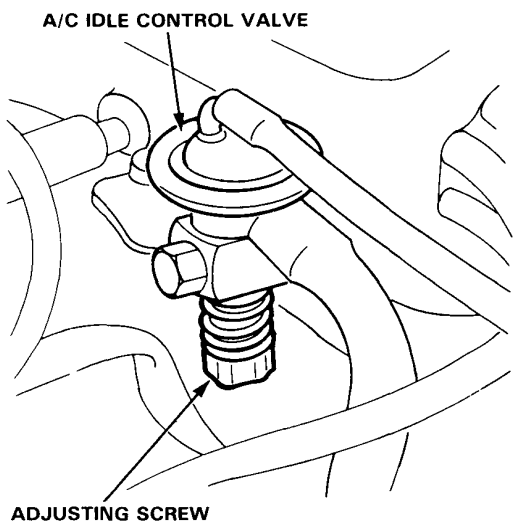
IDLE SPEED, A/C ON:

MODEL		A/C ON
Carbureted Engine	KS only	M/T 800 ± 50 rpm (in neutral) A/T 750 ± 50 rpm (N or P range)
	Except KS	M/T 750 ± 50 rpm (in neutral) A/T 750 ± 50 rpm (N or P range)
Fuel-Injected Engine	KX only	M/T 750 ± 50 rpm (in neutral) A/T 750 ± 50 rpm (N or p range)
	Except KX	M/T 800 ± 50 rpm (in neutral) A/T 800 ± 50 rpm (N or P range)

Carbureted Engine



Fuel-injected Engine

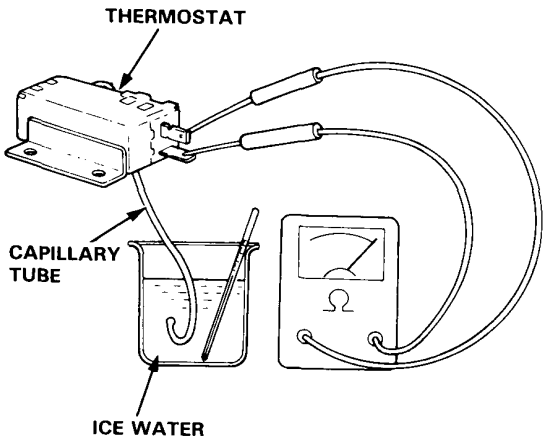


Thermostat Test

Dip the thermostat capillary tube into a pan filled with ice water, and check for continuity.

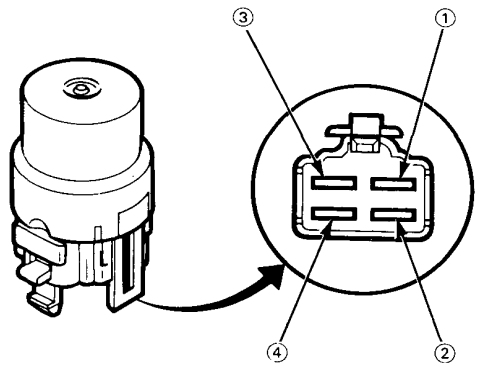
Cut-off ..... 1.5—0.5°C (35—33°F)
Cut-in ..... 2.5—5.0°C (37—41°F)

If cut-off or cut-in temperature is too low or too high, replace the thermostat.
The cut-off and cut-in of the thermostat must not be gradual, but sudden.



Clutch Relay Testing

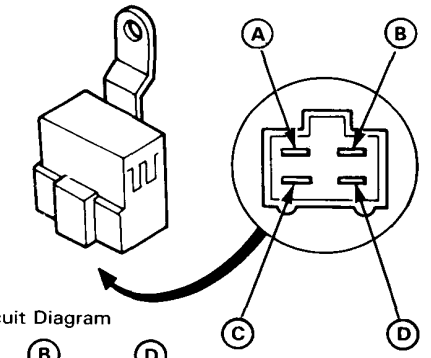
1. Check for continuity between terminals ③ and ④.
   There should be no continuity.
2. Connect a 12V battery across terminals ① and ②.
   There should be continuity between terminals ③ and ④.



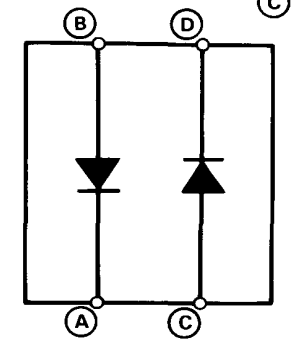
Diode Test

NOTE: The diodes are designed to pass current in one direction and block current in opposite direction.

1. Using an ohmmeter or continuity test, check the diodes.
2. Connect positive probe to (B) terminal and negative probe to (A) terminal.
   There should be continuity.
3. Reverse the test probe position and check.
   There should be no continuity.
4. Check the other diode (terminal (C) and (D)).
   - Connect positive probe to (C) terminal and negative to (D).
     There should be continuity.
   - Reverse the test probe position.
     There should be no continuity.



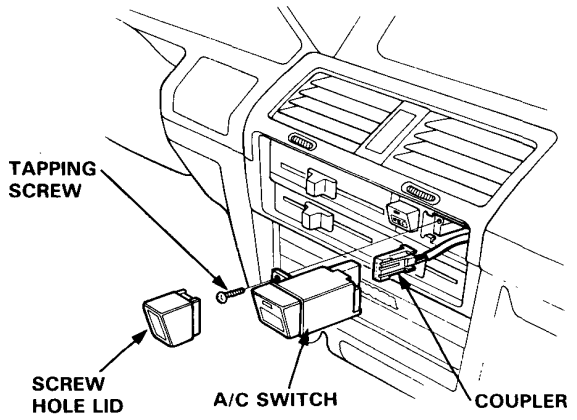
Circuit Diagram



Air Conditioner

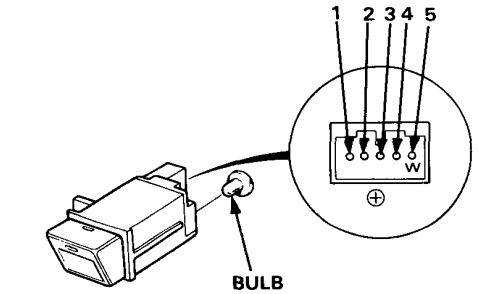
A/C Switch Test

1. Pull the screw hole lid.
2. Remove the screw and pull the switch out.
3. Disconnect the switch wire coupler and remove the A/C switch.

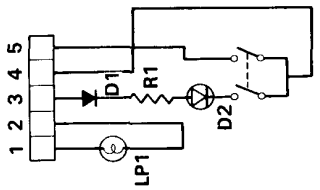


4. Check for continuity between the terminals as shown in the chart.

Terminal / Position	1		2	3		4	5
OFF	○	⊖	○				
ON	○	⊖	○	○	▷ ⊗	○	○

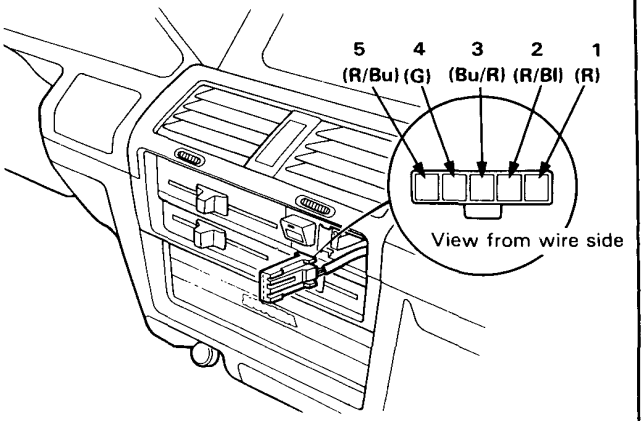


Circuit Diagram



A/C Switch Input Test

1. If the A/C switch is normal, check the switch wire between the control switch and A/C switch coupler according to the below table.



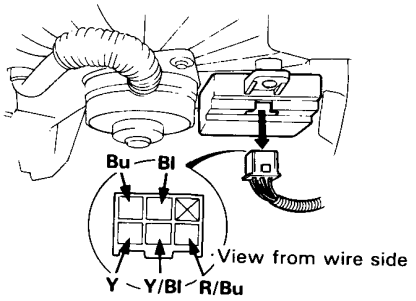
Terminal: test condition	Test: desired result	Actual result: possible cause
4(G): blower switch on	Check for continuity to ground: there should be continuity with blower switch ON.	• If not: there is an open in Gwire or blower switch.
5(Bu): ignition switch ON	Connect to body ground: the A/C system shoud start.	• If not: there is an open in Bu/R wire to diode box.
3(Bu/R): ignition switch ON	Check for voltage to ground: should have battery voltage.	• If not: check the control panel (page 22-15).
2(Bu/R): Headlight ON	Check for voltage to ground: should have battery voltage.	• If not: there is an open in R/Bl and /or R, or switch wire.

CAUTION: Use a digital circuit tester avoid damaging the LEDS in the system.

2. Reinstall the switch in the reverse order of removal.

Delay Control Unit Trouble shooting

1. Dis connect the control unit coupler.



Terminal: Test condition	Test: desired result	Actual result: possible cause
Bl: Ignition switch OFF	Check for continuity to ground: there should be continuity.	• If not: ground is bad or there is an open in Bl.
Y: Ignition switch ON	Check for voltage to ground: should have battery voltage	• If not: there is an open in Y.
Y/Bl: Ignition switch ON	Check for voltage to ground: should have battery voltage	• If not: there is an open in Y/Bl.
R/Bu: Ignition switch ON, and turn A/C switch ON OFF	Check for continuity to ground: there should be no continuity with the A/C switch OFF and continuity with the A/C and blower switches ON	• If there is continuity with A/C switch OFF: there is short circuit in R/Bu • If there is no continuity with A/C switch ON: there is an open in R/Bu
Bu: Ignition switch OFF	Check for continuity to Bu terminal at the emission control unit coupler: There should be continuity.	• If not: there is an open in Bu

If the above tests are good, replace the delay control unit.

Electrical

Engine Electrical

Engine Electrical

Illustrated Index

Before Troubleshooting:

- Check the main fuse and the fuse box.
- Check the battery for damage, state of charge, and clean and tight connections.

CAUTION:
- **Do not quick-charge a battery unless the battery ground wire has been disconnected, or you will damage the alternator diodes.**
- **Do not attempt to crank the engine with the ground wire disconnected or you will severely damage the wiring.**

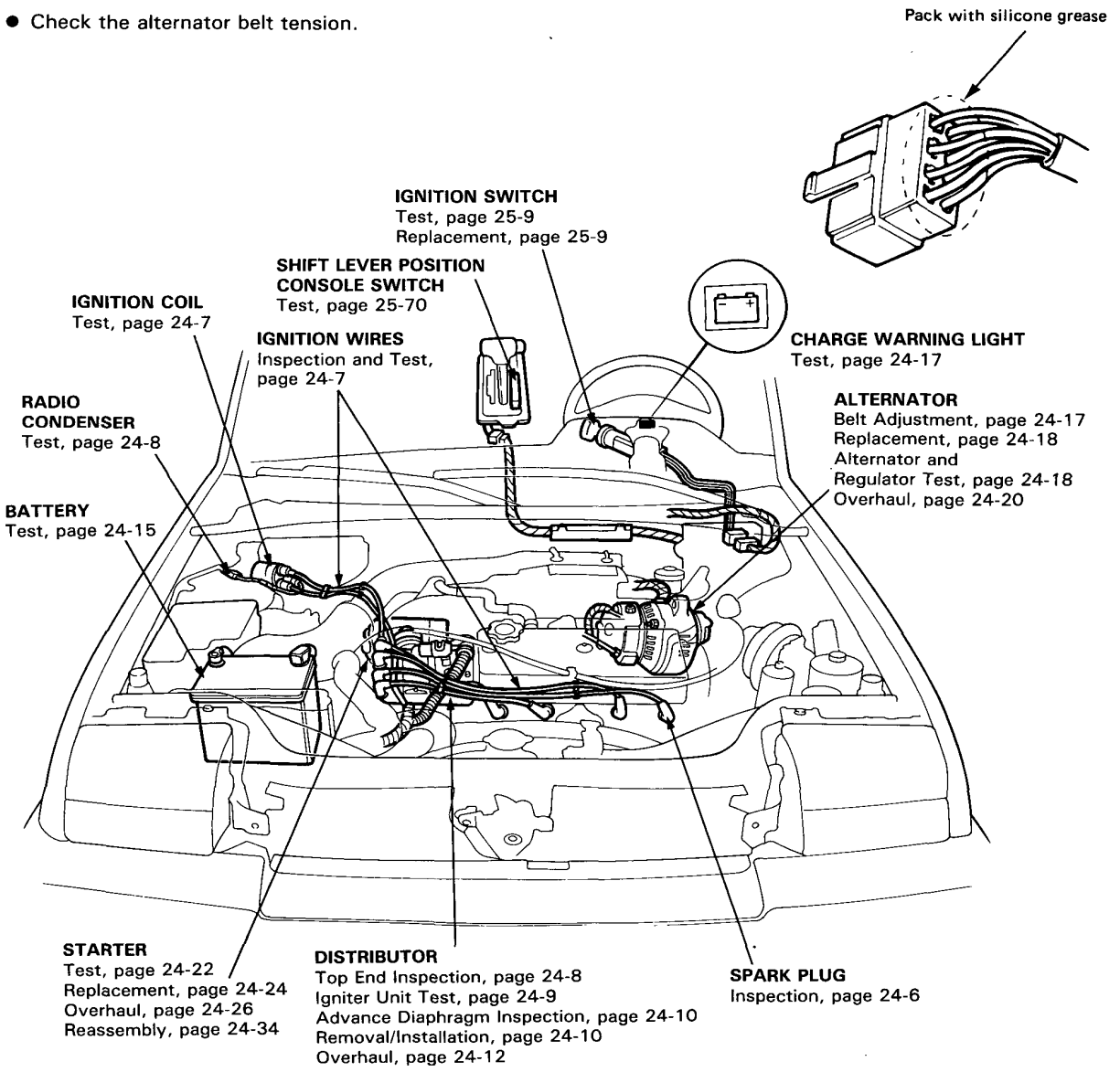
- Check the alternator belt tension.

While you're working:

- Make sure connectors are clean, and have no loose pins or receptacles.

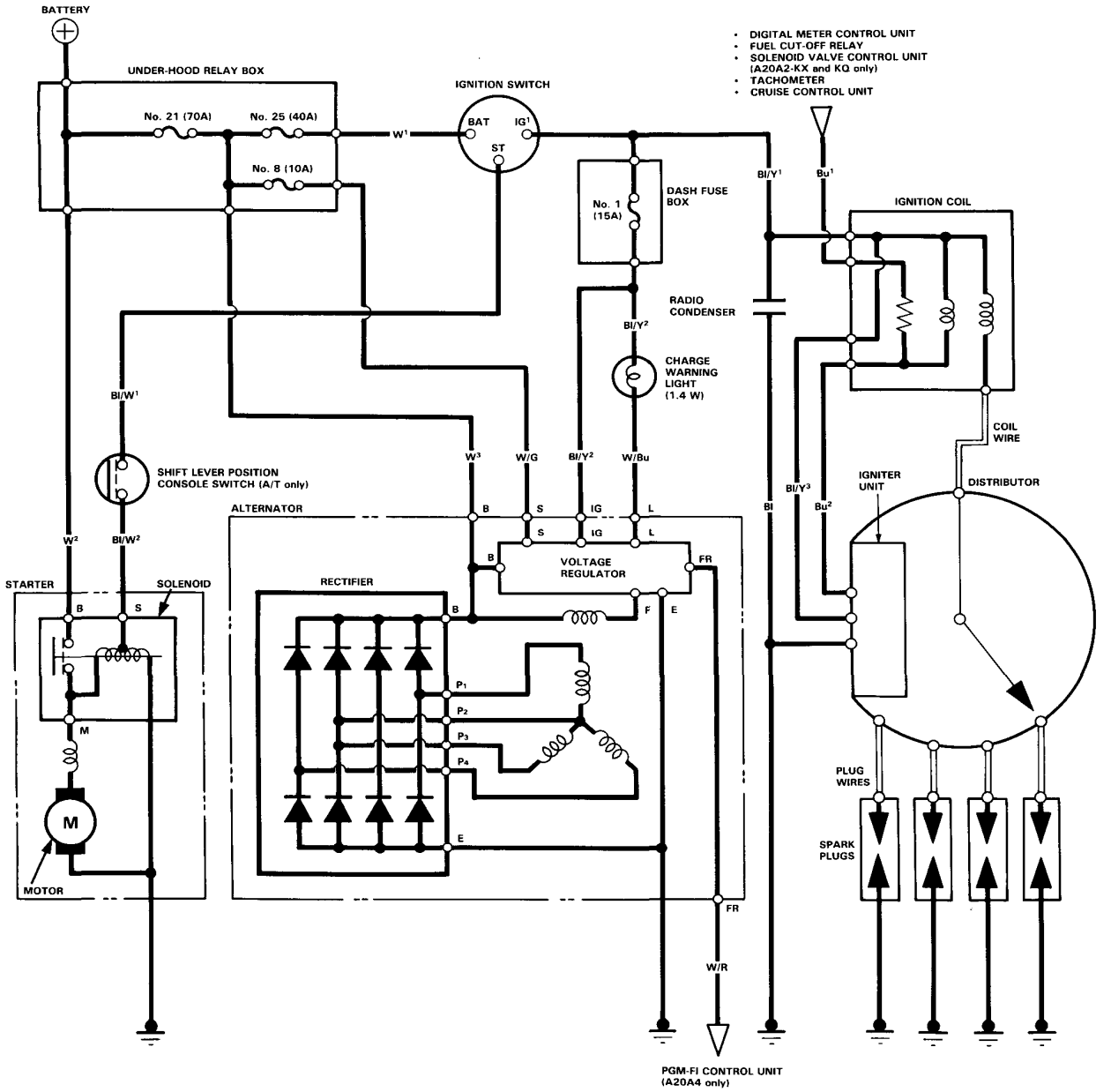
CAUTION: Do not pull on the wires when disconnecting a connector; pull only on the connector housings.

- When connecting a connector, push it until it clicks into place.
- Make sure multiple pin connectors are packed with silicone grease.



Wiring Diagram

NOTE: Several different wires have the same color; They have been given a number suffix to distinguish them (for example Bu¹ and Bu² are not the same).



Ignition Timing Inspection and Setting

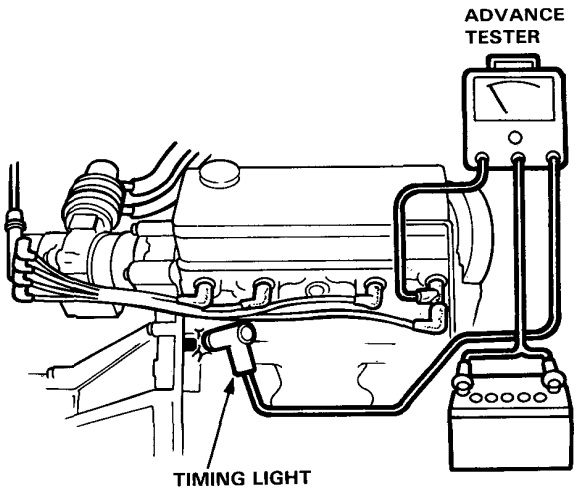
1. Remove the rubber cap from the inspection window of the cylinder block.
2. Start the engine and allow it to warm up (cooling fan comes on).
3. Disconnect the vacuum hose(s) from the vacuum advance diaphragm and, while the engine idles, check each hose for vacuum and plug the hose(s).
   - The inside hose should have vacuum.
   - The outside hose should not have vacuum.

Vacuum Hose Number:

Model / Vacuum Hose	A16A1	A20A2		A20A4	
		KP,KT	Others	KE	Others
Inside	#2	#2	#2	#2	#12
Outside			#15	#15	#15

If vacuum is not as specified, see Timing Control System (see page 11-61 or 12-56).

4. Connect an advance tester to the engine, while the engine idles, point a timing light foward the flywheel (for M/T), or the drive plate (for A/T).



5. Adjust ignition timing, if necessary, to the following specifications:

Ignition Timing
Manual Transmission:
(°BTDC at idle in neutral)

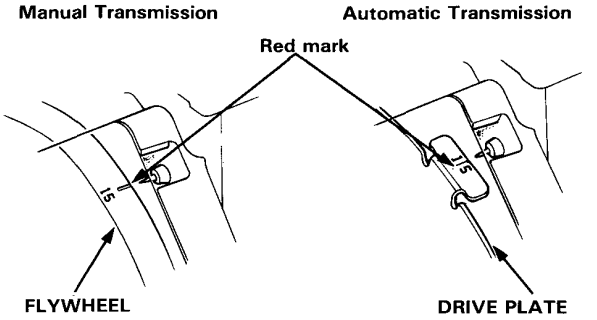
Model / Engine	A16A1	A20A2	A20A4
KS	——	10 ± 2	10 ± 2
KX	——	15 ± 2	15 ± 2
KQ	——	20 ± 2	——
KT	24 ± 2	20 ± 2	——
Others	20 ± 2	20 ± 2	15 ± 2

Automatic Transmission:
(°BTDC at idle in gear)

Model / Engine	A16A1	A20A2	A20A4
KS	——	10 ± 2	10 ± 2
KX	——	10 ± 2	15 ± 2
KQ	——	15 ± 2	——
KT	24 ± 2	20 ± 2	——
Others	20 ± 2	20 ± 2	15 ± 2

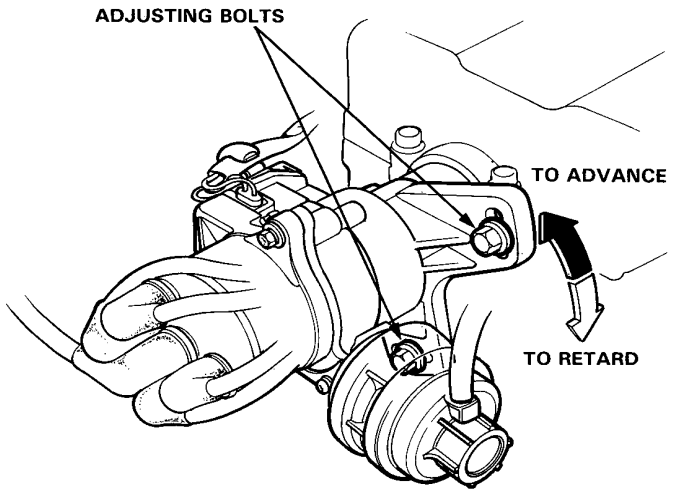
Idle Speed [min^{-1} (rpm)]

Model / Engine		A16A1	A20A2	A20A4
KS	M/T	——	750 ± 50	800 ± 50
	A/T	——	750 ± 50	750 ± 50
KX	M/T	——	750 ± 50	750 ± 50
	A/T	——	700 ± 50	750 ± 50
KQ	M/T	——	750 ± 50	800 ± 50
	A/T	——	700 ± 50	750 ± 50
Others	M/T	750 ± 50	750 ± 50	800 ± 50
	A/T	700 ± 50	700 ± 50	750 ± 50

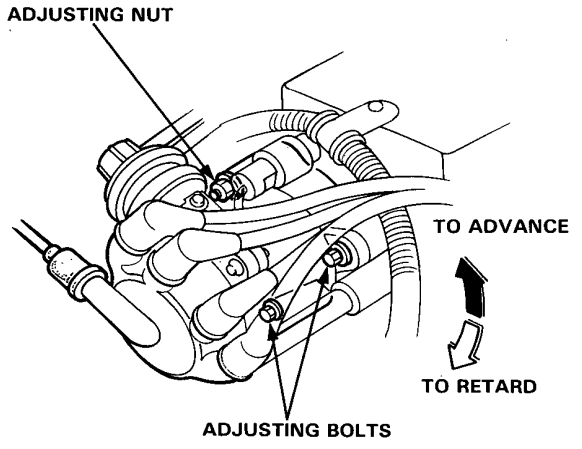


6. Loosen the distributor adjusting bolts (and nut for A20A4 engine), and turn the distributor housing counterclockwise to advance the timing, or clockwise to retard the timing.

A16A1 and A20A2 engines:



A20A4 engine:

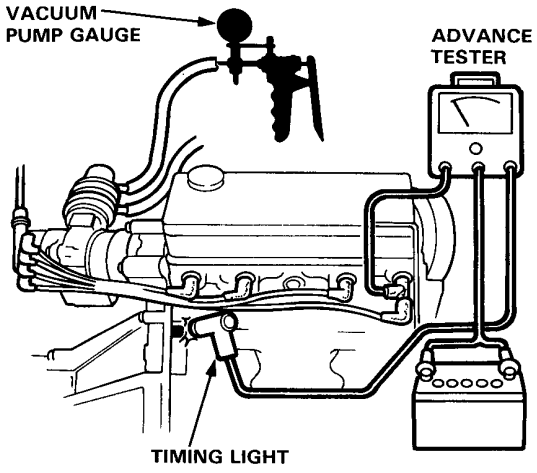


7. Tighten the adjusting bolts (and nut for A20A4 engine), recheck the timing.

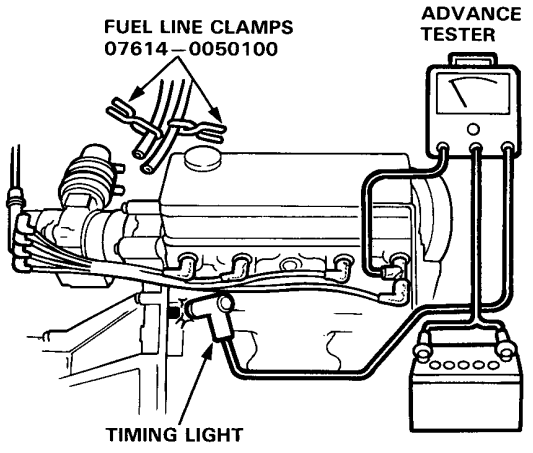
8. Disconnect the outside vacuum hose (#15 or #25) from the diaphragm and apply vacuum (more than 500 mmHg, 20 in.Hg), to the outside diaphragm with a vacuum pump.

The timing mark (Red) should advance an additional;

- A20A2-KX, KQ and KS (M/T) models: 6°
  -KS (A/T) model : 10°
  -Others : 10°
- A20A4-KX model : 6°
  -Others : 9°



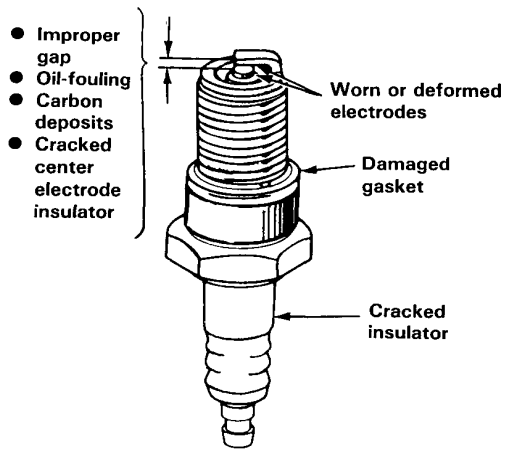
9. Disconnect the vacuum hose(s) from the vacuum advance diaphragm and pinch the end of the hose(s) using fuel line clamp(s), 07614 −0050100.
   The timing should be:
   - A16A1-All models : 9°BTDC
   - A20A240-All models : 4°BTDC
   - A20A4-KS and KX models: 4°BTDC
     -Others : 9°BTDC



10. If advance is not as specified, check the advance diaphragm and distributor advance mechanism.

Spark Plug Inspection

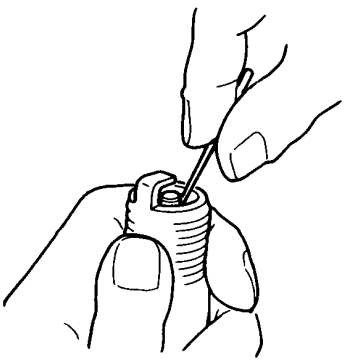
1. Inspect the electrodes and ceramic insulator for:



Burned or worn electrodes may be caused by:
- Lean fuel mixture
- Advanced ignition timing
- Loose spark plug
- Plug heat range too high
- Insufficient cooling

Fouled plug may be caused by:
- Rich fuel mixture
- Retarded ignition timing
- Oil in combustion chamber
- Incorrect spark plug gap
- Plug heat range too low
- Excessive idling/low speed running
- Faulty automatic choke (Standard for some types)
- Clogged air cleaner element
- Deteriorated ignition coil or ignition wires

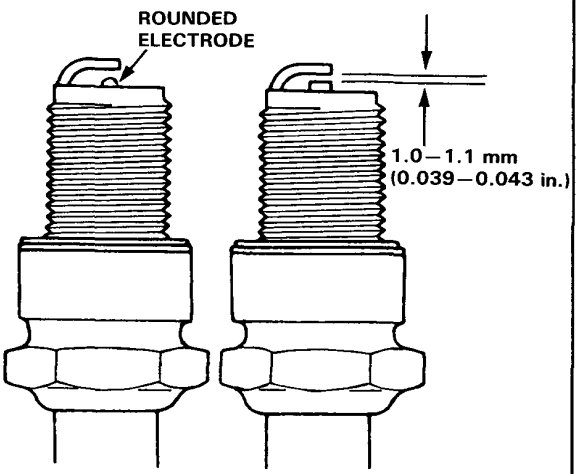
2. Clean the electrodes with a spark plug cleaning machine, or with a wire brush. Clean between the outer shell and center insulator with a stiff wire as shown. Clean plug threads with a wire brush.



3. Replace the plug if the center electrode is rounded as shown below.

Spark Plug:

		Standard Plug	*Optional Plug*
KX model	NGK	BPR5EY-11	BPR6EY-11
	ND	W16EXR-U11	W20EXR-U11
KQ model	NGK	BPR5EY-11 BPR5ES-11	BPR6EY-11
	ND	W16EXR-U11 W16EPR-U11	W20EXR-U11
Others	NGK	BPR6EY-11 BPR6ES-11	BPR5EY-11 BPR7EY-11 BPR5ES-11 BPR7ES-11
	ND	W20EXR-U11 W20EPR-U11	W16EXR-U11 W22EXR-U11 W16EPR-U11 W22EPR-U11



4. Adjust the gap with a suitable gapping tool.

Electrode Gap: 1.0—1.1 mm (0.039—0.043 in.)

5. Screw the plugs into the cylinder head finger tight, then torque them to 18 N·m (1.8 kg-m, 13 lb-ft).

NOTE: Apply a small quantity of anti-seize compound to the plug threads before installing.

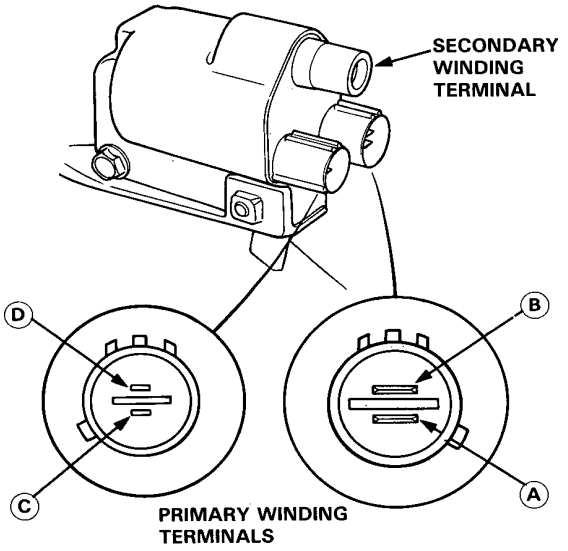
Ignition Coil Test

1. With the ignition switch OFF, disconnect the primary connectors and the coil wire.

2. Using an ohmmeter, measure resistance between the terminals. Replace the coil if the resistance is not within specifications.

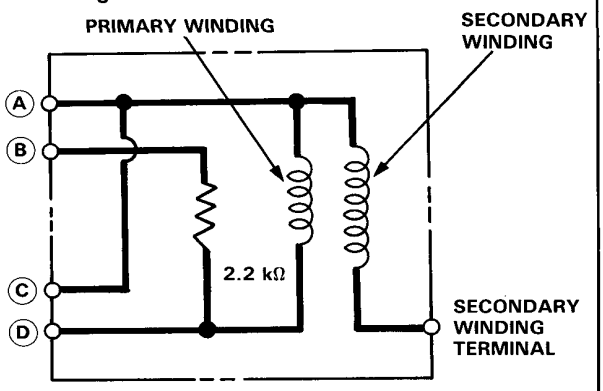
   NOTE: Resistance will vary with the coil temperature; specifications are at 20°C (70°F)

   Primary Winding Resistance (between Ⓐ and Ⓓ terminals):
   1,215—1,485 ohms
   Secondary Winding Resistance (between Ⓐ and secondary winding terminal:
   11,074—11,526 ohms
   Resistance between Ⓑ and Ⓓ terminals:
   Approx. 2,200 ohms



3. Check for continuity between Ⓐ and Ⓒ terminals. Replace the coil if there is no continuity.

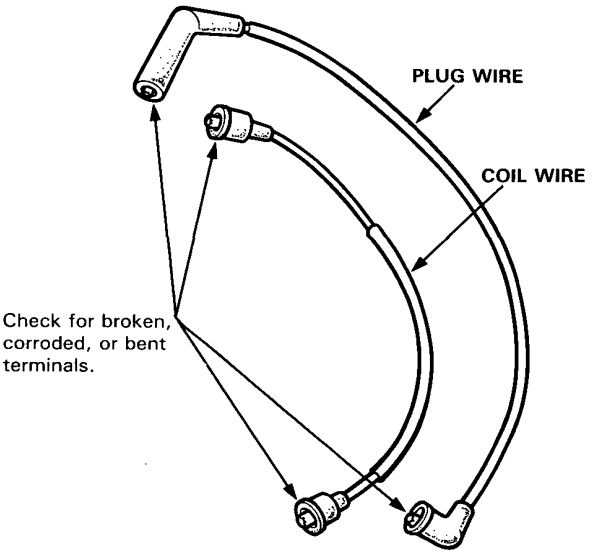
Circuit Diagram



Ignition Wire Inspection and Test

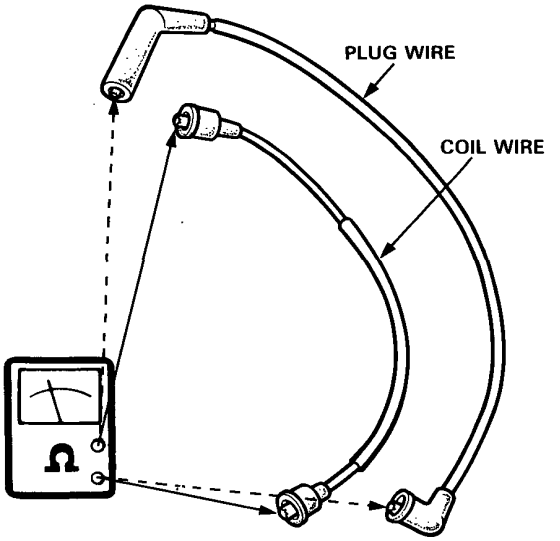
CAUTION: Carefully remove the ignition wires by pulling on the rubber boots. Do not bend the wire or the conductor may be broken.

1. Check condition of the wire terminals. If any terminal is corroded, clean it, and if it is broken or distorted, replace the wire.



2. Connect ohmmeter probes and measure resistance.

   Ignition Wire Resistance:
   25,000 ohms max. at 20°C (70°F)

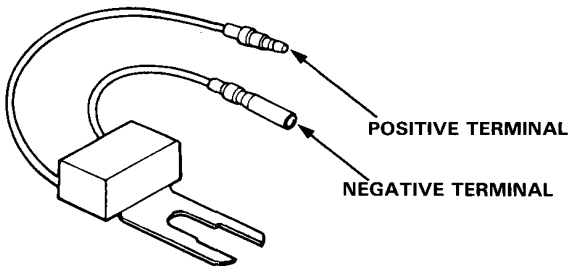


3. If resistance exceeds 25,000 ohms, replace the ignition wire.

Radio Condenser Capacity Test

1. Use a commercially available condenser tester. Connect the tester probes and measure condenser capacity.

   Condenser Capacity: 0.47 ± 0.09 microfarads (μF)



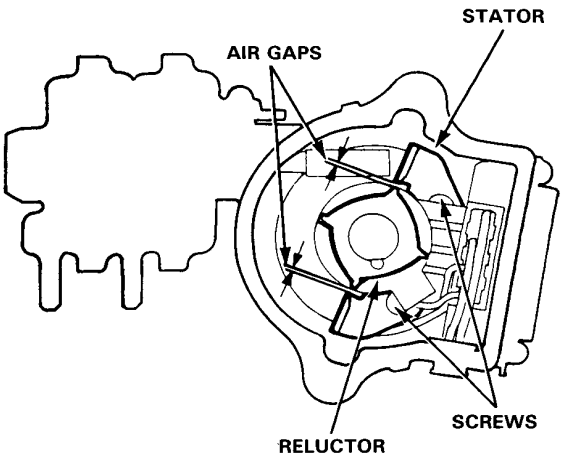
   NOTE: The radio condenser is intended to reduce ignition noise; however, condenser failure may cause the engine to stop running.

2. If not within the specifications, replace the radio condenser.

Distributor Top End Inspection

1. Check to be sure that the air gaps are equal.

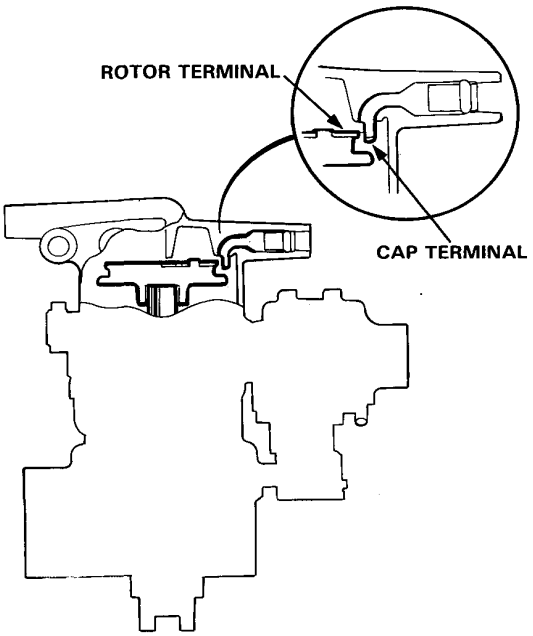
2. If necessary, back off the screws and move the stator as required to adjust.



3. Check for rough or pitted rotor and cap terminals.

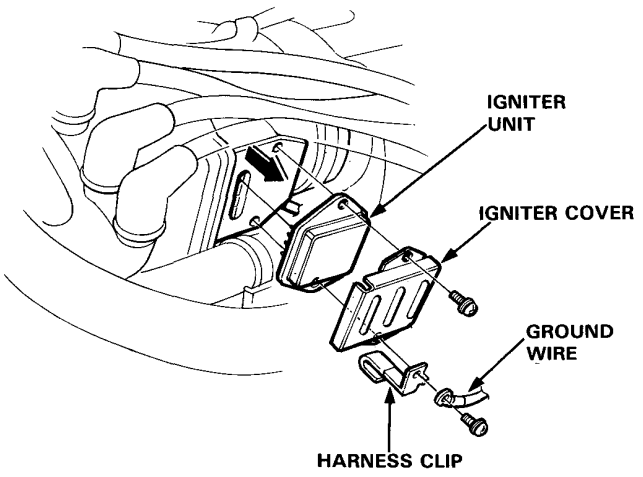
4. Scrape or file off the carbon deposits. Smooth the rotor terminal with an oil stone or #600 sandpaper if rough.

5. Check the distributor cap for cracks, wear and damages. If necessary, clean or replace it.

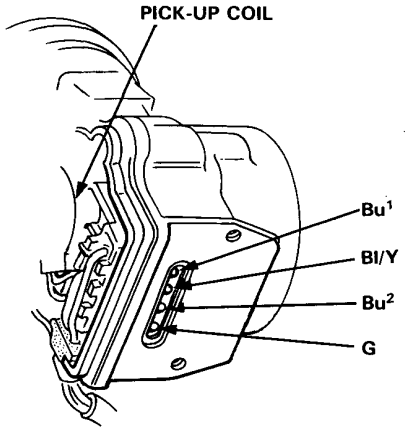


Igniter Unit Test

1. Remove the igniter cover and pull out the igniter unit.



2. Check voltage between the Bu terminal and body ground, then the Bl/Y terminal and body ground, with the ignition switch ON.
   There should be battery voltage.

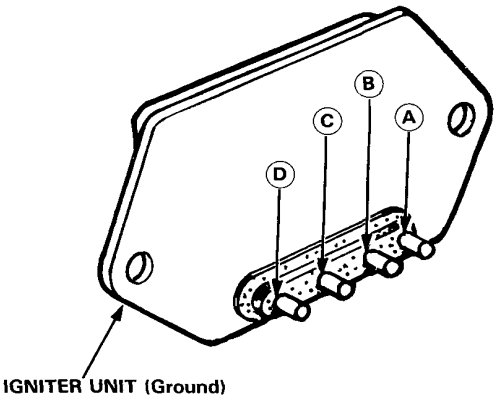


3. Measure resistance between the G and Bu² terminals on the pick-up coil. Replace the pick-up coil if the resistance is not within specifications.

   NOTE: Resistance will vary with the coil temperature.

   Pick-up Coil Resistance:
   Approx. 750 ohms at 20°C (70°F)

4. Check for continuity in both directions between (A) and (B) terminals on the igniter output.
   (RX100 scale).
   There should be continuity in only one direction.



5. Connect ohmmeter positive probe to (D) terminal, and negative to the igniter unit (ground), then measure resistance on the igniter input.

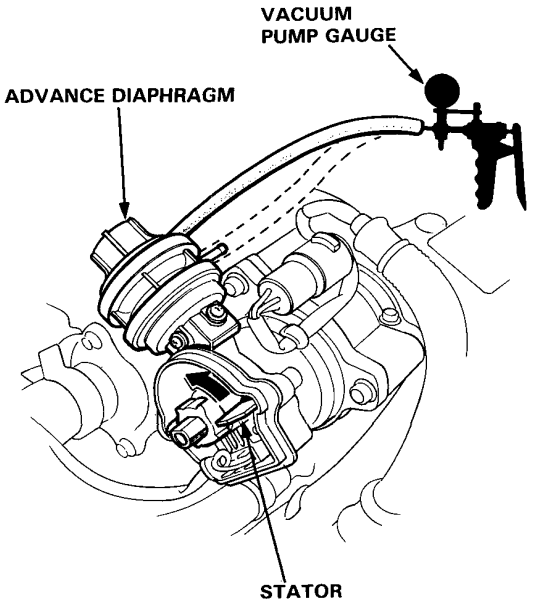
   NOTE: Resistance will vary with the unit temperature.

   Igniter Input Resistance:
   50,000 ohms at 20°C (70°F)

   NOTE: When installing the igniter, pack silicone grease in the connector housing.

Advance Diaphragm Inspection

1. Connect a vacuum pump to the advance diaphragm as shown.



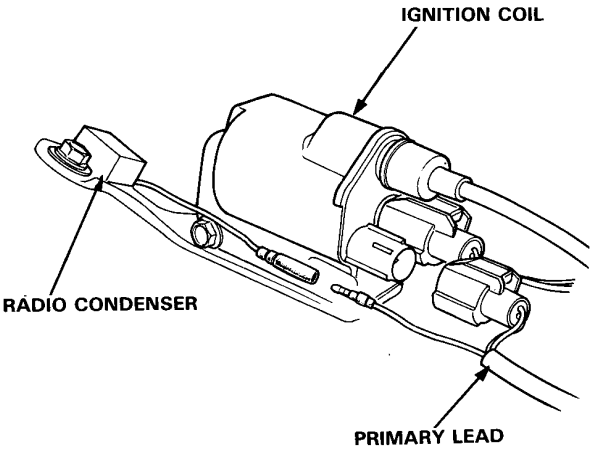
2. When vacuum (more than 500 mmHg, 20 in.Hg) is applied to the diaphragm, the stator should turn counterclockwise and stay. If the stator does not turn or stay, replace the diaphragm.

   When vacuum is released, the stator should return. If the stator does not return, replace the diaphragm.

Distributor Removal/Installation

Removal

1. Disconnect the primary lead from the ignition coil and radio condenser.

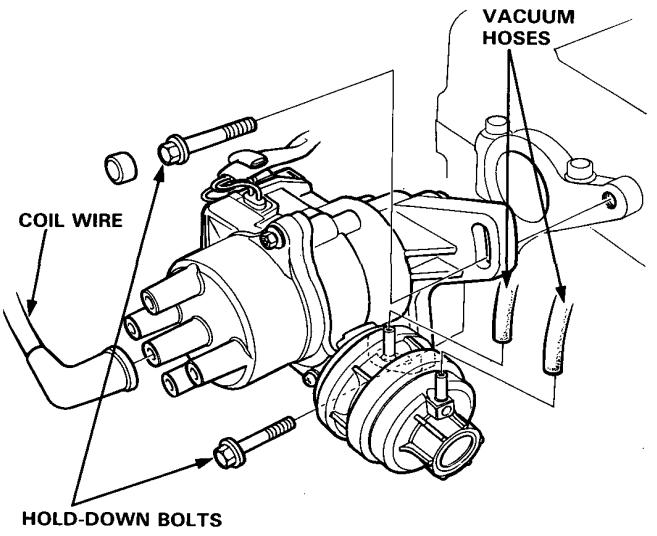


2. Disconnect the spark plug wires and coil wire from the distributor cap.

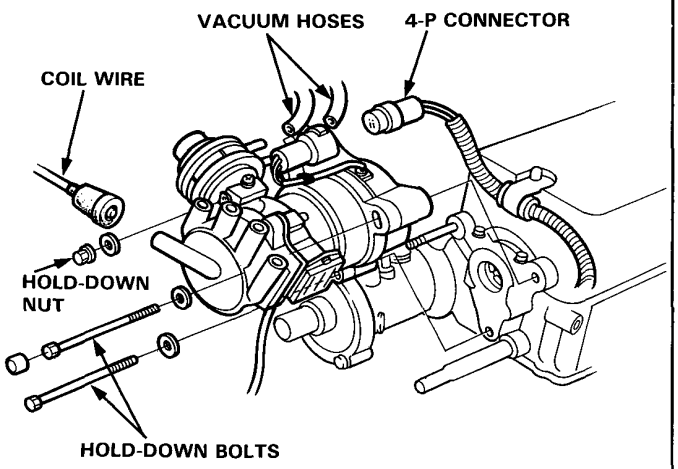
3. Disconnect the vacuum hose(s) from the advance diaphragm.

4. For A20A4 engine, disconnect the 4-P connector from the crank angle sensor on the distributor.

A16A1 and A20A2 engines:



A20A4 engine:

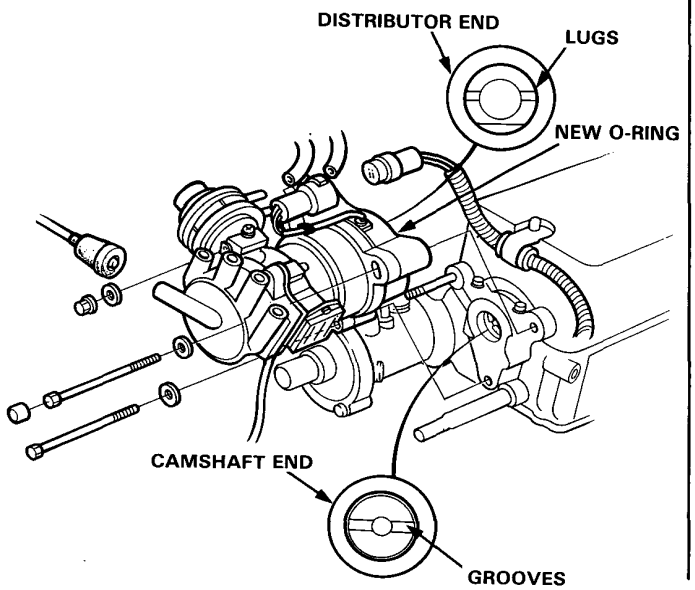


5. Remove the distributor hold-down bolts (and nut for A20A4 engine), then remove the distributor from the cylinder head.

Installation

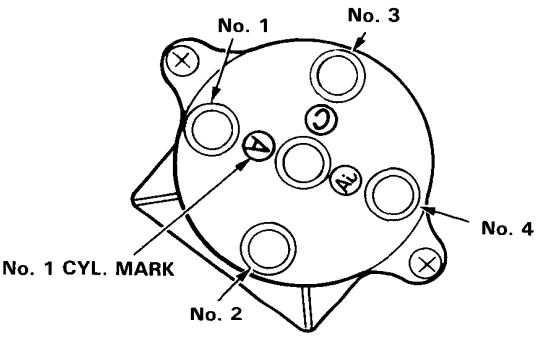
1. Coat a new O-ring with engine oil then install it.
2. Slip the distributor into position.

   NOTE: The lugs on the end of the distributor and its mating grooves in the camshaft end are both offset to eliminate the possibility of installing the distributor 180° out of time.

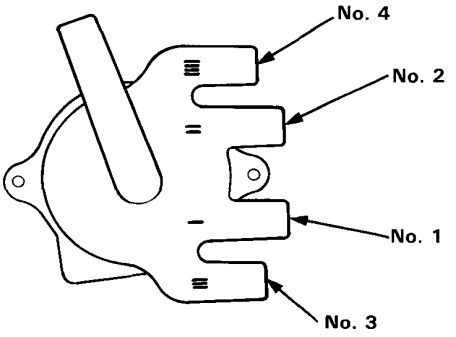


3. Install the hold-down bolts (and nut for A20A4 engine), and tighten temporarily.
4. Connect the coil wire to the distributor cap and the vacuum hose(s) to the advance diaphragm.
5. Connect the primary lead to the ignition coil and radio condenser.
6. For A20A4 engine, connect the 4-P connector to the connector of the crank angle sensor.
7. Connect the spark plug wires as shown.

A16A1 and A20A2 engines:



A20A4 engine:

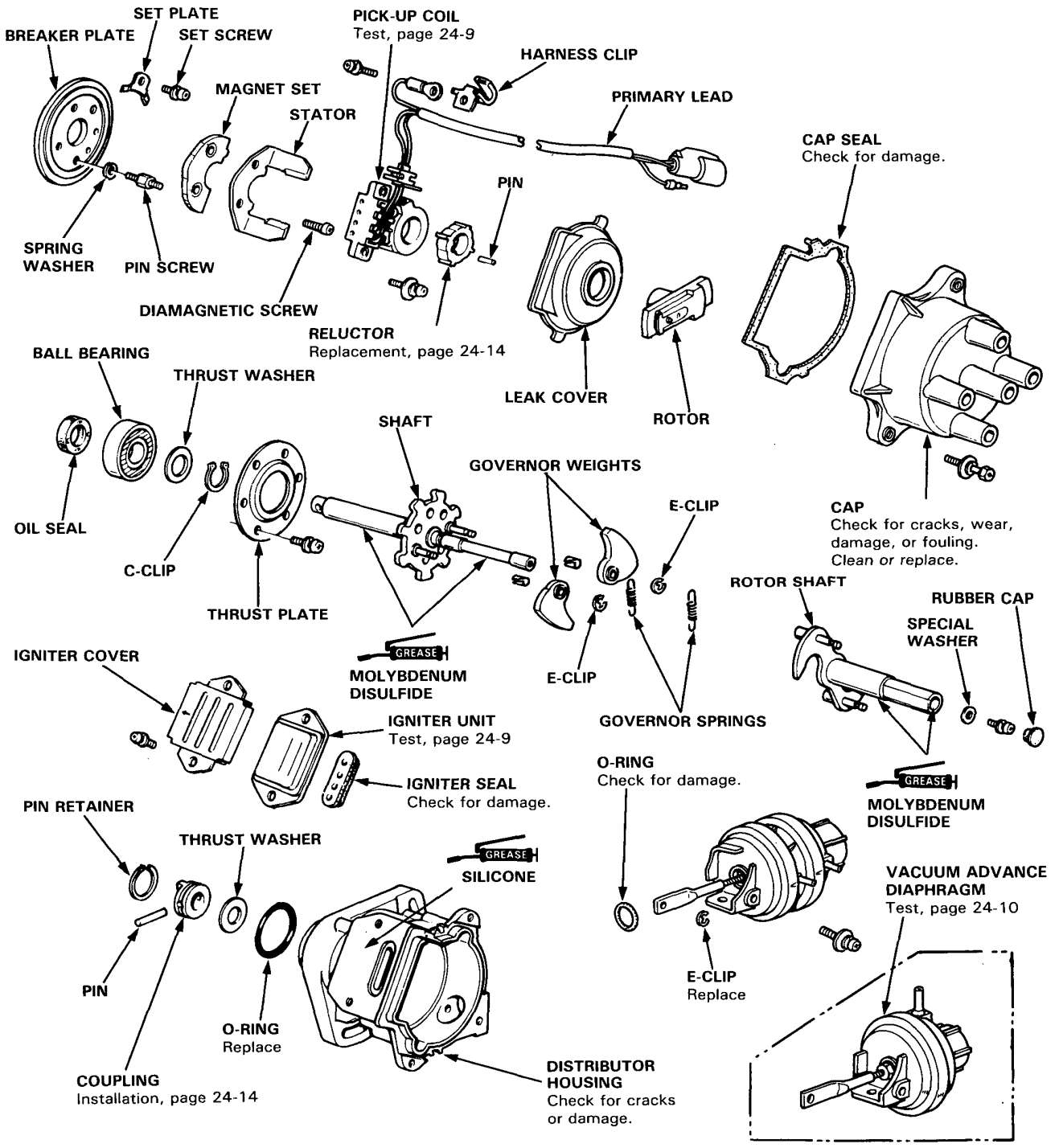


8. Set the timing with a timing light as shown on page 24-4.
9. After adjusting, tighten the adjusting bolts (and nut for A20A4 engine), then install the cap on the upper adjusting bolt.

Distributor Overhaul

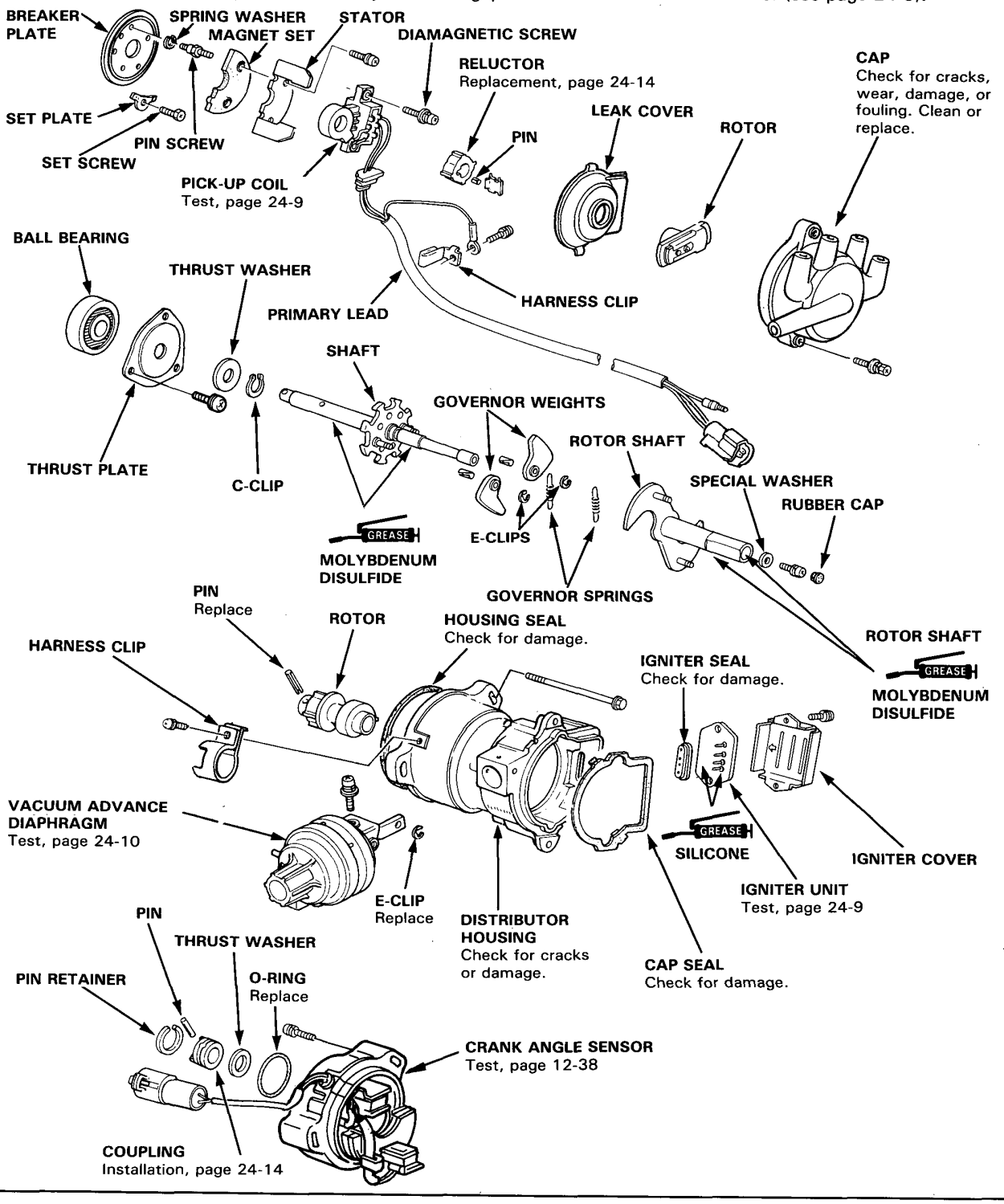
A16A1 and A20A2 engine:

NOTE: After installing the reluctor, adjust the air gaps between the stator and reluctor (see page 24-8).



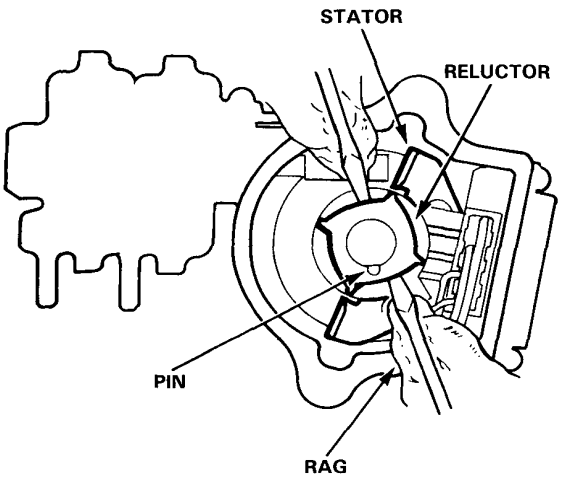
A20A4 engine:

NOTE: After installing the reluctor adjust the air gap between the stator and reluctor (see page 24-8).



Reluctor Replacement

1. Carefully pry up the reluctor by using two screwdrivers as shown. Do not damage the reluctor and stator.



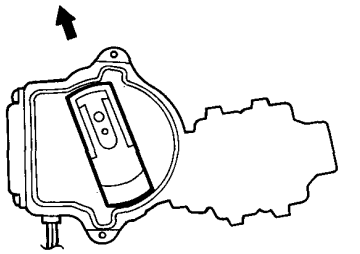
2. When installing the reluctor, be sure to drive in the pin with its gap away from the shaft.

   NOTE: The number or letter manufacturing code on the reluctor must always face up.

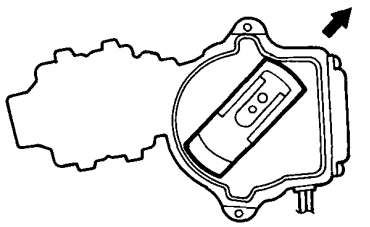
Distributor Coupling Installation

1. Install the rotor, then turn it so that it faces in the direction shown (toward the No. 1 cylinder).

A16A1 and A20A2 engines:



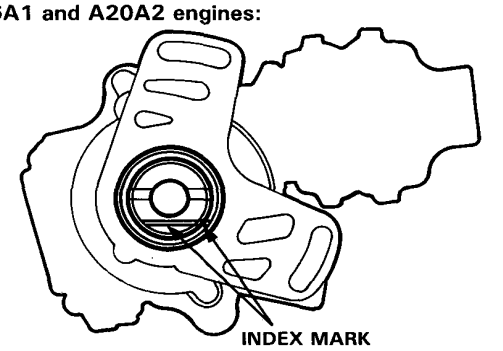
A20A4 engine:



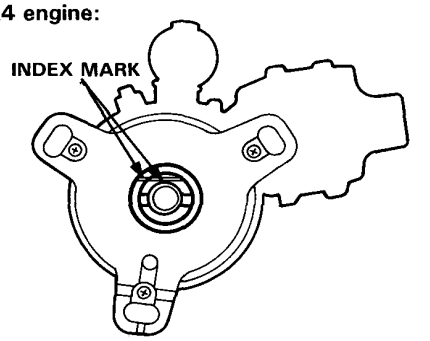
2. Set the thrust washer and coupling on the shaft.

3. Check that the rotor is still pointing toward the No. 1 cylinder, then align the index mark on the housing with the index mark on the coupling.

A16A1 and A20A2 engines:



A20A4 engine:



4. Drive in the pin and secure it with the pin retainer.

Battery Test

NOTE: To get accurate results, the temperature of the electrolyte must be between 15 and 38°C (59 and 100°F) before testing.

WARNING Keep sparks, flames and cigarettes away while charging battery.

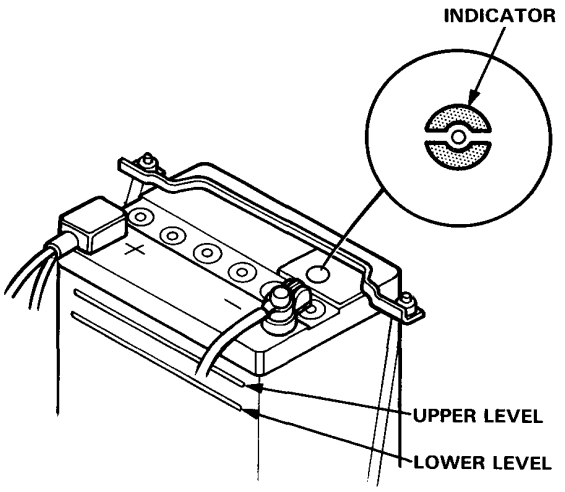
CAUTION: Battery electrolyte is a sulfuric acid solution.

- If it spills on painted surfaces, clothing, or skin, rinse it off with water immediately to minimize the damage.
- Always wear safety goggles or a face shield when servicing a battery.

1. Check for damage: If the case is cracked or the posts are loose, replace the battery.
2. Check the battery electrolyte level:

Conventional battery:
Check the electrolyte level in each cell.
If it's low, add distilled water until the electrolyte rises to the UPPER mark.

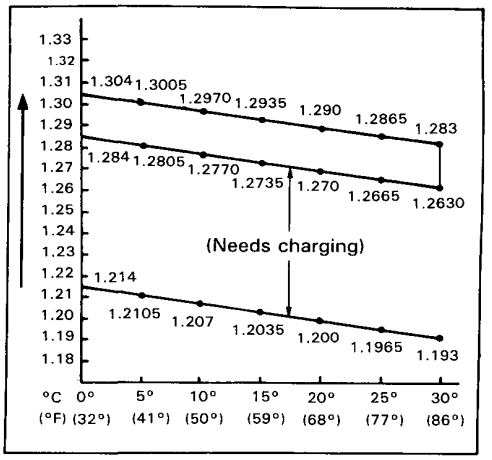
Maintenance-free battery:
Check the electrolyte level using the indicator on the top. If the indicator is red, peel the tape off, remove the caps, and add distilled water until the indicator turns blue or green; then reinstall the caps and tape.



3. Check the electrolyte specific gravity:

Conventional battery:
Use a hydrometer and the correct specific gravity range for your temperature. If the reading is at, or below, "Needs charging" level, go to step 4.

Variation of Specific Gravity with Temperature



Maintenance-free battery:
Check the specific gravity of the electrolyte by looking at the indicator on the top. If the indicator is clear, go to step 4.

Test Equipment Required:

- Battery tester with:
  Voltmeter with 0—18 V scale, Ammeter with 0—100 A and 0—500 A scales, and a carbon pile with 0—300 W.
- 12 V Battery Charger:
  Fast charge capability of 50 A and slow charge capability of 5 A.

(cont'd)

Battery Test (cont'd)

4. Test battery load capacity by connecting a battery tester, and applying a load of 185 amps.
When the load has been applied for exactly 15 seconds, the battery voltage reading should stay above 9.6 V.

   - If the reading stays above 9.6 V, the battery is OK; clean its terminals and case, and reinstall it. See installation procedure on step 5.

   - If the reading is between 6.5 and 9.6 V, fast charge the battery by connecting a battery charger, for 3 minutes at an initial rate of 40 amps.

   CAUTION: Amperage will drop as voltage increases; do not increase the amperage to compensate or you may damage the battery.

   Watch the battery voltage during the entire 3 minutes; the highest reading should stay below 15.5 V.

   — If the reading stays below 15.5 V, the battery is OK; clean its terminals and case, and reinstall it.

   — If the reading exceeds 15.5 V any time during the 3 minutes of fast charge, the battery is no good; replace it.

   - If the reading drops below 6.5, slow charge the battery by connecting a battery charge, at 5 amps for no more than 24 hours, (or until the indicator shows full charge, or the specific gravity of the electrolyte is at least 1.250). See slow charge procedure on step 6. Then test load capacity again.

   — If the voltage stays above 9.6 V, the battery is OK; clean its terminals and case, and reinstall it.

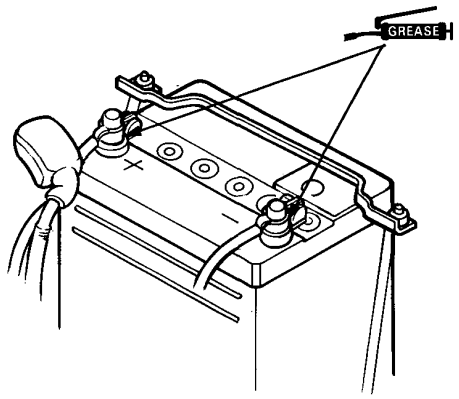
   — If the voltage still drops below 6.5 V, the battery is no good; replace it.

5. **Battery Installation Procedure:**

   - Keep the battery and terminals clean. If necessary, brush with baking-soda solution and flush with clean, lukewarm water. Check for loose terminal clamps.

   - If clamps become corroded inside, clean out with a wire brush or coarse emery cloth.

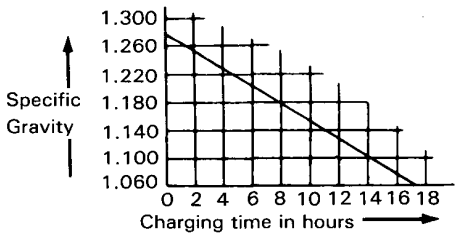
   NOTE: Coat terminals lightly with petroleum jelly to retard corrosion. Baking soda may be mixed with the jelly for additional protection against acid build-up.



6. **Slow Charge Procedure:**

   Charge at 10 % of the ampere-hour rating until the battery specific gravity is at least 1.250.

SLOW CHARGE PROCEDURE



Charge Warning Light Test

NOTE: Before testing, check the wire harness connections and alternator belt tension.

1. Turn the ignition switch on. The charge warning light should come on.
   If it does not come on, unplug the alternator connector and short the pin of the W/Bu wire to ground.

   - If the warning light still does not come on, check for:

     — Blown No. 1 (10 A) fuse in the dash fuse box.
     — Bad bulb.
     — An open in the Bl/Y wire between the warning light and dash fuse box, or the dash fuse box and ignition switch.
     — An open in the W/Bu wire between warning light and voltage regulator (inside the alternator).
     — Poor ground.

   - If the light come on, check the alternator and regulator (see page 24-18).

2. Start the engine and let it idle. The charge warning light should go off.
   If it stays on this time, check the No. 8 (10 A) fuse in the under-hood relay box and the W/G wire between the under-hood relay box and alternator.
   If the fuse and wire are OK, check the alternator and regulator (see page 24-18).
   If the system is charging proceed as follows.

3. A20A2 engines only (A16A1 and A20A4 engines to step 4) — Disconnect the choke heater connector. With the engine running, if the light goes out, there is a short in the choke heater.

4. If the light stays on, stop the engine and disconnect the alternator connector from the alternator. Turn on the ignition; if the light goes out, the voltage regulator is faulty.

5. A20A2 engines (KX and KQ models) only (Others to step 6) — If the light stays on, disconnect the 7-P connector from the EFE heater control unit (see page 11-48).
   Turn on the ignition; if the light goes out, the EFE heater control unit is faulty or shorted.

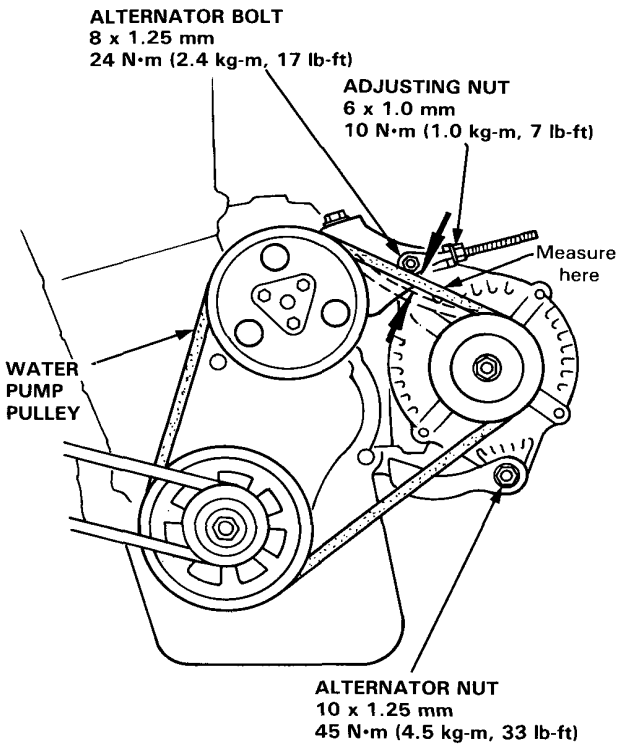
6. If the light stays on throughout steps 3, 4 and 5, there is a short to ground in the Bu/W wire from the charge warning light to one of the above components.

Alternator Belt Adjustment

1. Apply a force of 98 N (10 kg, 22 lb) and measure the deflection between the alternator and the water pump pulley.

   Deflection: 6—9 mm (0.24—0.35 in.)

   NOTE: On a brand-new belt, the deflection should be 4—6 mm (0.16—0.24 in.) when first measured.



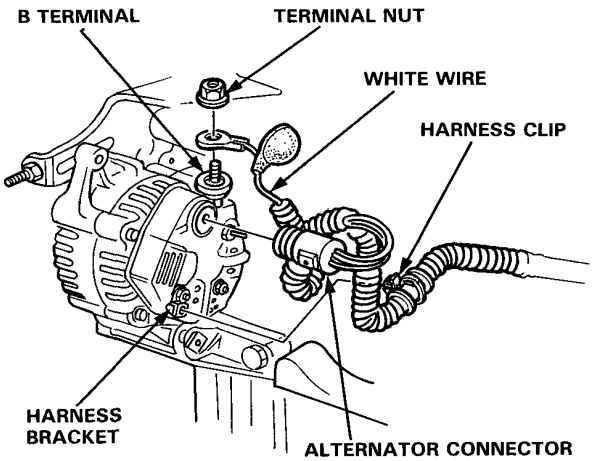
2. Loosen the alternator bolt and nut.

3. Move the alternator by turning the adjusting nut to obtain the proper belt tension, then retighten the bolt and nut.

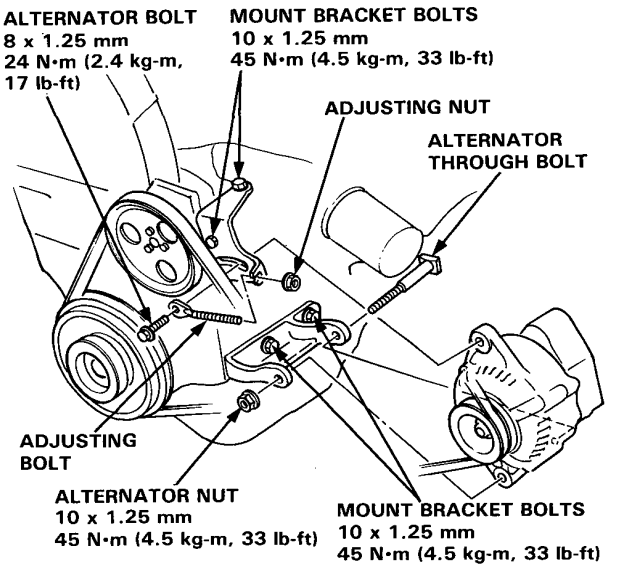
4. Recheck the deflection of the belt.

Alternator Replacement

1. Disconnect the ground wire from the battery negative post (−).
2. Disconnect the left driveshaft from the steering knuckle (see page 19-11).
3. Disconnect the alternator connector from the alternator, and remove the clip from the harness bracket.



4. Remove the terminal nut and the white wire from the B terminal.
5. Remove the alternator bolt and nut, then remove the alternator belt from the alternator pulley.

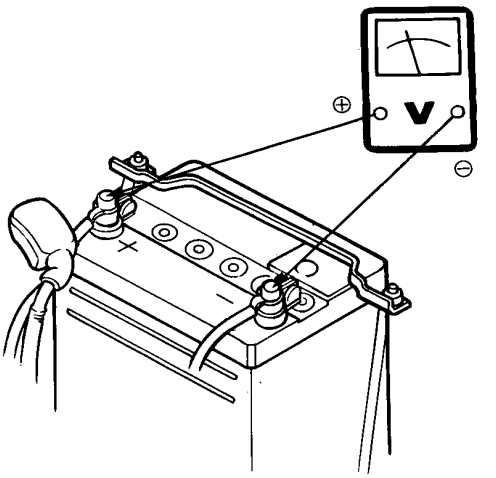


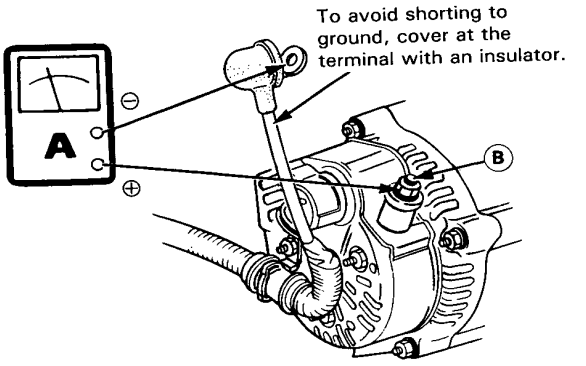
6. Remove the alternator through bolt, then the alternator.
7. If necessary, remove the mount bracket bolts, and the upper and lower mount brackets.
8. Adjust the alternator belt tension after installing.

Alternator and Regulator Test

1. First make sure you have a good battery, and that the alternator belt, and connections at the alternator and main fuse are good. Next, check the No. 1 (15 A) fuse in the dash fuse box and the No. 8 (10 A) fuse in the under-hood relay box. (If blown, the charge warning light will come on even if the system's working properly.)

2. If these check OK, connect a voltmeter to the battery, and an ammeter (80 amp capacity or higher) between the alternator (B) terminal and the white wire as shown. (An inductive pick up can be used instead of disconnecting the white wire.)





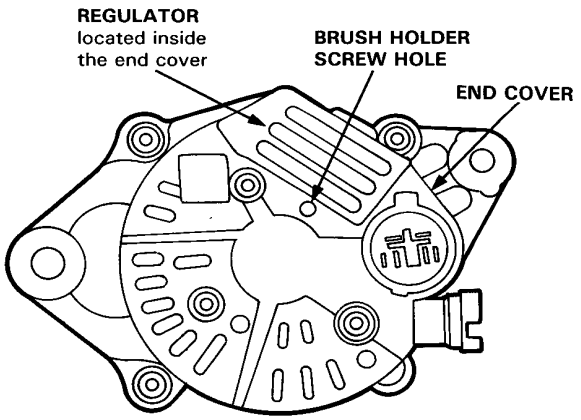
3. Start the engine, and turn on the headlights, blower motor, rear defogger and etc.

4. Compare the readings to the chart in step 8. If no output or below specification, go to step 6. if output is within specification and voltage is between 13.9 and 15.1 V, the voltage regulator and alternator are OK. The test is complete.
If the charge light is still on, go to charge light test page 24-17.

5. If the voltage is higher than 19 V, stop the engine immediately and replace the voltage regulator.

   NOTE: If the car has been running with excessive voltage, perform a complete functional check of all electrical systems, including the battery. They may have been damaged by the over voltage.

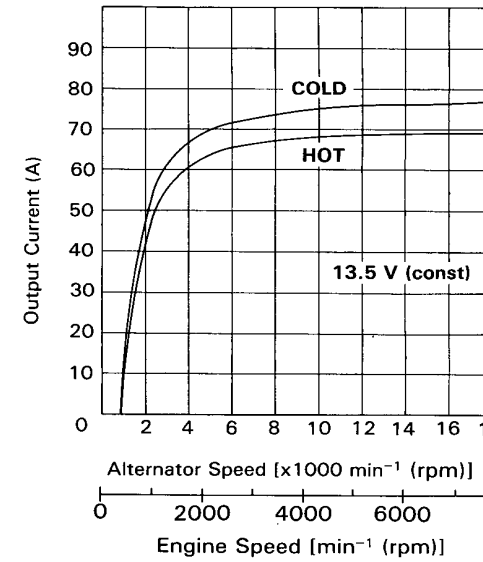
6. Perform a full-field test: Insert a short screwdriver into the brush holder screw hole in the alternator and cover.



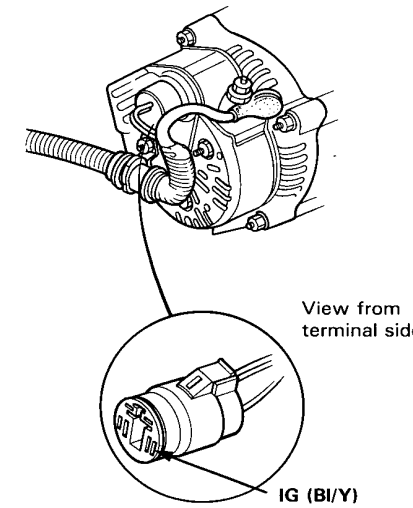
7. While it's touching the brush screw, ground the screwdriver against the cover (you may have to scrape some point off the cover for a good ground). Note the amperage while grounding the screwdriver.

   CAUTION: Ground the screwdriver for as short a time as possible. Do not exceed the maximum recommended voltage (19 V). There could possibly be damage to electrical components in the system.

8. Now compare the amperage reading from the full-field test with the specifications shown in the graph of the alternator output.



- If the reading is out of specification and you have 12 volts at IG terminal in the alternator connector with the ignition switch ON, the alternator is faulty.

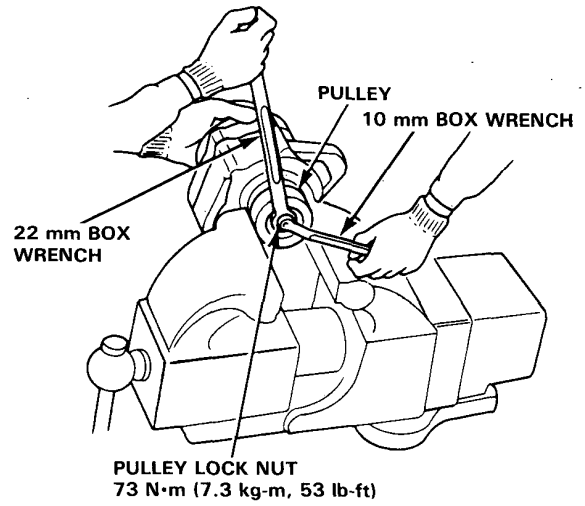


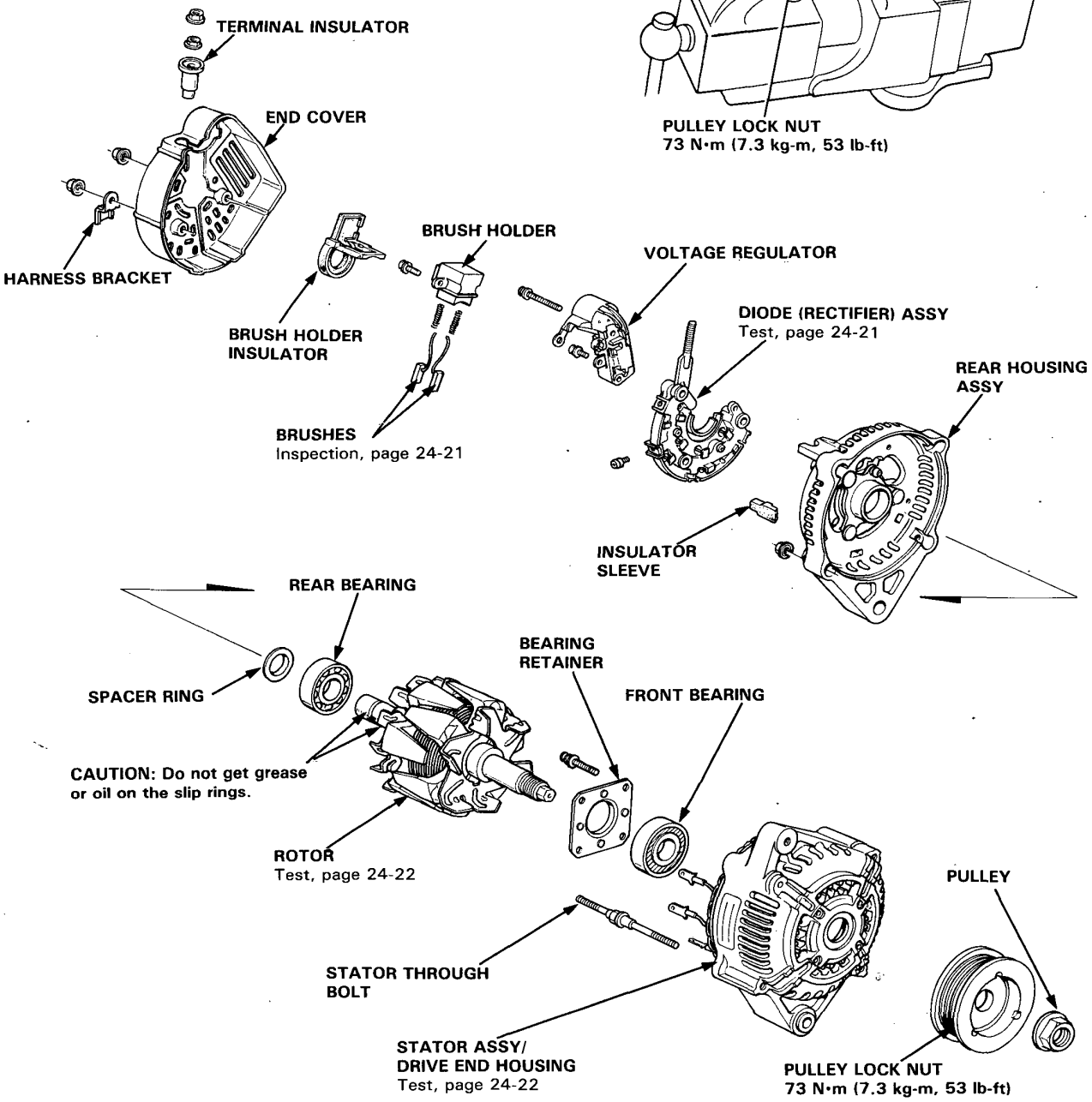
- If the amperage reading is within specification and you have 12 volts at IG terminal in the alternator connector with the ignition switch ON, the regulator is faulty.

Alternator Overhaul

NOTE: It is only necessary to separate the pulley, drive end housing and rotor when the front bearing needs replacement.

To remove the pulley and rotor, use 10 mm and 22 mm box wrenches to loosen the pulley lock nut. Use an impact wrench to remove the nut if necessary.

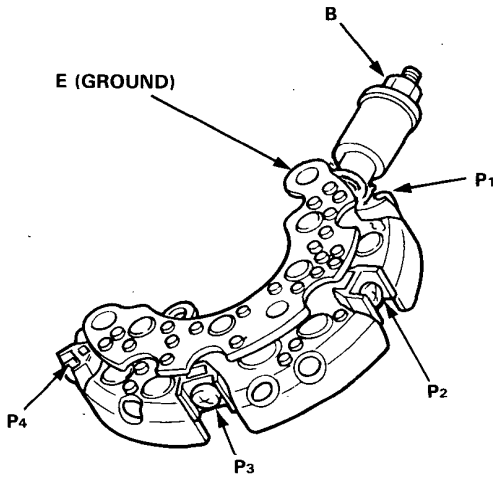




Rectifier Test

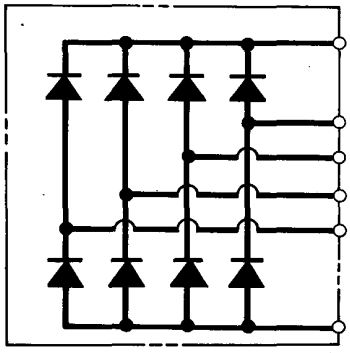
NOTE: The diodes are designed to pass current in one direction and block current in the opposite direction. Since the alternator rectifier is made up of eight diodes (4 pairs), each diode must be tested for continuity in both directions; a total of 16 checks.

1. Check for continuity in both direction, between the B and P (of each diode pair) terminals, and between the E (ground) and P (of each diode pair).
   All diodes should have continuity in only one direction.



2. If any of the 8 diodes fails, replace the rectifier assembly. (Diodes are not available separately.)

Circuit Diagram

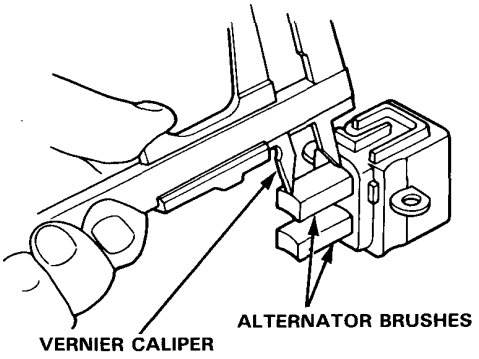


Alternator Brush Inspection

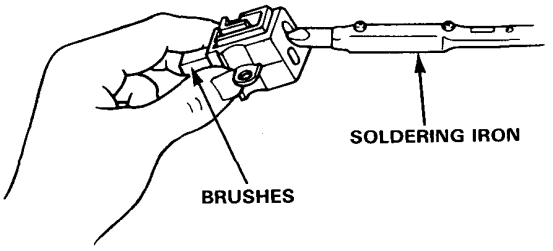
1. Remove the end cover, then take out the brush holder by removing its 2 screws.

2. Measure length of the brushes with a vernier caliper.

Alternator Brush Lengh:
Standard : 10.5 mm (0.41 in.)
Service Limit: 5.5 mm (0.22 in.)



If the brushes are not within the service limit, replace them.

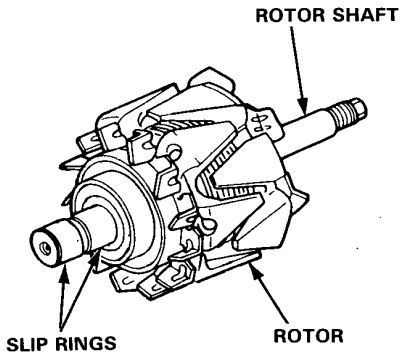


CAUTION: When replacing the brushes, use only a rosin core type solder or solder joints will corrode.

Charging

Rotor Slip Ring Test

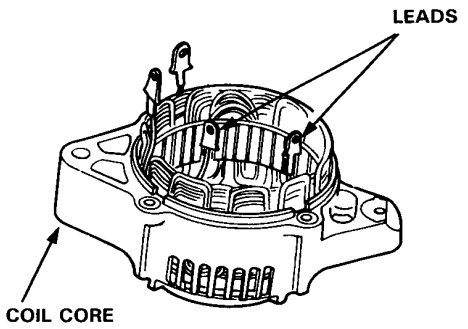
1. Check that there is continuity between the slip rings.
2. Check that there is no continuity between the rings and the rotor or rotor shaft.



3. If the rotor fails either continuity check, replace it.

Stator Test

1. Check that there is continuity between each pair of leads.
2. Check that there is no continuity between each lead and the coil core.



3. If the coil fails either continuity check, replace the stator.

Starter

Starter Test

NOTE: The air temperature must be between 15 and 38°C (59 and 100°F) before testing.

Recommended Procedure:

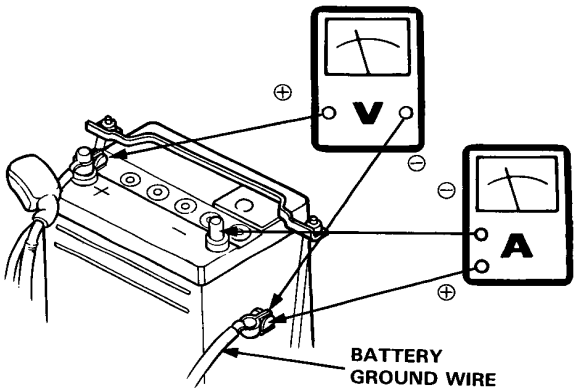
Use a starter system tester.
Connect and operate the equipment in accordance with manufacturer's instructions.
Test and troubleshoot as described starting with step 2.

Alternate Procedure:

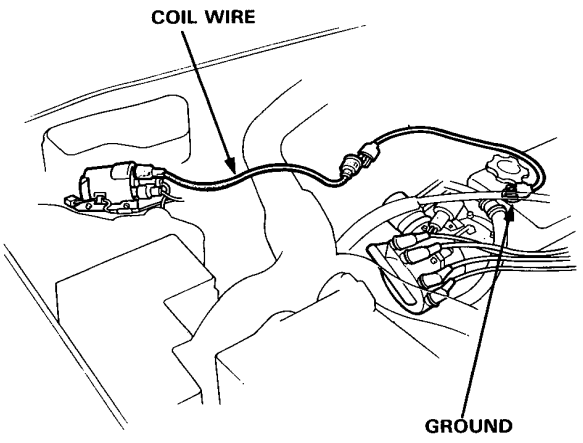
Use the following equipment:

- Ammeter, 0—400 A
- Voltmeter, 0—20 V (accurate within 0.1 volt)
- Tachometer 0—1200 min^{-1} (rpm)

1. Hook up voltmeter and ammeter as shown.



2. Disconnect the ignition coil wire from the distributor, and ground it.



3. Check the starter engagement:
Turn the ignition switch to "Start". The starter should crank the engine.

- If the starter does not crank the engine, check the battery, battery positive wire and ground, and the wire connections for looseness or corrosion.

- Test again.
If the starter still does not crank the engine, bypass the ignition switch circuit as follows:
Unplug the connector (Bl/W wire) from the starter. Connect a jumper wire from the battery positive (+) terminal to the solenoid terminal. The starter should crank the engine.

— If the starter still does not crank the engine, remove the starter and diagnose its internal problems (see pages 24-30 through 24-33).

— If the starter cranks the engine, check for an open in the Bl/W wire circuit between the starter and ignition switch, and connectors. Check the ignition switch. On cars with automatic transmission, check the shift lever position console switch and connectors.

4. Check for wear or damage:
The starter should crank the engine smoothly and steadily.

If the starter engages, but cranks the engine erratically, remove the starter motor. Inspect the starter, drive gear, and flywheel ring gear for damage.
Check the drive gear overrunning clutch for binding or slipping when the armature is rotated with the drive gear held. Replace the gears if damaged. See page 24-30.

5. Check cranking voltage and current draw:

Voltage should be no less than specified below:
0.8 kw and 1.4 kw: 8.0 volts
1.0 kw : 8.5 volts

Current should be no greater than specified below:
0.8 kw: 200 amperes
1.0 kw: 230 amperes
1.4 kw: 350 amperes

If voltage is too low, or current draw too high, check for:
- Battery fully charged.
- Open circuit in starter armature commutator segments (see page 24-33).
- Starter armature dragging.
- Shorted armature winding (see page 24-33).
- Excessive drag in engine.

6. Check cranking rpm:
Engine speed during cranking should be approximately 400 min^{-1} (rpm).

If cranking rpm is too low, check for:
- Loose battery or starter terminals.
- Excessively worn starter brushes (see page 24-31).
- Open circuit in commutator segments (see page 24-33).
- Dirty or damaged helical spline on drive gear.
- Defective drive gear overrunning clutch (see page 24-30).

7. Check the starter disengagement:
Turn the ignition switch to "Start" and release to "Run". The starter drive gear should disengage from the flywheel ring gear.

If the drive gear hangs up on the flywheel ring gear, check:
- Solenoid plunger and switch for malfunction.
- Drive gear assembly for dirty or damaged.

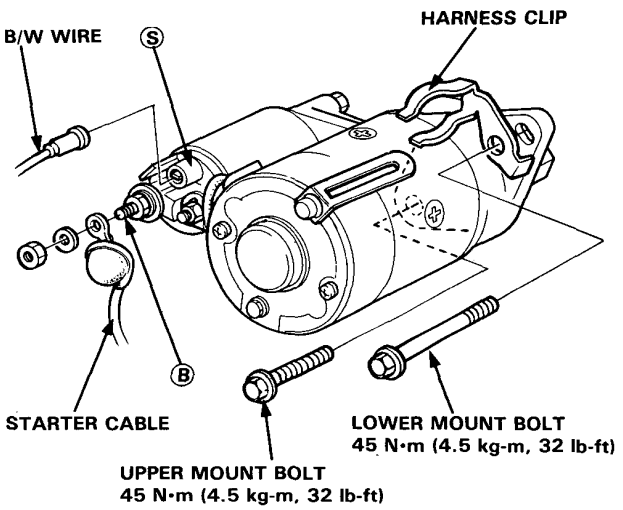
Starter Replacement

1. Disconnect the ground wire from the battery negative post (−).
2. Disconnect the starter cable from (B) terminal on the motor, and the Bl/W wire from (S) terminal on the solenoid.
3. Remove the engine wire harness from the harness clip on the starter.
4. Remove the 2 bolts holding the starter, and remove the starter.

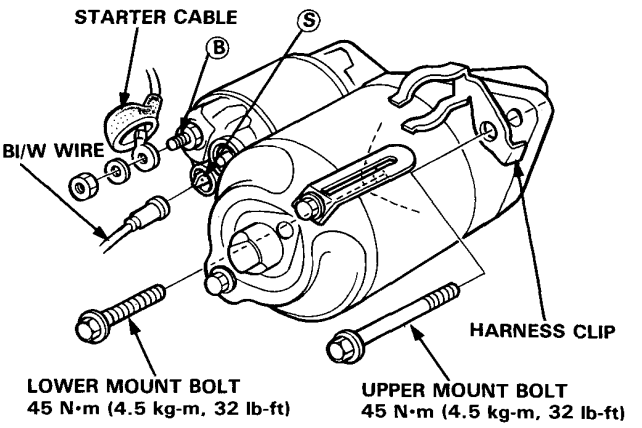
Upper Mount Bolt
- **Manual Transmission**
  All models: 10 x 1.25 x 85
- **Automatic Transmission**
  Gear reduction type:
  European model: 10 x 1.25 x 125
  Others: 10 x 1.25 x 130
  Direct drive type:
  All models: 10 x 1.25 x 125

Lower Mount Bolt
All models: 10 x 1.25 x 43

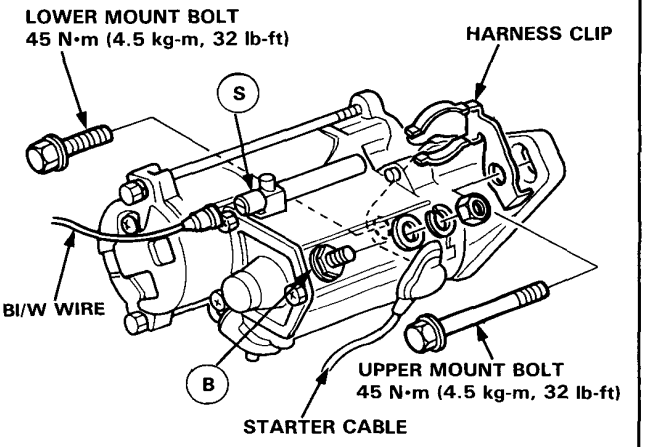
Hitachi 0.8 kw:



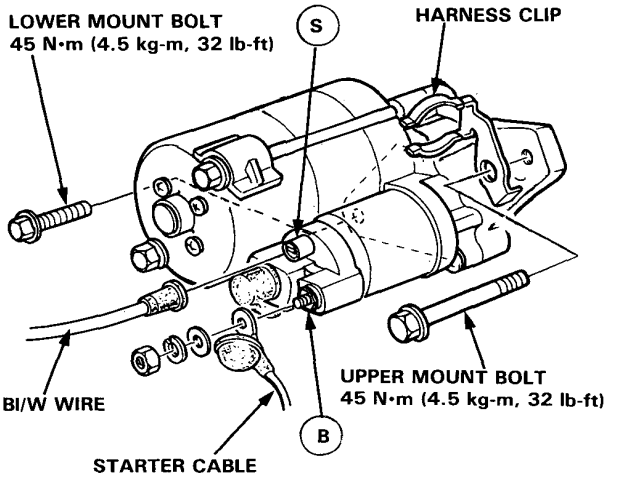
ND 0.8 kw:



ND 1.0 kw and 1.4 kw:



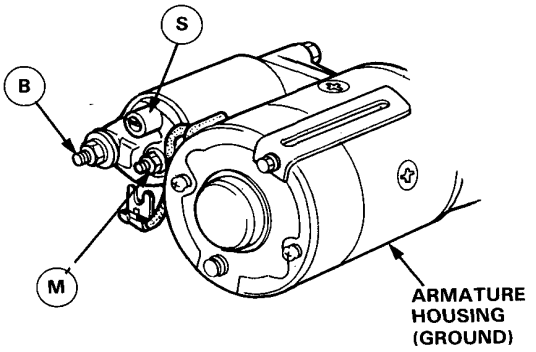
Mitsuba 1.0 kw and 1.4 kw:



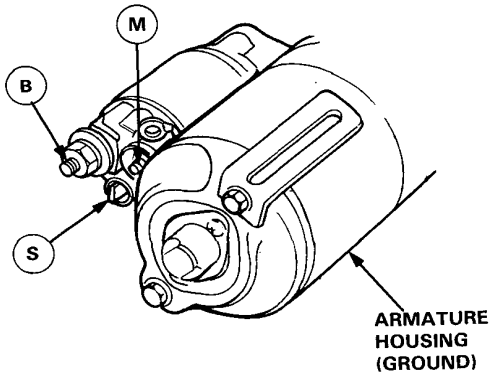
Starter Solenoid Test

1. Check the pull-in coil for continuity between Ⓢ terminal and the armature housing (ground). Coil is OK if there is continuity.
2. Check the hold-in coil for continuity between Ⓢ and Ⓜ terminals. Coil is OK if there is continuity.

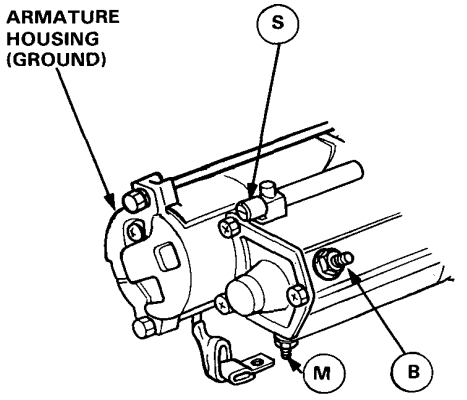
Hitachi 0.8 kw:



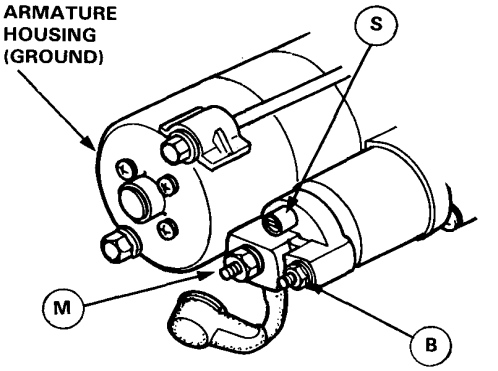
ND 0.8 kw:



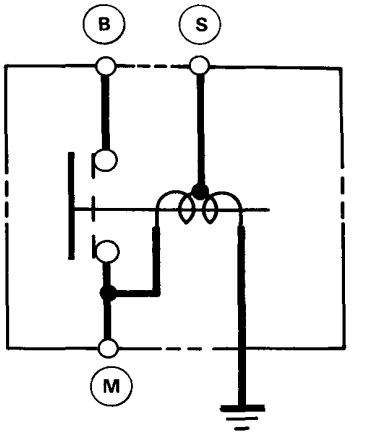
Nippon Denso 1.0 kw and 1.4 kw:



ND 1.0 kw and 1.4 kw:

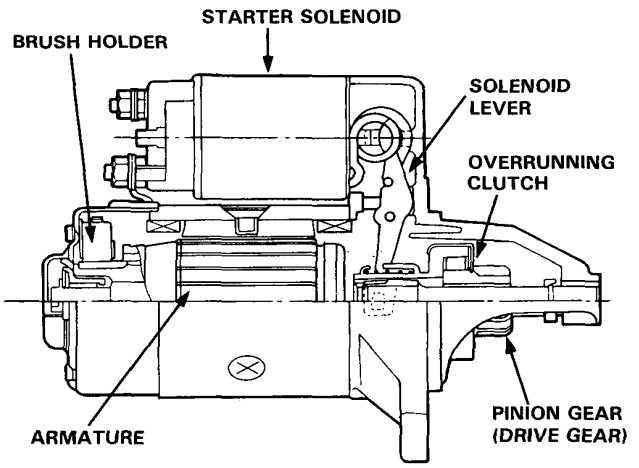


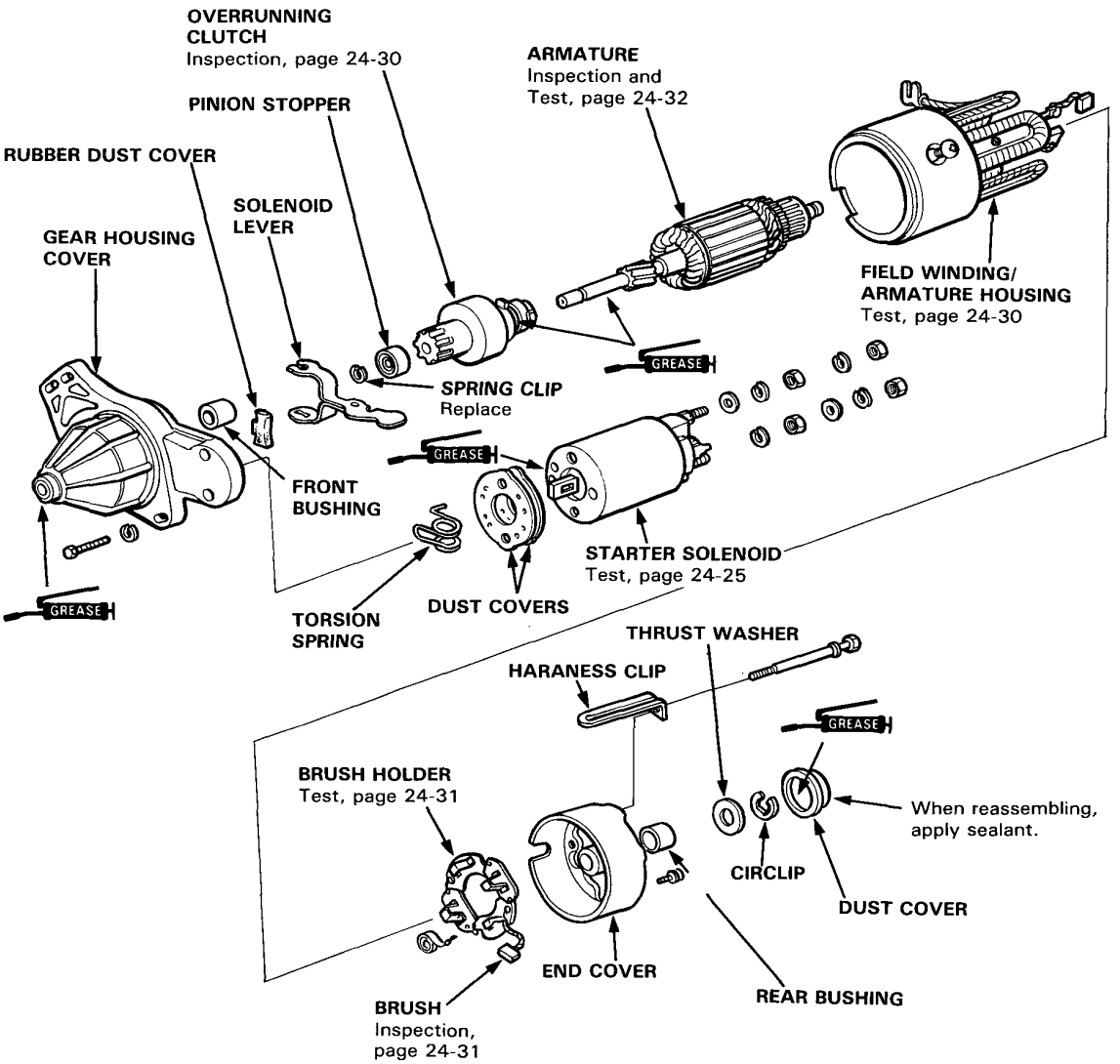
Circuit Diagram



Starter Overhaul (Direct drive 0.8 kw Hitachi)

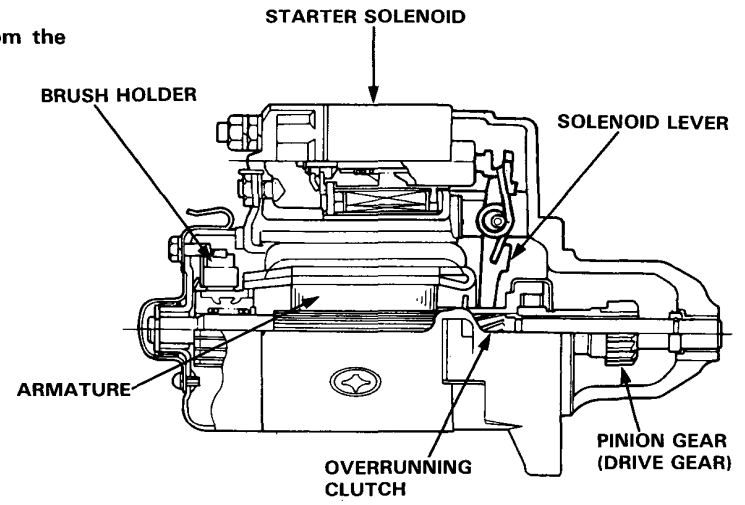
CAUTION: Disconnect the ground wire from the battery post before removing the starter.

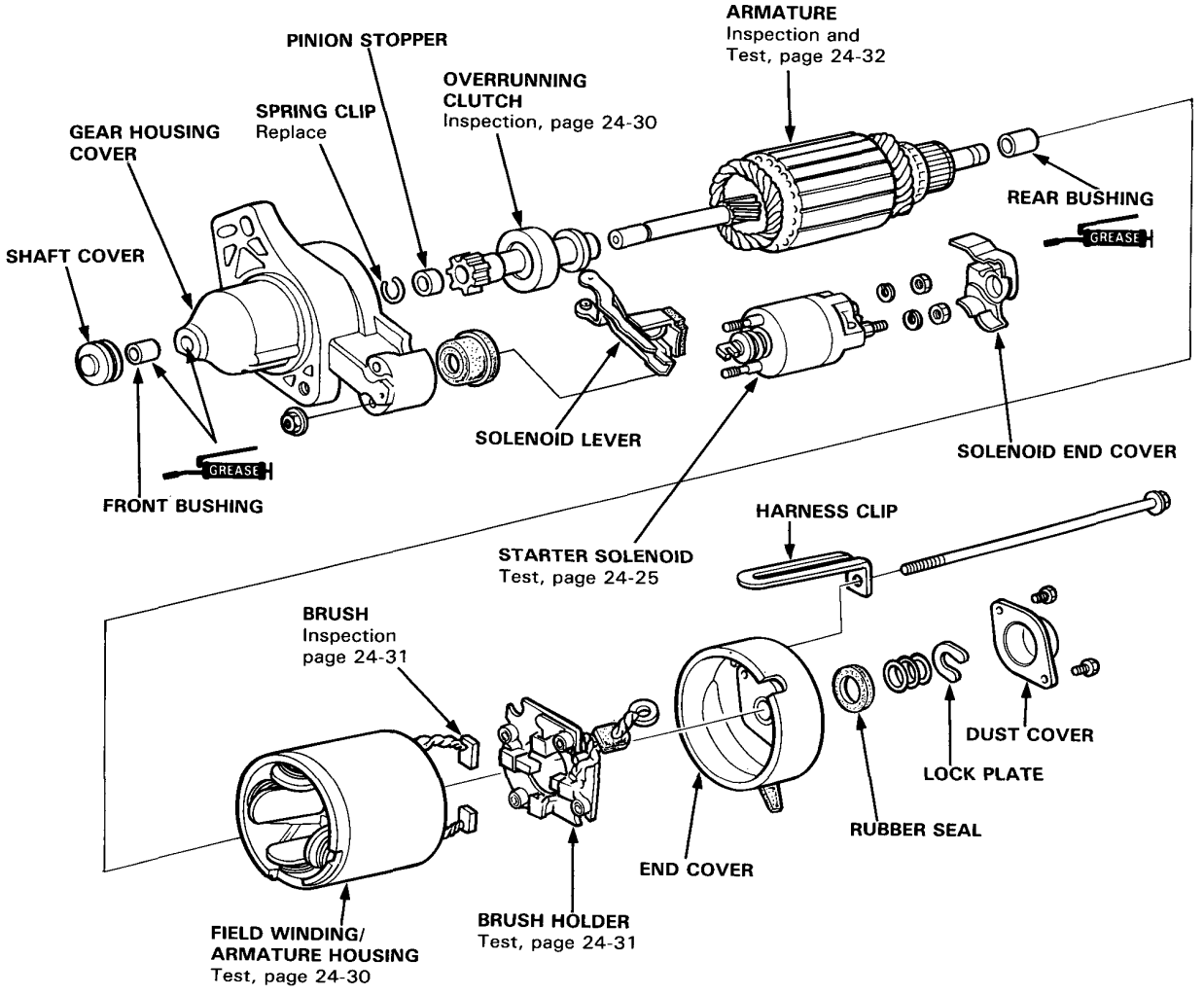




— (Direct drive 0.8 kw ND)

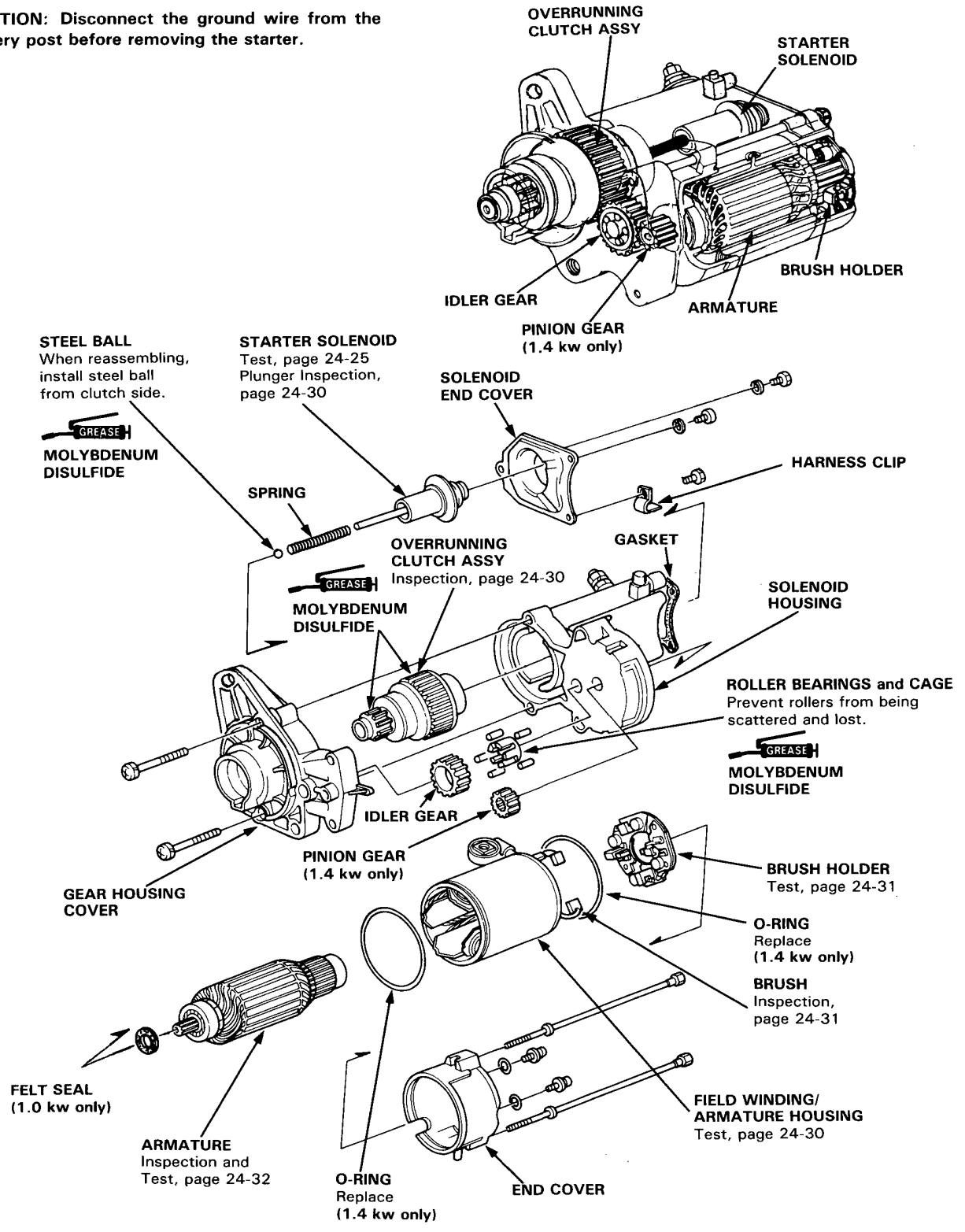
CAUTION: Disconnect the ground wire from the battery post before removing the starter.





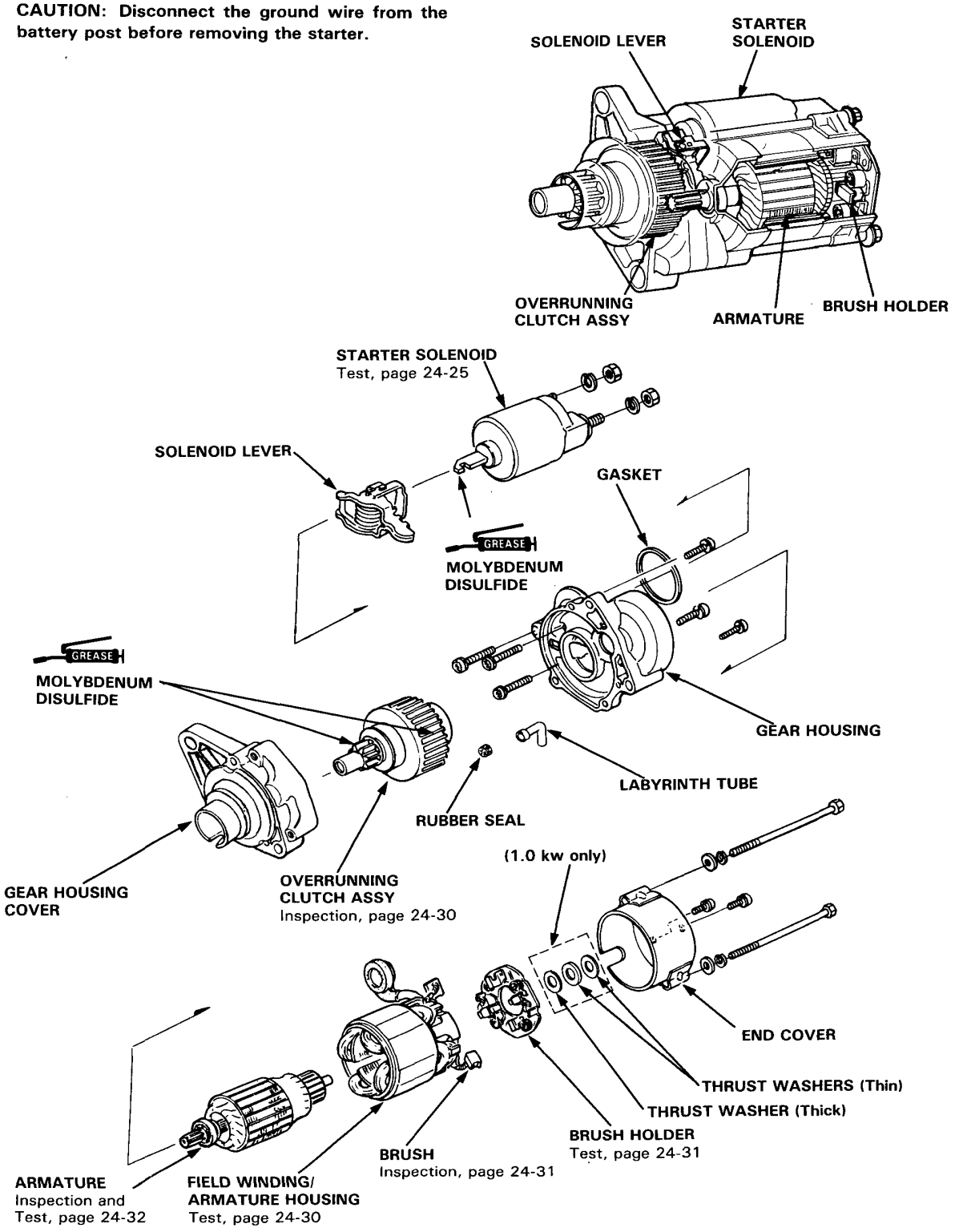
Starter Overhaul (Gear reduction 1.0 kw and 1.4 kw ND)

CAUTION: Disconnect the ground wire from the battery post before removing the starter.



(Gear reduction 1.0 kw and 1.4 kw Mitsuba)

CAUTION: Disconnect the ground wire from the battery post before removing the starter.

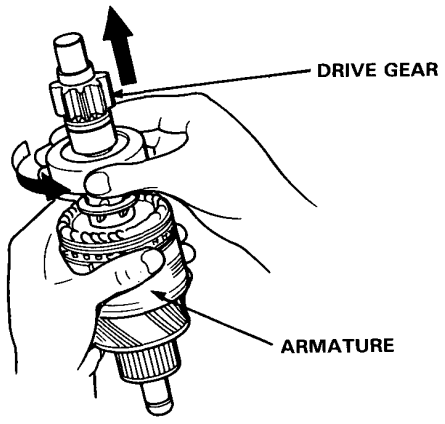


Overrunning Clutch Check

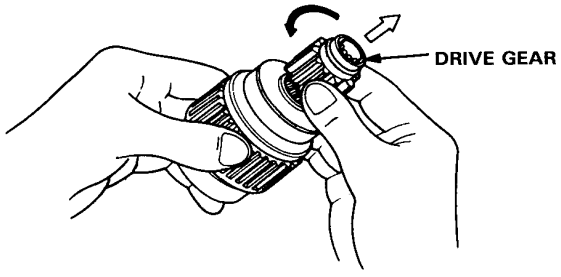
Move the overrunning clutch along the shaft.

If it does't move freely, or if the clutch slips when the armature is rotated while holding the drive gear, replace the clutch assembly.

Direct drive type:



Gear reduction type:

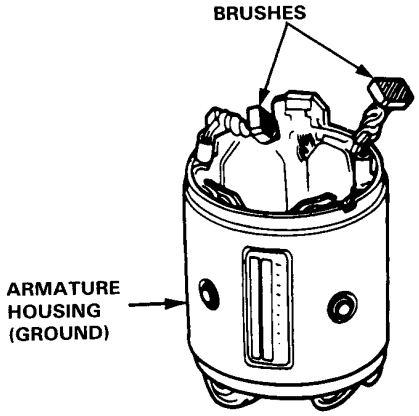


If the gear is worn or damaged, replace the overrunning clutch assembly; the gear is not available separately.

NOTE: Check condition of the flywheel or torque converter ring gear if the starter drive gear teeth are damaged.

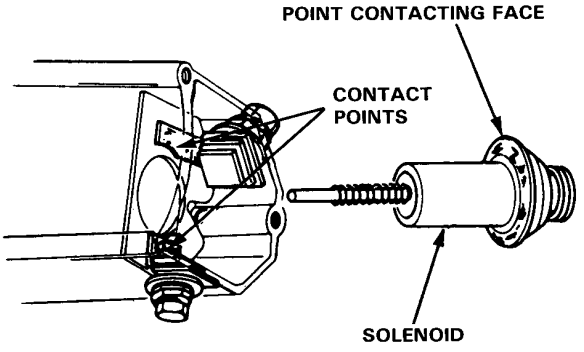
Starter Field Winding Test

1. Check for continuity between the brushes. If no continuity, replace the armature housing.
2. Check for continuity between each brush and the armature housing (ground).
   If continuity exists, replace the armature housing.



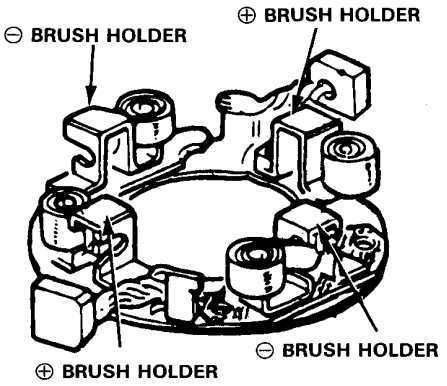
Solenoid Plunger Inspection (ND)

Check the contact points, and face of the starter solenoid plunger for burning, pitting or any other defects. If surfaces are rough, recondition with a strip of #500 or #600 sandpaper.



Starter Brush Holder Test

Check that there is no continuity between the ⊕ and ⊖ brush holders.
If continuity exists, replace the brush holder assembly.



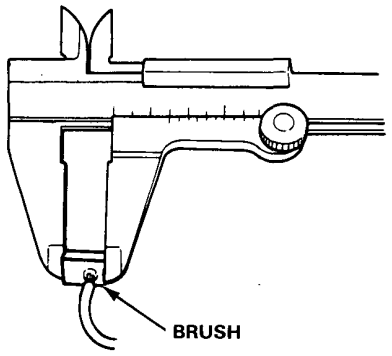
Starter Brush Inspection

Measure brush length. If not within service limit, replace the armature housing and brush holder assembly.

Brush Length

Standard (New):
Hitachi 0.8 kw:
14.5—15.5 mm (0.57—0.61 in.)
ND 0.8 kw: 15.5—16.5 mm (0.61—0.65 in.)
ND 1.0 kw: 12.5—13.5 mm (0.49—0.53 in.)
ND 1.4 kw: 14.5—15.5 mm (0.57—0.61 in.)
Mitsuba 1.0 kw and 1.4 kw:
14.3—14.7 mm (0.56—0.58 in.)

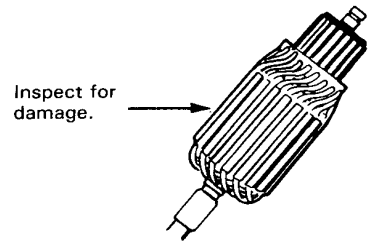
Service Limit:
Hitachi 0.8 kw : 11 mm (0.43 in.)
ND 0.8 kw : 10 mm (0.39 in.)
ND 1.0 kw and 1.4 kw : 8.5 mm (0.33 in.)
Mitsuba 1.0 kw and 1.4 kw: 9.3 mm (0.37 in.)



NOTE: To seat new brushes after installing them in their holders, slip a strip #500 or #600 sandpaper, with the grit side up, over the commutator, and smoothly rotate the armature. The contact surface of the brushes will be sanded to same contour as the commutator.

Armature Inspection and Test

1. Inspect the armature for wear or damage due to contact with the field coil magnets.

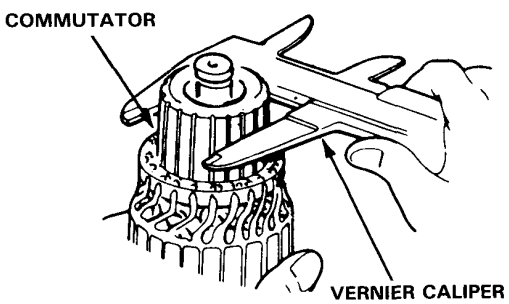


2. A dirty or burnt surface may be resurfaced with emery cloth or lathe within the following specifications.

Commutator Diameter

Standard (New):
Hitachi 0.8 kw: 39.7—40.0 mm (1.56 in.)
ND 0.8 kw : 27.9—28.0 mm (1.10 in.)
ND 1.0 kw and 1.4 kw: 29.9—30.0 mm (1.18 in.)
Mitsuba 1.0 kw and 1.4 kw: 28.0—28.1 mm (1.11 in.)

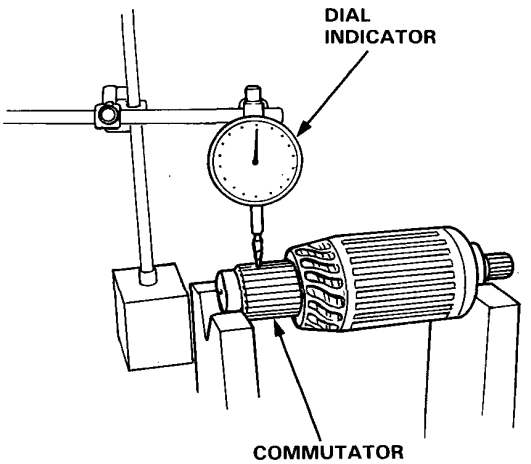
Service Limit:
Hitachi 0.8 kw: 39.0 mm (1.54 in.)
ND 0.8 kw : 27.0 mm (1.06 in.)
ND 1.0 kw and 1.4 kw: 29.0 mm (1.14 in.)
Mitsuba 1.0 kw and 1.4 kw: 27.5 mm (1.08 in.)



Commutator Runout

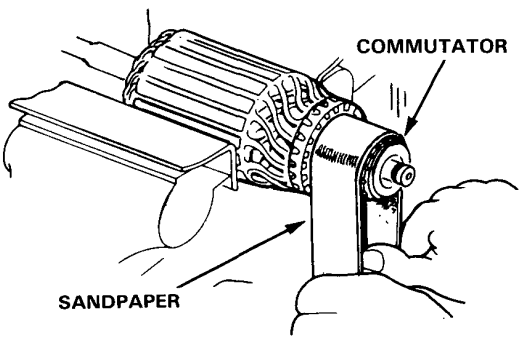
Standard (New):
0.8 kw : 0—0.05 mm (0—0.002 in.)
1.0 kw and 1.4 kw: 0—0.02 mm (0—0.001 in.)

Service Limit:
0.8 kw : 0.4 mm (0.016 in.)
1.0 kw and 1.4 kw: 0.05 mm (0.002 in.)



3. If the commutator runout and diameter are within limits, check the commutator for damage or for carbon dust or brass chips between the segments.

4. If surface is dirty, recondition it with a #500 or #600 sandpaper. Then, check mica depth. If necessary, undercut mica with a hacksaw blade to achieve proper depth.

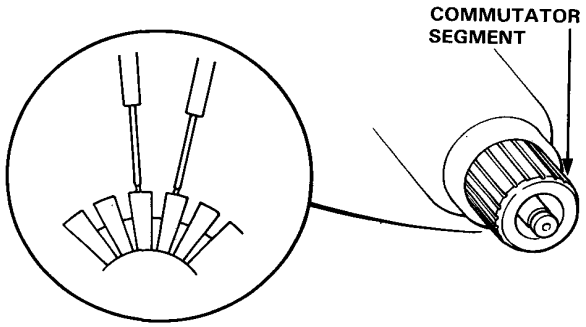


Commutator Mica Depth

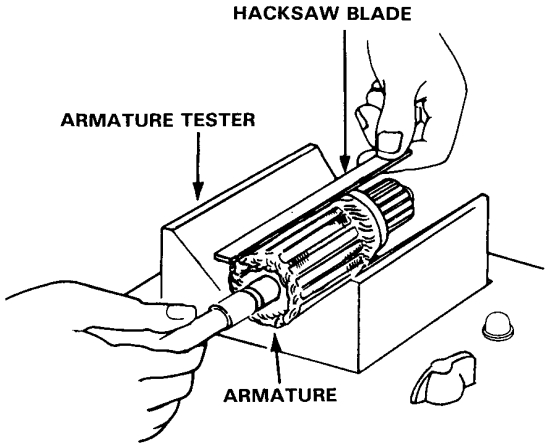
Standard (New):
Hitachi : 0.5—0.8 mm (0.020—0.031 in.)
ND : 0.4—0.8 mm (0.016—0.031 in.)
Mitsuba: 0.4—0.5 mm (0.016—0.020 in.)

Service Limit:
Hitachi : 0.2 mm (0.008 in.)
ND : 0.2 mm (0.008 in.)
Mitsuba: 0.15 mm (0.006 in.)

5. Check for continuity between each segment of the commutator. If an open circuit exists between any segment, replace the armature.

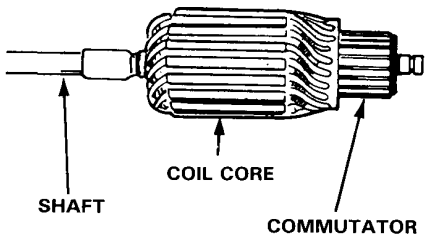


6. Place the armature on an armature tester. Hold a hacksaw blade on the armature core.



If the blade is attracted to the core or vibrates while core is turned, the armature is shorted. Replace the armature.

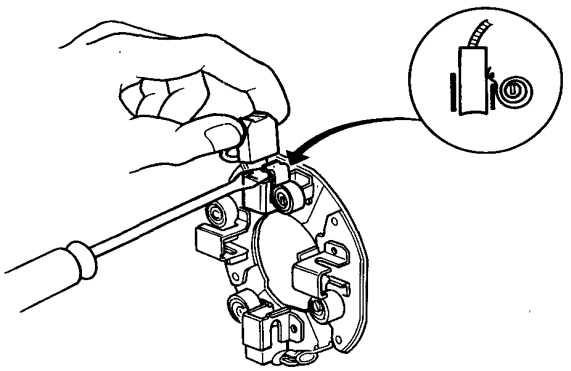
7. With an ohmmeter, check that no continuity exists between the commutator and armature coil core, *and between the commutator and armature shaft.* If continuity exists, replace the armature.



Starter Reassembly

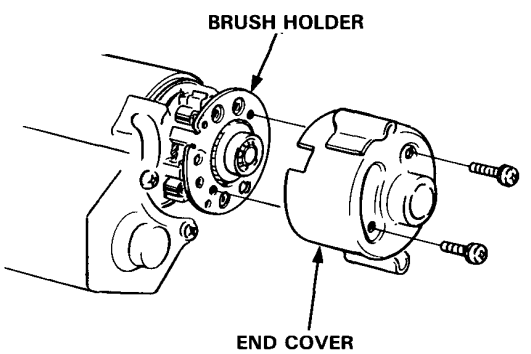
Reassemble the starter in the reverse order of disassembly.

1. Pry back each brush spring with a screwdriver, then position the brush about halfway out of its holder, and release the spring to hold it there.



2. Install the armature in the housing. Next pry back each brush spring again and push the brush down until it seats against the commutator, then release the spring against the end of the brush.

3. Install the end cover on the brush holder.



Body Electrical

Body Electrical

Illustrated Index (Engine Compartment and Front)

Before Troubleshooting:

- Check the main fuse and fuse box.
- Check the battery for damage, state of charge, and clean and tight connections.

CAUTION:

- **Do not quick-charge a battery unless the battery ground cable has been disconnected, or you will damage the alternator diodes.**
- **Do not attempt to crank the engine with the ground cable disconnected or you will severely damage the wiring.**

- Check the alternator belt tension.

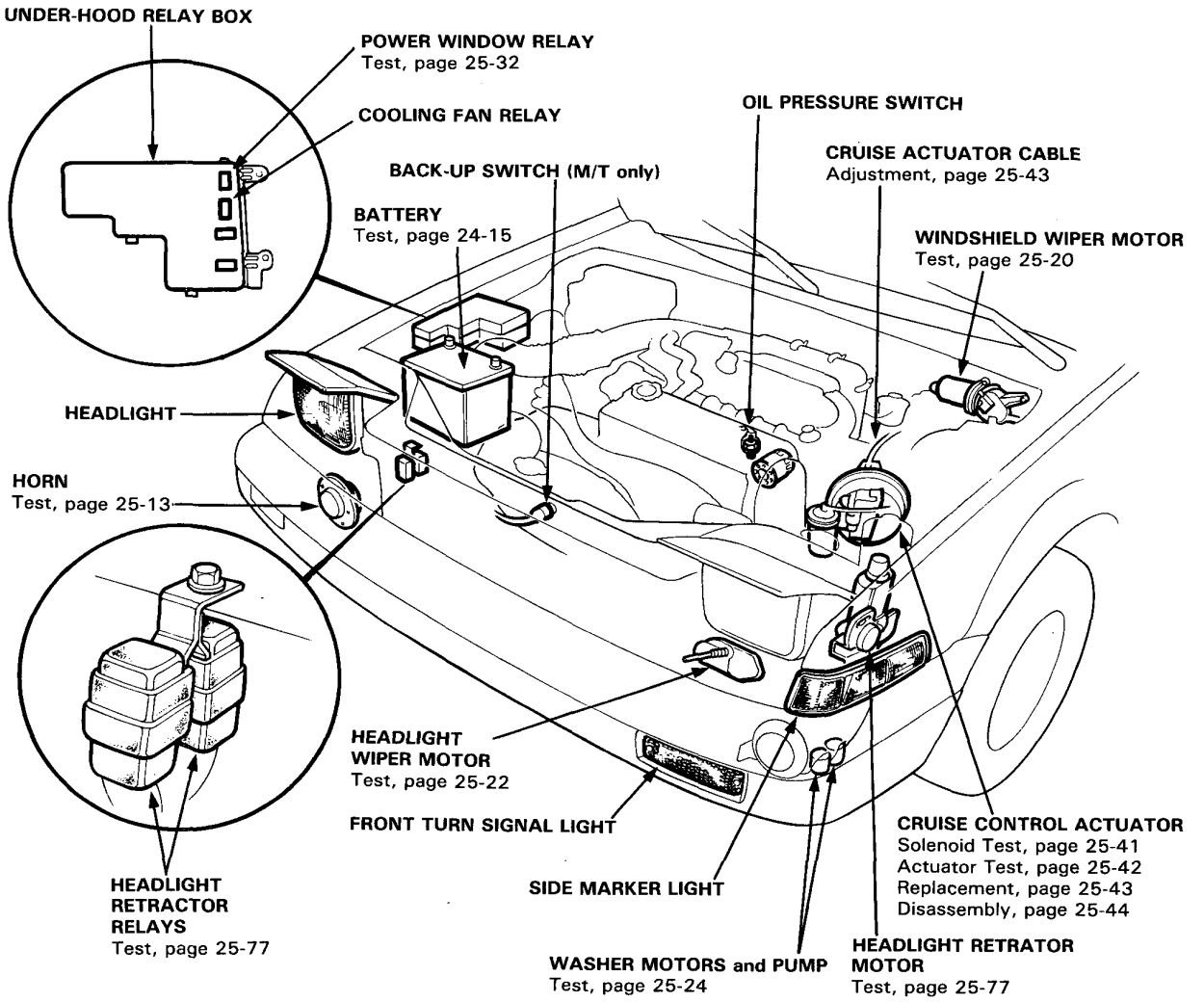
While you're working:

- Make sure connectors are clean, and have no loose pins or receptacles.

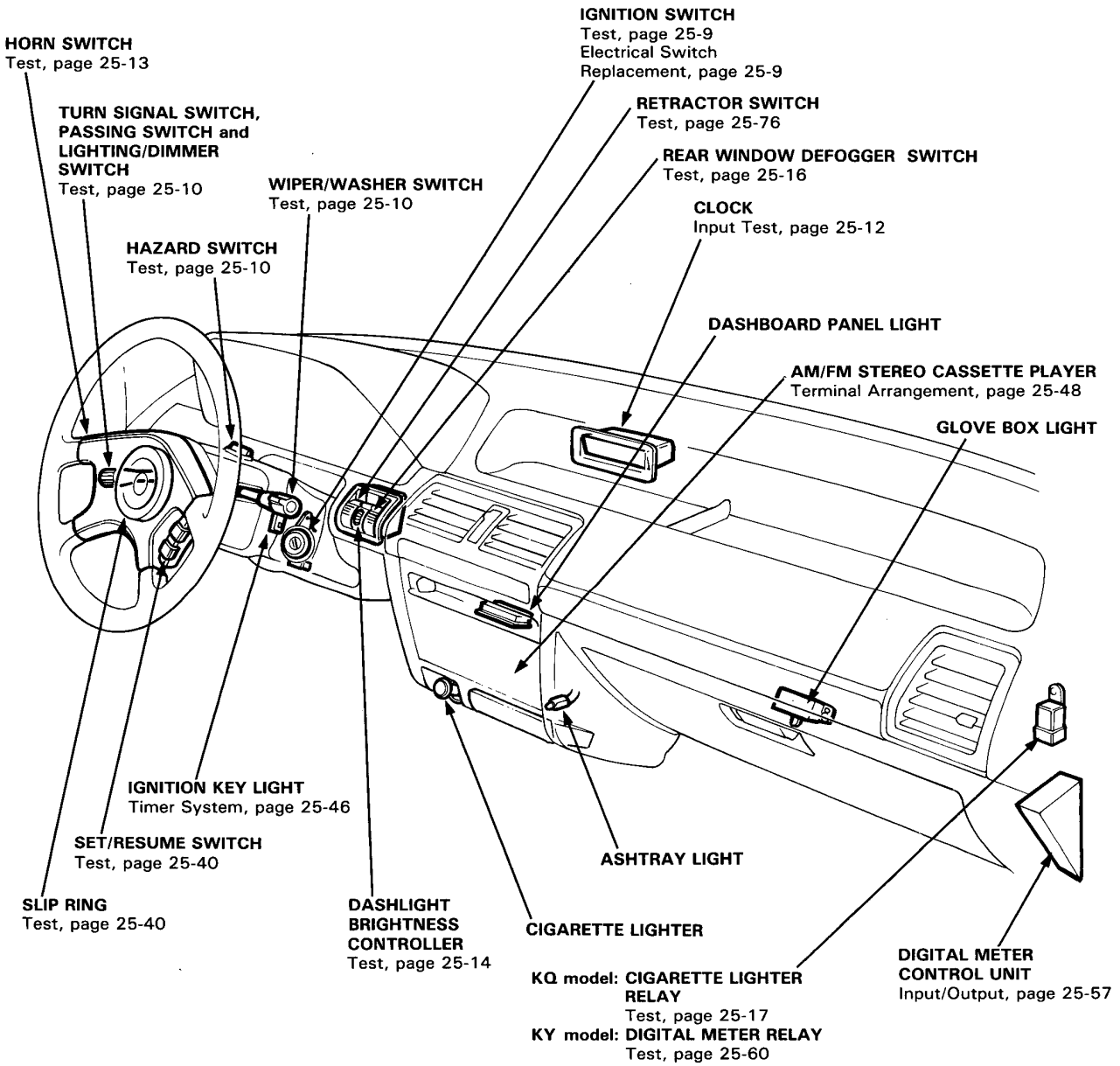
CAUTION: Do not pull on the wires when disconnecting a connector; pull only on the connector housings.

- When connecting a connector, push it until it clicks into place.

- Make sure multiple pin connectors are packed with silicone grease.

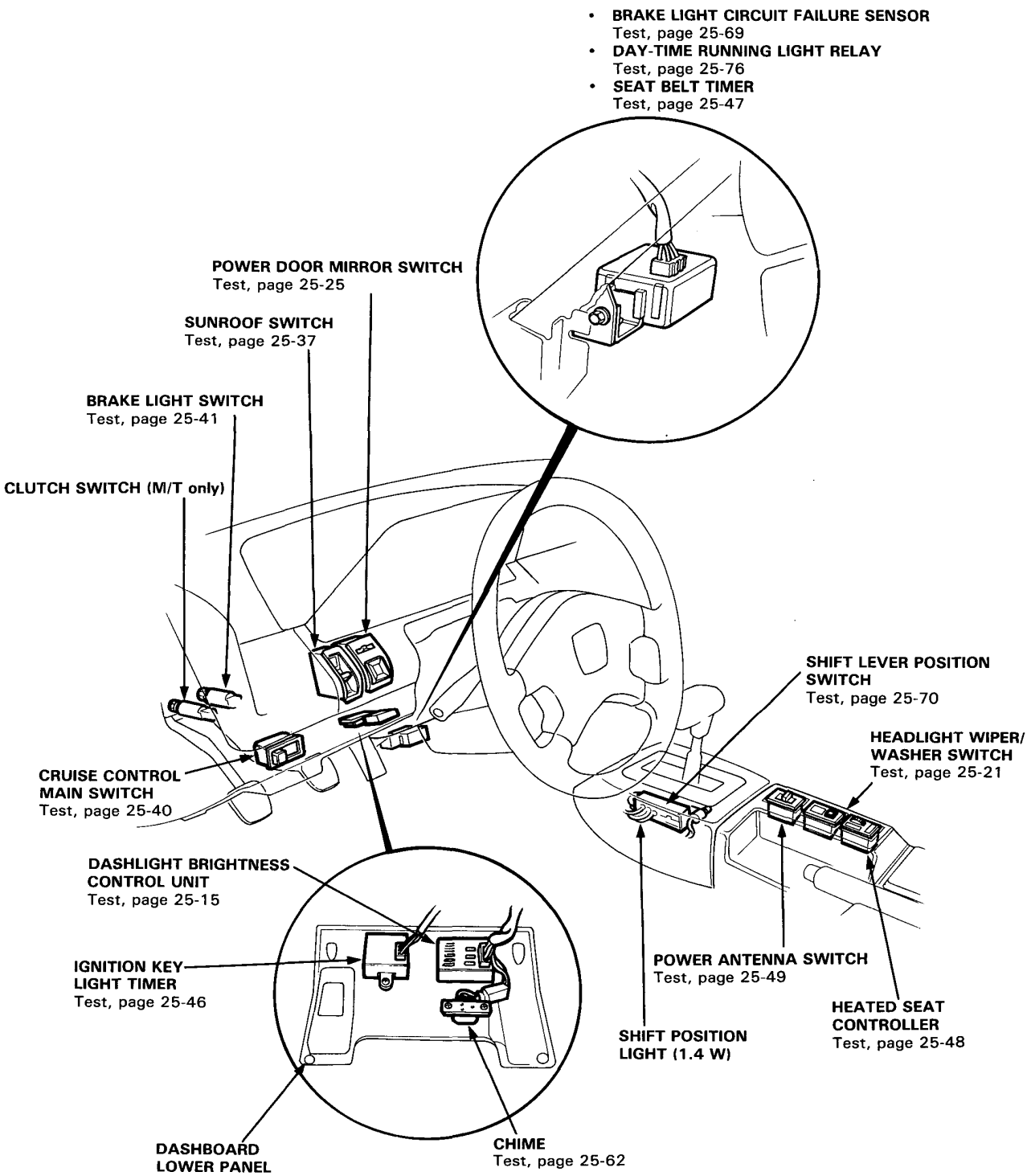


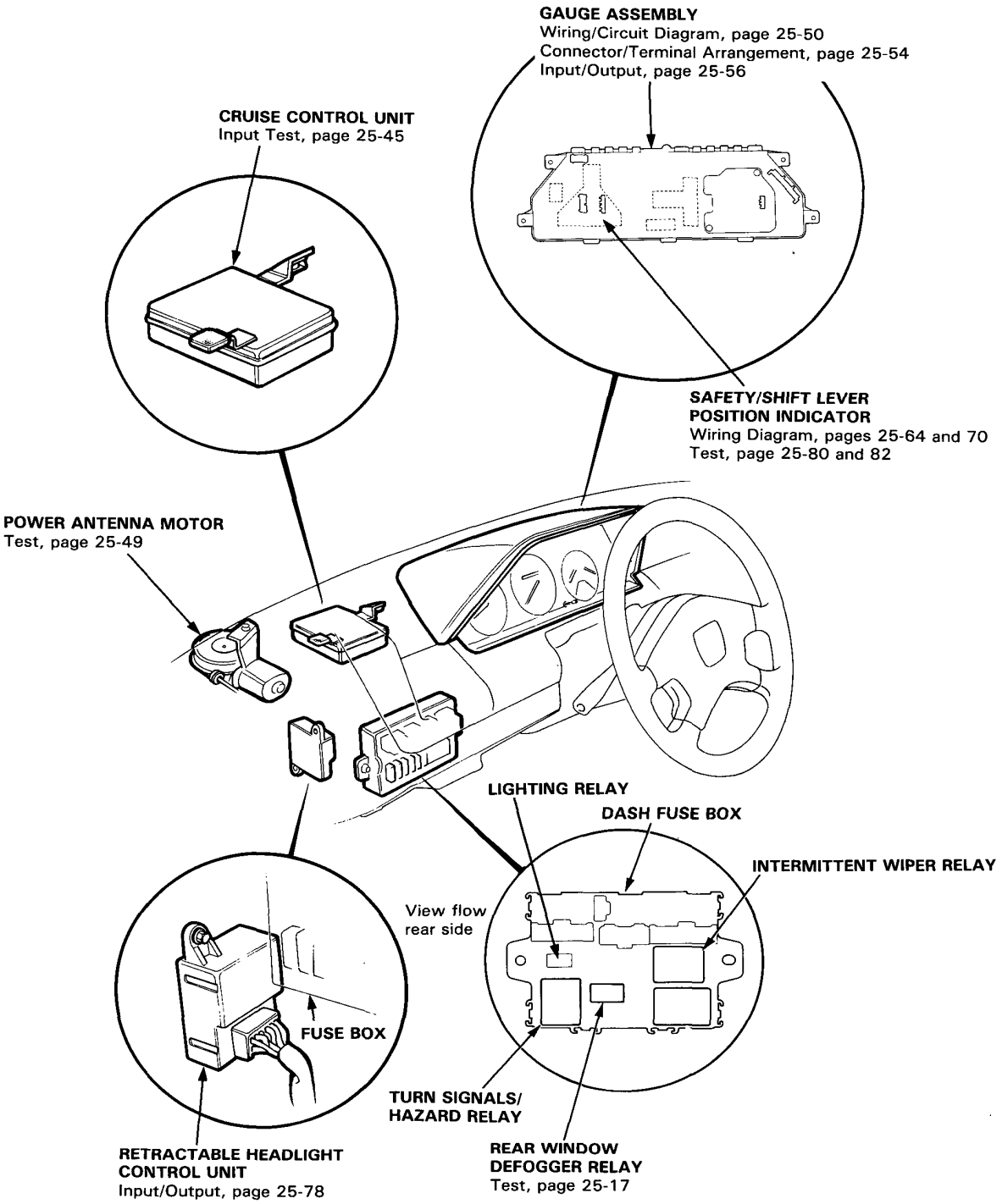
(Dashboard Area)



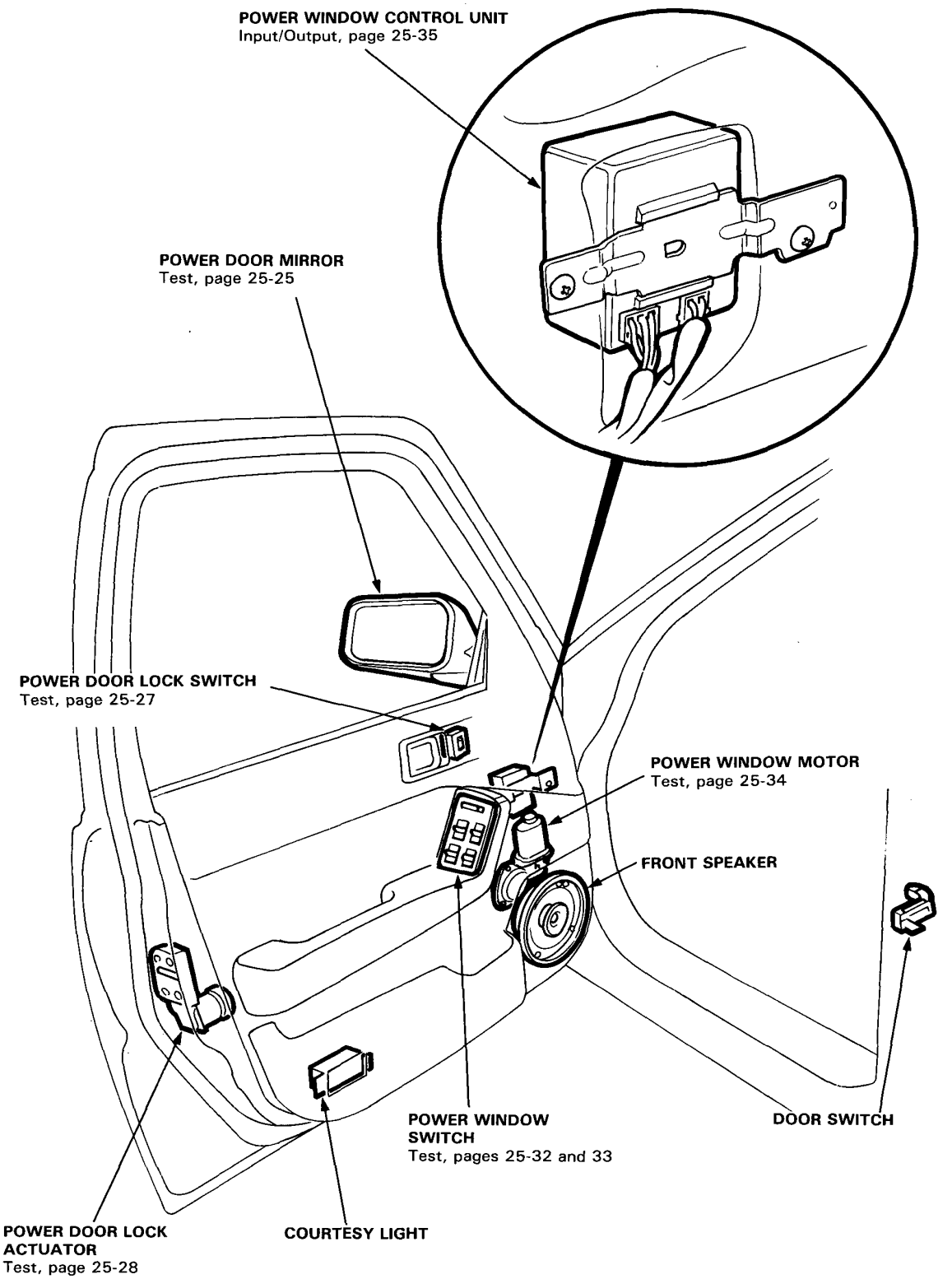
(cont'd)

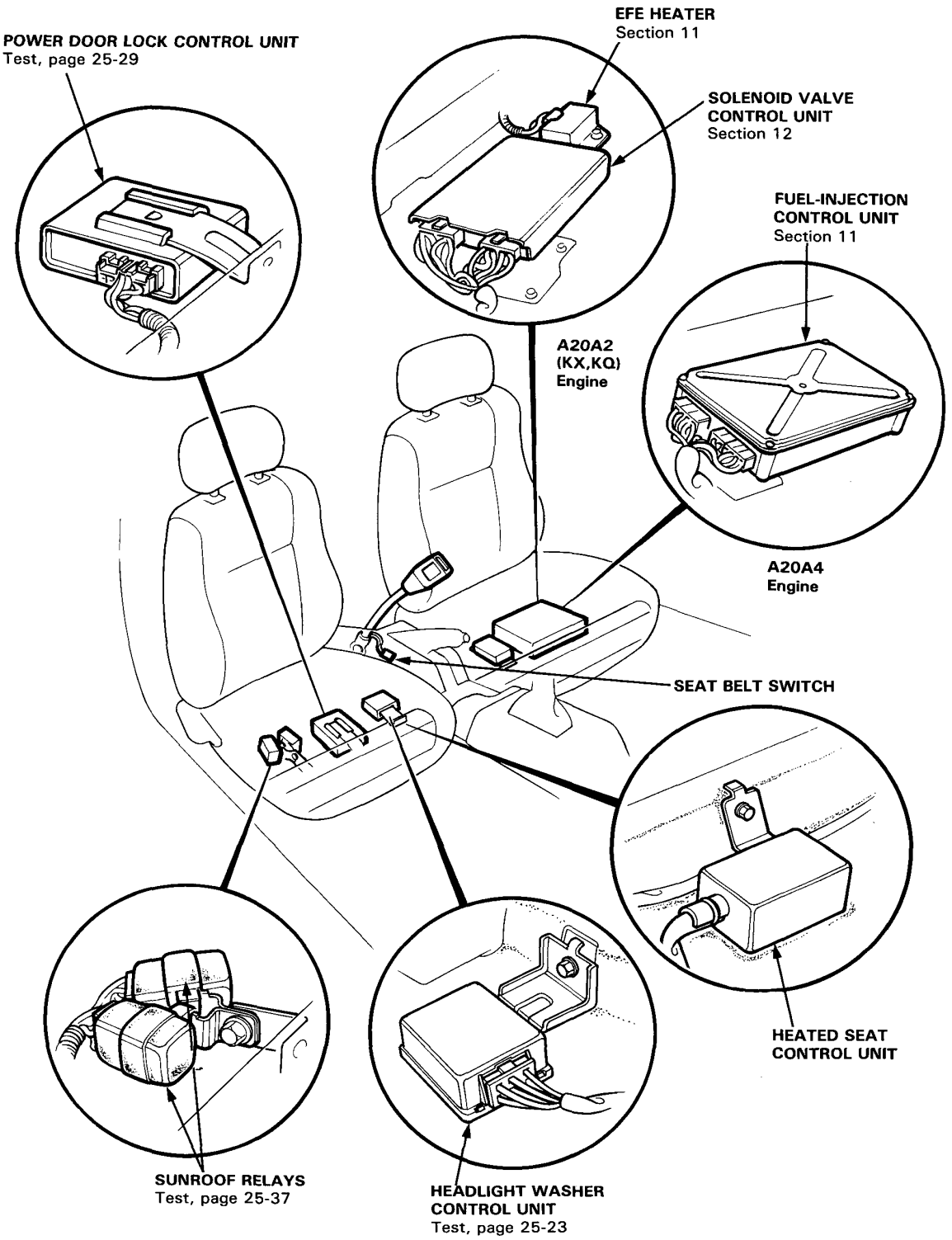
Illustrated Index (Dashboard Area cont'd)



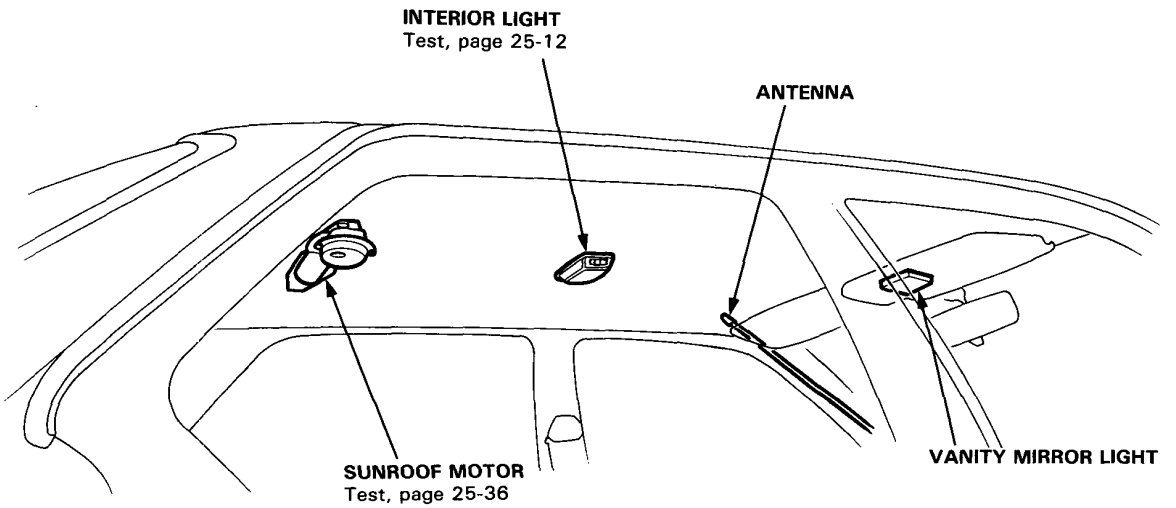

GAUGE ASSEMBLY
Wiring/Circuit Diagram, page 25-50
Connector/Terminal Arrangement, page 25-54
Input/Output, page 25-56
CRUISE CONTROL UNIT
Input Test, page 25-45
SAFETY/SHIFT LEVER
POSITION INDICATOR
Wiring Diagram, pages 25-64 and 70
Test, page 25-80 and 82
POWER ANTENNA MOTOR
Test, page 25-49
LIGHTING RELAY
DASH FUSE BOX
INTERMITTENT WIPER RELAY
View flow
rear side
FUSE BOX
TURN SIGNALS/
HAZARD RELAY
REAR WINDOW
DEFOGGER RELAY
Test, page 25-17
RETRACTABLE HEADLIGHT
CONTROL UNIT
Input/Output, page 25-78

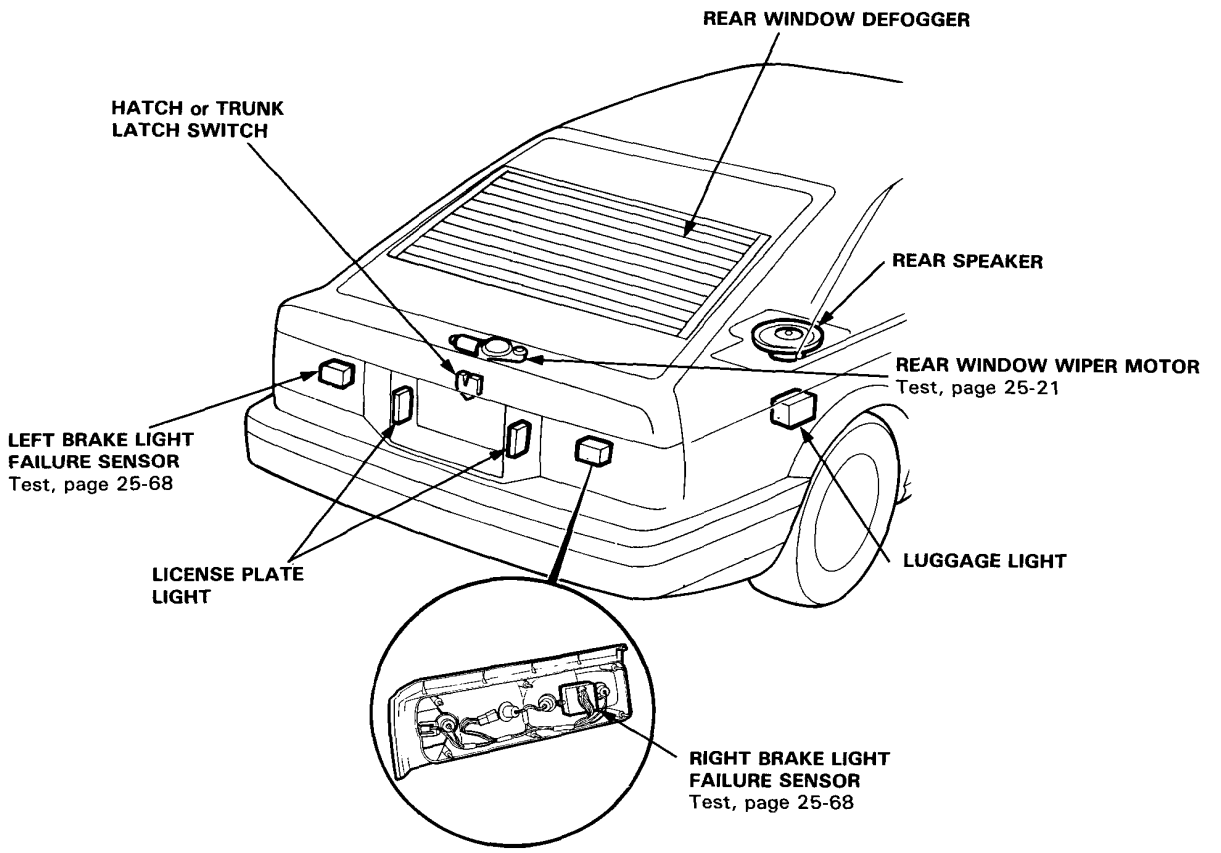
Illustrated Index (Door)




POWER DOOR LOCK CONTROL UNIT
Test, page 25-29
EFE HEATER
Section 11
SOLENOID VALVE
CONTROL UNIT
Section 12
FUEL-INJECTION
CONTROL UNIT
Section 11
A20A2
(KX,KQ)
Engine
A20A4
Engine
SEAT BELT SWITCH
HEATED SEAT
CONTROL UNIT
SUNROOF RELAYS
Test, page 25-37
HEADLIGHT WASHER
CONTROL UNIT
Test, page 25-23

Illustrated Index (Roof and Tail)



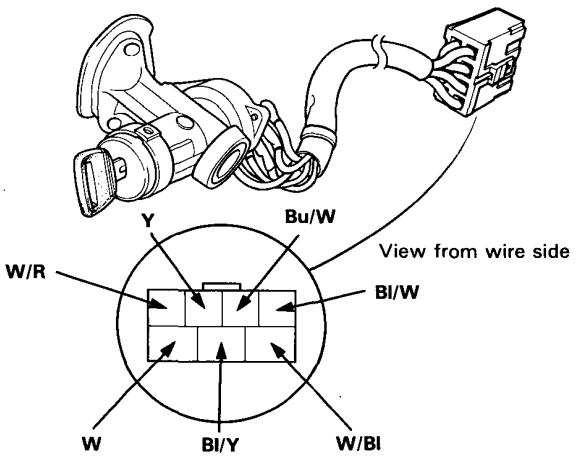


Ignition Switch

Test

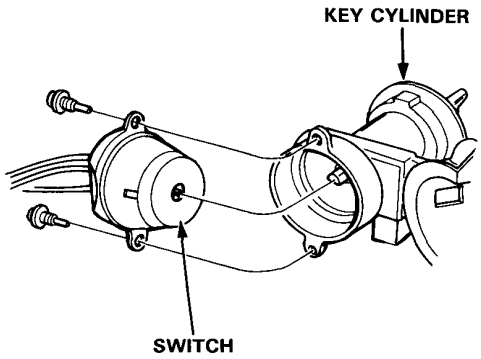
1. Disconnect the 7-P connector from the fuse box.
2. Check for continuity between the terminals in each switch position according to the table.

Position \ Terminal	W/R	W/Bl	Bu/W	W	Bl/Y	Y	Bl/W
0							
I	○—○						
II	○—○	○—○		○—○	○—○		
III				○—○	○—○		○



Electrical Switch Replacement

1. Remove the column lower panel and cover.
2. Disconnect the 7-P connector from the fuse box.
3. Insert the key and turn it to "O".
4. Remove the 2 bolts and replace the base of the switch.
5. If necessary, replace the key cylinder (section 18).



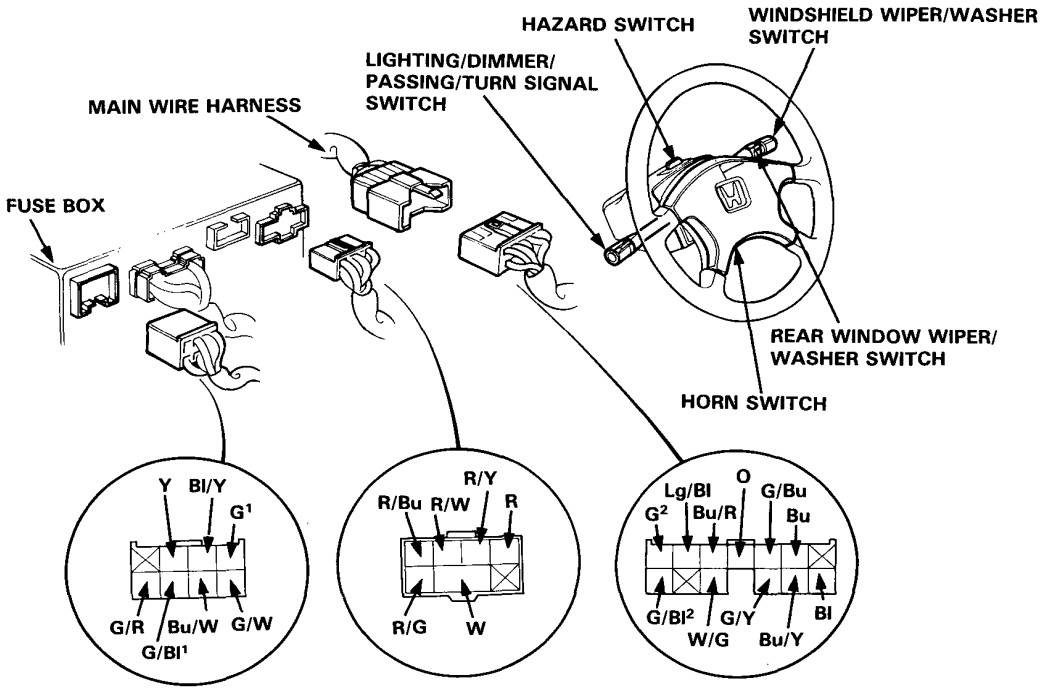
Combination Switch

Test

1. Disconnect the 7-P and 8-P connectors from the fuse box, and the 13-P connector from the main wire harness.

2. Check for continuity between the terminals in each switch position according to the tables.

   NOTE: Several different wires have the same color; They have been given a number suffix to distinguish them (for example G^1 and G^2 are not the same).



Turn Signal/Hazard Switch

European model:

Position: Terminal		W/G	Y	G/W	G/R	G/Y	G/Bu	O
Hazard Switch	Turn Signal Switch							
OFF	R		○—○		○—○			
	NEUTRAL		○—○					
	L		○—○		○—		—○	
ON	R	○—		—○	○—	—○	—○	—○
	NEUTRAL	○—		—○	○—	—○	—○	—○
	L	○—		—○	○—	—○	—○	—○

Others:

Position: Terminal		W/G	Y	G/W	G/R	G/Y	G/Bu
Hazard Switch	Turn Signal Switch						
OFF	R		○—○		○—○		
	NEUTRAL		○—○				
	L		○—○		○—		—○
ON	R	○—		—○	○—	—○	—○
	NEUTRAL	○—		—○	○—	—○	—○
	L	○—		—○	○—	—○	—○

Windshield Wiper Switch

Position: Wiper Switch	Position: Mist Switch	Bu/Y	Bu	Bl	Bu/W	G/Bl[1]	G[1]
OFF	OFF		○	○	○		
	ON	○	○	○			
INT	OFF		○	○	○	○	○
	ON	○		○		○	○
LO	OFF		○	○			
	ON	○		○			
HI	OFF	○		○			
	ON	○		○			

Windshield Washer Switch

Position \ Terminal	G/Bl[1]	Bl/Y
OFF		
ON	○	○

Rear Window Wiper/ Washer Switch

Position \ Terminal	G	Lg/Bl	Bl	G/Bl[2]	G/Bl[1]
OFF	○	○			
ON	○		○		
WASHER	○		○	○	○

(Internal connection)

(Internal connection)

Lighting/Dimmer Switch

European model:

Position: Lighting Switch	Position: Dimmer Switch	W	R	R/Y	R/G	R/Bu	R/W
OFF			○	○			
•		○	○	○			
●	HIGH	○	○	○	○	○	
	LOW	○	○	○	○		○

Passing Switch

Position \ Terminal	W	R/Bu
OFF		
ON	○	○

Horn Switch

Position \ Terminal	Bu/R	
OFF		
ON	○	⏚

(Internal connection)

(Internal connection)

General Export model (Sedan only):

Position: Lighting Switch	Position: Dimmer Switch	W	R	R/Bu	R/W
OFF					
•		○	○		
●	HIGH	○	○	○	
	LOW	○	○		○

(Internal connection)

(Internal connection)

Others:

Position: Lighting Switch	Position: Dimmer Switch	W	R	R/G	R/Bu	R/W
OFF						
•		○	○			
●	HIGH	○	○	○	○	
	LOW	○	○	○		○

(Internal connection)

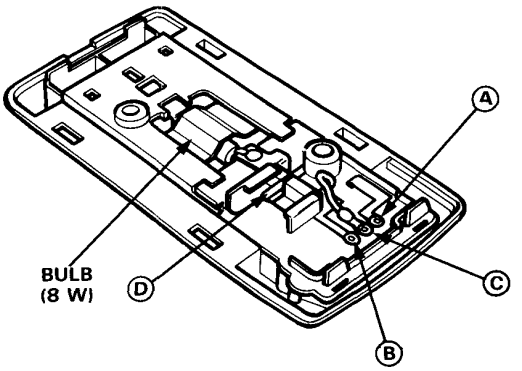
(Internal connection)

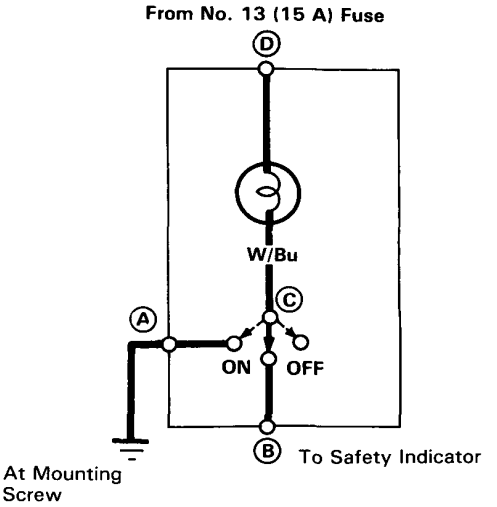
Interior Light, Clock

Interior Light Test

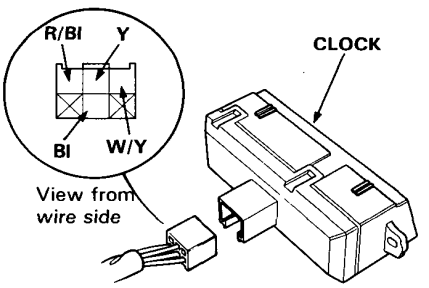
1. Remove the interior light.
2. Check for continuity between the terminals in each switch position according to the table.

Position \ Terminal	Ⓐ	Ⓑ	Ⓒ		Ⓓ
OFF			○	○	○
MIDDLE		○	○	○	○
ON	○	○	○	○	○





Clock Input Test



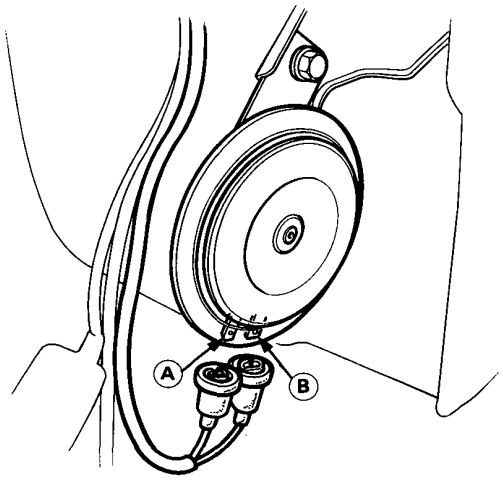
No.	Wire	Test condition	Test: disired result	Possible cause (if result is not obtained)
1	Bl	Under all conditions	Check for continuity to ground: should be continuity.	Poor ground. An open in the wire.
2	Y	Ignition switch ON	Check for voltage to ground: should have battery voltage.	An open in the wire. Blown No. 2 (10 A) fuse in fuse box.
3	W/Y	Under all conditions		An open in the wire. Blown No. 11 (10 A) fuse in relay box.
4	R/Bl	Lighting switch ON		An open in the wire. Faulty lighting switch.

NOTE: Replace the clock if all tests prove OK.

Horn

Horn Test

1. Remove the front bumper and disconnect the wires from the horn.
2. Test the horn by connecting battery wires to Ⓐ and Ⓑ terminals.
3. If the horn fails to sound, replace it.

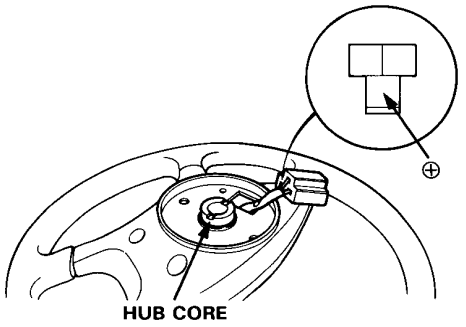


Switch Test

1. Remove the steering wheel, then turn it over.
2. Check for continuity between the hub core and contacting, or the hub core and ⊕ terminal for cars with equipped with cruise control, according to the table.

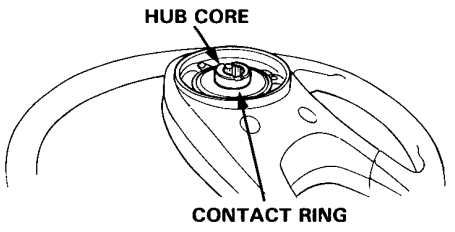
With Cruise Control:

Terminal / Position	HUB CORE	⊕
PRESS	○	○
FREE		



Without Cruise Control:

Terminal / Position	HUB CORE	CONTACT RING
PRESS	○	○
FREE		



3. If OK. reinstall the steering wheel, then test the combination switch.

Dashlight Brightness Control

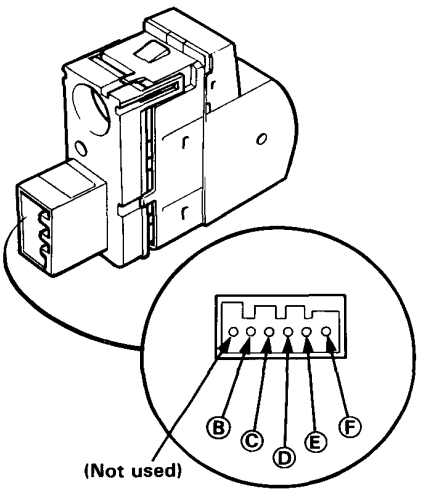
Controller Test

1. Remove the controller.
2. Measure resistance between (E) and (F) terminals.

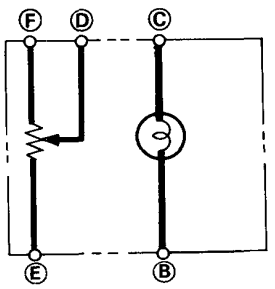
   Resistance: 10 kΩ

   NOTE: Resistance will vary slightly with temperature.
3. Measure resistance between (D) and (F) terminals while rotating the adjusting dial.
   Resistance should vary from 0 to 10,000 ohms as the dial rotated.

With Analog Meter:

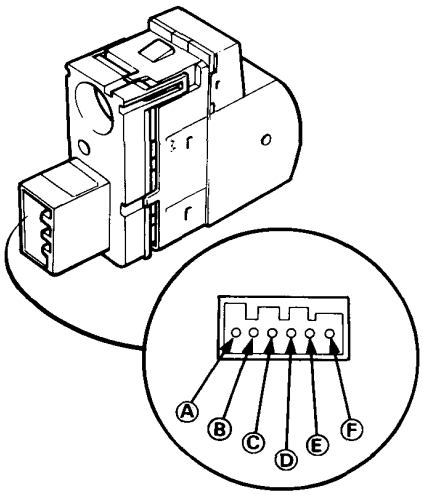


Circuit Diagram

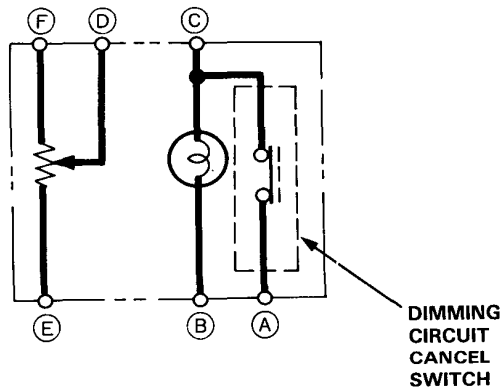


With Digital Meter:

4. Check for continuity between (A) and (C) terminals with dimming circuit cancel switch OFF.
   There should be no continuity.

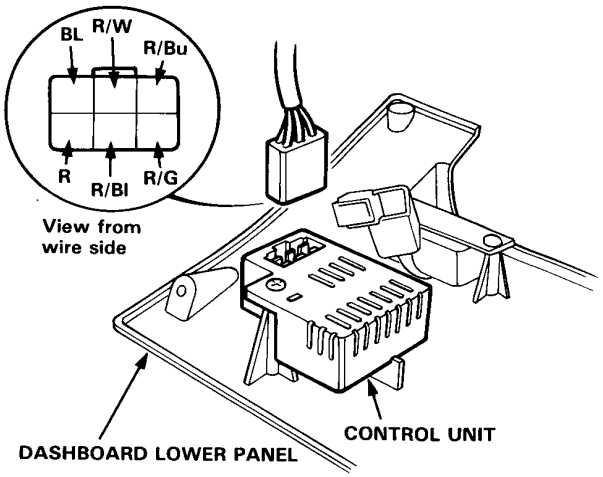


Circuit Diagram



Control Unit Test

Remove the dashboard lower panel and disconnect the 6-P connector from the control unit.



No.	Wire	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	Bl	At all times under all conditions	Check for continuity to ground: should be continuity.	Poor ground. An open in the wire.
2	R/Bl	Lighting switch ON	Check for voltage to ground: should have battery voltage.	An open in the wire. Blown No. 14 (15 A) fuse.
3	R	Lighting switch ON	Attach to ground: dash lights should come on full bright.	An open in R/Bl or R wire.
4	R/G and R/W	Adjusting dial rotated	Check for resistance between R/G and R/W wires: should have 10 kΩ at all time.	An open in the wires. Faulty controller.
5	R/Bu and R/W	Adjusting dial rotated	Check for resistance between R/Bu and R/W wires: should vary from 0 to 10,000 ohms as the dial is rotated.	An open in the wire. Faulty controller.

NOTE: Replace the control unit if all tests prove OK.

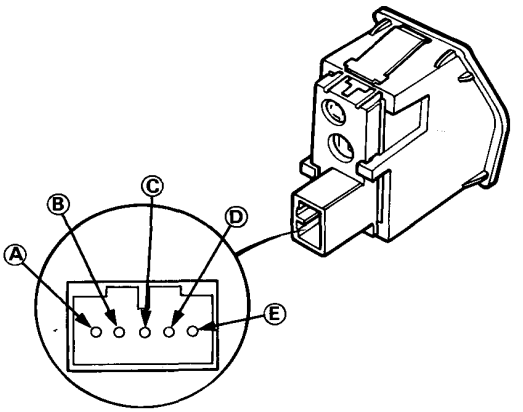
Rear Window Defogger

Switch Test

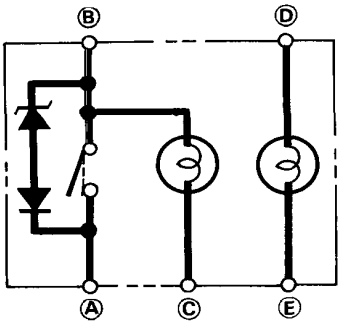
1. Remove the rear window defogger switch.
2. Check for continuity between the terminals in each switch position according to the table.

With Illumination:

Position \ Terminal	Ⓐ	Ⓑ		Ⓒ	Ⓓ		Ⓔ
OFF		○	○	○	○	○	○
ON	○	○	○	○	○	○	○

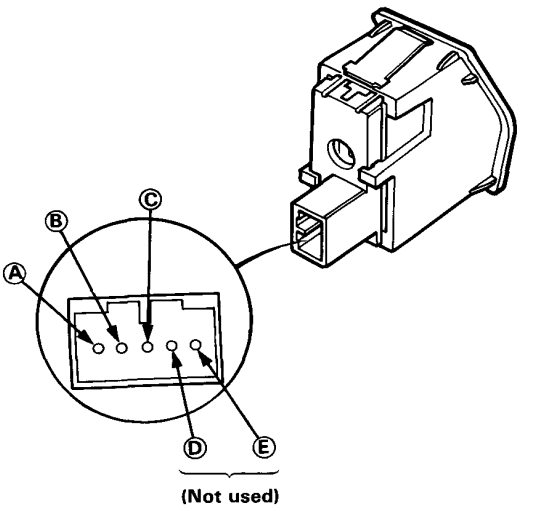


Circuit Diagram

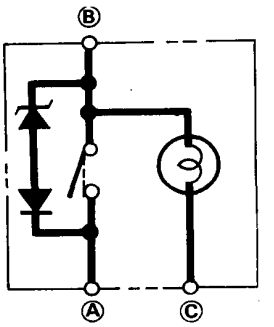


Without Illumination:

Position \ Terminal	Ⓐ	Ⓑ		Ⓒ
OFF		○	○	○
ON	○	○	○	○

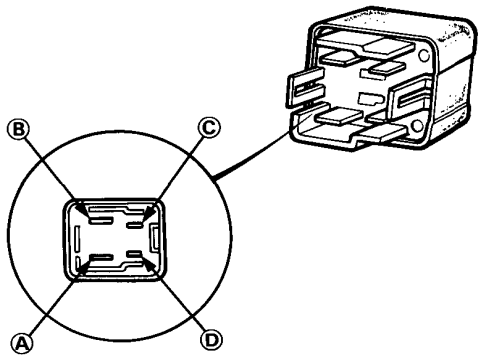


Circuit Diagram

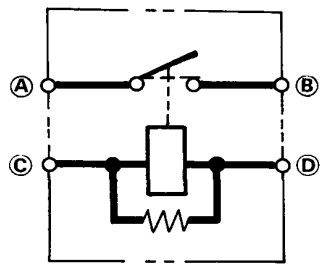


Relay Test

1. Remove the rear window defogger relay from the back of the fuse box.
2. There should be continuity between Ⓐ and B terminals when the battery is connected to Ⓒ and Ⓓ terminals.
   There should be no continuity when the battery is disconnected.

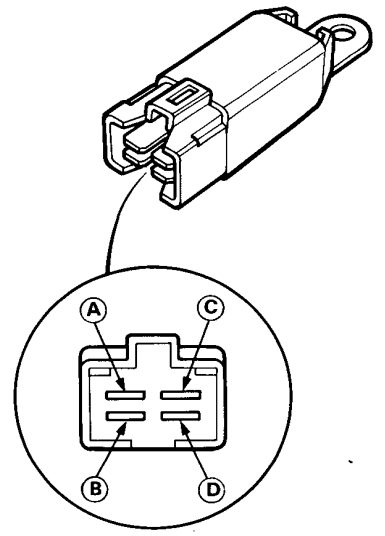


Circuit Diagram

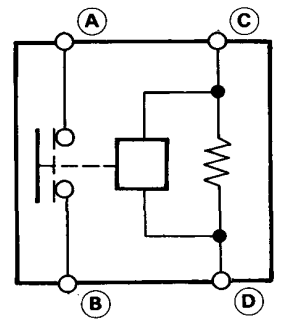


Relay Test

1. Remove the cigarette lighter relay located on the right side under dash.
2. There should be continuity between Ⓐ and Ⓑ terminals when the battery is connected to Ⓒ and Ⓓ terminals.
   There should be continuity between Ⓐ and Ⓑ terminals when the battery is disconnected.

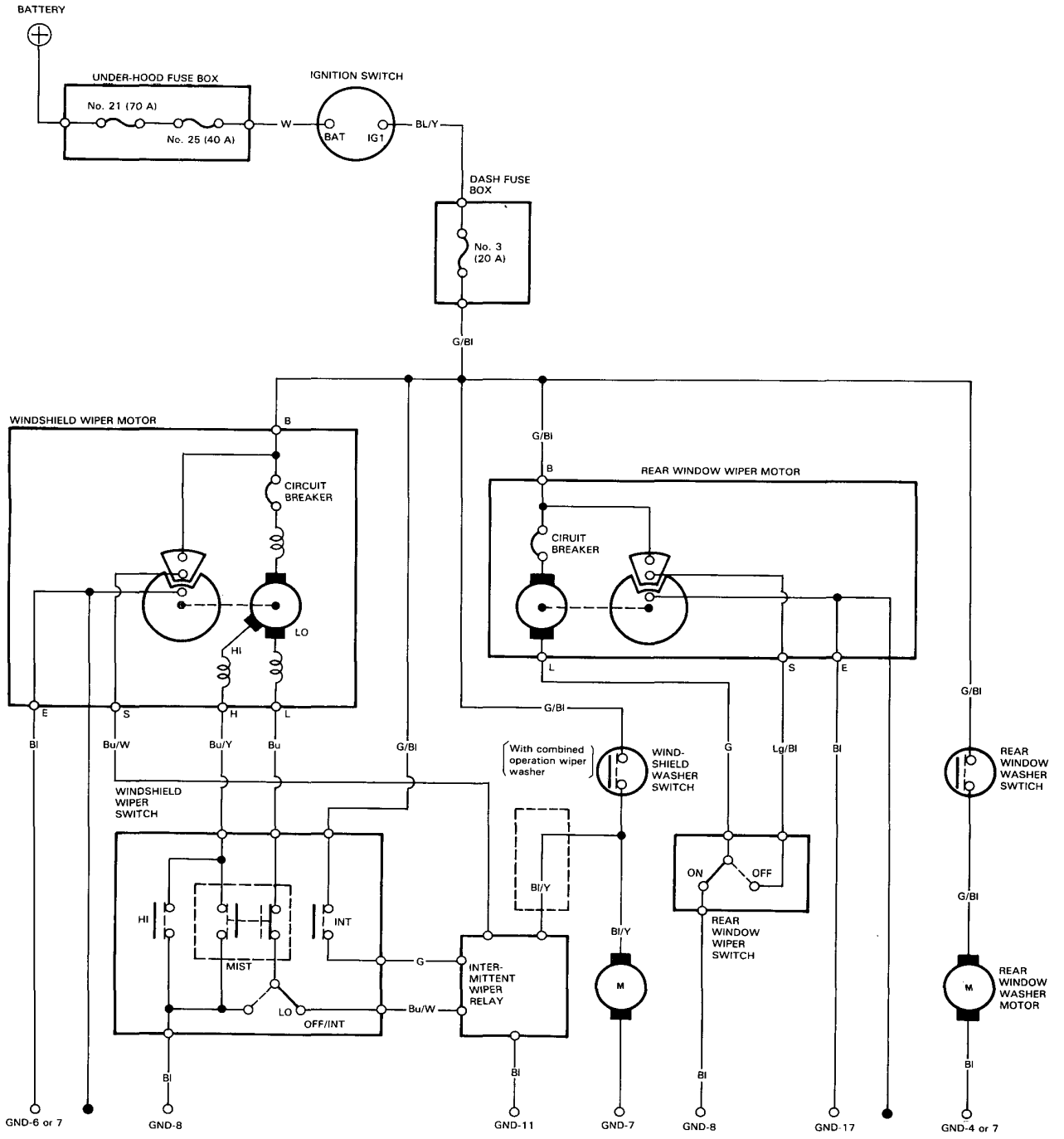


Circuit Diagram

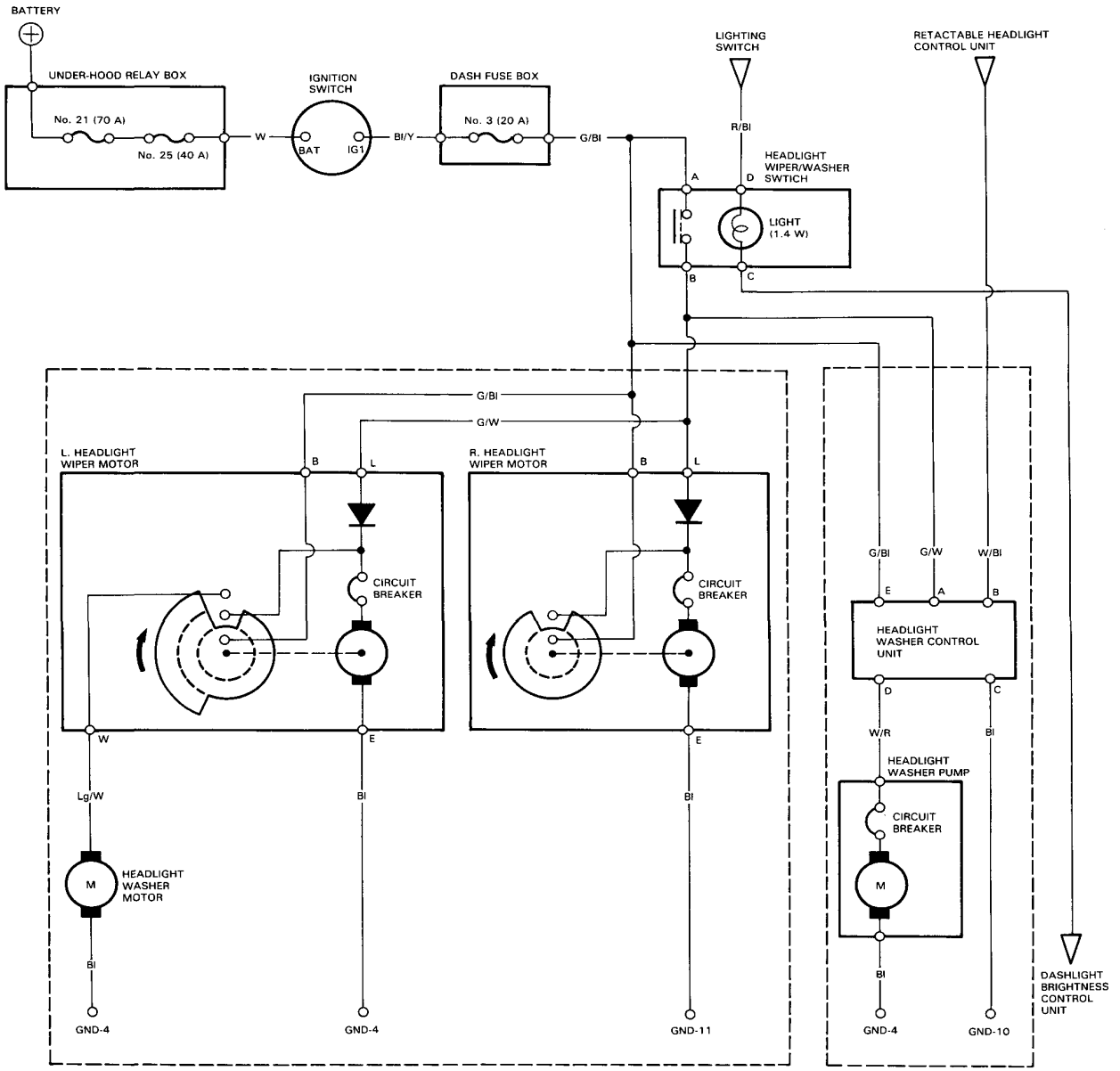


Wiring Diagram

Windshield and Rear Window Wiper/Washer:



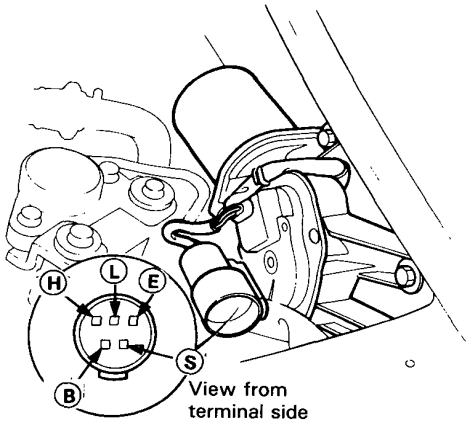
Headlight Wiper/Washer:



Windshield Wiper Motor Test

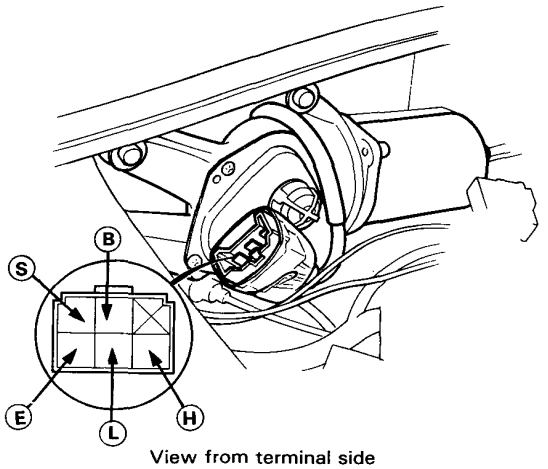
1. Disconnect the 5-P connector.
2. Test motor operation:
   LOW SPEED: Connect battery positive wire to (B) terminal and negative to (L).
   HIGH SPEED: Connect battery positive wire to (B) terminal and negative to (H).
3. If the motor fails to run smoothly, replace it.

European and KQ models:



View from terminal side

Others:

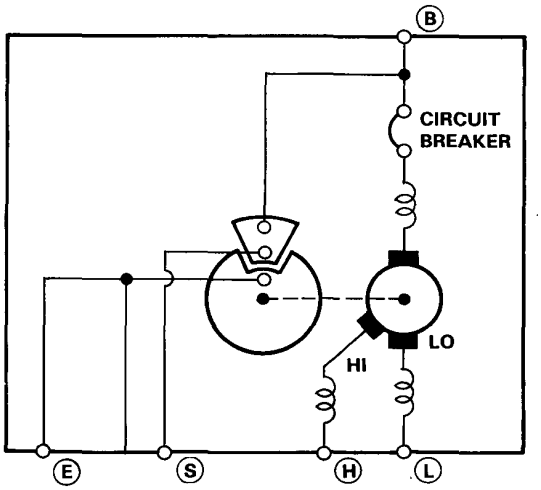


View from terminal side

4. Check for continuity between the terminals according to the table.

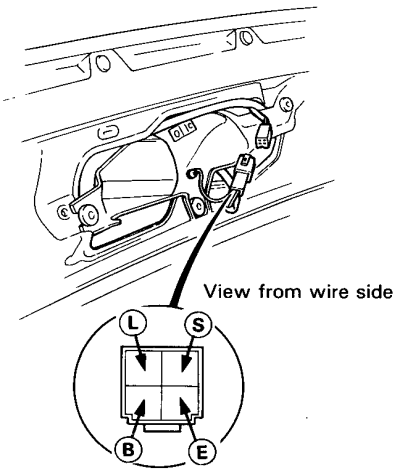
Wiper Blade \ Terminals	(B)	(S)	(E)
At park position	○——	——○	
At center position		○——	——○

Circuit Diagram



Rear Window Wiper Motor Test

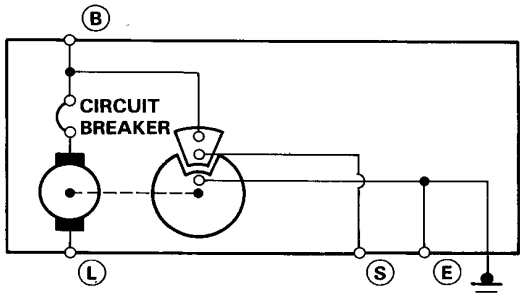
1. Remove the hatch trim panel and disconnect the 4-P connector.
2. Test motor operation by connecting battery positive wire to Ⓑterminal and negative to Ⓛ .
3. If the motor fails to run smoothly, replace it.



4. Check for continuity between the terminals according to the table.

Wiper Blade \ Terminal	Ⓑ	Ⓢ	Ⓔ
At park position	○—○		
At center position		○—○	

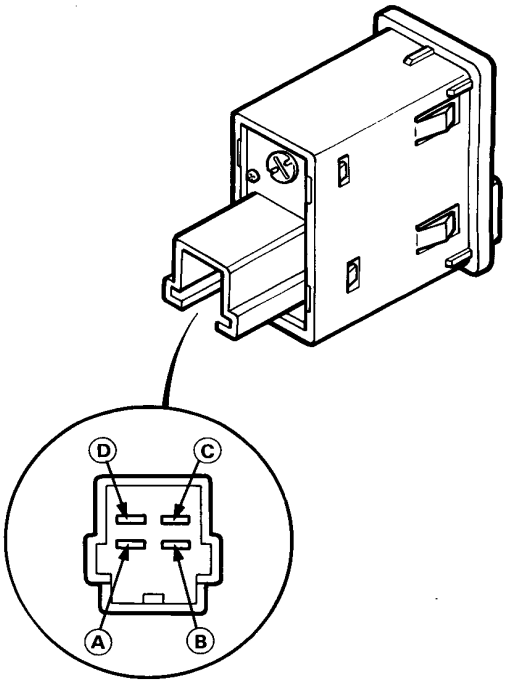
Circuit Diagram



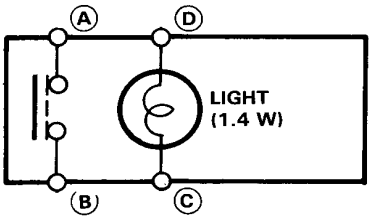
Headlight Wiper/Washer Switch Test

1. Remove the switch from the center console.
2. Check for continuity between the terminals according to the table.

Position \ Terminal	Ⓐ	Ⓑ	Ⓒ		Ⓓ
OFF			○	○	○
ON	○—○		○	○	○

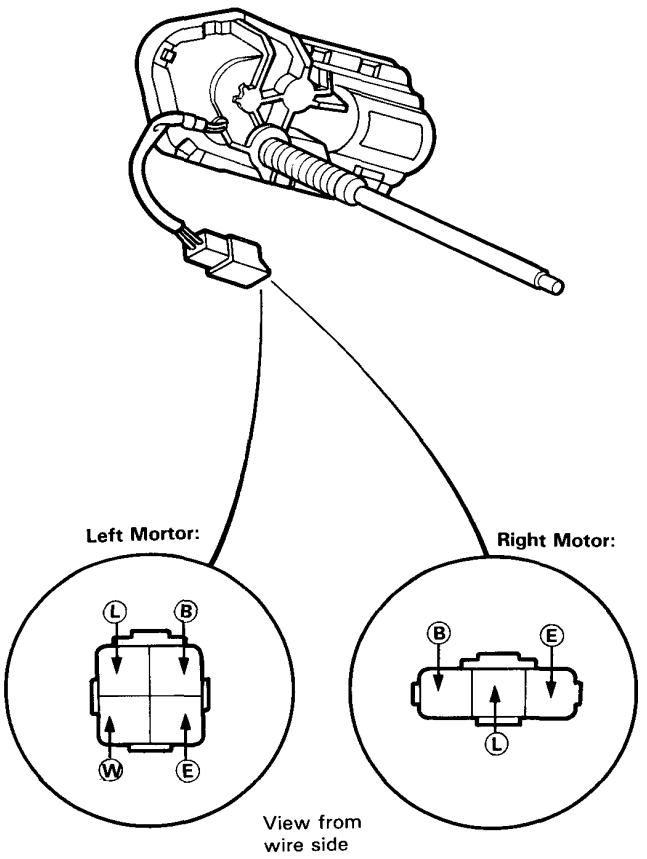


Circuit Diagram



Headlight Wiper Motor Test

1. Remove the front bumper and disconnect the 3-P connector (for right motor), or 4-P (for left motor).
2. Test motor operation by connecting battery positive wire to (L) terminal and negative to (E).
3. If the motor fails to run smoothly, replace it.

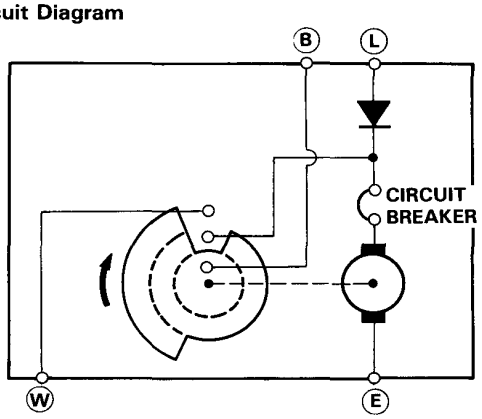


4. Check for continuity between the terminals according to the tables.

Left Motor:

Terminal / Wiper Blade	W	B		L
At park position				
At quarter position	○	○	▶	○
At center position		○	▶	○

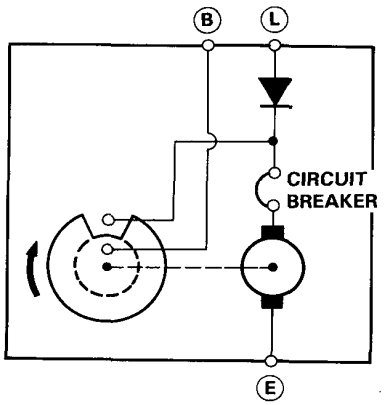
Circuit Diagram



Right Motor:

Terminal / Wiper Blade	B		L
At park position			
At center position	○	▶	○

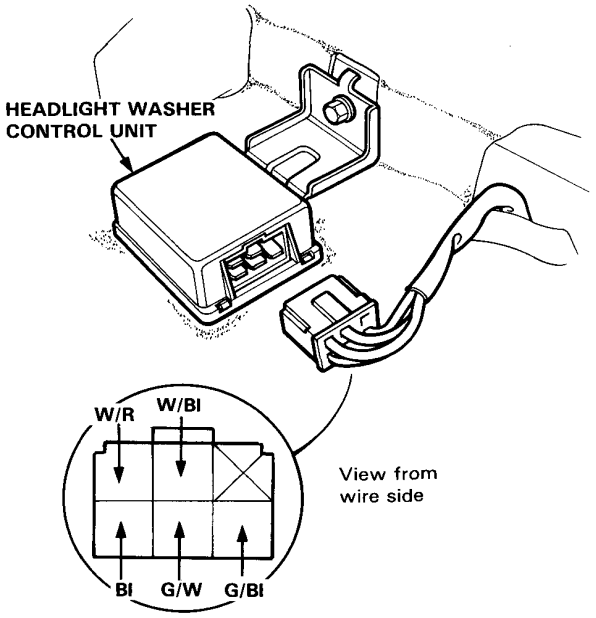
Circuit Diagram



Headlight Washer Control Unit Test

Disconnect the 6-P connector from the control unit under the front passenger's seat.
Make the following input tests at the harness pins.
If all tests prove OK, yet the headlight washer still fails to work, replace the control unit.

NOTE: Before testing, check the No. 3 (20A) fuse in the dash fuse box.

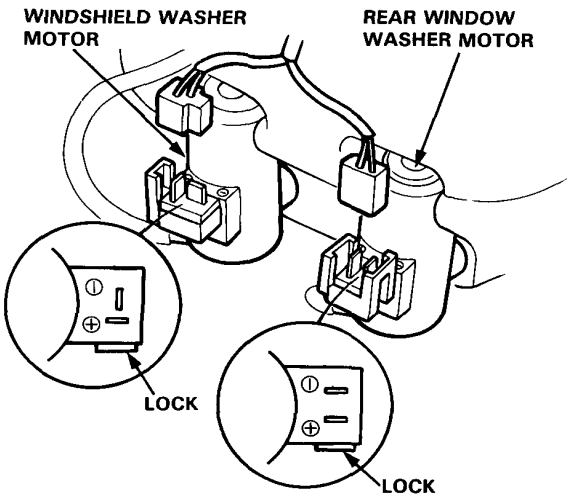


No.	Wire	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	Bl	Under all conditions.	Check for continuity to ground: should be continuity.	• Poor ground. • An open in the wire.
2	G/Bl	Ignition switch ON.	Check for voltage to ground: should be battery voltage.	• Blown No. 3 (20A) fuse. • An open in the wire.
3	G/W	Ignition switch and headlight washer switch ON.	Check for voltage to ground: should be battery voltage.	• Faulty headlight washer switch. • An open in the wire.
4	W/R	Connect battery positive wire to W/R terminal and negative to ground.	Check pump operation: Pump should run as the battery is connected.	• Faulty headlight washer pump. • An open in the wire. • Poor ground.
5	W/G	Headlight ON.	Check for voltage to ground: should be battery voltage.	• An open in the wire. • Faulty retractable headlight control unit.

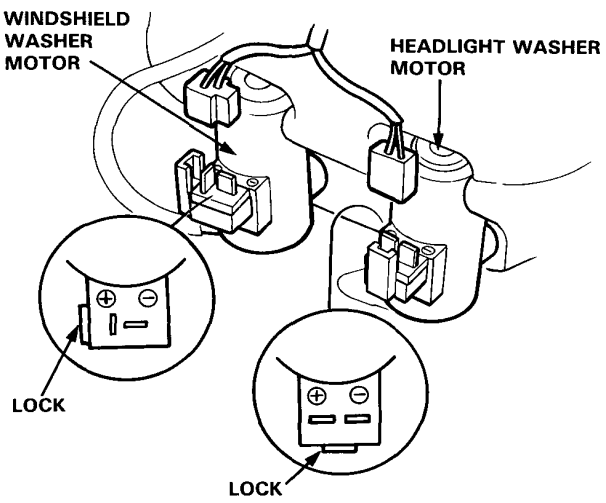
Washer Motor Test

1. Remove the front bumper and disconnect the 2-P connectors from the washer motors.
2. Test motor operation by connecting battery positive wire to ⊕ terminal and negative to ⊖.
3. If the motor fails to run, replace it.

Hatchback:

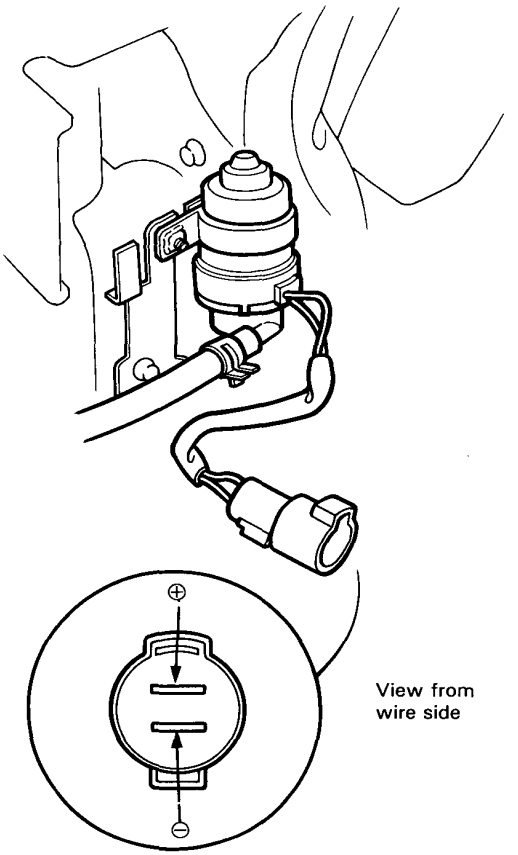


Sedan:



Washer Pump Test

1. Remove the front bumper and disconnect the 2-P connector.
2. Test motor operation by connecting battery positive wire to ⊕ terminal and negative to ⊖.
3. If the motor fails to run, replace it.

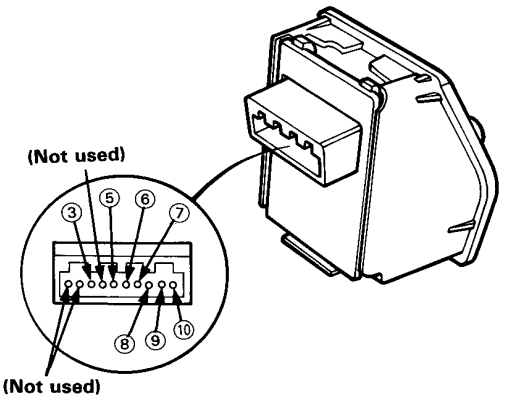


Power Door Mirror

Switch Test

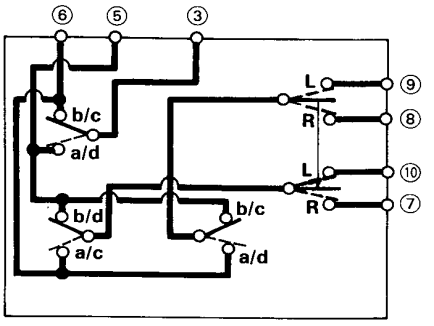
1. Remove the power door mirror switch.
2. Check for continuity between the terminals in each switch position according to the table.

Terminal / Postion		⑧	⑨	③	⑦	⑩	⑤	⑥
R	UP			○			○	
		○			○		○	
	DOWN	○			○		○	
				○				○
	LEFT			○	○		○	
		○						○
	RIGHT	○					○	
				○	○			○
L	UP			○			○	
			○			○		○
	DOWN		○			○	○	
				○				○
	LEFT			○		○	○	
			○					○
	RIGHT		○				○	
				○		○		○



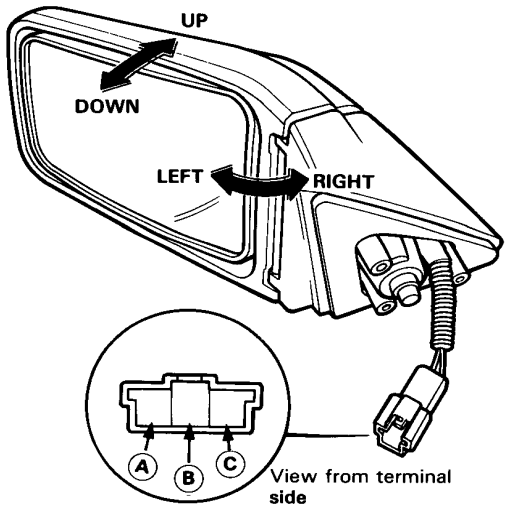
Circuit Diagram

a: UP
b: DOWN
c: RIGHT
d: LEFT

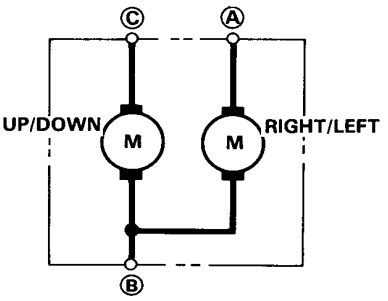


Actuator Test

1. Remove the door trim panel and disconnect the 3-P connector.
2. Test mirror actuator operation:
   - TILT UP: Connect battery positive wire to Ⓒ terminal and negative to Ⓑ terminal.
   - TILT DOWN: Connect battery positive wire to Ⓑ terminal and negative to Ⓒ terminal.
   - SWING RIGHT: Connect battery positive wire to Ⓐ terminal and negative to Ⓑ terminal.
   - SWING LEFT: Connect battery positive wire to Ⓑ terminal and negative to Ⓐ terminal.
3. If the mirror fails to operate properly, replace it.

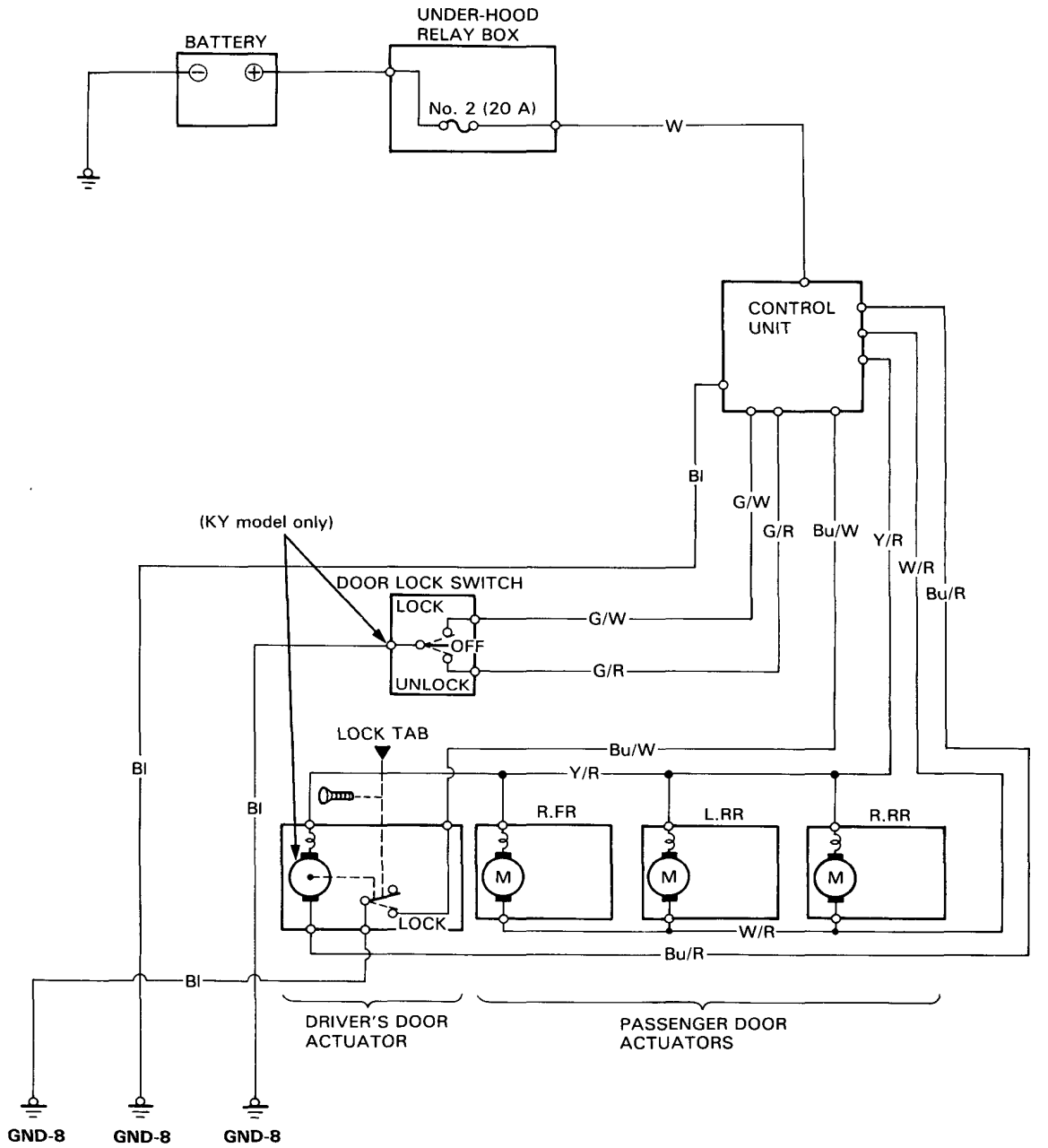


Circuit Diagram



Power Door Locks

Wiring Diagram



Troubleshooting

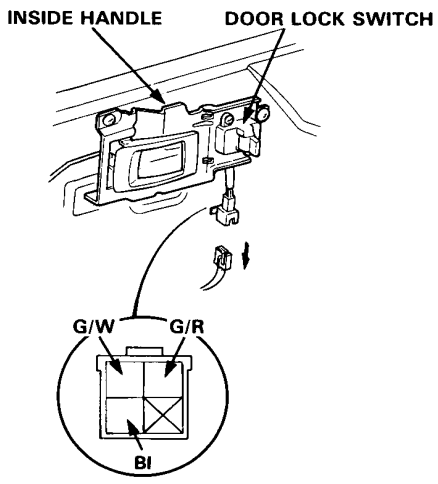
NOTE: The numbers in the table show the troubleshooting sequence.

	Symptom	Item to be inspected	Blown No. 2 (20 A) fuse in relay box	Door lock switch	Driver's door actuator: Door lock knob switch	Driver's door actuator: Motor	Passenger door actuator	Control unit	Door lock rod/linkage (Section 21)	Poor ground	Open circuit in wires or loose or disconnected terminals
	Doors don't lock with driver's door lock knob switch	All passenger doors	1		2			3	4	GND-8	W, Bu/W, Y/R or W/R
		One or more passenger door					1		2		Y/R or W/R
KY model only	Doors don't lock or unlock with door lock switch	All doors	1	2				3		GND-8	W, G/W, G/R or Y/R
		Driver's door				1		2	3		Y/R or Bu/R
		All passenger doors						1			Y/R or W/R
		One or more passenger door					1		2		Y/R or W/R

Door Lock Switch Test

1. Remove the driver's door trim panel.
2. Disconnect the 4-P connector.
3. Check for continuity between the terminals in each switch position according to the table.

Terminal / Position	G/R	Bl	G/W
UNLOCK	○——○		
OFF			
LOCK		○——○	

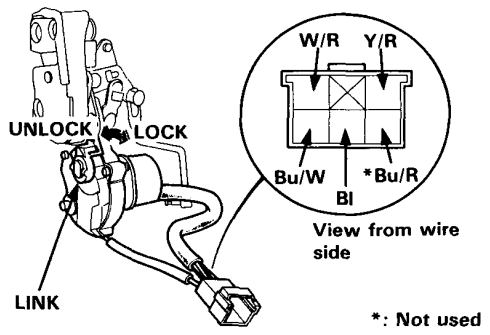


Power Door Locks

Driver's Door Actuator Test

1. Remove the door trim panel.
2. Disconnect the 6-P connector.
3. Test actuator operation:
   LOCK: With battery positive wire connected to the Y/R terminal, connect negative to the W/R terminal momentarily.
   UNLOCK: With battery positive wire connected to the W/R terminal, connect negative to the Y/R terminal momentarily.

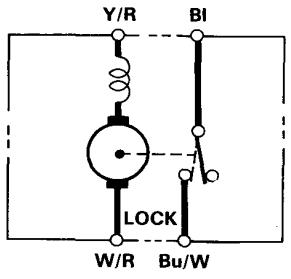
   CAUTION: To prevent damage to the motor, apply battery voltage momentarily.



4. If the actuator fails to operate properly, replace it.
5. Check for continuity between the Bu/W and Bl terminals according to the table.

Terminal / Position	Bu/W	Bl
LOCK	○	○
UNLOCK		

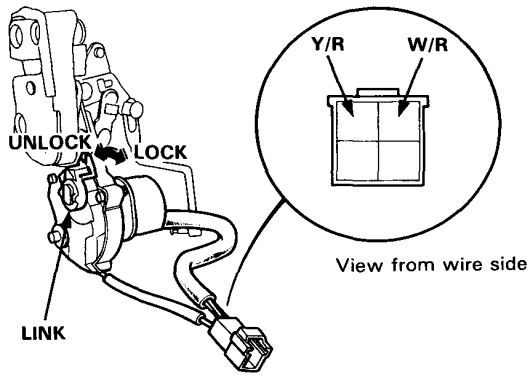
Circuit Diagram



Passenger Door Actuators Test

1. Remove the door trim panel.
2. Disconnect the 4-P connector.
3. Test actuator operation:
   LOCK: With battery positive wire connected to the Y/R terminal, connect negative to the W/R terminal momentarily.
   UNLOCK: With battery positive wire connected to the W/R terminal, connect negative to the Y/R terminal momentarily.

   CAUTION: To prevent damage to the motor, apply battery voltage momentarily.

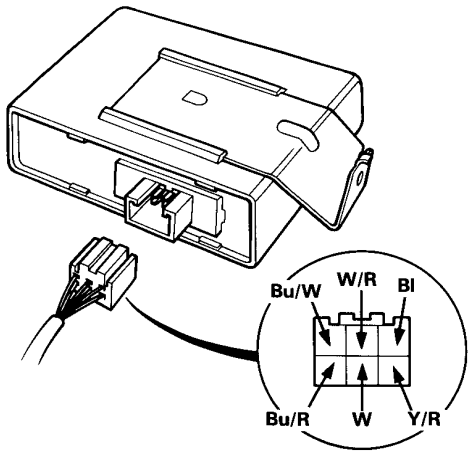


4. If the actuator fails to operate properly, replace it.

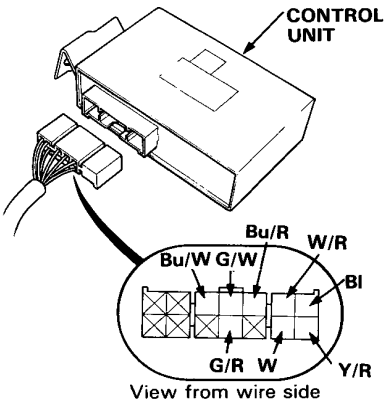
Control Unit Test

Input Test:
Remove the front passenger's seat and disconnect the 10-P connector from the control unit.

Except KY model:



KY model:



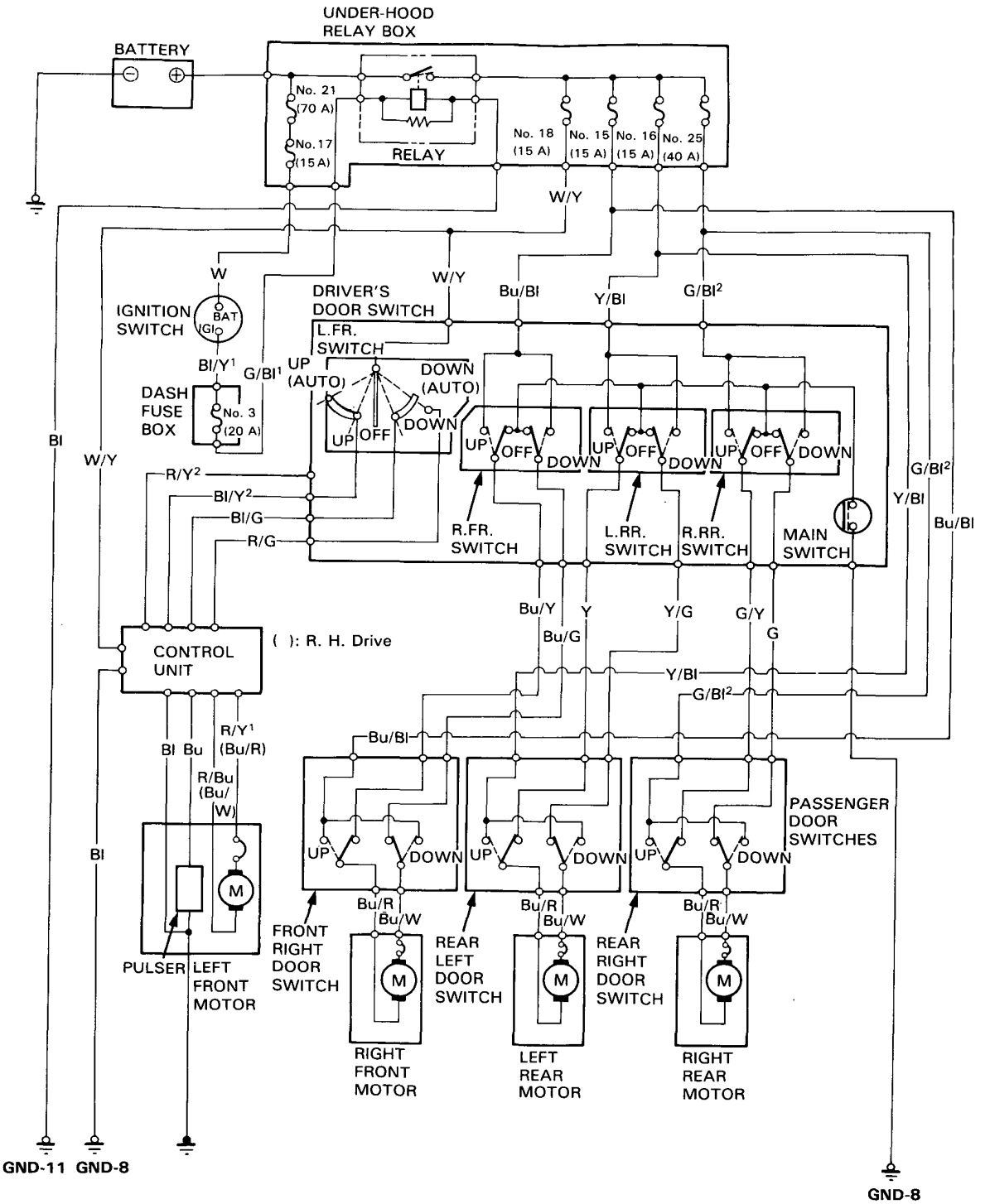
No.	Wire	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	Bl	Under all conditions	Check for continuity to ground: should be continuity.	Poor ground. An open in the wire.
2	W	Under all conditions	Check for voltage to ground: should have battery voltage.	An open in the wire. Blown No. 2 (20 A) fuse.
3	Bu/W	Driver's door lock knob in LOCK	Check for continuity to ground: should be continuity.	Poor ground. An open in the wire. Faulty dirver's door actuator.
4	G/W	Door lock switch in LOCK		Poor ground. An open in the wire. Faulty door lock switch.
5	G/R	Door lock switch in UNLOCK		

Output Test:
Reconnect the 10-P connector to the control unit.

6	Y/R	Door lock switch or driver's door lock knob in LOCK	Check momentarily for voltage to W/R or Bl/R wire: should have battery voltage.	Faulty control unit.
7	Bu/R	Door lock switch in UNLOCK	Check momentarily for voltage to Y/R wire: should have battery voltage.	Faulty control unit.
8	W/Rl	Door lock switch or driver's door lock knob in UNLOCK		

Power Windows

Wiring Diagram



NOTE: Several different wires have the same color. They have been given a number suffix to distinguish them (for example G/Bl¹ and G/Bl² are not the same).

Troubleshooting

NOTE: The numbers in the table show the troubleshooting sequence.

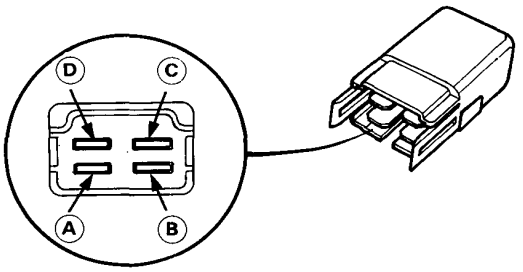
Symptom \ Item to be inspected		Blown No. 15 (15 A), No. 16 (15 A), No. 17 (15 A) or No. 18 (15 A) fuse in relay box	Blown No. 3 (20 A) fuse in fuse box	Relay	Control unit	Motor	Pulser in driver's door motor	Driver's door switch	Passenger door switch			Window regulator (Section 21)	State of charge of battery	Poor ground	Open circuit in wires or loose or disconnected terminals
									Assistant	Left rear	Right rear				
All windows do not operate			1	3									2	GND-11	Bl/Y[1] or G/Bl[1]
Driver's door window does not operate		1			2	4		3				5		GND-8	W/Y, Bl/Y[2], Bl/G, Bu/R or Bu/W
Driver's door window does not operate in (AUTO)					1		2	3							R/G, Bu or Bl, R/Y[2]
Passenger door windows do not operate	Assis-tant	1				4		3	2			5		GND-8	Bu/Bl, Bu/Y, Bu/G, Bu/R or Bu/W
	Left rear	1				4		3		2		5		GND-8	Y/Bl, Y, Y/G, Bu/R or Bu/W
	Right rear	1				4		3			2	5		GND-8	G/Bl[2], G/Y, G, Bu/R or Bu/W

NOTE: Several different wires have the same color. They have been given a number suffix to distinguish them (for example G/Bl[1] and G/Bl[2] are not the same).

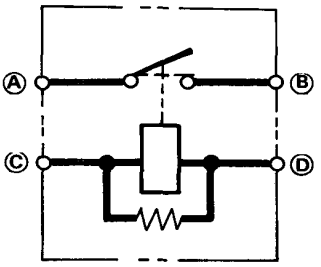
Power Windows

Relay Test

1. Remove the power window relay in the relay box.
2. There should be continuity between Ⓐ and Ⓑ terminals when the battery is connected to Ⓒ and Ⓓ terminals.
   There should be no continuity when the battery is disconnected.



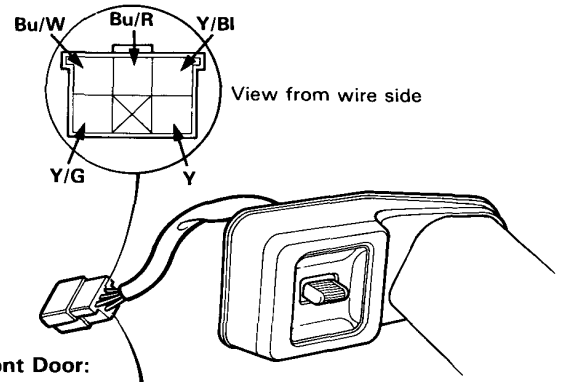
Circuit Diagram



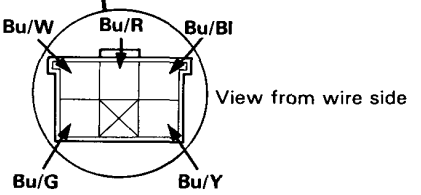
Passenger Door Switch Test

1. Remove the door trim panel.
2. Check for continuity between the terminals in each switch position according to the tables.

Rear Doors:



Front Door:



Rear Door Switches

Position \ Terminal	Y/Bl	Bu/R	Bu/W	Y	Y/G
UP	○	○			
			○		○
OFF			○		○
		○		○	
DOWN	○		○		
		○		○	

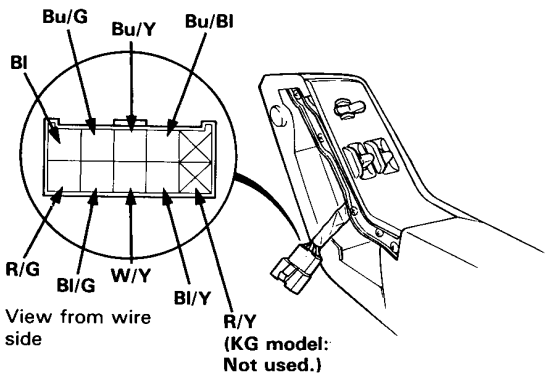
Front Door Switch

Position \ Terminal	Bu/Bl	Bu/R	Bu/W	Bu/Y	Bu/G
UP	○	○			
			○		○
OFF			○		○
		○		○	
DOWN	○		○		
		○		○	

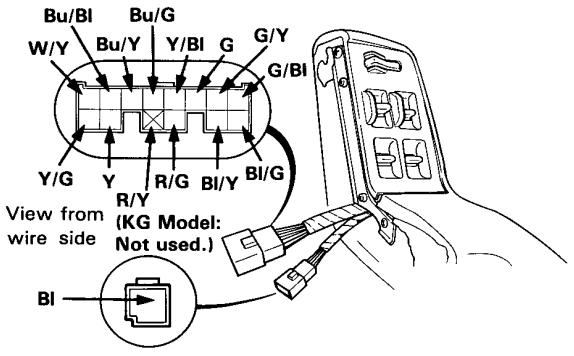
Driver's Door Switch Test

1. Remove the door trim panel and the arm rest.
2. Check for continuity between the terminals in each switch position according to the tables.

Hatchback:



Sedan:



Driver's Switch

Position \ Terminal	Bl/Y	W/Y	Bl/G	R/G	R/Y
UP (AUTO)	○	○			○
UP	○	○			
OFF					
DOWN		○	○		
DOWN (AUTO)		○	○	○	

Assistant Switch

Position	Terminal	Bu/Bl	Bu/Y	Bu/G	Bl
UP	ON	○	○	○	○
	OFF	○	○		
OFF	ON		○	○	○
	OFF		○	○	
DOWN	ON	○			○
			○	○	
	OFF		○	○	
	Main Switch				

Left Rear Switch

Position	Terminal	Y/Bl	Y	Y/G	Bl
UP	ON	○	○	○	○
	OFF	○	○		
OFF	ON		○	○	○
	OFF		○	○	
DOWN	ON	○			○
			○	○	
	OFF		○	○	
	Main Switch				

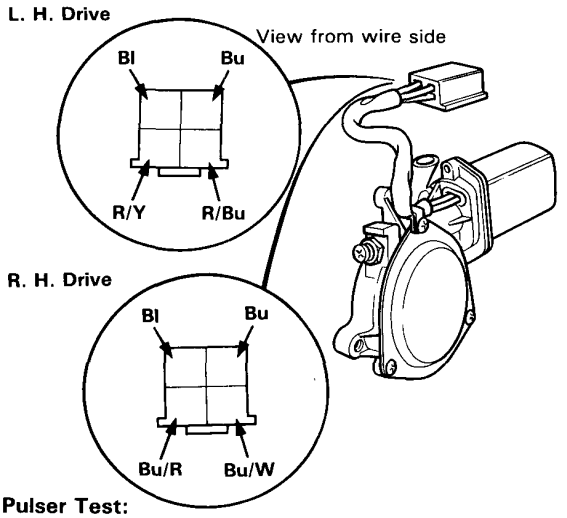
Right Rear Switch

Position	Terminal	G/Bl	G/Y	G	Bl
UP	ON	○	○	○	○
	OFF	○	○		
OFF	ON		○	○	○
	OFF		○	○	
DOWN	ON	○			○
			○	○	
	OFF		○	○	
	Main Switch				

Power Windows

Driver's Door Motor Test

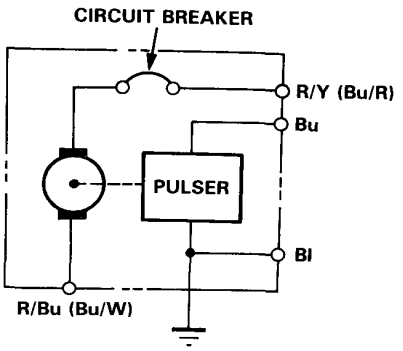
1. Remove the door trim panel.
2. Disconnect the 4P-connector from the power window control unit.
3. Test power window motor operation by connecting battery wires to the R/Y and R/Bu terminals. Test the motor in each direction, by switching the leads from the battery.
4. If the motor does not run, replace it.



Pulser Test:

Measure resistance between the Bu and Bl terminals when running the motor by connecting battery wires to the R/Y and R/Bu terminals.
Ohmmeter needle should indicate in between 20—50 Ω as the motor runs.

Circuit Diagram

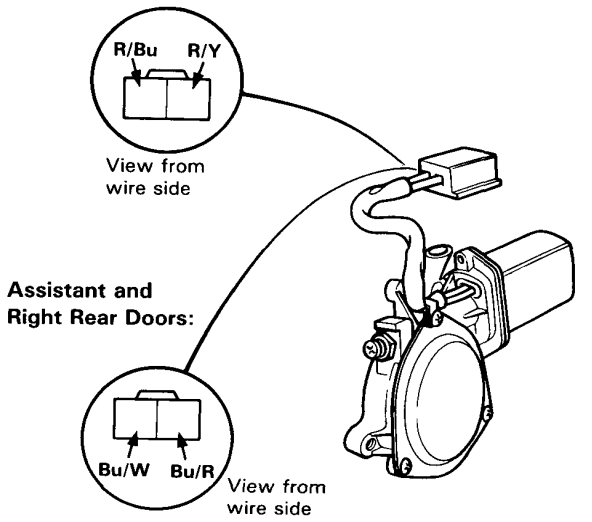


( ): R. H. Drive

Passenger Door Motor Test

1. Remove the door trim panel.
2. Disconnect the 2P-connector.
3. Test power window motor operation by connecting battery wires to the R/Y and R/Bu terminals (on rear left door), or the Bu/R and Bu/W terminals (on front right and rear right doors). Test the motor in each direction, by switching the leads from the battery.
4. If the motor does not run, replace it.

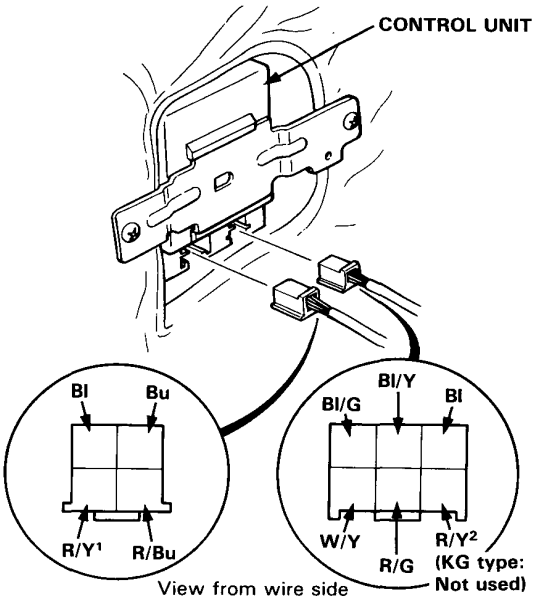
Left Rear Door:



Control Unit Input/Output

Input Test:
Remove the driver's door trim panel and disconnect the 4-P and 6-P connectors from the control unit.

NOTE: To test the unit, keep the driver's door switch connector connected with the door wire harness.



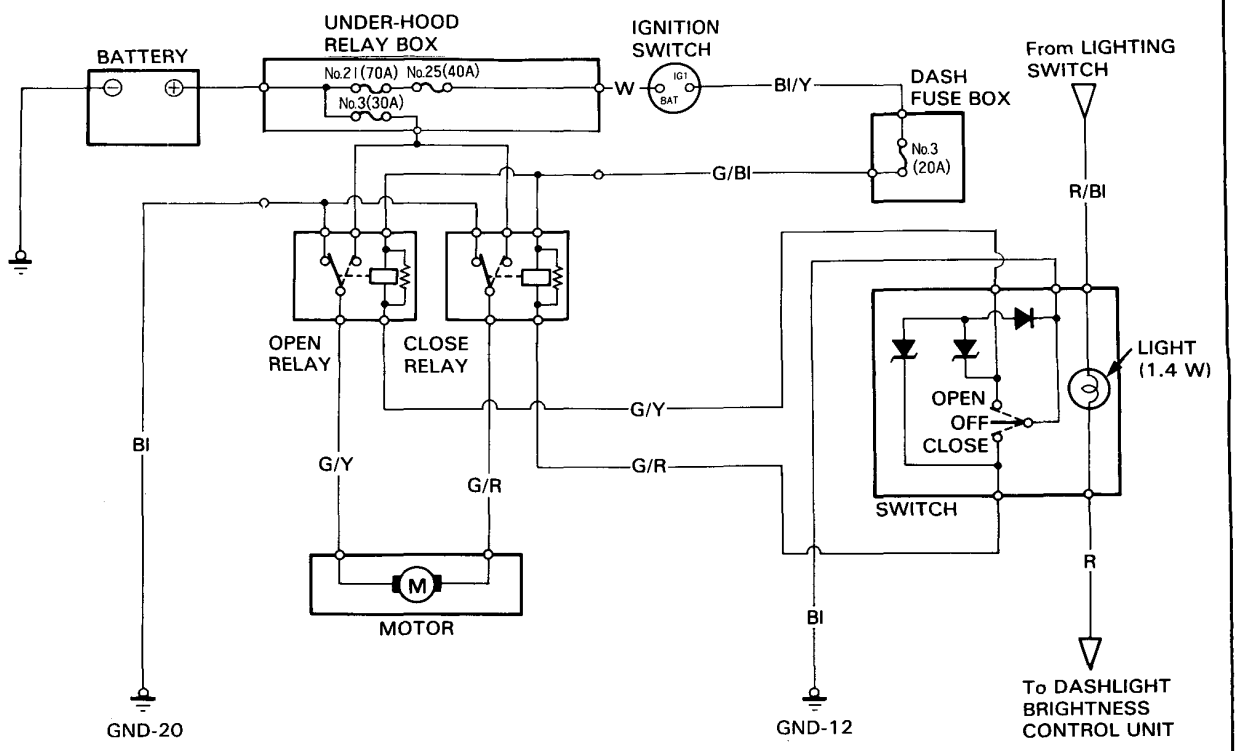
No.	Wire	Test condition	Test: disired result	Possible cause (if result is not obtained)
1	Bl	At all times under all conditions	Check for continuity to ground: should be continuity.	Poor ground. An open in the wire.
2	W/Y	Ignition switch ON	Check for voltage to ground: should have battery voltage.	An open in the wire. Blown No. 17 (15 A) fuse.
3	Bl/Y	Ignition switch ON and driver's window switch UP	Check for voltage to ground: should have battery voltage.	An open in the wire. Faulty driver's door switch.
4	Bl/G	Ignition switch ON and driver's window switch DOWN		
5	R/G or R/Y²	Ignition switch ON and driver's window switch DOWN (AUTO) or UP (AUTO)		
6	Bu	Connect battery wires to R/Y and R/Bu terminals.	Check for resistance to ground: should indicate between 20—50 Ω while operating the motor.	Poor ground. An open in the wire. Faulty driver's door motor.

Output Test:
Reconnect the 4-P and 6-P connectors to the control unit.

7	R/Bu	Ignition switch ON and driver's window switch UP	Check for voltage to R/Y wire: should have battery voltage.	Faulty control unit.
8	R/Y¹	Ignition switch ON and driver's window switch DOWN or DOWN (AUTO)	Check for voltage to R/Bu wire: should have battery voltage.	

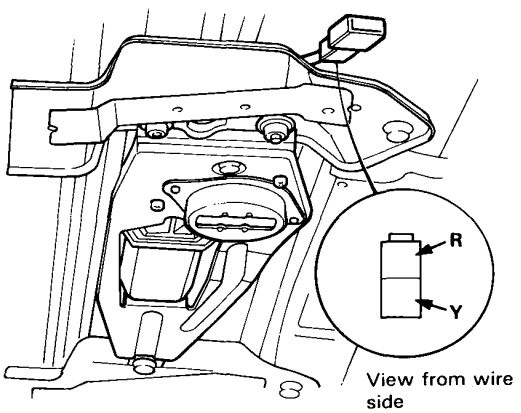
Sunroof

Wiring Diagram



Motor Test

1. Remove the headliner.
2. Disconnect the 2-P connector.
3. Test sunroof motor operation by connecting battery wires to the R and Y terminals in both directions.
4. If the motor does not run, replace it.

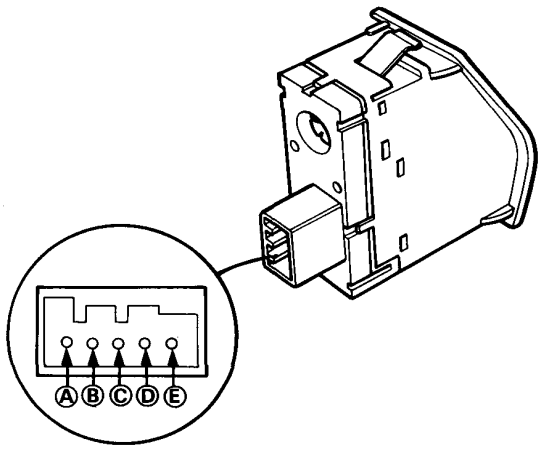


View from wire side

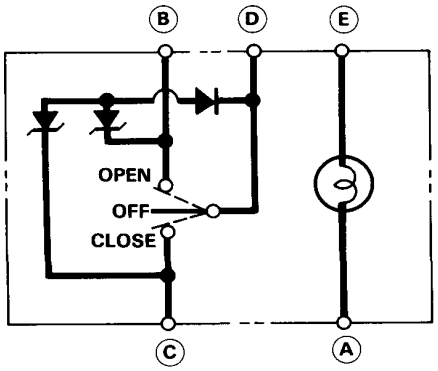
Switch Test

1. Remove the sunroof switch.
2. Check for continuity between the terminals in each switch position according to the table.

Terminal / Postion	Ⓐ		Ⓑ	Ⓒ	Ⓓ	Ⓔ
OPEN	○	○	○		○	○
OFF	○	○	○			
CLOSE	○	○	○	○	○	

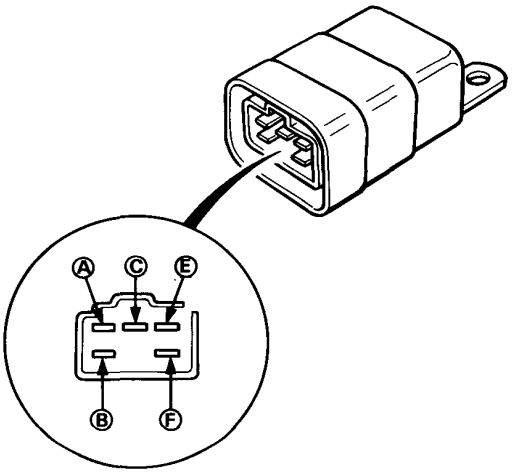


Circuit Diagram

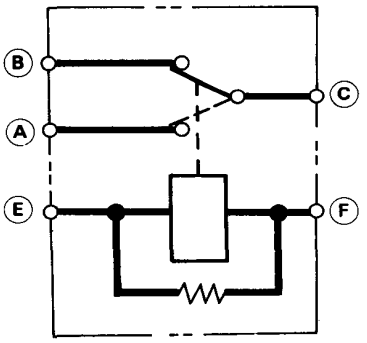


Relay Test

1. Remove the sunroof relays under the front passenger's seat.
2. There should be continuity between Ⓐ and Ⓒ terminals when the battery is connected to Ⓔ and Ⓕ terminals.
   There should be continuity between Ⓑ and Ⓒ terminals when the battery is disconnected.

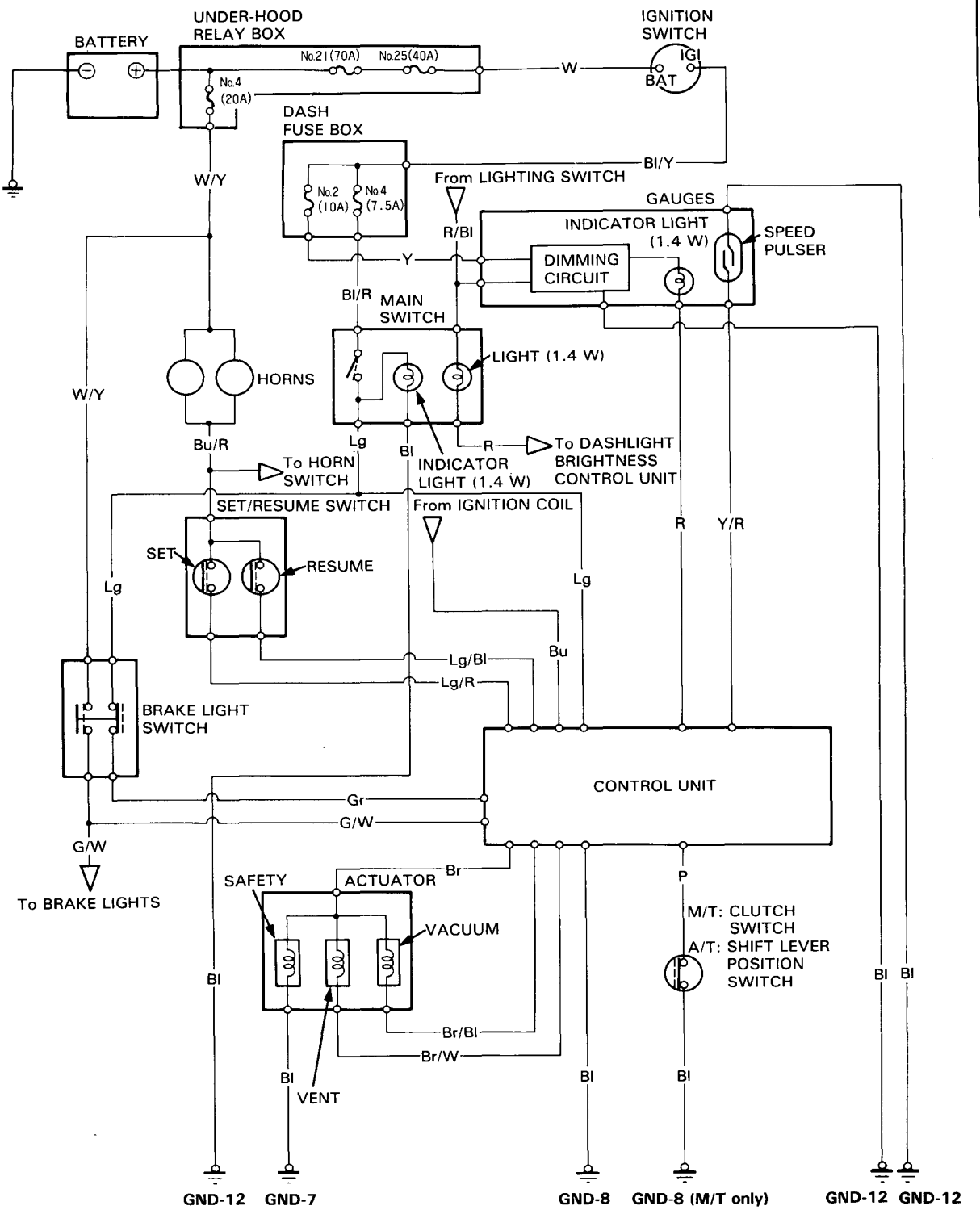


Circuit Diagram



Cruise Control

Wiring Diagram



Troubleshooting

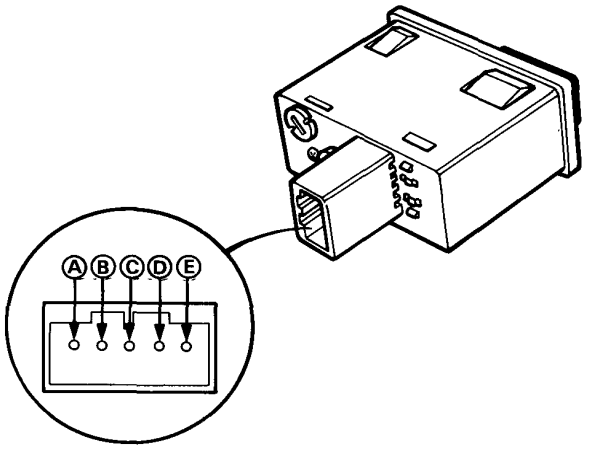
NOTE:
- The numbers in the table show the troubleshooting sequence.
- Before troubleshooting:
  - Check the No.2 (10A) and No.4 (7.5A) fuses in the fuse box, and the No.4 (20A) fuse in the relay box.
  - Check that the horns sound.
  - Check the tachometer for proper operation.

Item to be inspected / Symptom	Main switch	SET/RESUME switch	Brake light switch and mounting	Clutch switch and mounting (M/T)	Shift lever position switch (A/T)	Speedometer pulser or cable	Dimming circuit in gauges	Actuator	Disconnected, clogged or restricted vacuum lines/stuck check valve/ leaky vacuum reservoir	Control unit	Poor ground	Open circuit in wires or loose or disconnected terminals
Cruise control can't be set	2	3	4	5					6	1	GND-7 GND-8 GND-12	Bu/R, Lg/R, Bu, Bl/R, Lg, Gr, Y/R, Br, Br/Bl, Br/W or P
Cruise control can be set, but indicator light does not go on							2			1	GND-12	Y or R
Cruise speed noticeably higher or lower than what was set						1		2		3		
Excessive overshooting and/or undershooting when trying to set speed						2		1		3		
Steady speed not held even on a flat road with cruise control set						1		2	3	4		
Car does not decelerate or accelerate accordingly when SET or RESUME button is pushed		1								2		Lg/Bl
Set speed not cancelled when clutch pedal is pushed (M/T)				1						2		
Set speed not cancelled when shift lever is moved to N (A/T)					1					2		
Set speed not cancelled when brake pedal is pushed			1							2		
Set speed not cancelled when main switch is pushed OFF	1									2		
Set speed not resumed when RESUME button is pushed (with main switch on, but set speed temporarily cancelled)		1								2		Lg/Bl

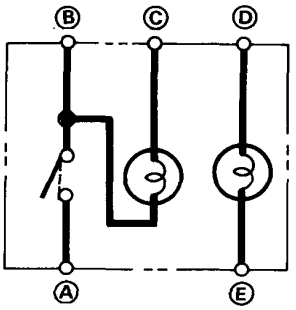
Main Switch Test

1. Remove the fuse compartment door.
2. Remove the switch by pushing from the rear of it.
3. Check for continuity between the terminals in each switch position according to the table.

Position \ Terminal	Ⓐ	Ⓑ		Ⓒ	Ⓓ		Ⓔ
OFF		○	○	○	○	○	○
ON	○	○	○	○	○	○	○



Circuit Diagram

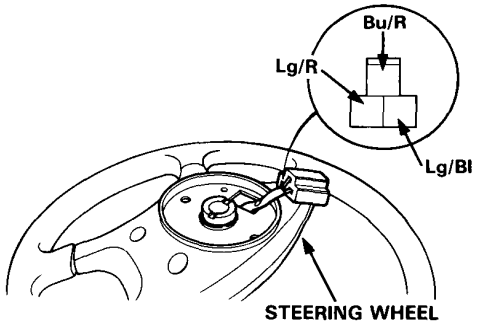


Set/Resume Switch Test

Switch Test:

1. *Remove the steering wheel.*
2. Check for continuity between the terminals in each switch position according to the table.

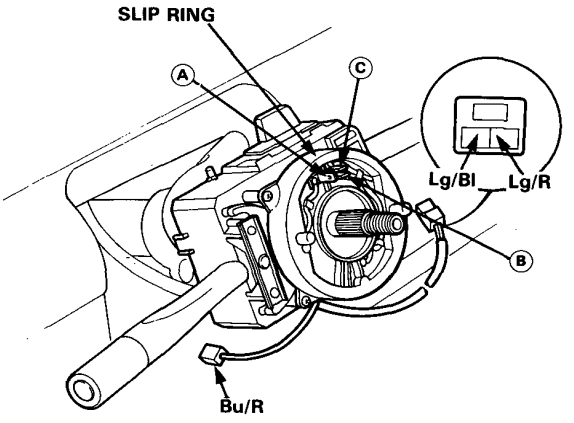
Position \ Terminal	Lg/Bl	Bu/R	Lg/R
OFF			
SET (ON)	○	○	
RESUME (ON)		○	○



Slip Ring Test:

3 Remove the column lower cover, then disconnect the 2-P connector and the Bu/R wire.

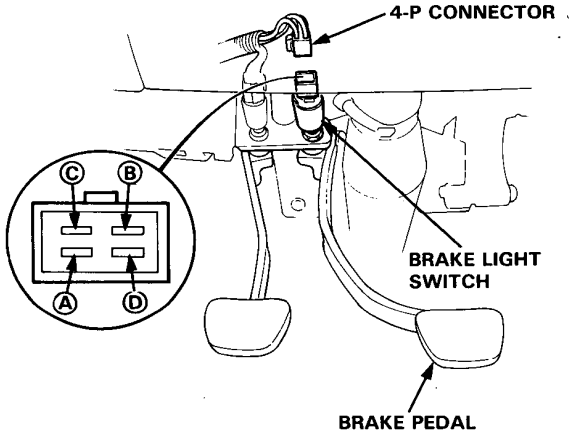
4 There should be continuity between the Bu/R and. Ⓐ terminals, the Lg/R and Ⓑ terminals, and the Lg/B and Ⓒ terminals, as you turn the slip ring.



Brake Light Switch Test

1. Disconnect the 4-P connector from the switch.
2. Check for continuity between the terminals according to the table.

Terminal / Brake Pedal	Ⓐ	Ⓑ	Ⓒ	Ⓓ
RELEASED	○—○			
PUSHED			○—○	



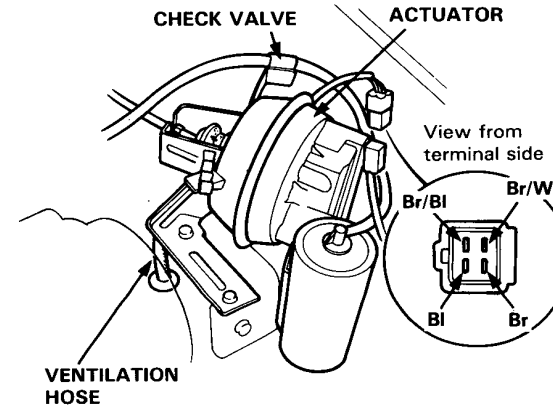
3. If necessary, replace the switch or adjust pedal height.

Actuator Solenoid Test

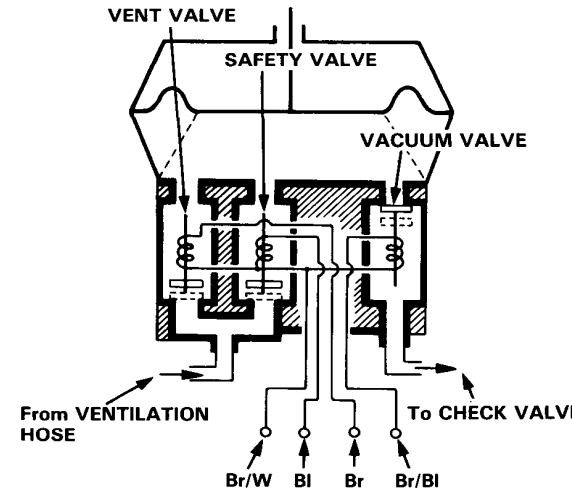
1. Disconnect the 4-P connector.
2. Measure resistance between the terminals.

Resistance:
VACUUM SOLENOID (between Br/W and Bl):
30—50 Ω
VENT SOLENOID (between Br/W and Br):
40—60 Ω
SAFETY SOLENOID (between Br/W and Bl):
40—60 Ω

NOTE: Resistance will vary slightly with temperature; specified resistance is at 20°C (70°F).

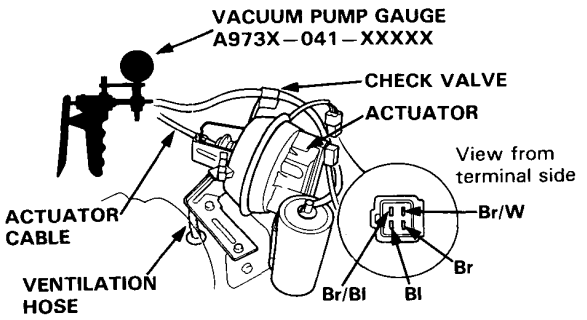


Circuit Diagram

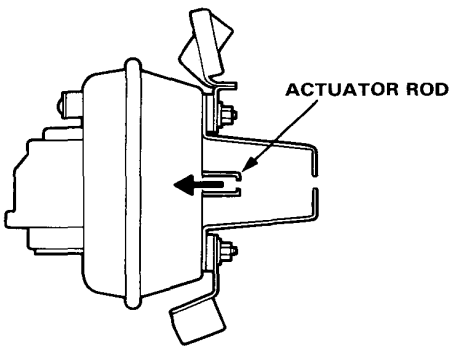


Actuator Test

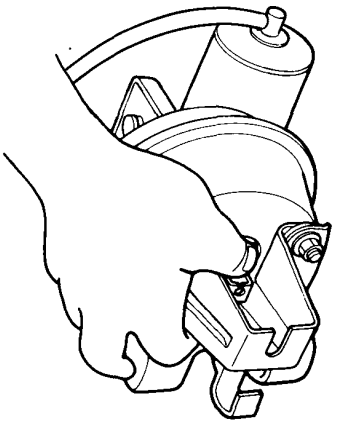
1. Disconnect the actuator cable from the actuator rod and the 4-P connector.
2. Connect battery positive wire to the Br/W terminal and negative to the Br/Bl, Br and Bl terminals.
3. Connect a vacuum pump to the check valve. Then apply vacuum to the actuator.



4. The actuator rod should pull in completely. If the rod pulls in only part-way or not at all, check for a leaking vacuum line or defective solenoid.



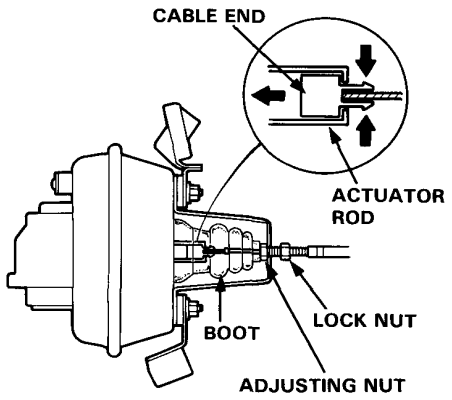
5. With voltage and vacuum still applied, try to pull the actuator rod out by hand. You should not be able to pull it. If you can, it is defective.



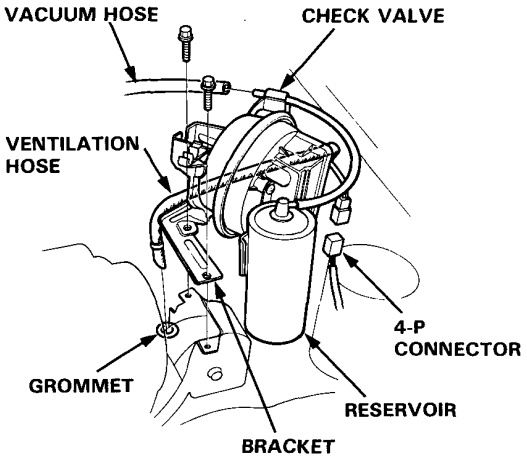
6. Disconnect battery negative wire from the Br/Bl terminal. The actuator rod should return. If the actuator rod does not return, and the ventilation hose and filter are free, the solenoid valve assembly is defective.
7. Repeat the steps 2-6, but this time disconnect battery negative wire from the Bl terminal. The actuator rod should return. If it does not return, and the the ventilation hose and filter are free, the solenoid valve assembly is defective.
8. If the solenoid valve assembly is replaced, be sure to use new O-rings at each solenoid.

Actuator/Cable Replacement

1. Pull back the boot and loosen the locknut, then disconnect the cable from the bracket.
2. Disconnect the cable end from the actuator rod.



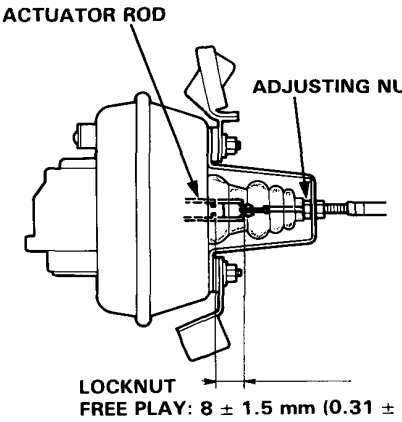
3. Disconnect the 4-P connector.
4. Pull the ventilation hose from the grommet.
5. Disconnect the vacuum hose from the check valve.
6. Remove the 2 mount bolts and the actuator with the bracket and reservoir.



7. If necessary, disconnect the cable end from the linkage over the accelerator pedal, then turn the gromment 90° in the firewall and remove the cable.
8. Install in the reverse order of removal, and adjust free-play at actuator rod after connecting the cable (see next column).

Actuator Cable Adjustment

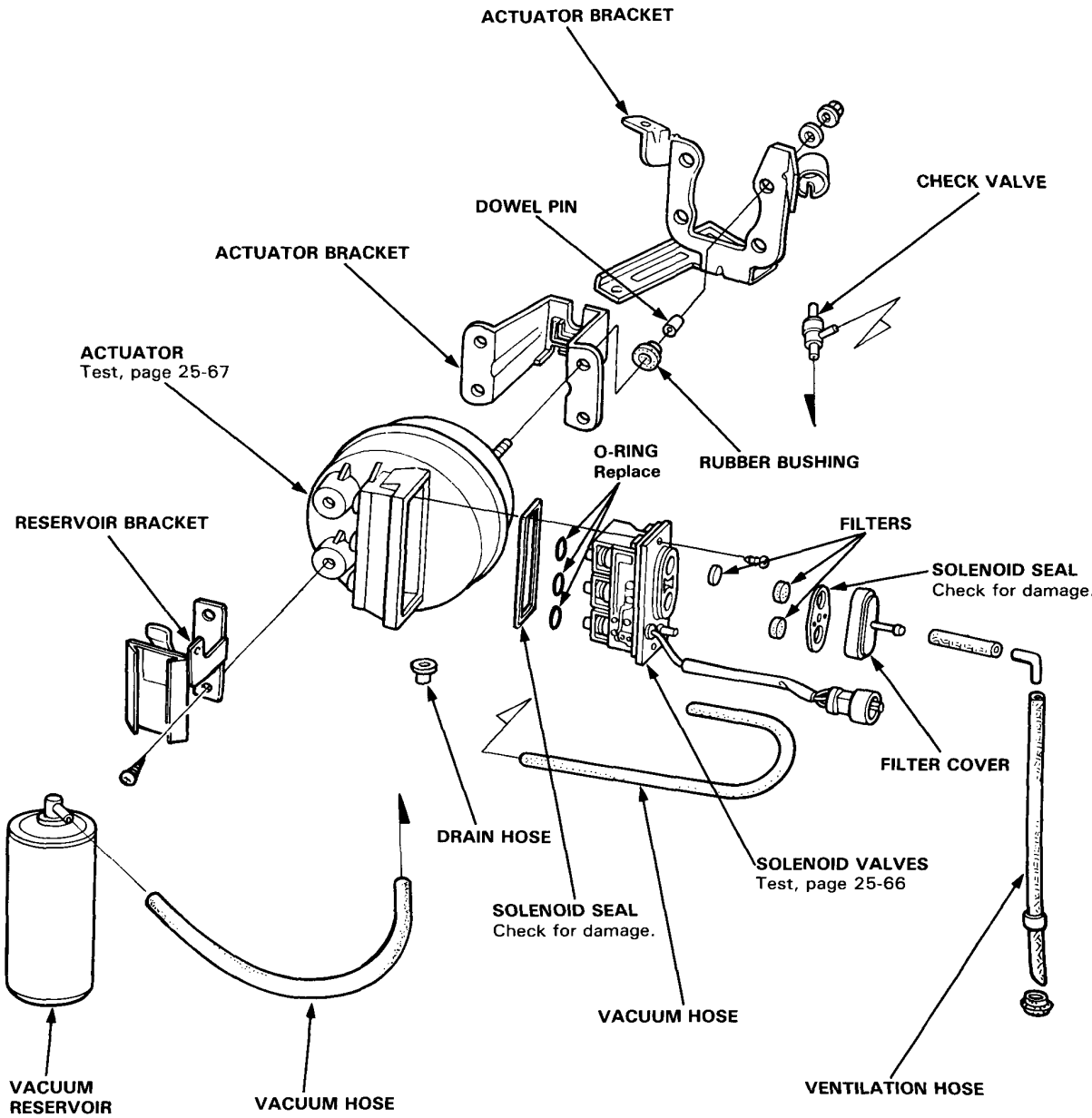
1. Check that the actuator cable operates smoothly with no binding or sticking.
2. Start the engine.
3. Measure the amount of movement of the actuator rod until the cable pulls on the accelerator lever (engine speed starts to increase). Free play should be 8 ± 1.5 mm (0.31 ± 0.06 in.).



4. If free play is not within specs, loosen the locknut and turn the adjusting nut as required.
5. Retighten the locknut and recheck the free play.
6. Test drive the car to make sure that over and undershoot are held within ±2 mph of the set speed.

   NOTE: If necessary, check the throttle cable free play, then recheck the actuator rod free play.

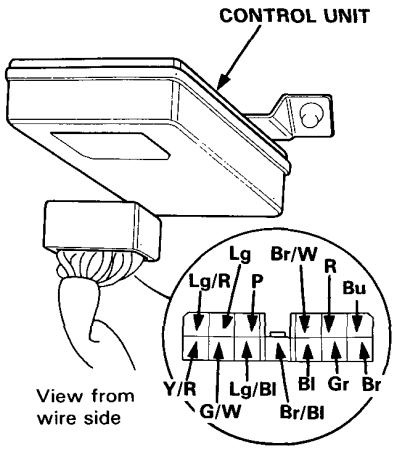
Actuator Disassembly



Control Unit Input Test

Lower the fuse box and disconnect the 13-P connector from the control unit.
Make the following tests at the harness pins:

NOTE: Replace the control unit if all input tests prove OK.



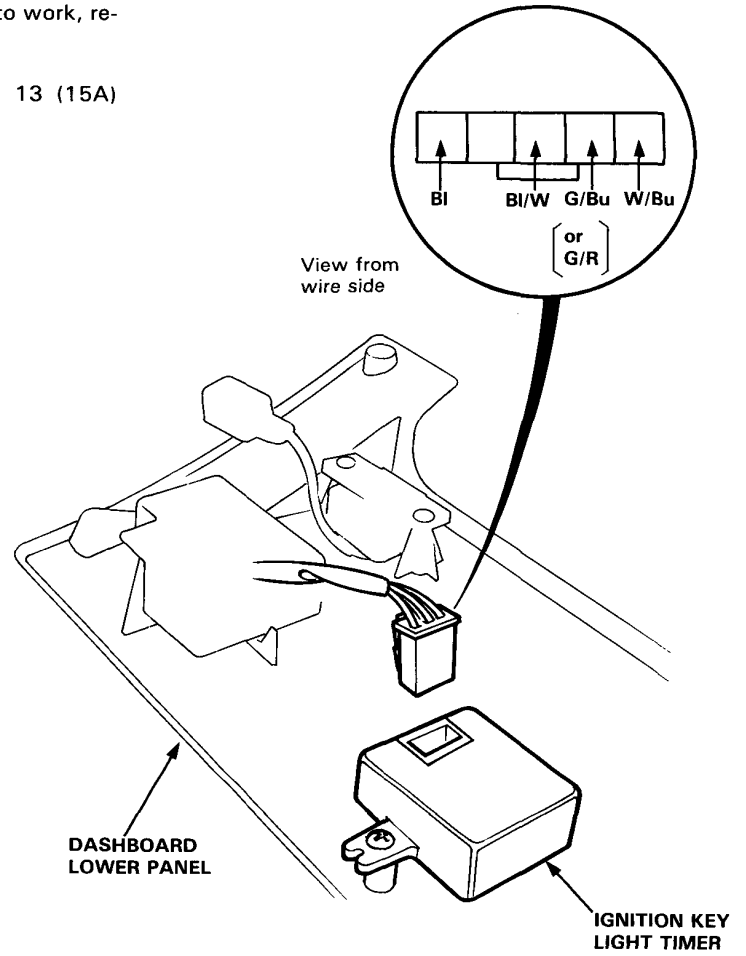
Wire	Test condition	Test: desired result	Possible cause (if result is not obtained)
Bl	Under all conditions	Check for continuity to ground: should be continuity.	Poor ground. An open in the wire.
Lg	Ignition switch ON and main switch ON	Check for voltage to ground: should have battery voltage.	An open in the wire. Faulty main switch. Blown No. 4 (7.5A) fuse.
Lg/Bl	Resume switch pushed	Ground each terminal: Horns should sound as the switch is pushed.	An open in the wire. Faulty SET/RESUME switch Faulty slip ring. Faulty horn. Blown No. 4 (20A) fuse
Lg/R	Set switch pushed		
P	M/T: Clutch pedal not pushed A/T: Shift lever in 2, D3 or D4	Check for continuity to ground: should be continuity.	Poor ground. An open in the wire. Faulty or misadjusted clutch switch (M/T). Faulty shift lever position switch.
Bu	Start the engine	Check for voltage to ground: should have battery voltage	An open in the wire. Faulty ignition system.
Y/R	Raise the front of the car and rotate one wheel. or remove the speedometer cable from the transmission and turn slowly by hand.	Check resistance in both directions between Y/R and Bl wires. There should be continuity in only one direction. 4 times per cable revolution or 23 times per 10 wheel revolutions.	Faulty speed pulser in speedometer. An open in the wire. Poor ground.
Gr	Ignition switch ON, main switch ON and brake pedal pushed, then released	Check for voltage to ground: There should be 0 V with the pedal pushed and battery voltage with the pedal released.	An open in Gr wire circuit. Faulty brake light switch.
G/W	Brake pedal pushed, then released	Check for voltage to ground: There should be battery voltage with the pedal pushed, and 0 V with the pedal released.	An open in G/W wire circuit. Blown No. 4 (20A) fuse. Faulty brake light switch.
R	Ignition switch ON	Attach R wire to ground: Indicator light in dash should come on.	Blown bulb. An open in R wire circuit. Faulty dimming circuit in gauges Blown No. 2 (10A) fuse.
Br/W	Under all conditions	Resistance to ground: should be 80–120 Ω.	Open or short in Br/W wire. Faulty actuator solenoid.
Br/Bl	Under all conditions	Resistance to ground: should be 80–120 Ω.	Open or short in Br/Bl wire. Faulty actuator solenoid.
Br	Under all conditions	Resistance to ground: should be 40–60 Ω.	Open or short in Br wire. Faulty actuator solenoid.

Ignition Key Light

Ignition Key Light Timer Test

Remove the dashboard lower panel to disconnect the 5-P connector from the key light timer. Make the following input tests at the harness pins.
If all tests prove OK, yet the timer still fails to work, replace the timer.

NOTE: Before testing, check the No. 13 (15A) fuse in the under-hood relay box.

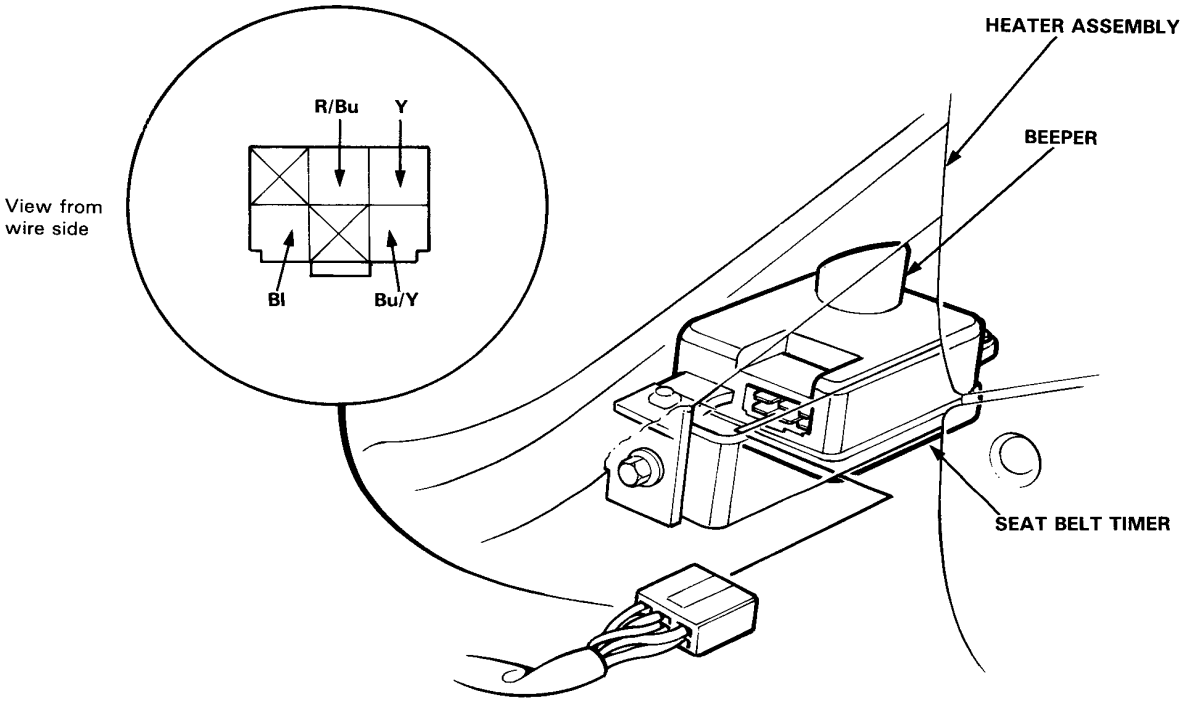


No.	Wire	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	Bl	Under all conditions.	Check for continuity to ground: should be continuity.	• Poor ground. • An open in the wire.
2	W/Bu	Under all conditions.	Check for voltage to ground: should be battery voltage.	• Blown No. 13 (15A) fuse. • An open in the wire.
3	Bl/W	Under all conditions.	Attach to ground: Ignition key light should come on.	• Blown bulb. • An open in the wire.
4	G/Bu [or G/R]	Driver's door opened.	Check for continuity to ground: should be continuity. NOTE: Before testing, remove No. 13 (15A) fuse.	• Faulty driver's door switch. • An open in the wire.

Seat Belt Timer Test

Disconnect the 6-P connector from the seat belt timer. Make the following input tests at the harness pins. If all tests prove OK, yet the timer still fails to work, replace the timer.

NOTE: Before testing, check the No. 1 (15A) and No. 2 (10A) fuses in the dash fuse box.

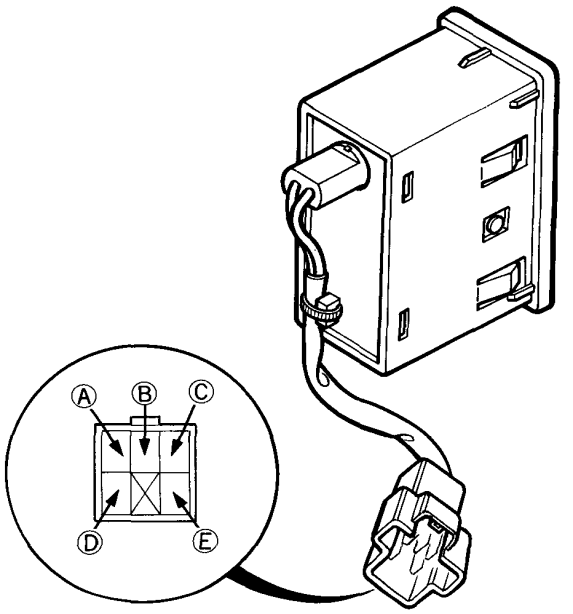


No.	Wire	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	Bl	Under all conditions.	Check for continuity to ground: should be continuity.	• Poor ground. • An open in the wire.
2	Y	Ignition switch ON.	Check for voltage to ground: should be battery voltage.	• Blown No. 2 (10A) fuse. • An open in the wire.
3	R/Bu	Driver's seat belt not buckled.	Check for continuity to ground: should be continuity.	• Faulty driver's seat belt switch. • An open in the wire.
4	Bu/Y	Ignition switch ON.	Attach to ground: Seat belt reminder light should come on as the ignition switch ON.	• Blown bulb. • An open in the wire.

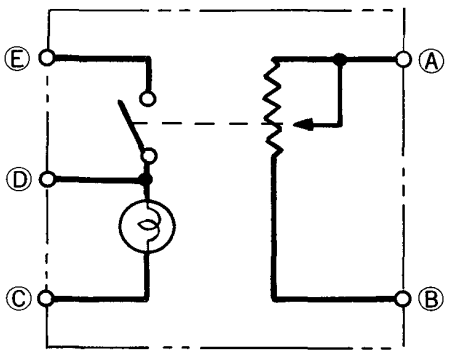
Heated Seat

Controller Test

1. Remove the controller.
2. Measure resistance between Ⓐ and Ⓑ terminals while rotating the adjusting dial.
   Resistance should vary from 0 to 10,000 ohms as dial is rotated.

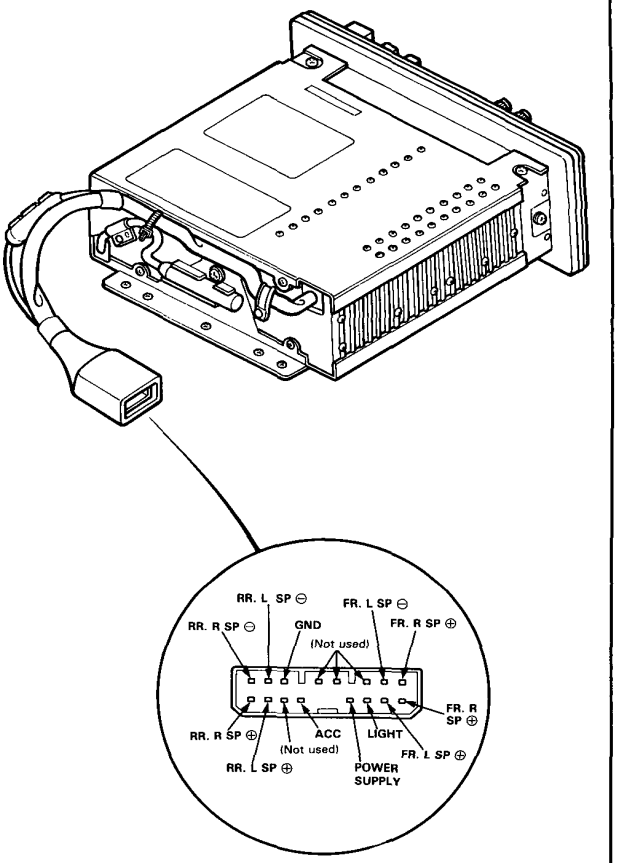


View from terminal side



Sound System

Terminal Arrangement

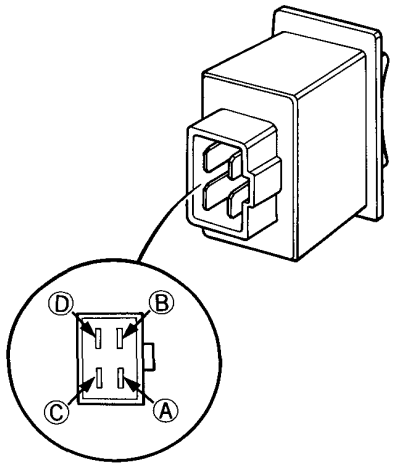


View from terminal side

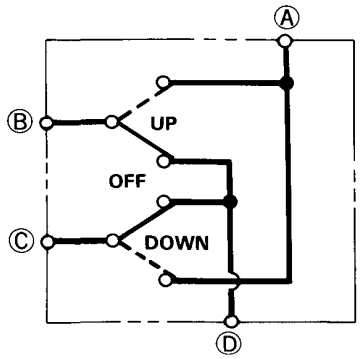
Power Antenna Switch Test

1. Remove the antenna switch.
2. Check for continuity between the terminals in each switch position according to the table.

Terminal / Postion	Ⓐ	Ⓑ	Ⓒ	Ⓓ
UP	○—○			
			○—○	
OFF		○—○	○—○	
DOWN	○	○	○	
		○		○

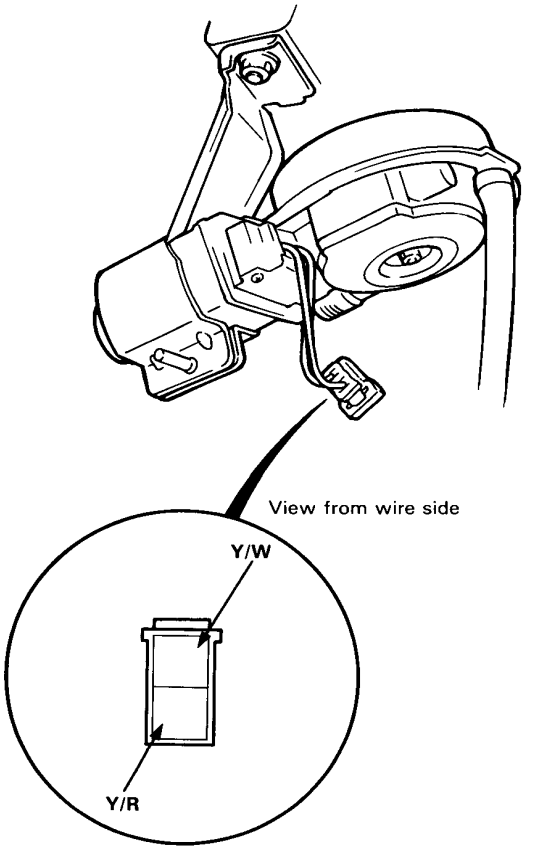


Circuit Diagram



Power Antenna Motor Test

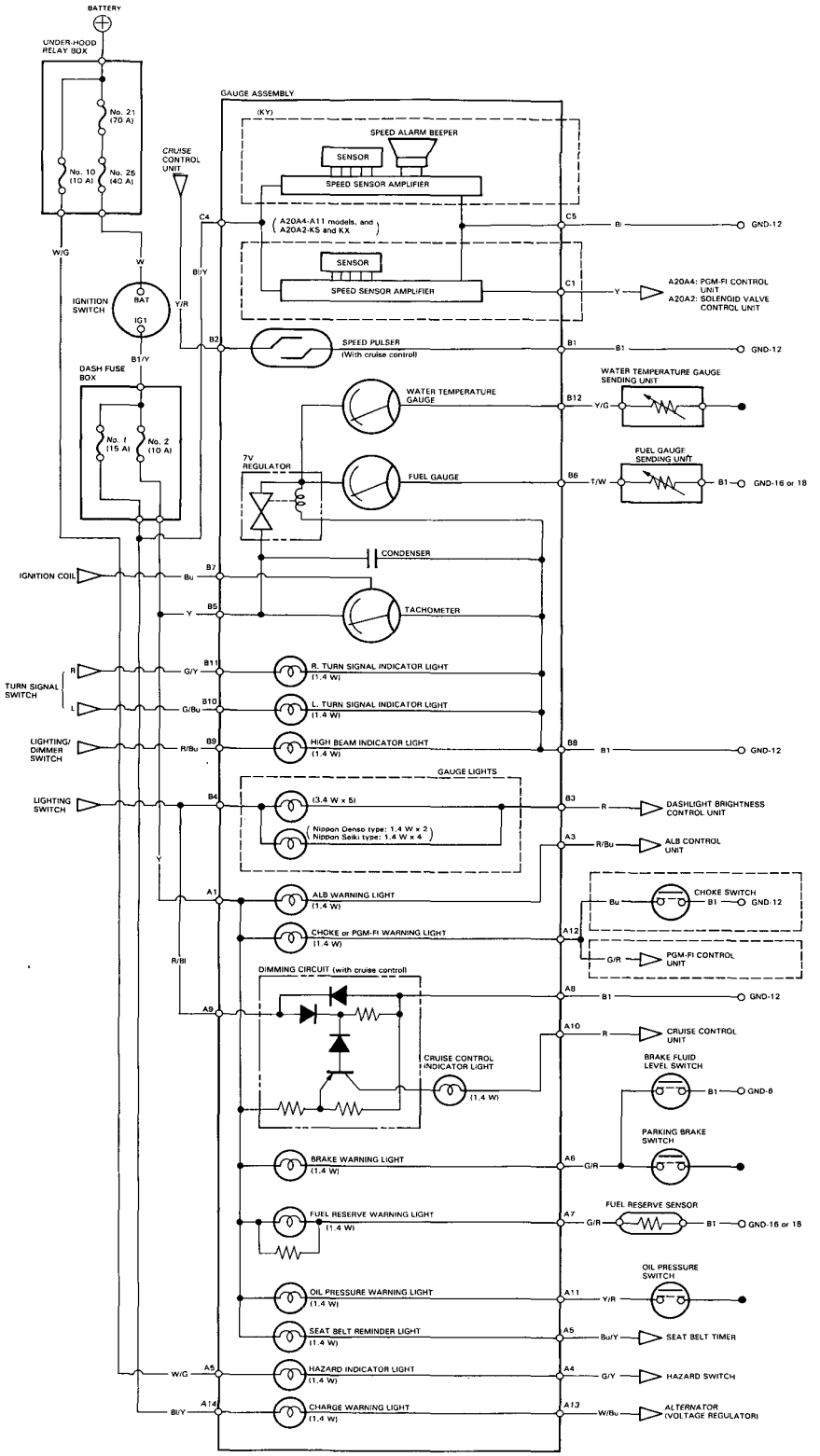
1. Remove the 2 fuse box nuts, then lower the fuse box.
2. Disconnect the 2-P connector.
3. Test antenna motor operation by connecting battery wires to the Y/W and Y/R terminals in both directions.
4. If the motor fails to run smoothly, replace it.



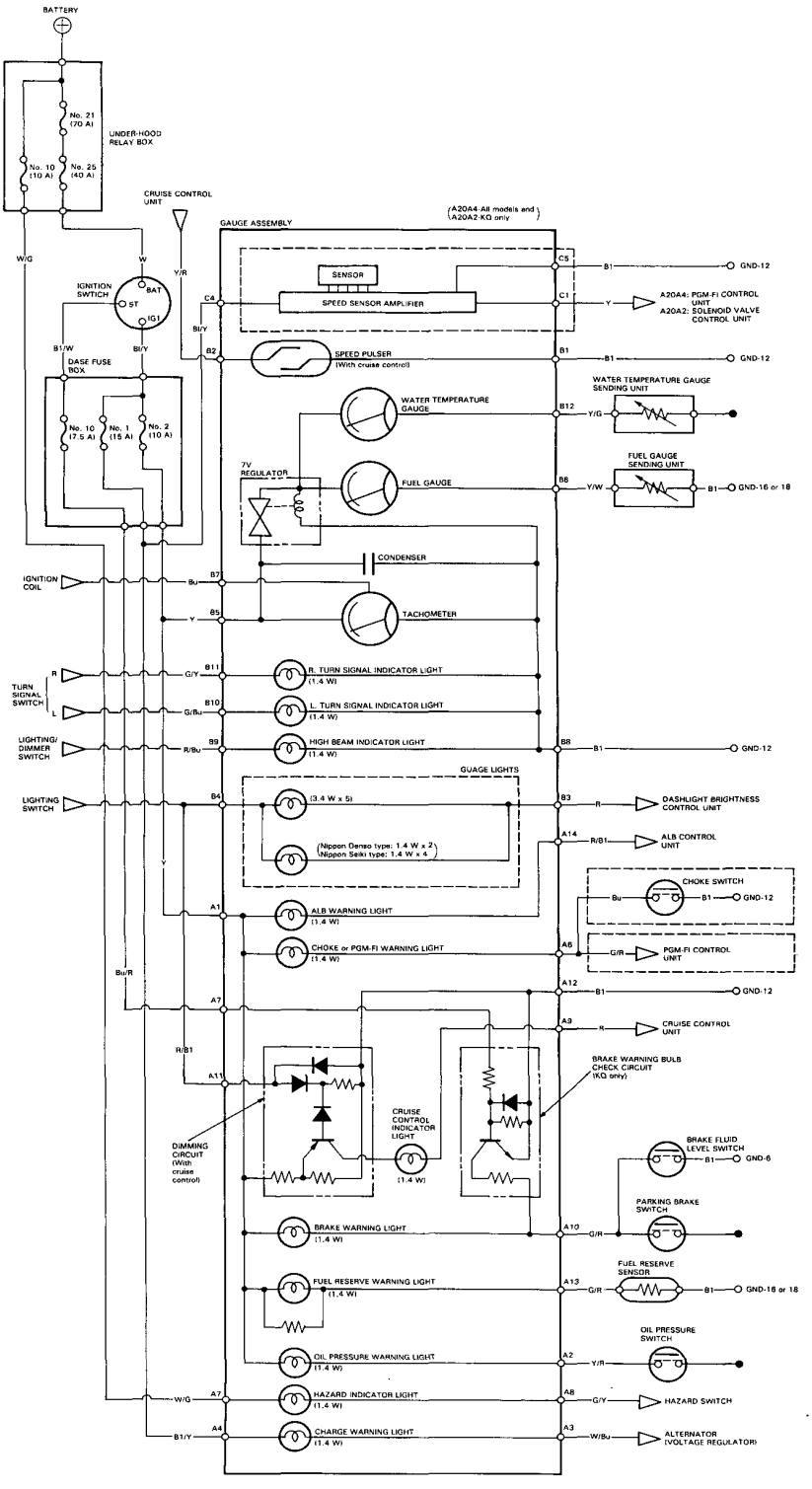
Gauge Assembly

Wiring/Circuit Diagram (Analog meter)

L. H. Drive:



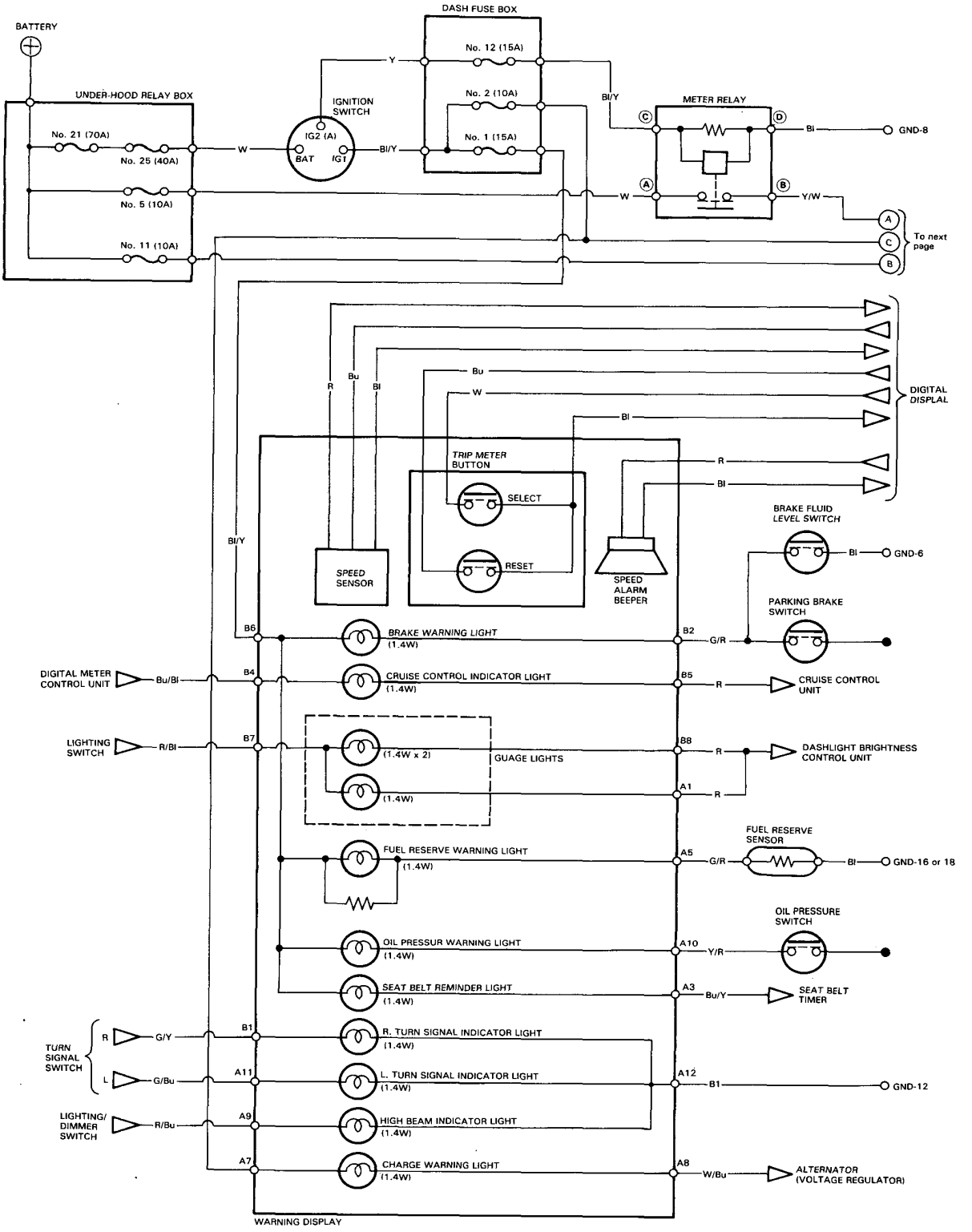
R. H. Drive:


BATTERY
No. 21 (70 A)
UNDER-HOOD RELAY BOX
No. 10 (10 A)
No. 25 (40 A)
CRUISE CONTROL UNIT
GAUGE ASSEMBLY
(A20A4: All models and A20A2: KQ only)
IGNITION SWITCH
BAT
ST
IG1
DASE FUSE BOX
No. 10 (7.5 A)
No. 1 (15 A)
No. 2 (10 A)
SENSOR
SPEED SENSOR AMPLIFIER
SPEED PULSER
(With cruise control)
WATER TEMPERATURE GAUGE
WATER TEMPERATURE GAUGE SENDING UNIT
7V REGULATOR
FUEL GAUGE
FUEL GAUGE SENDING UNIT
CONDENSER
TACHOMETER
IGNITION COIL
TURN SIGNAL SWITCH
R. TURN SIGNAL INDICATOR LIGHT (1.4 W)
L. TURN SIGNAL INDICATOR LIGHT (1.4 W)
LIGHTING/ DIMMER SWITCH
HIGH BEAM INDICATOR LIGHT (1.4 W)
LIGHTING SWITCH
GUAGE LIGHTS
(3.4 W x 5)
(Nippon Denso type: 1.4 W x 2, Nippon Seiki type: 1.4 W x 4)
ALB WARNING LIGHT (1.4 W)
CHOKE or PGM-FI WARNING LIGHT (1.4 W)
DIMMING CIRCUIT (With cruise control)
CRUISE CONTROL INDICATOR LIGHT (1.4 W)
BRAKE WARNING LIGHT (1.4 W)
FUEL RESERVE WARNING LIGHT (1.4 W)
OIL PRESSURE WARNING LIGHT (1.4 W)
HAZARD INDICATOR LIGHT (1.4 W)
CHARGE WARNING LIGHT (1.4 W)
GND-12
A20A4: PGM-FI CONTROL UNIT
A20A2: SOLENOID VALVE CONTROL UNIT
GND-16 or 18
DASHLIGHT BRIGHTNESS CONTROL UNIT
ALB CONTROL UNIT
CHOKE SWITCH
PGM-FI CONTROL UNIT
CRUISE CONTROL UNIT
BRAKE WARNING BULB CHECK CIRCUIT (KQ only)
BRAKE FLUID LEVEL SWITCH
GND-6
PARKING BRAKE SWITCH
FUEL RESERVE SENSOR
OIL PRESSURE SWITCH
HAZARD SWITCH
ALTERNATOR (VOLTAGE REGULATOR)

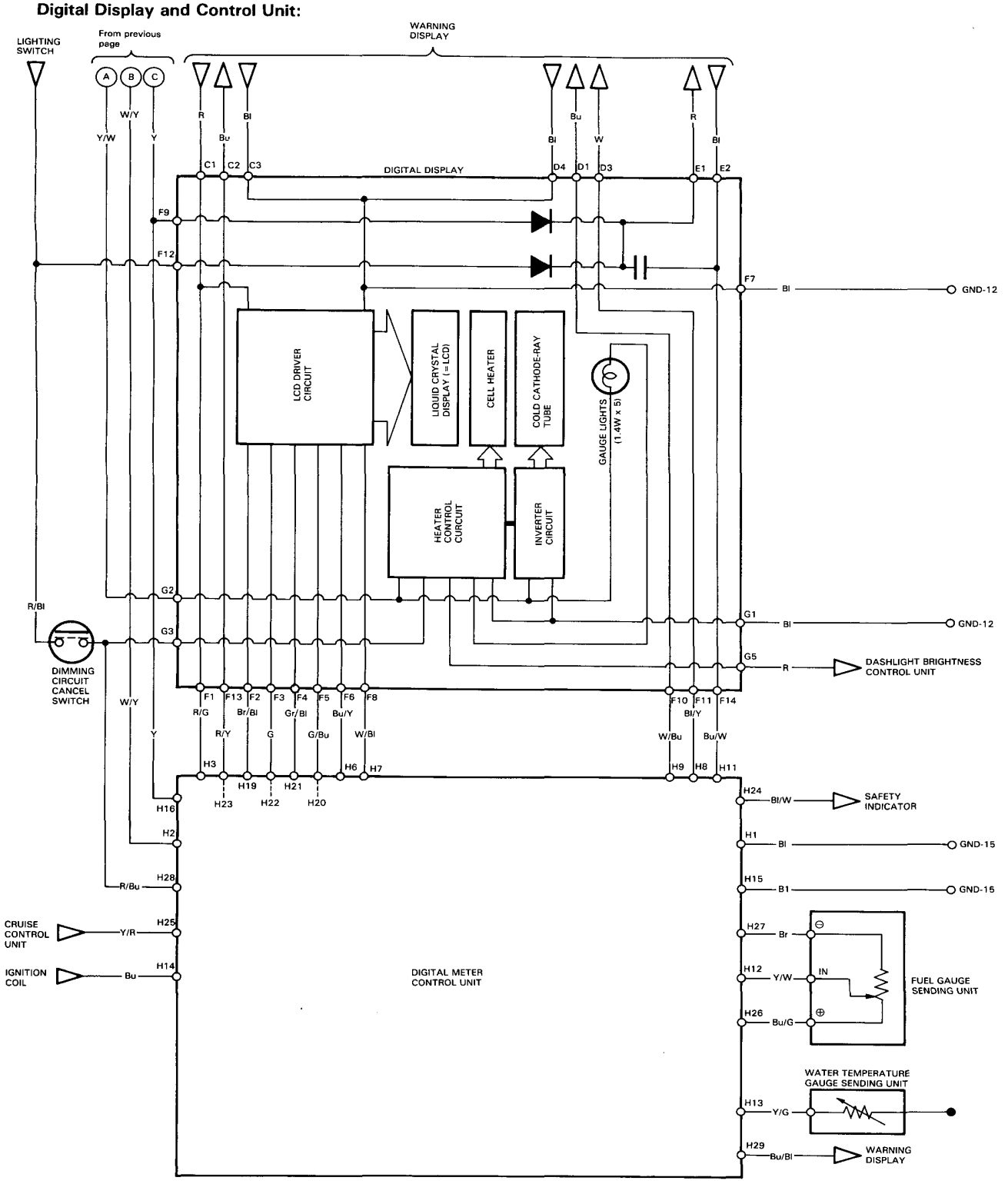
Gauge Assembly

Wiring/Circuit Diagram (Digital meter)

Warning Display:



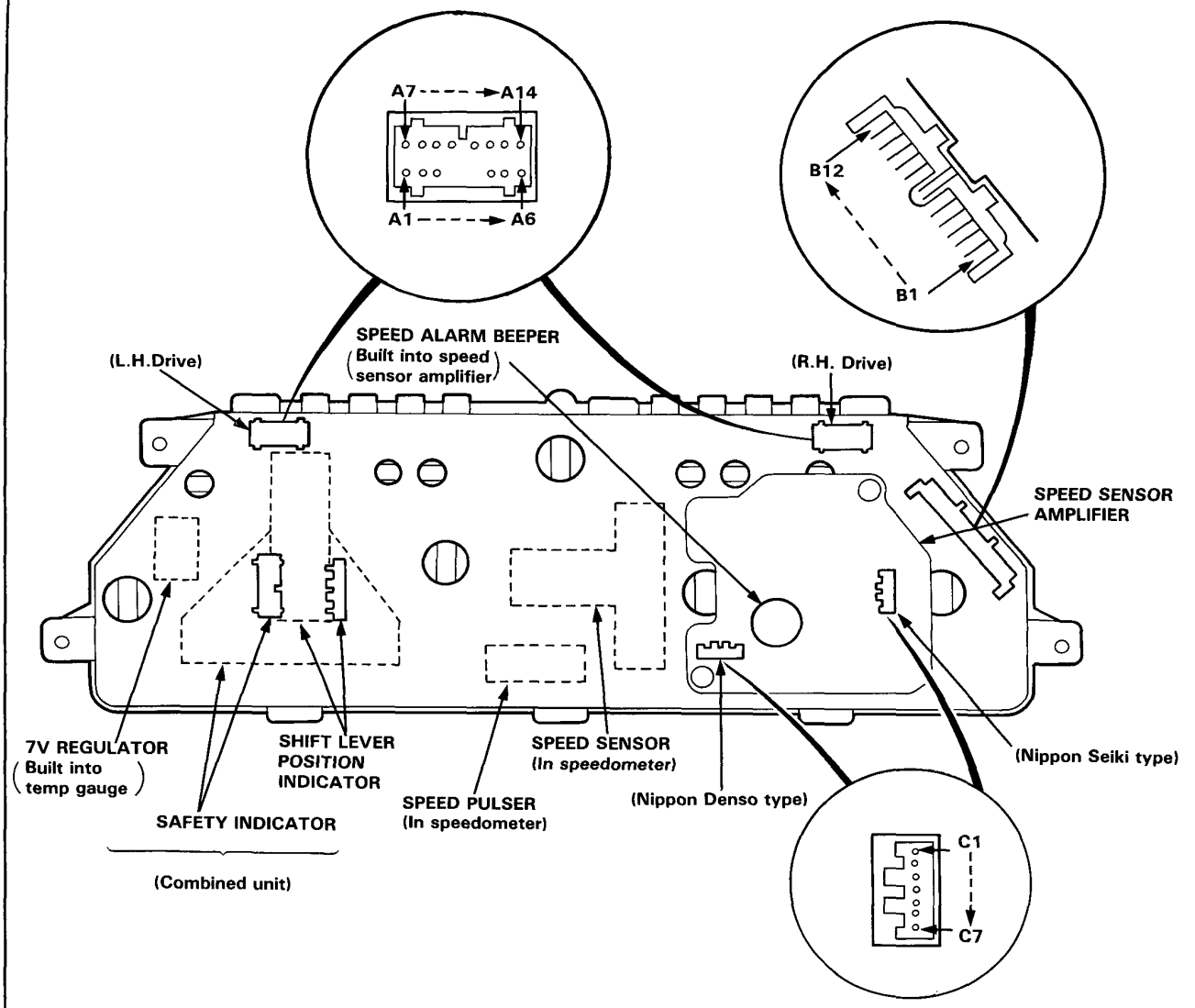
Digital Display and Control Unit:



Gauge Assembly

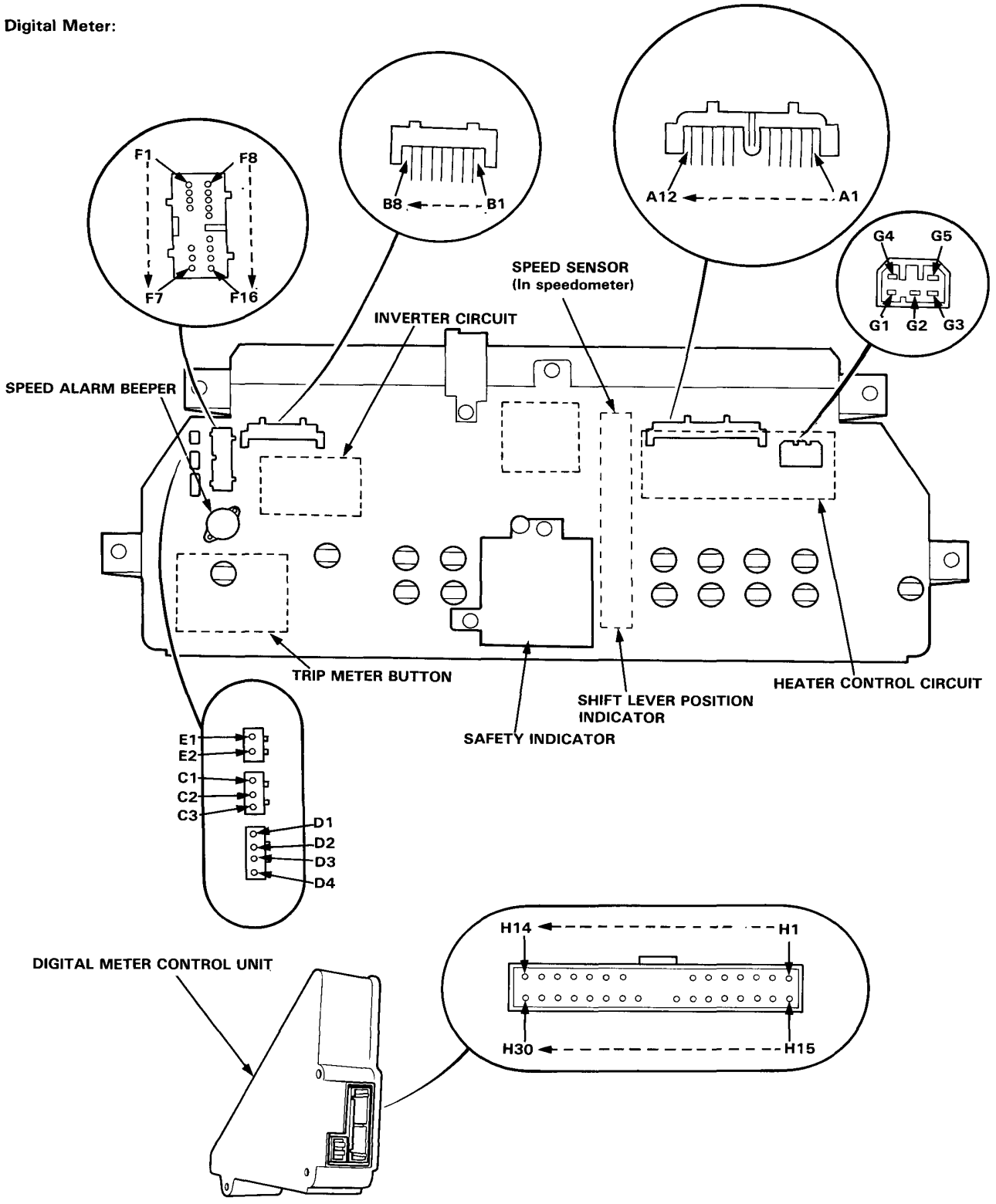
Connector/Terminal Arrangement

Analog Meter:



NOTE: The brake warning bulb check and dimming circuits are built into the top circuit board.

Digital Meter:



Gauge Assembly

Input/Output (Analog meter)

L.H.Drive:

A1	Warning lights/Dimming circuit (IG1)
A2	Not used
A3	ALB warning light ⊖
A4	Hazard indicator light (+B)
A5	Hazard indicator or Seat belt reminder light ⊖
A6	Brake warning light ⊖
A7	Fuel reserve warning light ⊖
A8	Dimming circuit ground
A9	Dimming circuit input (light on signal)
A10	Cruise control indicator light ⊖
A11	Oil pressure warning light ⊖
A12	Choke or PGM-FI warning light ⊖
A13	Charge warning light ⊖
A14	Charge warning light (IG1)
B1	Speed pulser ground
B2	Speed pulser output (4 pulses with each full turn of the speedometer cable)
B3	Gauge light ⊖
B4	Gauge light ⊕
B5	Tachometer/7V regulator (IG1)
B6	Fuel gauge input
B7	Tachometer input
B8	Gauges ground
B9	High beam indicator light ⊕
B10	L.Turn signal indicator light ⊕
B11	R.Turn signal indicator light ⊕
B12	Water temperature gauge input
C1	Speed sensor output
C2	Not used
C3	Not used
C4	Speed sensor amplifier (IG1)
C5	Speed sensor amplifier ground
C6	Not used
C7	Not used

R.H.Drive:

A1	Warning lights/Dimming circuit (IG1)
A2	Oil pressure warning light ⊖
A3	Charge warning light ⊖
A4	Charge warning light (IG1)
A5	Not used
A6	Choke or PGM-FI warning light ⊖
A7	KQ model: Bulb check circuit input (starter signal) Others: Hazard indicator light (+B)
A8	Hazard indicator light ⊖
A9	Cruise control indicator light ⊖
A10	Brake warning light ⊖
A11	Dimming circuit input (light on signal)
A12	Bulb check/Dimming circuits ground
A13	Fuel reserve warning light ⊖
A14	ALB warning light ⊖
B1	Speed pulser ground
B2	Speed pulser output (4 pulses with each full turn of the speedometer cable)
B3	Gauge light ⊖
B4	Gauge light ⊕
B5	Tachometer/7V regulator (IG1)
B6	Fuel gauge input
B7	Tachometer input
B8	Gauges ground
B9	High beam indicator light ⊕
B10	L.Turn signal indicator light ⊕
B11	R.Turn signal indicator light ⊕
B12	Water temperature gauge input
C1	Speed sensor output
C2	Not used
C3	Not used
C4	Speed sensor amplifier (IG1)
C5	Speed sensor amplifier ground
C6	Not used
C7	Not used

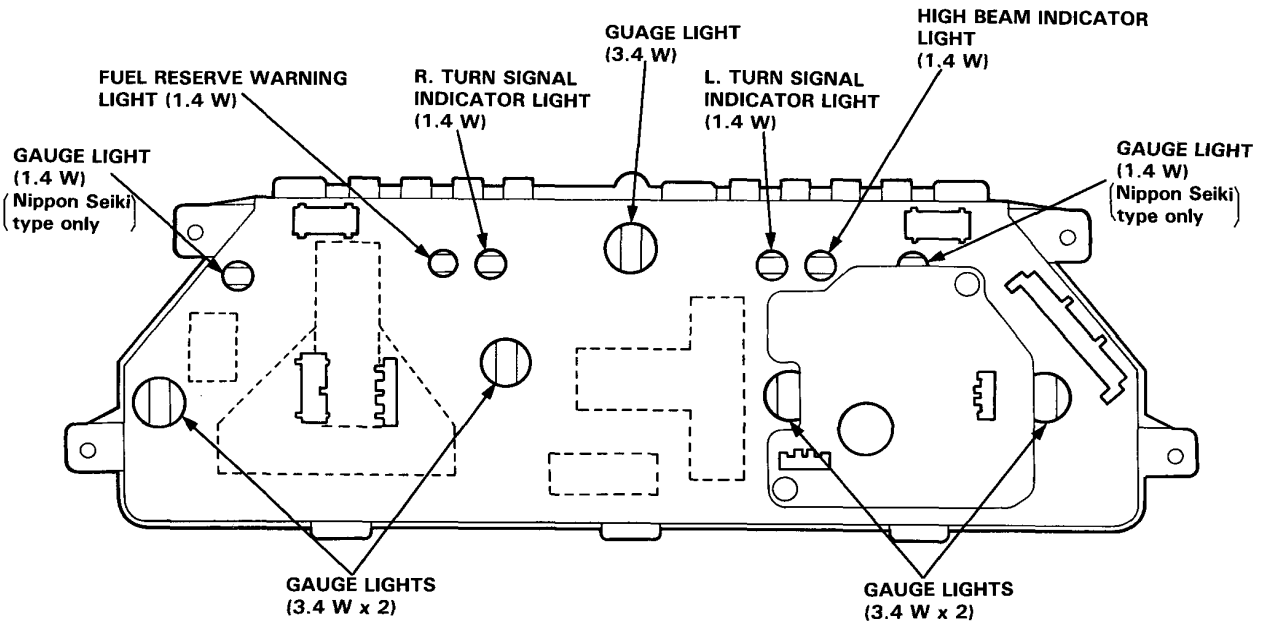
(Digital meter)

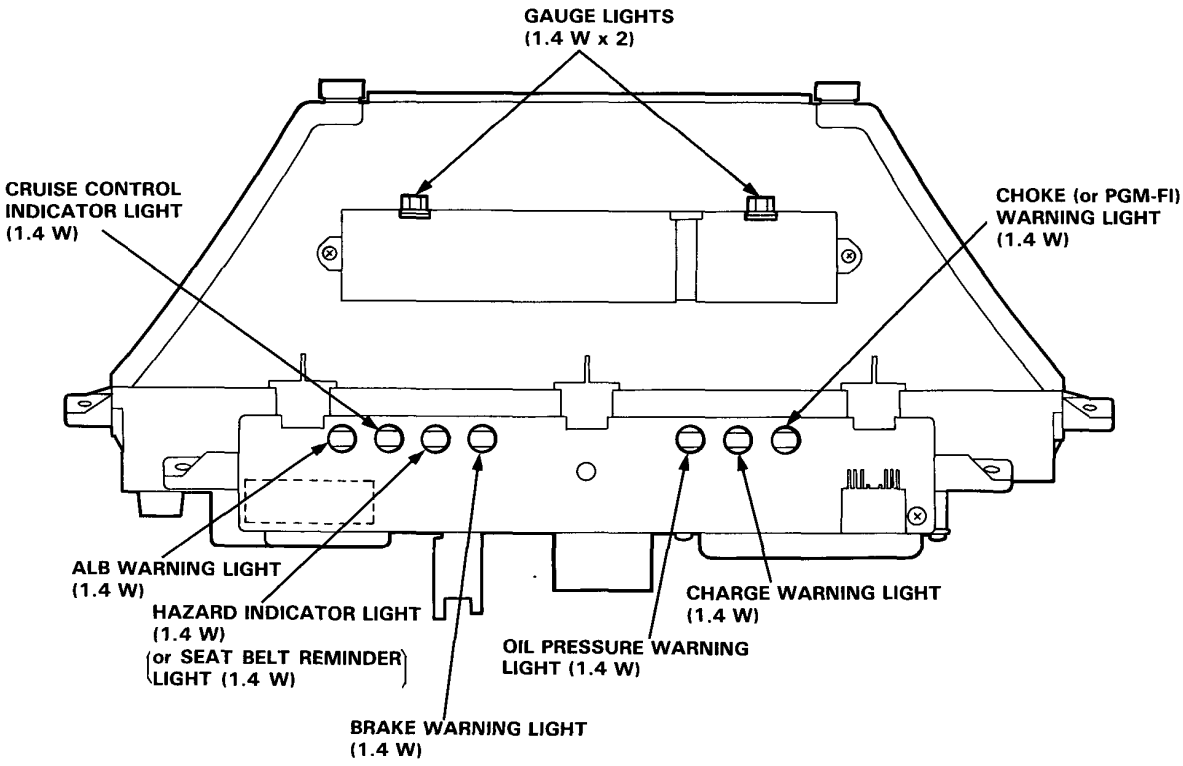
A1	Gauge light ⊖
A2	Not used
A3	Seat belt reminder light ⊖
A4	Not used
A5	Fuel reserve warning light ⊖
A6	Not used
A7	Charge warning light (IG1)
A8	Charge warning light ⊖
A9	High beam indicator light ⊕
A10	Oil pressure warning light ⊖
A11	L.Turn signal indicator light ⊕
A12	Indicator lights ground
B1	R.Turn signal indicator light ⊕
B2	Brake warning light ⊖
B3	Not used
B4	Cruise control indicator light ⊕
B5	Cruise control indicator light ⊖
B6	Warning lights (IG1)
B7	Gauge light ⊕
B8	Gauge light ⊖
C1	Speed sensor (IG1)
C2	Speed sensor input
C3	Speed sensor ground
D1	Trip meter (RESET button)
D2	Trip meter (SELECT button)
D3	Trip meter button ground
D4	Not used
E1	Speed alarm beeper ⊕
E2	Speed alarm beeper ⊖
F1	Speed sensor/LCD driver circuit (IG1)
F2	LCD driver circuit input
F3	LCD driver circuit input
F4	LCD driver circuit input
F5	LCD driver circuit input
F6	LCD driver circuit input
F7	Speed sensor/LCD driver circuit/Trip meter button ground
F8	LCD driver circuit input
F9	Speed alarm beeper (IG1)
F10	Trip meter (RESET button)
F11	Trip meter (SELECT button)
F12	Speed alarm beeper (light on)
F13	Speed sensor output
F14	Speed alarm beeper ⊖
F15	Not used
F16	Not used
G1	Heater control/Inverter circuit ground
G2	Heater control/Inverter circuits and Gauge light (+B)
G3	Gauge light dimming circuit (cancel signal)
G4	Not used
G5	Gauge light ⊖
H1	Unit ground
H2	Unit (+B)
H3	Speed sensor/LCD driver circuit (IG1)
H4	Not used
H5	Not used
H6	LCD driver circuit output
H7	LCD driver circuit output
H8	Trip meter input (SELECT)
H9	Trip meter input (RESET)
H10	Not used
H11	Speed alarm beeper ⊖
H12	Fuel gauge input (IN)
H13	Water temperature gauge input
H14	Tachometer input
H15	Unit ground
H16	Unit (IG1)
H17	Not used
H18	Not used
H19	LCD driver circuit output
H20	LCD driver circuit output
H21	LCD driver circuit output
H22	LCD driver circuit output
H23	Speed sensor amplifier input
H24	Safety indicator bulb check circuit ⊕
H25	Speed pulser output (4 pulses with each full turn of the speedometer cable)
H26	Fuel gauge input (+)
H27	Fuel gauge input (−)
H28	Dimming circuit (cancel signal)
H29	Cruise control indicator light ⊕
H30	Not used

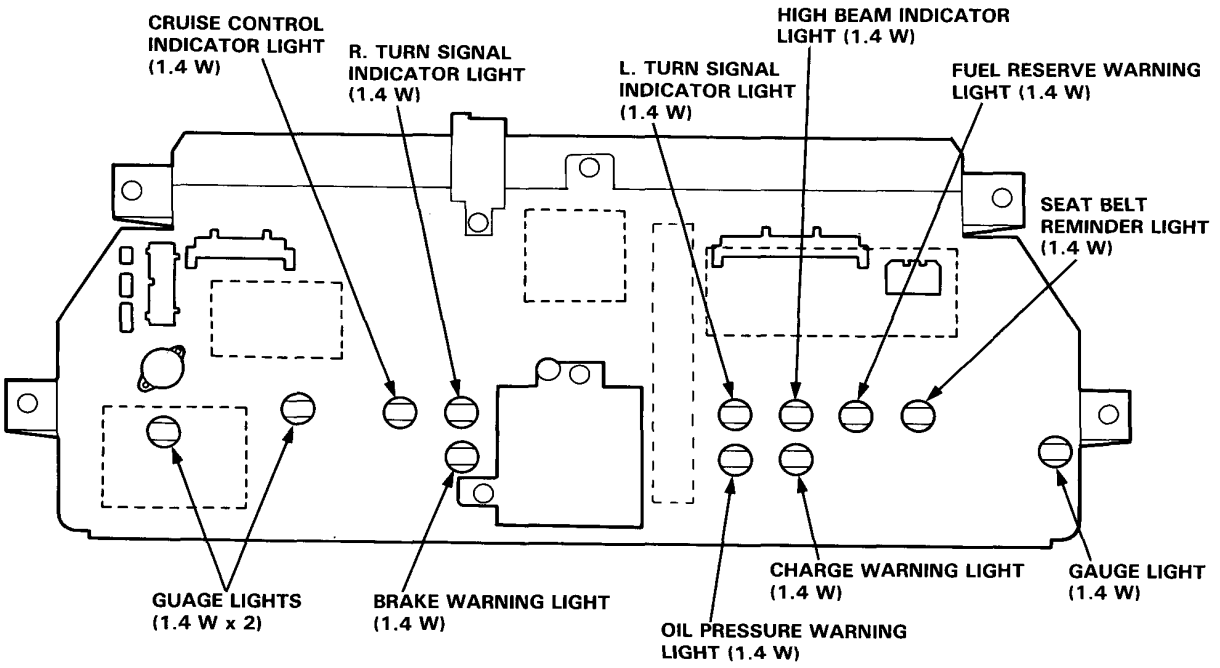
Gauge Assembly

Bulb Location

Analog Meter:



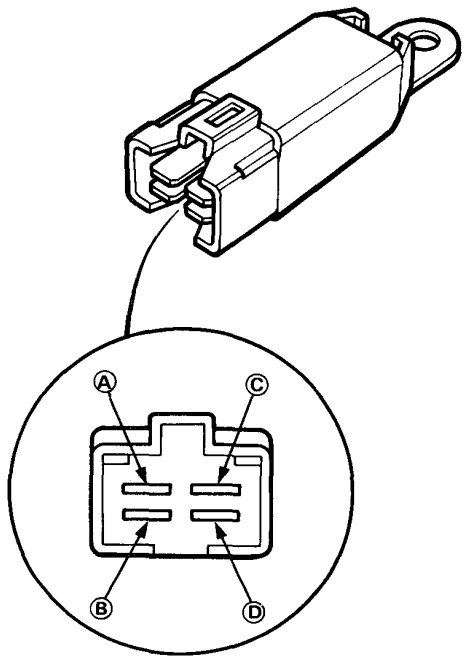



CRUISE CONTROL INDICATOR LIGHT (1.4 W)
R. TURN SIGNAL INDICATOR LIGHT (1.4 W)
HIGH BEAM INDICATOR LIGHT (1.4 W)
L. TURN SIGNAL INDICATOR LIGHT (1.4 W)
FUEL RESERVE WARNING LIGHT (1.4 W)
SEAT BELT REMINDER LIGHT (1.4 W)
GUAGE LIGHTS (1.4 W x 2)
BRAKE WARNING LIGHT (1.4 W)
OIL PRESSURE WARNING LIGHT (1.4 W)
CHARGE WARNING LIGHT (1.4 W)
GAUGE LIGHT (1.4 W)

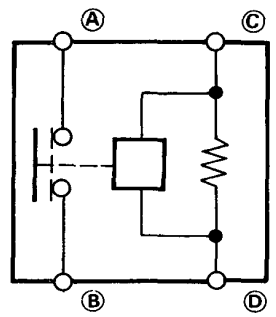
Gauge Assembly

Relay Test

1. Remove the digital meter relay located on the right side under dash.
2. There should be continuity between (A) and (B) terminals when the battery is connected to (C) and (D) terminals.
   There should be continuity between (A) and (B) terminals when the battery is disconnected.



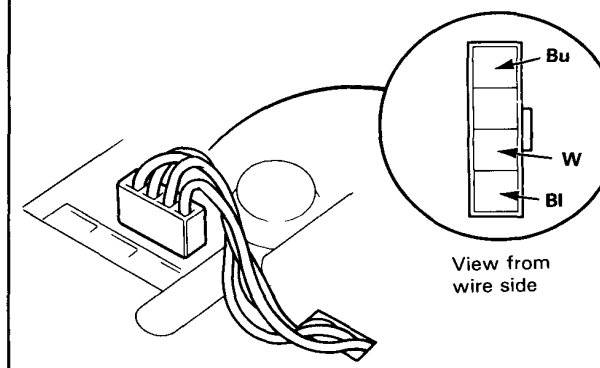
Circuit Diagram



Trip Meter Button Test

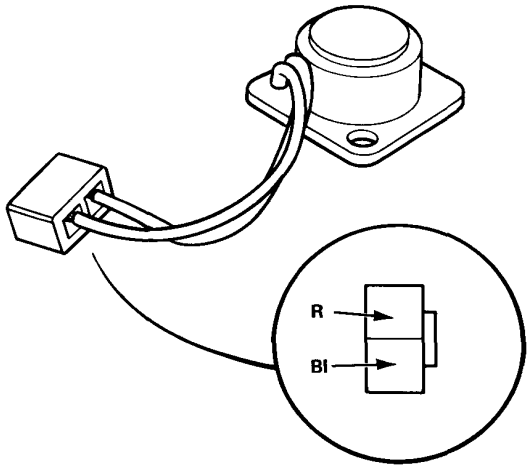
1. Remove the gauge assembly from the instrument panel.
2. Check for continuity between the terminals in each switch position according to the table.

Terminal / Position	Bl	Bu	W
OFF			
RESET	○—○		
SELECT	○——	——○	



Speed Alarm Beeper Test

1. Remove the gauge assembly from the instrument panel and disconnect the 2-P connector.
2. Test the beeper by connecting battery positive wire to the R terminal and negative to the Bl.
3. If the beeper fails to sound, replace it.



View from wire side

Brake Warning Bulb Check Circuit

Description:
The brake warning light goes on if the parking brake is applied, if the brake fluid level is low, and as a bulb test while cranking the engine.

Parking Brake:
With the ignition switch in "Run" or "Start", and the brake fluid level switch closed, the brake warning light operates to remind the driver that the parking brake is applied.

Brake Fluid Level:
With the ignition switch in "Run" or "Start", and the brake fluid level switch closed, the brake warning light operates to warn the driver low brake fluid level in the brake master cylinder.

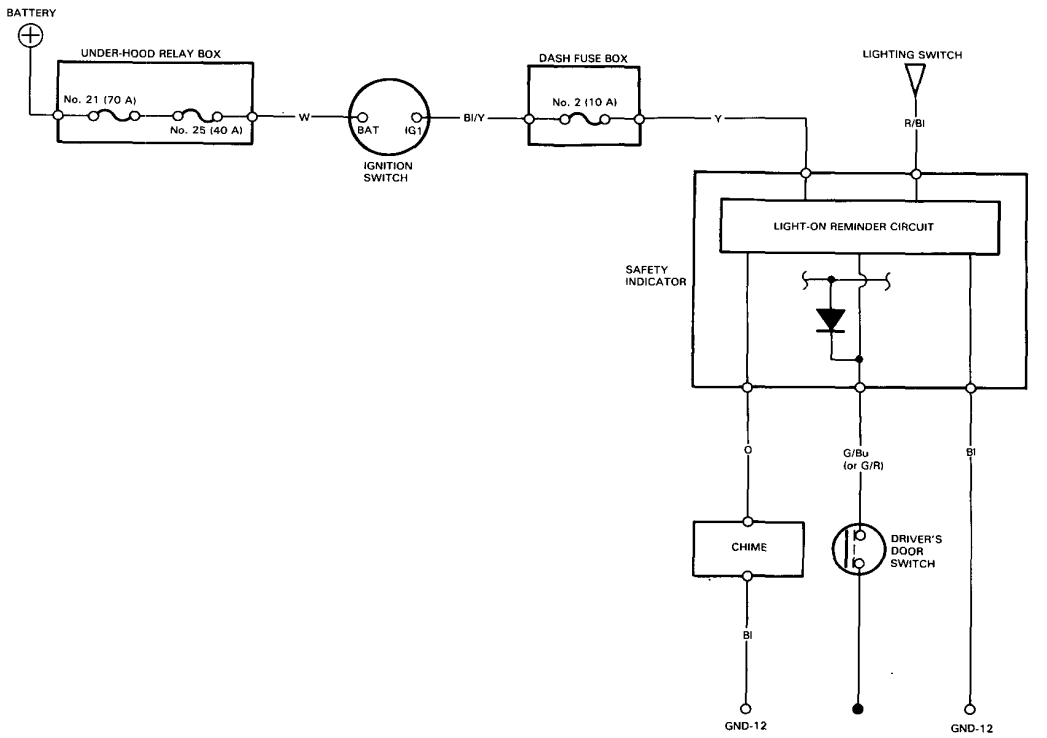
NOTE: Check brake pad wear before adding fluid.

Brake Check:
With the ignition switch in "Start", voltage is applied through the No. 10 (7.5 A) fuse to the bulb check circuit built into the top circuit board in the gauge assembly. The bulb check circuit contacts close, and current flows through the brake warning light and bulb check circuit contacts to ground. The brake warning light operates. This operation tests the brake warning light bulb.

NOTE: Refer to page 25-51 for wiring description of the bulb check circuit.

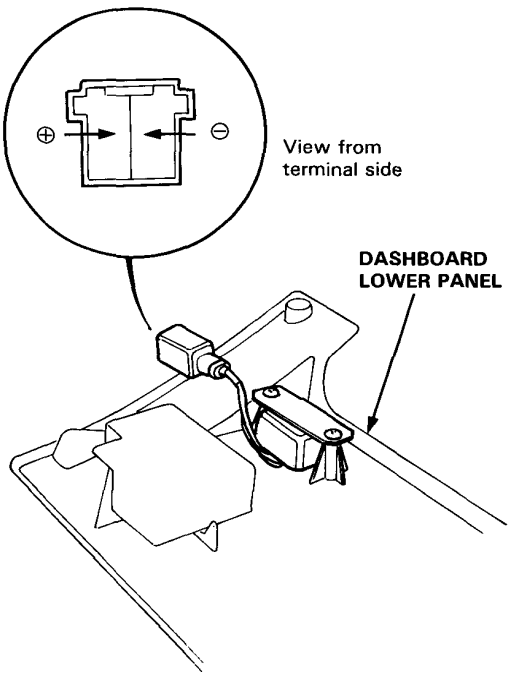
Light-on Warning System

Wiring Diagram



Chime Test

1. Remove the dashboard lower panel to disconnect the 2-P connector.
2. Test the chime by connecting battery positive wire to ⊕ terminal, and negative to ⊖, and cycling the power on-off repeatedly.
3. If the chime fails to sound every time power is cycled, replace it.

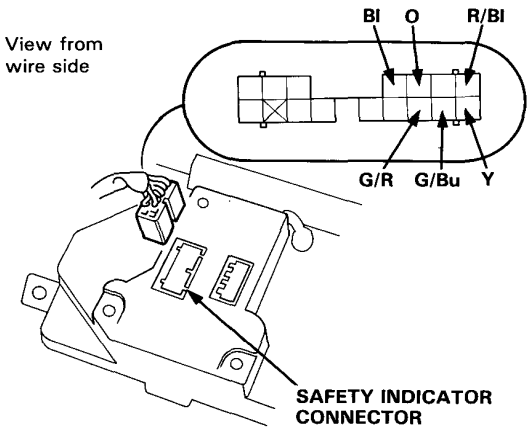


Input Test

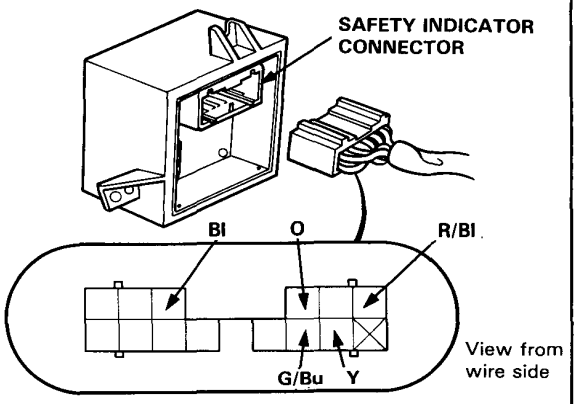
Remove the gauge assembly from the instrument panel to disconnect the 16-P or 14-P connector from the safety indicator.
Make the following input tests at the harness pins.
If all tests prove OK, yet the system still fails to work, replace the safety indicator assembly.

NOTE:
- Before troubleshooting, check the No. 2 (10A) fuse in the dash fuse box.
- G/Bu wire: L.H. Drive
  G/R: R.H. Drive

With analog meter:



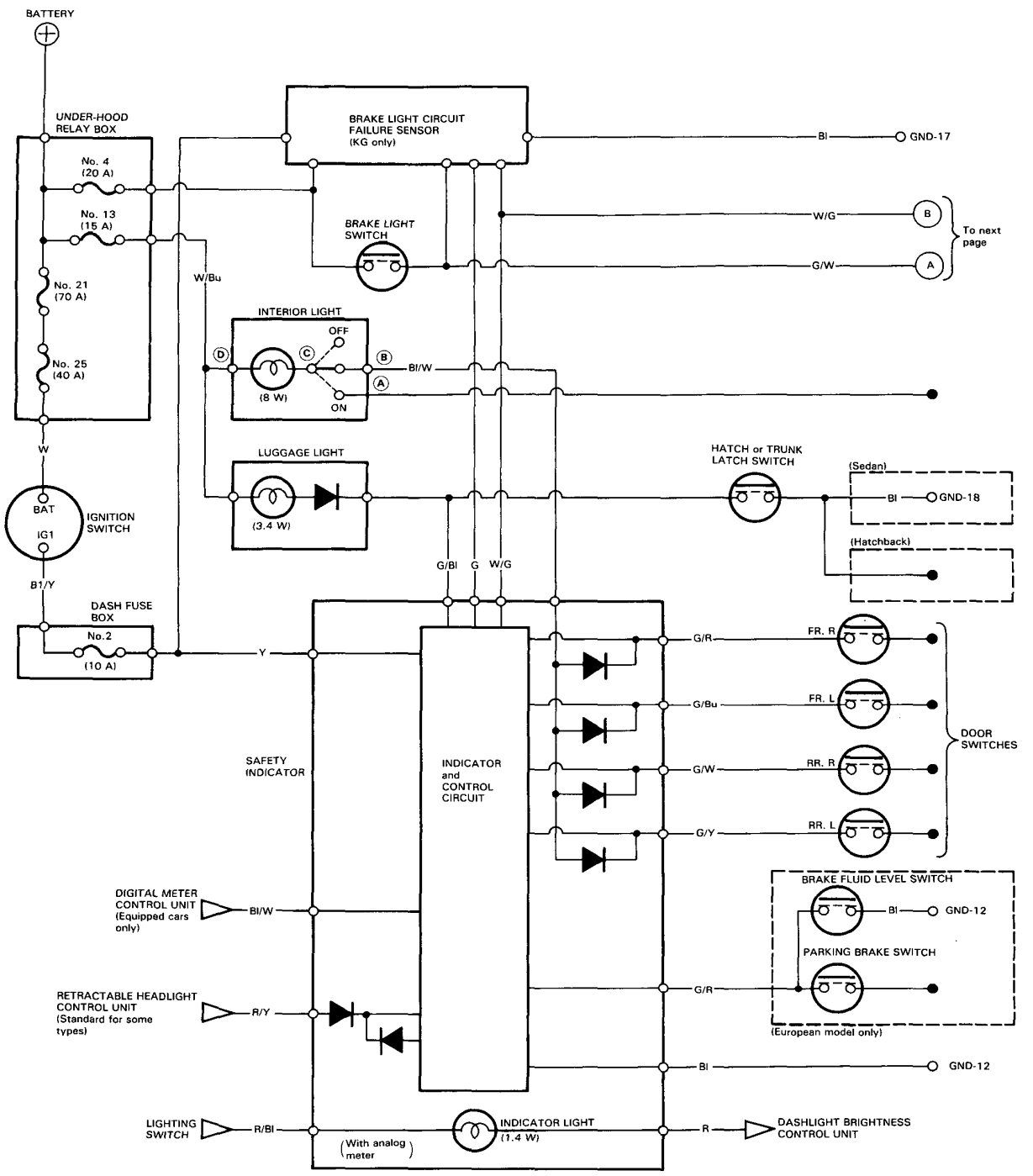
With digital meter:

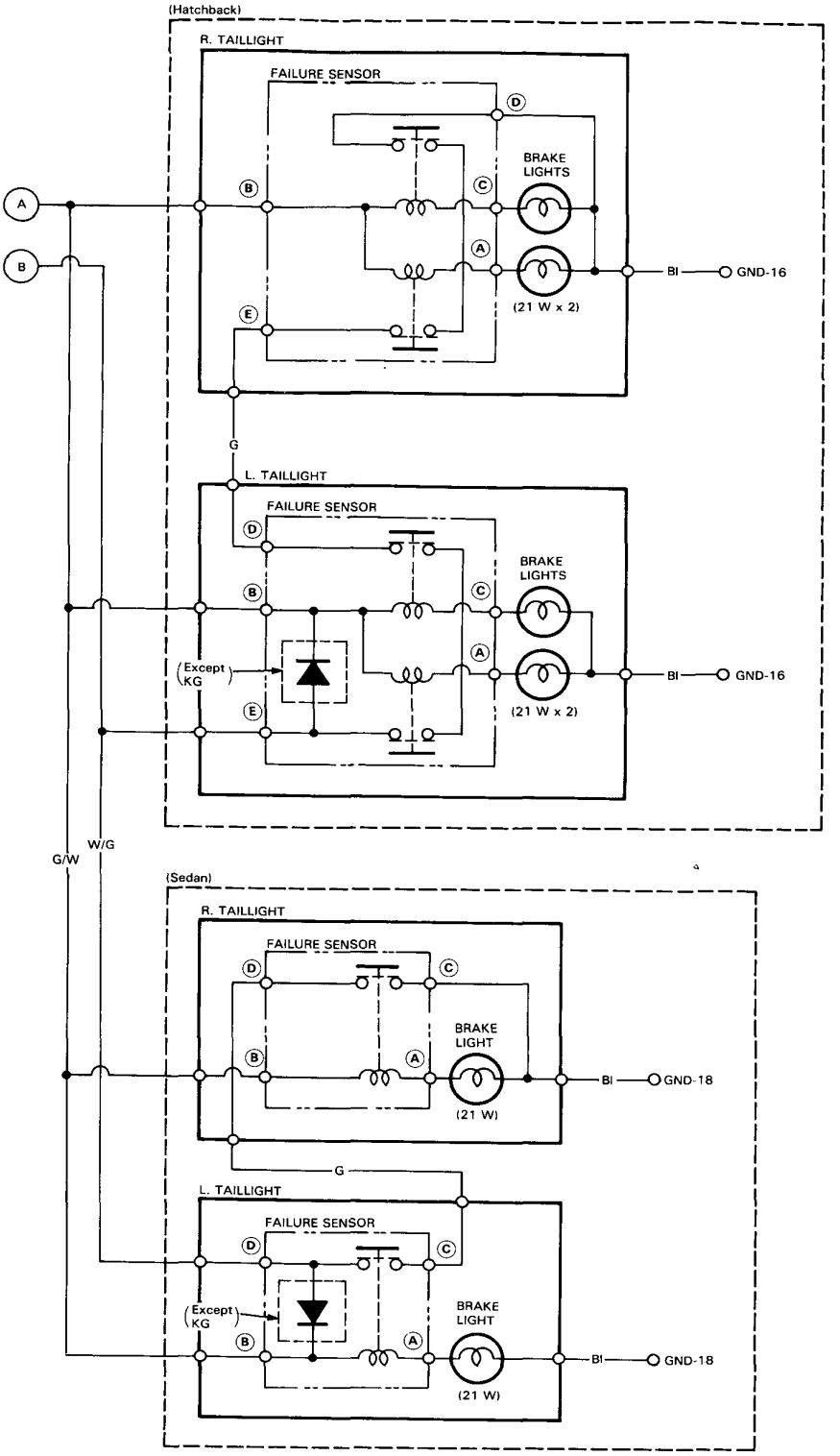


No.	Wire	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	Bl	Under all conditions.	Check for continuity to ground: should be continuity.	• Poor ground. • An open in the wire.
2	Y	Ignition switch ON.	Check for voltage to ground: should be battery voltage.	• Blown No. 2 (10 A) fuse. • An open in the wire.
3	R/Bl	Lighting switch ON.	Check for voltage to ground: should be battery voltage.	• Faulty lighting switch. • An open in the wire.
4	O	Connect battery positive wire to O terminal, and negative to ground.	Check chime operation: Chime should sound each time the battery is connected.	• Faulty chime. • An open in the wire.
5	G/Bu or G/R	Driver's door opened.	Check for continuity to ground: should be continuity. NOTE: Before testing, remove No. 13 (15A) fuse.	• Faulty driver's door switch. • An open in the wire.

Safety Indicator

Wiring Diagram




(Hatchback)
R. TAILLIGHT
FAILURE SENSOR
BRAKE LIGHTS
(21 W x 2)
Bl
GND-16
G
L. TAILLIGHT
FAILURE SENSOR
BRAKE LIGHTS
(Except KG)
(21 W x 2)
Bl
GND-16
G/W
W/G
(Sedan)
R. TAILLIGHT
FAILURE SENSOR
BRAKE LIGHT
(21 W)
Bl
GND-18
G
L. TAILLIGHT
FAILURE SENSOR
BRAKE LIGHT
(Except KG)
(21 W)
Bl
GND-18

Safety Indicator

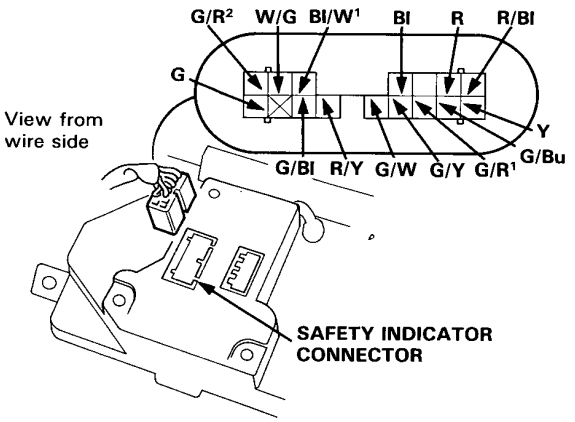
Indicator Test

Remove the gauge assembly from the instrument panel to disconnect the 16-P or 14-P connector from the safety indicator.
Make the following input tests at the harness pins.
If all tests prove OK, yet the indicator still fails to work, replace the indicator assembly.

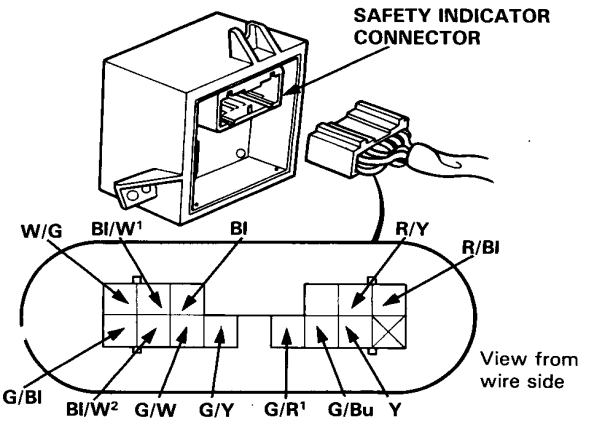
NOTE:

- Several different wires have the same color; They have been given a number suffix to distinguish them (for example G/R^1 and G/R^2 are not the same).
- Before troubleshooting, check the No. 4 (20 A) and No. 13 (15 A) fuses in the under-hood relay box, and No. 2 (10 A) fuse in the dash fuse box.
- G/R^2 wire: European model only
  G: KG model only
  R: Cars with analog meter
  Bl/W^2: Cars with digital meter

With analog meter:



With digital meter:



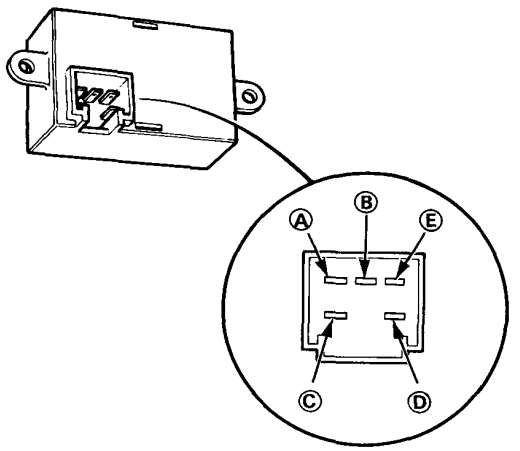
No.	Wire	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	Bl	Under all conditions.	Check for continuity to ground: should be continuity.	• Poor ground. • An open in the wire.
2	Y	Ignition switch ON.	Check for voltage to ground: should be battery voltage.	• Blown No. 2 (10A) fuse. • An open in the wire.
3	Bl/W[1]	Interior light switch in MIDDLE.	Attach to ground: Interior light should come on as the interior light switch in MIDDLE.	• Faulty interior light. • An open in the wire.
4	G/Bl	Hatch or trunk lid opened.	Check for continuity to ground: should be continuity. NOTE: Before testing, remove No. 13 (15A) fuse.	• Faulty hatch or trunk latch switch. • An open in the wire.
5	G/R[1]	Right front door opened.	Check for continuity to ground: should be continuity. NOTE: Before testing, remove No. 13 (15A) fuse.	• Faulty door switch. • An open in the wire.
	G/Bu	Left front door opened.		
	G/W	Right rear door opened.		
	G/Y	Left rear door opened.		
6	R/Y	Headlight retractor motors operated with retractor switch ON and OFF repeatedly.	Check for voltage to ground: should be OV.	• Frozen, stuck, or improperly installed retractor linkage. • Faulty retractable headlight control unit.
7	G/R[2]	Parking brake set (or brake fluid level too low).	Check for continuity to ground: should be continuity.	• Faulty parking brake switch (or brake fluid level switch). • An open in the wire.
8	W/G	Brake pedal pushed.	Check for continuity to ground: should be continuity.	• Blown brake light bulbs. • Faulty brake light failure sensors. • An open in the wire. • Faulty brake light switch.
9	Bl/W[2]	Ignition switch ON.	Check for voltage to ground: should be below 2V for 2 sec. with the ignition switch ON.	• Faulty digital meter control unit. • An open in the wire.
10	G	Ignition switch ON.	Check for continuity to ground: should be continuity.	• Faulty brake light circuit failure sensor. • An open in the wire. • Poor ground.
11	R/Bl R	Lighting switch ON and dashlight brightness control dial in full bright.	Check for voltage between R/Bl and R terminals: should be battery voltage.	• Faulty dashlight brightness control unit. • An open in the wire.

Safety Indicator

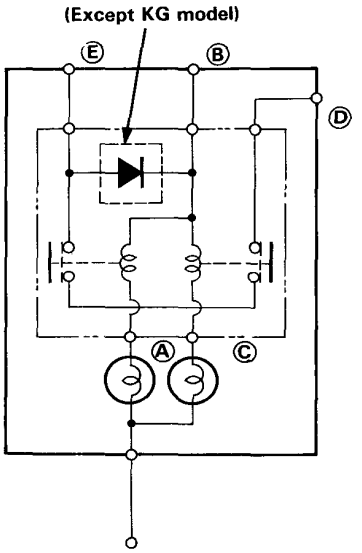
Brake Light Failure Sensor Test

Hatchback:

1. Remove the failure sensors from the taillights.
2. Check for continuity in both directions between (B) and (E) terminals. There should be continuity in only one direction. (Standard for some types)
3. There should be continuity between (D) and (E) terminals with the battery positive wire connected to (B) terminal, and the negative to (A) and (C). There should be no continuity between (D) and (E) terminals when the battery is disconnected.

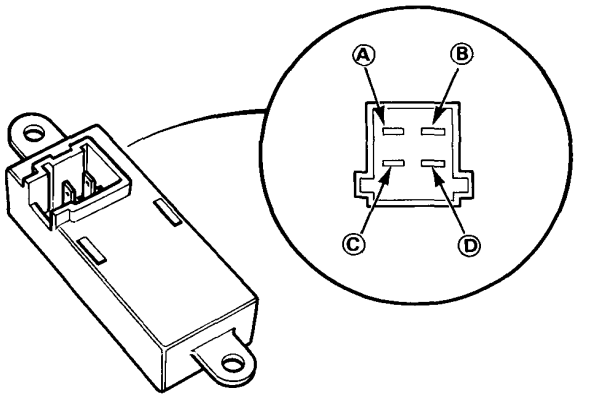


Circuit Diagram

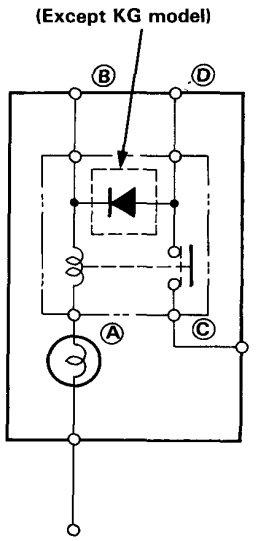


Sedan:

1. Remove the failure sensors from the taillights.
2. Check for continuity in both directions between (B) and (D) terminals. There should be continuity in only one direction. (Standard for some types)
3. There should be continuity between (C) and (D) terminals with the battery positive wire connected to (B) terminal, and negative to (A). There should be no continuity between (C) and (D) terminals when the battery is disconnected.



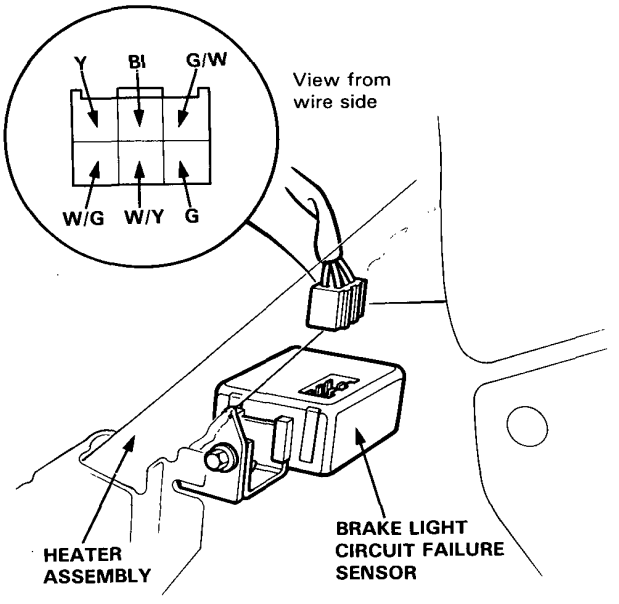
Circuit Diagram



Brake Light Circuit Failure Sensor Test

Disconnect the 6-P connector from the failure sensor. Make the following input tests at the harness pins. If all tests prove OK, yet the failure sensor still fails to work, replace the sensor.

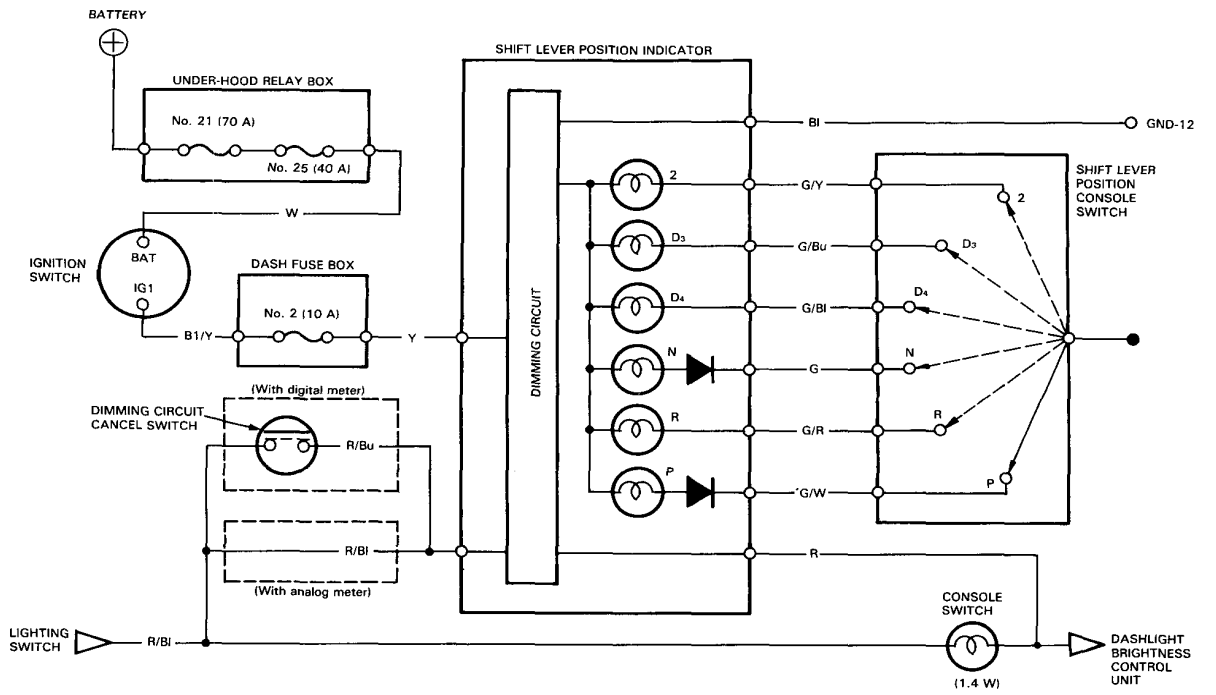
NOTE: Before testing, check the No. 4 (20A) fuse in the under-hood relay box, and the No. 2 (10A) fuse in the dash fuse box.



No.	Wire	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	Bl	Under all conditions.	Check for continuity to ground: should be continuity.	• Poor ground. • An open in the wire.
2	Y	Ignition switch ON.	Check for voltage to ground: should be battery voltage.	• Blown No. 2 (10A) fuse. • An open in the wire.
3	G	Ignition switch ON.	Attach to ground: "BRAKE LAMP" should light up as the ignition switch ON.	• Faulty safety indicator. • An open in the wire.
4	W/Y	Under all conditions	Check for voltage to ground: should be battery voltage.	• Blown No. 4 (20A) fuse. • An open in the wire.
5	G/W	Brake pedal pushed.	Check for voltage to ground: should be battery voltage.	• Faulty brake light switch. • An open in the wire.
6	W/G	Brake pedal pushed.	Check for continuity to ground: should be continuity.	• Blown brake light bulbs. • Faulty brake light failure sensors. • An open in the wire.

Shift Lever Position Indicator

Wiring Diagram



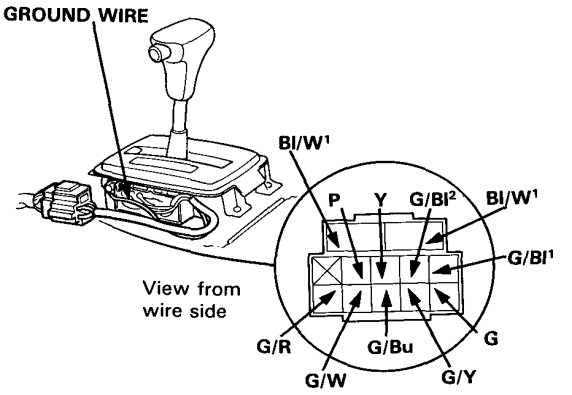
Console Switch Test

1. Remove the front console.
2. Check for continuity between the terminals in each switch position according to the tables.

   NOTE: Several different wires have the same color; They have been given a number suffix to distinguish them (for example G/Bl¹ and G/Bl² are *not the same*).

Position \ Terminal	G/W	G/R	G	G/Bl¹	G/Bu	G/Y	GROUND WIRE
2						○	○
D_3					○		○
D_4				○			○
N			○				○
R		○					○
P	○						○

Position \ Terminal	GROUND WIRE	P	Bl/W¹	Y	Bl/W²	G/Bl²
2	○	○				
D_3	○	○				
D_4	○	○				
N			○		○	
R				○		○
P			○		○	

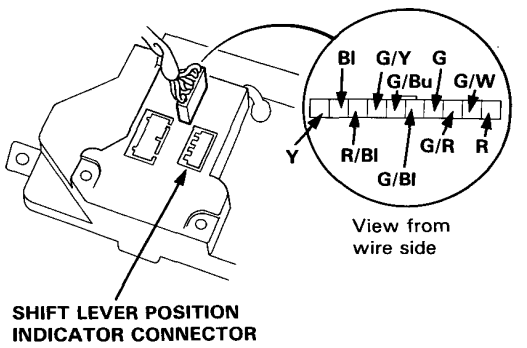


Indicator Input Test

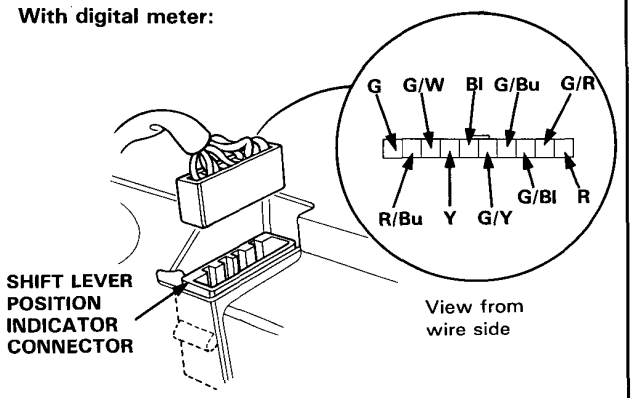
Remove the gauge assembly from the instrument panel to disconnect the 10-P connector from the shift lever position indicator.
Make the following input tests at the harness pins.
If all tests prove OK, yet the indicator still fails to work, replace the indicator assembly.

NOTE:
- Before troubleshooting, check the No. 2 (10A) fuse in the dash fuse box.
- R/Bl wire: Cars with analog meter
  R/Bu: Cars with digital meter

With analog meter:



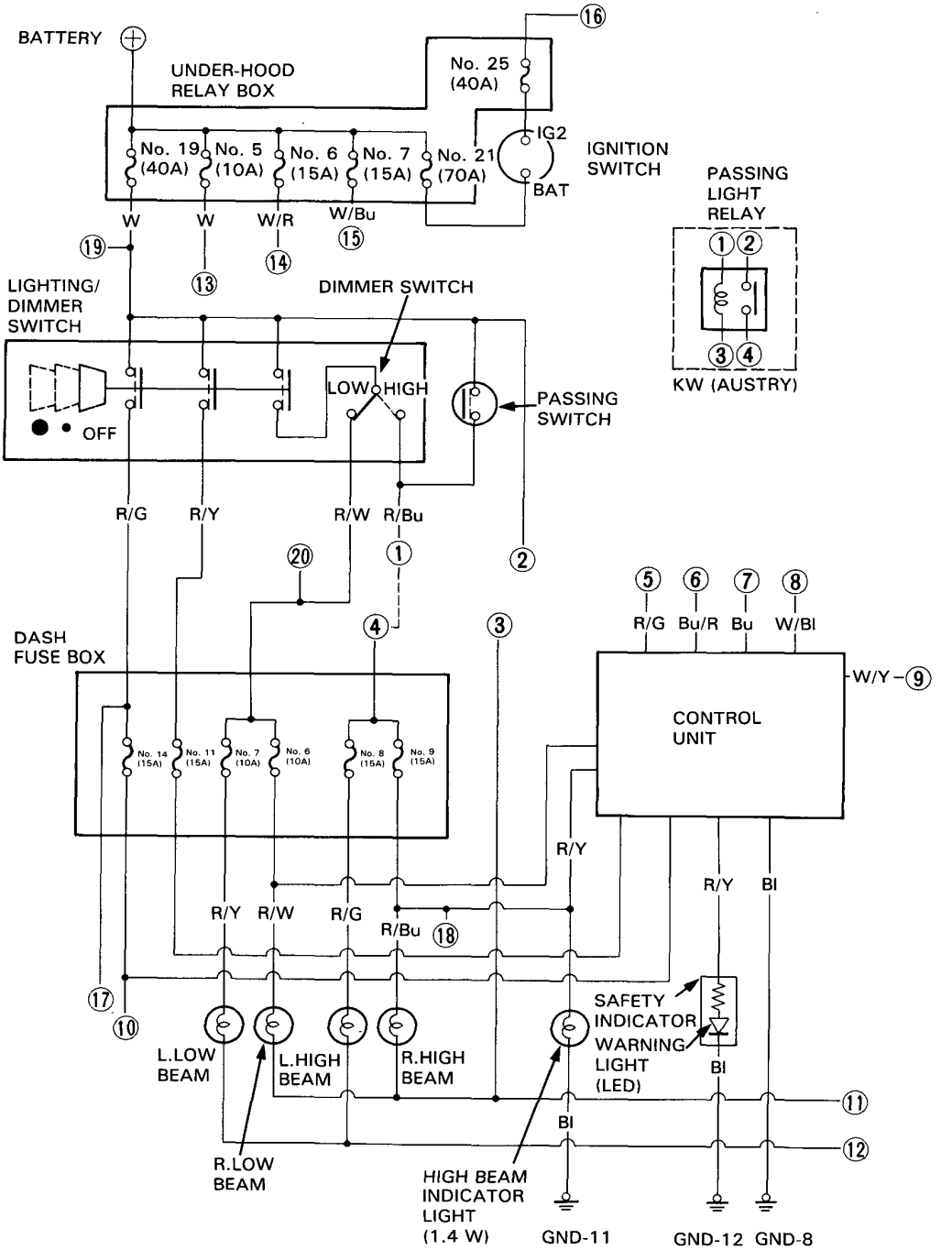
With digital meter:

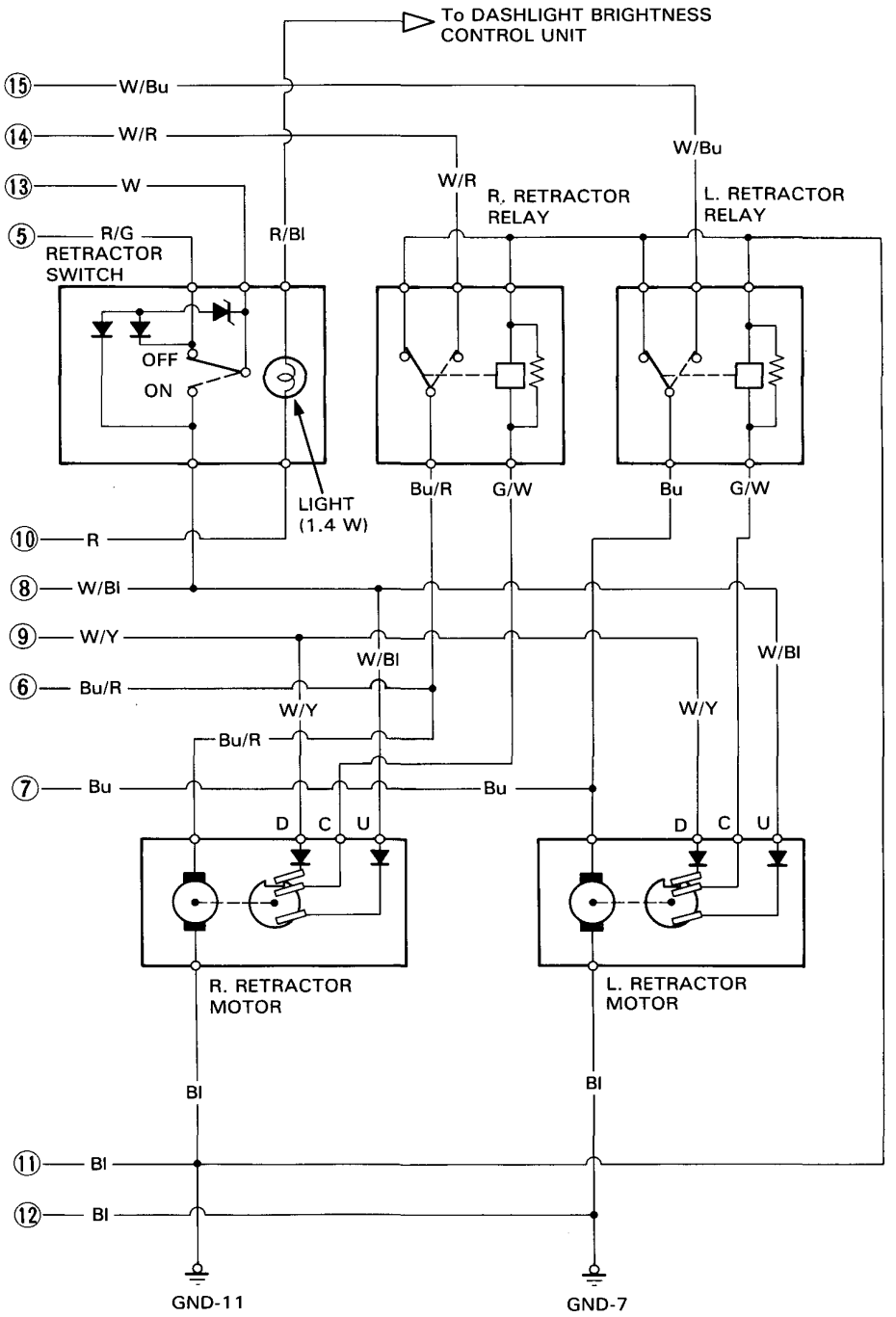


No.	Wire	Test condition		Test: desired result	Possible cause (if result is not obtained)
1	Bl	Under all conditions.		Check for continuity to ground: should be continuity.	• Poor ground. • An open in the wire.
2	Y	Ignition switch ON.		Check for voltage to ground: should be battery voltage.	• Blown No. 2 (10A) fuse. • An open in the wire.
3	G/W	Shift lever position	In P	Check for continuity to ground: should be continuity.	• Faulty shift lever position • An open in the wire. • Poor ground.
	G/R		In R		
	G		In N		
	G/Bl		In D_4		
	G/Bu		In D_3		
	G/Y		In 2		
4	R/Bl and R	Lighting switch ON and dashlight brightness control dial in full bright.		Check for voltage between R/Bl and R terminals: should be battery voltage.	• Faulty dashlight brightness control unit. • An open in the wire.
	R/Bu and R	Lighting switch ON and dashlight brightness control dial in full bright.		Check for voltage between R/Bu and R terminals: should be battery voltage.	• Faulty dashlight brightness control unit. • An open in the wire.

Wiring Diagram

Retractable Headlight:

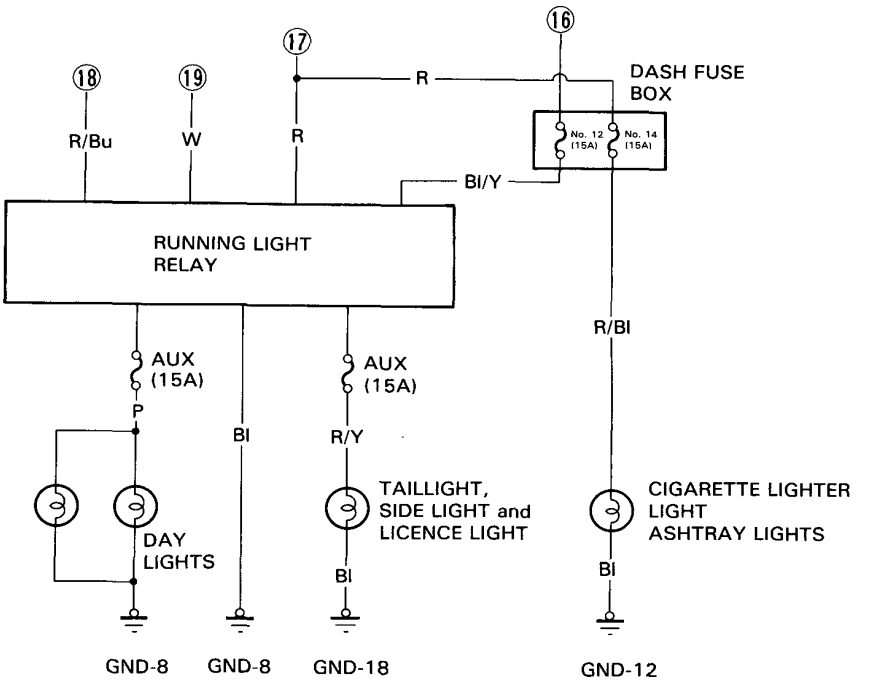



To DASHLIGHT BRIGHTNESS CONTROL UNIT
⑮ W/Bu
⑭ W/R
⑬ W
⑤ R/G
RETRACTOR SWITCH
R/Bl
W/R
R. RETRACTOR RELAY
W/Bu
L. RETRACTOR RELAY
OFF
ON
LIGHT (1.4 W)
Bu/R
G/W
Bu
G/W
⑩ R
⑧ W/Bl
⑨ W/Y
⑥ Bu/R
W/Bl
W/Y
W/Bl
W/Y
Bu/R
⑦ Bu
Bu
D C U
D C U
R. RETRACTOR MOTOR
L. RETRACTOR MOTOR
Bl
Bl
⑪ Bl
⑫ Bl
GND-11
GND-7

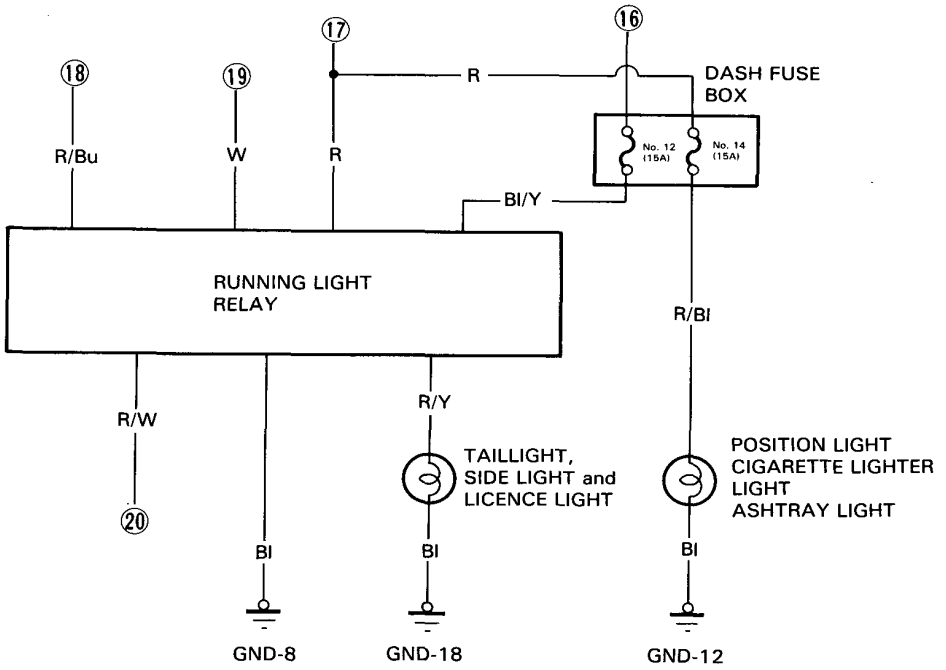
Wiring Diagram

Day-Time Running Light:

Hatchback:



Sedan:



Troubleshooting (Retractable Headlight)

Function: The retractor motors are controlled by their respective relays. The relays are energized by power to either the up-wire (W/Bl) or down-wire (W/Y), through the slip ring in the retractor motors. The up wire can be powered either by the headlight switch/control unit or via the retractor switch directly. The down wire can only be powered by the control unit via either the headlight switch or the retractor switch. The control unit also senses any abnormality in the way the retractor motors operate and warns the driver by illuminating the safety indicator warning light.

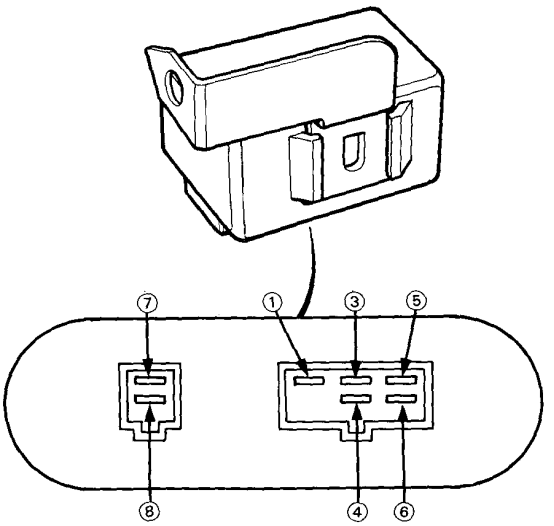
NOTE:
- The numbers in the table show the troubleshooting sequence.
- Before troubleshooting:
  - Check the No.19 (40A), No.5(10A), No.6 (15A) and No.7 (15A) fuses in the under-hood relay box.
  - Check the No.6 (10A), No.7 (10A), No.8 (15A), No.9 (15A), No.11 (15A) and No.14 (15A) fuses in the dash fuse box.

Symptom \ Items to be inspected		Retractor relay	Retractor motor	Lighting switch	Retractor switch	Control unit	Frozen, stuck, or improperly installed retractor linkage	Poor ground	Open circuit in wires or loose or disconnected terminals
Warning light ON			3			2	1		
Both headlights won't open	With either switch (lighting and retractor)							GND-7	W/Bl
	With lighting switch			1		2		GND-2	R/W or R/W
	With retractor switch				1				W or W/Bl
Both headlights won't close	With either switch					1			W/Y, R/G or W
	With lighting switch NOTE: All other switches OFF					1			W/Y
	With retractor switch NOTE: All other switches OFF					1			R/G, W/Y
Headlights close when lighting switch is turned from "●" to "•" NOTE: Other switch OFF						1			R/Bl

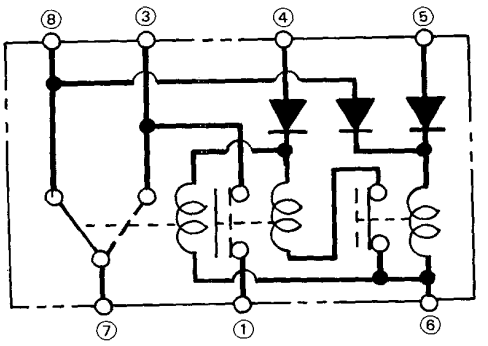
NOTE: Several different wires have the same color. They have been given a number suffix to distinguish them (for example G/Bl[1] and G/Bl[2] are not the same).

Running Light Relay Test

1. Remove the running light relay.
2. There should be continuity between ① and ⑦ terminals with the battery positive wire connected to ④ terminal, and the negative to ⑥.
   There should be no continuity between ① and ⑦ terminals with the battery positive wire connected to ④ and ⑤ terminals, and the negative to ⑥.
   There should be continuity between ⑦ and ⑧ terminals when the battery is disconnected.



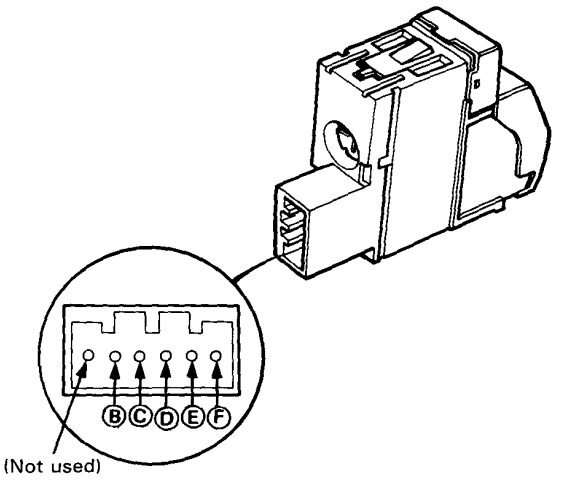
Circuit Diagram



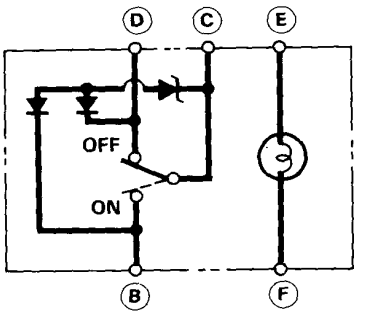
Retractor Switch Test

1. Remove the retractor switch.
2. Check for continuity between the terminals in each switch position according to the table.

Terminal / Postion	Ⓑ	Ⓒ	Ⓓ	Ⓔ		Ⓕ
OFF (RETRACT)		○—○		○—○		○—○
ON (RAISE)	○—○			○—○		○—○

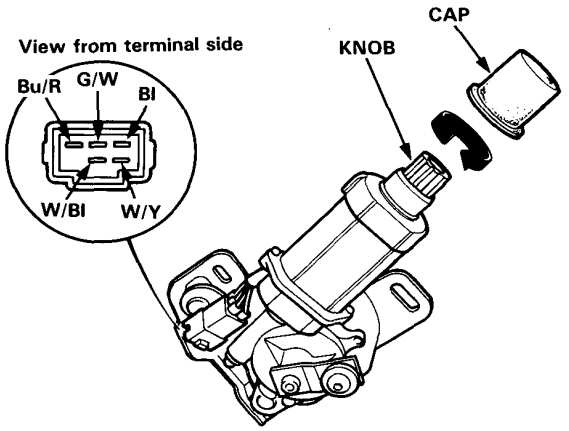


Circuit Diagram



Retractor Motor Test

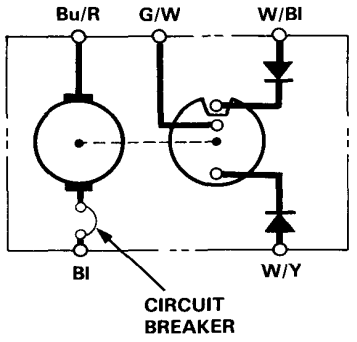
1. Remove the retractor motor.
2. Test motor operation by connecting battery positive wire to the Bu/R terminal and negative to the Bl terminal.
   The motor should run continuously.
3. If the motor fails to run smoothly, replace it.



4. Disconnect the power supply and check for continuity between the terminals according to the table while turning the knob clockwise, as shown above.

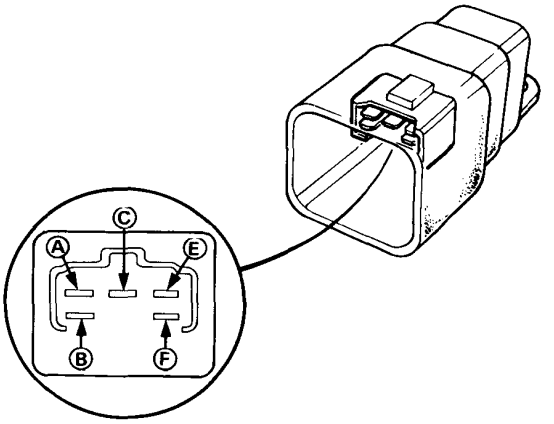
Terminal / Headlight	W/Bl		G/W		W/Y
At raised position			○	⊣	○
At retracted position	○	⊢	○		

Circuit Diagram

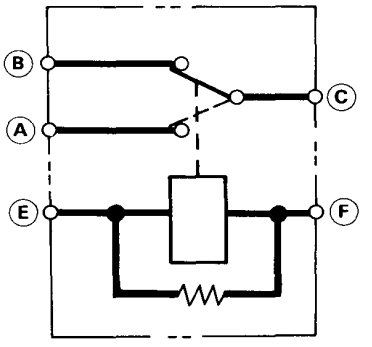


Retractor Relay Test

1. Remove the retractor relays located on the left side of the engine compartment.
2. There should be continuity between Ⓐ and Ⓒ terminals when the battery is connected to Ⓔ and Ⓕ terminals.
   There should be continuity between Ⓑ and Ⓒ terminals when the battery is disconnected.



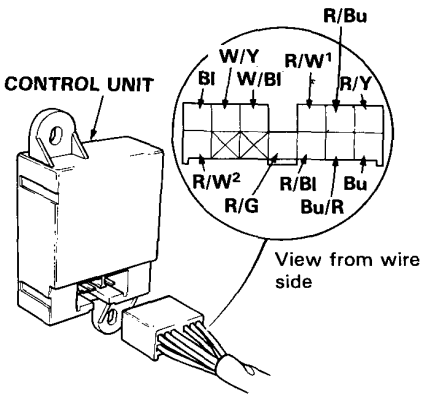
Circuit Diagram



Headlights

Control Unit Input/Output

The control unit is located on the kickpanel, to the left of the dash fuse box.



R/Bu: Standard for some types

Input Test:
Disconnect the 13-P connector from the control unit and perform tests 1—7.

No.	Wire	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	Bl	At all times under all conditions	Check for continuity to ground: should be continuity.	Poor ground. An open in the wire.
2	R/G	Retractor switch OFF	Check for voltage to ground: should have battery voltage.	An open in the wire. Faulty retractor switch.
3	R/W¹	Lighting switch "●"		An open in the wire. Blown No.11 (15A) fuse.
4	R/Bl	Lighting switch "•" or "◐"		An open in the wire. Blown No.14 (15A) fuse.
5	R/W²	Lighting switch "●" and dimmer switch LOW		An open in the wire. Blown No.7 (10A) fuse.
6	R/Bu	Lighting switch "●" and dimmer switch HIGH		An open in the wire. Blown No.8 (15A) fuse.
7	Bu/R or Bu	Retractor motor stationary	Check for continuity to ground: should be continuity.	An open in the wire. Poor ground. Faulty retractor relay.

Output Test:
Reconnect the 13-P connector to the control unit and disconnect the 5-P connectors from the 2 retractor relays on the left side of the engine compartment.

8	R/Y	Connect battery positive wire to Bu/R or Bu terminal, negative to ground.	Check for voltage to ground: should have battery voltage within about 15 seconds after battery has been connected.	Faulty control unit.
9	W/Bl	Retractor switch OFF and lighting switch "●", or when lighting switch is turned from "●" to "•".	Check for voltage to ground: should have battery voltage.	
10	W/Y	Retractor switch OFF and lighting switch OFF		

INTRODUCTION

Forward

This Shop Manual describes the construction and Function of the '86 Honda Accord.

All information contained in this manual is based on the latest product information available at the time of printing. We reserve the right to make changes at anytime without notice. No part of this publication may be reproduced, stored in retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the publisher. This includes text, figures and tables.

How To Use This Manual

This manual is divided into 7 sections. The first page of each section is marked with a black tab that lines up with one of the thumb index tabs on this page. You can quickly find the first page of each section without looking through a full table of contents. The symbols printed at the top corner of right pages can also be used as a quick reference system.

HONDA MOTOR CO., LTD.
Service Publication Office

First Edition 10/85, 200Pages
Second Print 3/89

INDEX

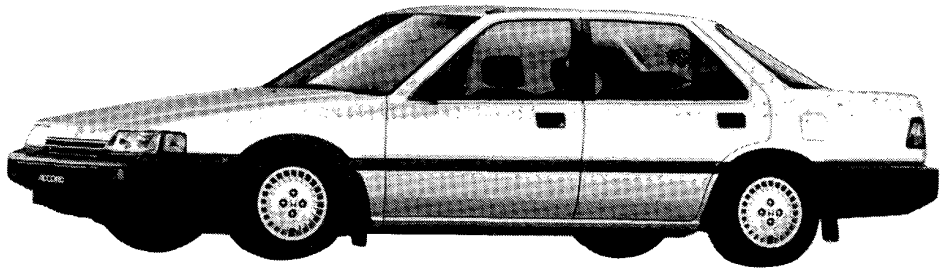
General Information

General Information

Development Aims

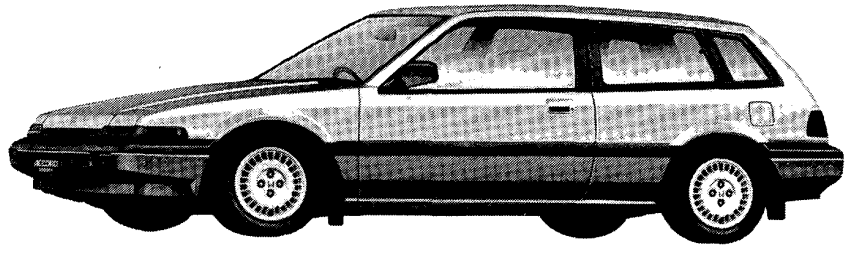
- **4 DOOR SEDAN**

Since the introduction of the original 1600cc Accord Hatchback in 1976, the refined image and superb driveability combined with economy made it immenesly popular in the market. Next year, Accord 4 door sedan was released as a high quality speciality car with powerful 1800cc engine.
Next came the second generation Accord 4-door sedan and 3-door Hatchback with a long list of new features and extra equipment which transform the vehicles into a truly luxuriously appointed car. In 1984, the Accord got an important attire — PGM-F1 and 4W-ALB — making it the top-of-the-line product and has enjoyed extraordinary success in many world markets. And here comes the New Generation Accord — an excitement to all who know well what a speciality personal sedan should offer !



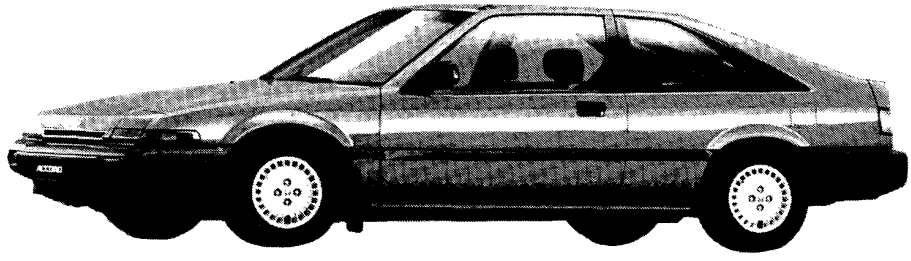
- **AERODECK**

AERODECK is a Honda's answer to the question of what a car should be and do. Featuring a long roof and large gal-wing tailgate, the owner has all the comforts of large luxurious sedans with lots of wagon extras.
The new, robust 2000cc, 3-valve, 4-cycle engine means ample power in every speed range the driver needs it.
The front and rear wheels use a double wishborn independent suspension which contributes to the car's perfectly predictable, safe handling and comfortable ride over rough, unpaved roads.
Retractable headlights and semi-concealed windshield wipers are few of examples built into this vehicle.



- **GLASS-BACK**

To add to this, the semi-concealed windshield wipers provides an amazingly wide forward visiblity. The water-cooled, 4-stroke, 3-valve 2,000cc engine and independent double wishbone suspension for the front and rear wheels combine to offer excellent roadholding, smooth ride and powerful output at all rpm levels.
The 3-door model comes into two types, each featuring refined external styling and beautiful interior with a large luggage space.



Engine-Frame

KC		4 DOOR		3 DOOR
		LX	EXi	S
PH4	2.0ℓ SOHC CARB.	○		○
PJO	2.0ℓ SOHC PGM-FI		○	

EC		4 DOOR										3 DOOR	
		KF		KB, KG, KW			KG	KS, KX			KE	KB, KE, KF KG, KS, KW	
		EX	EX2.0i	LX	EX	EX2.0i	EXC	LX	EX	EX2.0i	EX	EX2.0i	EX	EX2.0i
PH1	1.6ℓ SOHC CARB.	○		○									
PH4	2.0ℓ SOHC CARB.	○		○	○			○	○		○		○	
PJO	2.0ℓ SOHC PGM-FI		○			○				○		○		○
PH4	2.0ℓ SOHC CAB. USA E/M						○							

KQ, KY, GENERAL		4 DOOR							3 DOOR			
		KT		KY			KQ, KP, KU		KQ, KP, KT, KU		KY	
		STD	EX	GL	EX	EXR	STD	EX	STD	EX	EX	EXR
PH1	1.6ℓ SOHC CARB.	○	○									
PH4	2.0ℓ SOHC CARB.		○	○	○	○	○	○	○	○	○	○

4 Door	KC	KF	KG/KB	KS	KW/KR	KX	KY	KP	KQ	KE	KT	KU
TYPE	LX EXI	EX 2.0i	LX EX EX C 2.0i	LX EX EX 2.0i	LX EXX EX C 2.0i	LX EX EX 2.0i	GL EX EXR	STD EX	STD EX	EX EX 2.0i	STD EX	STD EX
[GENERAL]												
Tilt steering	O O	*1 O O	O O O	O O	O O	O O	O O	O	O	O O	*1 O	O
Power steering	O O	O O	O O O	O O	O O	O O	O O O	O	O	O O	O	O
Front/Rear stabilizer	O	O O	O O O O	O O O	O O O	O O O			O O	O O		
Front ventilated disc brake (13")	O O	O O	O O O O	O O O	O O O	O O O	O O O	O O	O O	O O	O O	O O
Rear disc brake (13")		/O O	/O O	/O O	/O O	/O O				/O O		
4 wheels double wishbone suspension	O O	O O	O O O O	O O O	O O O	O O O	O O O	O O	O O	O O	O O	O O
Progresive rate spring (Rear)	O O	O O	O O O O	O O O	O O O	O O O	O O O	O O	O O	O O	O O	O O
Electric sunroof	O	*1 F F	F F F	F F	F F F	F F	F O	F	F	F F	F	F
Air conditioner (Manual)		F F	F F F F	F F F	F F F	F F F	O O O	F F	F F	F F	F F	F F
Hydraulic engine mount	O O	*1 O O	*1 O O O	O O O	*1 O O	O O O			O O	O O		
Auto cruise control	*2 O O					O O	O			O		
4 wheel Anti-Lock Brake System		*1 /O /O	/O /O	/O /O	/O /O	/O /O				/O /O		
[EXTERIOR]												
Elec. remote control door mirror	O	O O	O O O	O O	O O	O O	O O O	O	O	O O	O	O
5 miles bumper	O O						O O O					
Alloy wheels	O	F F	F F F F	F F F	F F F	F F F	F F F	F F	F F	F F	F F	F F
Mudguard (Front)	O O	O O	O O O O	O O O	*3 O *3 O *3 O	O O O	O O O	O O	O O	O O	O O	O O
(Rear)					*3 O *3 O *3 O	O O	O O O	O O	O O	O O	O O	O O
Inner fender	O O	O O	O O O O	O O O	O O O	O O O	O O O	O O	O O	O O	O O	O O
Engine under cover	O O	O O	O O O O	O O O	O O O	O O O	O O O	F F	O O	O O	F F	F F
Side sill chaping primary	O O	O O	O O O O	O O O	O O O	O O O	O O O	O O	O O	O O	O O	O O
Wheel cap	O	O	O	O O	O O	O	O O	O	O	O	O	O
[INTERIOR]												
Door pocket (L: Large, S: Small)	L L	L L	S L L L	S L L	S L L	S L L	S L L	S L	S L	L L	S L	S L
Seat (M: Moquet, S: Soft weave)	M M	M M	S M M M	S M M	S M M	S M M	S M M	S M	S M	M M	S M	S M
Seat lifter		O O	O O O O	O O O	O O O	O O O	O O O	O O	O O	O O	O O	O O
Folding down rear seatback	O			O O	O O	O O			O			
Swing headrest		O O	O O O	O O	O O	O O	O O O	O		O O	O	O
Seat belt: Front ELR	O O	O O	O O O O	O O O	O O O	O O O	O O O	O O	O O	O O	O O	O O
Variable anchor		O O	O O O O	O O O	O O O	O O O		O O	O O	O O	O O	O O
Rear ELR 3P + MNL 2P	O O	O O	O O O O	O O O	*4 O *4 O *4 O	O O O	O O O		O O	O O		
Heated seat				*5 F *5 F *5 F	F F F	F F F						
Half shade window	O O	O O	O O O	O O	O O	O O	O O O	O		O O	O	O
Sunvisor (with vanity mirror)	*6 O	O O	O O O	O O	O O	O O	O *6 O	O	O	O O	O	O
Inside reaview mirror (Day/Night change)	O O	O O	O O O O	O O O	O O O	O O O	O O O	O O	O O	O O	O O	O O
Rear seat center armrest	O	O O	O O O	O O	O O	O O	O O	O	O	O O	O	O
Front seatback pocket	O	O O	O O O	O O	O O	O O	O O	O	O	O O	O	O
Childproof rear door locks	O O	O O	O O O O	O O O	O O O	O O O	O O O	O O	O O	O O	O O	O O
Trunk opener (K: with key)	K K	K K	K K K K	K K K	K K K	K K K	K K K	O K	O K	K K	O K	O K
Fuel lid opener	O O	O O	O O O O	O O O	O O O	O O O	O O O	O O	O O	O O	O O	O O

(cont'd)

General Information

Major Equipment (cont'd)

4 Door	KC	KF	KG/KB	KS	KW/KR	KX	KY	KP	KQ	KE	KT	KU
TYPE	LX EX I	EX EX 2.0i	LX EX EX EX C 2.0i	LX EX EX 2.0i	LXXX EE X C 2.0i	LX EX EX 2.0i	GL EX EX R	ST EX D	ST EX D	EX EX 2.0i	ST EX D	ST EX D
[INTERIOR]												
Power window	*7 O	O O	O	O O	O O	O O	O O	O	O	O O	O	O
Power door lock	*8 O	O O	O O O	O O	O O	O O	*8 *8 O O	O	O	O O	O	O
[INSTRUMENTATION]												
Tachometer	O O	O O	O O O O	O O O	O O O	O O O	O O O	O O	O O	O O	O O	O O
Automatic transmission position indicator	O O	O O	O O O O	O O O	O O O	O O O	O O O	O O	O O	O O	O O	O O
Safety indicator	O O	O O	O O O O	O O O	O O O	O O O	O O O	O O	O O	O O	O O	O O
Illumination control (Non cut-off type)	O O	O O	O O O O	O O O	O O O	O O O	O O O	O O	O O	O O	O O	O O
Heater control (L: Lever, B: Button)	L L	B B	L B B B	L B B	L B B	L B B	B B B	L B	L B	B B	L B	L B
Face cool control		O O	O O O	O O	O O	O O	O O O	O	O	O O	O	O
Rear heater duct	O O	O O	O O O O	O O O	O O O	O O O	O O O	O O	O O	O O	O O	O O
Glove box with key	O O	O O	O O O O	O O O	O O O	O O O	O O O	O	O O	O O	O	O
Speaker (2: 2 speakers, 4: 4 speakers)	4 4	2 4	2 2 2 4	2 2 4	2 2 4	2 2 4	2 4 4		2 2	2 4		
Antenna (A: Auto, M: Manual)	M A	A A	M A A A	M A A	M A A	M A A	M A A	M A	M A	A A	M A	M A
Digital clock	O O	O O	O O O O	O O O	O O O	O O O	O O O	O O	O O	O O	O O	O O
[ELECTRICAL SYSTEM]												
Special Design headlight		O O	O O O O	O O O	O O O	O O O		O O		O O	O O	O O
Halogen headlights	O O	O O	O O O O	O O O	O O O	O O O	O O O	O O	O O	O O	O O	O O
Headlight-on alarm (C: Chaim, B: Buzzer)	B B	C C	C C C C		C C C	C C C	C C C	C C	C C	C C	C C	C C
Day-light system				O O O	*9 *9 *9 O O O							
Headlight wiper				O O O	*10 *10 *10 O O O	O O				O		
Courtesy lights	O O	O O	O O O	O O	O O	O O	O O	O	O	O O	O	O
Rear fog light		O O	O O O O	O O O	O O O	O O O				O O		
Ignition switch illumination	O	O O	O O O	O O	O O	O O	O	O	O	O O	O	O

F: Factory option
*1: Except 1.6ℓ engine model
*2: Except 5M/T model
*3: Except KR
*4: Only KW (Finland, Norway and Austria), Other area; ELR-3P
*5: Driver's and assistant seats
*6: With illumination
*7: Lever type switch
*8: 4 actuators type
*9: Norway and Finland model only
*10: Norway, Finland and Turkey model only

3 Door

	GLASS-BACK										AERO-DECK											
	KC	KQ		KP		KT/KU		KY		KF		KG/KB		KS		KW		KX		KE		
TYPE	S	STD	EX	STD	EX	STD	EX	EX	EXR	EX	EX 2.0i	EX	EX 2.0i	EX	EX 2.0i	EX	EX 2.0i	EX	EX 2.0i	EX	EX 2.0i	
[GENERAL]																						
Tilt steering	O		O		O		O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	
Power steering	O *1		O		O		O	O	O	/O	O	/O	O	O	O	/O	O	O	O	O	O	
Front/Rear stabilizer	O	O	O							O	O	O	O	O	O	O	O	O	O	O	O	
Front ventilated disc brake (13")	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	
4-wheels double wishbone suspension	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	
Progresive rate spring (Rear)	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	
Electric sunroof										F	F	F	F	F	F	F	F	F	F	F	F	
Air conditioner (Manual)		F	F	F	F	F	F	O	O	F	F	F	F	F	F	F	F	F	F	F	F	
Hydraulic engine mount	O	O	O							O	O	O	O	O	O	O	O	O	O	O	O	
4-wheel Anti-Lock Brake System											/O		/O		/O		/O		/O		/O	
[EXTERIOR]																						
Elec. remote control door mirror			O		O		O	O	O		O		O		O		O	O	O		O	
Front spoiler											O		O		O		O		O		O	
Alloy wheels		F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	F	
Front mudguard	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	
Rear mudguard		O	O													O	O	O	O	O	O	
Inner fender	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	
Engine under cover	O	O	O	F	F	F	F	O	O	O	O	O	O	O	O	O	O	O	O	O	O	
Side sill chipping primary	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	
Wheel cap	O		O		O		O	O	O		O		O		O		O		O		O	
5 miles bumper	O							O	O													
[INTERIOR]																						
Door pocket (L: Large, S: Small)	S	S	L	S	L	S	L	L	L	S	L	S	L	S	L	S	L	L	L	S	L	
Seat (M: Moquet, S: Soft weave, T: Tricot)	T	T	M	T	M	T	M	M	M	S	M	S	M	S	M	S	M	S	M	S	M	
Seat lifter		O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	
Rear pillow										O	O	O	O	O	O	O	O	O	O	O	O	
Swing headrest											O		O		O		O		O		O	
Heated seat														*2 F	*2 F	F	F	F	F			
Walk-in seat	O	O	O		O		O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	
Seat belt: Front ELR	*3 O	*4 O	*4 O	O	O	O	O	*3 O	*3 O	O	O	O	O	O	O	O	O	O	O	O	O	
Feeder system (Driver side)											O		O		O		O		O		O	
Rear ELR 3P + MNL2P	O	O	O					O	O	O	O	O	O	O	O	*5 O	*5 O	O	O	O	O	
Half shade window					O		O	O	O		O		O		O		O	O	O		O	
Sun visor (P: PCV, T: Tricot)	P	P	T	P	T	P	T	T	T	P	T	P	T	P	T	P	T	P	T	P	T	
Inside rearview mirror (Day/Night change)	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	
Rear shelf	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	
Tailgate opener	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	
Fuel lid opener	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	
Power window			O		O		O	O	O		O		O		O		O	O	O		O	

(cont'd)

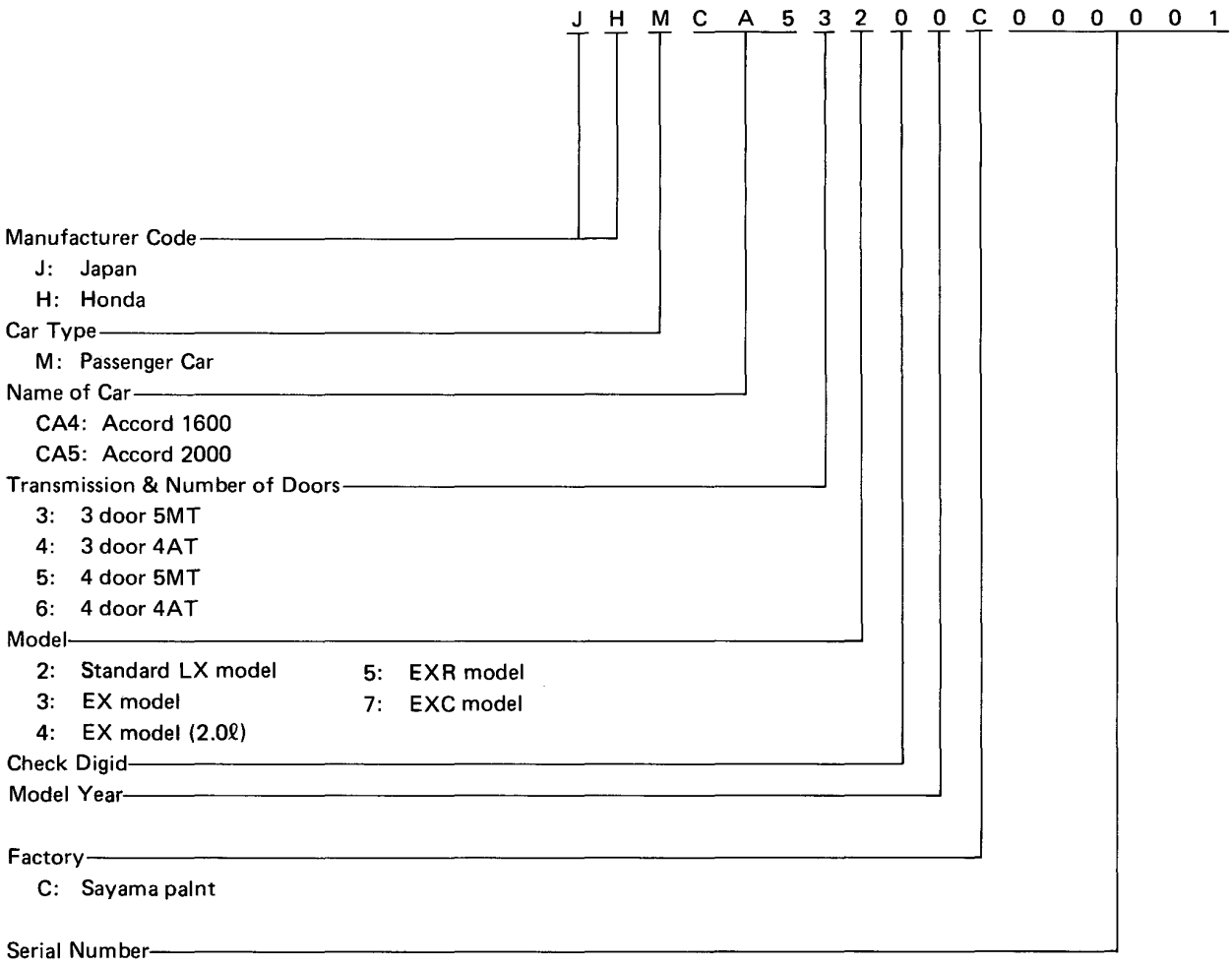
3 Door

	GLASS-BACK					AERO-DECK					
	KC	KQ	KP	KT/KU	KY	KF	KG/KB	KS	KW	KX	KE
TYPE	S	STD EX	STD EX	STD EX	EX EX R	EX EX 2.0i	EX EX 2.0i	EX EX 2.0i	EX EX 2.0i	EX EX 2.0i	EX EX 2.0i
[INSTRUMENTATION]											
Tachometer	O	O O	O O	O O	O O	O O	O O	O O	O O	O O	O O
Automatic transmission position indicator	O	O O	O O	O O	O O	O O	O O	O O	O O	O O	O O
Safety indicator	O	O O	O O	O O	O O	O O	O O	O O	O O	O O	O O
Illumination control (Cut-off type)	O	O O	O O	O O	O O	O O	O O	O O	O O	O O	O O
Heater control (L: Lever, B: Button)	L	L B	L B	L B	B B	B B	B B	B B	B B	B B	B B
Face cool control		O	O	O	O O	O O	O O	O O	O O	O O	O O
Rear Heater duct	O					O	O	O	O	O	O
Speaker (2: 2 speakers, 4: 4 speakers)	2	2 2			4 4	2 4	2 4	2 4	2 4	2 4	2 4
Antenna (A: Auto, M: Manual)	M	M A	M A	M A	A A	M A	M A	M A	M A	M A	M A
Digital clock	O	O O	O O	O O	O O	O O	O O	O O	O O	O O	O O
[ELECTRIC SYSTEM]											
Retractable headlight hold passing system		O O	O O	O O	O O	O O	O O	O O	O O	O O	O O
Retractable headlight (Halogen)	O	O O	O O	O O	O O	O O	O O	O O	O O	O O	O O
Headlight-on alarm (C: Chaim, B: Buzzer)	B	C C	C C	C C	C C	C C	C C		C C	C C	C C
Day-light system								O O	O *6 O *6		
Headlight washer								O O	O *6 O *6		
Courtesy Light		O	O	O	O O	O	O	O	O	O O	O
Rear fog light						O O	O O	O O	O O	O O	O O
Ignition switch illumination		O	O	O	O	O O	O O	O O	O O	O O	O O
Rear wiper	O	O O	O O	O O	O O	O O	O O	O O	O O	O O	O O

F: Factory option.
*1: Except 5M/T model
*2: Driver's and assistant seats
*3: Two axles with anchor return spring
*4: Without anchor outer slider bar
*5: Only Norway, Finland and Austria, other area: ELR-3P
*6: Only Norway and Finland

Chassis Number

EUROPE, GENERAL



General Information

Engine Number

PH4	2.0ℓ, SOHC, CARB.	—	KC	5MT / 4AT	BS1	1900001 ~
PHO	2.0ℓ, SOHC PGM-FI	—	KC (HAM)	4AT	BT1	1700001 ~
			KC			1900001 ~
PH1	1.6ℓ, SOHC CARB.	—	KB, KF KG, KR, KW	5MT	A16A1	1000001 ~
				4AT		1500001 ~
PH4	2.0ℓ, SOHC CARB.	CAT.	KG	5MT	A20A1	1700001 ~
				4AT		1500001 ~
		—	KB, KE, KF KG, KR, KS, KW	5MT	A20A2	1000001 ~
				4AT		1500001 ~
		CAT.	KX	5MT		1300001 ~
				4AT		1800001 ~
PJO	2.0ℓ, SOHC PGM-FI	—	KB, KE, KF KG, KR, KS, KW	5MT	A20A4	1000001 ~
				4AT		1500001 ~
		CAT.	KX	5MT		1300001 ~
				4AT		1800001 ~
PH4	2.0ℓ, SOHC CARB.	CAT.	KQ	5MT	A20A2	1300001 ~
				4AT		1800001 ~
PH1	1.6ℓ, SOHC CARB.	—	KT	5MT	A16A1	1000001 ~
				4AT		1500001 ~
PH4	2.0ℓ, SOHC CARB.	—	KY, KP, KT, KU	5MT	A20A2	1000001 ~
				4AT		1500001 ~

Transmission Number

TYPE	CODE	AREA		
PC8	M5	EUROPE	A1M5	1000001 ~
	A5		A2A5	1000001 ~
	K5		A2K5	1000001 ~
	Q6		A2Q6	1000001 ~
PF5	K5		B2K5	1000001 ~

TYPE	CODE	AREA		
PC8	M5	GENERAL	A1M5	1000001 ~
	A5		A2A5	1000001 ~
	K5		A2K5	1000001 ~
PF5	K5		B2K5	1000001 ~

〈Canadian Model〉

	ITEMS			METRIC	ENGLISH	NOTE
DIMENSION	Overall Length	3D		4,440 mm	174.8 in.	
		4D		4,535 mm	178.5 in.	
	Overall Width	3D/4D		1,695 mm	66.7 in.	
	Overall Height	3D		1,335 mm	52.6 in.	
		4D		1,325 mm	52.2 in.	
	Wheelbase	3D/4D		2,600 mm	102.3 in.	
	Tread F/R	3D/4D		1,480/1,475 mm	58.3/58.1 in.	
	Ground Clearance	3D/4D		160 mm	6.3 in.	
	Seating Capacity	3D/4D		5	———	
	Overhang F/R	3D		875/860 mm	34.4/33.8 in.	
		4D		875/1,060 mm	34.4/41.7 in.	
WEIGHT	Curb weight	3D	4–AT	1,105 kg	2,436 lb.	
			5–MT	1,075 kg	2,370 lb.	
		4D	4–AT	1,115 kg (1,155 kg)	2,458 kg (2,546 lb.)	( ): 2.0ℓ PGMF-1
			5–MT	1,095 kg	2,414 lb.	
	Weight Distribution (F/R)					
		3D	4–AT	685/415 kg	1,510/915 lb.	
			5–MT	655/420 kg	1,444/926 lb.	
		4D	4–AT	685/430 kg	1,510/948 lb.	
			5–MT	665/430 kg	1,466/948 lb.	
	Gross Vehicle Weight Rating (MVSS)			1,574 kg	3,470 lb.	Curb weight +A/C: 22.5 kg (49.6 lb.) +Cargo: 45 kg (100 lb.) +Passengers: 68 kg x 5 (150 lb. x 5)
	Max. permissible weight	4D		1,660 kg	3,660 lb.	
ENGINE	Type			Water cooled, gasoline fueled, 4-cycle O.H.C.		
	Cylinder arrangement			4-cyclinders in-line transverse		
	Bore and Stroke			82.7 x 91.0 mm		
	Displacement			1,995 cm^3 (cc)	119 cu. in.	
	Compression ratio	3D		9.1 : 1		
		4D		LX 9.1:1 EX 8.8:1		
	Valve Train			Timing belt driven, single overhead camshaft		
	Lubrication System			Trochoid pump		
	Fuel required			Regular gasoline with 91 RON (Research Octane Number) or higher, or Super/Premium gasoline with 97 RON (Research Octane Number) or higher.		

(cont'd)

Design Specifications (cont'd)

	ITEMS			METRIC	ENGLISH	NOTE
TRANS-MISSION	Clutch		4–AT	Three element, one stage, two phase		
			5–MT	Single dry plate, diaphragm spring		
	Transmission		4–AT	Torque converter with lock up clutch		
			5–MT	Synchromesh 5 forward speeds, 1 reverse		
	Gear Ratio	I		3.181 <2.529>		
	< >: 4AT	II		1.842 <1.481>		
		III		1.208 <1.030>		
		IV		0.878 <0.700>		
		V		0.694 ———		
		Reverse		3.000 <1.904>		
	Final Reduction			3.866 <4.066>		
	Clutch Facing Area			176 cm^3	(27.3 sq. in.)	
STEERING SYSTEM	Type	Manual Steering		Rack and Pinion Integral		
		Power Steering		Power Assisted Pack and Pinion Integral		
	Overall Ratio	Manual Steering		19.4		
		Power Steering		16.0		
	Turns, lock-to-lock	Manual Steering		3.78		
		Power Steering		3.11		
	Steering Wheel Dia.			375 mm	14.76 in.	
	Power Steering Oil Capacity			1.4ℓ	1.21 Imp. qt., 1.5 US qt.	
	Power Steering Oil			HONDA Genuine Power Steering Fluid		
SUSPENSION SYSTEM	Type, F			Double Wishbome		
	Type, R			Double Wishbome		
	Shock Absorber F/R			Telescopic, hydraulic		
WHEEL ALIGNMENT	Wheel Alignment					
		Camber	Front	0°		
			Rear	0°		
		Caster	Front	30′		
		Toe	Front	0 mm	0.0 in.	
			Rear	0 mm	0.0 in.	
BRAKE SYSTEM	Type, F			Self-adjusting power assisted disc brake		
	Type, R			Power assisted leading-training shoe and drum		
	Lining Surface Area F/R			43.3/67.2 mm	1.70/2.64 in.	
	Effective Disc Dia.			242 mm	9.5 in.	
	Effective Brake Drum I.D.			200 mm	7.9 in.	
	Parking Brake Type			Mechanical expanding, Rear two wheel brakes		
TIRES	F/R			P185/70R13		
	Spare			T105/80D13		
ELECTRICAL SYSTEM	Battery			12V–50AH (Cold cranking current −17.7°C [0°F] 410A)		
	Starting Motor			12–1.0/1.4KW		
	Generator			12–65A		
	Fuses			7.5A, 10A, 15A, 20A, 30A		
	Main Fuse			70A, 40A		
	Headlights	Low/High		12V–35/65W (SAE H6052)		
	Illumination lights			12V–1.4W		
	Front Turn Signal Lights/Position Lights (combination)			12V–32 cp/32 cp (SAE 1157)		
	Gauge lights			12V–3.4W/1.4W		
	Side Marker Lights (front and rear)			12V–5W, 12V–3 cp (SAE 168)		

	ITEMS	METRIC	ENGLISH	NOTE
ELECTRICAL SYSTEM (cont'd)	Warning/Indicator Lights	12V–1.2W		
	Interior Light	12V–8W		
	Rear Turn/Stop/Taillights	12V–32 cp/32 cp/2 cp (SAE1156, SAE2057)		
	Turn Signal Indicator Lights	12V–1.2W		
	Turn or Hatch Lights	12V–5W		
	Back-up Lights	12V–32 cp (SAE1156)		
	Licence Plate Lights	12V–8W		
	Glove Box Light	12V–3.4W		
	Door Courtesy Lights	12V–3.4W		
	Heater Illumination Lights	12V–1.4W		
	Fuse Box Lights	12V–2W		
SERVICE DATA (Engine)	Ignition Timing	15° ± 2° BTDC at idle		
	Valve Timing IN open	10°ATDC		
	IN close	35°ABDC		
	EX open	40°BBDC		
	EX close	15°BTDC		
	Spark Plug	NGK: BPR6EY-11, BPR5EY-11 ND: W16EXR-U11, W20EXR-U11		
	Spark Plug Gap	1.0–1.1 mm	0.039–0.043 in.	
	Idling Speed (with headlights off and cooling fan off.) 4–AT	800 ± 50 min^{-1} (rpm)		
	5–MT	750 ± 50 min^{-1} (rpm)		
	Fuel Tank Capacity/Remaining Gasoline Capacity	60ℓ	13.2 Imp. gal., 15.9 US gal.	
	Coolant Capacity 4–AT	6.2ℓ	5.4 Imp. qt., 6.5 US qt.	
	5–MT	5.6ℓ	4.9 Imp. qt., 5.9 US qt.	
	Alternator Belt Tension (Applied load)	6–9 mm (998 N, 10 kg)	0.2–0.4 in. (22 lb.)	
	Valve Clearance Intake/Exhaust Cold IN	0.12–0.17 mm	0.005–0.007 in.	
	EX	0.25–0.30 mm	0.010–0.012 in.	
	Compression Ratio	12.5 : 1	———	
	Engine Oil Capacity	3.5ℓ	3.1 Imp. qt, 3.7 US qt.	Including oil in filter
	Transmission Oil Capacity 5–MT	2.5ℓ	2.2 Imp. qt, 2.6 US qt.	
	4–AT	2.6ℓ	2.3 Imp. qt., 2.7 US qt.	
	Automatic Transmission Fluid	DEXRON®	———	
(Chassis)	Tire Pressure F/R	180 kPa	1.8 kg/cm^2, 26 psi	
	Spare	420 kPa	4.2 kg/cm^2, 60 psi	
	Brake Fluid	DOT 3 or 4 Type SAE J1703		
	Brake Pedal Free Play	1–5 mm	0.04–0.20 in.	
	Brake Pedal-to-Floor clearance	205 mm	0.04–0.20 in.	
	Brake Pad Wearing Limit	3.0 mm	8.1 in.	
	Brake Shoe Wearing Limit	2.0 mm	0.12 in.	
	Clutch Pedal Free Play	15–25 mm	0.59–0.98 in.	

< European Model >

	ITEMS			METRIC	ENGLISH	NOTE
DIMENSION	Overall length		3D	4,335 mm	170.6 in.	KW: 4,365 mm
			4D	4,535 mm	178.5 in.	KW: 4,565 mm
	Overall width			1,695 mm	66.7 in.	
	Overall height		3D	1,335 mm	52.6 in.	
			4D	1,335 mm	53.3 in.	
	Wheel base			2,600 mm	102.4 in.	
	Tread	Front		1,480 mm	58.3 in.	
		Rear		1,475 mm	58.1 in.	
	Ground clearance			160 mm	6.3 in.	
	Seating Capacity	(F/R)		5(2/3)	———	
	Overhang F/R	Front		875 mm	34.4 in.	KW: 905 mm
		Rear	3D	860 mm	33.9 in.	
			4D	1,060 mm	41.7 in.	
WEIGHT	Curb weight (F, R)					
	(5–MT)	3D	EX (2.0ℓ) CARB	1,065 kg	2,348 lb.	KF, KG, KB, KW
				1,030 kg	2,271 lb.	Holland
				1,085 kg	2,392 lb.	KX
				1,070 kg	2,359 lb.	SF
				1,095 kg	2,414 lb.	KS
				1,075 kg	2,370 lb.	KE
		3D	EX (2.0ℓ) PGM-FI	1,100 kg	2,425 lb.	KF, KG, KB, KX, KW
				1,050 kg	2,315 lb.	Holland
				1,110 kg	2,447 lb.	SF
				1,120 kg	2,469 lb.	KS
				1,105 kg	2,436 lb.	KE
		4D	LX (1.6ℓ)	1,050 kg	2,315 lb.	KG, KB, KW, SF
				1,020 kg	2,249 lb.	Holland
		4D	LX (2.0ℓ) CARB	1,060 kg	2,337 lb.	KG, KB, KW, SF
				1,030 kg	2,271 lb.	Holland
				1,065 kg	2,348 lb.	KX
				1,075 kg	2,370 lb.	KS
		4D	EX (2.0ℓ) CARB	1,085 kg	2,392 lb.	KF, KG, KB, KE
				1,095 kg	2,414 lb.	KG, KW
				1,050 kg	2,315 lb.	Holland
				1,100 kg	2,425 lb.	KX, SF
				1,105 kg	2,436 lb.	Swiss, Austria
				1,120 kg	2,469 lb.	KS
		4D	EX (2.0ℓ) PGM-FI	1,105 kg	2,436 lb.	KF, KG, KB
				1,070 kg	2,205 lb.	Holland
				1,120 kg	2,469 lb.	KX, SF, KS
				1,115 kg	2,458 lb.	KW, KE
	(4–AT)	3D	EX (2.0ℓ) CARB	1,085 kg	2,392 lb.	KF, KG, KB, KW
				1,040 kg	2,293 lb.	Holland
				1,105 kg	2,436 lb.	KX
				1,090 kg	2,403 lb.	SF
				1,115 kg	2,458 lb.	KS
				1,095 kg	2,414 lb.	KE

	ITEMS	METRIC	ENGLISH	NOTE
WEIGHT (cont'd)	Curb Weight (F, R) (4–AT)			
	3D EX (2.0ℓ) PGM-FI	1,120 kg	2,469 lb.	KF, KG, KB, KX, KW
		1,130 kg	2,491 lb.	SF
		1,140 kg	2,513 lb.	KS
		1,125 kg	2,480 lb.	KE
	4D LX (1.6ℓ) CARB	1,060 kg	2,337 lb.	KG, KB, KW, SF
	4D LX (2.0ℓ) CARB	1,080 kg	2,381 lb.	KG, KB, KW, SF
		1,045 kg	2,304 lb.	Holland
		1,085 kg	2,392 lb.	KX
		1,095 kg	2,414 lb.	KS
	4D EX (2.0ℓ) CARB	1,105 kg	2,436 lb.	KF, KG, KB, KE
		1,115 kg	2,458 lb.	KG, KW
		1,065 kg	2,348 lb.	Holland
		1,120 kg	2,469 lb.	KX, SF
		1,125 kg	2,480 lb.	Swiss, Austria
		1,140 kg	2,513 lb.	KS
	4D EX (2.0ℓ) CARB	1,125 kg	2,480 lb.	KF, KG, KB
		1,140 kg	2,513 lb.	KX, SF, KS
		1,135 kg	2,502 lb.	KW, KE
	Weight Distribution (F/R) (5–MT)			
	3D EX (2.0ℓ) CARB	645/420 kg	1,422/926 lb.	KF, KG, KB, KW
		665/420 kg	1,466/926 lb.	KX
		650/420 kg	1,433/926 lb.	SF
		670/425 kg	1,477/937 lb.	KS
		655/420 kg	1,444/926 lb.	KE
	3D EX (2.0ℓ) PGM-FI	665/435 kg	1,466/959 lb.	KF, KG, KB, KX
		675/435 kg	1,488/959 lb.	SF
		680/440 kg	1,499/970 lb.	KS
		670/435 kg	1,447/959 lb.	KE
	4D LX (1.6ℓ) CARB	625/425 kg	1,378/937 lb.	KG, KB, KW, SF
	4D LX (2.0ℓ) CARB	635/425 kg	1,400/937 lb.	KG, KB, KW, SF
		655/440 kg	1,444/970 lb.	KW
		640/425 kg	1,411/937 lb.	KX
		640/435 kg	1,441/959 lb.	KS
	4D EX (2.0ℓ) CARB	650/435 kg	1,433/959 lb.	KF, KG, KB, KE
		665/440 kg	1,444/970 lb.	KW
		660/435 kg	1,455/959 lb.	KG
		660/440 kg	1,455/970 lb.	KX, SF
		665/440 kg	1,466/970 lb.	SWISS, AUSTRIA
		680/440 kg	1,499/970 lb.	KS
	4D EX (2.0ℓ) PGM-FI	660/445 kg	1,455/981 lb.	KF, KG, KB
		670/450 kg	1,477/992 lb.	KX, SF, KS
		665/450 kg	1,466/992 lb.	KW, KE

(cont'd)

Design Specifications (cont'd)

	ITEMS		METRIC	ENGLISH	NOTE
WEIGHT (cont'd)	Weight Distribution (F/R)				
	(4–AT) 3D	EX (2.0ℓ) CARB	665/420 kg	1,466/926 lb.	KF, KG, KB, KW
			685/420 kg	1,510/926 lb.	KX
			670/420 kg	1,477/926 lb.	SF
			690/425 kg	1,521/937 lb.	KS
			675/420 kg	1,466/926 lb.	KE
	3D	EX (2.0ℓ) PGM-FI	685/435 kg	1,510/959 lb.	KF, KG, KB, KX, KW
			695/435 kg	1,532/959 lb.	SF
			700/440 kg	1,543/970 lb.	SF
			690/435 kg	1,521/959 lb.	KE
	4D	LX (1.6ℓ) CARB	635/425 kg	1,400/937 lb.	KG, KB, KW, SF
	4D	LX (2.0ℓ) CARB	655/425 kg	1,446/937 lb.	KG, KB, KW, SF
			660/425 kg	1,455/937 lb.	KX
			675/440 kg	1,466/970 lb.	KW
			660/435 kg	1,455/959 lb.	KS
	4D	EX (2.0ℓ) CARB	670/435 kg	1,477/959 lb.	KF, KG, KB, KE
			680/435 kg	1,499/959 lb.	KG
			675/440 kg	1,466/970 lb.	KW
			680/440 kg	1,499/970 lb.	KX, SF
			685/440 kg	1,510/970 lb.	SWISS, AUSTRIA
			700/440 kg	1,543/970 lb.	KS
	4D	EX (2.0ℓ) PGM-FI	680/445 kg	1,499/981 lb.	KF, KG, KB
			690/450 kg	1,521/992 lb.	KX, SF, KS
			685/450 kg	1,510/992 lb.	KW, KE
	Max. Loaded Vehicle Weight (ADR)				
	5–MT		1,570 kg	3,462 lb.	
	4–AT		1,585 kg	3,495 lb.	
	Max. Permissible Weight (EC)	2.0ℓ	1,660 kg	3,660 lb.	
		1.6ℓ	1,580 kg	3,484 lb.	
ENGINE	Type		Water cooled, gasoline fueled, 4-cycle OHC		
	Cylinder arrangement		4-cylinder in-line transverse		
	Bore and Stroke	1.6ℓ	80.0 x 79.5 mm	3.15 x 3.13 in.	
		2.0ℓ	82.7 x 91.0 mm	3.25 x 3.58 in.	
	Displacement	1.6ℓ	1,598 cm^3 (cc)	97.8 cu. in.	
		2.0ℓ	1,955 cm^3 (cc)	119 cu. in.	
	Compression Ratio		1.6ℓ: 9.0		
			2.0ℓ CARB: 9.2, KX: 9.1		
			2.0ℓ PGM-FI: 9.4, KS: 8.9, KX and KG: 8.8		
	Valve Train		Timing belt driven, single overhead camshaft		
	Fuel Required		Regular gasoline with 91 RON (Research Octane Number) or higher, or Super/Premium gasoline with 97 RON (Research Octane Number) or higher.		

	ITEMS		METRIC		ENGLISH		NOTE
TRANS-MISSION	Clutch	4–AT	Three element, one strage, two phase				
		5–MT	Single dry plate, diaphragm spring				
	Transmission	4–AT	Torque converter with lock up clutch				
		5–MT	Synchromesh 5 forward speeds, 1 reverse				
	Primary Reduction			1.6ℓ KW	KB,KE,KF KG, KW	KS, KX	
	Gear Ratio	I	3.181	<2.421>	<2.529>	<2.529>	
	< > : 4–AT	II	1.842	<1.560>	<1.481>	<1.481>	
		III	1.250	<0.969>	<1.060>	<1.030>	
		IV	0.937	<0.729>	<0.743>	<0.700>	
		V	0.771	–	–	–	
		Reverse	3.000	<1.954>	<1.904>	<1.904>	
	Final Reduction	5–MT	4.066	<3.933>	<4.066>	<4.066>	
	Clutch Facing Area	(2.0ℓ)	160 cm^2 (176 cm^2)		24.8 sq. in. (27.3 sq. in.)		
STEERING SYSTEM	Type	Manual Steering	Rack and Pinion Integral				
		Power Steering	Power assisted Rack and Pinion integral				
	Overall Ratio	Manual Steering	19.4				
		Power Steering	16.0				
	Turns, lock-to-lock	Manual Steering	3.78				
		Power Steering	3.11				
	Steering Wheel Dia.		375 mm		14.76 in.		
	Power Steering Oil Tank Capacity		1.4ℓ		1.2 Imp. pt., 1.5 US pt.		
	Power Steering Oil		Honda Genuine power steering fluid				
SUSPENSION SYSTEM	Type, F		Double Wishbone				
	Type, R		Double Wishbone				
	Shock Absorber F/R		Telescopic hydraulic				
WHEEL ALIGNMENT	Wheel Alignment						
	Camber	Front	0°				
		Rear	0°				
	Caster	Front	0°30'				
	Toe	Front	0 mm		0.0 in.		
		Rear	0 mm		0.0 in.		
BRAKE SYSTEM	Type, F		Self-adjusting power assisted disc brake type				
	Type, R		Drum *1				*1 Disc for EX 2.0ℓ and cans equipped with Anti-Lock Brake.
	Lining Surface Area F/R		43.3/21 (disc) 67.2 (drum) cm^2				
	Effective Disc Dia.		208 mm		8.2 in.		
	Effective Brake Drum I.D.		200 mm		7.9 in		
	Parking Brake Type		Mechanical expanding, Rear two wheel brakes*2				*2 Machanical to rear disc for equipped with Disc Brake.
TIRES	F/R		165R13 82S, 165SR13 185/70R13 86H, 185/70R13 86T, 185/70HR13, 195/60R14 85H				
		Spare	T105/80D13, T105/80R13, (T135/70D15)				For cars equipped with Anti-Lock Brake <Except for KE>
ELECTRICAL *SYSTEM*	Battery		12V–50AH (Cold cranking current –17.7°C [0°F] 410A)				
	Starting Motor		12V–1.0/1.4KW				
	Generator		12–65A				
	Fuses		7.5A, 10A, 15A, 20A, 30A				

(cont'd)

Design Specifications (cont'd)

	ITEMS		METRIC	ENGLISH	NOTE
ELECTRICAL SYSTEM (cont'd)	Main Fuse		70A, 40A		
	Headlights		12V–60/55W		
	Turn signal lights	Front	12V–21W		
		Rear	12V–21W		
		Side	12V–5W		
	License Plate Lights		12V–5W		
	Back-up Lights		12V–21W		
	Stop Lights		12V–21W		
	Tail Lights		12V–5W		
	Rear Fog Light		12V–21W		
SERVICE DATA (Engine)	Ignition Timing (at idle)	4–AT	20° BTDC 1.6ℓ 2.0ℓ Carb; 10° BTDC 2.0ℓ Carb. KX; 10° BTDC 2.0ℓ Carb. KS; 15° BTDC 2.0ℓ EFI KX		
		5–MT	20° BTDC 1.6ℓ 2.0ℓ Carb; 5° BTDC 2.0ℓ Carb. KX; 10° BTDC 2.0ℓ Carb. KS; 15° BTDC 2.0ℓ EFI KX; 10° BTDC 2.0ℓ EFI KS; 10° BTDC 2.0ℓ EFI KS		
	Valve Timing	IN open	10° ATDC 1.6ℓ Carb; 10° ATDC 2.0ℓ Carb; 10° ATDC 2.0ℓ Carb KX,5–MT		
		IN close	30° ABDC 1.6ℓ Carb; 35° ABDC 2.0ℓ Carb; 35° ATDC 2.0ℓ Carb KX,5–MT		
		EX open	35° BBDC 1.6ℓ Carb; 40° BBDC 2.0ℓ Carb; 40° BBDC 2.0ℓ Carb KX,5–MT		
		EX close	10° BTDC 1.6ℓ Carb; 5° BTDC 2.0ℓ Carb; 10° BTDC 2.0ℓ Carb KX,5–MT		
		IN open	10° ATDC 2.0ℓ EFI; (10° ATDC (No.1), 20° ATDC (No.2)) 2.0ℓ EFI KX; 5° ATDC 2.0ℓ Carb. KS, 4AT		
		IN close	35° ABDC 2.0ℓ EFI; 35° ABDC 2.0ℓ EFI KX; 35° ABDC 2.0ℓ Carb. KS, 4AT		
		EX open	40° BBDC 2.0ℓ EFI; 40° BBDC 2.0ℓ EFI KX; 40° BBDC 2.0ℓ Carb. KS, 4AT		
		EX close	10° BTDC 2.0ℓ EFI; 10° BTDC 2.0ℓ EFI KX; 5° BTDC 2.0ℓ Carb. KS, 4AT		
	Spark plug		NGK: BPR6ES-11, BPR6EY-11; BPR5ES-11, BPR5EY-11; BPR7ES-11, BPR7EY-11	ND: W20EPR-U11, W20EXR-U11; W16EPR-U11, W16EXR-U11; W22EPR-U11, W22EXR-U11	
	Spark Plug Gap		1.0–1.1 mm	0.039–0.043 in.	
	Idling Speed (with headlights off and cooling fan off.)	4–AT	700 ± 50 min^{-1} (rpm)		1.6ℓ, 2.0ℓ Carb. EC, KX 2.0ℓ Carb. KS, 2.0ℓ PGM-FI
			750 ± 50 min^{-1} (rpm)		2.0ℓ PGM-FI EC, KS
		5–MT	750 ± 50 min^{-1} (rpm)		
			800 ± 50 min^{-1} (rpm)		
	Fuel Tank Capacity/Remaining Gasoline Capacity		60ℓ	13.2 Imp. gal. 15.9 US gal.	
	Coolant Capacity/Adding Coolant				
		4–AT 1.6ℓ Engine	5.5ℓ	4.8 Imp. qt., 5.8 US qt.	
		4–AT 2.0ℓ Carb.	6.2ℓ	5.5 Imp. qt., 6.6 US qt.	
		4–AT 2.0ℓ EFI	6.3ℓ	5.5 Imp. qt., 6.7 US qt.	
		5–MT 1.6ℓ Engine	5.6ℓ	4.9 Imp. qt., 5.9 US qt.	
		5–MT 2.0ℓ Carb.	5.6ℓ	4.9 Imp. qt., 5.9 US qt.	
		5–MT 2.0ℓ EFI	5.7ℓ	5.0 Imp. qt., 6.0 US qt.	

	ITEMS		METRIC	ENGLISH	NOTE
SERVICE DATA (Engine) (cont'd)	Alternator Belt Tension (Applied load)		6–9 mm (98N, 10 kg)	0.2–0.4 in. (22 lb.)	
	Valve Clearance Intake/Exhaust (Cold)		0.15/0.28 mm	0.005–0.011 in.	
	Comprewsion Pressure	2.0ℓ PGM-FI	1,177 kPa (12.0 kg/cm², 170 psi) at 250 min⁻¹ (rpm)		
		Other	1,225 kPa (12.5 kg/cm², 178 psi) at 250 min⁻¹ (rpm)		
	Engine Oil Capacity		4.0ℓ	3.5 Imp. qt., 4.2 US qt.	
	Transmission Oil Capacity	5–MT	2.6ℓ	2.28 Imp. qt., 2.7 US qt.	
	Automatic Oil Capacity	4–AT (1.6ℓ)	5.4ℓ	4.8 Imp. qt., 5.7 US qt.	
		(2.0ℓ)	5.5ℓ	4.8 Imp. qt., 5.8 US qt.	
	Automatic Transmission Fluid		DEXRON®	———	
(Chassis)	Tire Pressures F/R		180 kPa	1.8 kg/cm², 26 psi	
		Spare	420 kPa	4.2 kg/cm², 60 psi	
	Brake Fluid		DOT 3 or 4 Type SAE J1703		
	Brake Pedal Free Play		1–5 mm	0.04–0.20 in.	
	Brake Pedal-to-Floor Clearance		205 mm	8.1 in.	
	Brake Pad Wearing Limit		3.0 mm	0.12 in.	
	Brake Shoe Wearing Limit		2.0 mm	0.08 in.	
	Clutch Pedal Free Play		15–25 mm	0.59–0.98 in.	

< General Export Model >

ITEMS				METRIC	ENGLISH	NOTE
DIMENSION	Ground Clearance	4D		170 mm	6.7 in.	KY
WEIGHT	Curb weight (F, R)					
	(5–MT)	3D (2.0ℓ) CARB	STD	1,060 kg	2,337 lb.	
			EX	1,080 kg	2,381 lb.	with P/S,P/W — KP,KT KU
			EX	1,130 kg	2,491 lb.	with P/S,P/W,HAC
			EX	1,140 kg	2,513 lb.	with P/S,P/W,A/C HAC — KY
		4D (1.6ℓ) CARB	STD	1,048 kg	2,310 lb.	
			EX	1,068 kg	2,354 lb.	with P/S,P/W; with P/S,P/W,S/R — KT
			EX	1,086 kg	2,394 lb.	
		4D (2.0ℓ) CARB	STD	1,060 kg	2,337 lb.	
			EX	1,085 kg	2,392 lb.	with P/S,P/W — KP, KT, KU
			EX	1,103 kg	2,432 lb.	with P/S,P/W,S/R — KP, KT, KU
			GL	1,130 kg	2,491 lb.	with P/S,HAC
			EX	1,140 kg	2,513 lb.	with P/S,P/W,HAC — KY
			EX	1,160 kg	2,557 lb.	with P/S,P/W,S/R, HAC — KY
			EXR	1,170 kg	2,579 lb.	with P/S,P/W,S/R, A/C,HAC — KY
	(4–AT)	3D (2.0ℓ) CARB	STD	1,075 kg	2,370 lb.	
			EX	1,095 kg	2,414 lb.	with P/S,P/W — KP,KT, KU
			EX	1,150 kg	2,535 lb.	with P/S,P/W,HAC
			EXR	1,160 kg	2,557 lb.	with P/S,P/W.S/R, HAC — KY
		4D (1.6ℓ) CARB	STD	1,058 kg	2,332 lb.	
			EX	1,078 kg	2,376 lb.	with P/S,P/W — KT
			EX	1,096 kg	2,416 lb.	with P/S,P/W,S/R — KT
		4D (2.0ℓ) CARB	STD	1,080 kg	2,381 lb.	
			EX	1,105 kg	2,436 lb.	with P/S,P/W — KP KT KU
			EX	1,123 kg	2,476 lb.	with P/S,P/W,S/R — KP KT KU
		4D (2.0ℓ) CARB	GL	1,150 kg	2,535 lb.	with P/S,HAC
			EX	1,160 kg	2,557 lb.	with P/S,P/W,HAC — KY
			EX	1,180 kg	2,601 lb.	with P/S,P/W,S/R, HAC — KY
			EXR	1,190 kg	2,623 lb.	with P/S,P/W,S/R, A/C,HAC — KY
	Weight Distribution (F/R)					
	(5–MT)	3D (2.0ℓ) CARB	STD	645/415 kg	1,422/915 lb.	
			EX	660/420 kg	1,455/926 lb.	with P/S,P/W — KP KT KU
			EX	690/440 kg	1,521/970 lb.	with P/S,P/W — KP KT KU
			EXR	695/445 kg	1,532/981 lb.	with P/S,P/W,A/C — KP KT KU
		4D (1.6ℓ) CARB	STD	625/324 kg	1,378/932 lb.	
			EX	640/428 kg	1,411/943 lb.	with P/S,P/W
			EX	649/437 kg	1,431/963 lb.	with P/S,P/W,S/R

	ITEMS			METRIC	ENGLISH	NOTE
WEIGHT (cont'd)	Weight Distribution (F/R)					
	(5–MT)	4D (2.0ℓ) CARB	STD	635/425 kg	1,400/937 lb.	
			EX	650/435 kg	1,433/959 lb.	with P/S,P/W } KP, KT, KU
			EX	659/444 kg	1,453/979 lb.	with P/S,P/W,S/R } KP, KT, KU
			GL	690/440 kg	1,521/970 lb.	with P/S,HAC
			EX	695/445 kg	1,532/981 lb.	with P/S,P/W,HAC
			EX	705/455 kg	1,554/1,003 lb.	with P/S,P/N,S/R, HAC } KY
			EXR	710/460 kg	1,565/1,014 lb.	with P/S,P/W,S/R, A/C,HAC } KY
	(4–AT)	3D (2.0ℓ) CARB	STD	660/415 kg	1,445/915 lb.	
			EX	675/420 kg	1,488/926 lb.	with P/S,P/W } KP,KT, KU
			EX	710/440 kg	1,565/970 lb.	with P/S,P/W,HAC
			EXR	715/445 kg	1,576/981 lb.	with P/S,P/W,A/C
		4D (1.6ℓ) CARB	STD	635/423 kg	1,400/932 lb.	
			EX	650/428 kg	1,433/943 lb.	with P/S,P/W } KT
			EX	659/437 kg	1,453/963 lb.	with P/S,P/W,S/R } KT
		4D (2.0ℓ) CARB	STD	655/425 kg	1,444/937 lb.	
			EX	670/435 kg	1,477/959 lb.	with P/S,P/W } KP, KT, KU
			EX	679/444 kg	1,497/979 lb.	with P/S,P/W,S/R } KP, KT, KU
		(2.0ℓ) CARB	GL	710/440 kg	1,565/970 lb.	with P/S,HAC
			EX	715/445 kg	1,576/981 lb.	with P/S,P/W,HAC
			EX	725/455 kg	1,598/1,003 lb.	with P/S,P/W,S/R, HAC } KY
			EXR	730/460 kg	1,609/1,014 lb.	with P/S,P/W,S/R, A/C } KY
TIRES	Tire Size F/R Sedan			165R13 82S, 185/70SR13, 185/70R13 86H, 195/60R14 84H, 165SR13, 185/70R13 86H, 185/70HR13		
ELECTRICAL SYSTEM	Battery			12V–40AH		
	Starting Motor			12V–1.0KW		

Design Specifications (cont'd)

< Australian Model >

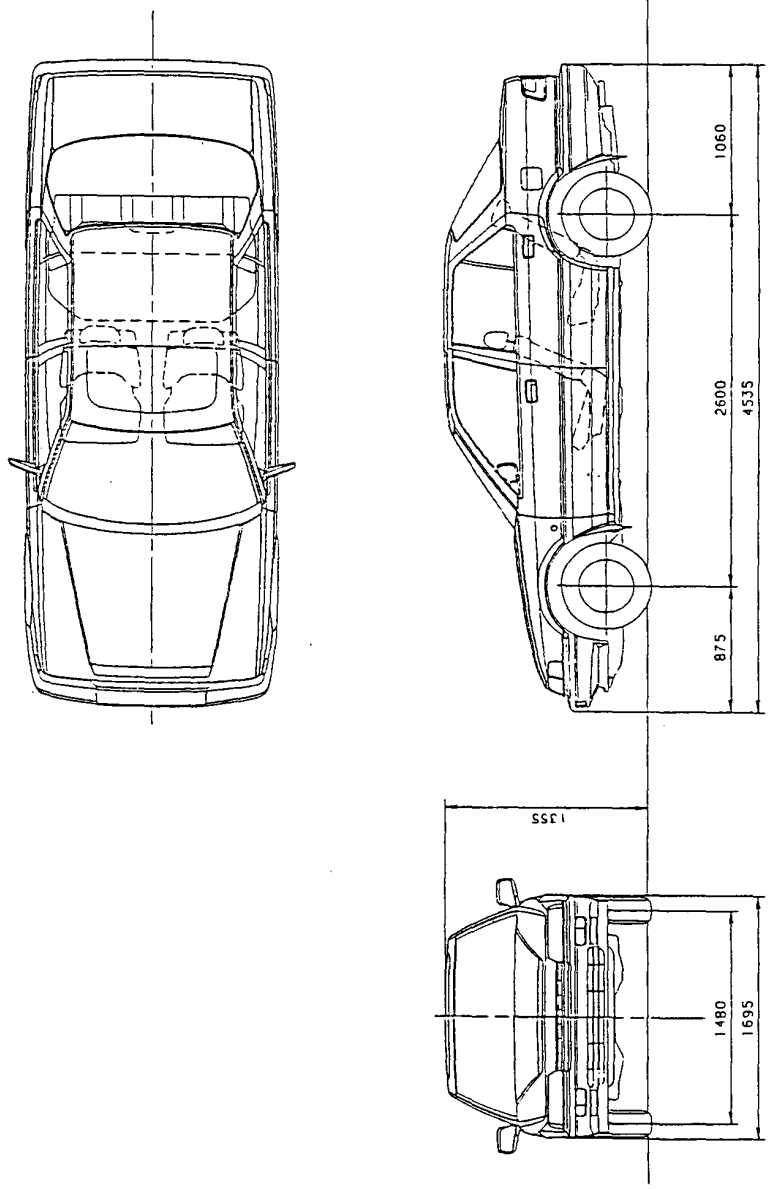
NOTE: Only the design specifications for models below different from those of the European model are listed. For the other items not given here, refer to the European Model design specification.

	ITEMS		METRIC	ENGLISH	NOTE
WEIGHT	Curb Weight	3D 5–MT STD	1,070 kg	2,359 lb.	
		EX	1,090 kg	2,403 lb.	
		4D STD	1,105 kg	2,436 lb.	
		EX	1,120 kg	2,469 lb.	
		EX(SR)	1,140 kg	2,513 lb.	
		3D 4–AT STD	1,085 kg	2,392 lb.	
		EX	1,105 kg	2,486 lb.	
		4D STD	1,120 kg	2,469 lb.	
		EX	1,135 kg	2,502 lb.	
		EX(SR)	1,155 kg	2,546 lb.	
	Weight Distribution (F/R)				
		3D 5–MT STD	655/415 kg	1,444/915 lb.	
		EX	670/420 kg	1,477/926 lb.	
		4D STD	665/440 kg	1,466/970 lb.	
		EX	675/445 kg	1,488/981 lb.	
		EX(SR)	685/455 kg	1,510/1,003 lb.	
		3D 4–AT STD	670/415 kg	1,477/915 lb.	
		EX	685/420 kg	1,510/926 lb.	
		4D STD	680/440 kg	1,499/970 lb.	
		EX	690/445 kg	1,521/981 lb.	
		EX(SR)	700/455 kg	1,543/1,003 lb.	
ELECTRICAL SYSTEM	Starting Motor		12V–1.0KW		
SERVICE DATA (Engine)	Compression ratio (2.0ℓ, CARB)		9.2 : 1		
	Alternator Belt Tension (Applied load)		6–9 mm (98N, 10kg)	0.2–0.4 in. (22 lb.)	
	Idling Speed (with headlight on and cooling fan off)		750 ± 50 min^{-1} (rpm)		

Body Specifications

< **4 Door Sedan** >

Unit: mm

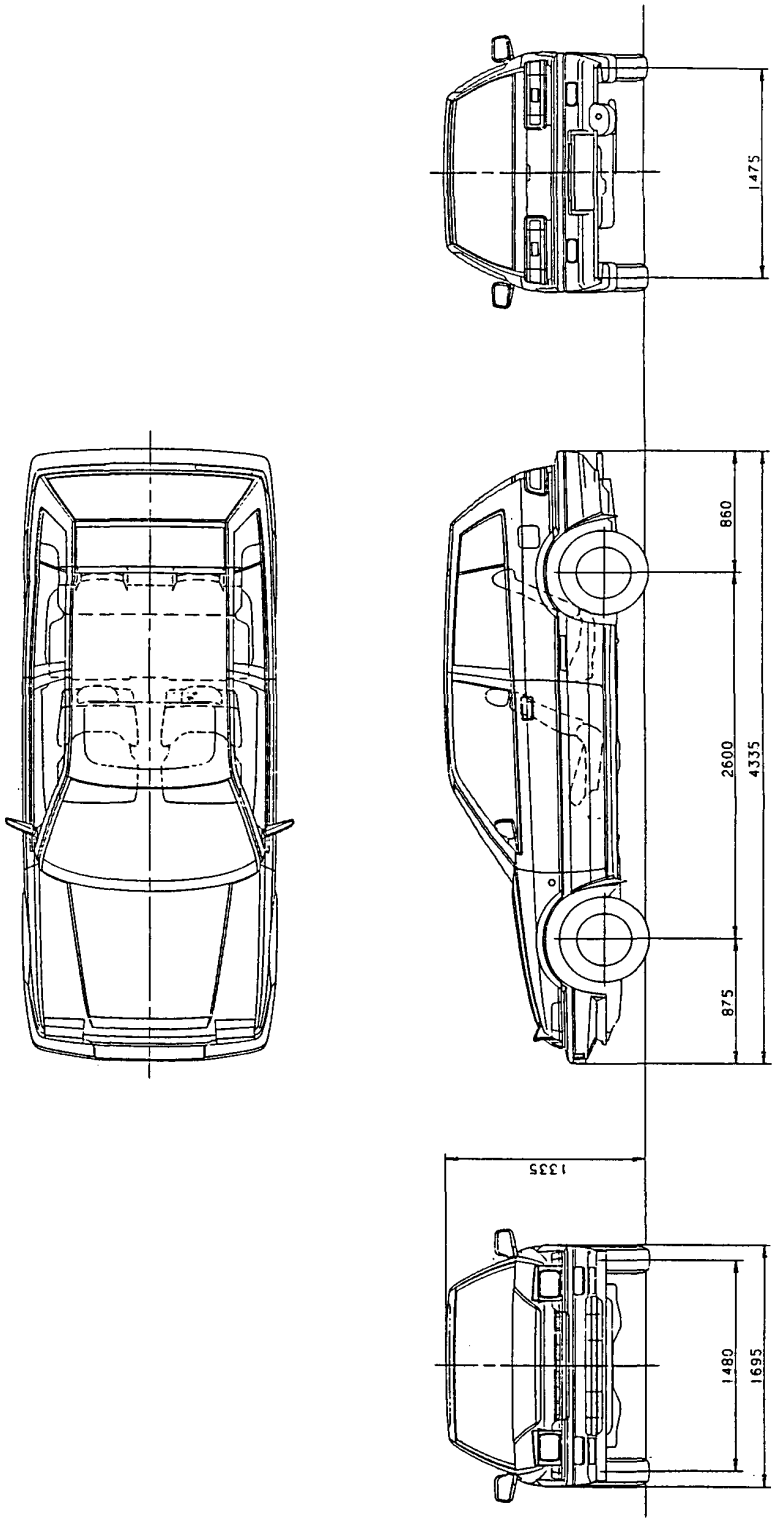


(cont'd)

Body Specification (cont'd)

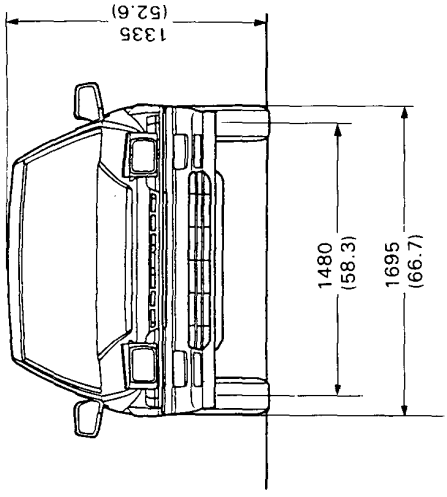
< **Aerodeck** >

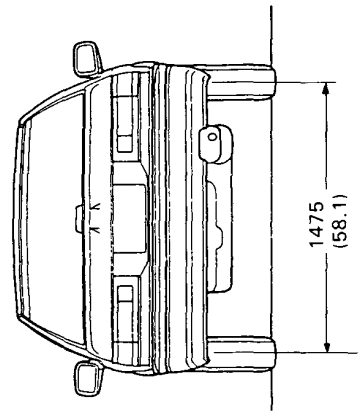
Unit: mm

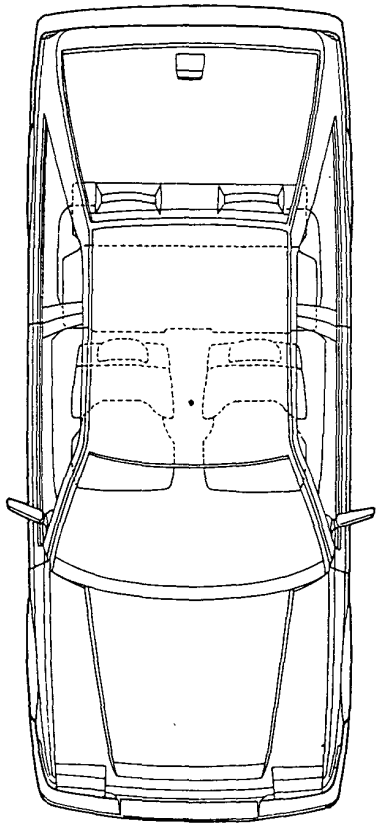


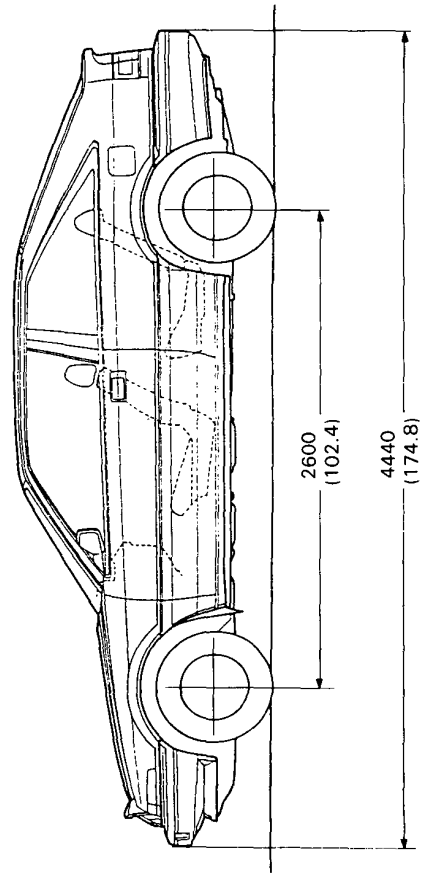
< **Glass Back** >

Unit: mm (in.)







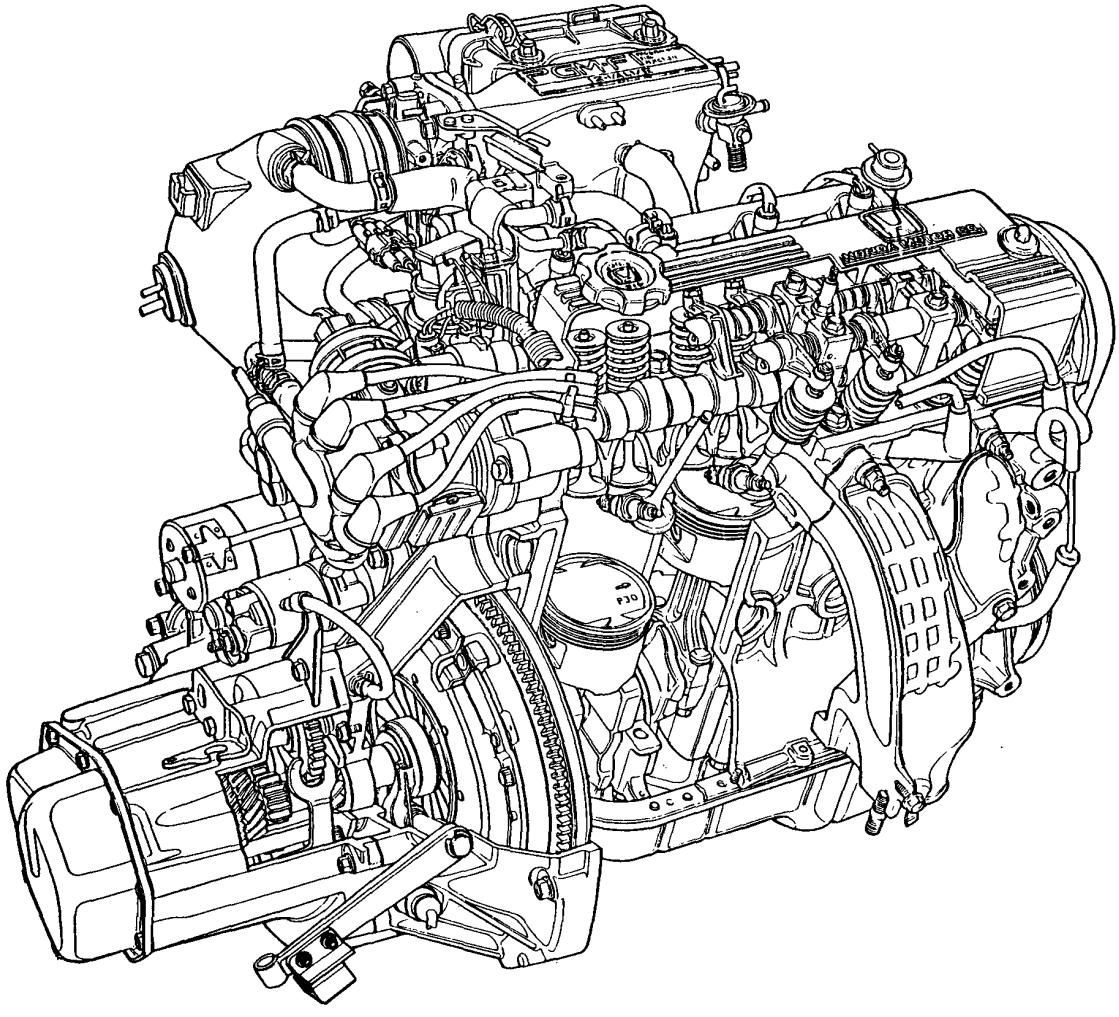


Engine

Engine

Description

The engine is a water cooled 4-cylinder SOHC engine with a piston displacement of 1,958 cm^3 (119.5 cu. in.).



Engine

Cylinder Block

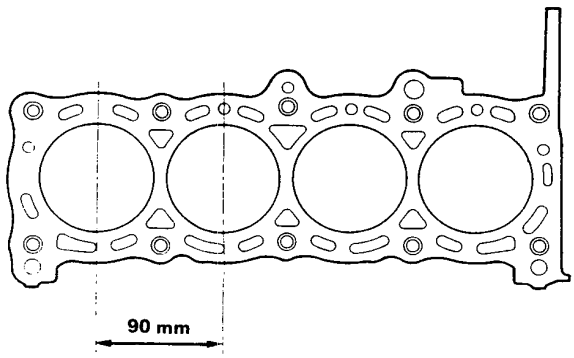
Lightweight and Compact 2.0 liter FC Block

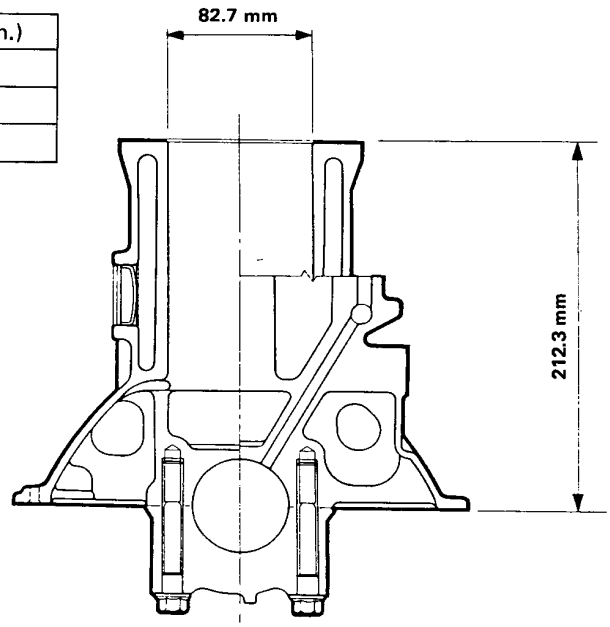
The 2.0 liter cylinder block is a bore-up version of the 1.8 liter block so the size is not incleased but the weight is reduced by improvements in the precision casting method to equalize the housing thickness while assuring sufficient rigidity for the incleased power.

About 1 kg (3 %) in weight reduction has been achieved compared to the previous 1.8 liter cylinder block.

Cylinder Block Specifications

Bore x Stroke	82.7 x 91.0 mm (3.255 x 3.583 in.)
Bore Pitch	90 mm (3.554 in.)
Block Height	212.3 mm (8.358 in.)
Displacement	1,955 cm^3 (119.303 cu. in.)



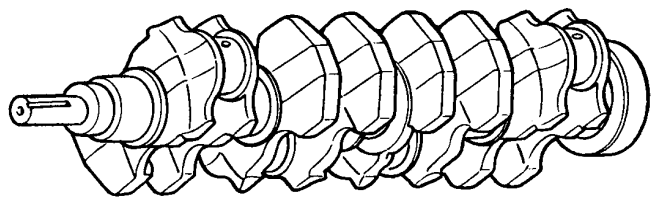


Crankshaft

The crankshaft used in all export 2.0 liter engine is newly provided. Although it is quite similar to the previous 1.8 liter crankshaft.

Crankshaft Specifications

Overall Length	452 mm (17.795 in.)
Journal Diameter	50 mm (1.968 in.)
Crankpin Diameter	45 mm (1.772 in.)
Crank Radius	45.5 mm (1.791 in.)



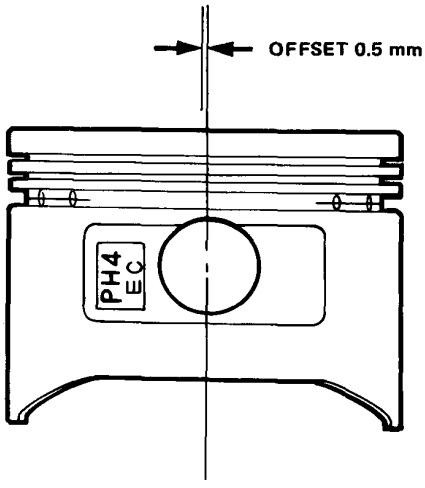
NOTE:
The bearing selection mark indicated for the #1 journal is one rank smaller than for other journals as the expansion in the #1 journal is greater.

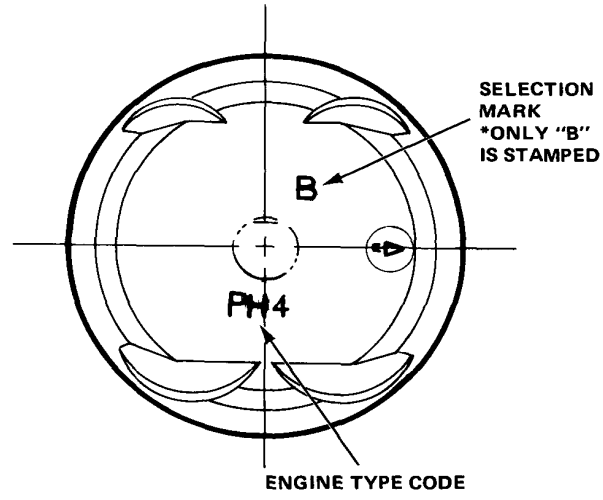
Piston

The design of the oil return passage at the oil ring groove has been changed from a slit type to a drilled type to assure rigidity of the piston skirt. The oil return passages drilled in the piston just below the last ring land (oil ring) have been abolished. Heat transmission from the piston head to skirt is also improved.

Piston Specifications

MODEL TYPE	CORD	AREA
2ℓ CARBURETOR	PH4	ALL EXPORT AREAS
2ℓ PGM-FI	PJO	KC, KS and KX KC and KQ
2ℓ PGM-FI (EC)	OEC	KY, KF, KG, KW and KE





A new aluminum alloy is employed for the Accord PGM-FI KE, KG, KF, KW and KY type piston. It features high strength at high temperature, small heat expansion and improved abrasion resistance. Oil consumption is reduced as a result of diminished wear at the ring grooves and diminished creep at the skirt area.

- **Oversized Piston**

For the above engines, only one range of oversized piston — 0.3 mm (0.0118 in.) oversize — is available.

Engine

Flywheel (Drive Plate)

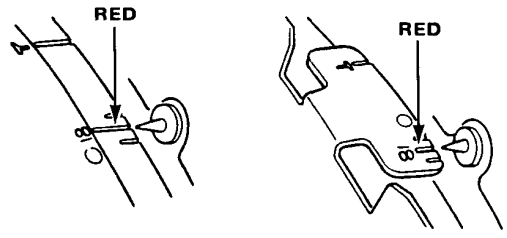
Timing marks are indicated on the flywheel (drive plate) as shown below.

TYPE	KC	KQ	KP	KT	KY
2ℓ CARB. MT	20°/700	20°/750	20°/750	20°/750	20°/750
2ℓ CARB. AT	15°/700	15°/700	20°/700	20°/700	20°/700
2ℓ FC-FI MT					
2ℓ FC-FI AT	15°/750				

TYPE	KF	KG	KW	KS	KX	KE
2ℓ CARB. MT	20°/750	20°/750	20°/750	10°/750	15°/750	20°/750
2ℓ CARB. AT						
2ℓ CARB. AT	20°/700	20°/700	20°/700	10°/750	10°/700	20°/700
2ℓ FC-FI MT	15°/800	15°/800	15°/800	10°/800	15°/800	15°/800
2ℓ FC-FI AT	15°/750D	15°/750D	15°/750D	10°/750D	15°/750	15°/750D

NOTE: The D mark indicates idle speed in the D-range.

Manual transmission **Automatic transmission**

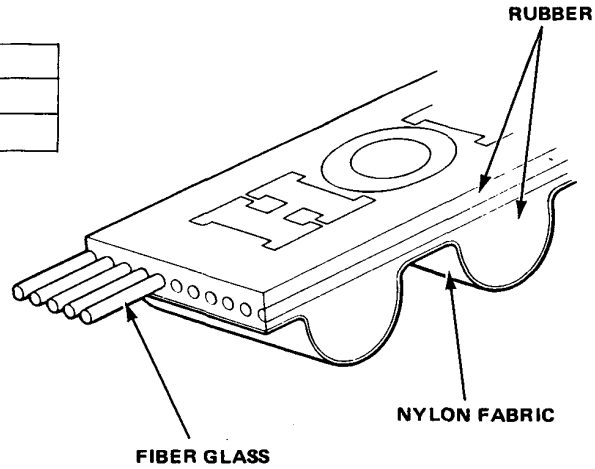


Timing Belt

A high strength super heat resistant belt is employed.

Timing Belt Specifications

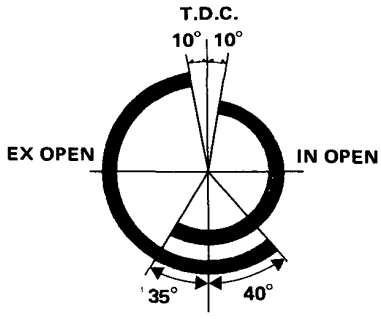
Belt Width	24 mm (0.945 in.)
Pitch	9.525 mm (0.375 in.)
Number of Teeth	108



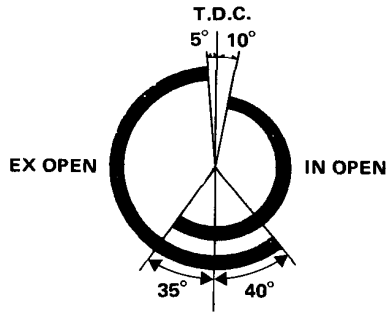
Valve Timing (At 1 mm lift)

[2.0ℓ Carburetor Engine]

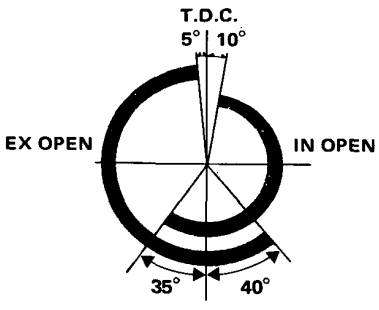
KC, KY and KQ
Manual Transmission



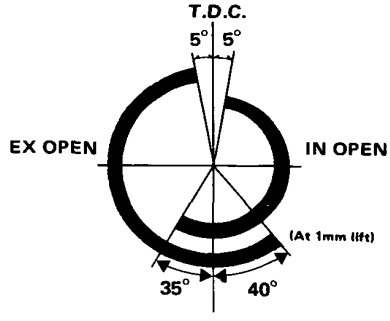
KF, KG, KW, KS, KE, KP, KT and KY
Manual Transmission



KC, KF, KG, KW, KX, KE, KP, KT
and KY Hondamatic Transmission

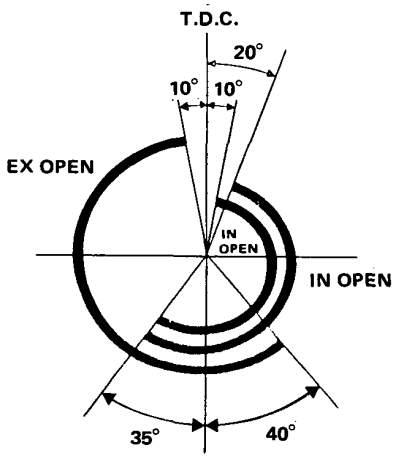


KS
Hondamatic Transmission

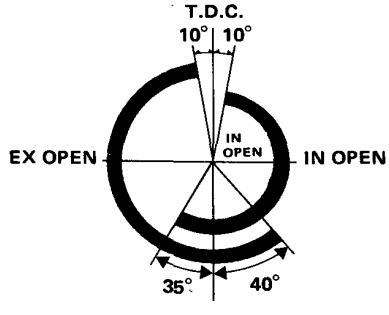


[2ℓ PGM-FI Engine]

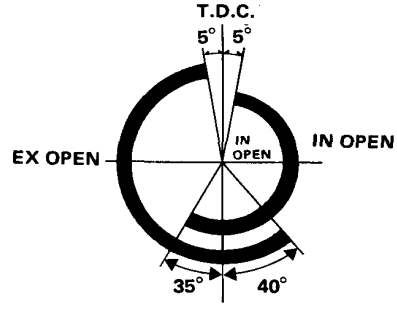
KL, KC, KX and KQ
Manual and Hondamatic



KF, KG, KW, KB, KE and KS (except AT)
Manual and Hondamatic



KS
Hondamatic Transmission

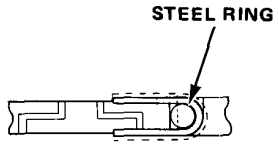


Engine

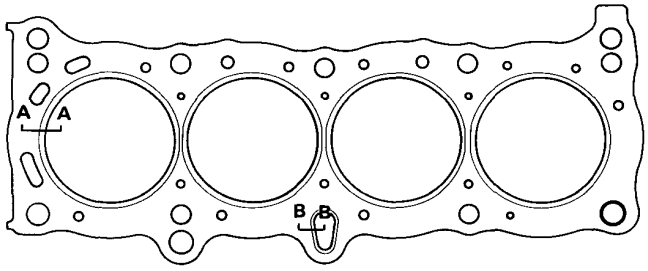
Cylinder Head Gasket

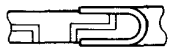
STEEL RING	2.0ℓ ALL EXPORT

A steel ring is newly provided in every bore grommet to prevent grommet cracking and to assure reliability against gasket blowout.



SECTION A–A

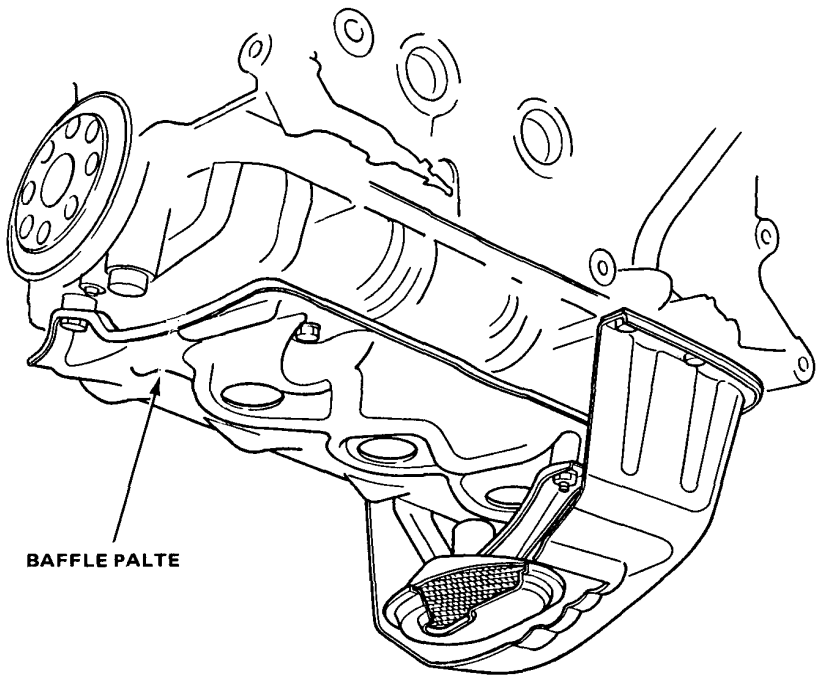




SECTION B–B

Bearing Cap Baffle Plate

The baffle plate, which used be welded in the oil pan, is now secured on the bearing cap by bolts. It contributes to lower engine oil temperature and prevents engine oil airation by completely separating the oil surface from the crankshaft locus. Improvement of power loss at the upper oil level results.

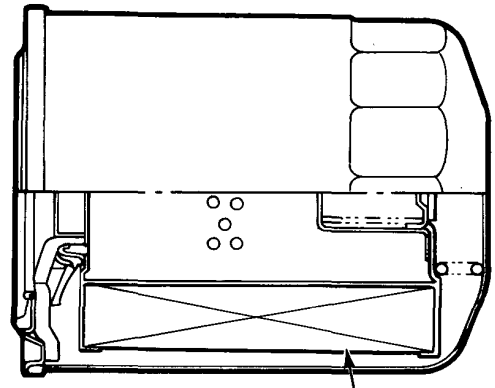


Oil Filter

An improved engine oil filter cartridge is newly employed. It features high filtration performance by aligning the filter paper fiber direction with the direction of oil flow.

Oil Filter Specifications

Filter type	Full flow paper filter
Overall length	100 mm (3.936 in.)
Color	Dark blue

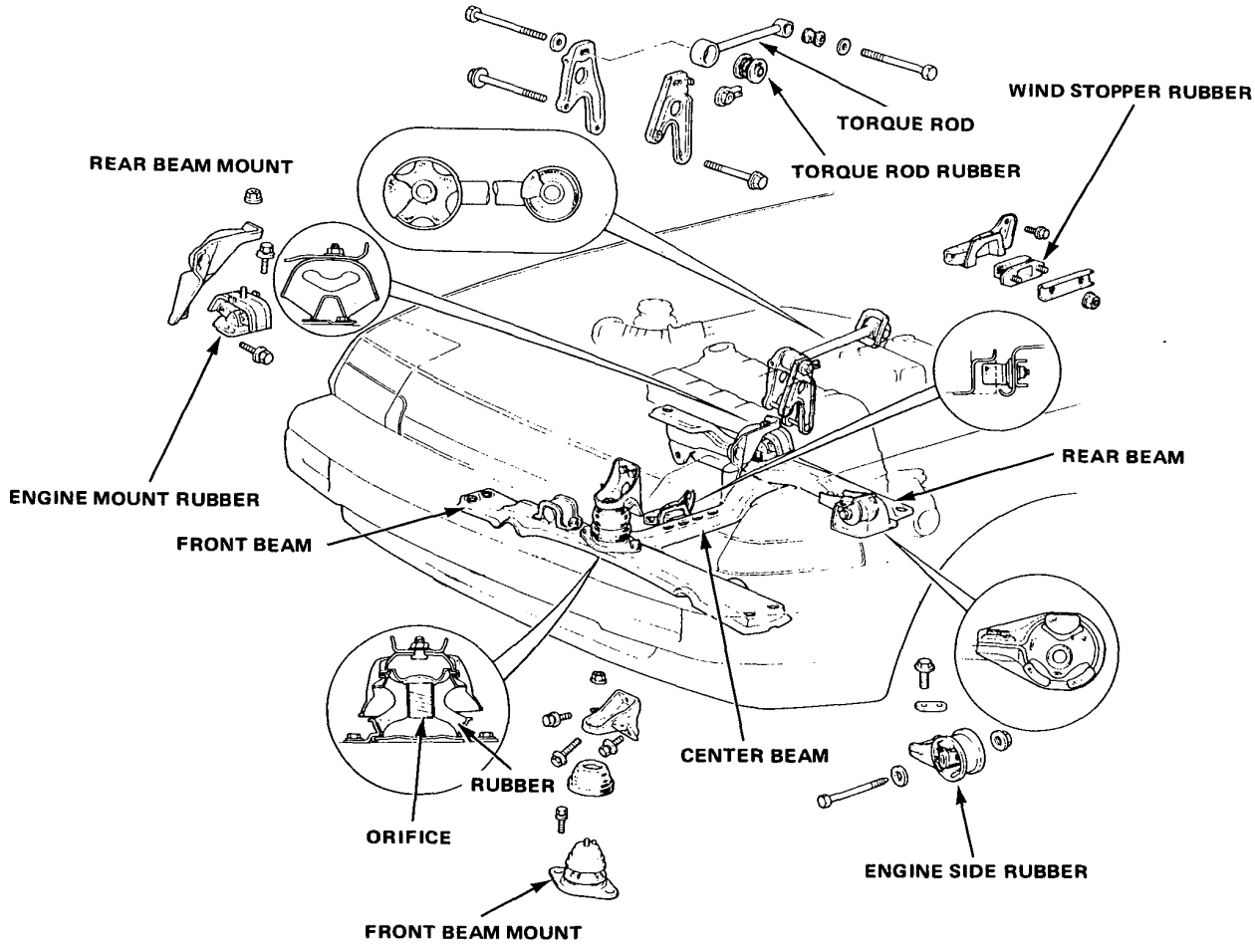


The oil cooler is installed on PGM-FI model.

Engine Mounting

Five engine mounts are provided, three for supporting the engine weight, and two functioning as stopper rubbers to maintain engine attitude against drive torque reaction and inertial force acting on the engine when driving. Front beam dampers are also provided to reduce humming noise in the cabin. The first three mounts represent the front and rear *mount rubbers installed on the front and rear beams and the engine side rubber installed on the left side of the cylinder* block. The latter two mounts are the torque rod, which extends horizontally from the rear of the engine, and the wind stopper rubber installed right under the engine.

A complex type mount is newly employed for the front beam mount.
There are two chambers located in the upper and lower part of the mount and filled with liquid. An orifice is provided to connect the chambers so that damping force takes place when large amplitude is applied. Driving comfort is further improved while insulating the cabin from engine noise and vibration.



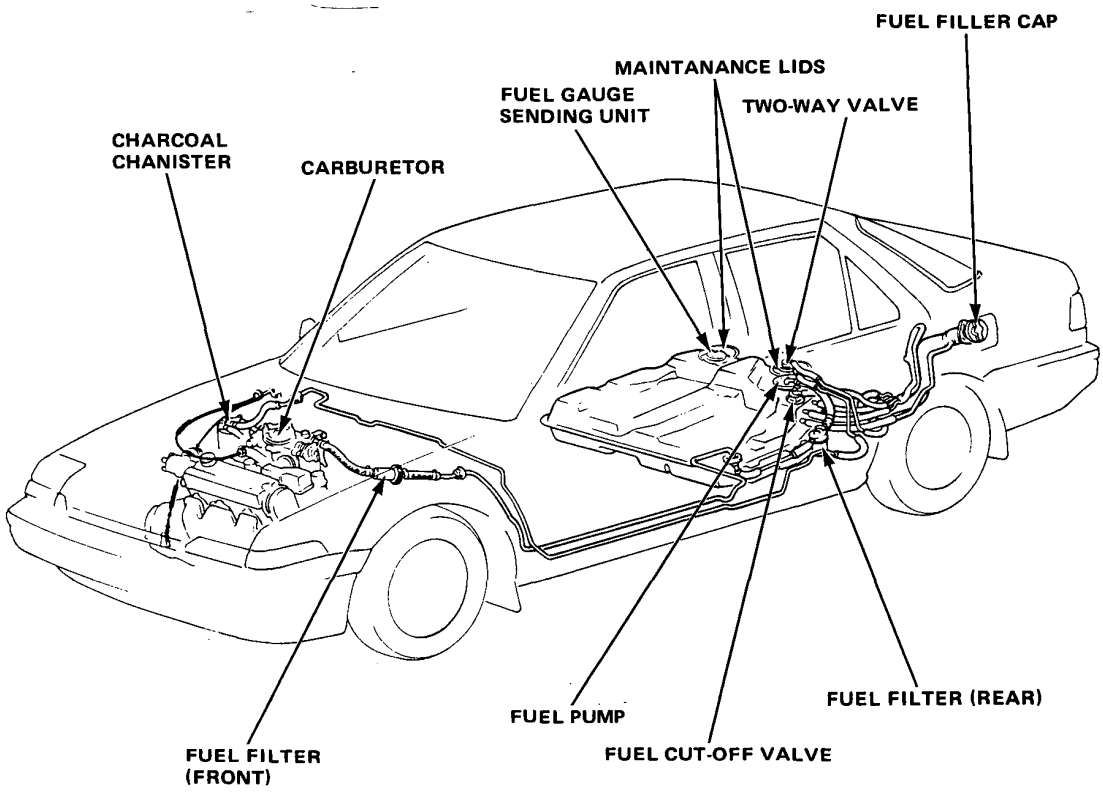
Fuel

Fuel

Description

The fuel system consists of a fuel tank, fuel pump, fuel filter, fuel lines, carburetor, etc.

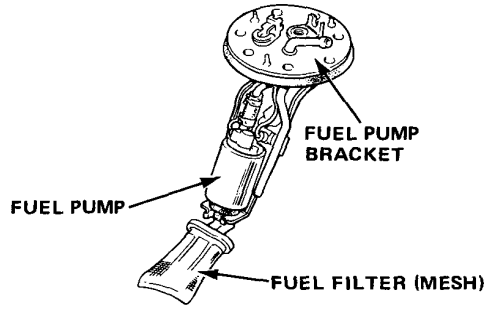
- The newly designed carburetor is a down draft, two barrel type.
- The newly designed fuel pump is an in-tank type mounted inside the fuel tank so that pump noise is decreased and fuel lines are simplified.
- The maintenance lids are newly designed to make it easy to replace the fuel pump and the fuel gauge sending unit without removing the fuel tank.

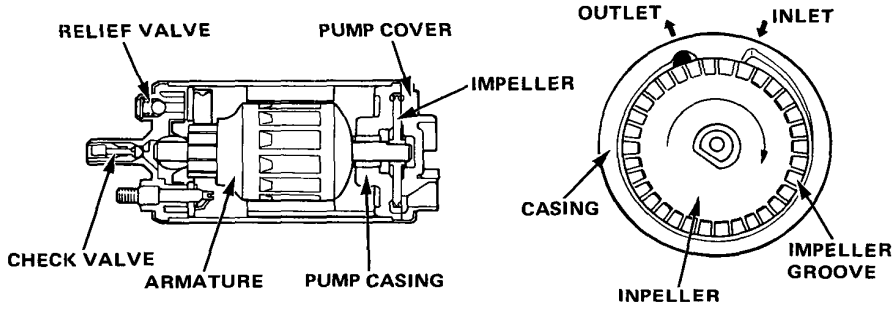


Fuel

Fuel Pump

The fuel pump is an in-tank type. Pumping action is provided by a small electric motor driving the pump impeller. The impeller blades force that fuel through the outlet pipe as the impeller spins.
The fuel pump is sufficiently small and light that can be mounted inside the fuel tank.
A relief valve is provided to prevent pressure over-load in the fuel line. It opens when there is a blockage in the discharge side of the fuel line.
A check valve is provided to maintain fuel pressure in the fuel line after the pump is stopped in order to make re-starting of the engine easy.





Specifications (EFI)

Item	Old (16700–PE7–743)	New (16700–PH3–003)	Remarks
Pump type	Roller	Impeller	
Location	In-line	In-tank	
Outer dia. x Length (mm)	55 x 212.5	50.7 x 123.6	Miniaturization ratio: 47%
Weight (kg)	1.18	0.585	Weight reduction ratio: 51%
Pulsation pressure (kg/cm^2)	0.13	0.05	Pulsation reduction ratio: 62%
Motor speed (rpm)	2,000	4,300	
Motor torque (kg/cm)	1.1	0.6	
Delivery pressure (kg/cm^2)	2.55	2.55	
Displacement (ℓ/Hr)	Min. 85	Min. 85	
Relief valve opening pressure (kg/cm^2)	4.6–6.0	4.5–6.0	

WARNING

The fuel pump is assembled by crimping and cannot be disassembled. Extremely strict product control for the wire harness layout and assembly is taken at the factory to prevent fuel in the tank from igniting. When repair is necessary, the fuel pump and bracket must be replaced with a new assembly.

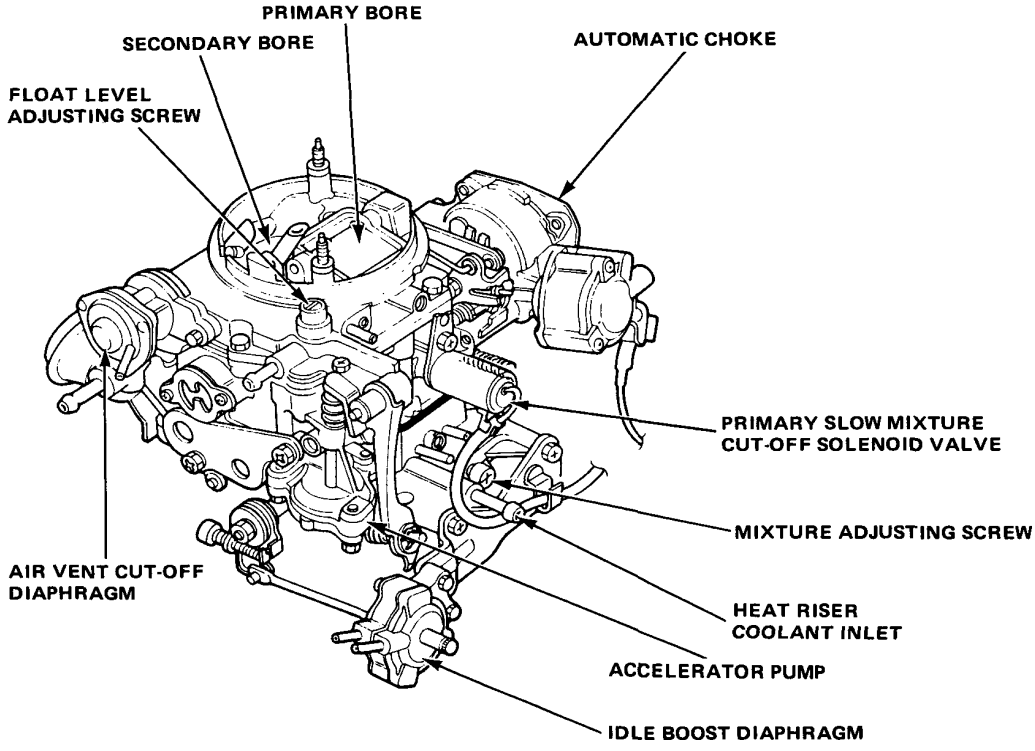
Carburetor

Description

The carburetor is a down draft, two barrel, fixed venturi type. The basic construction is essentially the same as that of current Civic carburetors.

Features

1. The primary and secondary throttle bore diameters are enlarged from the 28/32 mm (Prim./Sec.) of the Civic carburetor to 32/38 mm.
2. An automatic choke system, heat riser and accelerator pump bypass valve are newly adapted on the 2.0ℓ engine carburetor for European and General export model vehicles.
3. An air vent cut-off diaphragm is newly adapted on the 2.0ℓ engine for KC, and KQ types to prevent fuel vapor in the float chamber from escaping to the atmosphere.



Carburetor

Automatic Choke

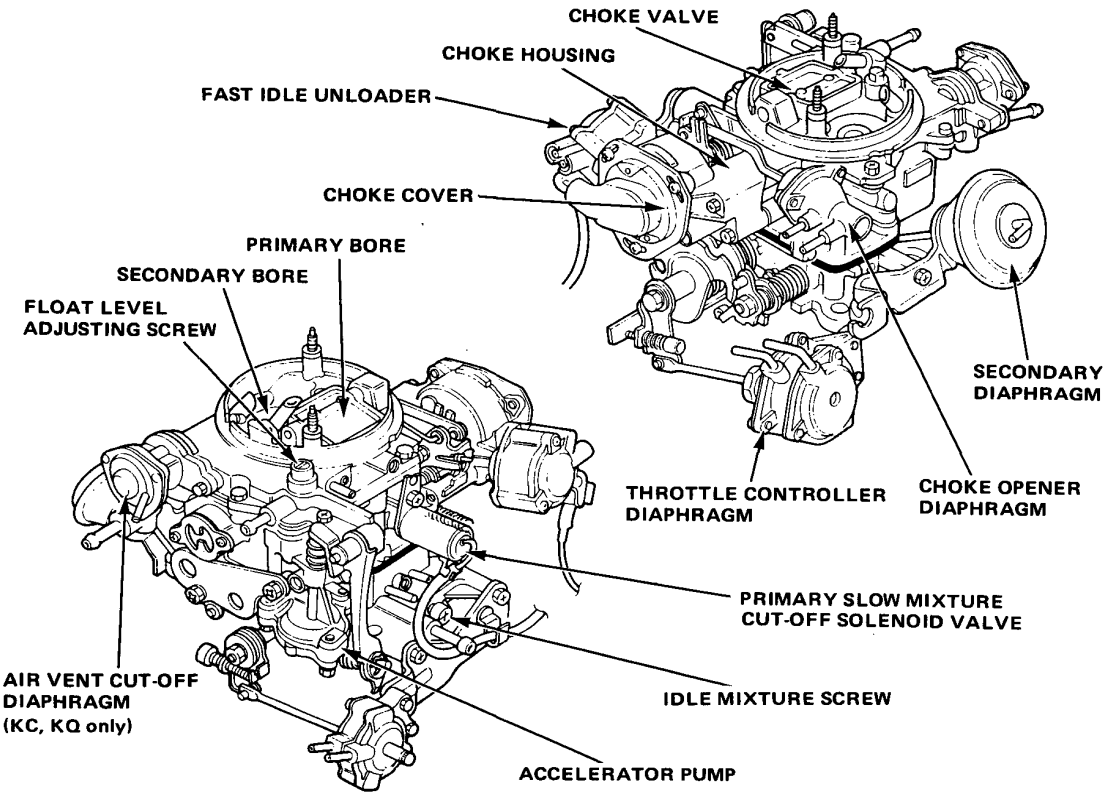
This system provides easy engine starting under a wide range of air temperatures.

The system consists of the following:

a) The choke valve and its linkage system
b) The choke heater electrical circuit
c) The choke opener
d) The fast idle and fast idle unloader system

The choke valve is located in the primary throttle bore of the carburetor. When the engine is not running, the choke valve angle is determined by the bimetallic coil spring acting against the choke return spring. When the engine is running, the choke opener also affects the choke valve angle.

When the engine is started, electric current supplied to the main choke heater causes the bimetallic coil spring to open the choke valve. As the air temperature in the choke cap rises, the thermal switch turns on and electric current is also directed to the secondary choke heater. This speeds the opening of the choke valve during its final stages. The combination of heater and thermistor keeps the bimetallic coil spring at a constant high temperature.



The choke opener adjusts the choke valve for increased air flow once the engine begins to fire. It operates in two steps according to coolant temperature and operates independently of the fast idle setting.

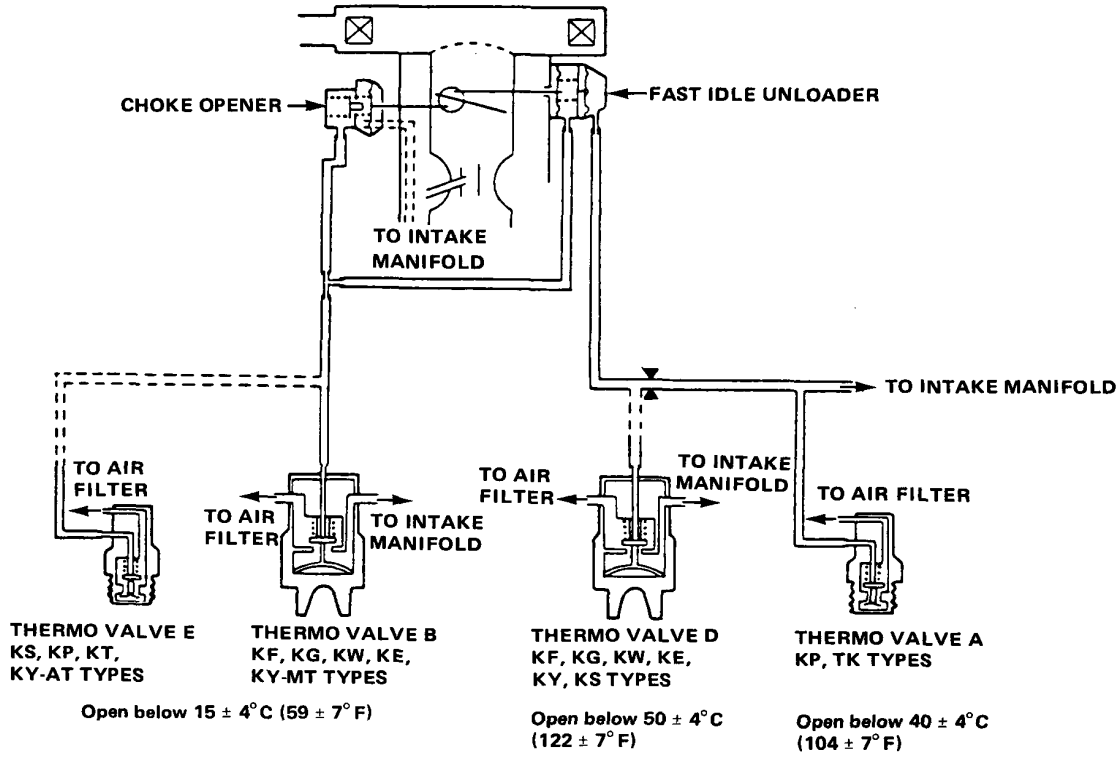
The fast idle unloader operates in two steps according to the characteristics of thermovalves A and B, which sense the engine coolant temperature differently.

Choke Opener System

2.0ℓ	EXCEPT KX, KQ

The fast idle cam is engaged and disengaged by depressing the accelerator pedal, and is also disengaged by the fast idle unloading mechanism.

The unloading mechanism consists of a fast idle unloader, and thermovalves A or D and B or E. The unloader has two diaphragms to release the throttle valve in two steps. When the coolant temperature reaches the set temperature of thermovalve B or E, it closes to shut off the vacuum bleed. This allows the inside diaphragm of the unloader to retract to the first step by manifold vacuum. Then, as the coolant temperature rises further and reaches the set temperature of thermovalve A or D, it closes and manifold vacuum is applied to the outside diaphragm of the unloader. This allows the unloader to operate on the second step.



Choke Opener

This system is designed to promote easy starting. When starting the engine, manifold vacuum is transmitted to the choke opener; thus the choke valve is opened a fixed amount.

Thermovalve B or E works to open the choke valve in response to engine coolant temperature. When the engine coolant temperature is below the set temperature of thermovalve B or E, it opens and manifold vacuum is bled from the valve. In this situation the choke opener diaphragm is retracted to an intermediate position because of the balance between the vacuum and the spring force of the choke opener.

When the engine coolant temperature exceeds the set temperature of thermovalve B or E, it closes to shut off the vacuum bleed and this allows the choke opener to retract fully and pull the choke valve open.

(cont'd)

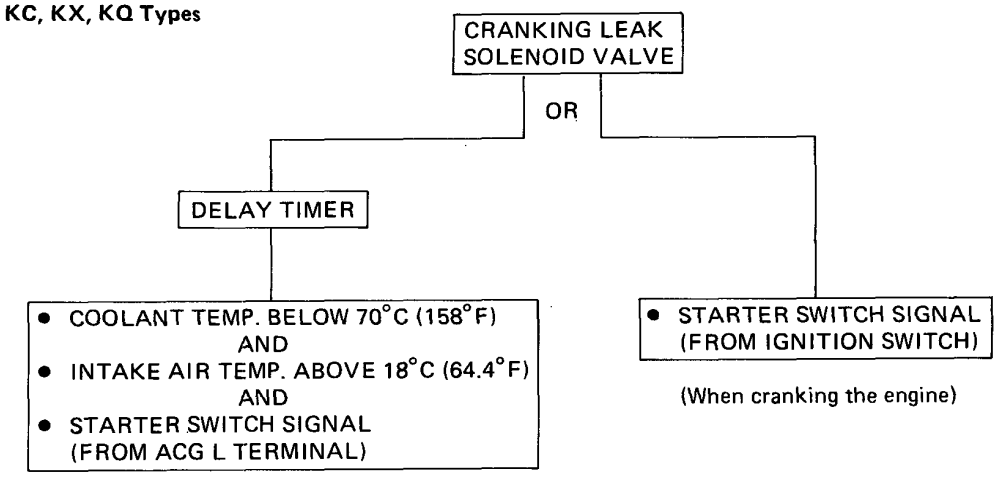
Choke Opener System (cont'd)

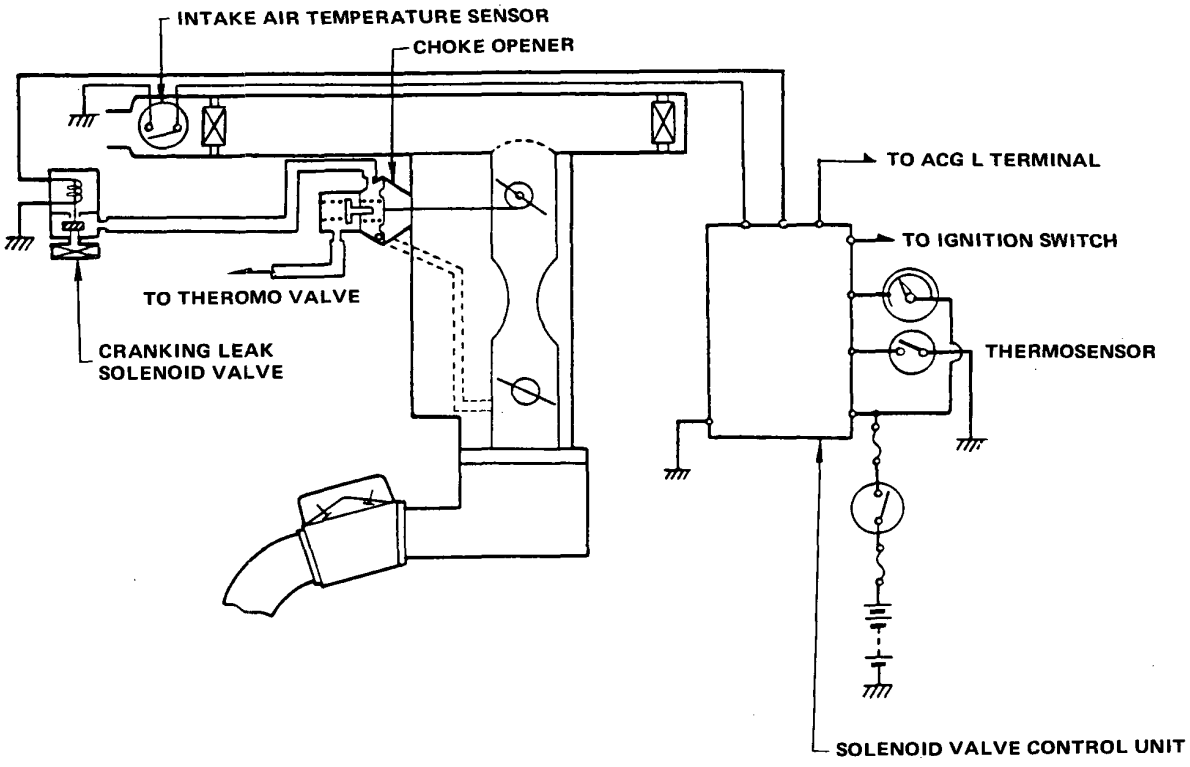
2.0ℓ	KX, KQ Only

Choke Opener

When cranking the engine to start, the cranking leak solenoid valve is activated and manifold vacuum is released from the valve so that the choke opener does not operate.
In addition, when cranking the engine or after starting, activation of the solenoid valve is delayed for several seconds by the solenoid valve control unit in order to improve cold engine driveability.

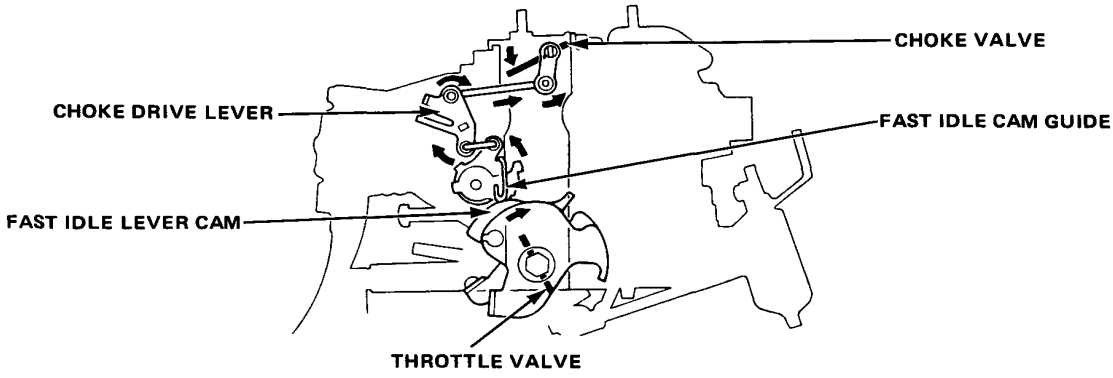
KC, KX, KQ Types





Unloader mechanism

When a cold engine is started, the closed choke valve is opened a fixed amount by the linkage whenever the accelerator pedal is depressed beyond a certain point. This mechanism prevents the air fuel mixture from becoming excessively rich when additional acceleration is required.



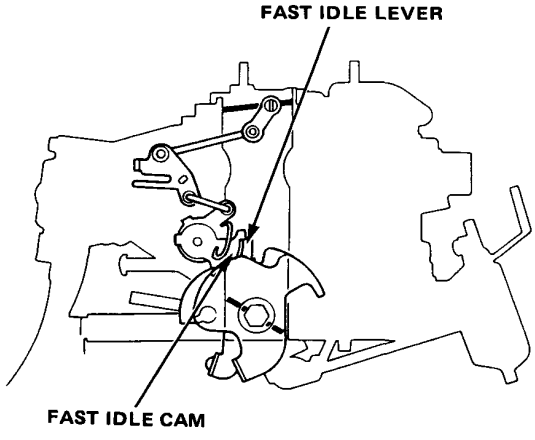
Fast idle mechanism

Before starting the cold engine, it is necessary to depress the accelerator pedal once in order to disengage the fast idle cam from the fast idle lever. When the accelerator pedal is released slowly, the fast idle cam is initially positioned by the bimetallic coil spring according to the ambient temperature.

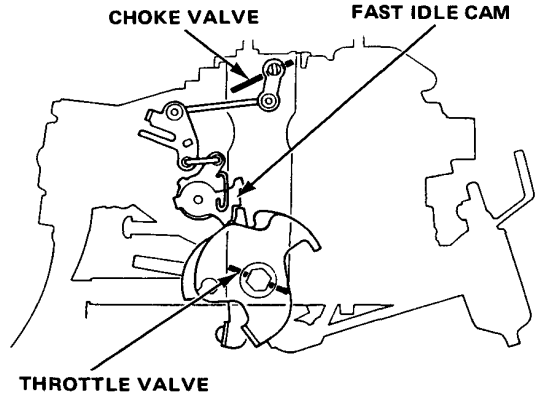
As the choke heater warms the bimetallic coil spring, the lever rotates clockwise, opening the choke valve. The fast idle cam and lever will remain where originally set unless the throttle is depressed to wide open.

When the engine runs smoothly, the idle speed can be reduced by slowly depressing the accelerator pedal.

Before Starting



During Warming up



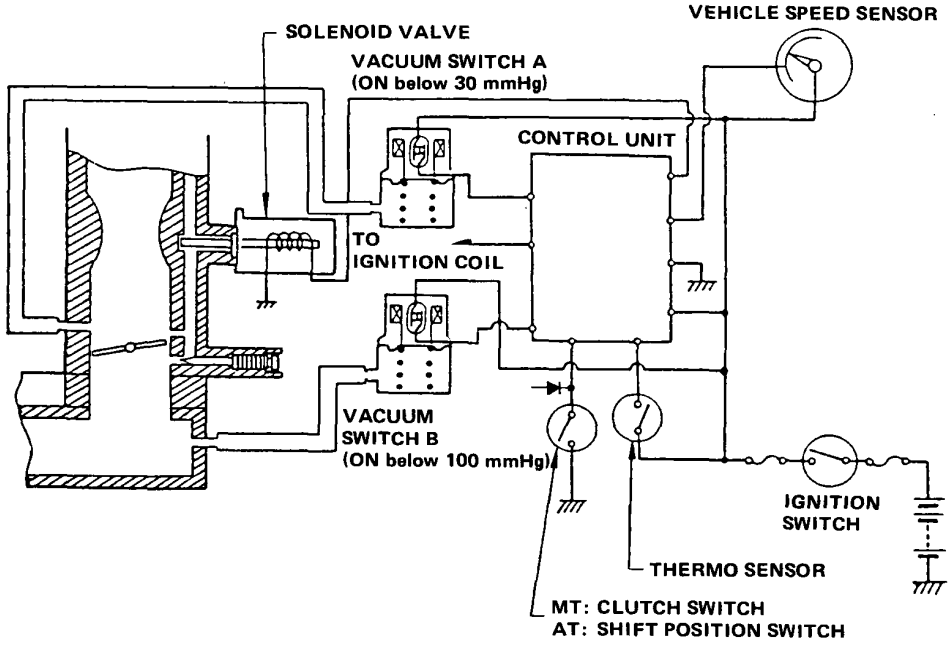
Fuel Cut-off System

KX, KQ Only

This system is designed for fuel economy and to prevent the catalytic converter from over-heating caused by unburned fuel when decelerating the vehicle.
When the primary slow mixture cut-off solenoid valve is deactivated by the solenoid valve control unit under certain conditions, the solenoid valve closes the carburetor primary slow fuel passage.

VACUUM SWITCH A ON
AND
VACUUM SWITCH B ON
AND
COOLANT TEMP. ABOVE 70°C (156.2°F)
AND
VEHICLE SPEED ABOVE 15.0 MPH
AND
ENGINE SPEED ABOVE 1,500 rpm
AND
MT: CLUTCH SWITCH OFF
(Clutch pedal is not depressed.)
AT: SHIFT POSITION SWITCH OFF
(Any position other than "N".)

→ PRIMARY SLOW MIXTURE CUT-OFF SOLENOID VALVE OFF



Power Valve

KS Only

This system is provided to supply supplementary fuel into the priamry main fuel passage when the vehicle is operated in the power mode.

In normal driving modes other than acceleration, manifold vacuum is applied on the diaphragm of the power valve and the valve is closed. When the throttle valve is suddenly opened to accelerate the vehicle, the power valve opens because of the decreased manifold vacuum and supplies additional fuel to the primary main fuel passage through the power jet, providing smooth acceleration performance.

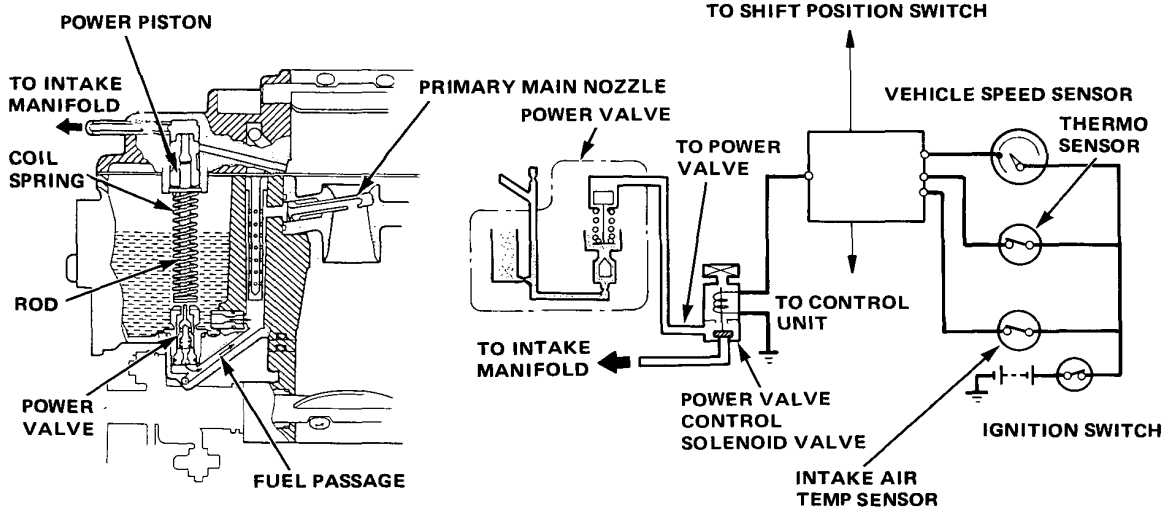
When the power valve control solenoid valve is activated by the solenoid valve control unit, the power valve is opened because the solenoid valve does not allow vacuum to act on the power valve.

POWER VALVE CONTROL SOLENOID VALVE OFF

OR

INTAKE AIR TEMP. BELOW 18°C (64.4°F)
AND
ENGINE SPEED BELOW 3,000 rpm
AND
AT: SHIFT POSITION SWITCH OFF
(Any position other than "P" or "N".)

VEHICLE SPEED BELOW 15 MPH
AND
COOLANT TEMP. BELOW 50°C (122°F)
AND
AT: SHIFT POSITION SWITCH OFF
(Any position other than "P" or "N".)



Carburetor

Accelerator Pump

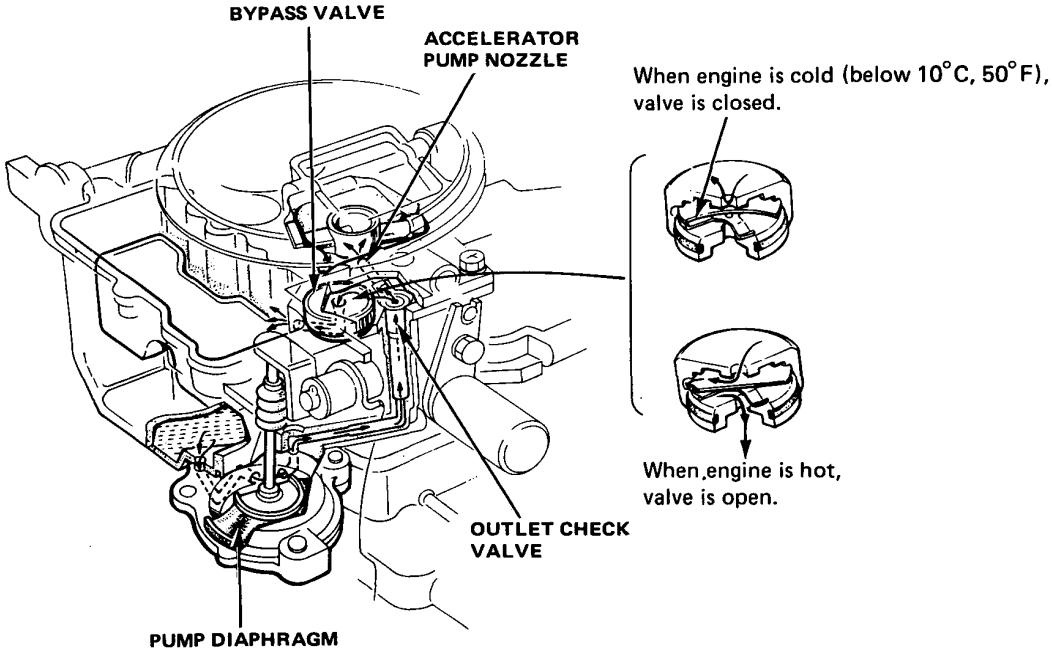
2.0ℓ TYPE

The accelerator pump supplies the extra fuel necessary to maintain the ideal air/fuel mixture when the accelerator pedal is depressed suddenly at low engine speeds.

When the accelerator pedal is depressed, the pump rod, which is connected to the throttle lever, pushes down on the accelerator pump diaphragm. This opens the outlet check valve and allows fuel to be pumped up to the accelerator pump nozzle, where it is sprayed into the carburetor's primary throat.

When the accelerator pedal is released, the accelerator pump diaphragm is pushed up by its spring and this closes the outlet check valve. Fuel, from the float chamber, flows into the acclerator pump chamber through the inlet check valve so that the pump will be ready when the accelerator pedal is again depressed suddenly.

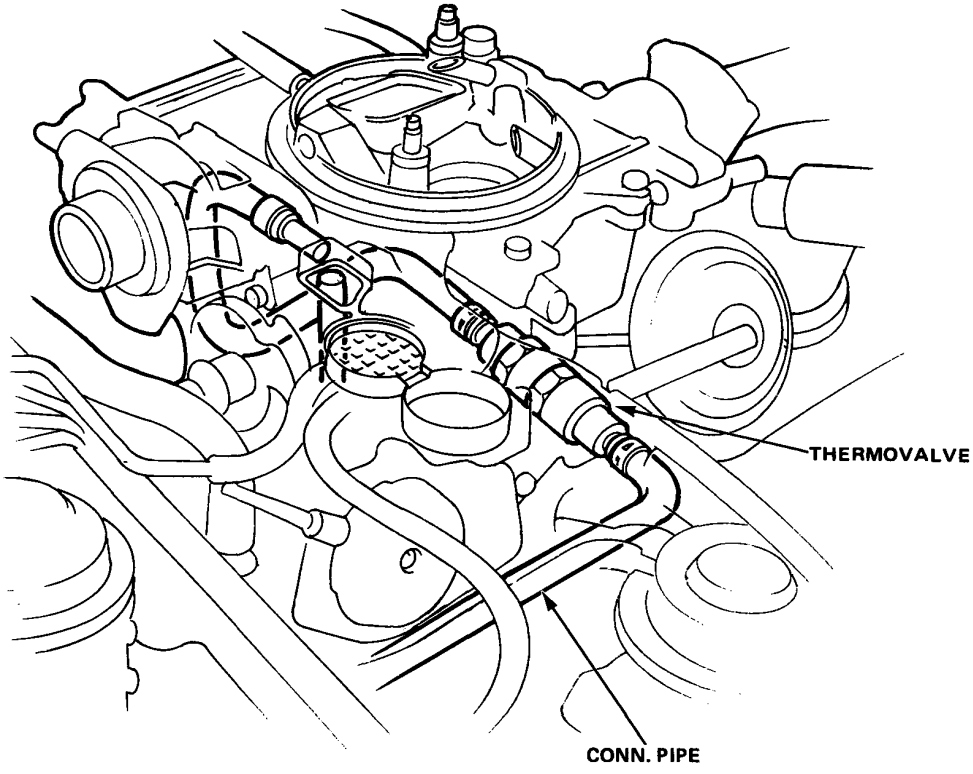
The fuel flow from the accelerator pump is further regulated by the temperature-sensitive bypass valve in the carburetor. When the engine is cold, the bypass portion of the valve is closed so that the accelerator pump nozzle will get the maximum of fuel available. When the engine warms up to its normal operating temperature, the bypass valve opens and this allows some of the fuel, which would ordinarily be routed to the nozzle, to be bled back into the float chamber of the carburetor.



Carburetor Heat Riser

2.0ℓ TYPE

A thermovalve, utilizing engine coolant, is built into the intake manifold to prevent carburetor icing and to improve cold driveability. This improves air-fuel mixture atomization. Since excessive heat can cause fuel percolation, a bypass valve with a thermostat shuts off coolant flow, at normal operating temperatures.

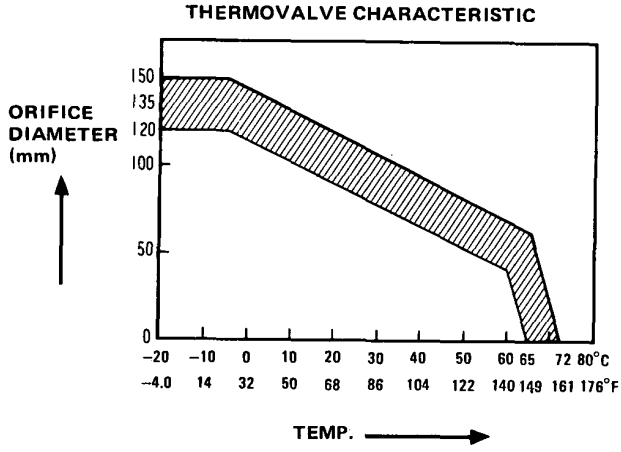


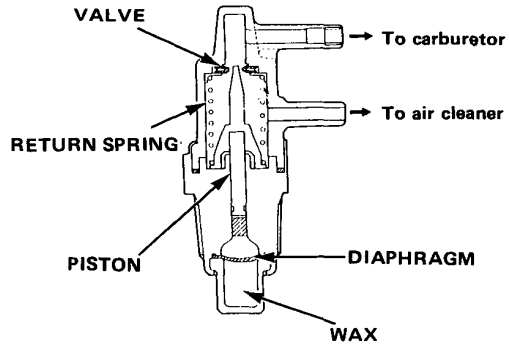
Carburetor

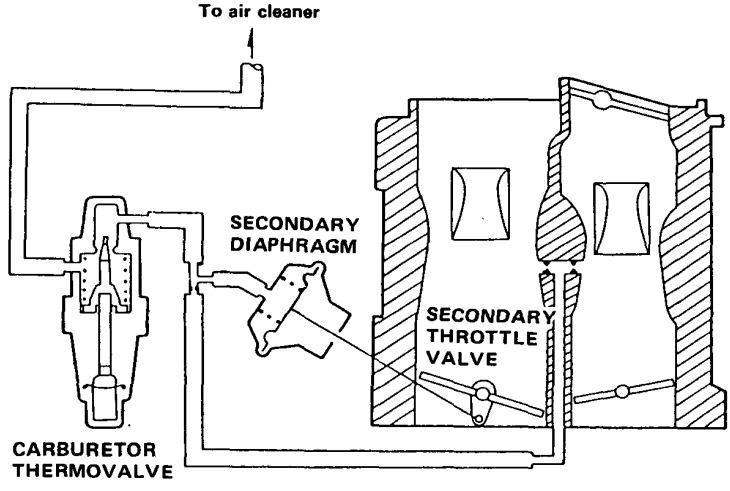
Secondary Diaphragm Vacuum Bypass System

2.0ℓ TYPE

This system is designed to control vacuum bypass into the air cleaner to keep the secondary throttle valve closed in order to improve drivability when the engine is cold.
The carburetor thermovalve is controlled by a thermowax plunger. When the thermowax is cold, the valve is open. When the thermowax melts, the valve closes. With the engine cold and the thermowax consequently cold, venturi vacuum bleeds off into the air cleaner so that the secondary throttle valve remains closed. When the engine reaches operating temperature, the valve is closed, allowing vacuum to act on the secondary diaphragm.
The carburetor thermovalve is located on the thermo case assembly.







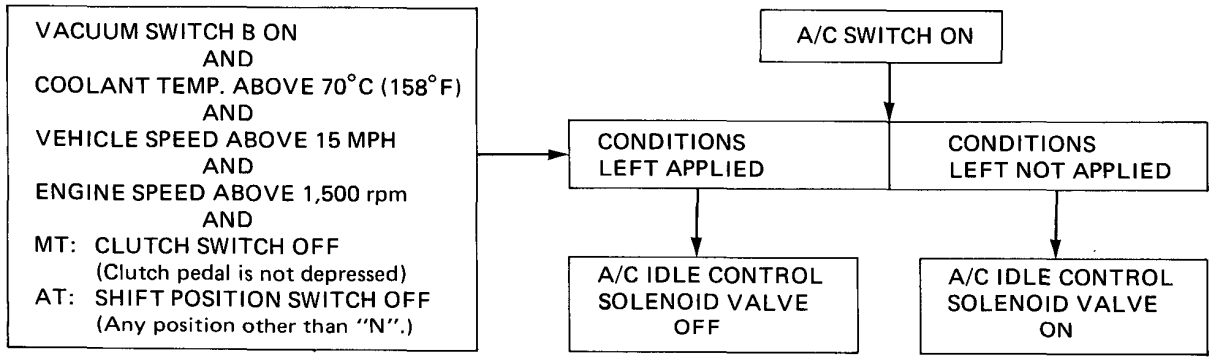
Idle Boost Control (A/C)

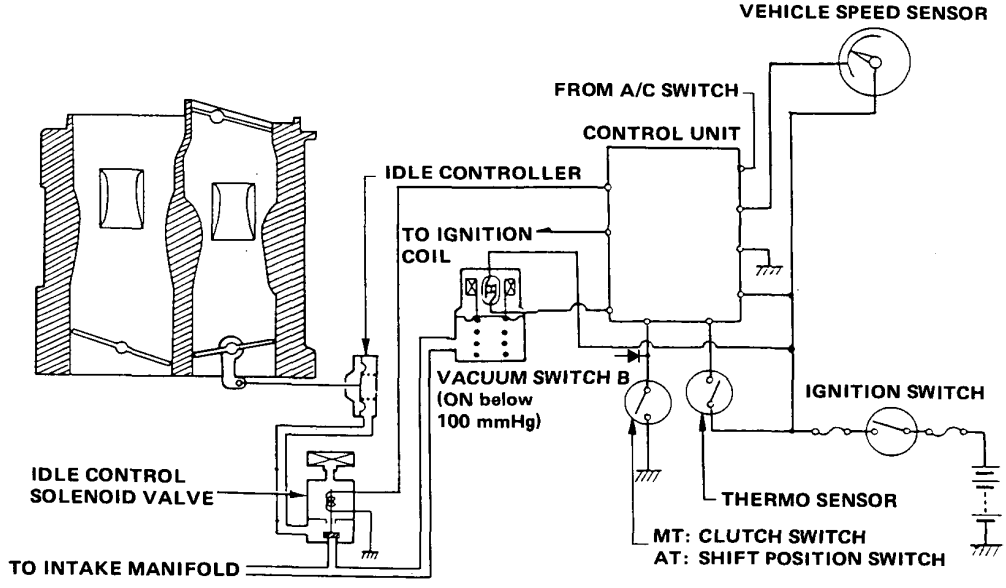
KX, KQ Only

This system prevents the idle speed from dropping when the A/C compressor switch is turned on.

When the compressor switch is on, manifold vacuum is introduced into the diaphragm chamber of the idle controller through the idle control solenoid valve which is activated by the compressor switch and the diaphragm rod is retracted to open the throttle valve by a certain amount. The amount of this throttle valve opening is adjusted with the idle control screw on the idle controller to maintain the original idle speed when the air conditioner compressor switch is turned on.

When the compressor is off, or engine coolant temperature, vehicle speed, and engine speed are above the set value the idle control solenoid valve is deactivated to close the vacuum passage and the vacuum stored in the controller is released by the air entering through the filter on the solenoid valve.

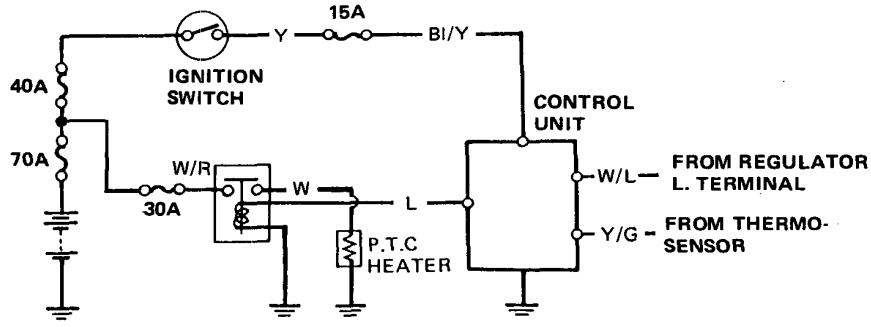




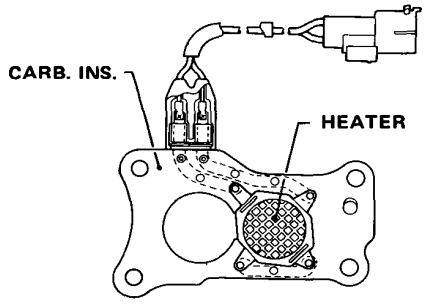
PTC Heater

KX, KQ Only

During cold-engine operation, just after starting, vaporization of the fuel is poor. To improve fuel vaporization and therefore cold engine driveability, a PTC Heater is provided to heat the air/fuel mixture when it passes through the carburetor insulator. In addition, fuel distribution to each cylinder is equalized by the honey comb shaped heater. A PTC Heater control unit is located under the left side front seat. A PCT control relay is located on the right side of the engine room near the relay box.



PTC Heater Activation Temp:
Below 70°C (158°F)

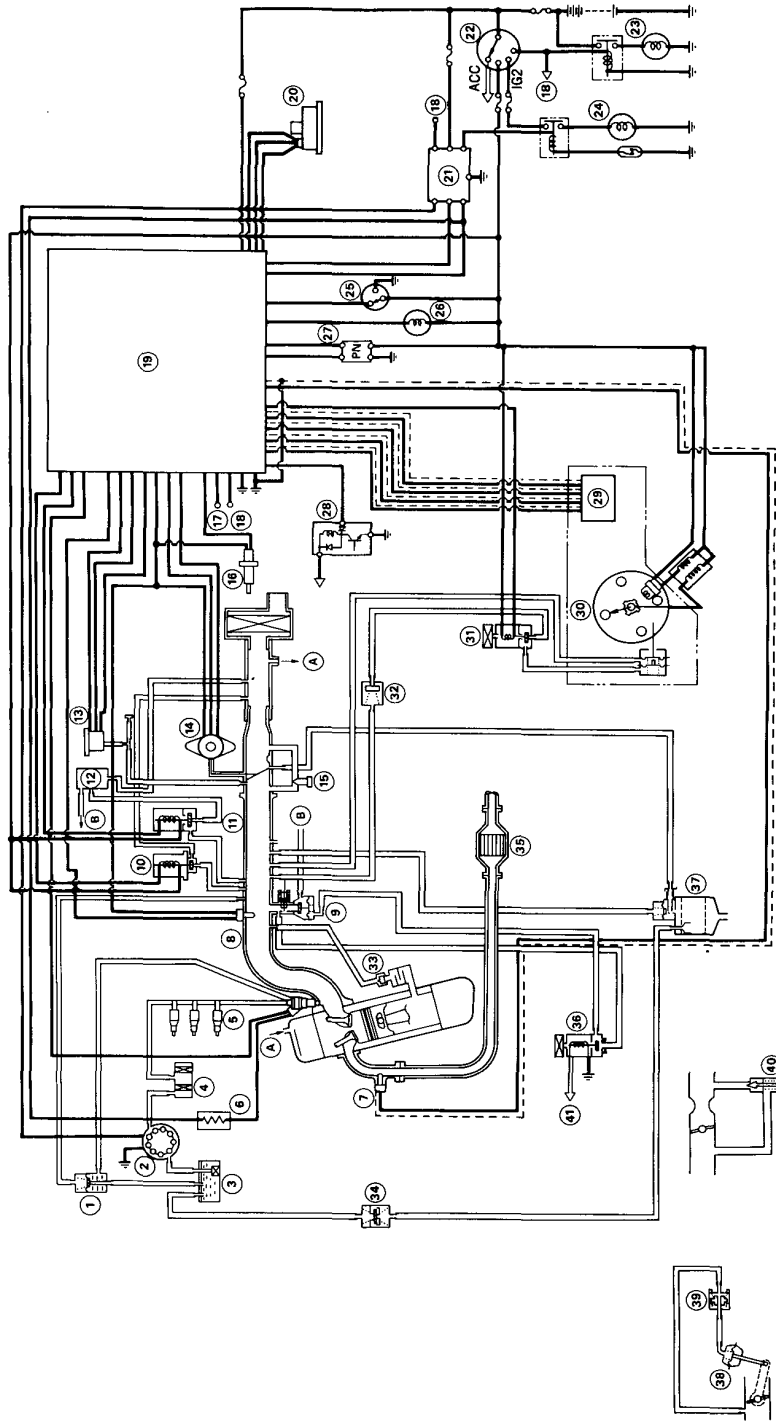


CAUTION:

1. **Be careful not to damage the insulator when servicing the carburetor.**
2. **Make sure that there is no foreign matter on the insulator after installing.**
3. **Make sure that the O-ring and seal are properly installed.**

Vacuum and Electrical Connections

[KC]

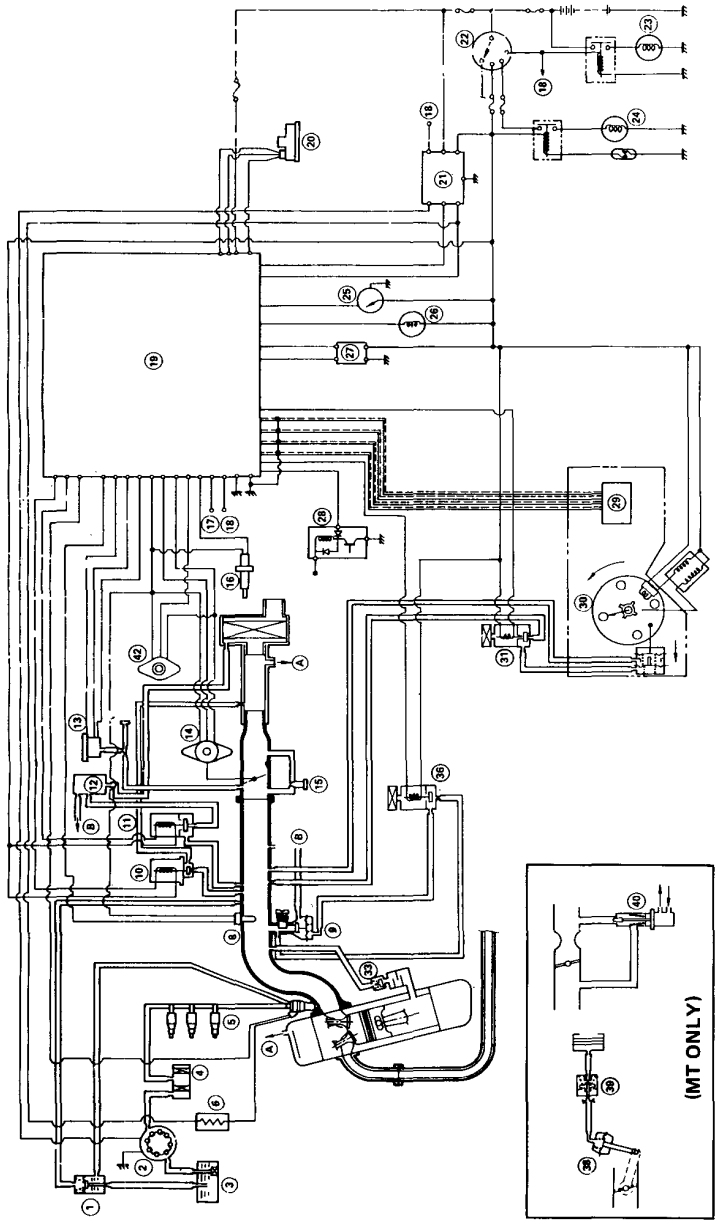


1. PRESSURE REGULATOR
2. FUEL PUMP
3. FUEL TANK
4. FUEL FILTER
5. INJECTOR
6. RESISTOR
7. OXYGEN SENSOR
8. INTAKE AIR TEMPERATURE SENSOR
9. IDLE CONTROL VALVE (A/C ONLY)
10. A/T IDLE CONTROL SOLENOID VALVE
11. IDLE CONTROL SOLENOID VALVE
12. AIR CHAMBER
13. MANIFOLD ABSOLUTE PRESSURE SENSOR
14. THROTTLE ANGLE SENSOR
15. IDLE ADJUSTING SCREW
16. COOLANT TEMPERATURE SENSOR
17. FROM A/C SWITCH
18. STARTER SIGNAL
19. ELECTRONIC CONTROL UNIT
20. ATMOSPHERIC PRESSURE SENSOR
21. MAIN RELAY
22. IGNITION SWITCH
23. STARTER MOTOR
24. RADIATOR FAN
25. VEHICLE SPEED SENSOR
26. PGM-FI WARNING LIGHT
27. A/T SHIFT POSITION SWITCH
28. ALTERNATOR
29. CRANK ANGLE SENSOR
30. DISTRIBUTOR
31. COLD ADVANCE SOLENOID VALVE OR VACUUM CONTROLER CONTROL SOLENOID VALVE
32. CHECK VALVE
33. PCV VALVE
34. 2 WAY VALVE
35. CATALYTIC CONVERTER
36. A/C IDLE CONTROL SOLENOID VALVE
37. CANISTER
38. DASHPOT
39. DASHPOT CHECK VALVE
40. FAST IDLE VALVE
41. FROM CONTROL UNIT

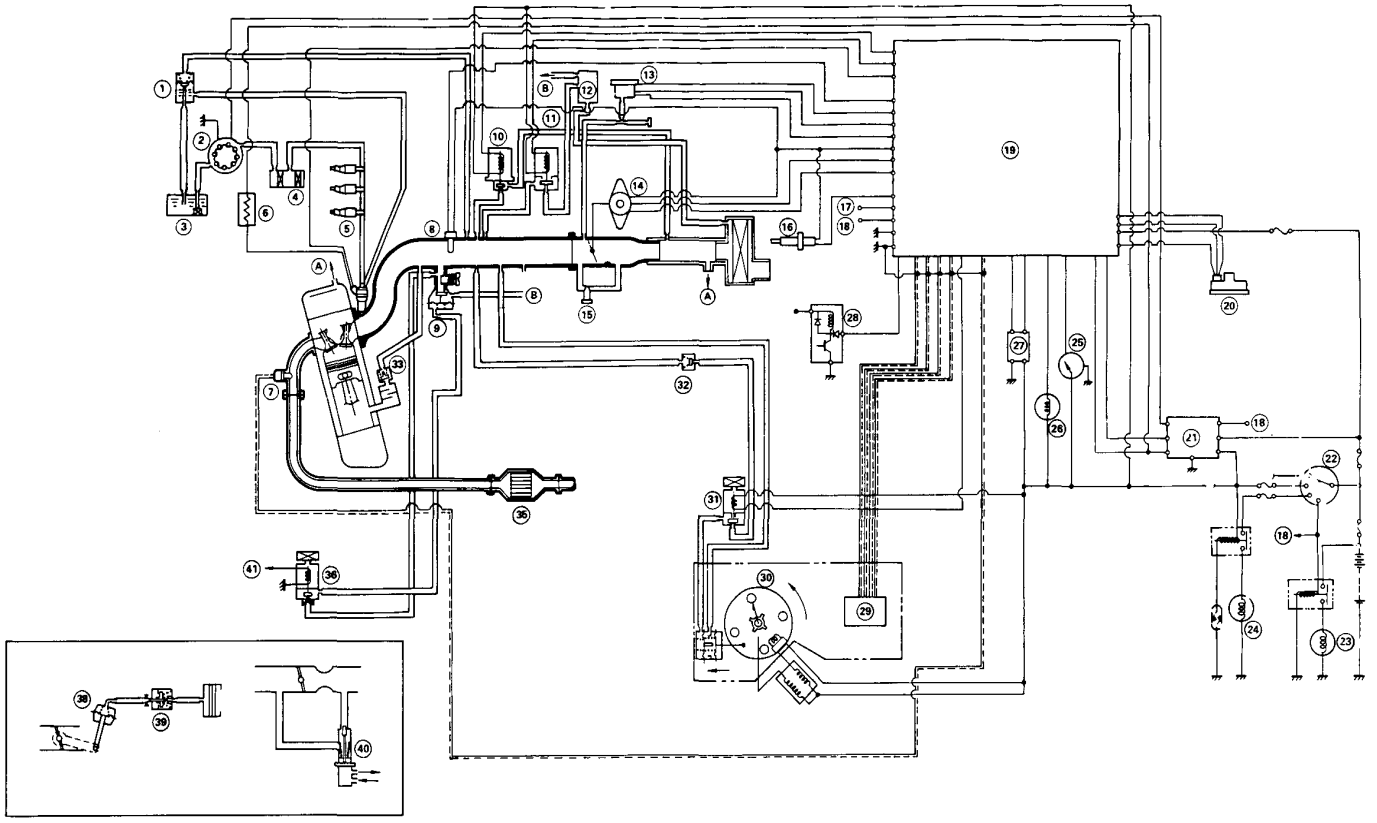
(cont'd)

Vacuum and Electrical Connections (cont'd)

[KF, KG, KW, KE–MT/AT]



1. PRESSURE REGULATOR
2. FUEL PUMP
3. FUEL TANK
4. FUEL FILTER
5. INJECTOR
6. RESISTOR
8. INTAKE AIR TEMPERATURE SENSOR
9. IDLE CONTROL VALVE (A/C ONLY)
10. A/T IDLE CONTROL SOLENOID VALVE
11. IDLE CONTROL SOLENOID VALVE
12. AIR CHAMBER
13. MANIFOLD ABSOLUTE PRESSURE SENSOR
14. THROTTLE ANGLE SENSOR
15. IDLE ADJUSTING SCREW
16. COOLANT TEMPERATURE SENSOR
17. FROM A/C SWITCH
18. STARTER SIGNAL
19. ELECTRONIC CONTROL UNIT
20. ATMOSPHERIC PRESSURE SENSOR
21. MAIN RELAY
22. IGNITION SWITCH
23. STARTER MOTOR
24. RADIATOR FAN
25. VEHICLE SPEED SENSOR
26. PGM-FI WARNING LIGHT
27. A/T SHIFT POSITION SWITCH
28. ALTERNATOR
29. CRANK ANGLE SENSOR
30. DISTRIBUTOR
31. COLD ADVANCE SOLENOID VALVE
33. PCV VALVE
36. A/C IDLE CONTROL SOLENOID VALVE (A/C ONLY)
38. DASHPOT
39. DASHPOT CHECK VALVE
40. FAST IDLE VALVE
42. IMA SENSOR

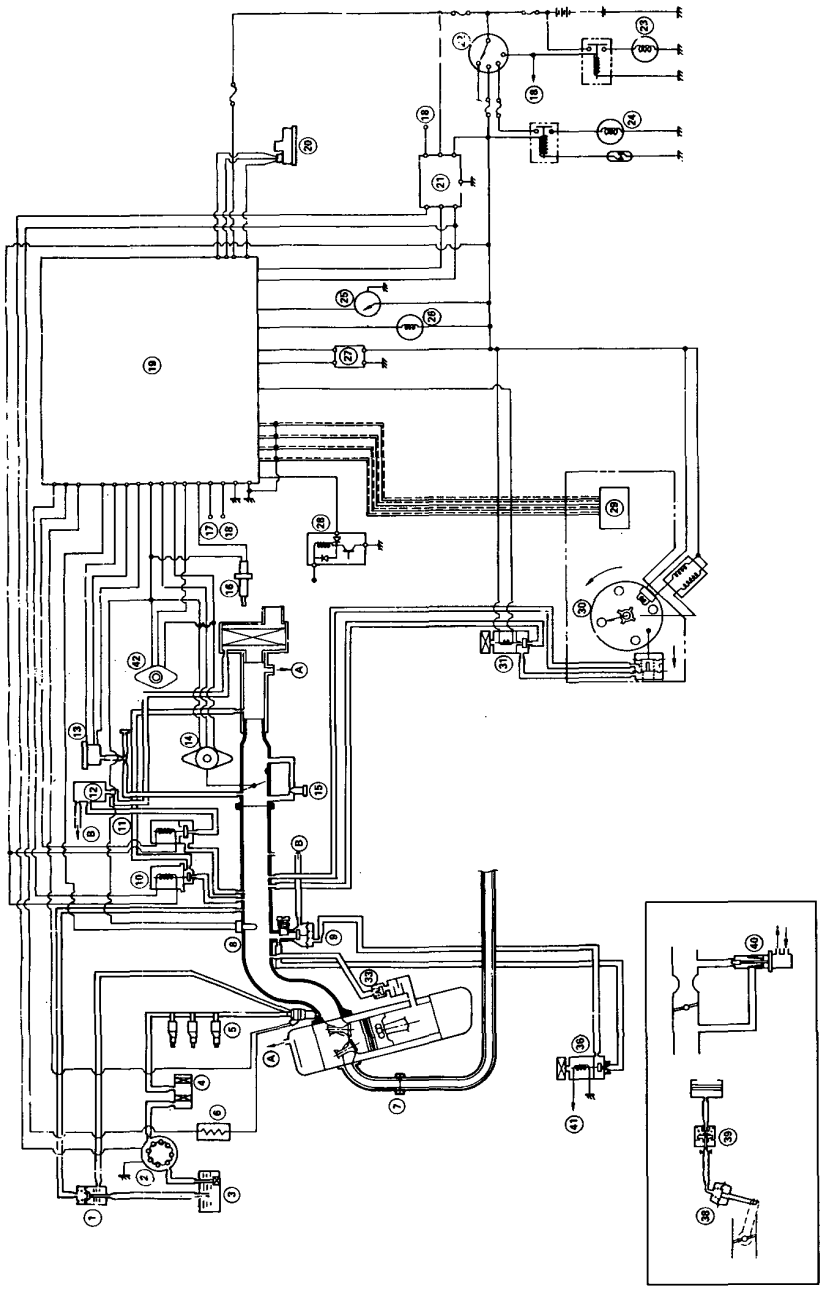


1. PRESSURE REGULATOR
2. FUEL PUMP
3. FUEL TANK
4. FUEL FILTER
5. INJECTOR
6. RESISTOR
7. OXYGEN SENSOR
8. INTAKE AIR TEMPERATURE SENSOR
9. IDLE CONTROL VALVE (A/C ONLY)
10. A/T IDLE CONTROL SOLENOID VALVE
11. IDLE CONTROL SOLENOID VALVE
12. AIR CHAMBER
13. MANIFOLD ABSOLUTE PRESSURE SENSOR
14. THROTTLE ANGLE SENSOR
15. IDLE ADJUSTING SCREW
16. COOLANT TEMPERATURE SENSOR
17. FROM A/C SWITCH
18. STARTER SIGNAL
19. ELECTRONIC CONTROL UNIT
20. ATMOSPHERIC PRESSURE SENSOR
21. MAIN RELAY
22. IGNITION SWITCH
23. STARTER MOTOR
24. RADIATOR FAN
25. VEHICLE SPEED SENSOR
26. PGM-FI WARNING LIGHT
27. A/T SHIFT POSITION SWITCH
28. ALTERNATOR
29. CRANK ANGLE SENSOR
30. DISTRIBUTOR
31. COLD ADVANCE SOLENOID VALVE
32. CHECK VALVE
33. PCV VALVE
35. CATALYTIC CONVERTER
36. A/C IDLE CONTROL SOLENOID VALVE
38. DASHPOT
39. DASHPOT CHECK VALVE
40. FAST IDLE VALVE

(cont'd)

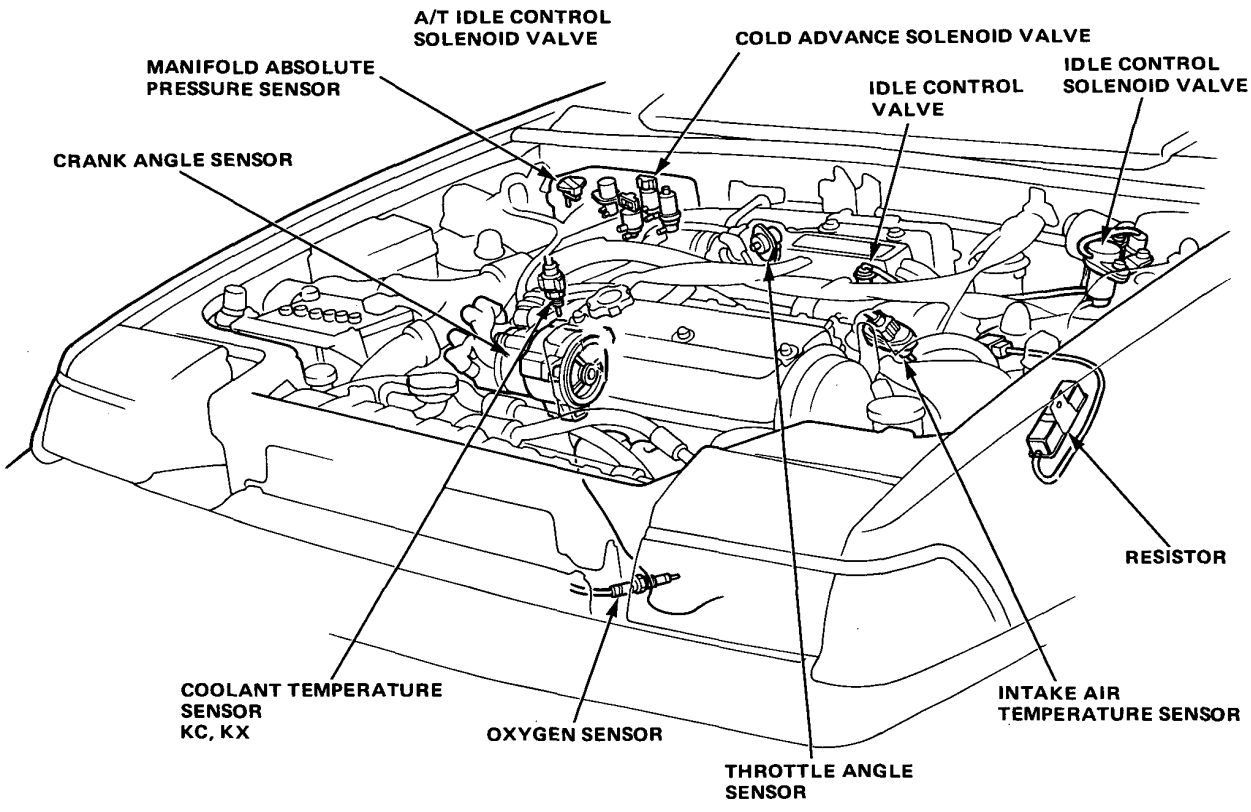
Vacuum and Electrical Connections (cont'd)

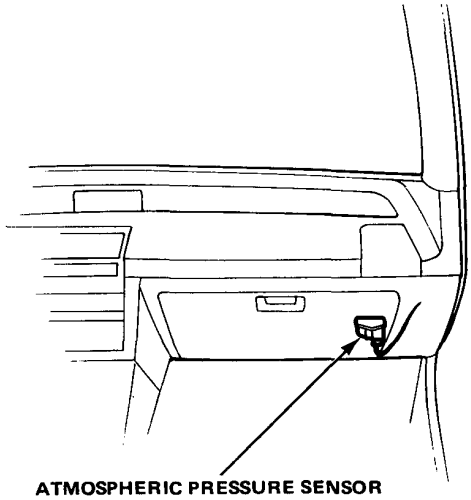
[KS–MT/AT]



1. PRESSURE REGULATOR
2. FUEL PUMP
3. FUEL TANK
4. FUEL FILTER
5. INJECTOR
6. RESISTOR
7. OXYGEN SENSOR
8. INTAKE AIR TEMPERATURE SENSOR
9. IDLE CONTROL VALVE (A/C ONLY)
10. A/T IDLE CONTROL SOLENOID VALVE
11. IDLE CONTROL SOLENOID VALVE
12. AIR CHAMBER
13. MANIFOLD ABSOLUTE PRESSURE SENSOR
14. THROTTLE ANGLE SENSOR
15. IDLE ADJUSTING SCREW
16. COOLANT TEMPERATURE SENSOR
17. FROM A/C SWITCH
18. STARTER SIGNAL
19. ELECTRONIC CONTROL UNIT
20. ATMOSPHERIC PRESSURE SENSOR
21. MAIN RELAY
22. IGNITION SWITCH
23. STARTER MOTOR
24. RADIATOR FAN
25. VEHICLE SPEED SENSOR
26. PGM-FI WARNING LIGHT
27. A/T SHIFT POSITION SWITCH
28. ALTERNATOR
29. CRANK ANGLE SENSOR
30. DISTRIBUTOR
31. COLD ADVANCE SOLENOID VALVE
33. PCV VALVE
36. A/C IDLE CONTROL SOLENOID VALVE
38. DASHPOT
39. DASHPOT CHECK VALVE
40. FAST IDLE VALVE
42. IMA SENSOR

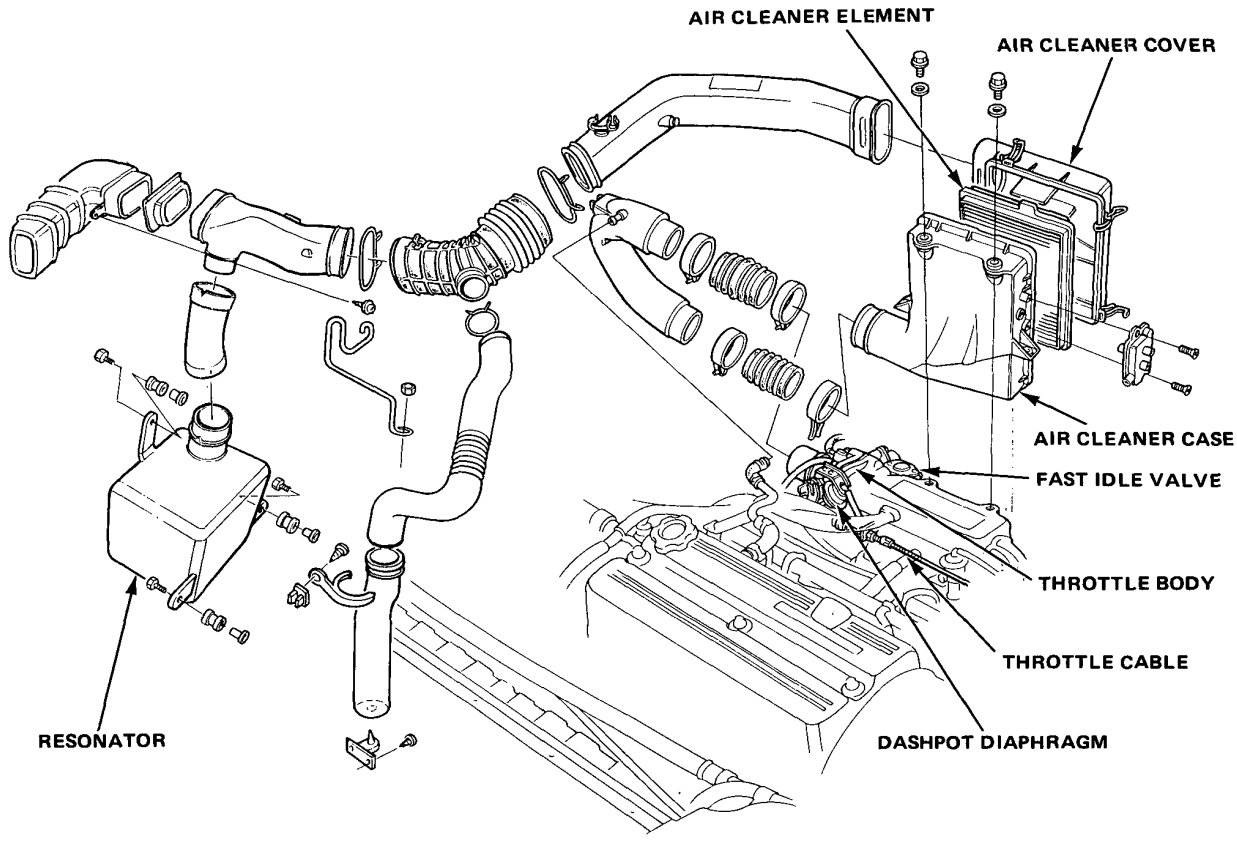
Description

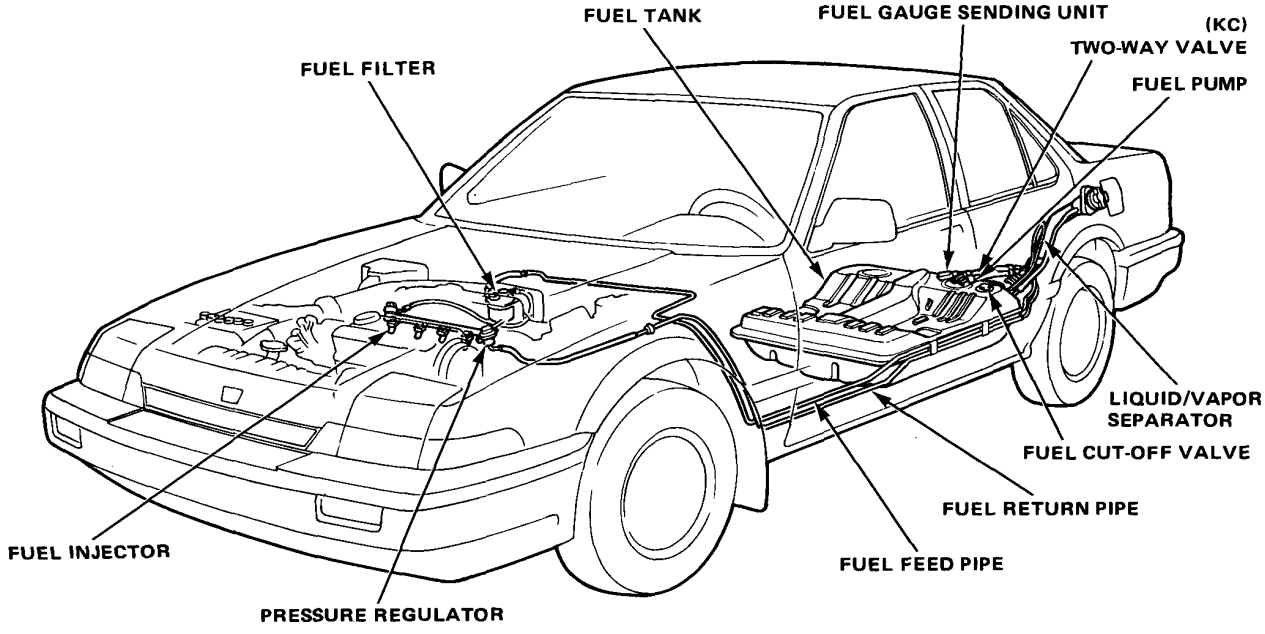




(cont'd)

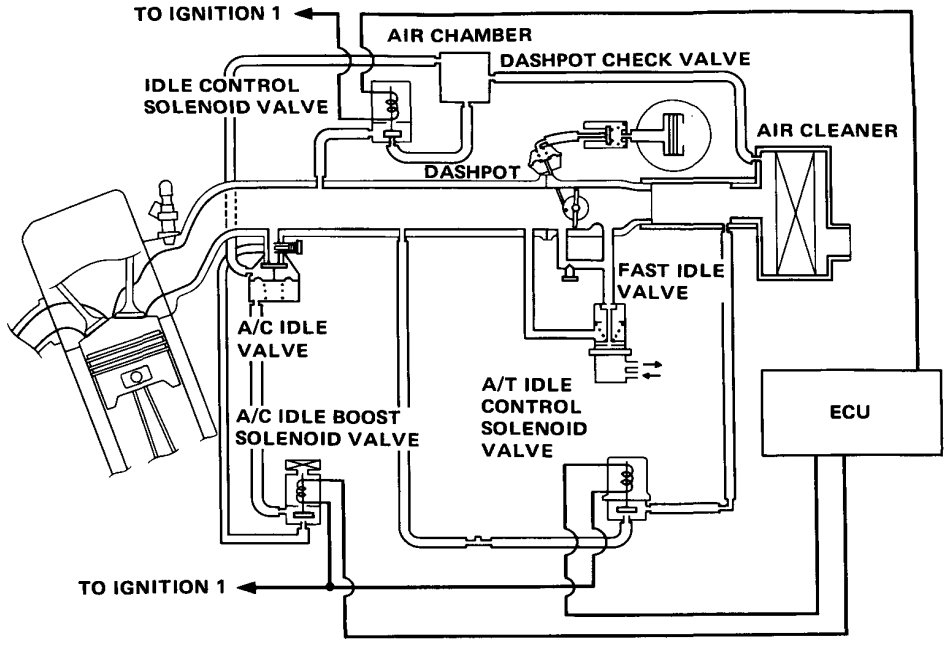
Description (cont'd)





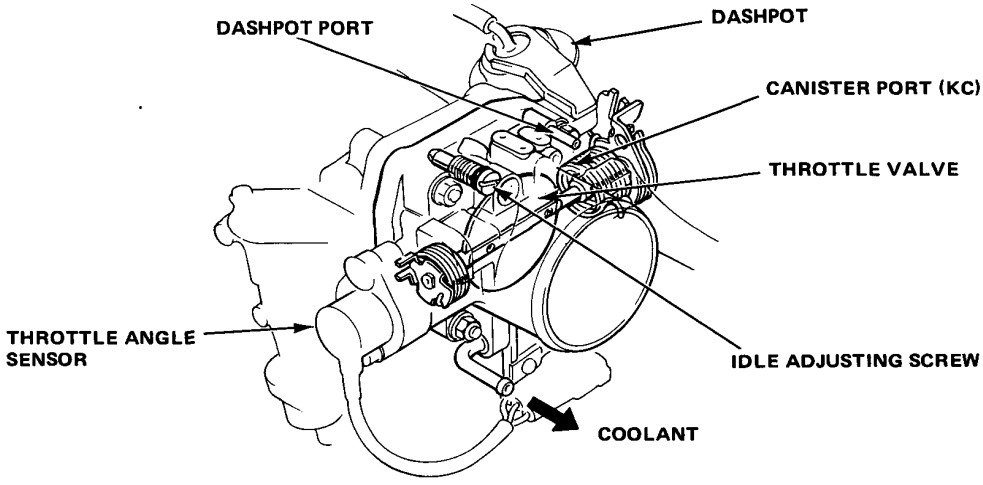
Air Intake System

The system supplies air for all engine needs. It consists of the air cleaner, air intake pipe, throttle body, idle control system, fast idle mechanism, and intake manifold. A resonator in the air intake pipe provides additional silencing as air is drawn into the system.



Throttle Body

The throttle body is a single-barrel side-draft type. To prevent icing of the throttle valve, lower portion of the throttle valve is heated by engine coolant which is led from the cylinder head. The idle adjusting screw which increases/decreases by-pass air is located on the top of the throttle body. A throttle sensor is attached to the throttle valve short to input the fuel injection control by sensing and sending a signal to the control unit. A dashpot is used to slow the throttle as it approaches the closed position. When the throttle is in the closed position, the throttle valve contacts the throttle stop screw.



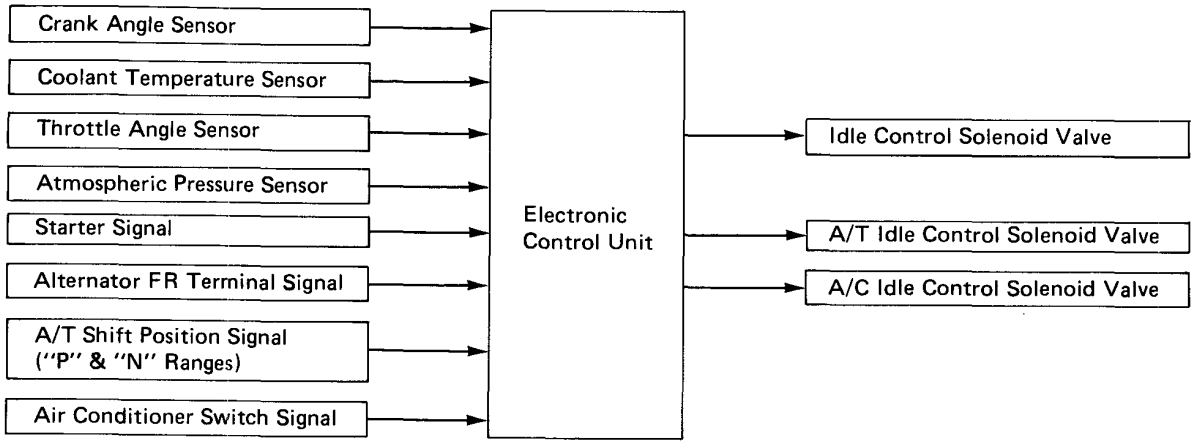
Air Intake System (cont'd)

Throttle Control System

The dashpot is employed to slow the closing of the throttle valve during gear shifting or deceleration to prevent the formation of incombustible mixtures.
When the throttle valve begins to close suddenly during gear shifting or deceleration, the throttle valve closes when the vacuum in the dashpot diaphragm overcomes the diaphragm spring. This vacuum from the throttle body increases gradually because of the orifice in the dashpot check valve. Thus, the diaphragm slowly pulls the diaphragm rod against the force of the spring, and the throttle valve is closed gradually.

Idle Control System

The idle speed is controlled by the electronic control unit and various solenoid valves such as idle control, A/T idle control, and A/C idle boost solenoid valves. These change the amount of air bypassing into the air intake manifold. The A/C idle boost solenoid valve opens the A/C idle boost valve to increase the air flow when the air conditioner is turned on.



Idle Control Solenoid Valve

When the idle speed is reduced due to electrical, or other, loads on the engine, the valve opens to bypass additional air into the intake manifold. This additional air will allow the idle speed to increase to its normal speed (750 ± 50 rpm). The operation depends upon changes in the voltage at the FR terminal of the alternator for quick response. The valve also lowers the fast idle speed during warm-up, after the coolant temperature has reached 40°C (104°F). To prevent erratic running after the engine first fires, the valve is opened during cranking and immediately after starting to provide additional air into the intake manifold.

A/T Idle Control Solenoid Valve

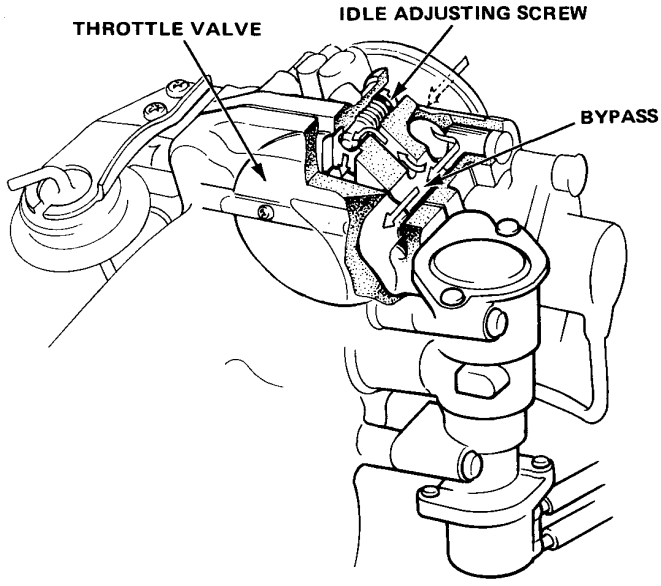
With the A/T shift lever is in gear, the idle speed will tend to lower. To compensate for this, the valve opens to maintain the specified idle speed (750 ± 50 rpm).

A/C Idle Solenoid Valve

When the air conditioner is turned on, the A/C idle solenoid valve is energized, the A/C idle boost valve opens to increase the air flow, and the idle speed is maintained at 750 ± 50 rpm. Adjust idle rpm with the A/C idle valve adjusting bolt. When the engine rpm is low, the idle control solenoid valve also functions to maintain specified idle.

Idle Adjuster (Bypass Circuit)

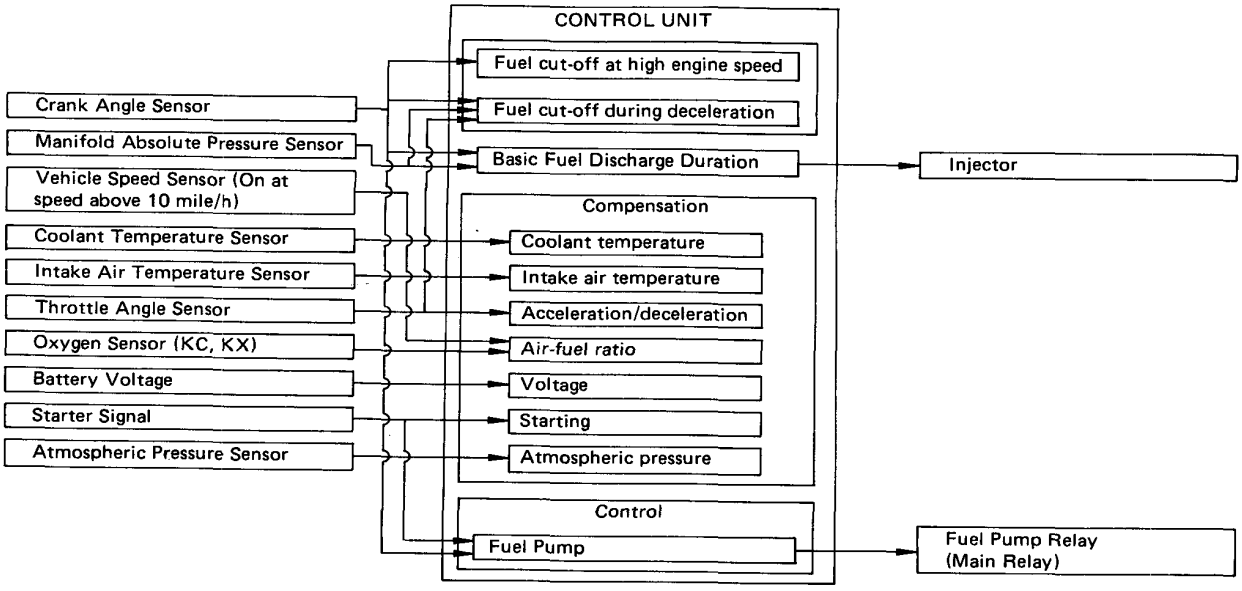
The throttle body contains an adjustable bypass circuit. This circuits is designed to control the amount of air bypassing into the intake manifold without changing the position of the throttle valve.
Usually it is necessary to adjust the speed by the idle adjusting screw since idle speed is adjusted automatically by the idle control system. Idle speed does not change by turning the idle adjusting screw while idle control system is in operation.



PGM-FI

Electronic Control System

In order to get fuel into the cylinders at the correct instant and in the correct amount, the control system must perform various separate functions. The ECU (Electronic Control Unit), the heart of the PGM-FI, uses an eight-bit microcomputer and consists of a CPU (Central Processing Unit), memories, and I/O (Input/Output) ports. Basic data stored in the memories are compensated by the signals sent from the various sensors to provide the correct air-fuel mixture for all engine needs.



Compensation	Sensor and Input	Description
Engine speed	Crank angle sensor Starter switch signal	Adjust amount of fuel injected according to engine speed.
Battery voltage	Battery voltage signal	Compensate for delay in injector operation due to drop in battery voltage.
Engine coolant temperature	Coolant temperture sensor	Increase amount of fuel injected according to manifold pressure when temperature is low.
Intake air temperature	Intake air temperature sensor	Adjust amount of fuel injected according to intake air temperature
Compensation immediately after starting	Starter switch signal	Gradually decrease amount of fuel added after starting
Compensation during acceleration	Throttle angle sensor	Increase amount of fuel injected according to angular velocity of throttle valve during acceleration.
Compensation during deceleration	Throttle angle sensor	Decrease amount of fuel injected according to angular velocity of throttle valve during deceleration particularly when throttle valve is close to fully closed position.
Compensation after fuel-cut	Crank angle sensor	Increase amount of fuel injected after fuel-cut off at low speeds.
Compensation under heavy load	Manifold abolute pressure sensor	Increase amount of fuel injected when inlet manifold pressure exceeds prescribed value.
Compensation for O_2 feed-back	Oxygen sensor	Increase or decrease amount of fuel injected to provide correct air-fuel ratio.
Atmospheric pressure	Atmospheric pressure sensor	Compensate for changes in atmospheric pressure.

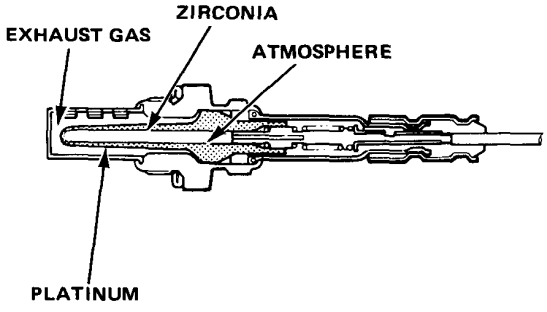
Oxygen Sensor (KC, KX)

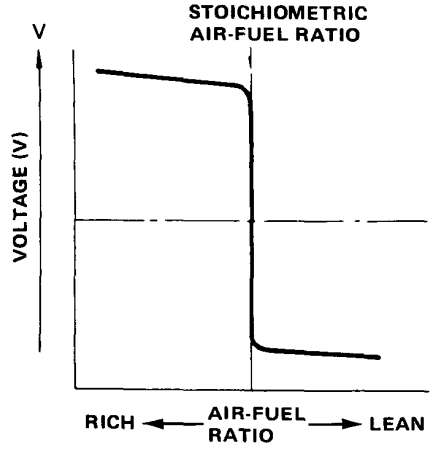
The Oxygen sensor detects the oxygen content in the exthaust gas, and inputs the ECU. In operation, the ECU receives the signals from the sensor and varies the duration during which fuel is injected. The oxygen sensor is located in the exhaust manifold.

The sensor is a hollow shaft of zirconia with a closed end. The inner and outer surfaces are plated with platinum, thus forming a platinum electrode. The inner surface or chamber is open to the atmosphere whereas the outer surface is exposed to the exhaust gas flow through the manifold.

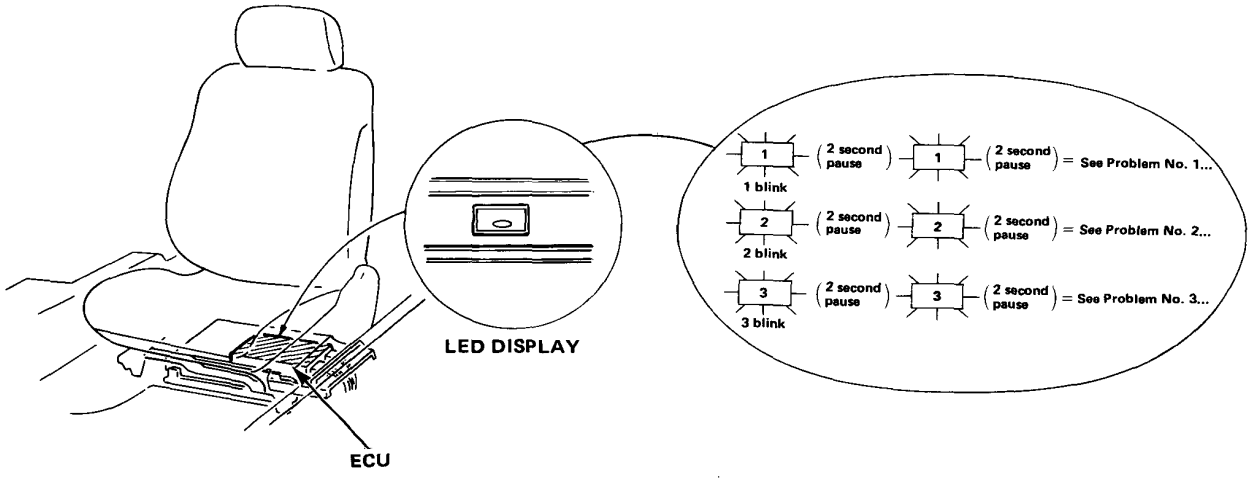
CAUTION: Keep all clearning materials away from the sensor; they could contaminate it and make it stop working.

Voltage is induced at the platinum electrode when there is any difference in oxygen concentration between the two layers of air over the surfaces. Operation of the device is dependent upon the fact the voltage induced changes sharply as the stoichiometric air-fuel ratio is exceeded when the electrode is heated above a certain temperature.





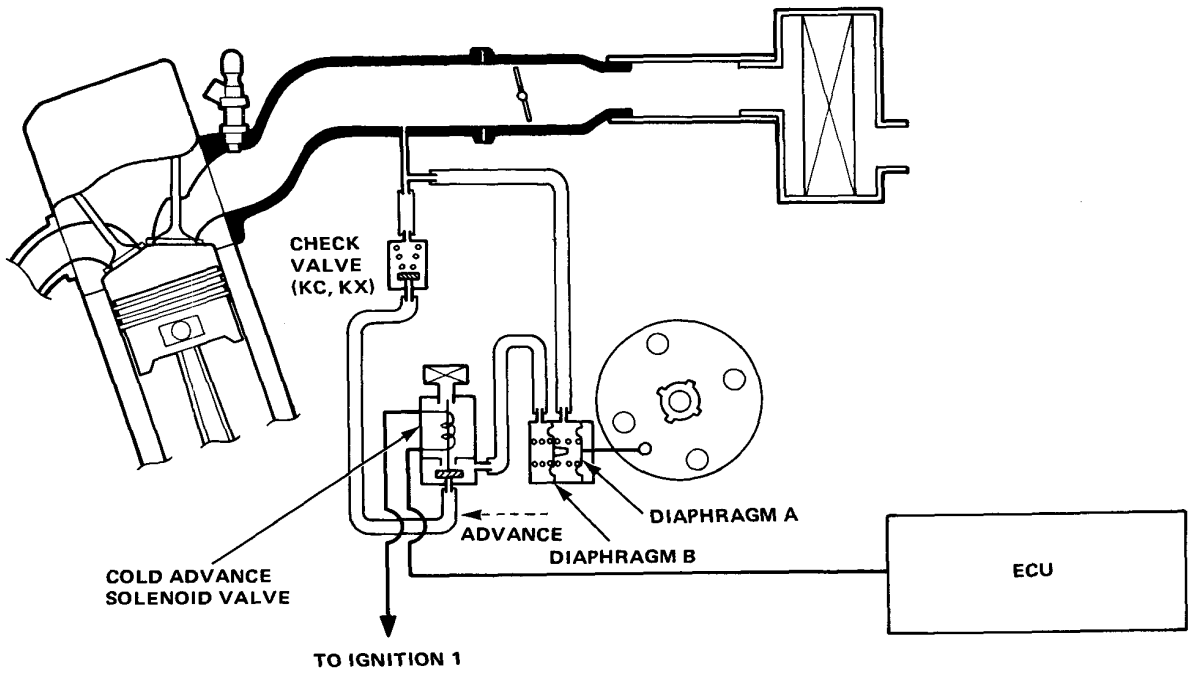
The PGM-FI system's ECU is equipped with self-diagnosis function. When an abnormality is detected, the PGM-FI dash warning light comes on, and the LED display on the ECU blinks. The location of the PGM-FI control system's trouble can be diagnosed from the frequency of the LED display.



Ignition Timing Controls

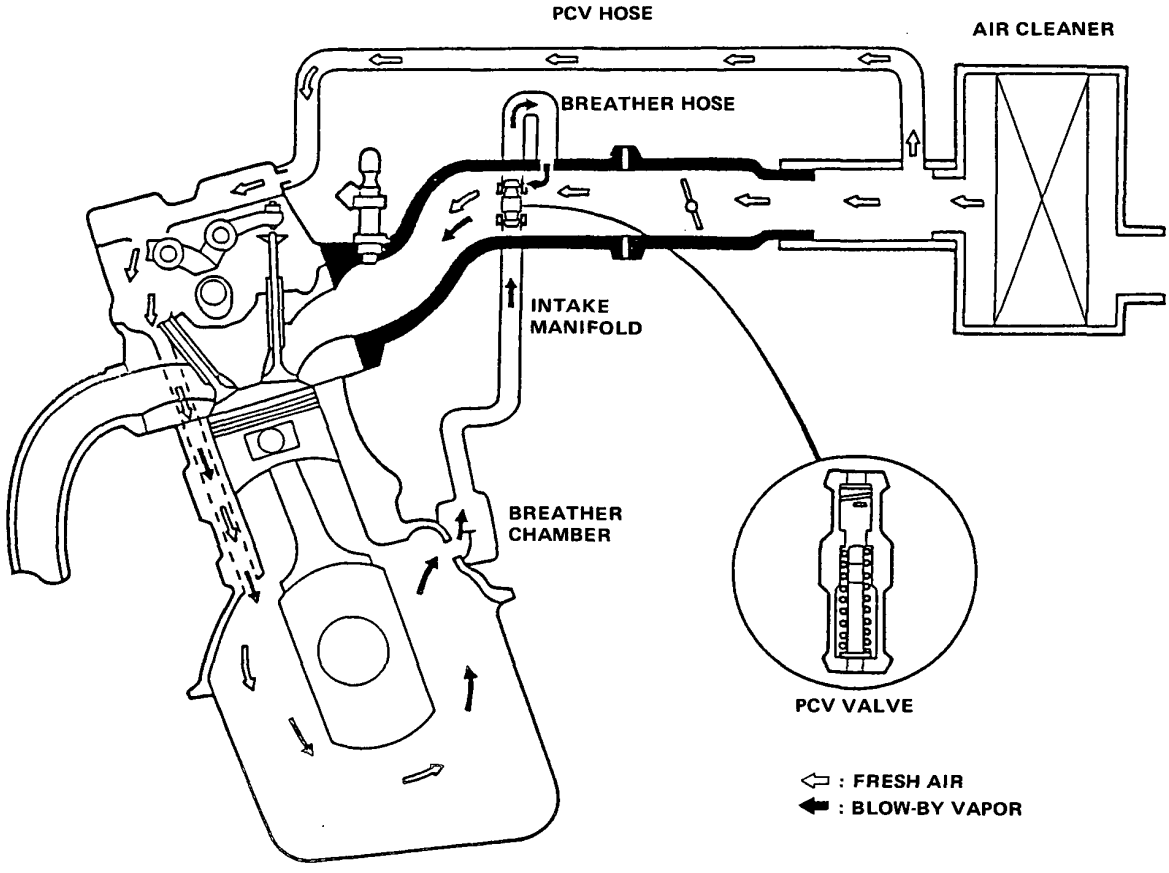
Ignition timing control, combined with the internal distributor control (centrifugal advance), affects the time at which each spark plug ignites the air-fuel mixture, in accordance with engine speed, load and coolant temperature.
This control system gives vacuum advance in response to the manifold vacuum and coolant temperature. This optimizes ignition timing during and after engine warm-up to control emission levels while maximizing fuel economy and engine performance.

The distributor has two separate vacuum advance diaphragms which operate on manifold vacuum. Diaphragm B also has a solenoid valve (cold advance solenoid valve) in the line. It is operated by the control unit which receives signals from the engine coolant temperature, engine speed and manifold vacuum. When the solenoid valve is open, it sends vacuum to Diaphragm B to improve cold engine performance.



Positive Crankcase Ventilation System

The Positive Crankcase Ventilation (PCV) system is designed to prevent blow-by gas from escaping to the atmosphere. The PCV valve contains a spring loaded plunger. When the engine starts, the plunger in the PCV valve is lifted in proportion to intake manifold vacuum and the blow-by gas is drawn directly into the intake manifold.



Evaporative Controls (KC)

The system consists of the vapor purge control system and fuel tank vapor control system.

a. Vapor purge control system.

The purge control diaphragm valve in the canister is opened by intake manifold vacuum. When the valve is open, vaports stored in the canister is purged to the throttle body bore by the vacuum generated at the purge purt.

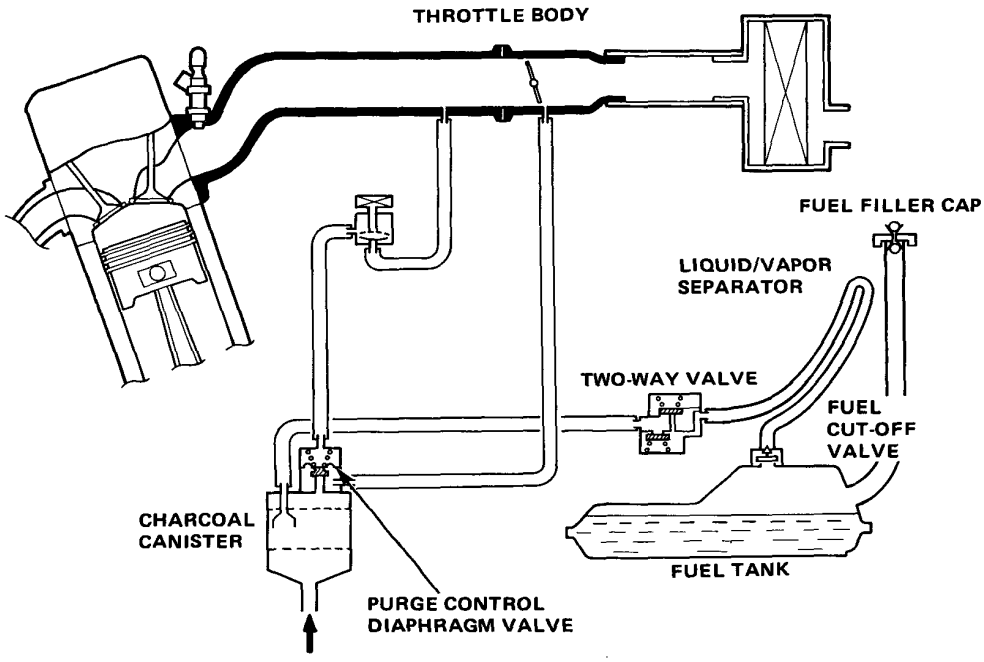
b. Fuel tank vapor control system

When fuel vapor pressure in the fuel tank is too high the two-way valve opens and fuel vapor is collected in the charcoal canister. When the vacuum in the fuel tank is too high, the two-way valve opens and air with fuel vapor is drawin into the fuel tank through the canister.

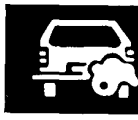
c. Fuel Filler Cap

The fuel filler cap seals the fuel filler neck under normal conditions and contains valves for the relief of excessive pressure or vacuum in the fuel tank.

In the event that the two-way valve in the evaporative emission control system fails to function properly, causing excessive pressure or vacuum build-up in the fuel tank, the valve incorporated in the fuel filler cap will open to relieve the pressure or vacuum.



Emission Controls



Emission Controls

Emission Systems

Purpose	System name	Related parts name	PH4				PH1	
			KC, KQ, KX		Others			
			MT	AT	MT	AT	MT	AT
Air-fuel ratio control	1. Power valve control	• Power valve	O	O	O	O	O	O
		• Power valve control solenoid valve			KS	KS		
		• Intake air temp. sensor			KS	KS		
		• Vehicle speed sensor			KS	KS		
		• Engine speed sensor			KS	KS		
		• Thermo sensor			KS	KS		
		• A/T shift position switch				KS		
		• Solenoid valve control unit			KS	KS		
	2. Atmospheric, pressure compensator	• Air jet controller						

(cont'd)

Emission Systems (cont'd)

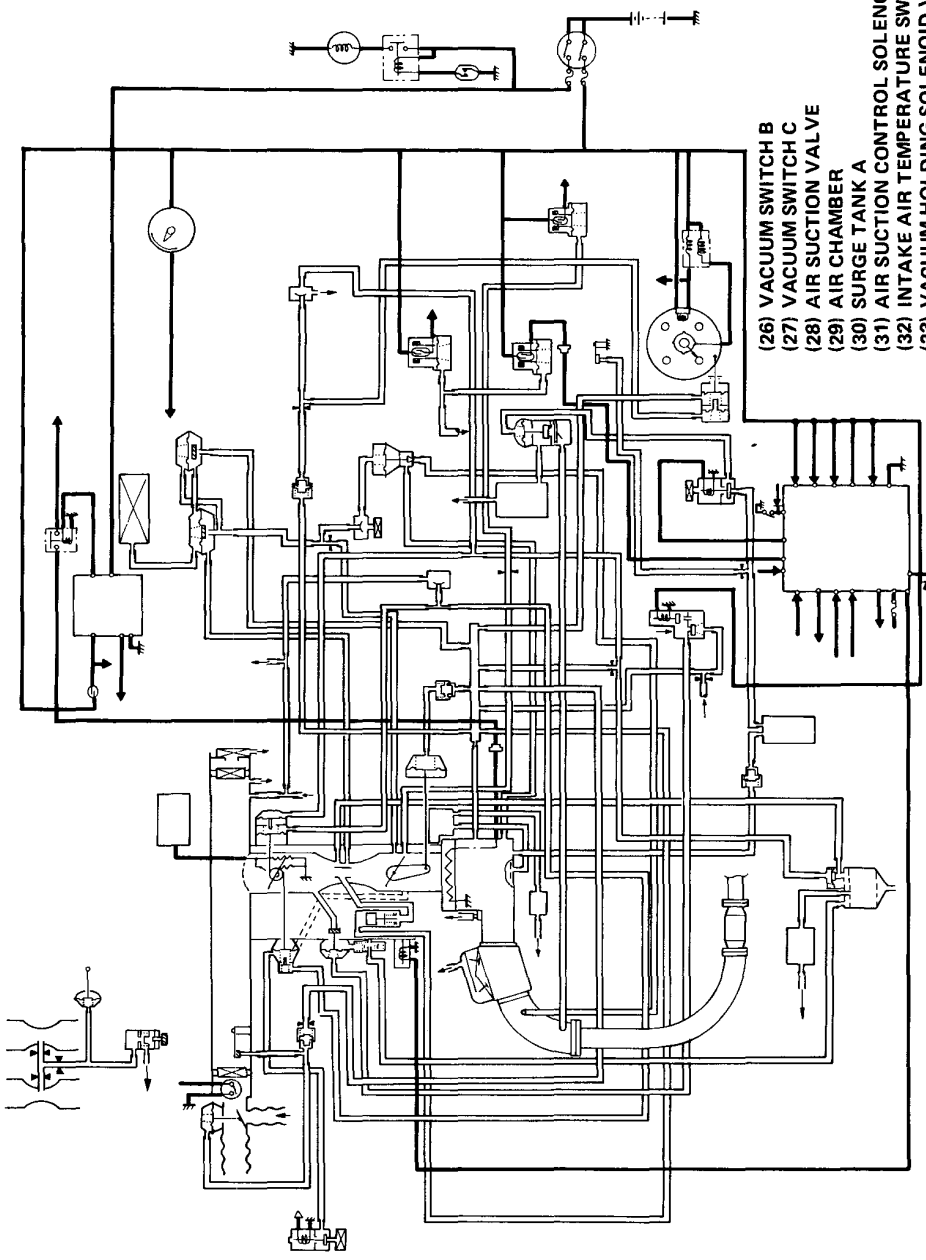
Purpose	System name	Related parts name	PH4				PH1	
			KC, KQ, KX		Others			
			MT	AT	MT	AT	MT	AT
Starting and driveability control when engine is cold	1. Choke system	• Automatic choke	O	O	O	O		
		• Manual choke					O	O
	2. Fast idle control	• Fast idle unloader	O	O	O	O		
		• Thermovalve A and B	O	O	O	O		
	3. Secondary diaphragm vacuum bypass system	• Carburetor thermovalve	O	O	O	O		
	4. Ignition timing control	• Distributor vacuum advance diaphragm	O	O	O	O		
		• Check valve	O	O	O	O		
		• Thermovalve	O	O	O	O		
	5. Choke opener	• Choke opener	O	O				
		• Cranking leak solenoid valve	O	O				
		• Intake air temp. sensor	O	O				
		• Thermo sensor	O	O				
		• Starter switch	O	O				
		• ACG L terminal	O	O				
		• Solenoid valve control unit	O	O				
	6. Throttle controller	• Throttle controller			O		O	
		• Cranking opener solenoid valve			O		O	
		• Check valve			O		O	
		• Starter switch			O		O	
					O		O	
	7. PTC. heater	• PTC. heater	O	O				
		• Thermo sensor	O	O				
		• Control relay	O	O				
		• Control unit	O	O				
	8. Honeycomb shaped carbu. insulator	• Carburetor insulator			O	O	O	O
	9. Carburetor heat riser	• Thermostat	O	O	O	O		

Purpose	System name	Related parts name	PH4		PH1			
			KC, KQ, KX		Others			
			MT	AT	MT	AT	MT	AT
Emission control	1. Secondary air supply system	• Air suction valve	O	O				
		• Air suction control solenoid valve	O	O				
		• Check valve	O	O				
		• Vacuum switch A and B	O	O				
		• Intake air temp. sensor	O	O				
		• Vehicle speed sensor						
		• Engine speed sensor	O	O				
		• Thermo sensor	O	O				
		• Solenoid valve control unit	O	O				
	2. EGR system	• EGR valve.	O	O				
		• EGR control valve A and B	O	O				
		• Thermovalve	O	O				
		• Check valve	O	O				
	3. Dashpot system	• Throttle controller						
		• Dashpot check valve	O	O		O		O
	4. Fuel cut-off control	• Primary main fuel cut-off solenoid valve	O	O				
		• Vacuum switch A and B	O	O				
		• Vehicle speed sensor	O	O				
		• Engine speed sensor	O	O				
		• Thermo sensor	O	O				
		• Clutch switch	O					
		• A/T shift position switch		O				
		• Solenoid valve control unit	O	O				
Emission control	5. Throttle opener	• Throttle controller			O		O	
		• Throttle opener control valve			O		O	
		• Throttle opener solenoid valve			KS			
		• Vehicle speed sensor			KS			
		• Thermovalve			KS			
		• Check valve			KS			
	6. Evaporative control	• Charcoal canister	KC,KQ	KC,KQ	KY	KY		
		• Purge control diaphragm valve	KC,KQ	KC,KQ				
		• Two-way valve	KC,KQ	KC,KQ	KY	KY		
		• Shed valve	KC,KQ	KC,KQ				
		• Thermowax switching valve						
		• Thermovalve	KC,KQ	KC,KQ				

(cont'd)

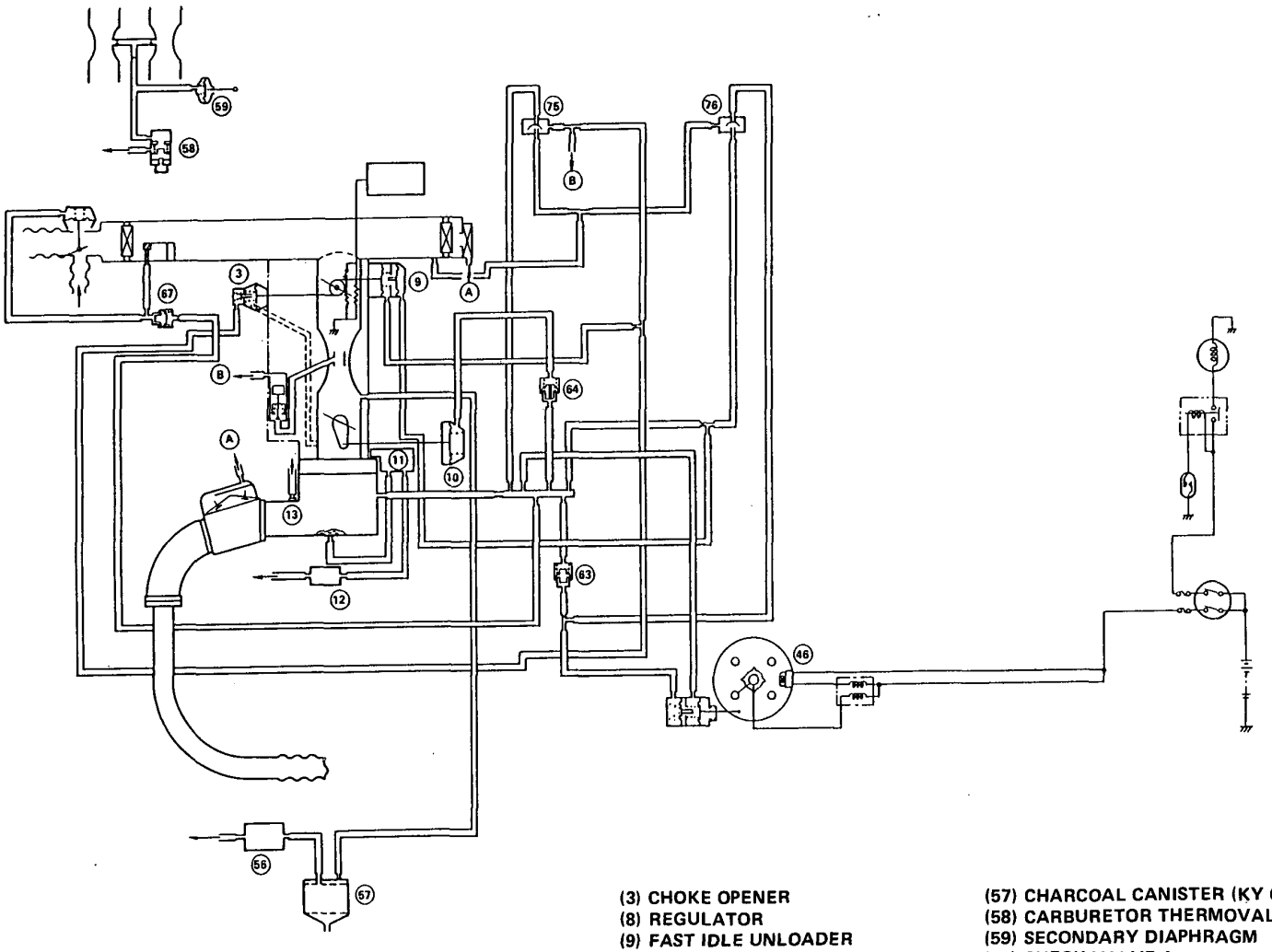
Emission Systems (cont'd)

< KC, KQ >



(1) SECONDARY DIAPHRAGM
(2) CARBURETOR THERMOVALVE
(3) INTAKE AIR TEMPERATURE SENSOR
(4) CRANKING LEAK SOLENOID VALVE
(5) CHOKE OPENER
(6) AIR VENT CUT-OFF DIAPHRAGM
(7) SHED VALVE
(8) PRIMARY SLOW MIXTURE CUT-OFF SOLENOID VALVE
(9) REGULATOR
(10) FAST IDLE UNLOADER
(11) THROTTLE CONTROLLER
(12) DASHPOT CHECK VALVE
(13) HEAT RISER
(14) HEAT RISER THERMOSTAT
(15) PCV VALVE
(16) PTC HEATER
(17) PTC HEATER CONTROL UNIT
(18) PTC HEATER CONTROL RELAY
(19) EGR CONTROL VALVES A AND B
(20) EGR VALVE
(21) THERMOVALVE B
(22) THERMOVALVE C
(23) THERMOVALVE D
(24) VEHICLE SPEED SENSOR
(25) VACUUM SWITCH A
(26) VACUUM SWITCH B
(27) VACUUM SWITCH C
(28) AIR SUCTION VALVE
(29) AIR CHAMBER
(30) SURGE TANK A
(31) AIR SUCTION CONTROL SOLENOID VALVE
(32) INTAKE AIR TEMPERATURE SWITCH
(33) VACUUM HOLDING SOLENOID VALVE
(34) CHECK VALVE A
(35) CHECK VALVE B
(36) TWO-WAY VALVE
(37) CHARCOAL CANISTER
(38) CONTROL UNIT
(39) DISTRIBUTOR
(40) RADIATOR FAN
(41) RADIATOR FAN RELAY
(42) SHIFT POSITION SWITCH (AT)
(43) CLUTCH SWITCH (MT)
(44) THERMO SENSOR
(45) TO A/C IDLE CONTROL SOLENOID VALVE
(46) FROM AIR CONDITIONER SWITCH
(47) FROM IGNITION COIL

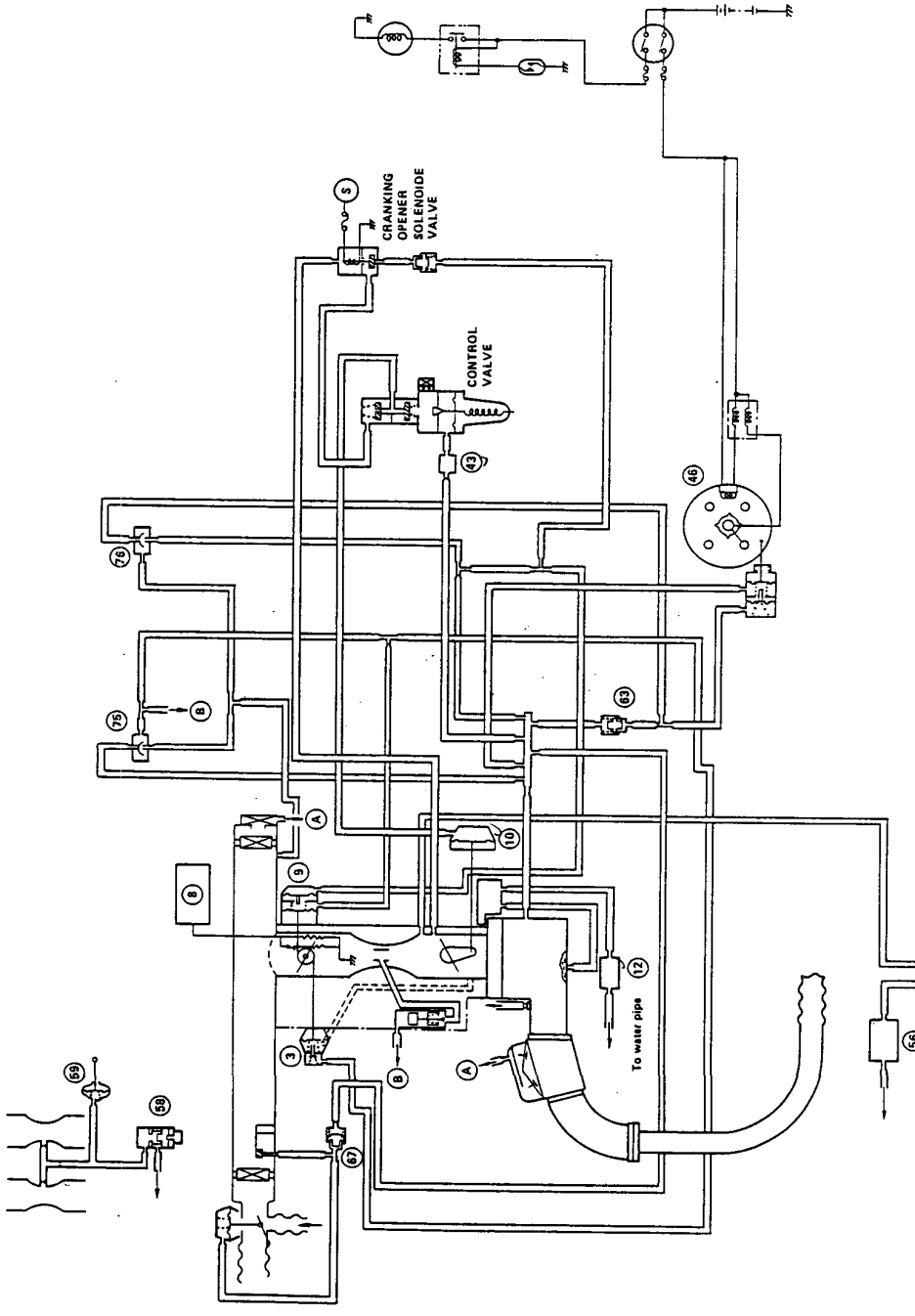
< KF, KG, KW, KE, KY–AT >



(3) CHOKE OPENER
(8) REGULATOR
(9) FAST IDLE UNLOADER
(10) THROTTLE CONTROLLER
(11) HEAT RISER
(12) HEAT RISER THERMOSTAT
(13) PCV VALVE
(46) DISTRIBUTOR
(56) TWO-WAY VALVE (KY ONLY)
(57) CHARCOAL CANISTER (KY ONLY)
(58) CARBURETOR THERMOVALVE
(59) SECONDARY DIAPHRAGM
(63) CHECK VALVE A
(64) CHECK VALVE B
(67) CHECK VALVE E
(75) THERMOVALVE B
(76) THERMOVALVE D

(cont'd)

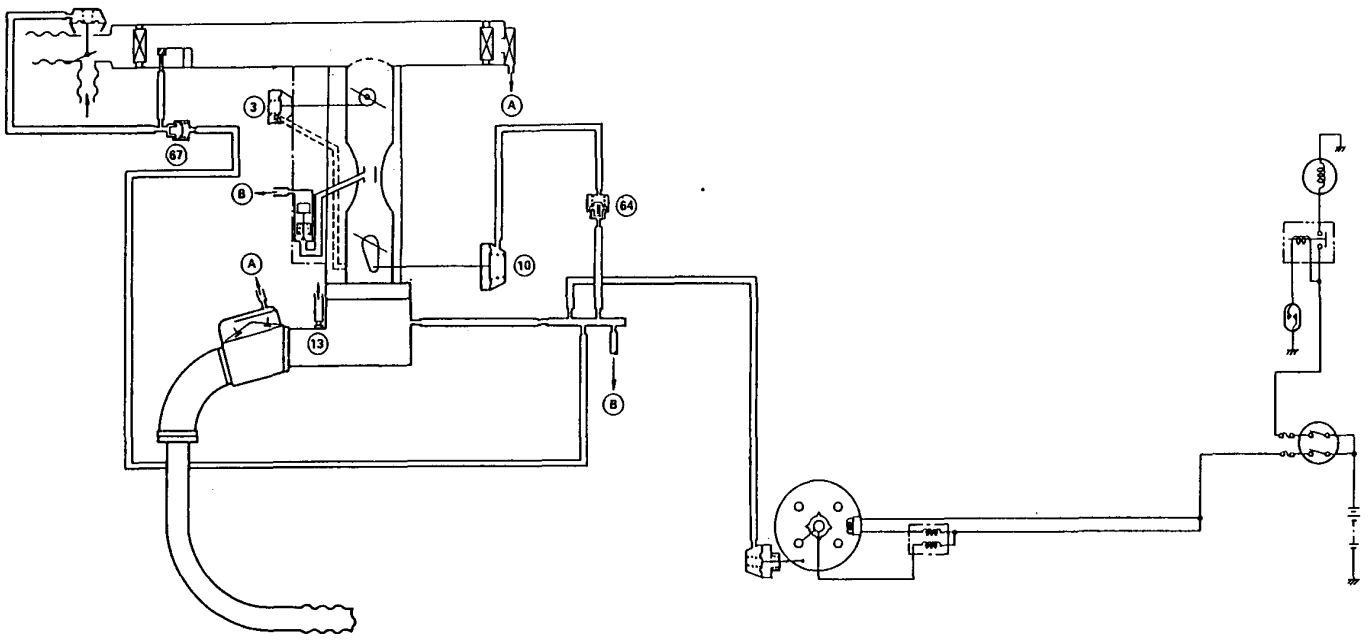
< KF, KG, KW, KE, KY–MT >



(3) CHOKE OPENER
(8) REGULATOR
(9) FAST IDLE UNLOADER
(10) THROTTLE CONTROLLER
(11) HEAT RISER
(12) HEAT RISER THERMOSTAT
(13) PCV VALVE
(43) AIR CHAMBER
(46) DISTRIBUTOR

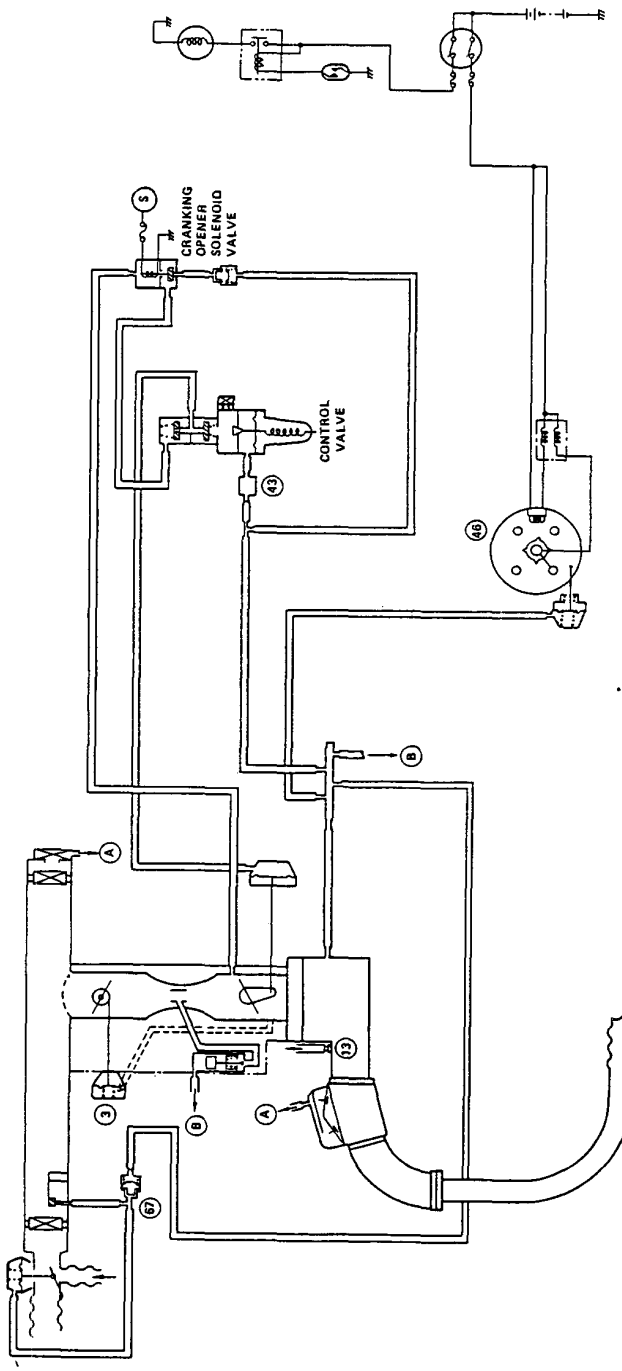
(56) TWO-WAY VALVE (KY ONLY)
(57) CHARCOAL CANISTER (KY ONLY)
(58) CARBURETOR THERMOVALVE
(59) SECONDARY DIAPHRAGM
(63) CHECK VALVE A
(67) CHECK VALVE E
(75) THERMOVALVE B
(76) THERMOVALVE D

< 1.6ℓ KG, KW, KF, Singapore–AT >



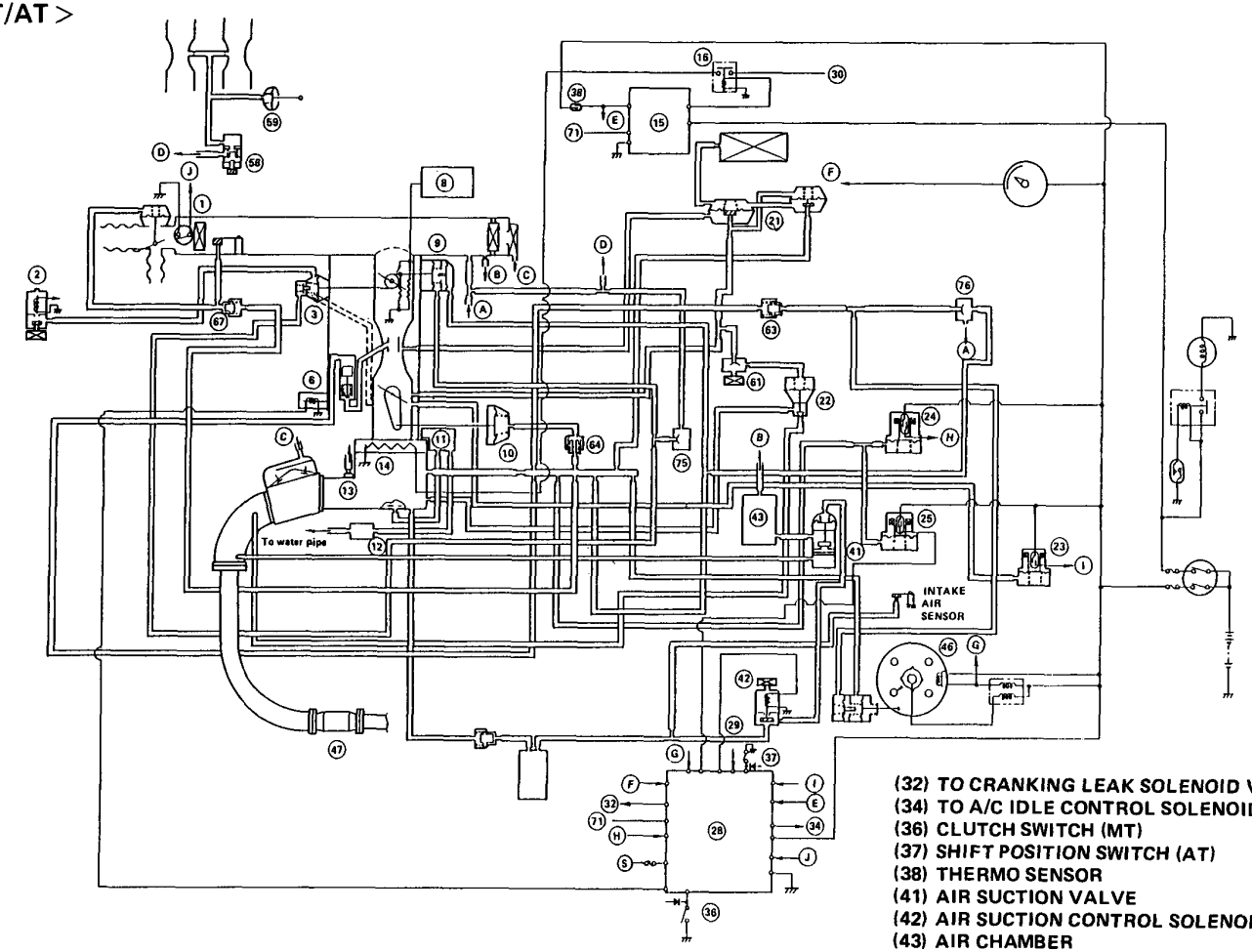
(3) CHOKE OPENER
(10) THROTTLE CONTROLLER
(13) PCV VALVE
(64) CHECK VALVE B
(67) CHECK VALVE E

Emission Systems (cont'd)

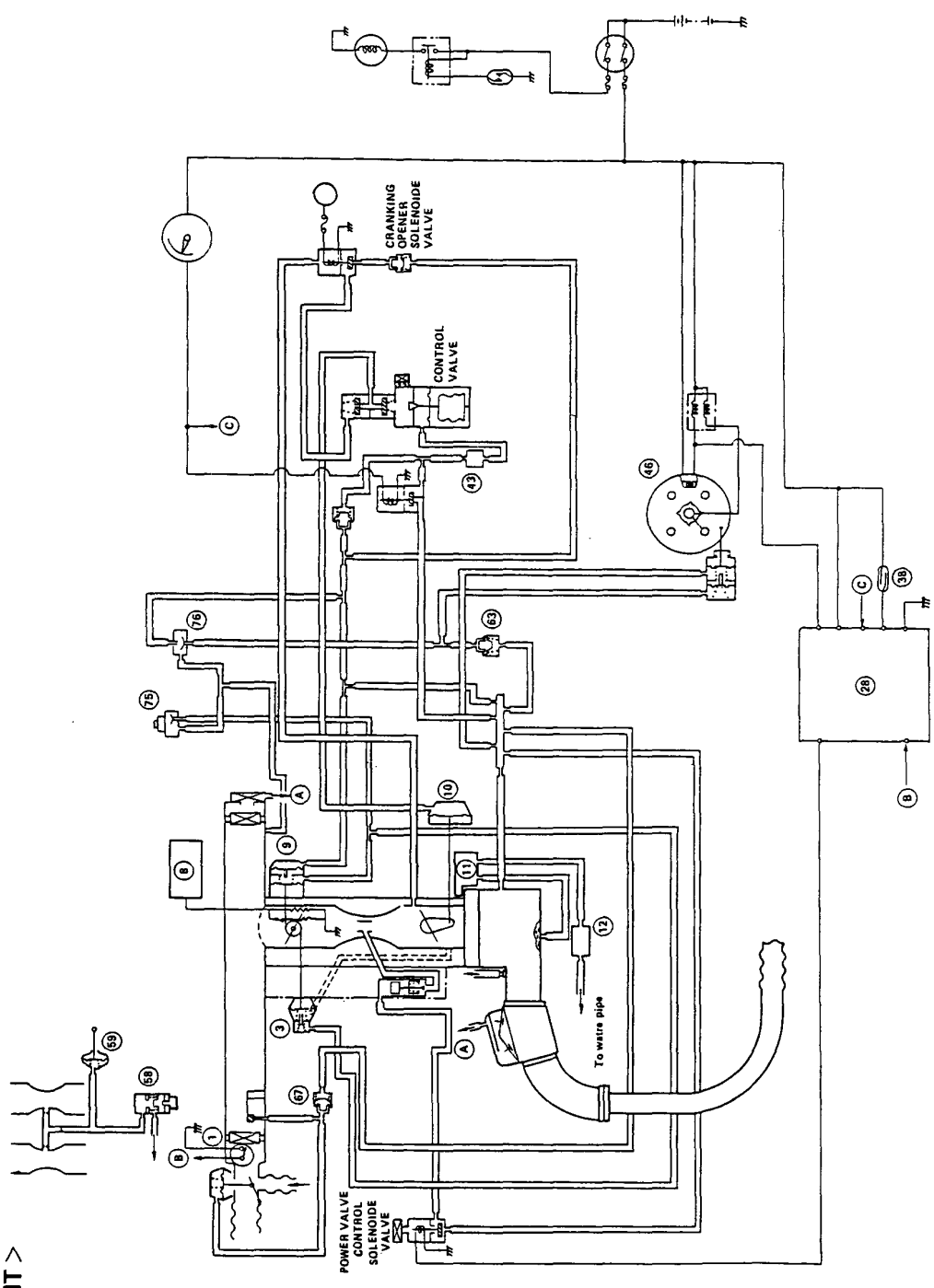


< 1.6ℓ KG, KF, KW, Singapore—MT >

< KX–MT/AT >

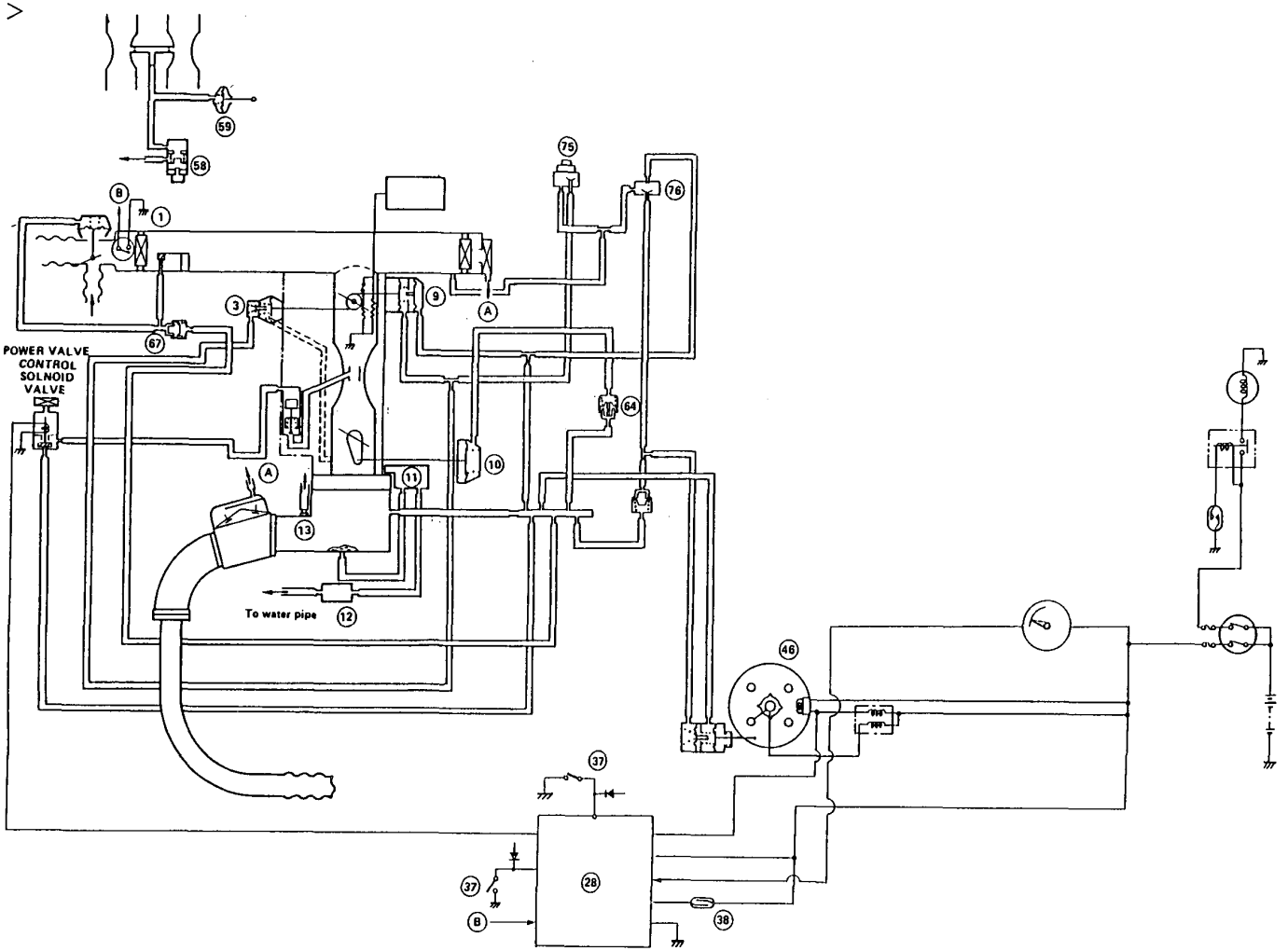


(1) INTAKE AIR TEMPERATURE SWITCH
(2) CRANKING LEAK SOLENOID VALVE
(3) CHOKE OPENER
(6) PRIMARY SLOW MIXTURE CUT-OFF SOLENOID VALVE
(8) REGULATOR
(9) FAST IDLE UNLOADER
(10) THROTTLE CONTROLLER
(11) HEAT RISER
(12) HEAT RISER THERMOSTAT
(13) PCV VALVE
(14) PTC HEATER
(15) PTC HEATER CONTROL UNIT
(16) PTC HEATER CONTROL RELAY
(21) EGR CONTROL VALVES A AND B
(22) EGR VALVE
(23) VACUUM SWITCH A
(24) VACUUM SWITCH B
(25) VACUUM SWITCH C
(28) CONTROL UNIT
(29) FROM AIR CONDITIONER SWITCH
(30) FROM BATTERY
(32) TO CRANKING LEAK SOLENOID VALVE
(34) TO A/C IDLE CONTROL SOLENOID VALVE
(36) CLUTCH SWITCH (MT)
(37) SHIFT POSITION SWITCH (AT)
(38) THERMO SENSOR
(41) AIR SUCTION VALVE
(42) AIR SUCTION CONTROL SOLENOID VALVE
(43) AIR CHAMBER
(46) DISTRIBUTOR
(47) CATALYTIC CONVERTER
(58) CARBURETOR THERMOVALVE
(59) SECONDARY DIAPHRAGM
(63) THERMOVALVE E
(63) CHECK VALVE A
(63) CHECK VALVE B
(67) CHECK VALVE E
(71) FROM "L" TERMINAL OF REGULATOR
(74) TO BATTERY
(75) THERMOVALVE B
(76) THERMOVALVE D


CRANKING OPENER SOLENOIDE VALVE
CONTROL VALVE
POWER VALVE CONTROL SOLENOIDE VALVE
To waste pipe
(1) INTAKE AIR TEMPERATURE SWITCH
(3) CHOKE OPENER
(8) REGULATOR
(9) FAST IDLE UNLOADER
(10) THROTTLE CONTROLLER
(11) HEAT RISER
(12) HEAT RISER THERMOSTAT
(13) PCV VALVE
(28) CONTROL UNIT
(38) THERMO SENSOR
(43) AIR CHAMBER
(46) DISTRIBUTOR
(58) CARBURETOR THERMOVALVE
(59) SECONDARY DIAPHRAGM
(63) CHECK VALVE A
(67) CHECK VALVE E
(75) THERMOVALVE B
(76) THERMOVALVE D

< KS–MT >

< KS–AT >



(1) INTAKE AIR TEMPERATURE SWITCH
(3) CHOKE OPENER
(8) REGULATOR
(9) FAST IDLE UNLOADER
(10) THROTTLE CONTROLLER
(11) HEAT RISER
(12) HEAT RISER THERMOSTAT
(13) PCV VALVE
(28) CONTROL UNIT
(37) SHIFT POSITION SWITCH (AT)
(38) THERMO SENSOR
(46) DISTRIBUTOR
(58) CARBURETOR THERMOVALVE
(59) SECONDARY DIAPHRAGM
(64) CHECK VALVE B
(67) CHECK VALVE E
(75) THERMOVALVE B
(76) THERMOVALVE D

Emission Controls

Evaporative Controls

Fuel Tank Venting

A two-way valve regulates the pressure or vacuum caused by changes in temperature and fuel level inside the tank.

(1) Pressure relief — fuel vapor is allowed to escape as vapor pressure increases with temperature.

(2) Vacuum relief — fuel tank vacuum is relieved when temperature decrease or fuel is pumped to the carburetor.

A fuel cut valve is installed in the vapor line at the fuel tank. This valve prevents liquid fuel from entering the line when the fuel surges in the tank.

Air Vent Cut-Off Diaphragm

When the engine is not running, the air vent passage in the float chamber is cut-off by the valve attached to the diaphragm so that fuel vapor in the float chamber can be vented into the charcoal canister. When the engine is running, manifold vacuum holds the cut-off diaphragm open. The vacuum holding solenoid valve stabilizes the manifold vacuum at the diaphragm.

Shed Valve

The shad valve is controlled by a thermowax plunger. When the carburetor body temperature is below the set temperature (91.4 ± 3.5°F) of the shed valve, the outer air vent passage is cut-off by the shed valve to prevent fuel vapor in the fuel tank from flowing back through the charcoal canister to the float chamber.

Thermovalve

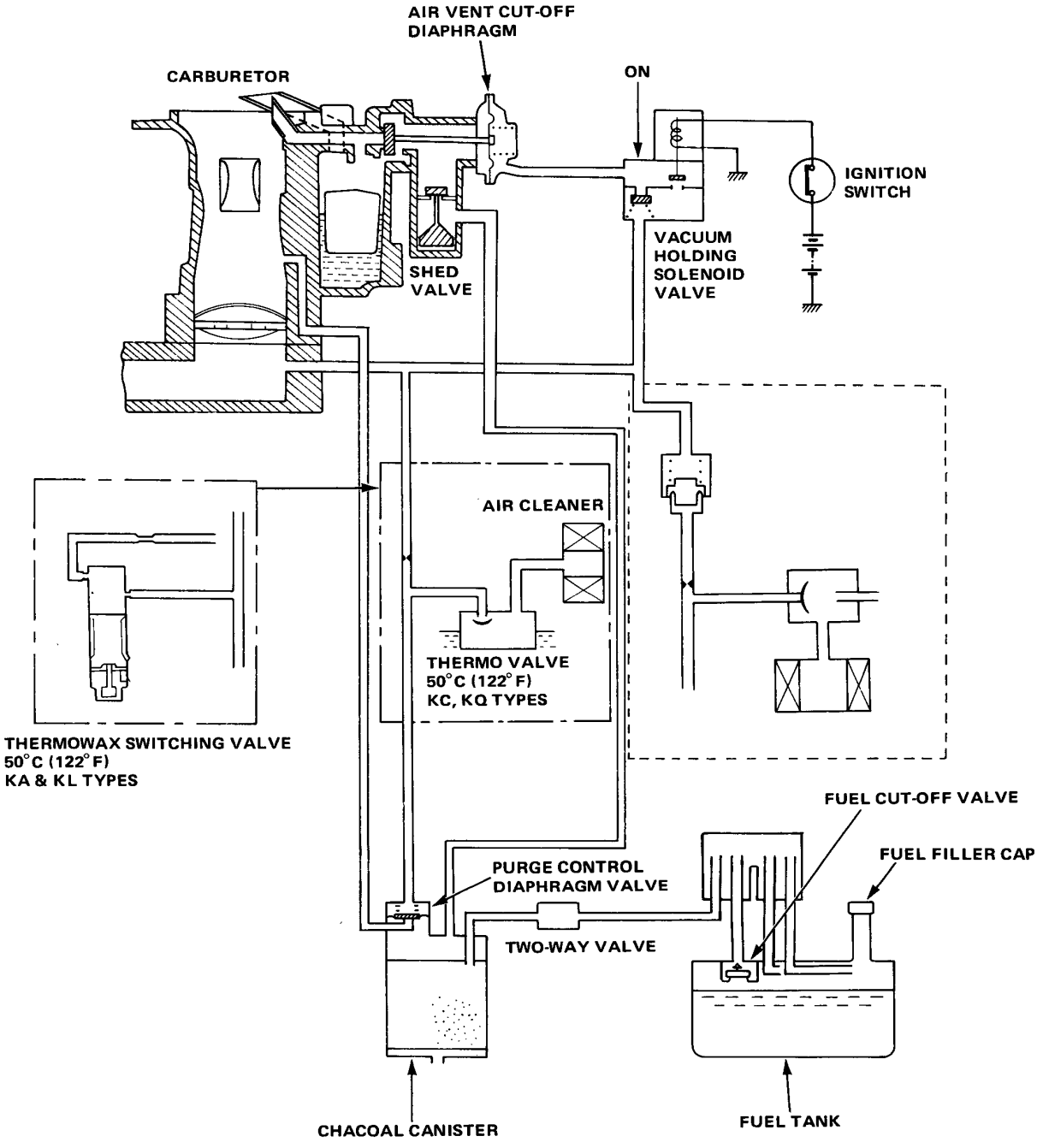
When the engine coolant temperature is above the set temperature 122°F, of the thermovalve, it closes and the purge control diaphragm valve in the canister is opened by intake manifold vacuum. Fuel vapor is purged from the charcoal canister through the purge control diaphragm valve by venturi vacuum.

Fuel Filler Cap

A two-way valve in the fuel filler cap acts as a safety device if the evaporative control system malfunctions.

Carburetor Fuel Cut-Off

When the engine is not running, the fuel passages for the slow primary fuel metering system are cut-off by a solenoid valve so that fuel in the float chamber cannot enter the carburetor bore.


AIR VENT CUT-OFF DIAPHRAGM
CARBURETOR
ON
IGNITION SWITCH
SHED VALVE
VACUUM HOLDING SOLENOID VALVE
AIR CLEANER
THERMO VALVE 50°C (122°F) KC, KQ TYPES
THERMOWAX SWITCHING VALVE 50°C (122°F) KA & KL TYPES
FUEL CUT-OFF VALVE
FUEL FILLER CAP
PURGE CONTROL DIAPHRAGM VALVE
TWO-WAY VALVE
CHACOAL CANISTER
FUEL TANK

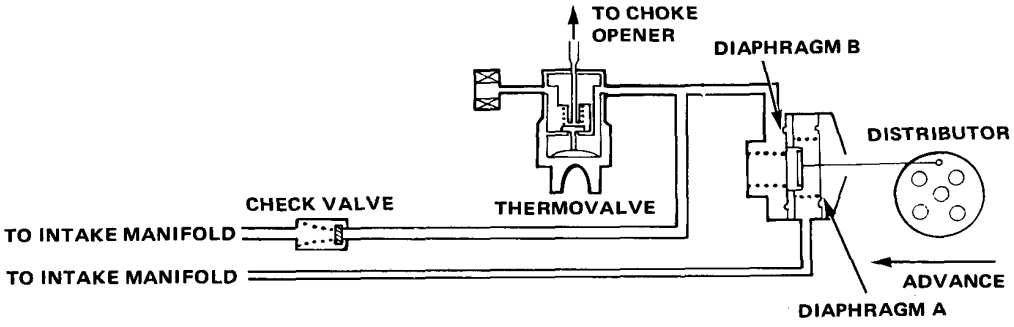
Emission Controls

Ignition Timing Controls

Ignition timing control, combined with the internal distributor control (centrifugal advance), affects the time at which each spark plug ignites the air/fuel mixture, in accordance with engine speed, load the coolant temperature.
This control system gives vacuum advance in response to the manifold vacuum and coolant temperature. This optiimizes ignition timing during and after engine warm-up to control emission levels while maximizing fuel economy and engine performance.

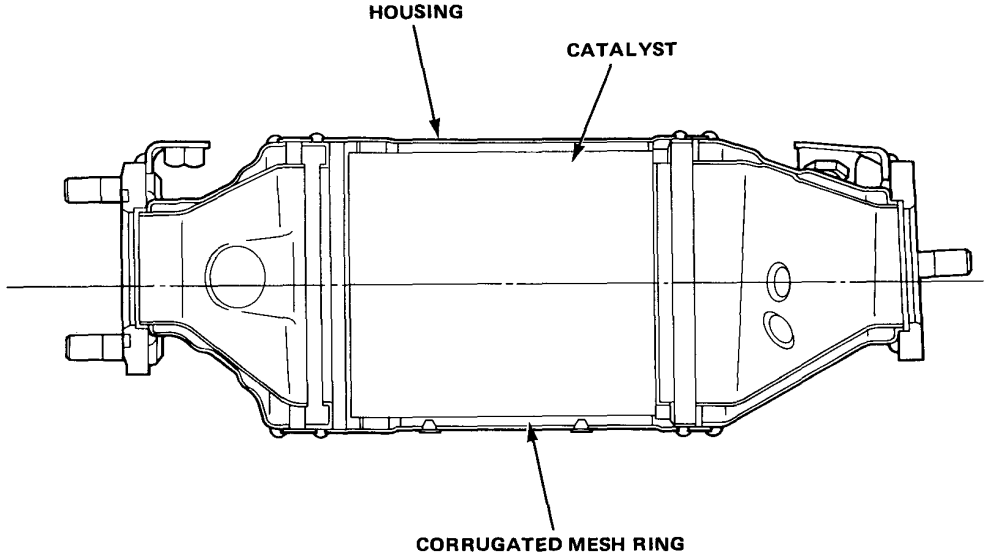
The distributor has two separate vacuum advance diaphragms. Diaphragm A operates on manifold vacuum. Diaphragm B also operates on manifold vacuum but has a control device in the line.

When the engine coolant temperature is below the set temperature of thermovalve B (50°C), thermovalve sends manifold vacuum to Diaphragm B through check valve to improve cold engine performance.



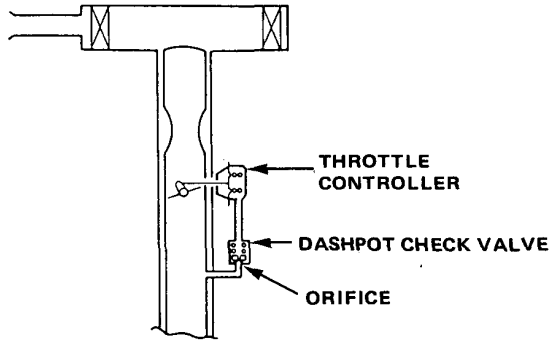
Catalytic Converter

The catalytic converter is used to convert hydrocarbons (HC), carbon monoxide (CO) and oxides of nitrogen (NOx) in the exhaust gas to carbon dioxide (CO_2), dinitrogen (N_2) and water vapor.



Dashpot System (Standard for some types)

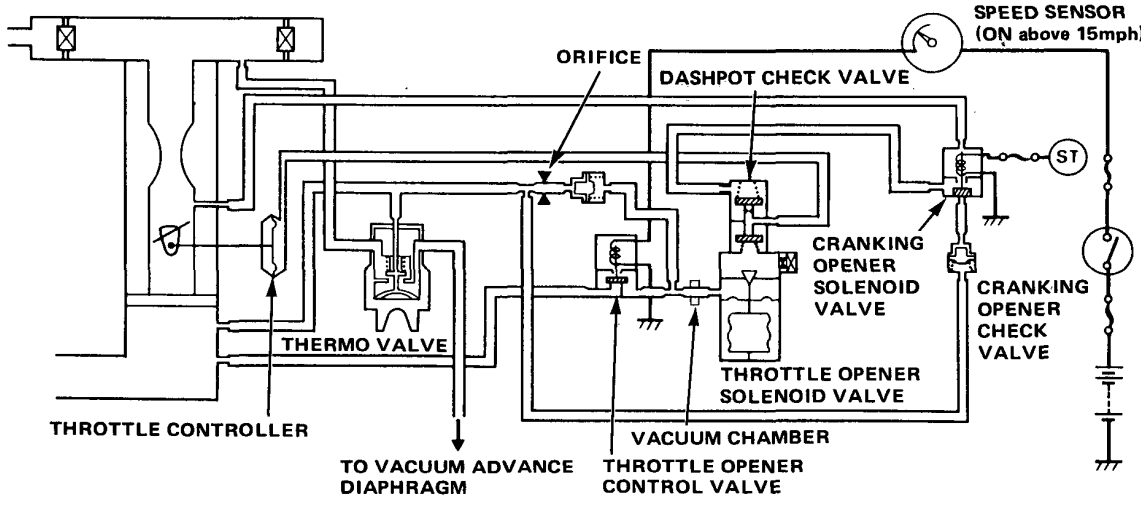
To improve combustion, a throttle controller holds the throttle open slightly to admit additional air during periods of gear shifting and deceleration. When the engine is running above idle, manifold vacuum is applied to the throttle controller through a dashpot check valve. On deceleration, the vacuum bleeds off through the orifice in the dashpot check valve, gradually decreasing unitl the throttle closes completely. Throttle closing speed is determined by the size of the dashport check valve orifice, tension of the throttle return spring, and the amount of vacuum available at the manifold port.



Throttle Opener (KS-MT)

The Dashpot System (ported vacuum) is combined with a solenoid valve, and control valve that operates on manifold vacuum to make up the Throttle Opener System. Above approximately 15 mph, the speed sensor in the speedometer causes the solenoid valve to open, allowing manifold vacuum to enter the control valve. When vacuum in the control valve exceeds a pre-set value (during deceleration) the valve opens and the throttle controller diaphragm opens the throttle a fixed amount to improve combustion. When vehicle speed drops below approximately 10 mph, the speed sensor close the solenoid valve, allowing control valve vacuum to drop below the pre-set value. Residual vacuum in the system is relieved through an orifice in the control valve and the throttle controller closes.

In addition, when the engine coolant temperature is below the set temperature (50°C, 122°F) of the thermovalve, it opens and manifold vacuum is bled from the valve through the orifice. This orifice produce the high manifold vacuum applied to the control valve.



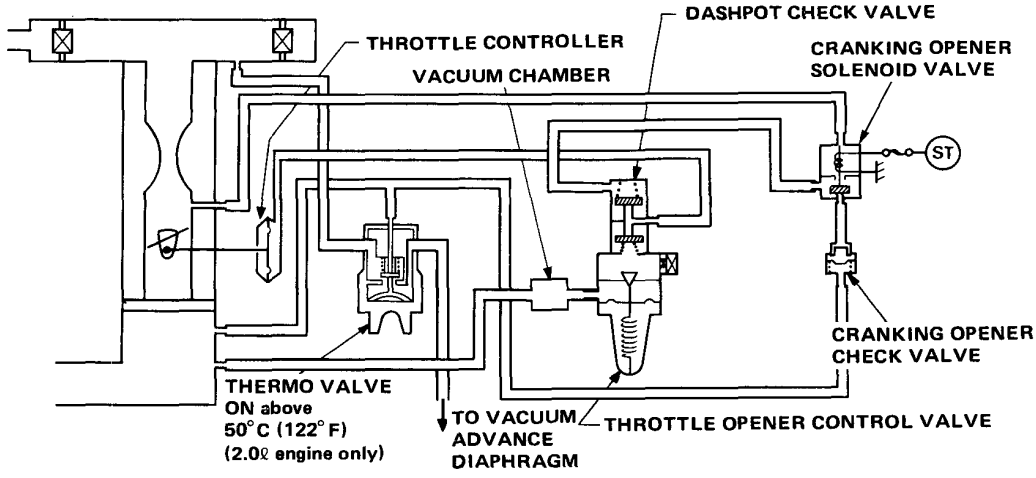
(cont'd)

Emission Controls

Throttle Controls (cont'd)

Throttle Controller (Standard for some types)

This system is provided for easy starting of the engine.
When cranking the engine to start, the cranking opener solenoid valve is activated through the starter switch to allow intake manifold vacuum into the diaphragm so that appropriate throttle opening angle is obtained.



Secondary Air Supply System

This system makes use of vacuum pulses in the exhaust manifold to draw air from the cleaner to the exhaust manifold to promote oxidation of hydrocarbons.
The control unit energizes the air suction control solenoid valve to apply manifold vacuum to the air suction cut-off diaphragm valve, which opens the secondary air passage. When negative pressure, created by exhaust pulses, opens the air suction reed valve, fresh air pours into the exhaust manifold.

The air chambers act as silencers to reduce exhaust noise and the delay valve maintains the proper air/fuel mixture after shifting gears or during deceleration.

KC, KX, KQ types

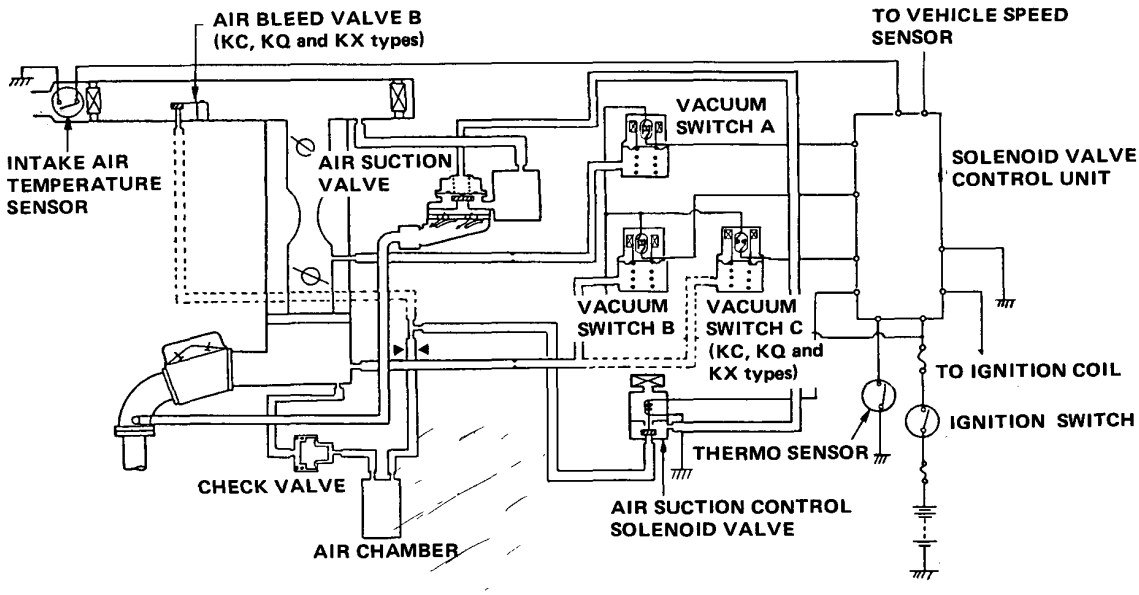
AIR SUCTION CONTROL SOLENOID VALVE ON

OR OR

		DELAY TIMER
INTAKE AIR TEMP. ABOVE 18°C (64°F) AND COOLANT TEMP. BELOW 70°C (158°F) AND VACUUM SWITCH B ON AND ENGINE SPEED BELOW AT: 3,400 rpm	INTAKE AIR TEMP. BELOW 50°C (122°F) AND COOLANT TEMP. ABOVE 70°C (158°F) AND VACUUM SWITCH C ON AND ENGINE SPEED BELOW AT: 3,400 rpm	INTAKE AIR TEMP. BELOW 50°C (122°F). AND COOLANT TEMP. ABOVE 70°C (158°F) AND VACUUM SWITCH C ON AND ENGINE SPEED BELOW AT: 3,400 rpm

This system does not work with the intake air temperature below 18°C (64°F) and the carburetor vacuum above 300mmHg.

(cont'd)


AIR BLEED VALVE B
(KC, KQ and KX types)
TO VEHICLE SPEED
SENSOR
VACUUM
SWITCH A
INTAKE AIR
TEMPERATURE
SENSOR
AIR SUCTION
VALVE
SOLENOID VALVE
CONTROL UNIT
VACUUM
SWITCH B
VACUUM
SWITCH C
(KC, KQ and
KX types)
TO IGNITION COIL
IGNITION SWITCH
THERMO SENSOR
CHECK VALVE
AIR SUCTION CONTROL
SOLENOID VALVE
AIR CHAMBER

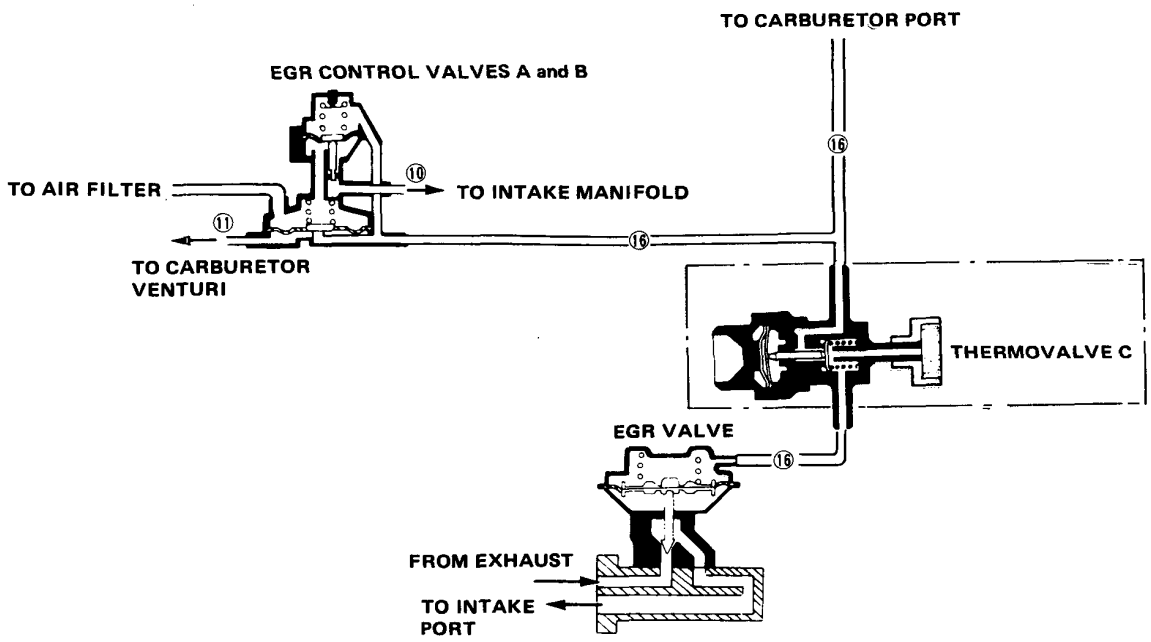
Emission Controls

EGR

The EGR System is designed to reduce oxides of nitrogen emission (NOx), by recirculating exhaust gas through the EGR valve and the intake manifold into the combustion chambers. It is composed of the EGR valve, EGR control valves A and B, and thermovalve C.

The EGR valve is operated by vacuum from the carburetor port and provides EGR volume proportional to engine loads (intake air volume) by the operation of the EGR control valves A and B.

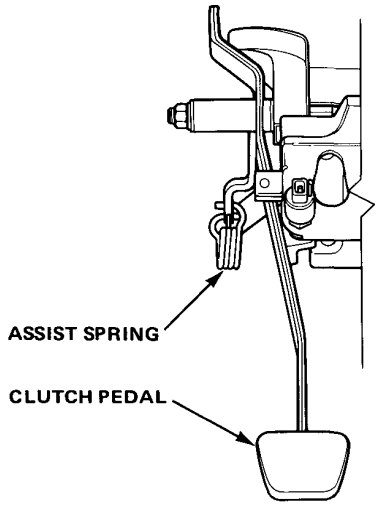
- The vacuum signal is ported above the idle throttle valve position to eliminate EGR at idle.
- In cold engine operation, the thermovalve is open so ported vacuum is bled from the thermovalve keeping the EGR valve closed for EGR cut-off.
- When the engine coolant temperature exceeds the set temperature of thermovalve C, the thermovalve is closed and ported vacuum is applied to the EGR valve and EGR control valve A. This opens the EGR valve allowing exhaust gas into the intake manifold.



Chassis

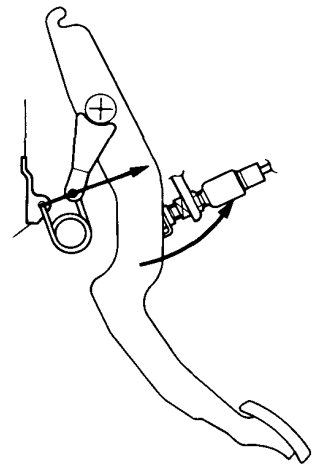
Clutch Assist Mechanism

In order to reduce clutch pedal operating force, a clutch assist mechanism using a coil spring is provided only 2.0ℓ cars on the clutch pedal bracket.

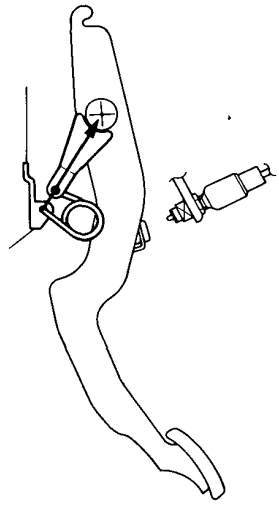


Function:

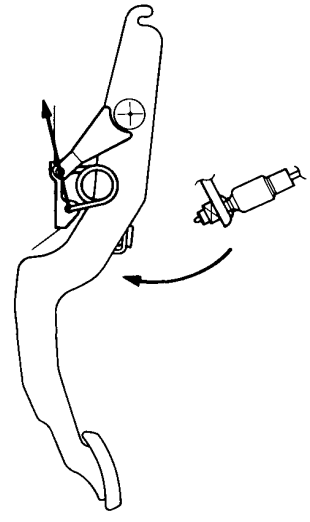
a. The clutch pedal is slightly depressed. The assist spring acts against the depressing force.



b. The clutch pedal is half way through the stroke (approx. 65 mm). The assist spring is at maximum depression but the reaction force is directed toward the pedal pivot so the reaction force of the assist spring does not act on the pedal.



c. The clutch pedal is over the half way point. The depressing force of the clutch pedal is assisted by the reaction force of the assist spring.



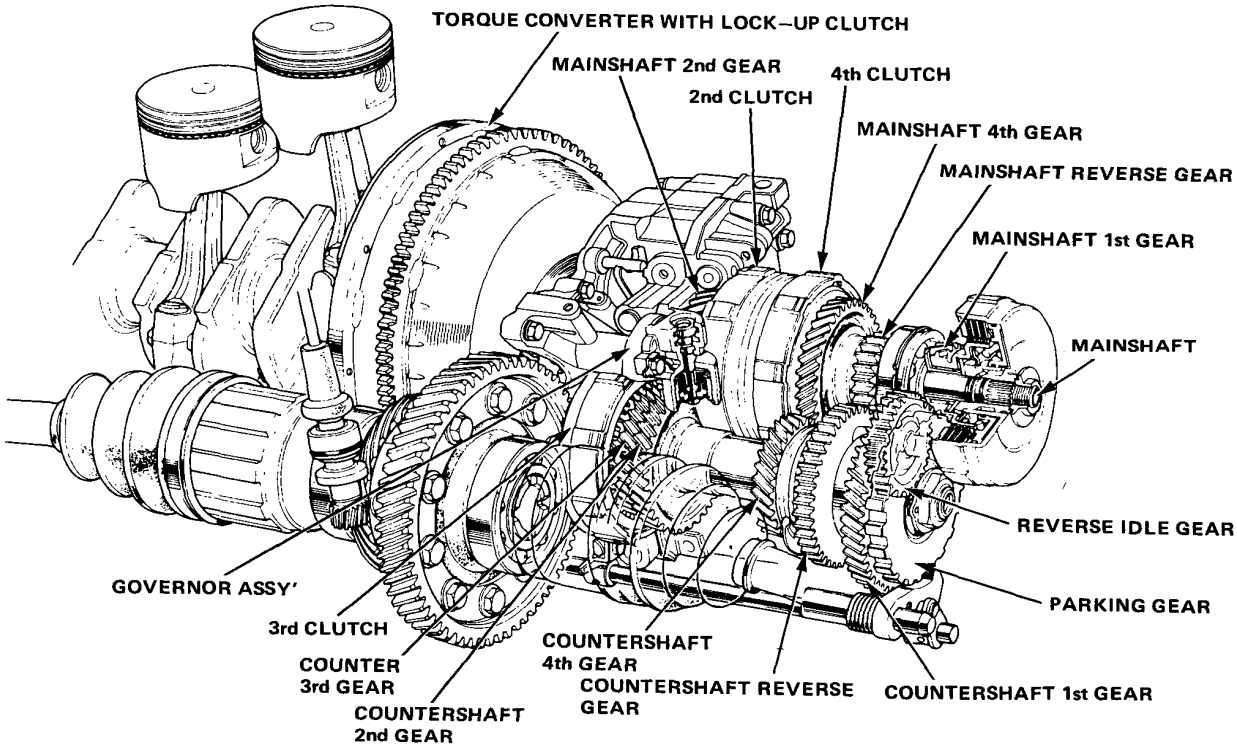
Automatic Transmission

Description

Several refinements have been made to the 4AT transmission written in the Shop Manual "Construction and Function" (No. 62SA511), as described below.

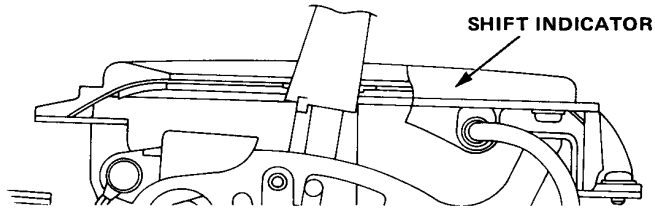
- A flat design shift indicator to improve the visibility of the indicator and give a roomier impression.
- A simplified control wire linkage which provides accurate response to throttle operation.
- The hidraulic pressure circuit has been modified to further reduce shift shock.
- The lock-up region has been expanded to the 2nd and 3rd speed ranges to improve fuel economy.

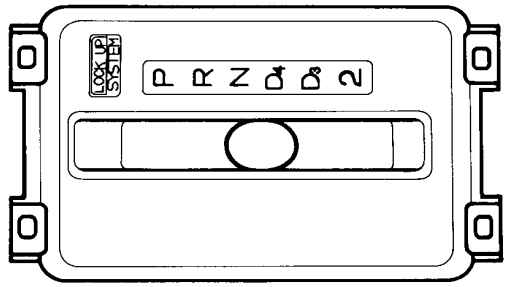
Construction



Flat Design Shift Indicator

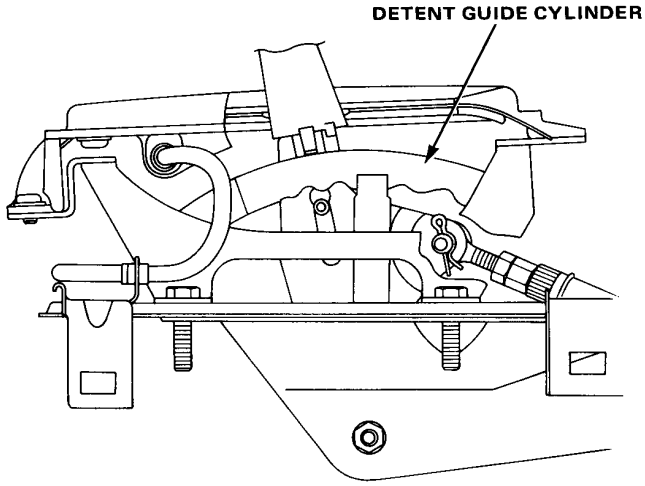
A flat shift indicator is newly provided. It is lower to the floor and allows improved visibility.

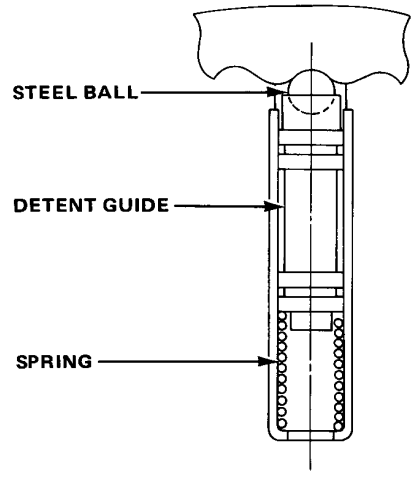




Selector Lever Detent

The detent system has been changed from a steel roller type to a steel ball type to reduce noise during shifting.

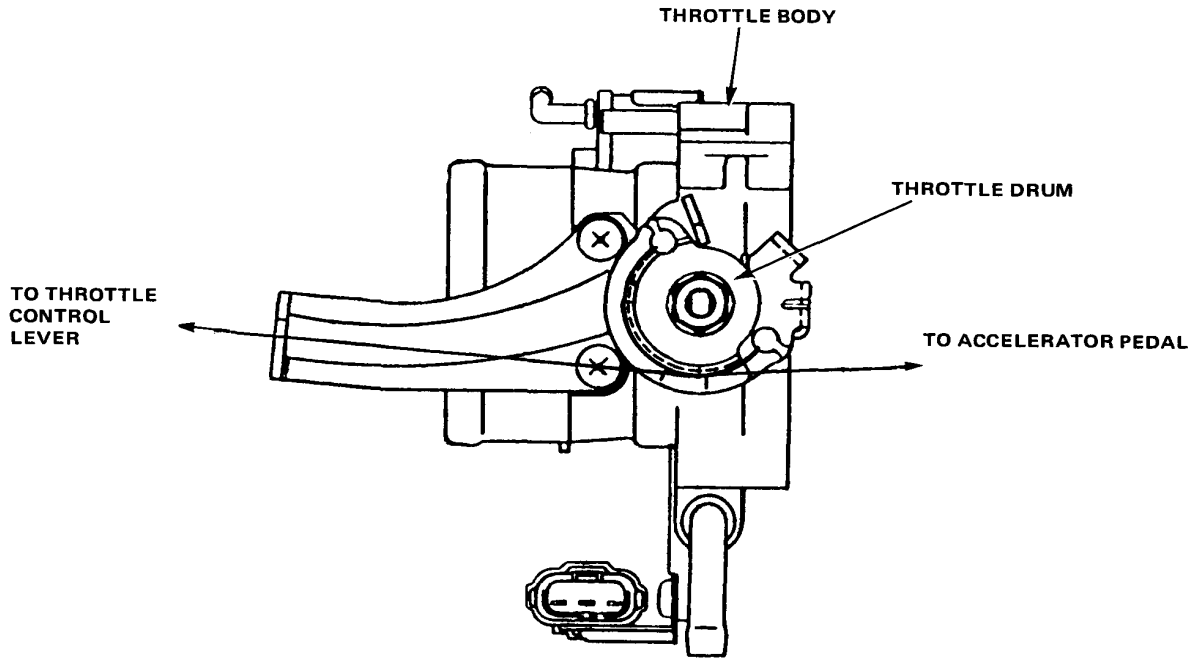




Throttle Control Cable Linkage

PGM-FI only

The throttle control cable is now connected in series to the throttle cable at the throttle drum. Movement of the throttle valve is directly transmitted to throttle valves A and B in the transmission, thus improving lock-up point accuracy and simplifying the engine room layout.



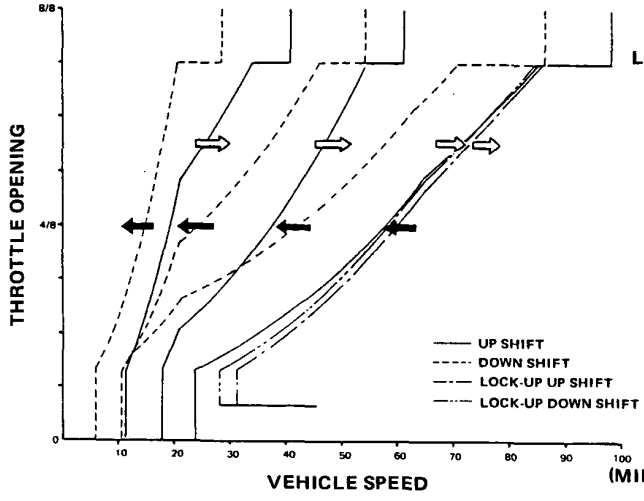
Broad Range Lock-up System

Compare to the '85 YM transmission, the lock-up area is expanded so that the lock-up clutch operates from the 2nd speed range.

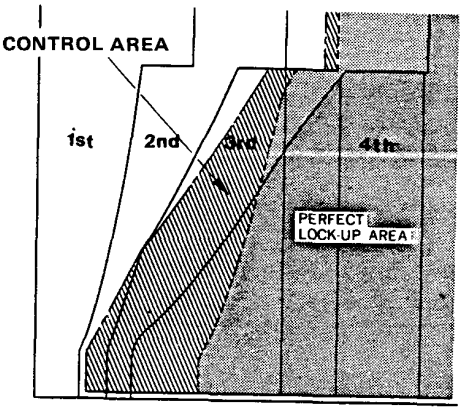
The lock-up area is divided into two parts; one is a lock-up control region and the other a perfect lock-up region. The torque transmitting capacity of the lock-up clutch is controlled in the lock-up control region. Unpleasant vibration caused by change of engine torque is absorbed in this region.

Lock-up Arrangement

'85 YM

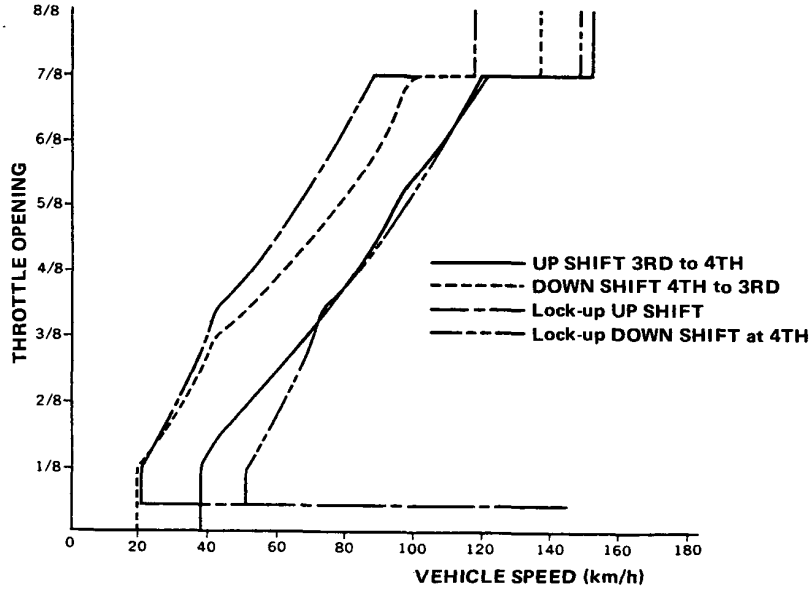


'86 YM



Lock-up Release in 4th Speed Range

A lock-up release mechanism in the 4th speed range is newly provided. Lock-up release point in this speed range is approx.30 km/h higher than the lock-up point. At the kick down from the 4th speed range the lock-up is released and the torque converter effect, which multiplies engine torque, is utilized. Quick acceleration at kick down from the 4th speed range is thereby maintained in this broad range lock-up system.



Automatic Transmission

Hydraulic Pressure Control Components

- **Points of modifications of '86 YM**

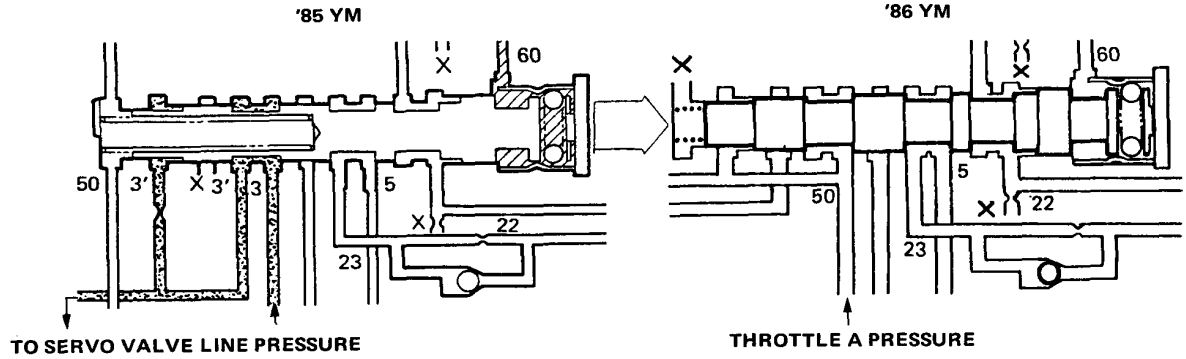
Ref.No.	Components	'85 YM	'86 YM	Ref.No.	Components	'85 YM	'86 YM
1.	Manual Valve	○	○	14.	Oriffice Control Valve (2nd)	○	●–4
2.	1-2 Shift Valve	○	○	15.	Oriffice Control Valve (3rd)	○	○
3.	2-3 Shift Valve	○	●–1	16.	LC Cut Valve	○	●–5
4.	3-4 Shift Valve	○	○	17.	LC Shift Valve	○	●–6
5.	Servo Valve	○	○	18.	LC Control Valve	○	●–7
6.	Governor Valve	○	○	19.	LC Timing Valve	○	–
7.	Throttle Valve A	○	○	20.	LC Timing Valve A	–	○–1
8.	Throttle Valve B	○	●–2	21.	LC Timing valve B	–	○–2
9.	Regulator Valve	○	○	22.	Shift Timing Valve	–	○–3
10.	Relief Valve	○	○	23.	Timing Accumulator Piston	–	○–4
11.	T.C. Check Valve	○	○	24.	3-2 Timing Valve	–	○–5
12.	Modulator Valve	○	○	25.	Kick Down Valve	–	○–6
13.	C.P.C. (Clutch Pressure Control) Valve	○	●–3	26.	Reverse Control Valve	–	○–7

NOTE: ●–1 ~ 7 indicate modified components, ○–1~7 indicate newly provided components.

1. Modified Components

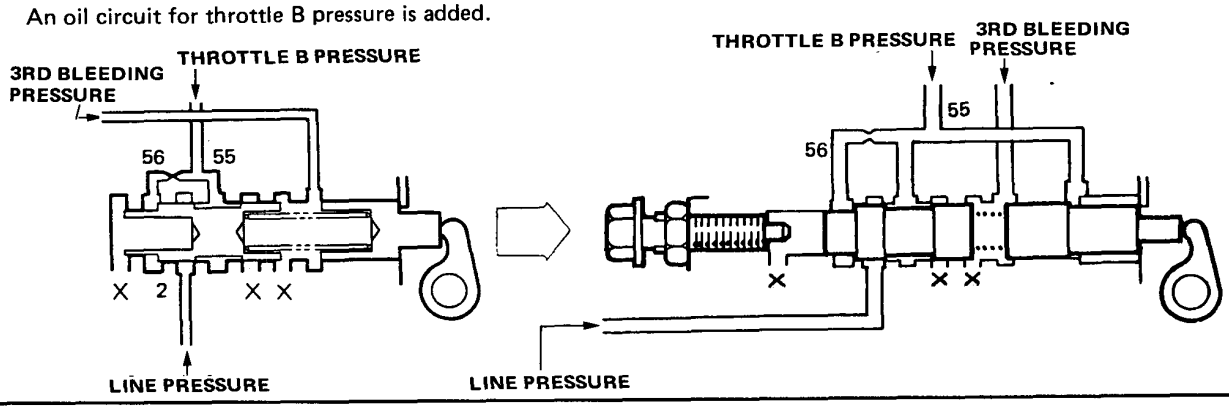
●–1. 2-3 Shift Vale

The reverse control function ('85 YM) has been separated from the 2-3 shift valve and a reverse control valve (○–7) is newly provided.



●–2 Throttle Valve B

An oil circuit for throttle B pressure is added.

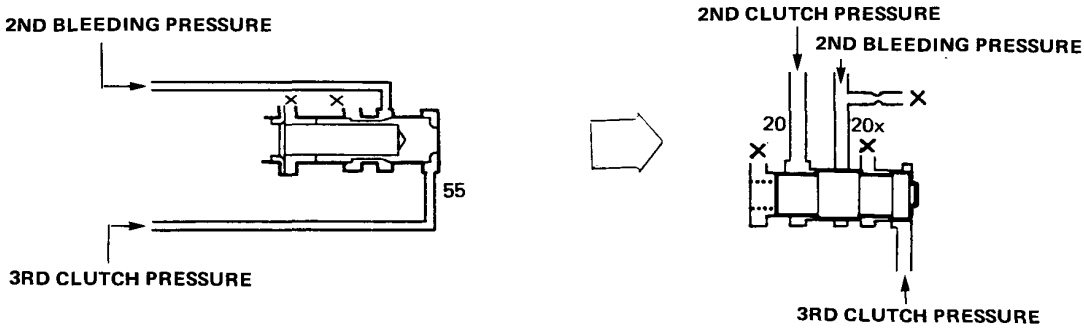


●—3 C.P.C. (Clutch Pressure Control) Valve

The signal pressure is changed from throttle A pressure to throttle B Pressure. The control of clutch pressures above 2nd in the D_3 and D_4 ranges in the small throttle opening area is improved.

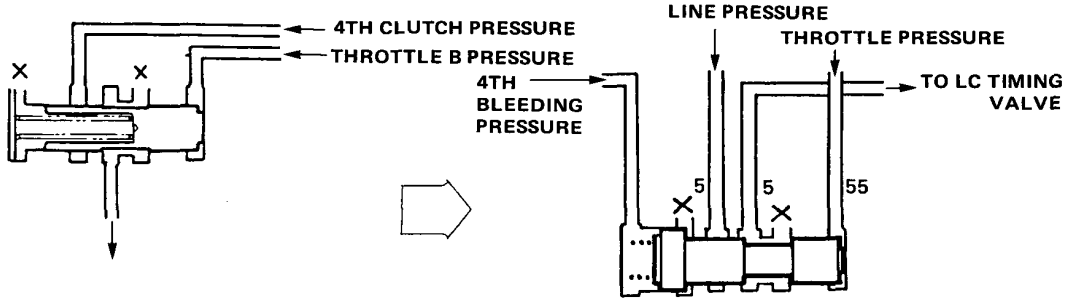
●—4 Oriffice Control Valve (2nd)

An oil pressure circuit (2nd clutch pressure) is newly provided to act against the 3rd clutch pressure so that shift shock between 2nd and 3rd is reduced.



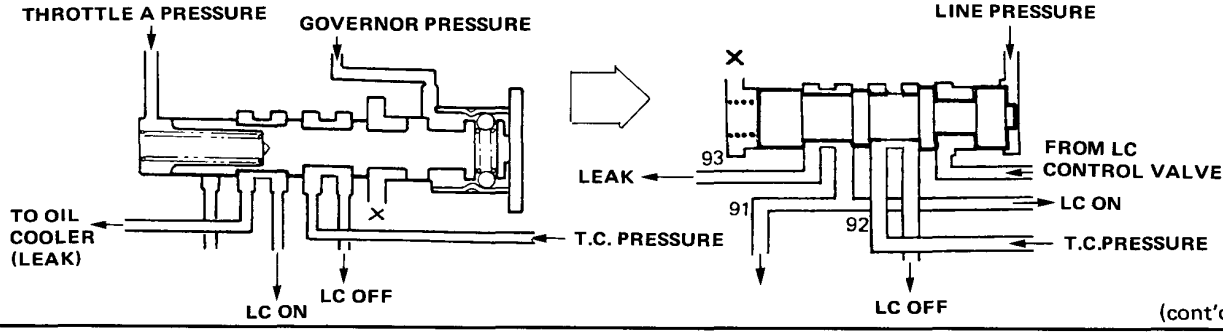
●—5 LC Cut Valve

The controlled pressure is changed from 4th clutch pressure to line pressure as a result of expansion of the lock-up range to 2nd and 3rd speeds. The 4th bleeding pressure circuit is connected to the LC cut valve opposing throttle B pressure. At kick down from 4th to 3rd or 2nd, the lock-up clutch is released by the pressure released from the 4th accumulator until 3rd or 2nd clutch pressure reaches a predetermind value. Kick down shock from the 4th is thus reduced. (Refer to kick down valve) The lock-up is released by this valve below approx. 1/24 throttle opening.



●—6 LC Shift Valve

Governor pressure is replaced by the line pressure to engage the lock-up. The throttle A pressure line used as a counter pressure to the governor pressure has been eliminated. When line pressure is applied to the LC shift valve, the plunger moves toward the spring. The T.C. pressure passage feeding the torque converter is then changed so that the lock-up clutch engages. The passage to the torque converter is changed to disengage the lock-up clutch by the return spring in the LC shift valve whenever line pressure is released by LC timing valve A.

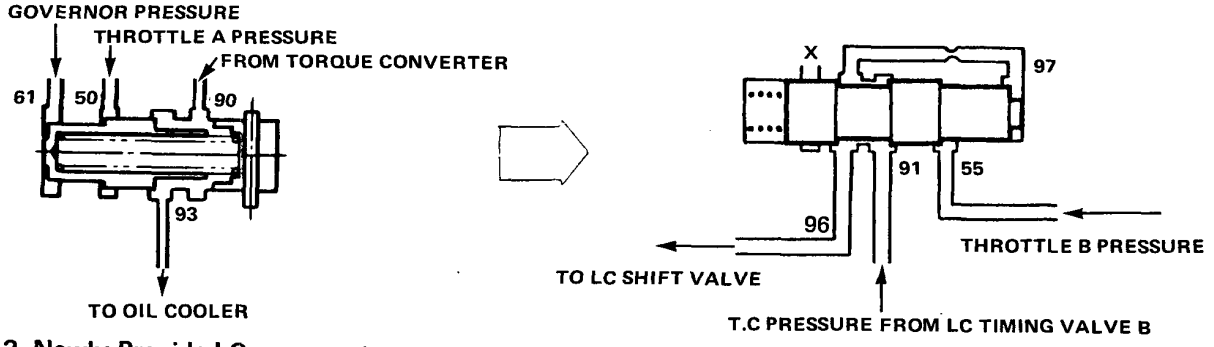


(cont'd)

Hydraulic Pressure Control Components (Cont'd)

•–7 LC Control Valve

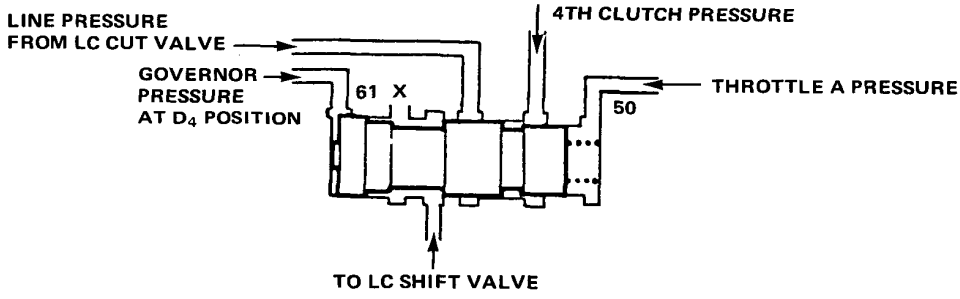
The LC control valve in '86 YM transmission controls the release pressure of the lock-up clutch unlike that of the '85 YM which controlled torque converter pressure. The modification contributes to creation of a wider lock-up control region.



2. Newly Provided Components

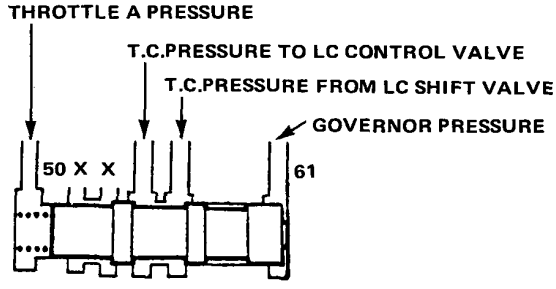
○-1 LC Timing Valve A

The LC timing valve A controls line pressure flow to the LC shift valve by opening and closing a plunger type valve. *The lock-up region appropriate to vehicle speed is determined by this valve. When governor pressure applied to the* plunger end is greater than throttle A pressure and spring tension on the other end of the valve line pressure is allowed to flow to the LC shift valve. The LC shift valve is thus shifted to the lock-up position. The lock-up release point in the 4th speed range is raised approx. 30 km/h by the 4th clutch pressure acting against governor pressure. After the valve closes the line pressure passage, the X orifice releases the remaining pressure between the LC shift valve and LC timing valve A.



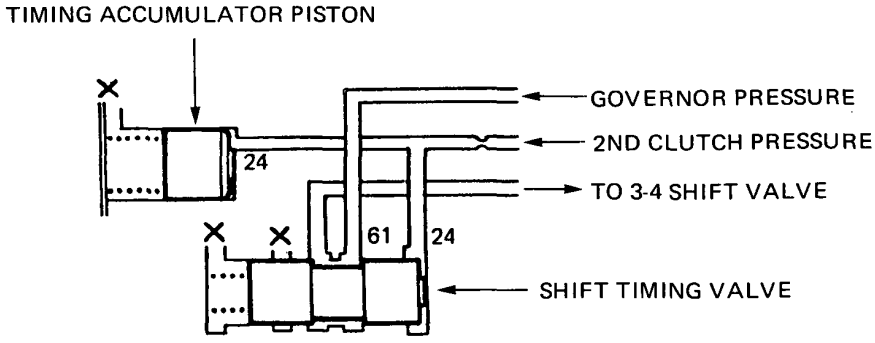
○–2 LCTiming Valve B

The lock-up control region is decided by this valve. When the LC shift valve is in the lock-up position T.C. pressure is transmitted to this valve. If the plunger is in the position shown below, T.C. pressure is transmitted to the LC control valve and lock-up capacity is controlled. On the other hand, when the plunger moves toward the spring by governor pressure, the passage of the T.C. pressure is closed and perfect lock-up is achieved.



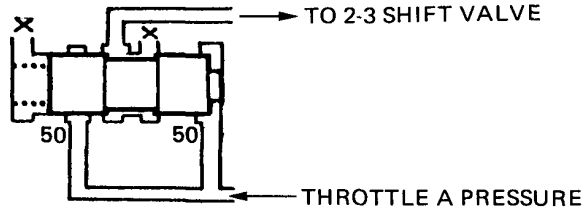
○—3. Shift Timing Valve and ○—4. Timing Accumulator Piston

In the 2nd speed range the shift timing valve closes the governor pressure passage to the 3-4 shift valve by 2nd clutch pressure applied against spring tension. At this time the timing accumulator piston is charged with 2nd clutch pressure. In such a case, shifting directly from 2nd to 4th speed range, the accumulated pressure in the timing accumulator piston maintains the shift timing valve to prevent the governor pressure from being transmitted to the 3-4 shift valve for the required amount of time. In the meantime, the 3rd clutch pressure is raised sufficiently to engage the 3rd clutch. Shift up is thus achieved and shift shock is moderated.



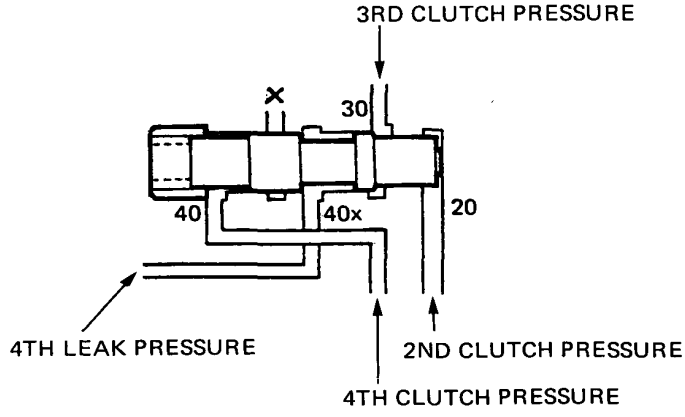
○—5 3-2 Timing Valve

The 3-2 timing valve prevents kick down from the 3rd to the 2nd speed range with a small throttle opening by reducing the throttle A pressure inversely proportionate to the throttle opening. Shock during the kick down from 3rd to 2nd is reduced as the kick down at a wider throttle opening follows a smaller shock.



○—6 Kick Down Valve

The kick down valve controls the opening and closing of the X exhaust port for the 4th bleeding pressure. During kick down from the 4th speed range, the remaining pressure of the 4th accumulator is applied to this valve, keeping the 4th exhaust port closed. It continues until the 3rd or 2nd clutch pressure load against 4th clutch pressure develops. Kick down is thus made to the speed range where the clutch is firmly engaged and kick down shock is reduced.

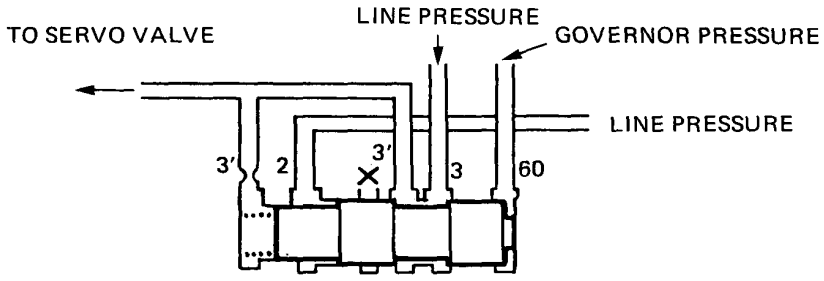


(cont'd)

Hydraulic Pressure Control Components (Cont'd)

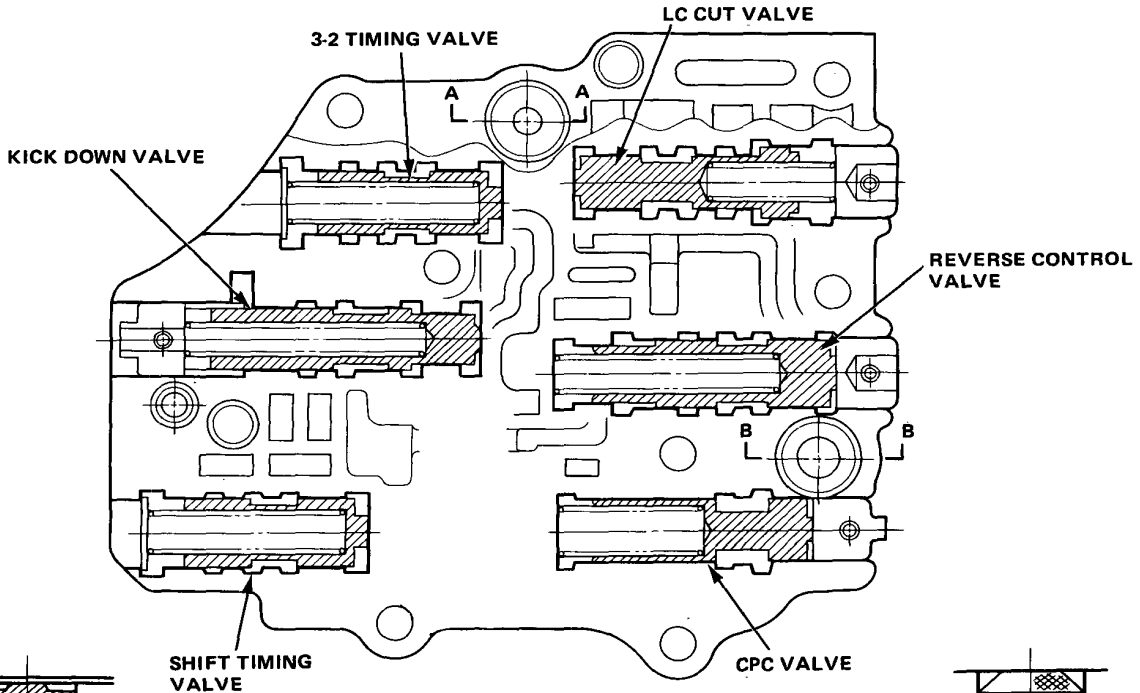
○–7. **Reverse Control Valve**

The reverse control function operated by the 2-3 shift valve has been replaced by this reverse control valve. Governor pressure closes the line pressure passage to the servo valve when vehicle speed reaches approx. 30km/h. Protection against accidental shifting into reverse is thereby achieved.



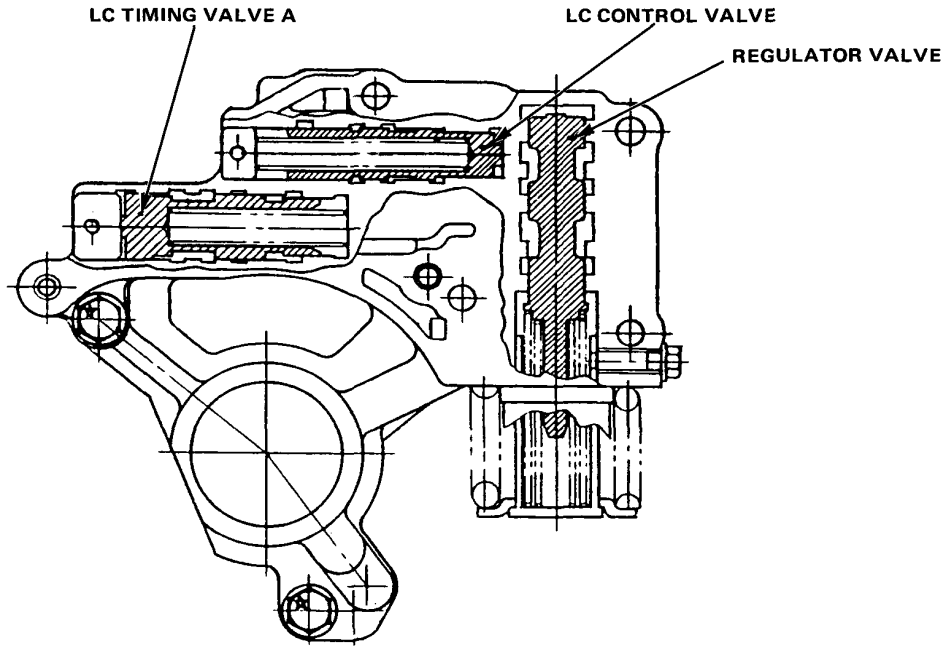
Secondary Valve Body

In order to provide for the increased number of valves, a secondary valve body is newly mounted between the main valve body and the servo valve body. The LC cut valve, reverse control valve, CPC valve, shift timing valve, kick down valve, 3-2 timing valve and timing accumulator piston are located in this body as shown below.



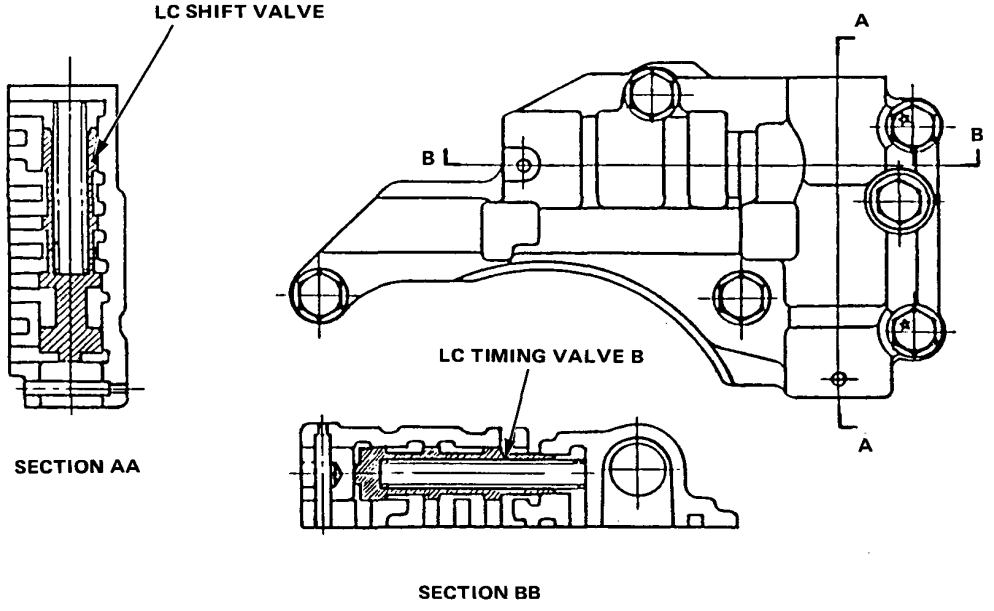
Regulator Valve Body

Modification has been made to the regulator valve body to permit inclusion of the LC timing valve A, as shown below.



Lock-up Valve Body

The lock-up valve body, which is located on the regulator valve body, has also been modified to contain the LC timing valve B and LC shift valve.;



Explanation of Schematic Diagram of Hydraulic System

NOTE: Explanations on this page cover the Schematic Diagrams on the following pages. Refer to the appropriate diagram.

[N] (Neutral): See page 5-14.

With the manual valve in Neutral, oil from the oil pump just flows around the oil port (1); i.e. all clutches are off since no oil is transmitted to the shift valves. The regulator valve serves to maintain the line pressure at a constant level. The torque converter check valve prevents oil pressure within the torque converter from falling below a predetermined limit.

[2] : See page 5-15.

Oil from te oil pump travels through the manual valve to the second clutch; the second clutch is on. It also flows through the governor valve to the 1-2 and 2-3 shift valves. The modulator and throttle valves also receive oil from the pump.

[D_3] (In 3rd Speed Range): See page 5-16.

With a further increase in vehicle speed, the governor pressure (60) is sufficient to overcome the throttle pressure (50) working on the end of the 2-3 shift valve. This moves the shift valve to cut off line pressure (5) from the 2nd clutch. As the 2-3 shift valve so moves, it transmits line pressure (5) to the 3rd clutch through an accumulator and causes the transmission to up shift from second to third. As in the 2nd speed range, no power is transmitted through the first clutch because it is freewheeling on the one-way clutch.

[D_4] (In 1st Speed Range): See page 5-17.

The manual valve directs oil to the first clutch through the port (4) and inlet (10). Line pressure is applied to the governor valve, modulator valve and throttle valve. In this transmission, two pressures from throttle valve A and the governor valve oppose each other in attempting to move the shift valves. In the 1st speed range, the 1-2 shift valve is moved to the right since the pressure (60) from the governor valve is lower than the pressure (50) from throttle valve A. With the 1-2 shift valve moved to the right, no oil is directed to the 2nd, 3rd and 4th clutches; that is, only the first clutch is on.

[D_4] (In 2nd Speed Range with Lock-up Clutch Released): See page 5-18.

As the vehicle picks up speed, this inclease oil pressure from the governor valve. This pressure is applied to one end of the 1-2 shift valve. When governor pressure (60) exceeds throttle pressure (50), the 1-2 shift valve is moved to the left. This causes the transmission to upshift from first to second by admitting line pressure (5) to the 2nd clutch through the 2-3 shift valve. The accumulator reduces shock during shifting. The first clutch remains on during this series of operations but no power is transmitted through this clutch since it is freewheeling on the one-way clutch. At this time the line pressure (5) from the LC shift valve through the LC timing valve A is cut by the LC cut valve or LC timing valve A so the lock-up clutch remains released.

[D_4] (In 2nd Speed Range Lock-up Control Mode): See page 5-19.

When the throttle opeining and the vehicle speed are within a predetermined band, line pressure (5) is transmitted to the LC shift valve to change the TC pressure passage from (92)—(94) to (92)—(91). TC pressure (91) is then divided in two, one directly feeding the torque converter to engage the lock-up clutch from port (91) of the torque converter, and the other feeding the torque converter from port (94), passing through the LC timing valve, LC control valve (91)—(96) and LC shift valve (96)—(94) to release the lock-up clutch. In the latter case, the TC pressure (94) is maintained at a lower lever than the TC pressure (91) by the LC control valve as it chokes the (91)—(96) passage by TC pressure (97) and throttle B pressure. As a result, the torque transmitting capacity of the lock-up clutch is controlled.
In the 2nd speed range the 2nd clutch pressure (24) to the shift timing valve cuts governor pressure (61) flow to the 3-4 shift valve and the timing accumulator piston is charged with 2nd clutch pressure. Both the shift timing valve and the timing accumulator piston work together to prevent direct up shifting from the 2nd to the 4th speed range.

D4 (In 3rd Speed Range with Lock-up Clutch Released): See page 5-20.

When throttle A pressure (50) is greater than the governor pressure (61) applied on the end of LC timing valve A, the valve closes the line pressure passage (5) to the LC shift valve. The LC shift valve then changes the feed line of the torque converter from (91) to (94) and the lock-up clutch is released.

D4 (In 3rd Speed Range Lock-up Control Mode): See page 5-21.

The operation of the shift valves is identical to D3 in the 3rd speed range but governor pressure (60) is connected to passage (61) at the manual valve and it opens the line pressure passage (5) at the LC timing valve A allowing line pressure to flow to the LC shift valve. Governor pressure (61) is also applied to LC timing valve B but it is not enough to overcome the opposing spring tension and throttle A pressure to close the torque converter pressure passage (91). Lock-up control is thus achieved.

D4 (In 3rd Speed Range Full Lock-up Mode): See page 5-22.

With a further inclease in vehicle speed, governor pressure (61) reaches a high enough value to overcome throttle A pressure (50) applied on the end of LC timing valve B. This moves LC timing valve B to cut off TC pressure (91) from the LC shift valve and open the X exhaust port to release pressure applied to the torque converter at port (94). By releasing the pressure opposing to TC pressure (91) in the torque converter, the lock-up clutch is firmly engaged. Full lock-up is thus achieved.

D4 (In 4th Speed Range): See page 5-23 and 5-24.

As the governor pressure increases with vehicle speed, it exceeds the throttle A pressure applied on the other end of the 3-4 shift valve. The line pressure passage to the 3rd clutch (30) is closed and the passage to the 4th clutch (42) is opened by the movement of 3-4 shift valve. The 4th clutch pressure line is then pressurized to engage the 4th clutch. At the same time remaining 3rd clutch pressure is released by the movement of the 3rd orifice control valve as it opens the X exhaust port for the remaining pressure of the 3rd clutch. The 4th clutch pressure is also applied on LC timing valve A to raise the lock-up release point approx. 30 km/h so that quick acceleration at kick down from the 4th speed range remains possible. The other 4th clutch pressure is transmitted to the kick down valve to hold the remaining 4th clutch pressure high during kick down from the 4th speed range in order to reduce kick down shock. This remaining 4th clutch pressure acts to release the lock-up clutch by cutting line pressure (5) at the LC cut valve.

R (Reverse): See page 5-25.

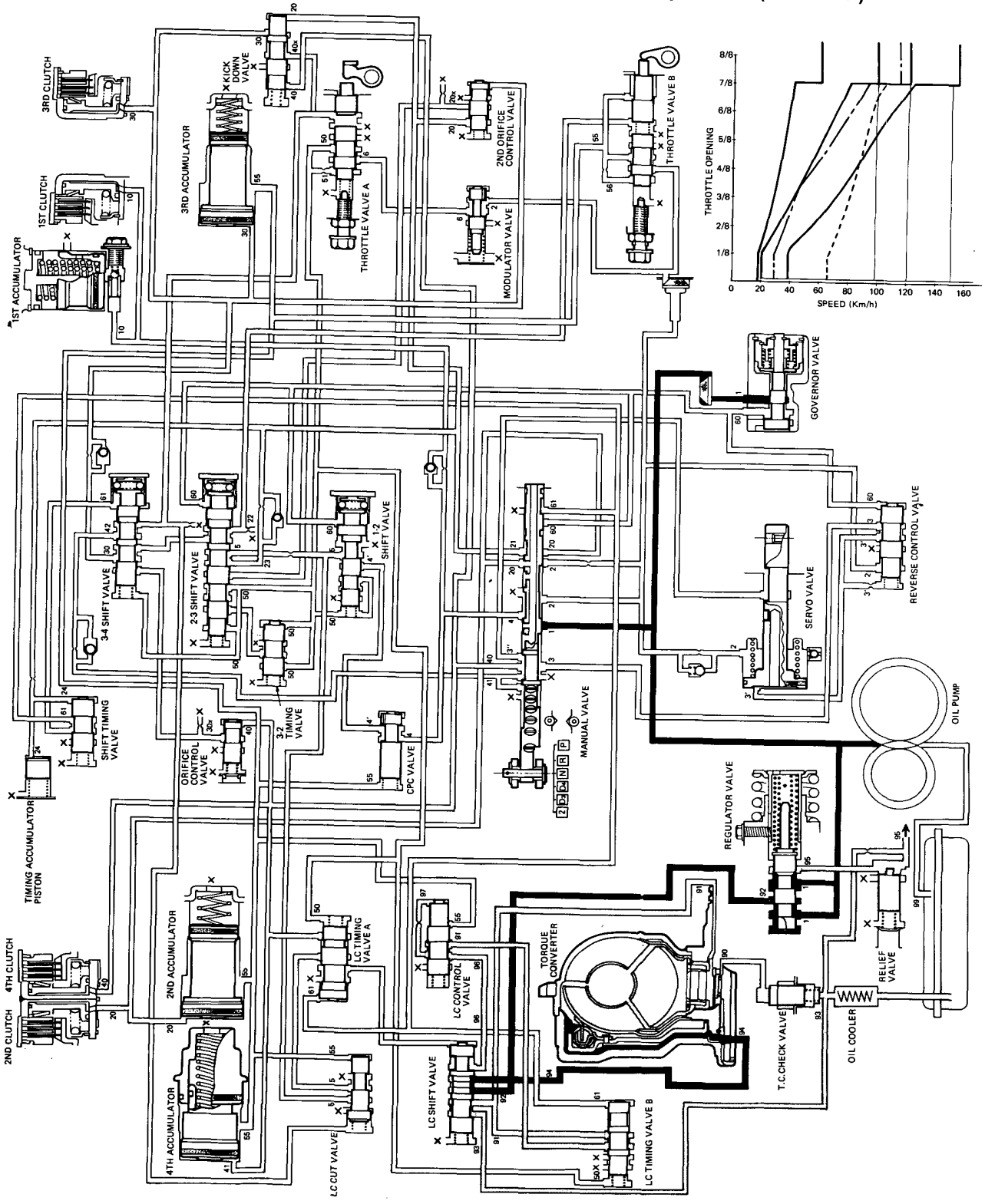
When the select level is placed in Reverse, this moves the manual valve, allowing line pressure (3) to travel to the servo valve through the reverse control valve. The reverse shift fork, which is installed on the servo valve, moves the selector into reverse gear. At the end of the servo valve stroke, the line pressure passage (3') opens and the 4th clutch pressure line is pressurized. Provision are made to guard against accidental shifting into reverse while the vehicle is in motion. When vehicle speed reaches a certain level (approx. 30 km/h), line pressure is cut by the governor pressure (60) which activates the reverse control valve.

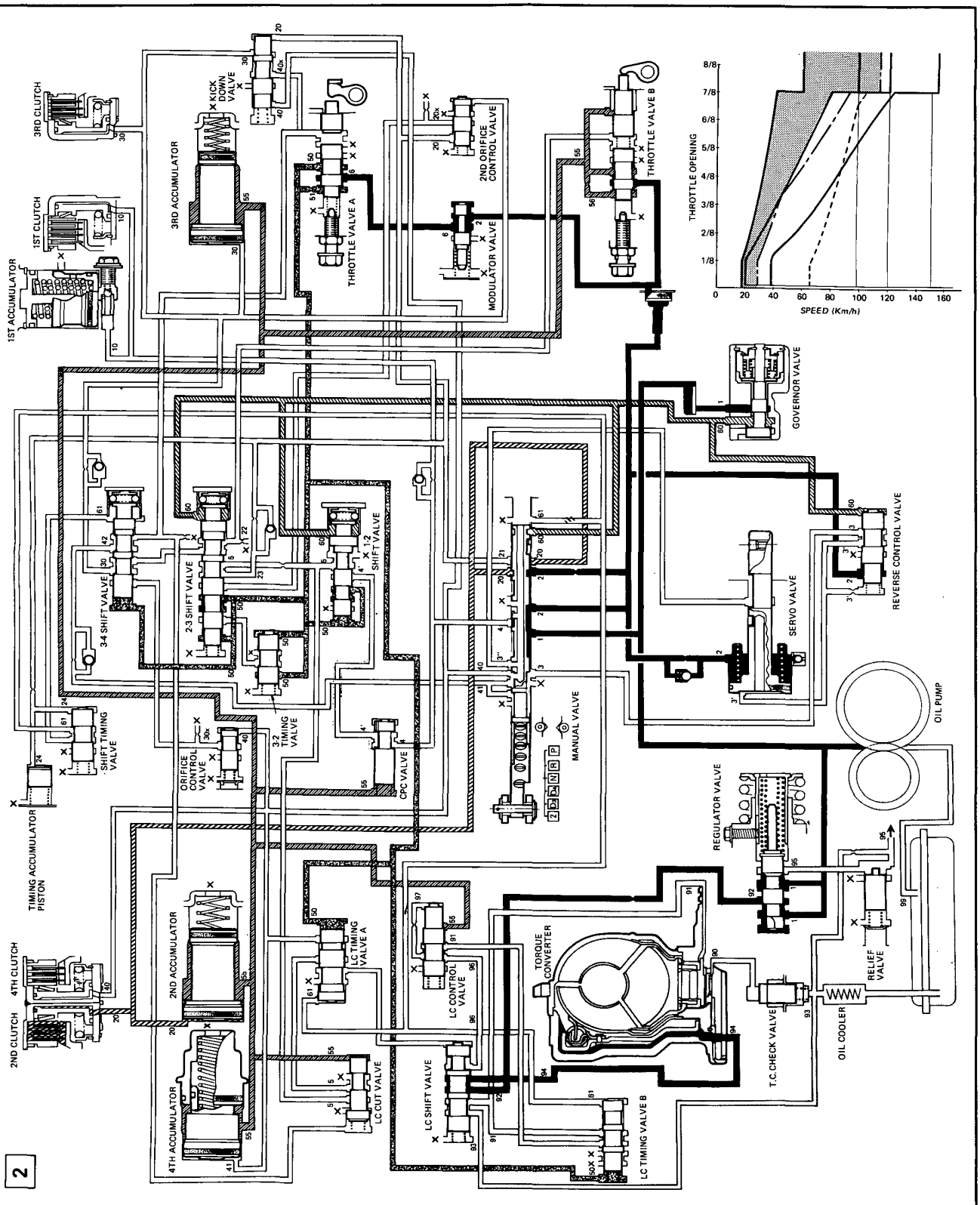
P (Park): See page 5-26.

In Park, all clutches are off since oil from the oil pump flows around the manual valve port as shown.

(cont'd)

Explanation of Schematic Diagram of Hydraulic System (Cont'd)

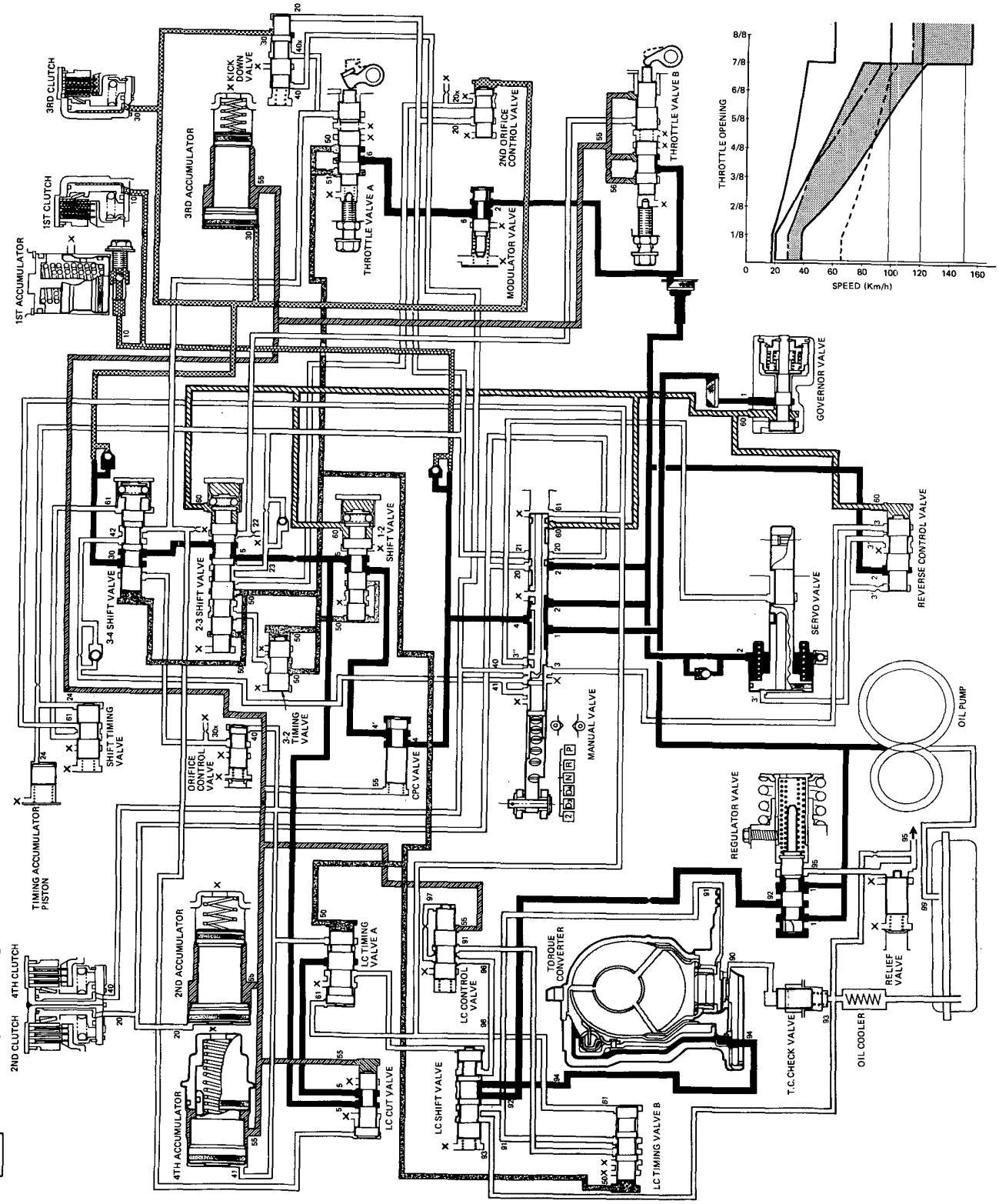



2
3RD CLUTCH
1ST CLUTCH
1ST ACCUMULATOR
3RD ACCUMULATOR
KICK DOWN VALVE
THROTTLE VALVE A
2ND ORIFICE CONTROL VALVE
MODULATOR VALVE
THROTTLE VALVE B
THROTTLE OPENING
SPEED (Km/h)
GOVERNOR VALVE
REVERSE CONTROL VALVE
SERVO VALVE
3-4 SHIFT VALVE
2-3 SHIFT VALVE
1-2 SHIFT VALVE
SHIFT TIMING VALVE
ORIFICE CONTROL VALVE
3-2 TIMING VALVE
CPC VALVE
MANUAL VALVE
OIL PUMP
REGULATOR VALVE
TIMING ACCUMULATOR PISTON
2ND CLUTCH
4TH CLUTCH
2ND ACCUMULATOR
4TH ACCUMULATOR
LC TIMING VALVE A
LC CONTROL VALVE
LC CUT VALVE
LC SHIFT VALVE
LC TIMING VALVE B
TORQUE CONVERTER
T.C. CHECK VALVE
OIL COOLER
RELIEF VALVE

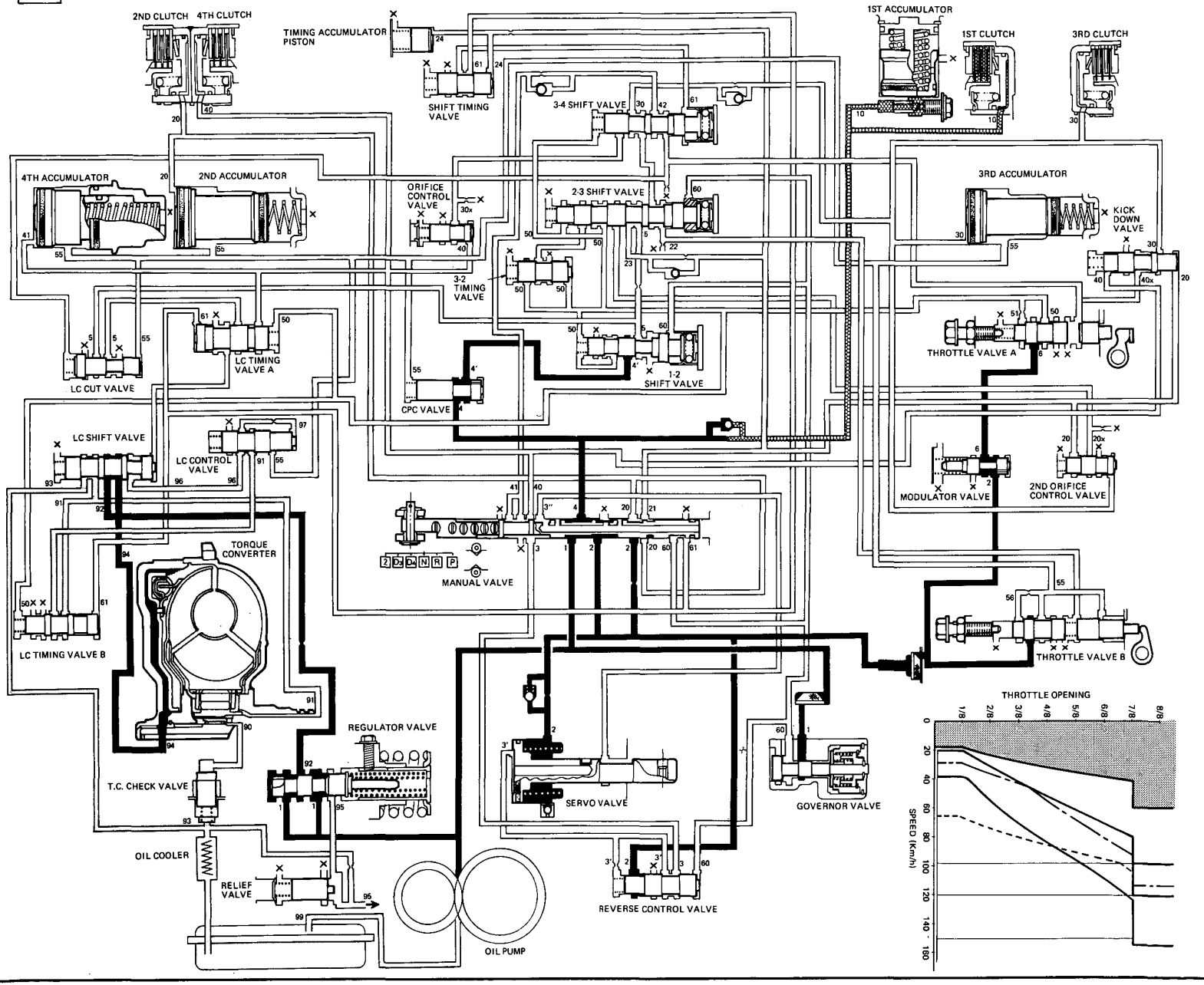
(cont'd)

Automatic Transmission

Explanation of Schematic Diagram of Hydraulic System (cont'd)



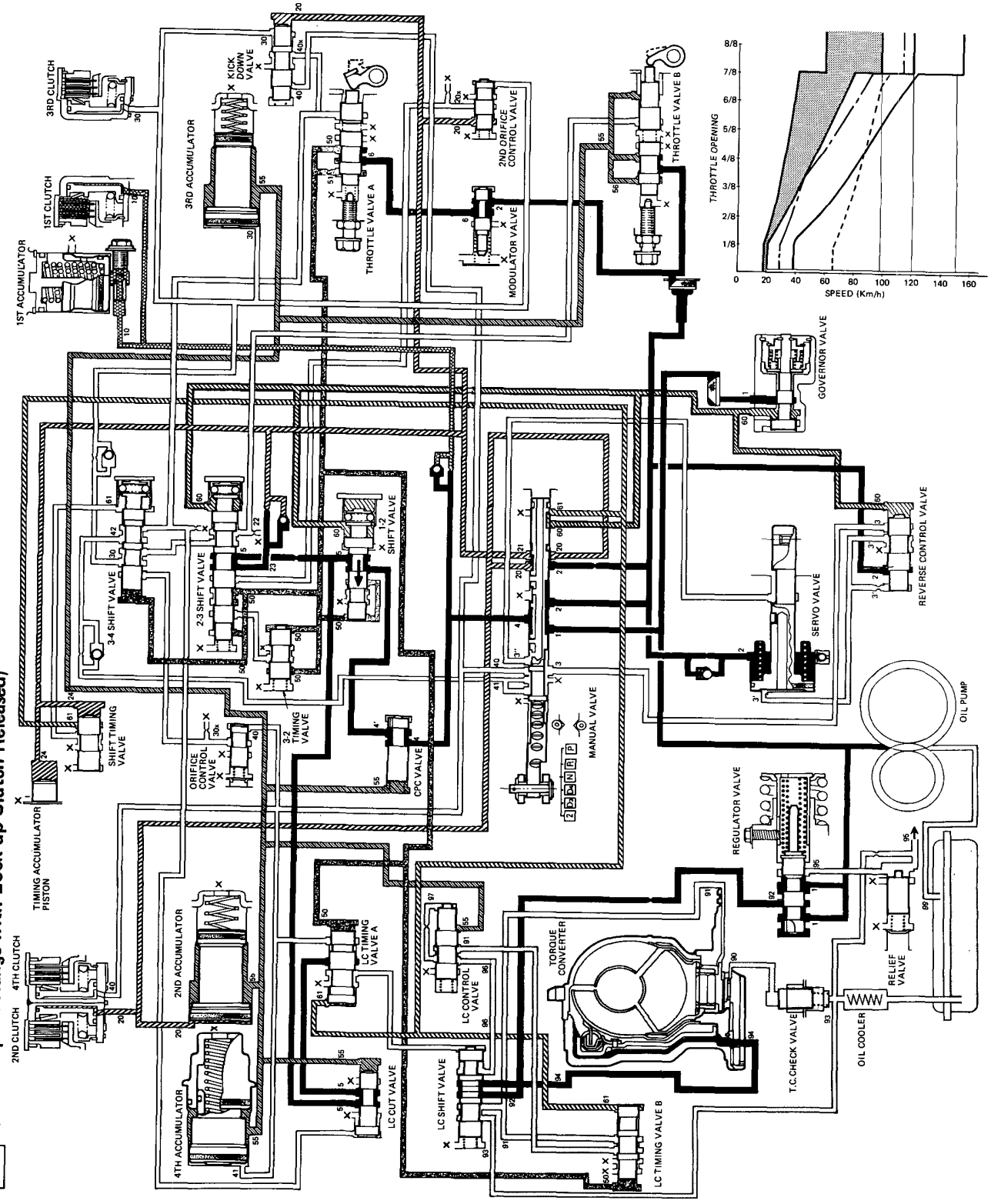
D4 (In 1st Speed Range)



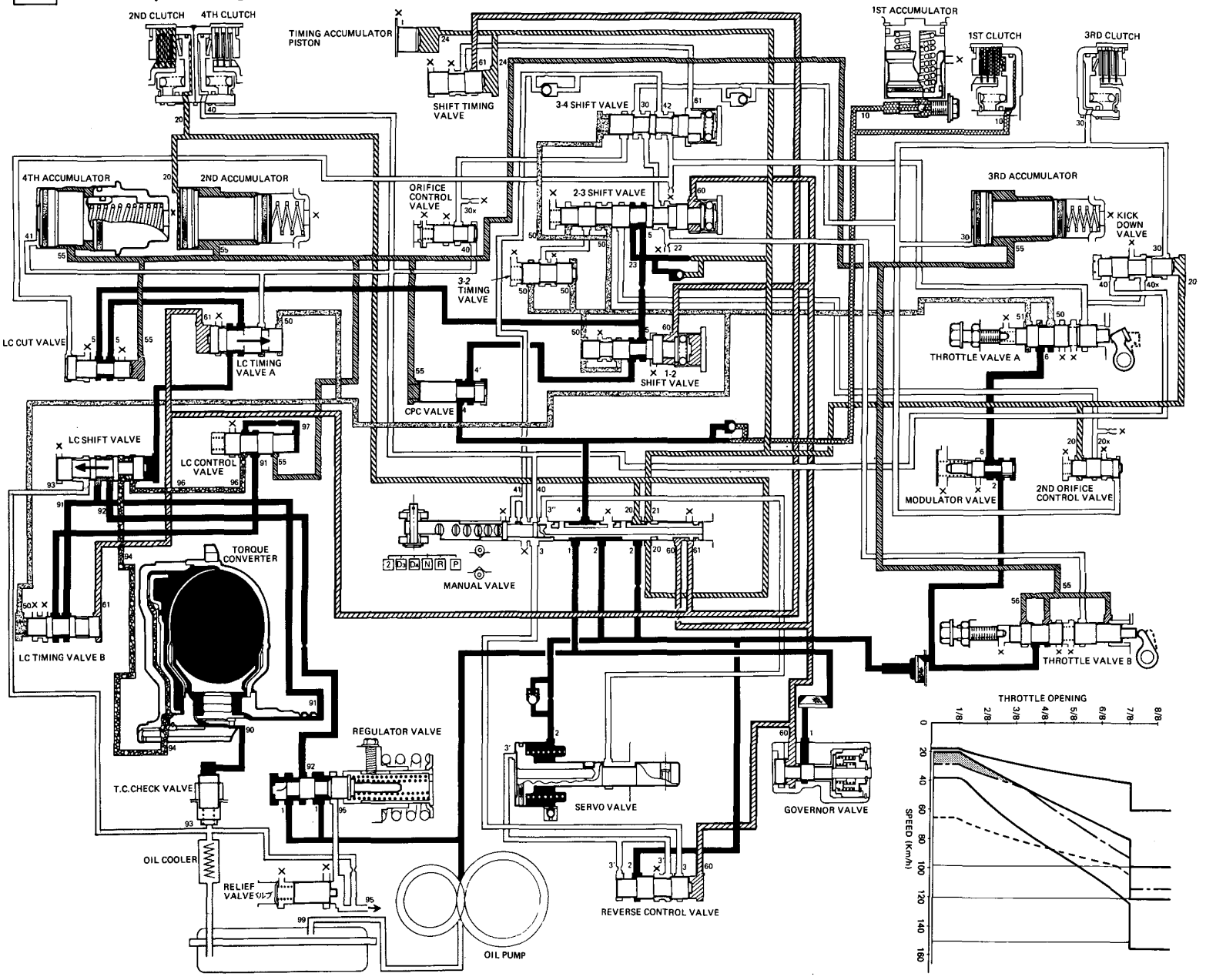
(cont'd)

Automatic Transmission

Explanation of Schematic Diagram of Hydraulic System (cont'd)

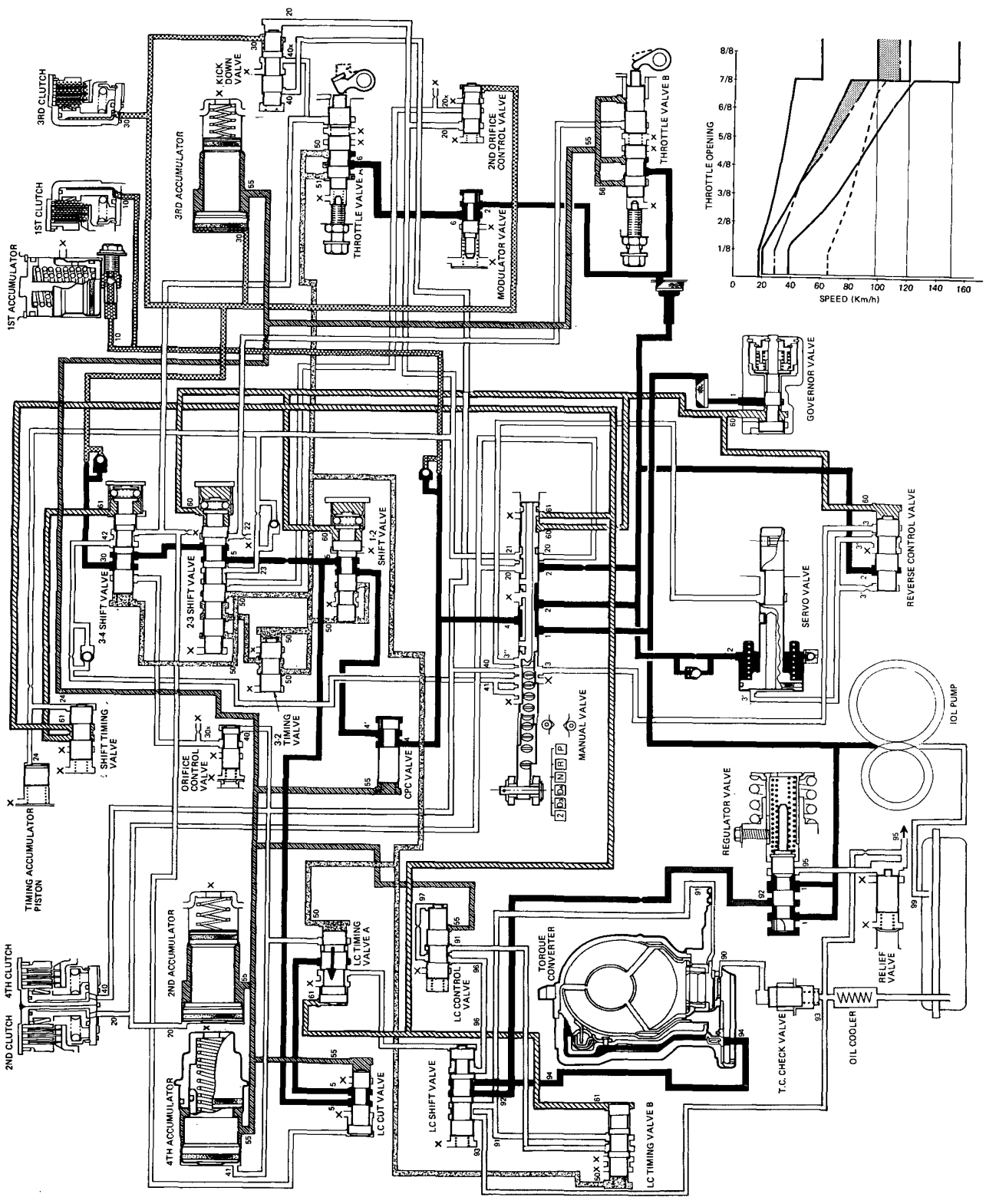


D_4 (In 2nd Speed Range Lock-up Control Mode)

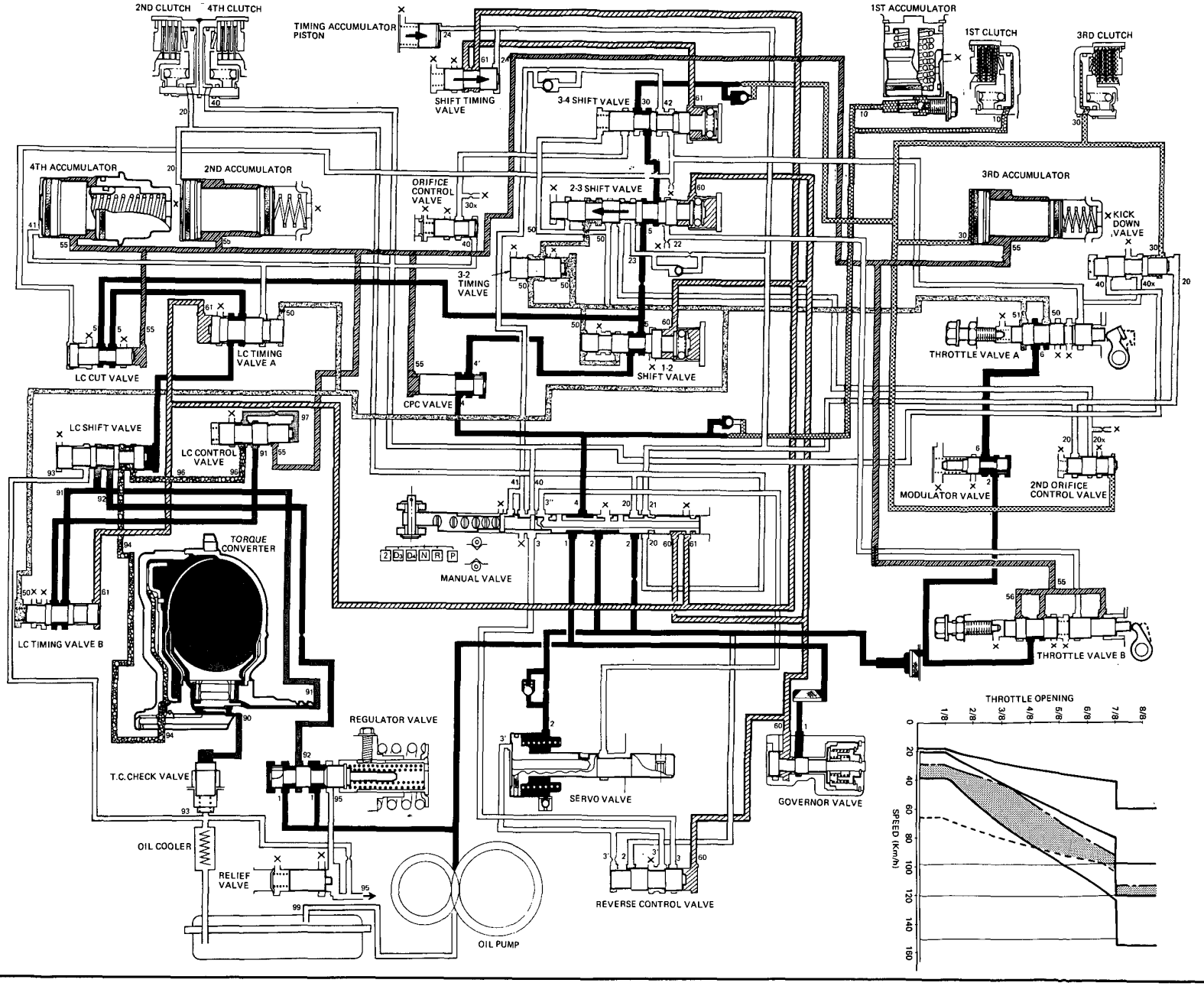


Automatic Transmission

Explanation of Schematic Diagram of Hydraulic System (cont'd)

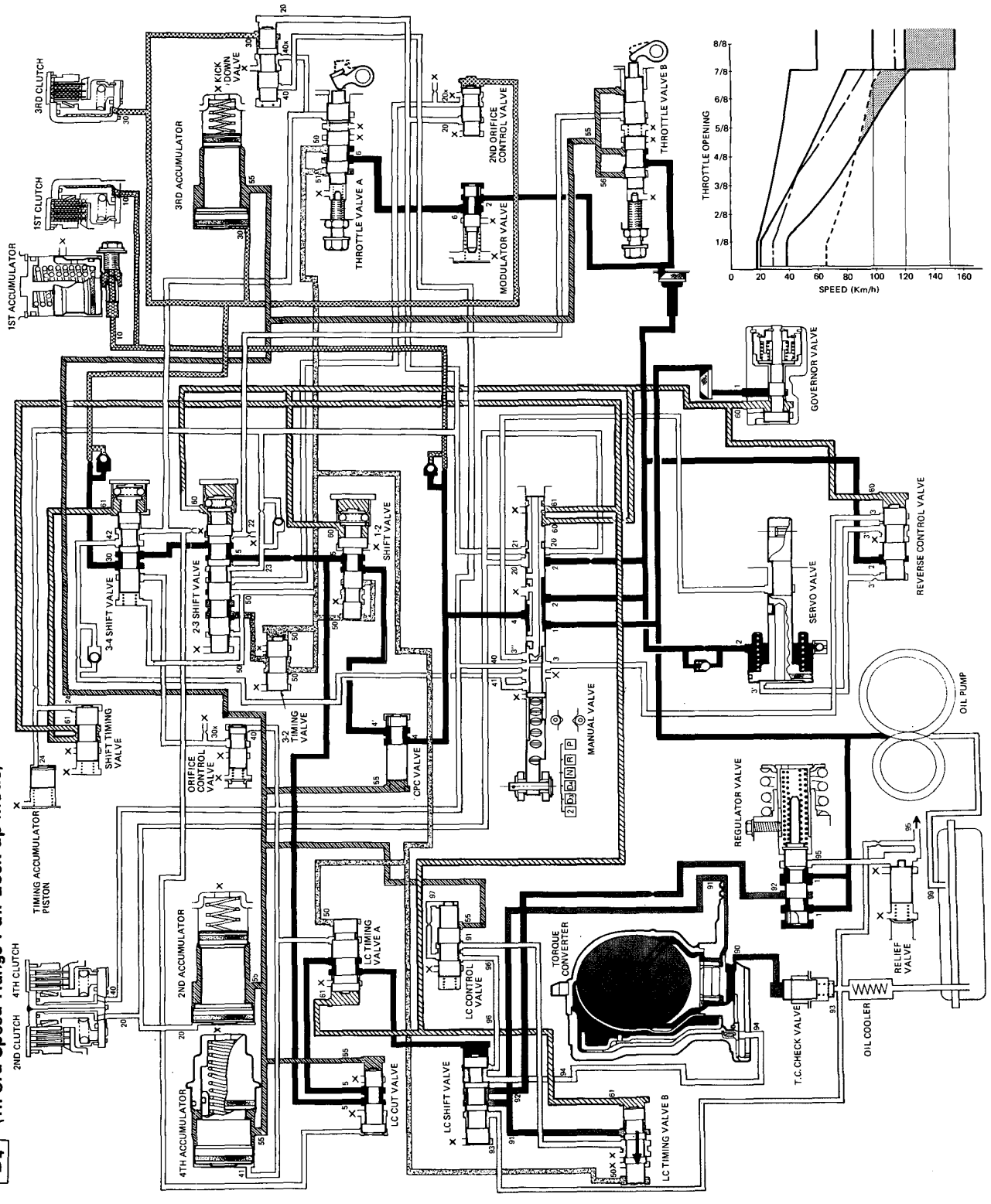


D_4 (In 3rd Speed Range Lock-up Control Mode)

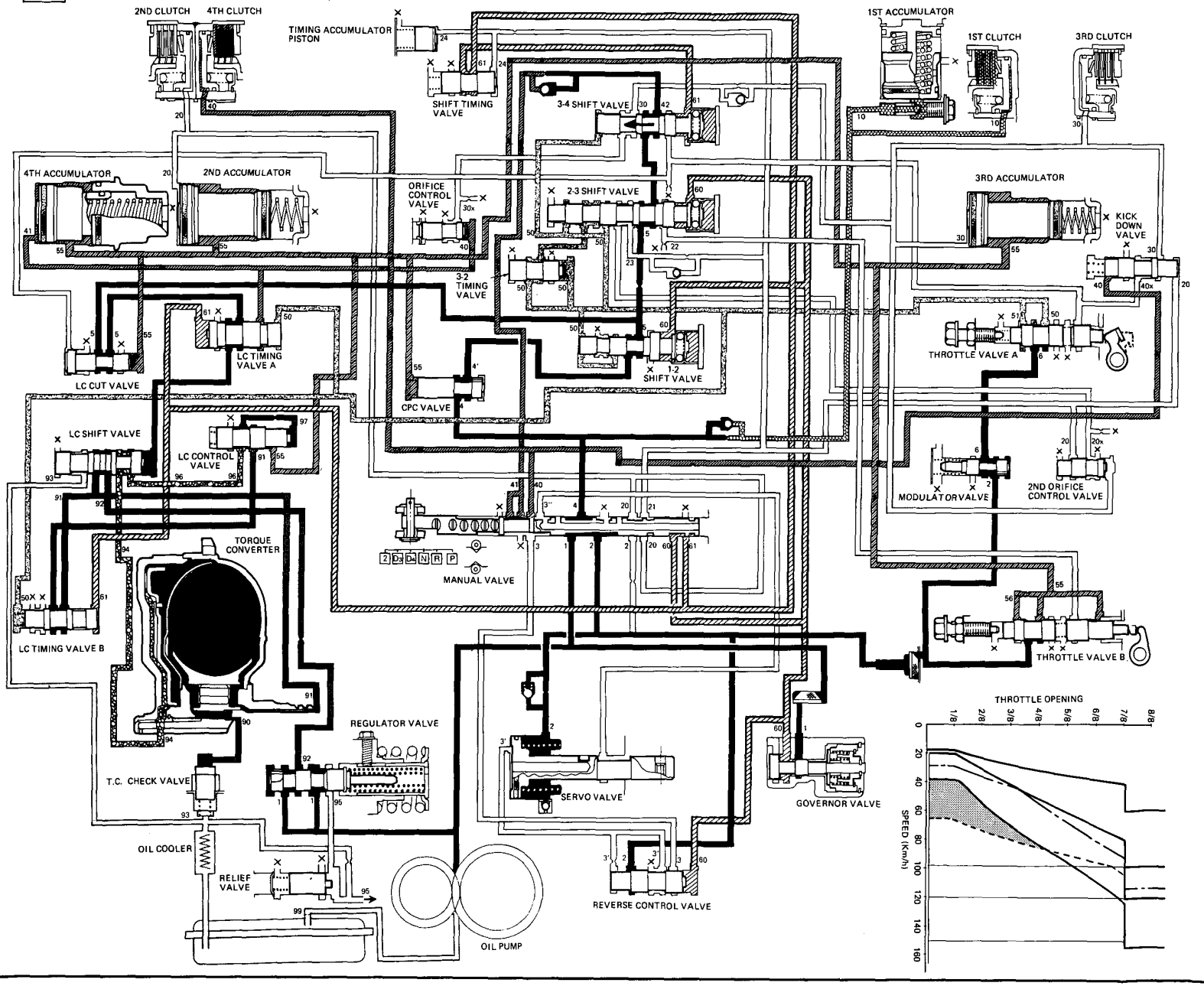


Automatic Transmission

Explanation of Schematic Diagram of Hydraulic System (cont'd)

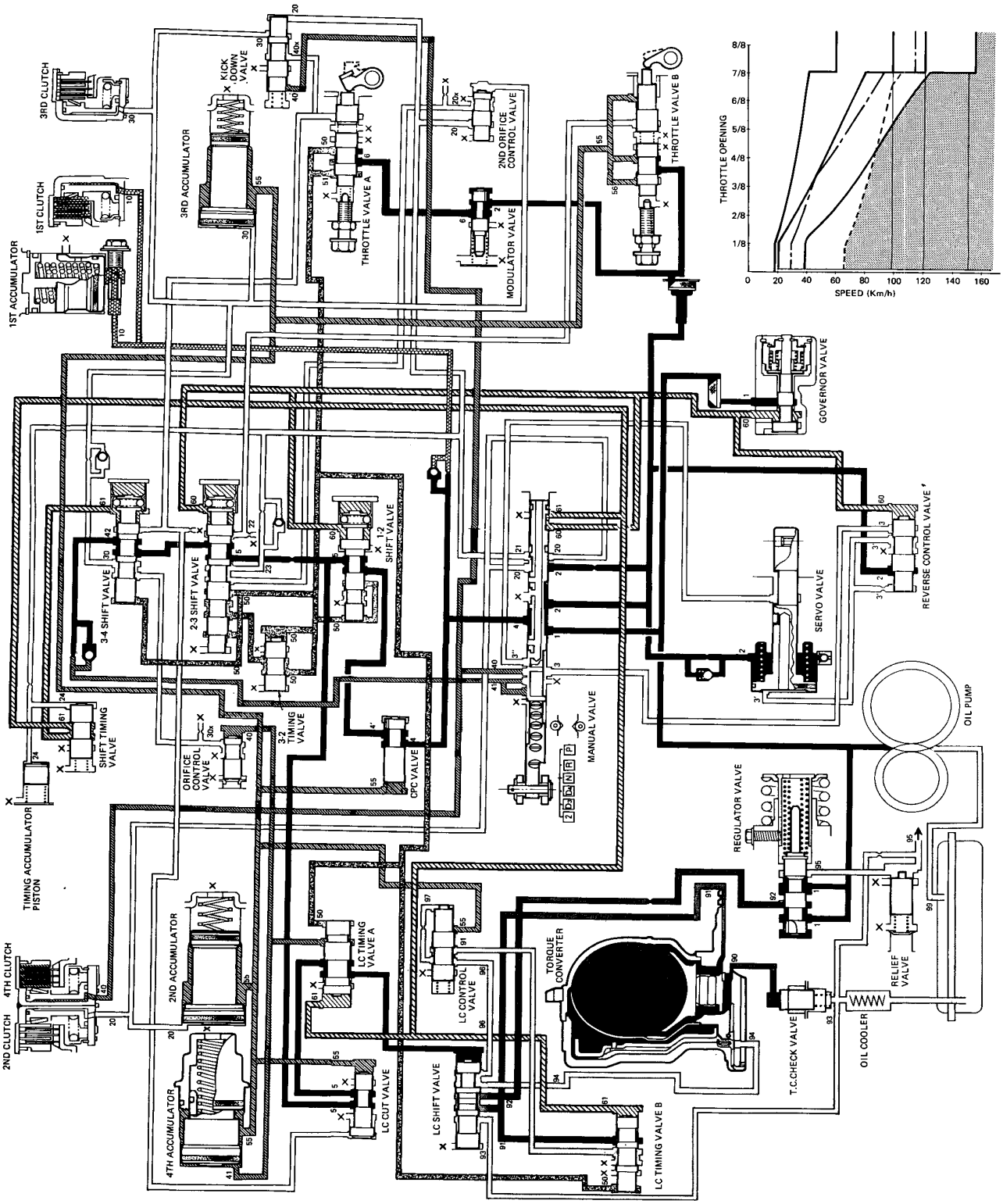


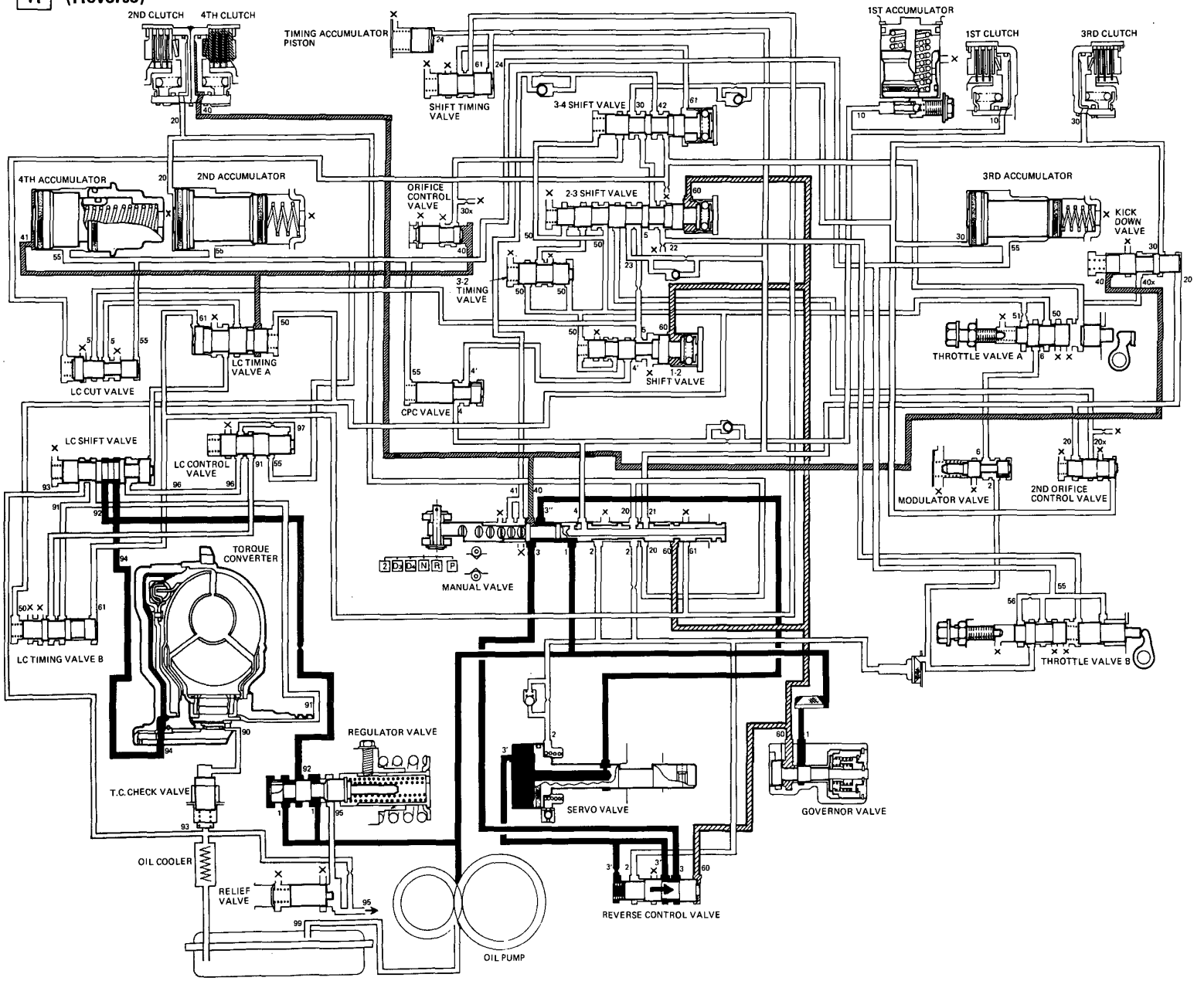
D_4 (In 4th Speed Range Lock-up Control Mode)



Automatic Transmission

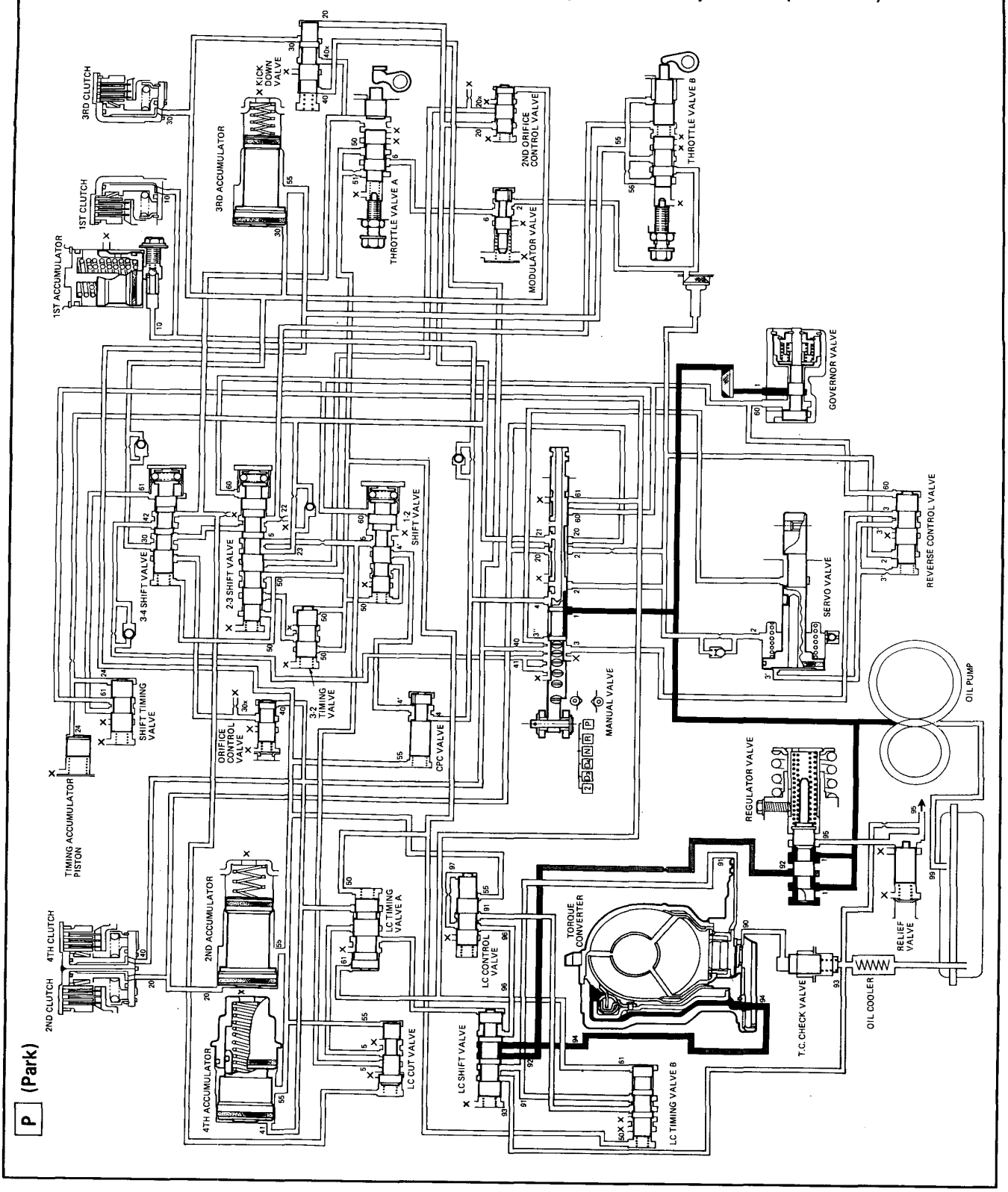
Explanation of Schematic Diagram of Hydraulic System (cont'd)




R (Reverse)
2ND CLUTCH
4TH CLUTCH
TIMING ACCUMULATOR PISTON
SHIFT TIMING VALVE
3-4 SHIFT VALVE
1ST ACCUMULATOR
1ST CLUTCH
3RD CLUTCH
4TH ACCUMULATOR
2ND ACCUMULATOR
ORIFICE CONTROL VALVE
2-3 SHIFT VALVE
3RD ACCUMULATOR
KICK DOWN VALVE
3-2 TIMING VALVE
LC TIMING VALVE A
LC CUT VALVE
CPC VALVE
1-2 SHIFT VALVE
THROTTLE VALVE A
LC SHIFT VALVE
LC CONTROL VALVE
MODULATOR VALVE
2ND ORIFICE CONTROL VALVE
TORQUE CONVERTER
MANUAL VALVE
LC TIMING VALVE B
THROTTLE VALVE B
REGULATOR VALVE
T.C. CHECK VALVE
SERVO VALVE
GOVERNOR VALVE
OIL COOLER
RELIEF VALVE
REVERSE CONTROL VALVE
OIL PUMP

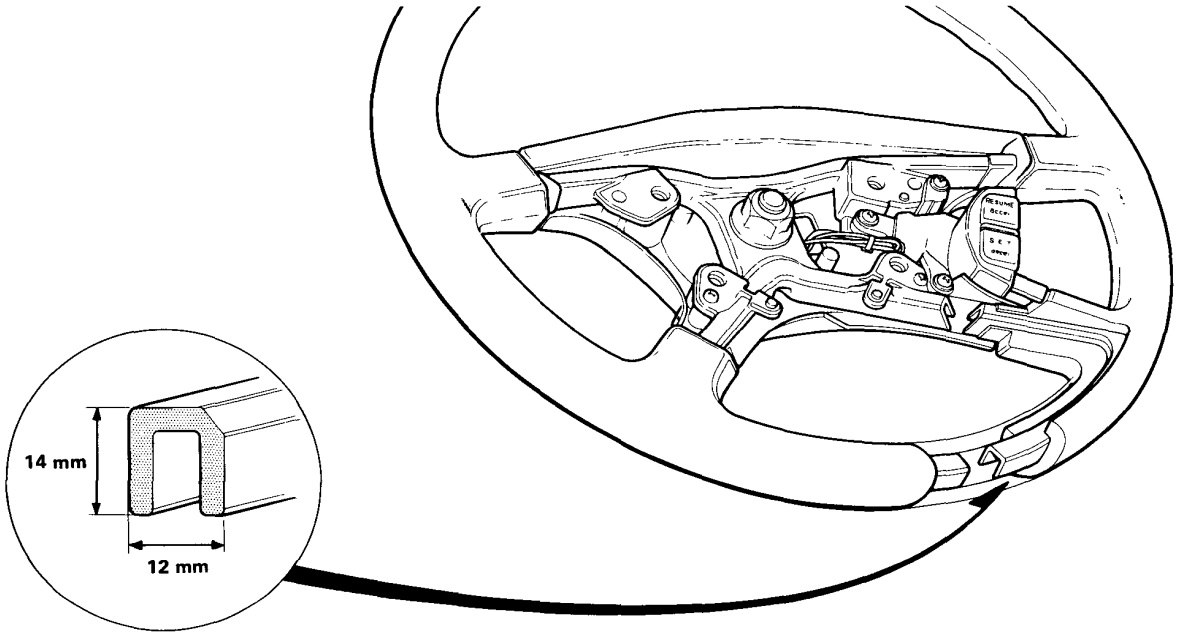
Automatic Transmission

Explanation of Schematic Diagram of Hydraulic System (cont'd)



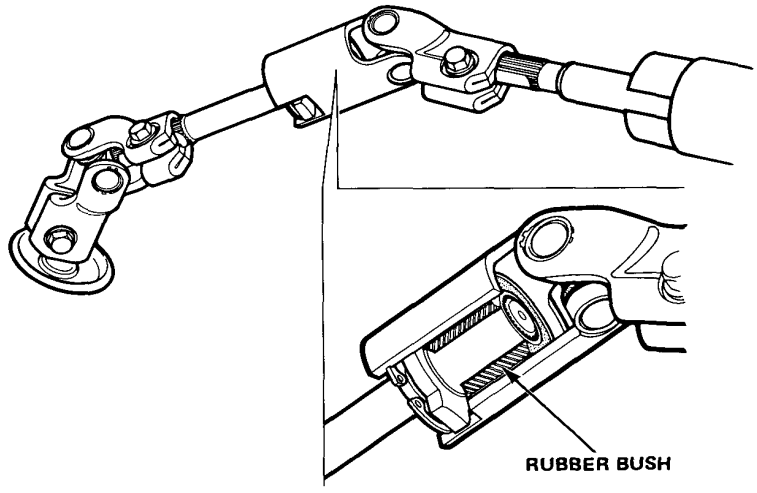
Steering Wheel

The steering wheel is in a configuration allowing excellent view of the instruments, and facilitates operating the horn from any position.



Steering Yoke Joint

A rubber bushing is provided within the steering shaft yoke in order to suppress the transmission of vibrations from the wheels. The space between the steering shaft pinions is connected by a cross joint containing two sets of needle bearings.

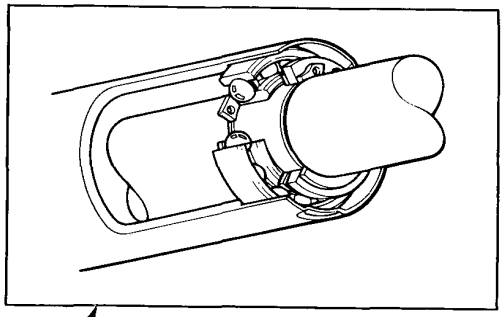


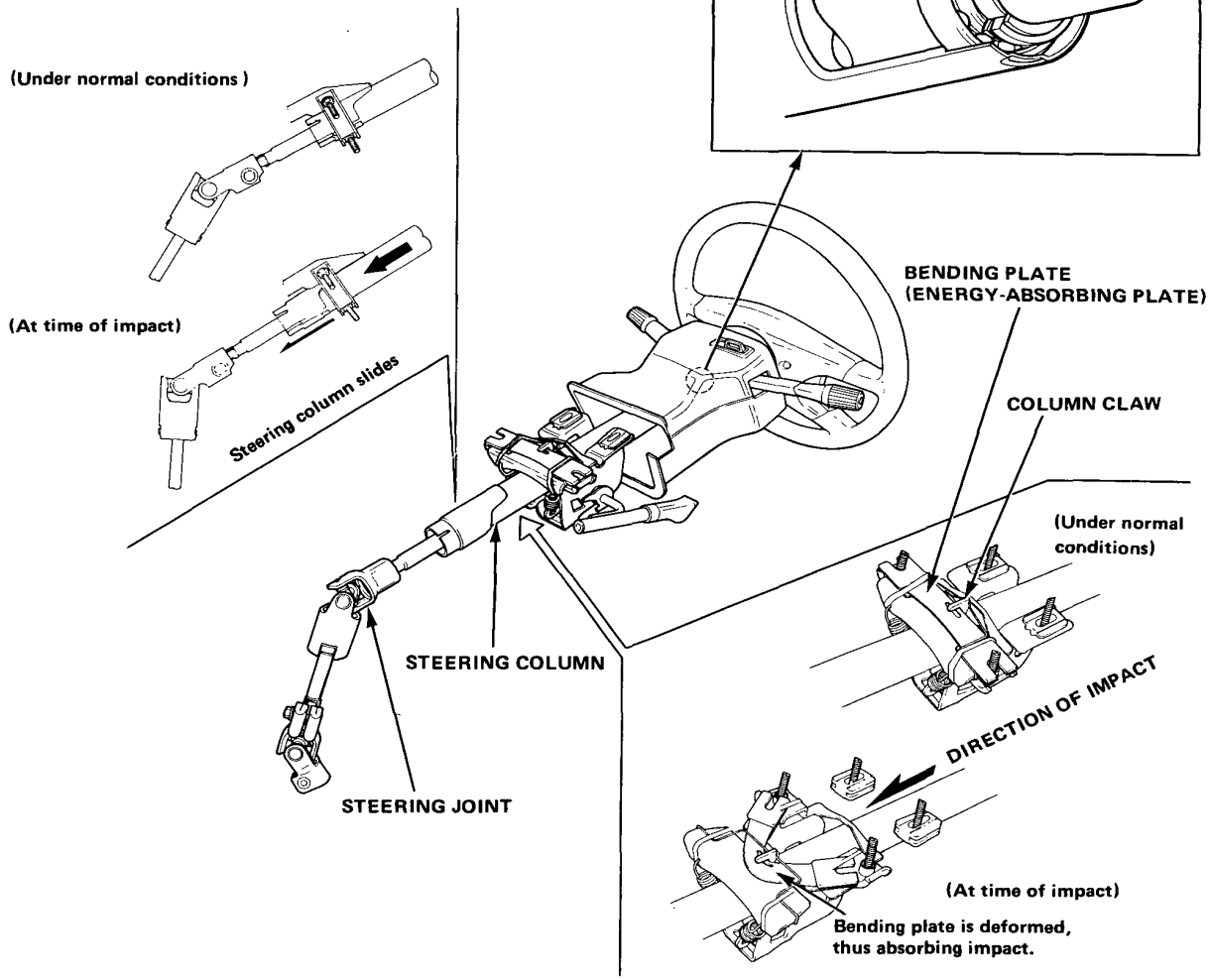
Energy-Absorbing Steering Column

General

The lower portion of the steering column is held in a bracket, allowing it to slide in the axial direction, while at the upper section, a claw welded to the center of the column catches on the bending plate (energy-absorbing plate). When force is exerted on the steering wheel side at time of impace, the bracket at the lower section of the column slides in the axial direction, so that the upper claw deforms the bending plate, and slides toward the front while absorbing the applied energy, thus softening the force of the impact.
A bearing joint is used in the steering shaft bearing to allow improved handling feel.

Steering wheel	Outer diameter (mm)	375
	Maximum number	3.7, 3.1 (P/S)
	Energy-absorbing method	Bending plate
Gear	Type	Rack and pinion
Steering angle	Inside	40°
	Outside	31°



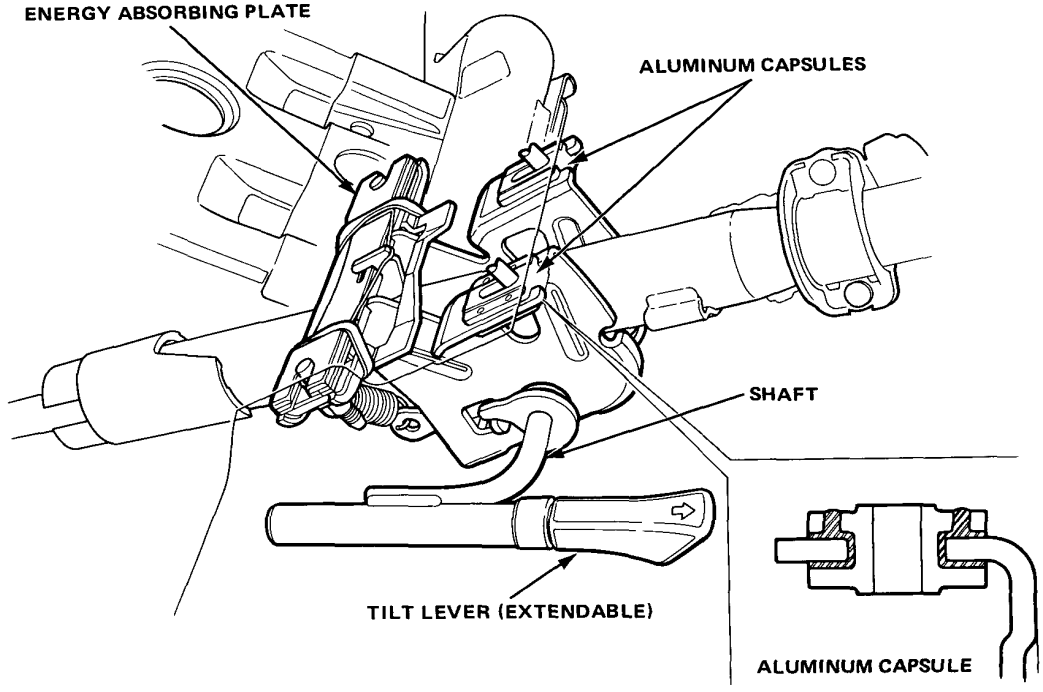


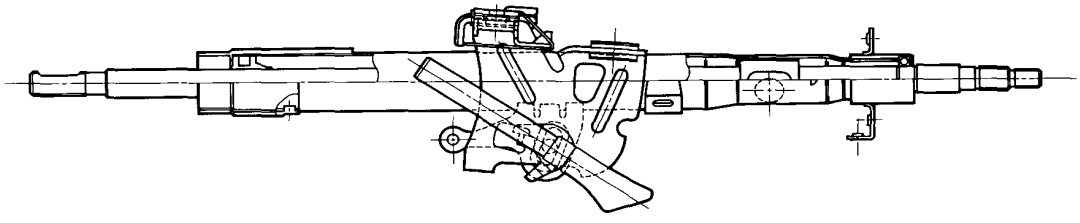
Tilt Steering

A tilt steering wheel is equipped on some types, thus allowing stepless adjustment of the height of the steering wheel in accordance with desired driving position.

Construction and operation

At the base of the steering wheel column is a pivot allowing the handle to move up and down, and a bracket with a slot is welded to the center of the column. The shaft linking the tilt operation moves within the slot.
The extendable tilt lever is attached to one end of the shaft, while screw threads are provided at the other end of the shaft to allow connection of the fixing nut.
The upper part of the steering column is connected to the underside of the dashbaord through the medium of this shaft, by means of four sluminum capsules and energy absorbing plates. When the tilt lever is pressed down (loosen), the steering column assembly is allowed to move up or down the extent of the length of the slot, thus allowing selection of the desired angle; the tilt lever is pressed upwards (tighten) to fix the position of the wheel. The aluminum capsules are provided on both manual and tilt steering models, and are injected with resin. In this way, when a strong shock is exterted on the column, the resin breaks, thus allowing thn column to move in the axial direction.
Built into the valve boby unit, and the two reactionchambers arranged around the 4-way valve.
The cutoff valve is located between the oil pump and the speed sensor passage, and functions to control the oil pressure to the reaction chambers. A direct passage to the oil tank is provided so that oil prssure is not applied on the spring chamber (rear chamber) of the cutoff valve.



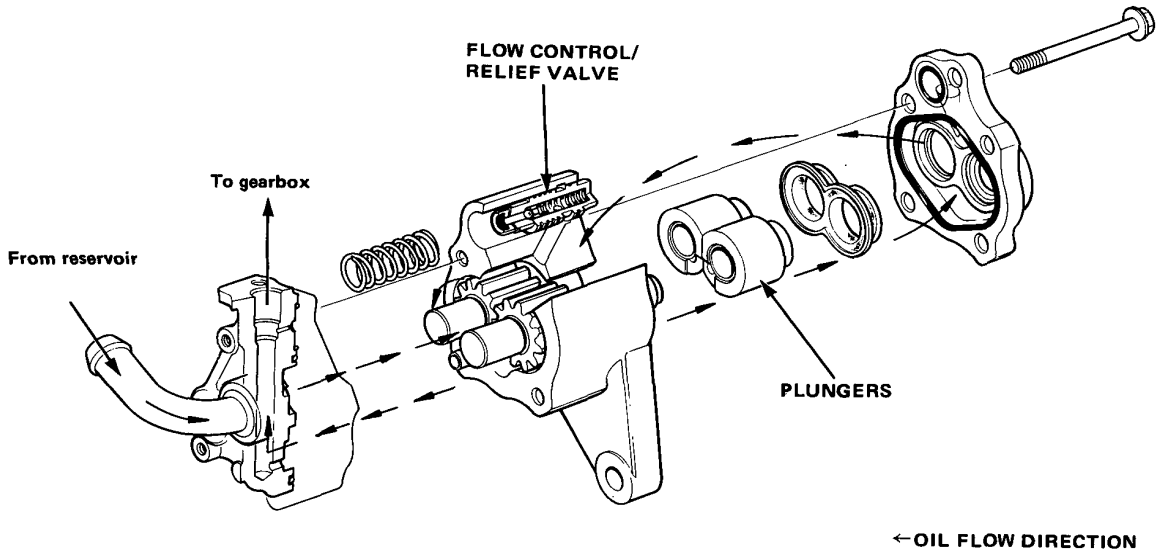


Power Steering

Pump

The location of the control valve is changed from the port housing to the pump housing to decrease the width of the pump.

The power steering pump is mounted at the left front corner of the engine and is driven by a V-belt from the crankshaft pulley. It uses a combination flow-control/relief valve to keep output pressure between 7839–8825 kPa (80–90 kg/cm^2, 1135–1280 psi). The pump is made of aluminum to reduce its weight and help it run cooler. It uses the a pressure balance system which allows fluid pressurized by the pump to flow behind two "floating" plungers, automatically maintaining the correct clearance between the other ends of the plungers, and the pump gears. This not only increases pump efficiency, but also improves durability, since the plungers can move to compensate for the expansion caused by high temperatures; otherwise the clearance would decrease, allowing more rapid pump wear.



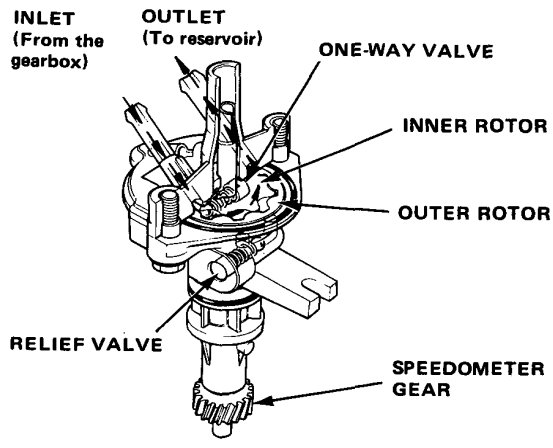
Speed Sensor

The speed sensor is a trochoid-rotor, hydraulic pump combined with a relief valve and a one-way valve. It is driven by the speedometer gear shaft which in turn is driven by a helical gear on the differential.

It turns only when the car is moving, controlling the cut-off valve by regulating fluid pressure in the control unit according to the speed of the car.

With the engine running in a parked car, fluid flow through the sensor rotors is blocked because the rotors are not turning.

As the car is driven away, the rotors start turning and pump fluid back to the reservoir, reducing pressure at the cut-off valve. The cut-off valve beings cycling, staying open for longer and longer intervals as the car accelerates and the sensor reduces the pressure further. This allows pressure in the reaction chambers to rise, restricting control valve movement more and more, and gradually reducing the assist as speed increases.



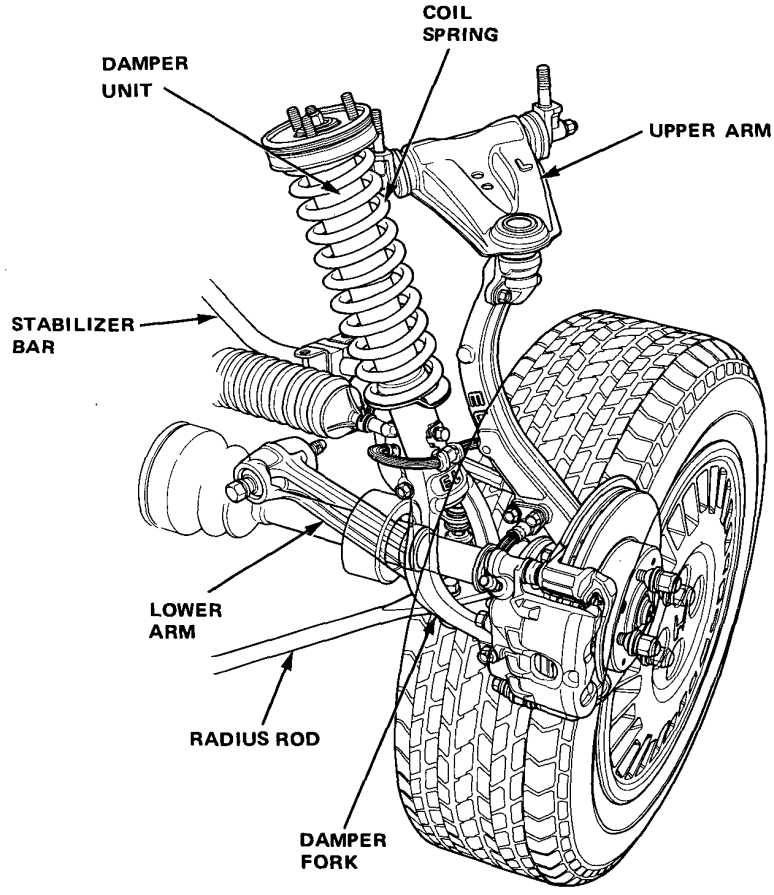
Front Suspension

General

A double wishbone independent suspension is used. It consists of a damper, coil spring, damper fork (connected to the lower arm), upper and lower arms, radius rod and stabilizer bar. With this suspension, there is less twisting motion imposed on the frame, or frame is less susceptible to changes in the road surface. When the wheel hits a bump, it is driven up and down, compressing and releasing the coil spring. The upper and lower ball joints allows the steering knuckle to pivot from side to side with reduced resistance. The arms are also so arranged so tio minimize "nose dive" by relieving impacts at braking toward the upper rear of the vehicle. The stabilizer bar provides better steering and controls body roll. The caster angle can be adjustedby simply changing the length of the radius rod.

Features

1. The upper arm is considerably shorter than the lower arm, contributing much to the large engine compartment. A large span between both arms increases rigidity and offers sufficient compliance forward and backward.
2. The damper fork straddles the drive shaft to reduce the height of the engine room.
3. The upper arm is twisted forward to increase the caster angle when the wheel hits a bump or hole in the rod.



(cont'd)

Damper

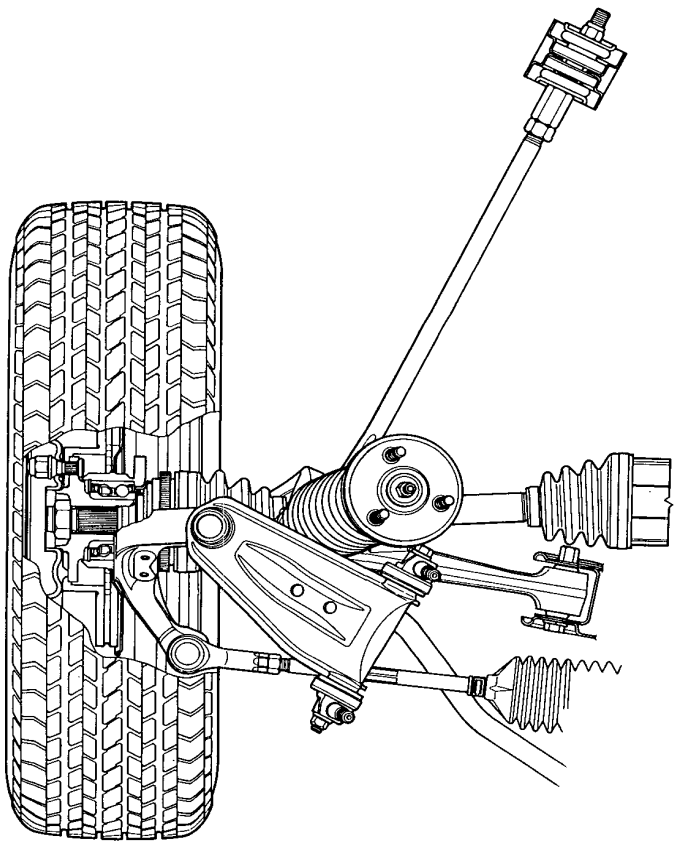
A telescopic hydraulic damper, mounted between the lower arm and front fender, cushions the violence of the damper spring when the wheel hits a bump. The sliding surfaces between the damper rod and guide use special materials which offer reduced resistance. The rubber bushing at the bottom and spring mount rubber at the top combine to insulate the damper from the frame to prevent transmission of noise and vibration between the two. The spring mount rubber also serves to absorb vibrations in the damper spring.

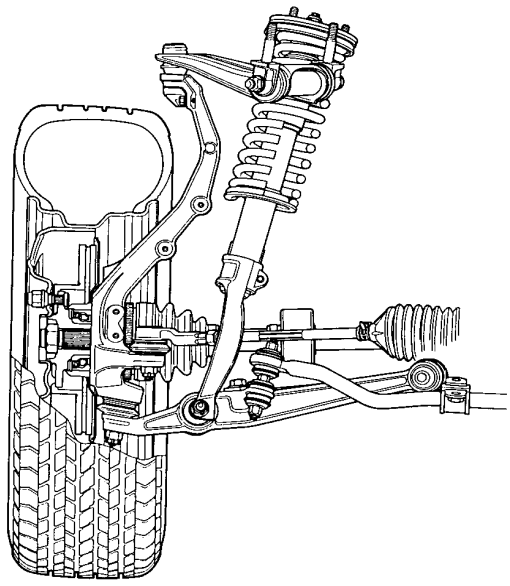
Steering knuckle

The steering knuckle is sturdy steel casting with extra margin of capacity against twisting. The top of the knuckle is attached to the upper arm ball joint with nuts. The bottom is attached to the lower arm also with nuts.

Upper and Lower Arms

The upper arm is a pressed steel plate and is carried by a bolt through a rubber bushing.
The lower arm is an I-shaped steel forging; the damper fork and redius rod are attached to this arm. The inner end is carried at its mount through a rubber bushing which allows the arm to pivot when it travels up and down.





Rear Suspension

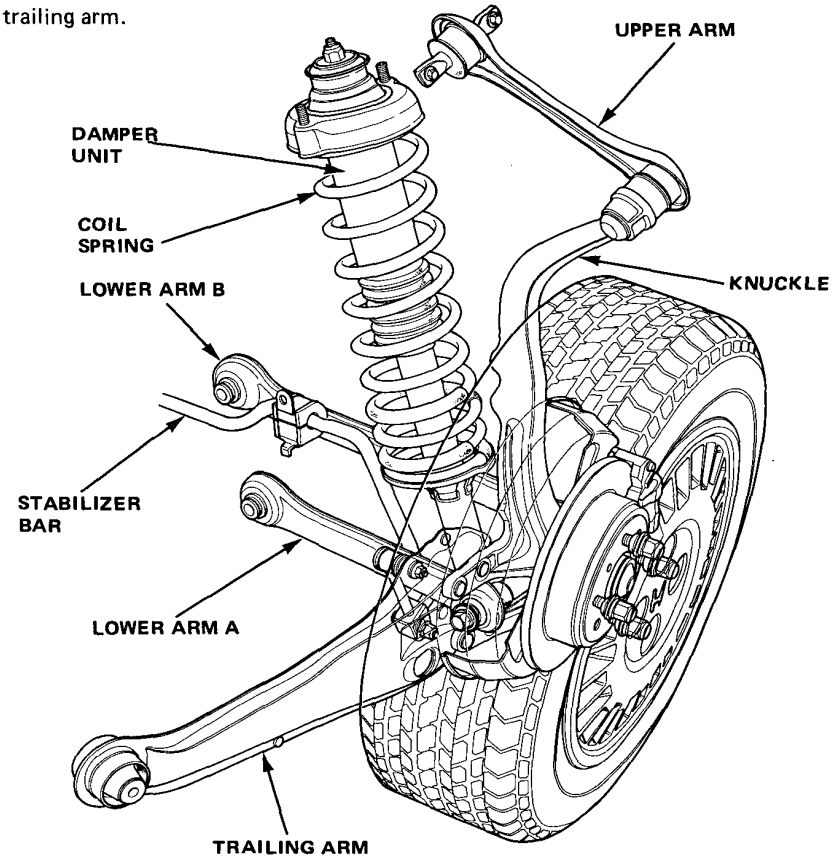
The rear wheels also use a double wishbone independent suspension without sacrificing the size of the internal space. It is similar to that used for the front wheels, ensuring greater stability and improved performance at high speed or on winding mountain roads.

General

The knuckle carries a trailing arm, upper arm, damper with coil spring, and set of two lower arms. The trailing arm is a pressed steel plate construction. The front end of the trailing arm is attached to the frame through a bracket and a rubber bushing by bolt. The rear end is fastened to the knuckle with four bolts and nuts. Thus, as the knuckle moves up and down, the arm twists the rubber bushing at its pivot. This plus some degree of laterial deflection in the arm as it encounters strees during operation permit smoother up-and-down knuckle movement. This also minimizes "lifting" as braking and offers desirable compliance. The top of the knuckle is attached to the upper arm through a ball joint above the rear tire. The upper arm is again a pressed steel plate construction and is attached to the frame through a rubber bushing. This arm and set to two lower arms control camber and minimize changes in tread to take advantage from the tires and front suspension to the fullest extent. The two lower arms have different lengths. Thus, as the knuckle moves up and down, they draw different arcs. This reduces changes in toe to virtually zero (0), providing excellent performance at high speed in straight-ahead. The right and left lower arms are interchangeable with each other. The damper, together with a progressive-rate coil spring, is mounted between the frame and bottom of the knuckle such that frictional resistance caused by side forces is minimized.

Features

1. Extended upper arm over the tire to produce ample rear space.
2. Better rear-end geometry through use of a double wishbone independent suspension.
3. Increased rigidity through a broad space between upper and lower arms as well as improved compliance forward and backward.
4. Anti-lift effect by trailing arm.



(cont'd)

Rear Suspension (cont'd)

Damper

The damper, mounted between the bottom of the knuckle and rear wheel house, cushions the violence of the damper spring. The rubber bushing at the bottom and spring mount rubber at the top insulate the damper from the frame to prevent transmission of noise and vibration between the two. The upper spring rubber also serves to absorb vibrations in the damper spring.

Knuckle

The knuckle is a sturdy steel casting with an extra margine of capacity against twisting.
The top of the knuckle is attached to the ball joint on the upper arm with a nut. The bottom is fastened to the two lower arms through bushings. Directly attached to the front end is the trailing arm.

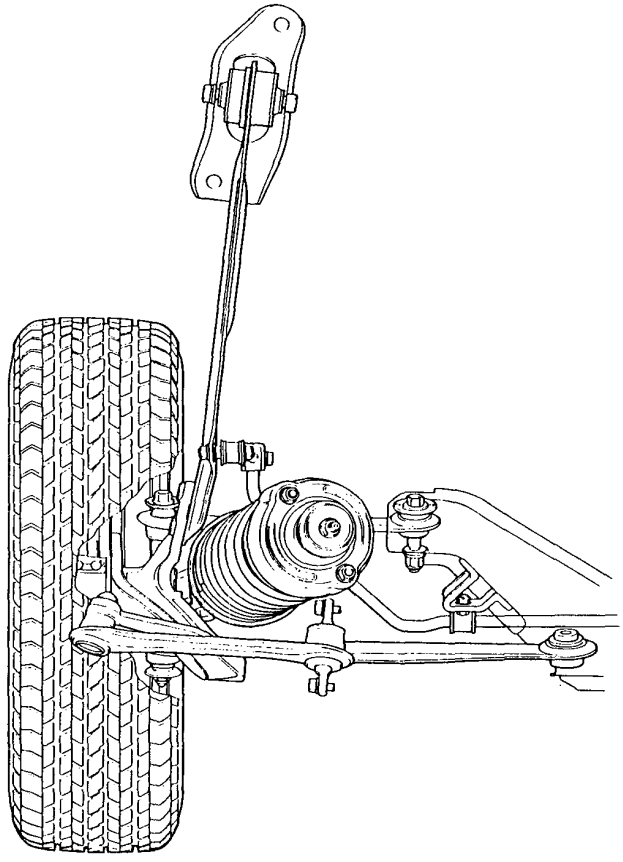
Upper Arm

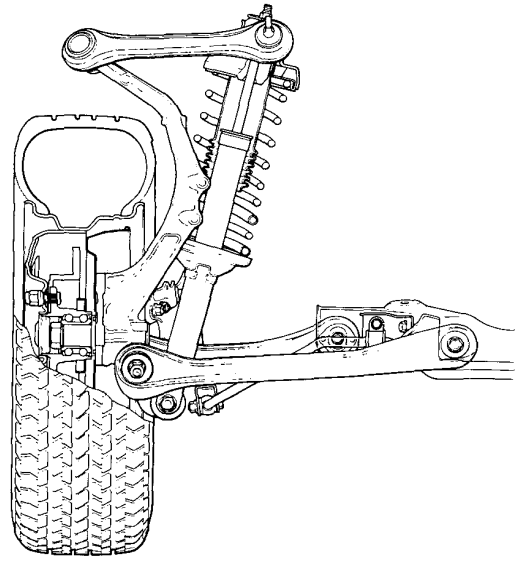
The upper arm is a husky pressed steel plate; it is attached to the rear wheel house through a bushing and to the knuckle through a ball joint.

Lower Arm

The lower arms are also a steel plate consturction and have different lengths. They are arranged side by side in parallel with each other. They are attached on one end to the rear cross beam through bushings and on the other to the knuckle through bushings.

CAUTION: Tighten the arms with the wheels under vehicle load.

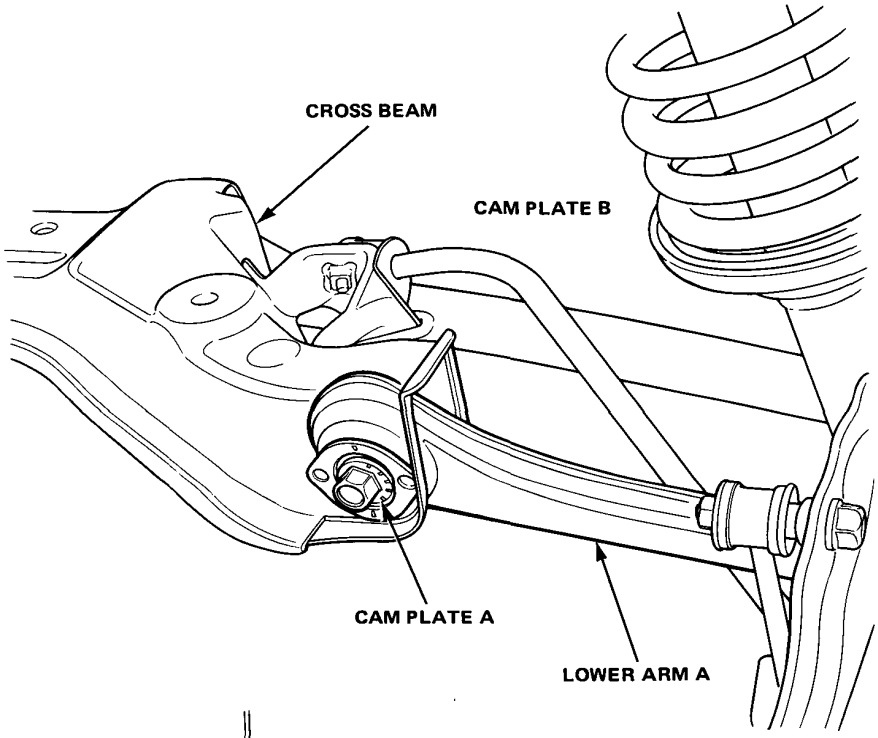


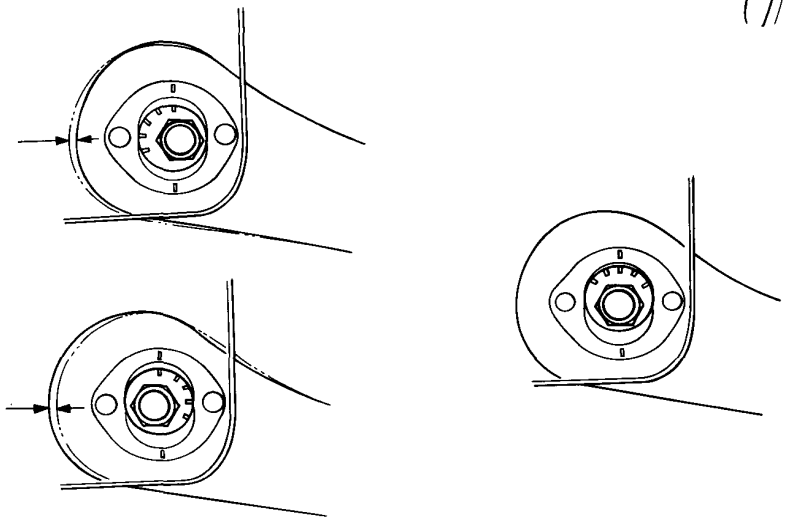


Rear Wheel Aligmment

Rear wheel alignment adjustment mechanism

Adjustment of rear wheel alignment is performed by an eccentric cam mechanism. An eccentric cam plate is unified with the bolt joining the rear suspension crossbeam and the lower arm A. A notch is provided on the end of the bolt, and this notch fits into the eccentric cam plate B. Also, the rear beam's attachment hole is in the form of a right-left slot. As a result, when the nut is loosened and the adjustment bolt is rotated, th lower arm A moves in the right-left direction, thus allowing adjustment of the toe (each rotation scale marking moves the bolt about 1.3 mm, resulting in a toe change on the respective wheel of about 4.1 mm).

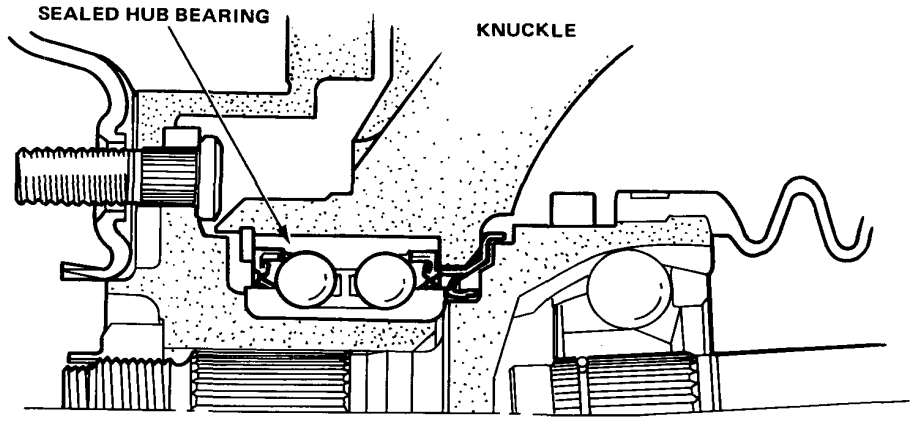




Axle

Front axle

A dust protected ball bearing, mounted between the steering knuckle, drive shaft outboard joint and hub, is used to support the front axle. The sealed end serves as an inner race whereas the press-on end acts as an outer race, making the bearing less susceptible to eccentricity and other strains, as well as entry of dust and mud. The extended bearing outer and inner races allow use of a recessed dust seal which permits easier installation and offers a greater effect of labyrinth.



Rear axle

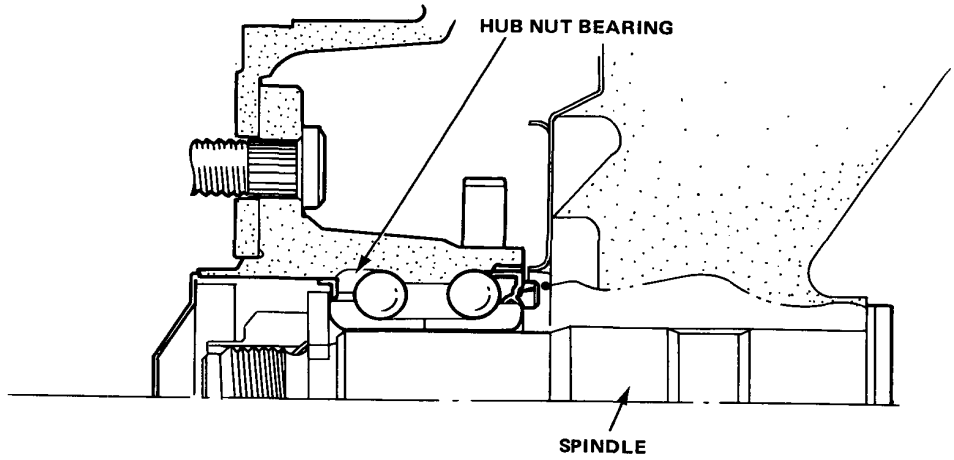
An angular contact bearing is integrated with the wheel hub in that the wheel hub serves as an outer race of the bearing.

Features:

- Lightweight
- Improved sealing
- Reduced rolling resistance
- Easier installation
- Life-time lubricated

Other features include:

1. Shorter spindle through use of an angular ball bearing.
2. Less susceptible to eccentricity and other strains.
3. Dust protected with a dust guard.
4. Less wear, less resistance to rolling.
5. Elimination of press-fitting outer race.
6. Elimination of preload adjustment.
7. Easier shoe replacement (drum brake type)



Front Disc Brake

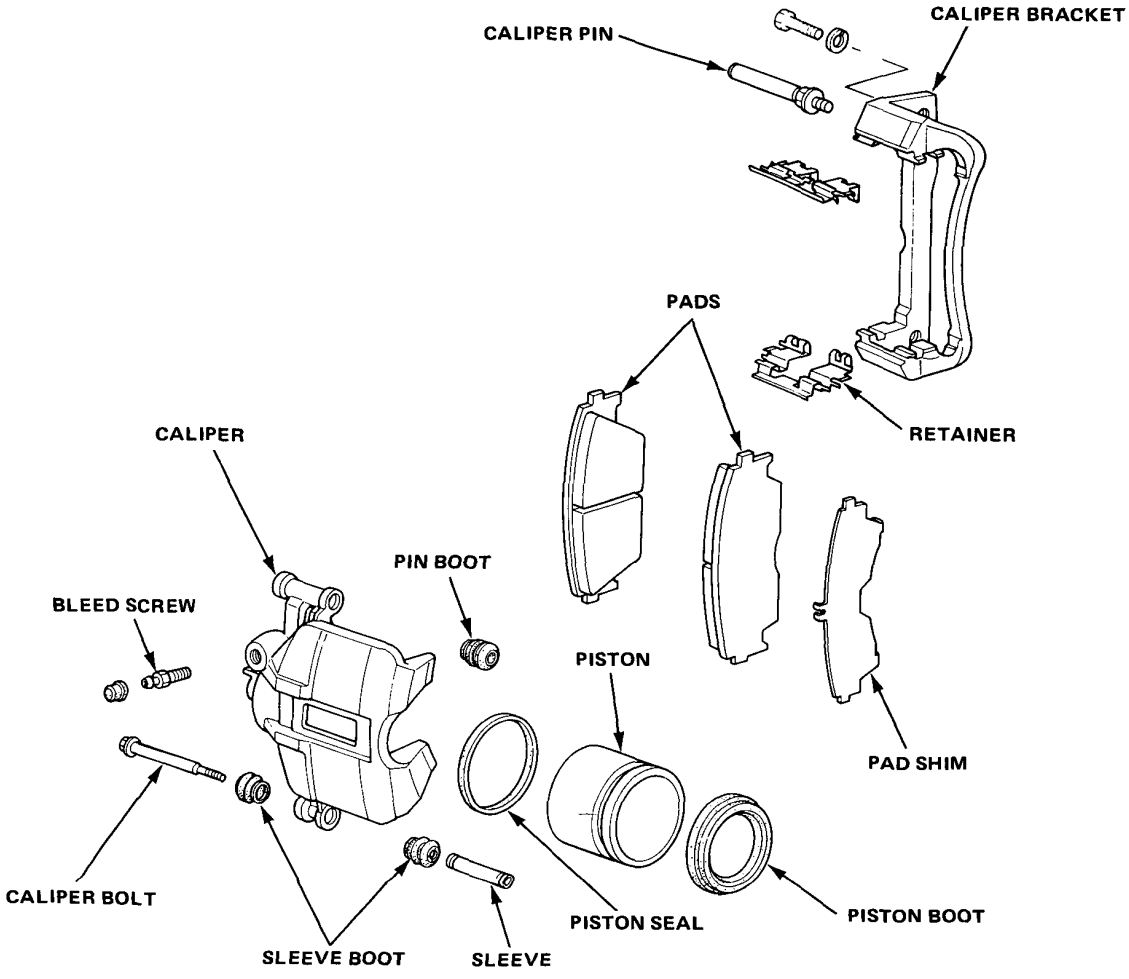
The front disc brakes is of a single piston design:

Front brake specifications

Item \ Type		ADR54
Cylinder	(mm)	53.97
Cylinder cross section area	(mm)	22.88
Effective brake radius	(mm)	97.0
Outer disc diameter	(mm)	242.0
Disc thickness	(mm)	19.0
Pad area, excluding slits	(mm)	43.3
Pad thickness	(mm)	10.0

Construction

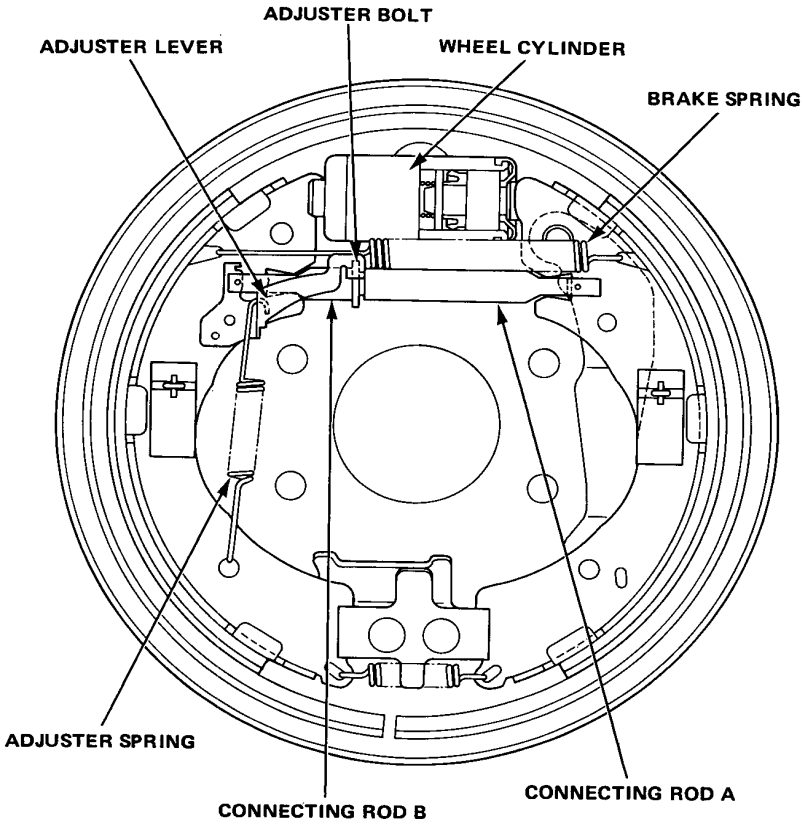
In this reverse type brake, a pin is fixed to the caliper bracket, and slides with respect to the bracket which is fixed to the knuckle. The sliding section is completely protected from dust by a bushing. The piston fits into the caliper body cylinder, and is sealed by a dust seal and piston seal. On the other hand, the pads fit into grooves in the bracket and slide in those grooves.

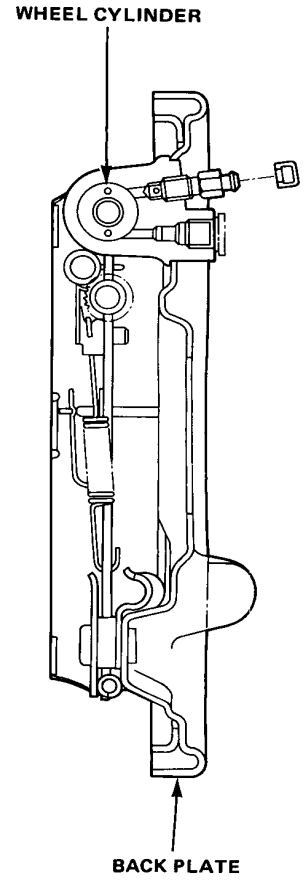


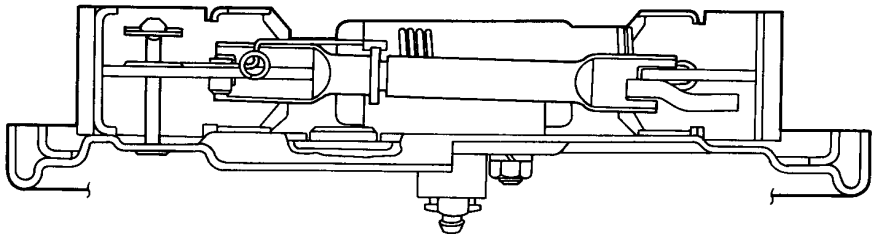
Brake

Rear Brake (Drum Type)

The rear drum brake is a leading-trailing type, and is equipped with an automatic self-adjustment mechanism.







Rear drum brake specifications

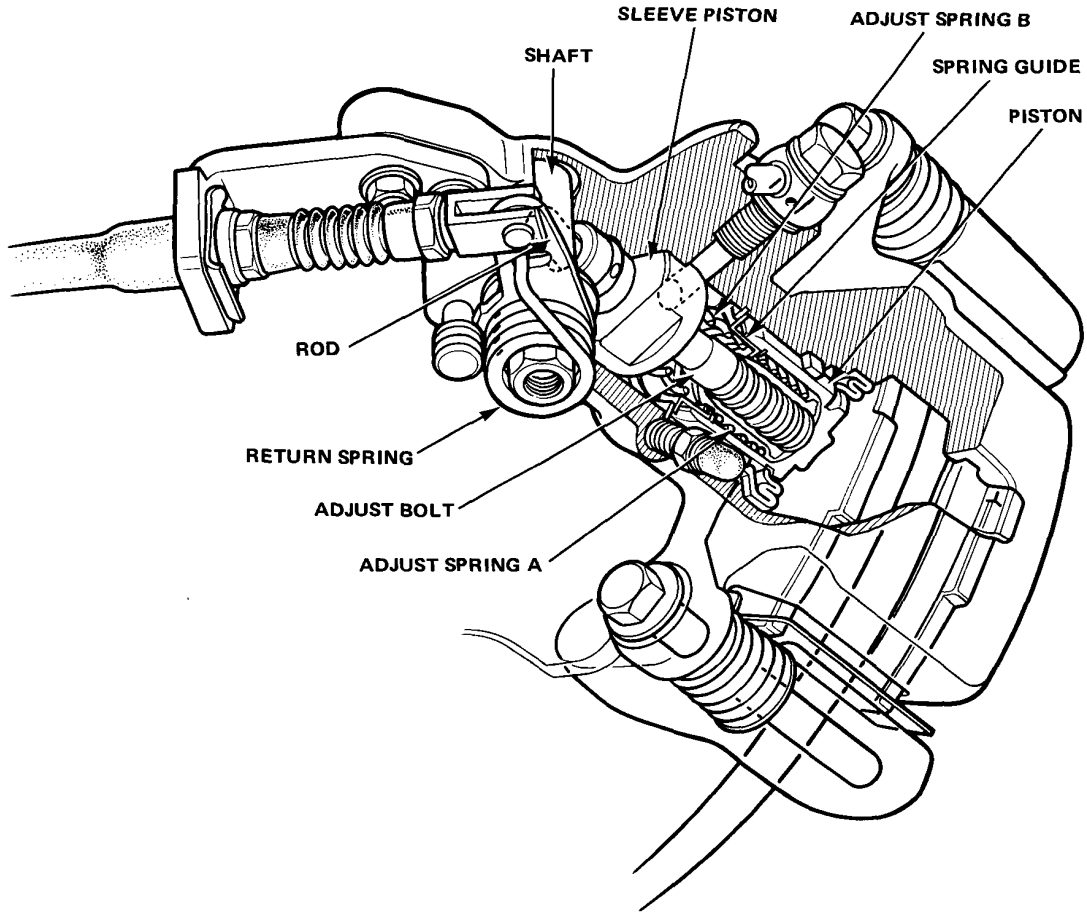
Type		Hydraulic servo assisted leading trailing shoe drum brake
Lining dimensions (width x thickness x length)	(mm)	35 x 4.5 x 192
Lining surface orea	(cm^2)	67
Brake drum diameter	(mm)	200
Wheel cylinder bore	(mm)	20.64

Rear Disc Brake

The Rear disc brake is equipped for some types:

Construction

The rear disc brake used is a collet type floating disc brake, differing somewhat from the reverse type front brake. Of particular difference is the face that the rear disc brakes are equipped with an automatic self-adjustment mechanism that maintains the parking brake stroke at a constant value.
Component parts include the adjustment springs A, B, piston spring guide, sleeve piston, shaft, rod, return spring, and adjustment bolt.



Rear disc brake specifications

Cylinder size	(mm)	30.23
Cylinder area	(cm^2)	7.18
Effective brake radius	(mm)	104
Outer disc diameter	(mm)	239
Disc thickness	(mm)	10
Pad area	(mm)	21
Pad thickness	(mm)	8

(cont'd)

Rear Disc Brake (cont'd)

Automatic Self-Adjustment Mechanism

Operation (1) (normal brake operation)

Hydraulic pressure produced when the brake pedal is depressed is exerted on piston (1). This operates to exert pressure on the pad side through the union of the piston (1) and the adjustment nut (2).

The adjustment nut (2) and the adjustment bolt (3) are joined by a four-thread interlock as shown in the upper right of the illustration below, with a clearance provided between them. Accordingly, the piston (1) and adjustment nut (2) move toward the pad side (4) only the amount of the clearance, thus performing the braking action.

Operation (2) (excessive adjustment prevention operation)

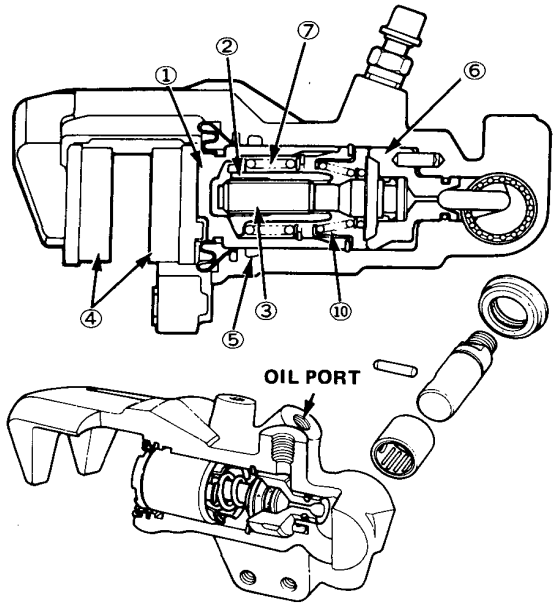
If high hydraulic pressure causes the brake to operate more than the clearance distance, the clearance of the four-thread interlock of the adjustment bolt (3) becomes as shown in the lower right illustration. In this case, the adjustment nut (2) and adjustment bolt (3) form a single unit, and the piston (1) alone contracts the adjustment spring A (7), thus moving toward the pad side (4), and performing the braking action.

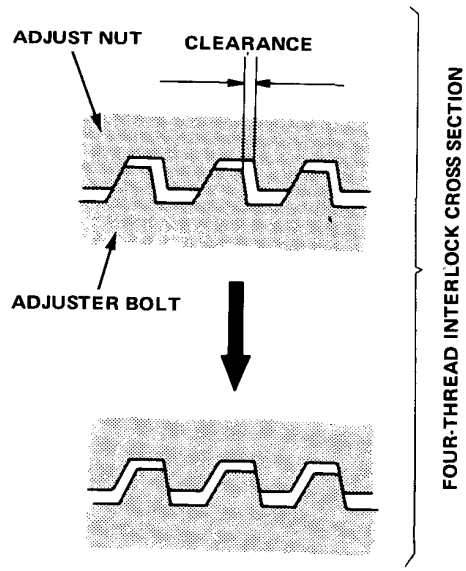
Operation (3) (adjustment mechanism operation)

When the pads are worn and hydraulic pressure is applied, the adjustment nut (2) moves together with the piston (1) to fill in the thread clearance. When there is more pad clearance than the thread clearance, the adjustment spring B (10) is contracted as the piston (1), adjustment nut (2), and adjustment bolt (3) continue to move together a small additional distance.

A clearance will be temporarily created between the adjustment bolt (3) and sleeve piston (6), but since hydraulic pressure is exerted on the adjustment bolt (3) as well, the adjustment bolt (3) moves back the distance necessary to fill in the clearance between the adjustment bolt (3) and sleeve piston (6).

In this way, the adjustment bolt (3) operates just the amount of pad wear, thus performing automatic self-adjustment. Piston (1) is returned in the same way as the front disc brake, as the piston seal (5) returns, thus creating a force causing th episton to return.





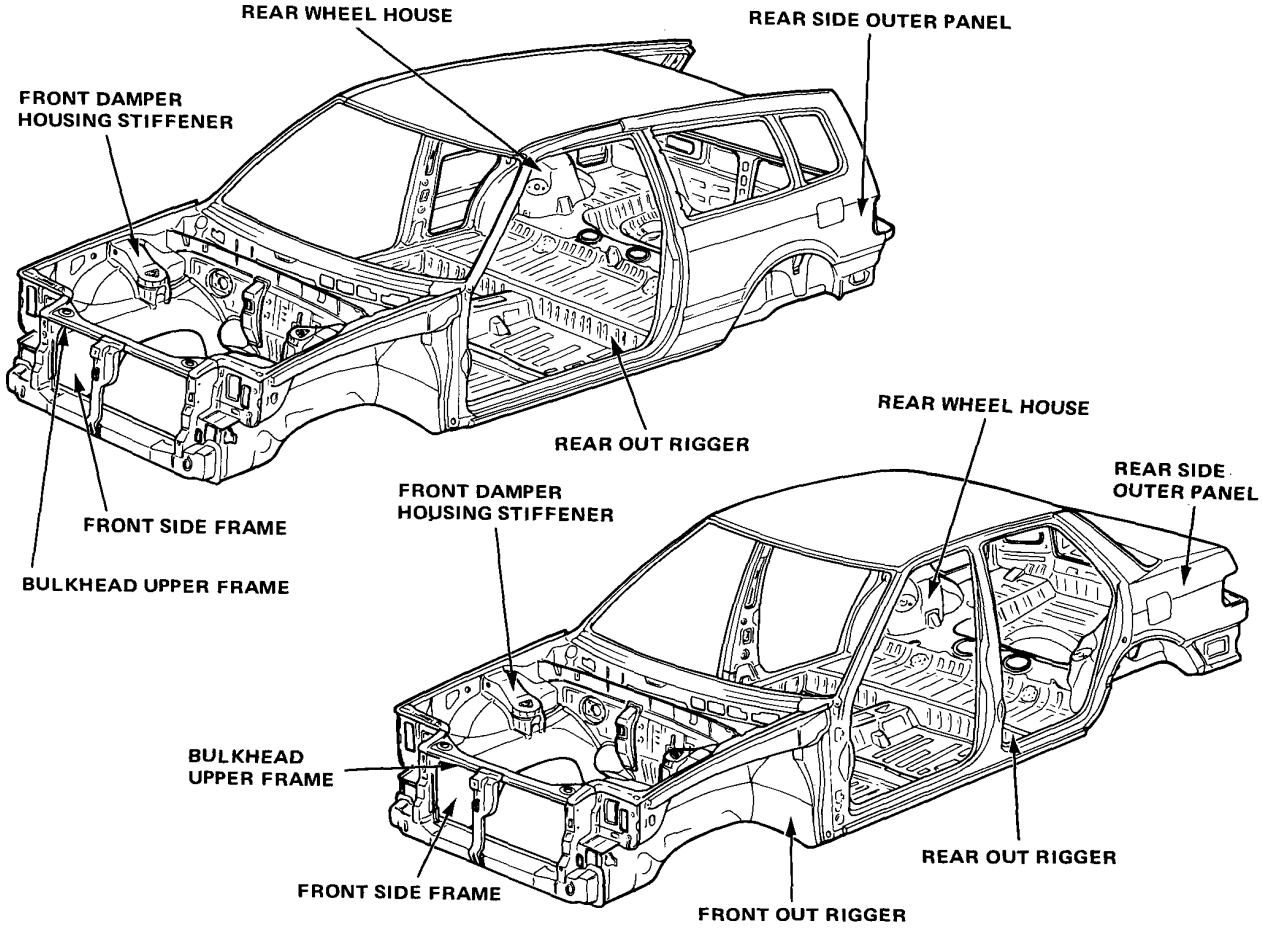
Body

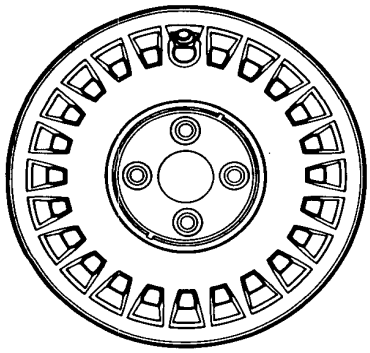
Body

Construction

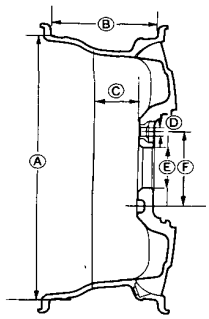
The body is of welded steel plate monocoque construction.
The side panel outers, which serve the roof side as well, from closed-section side rails, giving the body exeptional rigidity together with the side sills.
In regard to safety, collision test findings have been applied in construction and in the pillars, side sills and roof rails surrounding the cabin have increased rigidity. In case of collision, the safety of the driver and passenger is maintained by collision energy absorption in the front by deformation of the front side frame and in the rear by the spare tire in the rear trunk.
The front side frame is built-in to form a light, strong, closed-section, the front part of which is connected to the front bulkhead, and to the rear part to the front floor, thus providing strength and rigidity in regard to vibration from the engine and front suspention as well as in regard to external forces. As the strong closed-sections have been extended from the front side frames through the front floor, vibration noise from the engine and suspension is dispersed and absorbed.

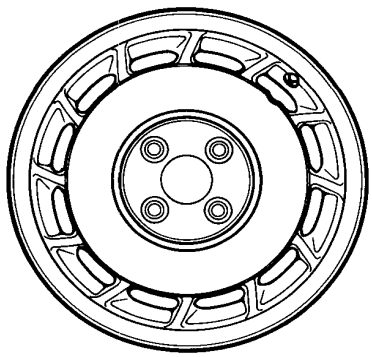
The 3-door model, which is based on the 4-door model, is also of sturdy steel monocoque construction. Wheelbase and tread are identical to the 4-door model but the rear portion of the rear trunk is approx.200 mm shorter in than the 4-door model.



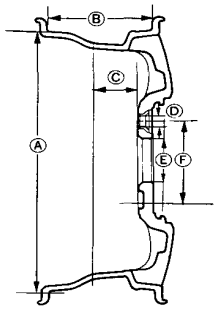


5–JX13

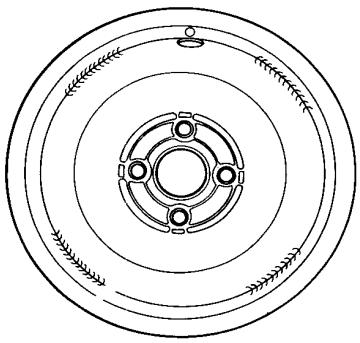


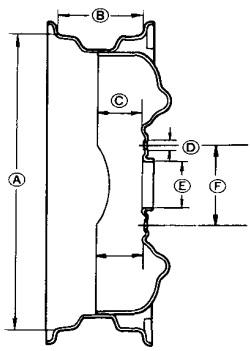


5–½–JJX14



	(A) <mm>	(B) <mm>	(C) <mm>	(D) <mm>	(E) <mm>	(F) <mm>
5–JX13	329.4	127.0	45.0	14.0	56.0	100.0
5½–JJX14	354.8	140.0	↑	↑	↑	↑

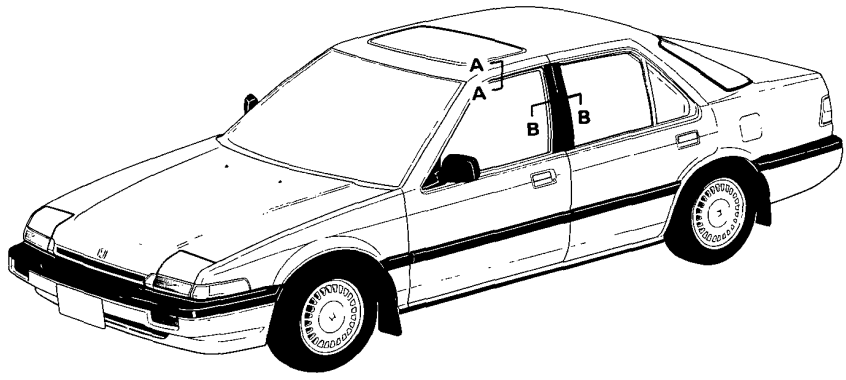


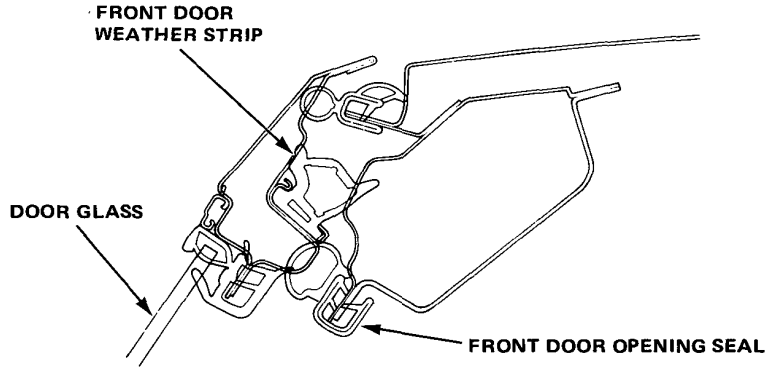


	(A) <mm>	(B) <mm>	(C) <mm>	(D) <mm>	(E) <mm>	(F) <mm>
4–TX13	329.4	102.0	50.0	15.0	56.0	100.0
4–TX15	380.2	↑	45.0	↑	↑	↑

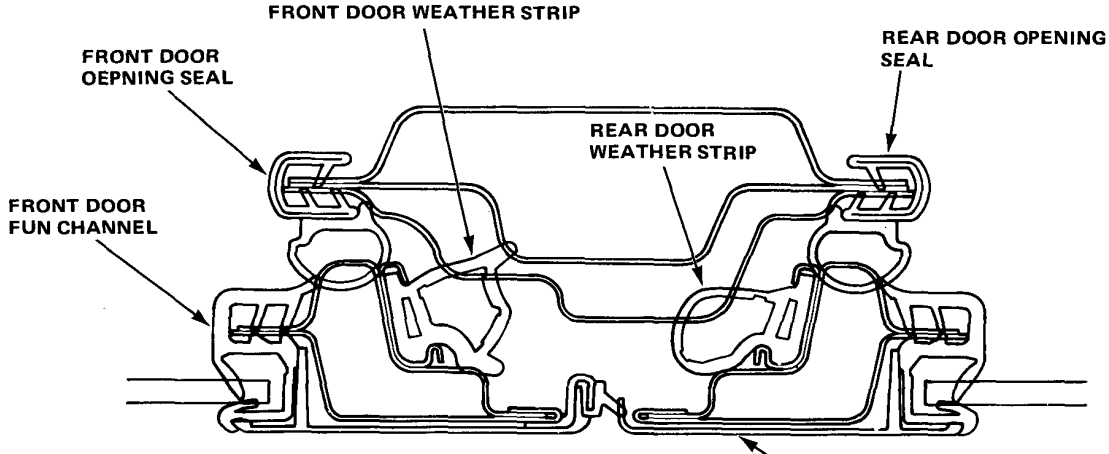
Flush Surface Exterior

In order to reduce air resistance, a flush surface design has been pursued.
An incredible CD value of 0.32 (4-door model) is achieved by reducing height differences between the body and the window glass.





[SECTION A–A]

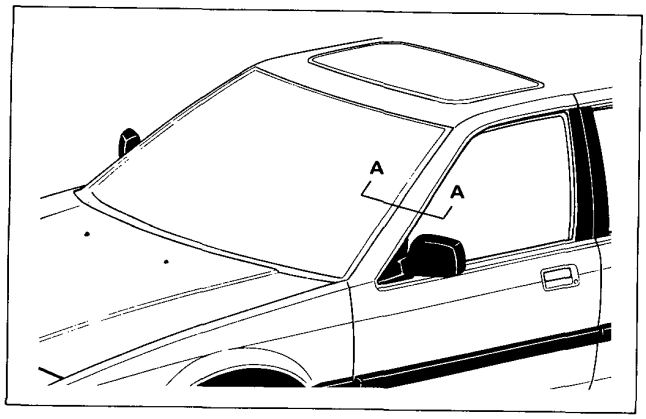


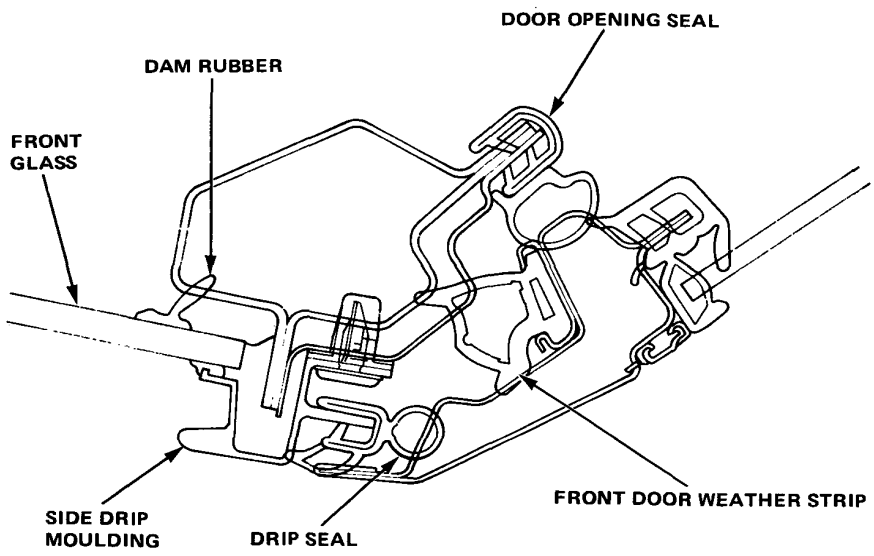
[SECTION B–B]

Body

Front Window Side Drip

Front window side drips are newly provided to prevent the rain water and windshield washer liquid from flowing around to the side windows. The side drip also reduce noise and chipping of the front door edge.

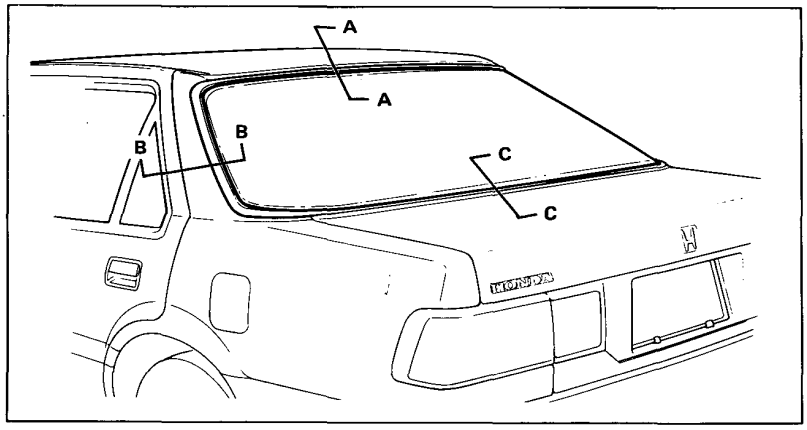


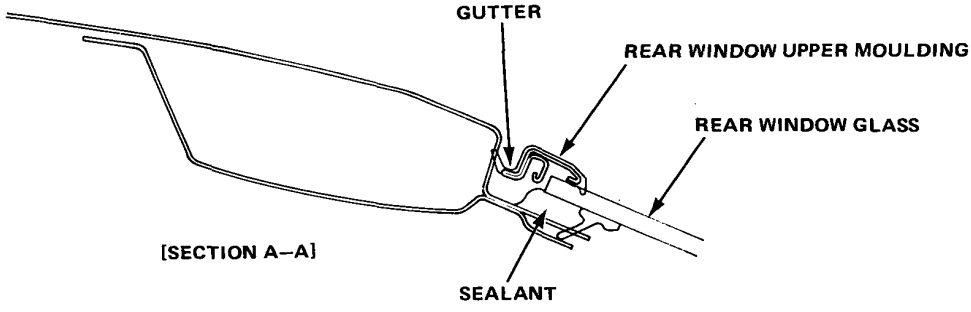


[SECTION A–A]

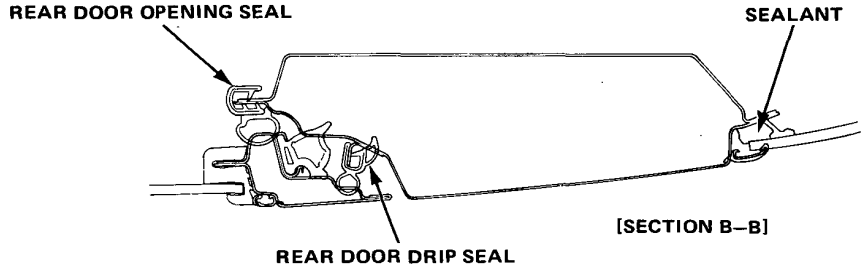
Rear Window (4-door Model)

Flush surface design is also applied to the rear pillars and rear window to reduce air resistance. A gutter is newly provided on the rear window upper moulding. The gutter prevents water from dripping from the roof on to the window and obscuring rear view.

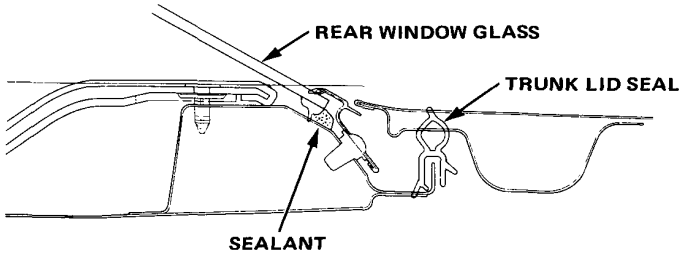




[SECTION A–A]



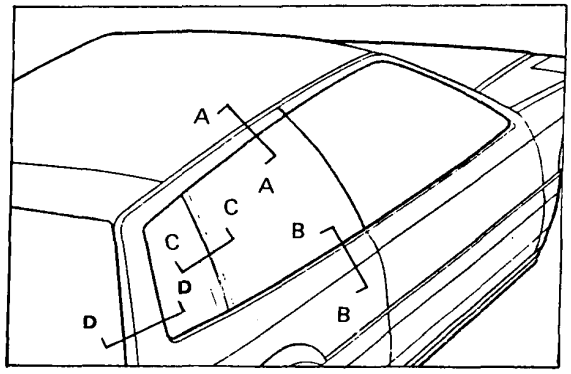
[SECTION B–B]

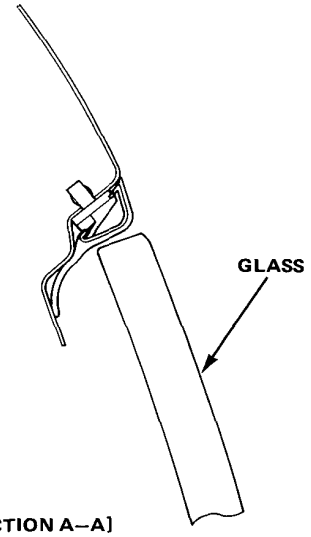


[SECTION C–C]

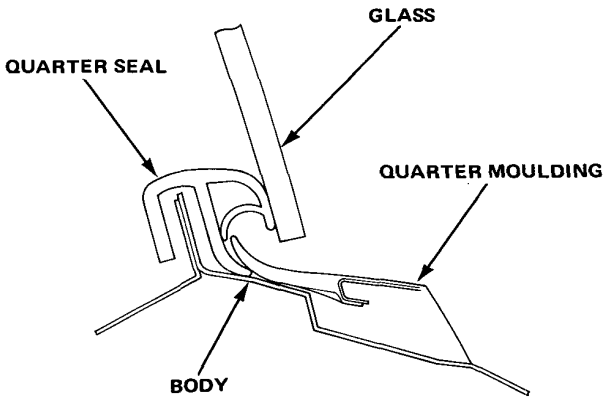
Quarter Windows (3-door Model)

The quarter windows provide an extra-wide glass section for the cabin and the quarter pillars are covered with glass to reduce air resistance, further contributing to the clean lines and flush surface design.

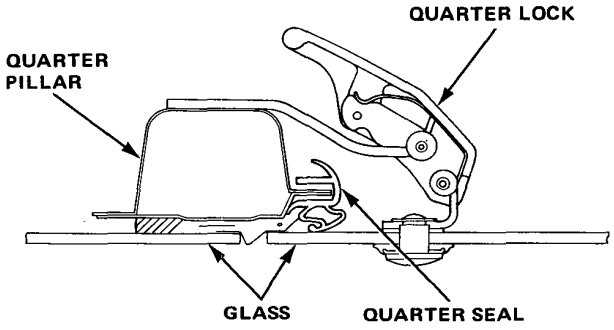




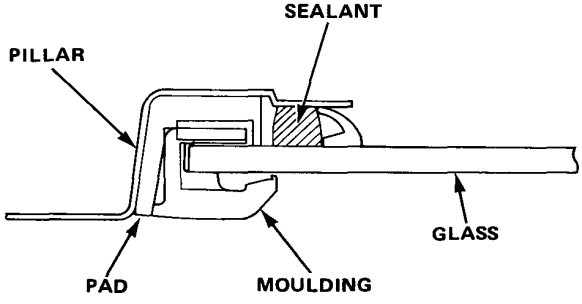
[SECTION A–A]



[SECTION B–B]



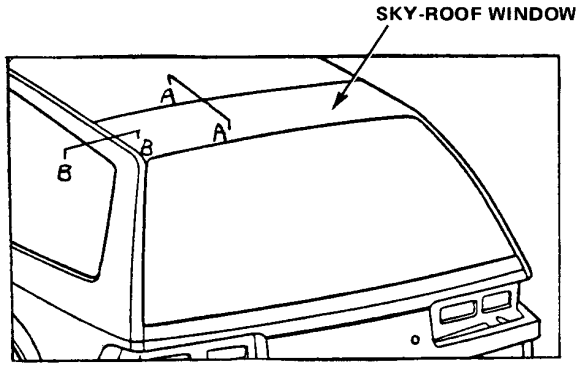
[SECTION C–C]

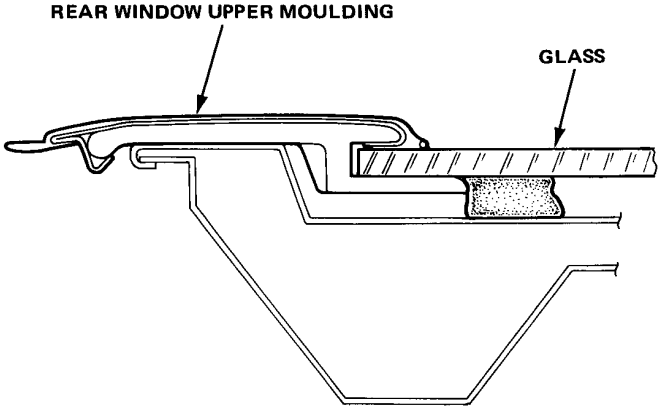


[SECTION D–D]

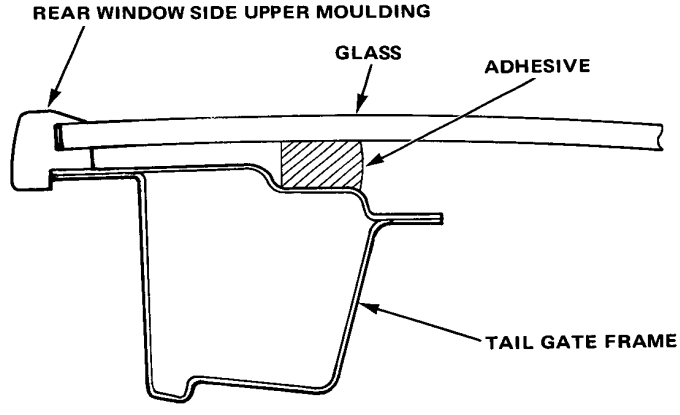
Sky-roof Window (3-door Model)

The progressive Sky-Roof window provides an open, airy and bright cabin. It also contributes to the flush surface design concept.





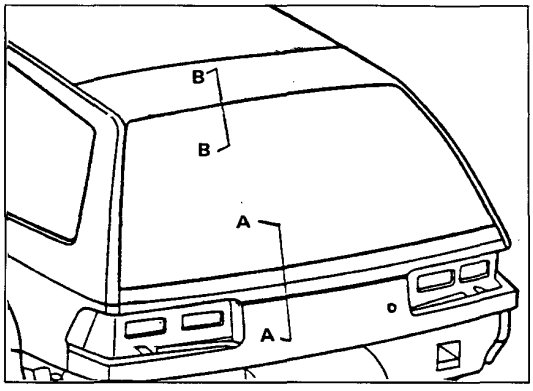
[SECTION A–A]

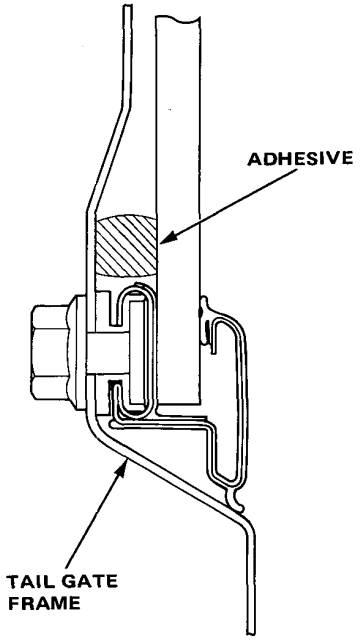


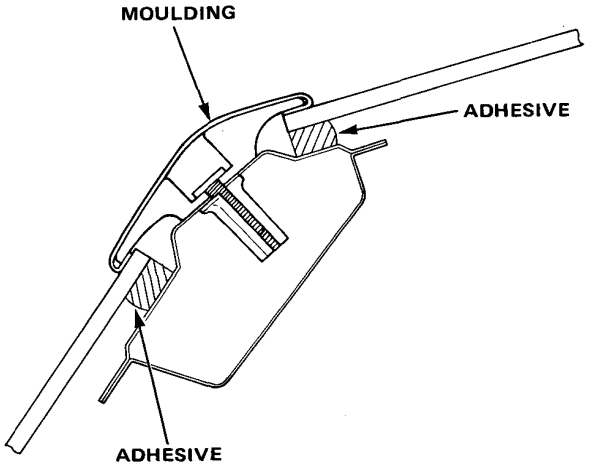
[SECTION B–B]

Tail Gate Window (3-door Model)

A fresh and simple window design tail gate which covers the frame part of the tail gate. The window glass is fitted to the frame with adhesive to increase the rigidity of the tail gate. The tail gate opens wide from the recessed roof end, facilitating luggage loading and unloading.

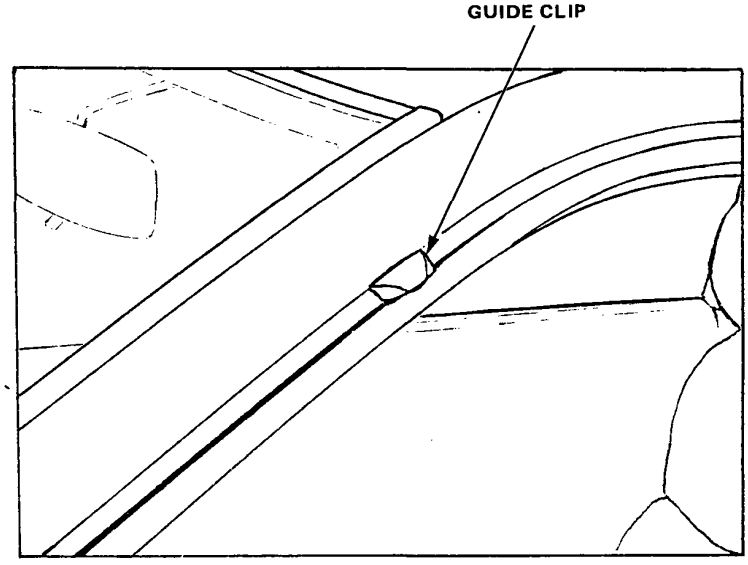






Guide Clip

Guide clips are newly employed on the front door sash mouldings to prevent the glass from warping due to the air pressure difference between the inside and outside of the cabin at high speed. They help reduce air noise.



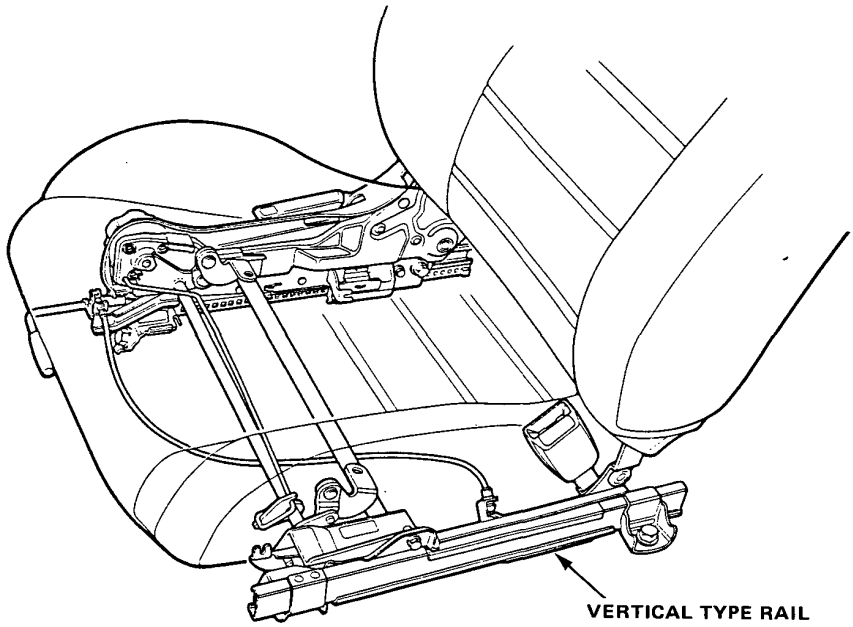
Seat Belt Buckle & Side Adjuster

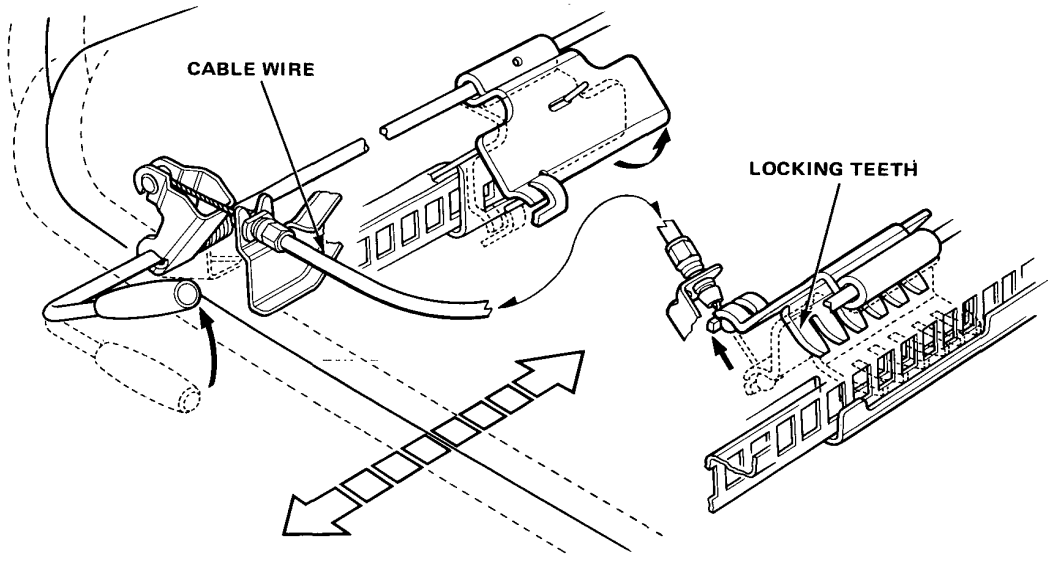
3-DOOR
EXCEPT KC

A slide-type seat belt buckle is newly employed. It slides on the seat rail together with the seat, providing the best position while assuring maximum passenger safety.

Features

- Verticle type rail providing sufficient strength for the seat belt anchor.
- Multiple locking teeth provided to maintain seat position against load.





Belt Feeder System (3-door Model)

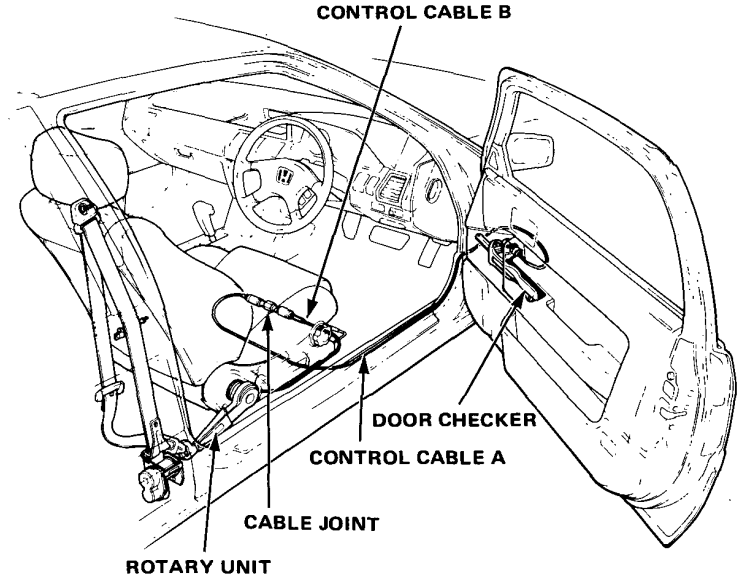
EC ONLY

Purpose

In case of the 3-door model, seat belts for the front are located far behind the seats because of the wide doors. In order to facilitate use of the seat belts, a belt feeder system is newly provided.

Construction

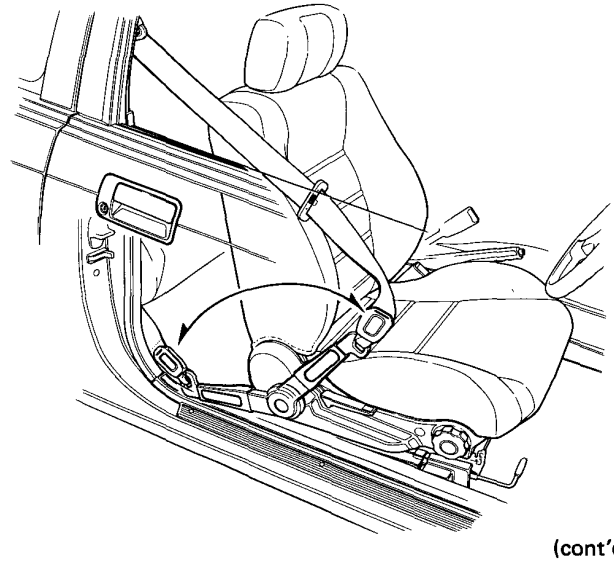
The belt feeder consists of a door checker, control cable A, control cable B, a cable joint, belt feeder arm and rotary unit, as shown below.



Operation

- As the door closes, the belt feeder arm is raised by the rotary unit as the door checker pulls the control cable A and B linked to the rotary unit. The set belt is thus neatly positioned at hand.
- When the door is opened, the belt feeder arm is folded down on the floor as the door checker loosens the control cable to the rotary unit.

Movement of the belt feeder arm occurs only when the door opening angle is between 0° and 20°.

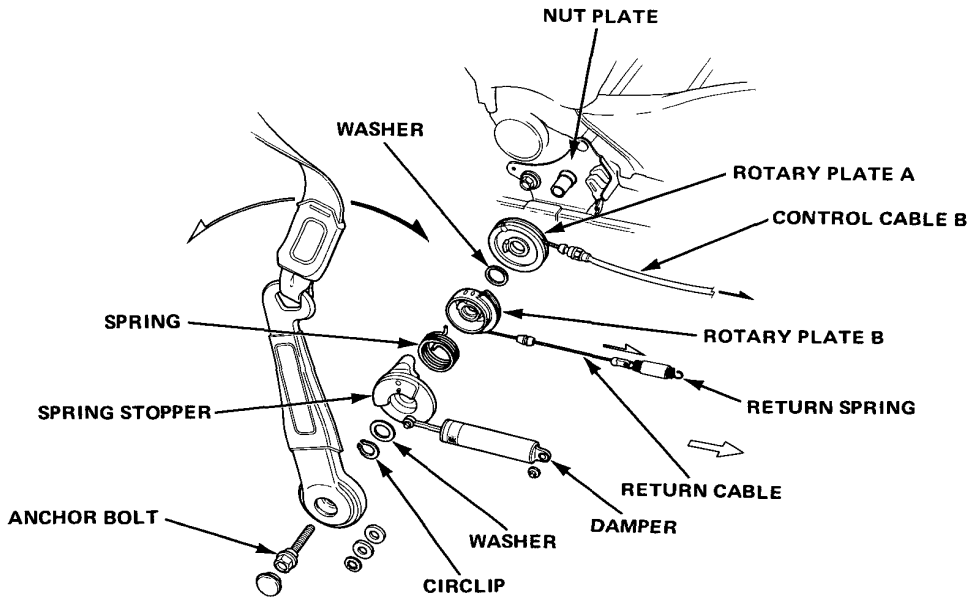


(cont'd)

Belt Feeder System (cont'd)

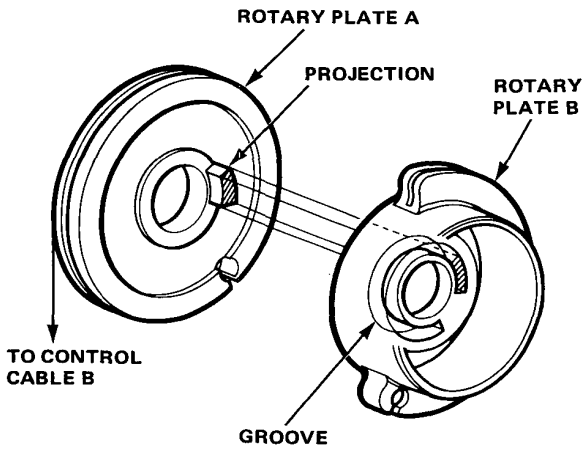
< Rotary Unit >

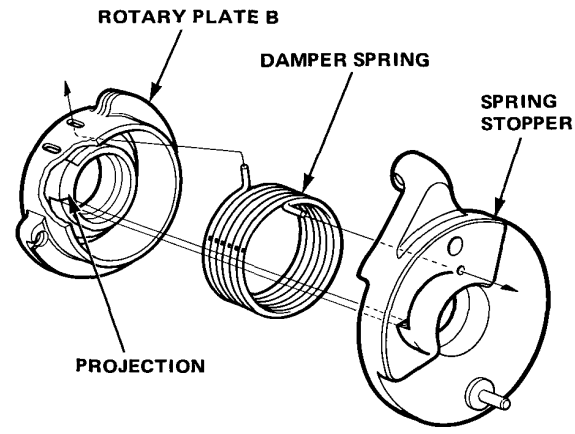
The rotary unit is the main component of the belt-feeder system. It is composed of the following parts as shown below.



Construction

Rotary plate A works as a wire reel for control cable B and the projection of rotary plate A engages a groove in rotary plate B.
Rotary plate B is connected to the spring stopper via a damper spring and pre-load is applied on this spring.

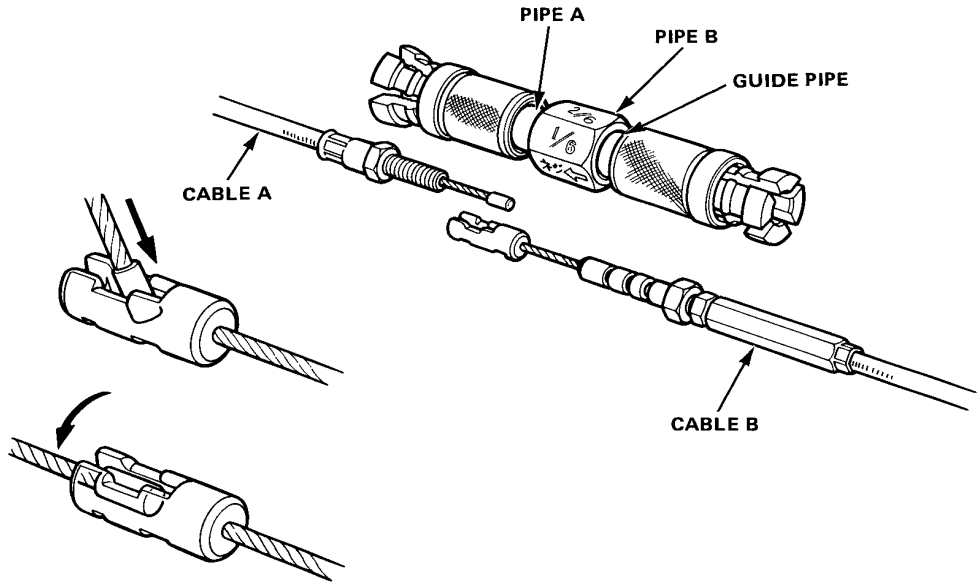




The return cable is wound on rotary plate B opposite to control cable B winding and tension is applied via the return spring. The damper rod is connected to the spring stopper which the belt feeder arm is engaged.
Protection is thus assured against handling the belt feeder arm manually when the control cables are locked.

< Cable Joint >

The cable joint connecting control cables A and B is located under the driver's seat.
Connection and disconnection can be easily done at this cable joint.

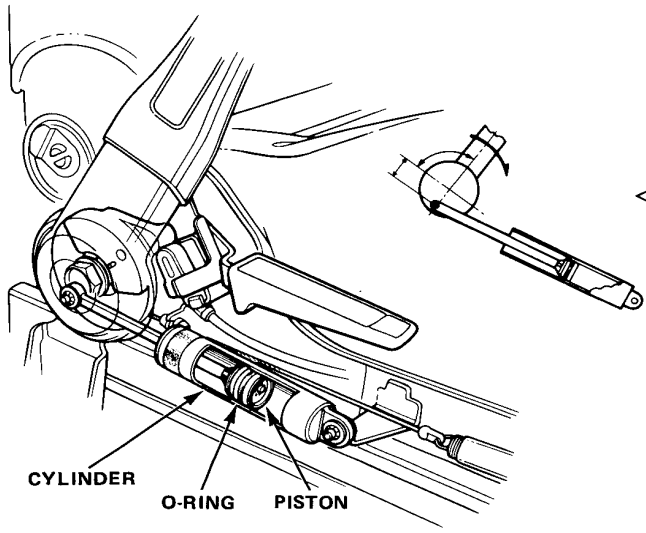


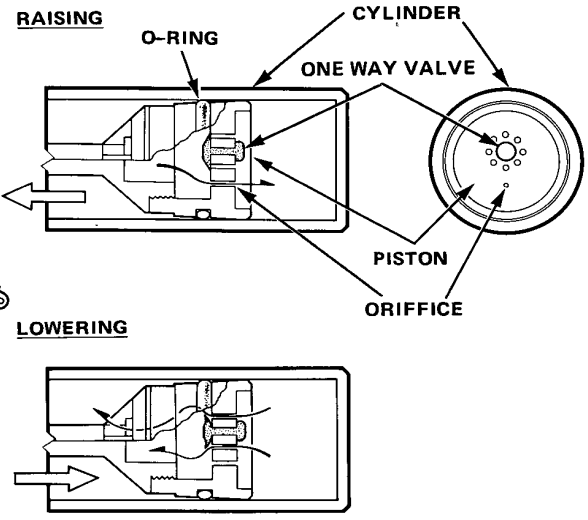
< Damper >

A damper is provided to control the speed of the belt feeder arm up and down movement.

When raising; As the one-way valve is closed, air is forced through the orifice into a low pressure cylinder chamber as the piston moves to expand the cylinder chamber volume.

When lowering; The piston compresses the air in the cylinder chamber but the one-way valve opens to allow large air leakage. Movement is thereby speeded up.





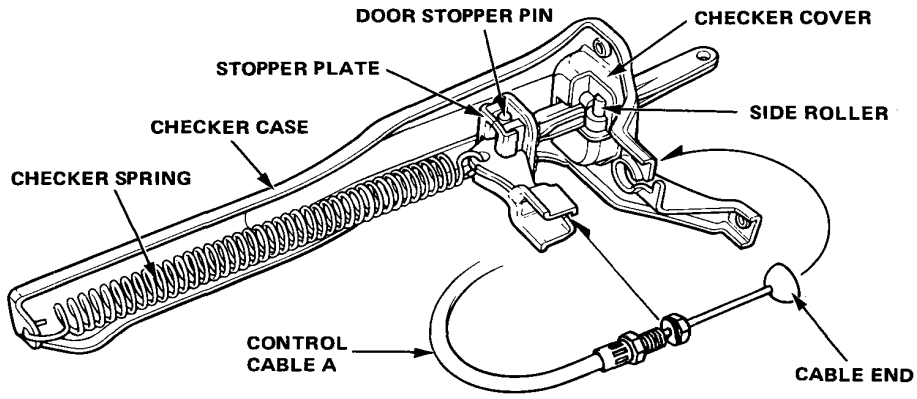
(cont'd)

Belt Feeder System (cont'd)

< Door Checker >

Components

The door checker is composed of the parts shown below.

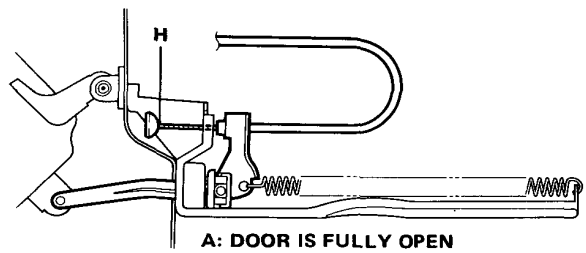


Operation

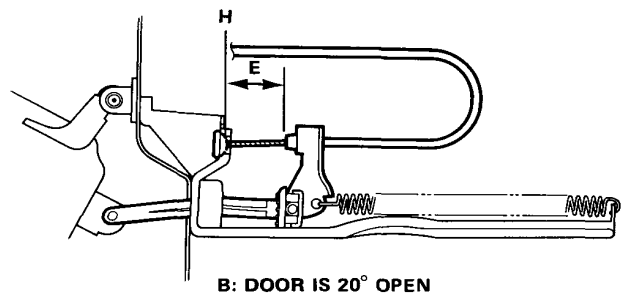
A: Sufficient slack is provided to the control cable when the stopper plate is in the full stroke position.

B: The stopper plate comes in contact with the cable end when the door is open 20°.
The stopper plate pulls the cable as the door is closed further.

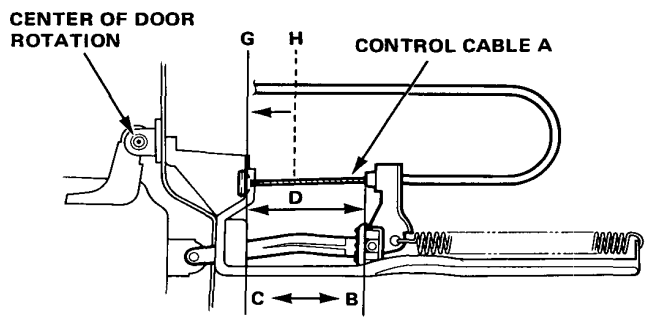
C: The control cable is pulled all the way out when the door is fully closed.



A: DOOR IS FULLY OPEN



B: DOOR IS 20° OPEN



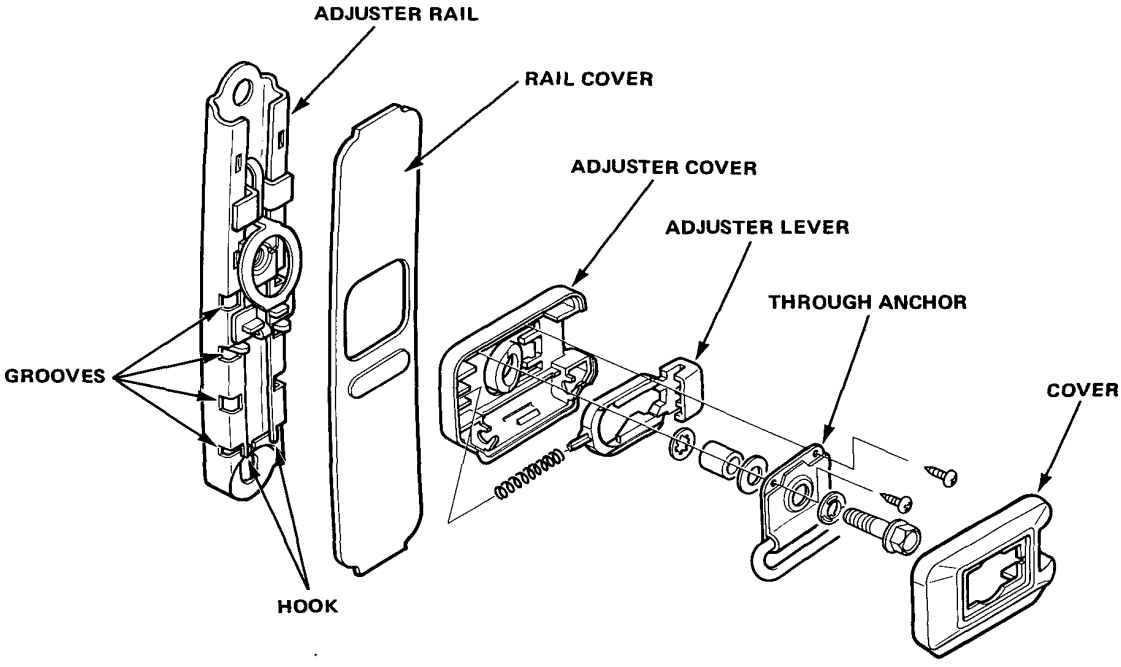
C: DOOR IS FULLY CLOSED

Shoulder Anchor Adjuster (4-door Model)

Adjustable seat belt shoulder anchors are newly employed. The height of the seat belt shoulder anchor can be adjusted between four positions to provide the best fit for the passenger.

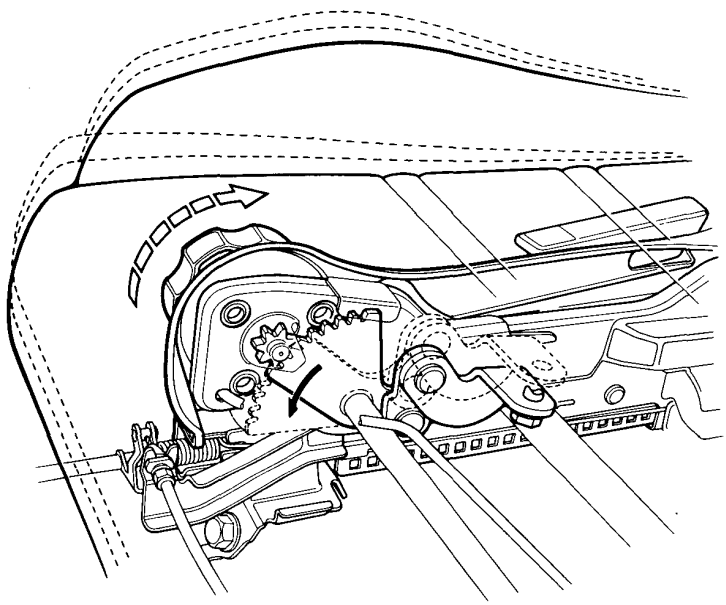
Operation

When the adjust lever is pushed in, the hooks installed in the adjuster rail are released from the adjuster groove and the anchor can be slid up and down between four pairs of grooves on the adjuster rail.



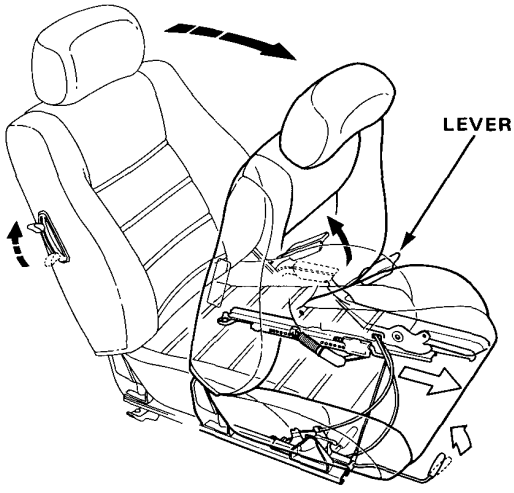
Stepless Adjustment Seat Lifter

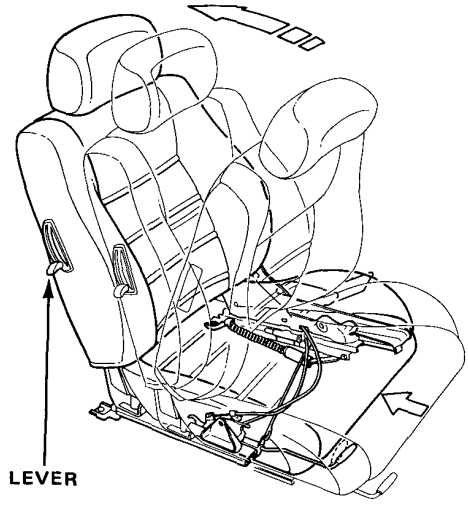
A stepless adjustment seat lifter is provided on some types. This allows the front part of the seat cushion to be adjusted to provide optimum leg support, thus reducing fatigue and improving posture. The range of adjustment is a stepless 28mm in the up-down direction.

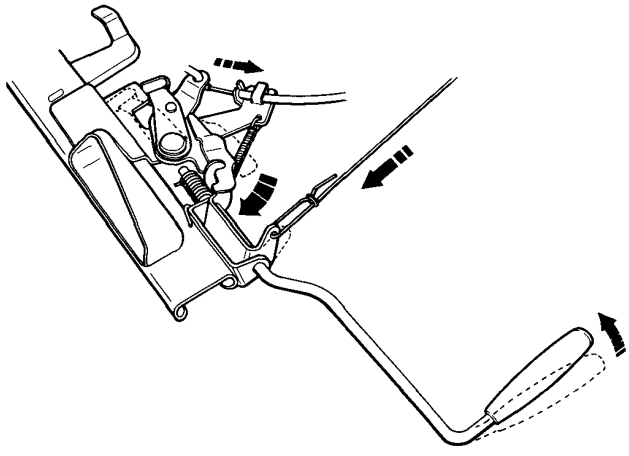


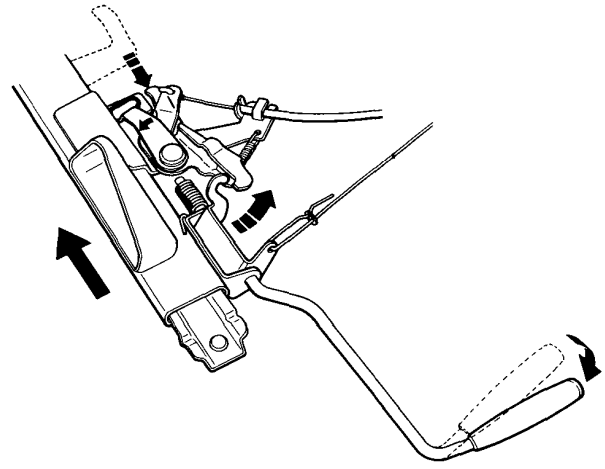
Walk-in Seat

In order to allow rear passengers to get in and out of the car more easily, some three-door types are provided with a walk-in seat. When the lever on the passenger-side seat is raised, the seat back folds forward, and the entire seat slides to the front. A lever is also provided on the inner side of the passenger-side seat, thus allowing the driver to operate the passenger-side seat easily. When the seat back is returned to the upright position, it is locked into place at the standard set position.





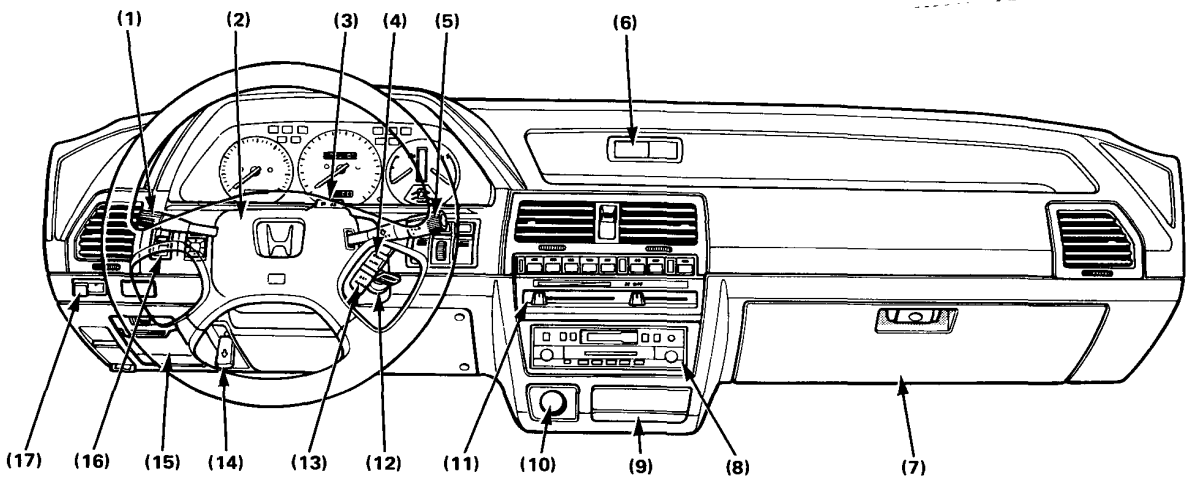




Body

Instrument Panel

The instrument panel has been designed to match with the low slant nose and wide front windshield to allow an wide unobstructed view to the front.
The surface of the panel has the texture of grain leather, and is constructed of ABS plastic and PVC, together with padded backing of foam urethane (polypropylene) over a base of ABS plastic. This structure results in excellent energy absorbing characteristics and a high level of safety.
Two air vents are located at the center and one at each side, while defogger vents are located toward the front of the right and left doors and beneath the front windshield. By operating the ram pressure vent knob at the right side of the driver's position, outside air will be supplied to the vent on the driver's side of the car.

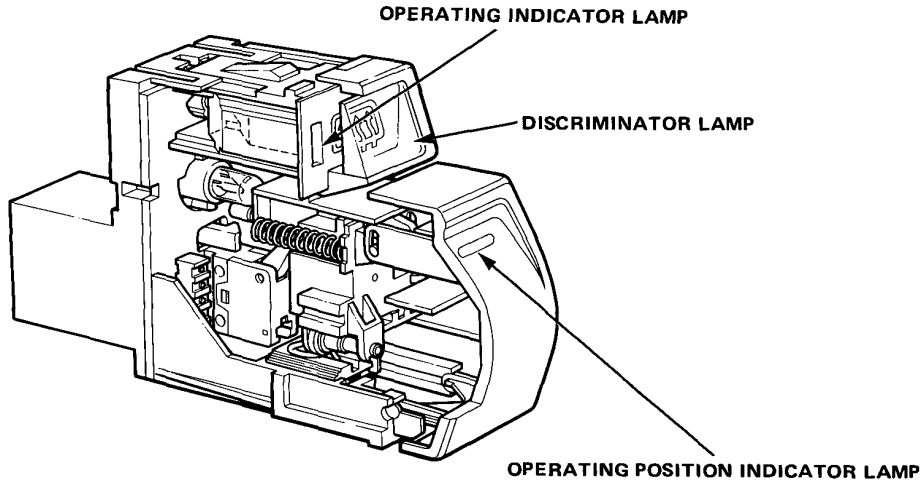


(1) WINDSHIELD WIPER/WASHER SWITCH
(2) HORN
(3) HAZARD WARNING SWITCH
(4) CRUISE CONTROL RESUME SWITCH
(5) LIGHT SWITCH/TURN SIGNAL/DIMMER SWITCH
(6) CLOCK
(7) GLOVE BOX
(8) RADIO
(9) ASHTRAY
(10) CIGARETTE LIGHTER
(11) HEATER CONTROL PANEL
(12) IGNITION SWITCH
(13) CRUISE CONTROL SET SWITCH
(14) TILT STEERING ADJUSTMENT LEVER
(15) FUSE BOX
(16) CRUISE CONTROL MAIN SWITCH
(17) SUNROOF SWITCH

Piano-touch Switches

General

To improve operation, piano-touch switches requiring low switch pressure have been provided in a configuration well matching the design of the instrument panel. In addition, each switch is equipped with a white discriminator lamp. a yellow operating indicator lamp, and a white operating position indicator lamp, thus improving the visibility of switches during nighttime driving.



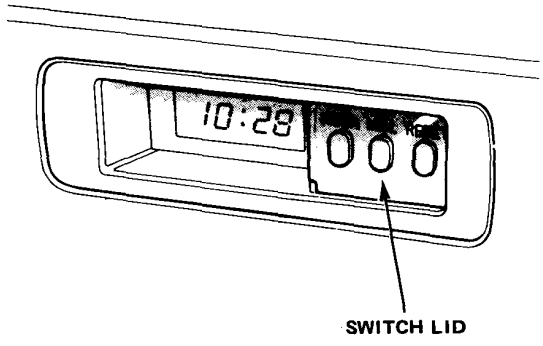
Digital Clock

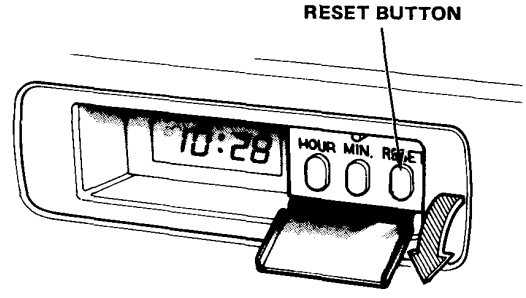
General

All cars are equipped with digital clocks featuring luminous indicator tubes for good visibility. Whenever the small or headlights are switched on, the clock's luminance level is reduced to 1/16, thus preventing excessive brightness and giving the optimum luminance level.

A time signal setting fuction is also provided; by pressing the RESET button at the sound of the radio time signal, the time can be set to the time signal.

The clock display lights when the ignition switch is turned ON. When the ignition switch is in the LOCK or ACC position, the switch lid can be pressed to illuminate the display.

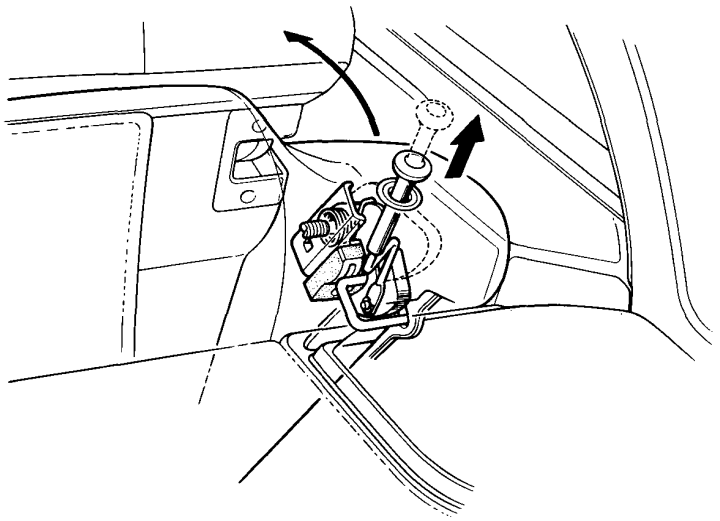




Rear Seat

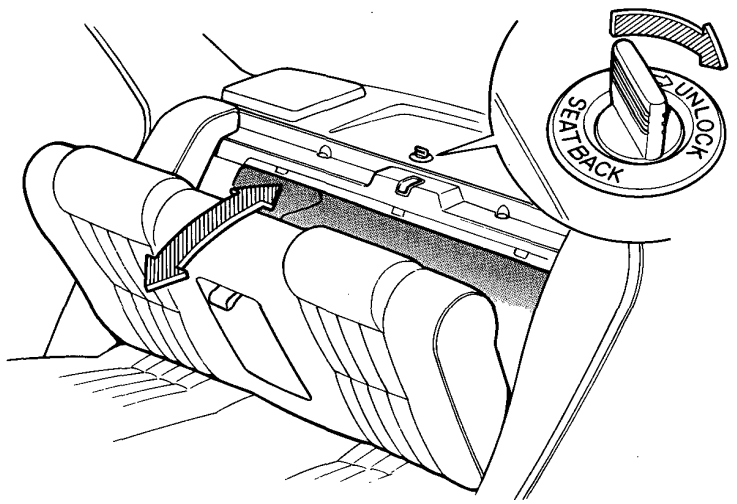
< Separate seat back type (3D) >

The rear seat backs are provided with neck rests to improve safety and comfort. By operating the knob, the seat backs can be inclined toward the front and folded down.



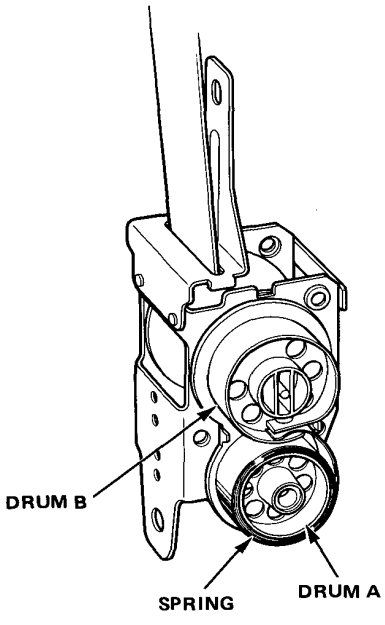
< Single seat back (4D) >

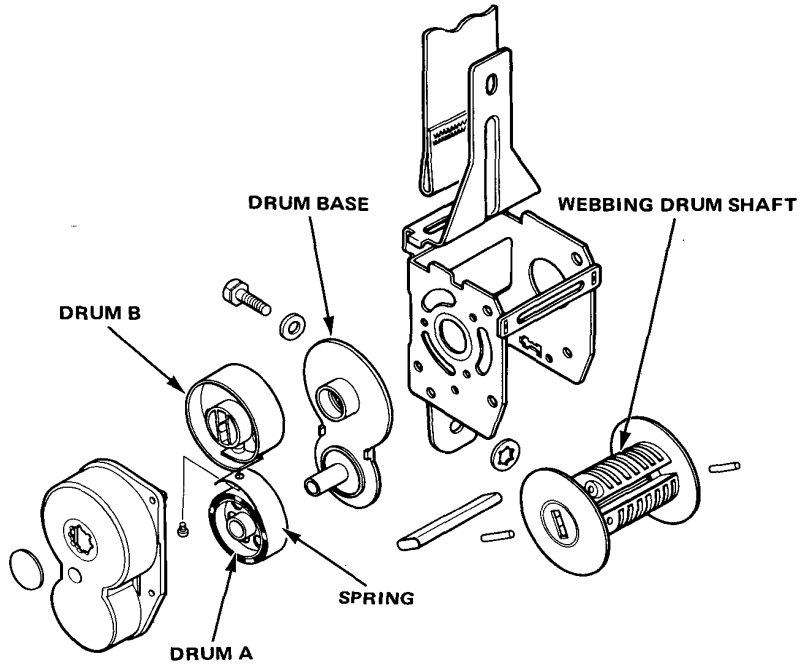
Depending on type, some cars are provided with seat backs which can be operated simply by the lock on the rear tray, thus allowing access to the trunk space.



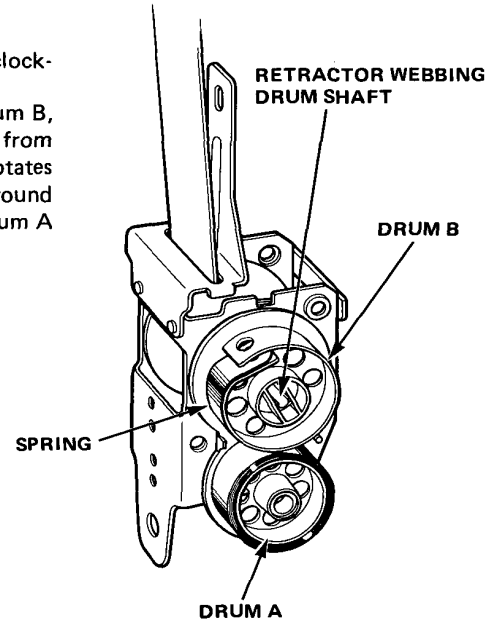
Seat Belt

The front seat belts use a double-shaft retractor spring providing excellent fastening operating. This results in reduced spring torque at the time of seat belt retraction and improved winding action. In addition, the weight of the belt on the shoulder at time of fastening is lessened, thus allowing the driver to operate the steering wheel comfortably.





The retractor spring is wound clockwise on drum A, and its end is fixed clockwise on drum B, thus forming an S-shaped configuration.
As shown in the illustration at right, when the seat belt is pulled out, drum B, which is fixed on the retractor webbing drum shaft, pulls out the spring from drum A, and winds the spring clockwise onto drum B. Drum A thus rotates to the left. When the seat belt is released, the tension of the spring wound onto drum B rotates drum B counterclockwise, while at the same time drum A rotates clockwise, thus taking up the spring from drum B.



(cont'd)

Seat Belt (cont'd)

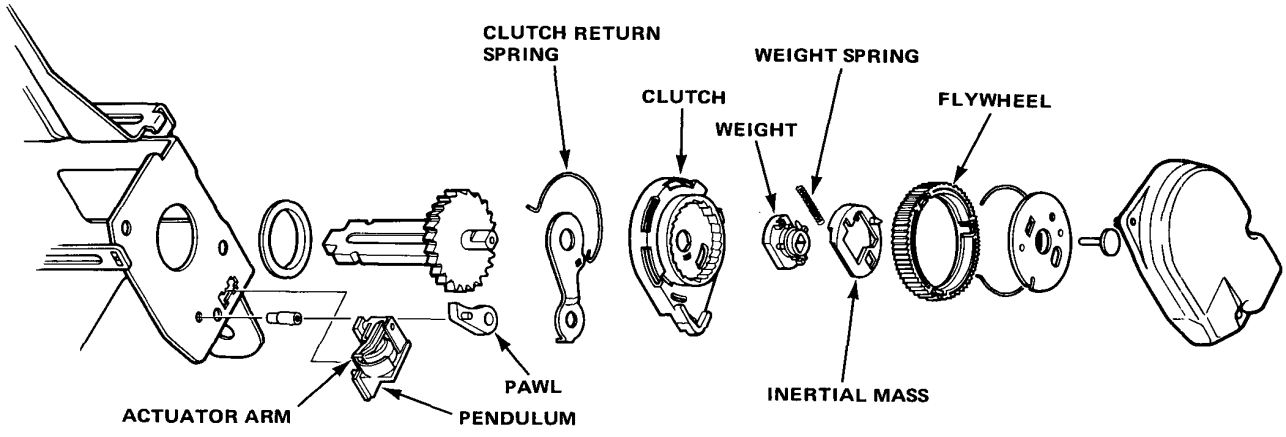
< Double-sensing lock mechanism >

General

The double-sensing lock mechanism uses a pendulum for G-Sensing, and an inertial mass (weight) for webbing sensing.

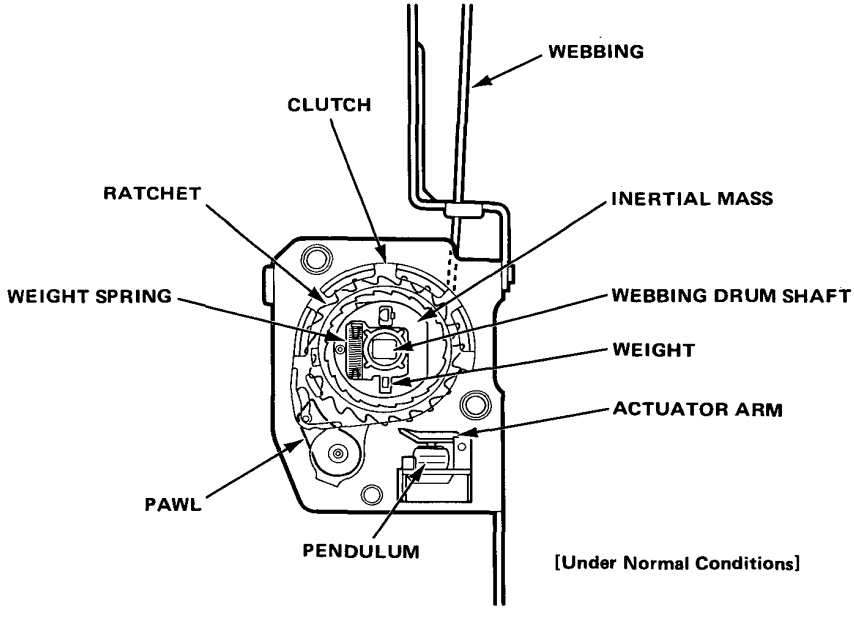
Construction

The system is composed of ratchet, pawl, clutch return spring, weight spring, inertial weight, flywheel pendulum, and actuator arm.



G-Sensing

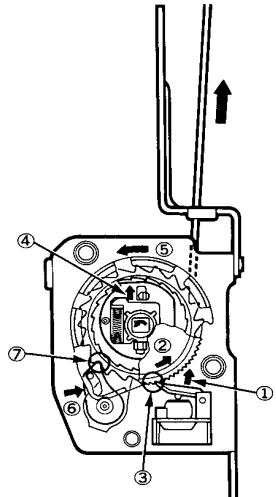
1. When G forces are applied on the car, the webbing is pulled out, and the flywheel rotates (1). Simultaneously, the pendulum is caused to incline due to inertia, and the actuator arm is forced upwards (2). The arm's lever catches in the gear teeth on the flywheel's outer periphery (3), thus stopping the movement of the flywheel.



[Under Normal Conditions]

2. When the flywheel stops, the inertial mass attached inside the flywheel receives reverse torque from the stopping of the flywheel, thus meshing with the gear on the inner surface of the clutch, and causing the clutch to rotate ④ ⑤.

3. When the clutch rotates to the left, the pawl is lifted up ⑥, catching the ratchet ⑦, and locking the seat belt securely.

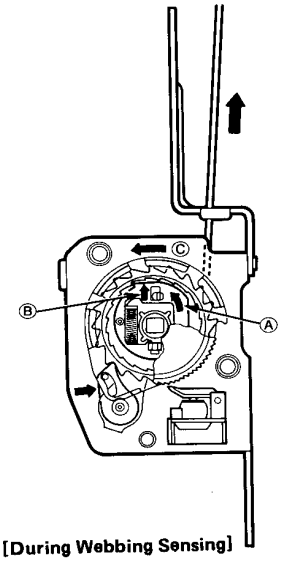


[During G-Sensing]

Webbing Sensing Operation

1. When the car experiences a sudden impact, the webbing is pulled out, and the drum shaft rotates counterclockwise, thus also rotating the weight holder Ⓐ. Since the inertial mass is not fixed with respect to the webbing drum shaft, it is caused to move to the outside around the pivot of the flywheel Ⓑ.

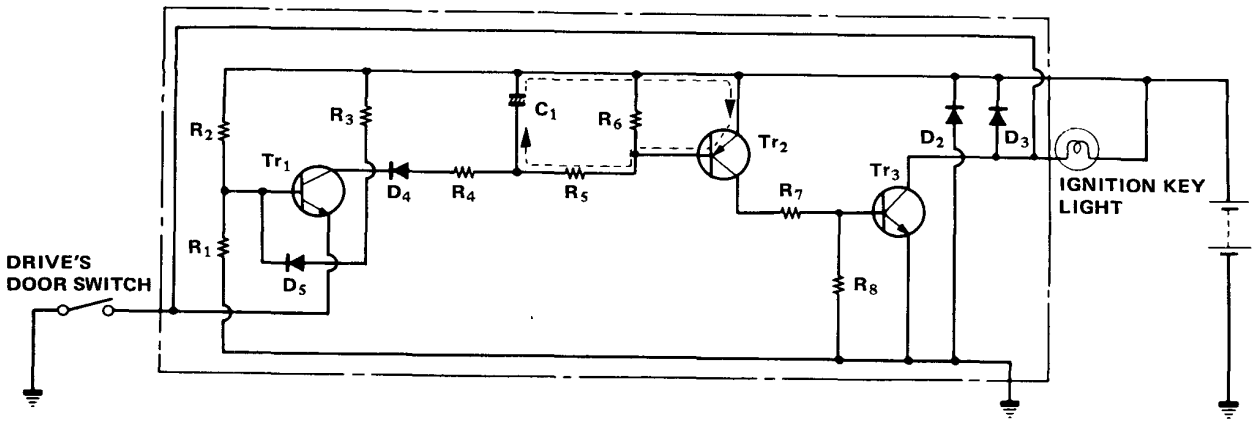
2. When the inertial mass moves to the outside, it meshes with the gear on the inner surface of the clutch, thus causing the clutch to rotate Ⓒ, and performing the same operation as in G-Sensing, (step 3).

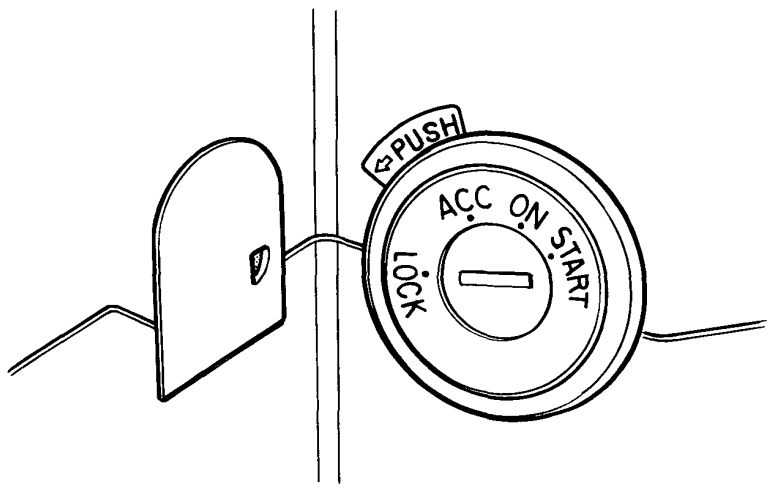


[During Webbing Sensing]

Ignition Key Light

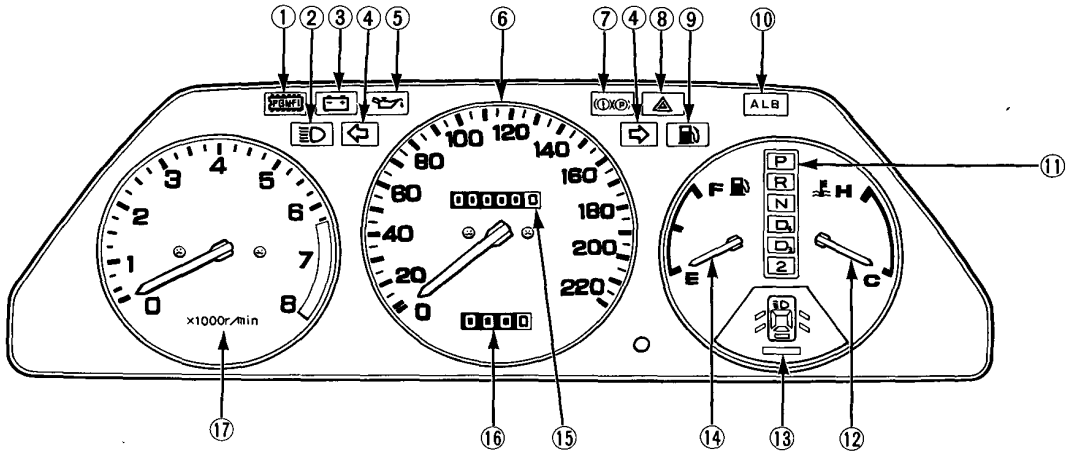
The light will go on for approximately 8 seconds after the driver's door is closed in order to insert the ignition key into the ignition switch easily at night.



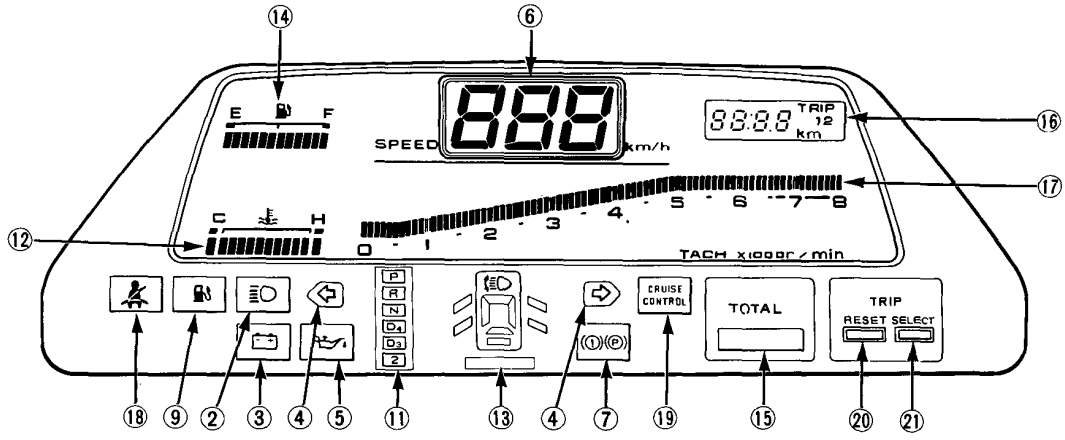


Combination Meters

< Analog Meter >



< Digital Meter >



(1) PGM-FI WARNING LIGHT
(2) HEADLIGHT HIGH BEAM INDICATOR LIGHT
(3) DISCHARGE WARNING LIGHT
(4) TURN SIGNAL INDICATOR LIGHT
(5) OIL PRESSURE WARNING LIGHT
(6) SPEEDOMETER
(7) BRAKE WARNING LIGHT
(8) HAZARD WARNING LIGHT
(9) FUEL RESERVE WARNING LIGHT
(10) ANTI-LOCK BRAKE (ALB) WARNING LIGHT
(11) SHIFT LEVER POSITION INDICATOR (FOR HM MODELS)
(12) WATER TEMPERATURE GAUGE SEGMENTED DISPLAY (FOR DIGITAL METER MODELS)
(13) SAFETY INDICATOR
(14) FUEL GAUGE SEGMENTED DISPLAY (FOR DIGITAL METER MODELS)
(15) ODOMETER
(16) TRIP METER
(17) TACHOMETER SEGMENTED DISPLAY (FOR DIGITAL METER MODELS)
(18) SEAT BELT REMINDER LIGHT
(19) CRUISE CONTROL INDICATOR
(20) TRIP METER RESET BUTTON
(21) TRIP METER SELECT BUTTON

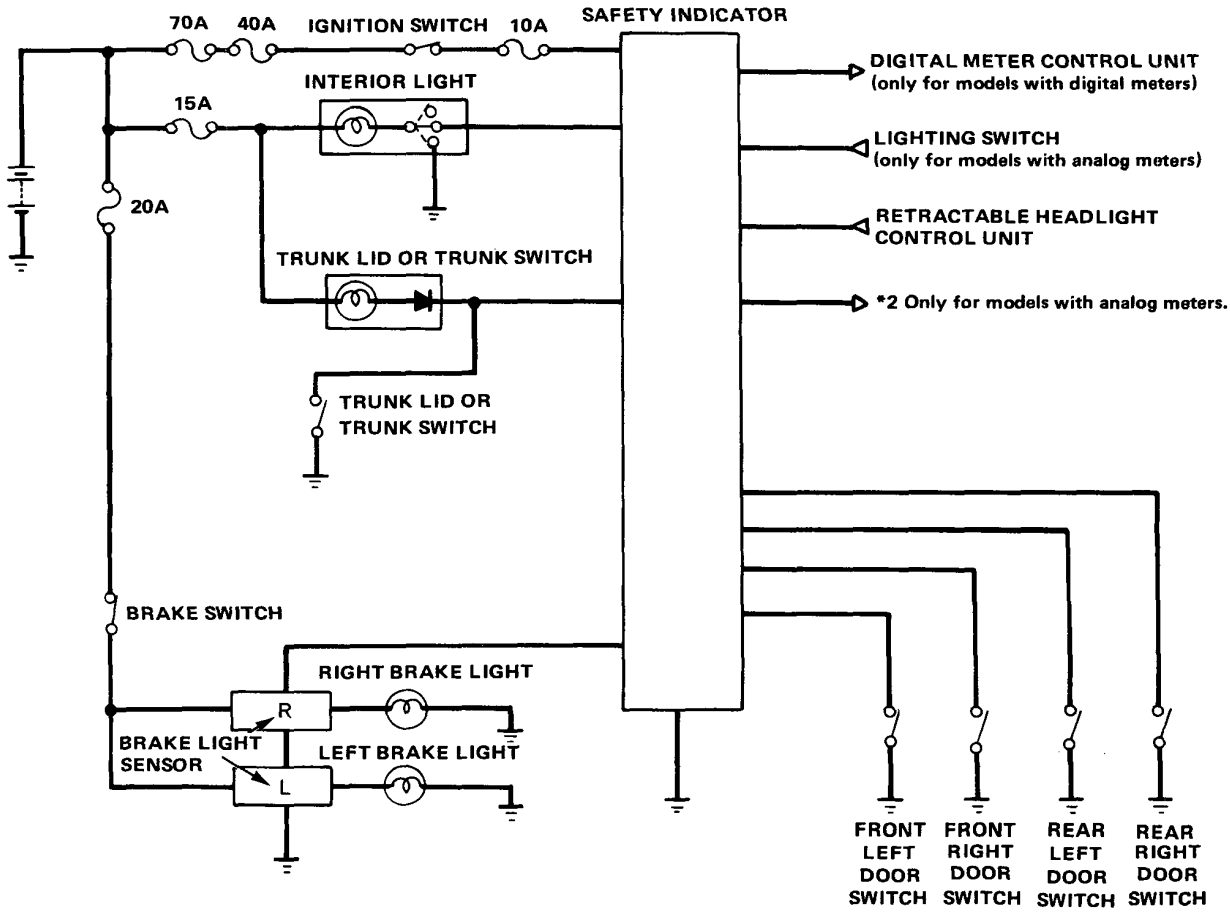
(cont'd)

Combination Meter (cont'd)

< Safety Indicator >

General

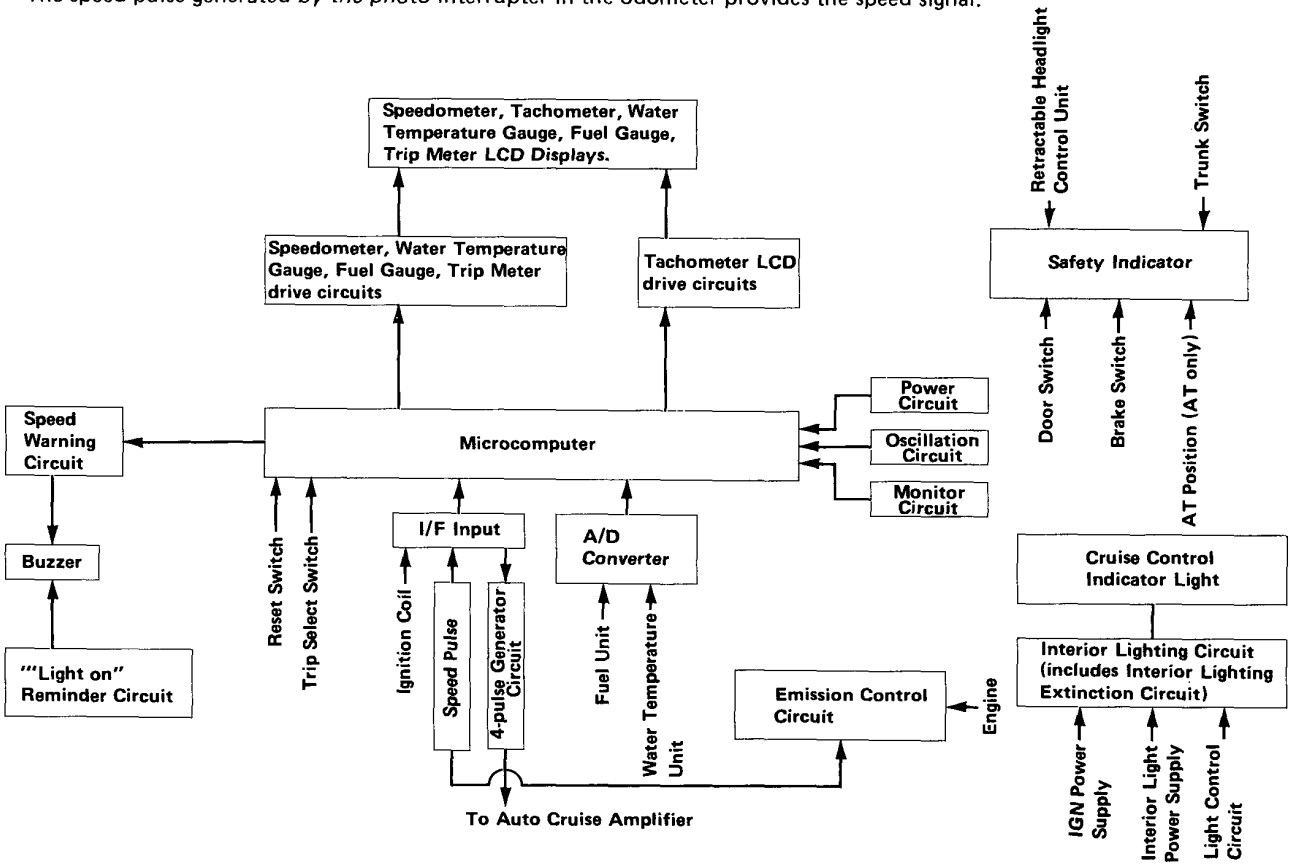
If any of the doors of the trunk lid is open, the brake lights are defective, a circuit is open or the retractable headlight system is closed, and the matching light in the panel will go on. The light will stay on until the problem has been corrected. There is also a special circuit to check for defective warning lights (*1 LED). All warning lights should go on for two seconds when the ignition switch is turned on.



*1: LED: Light Emiting Diode.
*2: For models with illumination control, connect this lead to the illumination control unit, otherwise connect to earth.

< Liquid Crystal Digital Meters >

These meters indicate vehicle and engine speed, fuel gauge and water temperature gauge readings in digits or colored segments. They are easy to read and consist of 2 layers of microcomputer controlled guest host type *1 LCD's.
The speed pulse generated by the photo interrupter in the odometer provides the speed signal.



(Block Diagram)

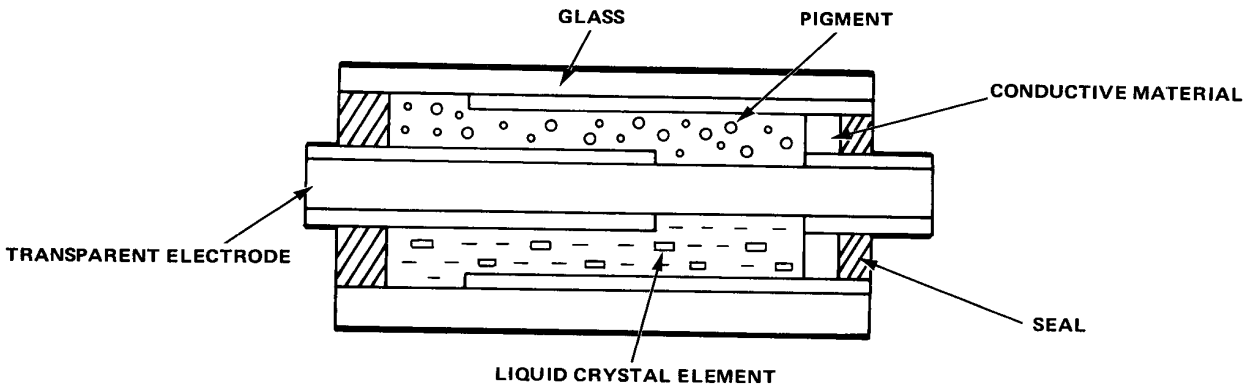
- Input Interface (I/F)
  This circuit converts speed pulse signal level to microcomputer input level.
- Oscillation Circuit
  Produces the reference signal required for microcomputer operation.
- Monitor Circuit (Watch Dog)
  Monitors microcomputer operation. In case of microcomputer malfunctioning, it transmits a reset signal to the microcomputer to return it to normal operation.
- Microcomputer
  An *2 LSI with a control unit, a memory and a processing unit for processing signal inputs.
- LCD Drive Circuit
  An LSI which controls the liquid crystal display elements.
- A/D Converter
  Converts analog data into digital data for the microcomputer.

*1 LCD (Liquid Crystal Display)
Crystals used for display purposes which become transparent or reflective when exposed to an electric current. The LCD does not produce any light of its own, it only reflects an external light source.
*2 LSI (Large Scale Intergration)
AN LSI circuit includes a great number of components, is fast, compact and extremely reliable.

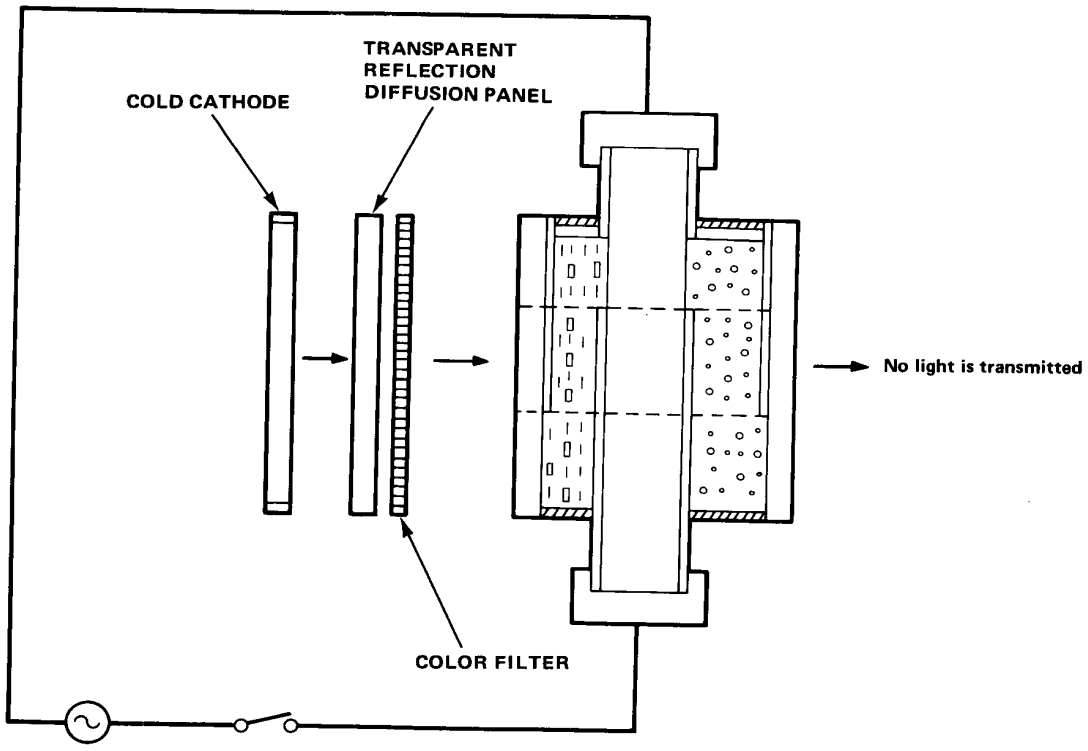
(cont'd)

Combination Meter (cont'd)

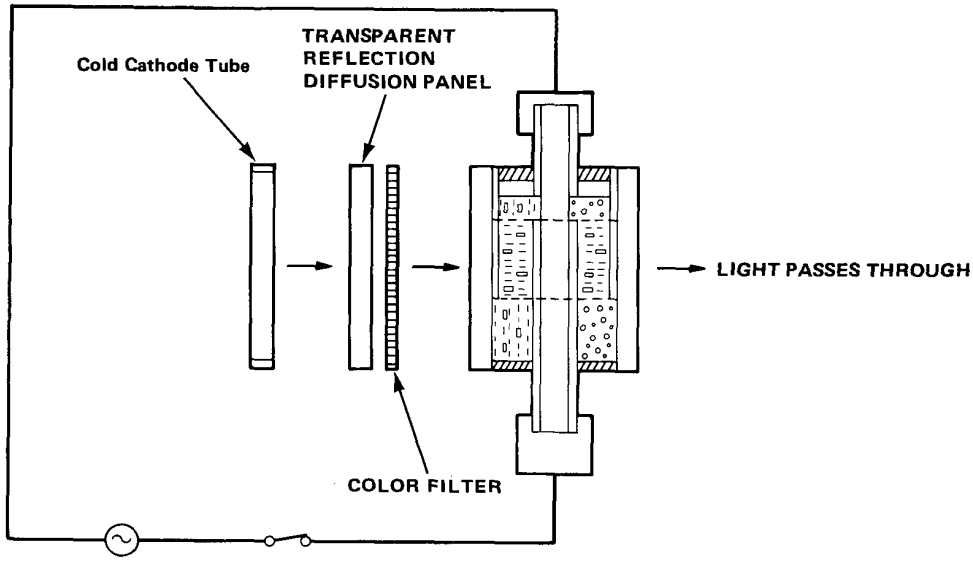
- **Liquid Crystal Panel Construction (Guest Host Type)**
  A liquid crystal panel consists of 3 layers of glass sheets and 2 layers of liquid crystal elements. The liquid crystal elements contain a pigment. The two layers of liquid crystal elements and the pigment are arranged in an orthogonal pattern.



- **Liquid Crystal Elements**
  1. This light from the cold cathode enters the liquid crystal panel after passing through the transparent reflection diffusion panel and the semi-transparent color filter. When the pigment cells are not exposed to a voltage they are arranged in such a way that they absorb the light (they become prependicular to incoming light).



2. When an electric current passes through the transparent electrode an electrical field builds up around the liquid crystal elements. The pigment cells change direction (they become parallel to incoming light) and the light from the cold cathode tube passes through the liquid crystal panel.



Electronic Navigator

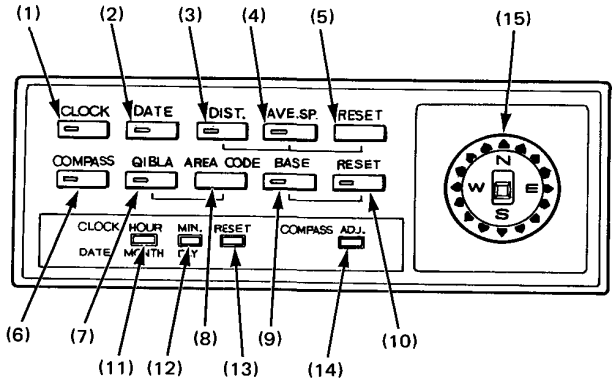
How to Operate Controls

1. QIBLA: By making an input of your position area code with a special map, this device will show the direction, to say Al-Kaaba (Mecca).
2. BASE: Indicates the direction and distance to point of destination. When the distance to point of destination after resetting is less than 3%, the direction indicator arrow (LCD) and the reset key LED starts to flicker.
3. CLOCK: Digital clock has a display that makes it easy to distinguish between AM and PM time readings.
4. DATE: Indicates solar calendar dates. It shares display space with the digital clock.
5. DIST: Indicates distance travelled after resetting and can also be used as a trip meter. It shares display space with the digital clock.
6. AV. SP.: Indicates average vehicle speed after resetting. It shares display space with the digital clock.
7. COMPASS: Indicates an absolute direction as distinguished from vehicle direction. An instruction manual explaning the way of the Quibla function can be found in the center console compartment.

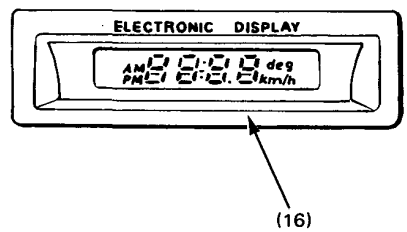
General

The navigator feature both digital and symbol displayes. The digital display panel is located at top center of the dashboard and the symbol display panel is part of the control section in the center console.

Control Section



Digital Display Panel



(1) CLOCK SWITCH
(2) DATE SWITCH
(3) DIST SWITCH
(4) AVE. SP. SWITCH
(5) RESET SWITCH
(6) COMPASS SWITCH
(7) QIBLA SWITCH
(8) AREA CODE SWITCH
(9) BASE SWITCH
(10) RESET SWITCH
(11) HOUR/MOUNTH SWITCH
(12) MIN/DAY SWITCH
(13) RESET SWITCH
(14) COMPASS ADJ SWITCH
(15) SYMBOL DISPLAY SECTION
(16) DIGITAL DISPLAY SECTION

Semi-Concealed Front Wipers

General

All models have been fitted with semi-concealed wipers to improve aerodynamic characteristics. As the wiper arms are less exposed to the wind, there is no build up of rain water on the windshield and the wiper blades do not come free during high-speed driving. All of which provides for better visibility.

Since the wipers are concealed when they are not being used, the driver gets a better overall view, which means improved safety, too.

Some models are equipped with wipers that are interconnected with the washer function. With such wipers the wiper relay is activated if the washer switch is pressed for longer than 1 second when the ignition switch is on and the wiper switch is either set to "OFF" or "INT". After a short time the wipers start operating and continue to operate until 3 seconds after the washer switch has been turned off. Other models are equipped with washer interconnected wipers featuring intermittent operation that can be varied from 2–12 seconds.

To prevent the wiper blades from freezing onto the windshield during the winter season and to facilitate window cleaning, the wiper arms are of an independent construction that makes it possible to lift them off the windshield and to leave them like that.

Construction

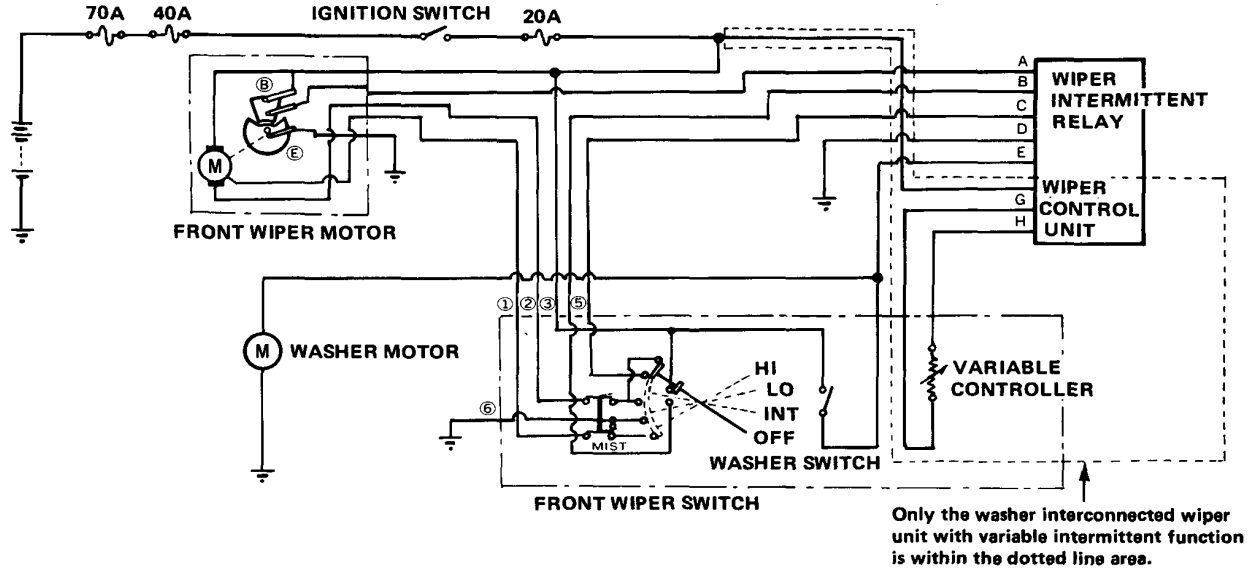
Washer interconnected wipers consist of a wiper intermittent relay, a wiper motor and a wiper switch. Washer interconnected wipers with variable intermittent function have a wiper control unit instead of a wiper intermittent relay and the variable function is build into the wiper switch.

Operation

< Washer Interconnected Wipers >

When the washer switch is turned on, battery current starts to flow through the ignition switch towards the wiper intermittent relay (or wiper control unit). This current charges the condenser in the relay or the control unit. At the same time the circuit in the relay is turned on, C and D are connected and the wiper motor beings to turn. When the washer switch is turned off, the condenser is discharged resulting in the relay being turned off after about 3 seconds.

The auto stop circuit turns off the wiper motor by switching the auto stop switch from position E to position B when the wiper arm reaches a predetermined position.

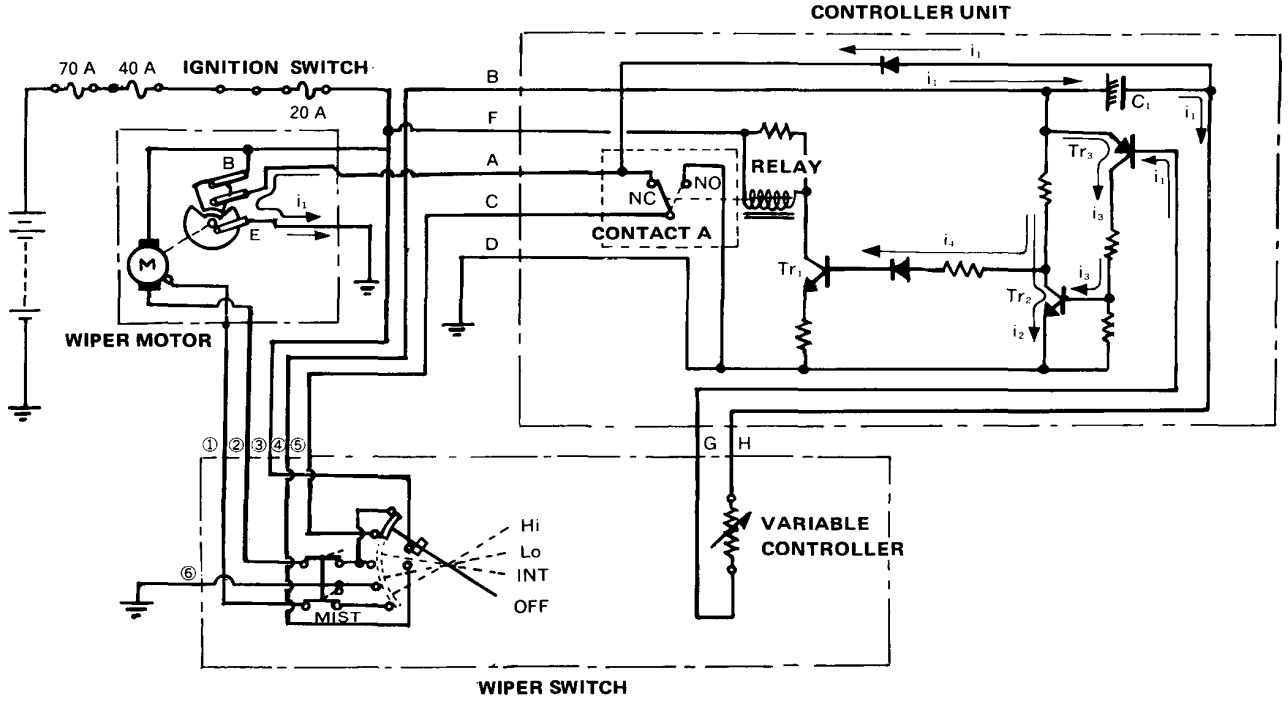


(cont'd)

Wiper (cont'd)

<Washer Interconnnected Wiper Unit with Variable Intermittent>

1. When the wiper switch is set to position "INT", battery current flows from 3 to 4 in the direction of B in the control unit. This current (i4) turns on control unit Tr1 and the relay starts to operate.
2. Relay operation connects contact A to No which causes C and D in the control unit to connect and the wiper motor starts to rotate. Since the auto stop switch in the motor is then set to E, A is connected to earth and current i_1 starts to flow, C_1 becomes charged.
3. At the same time i_1 turns on Tr3 and i_3 flow turns on Tr2 with the result that Tr1 and the relay are turned off causing switch A to return to Nc. As the wiper motor auto stop switch is at point E at this time, the motor continues to turn. However, when the wiper arm reaches a predetermined position (when it has completed one full cycle) the auto stop switch is set to B and the motor stops.
4. When the auto stop is at B, i_1 is cut off and condenser C_1 starts to discharge. After the discharge, which takes from between 2–12 seconds (depending on the setting of the variable controller resistor), Tr3 is turned off, i_2 is cut off and Tr2 is also turned off. When Tr2 is turned off, i_4 starts to flow in the direction of Tr1, contact A returns to position No and the wiper motor starts to rotate again.
5. Intermittent operation after this is a repetition of steps 2–4.

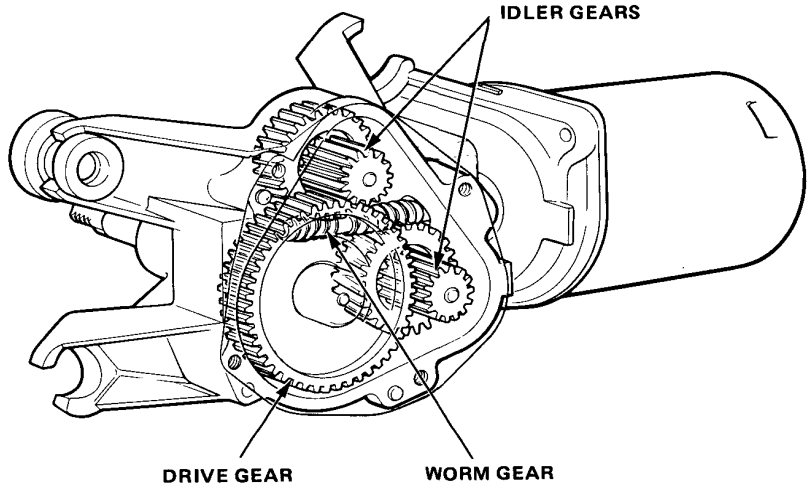


< **Front Wiper Motor** >

The wiper motor is installed in the engine bay (below the right section of the window shield) to ensure easy maintenance. Its location in the engine bay prevents motor noise from entering the cabin.

Construction

The front wiper motor is a magneto system DC motor, which can provide both low and high speeds. Furthermore the idler gears and the driver gear are made of resin to lower noise.



[FRONT WIPER MOTOR]

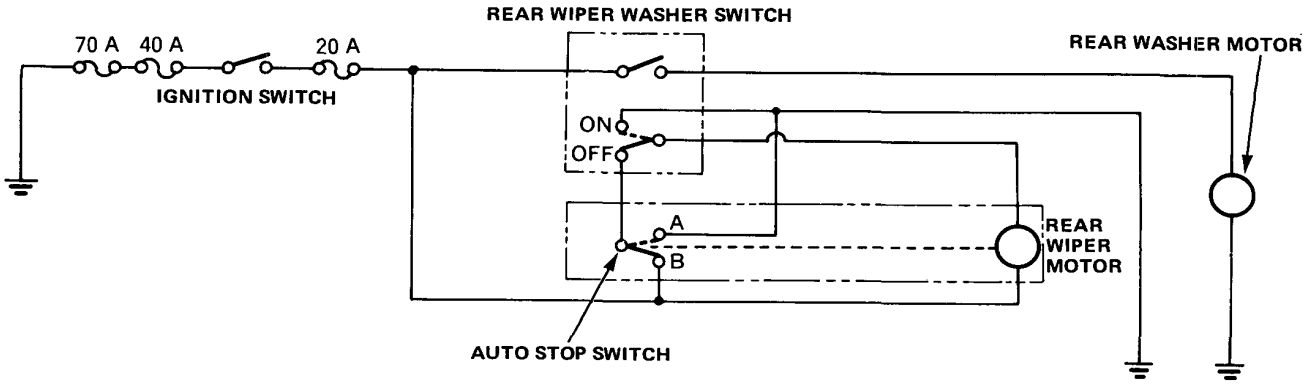
(cont'd)

Wiper (cont'd)

< Rear Wiper >

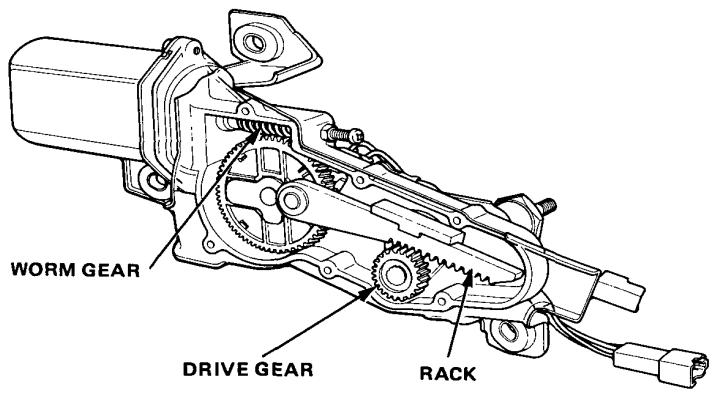
General

The large rear wiper provides an unequalled rear view even in rainy weather. Its location near the front wiper switch guarantees ease of operation.



Operation

1. When the rear wiper switch is turned on and the ignition switch is on, battery current flows through the ignition switch, the rear wiper motor and the rear wiper switch to turn on the wiper motor.
2. Motor rotation sets the built-in auto stop switch to position A.
3. As the auto stop switch is at position A, the motor continues to turn even when the wiper switch is turned off. It continues to turn until the wiper arm reaches a predetermined position, when the auto stop switch is switched over the position B and the motor stops.



[REAR WIPER MOTOR]

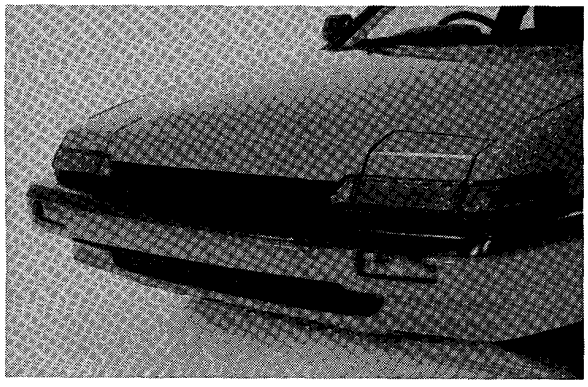
Retractable Headlight

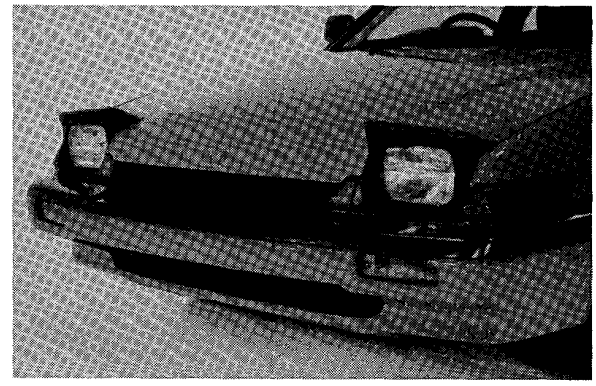
General

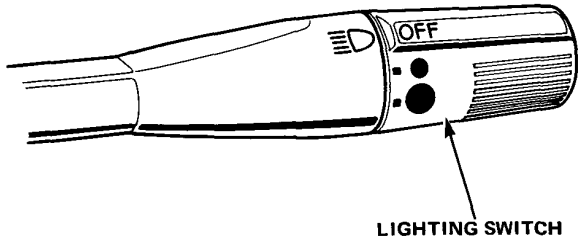
Same cars are equipped with retractable headlights, thus forming a slant-nose bodyline with optimum aerodynamic characteristics.

Features

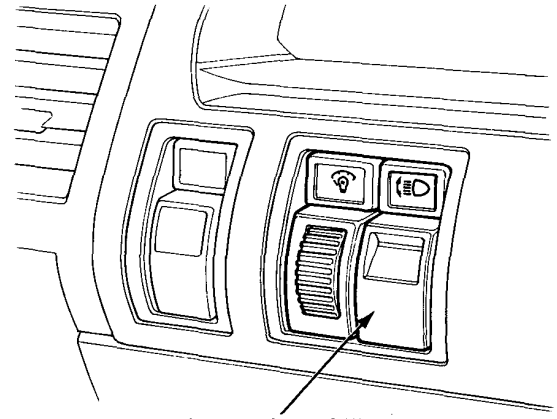
1. Retractors driven by independant right-left motors.
2. Retractors can be independantly raised or lowered without regard for the lighting switch.
3. Even if the drive mechanism is damaged, the retractors can be raised or lowered manually.
4. One-motion passing signals can be given by the linked raising and lowering of the retractors.







LIGHTING SWITCH



RETRACTABLE SWITCH

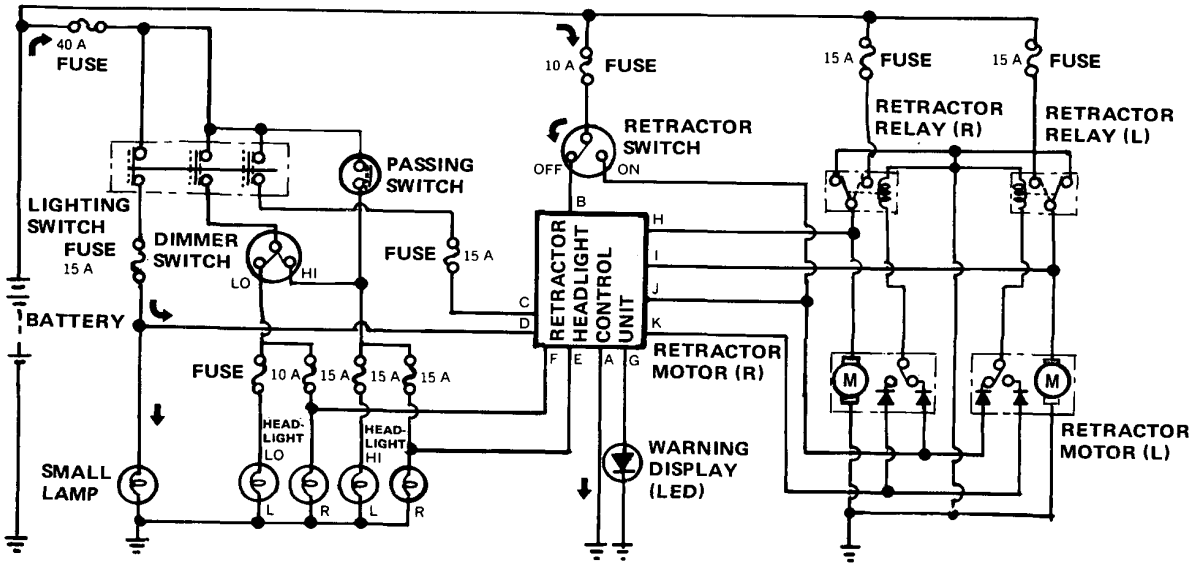
(cont'd)

Retractable Headlight (cont'd)

< Retractor circuit condition and various lighting switch positions >

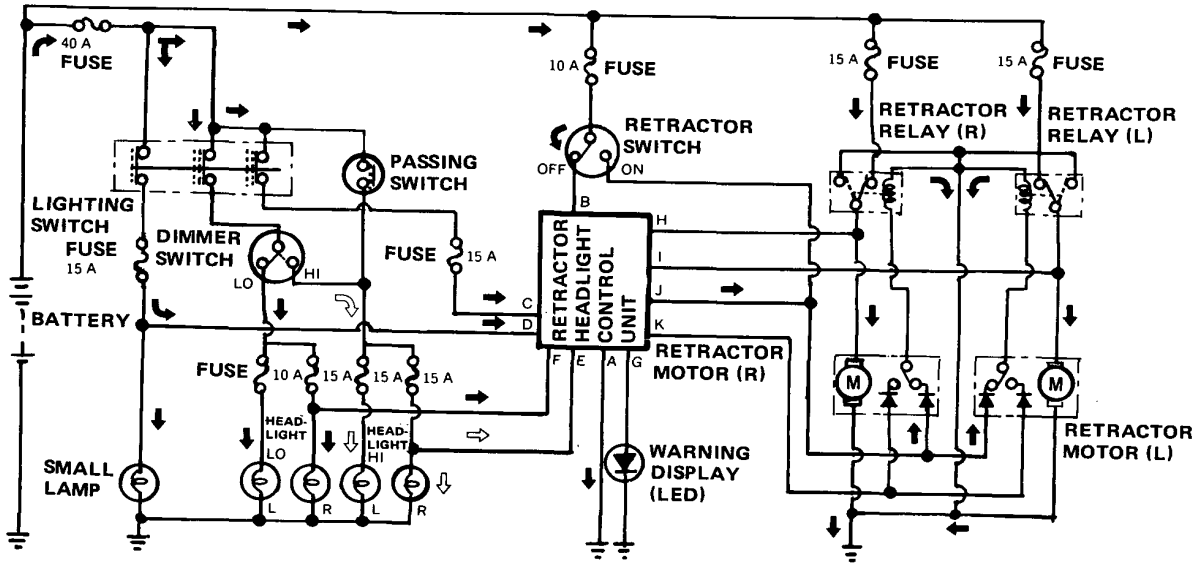
(1) OFF → (•) SMALL

When the lighting switch is moved from the OFF to the (•) small lamp position, the small lamps light. A part of the small lamp current is supplied to the retractor control unit [D], but in this condition the retractors do not operate.



(2) (•) SMALL → (●) HEADLIGHT

When the lighting switch is moved from the (•) small lamp position to the (●) headlight position, the headlights light and current flows to [B], [C], and [F] of the control unit, turning the switch inside the unit ON. As a result, current flows from the control unt [J], thus switching on the retractor relays, and opening the motor circuits, thus causing the motors to operate. When the retractors have opened fully, the switch inside the motor turns OFF, and simultaneously the motor circuits are switched to the lowering side.

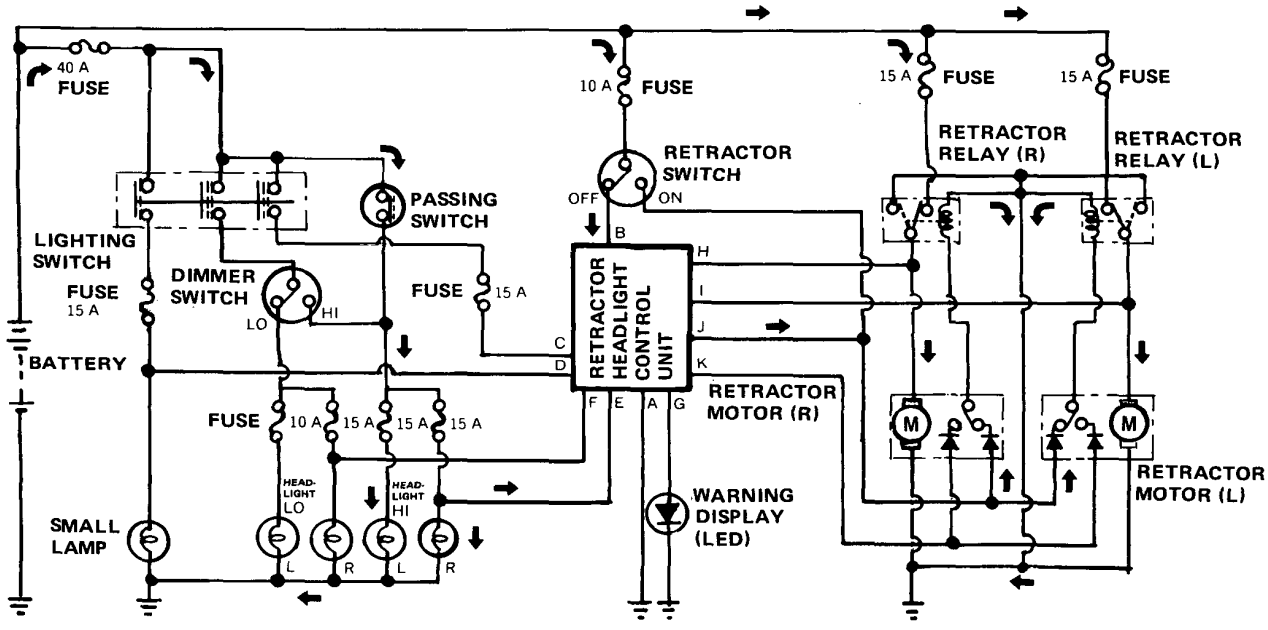


(3) (●) HEADLIGHTS → (•) SMALL LAMPS

When the lighting switch is switched from the (●) headlight position to the (•) small lamp position, the headlights are extinguished, and current to the control unit [C] and [F] is cut off, but the operation of the retractor hold circuit inside the control unit causes the retractor motors not to operate. Accordingly, the headlights are turned off, but the retractors are not lowered.

(4) (•) SMALL LAMPS → OFF [excluding OFF → (•) SMALL LAMPS → OFF]

When the lighting switch is switched from (•) small lamps position to the OFF position, the small lamps are extinguished and the current to the control unit [D] is disconnected. As a result, the hold circuit within the control unit is released, and current flows from [K] to the motor's lowering side, thus causing the retractors to be lowered. When the lighting switch is operated, the OFF time delay function within the control unit causes the retractors to remain up for a set time after the small lamps are extinguished, after which time the retractors are lowered.

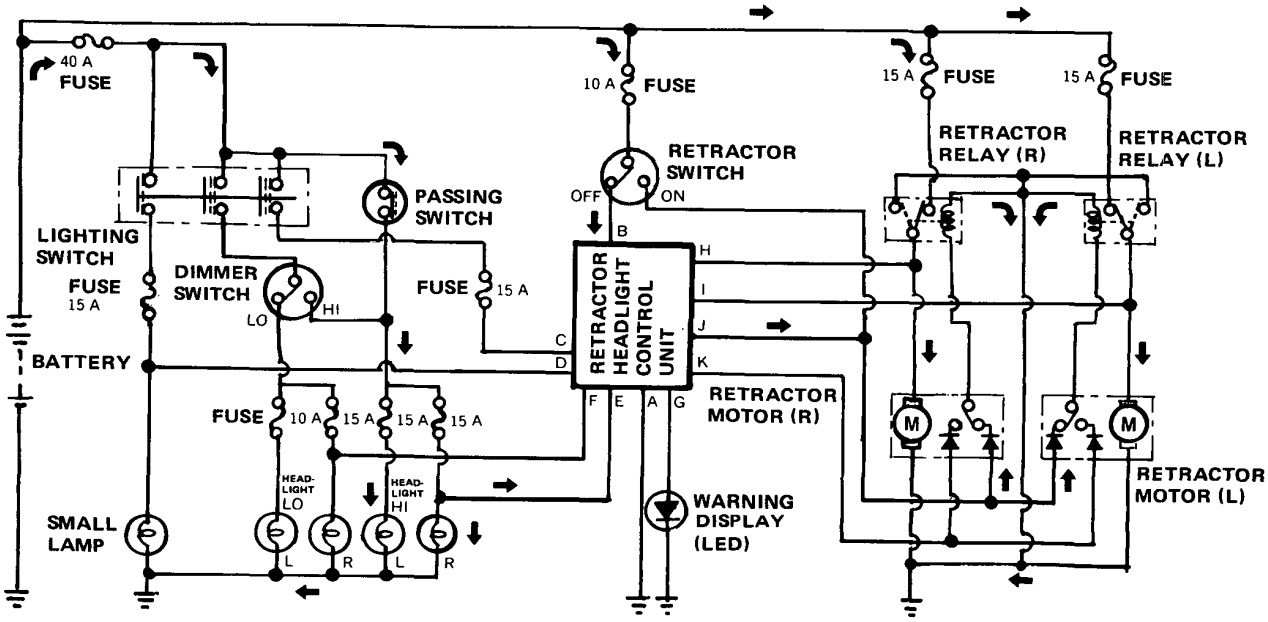


(cont'd)

Retractable Headlight (cont'd)

< One-motion passing mechanism >

The retractable headlights are equipped with a one-motion passing mechanism that allows the headlights to be used easily as a passing signal. When the passing switch is operated, the headlights light, while at the same time, the retractors rise automatically. Also, even if the passing switch is operated repeatedly, the passing hold circuit within the control unit operates to maintain the retractors at their up position for a set length of time, thus eliminating any troublesome "blinking" phenomenon. When the passing switch is set to ON, current flows to the headlight's [HI] side, while at the same time, a portion of the current to the right side light is provided to the control unit [E]. The current entering [E] turns the control unit ON, thus operating the retractors.



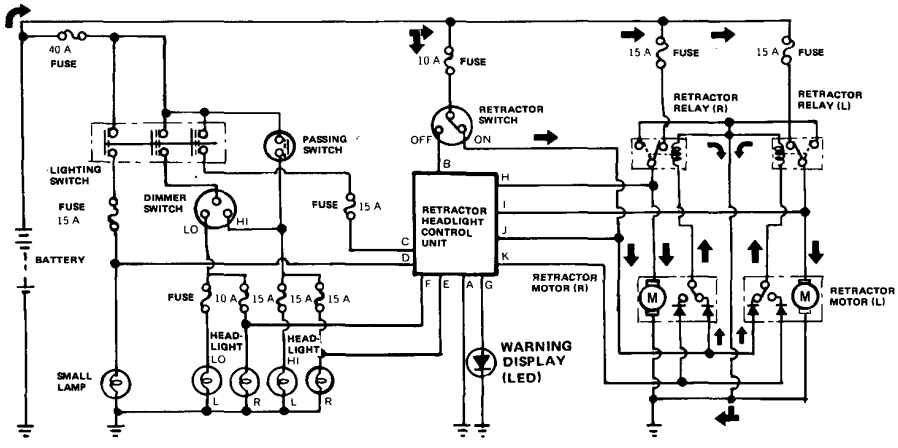
< Operation by retractor switch >

General

A retractor switch is provided to allow independent raising or lowering of the retractors without regard for the lighting switch (except when the headlights are turned on). In this way, the headlights can be raised whenever desired as a precaution to prevent possible malfunction due to freezing, etc.

Operation

When the retractor switch is turned ON, current is disconnected to the control unit [B], thus delivering battery current directly to the retractor relay, and operating the retractor motor.



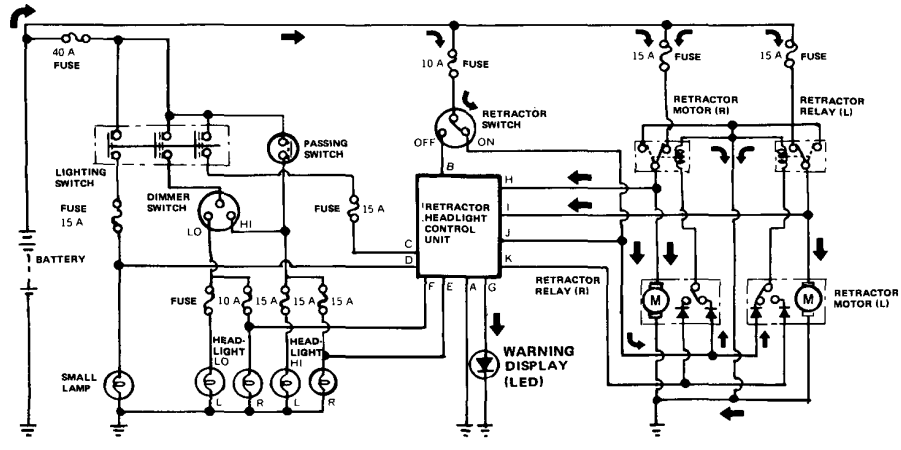
< Warning lamp mechanism >

General

In the event of system lockup, the warning display (LED) within the safety indicator lights, thus notifying the driver of a system malfunction.

Operation

During normal operation of the retractor motor, current flows to the control unit [H] and [I], and when the operation is completed, the current flow stops. However, in the event of system lockup, current continues to flow to [H] and [I]; when the current has flowed longer than a specified time, the control unit judges that an abnormality has occured, thus lighting the warning lamp.



(cont'd)

Retractable Headlight (cont'd)

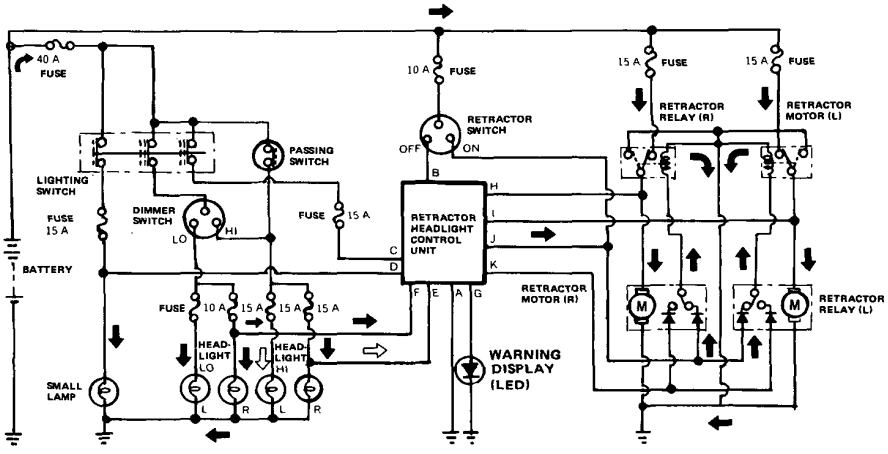
< Failsafe mechanism >

General

Even in the event of damage to the retractable control unit, a failsafe mechanism is provided to raise the rectractors when the lights are turned on, thus improving safety during nightime driving.

Operation

When the headlights are turned on, a part of the right side low-beam current flows to the control unit [F]. Since [F] and [J] are connected within the control unit, the current which enters [F] also flows to [J], thus operating the retractor relay, and raising the retractors. When the headlights are turned off, the current to [F] is interrupted, thus lowering the retractors.



< Emergency knob >

General

In the event that the rectractors do not operate by means of the lighting switch or retractor switch due to damage to the retractors or a burned fuse, etc., an emergency knob has been provided to allow manual rotation of the retractor motor.

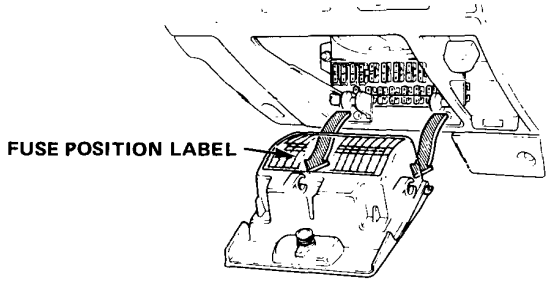
In the event that the retractors do not operate by means of the lighting switch or retractor switch due to damage to the retractors or a burned fuse, etc., an emergency knob has been provided to allow manual rotation of the retractor motor.

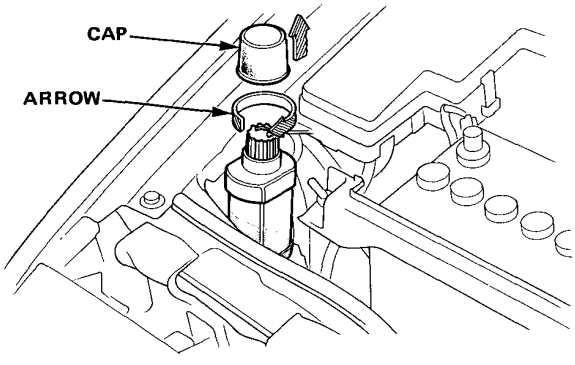
Construction

The shaft of the retractor motor is extended from the motor case, and the motor shaft is manually rotated.

Operation

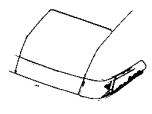
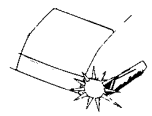
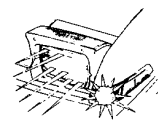
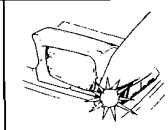
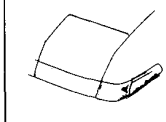
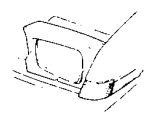
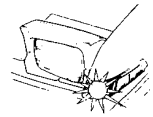
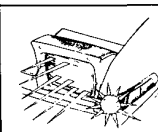
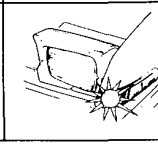
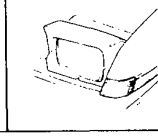
1. The retractor fuse on the undamaged side is removed from the passenger compartment fuse box.
2. Inside the engine compartment, the retractor motor shaft is removed, and the knob is rotated in the arrow direction (clockwise) indicated on the upper surface of the knob, thus moving the headlights to the fixed position (highest position or lowest position).



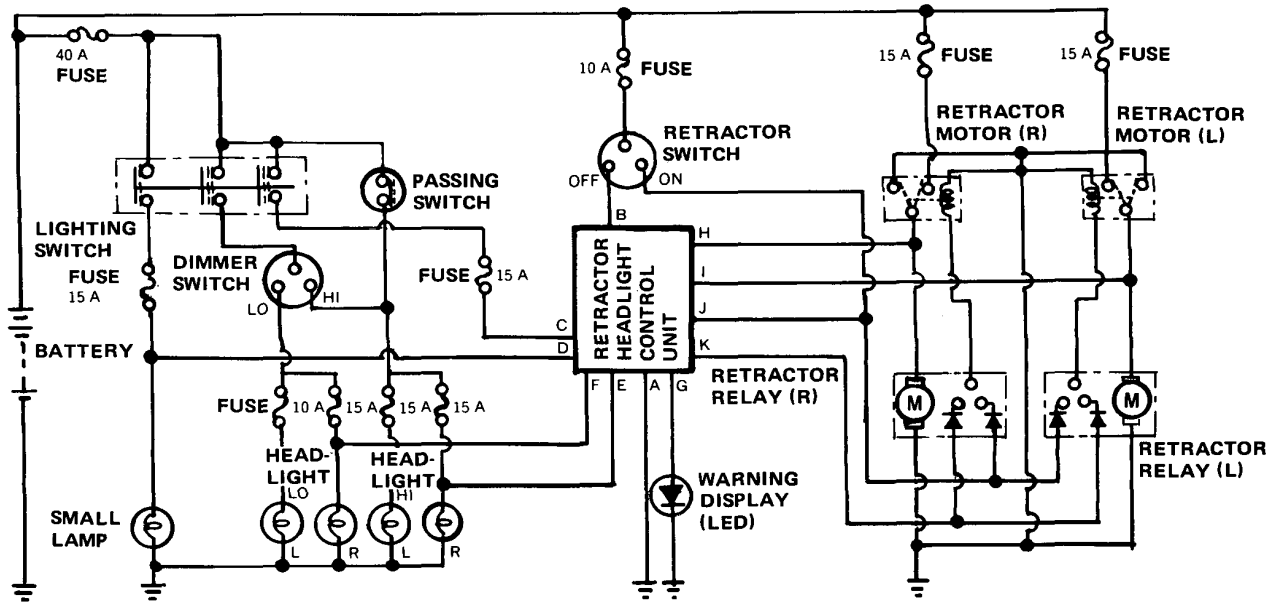


< Operation by retractor switch >

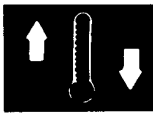
When the lighting switch is operated, the retractor control unit operates to automatically raise or lower the headlights. Lighting conditions produced by operation of the lighting switch are shown in the following table:

Switch Position		OFF ⟷ • ➡ ● ⟷ • ➡ OFF				
Name of lamps	Headlights	OFF	OFF	ON	OFF	OFF
	Side Lamp Tail Lamp Licence Lamp Instrument Panel Lamp	ON	ON	ON	ON	OFF
Light operation	Retractorable switch OFF					
	Retractorable switch ON					

Retractable Circuit Diagram



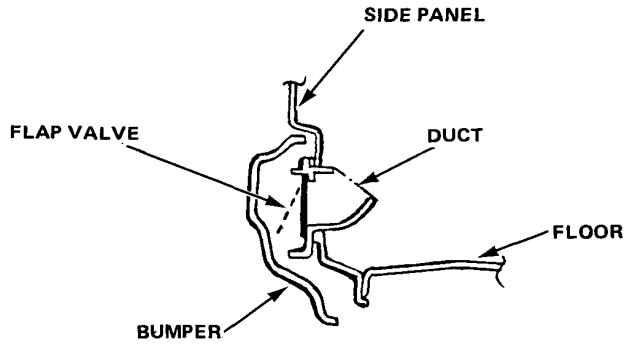
Heating and Air Conditioning

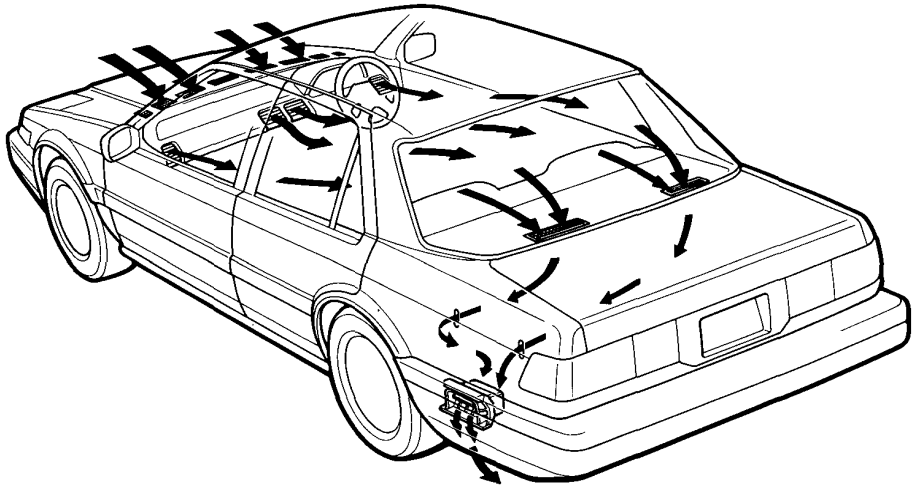


Heating and Air Conditioning

Ventilation Outlet (4D)

An outlet duct with a large discharge outlet is located on the left side of the trunk room behind the rear bumper for more complete discharge of stale air. The design also permits easy escape of the room air which is compressed when the door is closed. A flap valve in the duct prevents entry of dust, water and exhaust gases into the cabin. Virtually no wind noise can enter through the outlet because it is strategically located behind the rear bumper.





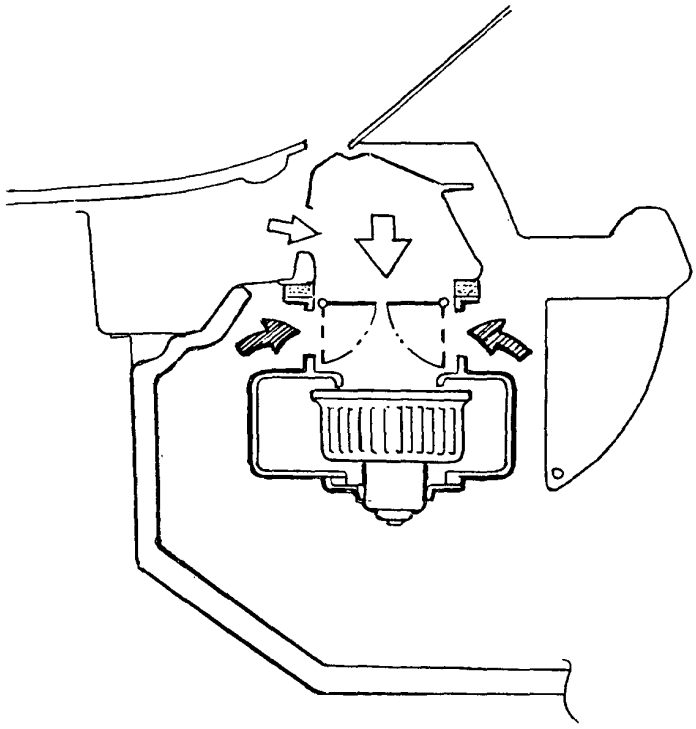
Heating and Air Conditioning

Heater Blower

The outside air door so far used has been replaced with a set of two air doors. Concurrently with this improvement, the blower motor has also been changed to a smaller unit.

Features

1. The new blower is capable of blowing more air through the larger discharge outlet.
2. One of the air door is open to the lower dashboard to reduce intake noise in recirculation.
3. As the overall height of the blower unit has been decreased, the leg room has increased accordingly.

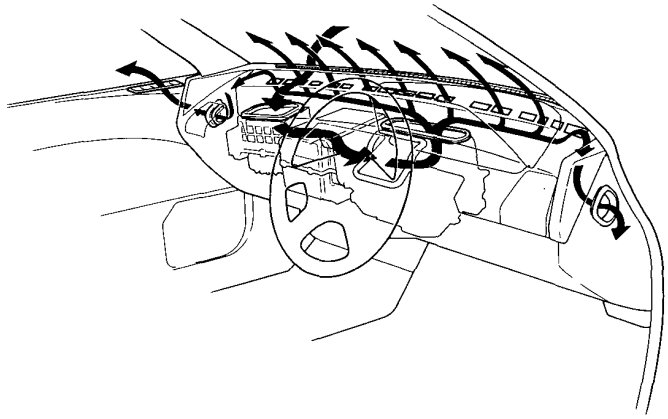


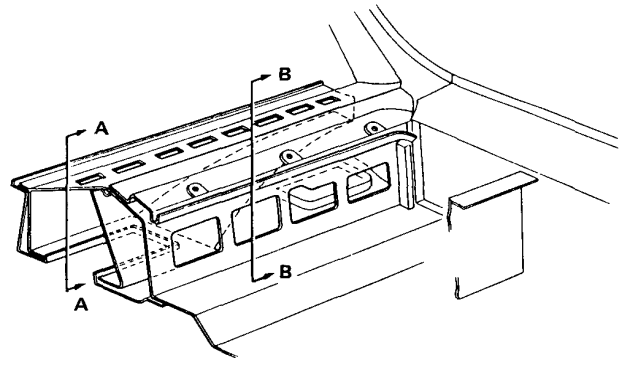
Upper Dashboard

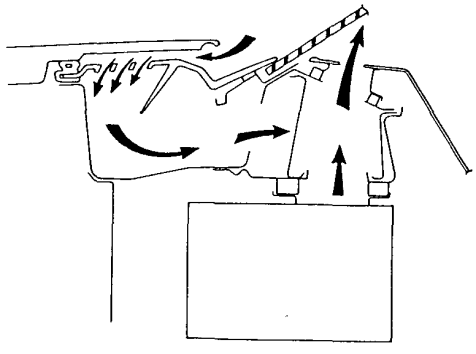
The ventilation duct is located in the instrument panel; the defroster duct serves as a cross member of the dashboard.

Features

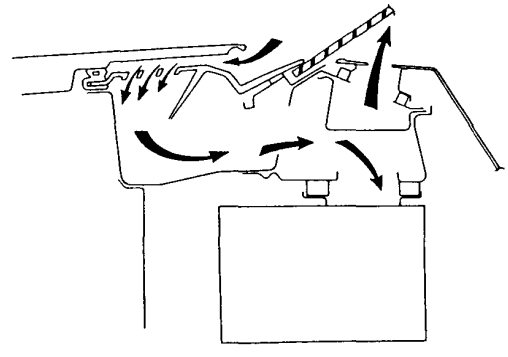
1. Shorter and lower front nose.
2. More cooled or hot air through larger discharge outlet.
3. Reinforced upper instrument panel.







(A–A SECTION)



(B–B SECTION)

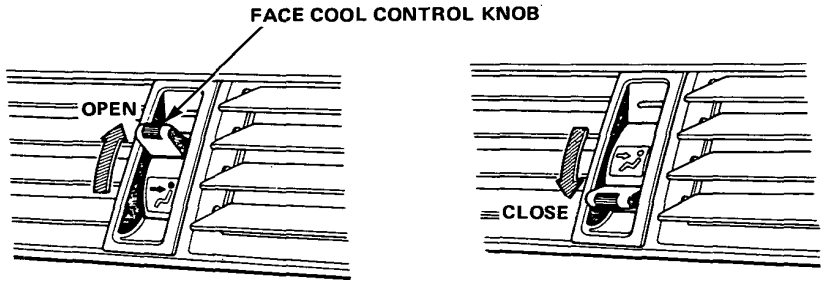
Heating and Air Conditioning

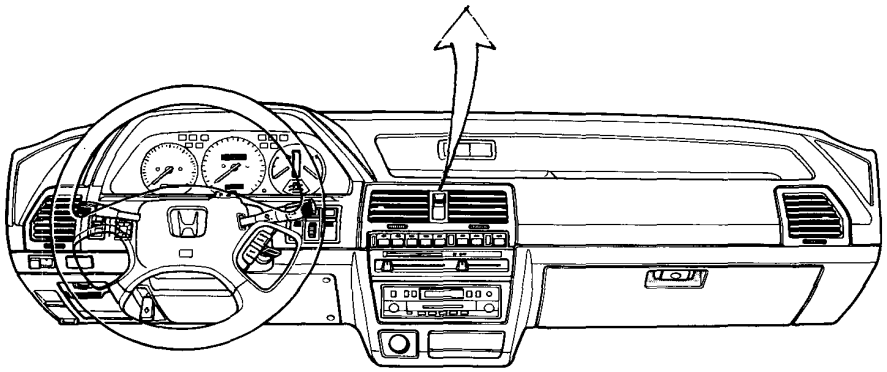
Face Cool Control

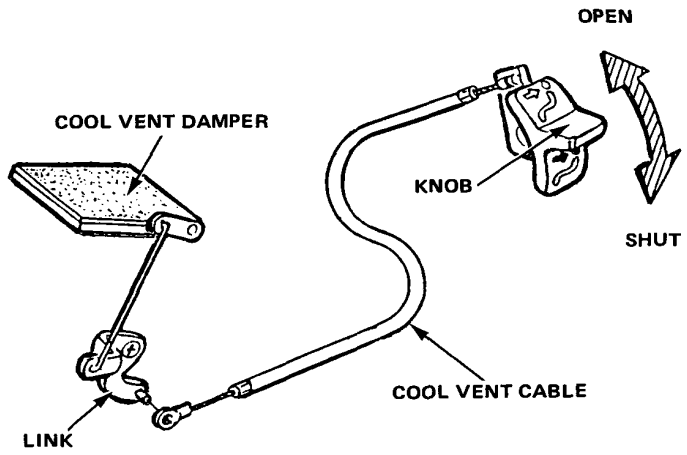
The "Mild Flow" ventilation system now features an independent temperature control for air blown through the upper vent in "BI-LEVEL" by adding a bypass duct and air damper.

Features

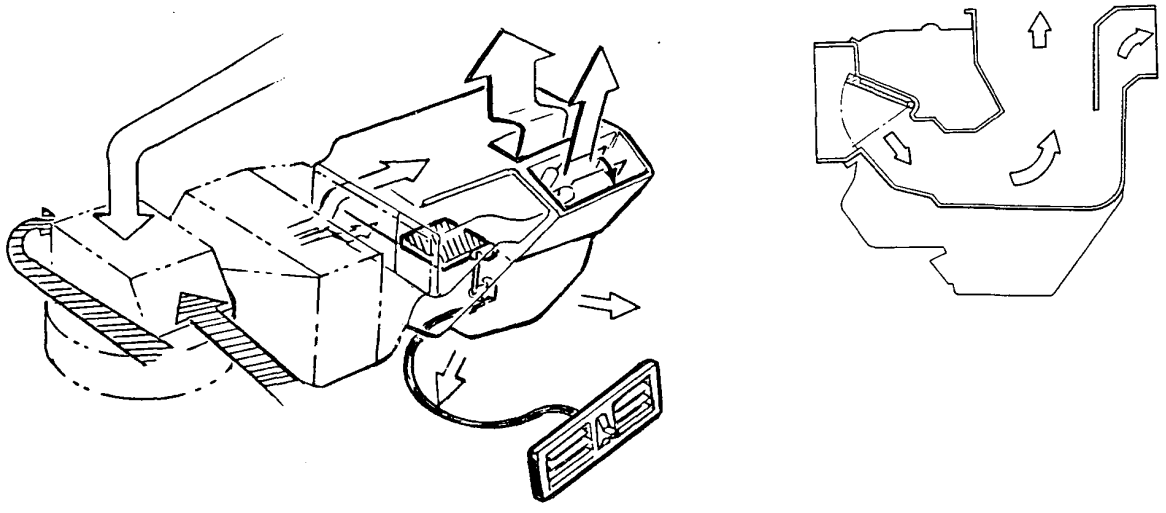
1. In BI-LEVEL, the temperatures of the airs blown through the upper and lower vents can be controlled separately.
2. In HEAT, cool air is obtained through the upper vent without lowering the temperature of the air blown through the lower vents.

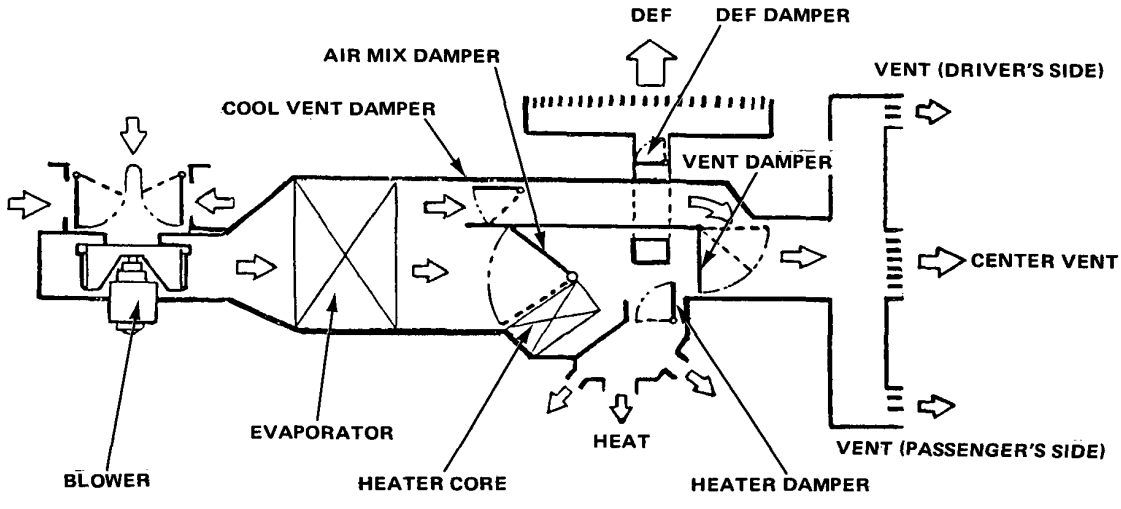






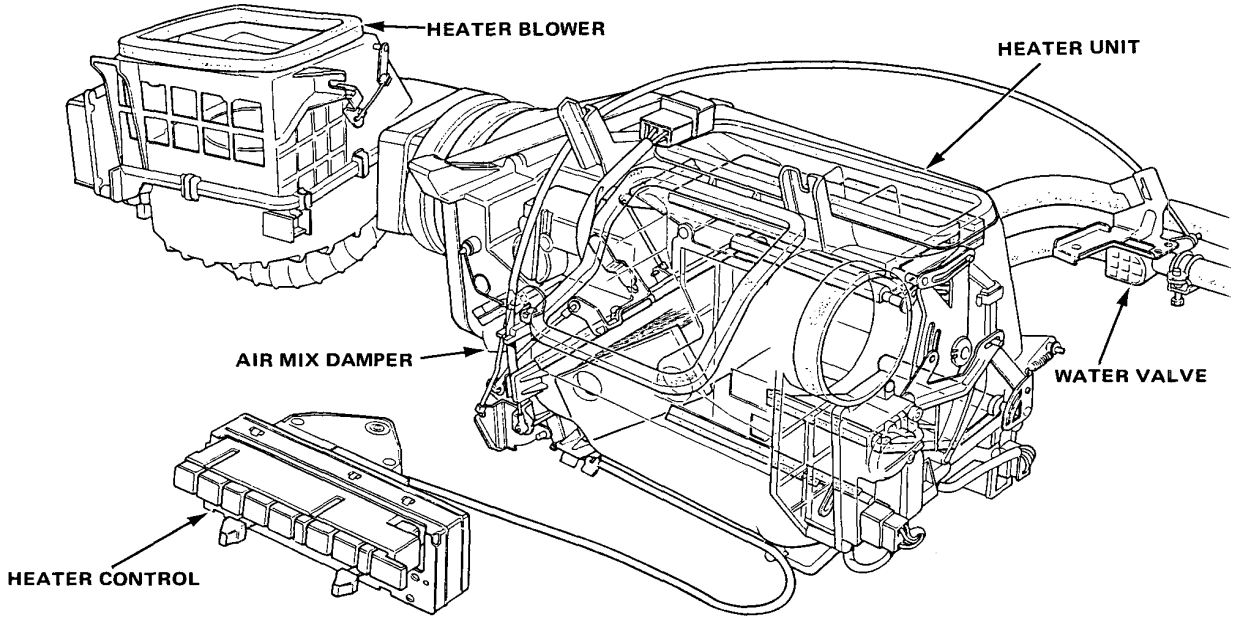
Construction

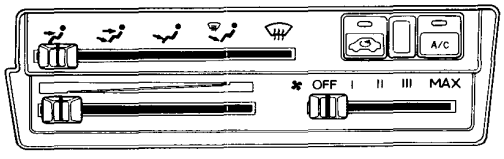




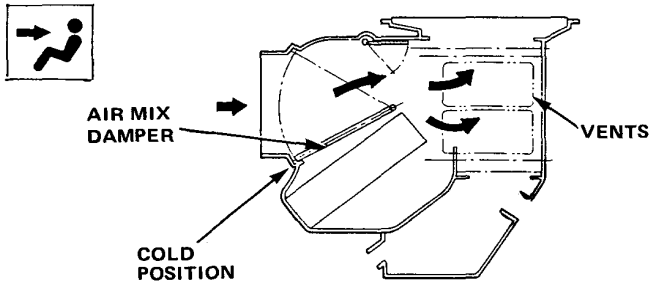
Heater Unit

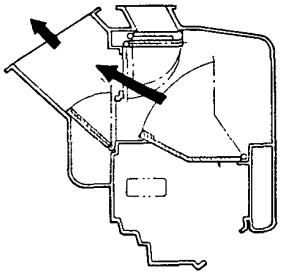
To change the modes, all air dampers except the air mix damper are activated. A lever control is used for 1.6ℓ Model, where as a push button type control is used for 2.0ℓ Model.



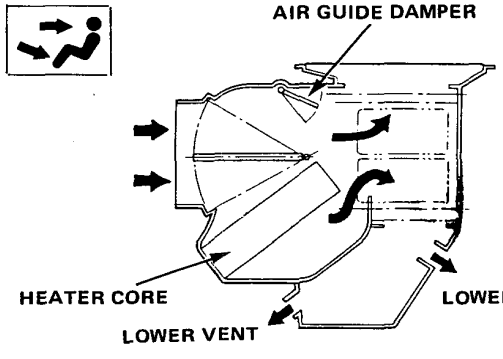


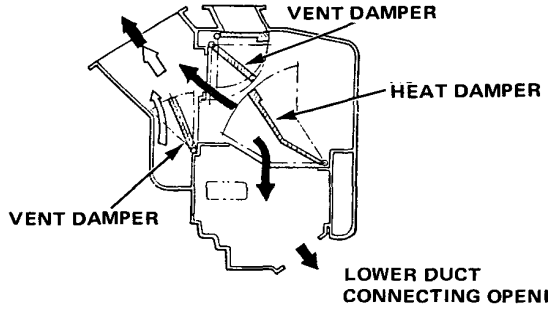
VENT IN INSTRUMENT PANEL

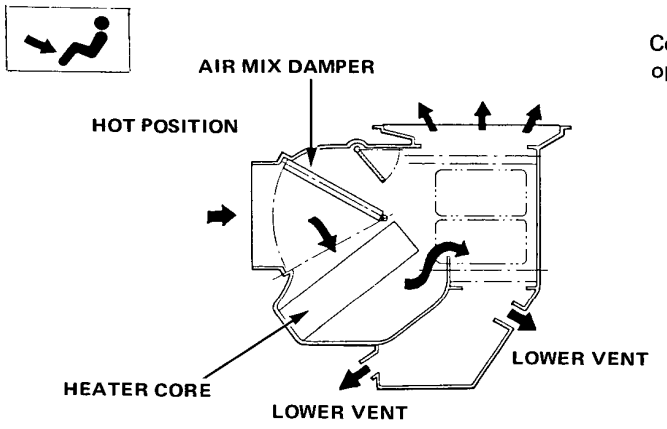




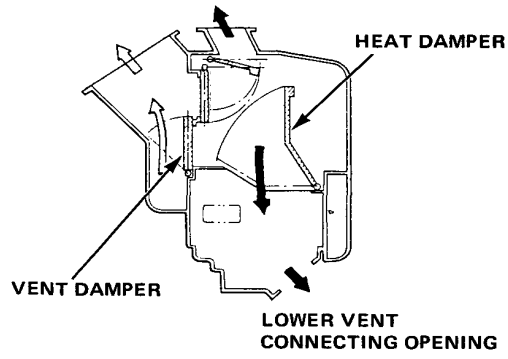
With Cool Vent open, hot air temperature is lowered.

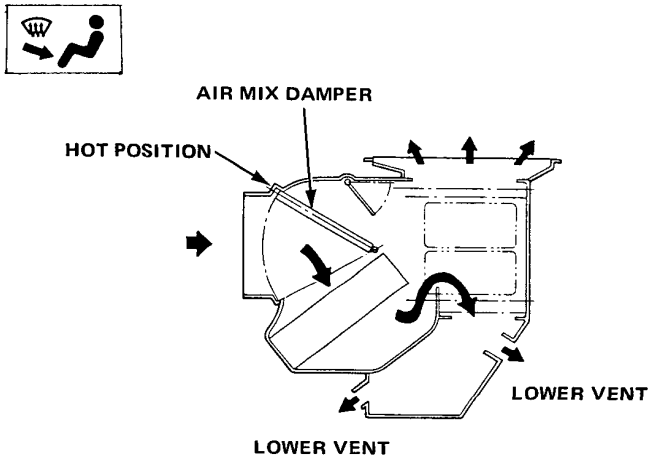


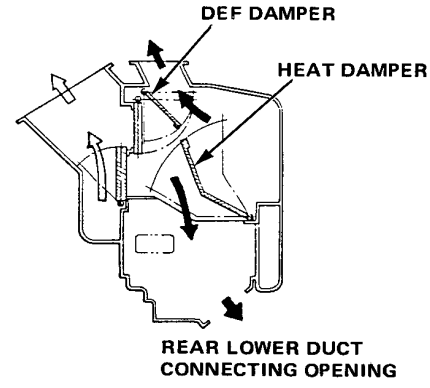


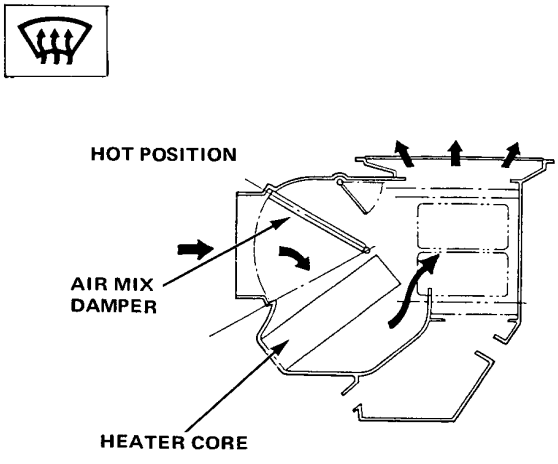


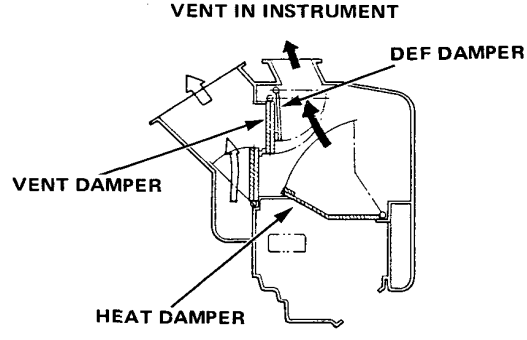
Cool air blown with cool vent open







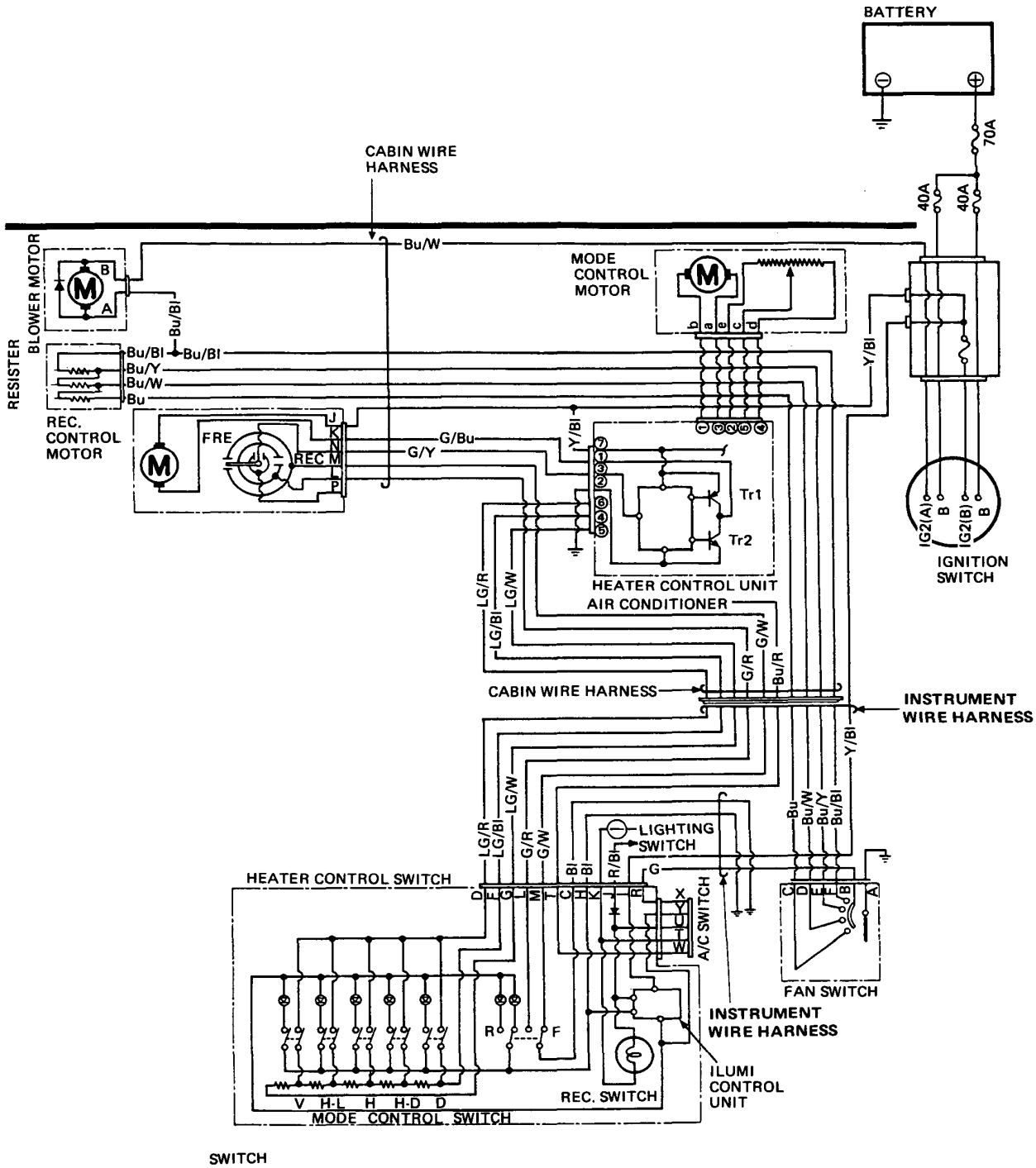




Specification

ITEM		SPECIFICATION
Compressor	Maker	Nippon Denso
	Type	Swash plate type, 10 pistons
	Piston displacement	153 cm^3 (cc)/rev
Condenser	Maker	Modine
	Type	Corrugated fin type
	Size	649 (W) x 328 (H) x 23.8 (t)
Evaporator	Maker	Modine
	Type	Corrugated fin type
	Size	278 (W) x 188 (H) x 102 (t)
Blower	Type	Sirocco fan
	Speed control	Infinitely variable
	Max. capacity	420 m^3/h
Compressor Belt	Type	Poli-V delt drive
Cooling Capacity		3,250 kcal/h

Air Conditioner with Mode Control



INTRODUCTION

How to Use This Manual

This supplement contains information specifically applicable to the 1987 ACCORD. Refer to the Base Shop Manual (No.62SE300) as the general source for service procedures applicable to this model. The first page of each section is marked with a black tab that lines up with one of the thumb index tabs on this page. You can quickly find the first page of each section without looking through a full table of contents. The symbols printed at the top corner of each page can also be used as a quick reference system.
Each setion includes:

1. A table of contents, or an exploded view index showing:
   - Parts disassembly sequence.
   - Bolt torques and thread sizes:
   - Page references to descriptions in text.
2. Disassembly/assembly procedures and tools.
3. Inspection.
4. Testing/troubleshooting.
5. Repair.
6. Adjustments.

Special Information

WARNING Indicates a strong possibility of severe personal injury or loss of life if instructions are not followed.

CAUTION: Indicates a possibility of personal injury or equipment damage if instructions are not followed.

NOTE: Gives helpful information.

CAUTION: Detailed descriptions of *standard* workshop procedures, safety principles and service operations are not included. Please note that this manual does contain warnings and cautions against some specific service methods which could cause PERSONAL INJURY, or could damage a vehicle or make it unsafe. Please understand that these warnings cannot cover all conceivable ways in which service, whether or not recommended by Honda motor, might be done, or of the possible hazardous consequences of each conceivable way, nor could Honda motor investigate all such ways. Anyone using service procedures or tools, whether or not recommended by Honda motor, *must satisfy himself thoroughly* that neither personal safety nor vehicle safety will be jeopardized.

* For these chapters, this supplement contains no new information; refer to the Base Shop Manual.

First Edition 9/86
Second Print 2/90 300 pages
All Rights Reserved

HONDA MOTOR CO., LTD.
Service Publication Office

Outline of Model Changes

ITEM		MODELS						DESCRIPTION	REF. SECTION
		KE	KF	KG	KQ	KW	KX		
Carbureted Engine Model (equipped with A20A1 Engine)							○	New Release (KG and KX models were released in 1986)	–
Fuel-Injected Engine Model	A20A3 Engine			○		○	○	New Release	–
	A20A4 Engine				○			New Release (Other models were released in 1986)	–
	B20A2 Engine	○	○	○				New Release	–
Engine		○ (EXSi type)	○ (EXSi type)	○ (EXSi type)				New Type (B20A2)	§5 thru. §10
Fuel and Emission Control System	A20A1 Engine			○		○	○	Idle Control System does not apply	–
	A20A3 Engine			○		○	○	New System	–
	A20A4 Engine				○			Evaporative Emission Control System added	§12
	B20A2 Engine	○	○	○				New System	§12
Clutch		○ (EXSi type)	○ (EXSi type)	○ (EXSi type)				New Type	§13
Manual Transmission								New Type (B2)	§14
Driveshafts								Intermediate Shaft added	§17
Front Brakes								Uses large Front Caliper and Disc	§20
Distributor		○	○	○		○	○	Uses New Type (for A20A1 and B20A2 Engines)	§24
Headlights		○						Equipped with Dim-Dip Lighting System	§25

ITEM	MODELS	DESCRIPTION	REF. SECTION
Front Brakes	Models equipped with 4W—ALB (except KS model)	Uses large Front Caliper and Disc	§20
Frame Specification	ALL	Frame Specifications near Rear Suspension are changed	§21
Combination Meter	ALL	For Coolant Temperature and Fuel Gauges, Design and Mechanism are changed	§25

General Information

Chassis and Engine Numbers

Vehicle Identification Number

JHMCA53400C100001

Model Name
- CA4: Acoord 1600
- CA5: Accord 2000

Transmission Group
- 3: 5-speed (3D)
- 4: Automatic (3D)
- 5: 5-speed (4D)
- 6: Automatic (4D)

Vehicle Version
- 2: STD, GL
- 3: EX
- 4: EXi
- 5: EXSi
- 6: EXR, LXC
- 7: EXC
- 8: EXCi

Model Year
- 0: 1987

Plant
- C: Sayama Plant

Serial Number

Engine Serial Number

A20A4 – 2000001

Engine Type
- A20A1: 2000 with Carburetor (With catalyst)
- A20A2: 2000 with Carburetor (Without catalyst)
- A20A3: 2000 with Fuel-Injection (EXCi)
- A20A4: 2000 with Fuel-Injection (EXi)
- A16A1: 1600 with Carburetor
- B20A2: 2000 DOHC with Fuel-Injection

Model Year
- 1: 1987 2000 with Fuel-Injection (EXCi and EXSi)
- 2: 1987 Other types

Transmission Group
- 0: 5-speed
- 3: 5-speed (KQ)
- 5: Automatic Transmission
- 7: 5-speed (KG, KX, KW with catalyst)
- 8: Automatic (KX, KQ, KG, KW with catalyst)

Serial Number

Transmission Number
(Manual Transmission)

A2K5 – 2000001

Transmission Type
- A2K5: for A20A Engine
- A1M5: for A16A Engine
- B2K5: for B20A2 Engine

Serial Number

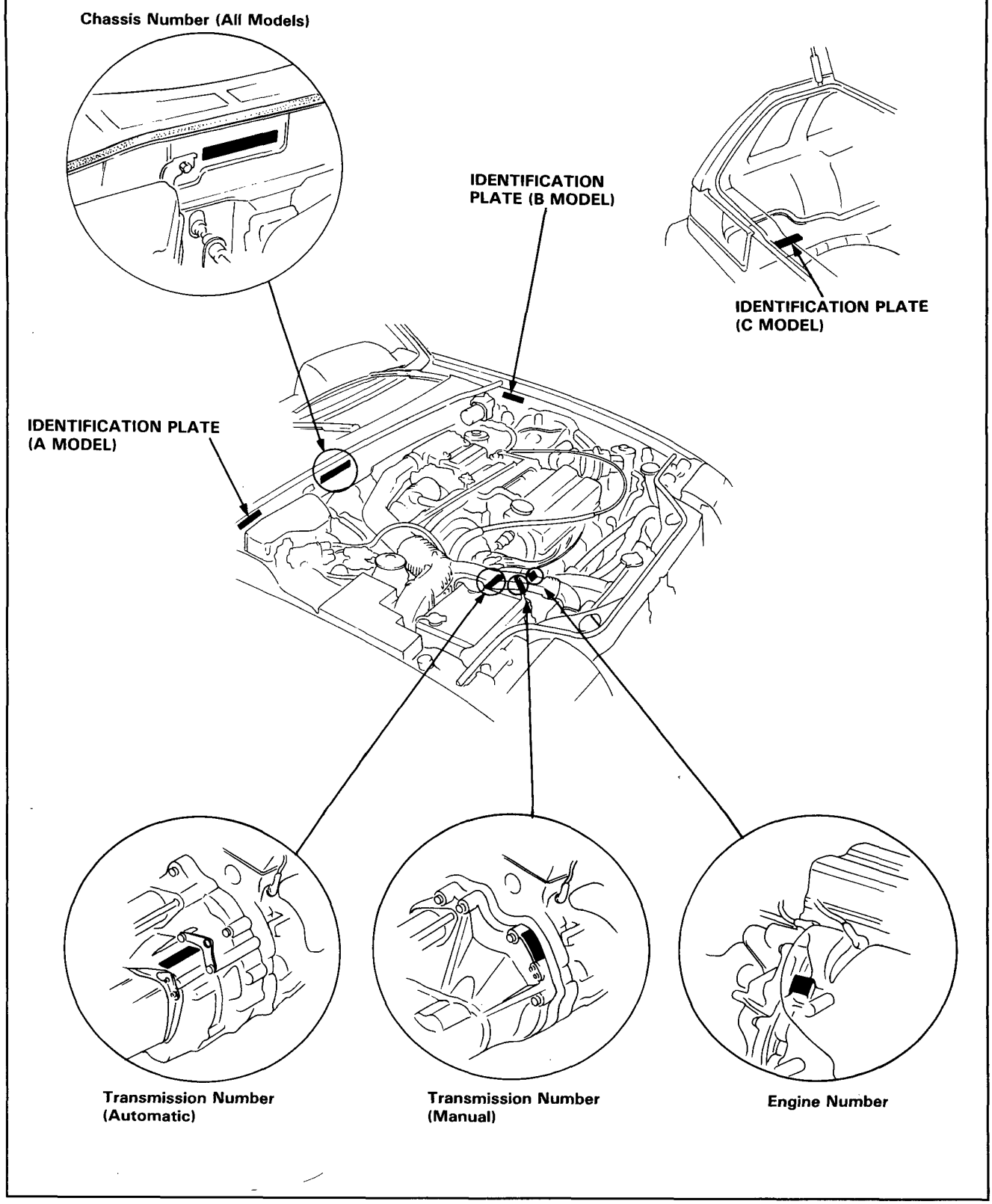
Transmission Number
(Automatic Transmission)

F4 – 6000001

Transmission Type
- F4: for A20A and B20A Engine
- C9: for A16A Engine

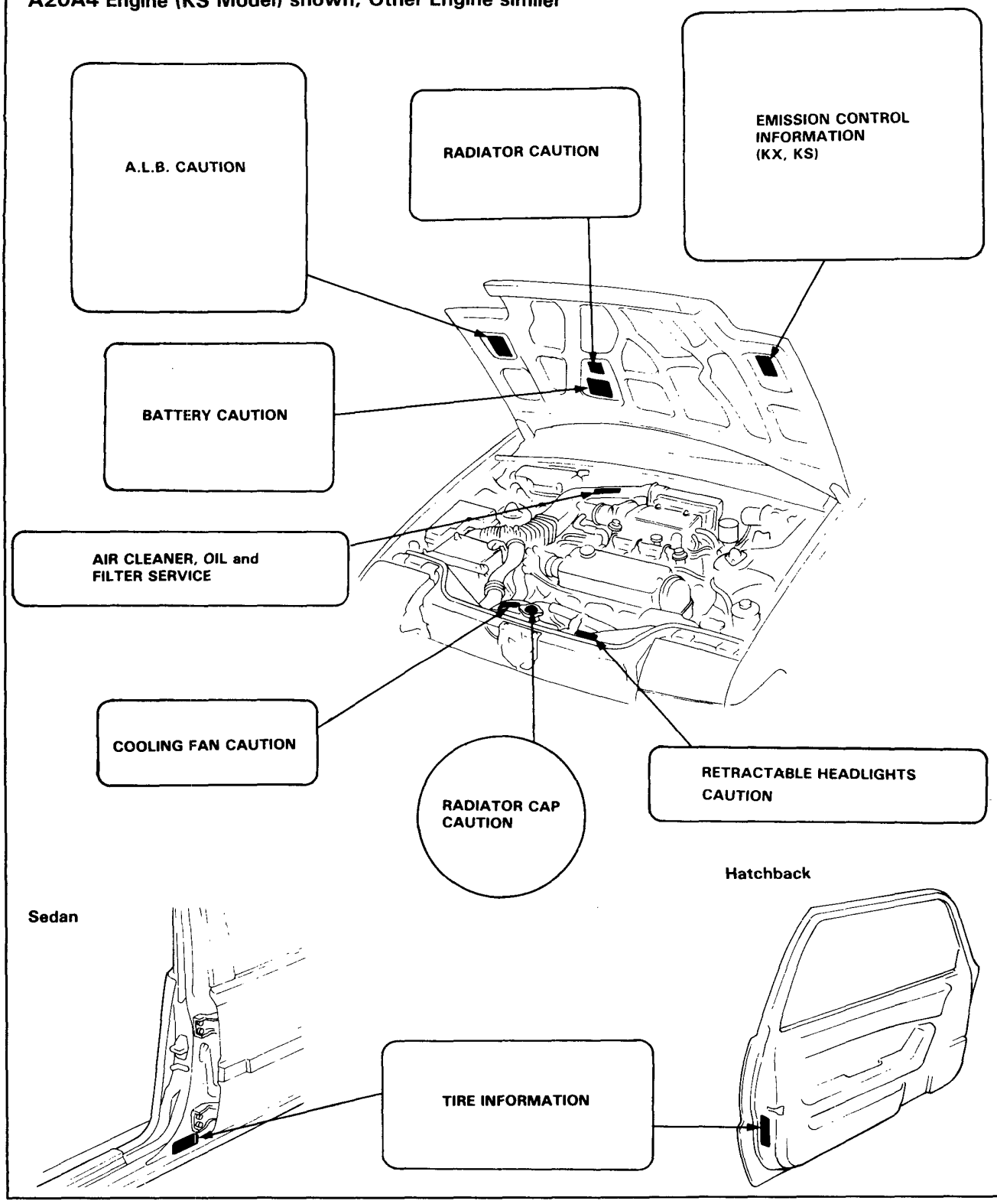
Serial Number

Identification Number Locations



Label Locations

A20A4 Engine (KS Model) shown; Other Engine similer



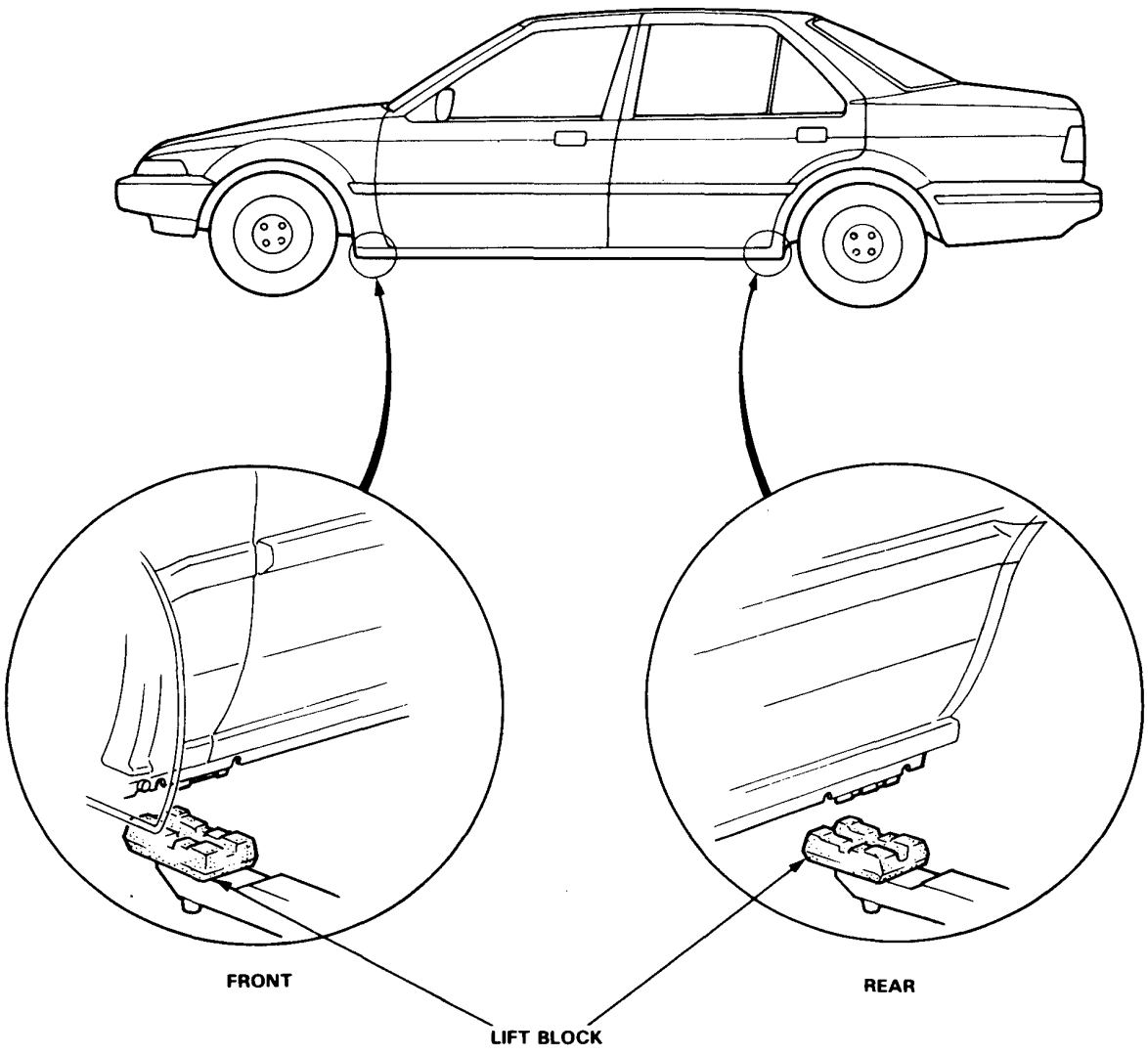
Lift and Support Points

Hoist

1. Place the lift blocks as shown.
2. Raise the hoist a few inches and rock the car to be sure it is firmly supported.
3. Raise the hoist to full height and inspect lift points for solid support.

WARNING When heavy rear components such as suspension, fuel tank, spare tire and trunk lid/hatch are to be removed, place additional weight in the trunk before hoisting. When substantial weight is removed from the rear of the car, the center of gravity may change and can cause the car to tip forward on the hoist.

NOTE: Since each tire/wheel assembly weights approximately 14 kg (30 lbs), placing the front wheels in the trunk can assist with the weight transfer.



(cont'd)

Lift and Support Points (cont'd)

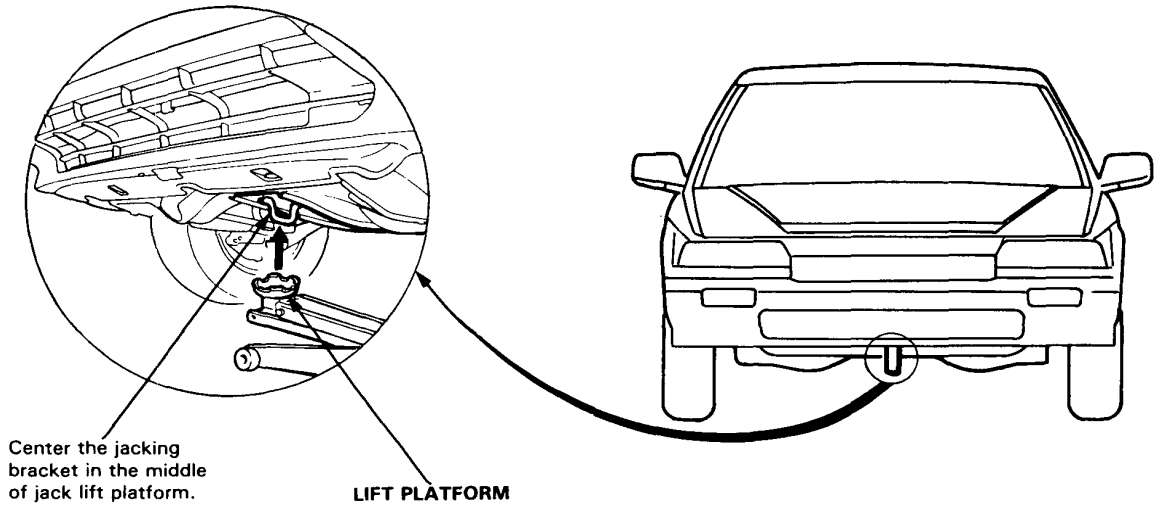
Floor Jack

1. Set the parking brake and block the wheels that are not being lifted.
2. When lifting the rear of the car, put the gearshift lever in reverse (Automatic in PARK).
3. Raise the car high enough to insert the safety stands.
4. Adjust and place the safety stands as shown on page 1-7 so the car will be approximately level, then lower the car onto them.

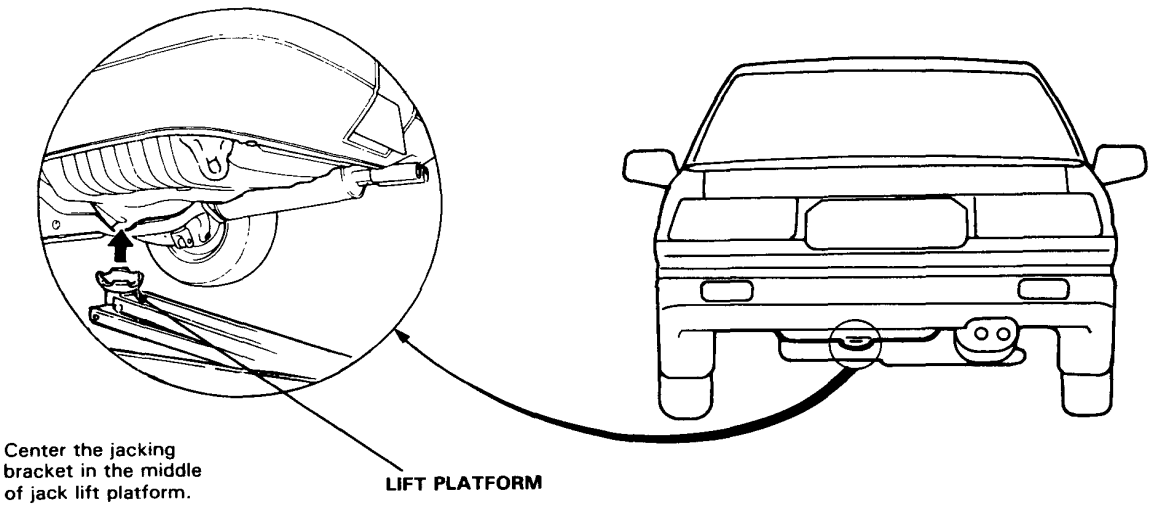
WARNING

- **Always use safety stands when working on or under any vehicle that is supported by only a jack.**
- **Never attempt to use a bumper jack for lifting or supporting the car.**

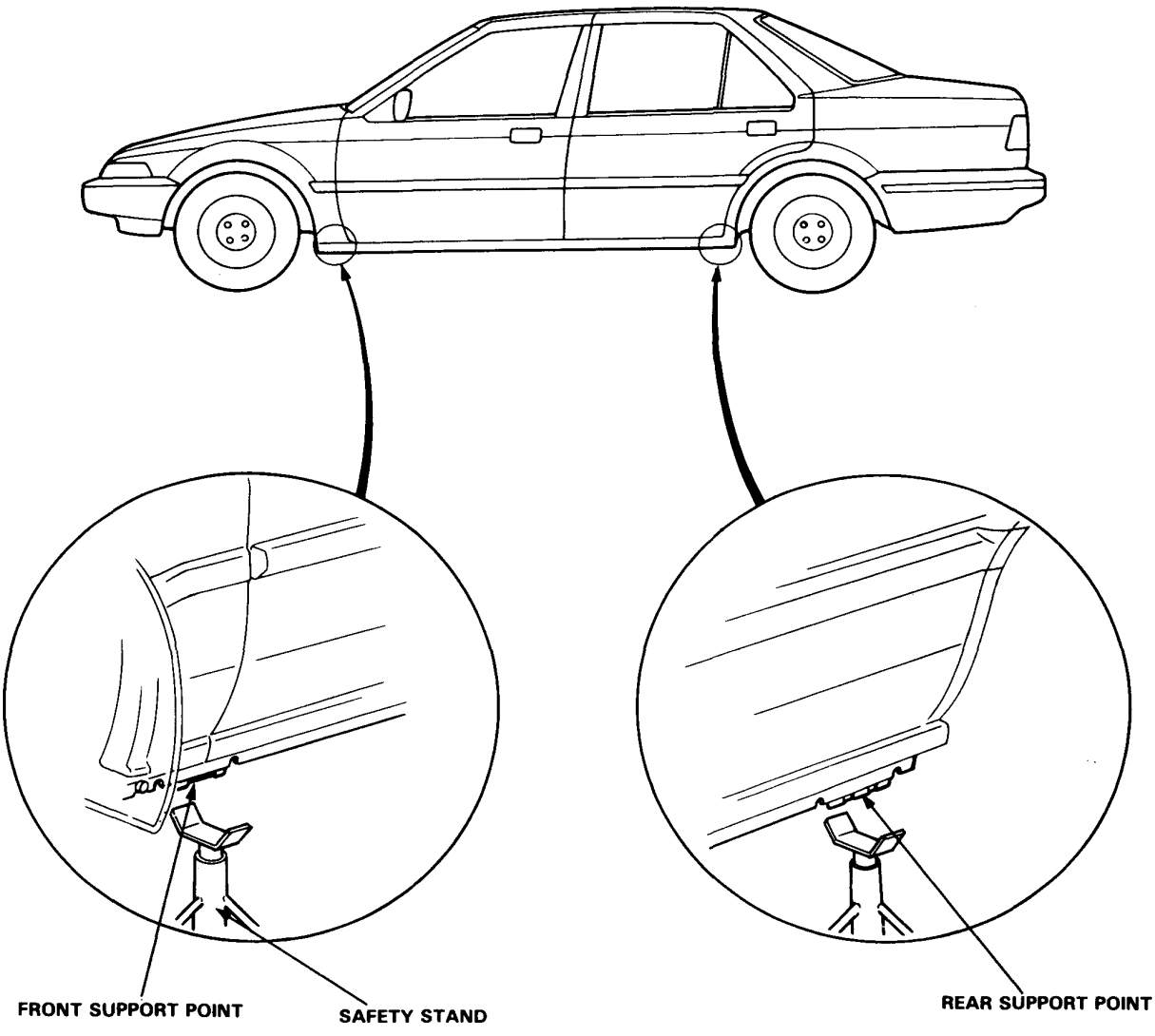
Front



Rear



Safety Stands

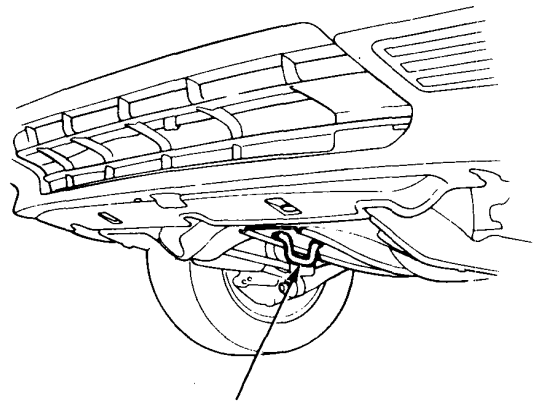


Towing

If possible, always tow the car with the front wheels off the ground. Do not use the bumpers to lift the car or to support the car's weight while towing. Check local regulations for towing with a chain or frame-mounted tow bar. A chain may be attached to the hook shown in the illustration. Do not attach a tow bar to either bumper.

If the car is to be towed with four wheels on the ground, observe the following precautions:

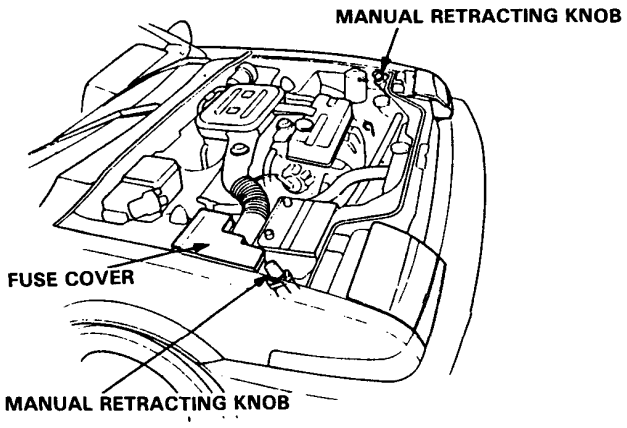
1. Wheels and axle must not be touching the body or frame.
2. Turn the ignition key to the "I" position and make sure the steering wheel turns freely.
3. Place the transmission in NEUTRAL.
4. Release the parking brake.
5. DO NOT exceed 55KPH (35 MPH) for distances of more than 80 km (50 miles).



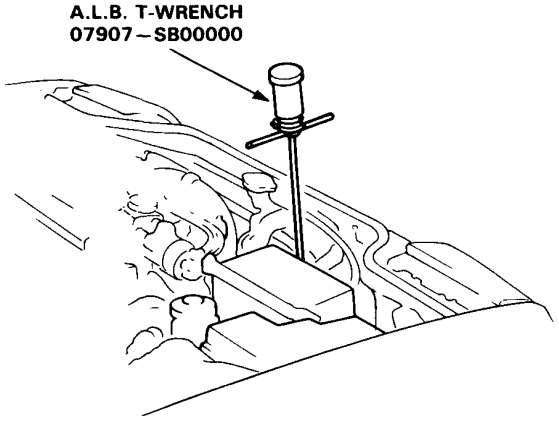
TOWING POINT

Special Caution Items For This Car

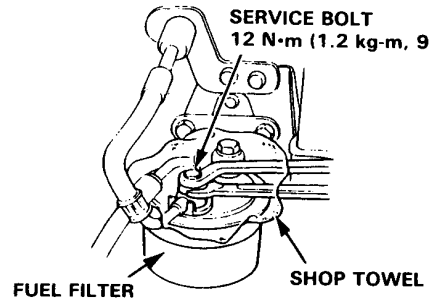
1. Retractable headlights are installed. For manual raising *and lowering*, the fuse must be pulled. When raising and lowering is executed without pulling the fuse, danger may be caused by rapid turning of the manual retracting knob.



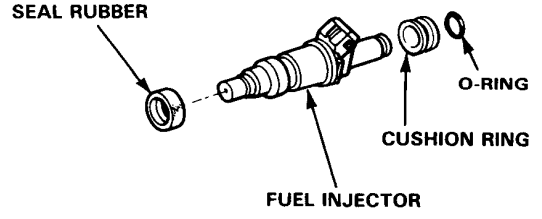
2. For cars equipped with A.L.B., the high-pressure brake fluid must be drained before disassembly of the A.L.B. piping system. When this is not done, danger may be caused by brake fluid squirting out under high pressure. For draining of the high-pressure brake fluid, refer to Section 20.



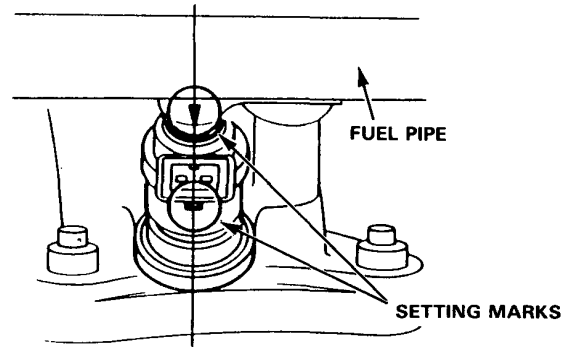
3. Fuel Line Servicing (Fuel-Injected Engine)
   - Relieve fuel pressure by loosening the service bolt provided on the top of the fuel filter before disconnecting a fuel hose or a fuel pipe.



   - Be sure to replace washers, O-rings, and seal rubbers with new ones when servicing fuel line parts.
   - Always apply oil to the surfaces of O-rings and seal rings before installation. Never use brake fluid, radiator fluid, vegetable oils or alcohol-based oils.



   - When assembling the flare joint of the high-pressure fuel line, clean the joint and coat with new engine oil.
   - When installing an injector, check the angle of the coupler. The center line of the coupler should align with the setting mark on the injector holder.



(cont'd)

Special Caution Items For This Car (cont'd)

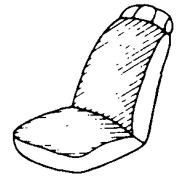
4. Inspection for fuel leakage
   - After assembling fuel line parts, turn ON the ignition switch (do not operate the starter) so that the fuel pump is operated for approximately two seconds and the fuel is pressurized. Repeat this operation two or three times and check whether any fuel leakage has occurred in any of the various points in the fuel line.

5. Installation of an amateur radio for cars equipped with PGM-FI and A.L.B.
   Care has been taken for the PGM-FI and A.L.B. control units (computer) and its wiring to prevent erroneous operation from external interference, but erroneous operation of the computer may be caused by entry of extremely strong radio waves. Attention must be paid to the following items to prevent erroneous operation of the computer.
   - The antenna and the body of the radio must be at least 200 mm (7.9 in.) away from the computer. (The computer installation position is under the right side seat.)
   - Do not lead the antenna feeder and the coaxial cable over a long distance parallel to the wiring, and when crossing with the wiring is required, execute crossing at a right angle.
   - Do not install a radio with a large output (max. 10 W).

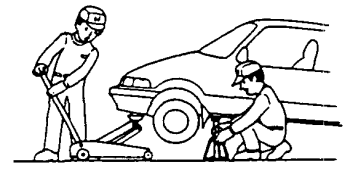
6. Apply liquid gasket to the transmission, oil pump cover, right side cover and water outlet. Use HONDA PARTS NO 08740—99986 as a liquid gasket.
   - Check that the mating surfaces are clean and dry before applying liquid gasket. Degrease the mating surfaces if necessary.
   - Apply liquid gasket evenly, being careful to cover all the mating surface.
   - To prevent leakage of oil, apply liquid gasket to the inner threads of the bolt holes.
   - Do not allow liquid gasket to stand for more than 20 minutes before assembly.
   - Fill the case with clean engine oil or coolant 30 minutes after assembly.

CAUTION: Observe all safety precautions and notes while working.

1. Protect all painted surfaces and seats against dirt and scratches with a clean cloth or vinyl cover.

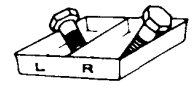


2. Work safely and give your work your undivided attention. When either the front or rear wheels are to be raised, block the remaining wheels securely. Exchange signals as frequently as possible when a work involves two or more workers. Do not run the engine unless the shop or working area is well ventilated.

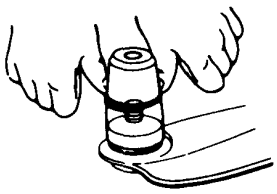


3. Prior to removing or disassembling parts, they must be inspected carefully to isolate the cause for which the service is called for. Observe all safety notes and precautions and follow the proper procedures as described in this manual.

Mark or place all removed parts in order in a parts rack so they can be placed back to their original places or parts from which they were removed or with which they were mated.

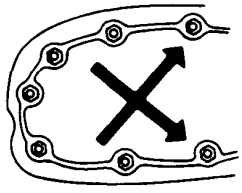


4. Use special tool when use of such a tool is specified.

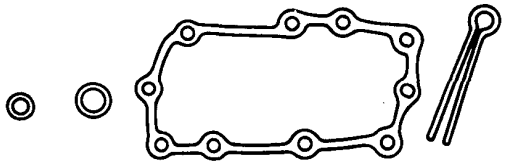


5. Parts must be assembled with the proper looseness or tightness according to the maintenance standards established.

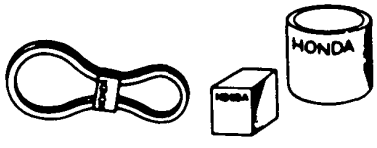
6. When tightening bolts or nuts, begin on center or large diameter bolts and tighten them in crisscross pattern in two or more steps if necessary.



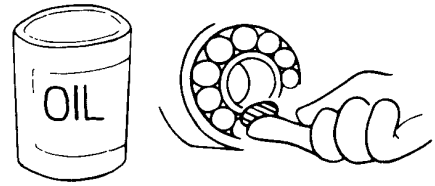
7. Use new packings, gaskets, O-rings and cotter pins whenever reassembling.



8. Use genuine HONDA parts and lubricants or those equivalent. When parts are to be reused, they must be inspected carefully to make sure they are not damaged or deteriorated and in good usable condition.



9. Coat or fill parts with specified grease where specified grease where specified (page 4-2). Clean all removed parts in or with solvent upon disassembly.

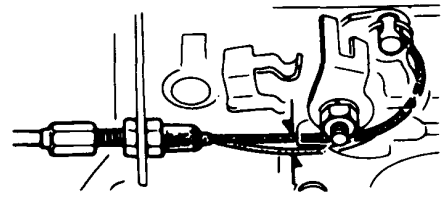


10. Brake fluid and hydraulic components
    - When replenishing the system, use extreme care not to allow dust and dirt from entering the inside.
    - Do not mix different brands of fluid as they may not be compatible.
    - Do not reuse drained brake fluid.
    - Brake fluid can cause damage to the painted surfaces. Wipe up spilled fluid at once.
    - After disconnecting brake hoses or pipes from the joint, be sure plug the opening to prevent loss of brake fluid.
    - Clean all disassembled parts only in clean BRAKE FLUID. Blow open all holes and passages with compressed air.

    - Keep disassembled parts form air-borne dust and abrasives.
    - Check that parts are clean before assembly.

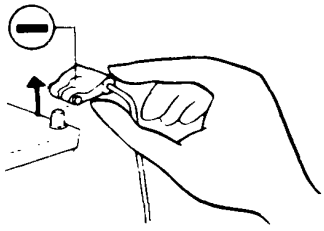
11. Avoid oil or grease getting on rubber parts and tubes.

12. Upon assembling, check every possible part for proper installation and movement or operation.

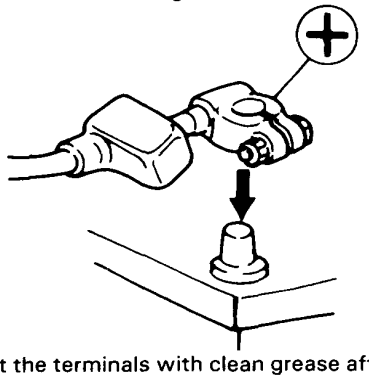


Electrical

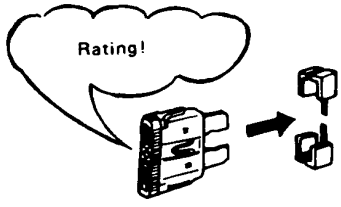
- Before making any repairs on electric wires or parts, disconnect the battery cables from the battery staring with the negative (−) terminal.



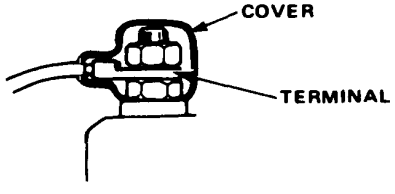
- After making repairs, check each wire or part for proper routing and installation. Also check to see that they are connected properly.
- Always connect the battery positive (+) cable first, then connect the negative (−) cable.



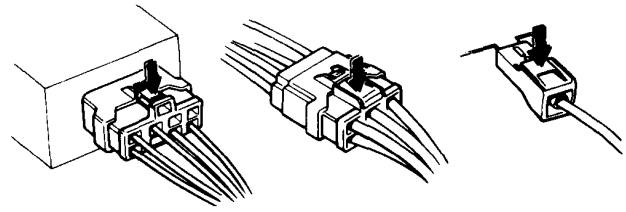
- Coat the terminals with clean grease after connecting the battery cables.
- Don't forget to install the terminal cover over the positive battery terminal after connecting.
- Before installing a new fuse, isolate the cause and take corrective measures, particularly when frequent fuse failure occurs.

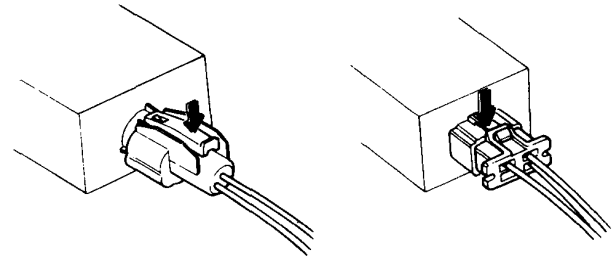


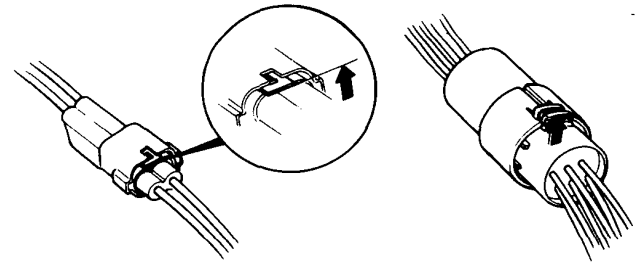
- Be sure to install the terminal cover over the connections after a wire or wire harness has been connected.



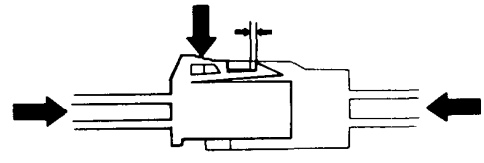
- When removing locking couplers, be sure to disconnect the lock before performing work.
- Couplers may be of two types, those in which the lock is pressed to remove, and those in which the lock is pulled up to remove. Be sure to ascertain the type of locking device before beginning work. The following is a depiction of the means of disconnecting various typical couplers.





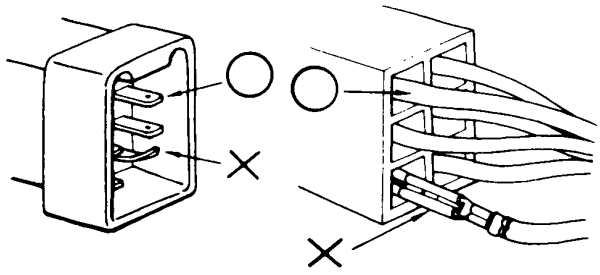


- When disconnecting locks, first press in the Coupler Tightly (to provide clearance to the locking device), then operate the tab fully and remove the coupler in the designated manner.

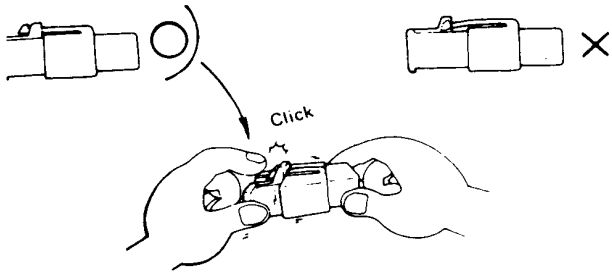


- When disconnecting a coupler, pull it off from the mating coupler by holding on both couplers.
- Never try to disconnect couplers by pulling on their wires.

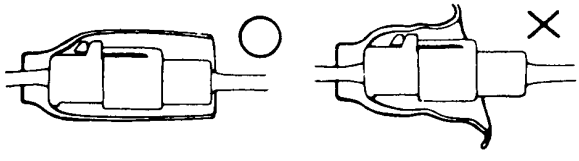
- Before connecting couplers, check to see that the terminals are in place and are not bent or distorted.



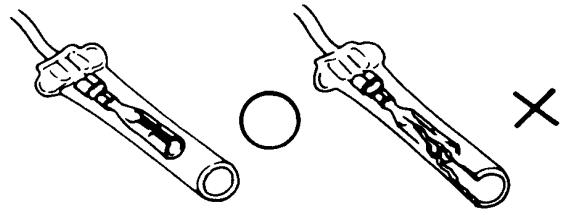
- Insert couplers fully until they will no longer go.
- Some couplers have locking tabs that must be aligned and engaged securely.
- Don't use wire harnesses with a loose wire or coupler.



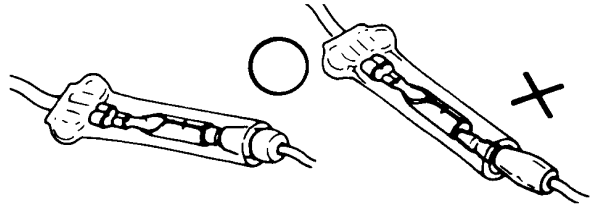
- Place the plastic cover over the mating coupler after reconnecting. Also check that the end is not inverted.



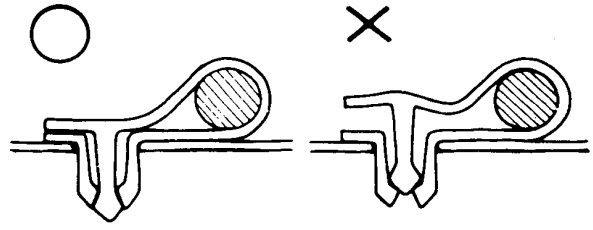
- Before connecting, check each connector cover for breakage. Also make sure that the female connector is tihgt and not pried open from the previous use.



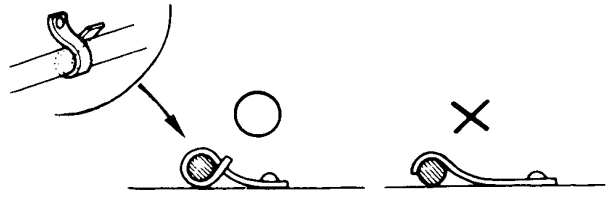
- Insert male connectors into the female connectors fully until they will no longer go.
- Be sure that plastic cover is placed over the connection.
- Don't place the opening of each plastic cover facing up.



- Secure wires and wire harnesses to the frame with their respective wire bands at the designated locations. Tighten the bands so that only the insulated surfaces contact the wires or wire harnesses.



- A loose wire harness or cable can be a hazard to safety. After clamping, check each wire for security in its clamp.

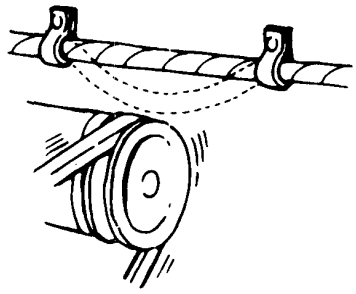


- Do not squeeze wires against the weld or nugget of its clamp when a weld-on clamp is used.

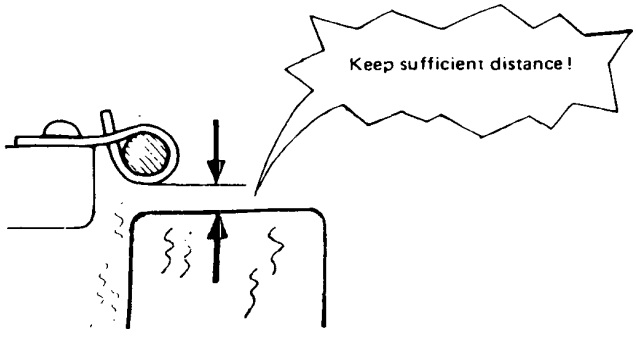
(cont'd)

Electrical (cont'd)

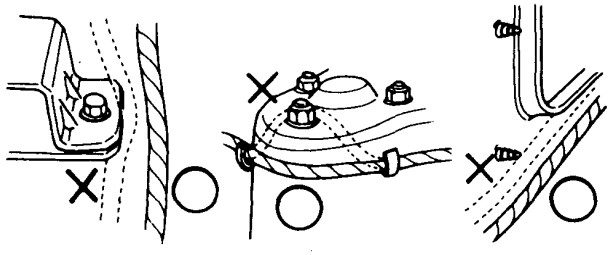
- After clamping, check each harness to be certain that it is not interferring with any moving or sliding parts of the vehicle.
- Keep wire harnesses away from the exhaust pipes and other hot parts.



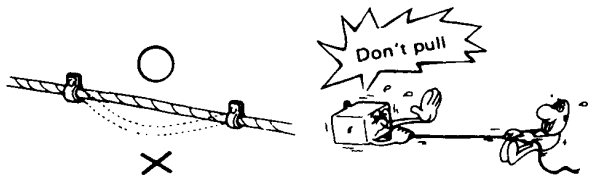
- Always keep a safe distance between wire harnesses and any heated parts.



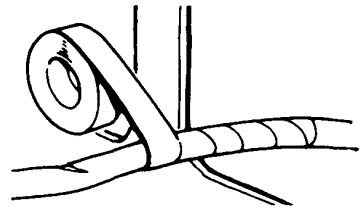
- Do not bring wire harnesses in direct contact with sharp edges or corners.
- Also avoid contact with the projected ends of bolts, screws and other fasteners.



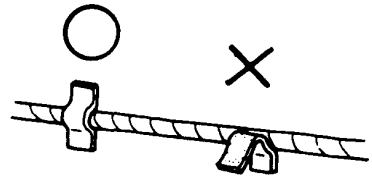
- Route harnesses so they are not pulled taut or slackened excessively.



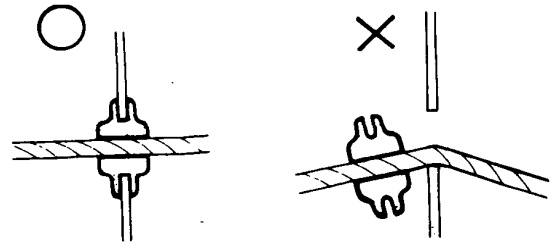
- Protect wires and harnesses with a tape or tube if they are in contact with a sharp edge or corner.



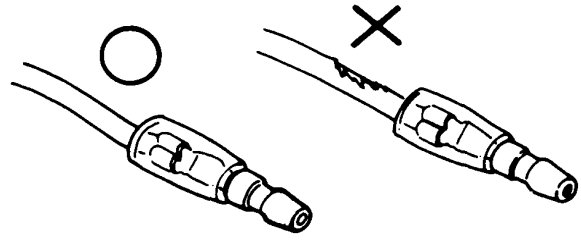
- Clean the attaching surface thoroughly if a plaster is used. Use a spirit wipe if necessary.



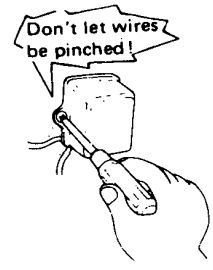
- Seat grommets in their grooves properly.



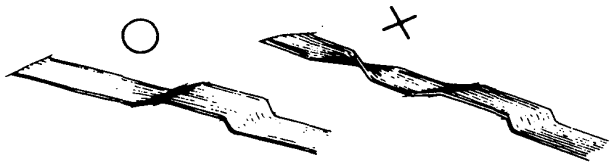
- Do not damage the insulator when connecting a wire.
- Do not use wires or harnesses with a broken insulator. Repair by wrapping with a protective tape or replace with new ones if necessary.



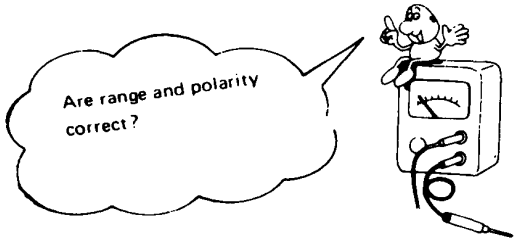
- After installing parts, make sure that wire harnesses are not pinched.



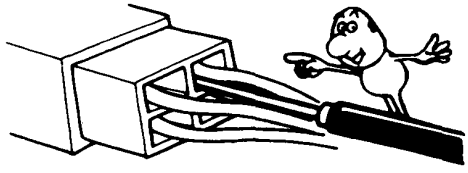
- After routing, check that the wire harnesses are not twisted or kinked.



- Wire harnesses should be routed so that they are not pulled taut, slackened excessively, pinched, or interferred with adjacent or surrounding parts in all stering positions.



- When using the Service Tester, follow the manufacturer's instructions and those described in the Shop Manual.



- Do not throw or let parts fall.

- Rust is the enemy of all finished surfaces. Before connecting connectors and couplers, check the terminals and remove, if any, rust using a fine sand paper or emery cloth.

Symbol Marks

The following symbols stand for:


:Apply engine oil.

:Apply brake fluid.

:Apply grease.

:Apply Automatic Transmission Fluid.

:Apply Power Steering Fluid.

Special Tools

Special Tools

Special Tools (Common with Other Models)

5. Engine Removal/Installation

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07941—6920002	Ball Joint Remover	1	
②	07966—6340011	Engine Block Hanger	1	

6. Cylinder head/Valve Train

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07743—0020000	Adj. Valve Guide Driver	1	
②	07757—PJ10100	Valve Spring Compressor Attachment	1	Use changed to 07757-0010000 attachment <B20 A Engine>
③	07757—0010000	Valve Spring Compressor	1	
④	07942—SA50000	Valve Guide Driver, 7.0 mm	1	07942—8230000 may also be used.
⑤	07942—6570100	Valve Guide Driver, 6.6 mm	1	07942—6110000 may also be used.
⑥	07947—SB00100	Camshaft Seal Driver	1	
⑦	07984—SA50000	Valve Guide Reamer, 7.0 mm	1	07984—6890100 may also be used.
⑧	07984—6570100	Valve Guide Reamer, 6.6 mm	1	07984—6110000 may also be used.

7. Engine Block

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07749—0010000	Driver	1	07949—6110000 may also be used.
②	07924—PD20002	Ring Gear Holder	1	
③	07947—SB00200	Oil Seal Driver	1	Crankshaft Seal <Carbureted Engine>
④	07948—SB00101	Driver Attachment	1	Crankshaft Seal (Clutch Side)
⑤	07973—SB00100	Piston Base Head	1	Not included in base set. Use each with the base set.
⑥	07973—SB00200	Pilot Collar	1	
⑦	07973—SB00400	Piston Pin Base Insert	1	
⑧	07973—PE00302	Adj. Piston Pin Driver	1	
⑨	07973—6570002	Piston Pin Insert Base Set	1	

8. Engine Lubrication

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07406—0030000	Oil Pressure Gauge Adaptor	1	
②	07746—0010100	Attachment, 32 x 35 mm	1	<A20A and A16A Engines>
③	07746—0010400	Attachment, 52 x 55 mm	1	<B20A Engine>
④	07749—0010000	Driver	1	07949—6110000 may also be used.
⑤	07912—6110001	Oil Filter Socket Wrench	1	

11, 12. Fuel and Emission Controls

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07GAC—SE00200	Fuel Sender Wrench	1	
②	07GAZ—SE00300	R.P.M. Connecting Adaptor	1	
③	07406—0040001	Fuel Pressure Gauge Set	1	<Fuel-Injected Engine>
③-1	07406—0040100	Pressure Gauge	(1)	Component Tool
③-2	07406—0040201	Hose Assembly	(1)	Component Tool
④	07411—0020000	Digital Circuit Tester	1	<Fuel-Injected Engine>
⑤	07614—0050100	Fuel Line Clamp	1	<Carbureted Engine>
⑥	07999—PD6000A	System Checker Harness	1	<Fuel-Injected Engine>

13. Clutch

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07GAG—PF50100	Clutch Disc Alignment Tool	1	<B20A Engine>
②	07708—0010102	10 mm T-Wrench	1	
③	07924—PD20002	Ring Gear Holder	1	
④	07974—6890101	Clutch Disc Alignment Tool	1	<A20A and A16A Engines>

14. Manual Transmission <B2>

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07933—6890101	Bearing Remover Attachment	1	
②	07744—0010200	Pin Punch, 3.0 mm	1	
③	07744—0010400	Pin Punch, 5.0 mm	1	07944—6110100 may also be used.
④	07746—0010200	Attachment, 37 x 40 mm	1	
⑤	07746—0010400	Attachment, 52 x 55 mm	1	07949—6340200 may also be used.
⑥	07746—0010500	Attachment, 62 x 68 mm	1	
⑦	07749—0010000	Driver	1	07949—6110000 may also be used.
⑧	07936—6340000	Bearing Remover Set	1	

14. Manual Transmission <A2>

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07GAC—PG40100	Transmission Housing Puller	1	07GAC-PF40100 may also be used.
②	07936—6890101	Bearing Remover Attachment	1	
③	07744—0010200	Pin Punch, 3.0 mm	1	
④	07744—0010400	Pin Punch, 5.0 mm	1	07944—6110100 may also be used.
⑤	07746—0010400	Attachment, 52 x 55 mm	1	
⑥	07749—0010000	Driver	1	07949—6110000 may also be used.
⑦	07907—PD10000	Socket Wrench, 30 mm	1	
⑧	07923—6890101	Mainshaft Holder	1	
⑨	07936—6340000	Bearing Remover Set	1	
⑩	07947—6110500	Driver Attachment, E	1	Differential Oil seal
⑪	07947—6340000	Oil Seal Driver	1	
⑫	07947—6340500	Driver Attachment, E	1	

15. Automatic Transmission

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07GAB—PF50100	Mainshaft Holder, Automatic	1	<F4 Transmission>
②	07GAC—PG40100	Transmission Housing Puller	1	07GAC—PF40100 may also be used.
③	07GAE—PG40000	Clutch Spring Compressor Set	1	07960—689000 may also be used.
③-1	07GAE—PG40100	Compressor Attachment	(1)	
③-2	07GAE—PG40200	Compressor Bolt Assembly	(1)	
③-3	07960—6120100	Compressor Attachment	(1)	
④	07406—0020003	Oil Pressure Gauge Set	1	
④-1	07406—0020201	Oil Pressure Hose	(3)	Component Tool
⑤	07406—0070000	Low Pressure Gauge	1	
⑥	07936—6890101	Bearing Remover Attachment	1	
⑦	07746—0010500	Attachment, 62 x 68 mm	1	
⑧	07749—0010000	Driver	1	07949—6110000 may also be used.
⑨	07907—PD10000	Socket Wrench, 30 mm	1	07907—6890100 may also be used.
⑩	07923—6890202	Mainshaft Holder	1	<C9 Transmission>
⑪	07936—6340000	Bearing Remover Set	1	
⑫	07947—6110500	Oil Seal Driver Attachment	1	
⑬	07947—6340201	Oil Seal Driver	1	
⑭	07947—6340500	Driver Attachment, E	1	
⑮	07974—6890300	Throttle Cable Adjustment Gauge	1	<Carbureted Engine>
⑯	07998—SA50000	Accelerator Pedal Weight Set	1	
⑯-1	07988—SA50100	Main Pedal Weight (1.0 kg)	(1)	Component Tool
⑯-2	07988—SA50200	Sub Pedal Weight (0.5 kg)	(1)	Component Tool

(cont'd)

Special Tools (Common with Other Models)

16. Differential

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07746—0030100	Driver	1	
②	07749—0010000	Driver	1	07949—6110000 may also be used.
③	07944—SA00000	Pin Punch, 4.0 mm	1	
④	07947—6110500	Seal Driver Attachment	1	
⑤	07947—6340500	Driver Attachment, E	1	

17. Drivershaft

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07GAD—SE00100	Oil Seal Driver Attachment	1	
②	07746—0010400	Attachment, 52 x 55 mm	1	
③	07746—0010500	Attachment, 62 x 68 mm	1	
④	07746—0040900	Pilot, 40 mm	1	
⑤	07749—0010000	Driver	1	
⑥	07947—SD90200	Oil Seal Driver Attachment	1	
⑦	07965—SD90100	Support Base	1	
⑧	07965—SD90200	Support Collar	1	

18. Stearing

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07746—0010300	Attachment, 42 x 47 mm	1	
②	07916—SA50001	Steering Gearbox Locknut Wrench, 40 mm	1	07916—6920000 may also be used.
③	07941—6920002	Ball Joint Remover	1	
④	07965—6340301	Hub Dis/Assembly Tool, Base A	1	
⑤	07974—SA50800	Ball Joint Boot Clip Installation Guide, B	1	
⑥	07974—6790000	Tie-Rod Boots Driver	1	

19. Power Steering

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07GAK—SE00100	P/S Joint Adaptor Set	1	
①-1	07GAK—SE00110	P/S Pump Joint Adaptor	(1)	Component tools
①-2	07GAK—SE00120	P/S Hose Joint Adaptor	(1)	
②	07406—0010001	P/S Pressure Gauge Set	1	
②-1	07406—0010101	Bypass Tube Joint	(1)	
②-2	07406—0010300	Oil Pressure Valve	(1)	Component tools
②-3	07406—0010400	Pressure Gauge	(1)	
③	07725—0030000	Universal Holder	1	07725—0010101 may also be used.
④	07746—0010300	Attachment, 42 X 47 mm	1	
⑤	07749—0010000	Driver	1	07949—6110000 may also be used.
⑥	07900—SA50000	P/S Seal Replacement Tool Set	1	
⑥-1	07974—SA50100	Piston Seal Ring Guide	(1)	
⑥-2	07974—SA50200	Piston Seal Ring Sizing Tool	(1)	
⑥-3	07974—SA50300	Cylinder End Packing Slider	(1)	Component Tools
⑥-4	07974—SA50400	End Seal Guide	(1)	
⑥-5	07974—SA50600	Dust Seal Guide	(1)	
⑥-6	07974—SA50900	P/S Tool Set Case	(1)	
⑦	07916—SA50001	Steering Gearbox Locknut Wrench, 40 mm	1	
⑧	07941—6920002	Ball Joint Remover	1	
⑨	07947—6340300	Driver Attachment	1	
⑩	07953—7190000	Collar Driver	1	

20. Suspension

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07GAE—SE00100	Shock Absorber Spring Compressor	1	
②	07GAF—SE00100	Hub Assembly Pin	1	
③	07GAF—SE00200	Hub Assembly Driver Attachment	1	
④	07GAF—SE00401	Front Hub Driver Base	1	
⑤	07410—0010200	Wheel Alignment Gauge ATT., B	1	
⑥	07746—0010100	Attachment, 32 x 35 mm	1	
⑦	07746—0010400	Attachment, 52 x 55 mm	1	
⑧	07746—0010600	Attachment, 72 x 75 mm	1	
⑨	07749—0010000	Driver	1	07949—6110000 may also be used.
⑩	07941—6920002	Ball Joint Remover	1	
⑪	07965—SB00000	Ball Joint Dis/Assebbly Tool Set	1	
⑪-1	07965—SB00100	Ball Joint Remover/Installer	(1)	Component tools
⑪-2	07965—SB00200	Ball Joint Remover Base	(1)	
⑪-3	07965—SB00300	Ball Joint Installer Base	(1)	
⑫	07965—6340301	Front Wheel Bearing Dis/Assembly Tool Base, A	2	
⑬	07965—6920201	Front Hub Dis/Assembly Tool, B	1	
⑭	07974—SA50700	Ball Joint Boot Clip Installation Guide, A	1	

21. Brake

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07GAF—SE00300	Pulser Driver Attachment	1	
②	07GAG—SE00100	Brake Booster Adjustment Gauge	1	
③	07GAZ—SE00100	A.L.B. Hand Pump Assembly	1	
④	07GAZ—SE00200	A.L.B. Checker Harness Adaptor	1	
⑤	07504—6340100	Brake Booster Tool Set	1	
⑤-1	07404—5790300	Vacuum Gauge	(1)	Short parts of the Brake Booster Set 07504—6340100
⑤-2	07406—5790200	Oil Pressuer Gauge	(2)	
⑤-3	07410—5790100	Pressure Gauge Attachment, C	(1)	
⑤-4	07410—5790500	Tube Joint Att, I	(2)	
⑤-5	07510—6340100	Pressuer Gauge Joint Pipe	(2)	
⑤-6	07510—6340300	Vacuum Joint Tube, A	(1)	
⑥	07508—SB00000	A.L.B. Checker	1	
⑦	07749—0010000	Driver	1	07494—611000 may also be used.
⑧	07907—SB00000	A.L.B. T-Wrench	1	
⑨	07914—SA50000	Snap-ring Pliers	1	
⑩	07921—0010000	Flare Nut Wrench	1	
⑪	07929—SB00000	Modulater Holder	1	
⑫	07947—6890300	Driver Attachment, C	1	
⑬	07960—SA50002	Brake Spring Compressor	1	
⑭	07965—5790300	Cup Guide	1	With 8'' Master Cylinder
⑮	07965—5790400	Cup Guide	1	With 9'' Master Cylinder
⑯	07965—6340301	Front Wheel Bearing Dis/Assembly Tool Base, A	2	
⑰	07967—SB00000	Pulser Driver	1	
⑱	07973—SA50000	Rear Caliper Guide	1	

(cont'd)

Special Tools (Common with Other Models)

22. Body

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07GAZ—SE30100	Torsion Rod Assembly Tool	1	

24. Air Conditioner

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07GAB—PJ60100	A/C Clutch Holder	1	07923—PB80001 may also be used.
②	07703—0010200	Torx Bit Driver, T-30	1	
③	07749—0010000	Driver	1	07949—6110000 may also be used.
④	07934—PB80001	A/C Clutch Puller	1	
⑤	07934—SB20000	Shaft Seal Remover	1	
⑥	07947—6340300	Driver Attachment, A	1	

Optional Tools

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07780—0012300	Valve Seat Cutter 30°	1	EX
②	07780—0012900	Valve Seat Cutter 30°	1	IN
③	07780—0014000	Valve Seat Cutter 60°	1	IN
④	07780—0014100	Valve Seat Cutter 60°	1	EX
⑤	07780—0010400	Valve Seat Cutter 45°	1	EX
⑥	07780—0010800	Valve Seat Cutter 45°	1	IN
⑦	07781—0010201	Valve Seat Cutter Holder, 6.6 mm	1	
⑧	07781—0010301	Valve Seat Cutter Holder, 7.0 mm	1	

Specifications

Standards and Service Limits

Cylinder Head/Valve Train <Expect B20A2 Engine> — Section 6

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Compression	*300 rpm and wide-open throttle*		Nominal A20A3, A20A4 Engines (Expect KS)	*1,226 kPa (12.5 kg/cm², 178 psi)*
			Other Engines	1,176 kPa (12.0 kg/cm², 171 psi)
			Minimum A20A3, A20A4 Engines (Expect KS)	1,030 kPa (10.5 kg/cm², 149 psi)
			Other Engines	980 kPa (10.0 kg/cm², 142 psi)
			Maximum variation	196 kPa (2 kg/cm², 28 psi)
Cylinder head	*Warpage*		—	0.05 (0.002)
	Height		90 (3.54)	89.8 (3.54)
Camshaft	End play		0.05–0.15 (0.002–0.006)	0.5 (0.02)
	Oil clearance No. 1,3 and 5 Journals		0.050–0.089 (0.002–0.004)	0.15 (0.006)
	No. 2 and 4 Journals		0.130–0.169 (0.005–0.007)	0.23 (0.009)
	Runout		0.03 (0.001) max.	0.06 (0.002)
	Cam lobe height A20A3 Engine	IN A	38.858 (1.5102)	—
		IN B	38.604 (1.5198)	—
		EX	38.796 (1.5274)	—
	A20A4 Engine	IN	38.858 (1.5102)	—
		EX	38.607 (1.5200)	—
	A20A1 Engine MT	IN	38.477 (1.5148)	—
		EX	38.653 (1.5218)	—
	A16A1 Engine	IN	38.175 (1.5029)	—
		EX	37.776 (1.4872)	—
	Other Engines	IN	38.541 (1.5174)	—
		EX	38.607 (1.5200)	—
Valve	Valve clearance	IN	0.12–0.17 (0.005–0.007)	—
		EX	0.25–0.30 (0.010–0.012)	—
	Valve stem O.D.	IN	6.58–6.59 (0.2591–0.2594)	6.55 (0.258)
		EX	6.94–6.95 (0.2732–0.2736)	6.91 (0.272)
	Stem-to-guide clearance	IN	0.02–0.05 (0.001–0.002)	0.08 (0.003)
		EX	0.06–0.09 (0.002–0.004)	0.12 (0.005)
	Stem installed height	IN	48.59 (1.913)	49.34 (1.943)
		EX	47.66 (1.876)	48.41 (1.906)
Valve seat	Width	IN and EX	1.25–1.55 (0.049–0.061)	2.0 (0.08)
Valve spring	Free length	IN	49.2 (1.94)	48.2 (1.90)
		EX Inner	39.8 (1.57)	38.8 (1.53)
		Outer	49.8 (1.96)	48.8 (1.92)
	Squareness Inner and Outer		—	1.75 (0.068)
Valve guide	I.D.	IN	6.61–6.63 (0.260–0.261)	6.65 (0.262)
		EX	7.01–7.03 (0.276–0.277)	7.05 (0.278)
Rocker arm	Arm-to-shaft clearance		0.008–0.054 (0.0003–0.0021)	0.08 (0.003)

Cylinder Head/Valve Train <B20A2 Engine> — Section 6

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Compression	300 min^{-1} (rpm) and wide-open throttle		Nominal	1,226 kpa (12.5 kg/cm², 178 psi)
			Minimum	1,030 kpa (10.5 kg/cm², 149 psi)
			Maximum variation	196 kpa (2 kg/cm², 28 psi)
Cylinder head	Warpage		—	0.05 (0.002)
	Height		132 (5.20)	131.8 (5.19)
Camshaft	End play		0.05–0.15 (0.002–0.006)	0.5 (0.02)
	Oil clearance		0.050–0.089 (0.002–0.004)	0.15 (0.006)
	Runout		0.03 (0.001) max.	0.06 (0.002)
	Cam lobe height	IN	33.676 (1.3258)	—
		EX	33.737 (1.3282)	—
Valve	Valve clearance	IN	0.08–0.12 (0.003–0.005)	—
		EX	0.16–0.20 (0.006–0.008)	—
	Valve stem O.D.	IN	6.58–6.59 (0.2591–0.2594)	6.55 (0.258)
		EX	6.55–6.56 (0.2579–0.2583)	6.52 (0.257)
	Stem-to-guide clearance	IN	0.02–0.05 (0.001–0.002)	0.08 (0.003)
		EX	0.05–0.08 (0.002–0.003)	0.11 (0.04)
	Stem installed height	IN and EX	42.75 (1.683)	43.54 (1.714)
Valve seat	Width	IN and EX	1.25–1.55 (0.049–0.061)	2.0 (0.08)
Valve spring	Free length	Inner	41.25 (1.622)	40.2 (1.583)
		Outer	44.74 (1.761)	43.74 (1.722)
	Squareness	Inner and Outer	—	1.6 (0.063)
Valve guide	I.D.	IN and EX	6.61–6.63 (0.260–0.261)	6.65 (0.262)

Engine Block <Expect B20A2 Engine> — Section 7

*A16A1 Engine only

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Cylinder block	Warpage of deck surface		0.08 (0.003) max.	0.10 (0.004)
	Bore diameter	A	82.70–82.71 (3.2559–3.2563)	82.74 (3.2575)
		B	82.69–82.70 (3.2555–3.2559)	82.73 (3.2571)
		A	*80.01–80.02 (3.1500–3.1504)	80.05 (3.1516)
		B	*80.00–80.01 (3.1496–3.1500)	80.04 (3.1512)
	Bore taper		0.007–0.012 (0.0003–0.0005)	0.05 (0.002)
	Reboring limit		—	0.5 (0.02)
Piston	Skirt O.D. (At 21 mm (0.83 in) from bottom of skirt)	A	82.67–82.68 (3.2574–3.2551)	82.66 (3.254)
		B	82.66–82.67 (3.2543–3.2574)	82.65 (3.253)
		A	*79.98–79.99 (3.1488–3.1492)	79.97 (3.148)
		B	*79.97–79.98 (3.1484–3.1500)	79.96 (3.148)
	Clearance in cylinder		0.02–0.04 (0.0008–0.0016)	0.08 (0.003)
	Piston-to-ring clearance	Top	0.030–0.060 (0.0012–0.0024)	0.13 (0.005)
		2nd	*0.030–0.055 (0.0012–0.0022)*	*0.13 (0.005)*
		* Top and 2nd	*0.02–0.05 (0.0008–0.0020)	0.13 (0.005)
Piston ring	Ring end gap	Top A16A1 Engine	0.20–0.37 (0.008–0.015)	0.6 (0.02)
		Others	0.20–0.35 (0.008–0.014)	0.6 (0.02)
		2nd A16A1 Engine	0.20–0.37 (0.008–0.015)	0.6 (0.02)
		Others	0.30–0.42 (0.012–0.017)	0.6 (0.02)
		Oil RIKEN	0.30–0.90 (0.012–0.035)	1.0 (0.04)
		TEIKOKU	0.20–0.70 (0.008–0.028)	0.8 (0.03)
Connecting rod	Pin-to-rod interference		0.013–0.032 (0.0005–0.0013)	0.013 (0.0005)
	Large end bore diameter		Nominal 48 (1.89) *45 (1.77)	—
	End play installed on crankshaft		0.15–0.30 (0.006–0.012)	0.40 (0.016)
Crankshaft	Main journal diameter		49.970–49.994 (1.9673–1.9683)	—
	Taper/out-of-round, main journal		0.005 (0.0002) max.	0.010 (0.0004)
	Rod journal diameter		44.976–45.000 (1.7707–1.7717)	—
			*41.976–42.000 (1.6530–1.6535)	—
	Taper/out-of-round, rod journal	Other Engine	0.005 (0.0002) max.	0.010 (0.0004)
	End play		0.10–0.35 (0.004–0.014)	0.45 (0.018)
	Runout		0.024 (0.0009) max.	0.04 (0.0016)
Bearings	Main bearing-to-journal	No. 1, 2, 4, and 5		
	Oil clearance	Journals	0.026–0.055 (0.0010–0.0022)	0.07 (0.003)
		No. 3 Journal	0.032–0.061 (0.0013–0.0024)	0.07 (0.003)
	Rod bearing-to-journal oil clearance		0.020–0.038 (0.0008–0.0015)	0.07 (0.003)

Engine Block <B20A2 Engine> — Section 7

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Cylinder block	Warpage of deck surface		0.07 (0.003) max.	0.10 (0.004)
	Bore diameter	A	81.01 – 81.02 (3.1894–3.1898)	81.05 (3.1909)
		B	81.00–81.01 (3.1890–3.1894)	81.04 (3.1905)
	Bore taper		0.007–0.012 (0.0003–0.0005)	0.05 (0.002)
	Reboring limit		–	0.05 (0.002)
Piston	Skirt O.D (At 21 mm (0.83 in) from bottom of skirt)	A	80.98–80.99 (3.1882–3.1886)	80.97 (3.188)
		B	80.97–80.98 (3.1878–3.1882)	80.96 (3.187)
	Clearance in cylinder		0.02–0.04 (0.0008–0.0016)	0.08 (0.003)
	Piston-to-ring clearance	Top	0.035–0.060 (0.0014–0.0024)	0.13 (0.005)
		2nd	0.030–0.055 (0.0012–0.0022)	0.13 (0.005)
Piston ring	Ring end gap	Top	0.25–0.35 (0.0.010–0.014)	0.6 (0.02)
		2nd	0.35–0.45 (0.014–0.018)	0.7 (0.03)
		Oil	0.20–0.70 (0.008–0.028)	0.8 (0.03)
Connecting rod	Pin-to-rod interference		0.013–0.032 (0.0005–0.0013)	0.013 (0.0005)
	Large end bore diameter		Nominal 51 (2.01)	–
	End play installed on crankshaft		0.15–0.30 (0.006–0.012)	0.40 (0.016)
Crankshaft	Main journal diameter		54.976–55.000 (2.1644–2.1654)	–
	Taper/out-of-round, main journal		0.005 (0.0002) max.	0.010 (0.0004)
	Rod journal diameter		47.976–48.000 (1.8888–1.8900)	–
	Taper/out-of-round, rod journal		0.005 (0.0002) max.	0.010 (0.0004)
	End play		0.10–0.35 (0.004–0.014)	0.45 (0.018)
	Runout		0.02 (0.0003) max.	0.030 (0.0012)
Bearings	Main bearing-to-journal	No. 1, 2, 4, and 5		
	Oil clearance	Journals	0.024–0.042 (0.0010–0.0017)	0.05 (0.002)
		No. 3 Journal	0.030–0.048 (0.0012–0.0019)	0.05 (0.002)
	Rod bearing-to-journal oil clearance		0.026–0.044 (0.0010–0.0017)	0.05 (0.002)

(cont'd)

Engine Lubrication <Expect B20A2 Engine> — Section 8

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Engine oil	Capacity ℓ (US. qt., Imp. qt.)		4.0 (4.2, 3.5) After engine disassembly 3.5 (3.7, 3.1) After oil change, including oil filter 3.0 (3.2, 2.6) After oil change, without oil filter	
Oil pump	Displacement		40.3 ℓ (10.6 US. gal., 8.9 Imp. gal.) 5,500 min^{-1} (rpm)	
	Inner-to-outer rotor radial clearance		0.15 (0.006) max.	0.2 (0.008)
	Pump body-to-rotor radial clearance		0.10–0.18 (0.004–0.007)	0.2 (0.008)
	Pump body-to-rotor side clearance		0.30–0.108 (0.001–0.004)	0.15 (0.006)
Relief valve	Pressure setting 80°C (176°F)	Idle	98 kPa (1.0 kg/cm^2, 14 psi) min.	
		3,000 min^{-1} (rpm)	373–451 kPa (3.8–4.6 kg/cm^2, 54–65 psi)	

Engine Lubrication <B20A2 Engine> — Section 8

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Engine oil	Capacity ℓ (US. qt., Imp. qt.)		5.0 (5.3, 4.4) After engine disassembly 4.0 (4.2, 3.5) After oil change, including oil filter 3.5 (3.7, 3.1) After oil change, without oil filter	
Oil pump	Displacement		54 ℓ (10.6 US. gal., 8.9 Imp. gal.) 5,000 min^{-1} (rpm)	
	Inner-to-outer rotor radial clearance		0.04–0.16 (0.002–0.006)	0.2 (0.008)
	Pump body-to-rotor radial clearance		0.10–0.19 (0.004–0.007)	0.21 (0.008)
	Pump body-to-rotor side clearance		0.02–0.071 (0.001–0.003)	0.12 (0.005)
Relief valve	Pressure setting 80°C (176°F)	Idle	137 kPa (1.4 kg/cm^2, 20 psi) min.	
		3,000 min^{-1} (rpm)	470–559 kPa (4.8–5.7 kg/cm^2, 67–80 psi)	

Cooling — Section 10

	MEASUREMENT	STANDARD (NEW)	
Cooling fan belt	Deflection midway between pulleys/load	6–9 (0.24–0.35) /98N (10 kg, 22 lb) for used belt 5 (0.20) /98N (10 kg, 22 lb) after replacement of belt	
Radiator	Capacity (incl. heater) ℓ (US. Gal., Imp. Gal.) (Includes reservoir tank 0.8 (0.21, 0.18)	A20A3, A20A4 Engines	Manual 6.4 (1.7, 1.4) Automatic 7.0 (1.8, 1.5)
		A20A1, A20A2 Engines	Manual 6.3 (1.7, 1.4) Automatic 6.9 (1.8, 1.5)
		B20A2 Engine	Manual 7.1 (1.9, 1.6)
		A16A1 Engine	Manual 6.3 (1.7, 1.4) Automatic 6.2 (1.6, 1.4)
	Pressure cap opening pressure	74–103 kPa (0.75–1.05 kg/cm^2, 11–15 psi)	
Thermostat	Starts to open	Primary: 82°C ±2 (180°F ±3) Secondary: 85°C ±2 (185°F ±3)	86–90°C (187–194°F)
	Full open	95°C (203°F)	100°C (212°F) OPTIONAL
	Valve lift at full open	8 (0.31) max.	8 (0.31) max.
Water pump	Gear ratio (crankshaft) Capacity: ℓ per min/at min^{-1} (rpm)	1.34 124/5,000 (32.7 US. gal/5,000 min^{-1} (rpm)	
Cooling fan	Fan-to-core clearance Thermoswitch "ON" temperature Thermoswitch "OFF" temperature	26.0 (1.02) 87°–93°C (188°–199°F) 83°C (181°F) or more (hysteresis 2°C (35°F) or more)	

Fuel and Emissions — Section 11

	MEASUREMENT		STANDARD (NEW)	
Fuel pump (Fuel-injected engine)	Delivery pressure Displacement		230–270 kPa (2.35–2.75 kg/cm^2, 33–39 psi) 230 cc/min in 10 seconds	
	Relief valve opening pressure		441–588 kPa (4.5–6.0 kg/cm^2, 64–85 psi)	
Pressure regulator (Fuel-injected engine)	Pressure		230–270 kPa (2.35–2.75 kg/cm^2, 33–39 psi)	
Fuel pump (Carbureted engine)	Delivery pressure Displacement		17.6–22.5 kPa (0.18–0.23 kg/cm^2, 2.6–3.3 psi) 760 cc at 12V (46 cu. in./12V)	
Fuel Tank	Capacity		60ℓ (15.9 US. Gal., 13.2 Imp. Gal.)	
Fuel injected engine	Fast idle		1,000–1,800 min^{-1} (rpm)	
	Idle Speed	with headlights and cooling fan off	Manual A20A3	750 ± 50 min^{-1} (rpm)
			A20A4, B20A2	800 ± 50 min^{-1} (rpm)
			Automatic A20A3	750 ± 50 min^{-1} (rpm)
			(in "N" or "P") A20A4	800 ± 50 min^{-1} (rpm)
				KQ: 750 ± 50 min^{-1} (rpm)
	idle CO		A20A3 and A20A4 KQ: 0.1 %	
Carbureted engine	Choke fast idle		A20A1 and A20A2: 2,000–3,000 min^{-1} (rpm) A16A1: 1,500–2,500 min^{-1} (rpm)	
	Idle Speed	with hedlights and cooling fan off	Manual A16A1, A20A2	750 ± 50 min^{-1} (rpm)
			A20A1	800 ± 50 min^{-1} (rpm)
			Automatic A16A1, A20A2	700 ± 50 min^{-1} (rpm)
			(in gear)	KS: 750 ± 50 min^{-1} (rpm)
			A20A1	730 ± 50 min^{-1} (rpm)
	Idle CO		A20A1 and A20A2 KQ: 0.1 %	

Clutch — Section 13

Unit: mm (in.)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Clutch pedal	Pedal height	205 (8.1) to floor 178 (7.0) to carpet	— —
	Stroke	138–143 (5.4–5.6)	—
	Pedal play	15–25 (0.6–1.0)	—
	Disengagement height	73 (2.9) min. to floor 49 (1.9) min. to carpet	— —
Clutch arm	Release arm adjustment	5.2–6.4 (0.20–0.25)	—
Flywheel	Clutch surface runout	0.05 (0.002) max.	0.15 (0.006)
Clutch plate	Rivet head depth	1.3 (0.05) min.	0.2 (0.008)
	Surface runout	0.8 (0.03) max.	1.0 (0.04)
	Radial play in splines	0.7–2.1 (0.028–0.083)	4.0 (0.16)
	Thickness	8.1–8.8 (0.32–0.35)	5.7 (0.22)
Clutch release bearing holder	I.D.	31.00–31.059 (1.220–1.223)	31.09 (1.224)
	Holder-to-guide sleeve clearance	0.05–0.15 (0.002–0.006)	0.22 (0.009)
Clutch cover	Uneveness of diaphragm spring	0.8 (0.03) max.	1.0 (0.04)

Manual Transmission (A1/A2) — Section 14

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission oil	Capacity ℓ (US. qt., Imp. qt)	2.4 (2.5, 2.1) at assembly 2.3 (2.4, 2.0) at oil change	
Mainshaft	End play	0.10–0.35 (0.004–0.014)	0.5 (0.02)
	Diameter of needle bearing contact area	28.002–28.015 (1.1024–1.1030)	27.95 (1.100)
	Diameter of third gear contact area	31.984–32.000 (1.2592–1.2598)	31.93 (1.2571)
	Diameter of ball bearing contact area	24.980–24.993 (0.9835–0.9840)	24.93 (0.981)
	Runout	0.04 (0.0016) max.	0.10 (0.004)
Mainshaft third and fourth gears	I.D.	37.009–37.025 (1.4570–1.4577)	37.07 (1.459)
	End play	0.03–0.18 (0.0012–0.0071)	0.3 (0.012)
	Thickness	30.42–30.47 (1.1976–1.1996)	30.3 (1.193)
Mainshaft fifth gear	I.D.	37.009–37.025 (1.4570–1.4577)	37.07 (1.459)
	End play	0.03–0.13 (0.0012–0.0051)	0.3 (0.012)
	Thickness	29.92–29.97 (1.1780–1.1799)	29.8 (1.173)
Countershaft	End play	0.10–0.35 (0.004–0.014)	0.5 (0.02)
	Diameter of needle bearing contact area	33.000–33.015 (1.2992–1.2998)	32.95 (1.297)
	Diameter of ball bearing contact area	24.980–24.993 (0.9835–0.9840)	24.93 (0.981)
	Diameter of low gear contact area	33.984–34.000 (1.3380–1.3386)	33.93 (1.336)
	Runout	0.04 (0.0016)	0.10 (0.004)
Countershaft low gear	I.D.	39.008–39.025 (1.5357–1.5364)	39.07 (1.538)
	End play	0.03–0.08 (0.0012–0.0031)	0.18 (0.007)
Countershaft second gear	I.D.	43.008–43.025 (1.6932–1.6939)	43.07 (1.696)
	End play	0.03–0.10 (0.0012–0.0039)	0.18 (0.007)
	Thickness	30.42–30.47 (1.1976–1.1996)	30.3 (1.193)
Spacer collar (Countershaft second gear)	I.D.	30.98–30.99 (1.2197–1.2201)	31.4 (1.236)
	O.D.	37.989–38.000 (1.4956–1.4961)	37.93 (1.493)
	Length	30.53–30.55 (1.2020–1.2028)	30.51 (1.201)
Spacer collar (Mainshaft fourth and fifth gears)	I.D.	25.002–25.012 (0.9843–0.9847)	25.06 (0.987)
	O.D.	31.989–32.000 (1.2594–1.2598)	31.93 (1.257)
	Length	27.03–27.08 (1.0642–1.0661)	27.01 (1.063)
Reverse idler gear	I.D.	17.016–17.043 (0.6699–0.6710)	17.09 (0.673)
	Gear-to-reverse gear shaft clearance	0.032–0.077 (0.0013–0.0030)	0.15 (0.006)
Synchronizer ring	Ring-to-gear clearance (ring pushed against gear)	0.73–1.18 (0.031–0.046)	0.4 (0.016)
Shift fork	Synchronizer sleeve gear	6.75–6.85 (0.266–0.270)	6.0 (0.24)
	Fork-to-synchronizer sleeve clearance	0.35–0.65 (0.014–0.026)	1.0 (0.04)
Reverse shift fork	End gap	11.8–12.1 (0.46–0.48)	—
	Fork-to-reverse idler gear clearance	0.2–1.0 (0.008–0.039)	1.7 (0.07)
	Groove width	7.05–7.25 (0.278–0.285)	—
	Fork-to-fifth/reverse shift shaft clearance	0.05–0.35 (0.002–0.014)	0.5 (0.02)
Shift arm	Width of groove in shift rod guide	11.8–12.0 (0.46–0.47)	—
	Shift arm-to-shift rod guide clearance	0.05–0.35 (0.002–0.014)	0.8 (0.03)
	Width in shift guide	7.9–8.0 (0.311–0.315)	—
	Shift arm-to-shift guide clearance	0.1–0.3 (0.004–0.012)	0.6 (0.02)
Shift rod guide	I.D.	14.000–14.068 (0.5512–0.5539)	—
	Guide-to-shaft clearance	0.011–0.092 (0.0004–0.0036)	0.15 (0.006)
	O.D.	11.9–12.0 (0.469–0.472)	—
	Guide-to-fifth/reverse shift shaft clearance	0.2–0.5 (0.008–0.020)	0.8 (0.03)
Selector arm	Width	11.9–12.0 (0.469–0.472)	—
	Arm-to-shift rod guide clearance	0.05–0.25 (0.002–0.010)	0.5 (0.02)
	End gap	10.05–10.15 (0.396–0.400)	—
	Arm-to-interlock clearance	0.05–0.25 (0.002–0.010)	0.7 (0.03)
	Arm-to-holder clearance	0.01–0.20 (0.0004–0.0079)	Selection with 5 types of shims

(cont'd)

Standards and Service Limits (cont'd)

Manual Transmission<B2>- Section 14

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission oil	Capacity ℓ (US. qt., Imp. qt)	1.9 (2.0, 1.7) at assembly 2.0 (2.1, 1.8) at oil change	
Mainshaft	End play	0.14–0.21 (0.006–0.008)	Adjust with a shim.
	Diameter of needle bearing contact area	27.987–28.000 (1.1018–1.1024)	27.94 (1.100)
	Diameter of third gear contact area	37.984–38.000 (1.4954–1.4961)	37.93 (1.493)
	Diameter of ball bearing contact area	27.987–28.000 (1.1018–1.1024)	27.94 (1.100)
	Runout	0.04 (0.0016) max.	0.10 (0.004)
Mainshaft third and fourth gears	I.D.	43.009–43.025 (1.6933–1.6939)	43.08 (1.696)
	End play	0.06–0.21 (0.0024–0.0083)	0.3 (0.012)
	Thickness 3rd	32.42–32.47 (1.2764–1.2783)	32.3 (1.272)
	4th	30.92–30.97 (1.2173–1.2193)	30.8 (1.213)
Mainshaft fifth gear	I.D.	43.009–43.025 (1.6933–1.6939)	43.08 (1.696)
	End play	0.06–0.21 (0.0024–0.0083)	0.3 (0.0012)
	Thickness	30.42–30.47 (1.1976–1.1996)	30.3 (1.193)
Countershaft	End play	0.10–0.35 (0.004–0.014)	0.5 (0.02)
	Diameter of needle bearing contact area	33.000–33.015 (1.2992–1.2998)	32.95 (1.297)
	Diameter of ball bearing contact area	24.987–25.000 (0.9837–0.9843)	24.94 (0.982)
	Diameter of low gear contact area	33.984–40.000 (1.3380–1.5748)	33.93 (1.336)
	Runout	0.04 (0.0016)	0.10 (0.004)
Cuntershaft low gear	I.D.	46.009–46.025 (1.8114–1.8120)	46.08 (1.814)
	End play	0.03–0.08 (0.0012–0.0031)	Adjust with a shim
Countershaft Second gear	I.D.	50.009–50.025 (1.9689–1.9695)	50.08 (1.972)
	End play	0.03–0.08 (0.0012–0.0031)	Adjust with a collar.
	Thickness	32.92–32.97 (1.2961–1.2980)	32.8 (1.291)
Spacer collar (Countershaft second gear)	I.D.	36.48–36.49 (1.4362–1.4366)	36.5 (1.437)
	O.D.	43.989–44.000 (1.7318–1.7323)	43.94 (1.730)
	Length A	28.98–29.00 (1.1409–1.1417)	–
	B	29.03–29.05 (1.1429–1.1437)	
Spacer collar (Mainshaft fourth and fifth gears)	I.D.	28.002–28.012 (1.1024–1.1028)	28.06 (1.105)
	O.D.	34.989–35.000 (1.3775–1.3780)	34.94 (1.376)
	Length A	55.95–56.05 (2.2028–2.2067)	–
	B	26.03–26.08 (1.0248–1.0268)	
Reverse Idler gear	I.D.	20.016–20.043 (0.7880–0.7891)	20.09 (0.791)
	Gear-to-reverse gear shaft clearance	0.036–0.084 (0.0014–0.0033)	0.16 (0.006)
Synchronizer ring	Ring-to-gear clearance (ring pushed against gear)	0.85–1.10 (0.033–0.043)	0.4 (0.016)
Shift fork	Synchronizer sleeve gear 1, 2, 3 and 4th	7.95–8.05 (0.313–0.317)	–
	5th	5.75–5.85 (0.226–0.230)	–
	Fork-to-synchronizer sleeve 1, 2, 3 and 4th	0.45–0.65 (0.018–0.026)	1.0 (0.04)
	5th	0.25–0.45 (0.010–0.018)	0.8 (0.03)
Reverse shift fork	End gap	13.0–13.3 (0.51–0.52)	–
	Fork-to-reverse idler gear clearance	0.5–1.1 (0.020–0.043)	1.8 (0.07)
	Groove width	7.05–7.25 (0.278–0.285)	–
	Fork-to-fifth/reverse shift shaft clearance	0.05–0.35 (0.002–0.014)	0.5 (0.02)
Shift arm	Width of groove in shift rod guide	12.8–13.0 (0.50–0.51)	–
	Shift arm-to-shift rod guide clearance	0.05–0.35 (0.002–0.014)	0.8 (0.03)
	Width in shift guide	7.9–8.0 (0.311–0.315)	–
	Shift arm-to-shift guide clearance	0.1–0.3 (0.004–0.012)	0.6 (0.02)
Shift rod guide	I.D.	14.000–14.068 (0.5512–0.5539)	–
	Guide-to-shaft clearance	0.011–0.092 (0.0004–0.0036)	0.15 (0.006)
	O.D.	11.9–12.0 (0.469–0.472)	–
	Guide-to-fifth/reverse shift shaft clearance	0.2–0.5 (0.008–0.020)	0.8 (0.03)
Selector arm	Width	11.9–12.0 (0.469–0.472)	–
	Arm-to-shift rod guide clearance	0.05–0.25 (0.002–0.010)	0.5 (0.02)
	End gap	9.9–10.0 (0.390–0.394)	–
	Arm-to-interlock clearance	0.05–0.20 (0.002–0.008)	0.45 (0.018)

Automatic Transmission (F4) — Section 15

Unit: mm (in.)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission oil	Capacity ℓ (US. qt., Imp.qt)	2.4 (2.5, 2.1) at oil change 5.4 (5.7, 4.8) at assembly	
Hydraulic pressure	Line pressure at 2,000 min^{-1} (rpm)	834–883 kPa (8.5–9.0 kg/cm², 121–128 psi)	785 kPa (8.0 kg/cm², 114 psi)
	4th, 3rd, 2nd clutch pressure at 2,000 min^{-1} (rpm)	441–834 kPa (4.5–8.5 kg/cm², 64–121 psi)	392 kPa (4.0 kg/cm², 57 psi) with lever released 785 kPa (8.0 kg/cm², 114 psi) with lever in full throttle position
	1st clutch pressure at 2,000 min^{-1} (rpm)	834–883 kPa (8.5–9.0 kg/cm², 121–128 psi)	785 kPa (8.0 kg/cm², 114 psi)
	Governor pressure at 60 km/h	181–191 kPa 1.85–1.95 kg/cm², 26–28	177 kPa (1.80 kg/cm², 25.6 psi)
	Throttle pressure A	485–500 kPa (4.95–5.1 kg/cm², 70–73 psi)	481 kPa (4.9 kg/cm², 69.7 psi)
	Throttle pressure B	834–883 kPa (8.5–9.0 kg/cm², 121–123 psi)	785 kPa (8.0 kg/cm², 114 psi)
Stall speed	Check with car on lever ground	* 2,500–2,800 min^{-1} (rpm) 2,600–2,900 min^{-1} (rpm)	— —
Clutch	Clutch initial clearance	1st 0.65–0.85 (0.026–0.033) 2nd 0.50–0.70 (0.020–0.028) 3rd, 4th 0.40–0.60 (0.016–0.024)	— — —
	Clutch return spring free length	31.0 (1.22)	29.0 (1.14)
	Clutch disc thickness	1.88–2.0 (0.074–0.079)	Until grooves worn out
	Clutch plate thickness	1.95–2.05 (0.077–0.079)	Discoloration
	Clutch end plate thickness Mark 1	2.05–2.10 (0.081–0.083)	
	Mark 2	2.15–2.20 (0.085–0.087)	
	Mark 3	2.25–2.30 (0.089–0.091)	
	Mark 4	2.35–2.40 (0.093–0.094)	
	Mark 5	2.45–2.55 (0.096–0.098)	
	Mark 6	2.55–2.60 (0.100–0.102)	
	Mark 7	2.65–2.70 (0.104–0.106)	
	Mark 8	2.75–2.80 (0.108–0.110)	
	Mark 9	2.85–2.90 (0.112–0.114)	
	Mark 10	2.95–3.00 (0.116–0.118)	Discoloration
Transmission	Diameter of needle bearing contact area on main and stator shaft	22.980–22.993 (0.9047–0.9052)	Wear or damage
	Diameter of needle bearing contact area on mainshaft 2nd gear	35.975–35.991 (1.4163–1.4169)	
	Diameter of needle bearing contact area on mainshaft 4th gear collar	31.975–31.991 (1.2588–1.2594)	
	Diameter of needle bearing contact area on mainshaft 1st gear collar	30.975–30.991 (1.2195–1.2201)	
	Diameter of needle bearing contact area on countershaft (L side)	38.505–38.515 (1.5159–1.5163)	
	Diameter of needle bearing contact area on countershaft 3rd gear	31.975–31.991 (1.2589–1.2595)	
	Diameter of needle bearing contact area on countershaft 4th gear	27.980–27.993 (1.1016–1.1021)	
	Diameter of needle bearing contact area on countershaft reverse gear collar	31.975–31.991 (1.2589–1.2595)	
	Diameter of needle bearing contact area on countershaft L gear collar	31.975–31.991 (1.2589–1.2595)	
	Diameter of needle bearing contact area on reverse idle gear	13.990–14.000 (0.5508–0.5512)	
	Reverse idler shaft holder diameter	14.416–14.434 (0.5676–0.5683)	
	Mainshaft 2nd gear I.D.	41.000–41.016 (1.6141–1.6148)	
	Mainshaft 1st gear I.D.	36.000–36.016 (1.4173–1.4179)	
	Countershaft 4th gear I.D.	33.000–33.016 (1.2992–1.2998)	
	Countershaft 3rd gear I.D.	38.000–38.016 (1.4961–1.4966)	
	Countershaft 2nd gear I.D.	31.000–31.016 (1.2204–1.2210)	
	Countershaft 1st gear I.D.	38.000–38.016 (1.4961–1.4966)	
	Countershaft reverse gear I.D.	38.000–38.016 (1.4961–1.4966)	
	Reverse idle gear I.D.	18.006–18.017 (0.7089–0.7093)	Wear or damage
	Mainshaft 4th gear end play	0.10–0.22 (0.004–0.009)	—
	Mainshaft 2nd gear end play	0.07–0.15 (0.003–0.006)	—
	Mainshaft 1st gear end play	0.08–0.24 (0.003–0.009)	—
	Countershaft 3rd gear end play	0.07–0.15 (0.003–0.006)	—
	Countershaft 2nd gear end play	0.08–0.40 (0.003–0.016)	—
	Reverse idler gear end play	0.05–0.18 (0.002–0.007)	—
	Countershaft reverse gear end play	0.10–0.25 (0.004–0.016)	—
	Reverse gear hub O.D.	51.87–51.90 (2.0421–2.0433)	Wear or damage

*Fuel Injected Engine

(cont'd)

Standards and Service Limits (cont'd)

Automatic Transmission (F4) — Section 15

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Transmission (cont'd)	Thrust washer thickness			
	Mainshaft 2nd gear	A	3.97–4.00 (0.156–0.157)	—
		B	4.02–4.05 (0.158–0.159)	—
		C	4.07–4.10 (0.160–0.161)	—
		D	4.12–4.15 (0.162–0.163)	—
		E	4.17–4.20 (0.164–0.165)	—
		F	4.22–4.25 (0.166–0.167)	—
		G	4.27–4.30 (0.168–0.169)	—
		H	4.32–4.35 (0.170–0.171)	—
		I	4.37–4.40 (0.172–0.173)	—
	Mainshaft bearing contact area (R side)		2.95–3.05 (0.116–0.120)	Wear or damage
	Mainshaft 1st gear		2.43–2.50 (0.096–0.098)	Wear or damage
	Countershaft 3rd gear	A	2.97–3.00 (0.1169–0.1181)	—
		B	3.02–3.05 (0.1189–0.1201)	—
		C	3.07–3.10 (0.1209–0.1220)	—
		D	3.12–3.15 (0.1228–0.1240)	—
		E	3.17–3.20 (0.1248–0.1260)	—
		F	3.22–3.25 (0.1268–0.1280)	—
		G	3.27–3.30 (0.1287–0.1299)	—
		H	3.32–3.35 (0.1307–0.1319)	—
		I	3.37–3.40 (0.1327–0.1339)	—
	Countershaft 4th gear collar thickness	A	38.97–39.00 (1.5342–1.5354)	—
		B	39.02–39.05 (1.5362–1.5374)	—
		C	39.07–39.10 (1.5382–1.5394)	—
		D	39.12–39.15 (1.5402–1.5413)	—
		E	39.17–39.20 (1.5421–1.5433)	—
		F	39.22–39.25 (1.5441–1.5453)	—
		G	39.27–39.30 (1.5461–1.5472)	—
	Thrust washer thickness (mainshaft 1st gear L side)		1.45–1.50 (0.057–0.059)	1.4 (0.055)
	Mainshaft 1st gear collar length		24.50–24.55 (0.4646–0.9665)	—
	Mainshaft 1st gear collar flange thickness		2.5–2.6 (0.098–0.102)	Wear or damage
	Countershaft reverse gear collar length		12.0–12.05 (0.472–0.474)	—
	Countershaft reverse gear collar flange thickness		2.4–2.6 (0.094–0.102)	Wear or damage
	Countershaft 1st gear collar length		12.0–12.1 (0.472–0.476)	—
	Countershaft 1st gear collar flange thickness		2.4–2.6 (0.095–0.102)	Wear or damage
	Diameter of countershaft one-way clutch contact area		83.339–83.365 (3.2811–3.2821)	Wear or damage
	Diameter of parking gear one-way clutch contact area		66.635–66.695 (2.6234–2.6258)	Wear or damage
	Mainshaft feed pipe O.D. (at 20 mm front end)		6.97–6.98 (0.2744–0.2748)	6.95 (0.2736)
	Countershaft feed pipe O.D. (at 20 mm from end)		7.97–7.98 (0.3138–0.3142)	7.95 (0.31)
	Mainshaft sealing ring 32 mm Thickness		1.980–1.995 (0.0780–0.0785)	1.8 (0.071)
	Mainshaft bushing I.D.		6.018–6.030 (0.2369–0.2374)	6.045 (0.238)
	Mainshaft bushing I.D.		9.000–9.015 (0.3543–0.3549)	9.03 (0.356)
	Countershaft bushing I.D.		8.000–8.015 (0.3150–0.3156)	8.03 (0.316)
	Mainshaft sealing ring groove width		2.025–2.060 (0.0797–0.0811)	2.08 (0.082)
Regulator valve body	Sealing ring contact area diameter		35.000–35.025 (1.3780–1.3789)	35.05 (1.38)
Shifting device and parking brake control	Reverse shift fork thickness		5.9–6.0 (0.232–0.236)	5.4 (0.21)
	Parking brake ratchet pawl		—	Wear or other defect
	Parking gear		—	Wear or other defect
	Throttle cam stopper		18.5–18.6 (0.728–0.732)	—
Servo body	Shift fork shaft bore I.D.	A	14.000–14.005 (0.5512–0.5514)	—
		B	14.006–14.010 (0.5514–0.5516)	—
		C	14.011–14.015 (0.5516–0.5518)	—
	Shift fork shaft valve bore I.D.		37.000–37.039 (1.4567–1.4582)	37.045 (1.4585)
Valve body	Oil pump gear side clearance		0.03–0.05 (0.0012–0.0020)	0.07 (0.003)
	Oil pump gear-to-body clearance	Drive:	0.240–0.265 (0.009–0.010)	—
		Driven:	0.125–0.175 (0.005–0.007)	—
	Stator camshaft needle bearing bore I.D.		27.000–27.021 (1.0630–1.0638)	Wear or damage
	Stator camshaft needle bearing contact and O.D.		29.000–30.013 (1.1417–1.1816)	Wear or damage
	Oil pump driven gear I.D.		14.016–14.034 (0.5518–0.5525)	Wear or damage
	Oil pump shaft O.D.		13.980–13.990 (0.5504–0.5508)	Wear or damage

Automatic Transmission (C9) — Section 15

Unit: mm (in.)

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Transmission oil	Capacity ℓ (US. qt., Imp.qt.)		2.2 (2.3, 1.9) at oil change 5.2 (5.5, 4.6) at assembly	
Hydraulic pressure	Line pressure at 2,000 min^{-1} (rpm)		785–834 kPa (8.0–8.5 kg/cm^2, 114–121 psi)	736 kPa (7.5 kg/cm^2, 107 psi)
	4th, 3rd, 2nd clutch pressure at 2,000 min^{-1} (rpm)		441–834 kPa (4.5–8.5 kg/cm^2, 64–121 psi)	392 kPa (4.0 kg/cm^2, 57 psi) with lever released 736 kPa (7.5 kg/cm^2, 107 psi) with lever in full throttle position
	1st clutch pressure at 2,000 min^{-1} (rpm)		736–834 kPa (7.5–8.5 kg/cm^2, 107–121 psi)	736 kPa (7.5 kg/cm^2, 107 psi)
	Governor pressure at 60 km/h		198–208 kPa (2.02–2.12 kg/cm^2, 29–30 psi)	193 kPa (1.97 kg/cm^2, 28 psi)
	Throttle pressure A		495–510 kPa (5.05–5.20 kg/cm^2, 72–74 psi)	490 kPa (5.0 kg/cm^2, 71 psi)
	Throttle pressure B		735–834 kPa (8.0–8.5 kg/cm^2, 114–121 pai)	736 kPa (7.5 kg/cm^2, 107 psi)
Stall speed	Check with car on lever ground		2,600–2,900 min^{-1} (rpm)	—
Clutch	Clutch initial clearance	1st	0.65–0.85 (0.026–0.033)	—
		2nd	0.60–0.80 (0.024–0.031)	—
		3rd, 4th	0.4–0.6 (0.016–0.024)	—
	Clutch return spring free length	1st	31.0 (1.22)	28.5 (1.12)
		2nd–4th	30.5 (1.20)	28.5 (1.12)
	Clutch disc thickness		1.88–2.0 (0.074–0.079)	Until grooves worn out
	Clutch plate thickness		1.95–2.05 (0.077–0.079)	Discoloration
	Clutch end plate thickness	Mark 1	2.3–2.4 (0.091–0.094)	↑
		Mark 2	2.4–2.5 (0.094–0.098)	
		Mark 3	2.5–2.6 (0.098–0.102)	
		Mark 4	2.6–2.7 (0.102–0.106)	
		Mark 5	2.7–2.8 (0.106–0.110)	
		Mark 6	2.8–2.9 (0.110–0.114)	
		Mark 7	2.9–3.0 (0.114–0.118)	
		Mark 8	3.0–3.1 (0.118–0.122)	
		Mark 9	3.1–3.2 (0.122–0.126)	
		Mark 10	3.2–3.3 (0.126–0.130)	Discoloration
Transmission	Diameter of needle bearing contact area on main and stator shaft		19.980–19.983 (0.7866–0.7867)	Wear or damage
	Diameter of needle bearing contact area on mainshaft 2nd gear		35.975–35.991 (1.4163–1.4169)	↑
	Diameter of needle bearing contact area on mainshaft 4th gear collar		31.975–31.991 (1.2588–1.2594)	
	Diameter of needle bearing contact area on mainshaft 1st gear collar		30.975–30.991 (1.2195–1.2201)	
	Diameter of needle bearing contact area on countershaft (L side)		38.505–38.515 (1.5159–1.5163)	
	Diameter of needle bearing contact area on countershaft 3rd gear		31.975–31.991 (1.2589–1.2595)	
	Diameter of needle bearing contact area on countershaft 4th gear		27.980–27.993 (1.1016–1.1021)	
	Diameter of needle bearing contact area on countershaft reverse gear collar		29.980–29.993 (1.1803–1.1808)	
	Diameter of needle bearing contact area on countershaft L gear collar		29.980–29.993 (1.1803–1.1808)	
	Diameter of needle bearing contact area on reverse idle gear		13.994–14.000 (0.5509–0.5512)	
	Reverse idler shaft holder diameter		14.416–14.434 (0.5676–0.5683)	
	Mainshaft 2nd gear I.D.		41.000–41.016 (1.6141–1.6148)	
	Mainshaft 1st gear I.D.		36.000–36.016 (1.4173–1.4179)	
	Countershaft 4th gear I.D.		33.000–33.016 (1.2992–1.2998)	
	Countershaft 3rd gear I.D.		38.000–38.016 (1.4961–1.4966)	
	Countershaft 2nd gear I.D.		31.000–31.016 (1.2204–1.2210)	
	Countershaft 1st gear I.D.		35.000–35.016 (1.3779–1.3785)	
	Countershaft reverse gear I.D.		36.000–36.016 (1.4173–1.4179)	
	Reverse idle gear I.D.		18.007–18.020 (0.7086–0.7094)	Wear or damage
	Mainshaft 4th gear end play		0.10–0.22 (0.004–0.009)	—
	Mainshaft 2nd gear end play		0.07–0.15 (0.003–0.006)	—
	Mainshaft 1st gear end play		0.08–0.24 (0.003–0.009)	—
	Countershaft 3rd gear end play		0.07–0.15 (0.003–0.006)	—
	Countershaft 2nd gear end play		0.08–0.40 (0.003–0.016)	—
	Reverse idler gear end play		0.05–0.18 (0.002–0.007)	—
	Countershaft reverse gear end play		0.10–0.20 (0.004–0.008)	—
	Reverse gear hub O.D.		51.87–51.90 (2.0421–2.0433)	Wear or damage

(cont'd)

Standards and Service Limits (cont'd)

Automatic Transmission (C9) — Section 15

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Transmission (cont'd)	Thrust washer thickness			
	Mainshaft 2nd gear	A	3.47–3.50 (0.137–0.138)	—
		B	3.52–3.55 (0.139–0.140)	—
		C	3.57–3.60 (0.141–0.142)	—
		D	3.62–3.65 (0.143–0.144)	—
		E	3.67–3.70 (0.144–0.146)	—
		F	3.72–3.75 (0.146–0.148)	—
		G	3.77–3.80 (0.148–0.150)	—
		H	3.82–3.85 (0.150–0.152)	—
		I	3.87–3.90 (0.152–0.154)	—
	Mainshaft bearing contact area (R side)		2.95–3.05 (0.116–0.120)	Wear or damage
	Mainshaft 1st gear		2.43–2.50 (0.096–0.098)	Wear or damage
	Countershaft 3rd gear	A	2.97–3.00 (0.1169–0.1181)	—
		B	3.02–3.05 (0.1189–0.1201)	—
		C	3.07–3.10 (0.1209–0.1220)	—
		D	3.12–3.15 (0.1228–0.1240)	—
		E	3.17–3.20 (0.1248–0.1260)	—
		F	3.22–3.25 (0.1268–0.1280)	—
		G	3.27–3.30 (0.1287–0.1299)	—
		H	3.32–3.35 (0.1307–0.1319)	—
		I	3.37–3.40 (0.1327–0.1339)	—
	Countershaft 4th gear collar thickness	A	38.97–39.00 (1.5342–1.5354)	—
		B	39.02–39.05 (1.5362–1.5374)	—
		C	39.07–39.10 (1.5382–1.5394)	—
		D	39.12–39.15 (1.5402–1.5413)	—
		E	39.17–39.20 (1.5421–1.5433)	—
		F	39.22–39.25 (1.5441–1.5453)	—
		G	39.27–39.30 (1.5461–1.5472)	—
	Thrust washer thickness (mainshaft 1st gear L side)		1.45–1.50 (0.057–0.059)	1.4 (0.055)
	Mainshaft 1st gear collar length		22.50–22.55 (0.886–0.888)	—
	Mainshaft 1st gear collar flange thickness		2.5–2.6 (0.098–0.102)	Wear or damage
	Countershaft reverse gear collar length		12.00–12.05 (0.472–0.474)	—
	Countershaft reverse gear collar flange thickness		2.45–2.55 (0.096–0.100)	Wear or damage
	Countershaft 1st gear collar length		11.0–11.1 (0.433–0.437)	—
	Countershaft 1st gear collar flange thickness		2.4–2.6 (0.095–0.102)	Wear or damage
	Diameter of countershaft one-way clutch contact area		74.414–74.444 (2.9297–2.9309)	Wear or damage
	Diameter of parking gear one-way clutch contact area		57.755–57.768 (2.2738–2.2743)	Wear or damage
	Mainshaft feed pipe O.D. (at 20 mm front end)		6.97–6.98 (0.2744–0.2748)	6.95 (0.2736)
	Countershaft feed pipe O.D. (at 20 mm from end)		7.97–7.98 (0.3138–0.3142)	7.95 (0.31)
	Mainshaft sealing ring 32 mm Thickness		1.980–1.995 (0.0780–0.0785)	1.8 (0.071)
	Mainshaft bushing I.D.		6.018–6.030 (0.2369–0.2374)	6.045 (0.238)
	Mainshaft bushing I.D.		9.000–9.015 (0.3543–0.3549)	9.03 (0.356)
	Countershaft bushing I.D.		8.000–8.015 (0.3150–0.3156)	8.03 (0.316)
	Mainshaft sealing ring groove width		2.025–2.060 (0.0797–0.0811)	2.08 (0.082)
Regulator valve body	Sealing ring contact area diameter		32.000–32.025 (1.2598–1.2608)	32.05 (1.262)
Shifting device and parking brake control	Reverse shift fork thickness		5.90–6.00 (0.232–0.236)	5.4 (0.21)
	Parking brake ratchet pawl		—	Wear or other defect
	Parking gear		—	Wear or other defect
	Throttle cam stopper		18.5–18.6 (0.728–0.732)	—
Servo body	Shift fork shaft bore I.D.	A	14.000–14.005 (0.5512–0.5514)	—
		B	14.006–14.010 (0.5514–0.5516)	—
		C	14.011–14.015 (0.5516–0.5518)	—
	Shift fork shaft valve bore I.D.		37.000–37.039 (1.4567–1.4582)	37.045 (1.4585)
Valve body	Oil pump gear side clearance		0.03–0.05 (0.0012–0.0020)	0.07 (0.003)
	Oil pump gear-to-body clearance	Drive:	0.240–0.265 (0.009–0.010)	—
		Driven:	0.125–0.175 (0.005–0.007)	—
	Stator camshaft needle bearing bore I.D.		24.000–24.021 (0.9449–0.9457)	Wear or damage
	Stator camshaft needle bearing contact and O.D.		26.000–26.013 (1.0236–1.0241)	Wear or damage
	Oil pump driven gear I.D.		14.016–14.034 (0.5518–0.5525)	Wear or damage
	Oil pump shaft O.D.		13.980–13.990 (0.5504–0.5508)	Wear or damage

Differential — Section 16

Unit: mm (in.)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Ring gear	Backlash	0.085–0.149 (0.0033–0.0059)	0.2 (0.0079)
Differential carrier	Pinion shaft bore diameter	18.000–18.018 (0.7087–0.7094)	18.1 (0.71)
	Carrier-to-pinion shaft clearance	0.016–0.052 (0.0006–0.0020)	0.1 (0.004)
	Driveshaft bore diameter	28.000–28.021 (1.1024–1.1032)	—
		*1 26.000–26.021 (1.0236–1.0244)	—
	Carrier-to-driveshaft clearance	0.025–0.066 (0.0010–0.0026)	0.12 (0.005)
	Side clearance	0.10–0.20 (0.004–0.008)	0.15 (0.006)
Differential pinion gear	Backlash	0.05–0.15 (0.002–0.006)	Selection with 8 types of washers
	Pinion gear bore diameter	18.041–18.061 (0.7103–0.7111)	—
	Pinion gear-to-pinion shaft clearance	0.057–0.093 (0.0022–0.0037)	0.15 (0.006)

*1 A1 Transmission only

Driveshaft — Section 17

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Driveshaft	Right boot	As installed	506.0–510.5 (19.9–20.1)	—
	Left boot	As installed MT	805.0–809.5 (31.7–31.9)	—
		AT	812.0–816.5 (32.0–32.1)	—

Steering — Section 18

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Steering wheel	Play		10 (0.39) Max.	—
	Steering assist N (kg, lb)	P/S	15 (1.5, 3.31) Max 18 (1.8, 3.97) Max	
Power steering	Pump pressure with valve closed (Oil temp./ speed: 40°C (104°F) min/idle. Do not run for more than 5 seconds) kPa (kg/cm², psi)		7845–8826 (80–90, 1138–1280)	
	Fluid capacity	Reservoir	0.5ℓ (0.53 US. qt., 0.44 Imp. qt.)	—
		At change	approx 1.7ℓ (1.8 US. qt., 1.5 Imp. qt.)	—

Suspension — Section 19

	MEASUREMENT			STANDARD (NEW)		SERVICE LIMIT
Wheel alignment	Camber			Front 0° 00' ± 1°	Rear 0° 00' ± 1°	
	Caster			0°31' ± 1°		
	Toe-in			0 ± 3 (0 ± 0.118)	0 ± 2 (0 ± 0.079)	
	Kingpin inclination			6° 50'		
	Steering angle	R/L	Inside	39°30'		
			Outside	30°30'		
Wheel	Rim runout	Steel	Axial	0–1.0 (0–0.039)		—
			Radial	0–1.0 (0–0.039)		—
		Aluminum	Axial	0–0.7 (0–0.028)		—
			Radial	0–0.07 (0–0.003)		—
Wheel bearing	Front wheel bearing axial play			0–0.05 (0–0.002)		—
	Rear wheel bearing axial play			0–0.05 (0–0.002)		—

(cont'd)

Standards and Service Limits (cont'd)

Unit: mm (in.)

Brake — Section 20

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Parking brake lever	Play in stroke 200N (20 kg, 44 lbs)	To be locked when pulled 7—11 notches	
Foot brake pedal	Pedal height Free play	205 (8.1) from floor 1—5 (0.04—0.20)	—— 5 (0.20)
Master cylinder	Piston-to-push rod clearance with ALB	0—0.4 (0.016) 0—0.6 (0—0.024)	—— ——
Brake drum	I.D.	200.0 (7.87)	201.0 (7.91)
Lining	Thickness	4.5 (0.18)	2.0 (0.08)
Disc brake	Disc thickness Front Rear Disc runout Disc parallelism Pad thickness Front Rear	19.0 (0.75) *21 (0.83) 10.0 (0.39) —— —— 11.0 (0.43) *11.5 (0.45) 8.0 (0.31)	17.0 (0.67) *19 (0.75) 8 (0.31) 0.15 (0.006) *0.1 (0.004) 0.015 (0.0006) 3.0 (0.12) 1.6 (0.06)

		Vacuum (mm Hg)	Pedal Pressure kg (lbs)	Line Pressure kPa (kg/cm², psi)	
				8" Booster	9" Booster
Brake booster	Characteristics	0	20 (44)	1.304 (13.3, 189.1) min	1.177 (12.0, 170.6) min
		300	20 (44)	4.501 (45.9, 652.7) min	4.766 (48.6, 691.1) min
		500	20 (44)	6.629 (67.6, 961.3) min	7.149 (72.9, 1,036.6) min

*EXSi model and cars equipped with ALB (Except KS type)

Engine Electrical — Section 24

	MEASUREMENT		STANDARD (NEW)		
Ignition coil	Rated voltage Insulation resistance		12 Volts 10,000 ohms min.		
	Performance: Make sure strong sparks jump across electrodes (3-point tester)				
	Voltage	Camshaft	Secondary Voltage	3-point gap	Condition
	6 V 12 V	75 rpm 3,000 rpm	30±4 kV 22±4 kV	15—21 mm (0.59—0.83) 13—19 mm (0.51—0.75)	At 80°C (176°F)
Ignition wire	Resistance		25,000 ohms max.		
Spark plug	Type Standard	B20A2	BCPR6E-11 (NGK), Q20PR-U11 (ND)		
		Others	BPR5EY-11 (NGK), W16EXR-U11 (ND)		
	Gap		1.0—1.1 (0.039—0.043)		
Ignition timing	At idling Carbureted Engine	Manual Automatic (in gear)	20±2° BTDC *24±2° BTDC 15±2°BTDC		
	At idling Fuel-injected Engine	Manual Automatic (in gear)	15±2° BTDC 15±2° BTDC		
Battery	Lighting capacity (20-hour ratio) Starting capacity (5-second ratio)		47 Ampere Hours 8.4 V minumum at 300 Ampere draw		
Alternator	Output at no-load Output		14 V at 1,000 rpm max. 14 V/65 A at 5,500 rpm max.		
	Coil resistance (rotor) Slip ring O.D. Brush length Brush spring tension		2.8—3.0 ohms 32.5 (1.28) 10.5 (0.41) 300—500 g (10.6—18.6 oz)		±0.1 ohms 32.1 (1.26) 5.5 (0.22) ——

Starting motor		ND 0.8 kW		HITACH 0.8 kW		ND 1.0 kW, 1.4 kW		MITSUBA 1.0 kW, 1.4 kW	
	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT	STANDARD (NEW)	SERVICE LIMIT	STANDARD (NEW)	SERVICE LIMIT	STANDARD (NEW)	SERVICE LIMIT
	Mica depth	0.5—0.8 (0.020—0.031)	0.2 (0.008)	0.5—0.8 (0.020—0.031)	0.2 (0.008)	0.5—0.8 (0.020—0.031)	0.2 (0.008)	0.4—0.5 (0.016—0.020)	0.15 (0.006)
	Commutator runout	0—0.5 (0.020)	0.3 (0.012)	0—0.1 (0.004)	0.4 (0.016)	0—0.02 (0.0008)	0.05 (0.020)	0—0.02 (0.008)	0.05 (0.020)
	Commutator O.D.	28.0 (1.10)	27.0 (1.06)	——	39.0 (1.54)	30.0 (1.18)	29.0 (1.14)	28.0 (1.10)	27.5 (1.08)
	Brush length	15.5—16.5 (0.61—0.65)	10.0 (0.39)	14.5—15.5 (0.57—0.61)	11.0 (0.43)	12.5—13.5 (0.49—0.53)	8.5 (0.33)	14.3—14.7 (0.56—0.58)	9.3 (0.37)
	Spring pressure (new)	1.2 kg (2.6 lb)	——	1.6 kg (3.5 lb)	——	1.75 kg (3.8 lb)	——	2.1 kg (4.6 lb)	——

Design Specificaitons

European Model

	ITEMS			METRIC	ENGLISH	NOTE
DIMENSION	Overall length		3D	4,335 mm	170.6 in.	KW: 4,365 mm
			4D	4,535 mm	178.5 in.	KW: 4,565 mm
	Overall width			1,695 mm	66.7 in.	
	Overall height		3D	1,335 mm	52.6 in.	
			4D	1,335 mm	52.6 in.	
	Wheel base			2,600 mm	102.4 in.	
	Tread	Front		1,480 mm	58.3in.	
		Rear		1,475 mm	58.1 in.	
	Ground clearance			160 mm	6.3 in.	
	Seating Capacity	(F/R)		5 (2/3)		
WEIGHT	Curb weight					
On cars equipped with sunroof (S/R), ALB or air conditioner (A/C), add	(5-MT)	3D	EX (A20A2)	1,065 kg*	2,348 lb.*	KF, KG, KB, KW
				1,070 kg*	2,359 lb.*	SF
				1,077 kg	2,374 lb.	KF, KG, KB, KW
				1,082 kg	2,385 lb.	SF
				1,095 kg	2,414 lb.	KS
				1,075 kg	2,370 lb.	KE
S/R: 18 kg (40 lb)			EXi (A20A4)	1,100 kg	2,425 lb.	KF, KG, KB, KW
ALB: KE				1,110 kg	2,447 lb.	SF
19 kg (42 lb)				1,120 kg	2,469 lb.	KS
except KE				1,105 kg	2,436 lb.	KE
14 kg (31 lb)			EXC (A20A1)	1,085 kg*	2,392 lb.*	KG, KB
A/C: 22 kg (49 lb)				1,095 kg	2,414 lb.	KG, KB
				1,100 kg	2,425 lb.	KX
			EXCi (A20A3)	1,115 kg	2,458 lb.	KG, KB, KX
		4D	STD (A16A1)	1,050 kg	2,315 lb.	KG, KB, KW, SF
			STD (A20A2)	1,060 kg	2,337 lb.	KG, KB, KW, SF
				1,075 kg	2,370 lb.	KS
			EX (A16A1)	1,062 kg	2,341 lb.	KW, SF
				1,085 kg	2,392 lb.	KF
			EX (A20A2)	1,085 kg	2,392 lb.	KF, KG, KB, KE
				1,095 kg	2,414 lb.	KW
				1,100 kg	2,425 lb.	KS, SF
			EXi (A20A4)	1,105 kg	2,436 lb.	KF, KG, KB
				1,115 kg	2,458 lb.	KW, KE
				1,120 kg	2,469 lb.	KS, SF
			LXC (A20A1)	1,080 kg	2,381 lb.	KW
			EXC (A20A1)	1,105 kg	2,436 lb.	KG, KB
				1,115 kg	2,458 lb.	KW, KX
			EXCi (A20A3)	1,120 kg	2,469 lb.	KG, KB
				1,135 kg	2,502 lb.	KX
				1,130 kg	2,491 lb.	KW
			EXSi (B20A2)	1,170 kg	2,579 lb.	KF
				1,155 kg	2,546 lb.	KG, KB
				1,185 kg	2,612 lb.	KE

*: Cars equipped with manual steering SF: Finland and Norway

(cont'd)

Design Specifications (cont'd)

European Model (cont'd)

ITEMS				METRIC	ENGLISH	NOTE
WEIGHT (cont'd)	(4-AT)	3D	EX (A20A2)	1,085 kg*	2,392 lb.*	KF, KG, KB, KW
				1,090 kg*	2,403 lb.*	SF
On cars equipped with sunroof (S/R), ALB or air conditioner (A/C), add				1,097 kg	2,418 lb.	KF, KG, KB, KW
				1,102 kg	2,429 lb.	SF
				1,115 kg	2,458 lb.	KS
				1,095 kg	2,414 lb.	KE
S/R: 18 kg (40 lb)		3D	EXi (A20A4)	1,120 kg	2,469 lb.	KF, KG, KB, KW
				1,130 kg	2,491 lb.	SF
ALB: KE 19 kg (42 lb)				1,140 kg	2,513 lb.	KS
except KE 14 kg (31 lb)				1,125 kg	2,480 lb.	KE
			EXC (A20A1)	1,105 kg*	2,436 lb.*	KG, KB
A/C: 22 kg (49 lb)				1,115 kg	2,458 lb.	KG, KB
			EXi (A20A3)	1,135 kg	2,502 lb.	KG, KB, KX
		4D	STD (A16A1)	1,060 kg	2,337 lb.	KG, KB, KW, SF
			STD (A20A2)	1,080 kg	2,381 lb.	KG, KB, KW, SF
				1,095 kg	2,414 lb.	KS
			EX (A16A1)	1,072 kg	2,363 lb.	KW, SF
				1,100 kg	2,425 lb.	KF
			EX (A20A2)	1,105 kg	2,436 lb.	KF, KG, KB KE
				1,115 kg	2,458 lb.	KW
				1,120 kg	2,469 lb.	KS, SF
			EXi (A20A4)	1,125 kg	2,480 lb.	KF, KG, KB
				1,135 kg	2,502 lb.	KW, KE
				1,140 kg	2,513 lb.	SF
			LXC (A20A1)	1,100 kg	2,425 lb.	KW
			EXC (A20A1)	1,125 kg	2,480 lb.	KG, KB
				1,135 kg	2,502 lb.	KX, KW
			EXCi (A20A3)	1,140 kg	2,513 lb.	KG, KB
				1,155 kg	2,546 lb.	KX
				1,150 kg	2,535 lb.	KW
On cars equipped with sunroof (S/R), ALB or air conditioner (A/C), add	Weight Distribution (Fr/Rr)					
	(5-MT)	3D	EX (A20A2)	645/420 kg*	1,422/926 lb.*	KF, KG, KB, KW
				650/420 kg*	1,433/926 lb.*	SF
				657/420 kg	1,448/926 lb.	KF, KG, KB, KW
				662/420 kg	1,459/926 lb.	SF
				670/425 kg	1,477/937 lb.	KS
				655/420 kg	1,444/926 lb.	KE
S/R: 9/9 kg (20/20 lb)			EXi (A20A4)	665/435 kg	1,466/959 lb.	KF, KG, KB, KW
				675/435 kg	1,488/959 lb.	SF
ALB: KE 12/7 kg (26/15 lb)				680/440 kg	1,499/970 lb.	KS
except KE 12/2 kg (26/4 lb)				670/435 kg	1,477/959 lb.	KE
			EXC (A20A1)	665/420 kg*	1,466/926 lb.*	KG, KB
A/C: 24/-2 kg (53/-4 lb)				675/420 kg	1,488/926 lb.	KG, KB
				680/420 kg	1,499/926 lb.	KX
			EXCi (A20A3)	680/435 kg	1,499/959 lb.	KG, KB, KX
		4D	STD (A16A1)	625/425 kg	1,378/937 lb.	KG, KB, KW, SF
			STD (A20A2)	635/425 kg	1,400/937 lb.	KG, KB, KW, SF
				640/435 kg	1,411/959 lb.	KS

*: Cars equipped with manual steering SF: Finland and Norway

ITEMS				METRIC	ENGLISH	NOTE
WEIGHT			EX (A16A1)	637/425	1,404/937 lb.	KW, SF
				645/440 kg	1,422/970 lb.	KF
			EX (A20A2)	650/435 kg	1,433/959 lb.	KF, KG, KB, KE
				655/440 kg	1,444/970 lb.	KW
				660/440 kg	1,455/970 lb.	KS, SF
			EXi (A20A4)	660/445 kg	1,455/981 lb.	KF, KG, KB
				665/450 kg	1,466/992 lb.	KW, KE
				670/450 kg	1,477/992 lb.	KS, SF
			LXC (A20A1)	655/425 kg	1,444/937 lb.	KW
			EXC (A20A1)	670/435 kg	1,477/959 lb.	KG, KB
				675/440 kg	1,488/970 lb.	KW, KX
			EXCi (A20A3)	675/445 kg	1,488/981 lb.	KG, KB
				685/450 kg	1,510/992 lb.	KX
				680/450 kg	1,499/992 lb.	KW
			EXSi (B20A2)	710/460 kg	1,565/1,014 lb.	KF
				695/460 kg	1,532/1,014 lb.	KG, KB
				715/470 kg	1,576/1,036 lb.	KE
	(4-AT)	3D	EX (A20A2)	665/420 kg*	1,466/926 lb.*	KF, KG, KB, KW
				670/420 kg*	1,477/926 lb.*	SF
				677/420 kg	1,493/926 lb.	KF, KG, KB, KW
				682/420 kg	1,504/926 lb.	SF
				690/425 kg	1,521/937 lb.	KS
				675/420 kg	1,488/926 lb.	KE
			EXi (A20A4)	685/435 kg	1,510/959 lb.	KF, KG, KB, KW
				695/435 kg	1,532/959 lb.	SF
				700/440 kg	1,543/970 lb.	KS
				690/435 kg	1,521/959 lb.	KE
			EXC (A20A1)	685/420 kg*	1,510/926 lb.*	KG, KB
				695/420 kg	1,532/926 lb.	KG, KB
			EXCi (A20A3)	700/435 kg	1,543/959 lb.	KG, KB, KX
		4D	STD (A16A1)	635/425 kg	1,400/937 lb.	KG, KB, KW, SF
			STD (A20A2)	655/425 kg	1,444/937 lb.	KG, KB, KW, SF
				660/435 kg	1,455/959 lb.	KS
			EX (A16A1)	647/425 kg	1,426/937 lb.	KW, SF
				660/440 kg	1,455/970 lb.	KF
			EX (A20A2)	670/435 kg	1,477/959 lb.	KF, KG, KB, KE
				675/440 kg	1,488/970 lb.	KW
				680/440 kg	1,499/970 lb.	KS, SF
			EXi (A20A4)	680/445 kg	1,499/981 lb.	KF, KG, KB
				685/450 kg	1,510/992 lb.	KW, KE
			EXi (A20A4)	690/450 kg	1,521/992 lb.	SF
			LXC (A20A1)	675/425 kg	1,488/937 lb.	KW
			EXC (A20A1)	690/435 kg	1,521/959 lb.	KG, KB
				695/440 kg	1,532/970 lb.	KX, KW
			EXCi (A20A3)	695/445 kg	1,532/981 lb.	KG, KB
				705/450 kg	1,554/992 lb.	KX
				700/450 kg	1,543/992 lb.	KW

*: Cars equipped with manual steering, SF: Finland and Norway

(cont'd)

Design Specifications (cont'd)

European Model (cont'd)

	ITEMS		METRIC	ENGLISH	NOTE
WEIGHT (cont'd)	Max. Loaded Vehicle Weight (ADR)	5—MT	1,590 kg	3,505 lb.	
		4—AT	1,610 kg	3,549 lb.	
	Max. Permissible Weight (EC)	2000	1,660 kg	3,660 lb.	
		1600	1,580 kg	3,484 lb.	
ENGINE (Expect B20A2)	Type		Water cooled, gasoline fueled, 4-cycle OHC		
	Cylinder arrangement		4-cylinder in-line transverse		
	Bore and Stroke	1600	80.0 x 79.5 mm	3.15 x 3.13 in.	
		2000	82.7 x 91.0 mm	3.25 x 3.58 in.	
	Displacement	1600	1,598 cm³	97.8 cuin	
		2000	1,955 cm³	119 cuin	
	Compression Ratio		A16A1:9.0 A20A1:9.1, A20A2:9.2 A20A3:8.8, A20A4:9.4, 8.9 (KS)		
	Valve Train		Trochoid Pump		
	Fuel Required		Regular gasoline with 91 RON (Research Octane Number) or higher Super/Premium gasoline with 97 RON (Research Octane Number) or higher.		
ENGINE (B20A2)	Type		Water cooled, 4-cycle D.O.H.C		
	Cylinder Arrangement		4-cylinder in line, transverse		
	Bore and Stroke		81.0 x 95 mm	3.18 x 3.74 in.	
	Displacement		1,958 cm³	120 cu.in.	
	Compression Ratio		9.5:1		
	Valve Train		Timing belt driven, double overhead camshaft		
	Lubrication System		Trochoid pump		
	Fuel Required		Leaded gasoline with 97 research octane number or higher.		
TRANS-MISSION	Clutch	4—AT	Three element, one strage, two phase		
		5—MT	Single dry plate, diaphragm spring		
	Transmission	4—AT	Torque converter with lock up clutch		
		5—MT	Synchromesh 5 forward speeds, 1 reverse		

		A16A1	A20A2 A20A4	A20A1 A20A2 KS A20A3	B20A2	
Primary Reduction		1.000	1.000	1.000	1.000	A20A1 KX
Gear Ratio	I	3.181	<2.421>	<2.529>	<2.529>	3.166	*1:1.208
< >:4—AT	II	1.842	<1.560>	<1.481>	<1.481>*2	1.857	A20A3 KX
	III	1.250*1	<0.969>	<1.060>	<1.030>*3	1.259	*2:1.428
	IV	0.937	<0.729>	<0.743>	<0.700>*4	0.967	*3:1.060
	V	0.771	——	——	——	0.794	*4:0.743
	Reverse	3.000	<1.954>	<1.904>	<1.904>	3.000	
	Final	4.066	<3.933>	<4.066>	<4.066>	4.066	
Clutch Facing Area	1600	160 cm²		24.8 sq. in.		
	2000	176 cm²		27.3 sq. in.		

	ITEMS		METRIC	ENGLISH	NOTE
STEERING SYSTEM	Type	Manual Steering	Rack and Pinion		
		Power Steering	Power assisted Rack and Pinion integral		
	Overall Ratio	Manual Steering	19.4		
		Power Steering	18.0		
	Turns, lock-to-lock	Manual Steering	3.78		
		Power Steering	3.50		
	Steering Wheel Dia.		375 mm	14.76	
	Power Steering Oil Tank Capacity		1.4 ℓ	1.2 Imp. pt., 1.5 US pt.	
	Power Steering Oil		Honda Genuine power steering fluid		
SUSPENSION SYSTEM	Type, F		Double Wishbone		
	Type, R		Double Wishbone		
	Shock Absorber F/R		Telescopic hydraulic		
WHEEL ALIGNMENT	Wheel Alignment				
	Camber	Front	0°		
		Rear	0°		
	Caster	Front	0°30′		
	Toe	Front	0 mm	0.0 in.	
		Rear	0 mm	0.0 in.	
BRAKE SYSTEM	Type, F		Self-adjusting power assisted disc brake type		
	Type, R		Drum *1		*1 Disc for EX 2.0 ℓ and cans equipped with Anti-Lock Brake.
	Lining Surface Area F/R		43.3/21 (disc) 67.2 (drum) cm²		
	Effective Disc Dia.		208 mm		
	Effective Brake Drum I.D.		200 mm	7.9 in	
	Parking Brake Type		Mechanical expanding, Rear two wheel brakes*2		*2 Mechanical to rear disc for equipped with Disc Brake.
TIRES	F/R		165SR13, 185/70 R13 86T, 185/70 HR13 195/60 HR 14, 195/60 VR 14		
		Spare	T105/80D13, T105/80R13, T105/70D14 T135/70D15*		* For cars equipped with ALB <Except for KE>
ELECTRICAL SYSTEM	Battery		12V—50AH (Cold cranking current −17.7°C [0°F] 410A)		
	Starting Motor		12V—1.0/1.4KW		
	Generator		12—65AH		
	Fuses		7.5A, 10A, 15A, 20A, 30A		
	Main Fuse		70A, 40A		
	Headlights		12V—60/55W		
	Turn signal lights	Front	12V—21W		
		Rear	12V—21W		
		Side	12V—5W		
	License Plate Lights		12V—5W		
	Back-up Lights		12V—21W		
	Stop Lights		12V—21W		
	Tail Lights		12V—5W		
	Rear Fog Light		12V—21W		

(cont'd)

Design Specification (cont'd)

KQ Model

NOTE: Only the design specifications for models below different from those of the European model are listed. For the other items not given here, refer to the European Model design specification.

	ITEMS			METRIC	ENGLISH	NOTE
DIMENSION	Curb weight					
On cars equipped with air conditioner, add 22 kg (49 lb).	(5-MT)	3D	EX (A20A2)	1,120 kg	2,469 lb.	
			EXi (A20A4)	1,128 kg	2,487 lb.	
		4D	EX (A20A2)	1,130 kg	2,491 lb.	
				1,148 kg	2,531 lb.	
			EXi (A20A4)	1,142 kg	2,518 lb.	
				1,160 kg	2,557 lb.	S/R
	(4-AT)	3D	EX (A20A2)	1,140 kg	2,513 lb.	
			EXi (A20A4)	1,148 kg	2,531 lb.	
		4D	EX (A20A2)	1,150 kg	2,535 lb.	
				1,168 kg	2,575 lb.	S/R
			EXi (A20A4)	1,162 kg	2,562 lb.	
				1,180 kg	2,601 lb.	S/R
On cars equipped with air conditioner, add 24/-2kg (53/-4 lb).	Weight Distribution (F/R)					
	(5-MT)	3D	EX (A20A2)	670/450 kg	1,477/992 lb.	
			EXi (A20A4)	677/451 kg	1,493/994 lb.	
		4D	EX (A20A2)	673/457 kg	1,484/1,007 lb.	
				682/466 kg	1,504/1,027 lb.	S/R
			EXi (A20A4)	681/461 kg	1,502/1,016 lb.	
				690/470 kg	1,521/1,036 lb.	S/R
	(4-AT)	3D	EX (A20A2)	690/450 kg	1,521/992 lb.	
			EXi (A20A4)	697/451 kg	1,537/994 lb.	
		4D	EX (A20A2)	693/457 kg	1,528/1,007 lb.	
				702/466 kg	1,548/1,027 lb.	S/R
			EXi (A20A4)	701/461 kg	1,546/1,016 lb.	
				710/470 kg	1,565/1,036 lb.	S/R
ENGINE	Compression ratio			A20A2 9.1 A20A4 8.8		
TRANSMISSION	Gear Ratio		I	3.181 <2.529>		
	< >: 4AT		II	1.842 <1.481>		
			III	1.250 <1.060>		
			IV	0.937 <0.743>		
			V	0.771 ——		
			Reverse	3.000 <1.904>		
			Final	4.066 <4.066>		
TIRES	Tire size F/R		EX	185/70 R13 86T		
			2.0 si	185/70 HR 13		
ELECTRICAL SYSTEM	Starting Motor			12 V–1.0 KW		
	Battery			12 V–40 AH		

S/R: Cars equipped with sunroof

General Export Model

NOTE: Only the design specifications for models below different from those of the European model are listed. For the other items not given here, refer to the European Model design specification.

	ITEMS			METRIC	ENGLISH	NOTE
DIMENSION	Ground Clearance			170 mm	6.7 in.	KY
On cars equipped	Curb weight					
with air condi-	(5-MT)	3D (A20A2)	STD	1,060 kg	2,337 lb.	KP, KT, KU
tioner, add 22 kg			EX	1,080 kg	2,381 lb.	KP, KT, KU
(49 lb).				1,130 kg	2,491 lb.	KY (A/C)
			EXR	1,140 kg	2,513 lb.	KY (A/C)
		4D (A16A1)	STD	1,055 kg	2,315 lb.	KT
				1,060 kg	2,337 lb.	Singapore
				1,085 kg	2,392 lb.	KT, Singapore
				1,103 kg	2,432 lb.	KT, Singapore (S/R)
		4D (A20A2)	STD	1,060 kg	2,337 lb.	KP, KU
			EX	1,085 kg	2,392 lb.	KP, KT, KU
				1,103 kg	2,432 lb.	KP, KT, KU (S/R)
			GL	1,130 kg	2,491 lb.	KY (A/C)
			EX	1,140 kg	2,513 lb.	KY (A/C)
				1,160 kg	2,557 lb.	KY (S/R, A/C)
			EXR	1,170 kg	2,579 lb.	KY (S/R, A/C)
	(4-AT)	3D (A20A2)	STD	1,075 kg	2,370 lb.	KP, KT, KU
			EX	1,095 kg	2,414 lb.	KP, KT, KU
				1,150 kg	2,535 lb.	KY (A/C)
			EXR	1,160 kg	2,557 lb.	KY (A/C)
		4D (A16A1)	STD	1,070 kg	2,359 lb.	KT
				1,075 kg	2,370 lb.	Singapore
			EX	1,100 kg	2,425 lb.	KT, Singapore
				1,118 kg	2,465 lb.	KT, Singapore (S/R)
		4D (A20A2)	STD	1,080 kg	2,381 lb.	KP, KU
			EX	1,105 kg	2,436 lb.	KP, KT, KU
				1,123 kg	2,476 lb.	KP, KT, KU (S/R)
			GL	1,150 kg	2,535 lb.	KY (A/C)
			EX	1,160 kg	2,557 lb.	KY (A/C)
				1,180 kg	2,601 lb.	KY (S/R, A/C)
			EXR	1,190 kg	2,623 lb.	KY (S/R, A/C)
On cars equipped	Weight Distribution (Fr/Rr)					
with air condi-	(5-MT)	3D (A20A2)	STD	645/415 kg	1,422/915 lb.	KP, KT, KU
tioner, add 24/			EX	660/420 kg	1,455/926 lb.	KP, KT, KU
-2 kg (53/-4 lb).				690/440 kg	1,521/970 lb.	KY (A/C)
			EXR	695/445 kg	1,532/981 lb.	KY (A/C)
		4D (A16A1)	STD	625/430 kg	1,378/978 lb.	KT
				630/430 kg	1,389/948 lb.	Singapore
			EX	645/440 kg	1,422/970 lb.	KT, Singapore
				654/449 kg	1,441/990 lb.	KT, Singapore (S/R)

S/R: Cars equipped with sunroof A/C: Cars equipped with air conditioner

(cont'd)

Design Specifications (cont'd)

General Export Model (cont'd)

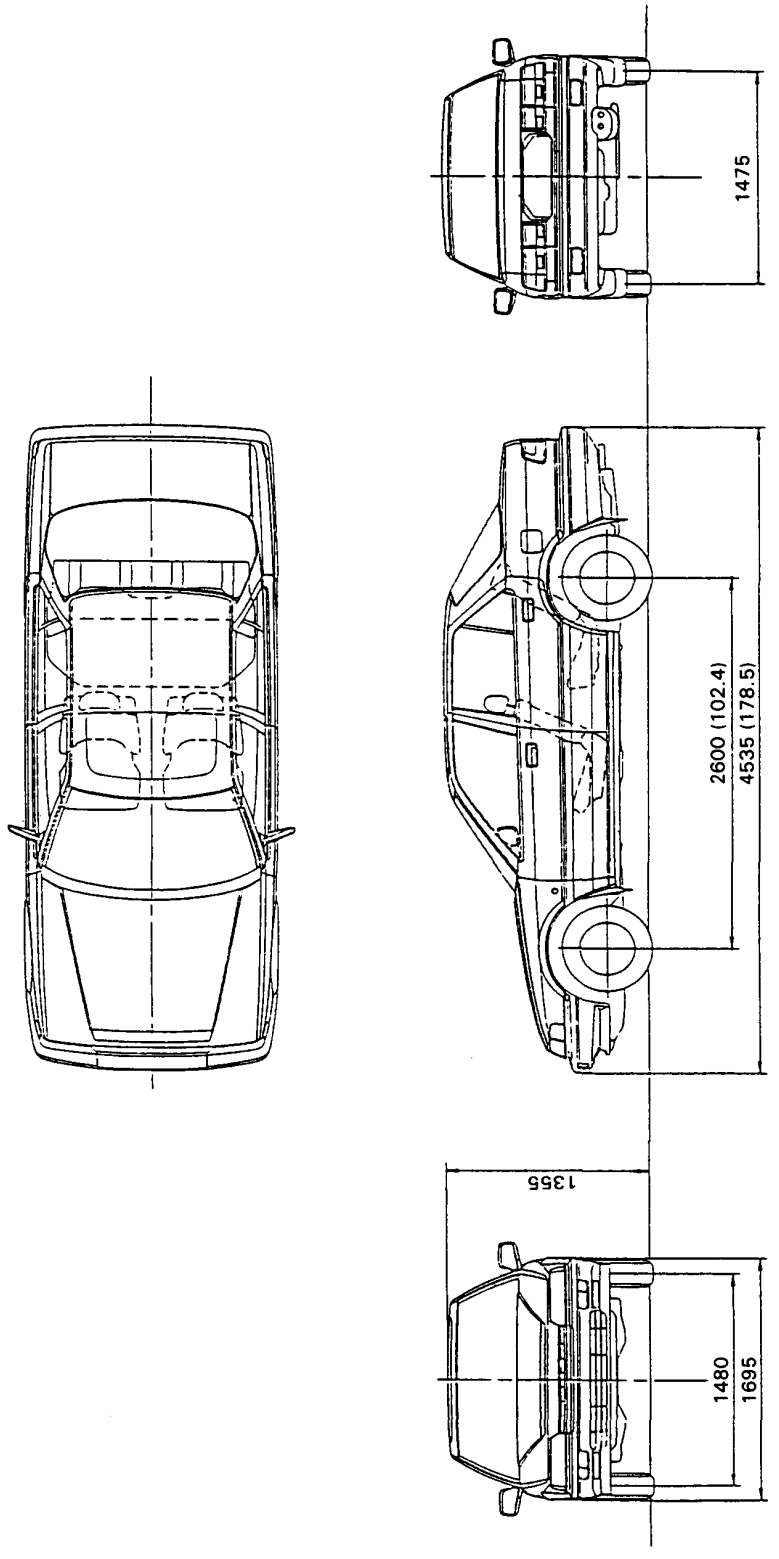
	ITEMS			METRIC	ENGLISH	NOTE
DIMENSION (cont'd)	Weight Distribution					
		4D (A20A4)	STD	635/425 kg	1,400/937 lb.	KP, KU
			EX	650/435 kg	1,433/959 lb.	KP, KT, KU
				659/444 kg	1,453/979 lb.	KP, KT, KU (S/R)
			GL	690/440 kg	1,521/970 lb.	KY (A/C)
			EX	695/445 kg	1,532/981 lb.	KY
				705/455 kg	1,554/1,003 lb.	KY (S/R, A/C)
			EXR	710/460 kg	1,565/1,014 lb.	KY (S/R, A/C)
	(4-AT)	3D (A20A2)	STD	660/415 kg	1,445/915 lb.	KP, KT, KU
			EX	675/420 kg	1,488/926 lb.	KP, KT, KU
				710/440 kg	1,565/970 lb.	KY (A/C)
			EXR	715/445 kg	1,576/981 lb.	KY (A/C)
		4D (A16A1)	STD	640/430 kg	1,411/948 lb.	KT
				645/430 kg	1,422/948 lb.	Singapore
			EX	660/440 kg	1,455/970 lb.	KT, Singapore
				669/449 kg	1,475/990 lb.	KT, Singapore (S/R)
		4D (A20A2)	STD	655/425 kg	1,444/937 lb.	KP, KU
			EX	670/435 kg	1,477/959 lb.	KP, KT, KU
				679/444 kg	1,497/979 lb.	KP, KT, KU (S/R)
			GL	710/440 kg	1,565/970 lb.	KY (A/C)
			EX	715/445 kg	1,576/981 lb.	KY (A/C)
				725/455 kg	1,598/1,003 lb.	KY (S/R, A/C)
			EXR	730/460 kg	1,609/1,014 lb.	KY (S/R, A/C)
ENGINE	Compression Ratio			A16A1 9.0 A20A2 9.2		
TRANSMISSION	Gear Ratio		I	3.181 <2.529> (2.421)		
	< >: 4AT with 2000		II	1.842 <1.481> (1.560)		
	( ): 4AT with 1600		III	1.250 <1.060> (0.969)		
			IV	0.937 <0.743> (0.729)		
			V	0.771 —— ——		
			Reverse	3.000 <1.904> (1.954)		
			Final	4.066 <4.066> (3.933)		
TIRES	Tire Size F/R Sedan		STD, GL	165SR13		
			EX	185/70SR13		
ELECTRIAL SYSTEM	Battery			12 V–40 AH		
	Starting Motor			12 V–1.0 W		

S/R: Cars equipped with sunroof A/C: Cars equipped with air conditioner

Body Specifications

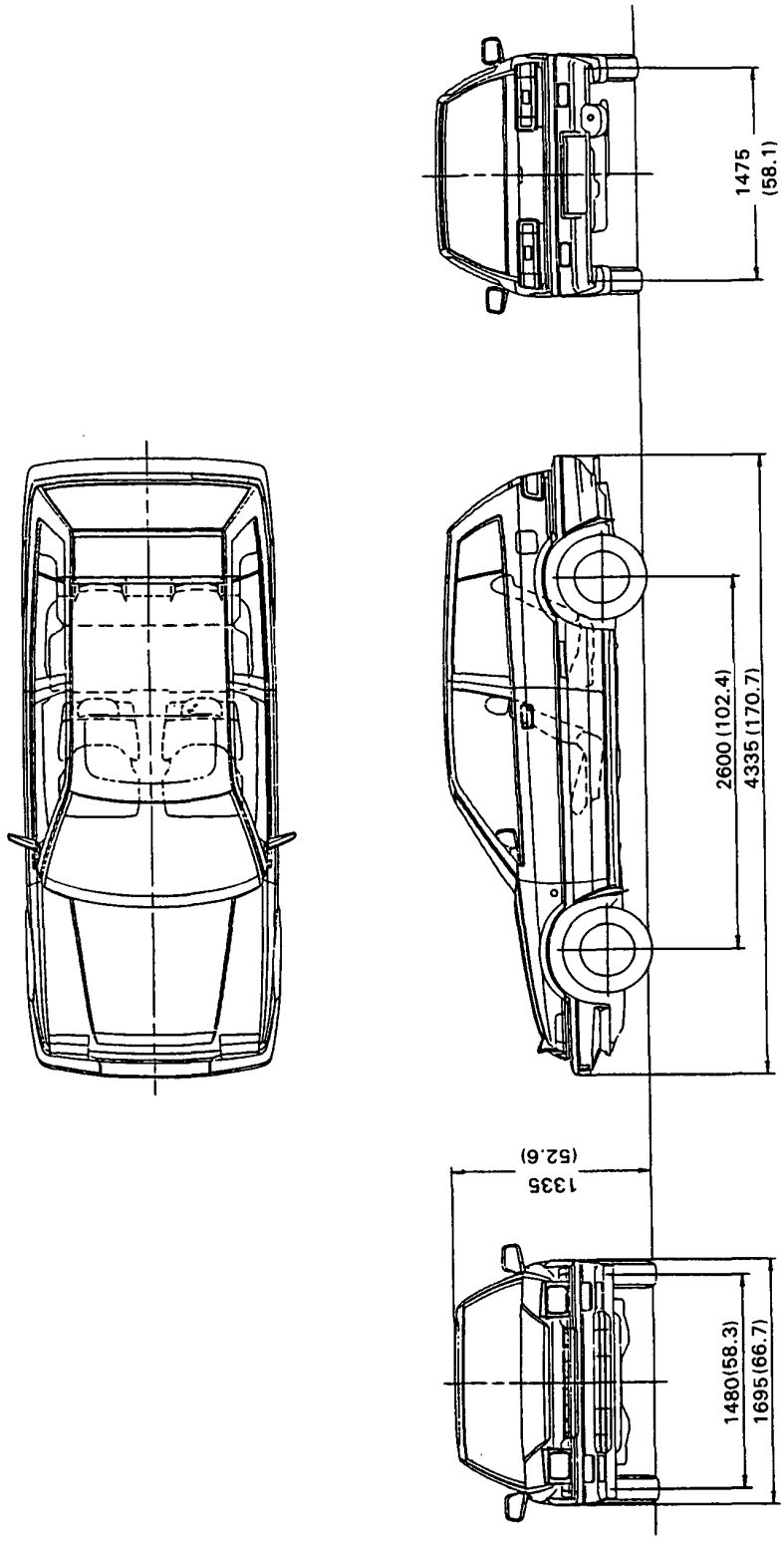
4 D Sedan

Unit: mm



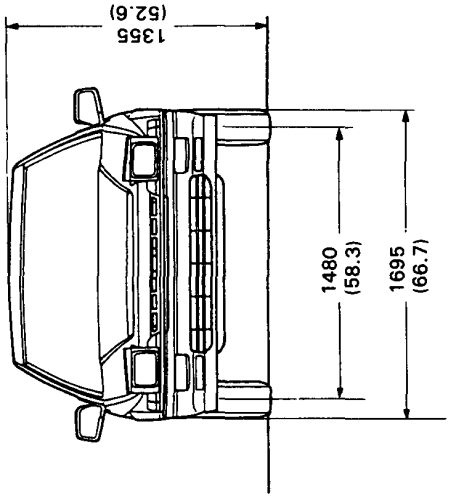
Aerodeck

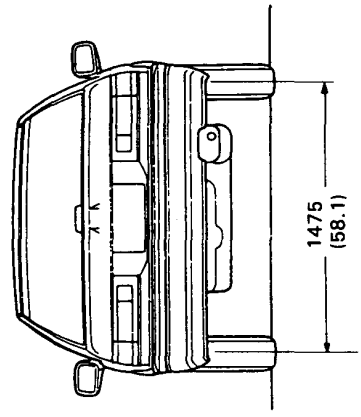
Unit: mm (in.)

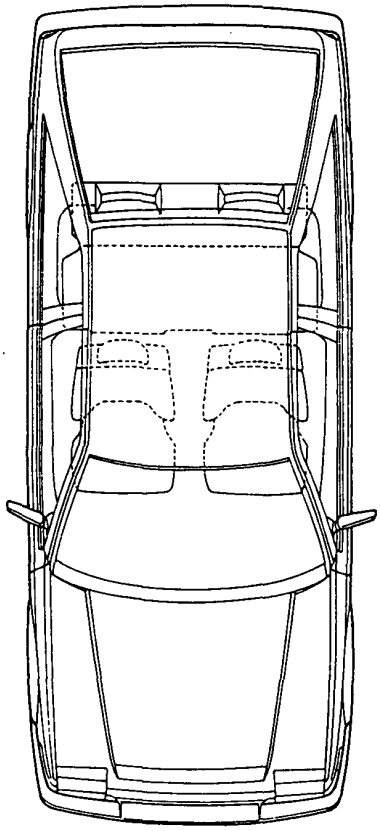


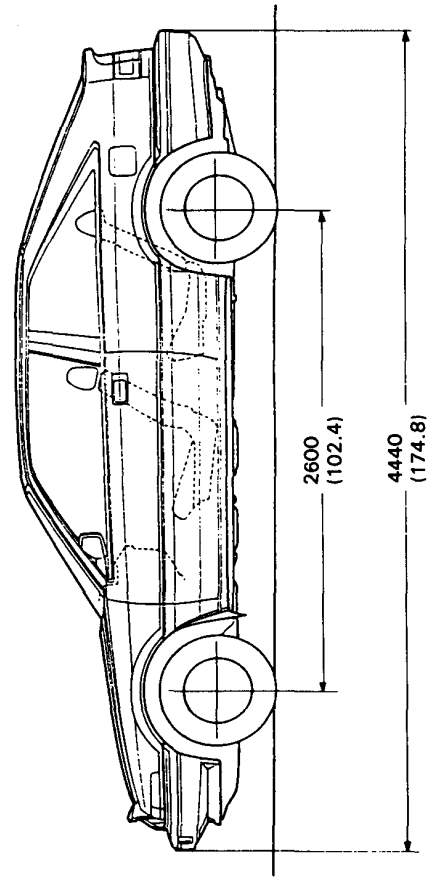
Glass Back

Unit: mm (in.)







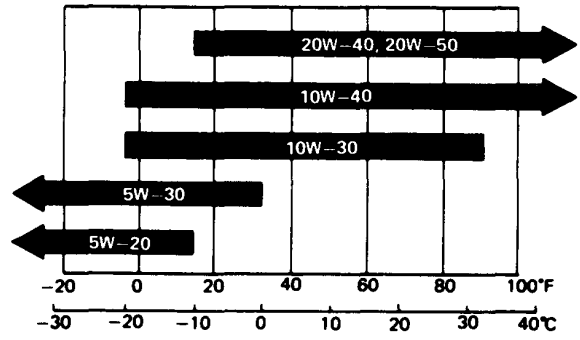


Maintenance

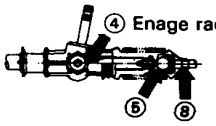
Lubrication Points

No	LUBRICATION POINTS		LUBRICANT
1	Engine		API Service Grade: SE or SF SAE Viscosity: See chart below
2	Transmission	Manual Automatic	API Service Grade: SE or SF SAE30, 10W—30, 10W—40 or 20W—40 grade oil DEXRON® Automatic transmission fluid
3	Brake reservoir		Brake fluid DOT 3 or DOT 4
4	Steering gearbox (Power)		Honda steering grease P/N 08704—99969
4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28	Steering gearbox (Manual) Steering ball joint Suspension ball joints Front upper arm Steering Boot Shift lever pivot (Manual) Steering column bushings Horn contact Shift rod clevis bushings Select lever (Automatic) Pedal linkage Throttle cable end Brake master cylinder push rod Rear caliper Tailgate hinges (Hatchback) Trunk hinges (Sedan) Door hinges upper and lower Door opening detents Fuel filler lid Engine hood hinges Engine hood latch Tilt lever Select lever Rear brake shoe linkage Intermediate shaft (B20A Engine)		Multipurpose Grease
29 30	Caliper	Piston seal Dust seal Caliper pin Piston	Silicone Grease
31	Power steering reservoir		Honda power steering fluid P/N 08208—99961

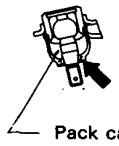
Recommended Engine Oil
(SE or SF Grade only)



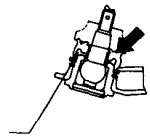
Engine oil viscosity for
ambient temperature ranges.



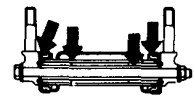
④ STEERING GEARBOX
⑤ STEERING BALL JOINT
⑧ STEERING BOOT



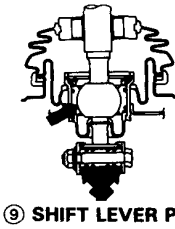
⑥ FRONT SUSPENSION BALL JOINTS



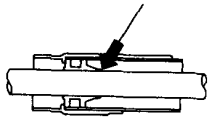
⑥ REAR SUSPENSION BALL JOINTS



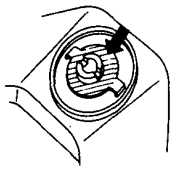
⑦ FRONT UPPER ARM



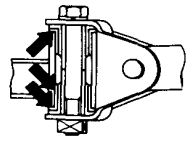
⑨ SHIFT LEVER PIVOT



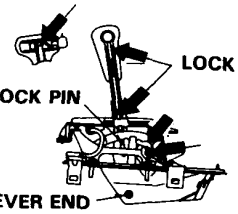
⑩ STEERING COLUMN BUSHING



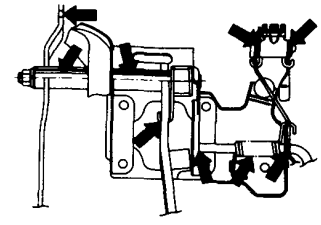
⑪ HORN CONTACT



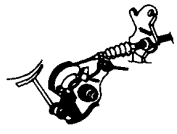
⑫ SHIFT ROD CLEVIS BUSHINGS



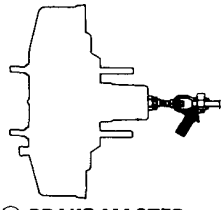
⑬ SELECT LEVER



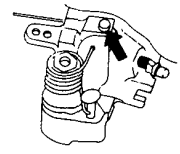
⑭ PEDAL LINKAGE



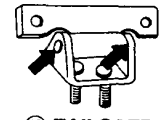
⑮ THROTTLE CABLE END



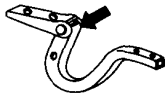
⑯ BRAKE MASTER CYLINDER PUSH ROD



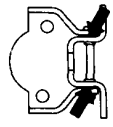
⑰ REAR CALIPER



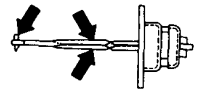
⑱ TAILGATE HINGES



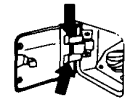
⑲ TRUNK HINGES



⑳ DOOR HINGES

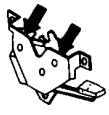


㉑ DOOR OPENING DETENTS

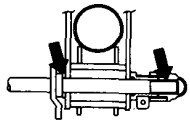


㉒ FUEL FILLER LID

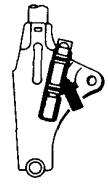
㉓ ENGINE HOOD HINGES



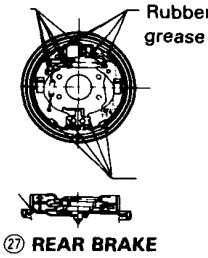
㉔ ENGINE HOOD LATCH



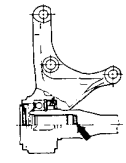
㉕ TILT LEVER



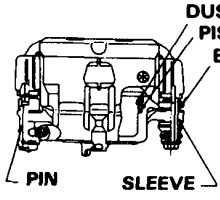
㉖ SERECT LEVER



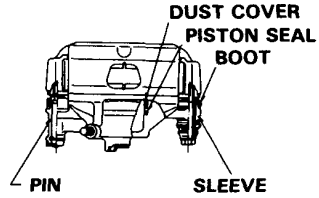
㉗ REAR BRAKE



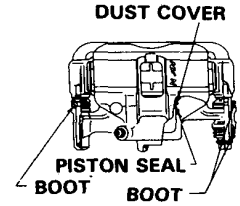
㉘ INTERMEDIATE SHAFT



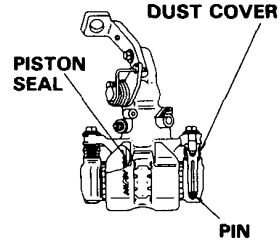
㉙ FRONT CALIPER



㉙ FRONT CALIPER



㉙ FRONT CALIPER



㉚ REAR CALIPER

Maintenance Schedule

	ITEMS	SERVICE AT THE INTERVAL OF LISTED KM (MILES) OR MONTHS, WHICHEVER OCCURS FIRST.					
		x 1,000 km	20	40	60	80	100
		x 1,000 miles	12	24	36	48	60
		months	12	24	36	48	60
	IDLE SPEED AND IDLE CO		I	I	I	I	I
	VALVE CLEARANCE		I	I	I	I	I
	ALTERNATOR DRIVE BELT			I		I	
■	ENGINE OIL AND OIL FILTER		Replace every 10,000 km (6,000 miles) or 6 months				
■	TRANSMISSION OIL			R		R	
■	RADIATOR COOLANT					R*1	
	COOLING SYSTEM, HOSES AND CONNECTIONS			I		I	
	E.G.R. SYSTEM (For cars using unleaded gasoline)*7						I
	SECONDARY AIR SUPPLY SYSTEM (For carburetor type)*2						I
	AIR CLEANER ELEMENT*5		R	R	R	R	R
	AIR CLEANER ELEMENT*6			R		R	
	FUEL FILTER (Including aux. filter for carburetor type)			R		R	
	INTAKE AIR TEMP. CONTROL SYSTEM (For carburetor type)						I
	TANK, FUEL LINE AND CONNECTIONS			I		I	
	THROTTLE CONTROL SYSTEM (For carburetor type)			I		I	
	CHOKE MECHANISM (For carburetor type)			I		I	
	CHOKE OPENER OPERATION (For carburetor type)*3						I
	EVAPORATIVE EMISSION CONTROL SYSTEM*4						I
	IGNITION TIMING AND CONTROL SYSTEM			I		I	
	SPARK PLUGS (For cars using leaded gasoline)		R	R	R	R	R
	SPARK PLUGS (For cars using unleaded gasoline)			R		R	
	DISTRIBUTOR CAP AND ROTOR			I		I	
	IGNITION WIRING			I		I	
	CRANKCASE EMISSION CONTROL SYSTEM			I		I	
	BRAKE HOSES, LINES (Includes ALB hoses and pipes for ALB models)		I	I	I	I	I
	BRAKE FLUID (Includes ALB fluid for ALB models)			R		R	
	FRONT BRAKE DISCS AND CALIPERS		I	I	I	I	I
	FRONT BRAKE PADS		Inspect every 10,000 km (6,000 miles) or 6 months				
	REAR BRAKES			I		I	
	PARKING BRAKE		I	I		I	
	CLUTCH RELEASE ARM TRAVEL		I	I	I	I	I
	ENGINE EXHAUST SILENCER, SUSPENSION MOUNTING BOLTS		I	I	I	I	I
	FRONT WHEEL ALIGNMENT		I	I	I	I	I
	STEERING OPERATION, TIE ROD ENDS, STEERING GEAR BOX AND BOOTS		I	I		I	
	ALB HIGH PRESSURE HOSES					R	
	ALB OPERATION		I	I		I	
	POWER STEERING SYSTEM		I	I	I	I	I
	POWER STEERING PUMP BELT			I		I	
	CATALYTIC CONVERTER HEAT SHIELD (Cars equipped with Catalytic Converter)						I

R—Replace I—Inspect. After inspection, clean, adjust, repair or replace if necessary

■ REMARK: These service intervals assume routine checking and replenishment has been done, as needed, by the customer.

*1 Thereafter, replace every 2 years or 48,000 km (30,000 miles), whichever comes first.
*2 Only for cars using unleaded gasoline (KG, KW, KX, KQ)
*3 Only for 2.0 ℓ model
*4 Only for KQ, KY, KX types and for KG, KW types using unleaded gasoline
*5 Except KQ type and for European types
*6 Only for KQ type and for European types
*7 Only for KG, KW, KX, KQ types using carbureted Engine and KG, KW, KX using Fuel-Injected Engine

CAUTION: The following items must be serviced more frequently on cars normally used under severe driving conditions. Refer to the chart below for the appropriate maintenance intervals.

"Severe driving conditions" include:
- A: Repeated short distance driving
- B: Driving in dusty conditions
- C: Driving in severe, cold weather
- D: Driving in areas using road salt or other corrosive materials
- E: Driving on rough and/or muddy roads
- F: Towing a trailer

R—Replace
I —Inspect. After inspection, clean, adjust, repair or replace if necessary.

Condition	Maintenance item	Maintenance operation	Interval
A, B, F	Engine oil and oil filter	R	Every 5,000 km (3,000 miles) or 3 months
F	Transmission oil	R	Every 20,000 km (12,000 miles) or 12 months
A, B, D, E, F	Front brake discs and calipers	I	Every 10,000 km (6,000 miles) or 6 months
A, B, D, E, F	Rear brakes (Only for disc type brakes)	I	Every 20,000 km (12,000 miles) or 12 months
A, B, C, E, F	Clutch release arm travel	I	Every 10,000 km (6,000 miles) or 6 months
B, C, E	Power steering system	I	Every 10,000 km (6,000 miles) or 6 months

Engine

Outline of Model Change

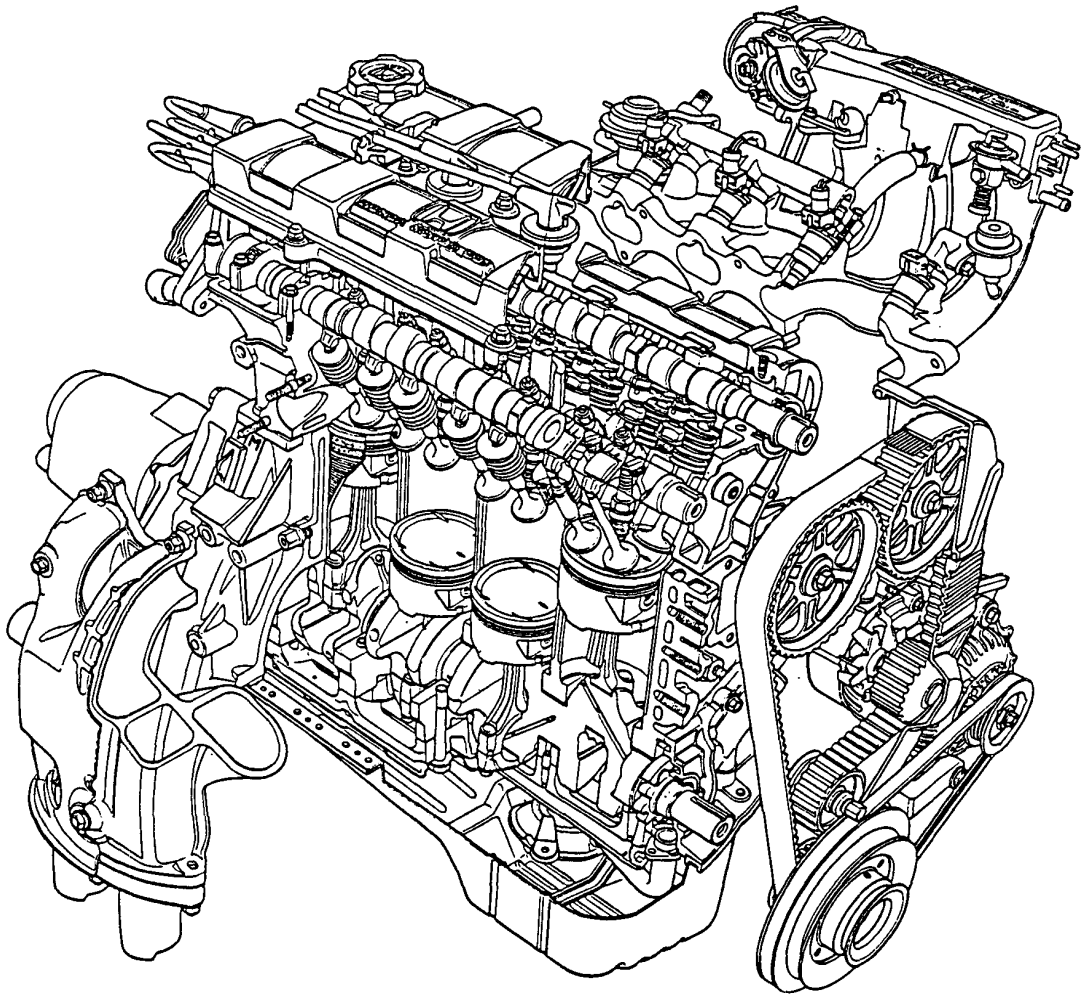
B20A2 engine is newly added.

Description

Outline

A 2.0 liter DOHC PGM-F1 engine version is newly added to the Accord series.
It features the following new points;

- A lightweight, compact 4-row-siamese closed deck aluminum cylinder block.
- A compact, high valve lift, inside pivot rocker arm type cylinder head.
- Lightweight, hollow camshafts.
- Power-saving crankshaft buffle plate.
- Internal recirculation direct-driven oil pump.

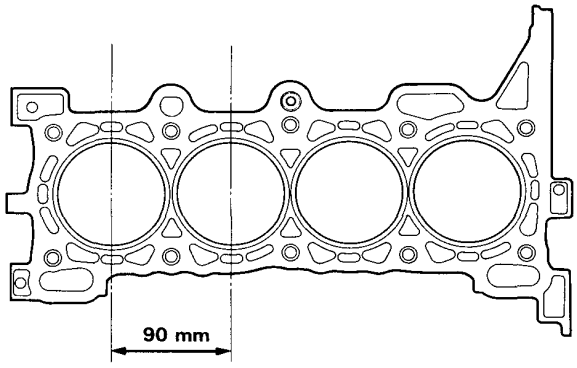


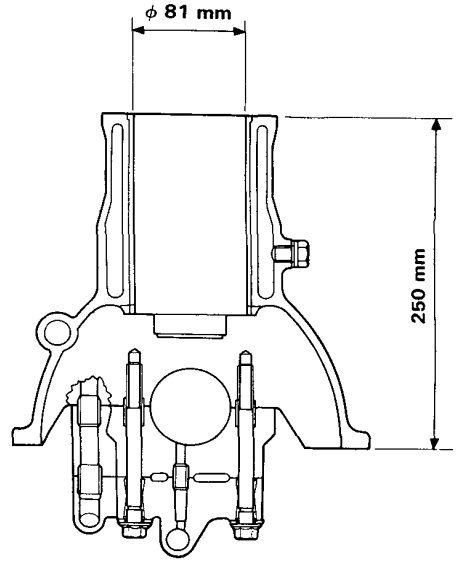
Cylinder Block

The cylinder block is a 4-row-siamese closed deck design which features compact and high rigidity. A Honda original NDC (New Diecast) method is used in the manufacture. The aluminum cylinder block is aprox. 50% lighter than a cast iron cylinder block having the same rigidity.

Specifications

Bore x Stroke	81 x 95.0 mm
Bore Pitch	90 mm
Block Height	250 mm
Displacement	1.955 cm^3





Crankshaft

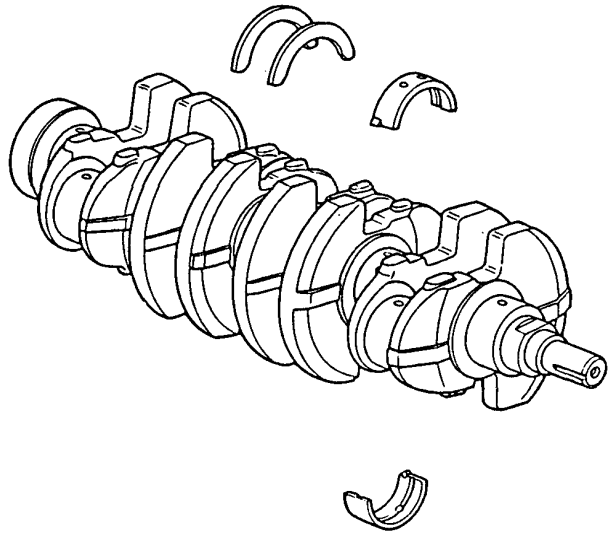
The crankshaft is of high-strength microalloyed steel with an ideal combination of forging material treatment and nitriding process to provide the strength and quality needed for the increased output of this engine.

Specifications

Overall Length	471 mm
Journal Diameter	55 mm
Crankpin Diameter	48 mm

NOTE:
The bearing selection mark indicated for the #3 journal is one rank smaller than for other journals as the housing expansion in the #3 journal is greater.

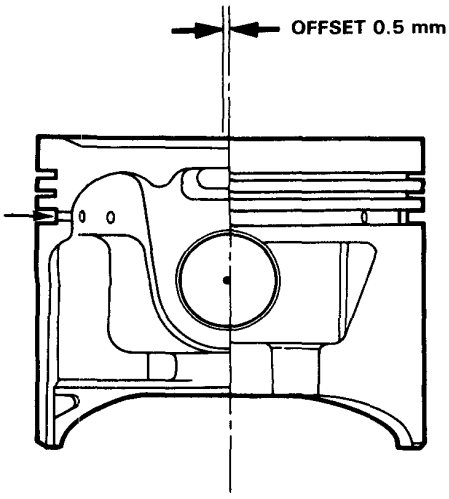
#3 JOURNAL		OTHER JOURNALS	
MARK	RANGE (μ)	MARK	RANGE(μ)
1	−6∼−12	1	0∼−6
2	−12∼−18	2	−6∼−12
3	−18∼−24	3	−12∼−18
4	−24∼−30	4	−18∼−24

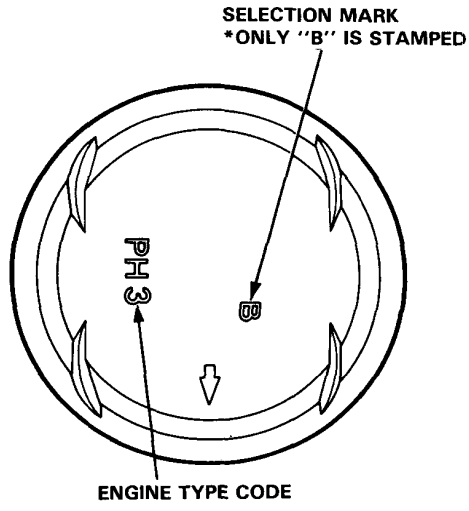


Description

Piston

The design and material are identical to the pistons for A20A4 engine. "PH 3" is marked on the piston head. Two oversize piston sizes (0.25 and 0.50) are available.





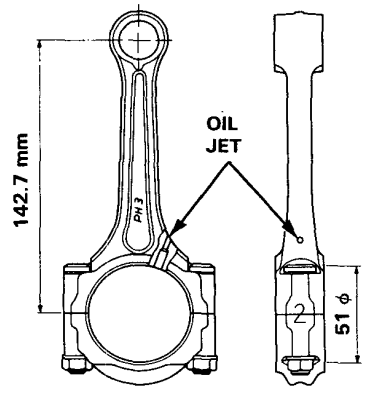
Connecting Rod

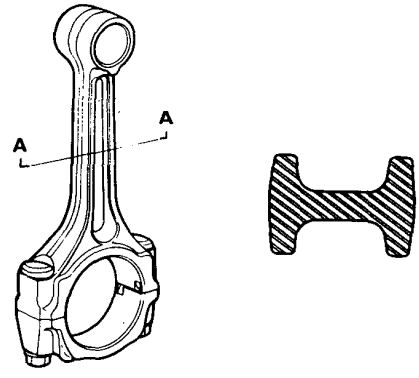
Connecting rods are of high-strength microalloyed steel providing sufficient rigidity for the increased power with a 5% reduction in weight. The weight reduction contributes to reduced inertial mass, hence reduced engine vibration. The weight balance for each cylinder is also controlled within 5 grams to help prevent engine vibration.

Specifications

Big End Bore Diameter	51 mm
Small End Bore Diameter	20 mm
Bore Center Distance	142.7 mm

NOTE:
When assembling the piston and connecting rod, the arrow mark should be on the left side when facing the oil jet.



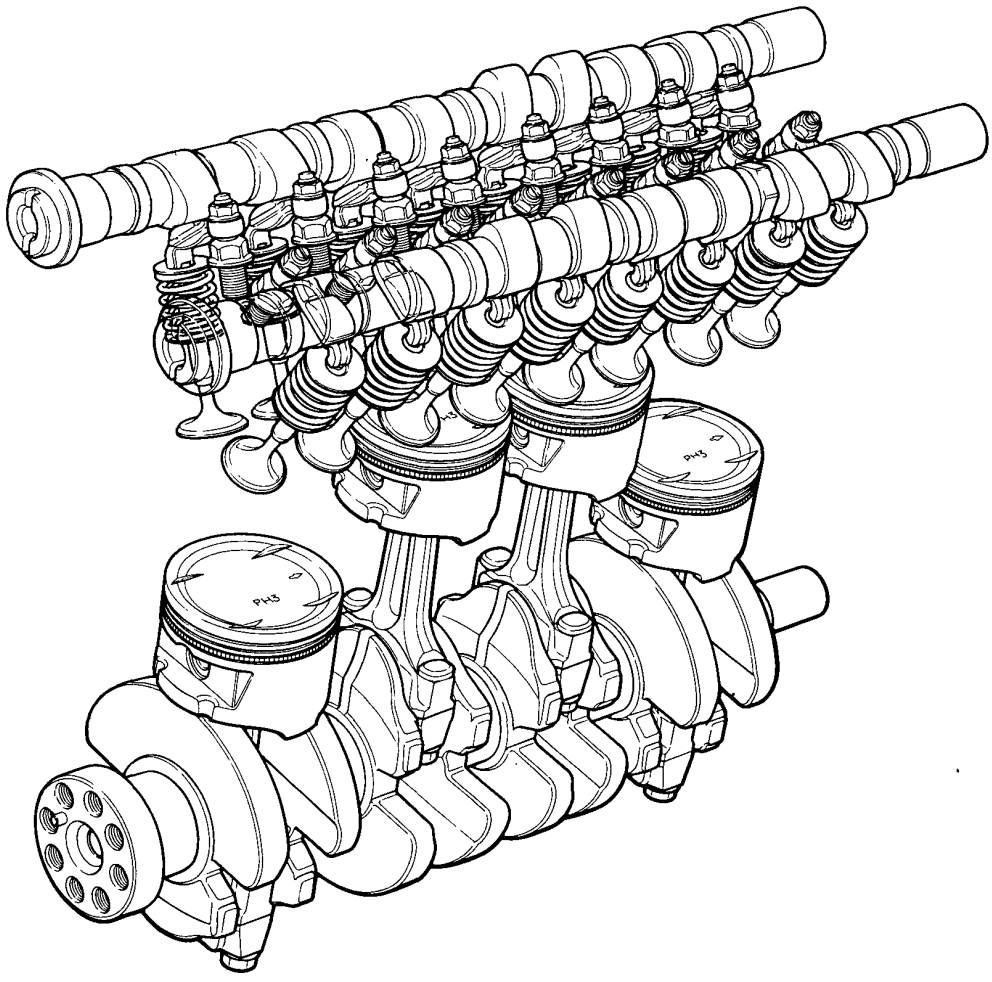


Valve Train

The DOHC mechanism with 4 valves per cylinder (2 intake and 2 exhaust valves) incorporates a new center plug layout. The DOHC mechanism has the following features:

- The large valve opening area contributes to high intake/exhaust efficiency.
- The center plug layout displays minimum flame propagation time.
- The small inertial mass of the valves contribute to accurate operation at high speed.

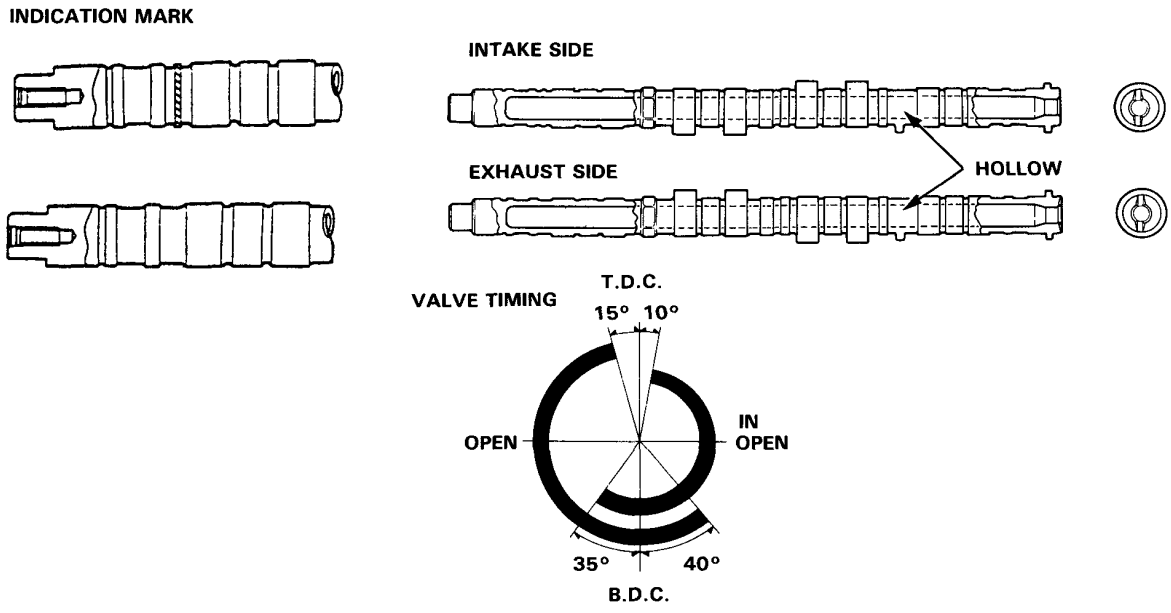
And the high lift valve design of Honda's Inside Pivot Swing-arm System maximize the efficiency.



Description

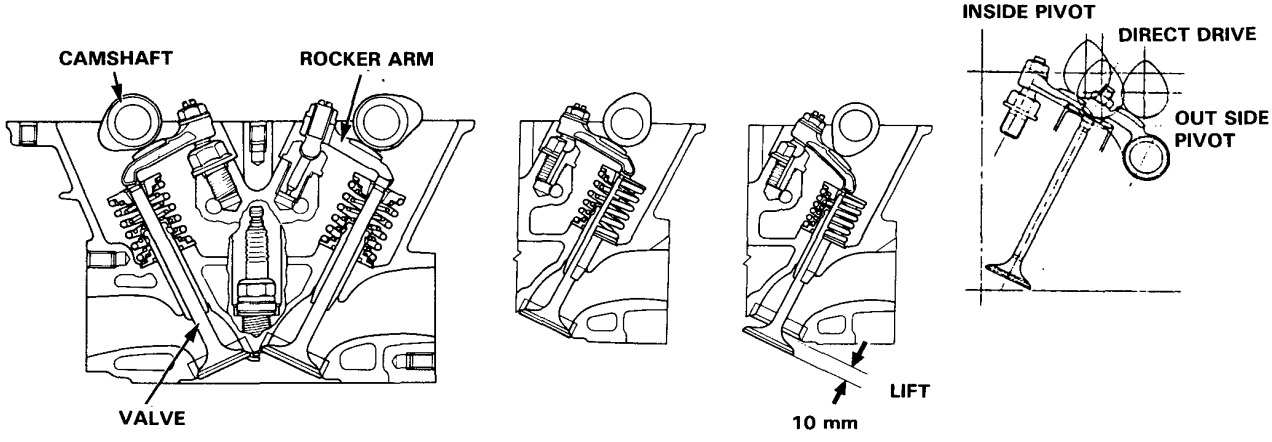
Camshaft

In order to reduce weight, hollow camshafts are newly employed.



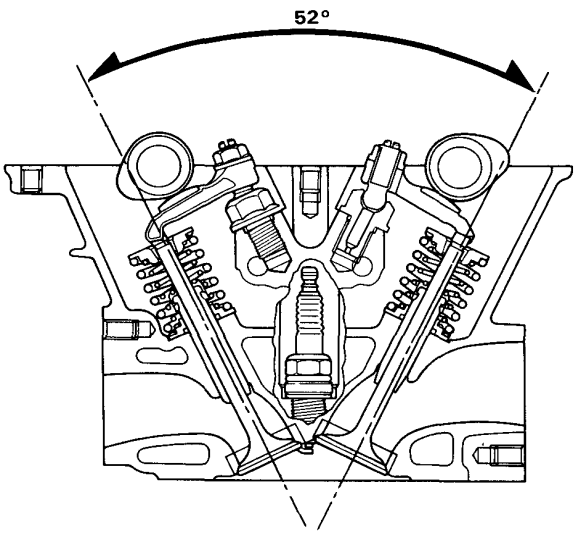
Valve Mechanism

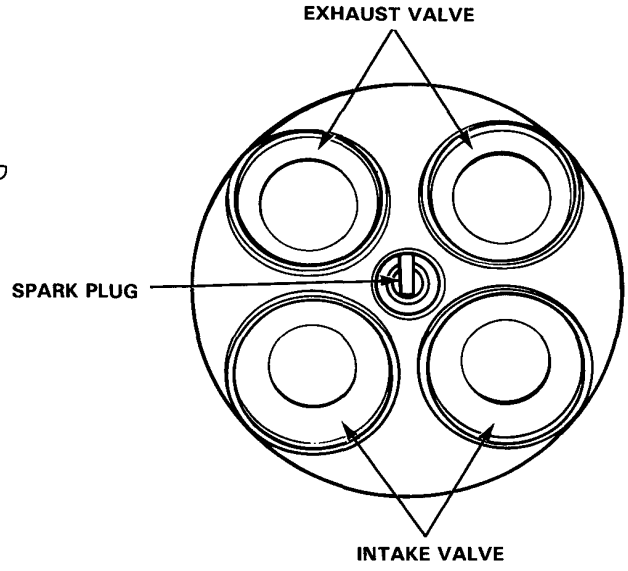
The inside pivot swing arm provides high valve lift without increasing the cam height of the camshaft, does away with the large diameter tappets of the direct drive valve system and reduces the inertial mass to an appropriate level while cylinder head width to a minimum.



Cylinder Head

The cylinder head is an aluminum alloy casting monoblock piece. And the combustion chambers are of the compact roof type with center spark plugs, two exhaust valves and two intake valves installed as shown below.





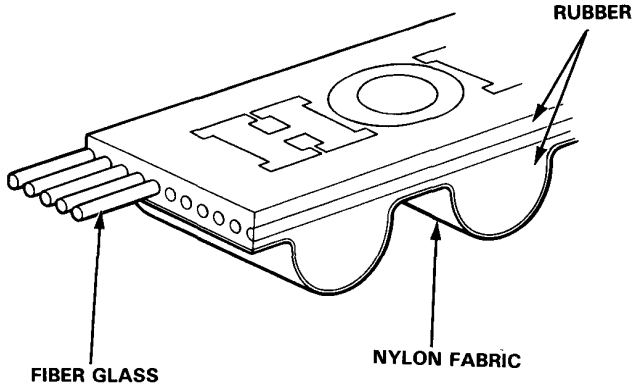
33 mm diameter intake valves and 28 mm diameter exhaust valves contribute maximum intake/exhaust efficiency.

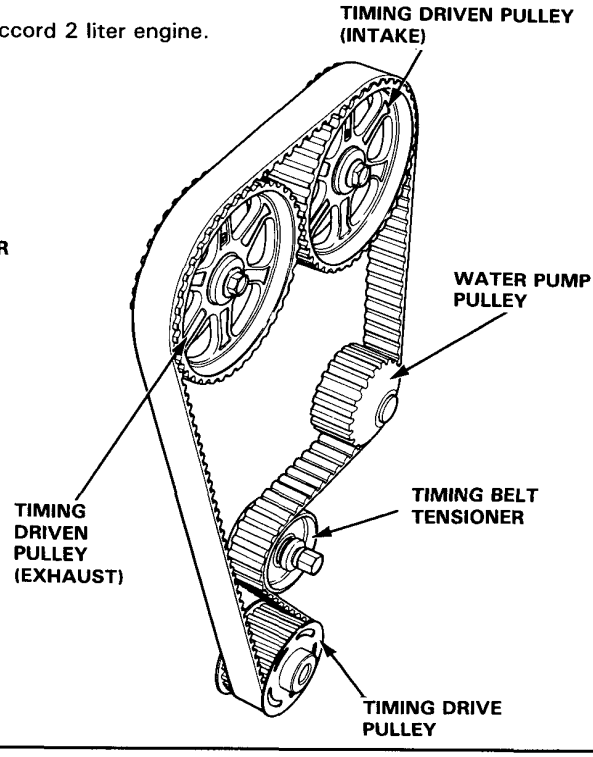
Timing Belt

The structure of the belt is identical to the belt used in the Accord 2 liter engine.

Specifications

Belt Width	24 mm
Pitch	9.525 mm
Number of Teeth	133

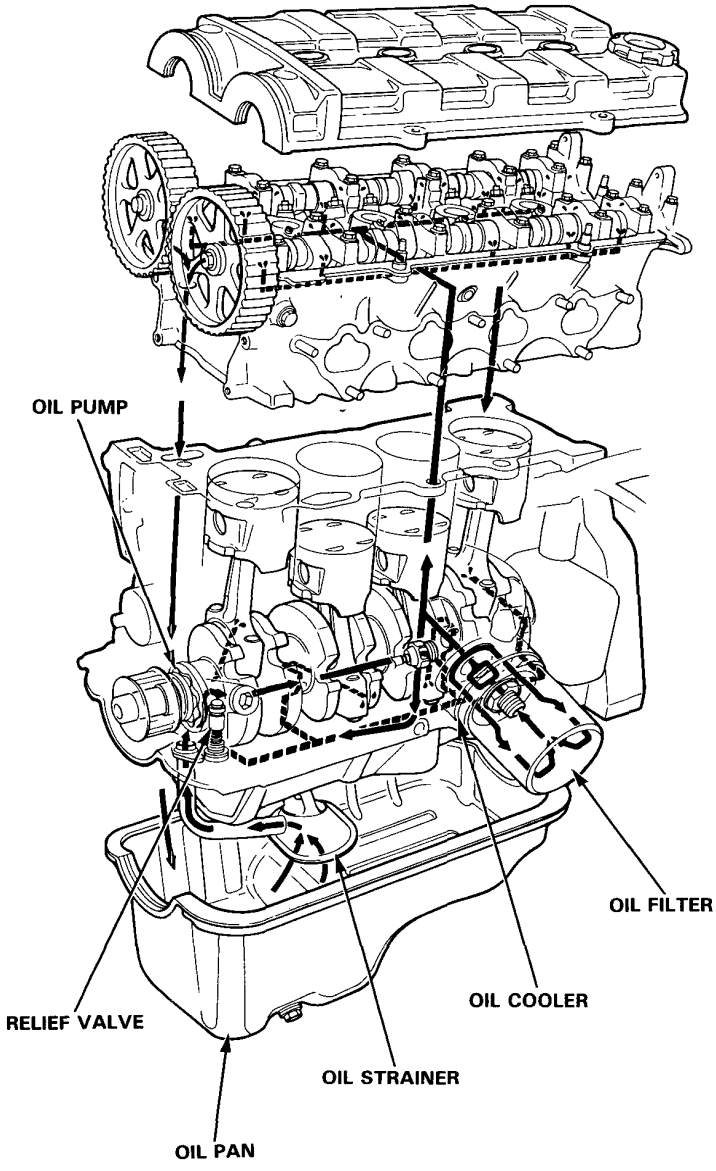


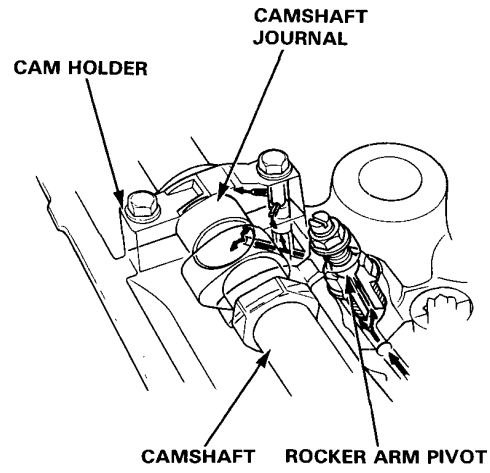


Description

Lubrication System

The lubrication system is a full-filtration, force fed. The trochoid type oil pump is directly driven by the crankshaft and pumps oil from the oil pan up through the strainer to the respective engine part for lubrication. The relief valve is installed in the oil pump body and relieved oil is re-circulated to the intake port of the oil pump directly. An oil cooler is provided at the oil filter base on the cylinder block. Oil flow to the cylinder head is regulated by a control orifice, that lubricates the journals of the two camshafts, rocker arm pivots and cam surfaces.



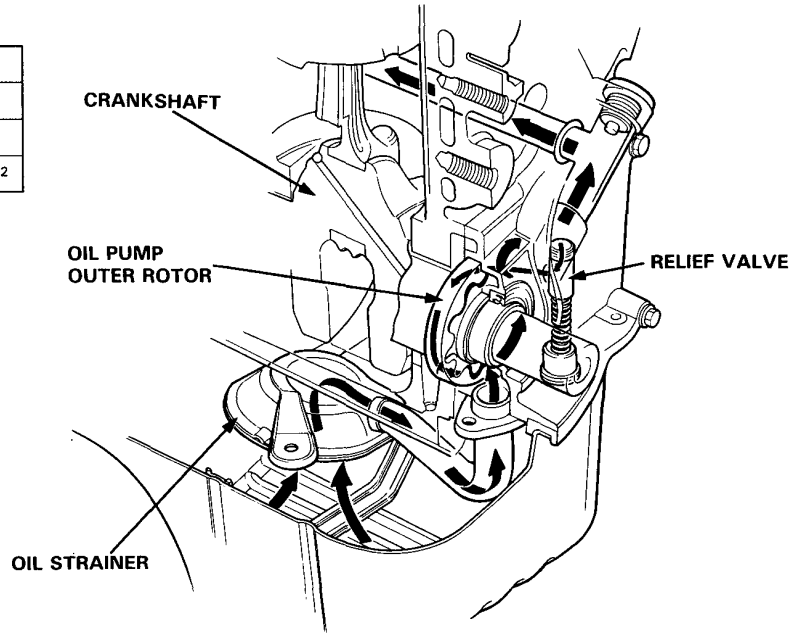


Oil Pump

The oil pump is directly driven by the crankshaft and the oil pump body serves as well as the cylinder block side cover. An internal recirculation pressure relief system helps to prevent aeration of the oil.

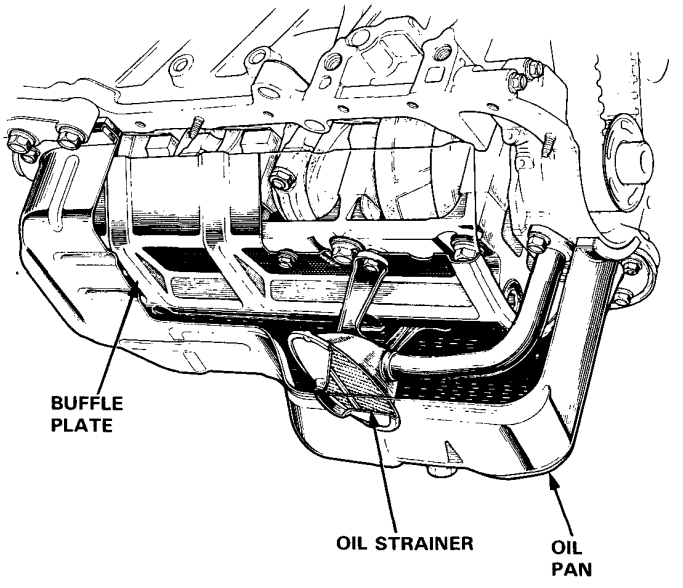
Specifications

No. of Teeth	Inner rotor	9
	Outer rotor	10
Displacement at 5000 min^{-1}		54 ℓ/min
Relief Valve Setting Pressure		5.35 kg/cm^2



Buffle Plate and Bearing Cap

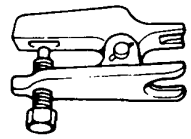
The buffle plate and oil strainer are also secured on the bearing cap by bolts. Bearing caps and cap bridge are now separated pieces. Identification marks of journals and direction marks are indicated on the caps.



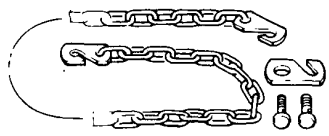
Engine Removal/Installation

Special Tools

Ref. No.	Tool Number	Desctiption	Q'ty	Remarks
①	07941—6920002	Ball Joint Remover	1	
②	07966—6340011	Engine Block Hanger	1	



①



②

WARNING

- Make sure jacks and safety stands are placed properly (pages 1-6 thru 8), and hoist brackets are attached to correct positions on the engine (page 5-16).
- **Apply parking brake and block rear wheels, so car will not roll off stands and fall on you while working under it.**

CAUTION: Use fender covers to avoid damaging painted surfaces.

1. Disconnect the battery negative terminal first, then the positive terminal.
2. Remove the air intake duct and air cleaner case.
3. Unbolt the hood brackets and remove the hood.
   - Disconnect the washer fluid tube.

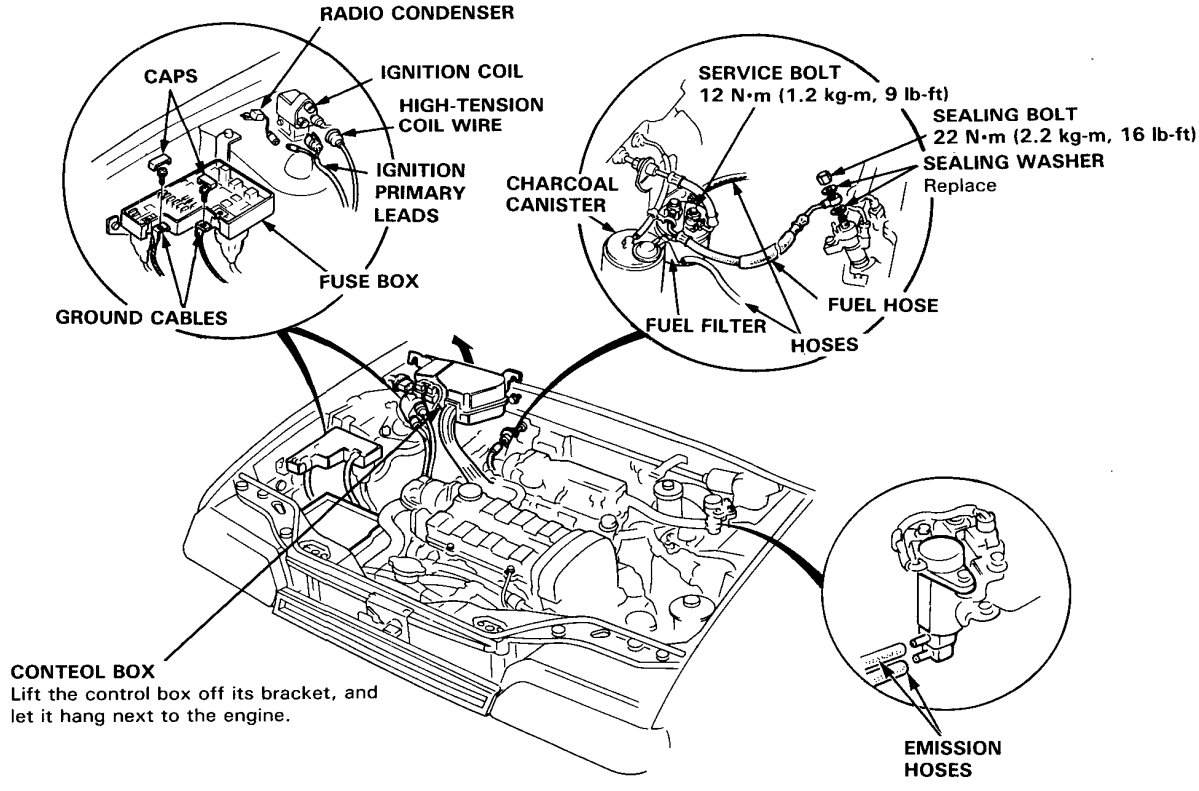
   CAUTION: Use care when storing the hood to avoid damaging the paint.
4. Drain the engine oil. Remove the oil filler cap to speed draining. Reinstall the drain plug with a new washer.

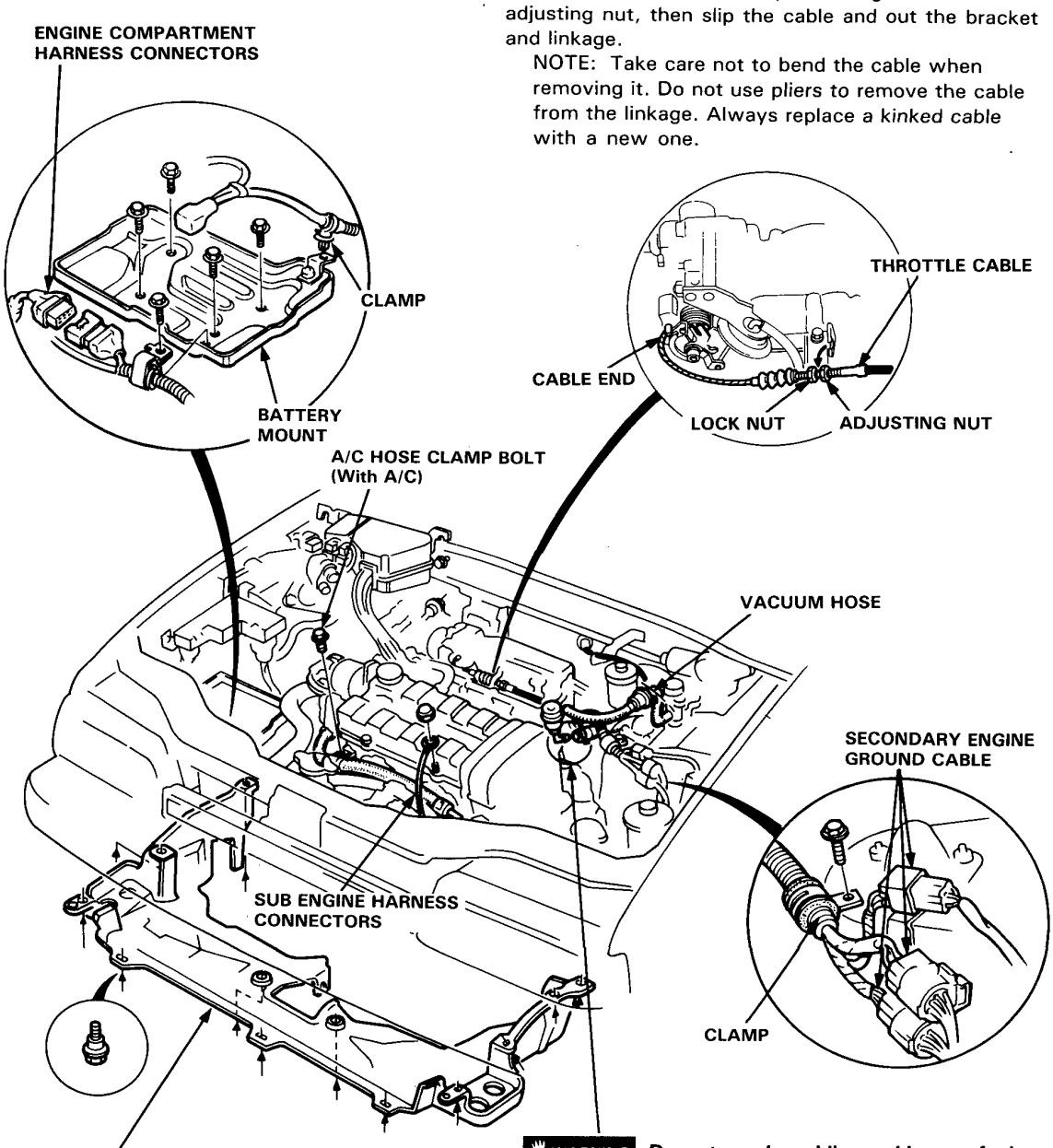
   CAUTION: Do not re-use old washer.
5. Drain the coolant from the radiator into a clean pan so it may be re-used. Remove the radiator cap to speed draining.

   WARNING Use care when removing rediator cap to avoid scalding by hot coolant or steam.
6. Drain transmission oil. Use a 3/8" drive socket wrench to remove the drain plug. Remove the oil filler plug to speed draining. Reinstall the drain plug with a new washer.
7. Remove the air cleaner case mounting bolts (nuts) then remove the air cleaner case.
8. Relieve fuel pressure.

   WARNING Do not smoke while working on fuel system. keep open flame away from work area. Drain fuel only into an approved container.

   CAUTION: Before disconnecting the fuel line, fuel pressure should be relieved by loosening the service bolt on the top of the fuel filter while engine is stopped.





THROTTLE CABLE

Remove the throttle cable by loosening the locknut and adjusting nut, then slip the cable and out the bracket and linkage.

NOTE: Take care not to bend the cable when removing it. Do not use pliers to remove the cable from the linkage. Always replace a kinked cable with a new one.

SPLASH/GUARD

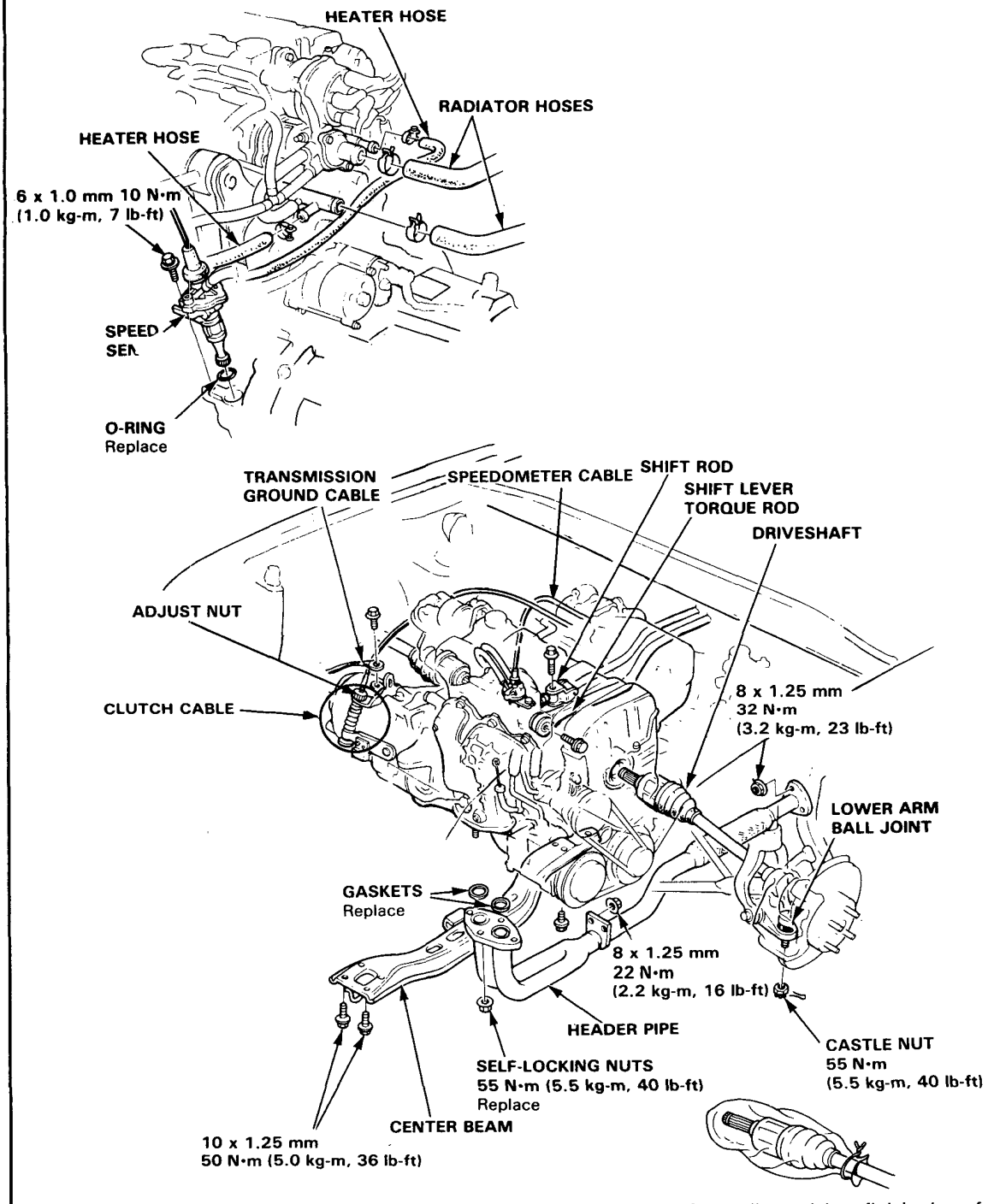
Remove the splash guard from under the engine.

WARNING Do not smoke while working on fuel system. Keep open flame away from work area. Drain fuel only into an approved container.

CAUTION: Before disconnecting the fuel line, fuel pressure should be relieved by loosening the service bolt on the top of the fuel filter while engine is stopped.

(cont'd)

- Remove speed sensor complete with hoses.



NOTE: Coat all precision finished surfaces with clean engine oil or grease. Tie plastic bags over the drive shaft ends.

POWER STEERING PUMP

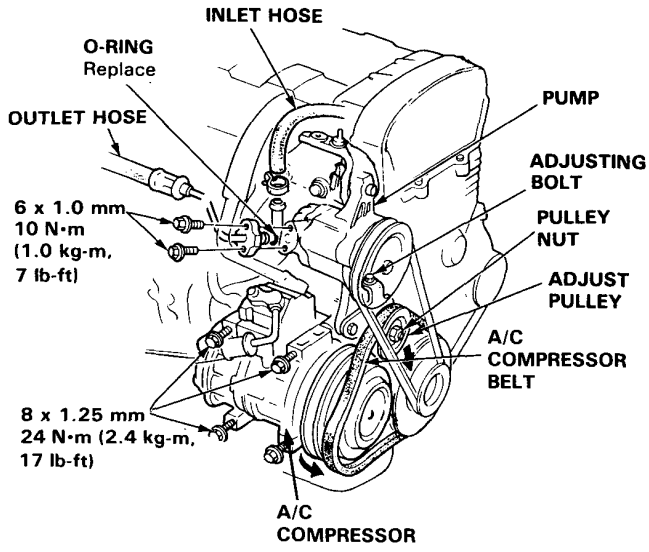
- Disconnect the inlet hose.
- Remove the two bolts then remove the outlet hose.

A/C COMPRESSOR

- Loosen the adjust pulley nut and belt adjusting bolt.

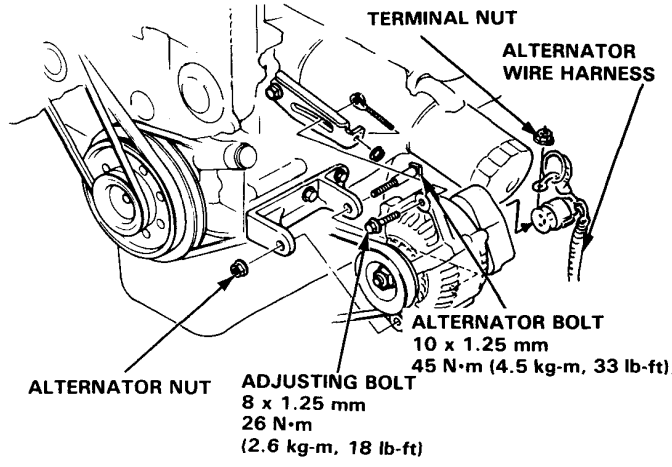
NOTE: The compressor can be moved without discharging the air conditioner system.

- Remove the compressor mounting bolts, then lift the compressor out of the bracket with hoses attached, and wire it up to the front bulkhead.



ALTERNATOR

- Disconnect the alternator wire harness connectors.
- Remove the belt adjusting bolt and remove the belt.
- Remove the alternator mount bolt and remove the alternator.



(cont'd)

9. Attach a chain hoist to the engine block and raise the hoist just enough to remove slack from chain.

10. Check that the engine/transaxle is completely free of vacuum, fuel, and coolant hoses, and electrical wires.

11. Remove the bolt from the rear torque rod at the engine, then loosen the bolt in the frame mount and swing the rod up out of the way.

12. Raise the engine just enough to let the engine mounting brackets clear the mounting studs, then lower the engine onto the mounts. Shorten the length of the chain from 13 to 7 links on the timing belt side, then raise the engine all the way and remove it from the car.

13. Install the engine in the reverse order of removal. After the engine is in place:

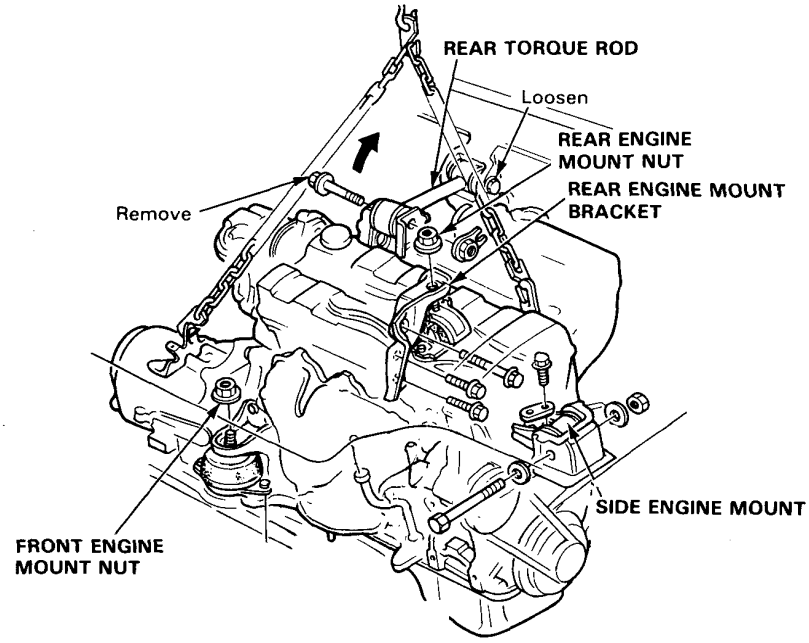
- Torque engine mount bolts in sequence shown on next page.

CAUTION: Failure to tighten the bolts in the proper sequence can cause excessive noise and vibration, and reduce bushing life; check that the bushings are not twisted or offset.

- Check that the spring clip on the end of each driveshaft clicks into the differential.

CAUTION: Use new spring clips on installation.

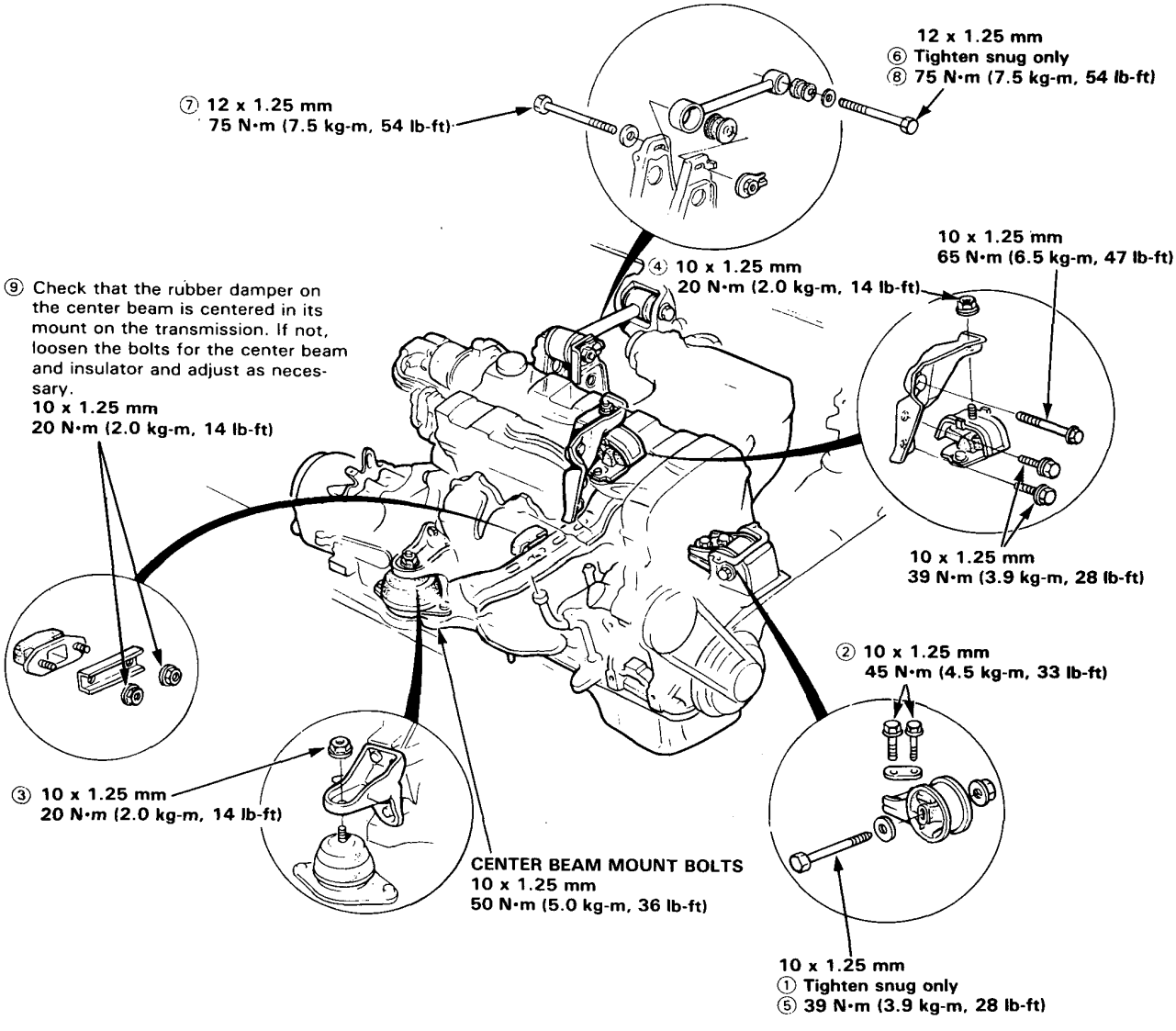
- Bleed air from the cooling system at the bleed bolt with the heater valve open.



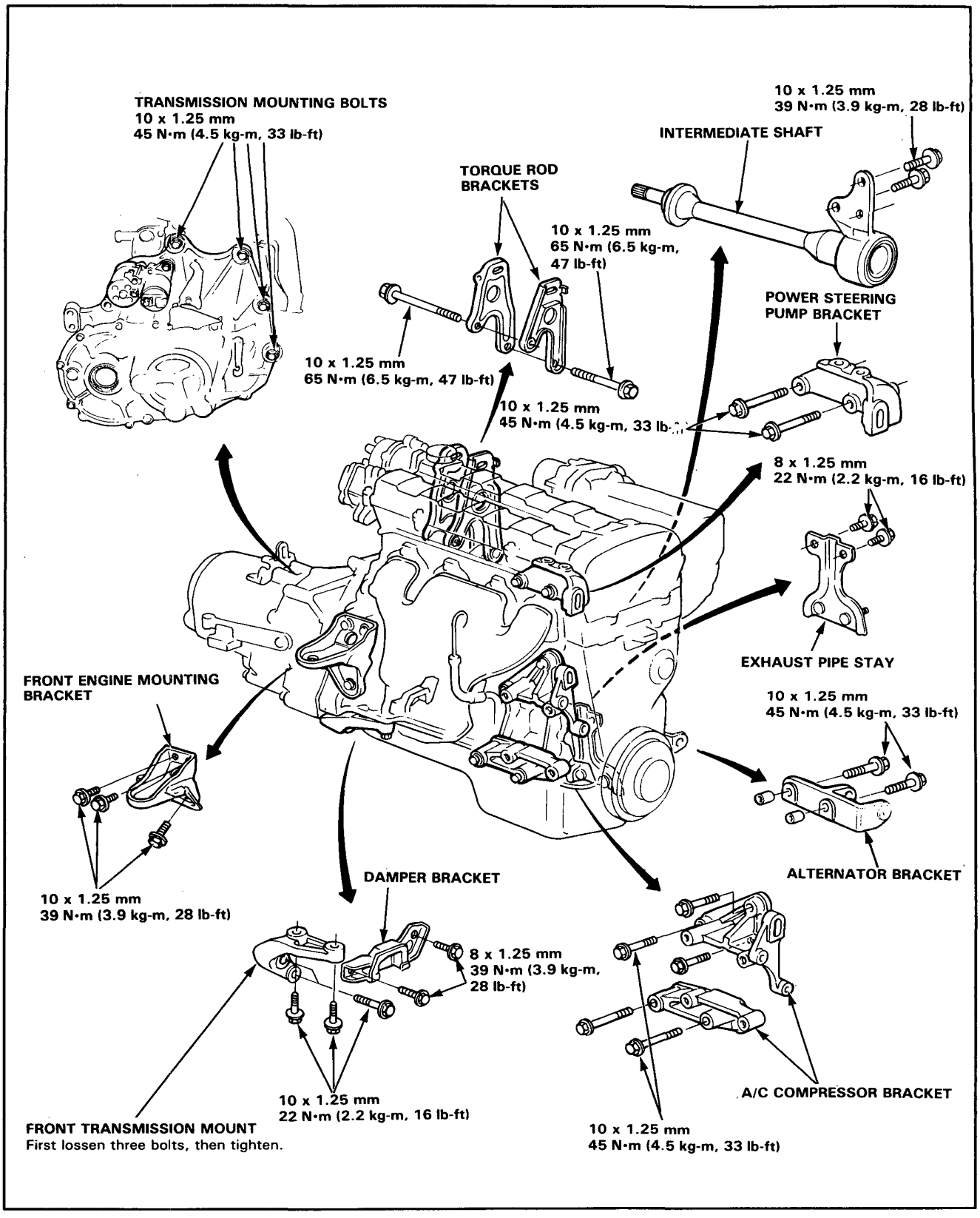
- Adjust the throttle cable tension.
- Adjust the alternator belt tension.
- Check the clutch pedal free play.
- Check that the transmission shifts into gear smoothly.
- Connect the air conditioning hoses, wiring and V-belt.
- Clean battery posts and cable terminals with sandpaper, assemble, then apply grease to prevent corrosion.

NOTE:

- For proper suppression of noise and vibration, and maximum bushing life, tighten the bolts in the sequence shown with the bushings centered in their mounts.
- From step 5 on, the car must be sitting level; make sure that the engine hoist is not holding up the engine and car.



(cont'd)

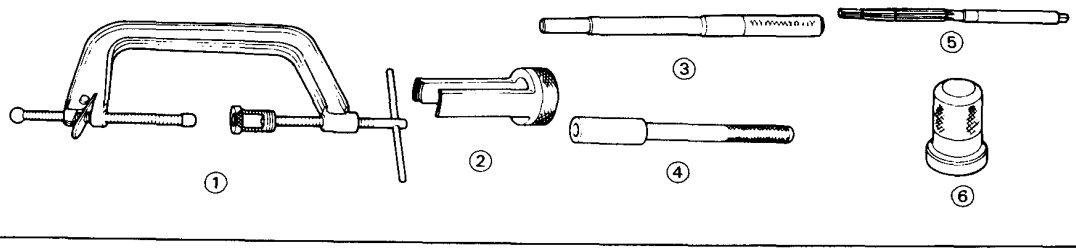

TRANSMISSION MOUNTING BOLTS
10 x 1.25 mm
45 N·m (4.5 kg-m, 33 lb-ft)
TORQUE ROD BRACKETS
10 x 1.25 mm
65 N·m (6.5 kg-m, 47 lb-ft)
10 x 1.25 mm
65 N·m (6.5 kg-m, 47 lb-ft)
10 x 1.25 mm
45 N·m (4.5 kg-m, 33 lb-ft)
10 x 1.25 mm
39 N·m (3.9 kg-m, 28 lb-ft)
INTERMEDIATE SHAFT
POWER STEERING PUMP BRACKET
8 x 1.25 mm
22 N·m (2.2 kg-m, 16 lb-ft)
EXHAUST PIPE STAY
FRONT ENGINE MOUNTING BRACKET
10 x 1.25 mm
45 N·m (4.5 kg-m, 33 lb-ft)
ALTERNATOR BRACKET
10 x 1.25 mm
39 N·m (3.9 kg-m, 28 lb-ft)
DAMPER BRACKET
8 x 1.25 mm
39 N·m (3.9 kg-m, 28 lb-ft)
10 x 1.25 mm
22 N·m (2.2 kg-m, 16 lb-ft)
A/C COMPRESSOR BRACKET
10 x 1.25 mm
45 N·m (4.5 kg-m, 33 lb-ft)
FRONT TRANSMISSION MOUNT
First lossen three bolts, then tighten.

Cylinder Head/Valve Train

B20A2 Engine

Special Tools

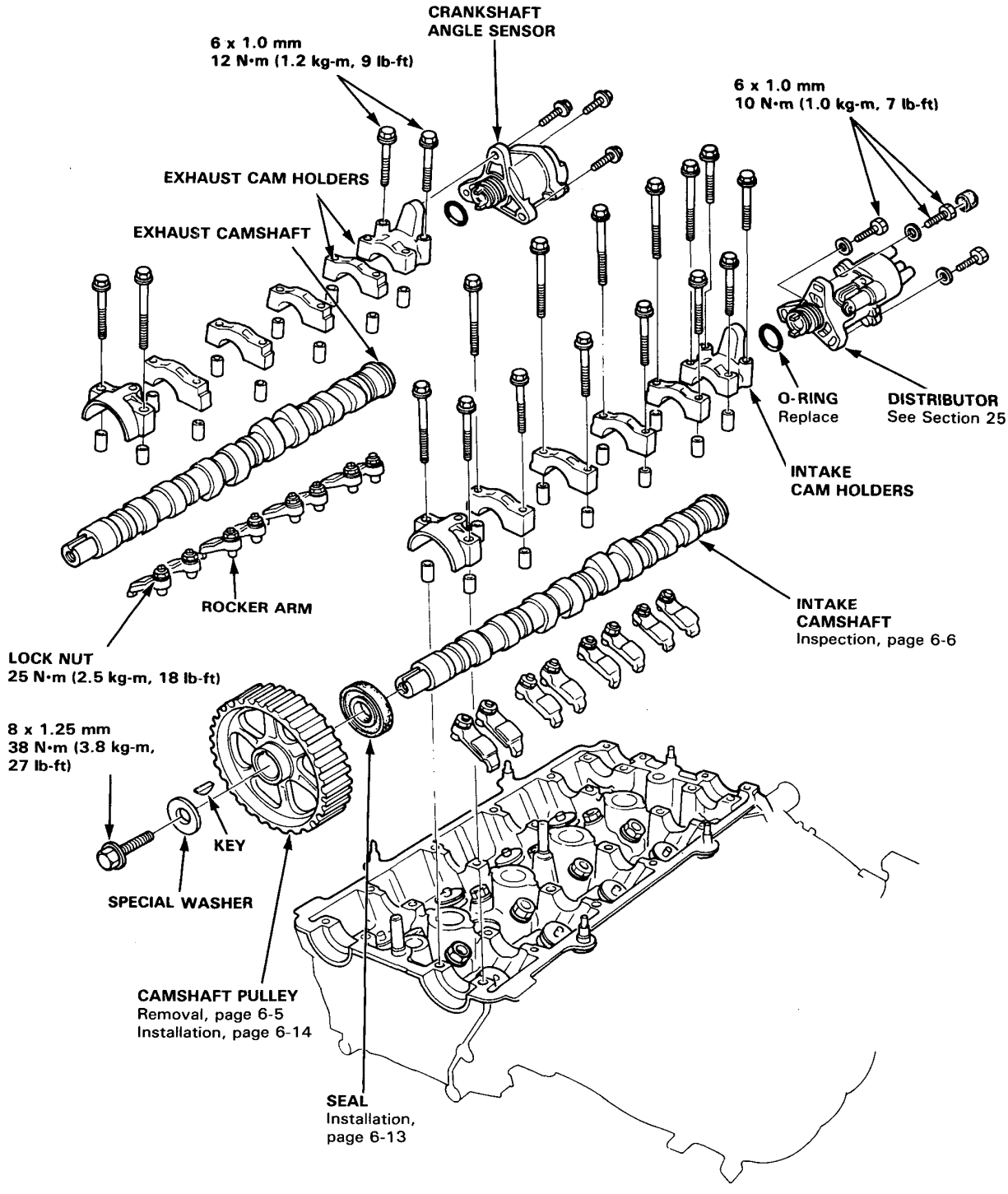
Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07757—0010000	Valve spring Compressor	1	
②	07757—PJ10100	Valve spring Compressor Attachment	1	Use changed to 07757—0010000 attachment
③	07942—6570100	Valve Guide Driver, 6.6 mm	1	07942—6110000 may also be used.
④	07743—0020000	Adj. Valve Guide Driver	1	
⑤	07984—6570100	Valve Guide Reamer, 6.6 mm	1	07984—6110000 may also be used.
⑥	07947—SB00100	Camshaft Seal Driver	1	

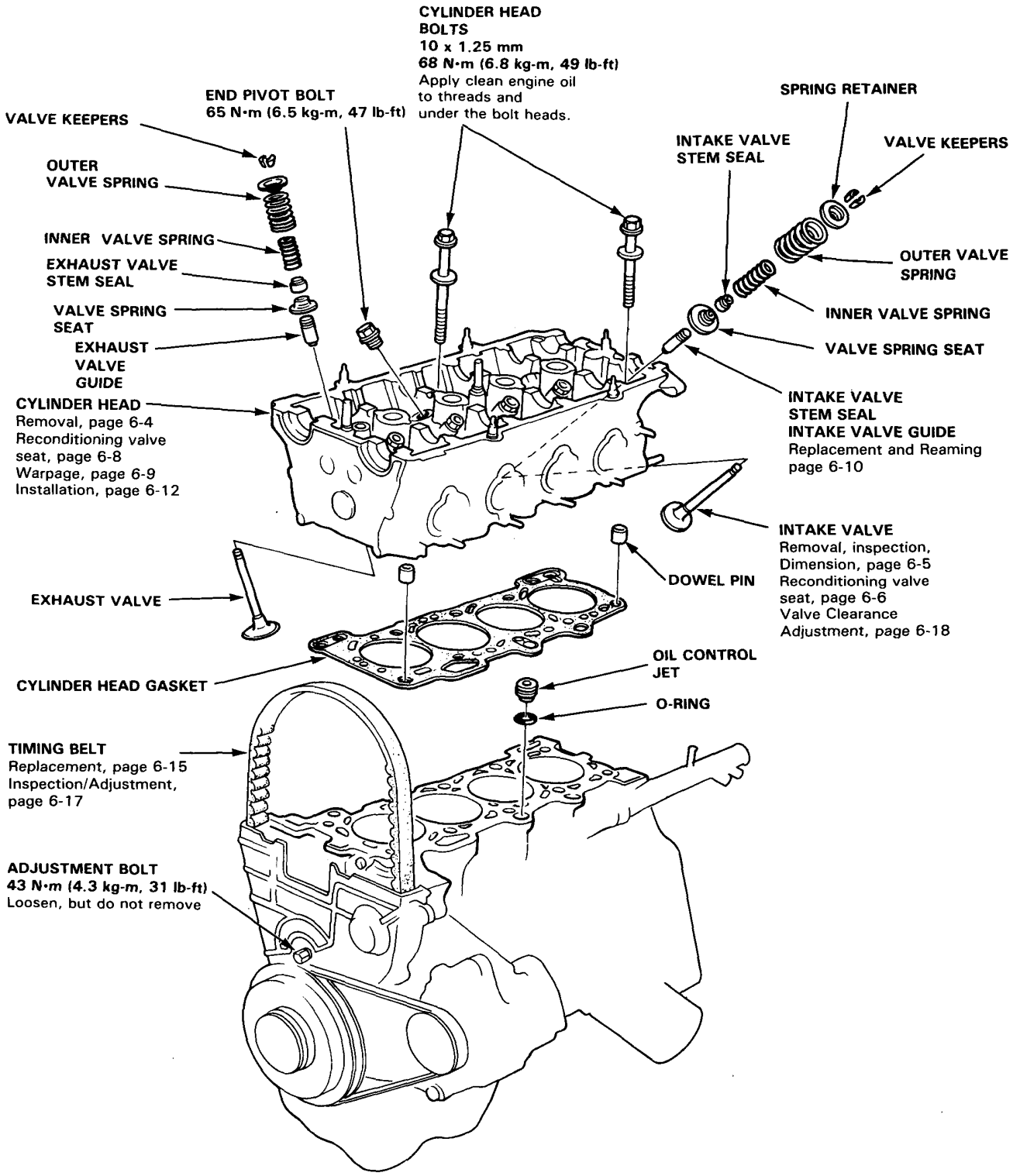


Illustrated Index

CAUTION: To avoid damaging the cylinder head, wait until the coolant temperature drops below 38°C (100°F) before removing it.

NOTE: Use new O-rings and gaskets whenever reassembling.




CYLINDER HEAD BOLTS
10 x 1.25 mm
68 N·m (6.8 kg-m, 49 lb-ft)
Apply clean engine oil to threads and under the bolt heads.
END PIVOT BOLT
65 N·m (6.5 kg-m, 47 lb-ft)
VALVE KEEPERS
OUTER VALVE SPRING
INNER VALVE SPRING
EXHAUST VALVE STEM SEAL
VALVE SPRING SEAT
EXHAUST VALVE GUIDE
CYLINDER HEAD
Removal, page 6-4
Reconditioning valve seat, page 6-8
Warpage, page 6-9
Installation, page 6-12
EXHAUST VALVE
CYLINDER HEAD GASKET
TIMING BELT
Replacement, page 6-15
Inspection/Adjustment, page 6-17
ADJUSTMENT BOLT
43 N·m (4.3 kg-m, 31 lb-ft)
Loosen, but do not remove
SPRING RETAINER
INTAKE VALVE STEM SEAL
VALVE KEEPERS
OUTER VALVE SPRING
INNER VALVE SPRING
VALVE SPRING SEAT
INTAKE VALVE STEM SEAL
INTAKE VALVE GUIDE
Replacement and Reaming page 6-10
INTAKE VALVE
Removal, inspection, Dimension, page 6-5
Reconditioning valve seat, page 6-6
Valve Clearance Adjustment, page 6-18
DOWEL PIN
OIL CONTROL JET
O-RING

Cylinder Head

Removal (engine removal not required)

CAUTION: Do not remove the cylinder head until the coolant temperature drops below 38°C (100°F)

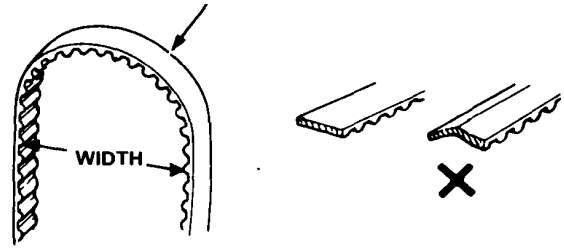
NOTE:
- Inspect the timing belt before removing the cylinder head.
- Before removal of the cylinder head, turn the flywheel so that the No. 1 cylinder is at top-dead-center (page 6-16).
- Mark all emissions hoses before disconnecting them.

1. Disconnect the negative terminal from the battery.
2. Drain the cooling system.
3. Remove the brake booster vacuum tube from the tubing manifold.
4. Remove the engine secondary ground cable from the valve cover (page 5-3).
5. Disconnect the radio noise condenser connector, coil wire and ignition primary connector (page 5-2).
6. Remove the air cleaner cover.
7. Relieve fuel pressure.

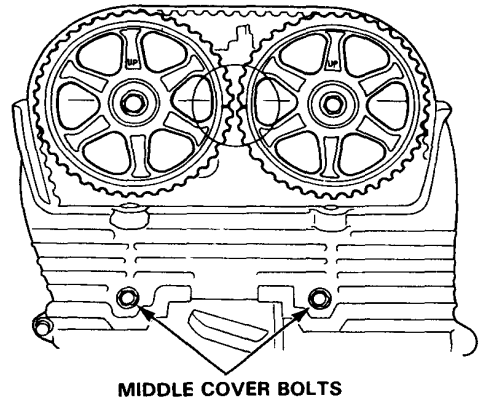
WARNING Do not smoke while working on fuel system, keep open flame or spark away from work area. Drain fuel only into an approved container.

8. Disconnect the fuel hose and fuel return hose (page 5-2).
9. Disconnect the throttle cable at the throttle body (page 5-3).
10. Disconnect the charcoal canister tube at the throttle valve.
11. Disconnect the engine sub harness connectors and couplers from the cylinder head and intake manifold.
    - Four injector couplers
    - TA sensor connector
    - Temperature unit connector
    - Ground terminal near by the fuel pipe
    - Throttle sensor connector
    - TW sensor connector
    - Crankshaft angle sensor coupler
    - Four wire harness clamps
12. Disconnect the upper radiator hose, heater hose, and bypass inlet hose from the cylinder head (page 5-4).
13. Remove the hose between the thermostat housing and the intake manifold.
14. Disconnect the connecting pipe-to-valve body hose and bypass outlet hose.
15. Remove the power steering oil pump but do not disconnect the pump hoses (page 5-5).
16. Remove the hose clamp bolt on the cylinder head.
17. Remove the power steering pump bracket from the cylinder head.
18. On cars equipped with air conditioning, disconnect the idle control solenoid hoses.
19. Remove the exhaust header pipe nuts.
20. Remove the header pipe bracket and pull the pipe clear of the exhaust manifold.
21. Remove the air cleaner base mount bolts.
22. Disconnect the hose from the intake manifold to the breather chamber.
23. Remove the valve cover and the timing belt upper cover.
24. Loosen the tensioner adjustment bolt, then remove the timing belt.

CAUTION: Do not crimp or bend timing belt more than 90° or less than 25 mm (1 in.) in diameter.



25. Remove the timing belt middle cover bolts, which are tighten to the cylinder head.



MIDDLE COVER BOLTS

26. Remove the camshaft holder bolts, then remove the camshaft holders, camshafts and rocker arms.
27. Remove the cylinder head bolts, then remove the cylinder head.

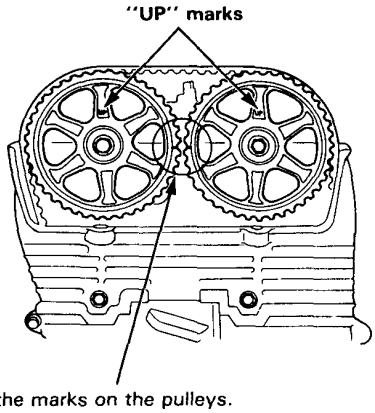
CAUTION: To prevent warpage, unscrew bolts 1/3 turn each time and repeat sequence until loose.

28. Remove the exhaust manifold from the cylinder head.
29. Remove the intake manifold from the cylinder head.

Camshaft Pulleys

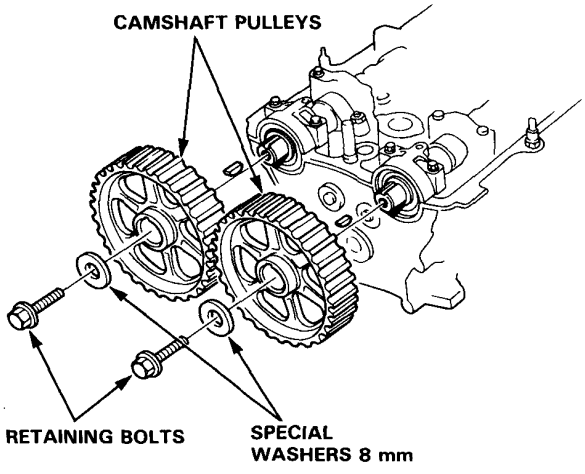
Removal

1. To ease reassembly, turn the pulley until the "UP" marks faces up, and the front timing marks are aligned with the both mark on the pulleys.



Align the marks on the pulleys.

2. Remove the pulley retaining bolts and washers, then remove the pulleys.



NOTE: Before removing camshafts assembly, check camshaft end play.

Camshafts

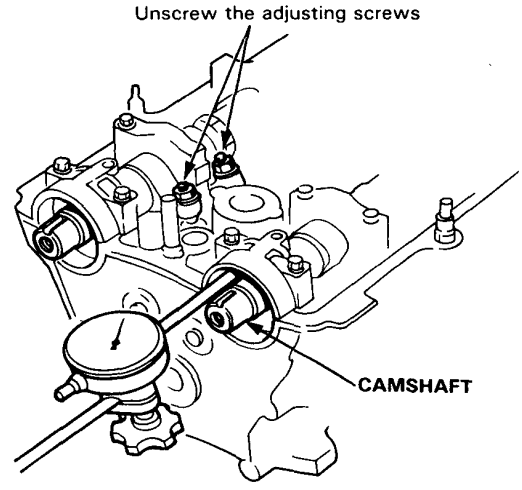
Inspection

NOTE: Do not rotate camshaft during inspection; loosen the adjusting screws before starting.

1. Seat camshafts by prying it toward distributor end of head with screwdriver.

2. Zero dial indicator against end of distributor drive, then pry camshafts back and forth, and read end play.

Camshaft End Play:
Standard (New): 0.05—0.15 mm (0.002—0.006 in.)
Service Limit: 0.5 mm (0.02 in.)



3. Remove the bearing cap bolts from the cylinder head.

NOTE: Unscrew the rocker arm bolts, two turns at a time, in a criss-cross pattern, to prevent damaging valves or rocker arms.

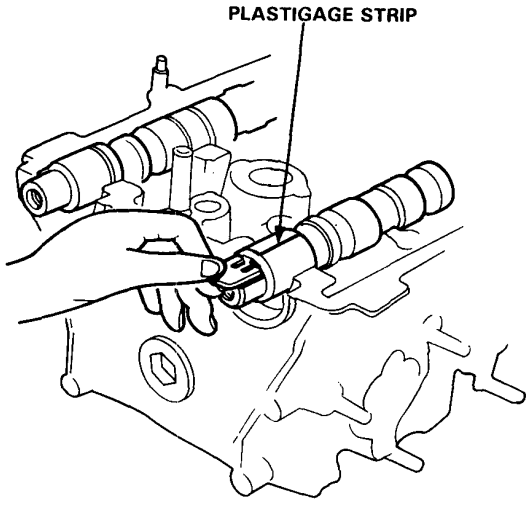
- Lift camshaft out of cylinder head, wipe clean, then inspect lift ramps. Replace camshaft if lobes are pitted, scored, or excessively worn.
- Clean the camshaft bearing surfaces in the cylinder head, then set camshaft back in place.
- Insert plastigage strip across each journal.
- Install the bearing caps and torque bolts to valves and in sequence shown on page 6-13, then remove the bolts and the bearing caps.

(cont'd)

Inspection (cont'd)

4. Measure widest portion of plastigage on each journal.

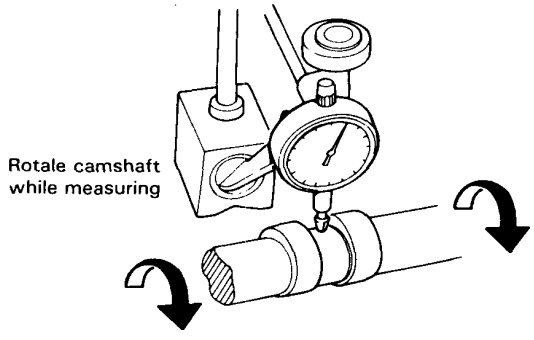
Camshaft Bearing Radial Clearance:
Standard (New): 0.050—0.089 mm (0.002—0.004 in.)
Service Limit: 0.15 mm (0.006 in.)



5. If camshaft bearing radial clearance is out of tolerance:

- And camshaft has already been replaced, you must replace the cylinder head.
- If camshaft has not been replaced, first check total runout with the camshfat supported on V-blocks.

Camshaft Total Runout:
Standard (New): 0.03 mm (0.001 in.)
Service Limit: 0.06 mm (0.002 in.)

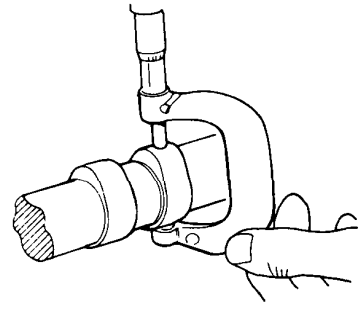


— If the total runout of the camshaft is within tolerance, replace the cylinder head.

— If the total runout is out of tolerance replace the camshaft and recheck. If the bearing clearance is still out of tolerance, replace the cylinder head.

6. Measure camshaft height.

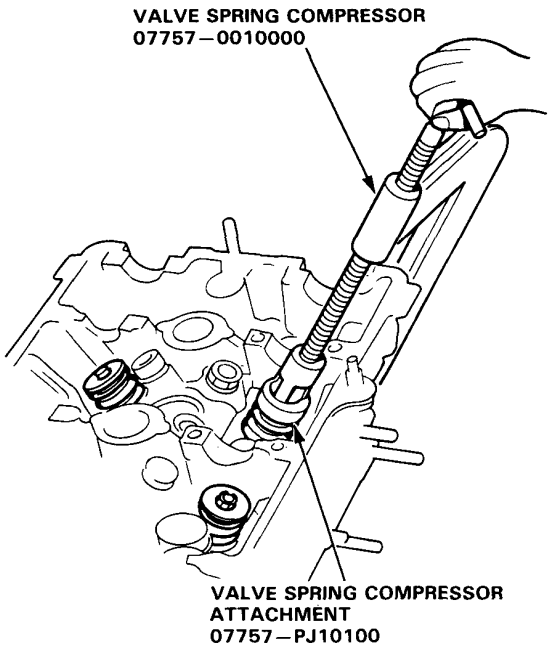
Intake Standard: 33.716 mm (1.3274 in.)
Exhaust Standard: 33.781 mm (1.3300 in.)

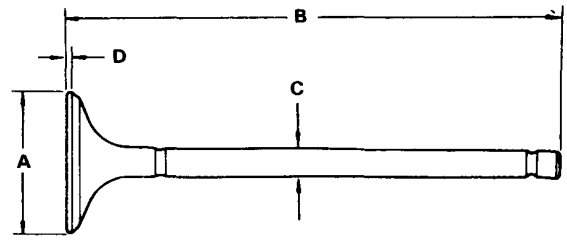


Replacement

NOTE: Identify valves and valve springs as they are removed so that each item can be reinstalled in its original position.

1. Tap each valve stem with a plastic mallet to loosen valve keepers before installing spring compressor.
2. Install spring compressor. Compress spring and remove valve keeper.





Intake Valve Dimensions

A Standard (New):	32.9—33.1 mm (1.295—1.303 in.)
B Standard (New):	140.3—140.6 mm (5.524—5.535 in.)
C Standard (New):	6.58—6.59 mm (0.2591—0.2594 in.)
C Service Limit:	6.55 mm (0.258 in.)
D Standard (New):	1.35—1.65 mm (0.053—0.065 in.)
D Service Limit:	1.15 mm (0.045 in.)

Exhaust Valve Dimensions

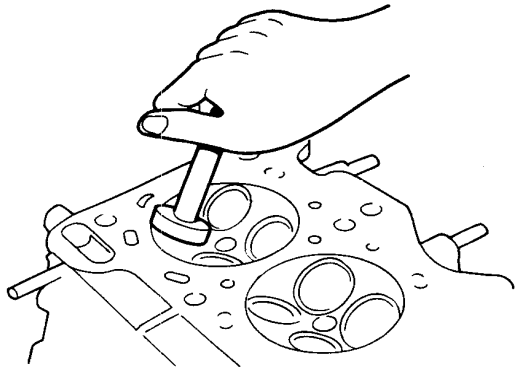
A Standard (New):	27.9—28.1 mm (1.098—1.106 in.)
B Standard (New):	106.5—106.7 mm (4.193—4.201 in.)
C Standard (New):	6.55—6.56 mm (0.2579—0.2583 in.)
C Service Limit:	6.52 mm (0.256 in.)
D Standard (New):	2.35—2.65 mm (0.093—0.104 in.)
D Service Limit:	2.15 mm (0.085 in.)

Valve Seats

Reconditioning

1. Renew the valve seats in the cylinder head using a valve seat cutter.

   NOTE If guides are worn (page 6-9), replace them (page 6-10) before cutting valve seats.



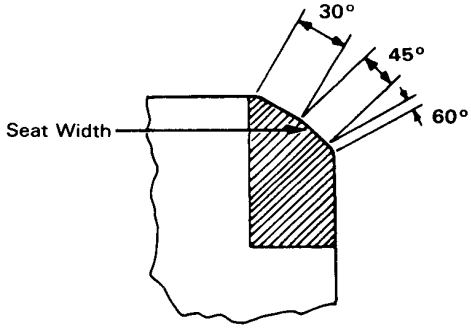
CUTTER	INTAKE	EXHAUST
30°	07780–0012900	07780–0012300
60°	07780–0014000	07780–0014100
45°	07780–0010800	07780–0010400
HOLDER	07781–0010201 and 07781–0010301	

2. Bevel the upper edge of seat with the 30° cutter until required seat width is obtained.

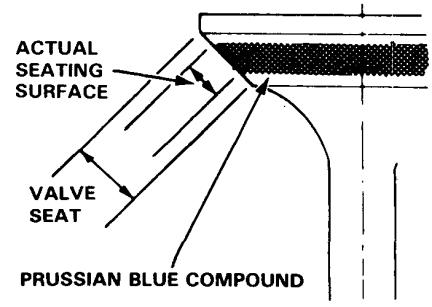
3. Bevel the inner edge of seat slightly with the 60° cutter.

4. Carefully center 45° cutter.
   Remove as little material as possible. (See measurement after reconditioning shown below.)

   Valve Seat Width:
   Standard: 1.25–1.55 mm (0.049–0.061 in.)
   Service Limit: 2.0 mm (0.08 in.)



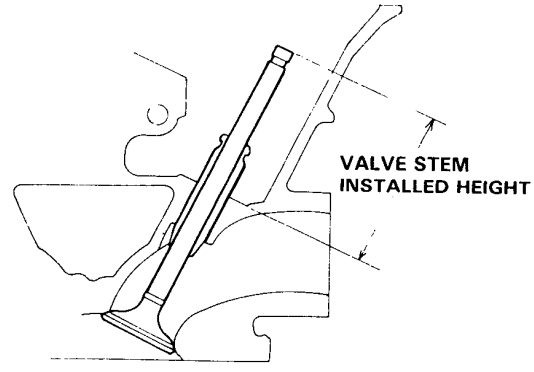
5. After resurfacing seat, inspect for even valve seating: Apply Prussian blue compound to valve face, and insert valve in original location in head, then lift it and snap it closed against seat several times.



6. The actual valve seating surface, as shown by the blue compound, should be centered on the seat.
   - If it is too high (closer to the valve stem), you must make a second cut with the 60° cutter to move it down, then one more cut with the 45° cutter to restore seat width.
   - If it is too low (closer to valve edge), you must make a second cut with the 30° cutter to move it up, then one more cut with the 45° cutter to restore seat width.

   NOTE: The final cut should always be made with the 45° cutter.

7. Insert intake and exhaust valves in head and measure valve stem installed height.
   Intake and Exhaust Valve Stem Installed Height:
   Standard (New): 42.75 mm (1.683 in.)
   Service Limit: 43.54 mm (1.714 in.)



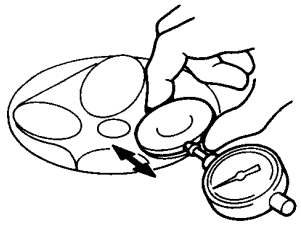
8. If valve stem installed height is over service limit, replace valve and recheck. If still over service limit, replace cylinder head; the valve seat in the head is too deep.

Valve Guide-to-Valve Stem Clearance

1. Measure the guide-to-stem clearance with a dial indicator, while rocking the stem in the direction of normal thrust (Wobble Method).

Intake Valve Stem-to-Guide Clearance
Standard (New): 0.04—0.10 mm (0.0016—0.004 in.)
Service Limit: 0.16 mm (0.006 in.)
Exhaust Valve Stem-to-Guide Clearance
Standard (New): 0.10—0.16 mm (0.004—0.006 in.)
Service Limit: 0.22 mm (0.009 in.)

Valve extended 10 mm out from seat.



- If measurement exceeds the service limit, recheck using new valve.
- If measurement is now within service limit, reassemble using new valve.
- If measurement still exceeds limit, recheck using alternate method below, then replace valve and guide, if necessary.

NOTE: An alternate method of checking guide to stem clearance is to subtract the O.D. of the valve stem, measured with a micrometer, from the I.D. of the valve guide, measured with an inside micrometer or ball gauge.
Take the measurements in three places along the valve stem and three places inside the valve guide. The difference between the largest guide measurement and the smallest stem measurement should not exceed the service limit.

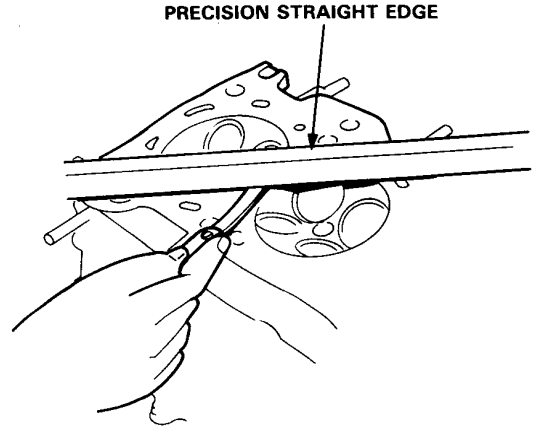
Intake Valve Stem-to-Guide Clearance
Standard (New): 0.02—0.05 mm (0.001—0.002 in.)
Service Limit: 0.08 mm (0.003 in.)
Exhaust Valve Stem-to-Guide Clearance
Standard (New): 0.05—0.08 mm (0.002—0.003 in.)
Service Limit: 0.11 mm (0.004 in.)

Warpage

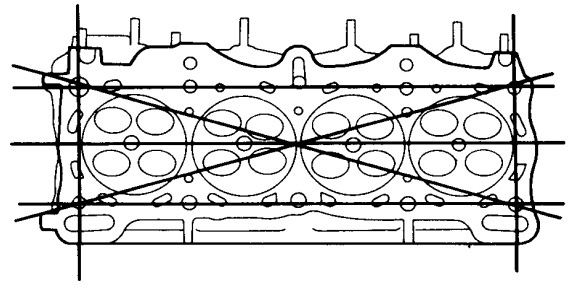
NOTE: If camshaft bearing clearances are not within specification, the head cannot be resurfaced (page 6-6).

If camshaft bearing radial clearances are within specifications, check head for warpage.

- If warpage is less than 0.05 mm (0.002 in.) cylinder head resurfacing is not required.
- If warpage is between 0.05 mm (0.002 in.) and 0.2 mm (0.008 in.), resurface cylinder head.
- Maximum resurface limit is 0.2 mm (0.008 in.) based on height of 131.8 mm (5.19 in.).



Measure along edges, and 3 ways across center.



Cylinder Head Height:
New: 132.0 mm (5.20 in.)
Service Limit: 131.8 mm (5.19 in.)

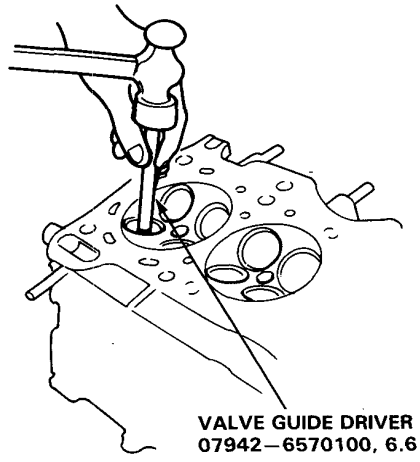
Valve Guides

Replacement

NOTE:
- For best results, heat cylinder head to 150°C (300°F) before removing or installing guides.
- It may be necessary to use an air hammer to remove some valve guides.

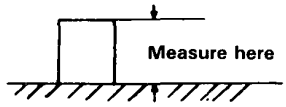
CAUTION: To avoid burns, use heavy gloves when handling heated cylinder head.

1. Drive the valve guide out from the bottom of the cylinder head.

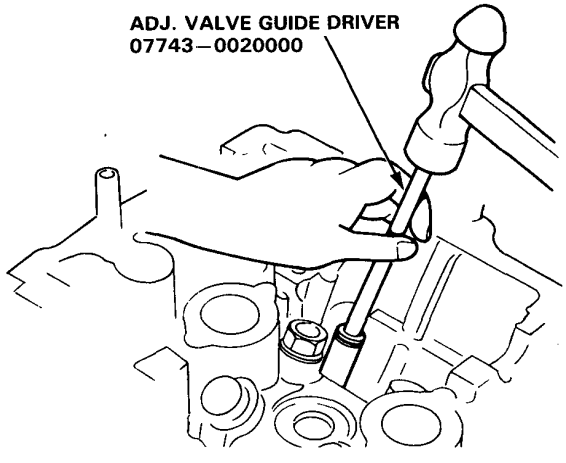


2. Drive in a new valve guide to the specified depth.

Intake: 16.0 mm (0.63 in.)
Exhaust: 16.0 mm (0.63 in.)



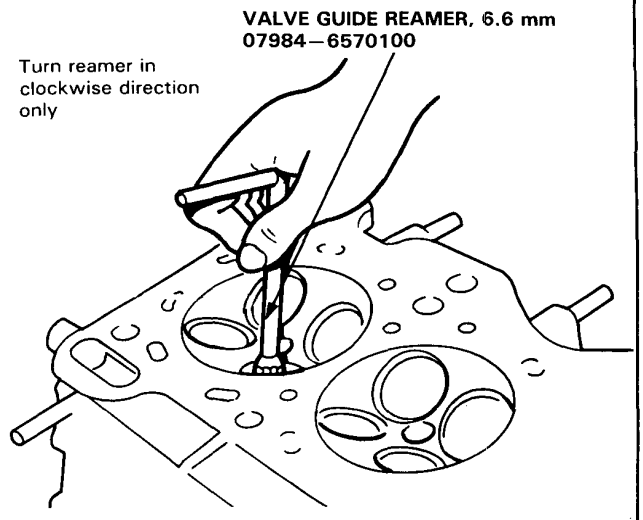
NOTE: If using adjustable valve guide driver 07743—0020000, adjust the collar depth to correspond with the measurements given above.



Reaming

NOTE: For new valve guides only.

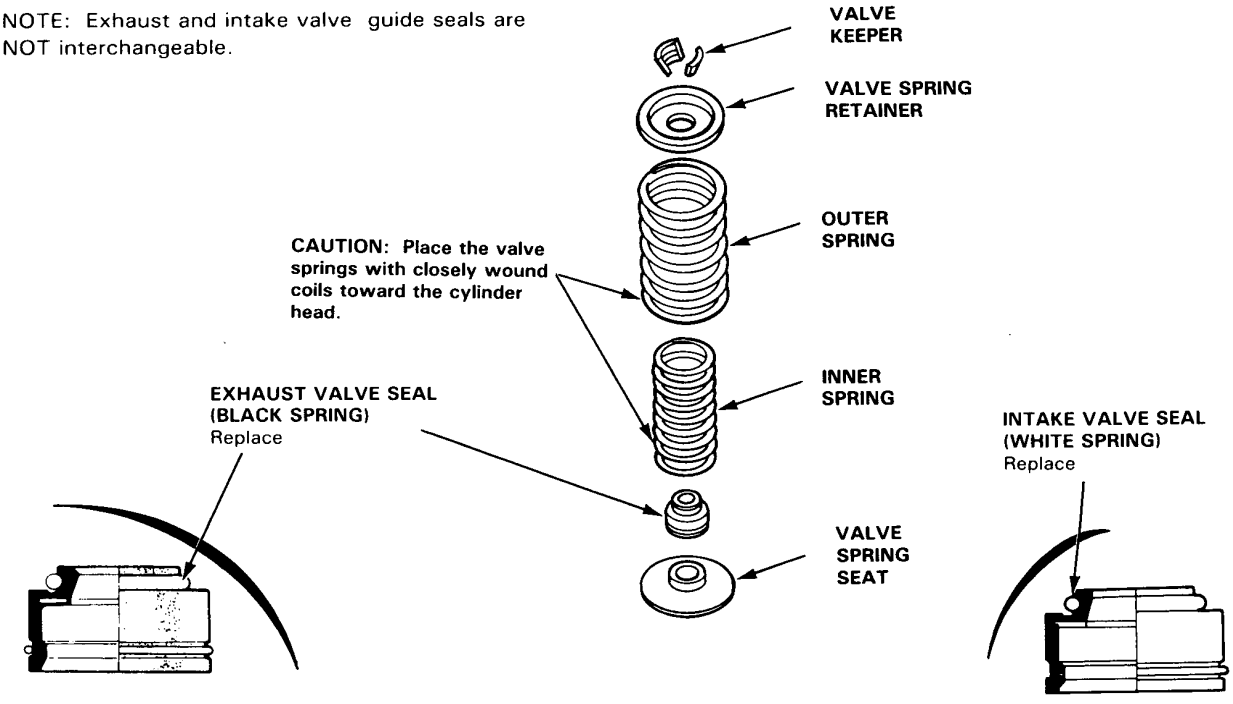
1. Coat reamer and valve guide with cutting oil.
2. Rotate reamer clockwise the full length of the valve guide bore.



3. Continue to rotate reamer clockwise while removing.
4. Thoroughly wash the guide in detergent and water to remove any cutting residue.
5. Check clearance with valve (page 6-9).

Valve Spring Installation Sequence

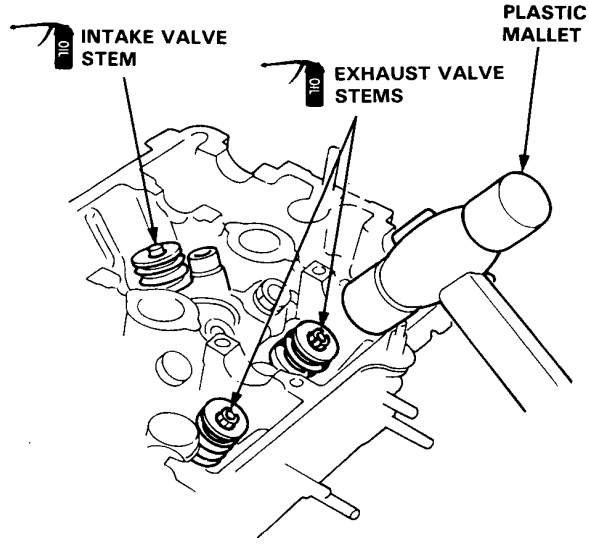
NOTE: Exhaust and intake valve guide seals are NOT interchangeable.



Valve Installation

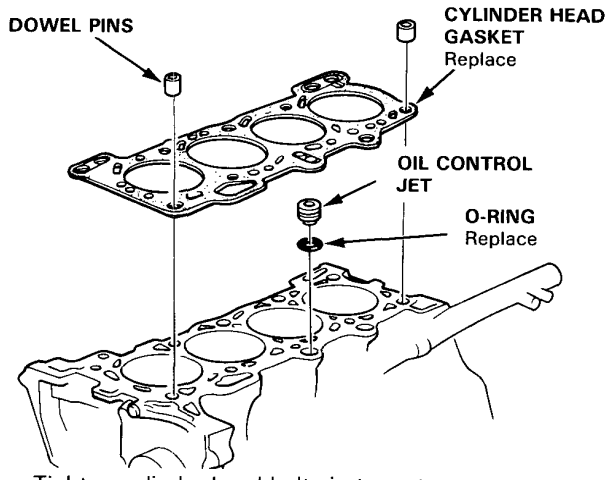
When installing valves in cylinder head, coat valve stems with oil before inserting into valve guides, and make sure valves move up and down smoothly.

When valves and springs are in place, lightly tap the end of each valve stem two or three times with a plastic mallet to ensure proper seating of valve and valve keepers.



Installation

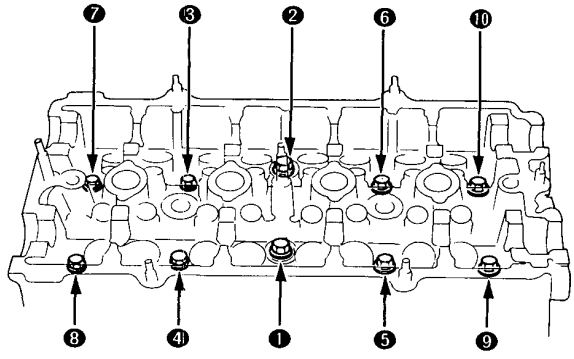
1. Install the cylinder head in the reverse order of removal:
   - Always use a new head gasket.
   - Cylinder head and engine block surface must be clean.
   - "UP" mark on timing belt pulley should be at the top.
2. Cylinder head dowel pins and oil control jet must be aligned.



3. Tighten cylinder head bolts in two steps.
   In the first step tighten all bolts and nuts, in sequence, to about 30 N·m (3.0 kg-m, 22 lb-ft); in the final step tighten, in same sequence, to 68 N·m (6.8 kg-m, 49 lb-ft).

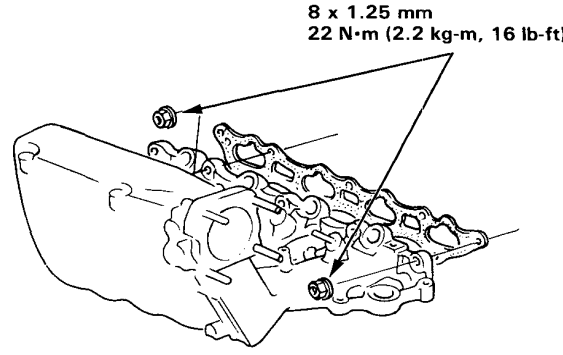
   NOTE:
   - Apply engine oil to the cylinder head bolts and the washer.
   - Use the longer bolts at the position No. 1 and No. 2 as shown.

CYLINDER HEAD TORQUE SEQUENCE

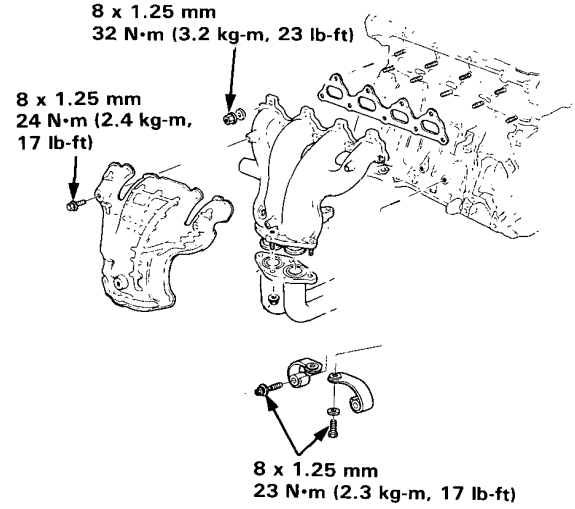


CYLINDER HEAD BOLT
10 x 1.25 mm
68 N·m (6.8 kg-m, 49 lb-ft)

4. Install the intake and exhaust manifolds and tighten the nuts in a criss-cross pattern in 2 or 3 steps, beginning with the inner nuts.



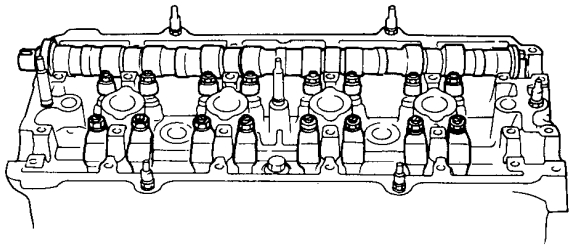
5. Install the exhaust manifold and bracket.



Installation

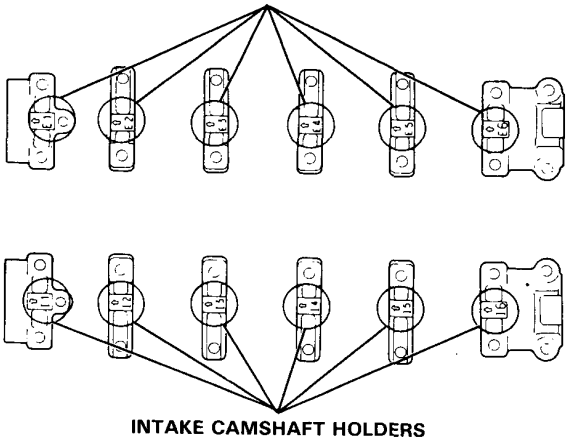
CAUTION:
- **Make sure that the keyway on the camshafts is** facing UP (No. 1 cylinder TDC).
- **Valve locknuts should be loosened and adjusting screws backed off before installation.**
- **In case of reassembling, place the rocker arms at same position.**

1. Place the rocker arms on the pivot bolts and the valve stems.



2. Install the camshafts and the camshaft seals with the open side (spring) facing in.

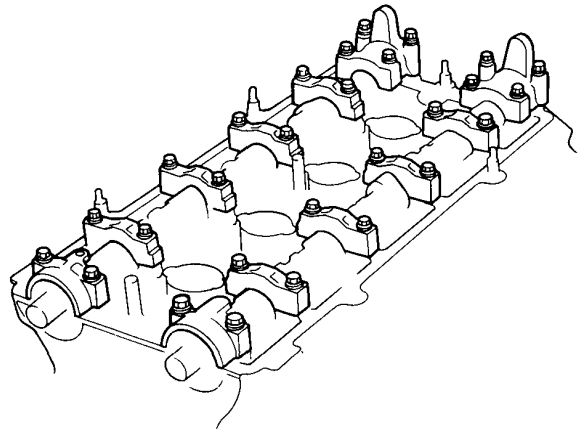
NOTE:
- "I" or "E" marks are stamped on the each camshaft holders. Install correct one.
- Do not apply oil to the holder mating surface of camshaft seal.



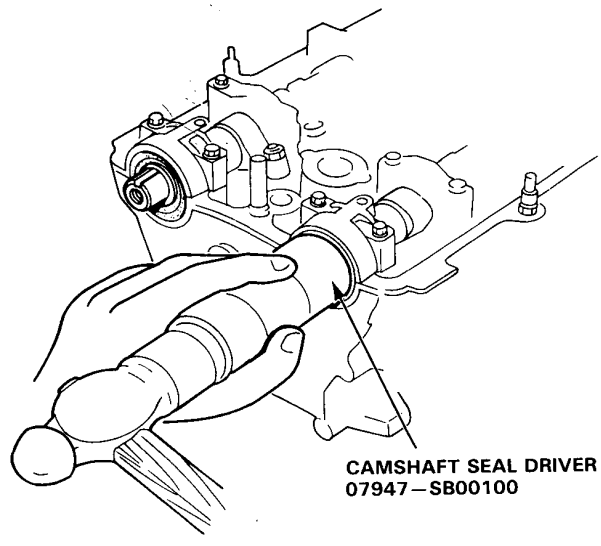
3. Apply liquid gaskets to the head mating surface of the No. 1 and No. 6 camshaft holders and place them on top of the cylinder along with the No. 2, 3, 4 and 5.

4. Tighten the camshaft holders temporarily.

NOTE: Make sure that the rocker arms contact correctly with the valve stems.



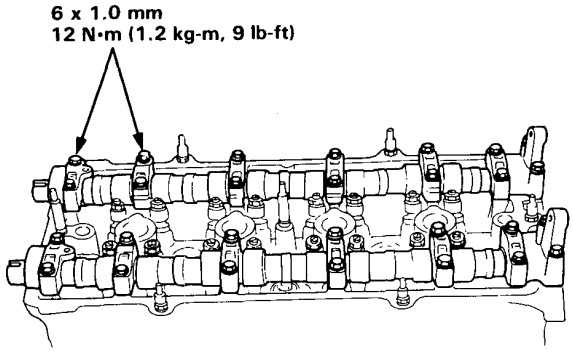
5. Drive in the camshaft seal securely with the special tools.



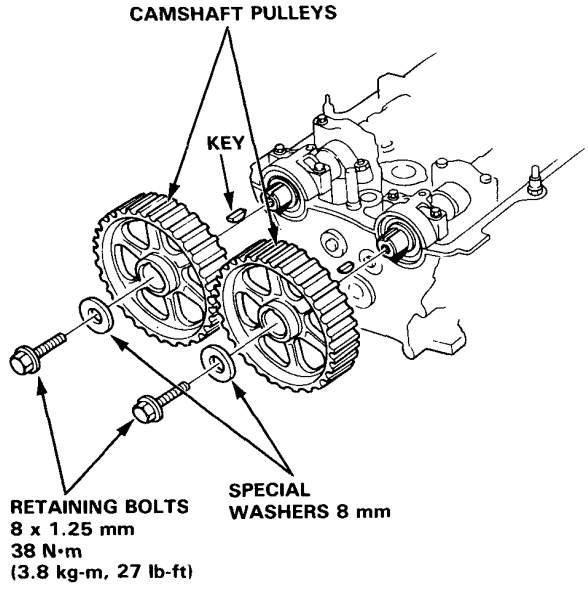
(cont'd)

Installation (cont'd)

6. Tighten each bolt two turns at a time in the sequence shown below to ensure that the rockers do not bind on the valves.



7. Install key into groove in camshafts.



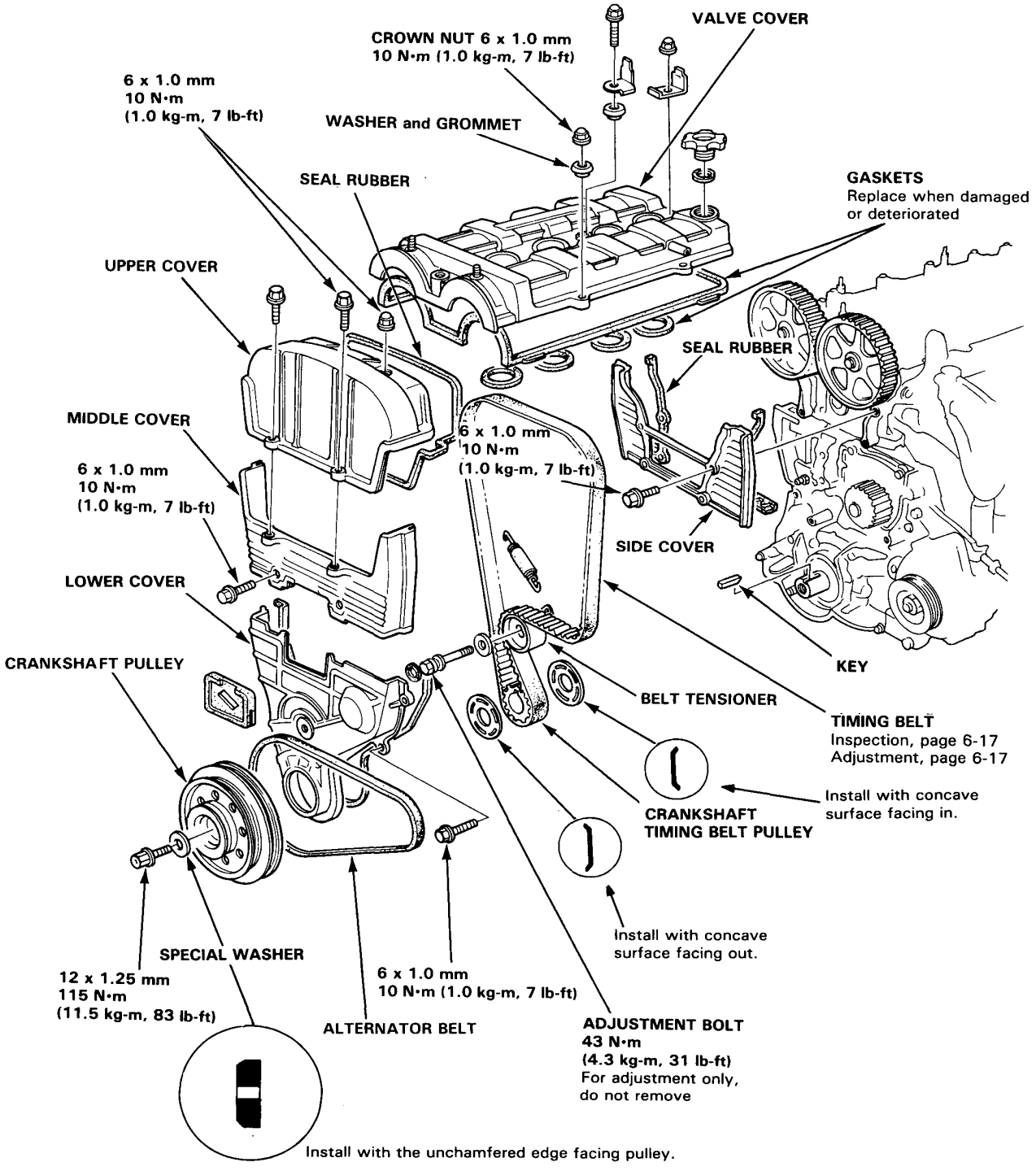
8. Push camshaft pulleys onto camshafts, then tighten retaining bolts to torque shown.

9. Adjust the valve timing (page 6-16).

10. After the installation, check that the all tubes, hoses and connectors are installed correctly.

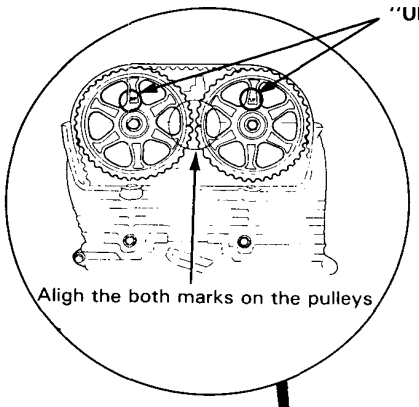
Replacement

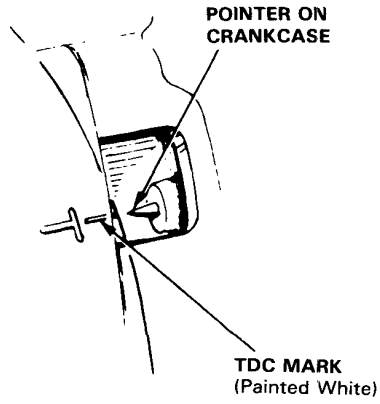
NOTE:
- Refer to next page for positioning crank and pulley before installing belt.
- Mark direction of rotation before removing.

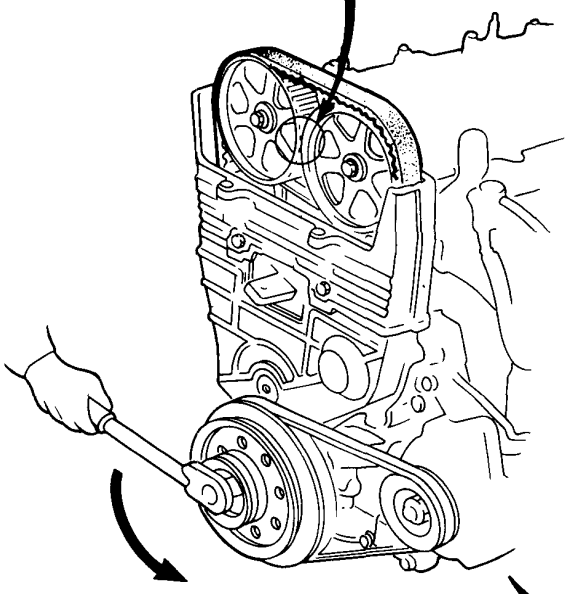


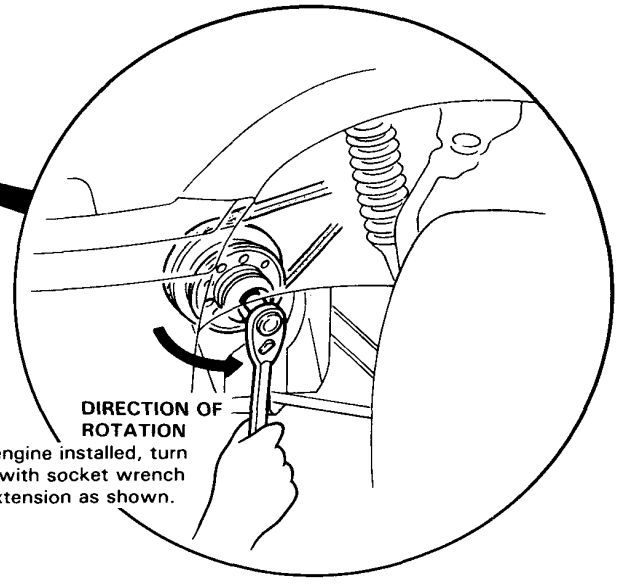
Positioning Crankshaft Before Installing Timing Belt

NOTE: Install the timing belt with the No. 1 piston at TDC (Top Dead Center) of the compression stroke.



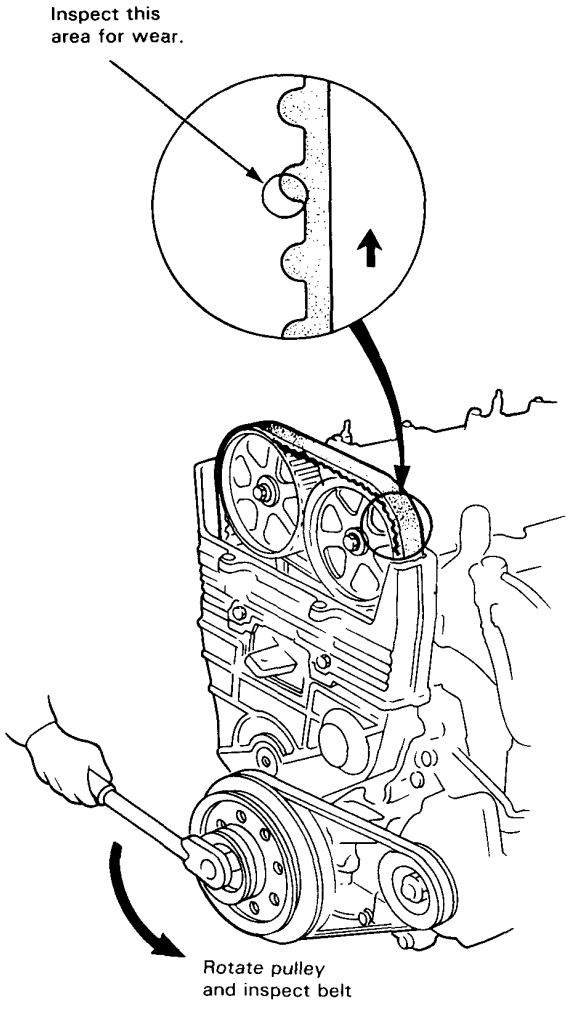






Inspection

NOTE:
- Replace belt if oil soaked.
- Remove any oil or solvent that gets on the belt.

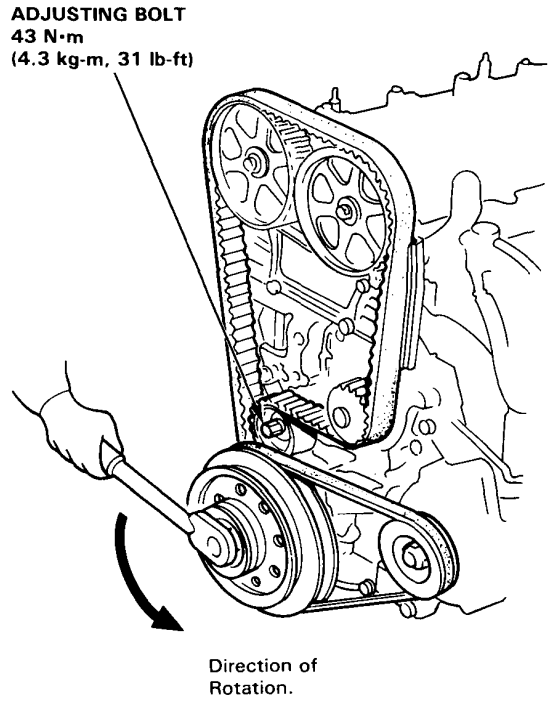


Tension Adjustment

CAUTION: Always adjust timing belt tension with the engine cold.

NOTE: Tensioner is spring-loaded to apply proper tension to the belt automatically after making the following adjustment:

1. Set the No. 1 piston at TDC.
2. Loosen adjusting bolt.



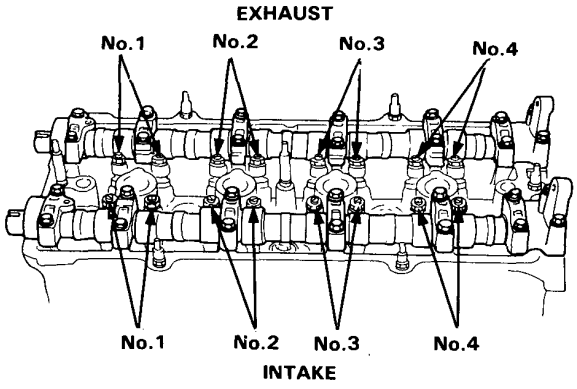
3. Rotate crankshaft counterclockwise 3-teeth on camshaft pulley to create tension on timing belt.
4. Tighten adjusting bolt.
5. If pulley bolt broke loose while turning crank, re-torque it to 115 N·m (11.5 kg-m, 83 lb-ft).

   NOTE: Put transmission in gear and set parking brake before retorquing pulley bolt.

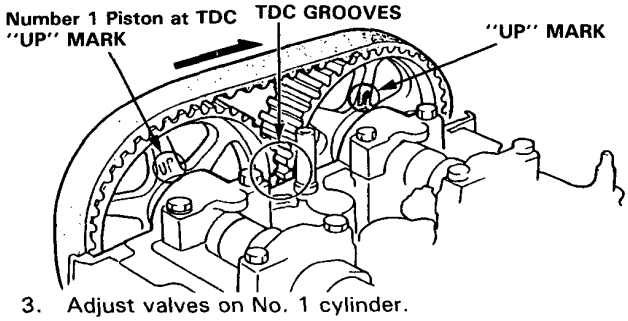
Adjustment

NOTE: Valves should be adjusted cold when the cylinder head temperature is less than 38°C (100°F). Adjustment is the same for intake and exhaust valves.

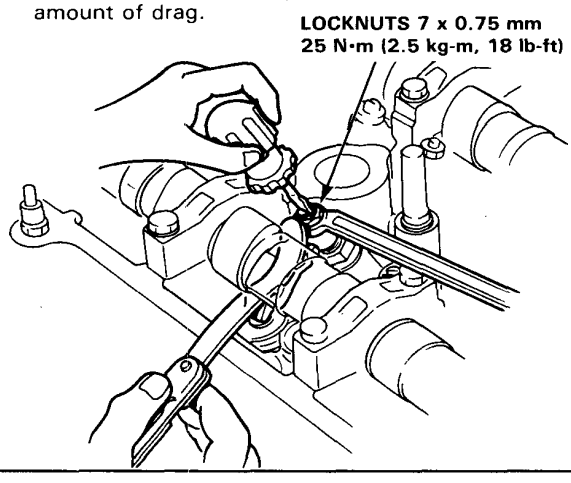
1. Remove the valve cover.



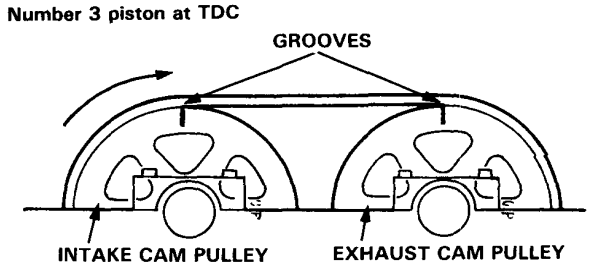
2. Set the No. 1 piston at TDC. "UP" marks in the pulleys should be at top, and the TDC grooves on back side of pulley should align with cylinder head surface. The distributor rotor must be pointing towards No. 1 plug wire.



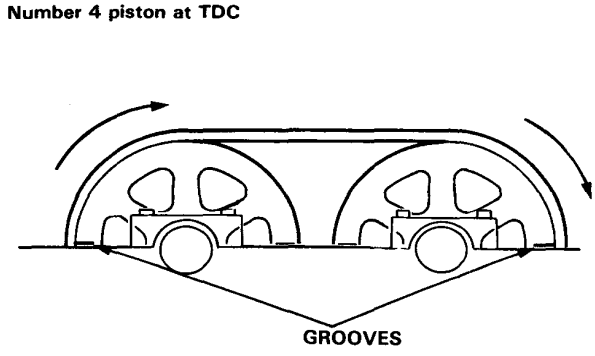
3. Adjust valves on No. 1 cylinder.
   Intake: 0.08—0.12 mm (0.003—0.005 in.)
   Exhaust: 0.16—0.20 mm (0.006—0.008 in.)
4. Loosen locknut and turn adjustment screw until feeler gauge slides back and forth with slight amount of drag.



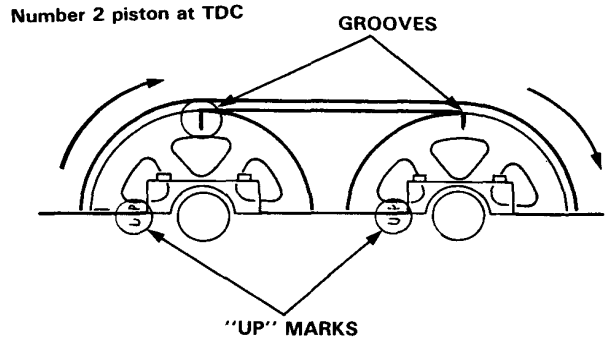
5. Tighten locknut and check clearance again. Repeat adjustment if necessary.
6. Rotate crankshaft 180° counterclockwise (cam pulley turns 90°). The "UP" marks should be at exhaust side. Distributor rotor should point to No. 3 plug wire. Adjust valves on No. 3 cylinder.



7. Rotate crankshaft 180° counterclockwise to bring No. 4 piston to TDC. Both "UP" marks should be at bottom and distributor rotor points to No. 4 plug wire. Adjust valves on No. 4 cylinder.



8. Rotate crankshaft 180° counterclockwise to bring No. 2 piston to TDC. "UP" marks should be at intake side. Distributor rotor should point to No. 2 plug wire. Adjust valves on No. 2 cylinder.

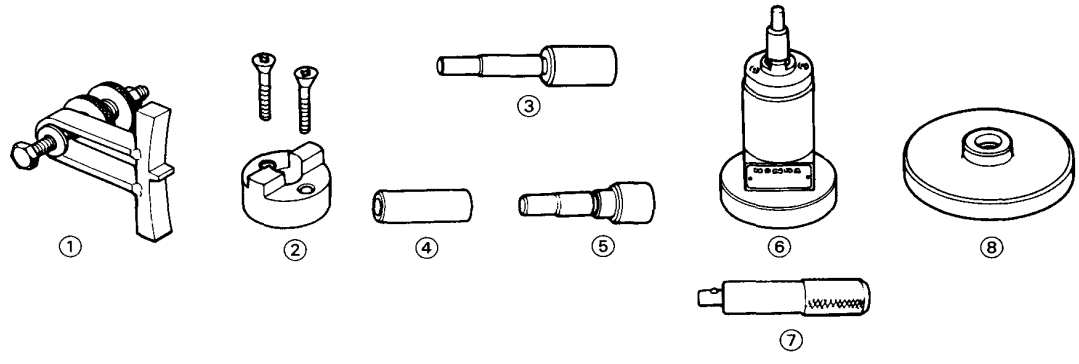


Engine Block

B20A2 Engine

Special Tools

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07924—PD20002	Ring Gear Holder	1	
②	07973—SB00100	Piston Base Head	1	Not included in base set. Use each with the base set.
③	07973—SB00400	Piston Pin Base Insert	1	
④	07973—SB00200	Pilot Collar	1	
⑤	07973—PE00302	Adj. Piston Pin Driver	1	
⑥	07973—6570002	Piston Pin Insert Base Set	1	
⑦	07749—0010000	Driver	1	07949—6110000 may also be used.
⑧	07948—SB00101	Driver Attachment	1	Crankshaft Seal (Clutch Side)

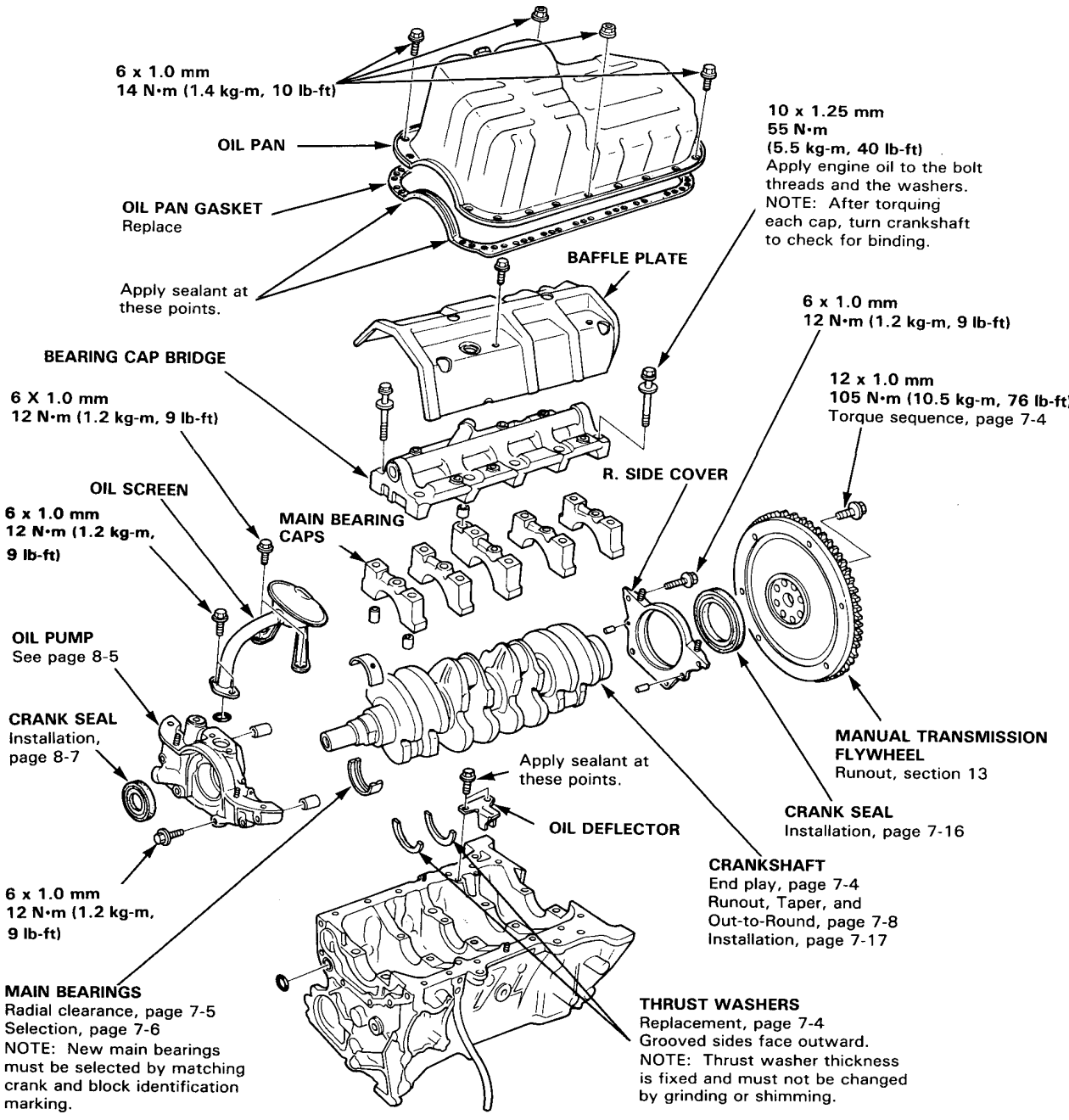


Engine Block

Illustrated Index

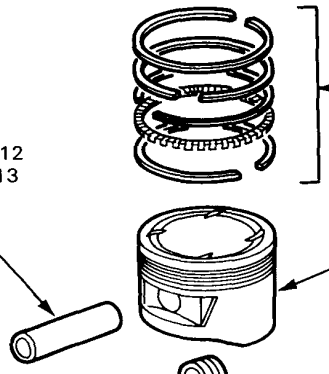
Lubricate all internal parts with engine oil during reassembly.

NOTE: Apply non-hardening liquid gasket to the mating surfaces of the right side cover and oil pump case, before installing them.



NOTE: New rod bearings must be selected by matching connecting rod and crankshaft identification markings (page 7-6).

CAUTION: The piston skirts is coated with moliybdenum: handle the piston carfully to prevent any damage.



PISTON RINGS
Replacement, page 7-14
Measurement, pages 7-14, and 15
Alignment, page 7-15

PISTON PIN
Removal, page 7-11
Installation, page 7-12
Inspection, page 7-13

PISTON
Removal, page 7-7
Measurement, pgae 7-9

NOTE:
- Before removing piston, inspect the top of the cylinder bore for carbon build-up or ridge. Remove ridge if necessary, page 7-7
- To maintain proper piston clearance match the letter on the piston top (No letter denotes A) with the letter to each cylinder stamped on the block.

CONNECTING ROD
End play, page 7-4
Selection, page 7-12
Small end measurement, page 7-13

ENGINE BLOCK
Cylinder bore inspection, page 7-10
Warpage inspection, page 7-10

CONNECTING ROD BEARINGS
Clearance, page 7-5
Selection, page 7-6

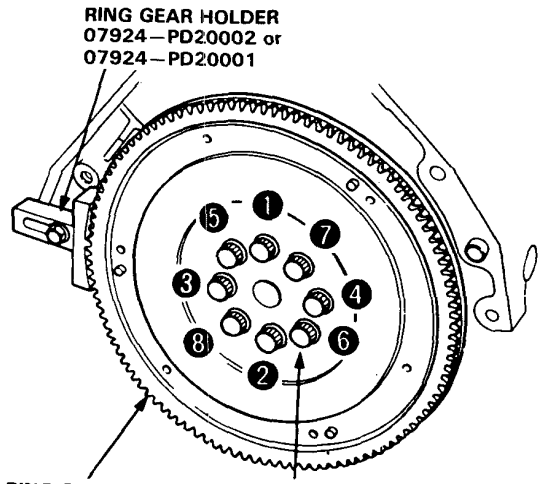
CYLINDER BORE SIZES (A or B)
NOTE: To maintain proper piston clearance, match these letters with the letters on the pistons. The letters on the block read from left to right, No. 1 through No. 4 cylinders.

CONNECTING ROD BEARING CAP
Install with bearing recess on same side as recess in rod, see page 7-17

CONNECTING ROD NUT
8 x 0.75 mm
45 N·m (4.5 kg-m, 33 lb-ft)
After torquing each bearing cap, rotate crankshaft to check for binding.

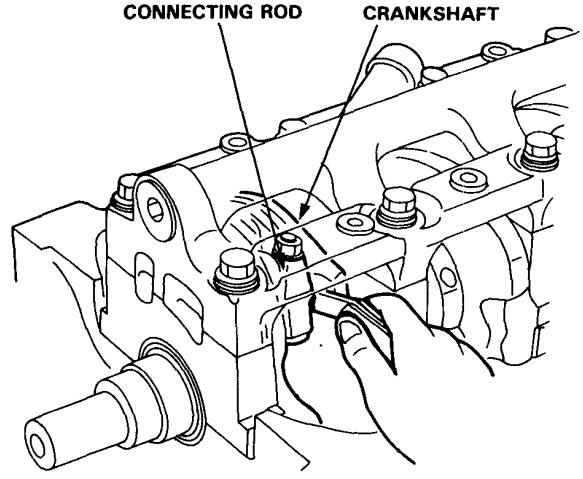
Flywheel Replacement (Manual Transmission)

Remove the eight flywheel bolts, then separate the flywheel from the crankshaft flange. After installation, tighten the bolts in the sesquence shown.



Connecting Rods End Play

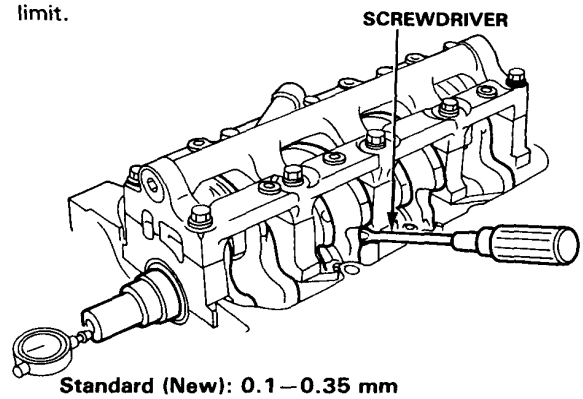
Standard (New): 0.15—0.30 mm (0.006—0.012 in.)
Service Limit: 0.40 mm (0.016 in.)



- If out-of tolerance, install new connecting rod.
- If still out-of-tolerance, replace crankshaft (page 7-7 and 7-17).

Crankshaft End Play

Push crank firmly away from dial indicator, and zero dial against end of crank. Then pull crank firmly back toward indicator; dial reading should not exceed service limit.



Standard (New): 0.1—0.35 mm (0.004—0.014 in.)
Service Limit: 0.45 mm (0.018 in.)

- If end play is excessive, inspect thrust washers and thrust surface on crankshaft. Replace parts as necessary.

NOTE: Thrust washer thickness is fixed and must not be changed either by grinding or shimming. Thrust washers are installed with grooved sides outward.

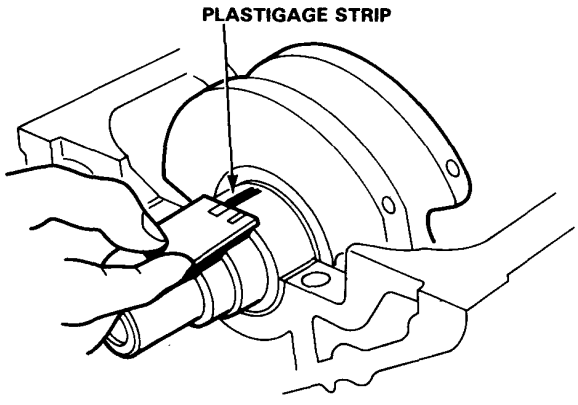
Main Bearings

Clearance

1. To check main bearing clearance, remove the main caps and bearing halves.
2. Clean each main journal and bearing half with a clean shop rag.
3. Place one strip of plastigage across each main journal.
   NOTE: If the engine is still in the car when you bolt the main cap down to check clearance, the weight of the crank and flywheel will flatten the plastigage further than just the torque on the cap bolts, and give you an incorrect reading. For an accurate reading, support the crank with a jack under the counterweights and check only one bearing at a time
4. Reinstall the bearings and caps, then torque the bolts to 55 N·m (5.5 kg-m, 40 lb-ft).
5. Remove the caps and bearings again, and measure the widest part of the plastigage.

Main Bearing Clearance:
Standard (New):

No. 1, 2, 4 and 5 Journals	**0.024—0.042 mm (0.0010—0.0017 in.)**
No. 3 Journal	**0.030—0.048 mm (0.0012—0.0019 in.)**
Service Limit:	**0.05 mm (0.002 in.)**



6. If the plastigage measures too wide or too narrow, (remove the engine if it's still in the car), remove the crank, remove the upper half of the bearing, then install a new, complete bearing with the same color code (select the color as shown on the next page), and recheck the clearance.
   CAUTION: Do not file, shim, or scrape the bearings or the caps to adjust clearance.

7. If the plastigage shows the clearance is still incorrect, try the next larger or smaller bearing (the color listed above or below that one), and check again.
   NOTE: If the proper clearance cannot be obtained by using the appropriate larger or smaller bearings, replace the crank and start over.

Rod Bearings

Clearance

1. Remove the connecting rod cap and bearing half.

2. Clean the crankshaft rod journal and bearing half with a clean shop rag.

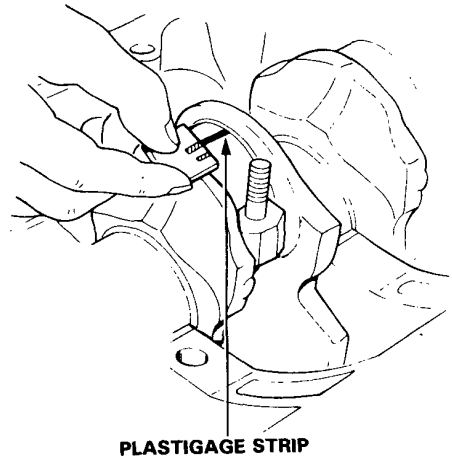
3. Place plastigage across the rod journal.

4. Reinstall the bearing half and cap, and torque the nuts to 45 N·m (4.5 kg-m, 33 lb-ft).

   NOTE: Do not rotate the crank during inspection.

5. Remove the rod cap and bearing half and measure the widest part of the plastigage.

Connecting Rod Bearing Clearance:
Standard (New): 0.026—0.044 mm (0.0010—0.0017 in.)
Service Limit: 0.05 mm (0.002 in.)



6. If the plastigage measures too wide or too narrow, remove the upper half of the bearing, install a new, complete bearing with the same color code (select color as shown on next page), and recheck the clearance.

   CAUTION: Do not file, shim, or scrape the bearing or the caps to adjust clearance.

7. If the plastigage shows the clearance is still incorrect, try the next larger or smaller bearing (the color listed above or below that one), and check clearance again.

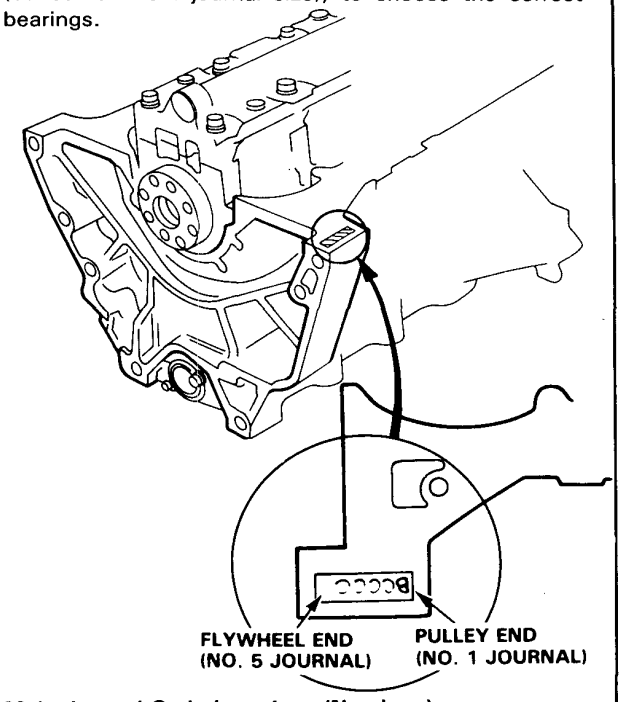
   NOTE: If the proper clearance cannot be obtained by using the appropriate larger or smaller bearings, replace the crank and start over.

Main Bearings

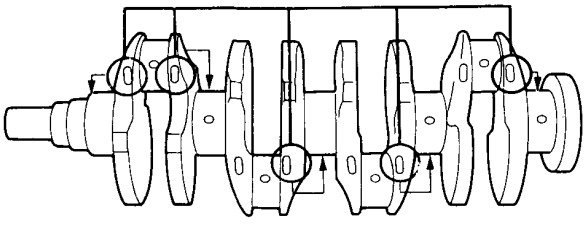
Selection

Crank Bore Code Location (Letters)

Letters have been stamped on the end of the block as a code for the size of each fo the 5 main journal bores. Use them, and the numbers stamped on the crank (codes for main journal size), to choose the correct bearings.



Main Journal Code Locations (Numbers)



Bearing Identification

Color code is on the edge of the bearing

Larger crank bore

A or I	B or II	C or III	D or IIII

Smaller bearing (thicker)

Red	Pink	Yellow	Green
Pink	Yellow	Green	Brown
Yellow	Green	Brown	Black
Green	Brown	Black	Blue

1 or I
2 or II
3 or III
4 or IIII

Smaller main journal

Smaller bearing (thicker)

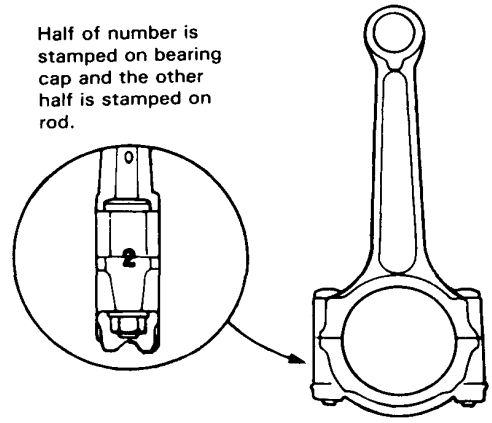
Rod Bearings

Selection

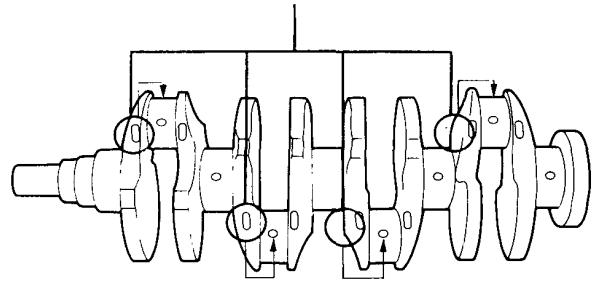
Rod Code Location (Numbers)

Numbers have been stamped on the side of each connecting rod as a code for the size of the big end. Use them, and the letters stamped on the crank (codes for rod journal size), to choose the correct bearings.

Half of number is stamped on bearing cap and the other half is stamped on rod.



Rod Journal Code Locations (Letters)



Bearing Identification

Color code is on the edge of the bearing

Larger big end bore

1 or I	2 or II	3 or III	4 or IIII

Smaller bearing (thicker)

Red	Pink	Yellow	Green
Pink	Yellow	Green	Brown
Yellow	Green	Brown	Black
Green	Brown	Black	Blue

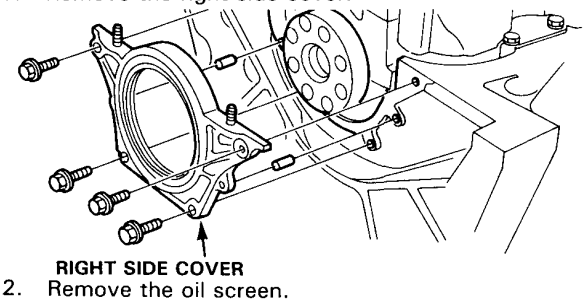
A or I
B or II
C or III
D or IIII

Smaller rod journal

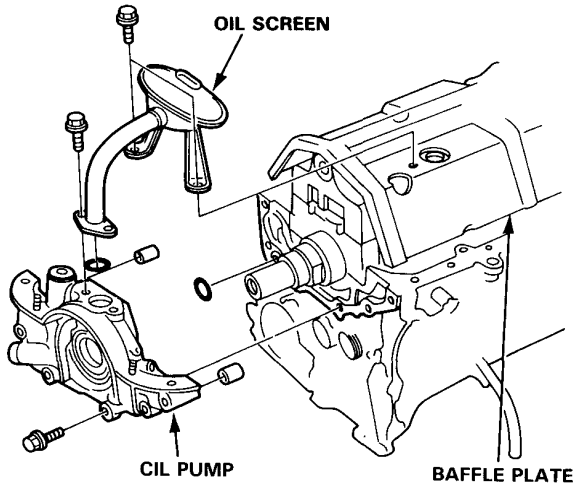
Smaller bearing (thicker)

Removal

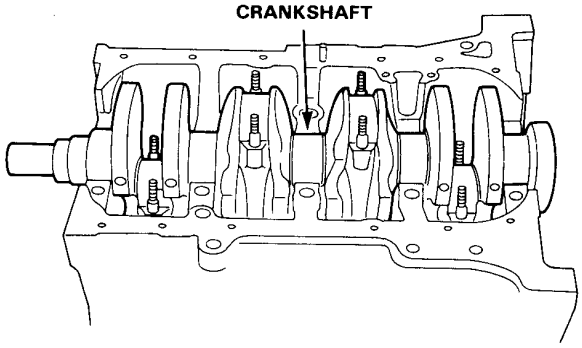
1. Remove the right side cover.



2. Remove the oil screen.

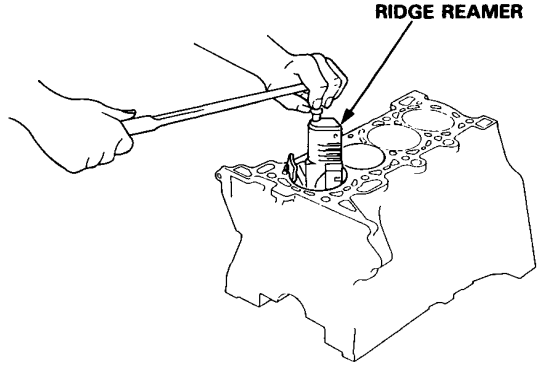


3. Remove the oil pump.
4. Remove the baffle plate.
5. Turn the crankshaft so No. 2 and 3 crankpins are at the bottom.
6. Remove the rod caps/bearings and main caps/bearings. Keep all caps/bearings in order.
7. Lift the crankshaft out of engine, being careful not to damage journals.

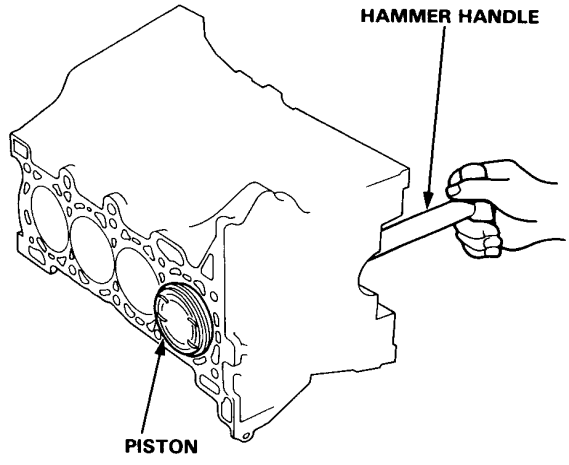


8. Remove upper bearing halves from connecting rods and set aside with their respective caps.
9. Reinstall main cap and bearings on engine in proper order.
10. If you can feel a ridge of metal or hard carbon around the top of each cylinder, remove it with a ridge reamer. Follow reamer manufacturer's instructions.

CAUTION: If the ridge is not removed, it may damage the pistons as they are pushed out.



11. Use the wooden handle of a hammer to drive out pistons.



12. Reinstall the rod bearings and caps after removing each piston/connecting rod assembly.
13. Mark piston/connecting rod assemblies with cylinder numbers to avoid mixup on reassembly.

NOTE: The existing number on the connecting rod does not indicate its position in the engine, it indicates the rod bore size.

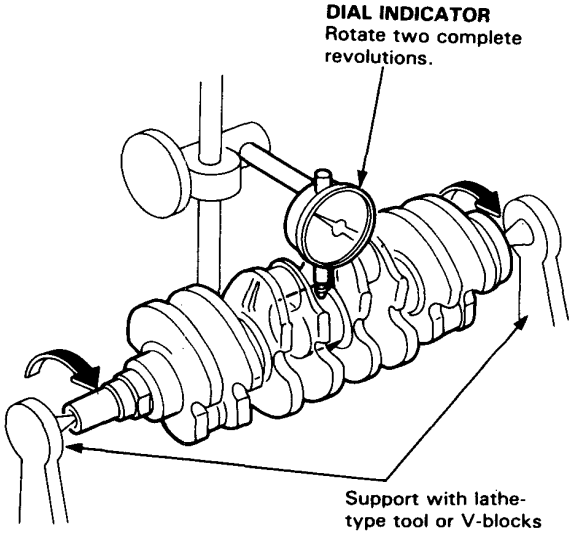
Inspection

- Clean the crankshaft oil passages with pipe cleaners or a suitable brush.
- Check the keyway and threads.

Alignment

- Measure runout on all main journals to make sure the crank is not bent.
- The difference between measurements on each journal must not be more than the sevice limit.

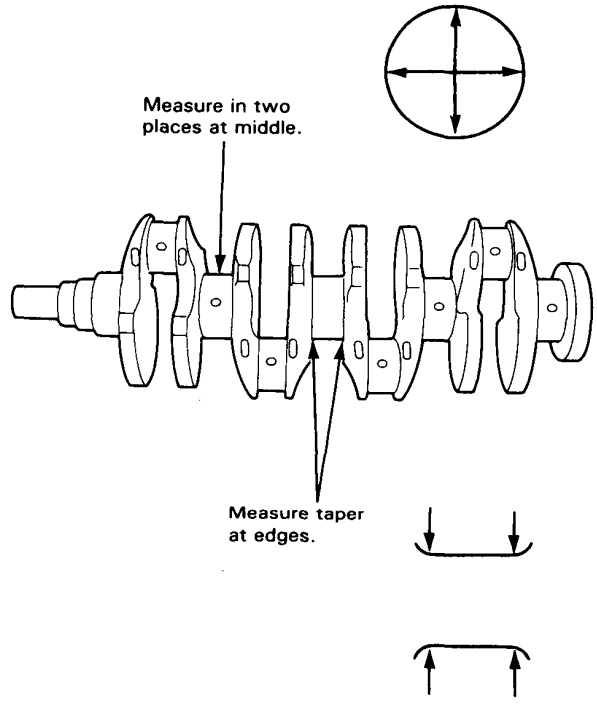
Crankshaft Total Indicate Runout:
Standard (New): 0.02 mm (0.0008 in.)
Service Limit: 0.03 mm (0.0012 in.)



Out-of-Round and Taper

- Measure out-of-round at the middle of each rod and main journal in two places.
- The difference between measurements on each journal must not be more than the service limit.

Journal Out-of-Round:
Standard (New): 0.005 mm (0.0002 in.)
Service Limit: 0.010 mm (0.0004 in.)



- Measure taper at edges of each rod and main journal.
- The difference between measurements on each journal must not be more than the service limit.

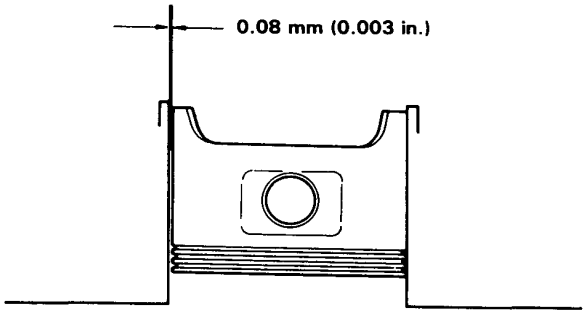
Journal Taper:
Standard (New): 0.005 mm (0.0002 in.)
Service Limit: 0.010 mm (0.0004 in.)

Cylinder Block

Piston-to-Block Clearance

1. Make a preliminary piston-to-block clearance check with a feeler gauge:

   Service Limit: 0.08 mm (0.003 in.)



   If the clearance is near or exceeds the service limit, inspect the piston and cylinder block for excessive wear.
   To confirm the feeler gauge check, further measurement with a micrometer will be necessary.

2. Calculate difference between cylinder bore diameter on page 7-10 and piston diameter.

   Piston-to-Cylinder Clearance:
   Standard (New): 0.02—0.04 mm (0.0008—0.0016 in.)
   Service Limit: 0.08 mm (0.003 in.)

Pistons

Inspection

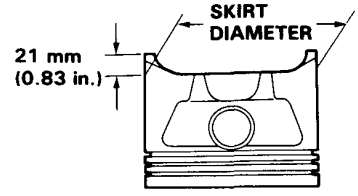
1. Check the piston for distortion or cracks.

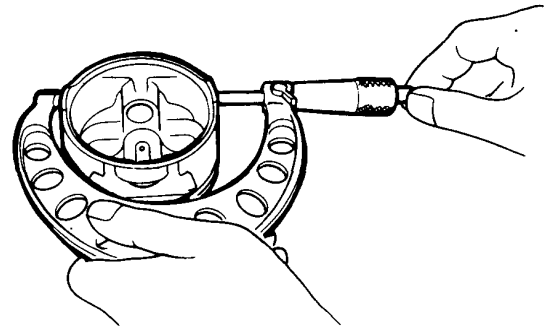
   NOTE: If cylinder is bored, an oversized piston must be used.

2. Measure piston diameter at a point 21 mm (0.83 in.) from bottom of skirt.

   NOTE: There are two standard-size pistons (No letter denotes A). The letter is stamped on the top of the piston.
   These letters are also stamped on the block as cylinder bore sizes.

   Piston A Diameter
   Standard (New): 80.98—80.99 mm (3.1882—3.1886 in.)
   Service Limit: 80.97 mm (3.1878 in.)
   Piston B Diameter
   Standard (New): 80.97—80.98 mm (3.1878—3.1882 in.)
   Service Limit: 80.96 mm (3.1874 in.)





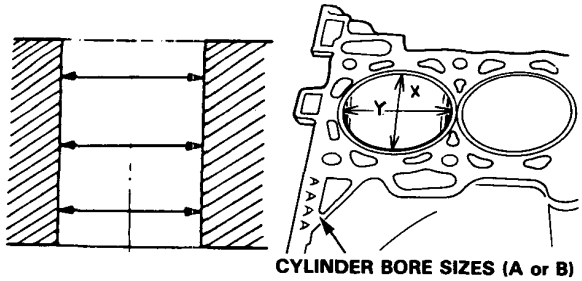
   Oversize Piston Diameter
   Standard 0.25: 81.248—81.249 mm (3.19873—3.19877 in.)
   Standard 0.5: 81.498—81.499 mm (3.20858—3.20862 in.)

3. Check the piston pin-to-piston clearance. Coat the piston pin with engine oil.
   It should then be possible to push the piston pin into the piston hole with thumb pressure.

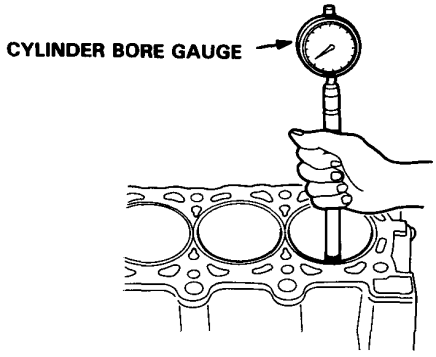
   Piston Pin-to-Piston Clearance:
   Service limit: 0.012—0.024 mm (0.0005—0.0009 in.)

Inspection

1. Measure wear and taper in directions X and Y at three levels in each cylinder as shown.



CYLINDER BORE SIZES (A or B)
Read the letters from left-to-right for No. 1 through No. 4 cylinders.



Cylinder Bore Size A
Standard (New): 81.01–81.02 mm (3.1894–3.1898 in.)
Service Limit: 81.05 mm (3.1909 in.)

Cylinder Bore Size B
Standard (New): 81.00–81.01 (3.1890–3.1894 in.)
Service Limit: 81.04 mm (3.1905 in.)

Oversize
Standard 0.30 (New): 83.01–83.02 mm (3.2681–3.2685 in.)

Bore Taper
Limit: (Difference between first and third measurement) 0.05 mm (0.002 in.)

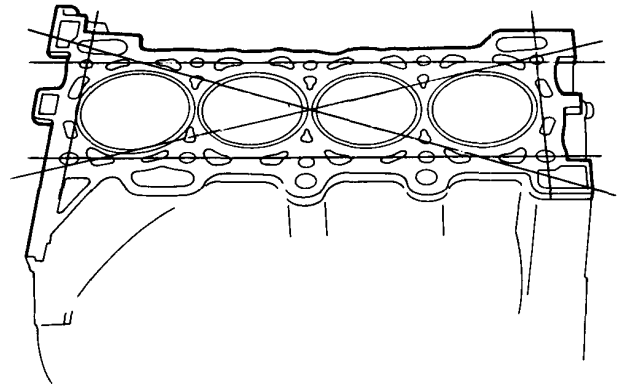
- If measurements in any cylinder are beyond Oversize Bore Service Limit, replace the block.
- If block is to be rebored, refer to Piston Clearance Inspection (page 7-9) after reboring.

NOTE: Scored or scratched cylinder bores must be honed.

Out-of-Round
Service Limit: 0.5 mm (0.02 in.)

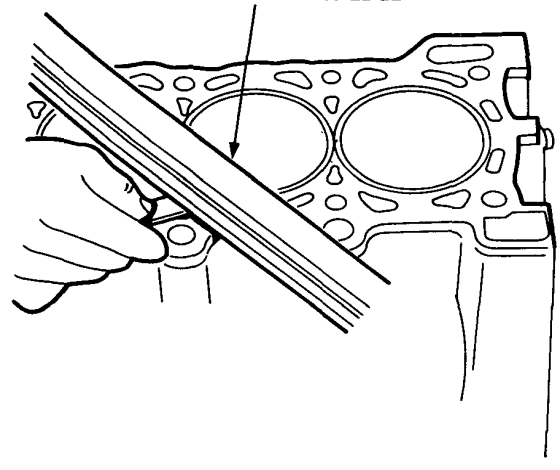
2. Check the top of the block for warpage. Measure along the edges and across the center as shown.

SURFACES TO BE MEASURED



Engine block Warpage:
Standard (New): 0.07 mm (0.003 in.)
Service Limit: 0.10 mm (0.004 in.)

PRECISION STRAIGHT EDGE

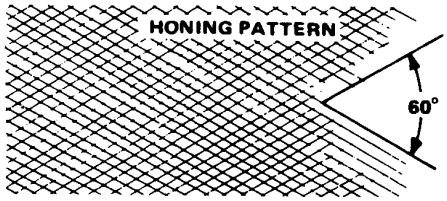


Piston Pins

Bore Honing

1. Measure cylinder bores as shown on page 7-10. If the block is to be re-used, hone the cylinders and remeasure the bores.

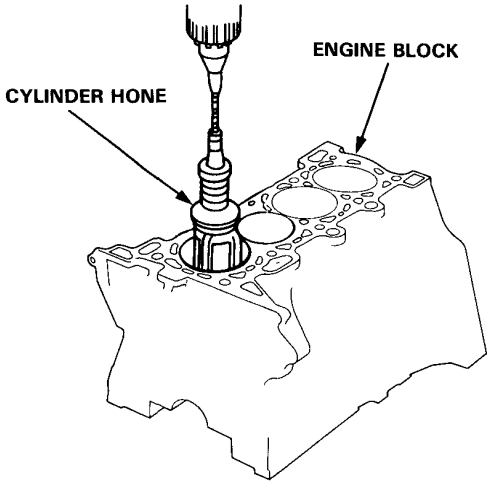
2. Hone cylinder bores with honing oil and a fine (400 grit) stone in a 60 degree cross-hatch pattern.



3. When honing is complete, thoroughly clean the engine block of all metal particles. Wash the cylinder bores with hot soapy water, then dry and oil immediately to prevent rusting.

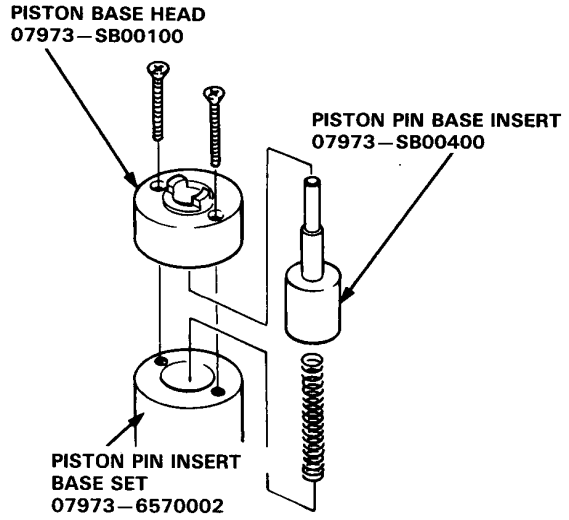
4. If Scoring or scratches are still present in cylinder bores after honing to service limit, rebore the engine block.

   NOTE: Some light vertical scoring and scratching is acceptable if it is not deep enough to catch your fingernail and does not run the full length of the bore.

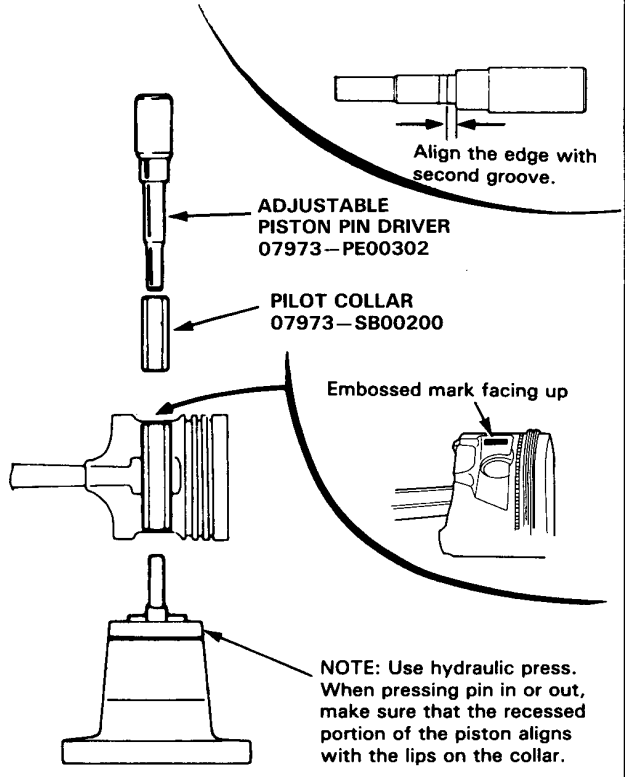


Removal

1. Install the attachment on the piston base.



2. Turn the handle of the piston pin driver so that the end of the drive aligns with the second groove of the driver body as shown.



3. Place the piston on the piston base and press the pin out with a hydraulic press.

Connecting Rods

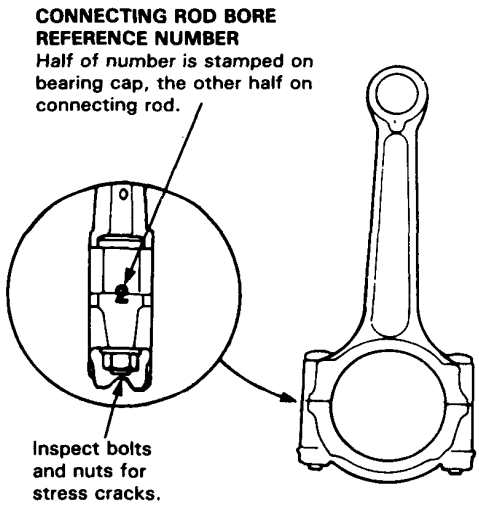
Selection

Each rod is sorted into one of four tolerance ranges (from+0.006 to 0.024 mm, in 0.006 mm increments) *depending on the size of its big end bore.* It's then stamped with a number (1, 2, 3, or 4) indicating that tolerance. You may find any combination of 1, 2, 3, or 4, in any engine.

Normal Bore Size: 51 mm (2.01 in.)

NOTE:

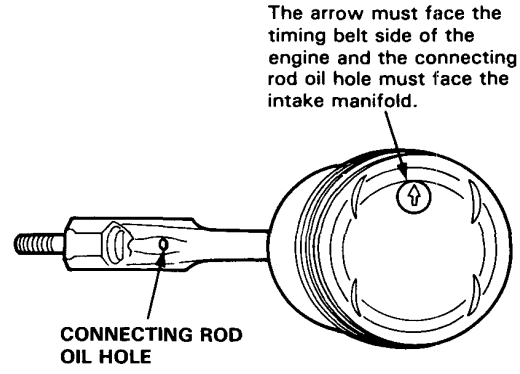
- Reference numbers are for big end bore size and do NOT indicate the position of rod in engine.
- Inspect connecting rod for cracks and heat damage.

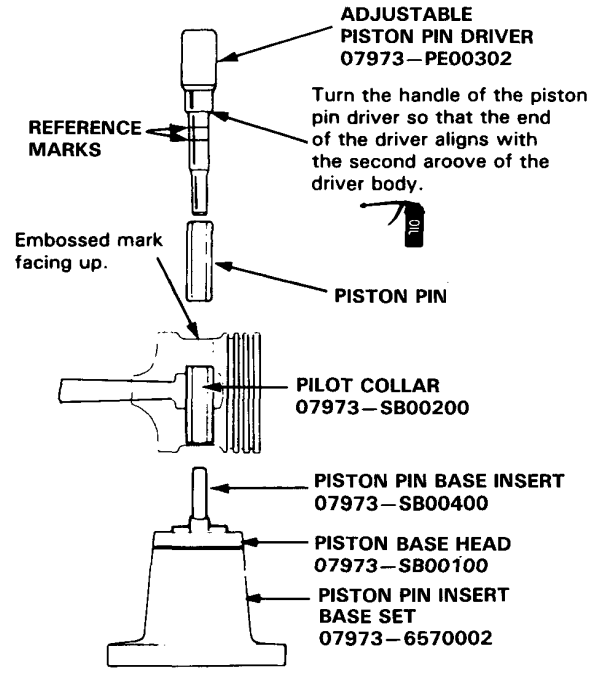


Piston Pins

Installation

1. Use a hydraulic press for installation.
   - When pressing pin in or out, be sure you position the recessed flat on the piston against the lugs on the base attachment.





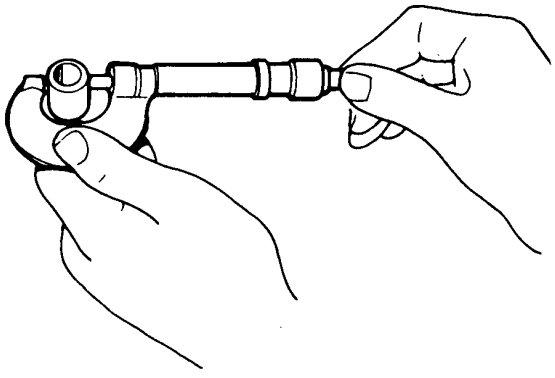
NOTE: Install the assembled piston and rod with the oil hole facing the intake manifold.

Inspection

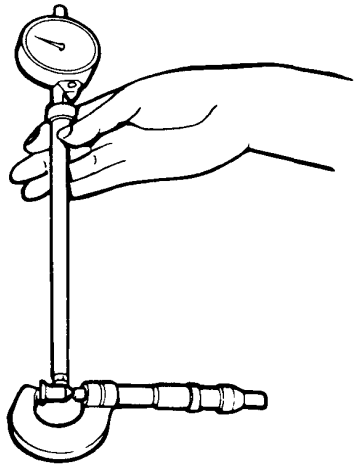
1. Measure the diameter of the piston pin.

Piston Pin Diameter:
Standard (New): 19.994—20.0 mm
(0.7872—0.7874 in.)
Oversize: 19.997—20.003 mm
(0.7873—0.7875 in.)

NOTE: All replacement piston pins are oversize.



2. Zero the dial indicator to the piston pin diameter.

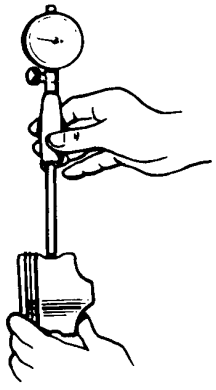


3. Measure the piston pin-to-piston clearance.

NOTE: Check the piston for distortion or cracks.

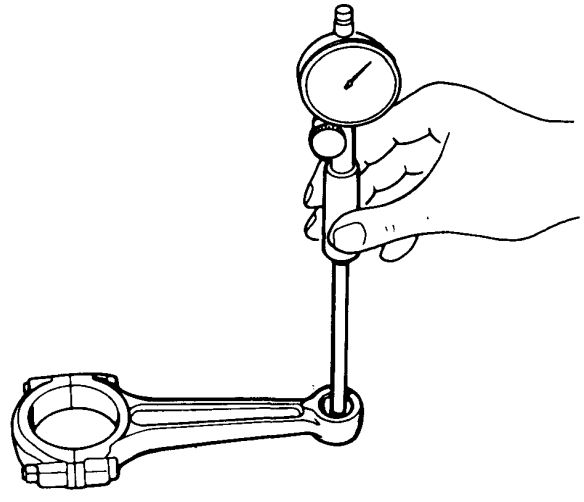
If the piston pin clearance is greater than 0.024 mm (0.0009 in.), re-measure using an oversize piston pin.

Piston Pin-to-Piston Clearance:
Service Limit: 0.012—0.024 mm
(0.0005—0.0009 in.)



4. Check the difference between piston pin diameter and connecting rod small end diameter.

Piston Pin-to-Connecting Rod Interference:
Standard (New): 0.013—0.032 mm
(0.0005—0.0013 in.)



Piston Rings

End Gap

1. Using a piston, push a new ring into the cylinder bore 15—20 mm (0.6—0.8 in.) from the bottom.
2. Measure the piston ring end-gap with a feeler gauge:

   - If the gap is too small, check to see if you have the proper rings for your engine.

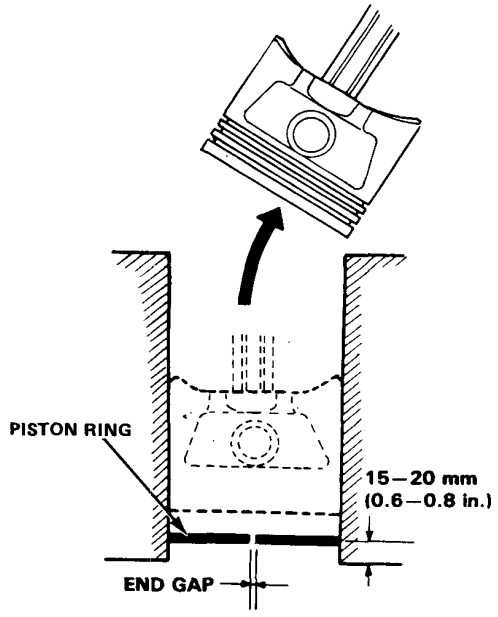
   - If the gap is too large, re-check the cylinder bore diameter against the wear limits on page 7-10. If the bore is over limit, the engine block must be rebored.

Piston Ring End-Gap:

Top Ring
Standard (New): 0.25—0.35 mm (0.010—0.014 in.)
Service Limit: 0.6 mm (0.02 in.)

Second Ring
Standard (New): 0.35—0.45 mm (0.014—0.018 in.)
Service Limit: 0.7 mm (0.03 in.)

Oil Ring
Standard (New): 0.2—0.7 mm (0.008—0.028 in.)
Service Limit: 0.8 mm (0.03 in.)



Replacement

1. Using ring expander, remove *old* piston rings.
2. Clean all ring grooves thoroughly.

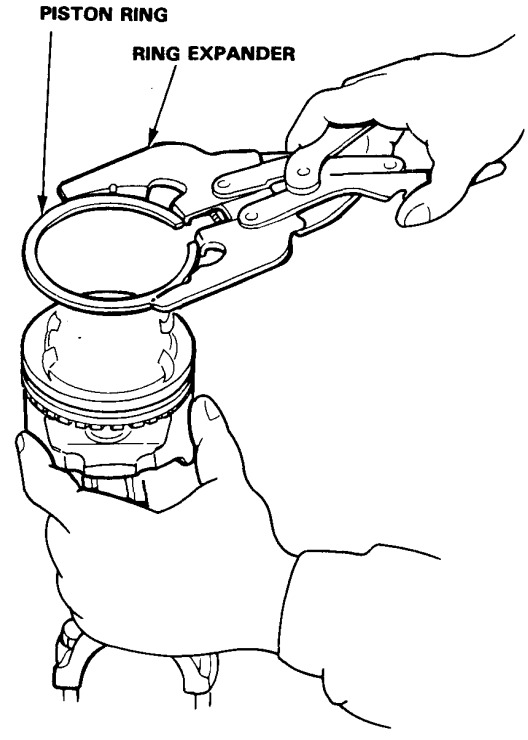
   NOTE: Use squared-off broken ring, or file down blade on ring groove cleaner to fit (compression rings are 1.5 mm wide; oil ring is 4.0 mm wide).

   CAUTION: Do not use a wire brush to clean ring lands, or cut ring lands deeper with cleaning tool.

   NOTE: If piston is to be separated from connecting rod, do not install new rings yet.

3. Install new rings in proper sequence and position (page 7-15).

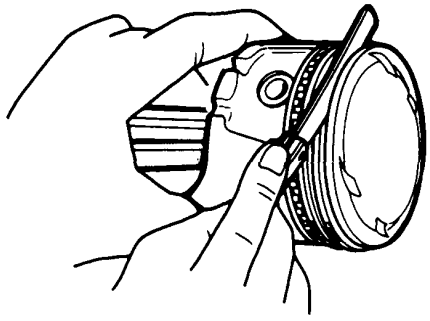
   NOTE: Do not re-use old piston rings.



Land Clearances

After installing a new set of rings, measure ring-to-land clearances:

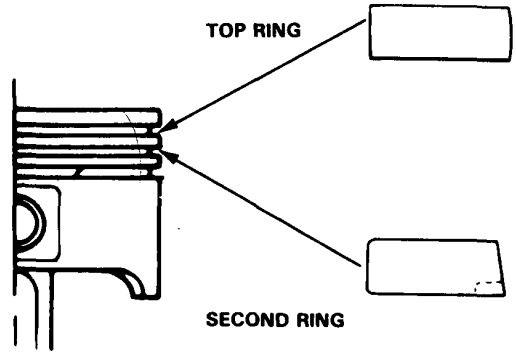
Top Ring Clearance:
Standard (New): 0.035—0.060 mm
(0.0014—0.0024 in.)
Service Limit: 0.13 mm (0.005 in.)
Second Rings Clearance
Standard (New): 0.030—0.055 mm
(0.0012—0.0022 in.)
Service Limit: 0.13 mm (0.005 in.)



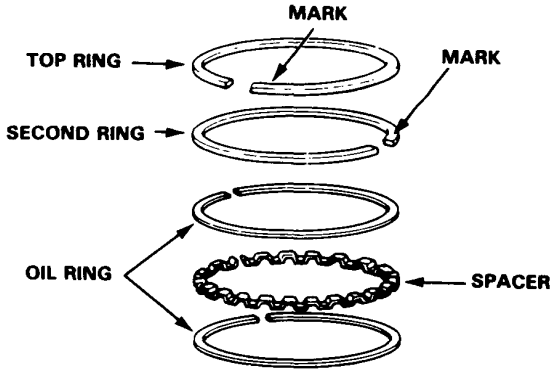
Alignment

1. Install the rings as shown on page 7-14.

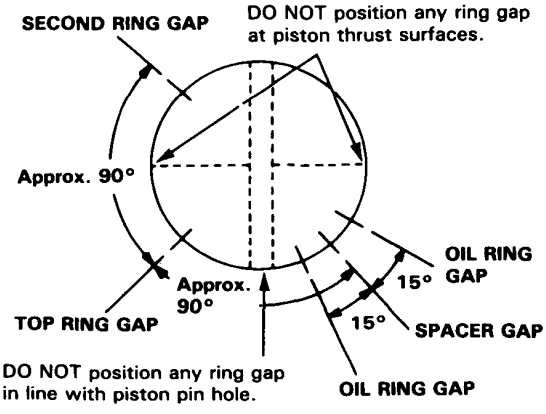
   Identify top and second rings by the chamfer on the edge, and make sure they are in proper grooves on piston.



2. Rotate the rings in grooves to make sure they do not bind.
3. The manufacturing marks must be facing upward



4. Position the ring end gaps as shown:

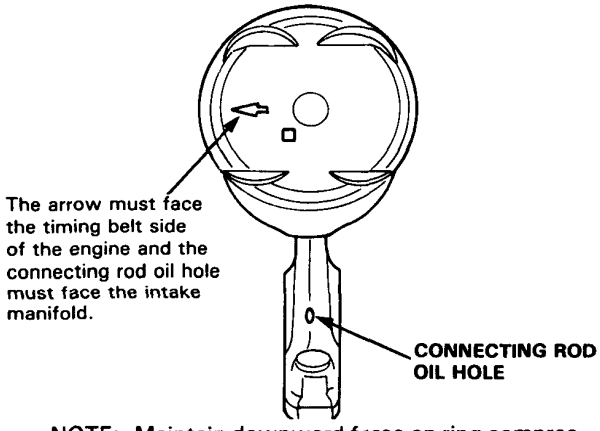


Pistons

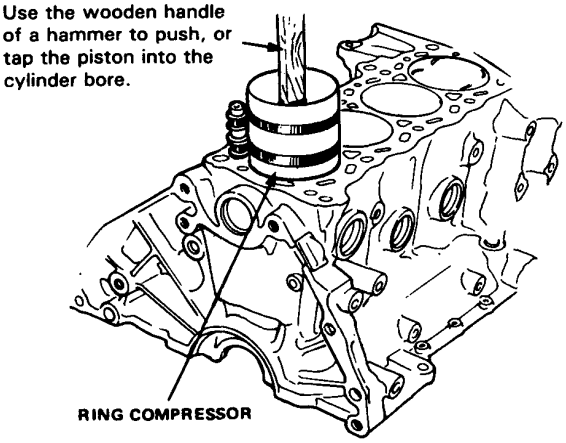
Installation

Before installing the piston, apply a coat of engine oil to the ring grooves and cylinder bores.

1. If the crankshaft is already installed:
   - Remove the connecting rod caps, then slip short sections of rubber hose over the threaded ends of the connecting rod bolts.
   - Install the ring compressor, check that the bearing is securely in place, then position the piston in the cylinder and drive it in using the wooden handle of a hammer.
     Stop after the ring compressor pops free and check the connecting rod-to-crank journal alignment before driving rod into place.
   - Install the rod caps with bearings, and torque the nuts to 45 N·m (4.5 kg-m, 33 lb-ft).
2. If the crankshaft is not installed:
   - Remove the rod caps and bearings, install the ring compressor, then position the piston in the cylinder and drive it in using the wooden handle of a hammer.
   - Position all pistons at top dead center.



NOTE: Maintain downward force on ring compressor to prevent rings from expanding before entering the cylider bore.

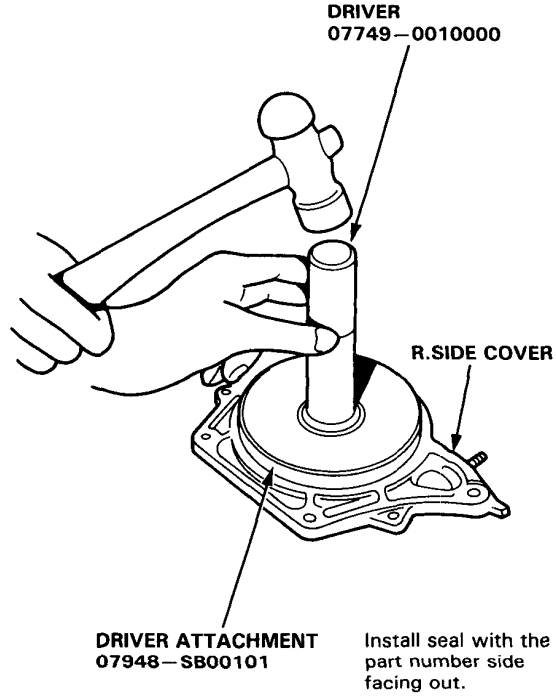


Oil Seal

Installation

The seal surface on the block should be dry. Apply a light coat of oil to the crankshaft and to the lip of seal.

1. Drive in flywheel-end seal until to bottoms against R. side cover.

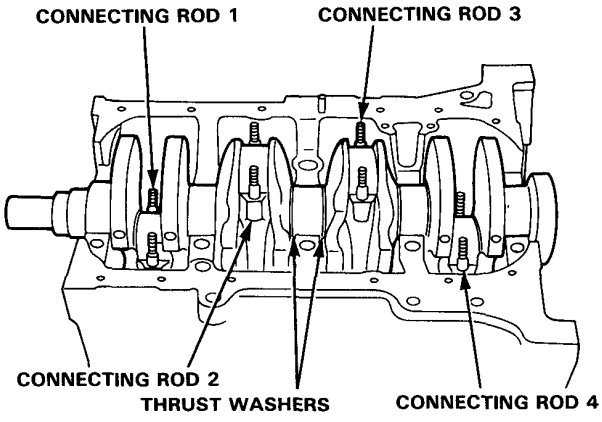


NOTE: Refer to page 8-7 for steps on the oil pun side oil seal.

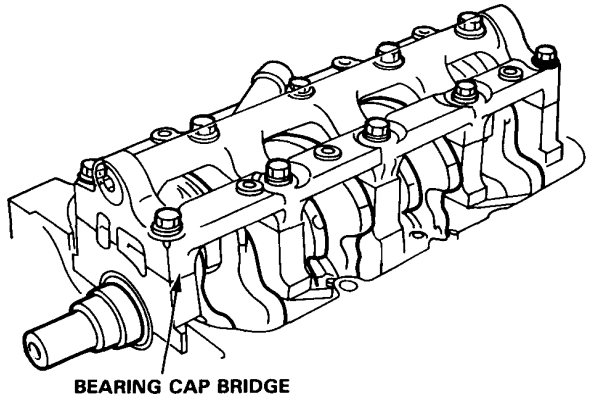
Installation

Before installing the crankshaft, apply a coat of engine oil to the main bearings and rod bearings.

1. Insert bearing halves in the engine block and connecting rod.
2. Hold the crankshaft so rod journals for cylinder No. 2 and No.3 are straight down.
3. Lower the crankshaft into the block, seating the rod journals into connecting rods No. 2 and No. 3 and install rod caps and nuts finger tight.



4. Rotate the crankshaft clockwise, seat journals into connecting rods No. 1 and No. 4, and install the rod caps and nuts finger tight.
5. Install the thrust washers, main bearing halves caps and cap bridge, check clearance with plastigage (page 7-5), then torque the nuts to 55 N·m (5.5 kg-m, 40 lb-ft).
   Oil thrust washer surfaces.



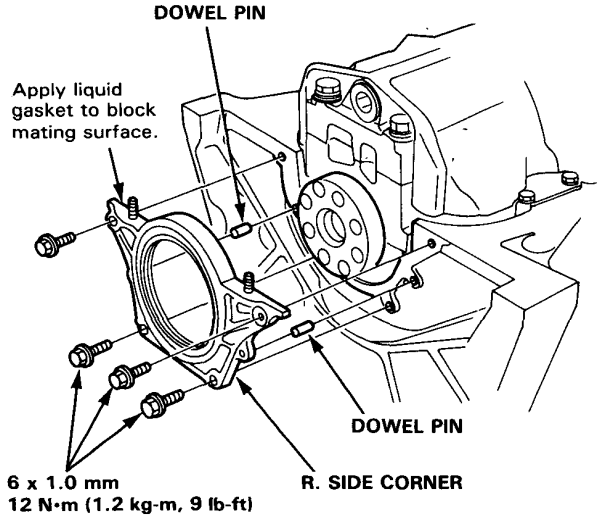
6. Check the rod bearing clearance with plastigage (page 7-5), then torque nuts to 45 N·m (4.5 kg-m, 33 lb-ft).

   NOTE: Reference numbers on connecting rod are for big-end bore tolerance and do NOT indicate the position of piston in engine.

   CAUTION: Whenever any crankshaft or connecting rod bearing is replaced, after reassembly run the engine at idling speed until it reaches normal operating temperature, then continue to run for approximately 15 minutes.

7. Insatll the baffle plate.
8. Apply non-hardening liquid gasket to the block mating surface of the right side cover and oil pump case, and install them on the engine block.

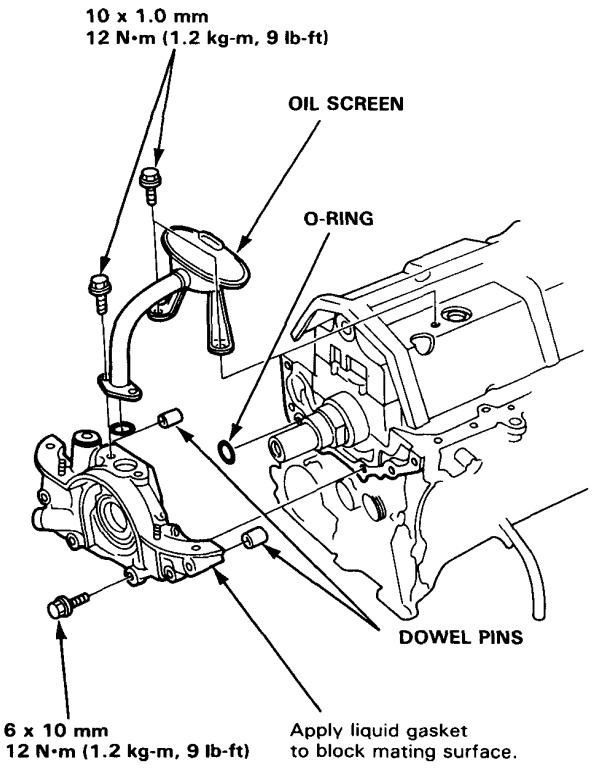
R.SIDE COVER SIDE;



(cont'd)

Installation (cont'd)

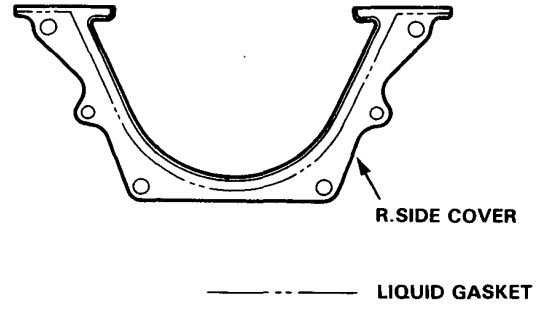
OIL PUMP SIDE:



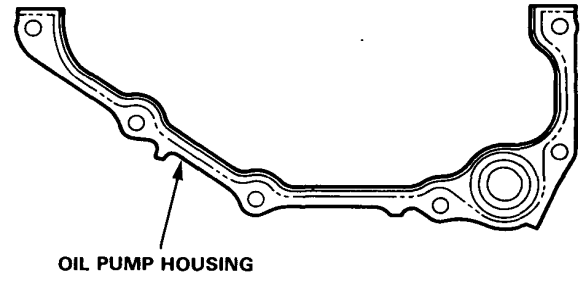
NOTE:

- Use HONDA PART NO 08740—99986 for the liquid gasket.
- Check that the mating surfaces are clean and dry before applying liquid gasket.
- Apply liquid gasket by starting with an even bend, centered between edges of the mating surface.
- To prevent leakage of oil, apply liquid gasket to the inner threads of the bolt holes.

R.SIDE COVER SIDE:



OIL PUMP SIDE:



- Do not allow the sealant to dry before assembly.
- Wait at least 30 minutes after assembly before filling the engine with oil.

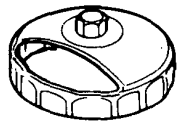
8. Install the oil screen.
9. Install the oil pan.

Engine Lubrication

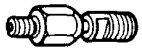
B20A2 Engine

Special Tools

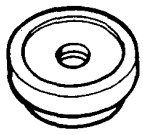
Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07912—6110001	Oil Filter Socket Wrench	1	
②	07406—0030000	Oil Pressure Gauge Adaptor	1	
③	07746—0010400	Attachment, 52 x 55 mm	1	
④	07749—0010000	Driver	1	07949—6110000 may also be used.



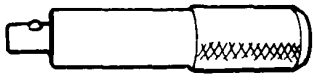
①



②



③



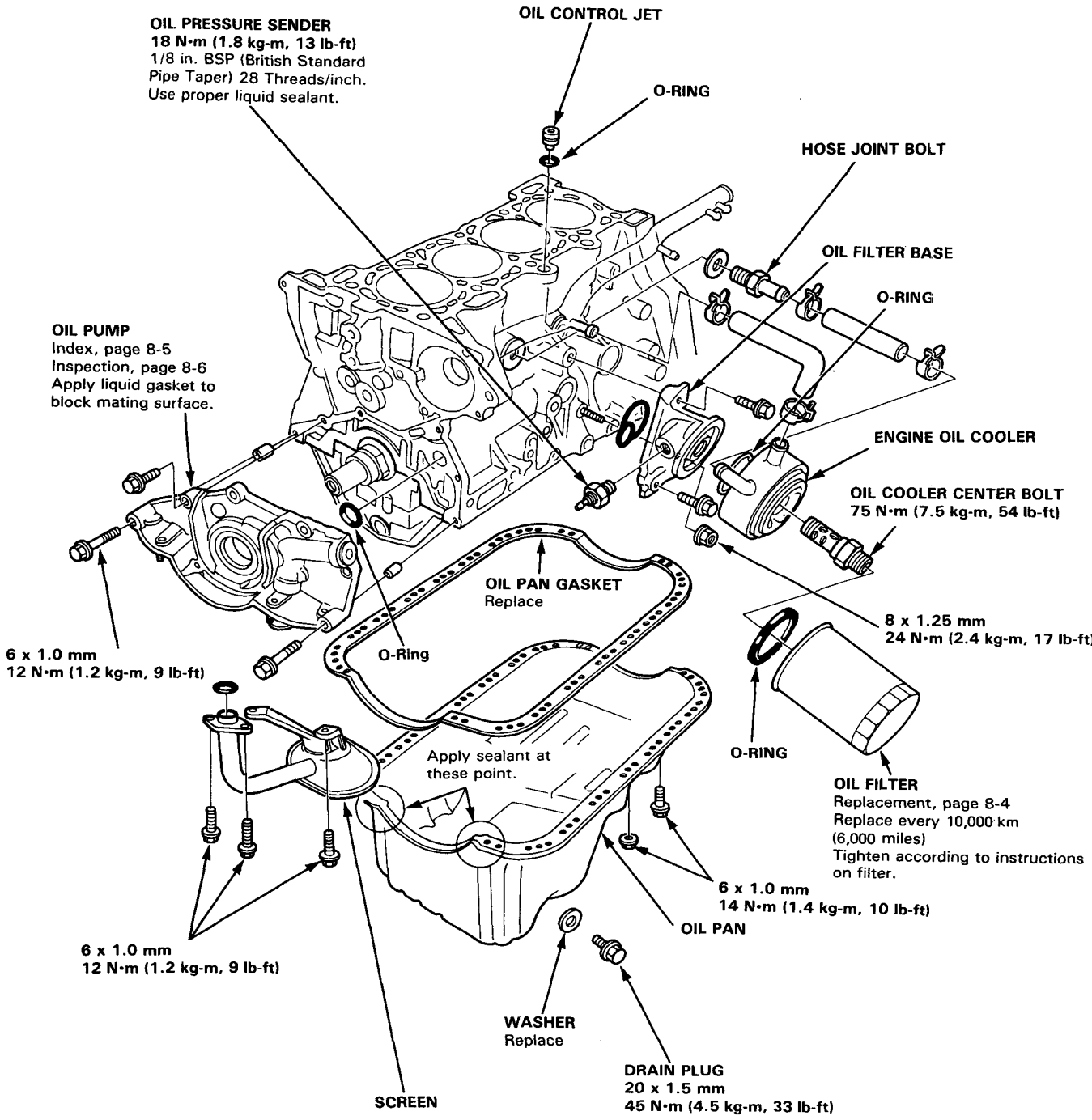
④

Engine Lubrication

Illustrated Index

NOTE:

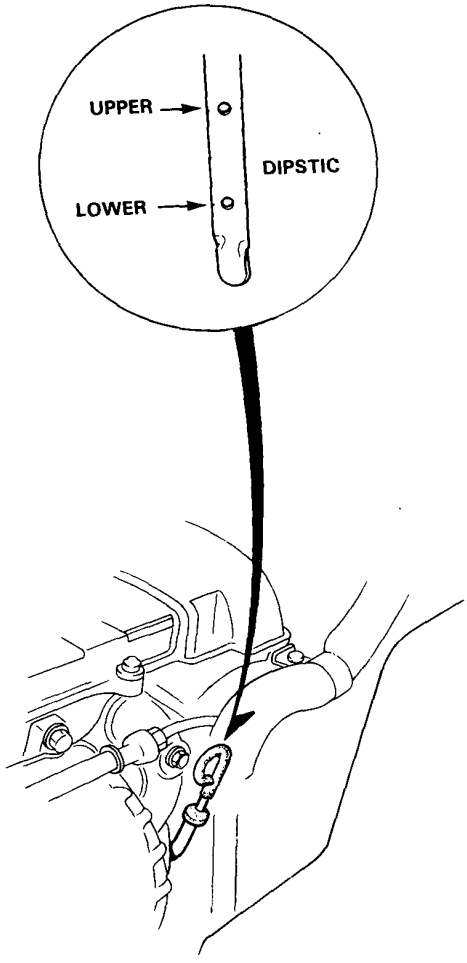
- Use new O-rings whenever reassembling.
- Apply oil to O-rings before Installation.



Engine Oil

Level Inspection

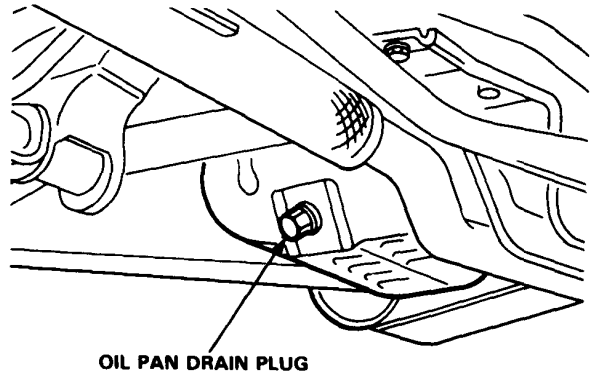
1. Check engine oil with the engine off and the car parked on level ground.
2. Make certain that the oil level indicated on the dipstick is between the upper and lower marks.
3. If the level has dropped close to the lower mark, add oil until it reaches the upper mark.



Replacement

1. Warm up the engine.
2. Drain the engine oil.

   NOTE: Remove the filler cap to speed draining.



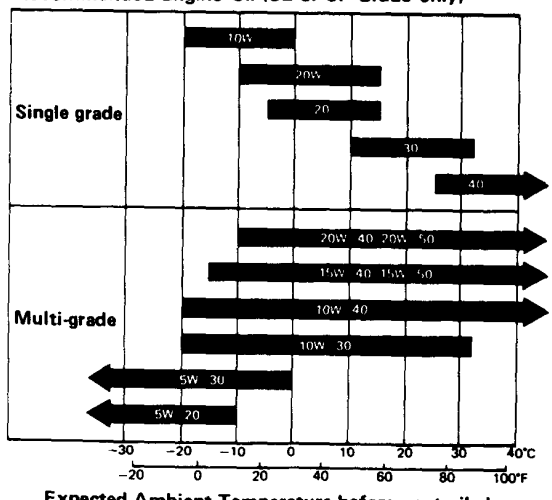
OIL PAN DRAIN PLUG
45 N·m (4.5 kg-m, 33 lb-ft)

3. Reinstall the drain drain plug with a new washer, and refill with the recommended oil.

Capacity	3.5 lit (3.7 US qt, 3.1 Imp. qt) Exclude oil filter 4.0 lit (4.2 US qt, 3.5 Imp. qt) Adding replace oil filter 5.0 lit (5.3 US qt, 4.4 Imp. qt) Means designed value
Change	Every 10,000 km (6,000 miles)

NOTE: Oil filter should be replaced at each oil change.

Recommended Engine Oil (SE or SF Grade only)



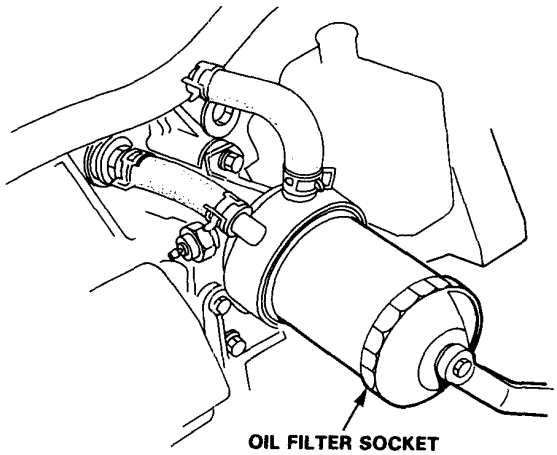
Expected Ambient Temperature before next oil change

Oil Filter

Replacement

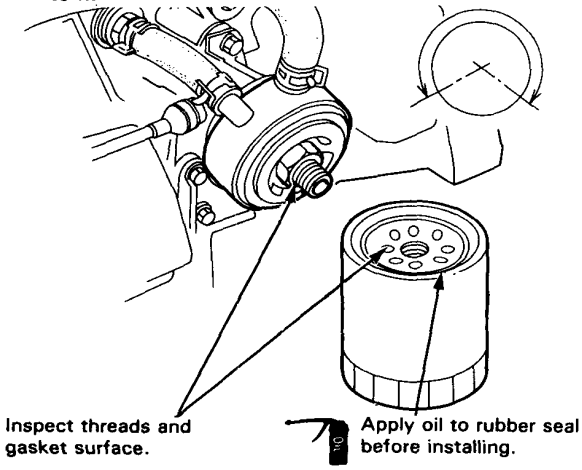
CAUTION: After the engine has been run, the exhaust pipes will be hot; be careful when working around the exhaust manifold.

1. Remove the oil filter with the special oil filter socket.



2. Inspect the threads and gasket on the new filter. Wipe off seat on engine block, then apply a light coat of oil the gasket, and install filter. Tighten according to instructions on, or with, the filter.

NOTE: Use only filters with a built-in bypass system.



Oil Pressure

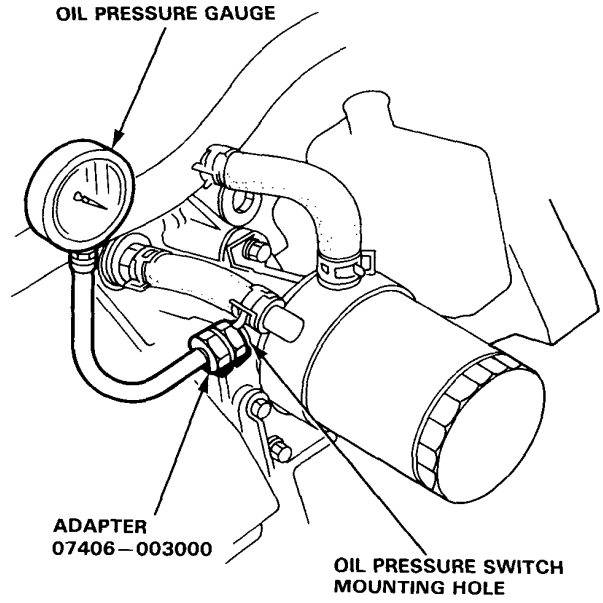
Test

If the oil pressure warning light stays on with the engine running. Check the engine oil level. If the oil level is correct:

1. Remove the oil pressure sender and install an oil pressure gauge.
2. Start the engine and allow to reach operating temperature (fan comes on at least twice).
3. Pressure should be:

Engine Oil Pressure:
at idle: 137 kPa (1.4 kg/cm², 20 psi) minimum
at 3,000 rpm: 470—559 kPa (4.8—5.7 kg/cm² 67-80 psi)

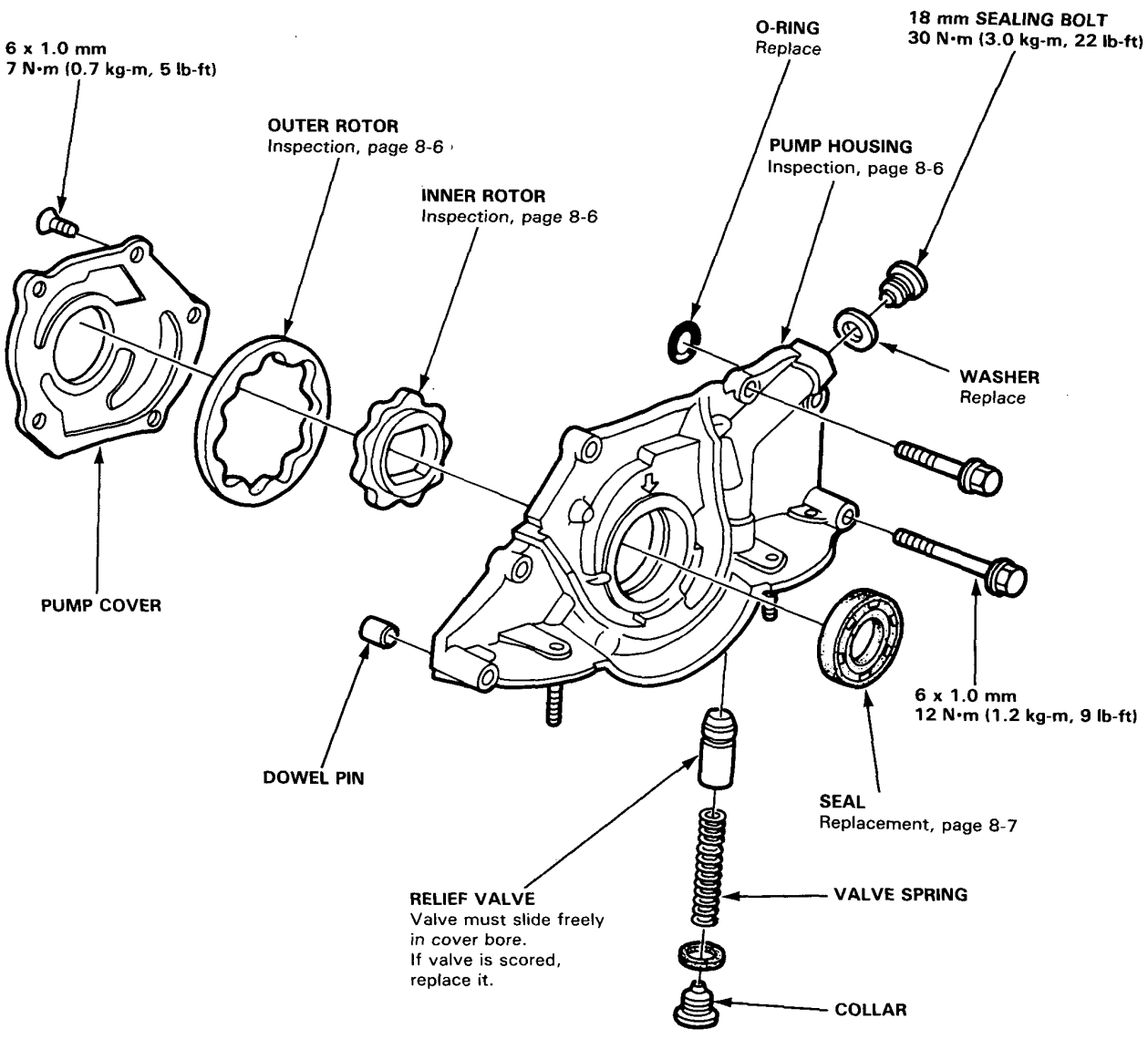
- If oil pressure is within specifications, replace oil pressure sender and recheck.
- If oil pressure is NOT within specifications, inspect oil pump (page 8-6).



Oil Pump

Illustrated Index

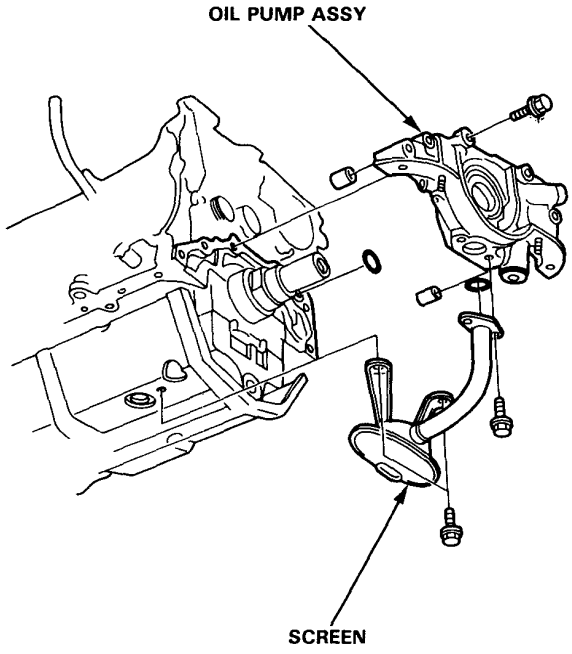
NOTE:
- Note the installation direction of the rotors.
- After assembling, check that the rotors turn smoothly.



Oil Pump

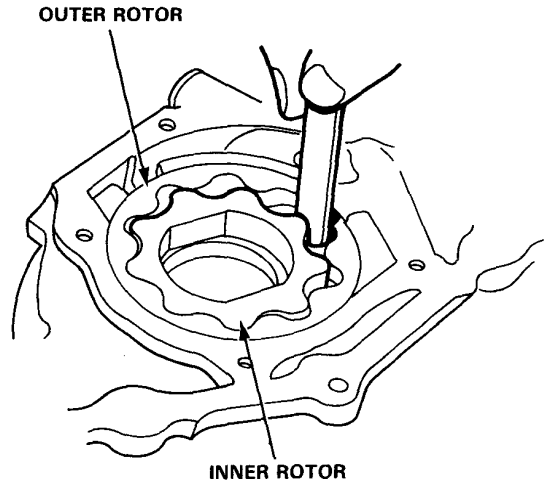
Removal/Inspection

1. Drain the engine oil.
2. Turn the crankshaft and align the "T" mark on the crankshaft pulley with the index mark on the cover.
3. Remove the cylinder head cover and timing belt upper cover.
4. Remove the alternator belt.
5. Remove the crankshaft pulley and remove the timing belt lower cover.
6. Replace the belt tensioner, and remove the timing belt and driven pulley.
7. Remove the oil pan.
8. Remove the oil screen.
9. Remove the mounting bolts and the oil pump assembly.



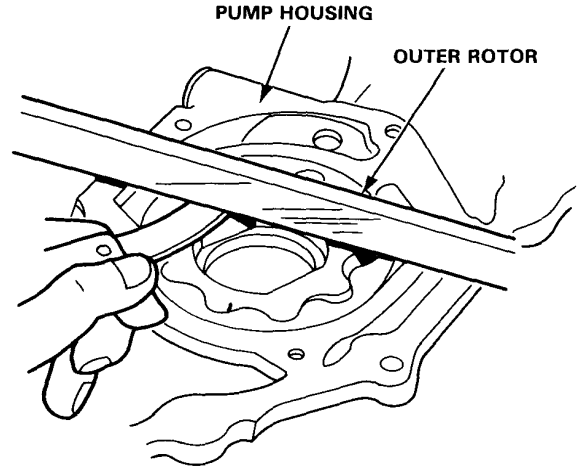
10. Remove the five screws from the pump housing, then separate the housing and cover.
11. Check the radial clearance on the pump rotor.

Rotor Radial Clearance
Standard (New): 0.04—0.16 mm (0.002—0.006 in.)
Service Limit: 0.2 mm (0.008 in.)



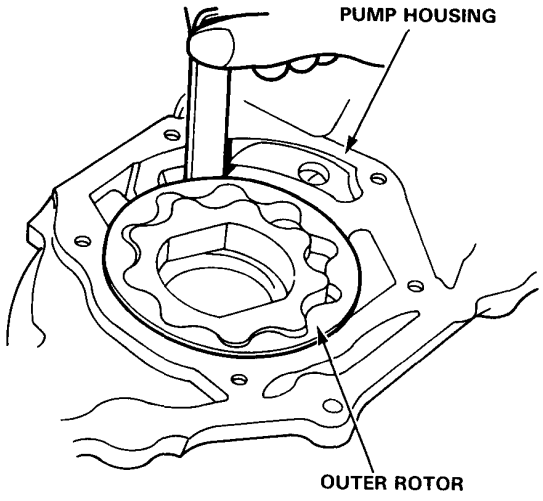
12. Check the axial clearance on the outer pump rotor.

Housing-to-Rotor Axial Clearance
Standard (New): 0.02—0.07 mm (0.001—0.003 in.)
Service Limit: 0.12 mm (0.005 in.)



13. Check the radial clearance between the housing and the outer rotor.

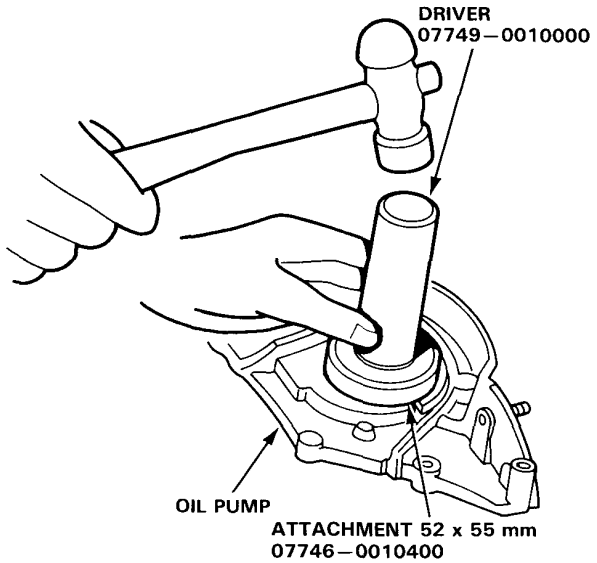
Housing-to-Rotor Radial Clearance
Standard (New): 0.1—0.19 mm (0.004—0.007 in.)
Service Limit: 0.21 mm (0.008 in.)



14. Inspect both rotors and pump housing for scoring or other damage.
Replace parts as necessary.

15. Remove the old oil seal from the oil pump.

16. Gently tap in the new oil seal until the tool bottoms on the pump.



17. Reassemble the oil pump, applying locking fluid to the pump housing screws.

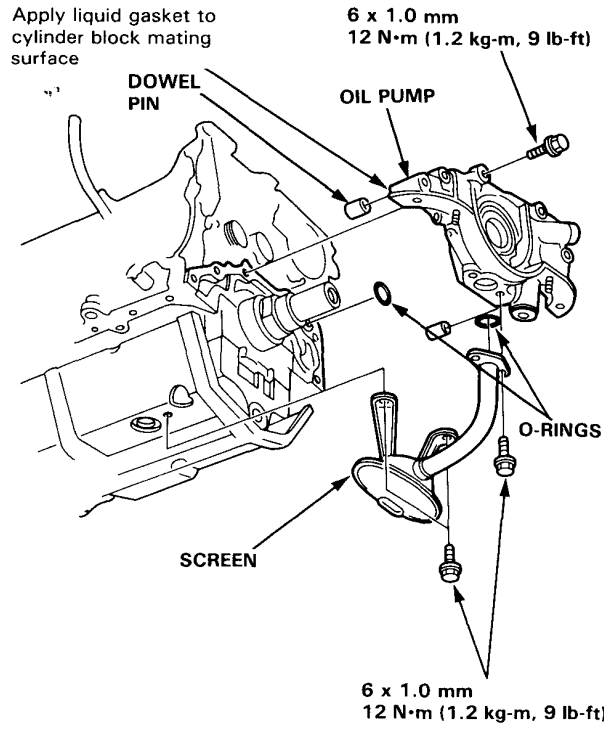
18. Check that the oil pump turns freely.

19. Apply a light coat of oil to the seal lip.

20. Install the two dowel pins and new O-ring on the cylinder block.

21. Apply liquid gasket to the cylinder block mating surface of the oil pump.

NOTE:
- Use HONDA PART NO. 08740—99986 for the liquid gasket.
- Check that the mating surfaces are clean and dry before applying liquid gasket.
- Apply liquid gasket evenly, in a narrow bead centered on the mating surface.
- To prevent leakage of oil, apply sealant to the inner threads of the bolt holes.
- Do not allow the sealant to dry before assembly.
- Wait at least 30 minutes after assembly before filling the engine with oil.



22. Install the oil pump on the cylinder block.

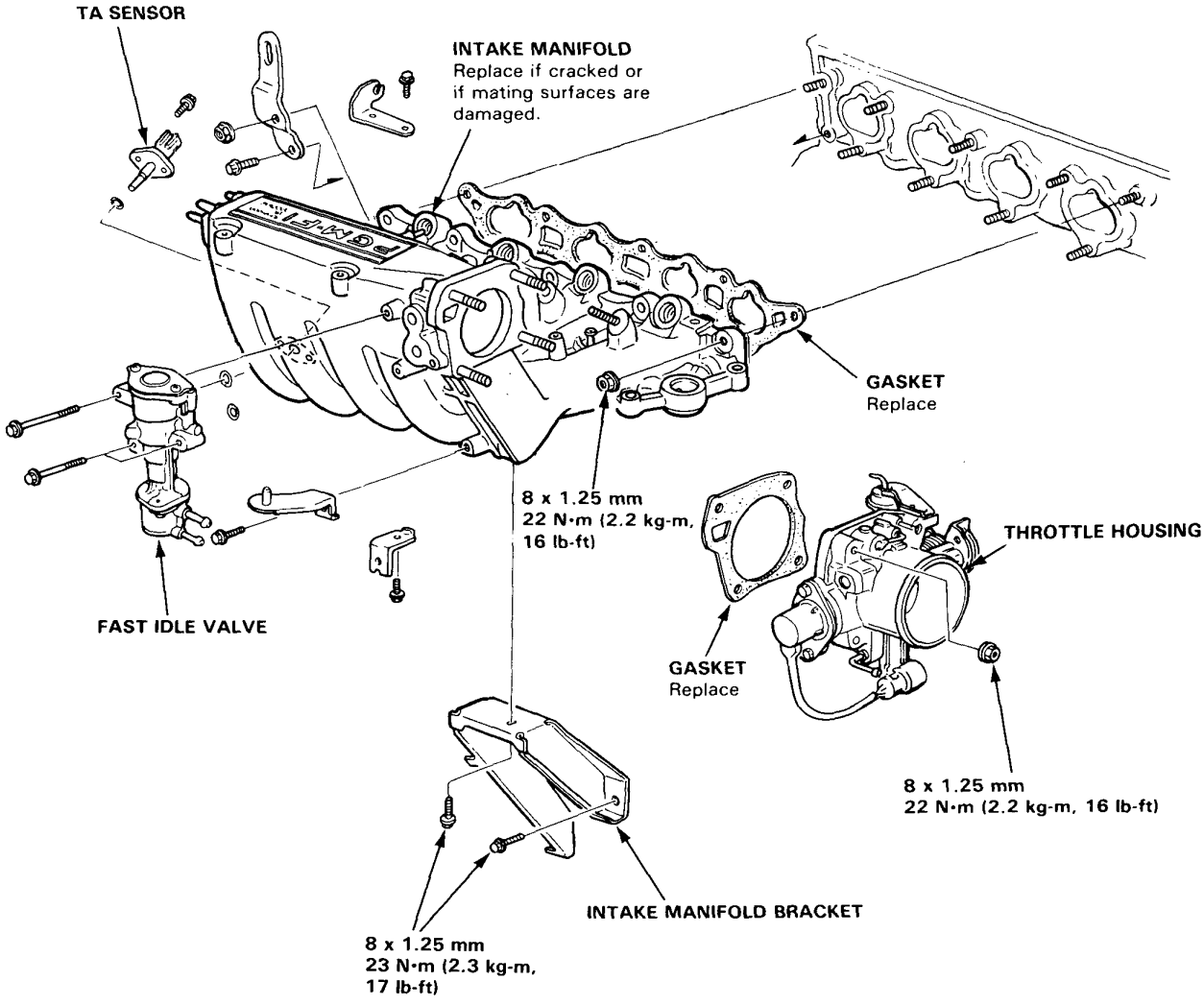
23. Install the oil screen.

Intake Manifold/Exhaust System

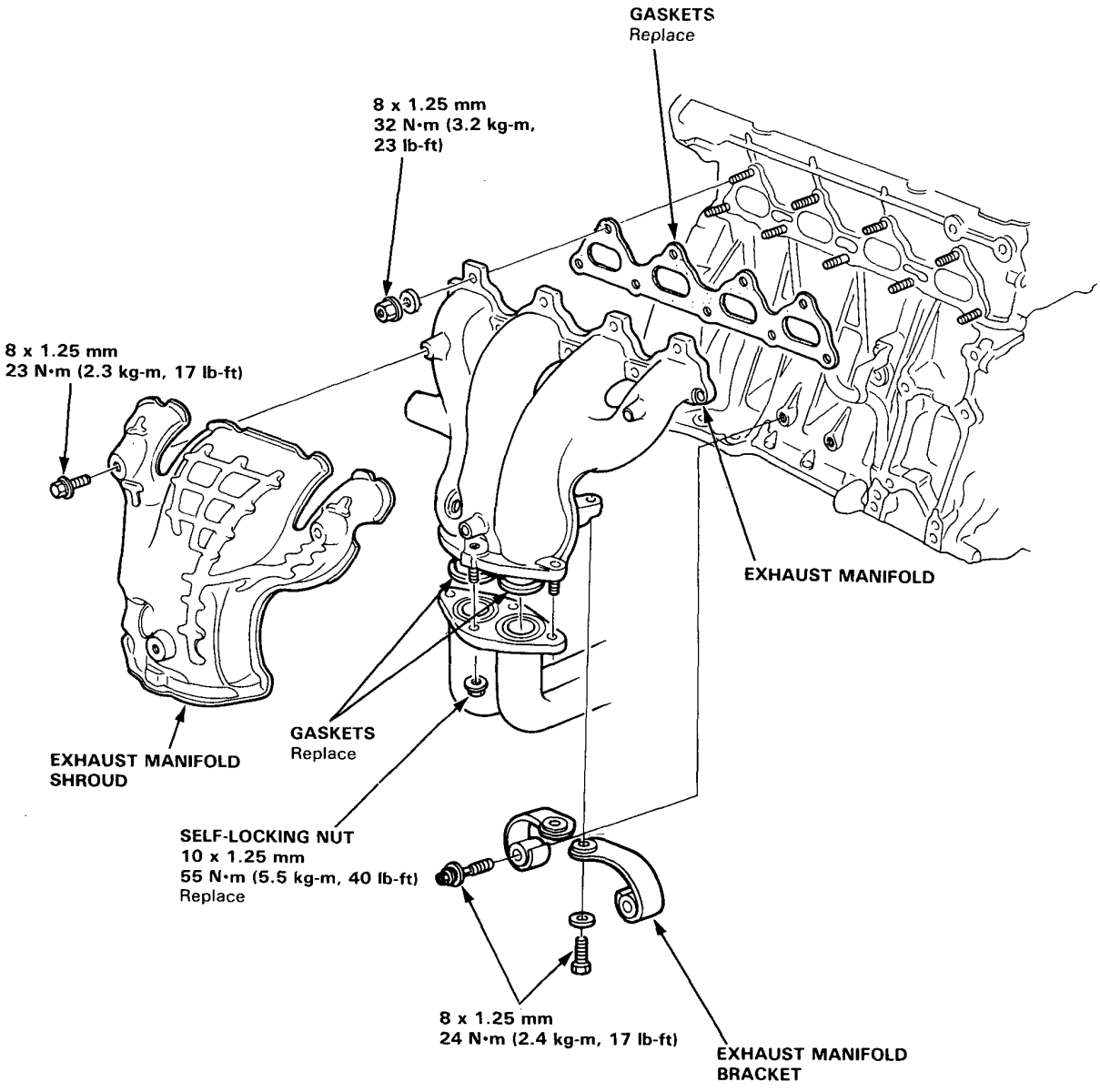
B20A2 Engine

Intake Manifold

Illustrated Index



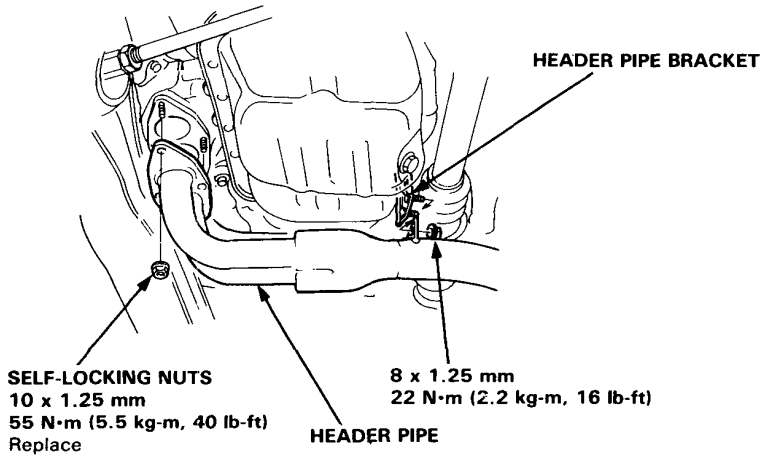
Illustrated Index

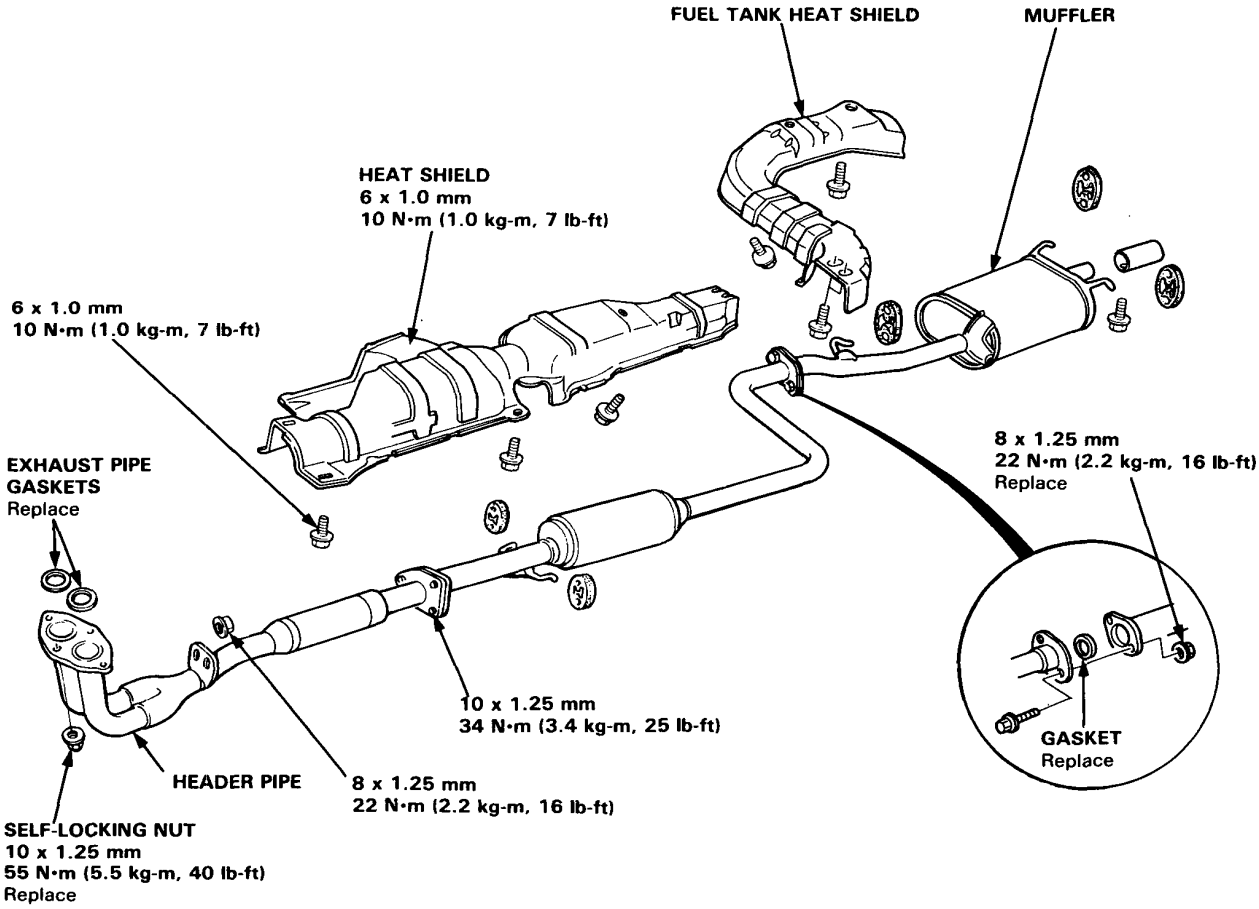


(cont'd)

Exhaust Pipe and Muffler

Replacement





Cooling

Outline of Model Change

B20A2 engine is newly added.

Radiator

Replacement

WARNING

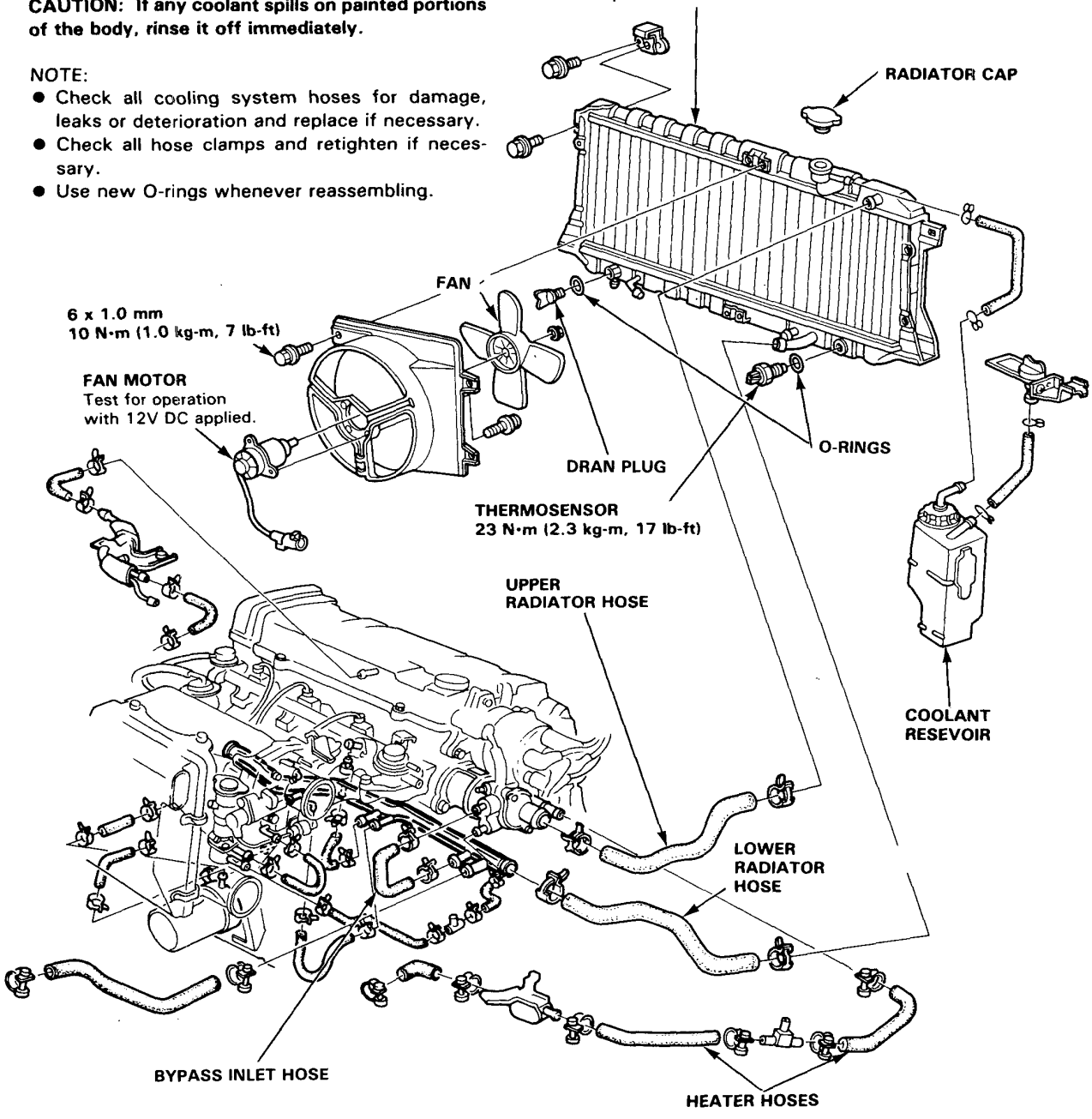
- **System is under high pressure when engine is hot. To avoid danger of releasing scalding coolant, remove cap only when engine is cool.**

Total Cooling System Capacity (Incl. heater, and reservoir tank): 5.9 liter (1.6 U.S. gal.)

CAUTION: If any coolant spills on painted portions of the body, rinse it off immediately.

NOTE:

- Check all cooling system hoses for damage, leaks or deterioration and replace if necessary.
- Check all hose clamps and retighten if necessary.
- Use new O-rings whenever reassembling.



Refilling and Bleeding

1. Set the heater temperature lever to maximum heat.
2. When the radiator is cool, remove the radiator cap and drain plug, and drain the radiator.
3. Reinstall the radiator drain plug and tighten it securely.
4. Remove, drain and reinstall the reserve tank. Fill the tank halfway to the MAX mark with water, then up to the MAX mark with coolant.
5. Mix the recommended anti-freeze with an equal amount of water, in a clean container.

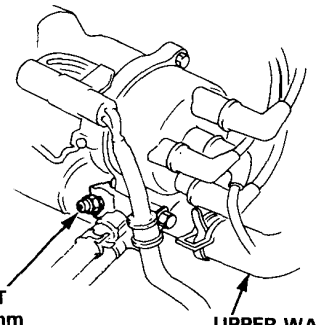
   NOTE:
   - Use only HONDA-RECOMMENDED anti-freeze/coolant.
   - For best corrosion protection, the coolant concentration must be maintained year-round at 50% MINIMUM. Coolant concentrations less than 50% may not provide sufficient protection against corrosion or freezing.
   - Coolant concentrations greater than 60% will impair cooling efficiency and are not recommended.

   CAUTION:
   - **Do not mix different brand anti-freeze/coolants.**
   - **Do not use additional rust inhibitors or anti-rust products; they may not be compatible with the recommended coolant.**

   Radiator Coolant Refill Capacity

   5.2 liters (1.4 U.S. gal.)

6. Loosen the air bleed bolt in the water outlet, then fill the radiator to the bottom of the filler neck with the coolant mixture. Tighten the bleed bolt as soon as coolant starts to run out in a steady stream without bubbles.

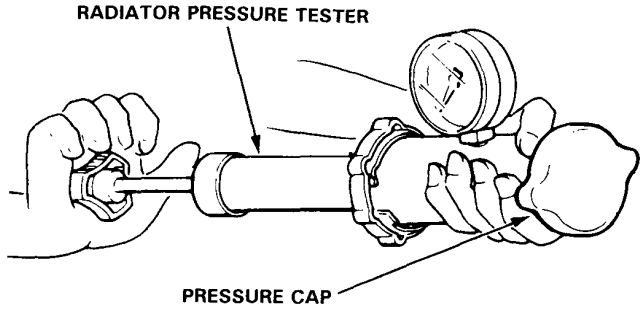


7. With the radiator cap off, start the engine and let it run until warmed up (fan goes on at least twice). Then, if necessary add more coolant mix to bring the level back up to the bottom of the filler neck.
8. Put the radiator cap on, then run the engine again and check for leaks.

Radiator

Cap Testing

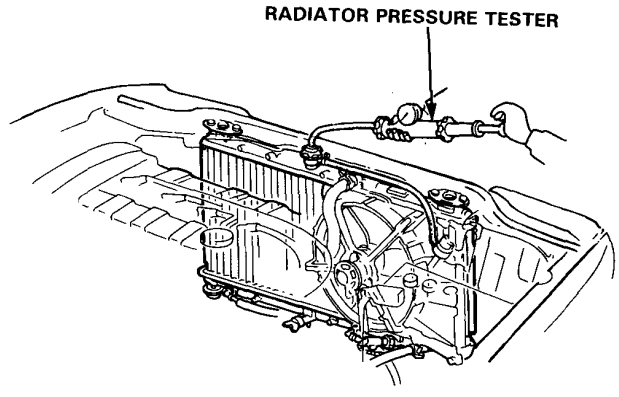
1. Remove the radiator cap, wet its seal with coolant, then install it on the pressure tester.
2. Apply a pressure of 74—103 kPa (0.75—1.05 kg/cm², 11—15 psi).
3. Check for a drop in pressure.
4. If the pressure drops, replace the cap.



Radiator Testing

1. Wait until the engine is cool, then carefully remove the pressure cap and fill the radiator with coolant to the top of the filler neck.
2. Attach the pressure tester to the radiator and apply a pressure of 74—103 kPa (0.75—1.05 kg/cm², 11—15 psi).
3. Inspect for coolant leaks and a drop in pressure.
4. Remove the tester and reinstall the pressure cap.

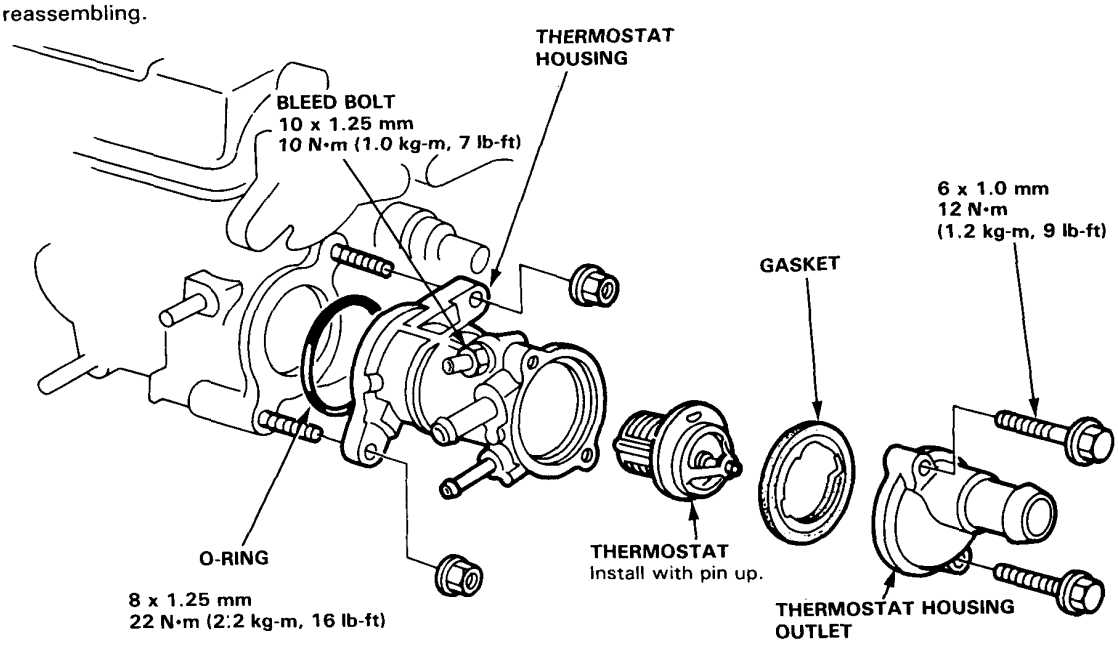
   NOTE: Check for engine oil in coolant and/or coolant in engine oil.



Thermostat

Replacement

NOTE: Use new gaskets and O-rings whenever reassembling.



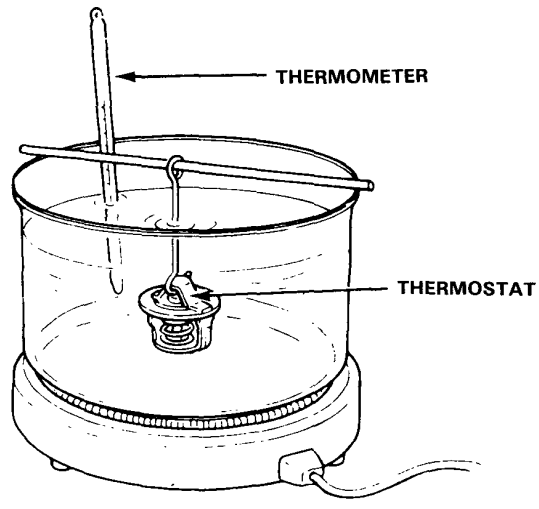
Testing

Replace thermostat if it is open at room temperature.

To test a closed thermostat:

1. Suspend the thermostat in a container of water as shown.
2. Heat the water and check the temperature with a thermometer. Check the temperature at which the thermostat first opens and at full lift.

   CAUTION: Do not let thermometer touch bottom of hot container.
3. Measure lift height of thermostat when fully open.

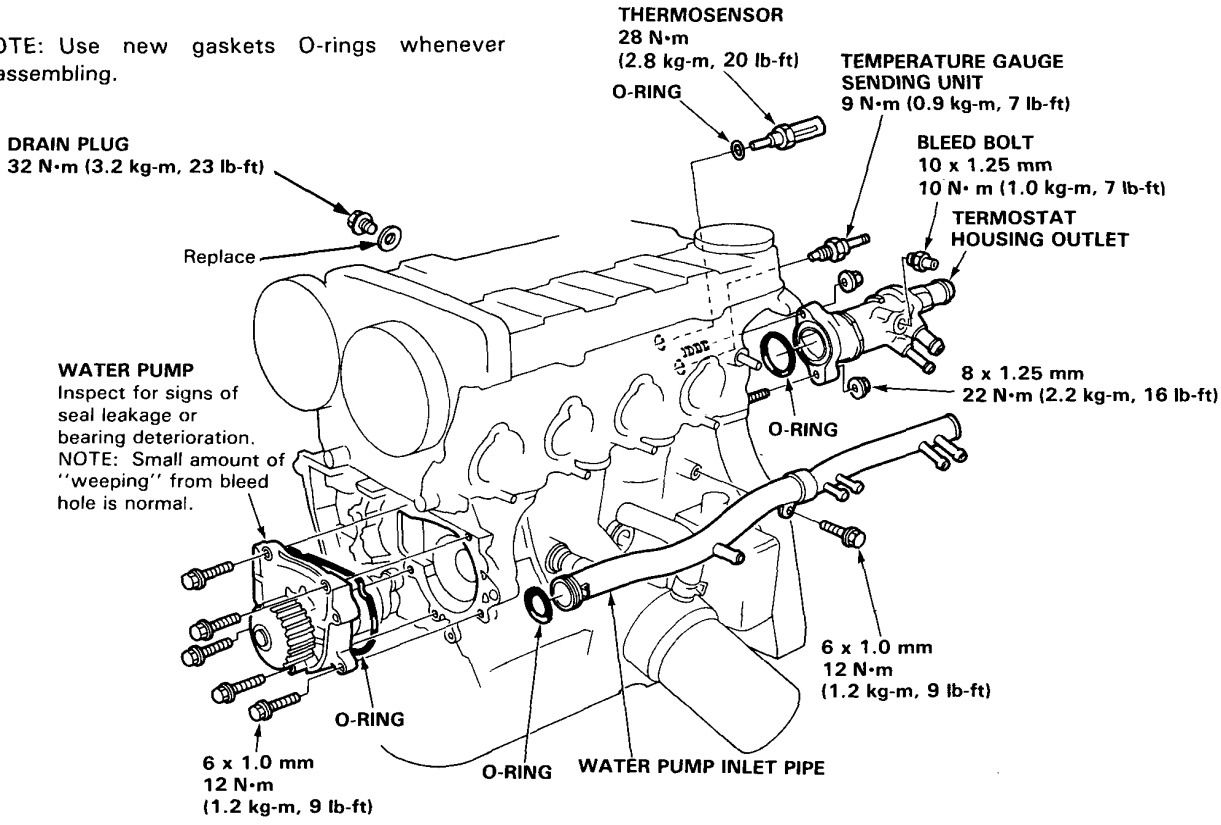


STANDARD THERMOSTAT
Lift height: 8 mm (0.31 in.)
Starts opening:
Primary: 82°C ± 2 (180°F ± 3)
Secondary: 85°C ± 2 (185°F ± 3)
Fully open: 95°C (203°F)
OPTIONAL THERMOSTAT
Lift height: 8 mm (0.31 in.)
Starts opening: 86—90°C (187—194°F)
Fully open: 100°C (212°F)

Water Pump

Replacement

NOTE: Use new gaskets O-rings whenever reassembling.



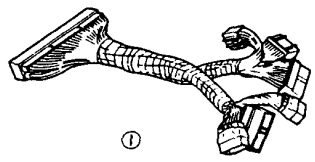
Fuel and Emission Controls

Outline of Model Changes

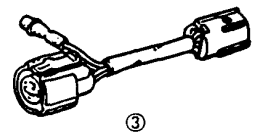
- A20A4 Engine with Evaporative Control System has been newly applied to KQ model.
- B20A2 Engine has been added (KF, KG, KE models).
  * Emission control system for new engine is basically same as A20A4 engine except B20A2 engine has secondary air supply system.

Special Tools

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07999—PD6000A	System Checker Harness	1	
②	07411—0020000	Digital Circuit Tester	1	
③	07GAZ—SE00300	R.P.M. Connecting Adapter	1	

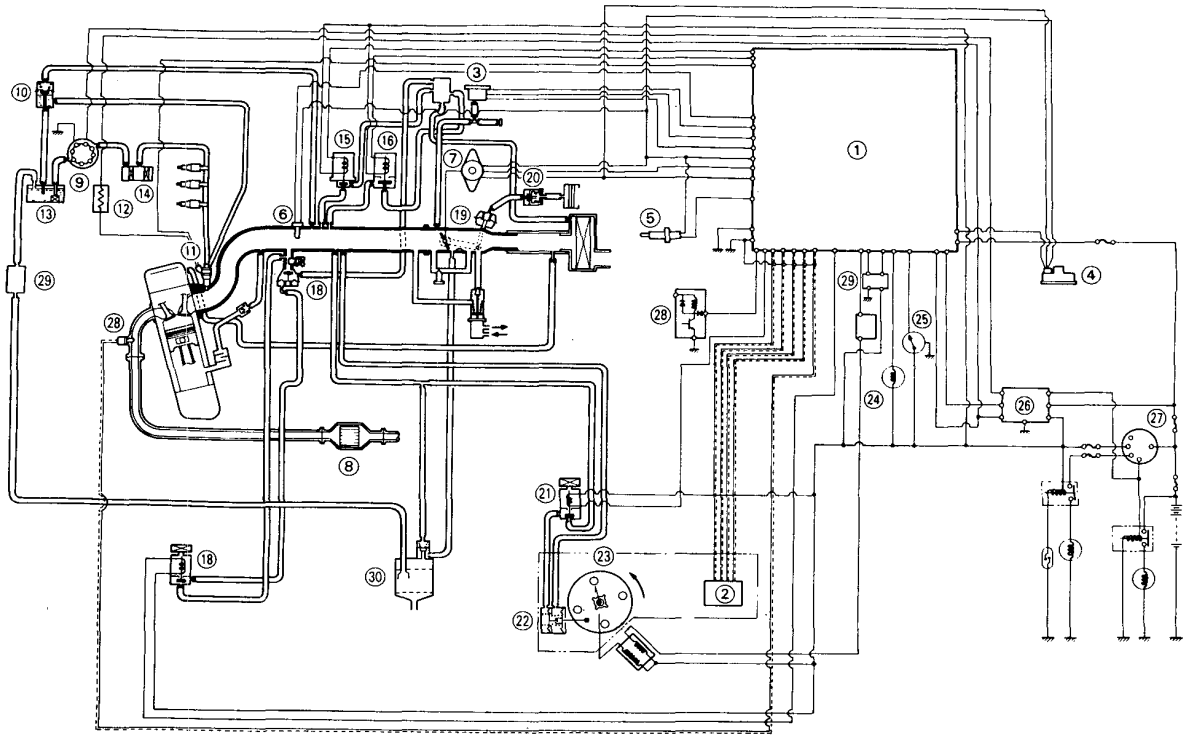

①


②


③

A20A4 Engine

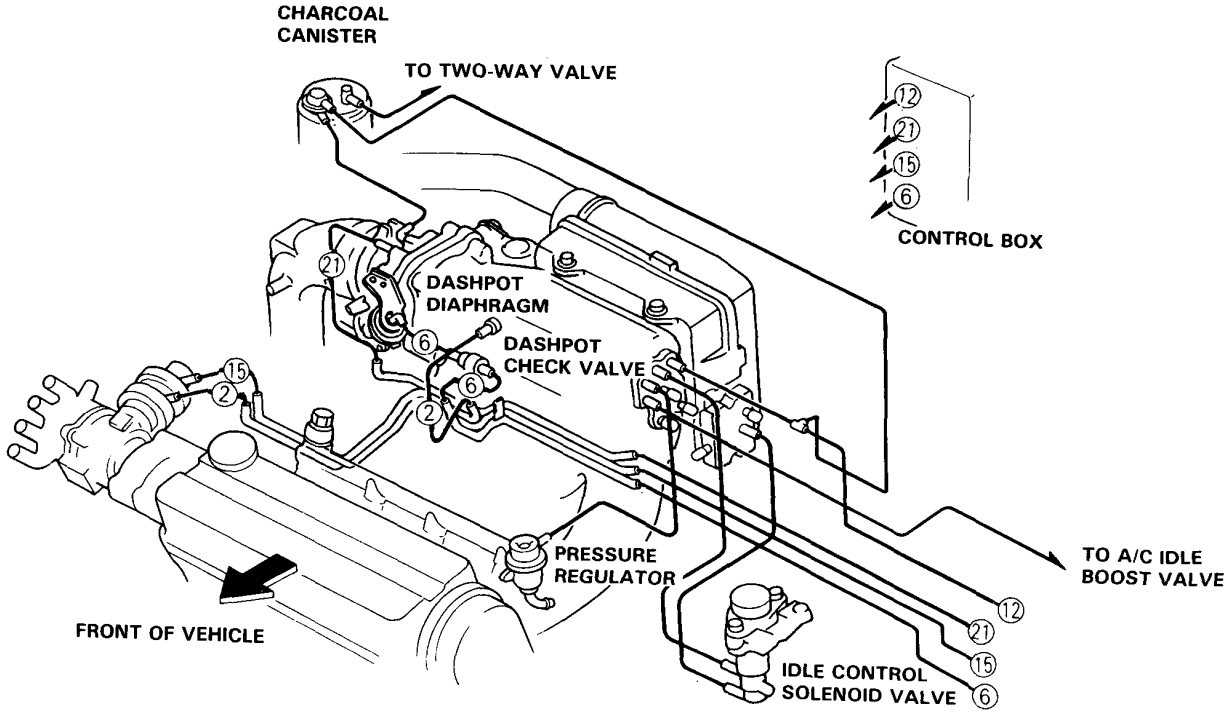
Vacuum and Electrical Connections



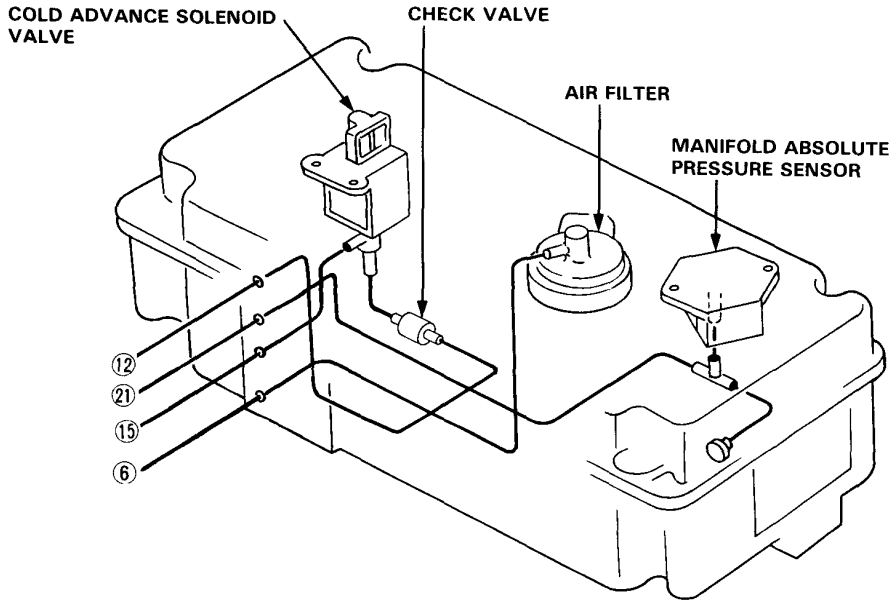
① ELECTRONIC CONTROL UNIT (ECU)
② CRANK ANGLE SENSOR
③ MANIFOLD ABSOLUTE PRESSURE SENSOR
④ ATMOSPHERIC PRESSURE SENSER
⑤ COOLANT TEMPERATURE SENSOR
⑥ INTAKE AIR TEMPERATURE SENSOR
⑦ THROTTLE ANGLE SENSOR
⑧ CATALYTIC CONVERTER
⑨ FUEL PUMP
⑩ PRESSURE REGULATOR
⑪ INJECTOR
⑫ RESISTOR
⑬ FUEL TANK
⑭ FUEL FILTER
⑮ A/T IDLE CONTROL SOLENOID VALVE
⑯ IDLE CONTROL SOLENOID VALVE
⑰ A/C IDLE BOOST SOLENOID VALVE
⑱ A/C IDLE BOOST VALVE
⑲ DASHPOT DIAPHRAGM
⑳ DASHPOT CHECK VALVE
㉑ COLD ADVANCE SOLENOID VALVE
㉒ VACUUM ADVANCE DIAPHRAGM
㉓ DISTRIBUTOR
㉔ PGM-FI WARNING LIGHT
㉕ SPEED SENSOR
㉖ MAIN RELAY
㉗ IGNITION SWITCH
㉘ OXYGEN SENSOR
㉙ TWO-WAY VALVE
㉚ CHARCOAL CANISTER

Interconnect Diagram

Manual

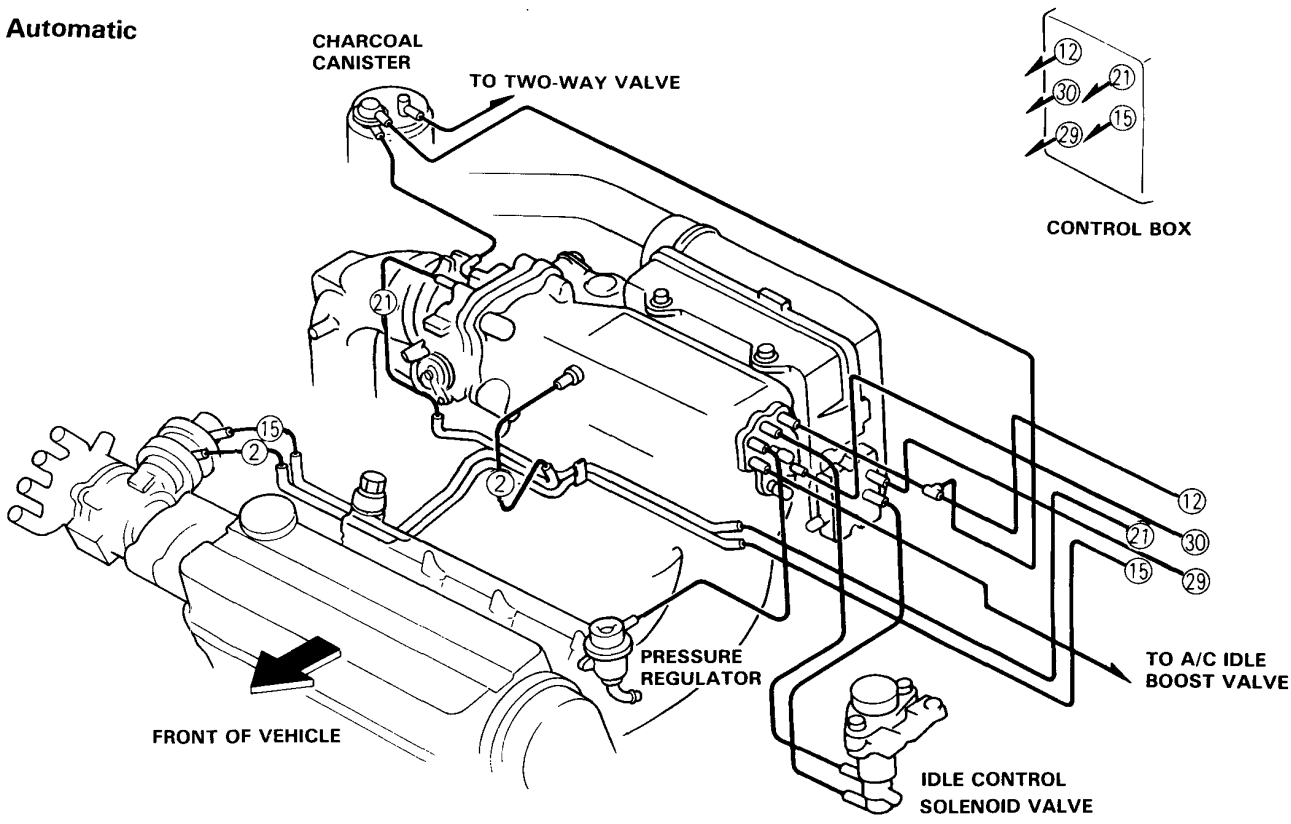


Control Box

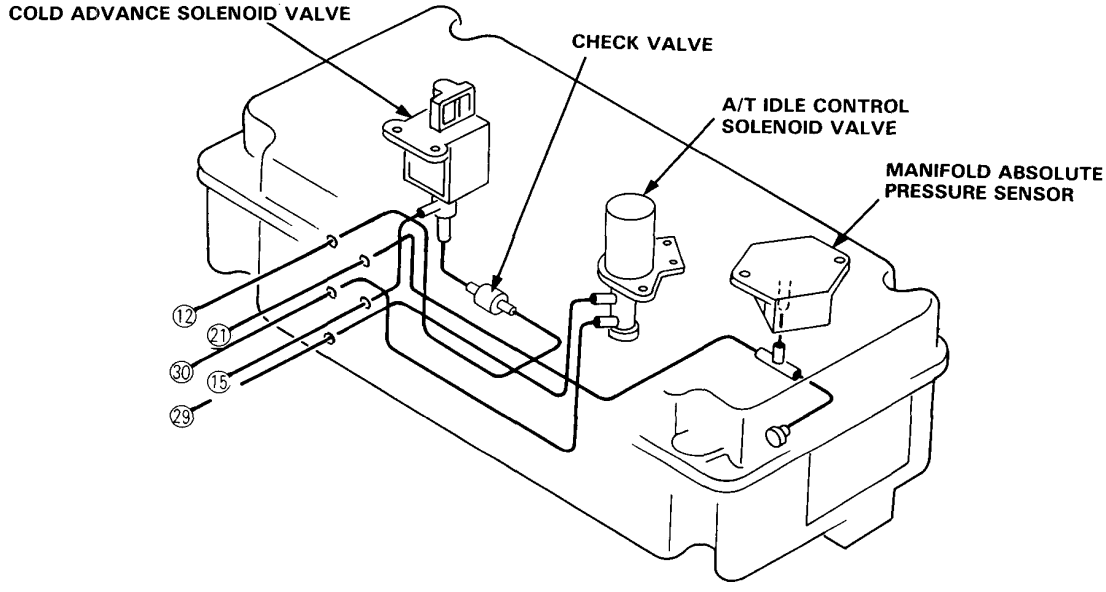


Interconnect Diagram

Automatic

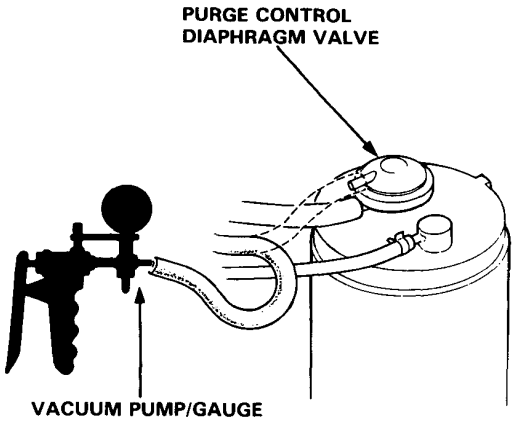


Control Box



Evaporative Controls

1. Disconnect the upper vacuum hose of the purge control diaphragm valve (on the charcoal canister) and connect vacuum gauge to the hose.



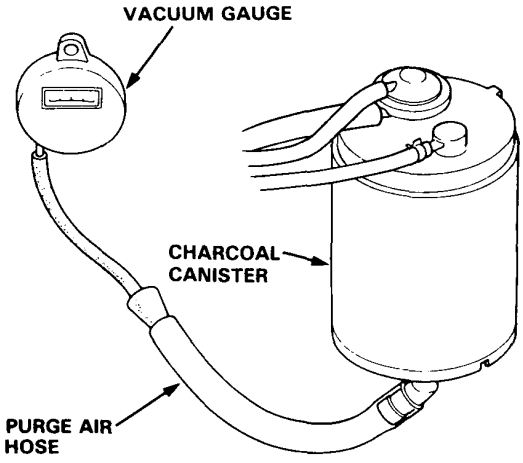
2. Start the engine and allow to idle.

   There should be vacuum.

   - If vacuum is not available, check the hose for clogging, kinking or leakage.

Charcoal Canister

1. Remove fuel filler cap.
2. Remove canister purge air hose from frame and connect hose to vacuum gauge as shown.



3. Start engine and raise speed to 3500 min^{-1} (rpm). Vacuum should appear on gauge within 1 minute.

   - If vacuum appears on gauge in 1 minute, remove gauge, test is complete.
   - If no vacuum, disconnect vacuum gauge and re-install fuel filler cap.

4. Remove charcoal canister and check for signs of damage or defects.

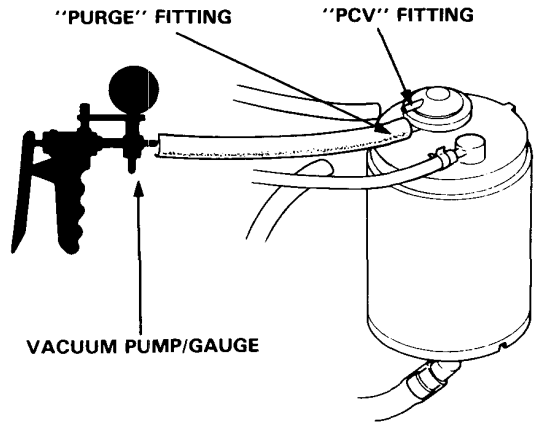
   - If defective, replace canister.
   - If OK, go on to step 5.

(cont'd)

Evaporative Controls (cont'd)

5. Stop engine. Disconnect the upper vacuum hose of the purge control diaphragm valve from canister "PCV" fitting.
   Connect vacuum pump to canister "purge" fitting as shown, and apply vacuum.

   Vacuum should remain steady.



- If vacuum remains steady, go on to step 6.
- If vacuum drops, replace canister and re-test.

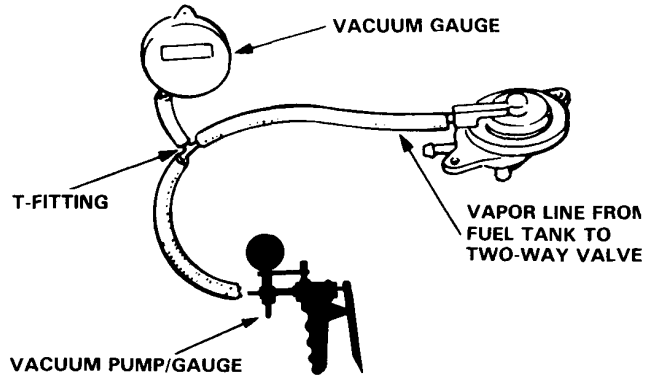
6. Restart engine. Reconnect hose to canister "PCV" fitting.

   "PURGE" side vacuum should drop to zero.

   - If "PURGE" side vacuum does not drop to zero, replace the canister and re-test.

Two-Way Valve

1. Remove the fuel filler cap.
2. Remove vapor line from the fuel tank and connect to T-fitting from vacuum gauge and vacuum pump as shown.

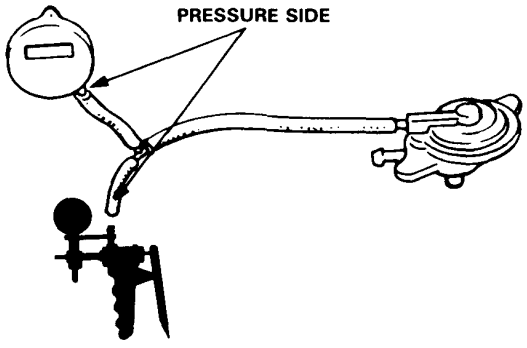


3. Slowly apply a vacuum while watching the gauge.

   Vacuum should stabilize at 5 to 15 mmHg (0.2 to 0.6 in.Hg).

   - If vacuum stabilizes momentarily (two-way valve opens) between 5 and 15 mmHg (0.2 and 0.6 in.Hg), go on to Step 4.
   - If vacuum stabilizes (valve opens) below 5 mmHg (0.2 in.Hg) or above 15 mmHg (0.6 in.Hg), install new valve and re-test.

4. Move vacuum pump hose from vacuum to pressure fitting, and move vacuum gauge hose from vacuum to pressure side as shown.



VACUUM PUMP/GAUGE

5. Slowly pressurize the vapor line while watching the gauge.

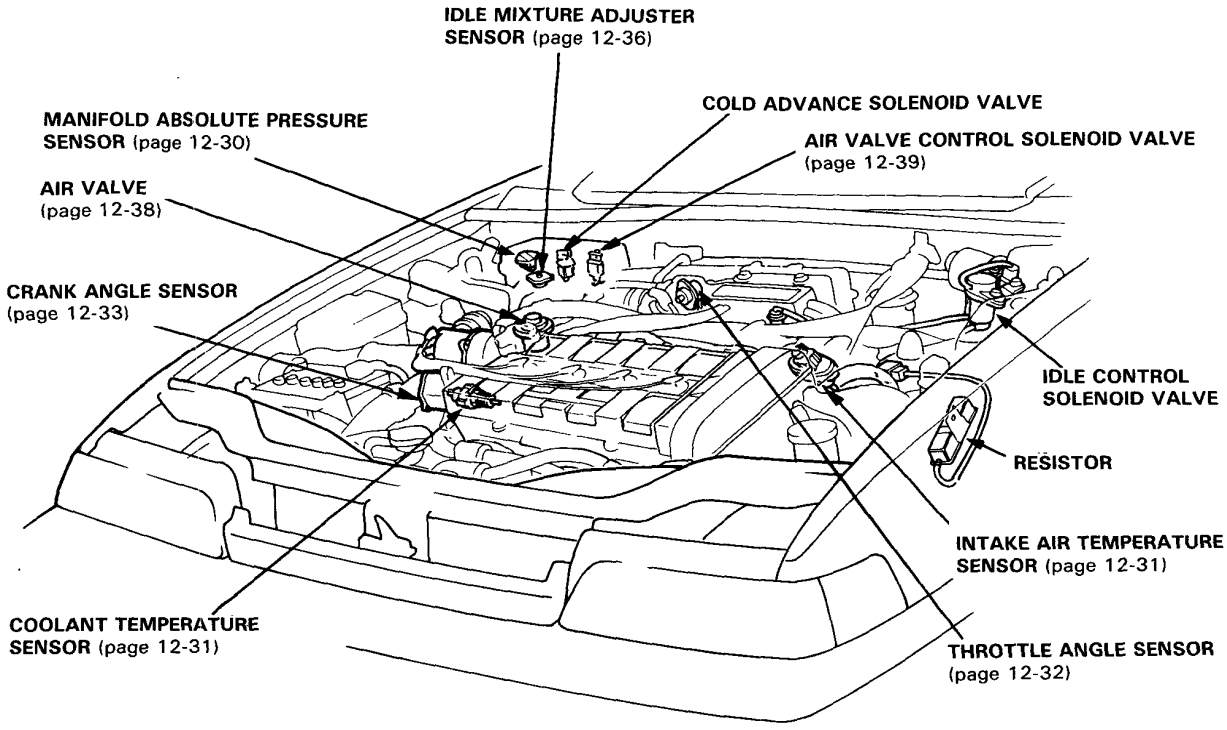
   Pressure should stabilize at:

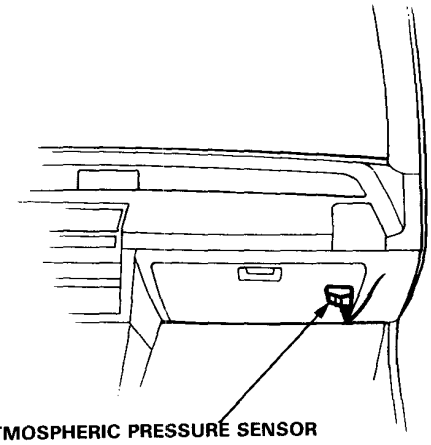
   25 to 55 mmHg (1.0 to 2.2 in.Hg)

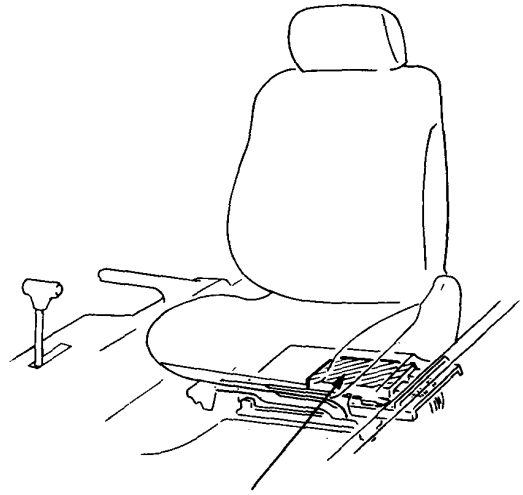
   - If pressure momentarily stablizes (valve opens) at above ranges, the valve is OK.
   - If pressure stabilizes out of above ranges, install a new valve and re-test.

B20A2 Engine

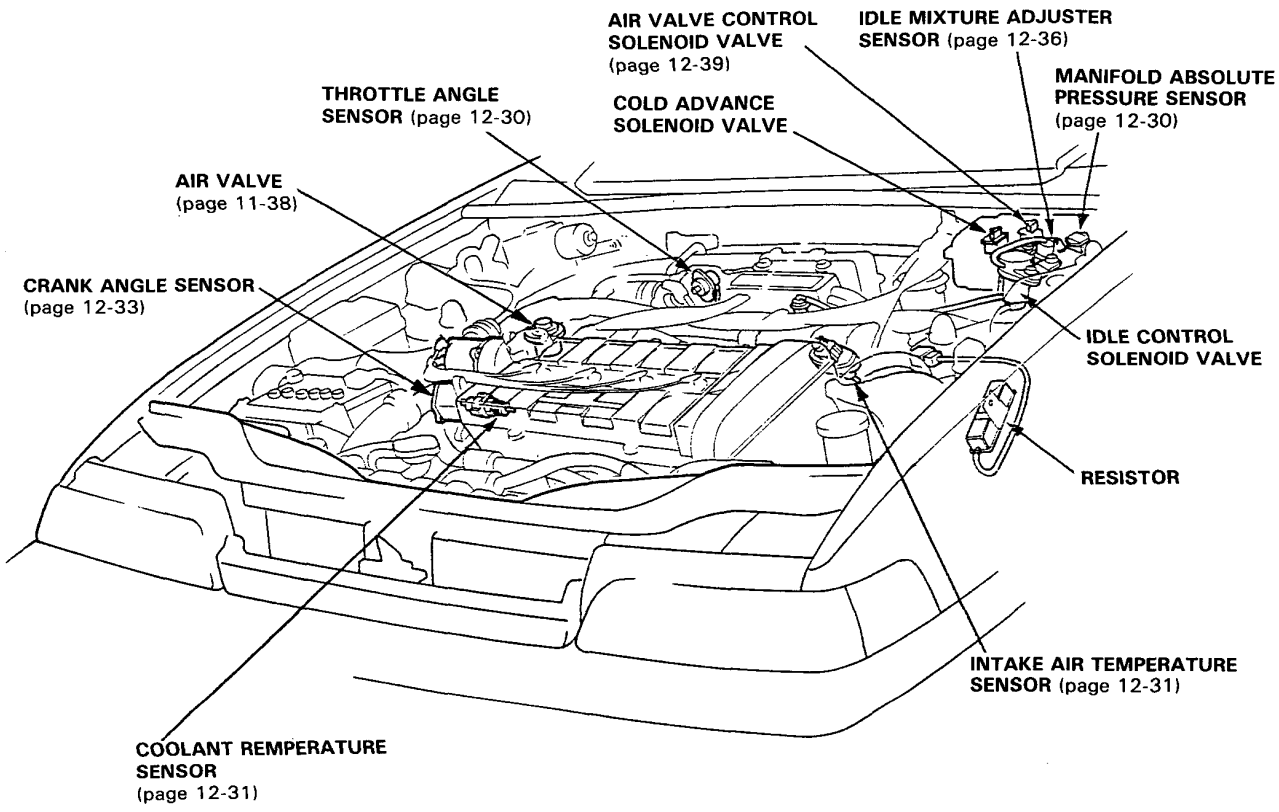
[Except KE model]

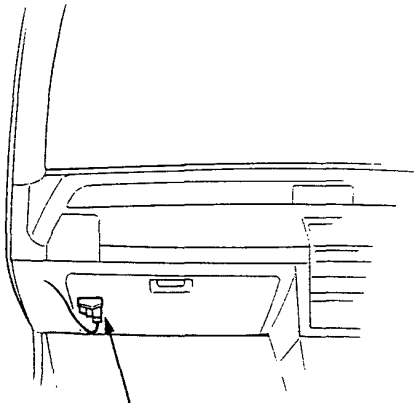


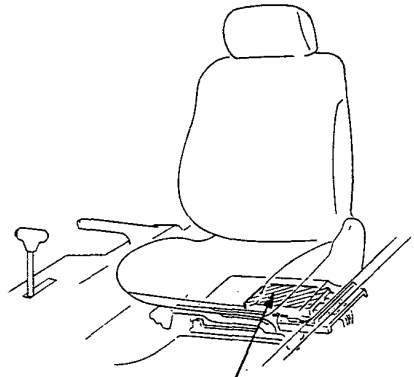


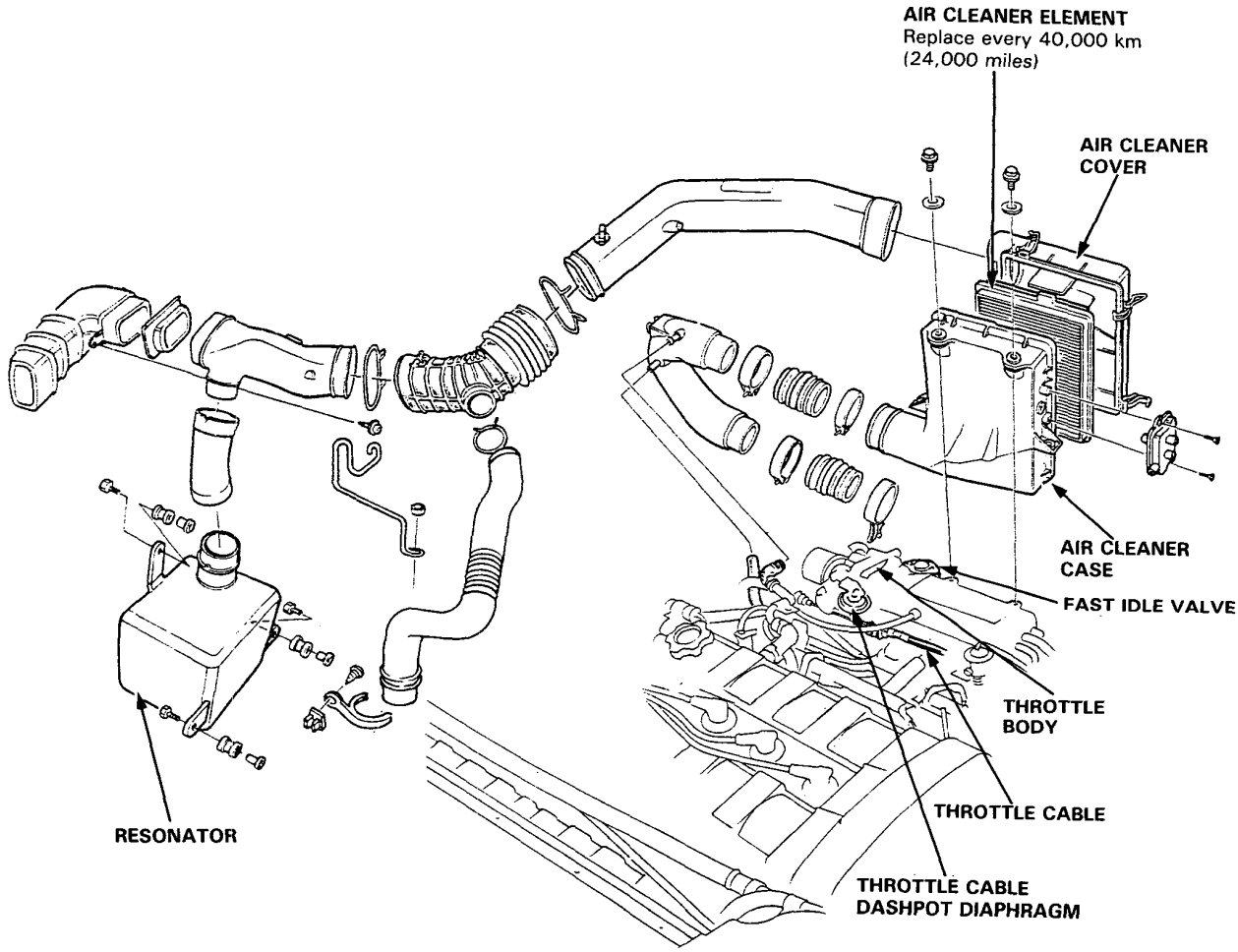


[KE model]

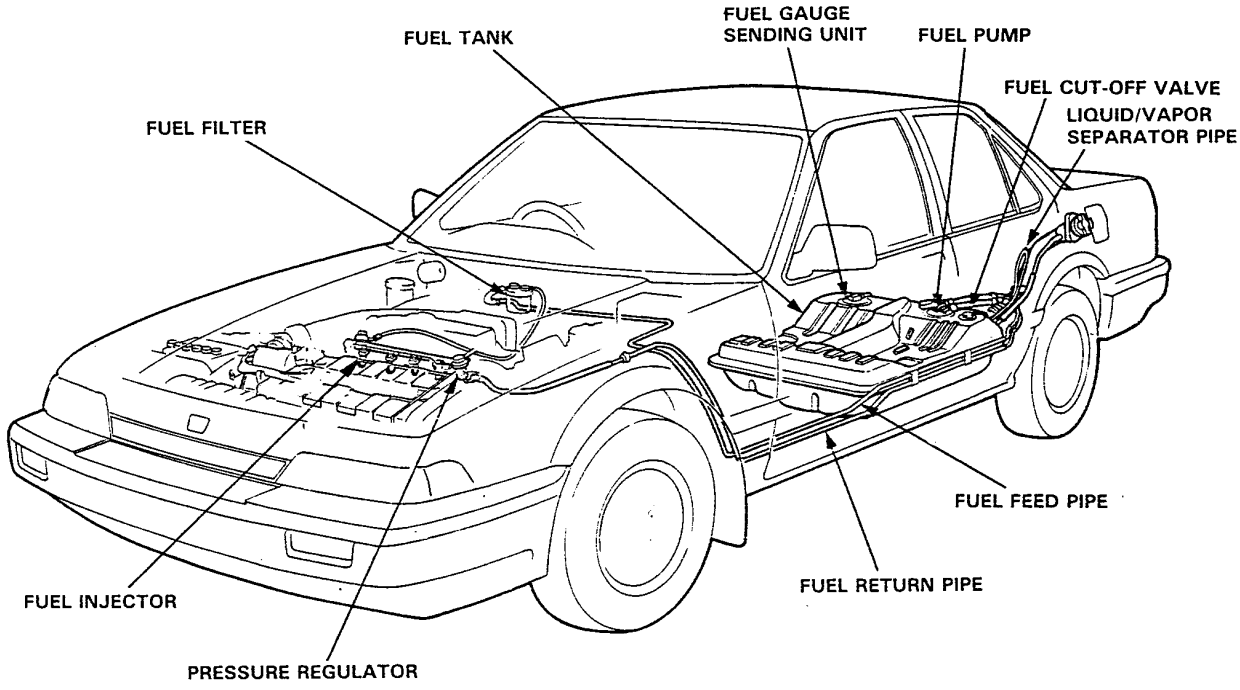

AIR VALVE CONTROL SOLENOID VALVE (page 12-39)
IDLE MIXTURE ADJUSTER SENSOR (page 12-36)
MANIFOLD ABSOLUTE PRESSURE SENSOR (page 12-30)
THROTTLE ANGLE SENSOR (page 12-30)
COLD ADVANCE SOLENOID VALVE
AIR VALVE (page 11-38)
CRANK ANGLE SENSOR (page 12-33)
IDLE CONTROL SOLENOID VALVE
RESISTOR
INTAKE AIR TEMPERATURE SENSOR (page 12-31)
COOLANT REMPERATURE SENSOR (page 12-31)


ATMOSPHERIC PRESSURE SENSOR (page 12-36)

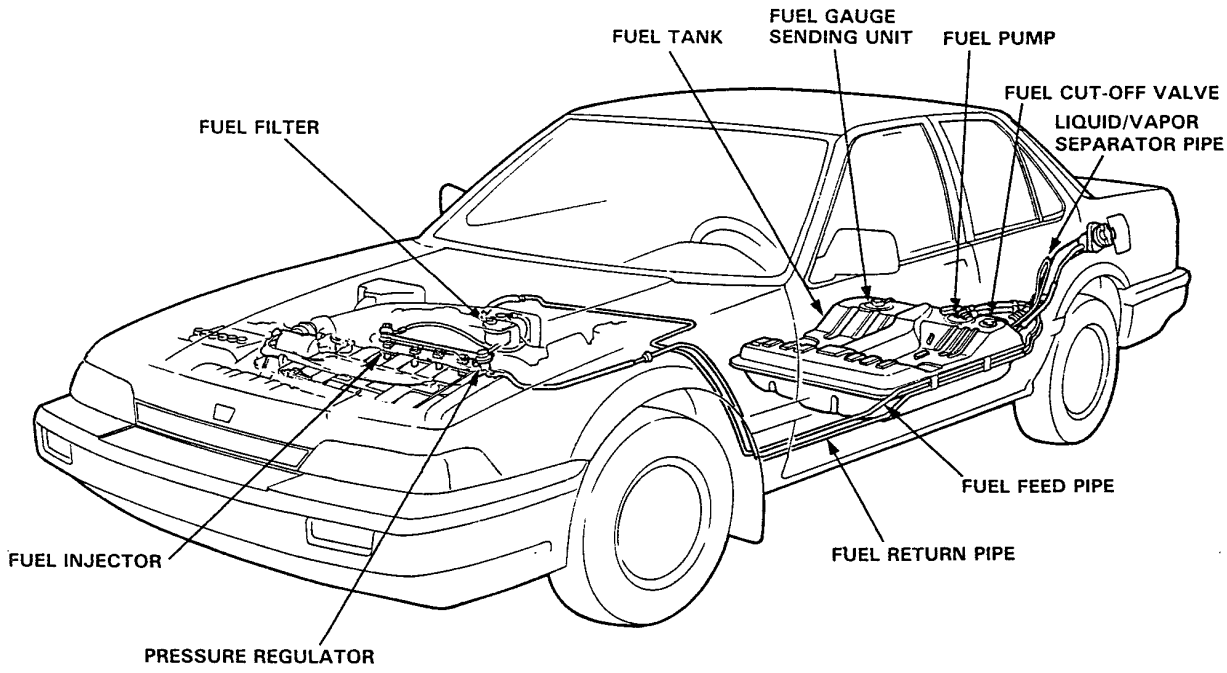

ELECTRONIC CONTROL UNIT

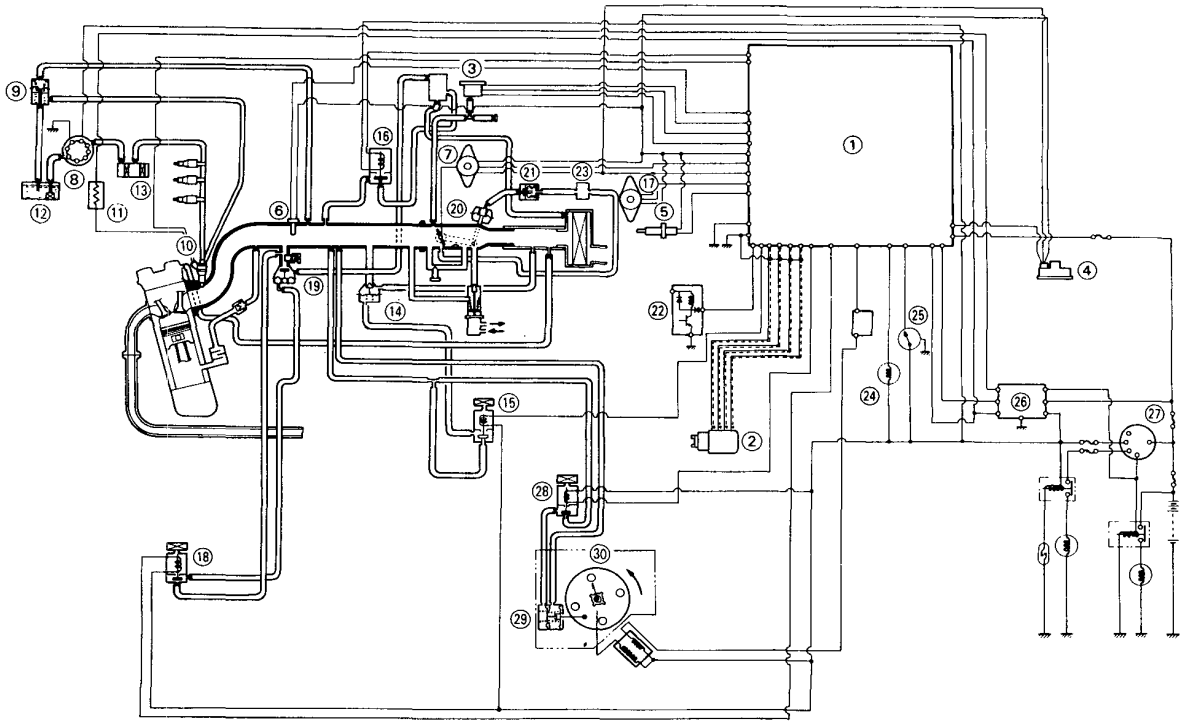

AIR CLEANER ELEMENT
Replace every 40,000 km
(24,000 miles)
AIR CLEANER COVER
AIR CLEANER CASE
FAST IDLE VALVE
THROTTLE BODY
THROTTLE CABLE
THROTTLE CABLE DASHPOT DIAPHRAGM
RESONATOR

[Except KE model]



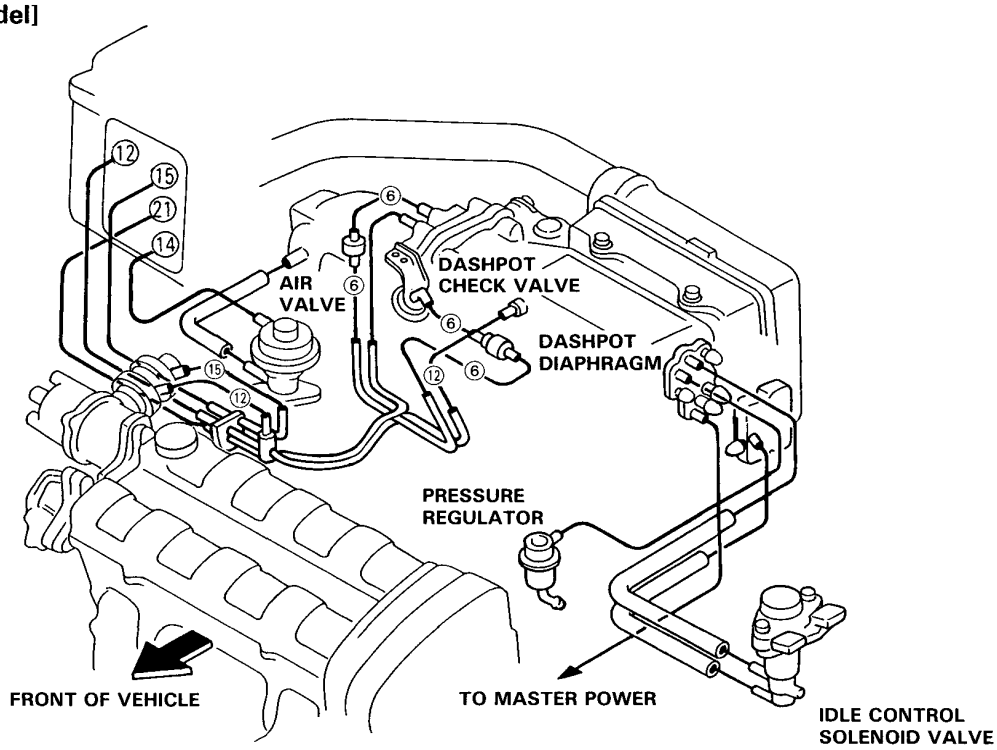
[KE model]



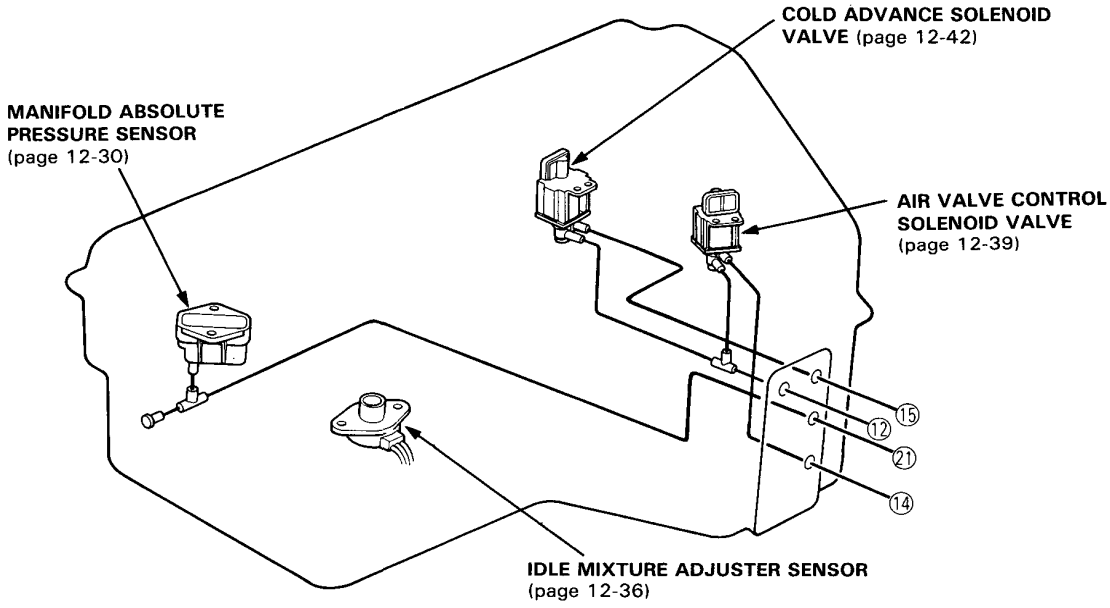


① ELECTRONIC CONTROL UNIT (ECU)
② CRANK ANGLE SENSOR
③ MANIFOLD ABSOLUTE PRESSURE SENSOR
④ ATMOSPHERIC PRESSURE SENSOR
⑤ COOLANT TEMPERATURE SENSOR
⑥ INTAKE AIR TEMPERATURE SENSOR
⑦ THROTTLE ANGLE SENSOR
⑧ FUEL PUMP
⑨ PRESSURE REGULATOR
⑩ INJECTOR
⑪ RESISTOR
⑫ FUEL TANK
⑬ FUEL FILTER
⑭ AIR VALVE
⑮ AIR VALVE CONTROL SOLENOID VALVE
⑯ IDLE CONTROL SOLENOID VALVE
⑰ IDLE MIXTURE ADJUSTER SENSOR
⑱ A/C IDLE BOOST SOLENOID VALVE
⑲ A/C IDLE BOOST VALVE
⑳ DASHPOT DIAPHRAGM
㉑ DASHPOT CHECK VALVE
㉒ ALTERNATOR
㉓ DASHPOT CHAMBER
㉔ PGM-FI WARNING LIGHT
㉕ SPEED SENSOR
㉖ MAIN RELAY
㉗ IGNITION SWITCH
㉘ COLD ADVANCE SOLENOID VALVE
㉙ VACUUM ADVANCE DIAPHRAGM
㉚ DISTRIBUTOR

[Except KE model]

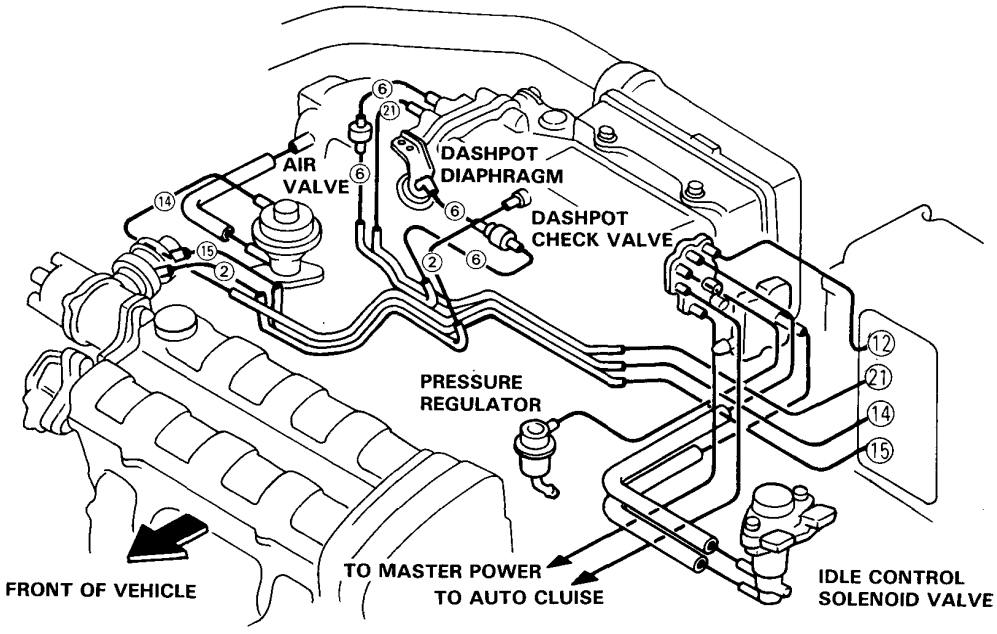


Control Box

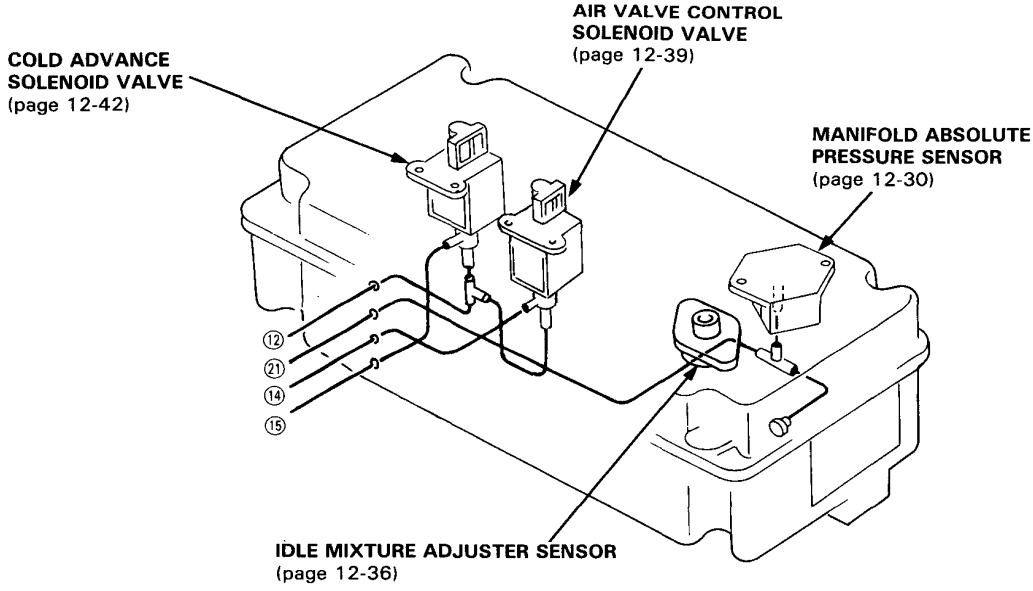


Interconnect Diagram

[KE model]



Control Box



Troubleshooting

Before starting troubleshooting on the PGM-FI system, check that other items that affect engine performance are within specification. Check the valve clearance, air cleaner, and PCV valve. In addition, check the ignition timing, function of the vacuum and centrifugal advance, and the condition of the spark plugs. If those items are all within specifications, begin with the troubleshooting listed.

Troubleshooting

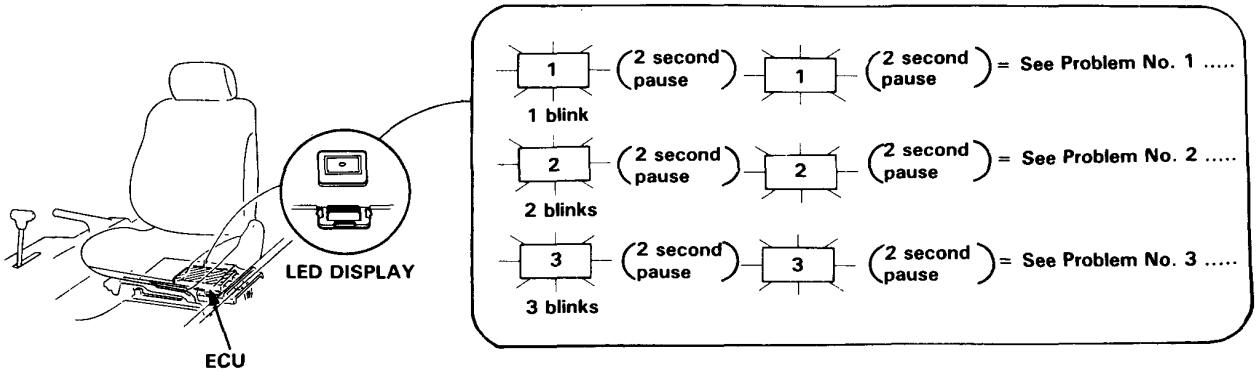
SYMPTOM / CAUSAL PART		ECU	INJECTOR	FUEL PUMP	FUEL LINE	FAST IDLE MECHANISM	THROTTLE BODY	CRANK ANGLE SENSOR	MANIFOLD ABSOLUTE PRESSURE SENSOR
ENGINE WON'T START		FAULTY ECU	• OPEN/SHORT CIRCUIT • DAMAGED INJECTORS	• FAULTY PUMP/MAIN RELAY • POOR GROUNDING	• FROZEN FUEL LINE • BLOCKED FILTER			• OPEN/SHORT CIRCUIT • FAULTY SENSOR	
DIFFICULT TO START ENGINE WHEN COLD		↑	• OPEN/SHORT CIRCUIT • FAULTY INJECTOR	↑	• ICE IN FUEL LINE • CLOGGED FILTER	STUCK AIR BYPASS VALVE		↑	
IRREGULAR IDLING	WHEN COLD	↑	• OPEN/SHORT CIRCUIT • STUCK INJECTOR			↑		↑	• OPEN/SHORT CIRCUIT • BROKEN/DISCONNECTED HOSE • FAULTY SENSOR
	AFTER WARMING UP	↑	↑			↑		↑	↑
	RPM TOO HIGH					↑	• IDLE ADJUSTING SCREW OUT OF ADJUSTMENT • THROTTLE VALVE STUCK OPEN		↑
	RPM TOO LOW						• IDLE ADJUSTING SCREW OUT OF ADJUSTMENT		
FREQUENT STALLING	WHILE WARMING UP	FAULTY ECU	• OPEN/SHORT CIRCUIT • STUCK INJECTOR	• FAULTY PUMP/MAIN RELAY • POOR GROUNDING	• IMPROPER LINE PRESSURE • CLOGGED FILTER	STUCK AIR BYPASS VALVE			• OPEN/SHORT CIRCUIT • BROKEN/DISCONNECTED HOSE • FAULTY SENSOR
	AFTER WARMING UP	↑	↑	↑	↑		IDLE ADJUSTING SCREW OUT OF ADJUSTMENT	• OPEN/SHORT CIRCUIT • FAULTY SENSOR	↑
POOR PERFORMANCE	POOR DRIVEABILITY HIGH FUEL CONSUMPTION	↑	↑	↑	↑	STUCK AIR BYPASS VALVE		↑	↑
	AFTERBURN	↑	↑						↑
	BACKFIRE	↑	↑	• FAULTY PUMP/MAIN RELAY • POOR GROUNDING	• IMPROPER LINE PRESSURE • CLOGGED FILTER.				↑
	KNOCKING	↑	↑	↑	↑				
	LACK OF POWER AT LOW RPM	↑	↑	↑	↑				
	LACK OF POWER AT MID RPM	↑	↑	↑	↑				• OPEN/SHORT CIRCUIT • BROKEN/DISCONNECTED HOSE • FAULTY SENSOR
	LACK OF POWER AT HIGH SPEED	↑		↑	↑				↑
WARNING/ INDICATOR LIGHT TURNS ON	PGM-FI WARNING LIGHT	↑						• OPEN/SHORT CIRCUIT • FAULTY SENSOR	↑
	SELF DIAGNOSIS INDICATOR	↑						↑	↑

ATMOSPHERIC PRESSURE SENSOR	COOLANT TEMPERATURE SENSOR	THROTTLE ANGLE SENSOR	INTAKE AIR TEMPERATURE SENSOR	SECONDARY AIR SUPPLY SYSTEM	IDLE CONTROL SYSTEM	IDLE MIXTURE ADJUSTER SENSOR	IMPORTANT POINTS
							• CHECK FUEL PUMP/INJECTOR
(AT HIGH ALTITUDE) • OPEN/SHORT CIRCUIT • FAULTY SENSOR	• OPEN/SHORT CIRCUIT • FAULTY SENSOR						• CHECK FUEL PUMP/INJECTOR • POSSIBLE TO START BY OPERATING THROTTLE? (STUCK AIR BYPASS VALVE)
↑	↑						• CHECK IGNITION SYSTEM (SPARKS) AND EACH INJECTOR. POSSIBLE TO START BY OPERATING THROTTLE? (STUCK AIR BYPASS VALVE)
					FAULTY SOLENOID VALVE		↑
				FAULTY SOLENOID VALVE (STUCK OPEN)			• DISCONNECTED OR LEAKY VACUUM LINES • CHECK AIR BYPASS VALVE • CHECK SELF DIAGNOSIS INDICATOR
		SENSOR OUT OF ADJUSTMENT					
	• OPEN/SHORT CIRCUIT • FAULTY SENSOR		• OPEN/SHORT CIRCUIT • FAULTY SENSOR				• CHECK AIR BYPASS VALVE • CHECK COOLANT TEMPERATURE SENSOR
					• FAULTY SOLENOID VALVE (RPM DOWN)		• CHECK IDLE SPEED • CHECK FOR FUEL CUT-OFF OPERATION
	• OPEN/SHORT CIRCUIT • FAULTY SENSOR	• OPEN/SHORT CIRCUIT • FAULTY SENSOR	• OPEN/SHORT CIRCUIT • FAULTY SENSOR		FAULTY SOLENOID VALVE (STUCK OPEN)	OPEN/SHORT CIRCUIT	• CHECK IGNITION TIMING • CHECK FOR FUEL CUT-OFF OPERATION
	↑	↑					↑
	↑	↑					• CHECK IGNITION TIMING • CHECK MANIFOLD ABSOLUTE PRESSURE SENSOR/ INJECTORS
	↑	↑					• CHECK IGNITION TIMING
	↑	↑					• CHECK IGNITION TIMING (DISCONNECTED OR BROKEN LINES) • CHECK INJECTORS
	↑	↑		↑			• CHECK IGNITION TIMING
							• CHECK MANIFOLD ABSOLUTE PRESSURE SENSOR • CHECK IGNITION TIMING
• OPEN/SHORT CIRCUIT • FAULTY SENSOR	• OPEN/SHORT CIRCUIT • FAULTY SENSOR	• OPEN/SHORT CIRCUIT • FAULTY SENSOR	• OPEN/SHORT CIRCUIT • FAULTY SENSOR			• OPEN/SHORT CIRCUIT • FAULTY SENSOR	• CONSULT TROUBLESHOOTING CHART ON PAGE 12-21
↑	↑	↑	↑	↑		↑	↑

Self-Diagnosis Indicator

Troubleshooting

The PGM-FI system's ECU is equipped with a self-diagnosis function. When an abnormality is detected, the PGM-FI dash warning light comes on, and the LED display on the ECU blinks. The location of the PGM-FI control system's trouble can be diagnosed from the frequency of the LED display blinks.



The quick reference chart on the next page covers the failure modes and possible causes for the PGM-FI.
If you run through all the possible causes listed and the problem is still unsolved, go on to the more detailed troubleshooting on the following pages.

Sometimes the PGM-FI dash warning light and/or ECU LED display will come on, indicating a system problem, when, in fact, there is a bad or intermittent electrical connection. To troubleshoot bad connections, note the ECU LED display blink frequency, refer to the diagnosis chart on page 12-21 and check the connectors associated with the items mentioned in the "Possible Cause" column. Clean or repair connections if necessary.

NOTE:

- The memory for the "PGM-FI" dash warning light will be erased when the ignition switch is turned off; however, the memory for the LED display will not be cancelled. Thus, the warning light will not come on when the ignition is again turned on unless the trouble is once more detected. Troubleshooting should be done according to the LED display even if the warning light is OFF.
  If the LED display fails to come on when the ignition switch is turned on again, check for:
  — Blown No. 11 fuse in the engine compartment (also the fuse for the clock).
  — Open circuit in White/Yellow wire between ECU A17 terminal and No. 11 fuse.
  Then, if there is no problem, substitute a known-good ECU and re-check.
- Turn the ignition switch ON. The PGM-FI dash warning light should come on for about 2 seconds.
  If the warning light won't come on, check for:
  — Blown No. 2 fuse (also the fuse for the back-up lights, turn signals, and fuel gauge)
  — Open circuit in Yellow wire between No. 2 fuse and combination meter.
  — Open circuit in Green/Red wire between combination meter and ECU B6 terminal.
  — Open circuit in Black wires between ECU A2, A4 and ground 1.
  — Blown warning light bulb.
  Then, if there is no problem, substitute a known-good ECU and re-check.
- After making repairs, disconnect the No. 11 fuse for at least 10 seconds to reset the ECU memory.
  After reconnecting the fuse, check that the LED display is turned off.

No. of LED Blinks between 2 second pauses	Dash warning light	Symptom	Possible cause
0		• Engine will not start	• Disconnected control unit ground wire • Faulty ECU
		• Engine will not start • No particular symptom shown	• Loose or poorly connected power line to ECU • Disconnected control unit ground wire • Short circuit in combination meter or warning light wire • Faulty ECU
3		• Fuel fouled plug • Frequent engine stalling • Hesitation	• Disconnected manifold absolute pressure sensor coupler • Short or open circuit in manifold absolute pressure sensor wire • Faulty manifold absolute pressure sensor
5		• Hesitation • Fuel fouled plug • Frequent engine stalling	• Disconnected manifold absolute pressure sensor piping
6		• High idle speed during warm-up • High idle speed • Hard starting at low temp	• Disconnected coolant temperature sensor coupler • Open or short circuit in coolant temperature sensor wire • Faulty coolant temperature sensor (thermostat housing)
7		• Poor engine response to opening throttle rapidly • High idle speed • Engine does not rev up when cold	• Disconnected throttle angle sensor coupler • Open or short circuit in throttle angle sensor wire • Faulty throttle angle sensor
8		• Engine does not rev up • High idle speed • Erratic idling	• Short or open circuit in crank angle sensor wire • Crank angle sensor wire interfering with spark plug wires • Crank angle sensor at fault
9		• Same as above	• Same as above
10		• High idle speed • Erratic idling when very cold	• Disconnected intake air temperature sensor • Open or short circuit in intake air temperature sensor wire • Faulty intake air temperature sensor
11		• No particular symptom shown • High idle speed	• Disconnected idle mixture adjuster sensor coupler • Shorted or disconnected idle mixture adjuster sensor wire • Faulty idle mixture adjuster sensor
13		• Poor acceleration at high altitude • Hard starting at high altitude when cold	• Disconnected atmospheric pressure sensor coupler • Shorted or disconnected atmospheric pressure sensor wire • Faulty atmospheric pressure sensor

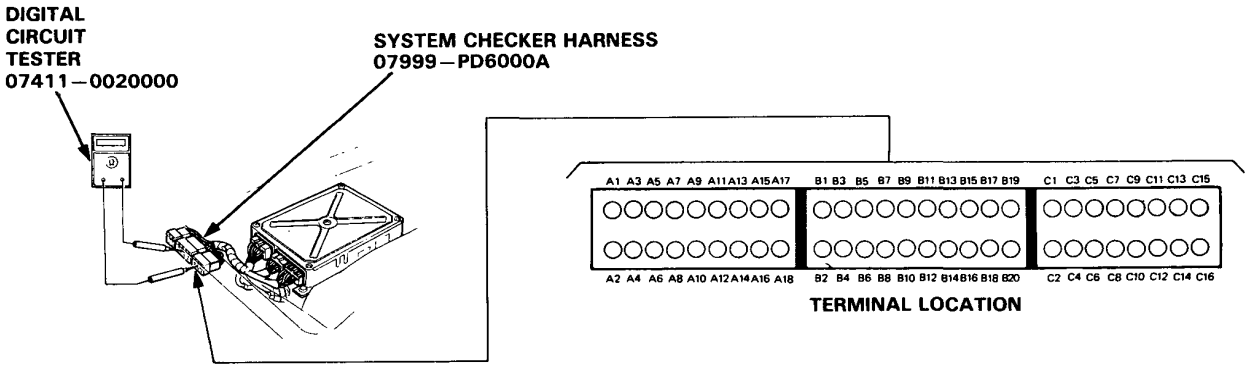
NOTE:

- If the number of blinks between 2 second pauses otherwise above, or if the LED indicator stays on, substitute a known-good ECU and re-check. If the indication goes away, replace the original ECU.
- Some failure indications (such as , one blink) require the full test procedures on the following pages to confirm that the failure has or has not been eliminated.

(cont'd)

Troubleshooting (cont'd)

Use the system checker harness and digital circuit tester to check the system.



0 — Self-diagnosis indicator remains off — The dash warning light is not lit.

Connect the system checker harness between the ECU and connector.

Check for continuity between the A2 (Black), the A4 (Black) terminals and body ground.

Does continuity exist?

NO — Faulty ground circuit at GND 1.

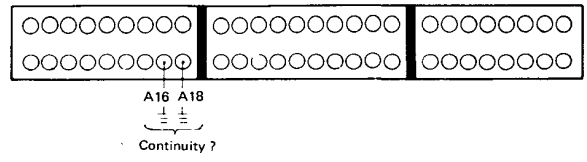
YES

Substitute a known-good ECU and re-check. If symptom goes away, replace the original ECU. If symptom does not go away, check to see if the dash warning light is on and the LED indicator is now blinking, and troubleshoot the true cause.

0 — Self-diagnosis indicator remains off — The dash warning light is lit.

Connect the system checker harness between the ECU and connector.

Check for continuity between the A16 (Brown/Black), the A18 (Black/Red) terminals and body ground.



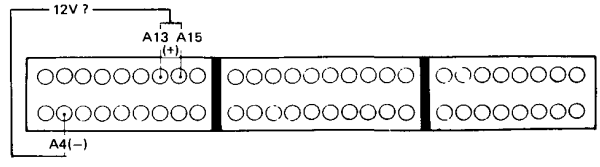
Does continuity exist?

NO — Faulty ground circuit at GND 2.

YES

Turn the ignition switch ON.

Measure voltage between A15 (Yellow/Black (+)), the A13 (Black/Yellow (+)) terminals and the A4 terminal (Black (−)).



(To page 12-23)

(From page 12-22)

Is 12 V available?

NO
- No. 1 fuse (10 A) in the engine compartment blown
- Open circuit in Yellow/Blue wire between No. 1 fuse and main relay
- Faulty main relay
- Open circuit in Yellow/Black wire between main relay and ECU
- No. 1 fuse (15 A) blown (fuel pump is not working).
- Open circuit in Black/Yellow wire between No.1 fuse and main relay
- Open circuit in main relay ground wire (Black)
- Faulty ECU.

NOTE: No voltage available.

YES

Check for short circuits in the Green/Red wire between the combination meter and B6 terminal (Gree/Red), as well as in the combination meter printed circuit board.

Are wires normal?

NO — Faulty circuit or combination meter.

YES

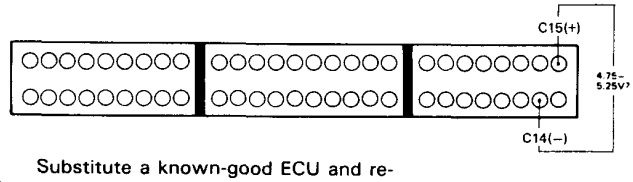
Substitute a known-good ECU and re-check. If symptom/indication goes away, replace the original ECU.

3 Self diagnosis indicator blinks three times.

Connect system checker harness between the ECU and connector.

Turn ignition switch ON.

Measure voltage between C15 terminal (Red/White (+)) of system checker harness and C14 terminal (Blue/White (−)).

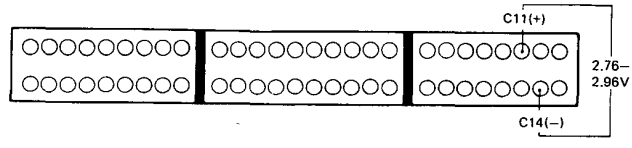


Is voltage between 4.75 and 5.25 V?

NO — Substitute a known-good ECU and re-check.
If prescribed voltage is now available, replace the original ECU.

YES

Measure voltage between C11 terminal (White/Blue (+)) of system checker harness and C14 terminal (Blue/White (−)).



Is voltage between 2.76 and 2.96 V?

NO — Open or short circuit in White/Blue wire or Blue/White wire between manifold absolute pressure sensor and ECU.
Faulty manifold absolute pressure sensor.

NOTE: If the voltage is below the specified range, there are open or poorly connected wires. If the wires are normal, the manifold absolute pressure sensor is at fault.

YES

Substitute a known-good ECU and re-check.
If symptom/indication goes away, replace the original ECU.

(cont'd)

Troubleshooting (cont'd)

5 — **Self diagnosis indicator blinks five times.**

Check that the manifold absolute pressure sensor pipe is connected securely.

NOTE: Also check hose routing inside control box.

Is routing normal?
- NO — Reconnect routing
- YES

Disconnect pipe from manifold absolute pressure sensor and plug open end.

Disconnect vacuum hose #21 from throttle body.

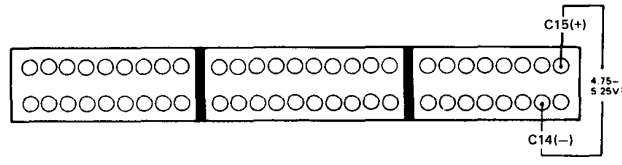
Connect hand vacuum pump to vacuum hose #21 and check for a leak.

Is vacuum maintained?
- NO — Replace vacuum hose.
- YES

Connect system checker harness between the ECU and connector.

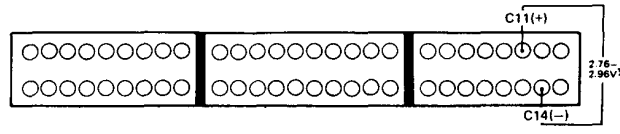
Turn ignition switch ON.

Measure voltage between C15 terminal (Red/White (+)) of system checker harness and C14 terminal (Blue/White (−)).



Is voltage between 4.75 and 5.25 V?
- NO — Substitute a known-good ECU and re-check. If prescribed voltage is now available, replace the original ECU.
- YES

Measure voltage between C11 terminal (White/Blue (+)) of system checker harness and C14 terminal (Blue/White (−)).



Is voltage between 2.76 and 2.96 V?
- NO — Open or short circuit in White/Blue or Blue/White wire between manifold absolute pressure sensor and ECU. Faulty manifold absolute pressure sensor.
- YES

NOTE: If there is no voltage, or if voltage is low, check for a shorted wire. If voltage is high, wire may be open or bad contact. If wire is normal, manifold absolute pressure sensor is at fault.

Connect hand vacuum pump to manifold absolute pressure sensor.

Check that voltage changes as vacuum is applied.

Has voltage changed?
- NO — Faulty manifold absolute pressure sensor
- YES

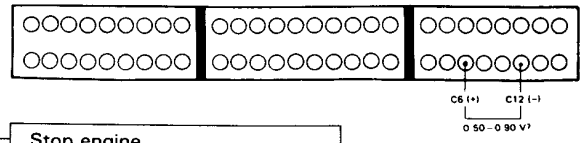
Substitute a known-good ECU and re-check. If symptom/indication goes away, replace the original ECU.

6 Self diagnosis indicator blinks six times.

Connect system checker harness between the ECU and connector.

Warm up engine until radiator fan comes on twice.

Measure voltage between C6 terminal (Yellow/Green (+)) of system harness checker and C12 terminal (Green/White (−)).



Is voltage between 0.50 and 0.90 V?

NO → Stop engine.

YES

Substitute a known-good ECU and re-check.
If symptom/indication goes away, replace the original ECU.

Check for open or short circuit in Yellow/Green and Green/White wires between coolant temperature sensor and the ECU.

NOTE: If there is no voltage or if voltage is low, check for shorted wire. If voltage is high, wire may be open or bad contact.

Are wires normal?

NO → Faulty wires

YES

Check coolant temperature sensor (page 12-31).

Is sensor normal?

NO → Faulty coolant temperature sensor

YES

Substitute a known-good ECU and re-check.
If symptom/indication goes away, replace the original ECU.

(cont'd)

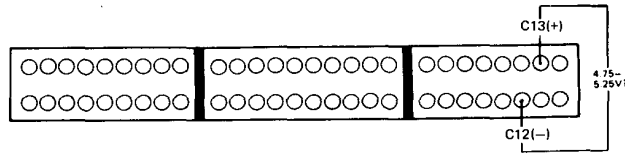
Troubleshooting (cont'd)

7 **Self diagnosis indicator blinks seven times.**

Connect system checker harness between ECU and connector.

Turn ignition switch ON.

Measure voltage between C13 terminal (Yellow/White (+)) of system checker harness and C12 terminal (Green/White (–)).



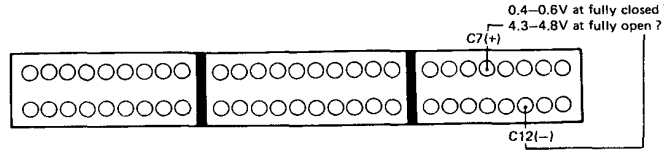
Is 4.75–5.25 V attained?

NO — Substitute a known-good ECU and re-check.
If prescribed voltage is now available, replace the original ECU.

YES

Connect voltmeter positive probe to C7 terminal (Red/Yellow), and negative probe to C12 terminal (Green/White (–)) of system checker harness.

Operate accelerator pedal from fully closed to fully open.



Check that 0.4–0.6 V is available at fully closed, and 4.3–4.8 V at fully open.

Are voltages within above ranges?

NO — Check for short or open circuit in Red/Yellow and Green/White wires between the ECU and throttle angle sensor.

Are wires normal?

NO — Replace wires

YES

Adjust or replace throttle angle sensor (page 12-39).

YES

Substitute a known-good ECU and re-check.
If symptom/indication goes away, replace the original ECU.

8 **Self diagnosis indicator blinks eight times.**

Check for open or short circuit in Orange/Blue and White/Blue wires between the ECU and crank angle sensor.

NOTE: Check that crank angle sensor harness is not interfering with the spark plug wires.

Are wires normal?

NO — Replace wires

YES

Check crank angle sensor (page 12-33).

Does crank angle sensor operate properly?

NO — *Faulty crank angle sensor*

YES

Substitute a known-good ECU and re-check.
If symptom/indication goes away, replace the original ECU.

9 Self diagnosis indicator blinks nine times.

Check for open or short circuit in Orange and White wires between the ECU and crank angle sensor.

NOTE: Check that sensor harness is not interfering with the spark plug wires.

Are wires normal? — NO → Replace wires

YES

Check crank angle sensor (page 12-33).

Is sensor normal? — NO → Faulty crank angle sensor

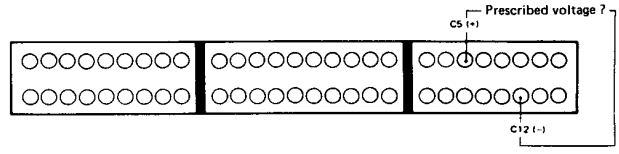
YES

Substitute a known-good ECU and re-check.
If symptom/indication goes away, replace the original ECU.

10 Self diagnosis indicator blinks ten times.

Connect system checker harness between the ECU and harness connector.

Attach voltmeter positive probe to C5 terminal (White/Red), and negative probe to C12 terminal (Green/White) of system checker harness.



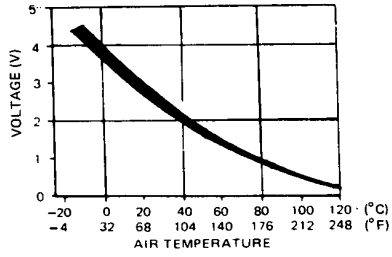
Turn igniton switch ON.

Check that voltage is correct for the intake air temperature.

Is voltage correct? — NO → Turn ignition switch OFF.

YES

Substitute a known-good ECU and re-check.
If symptom/indication goes away, replace the original ECU.



Check for open or short circuit in White/Red and Green/White wires between intake air temperature sensor and the ECU.

NOTE: If voltage is low, or there is no voltage, check wires for short circuit. If voltage is high, probability is open or bad contact.

Are wires normal? — NO → Faulty wires

YES

Check intake air temperature sensor (page 12-31).

Is sensor normal? — NO → Faulty intake air temperature sensor

YES

Substitute a known-good ECU and re-check.
If prescribed voltage is now available, replace the original ECU.

(cont'd)

Troubleshooting (cont'd)

11 — **Self diagnosis indicator blinks eleven times**

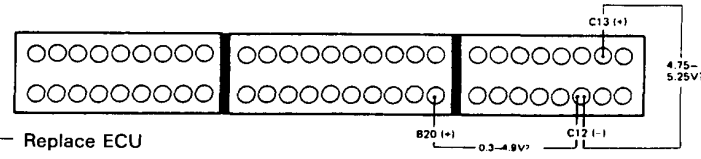
Connect system checker harness between the ECU and harness connector.

Turn ignition switch ON.

Measure voltage between C13 terminal (Yellow/White (+)) of system checker harness and C12 terminal (Green/White (−)).

Is 4.75—5.25 V available?

NO — Replace ECU



YES

Measure voltage between B20 terminal (Brown (+)) of system checker harness and C12 terminal (Green/White (−)).

Is 0.3—4.9 V available?

NO — Turn Ignition switch OFF.

YES

Substitute a known-good ECU and re-check.
If symptom/indication goes away, replace the original ECU.

Check for open or short circuit in Brown and Green/White wires between idle mixture adjuster sensor and the ECU.

NOTE: If there is no voltage, check for short circuit in the wires. If voltage is high, probability is open or bad contact.

Are wires normal?

NO — Faulty wires.

YES

Check idle mixture adjuster sensor (page 12-36).

Does sensor operate properly?

NO — Faulty idle mixture adjuster sensor.

YES

Substitute a known-good ECU and re-check.
If symptom/indication goes away, replace the original ECU.

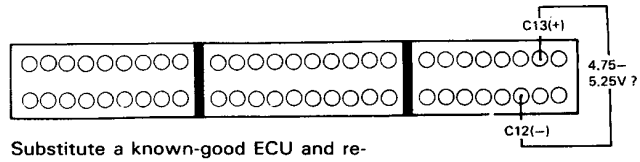
13 Self diagnosis indicator blinks thirteen times.

Connect system checker harness between the ECU and harness connector.

Turn ignition switch ON.

Measure voltage between C13 terminal (Yellow/White (+)) of system checker harness and C12 terminal (Green/White (−)).

Is 4.75−5.25 V available? NO

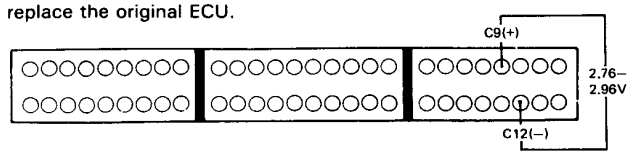


Substitute a known-good ECU and re-check.
If prescribed voltage is now available, replace the original ECU.

YES

Measure voltage between C9 terminal (Red (+)) of system checker harness and C12 terminal (Green/White).

Is 2.76−2.96 V available? NO



Turn Ignition switch OFF.

YES

Substitute a known-good ECU and re-check.
If symptom/indication goes away, replace the original ECU.

Check for open or short circuit in Red and Green/White wires between atmospheric pressure sensor and the ECU.

NOTE: If there is no voltage, check for a short circuit. If voltage is high, wires may be open or bad contact.

Are wires normal? NO — Faulty wires.

YES

Check atmospheric pressure sensor (page 12-36).

Does sensor operate properly? NO — Faulty atmospheric pressure sensor.

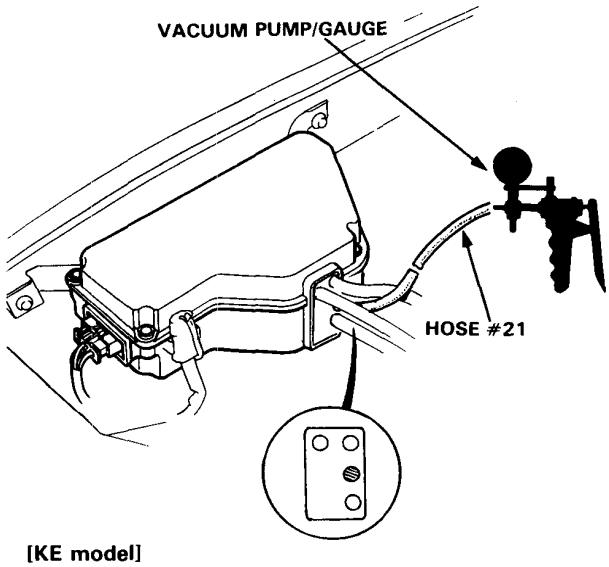
YES

Substitute a known-good ECU and re-check.
If prescribed voltage is now available, replace the original ECU.

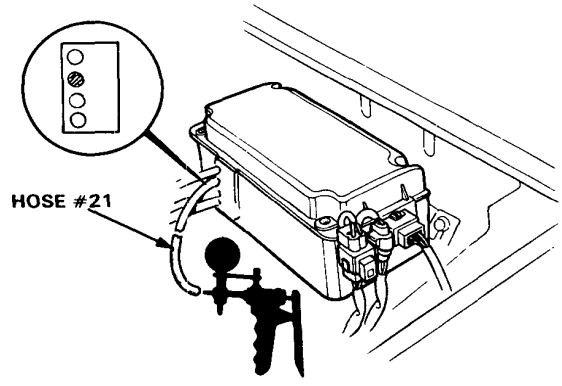
Manifold Absolute Pressure (MAP) Sensor

1. Disconnect the vacuum hose #21 from the throttle body; plug the opening in the throttle body. Connect a vacuum pump to the open end of the vacuum hose.

[Except KE model]

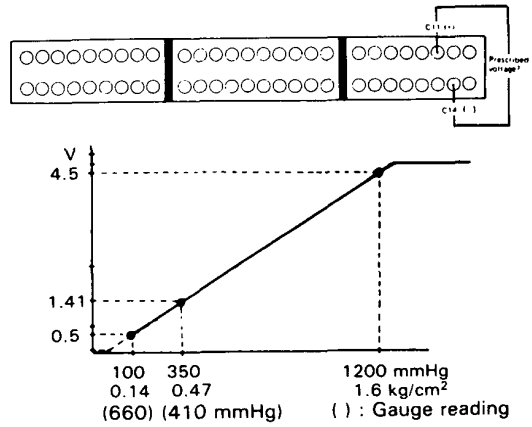


[KE model]



2. Disconnect the connector from the control unit. Connect the system checker harness (No. 07999—PD6000A) between the control unit and wire harness connector.

3. Turn the ignition switch ON. Connect a digital voltmeter positive probe to the C11 terminal of the system checker harness and negative probe to the C14 terminal. Measure the voltage between the two terminals.



Voltmeter should indicate voltage along with the chart above.

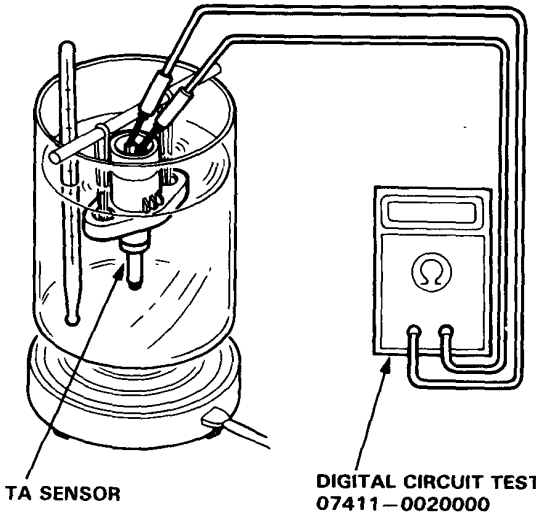
- If the voltage is incorrect, check the vacuum hose for leakage, and wires between the control unit and sensor for open or short circuit. Replace the sensor if the wires are normal.

Intake Air Temperature (TA) Sensor

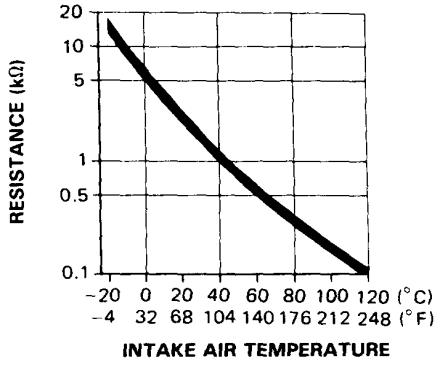
1. Disconnect the connector, then remove the TA sensor from the intake manifold.

2. To test the sensor, suspend it in cold water and heat the water slowly.
   Make sure more than half of the connector is submerged. Measure the resistance between the terminals.

   STANDARDS: 0.98–1.34 kΩ at 40°C (104°F)
   0.22–0.35 kΩ at 80°C (176°F)



3. The chart below shows the change in resistance over a range of intake air temperature.



- Replace the sensor if resistance is outside the range.

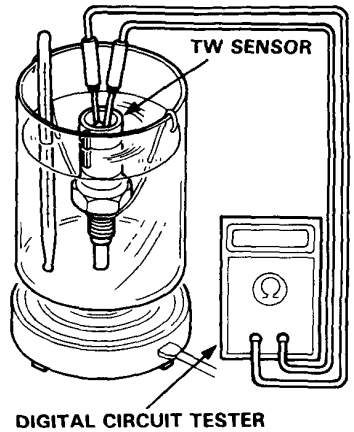
NOTE:
- Don't let the sensor touch the bottom of the container.
- During the test, stir the water in the container to ensure even temperature.

Coolant Temperature (TW) Sensor

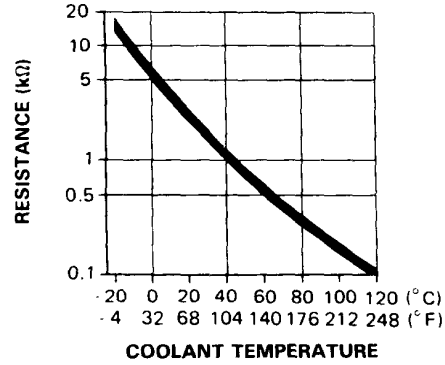
1. Disconnect the connector, then remove the TW sensor from the thermostat housing.

2. To test the sensor, suspend it in cold water and heat the water slowly.
   Make sure more than half of the connector is submerged. Measure the resistance between the terminals.

   STANDARDS: 0.98–1.34 kΩ at 40°C (104°F)
   0.22–0.35 kΩ at 80°C (176°F)



3. The chart below shows the change in resistance over a range of coolant temperature.



- Replace the sensor if resistance is outside the range.

- On installing the sensor, torque to:
  28 N·m (2.8 kg-m, 20 lb-ft)

NOTE:
- Don't let the sensor touch the bottom of the container.
- During the test, stir the water in the container to ensure even temperature.

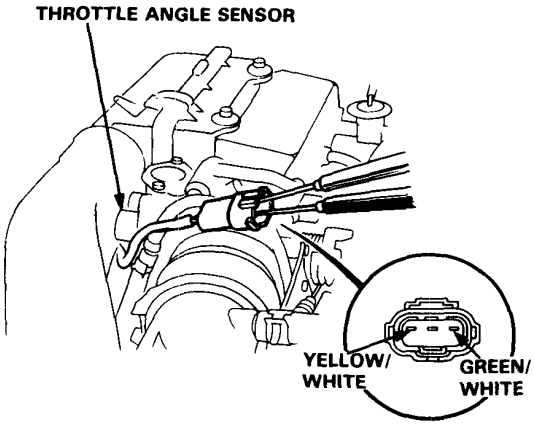
Throttle Angle Sensor

Testing/Removal:

CAUTION: The throttle stop screw is non-adjustable.

1. Disconnect the connector of the throttle angle sensor.
2. Measure full resistance between the Yellow/White terminal and Green/White terminal at the sensor.

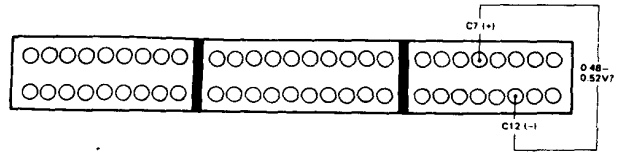
Resistance should be: 4—6 kΩ



- If the resistance is outside the above range, adjust the installation position of the sensor and re-test. Replace if necessary.

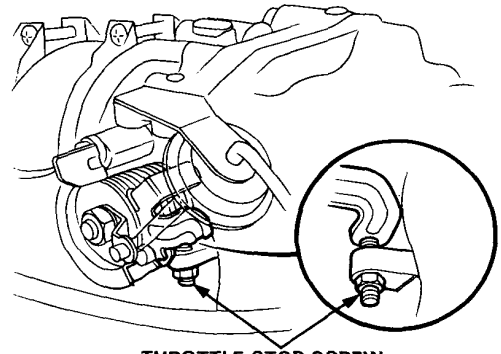
Installation:

1. Align the pin of the sensor with the throttle valve shaft groove and tighten temporarily.
2. Disconnect the control unit connectors and connect the System Checker Harness (NO. 07999—PD6000A) between the control unit and wire harness connector.
3. Connect a digital voltmeter positive probe to C7 terminal of the system checker harness and negative probe to C12 terminal.

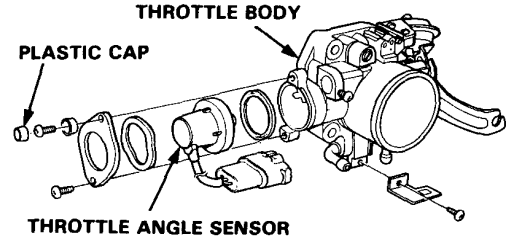


4. With the ignition switch turned ON, adjust the sensor to a position where the throttle stop lever just touches the stop screw. Then measure the voltage between the two terminals.

There should be: 0.48—0.52 V



5. If the voltage is within specification, tighten the screws provisionally.



6. After reassembling the sensor, test the deceleration fuel cut-off system.
   - If the deceleration fuel cut-off system is OK, tighten the screws.
   - If the deceleration fuel cut-off system does not work, repeat steps 1 through 5 and check the voltage.

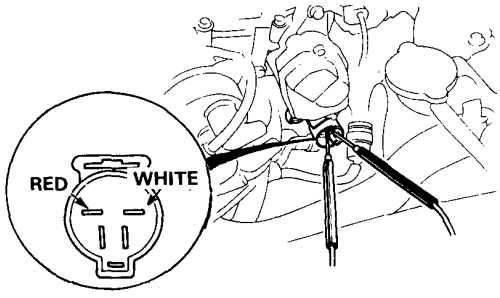
Crank Angle Sensor Inspection

NOTE: If either the CYL or TDC sensor tests bad, replace the crank angle sensor coil assembly.

CYL Sensor Inspection

1. Disconnect the connector of the crank angle sensor.
2. Measure the resistance between the White terminal and Red terminal at the sensor.

   Resistance should be: 0.65—0.85 kΩ

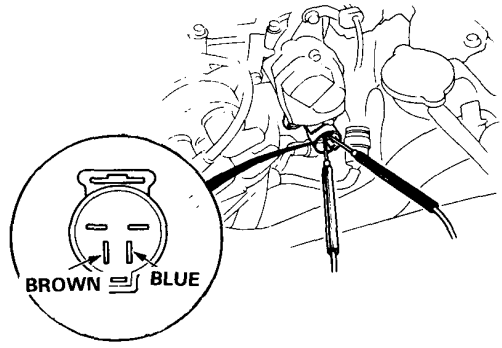


3. Measure the resistance between the White and Red terminals, and crank angle sensor housing.
   Resistance should be: 100 kΩ or more

TDC Sensor Inspection

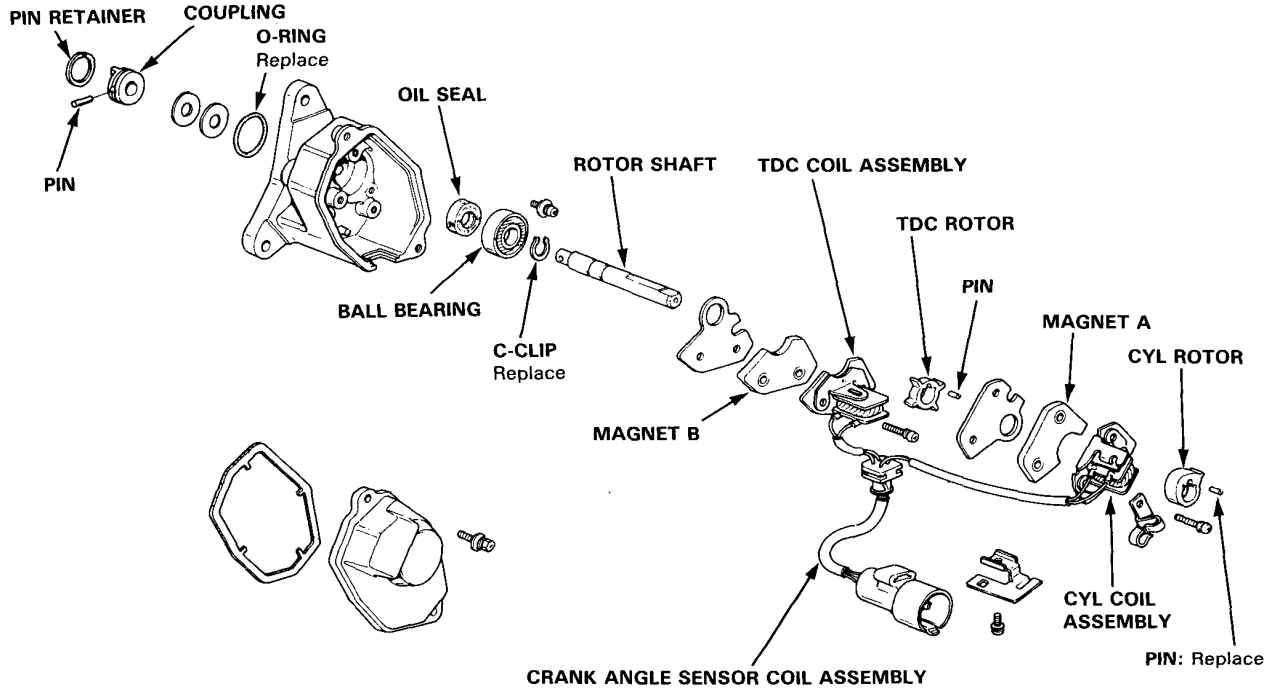
1. Disconnect the connector of the crank angle sensor.
2. Measure the resistance between the Brown terminal and Blue terminal at the sensor.

   Resistance should be: 0.65—0.85 kΩ



3. Measure the resistance between the Brown and Blue terminals, and crank angle sensor housing.
   Resistance should be: 100 kΩ or more

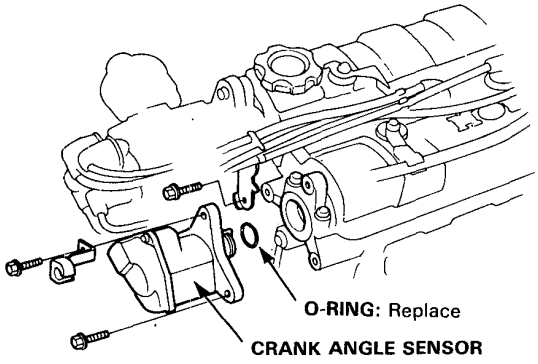
Crank Angle Sensor Disassembly



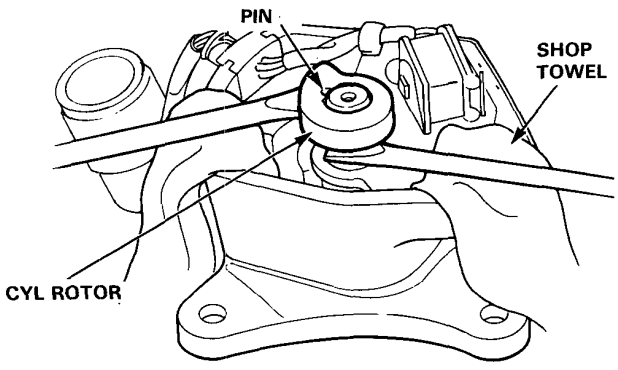
(cont'd)

Crank Angle Sensor Disassembly (cont'd)

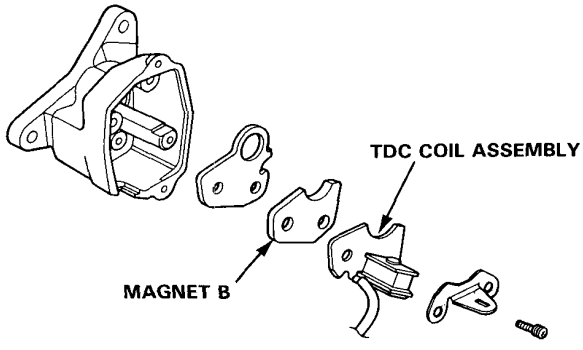
1. Remove the crank angle sensor from the engine.



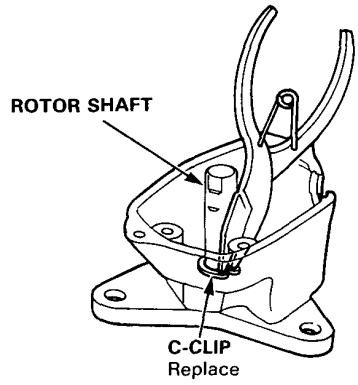
2. Carefully pry up the CYL rotor by using two screwdrivers as shown. Do not damage the CYL rotor.



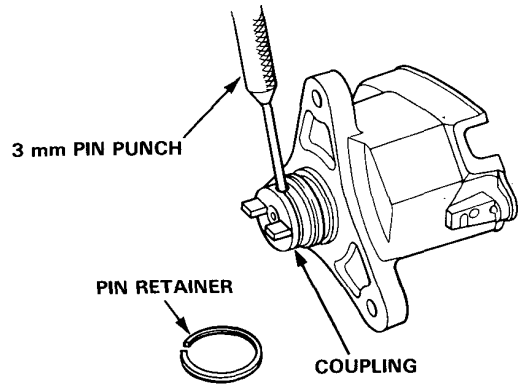
3. Pull the CYL coil assembly and magnet A out from the rotor shaft by removing the screws.
4. Pry up the TDC rotor in the same order of prying up the CYL rotor.
5. Pull the TDC coil assembly and magnet B out from the rotor shaft by removing the screws.



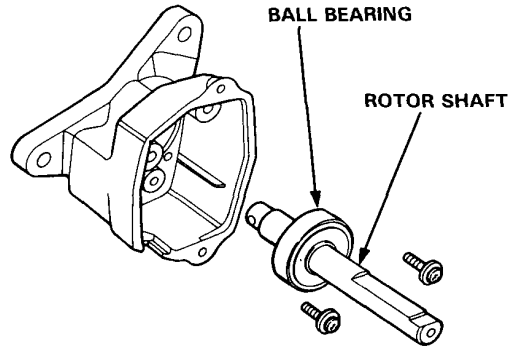
6. Remove the C-clip.



7. Slide off the pin retainer being careful not to stretch it.
8. Separate the coupling from the shaft by removing the roll pin as shown.

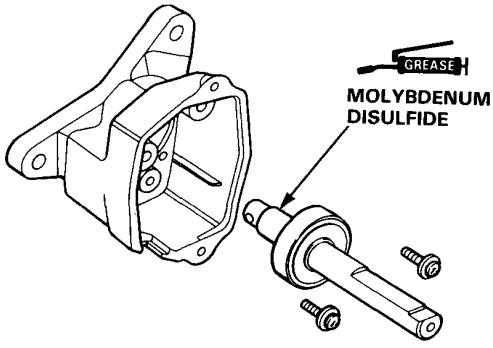


9. Remove the ball bearing and rotor shaft as an assembly by removing the screws.

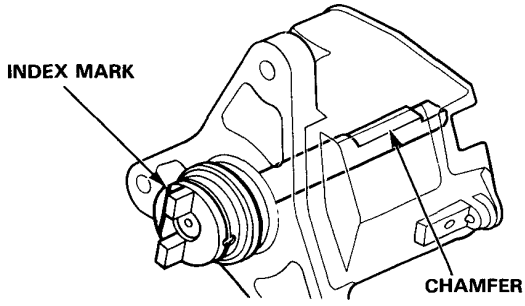


Crank Angle Sensor Reassembly

1. Apply a molybdenum disulfide grease to the tip of the rotor shaft, then install it on the sensor housing with 4 mm screws.

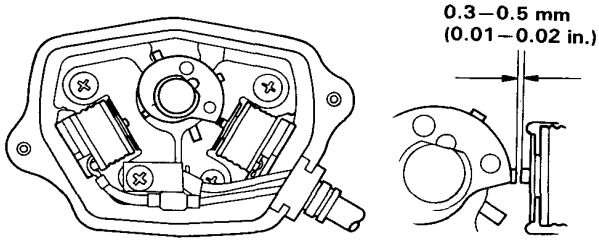


2. Install the coupling with its index mark facing in the direction shown, install the pin, and install the pin ratainer.

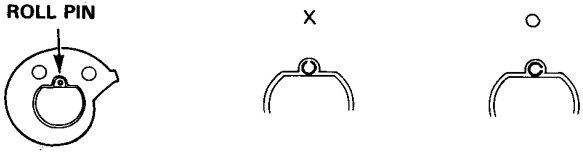


3. Install a new C-clip on the rotor shaft.

4. Install the TDC coil assembly and TDC rotor so that the air gap is 0.3—0.5 mm (0.01—0.02 in.), then install the CYL coil assembly and CYL rotor in the same way.



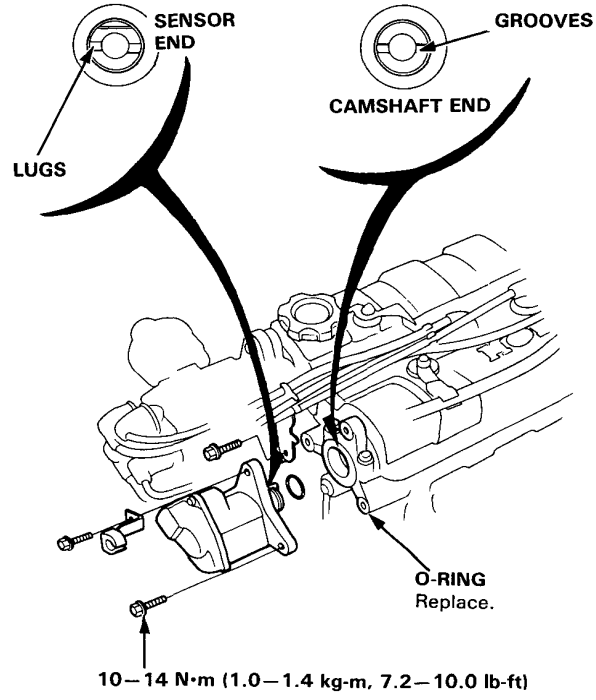
NOTE:
- Install the rotors with the part number facing up.
- Install the roll pin so that if faces as shown below.



Crank Angle Sensor Installation

1. Install a new O-ring on the sensor housing.
2. Slip the sensor into the position.

NOTE: The lugs on the end of the sensor and its mating grooves in the camshaft end are both offset to eliminate the possibility of installing the distributor 180° out of time.

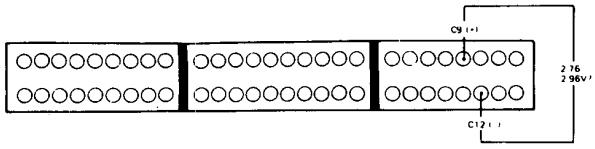


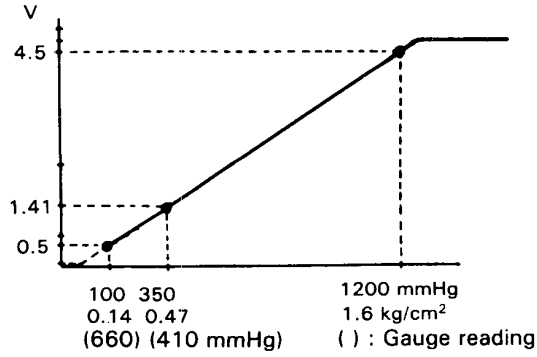
Atmospheric Pressure (PA) Sensor

NOTE: Check the sensor at the ECU connector.

1. Disconnect the wire harness connector from the control unit and connect the system checker harness (No. 07999—PD6000A) to the control unit and wire harness connector.
2. Turn the ignition switch ON. Connect a digital voltmeter positive probe to the C9 terminal of the system checker harness and negative probe to the C12 terminal.

There should be: 2.76—2.96 V



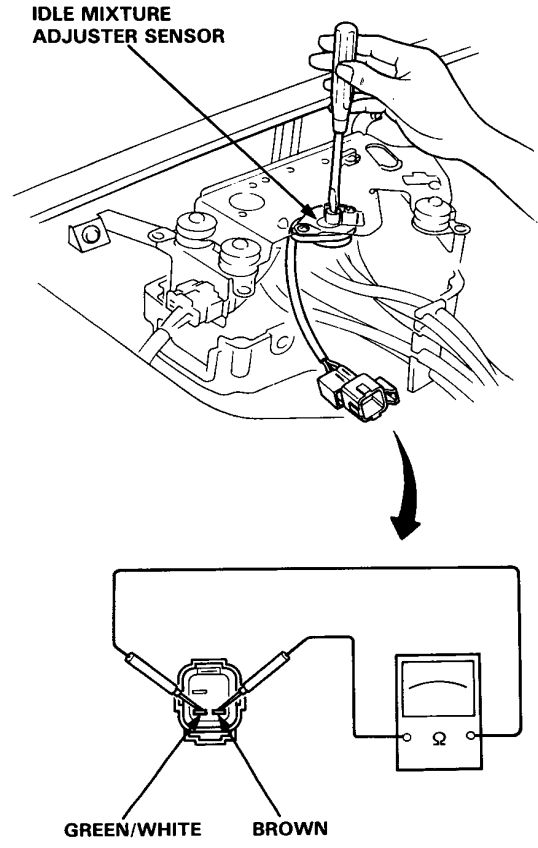


- If voltage is outside ranges, check for open or short circuit between the ECU and PA sensor. Replace the PA sensor with a new one if the wires are in good condition.
- On installing the sensor, torque to: 5 N·m (0.5 kg-m, 4 lb-ft)

Idle Mixture Adjustor (IMA) Sensor

1. Open the control box lid and disconnect the connector of the IMA sensor at the control box.
2. Turning the adjusting screw on the sensor fully, measure resistance between the Brown terminal and the Green/White terminal at the sensor.

Resistance should be: 0.25—6.2 KΩ



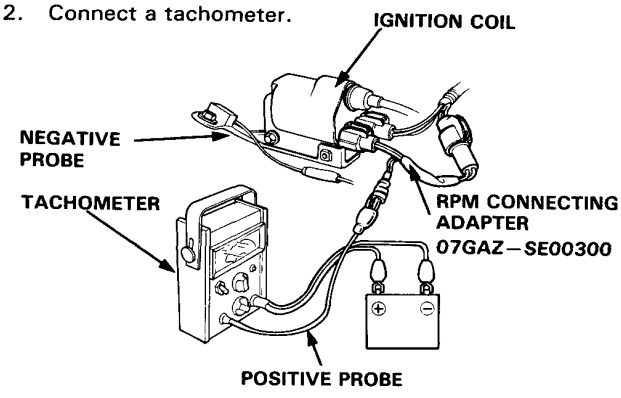
- If resistance is outside above ranges, replace IMA sensor.

NOTE: Whenever the inspection or the replacement of IMA sensor is performed, check specification for CO.

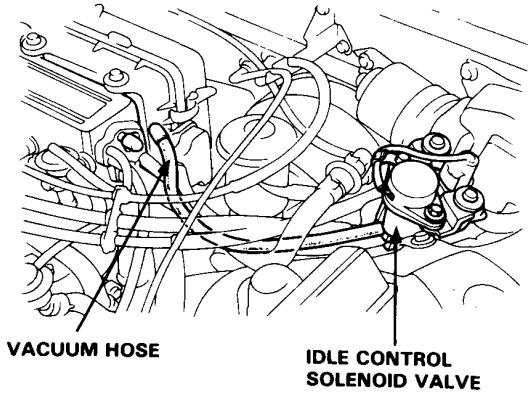
Idle Speed

Inspection/Adjustment

1. Start the engine and warm it up to normal operating temperature (the cooling fan goes on twice).
2. Connect a tachometer.



3. Disconnect the upper vacuum hose of the idle control solenoid valve (between the valve and intake manifold) from the intake manifold.
4. Cap the end of the hose and intake manifold.

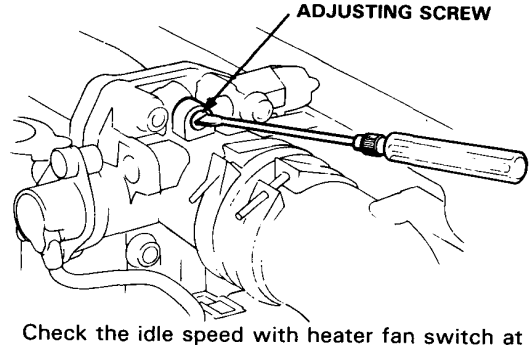


5. Adjust the idle speed with headlights, heater blower, rear window defroster, cooling fan and air conditioner off.

   Idle Speed should be:

   800 ± 50 min^{-1} (rpm)

   Adjust the idle speed, if necessary, by turning the adjusting screw on the top of the throttle body.

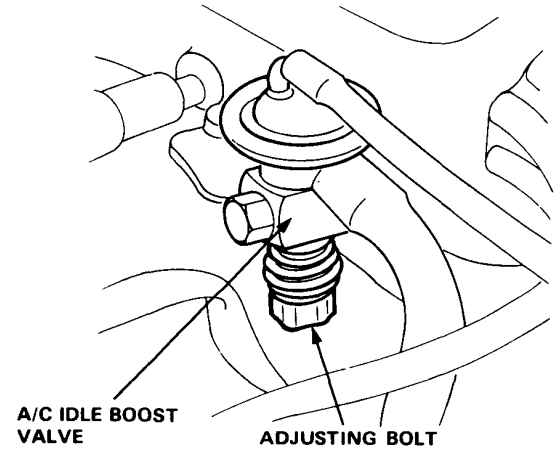


6. Check the idle speed with heater fan switch at HI (right end) and air conditioner on.

   Idle Speed should be:

   800 ± 50 min^{-1} (rpm)

   Adjust idle speed, if necessary, by turning the adjusting bolt on the A/C idle boost valve.



7. After adjustment, connect the idle control solenoid valve vacuum hose.
9. Check the idle speed with headlights,heater blower, rear window defroster, and cooling fan on but air conditioner off.

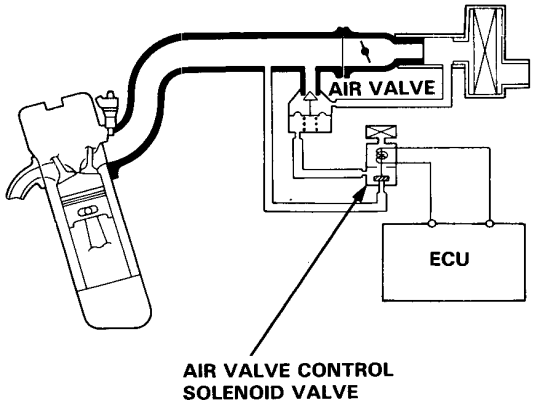
   It should be the same as normal idle speed.

   NOTE: If the idle speed is not within specifications, see Troubleshooting.

Secondary Air Supply System

Description

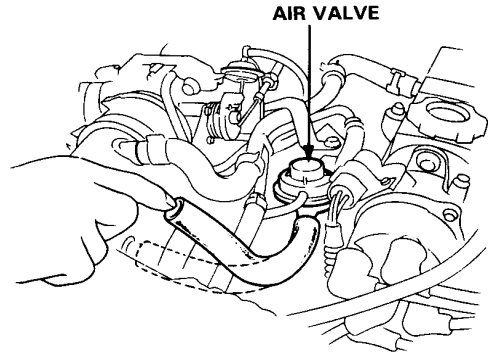
At deceleration, the ECU causes the air control solenoid valve to open the air valve.
This supplies secondary air into the intake manifold, preventing rise in negative pressure in the manifold.



Inspection

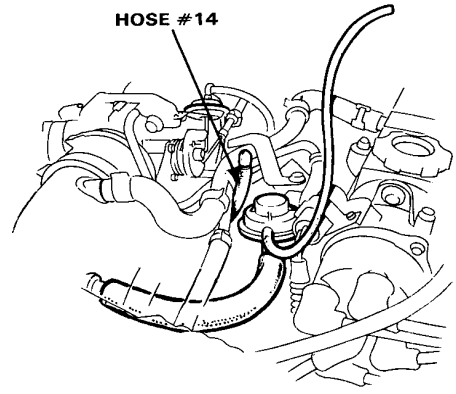
Air Valve

1. Start the engine and warm up the engine to normal operating temperature (the cooling fan comes on).
2. Raise the engine speed to around 4,000 min^{-1} (rpm).
3. Check for vacuum at the accelerator pedal released.



- If there is no vacuum, go to step 4.

4. Disconnect the #26 vacuum hose from the air valve.



5. Raise the engine speed to around 4,000 min^{-1} (rpm).
6. Check for vacuum at the accelerator pedal released.
   There should be vacuum.

- If there is vacuum, replace the air valve and re-test.
- If there is no vacuum, air valve control solenoid valve.

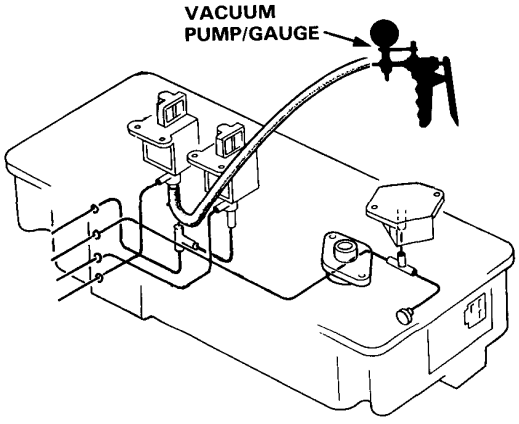
Air Valve Control Solenoid Valve

1. Open the control box lid and disconnect the rectangular connector from the control box.
2. Disconnect the lower vacuum hose of the air valve control solenoid valve (between the solenoid valve and the three-way joint) from the joint.
3. Apply vacuum to the hose.

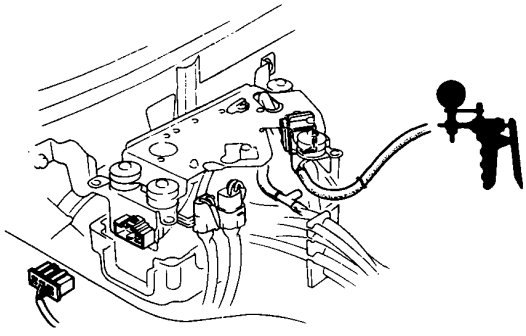
   It should hold vacuum.

   - If it does not hold vacuum, replace the valve.

[KE Model]



[Other Models]

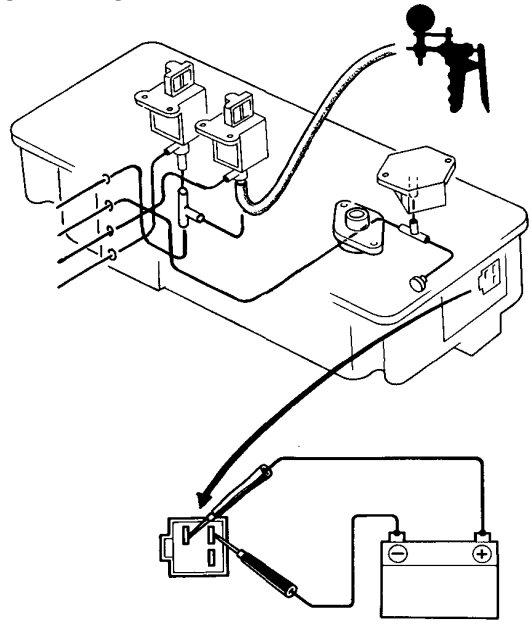


4. Connect the battery positive terminal to the Black/Yellow terminal of the control box coupler, and the negative terminal to the Orange terminal.
5. Apply vacuum to the hose.

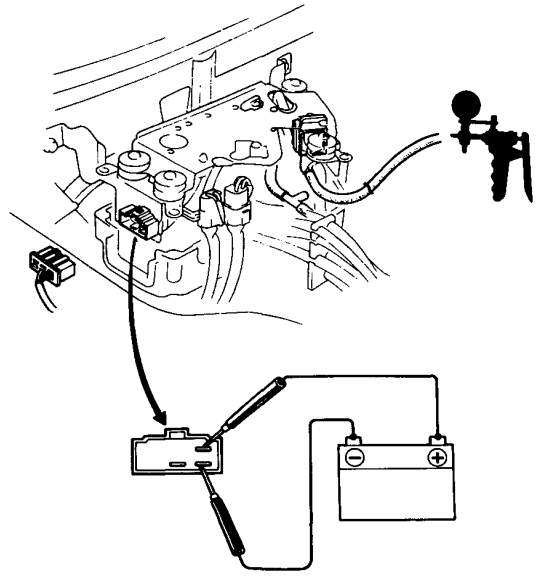
   It should not hold vacuum.

   - If it holds vacuum, replace the valve.

[KE Model]



[Other Models]

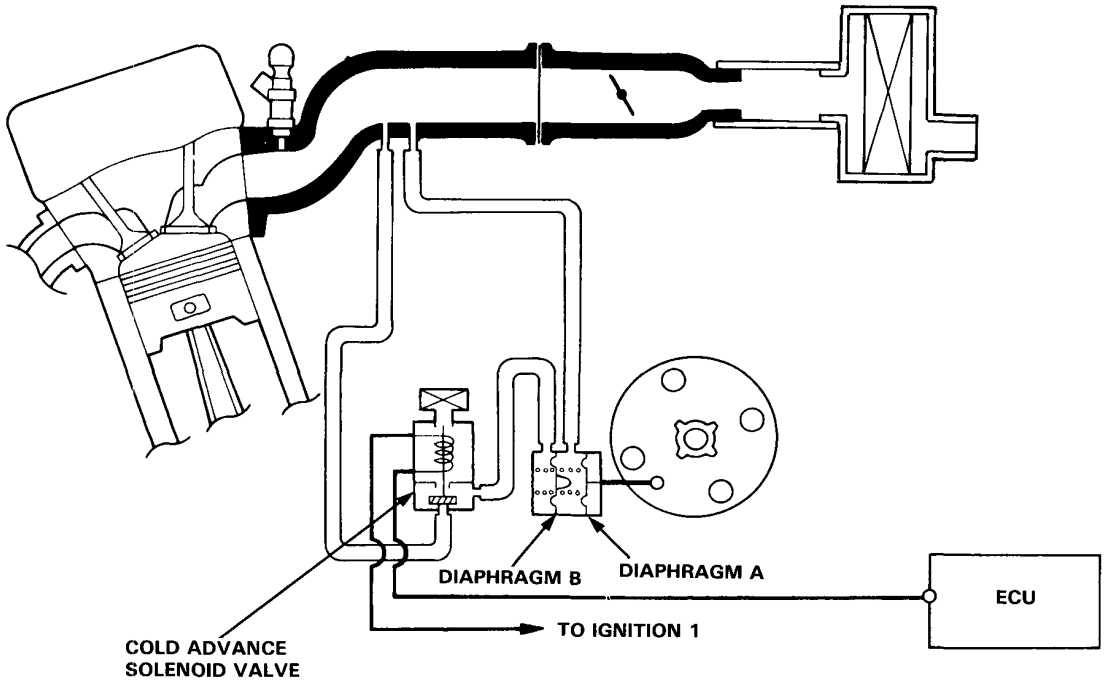


Ignition Timing Controls

Description

Ignition timing control, combined with the internal distributor control (centrifugal advance), affects the time at which each spark plug ignites the air-fuel mixture, in accordance with engine speed, load and coolant temperature.
This control system gives vacuum advance in response to the manifold vacuum and coolant temperature. This optimizes ignition timing during and after engine warm-up to control emission levels while maximizing fuel economy and engine performance.

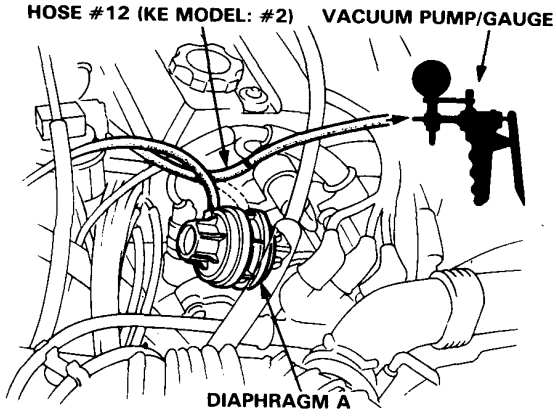
The distributor has two separate vacuum advance diaphragms which operate on manifold vacuum. Diaphragm B also has a solenoid valve (cold advance solenoid valve) in the line. It is operated by the control unit which receives signals from the engine coolant temperature, engine speed and manifold vacuum. When the solenoid valve is open, it sends vacuum to Diaphragm B to improve cold engine performance.



Inspection

NOTE:
- Engine coolant temperature must be below 60°C (140°F).
- Intake air temperature must be below 20°C (68°F).

1. Disconnect vacuum hose #12 (KE Model: #2) from the vacuum advance diaphragm A on the distributor and connect a vacuum pump/gauge to the hose.

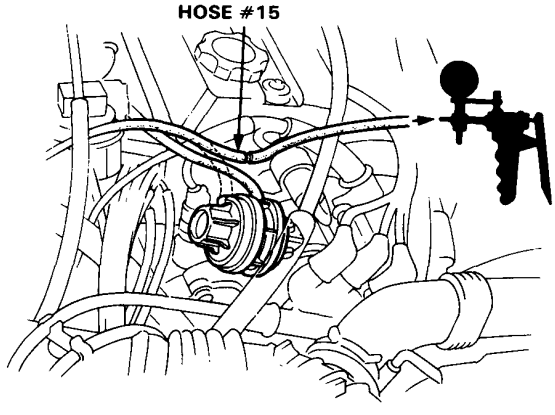


2. Start the engine, allow it to idle and check for vacuum.

   There should be vacuum.

   - If there is no vacuum, check the vacuum line for leaks, blockage or a disconnected hose and retest.
   - If there is vacuum, go on to step 3.

3. Disconnect vacuum hose #15 from the vacuum advance diaphragm B on the distributor and connect a vacuum pump/gauge to the hose.



4. Allow the engine to idle and check for vacuum.

   There should be vacuum.

   - If there is vacuum, go on to step 5.
   - If there is no vacuum, check the vacuum line for leas, blockage or a disconnected hose.
     If no problem, go on the cold advance solenoid valve inspection (page 12-42).

5. Wait for the engine to warm up (cooling fan comes on).
   Check for vacuum at idle.

   There should be no vacuum.

   - If there is no vacuum, go on to step 6.
   - If there is vacuum, go on to cold advance solenoid valve inspection (page 12-42).

6. If there is no abnormality at each test, inspect the vacuum advance diaphragm.

(cont'd)

Inspection (cont'd)

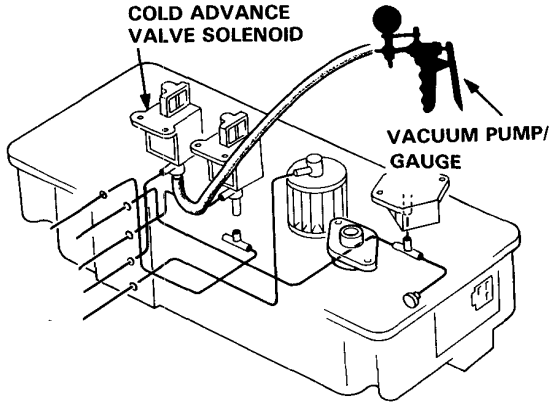
Cold Advance Solenoid Valve

The cold advance solenoid valve is activated by commands from the ECU. When the solenoid valve opens, this causes vacuum in the #15 vacuum hose and sends vacuum to diaphragm B to improve cold engine performance under the following conditions:

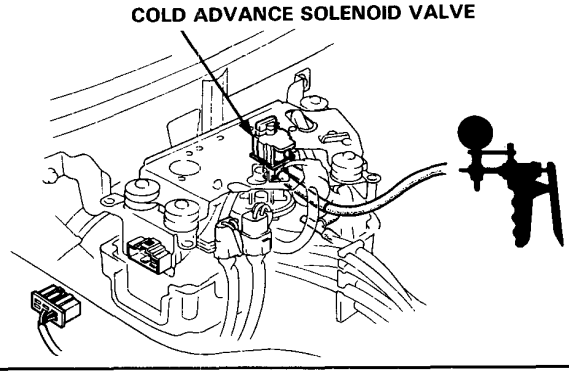
- Whenever the coolant temperature is below 60°C (140°F) and the intake air temperature is below 20°C (68°F)

1. Open the control box lid and disconnect the rectangular connector from the control box.
2. Disconnect the lower vacuum hose of the cold advance solenoid valve (between the solenoid valve and the three-way joint) from the three-way joint.
3. Apply vacuum to the hose.
   It should hold vacuum.
   If it does not hold vacuum, replace the valve.

[KE Model]

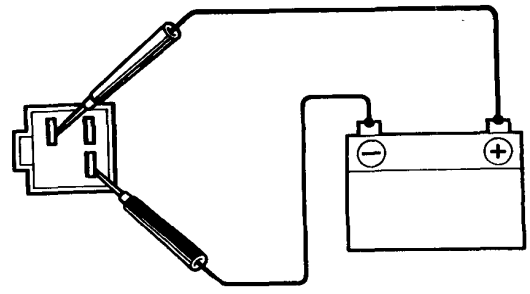


[Except KE Model]

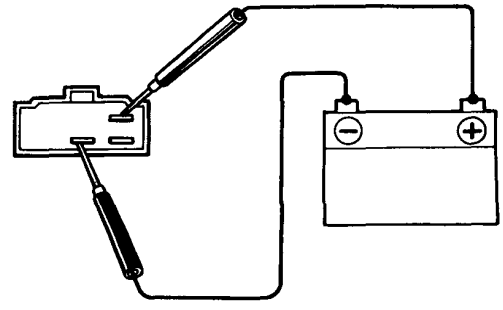


4. Connect the battery positive terminal to the Black/Yellow terminal of the control box coupler, and the battery negative terminal to the Yellow/Green terminal.

[KE Model]

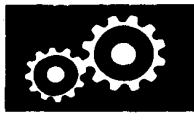


[Except KE Model]



5. Apply vacuum to the hose.
   It should not hold vacuum.
   If it holds vacuum, replace the valve.

Transaxle

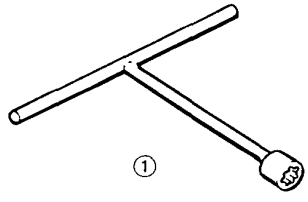


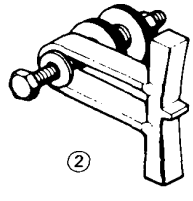
Outline of Model Changes

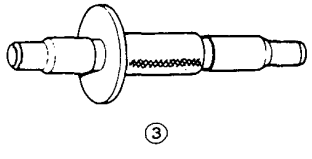
On models equipped with B20A2 engine, clutch pedal arrangement and clutch disc alignment tool are changed.

Special Tools

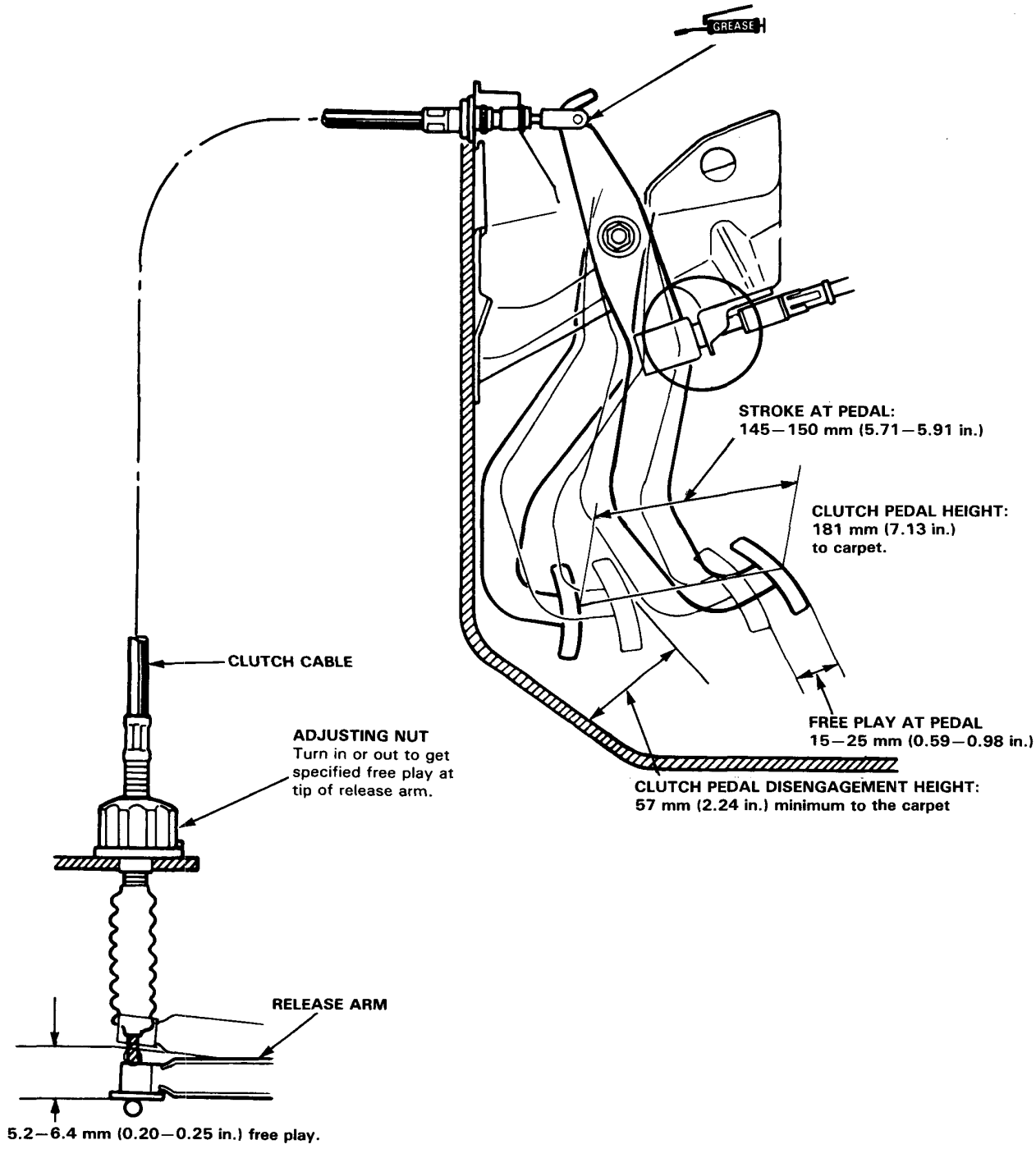
Ref. No.	Tool Number	Desctiption	Q'ty	Remarks
①	07708—0010102	10 mm T-Wrench	1	
②	07924—PD20002	Ring Gear Holder	1	
③	07GAG—PF50100	Clutch Disc Alignment Tool	1	







Adjustment

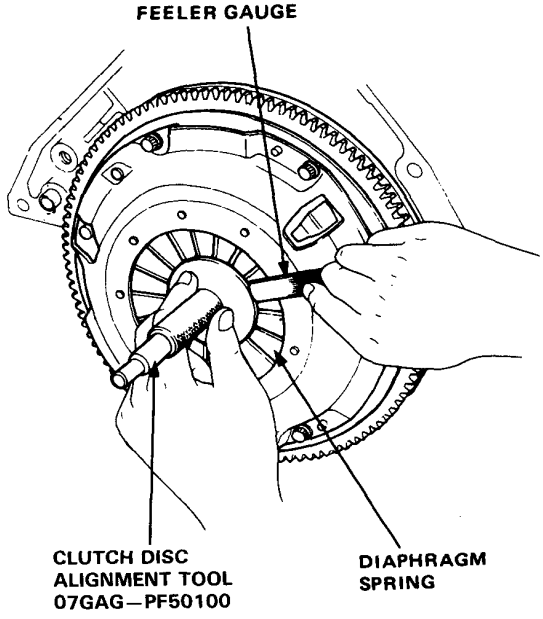

GREASE
STROKE AT PEDAL:
145—150 mm (5.71—5.91 in.)
CLUTCH PEDAL HEIGHT:
181 mm (7.13 in.)
to carpet.
CLUTCH CABLE
ADJUSTING NUT
Turn in or out to get specified free play at tip of release arm.
FREE PLAY AT PEDAL
15—25 mm (0.59—0.98 in.)
CLUTCH PEDAL DISENGAGEMENT HEIGHT:
57 mm (2.24 in.) minimum to the carpet
RELEASE ARM
5.2—6.4 mm (0.20—0.25 in.) free play.

Pressure Plate

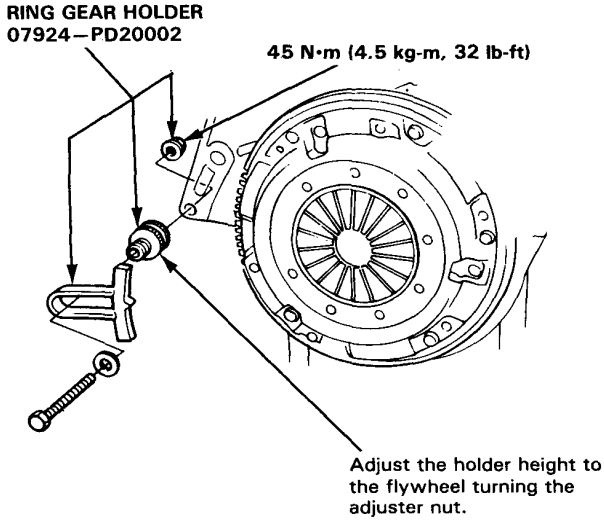
Removal/Inspection

1. Inspect the fingers of the diaphragm spring for wear at the release bearing contact area.
2. Check the diaphragm spring fingers for height using the Clutch Disc Alignment Tool and feeler gauge.

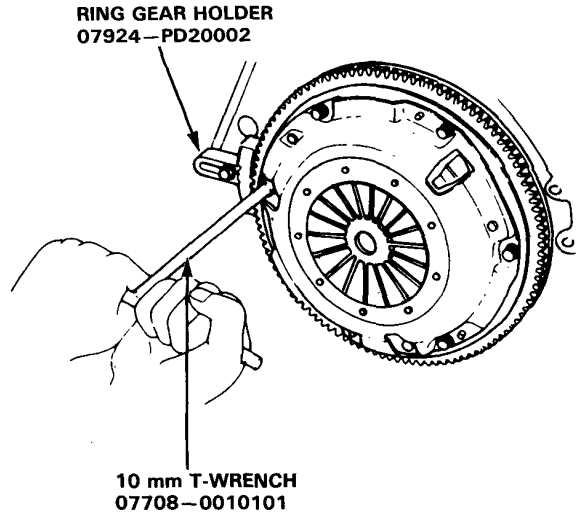
   Service Limit: 1.0 mm (0.04 in.) Max.



3. Install the Ring Gear Holder.

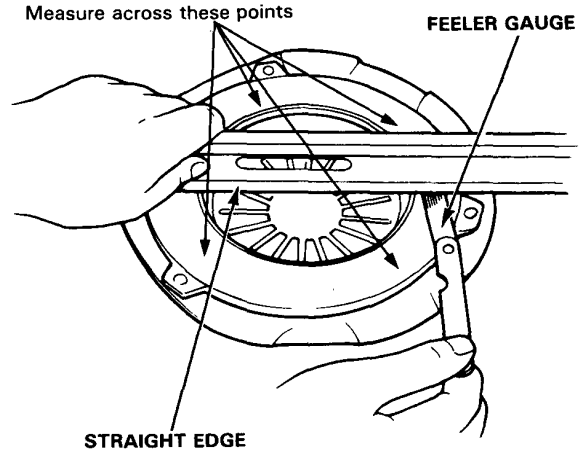


4. To prevent warping, unscrew the pressure plate mounting bolts two turns at a time in a crisscross pattern using a 10 mm T-wrench, then remove the pressure plate and clutch disc.

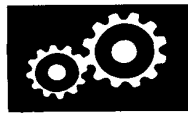


5. Inspect the pressure plate surface for wear, cracks, or burning.
6. Inspect for warpage using a straight edge and feeler gauge.

   Service Limit: 0.15 mm (0.006 in.) Max.



Manual Transmission <Type B2: for B20A2 Engine>



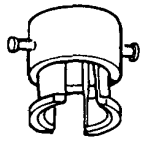
Outline of Model Changes, Special Tools

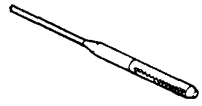
Outline of Model Change

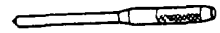
On models equipped with B20A2 engine, B2 type manual transmission is newly added.

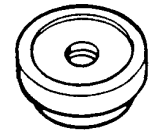
Special Tools

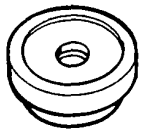
Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07936—6890101	Bearing Remover Attachment	1	Use changed to 07936—6340000 attachment
②	07744—0010200	Pin Punch, 3.0 mm	1	
③	07744—0010400	Pin Punch, 5.0 mm	1	07944—6110100 may also be used.
④	07746—0010200	Attachment, 37 x 40 mm	1	
⑤	07746—0010400	Attachment, 52 x 55 mm	1	07949—6340200 may also be used.
⑥	07746—0010500	Attachment, 62 x 68 mm	1	
⑦	07749—0010000	Driver	1	07949—6110000 may also be used.
⑧	07936—6340000	Bearing Remover Set	1	

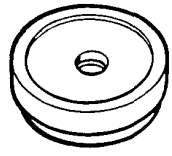

①


②

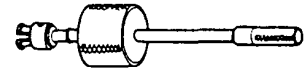

③


④


⑤


⑥


⑦

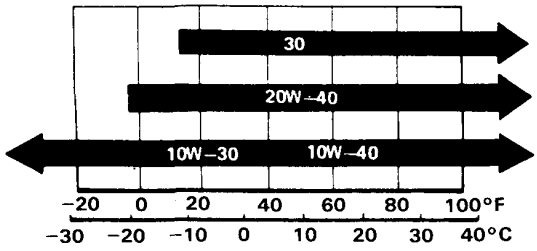

⑧

Oil Level Inspection

1. Check with oil at operating temperature, engine OFF, and car on level ground.
2. Remove oil filler plug and check level with finger.
3. Oil level must be up to fill hole. If it is below hole, add oil until it runs out, then reinstall plug.

Oil Change

Change oil every 40,000 km (24,000 miles).
Use only SAE30, 10W-30, 10W-40, or 20W-40 weight oil rated SE or SF grade.



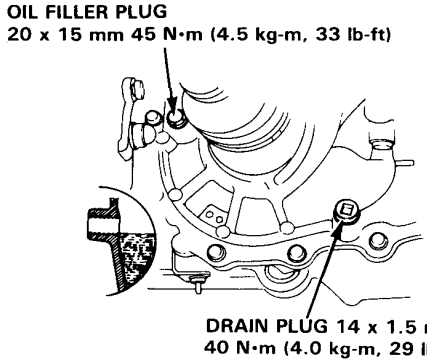
1. With transmission oil at operating temperature, engine OFF, and car on level ground, remove drain plug and drain transmission.

2. Reinstall drain plug with new washer, and refill to proper level.

   NOTE: Drain plug washer should be replaced at every oil change.

Oil Capacity

1.9 ℓ (2.0 U.S. qt.) after drain.
2.0 ℓ (2.1 U.S. qt.) after overhaul.



Removal

Car on Ground

1. Disconnect the ground cable at battery and at transmission.
2. Release the steering lock and place gear selector in neutral position.
3. Disconnect the engine compartment wiring as follows:
   - Battery positive cable from starter motor.
   - Black/white wire from starter solenoid.
   - Green/black and yellow wires from back-up light switch.
4. Release the engine sub wire harness from clamp at clutch housing.
5. Disconnect the clutch cable at the release arm.
6. Remove the two upper transmission mounting bolts.

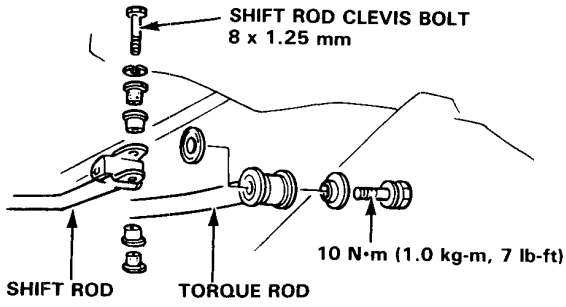
Car Raised on Hoist

7. Drain transmission oil. Reinstall drain plug and washer.
8. Remove front wheels.
9. Place transmission jack securely beneath transmission.
10. Remove bolt securing speedometer drive holder and pull assembly out of transmission.

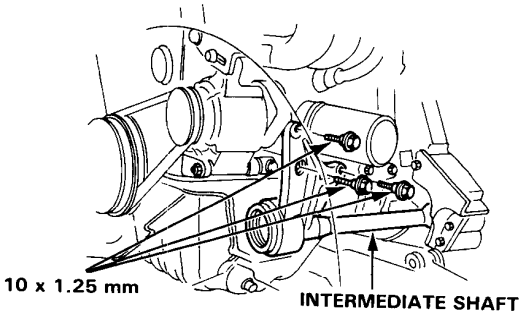
(cont'd)

Removal (cont'd)

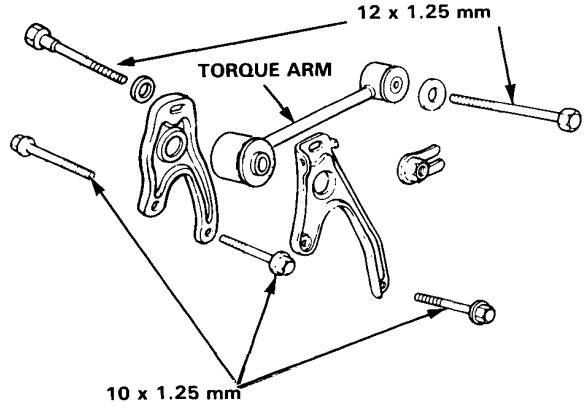
11. Disconnect shift lever torque rod from clutch housing.
12. Remove bolt from shift rod clevis.



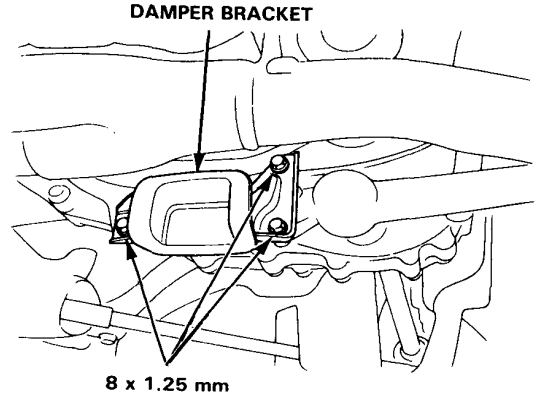
13. Disconnect the tie-rod ball joints and remove using the Ball Joint Remover.
14. Remove the lower arm ball joint bolt from the rightside lower control arm, then use a puller to disconnect the ball joint from the knuckle. Remove the damper fork bolt.
15. Turn each steering knuckle to its most outboard position. With screwdriver, pry right-side CV joint out approximately 1/2", then pull sub-axle out of transmission housing. Repeat on opposite side. Remove the right-side radius rod.
16. Remove the intermediate shaft from clutch housing.



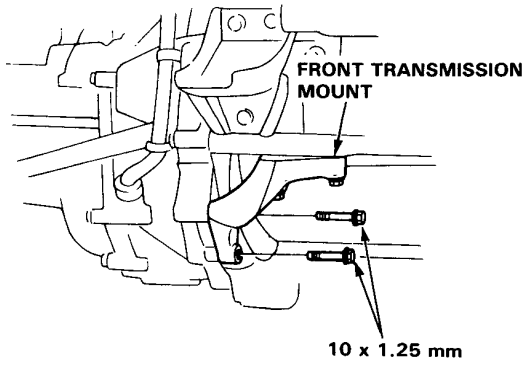
17. Remove the torque arm bracket bolts from the clutch housing.



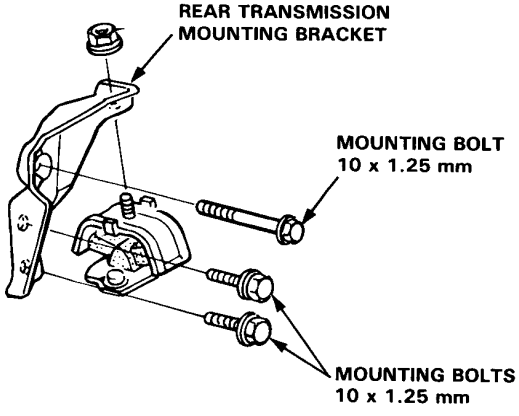
18. Remove the damper bracket from the transmission.



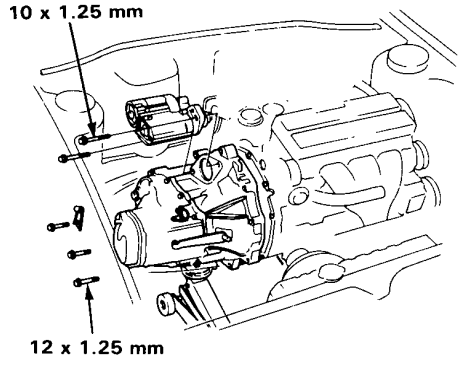
19. Remove the clutch housing bolts from the front transmission mount.



20. Remove the clutch housing bolts from the rear transmission mounting bracket.



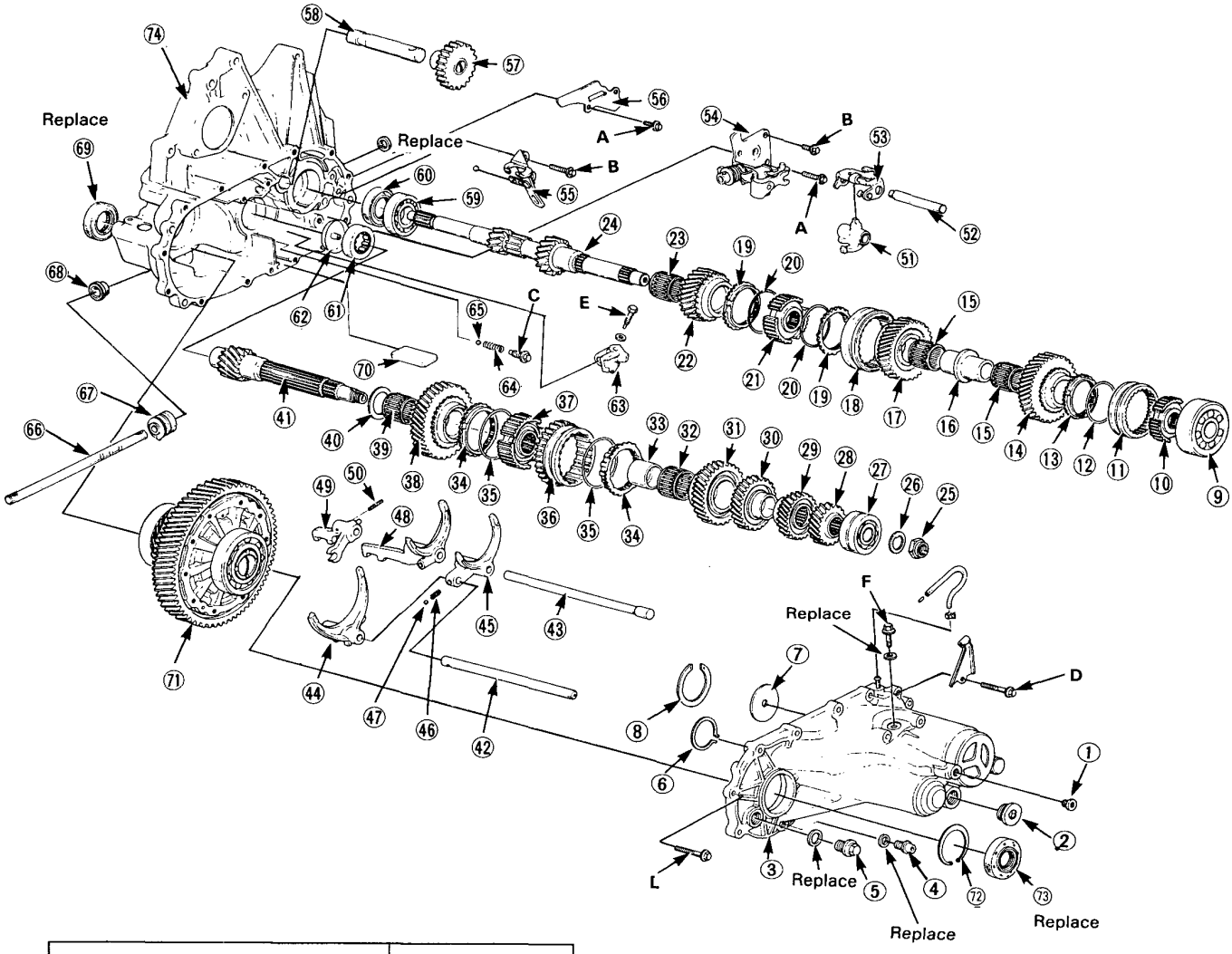
21. Remove the clutch cover.
22. Remove the starter mounting bolts. Detach the starter motor and lower through chassis.
23. Remove the front transmission mounting bolt.
24. Pull transmission away from the engine block to clear the two 14 mm dowel pins and lower on transmission jack.



Clean all parts thoroughly in solvent and dry with compressed air.

Lubricate all parts with oil before reassembly.

NOTE: This transmission uses no gaskets between the major housings; use Honda P/N 08740—99986 sealant. Assemble the housings within 20 minutes after applying the sealant and allow it to cure at least 30 minutes after assembly before filling the transmission with oil.



Torque Value	Bolt Size
A-12 N•m (1.2 kg-m, 9 lb-ft)	1-6 x 1.0 mm
B-14 N•m (1.4 kg-m, 10 lb-ft)	2-8 x 1.25 mm
C-22 N•m (2.2 kg-m, 16 lb-ft)	3-10 x 1.5 mm
D-26 N•m (2.6 kg-m, 19 lb-ft)	
E-29 N•m (2.9 kg-m, 21 lb-ft)	
F-55 N•m (5.5 kg-m, 40 lb-ft)	

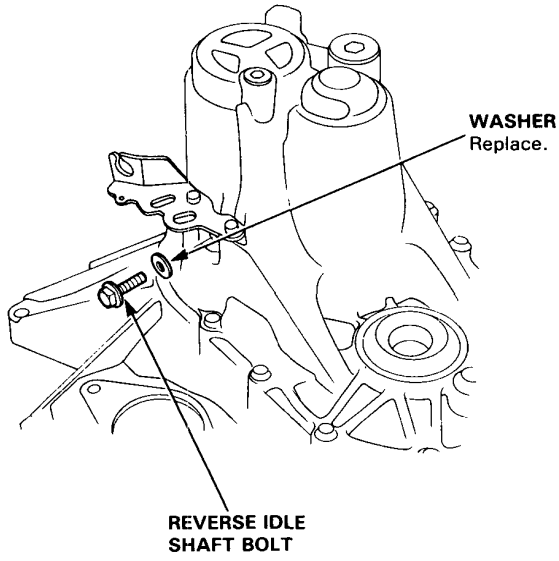
NOTE: Always clean the magnet ⑦⓪ whenever the transmission housing is disassembled.

① **18 mm SEALING BOLT**
35 N·m (3.5 kg-m, 25 lb-ft)
② **32 mm SEALING BOLT**
70 N·m (7.0 kg-m, 51 lb-ft)
③ **TRANSMISSION HOUSING**
④ **OIL DRAIN PLUG**
40 N·m (4.0 kg-m, 29 lb-ft)
⑤ **OIL FILLER BOLT**
45 N·m (4.5 kg-m, 33 lb-ft)
⑥ **SNAP RING**
⑦ **OIL GUIDE PLATE**
⑧ **THRUST SHIM**
Inspection, page 14-16
⑨ **MAINSHAFT BALL BEARING**
⑩ **5th GEAR SYNCHRO HUB**
⑪ **5th GEAR SYNCHRO SLEEVE**
⑫ **SYNCHRO SPRING**
⑬ **5th GEAR SYNCHRO RING**
⑭ **5th GEAR**
Inspection, page 14-26
⑮ **NEEDLE BEARING**
⑯ **COLLAR**
Inspection, page 14-26
⑰ **4th GEAR**
Inspection, page 14-26
⑱ **SYNCHRO SLEEVE**
⑲ **SYNCHRO RING**
⑳ **SYNCHRO SPRING**
㉑ **SYNCHRO HUB**
㉒ **3rd GEAR**
Inspection, page 14-25
㉓ **NEEDLE BEARING**
㉔ **MAINSHAFT**
Disassembly, page 14-18
Inspection, page 14-20
Measurement, page 14-25
㉕ **COUNTERSHAFT LOCKNUT**
110 N·m (11.0 kg-m, 80 lb-ft)
㉖ **LOCK WASHER**
㉗ **COUNTERSHAFT BALL BEARING**
㉘ **COUNTERSHAFT 5th GEAR**
㉙ **COUNTERSHAFT 4th GEAR**
㉚ **COUNTERSHAFT 3rd GEAR**
㉛ **COUNTERSHAFT 2nd GEAR**
㉜ **NEEDLE BEARING**
㉝ **COLLAR**
㉞ **SYNCHRO RING**
㉟ **SYNCHRO SPRING**
㊱ **REVERSE GEAR**
㊲ **SYNCHRO HUB**
㊳ **1st GEAR**
㊴ **NEEDLE BEARING**
㊵ **THRUST WASHER**
Inspection, page 14-23
㊶ **COUNTERSHAFT**
Disassembly, page 14-19
Inspection, page 14-22
Measurement, page 14-24
㊷ **SHIFT FORK SHAFT**
㊸ **SHIFT FORK SHAFT**
㊹ **1st GEAR SHIFT FORK**
㊺ **5th GEAR SHIFT FORK**
㊻ **DETENT SPRING**
㊼ **DETENT BALL**
㊽ **3rd/4th GEAR SHIFT FORK**
㊾ **5th/REVERSE GEAR SHIFT PIECE**
㊿ **3 mm SPRING PIN**
(51) **SHIFT SHAFT GUIDE**
(52) **SHIFT ARM SHAFT**
(53) **INTERLOCK**
(54) **GEAR SHIFT ARM HOULDER ASSEMBLY**
(55) **REVERSE SHIFT FORK**
(56) **SEPARATOR PLATE**
(57) **REVERSE IDLE GEAR**
(58) **REVERSE IDLE GEAR SHAFT**
(59) **MAINSHAFT BALL BEARING**
Removal, page 14-16
Installation, page 14-16
(60) **SEAL**
Removal, page 14-16
Installation, page 14-16
(61) **NEEDLE BEARING**
Removal, page 14-15
Installation, page 14-15
(62) **OIL GUIDE PLATE**
(63) **GEAR SHIFT ARM**
(64) **DETENT SPRING**
(65) **DETENT BALL**
(66) **GEAR SHIFT ROD**
(67) **BOOT**
(68) **SEAL**
(69) **SEAL**
(70) **MAGNET**
(71) **DIFFERENTIAL**
(72) **SNAP RING**
(73) **SEAL**
(74) **CLUTCH HOUSING**

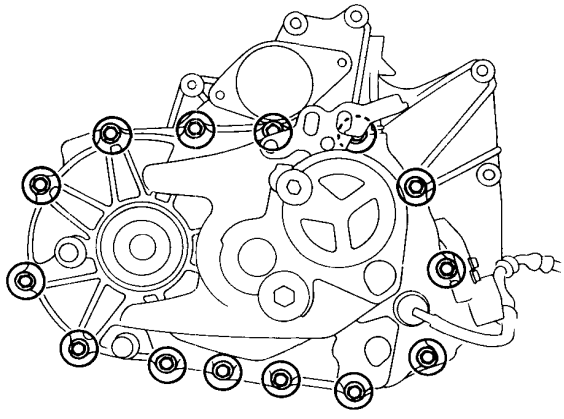
Transmission Housing

Removal

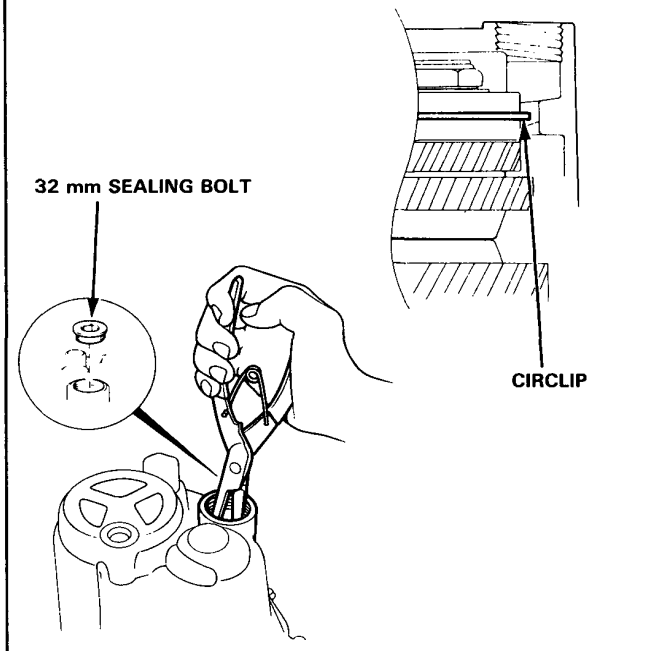
1. Remove the reverse idle shaft bolt shown from the transmission housing.



2. Remove 8 mm bolts attaching the clutch housing to the transmission housing.

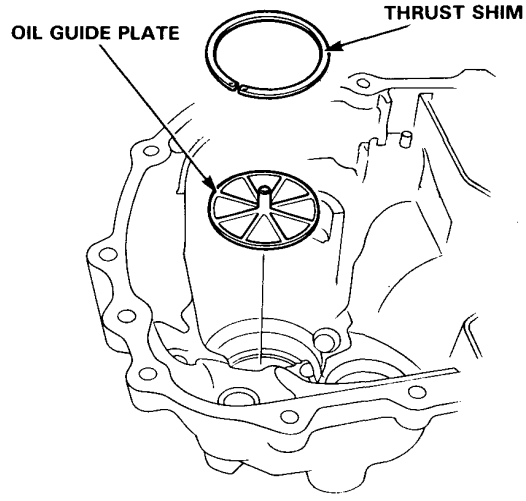


3. Remove the 32 mm sealing bolt and the circlip holding the countershaft ball bearing.



4. Separate the clutch housing from the transmission housing. Clean the mating surfaces thoroughly.

5. Remove the thrust shim and oil guide plate from the transmission housing.



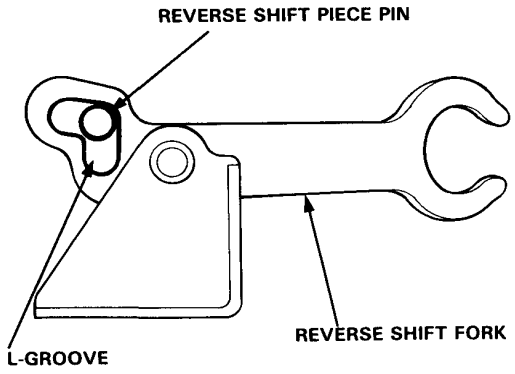
Reverse Shift Fork/ 5th Reverse Shift Fork

Clearance Inspection

1. Measure the clearance between the reverse shift fork and 5th/reverse shift piece pin.

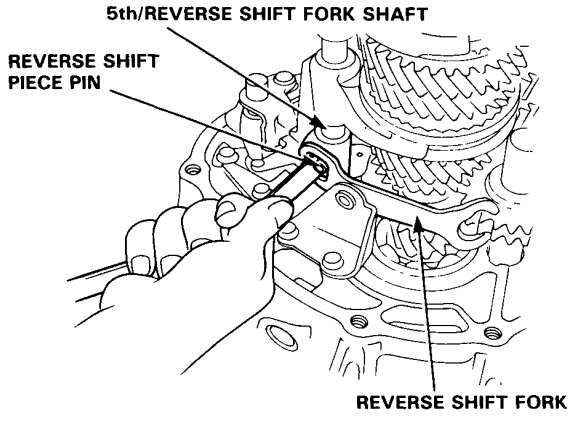
   Standard: 0.05—0.35 mm (0.002—0.014 in.)
   Service Limit: 0.5 mm (0.020 in.)

2. If the clearance is outside the above limits, measure the width of the L-groove in the reverse shift fork.



   Standard: 7.05—7.25 mm (0.278—0.285 in.)

3. Replace the reverse shift fork with a new one if the width exceeds 7.25 mm.

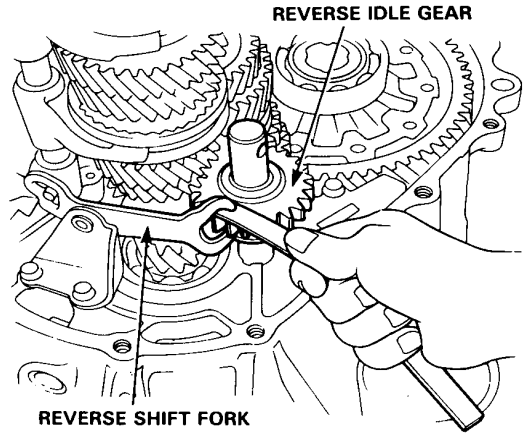


Reverse Shift Fork/ Reverse Idle Gear

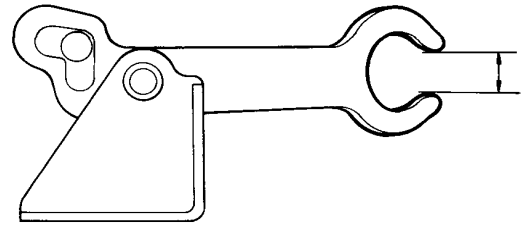
Clearance Inspection

1. Measure the clearance between the reverse idle gear and reverse shift fork.

   Standard: 0.5—1.1 mm (0.020—0.043 in.)
   Service Limit: 1.8 mm (0.071 in.)



2. If the clearance exceeds 1.8 mm (service limit), measure the width of the reverse shift fork pawl groove.



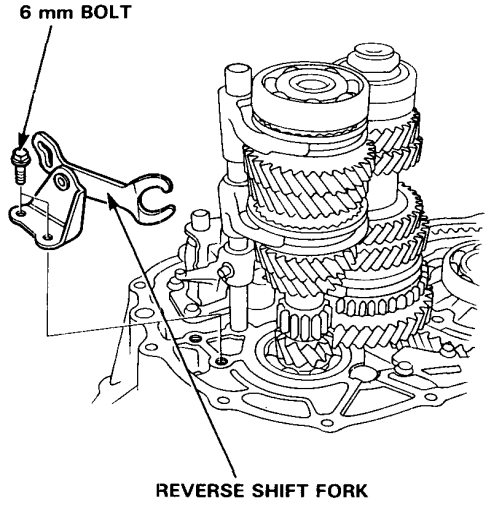
   Standard: 13.0—13.3 mm (0.512—0.524 in.)

3. If the width is outside the above limits, replace the shift fork with a new one.

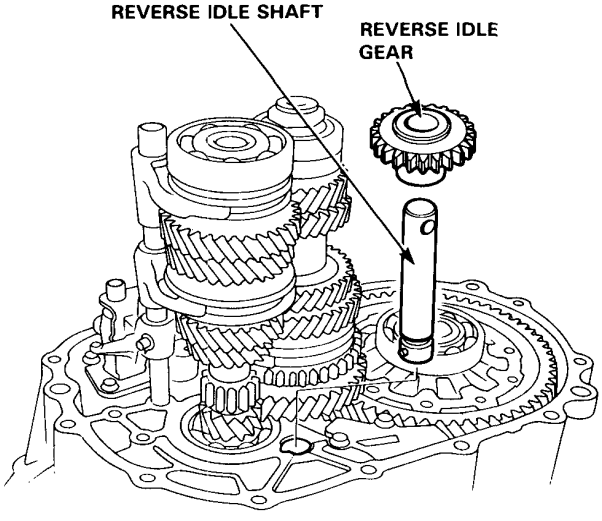
Reverse Shift Fork/ Reverse Idle Gear

Removal

1. Remove the reverse shift fork from the clutch housing.



2. Remove the reverse idle shaft and reverse idle gear from the clutch housing together.



Shift Arm Holder/ Shift Piece

Clearance Inspection

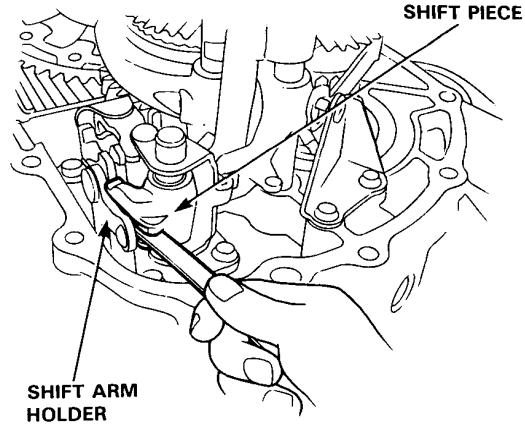
1. Measure the clearance between the shift arm holder and shift piece.

   Standard: 0.1—0.3 mm (0.004—0.019 in.)
   Service Limit: 0.6 mm (0.024 in.)

2. If the clearance is outside the above limits, measure the width of the groove in the shift piece.

   Standard: 7.9—8.0 mm (0.311—0.315 in.)

3. Replace the shift arm with the new one if the width exceeds 8.0 mm.



Selector Arm/Interlock

Clearance Inspection

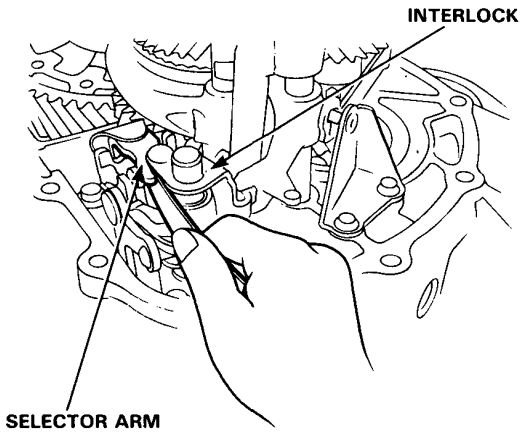
1. Measure the clearance between the selector arm and interlock.

   Standard: 0.05—0.20 (0.002—0.008 in.)
   Service Limit: 0.45 mm (0.017 in.)

2. If the clearance is outside the above limits, measure the width of the groove in the selector arm.

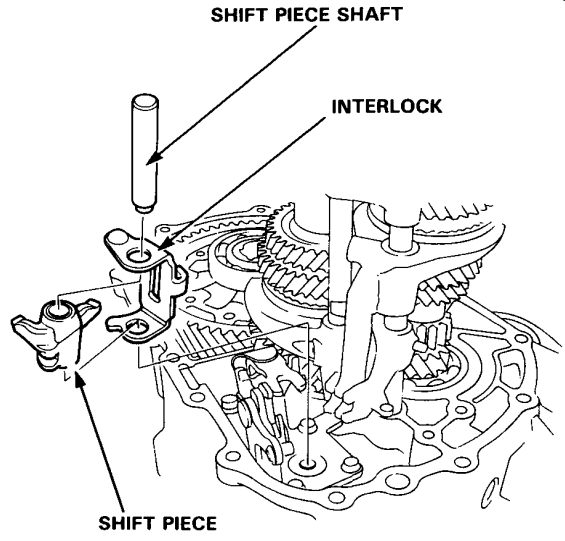
   Standard: 9.9—10.0 mm (0.390—0.394 in.)

3. Replace the selector arm with a new one if the width exceeds 10.0 mm (0.394 in.)

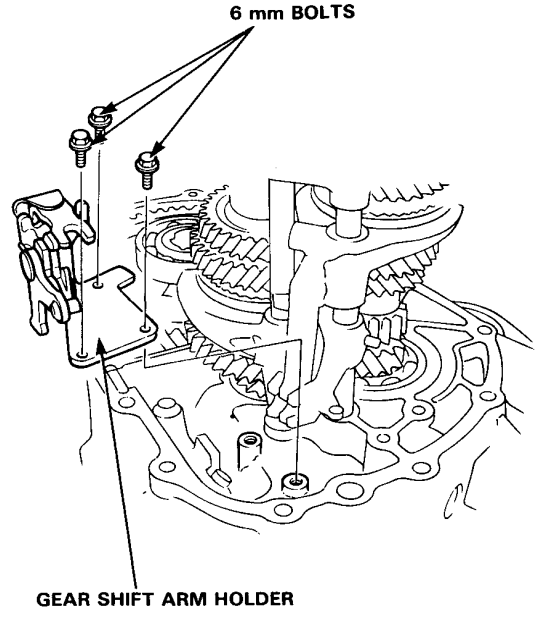


Removal

1. Remove the shift piece shaft, shift piece and interlock from the clutch housing.



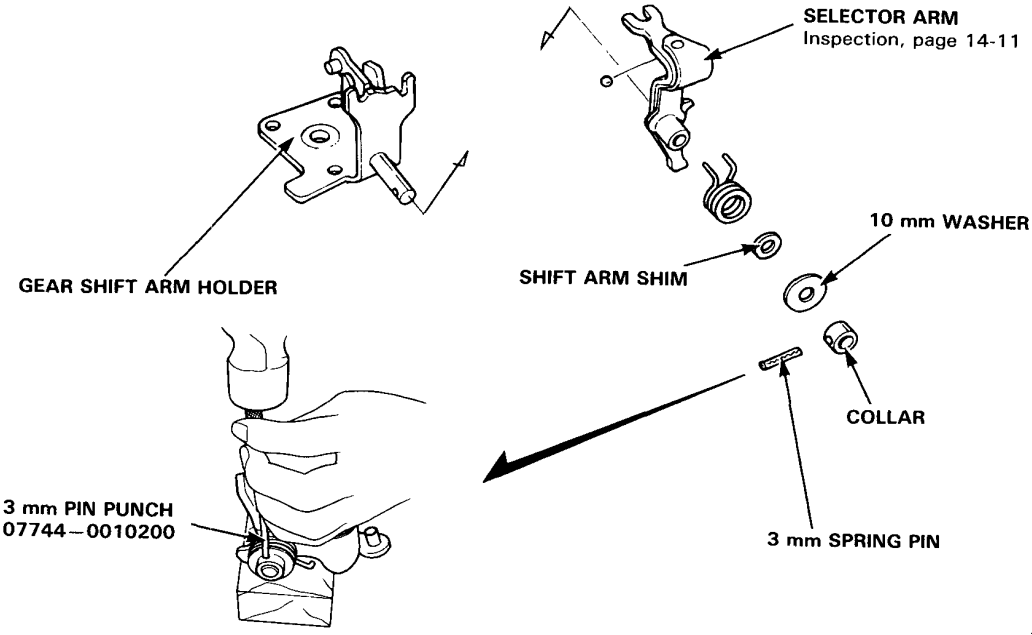
2. Remove the gear shift arm holder assembly from the clutch housing.



Shift Arm Holder

Disassembly

To remove selector arm from holder for shimming or replacement, drive out spring pin with driver.



Clearance Inspection

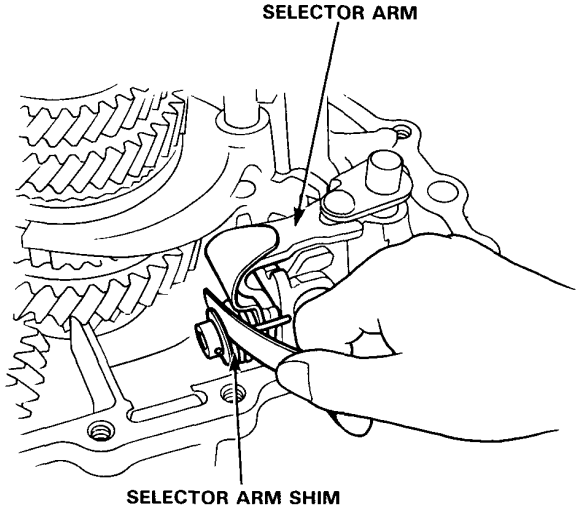
1. Measure the clearance between the gear shift arm holder and the selector arm shim.

   Standard: 0.01–0.2 mm (0.0003–0.008 in.)

2. If the clearance is outside the above limits, select the appropriate selector arm shim for the correct clearance from the chart below.

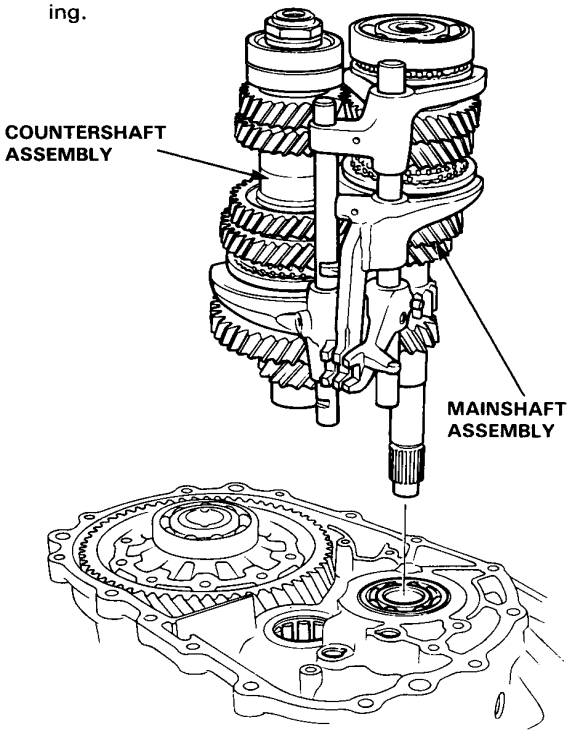
Thickness of Select or Arm Shim

Class	Thickness
A	0.8 mm (0.032 in.)
B	1.0 mm (0.039 in.)
C	1.2 mm (0.047 in.)
D	1.4 mm (0.055 in.)
E	1.6 mm (0.063 in.)

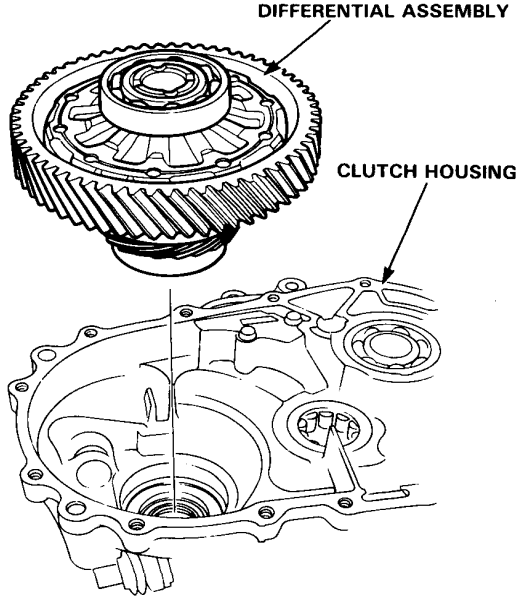


Removal

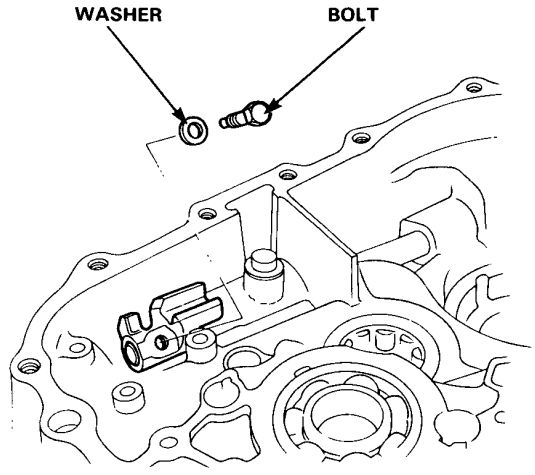
1. Remove the mainshaft assembly and countershaft assembly with the shift fork from the clutch housing.



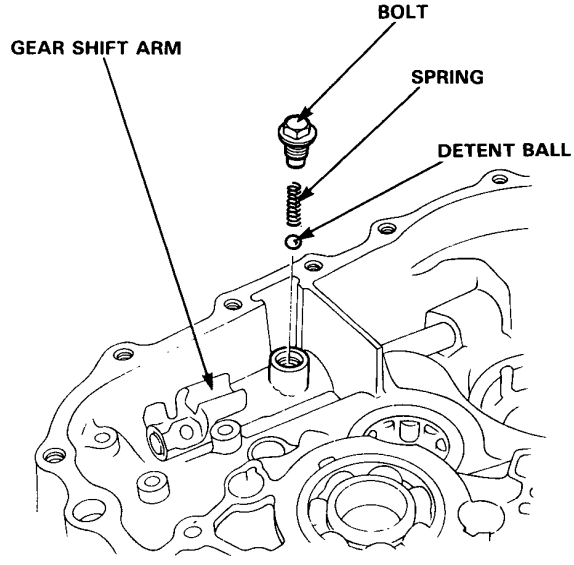
2. Remove the differential assembly from the clutch housing.



3. Remove the bolt and washer which hold the gear shift arm.



4. Remove the detent ball and spring from the clutch housing.

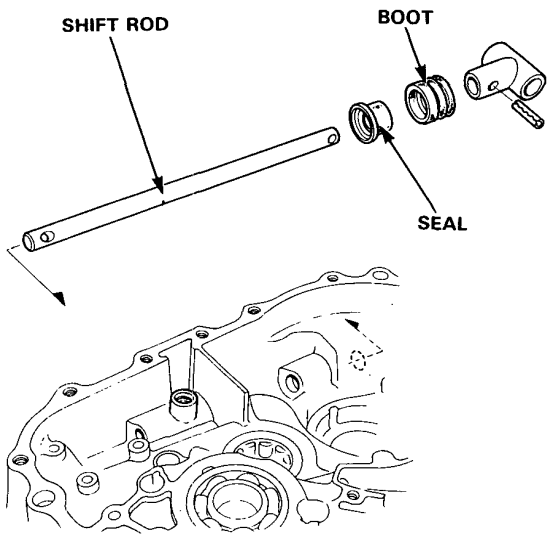


(cont'd)

Transmission Assembly

Removal (cont'd)

5. Remove the shift rod and boot from the clutch housing.



Shift Arm Holder

Clearance Inspection

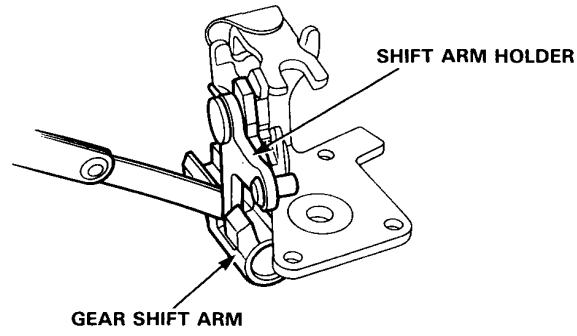
1. Measure the clearance between the shift arm holder and the gear shift arm.

   Standard: 0.05—0.35 mm (0.002—0.014 in.)
   Service Limit: 0.8 mm (0.032 in.)

2. If the clearance is outside the above limits, measure the width of the groove in the gear shift arm.

   Standard: 12.8—13.0 mm (0.504—0.512 in.)

3. If the width of the groove is outside the standard, replace the gear shift arm with a new one.



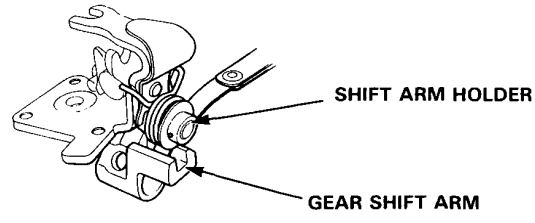
1. Measure the clearance between the selector arm and the gear shift arm.

   Standard: 0.05—0.25 mm (0.002—0.010 in.)
   Service Limit: 0.5 mm (0.020 in.)

2. If the clearance is outside the limits, measure the width of the groove in the selector arm.

   Standard: 11.9—12.0 mm (0.469—0.472 in.)

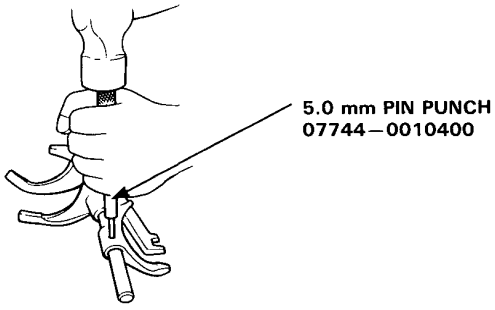
3. If the width is outside the standard, replace the selector arm with a new one.

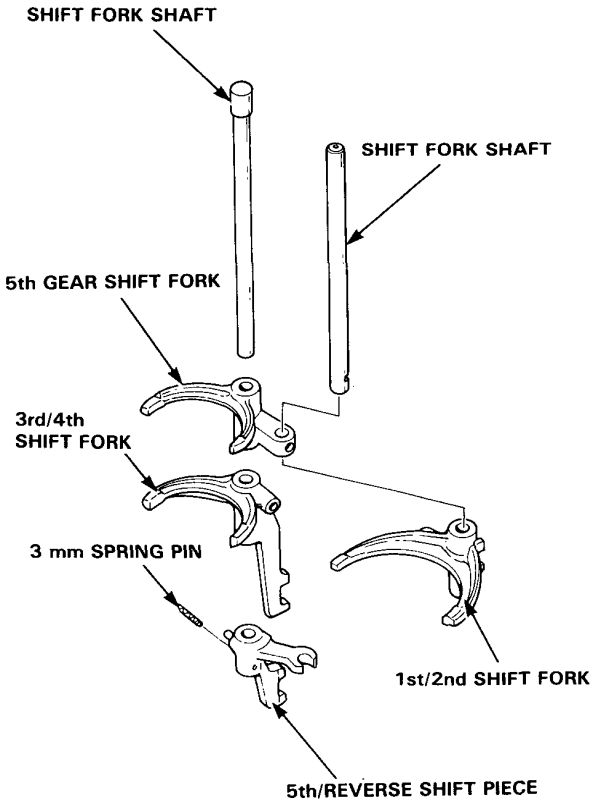


Shift Fork

Removal

1. Remove the shift fork shaft by removing the spring pin on 5th/Reverse shift piece.

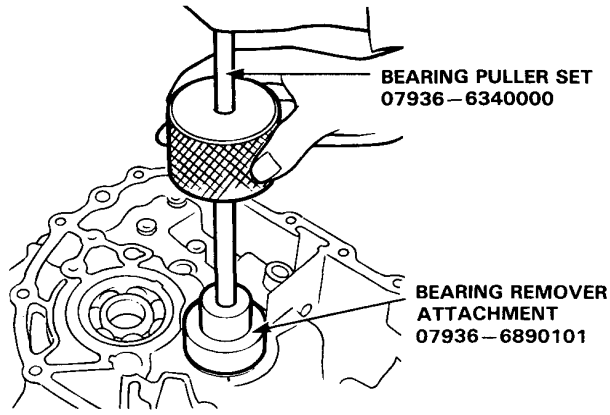




Countrshaft Bearing (Clutch Housing)

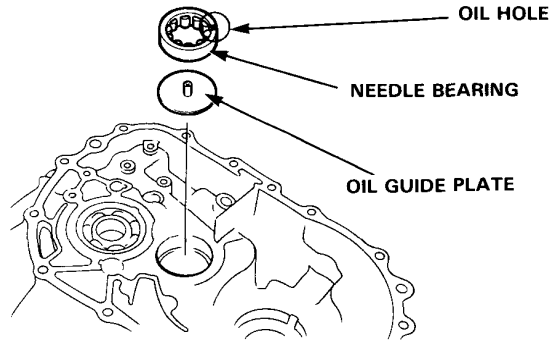
Replacement

1. Remove the needle bearing with the bearing puller.

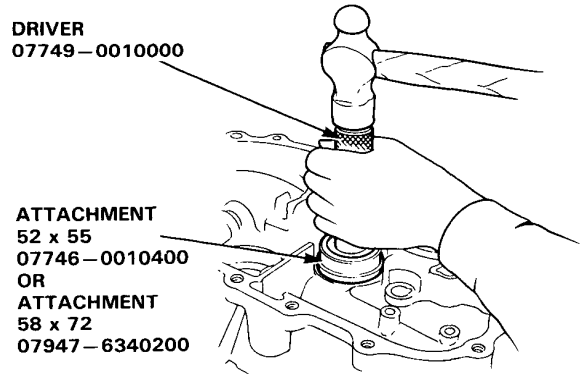


2. Position the oil guide plate and new needle bearing in the bore of the clutch housing.

   NOTE: Position the needle bearing with the oil hole facing up.



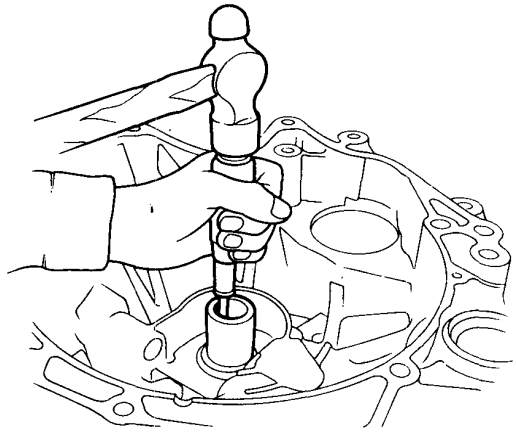
3. Drive the needle bearing in using the tools shown.



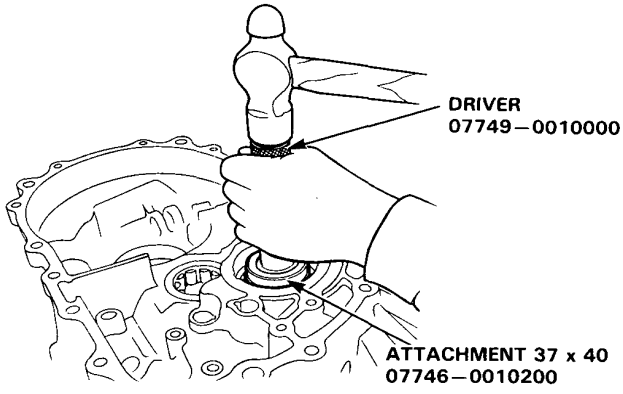
Mainshaft Bearing/Oil Seal (Clutch Housing)

Replacement

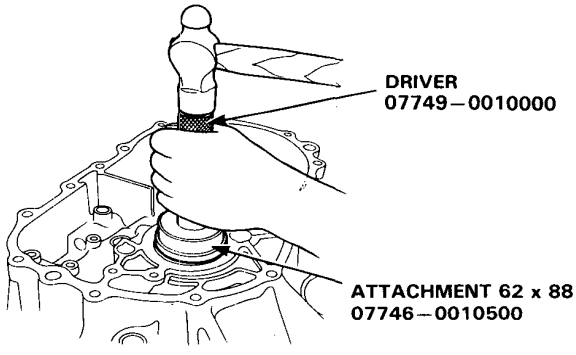
1. Remove the mainshaft bearing and oil seal from the clutch side.



2. Drive in a new oil seal from the transmission side.



3. Using the tools as shown, drive in a new bearing from the transmission side.

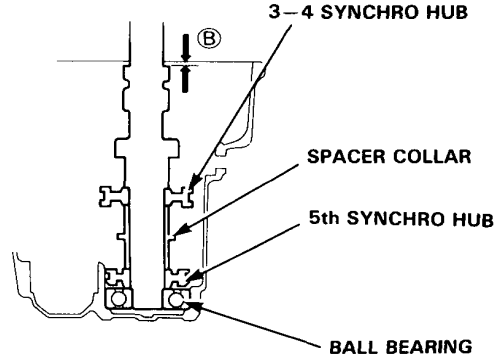


Mainshaft/Countershaft

Thrust Shim Selection

1. Remove the thrust shim and oil guide plate from the transmission housing.
(See Page 14-8).

2. Install the 3–4 synchro hub, spacer collar, 5th synchro hub, and ball bearing on the mainshaft; install the above assembly in the transmission case.

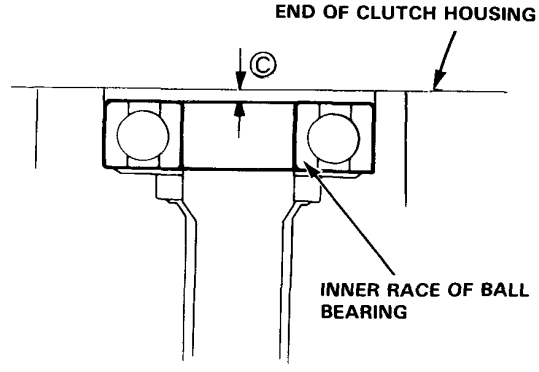


3. Measure distance Ⓑ between the end of the transmission housing and mainshaft.

NOTE:
- Use a straight edge and vernier caliper.
- Measure at three locations and average the reading.

4. Measure distance Ⓒ between the end of the clutch housing and bearing inner race.

NOTE:
- Use a straight edge and feeler gauge.
- Measure at three locations and average, the readings.



5. Select the correct thickness thrust shim as follows:
   (a) Subtract the height (C) of clutch housing ball bearing inner race surface and clutch housing seal surface determined in (step 4) from the measurement (B) of mainshaft and transmission housing end in (step 3).
   (b) Subtract the standard clearance 0.14—0.21 mm (0.006—0.008 in.) from the dimension determined in step 5a.

Example

Distance B:	1.74 mm (0.068 in.)
Distance C:	−0.10 mm (0.004 in.)
	1.64 mm (0.064 in.)
	1.64 mm (0.064 in.)
Thrust shim height: (minimum)	−0.14 mm (0.006 in.)
	1.50 mm (0.059 in.)
	1.64 mm (0.064 in.)
Thrust shim height: (maximum)	−0.21 mm (0.008 in.)
	1.43 mm (0.056 in.)

Select the thrust shim in the range between 1.50 mm (0.059 in.) and 1.43 mm (0.056 in.) from the part list.

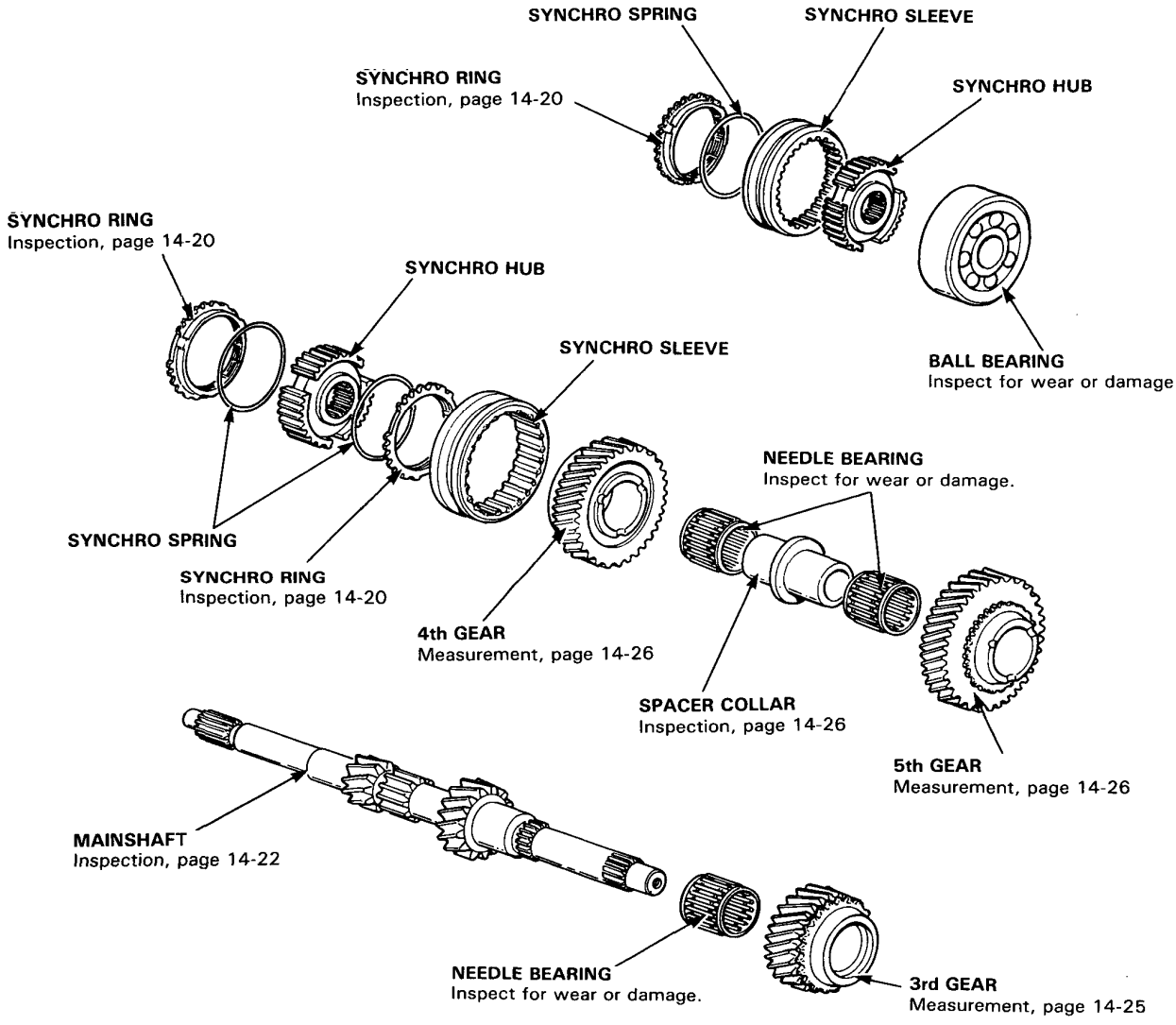
Part No.	Thickness
23931—PH8—010	1.10 mm (0.043 in.)
23932—PH8—010	1.15 mm (0.045 in.)
23933—PH8—010	1.20 mm (0.047 in.)
23934—PH8—010	1.25 mm (0.049 in.)
23935—PH8—010	1.30 mm (0.051 in.)
23936—PH8—010	1.35 mm (0.053 in.)
23937—PH8—010	1.40 mm (0.055 in.)
23938—PH8—010	1.45 mm (0.057 in.)
23939—PH8—010	1.50 mm (0.059 in.)
23940—PH8—010	1.55 mm (0.061 in.)
23941—PH8—010	1.60 mm (0.063 in.)
23942—PH8—010	1.65 mm (0.065 in.)
23943—PH8—010	1.70 mm (0.067 in.)
23944—PH8—010	1.75 mm (0.069 in.)
23945—PH8—010	1.80 mm (0.071 in.)
23946—PH8—010	1.85 mm (0.073 in.)
23947—PH8—010	1.90 mm (0.075 in.)
23948—PH8—010	1.95 mm (0.077 in.)
23949—PH8—010	2.00 mm (0.079 in.)
23950—PH8—010	2.05 mm (0.081 in.)
23951—PH8—010	2.10 mm (0.083 in.)
23952—PH8—010	2.15 mm (0.085 in.)

Mainshaft Assembly

Index

NOTE: The needle bearings are of the same size

Before assembling, clean all parts in solvent, dry them with compressed air, then coat them with clean oil.

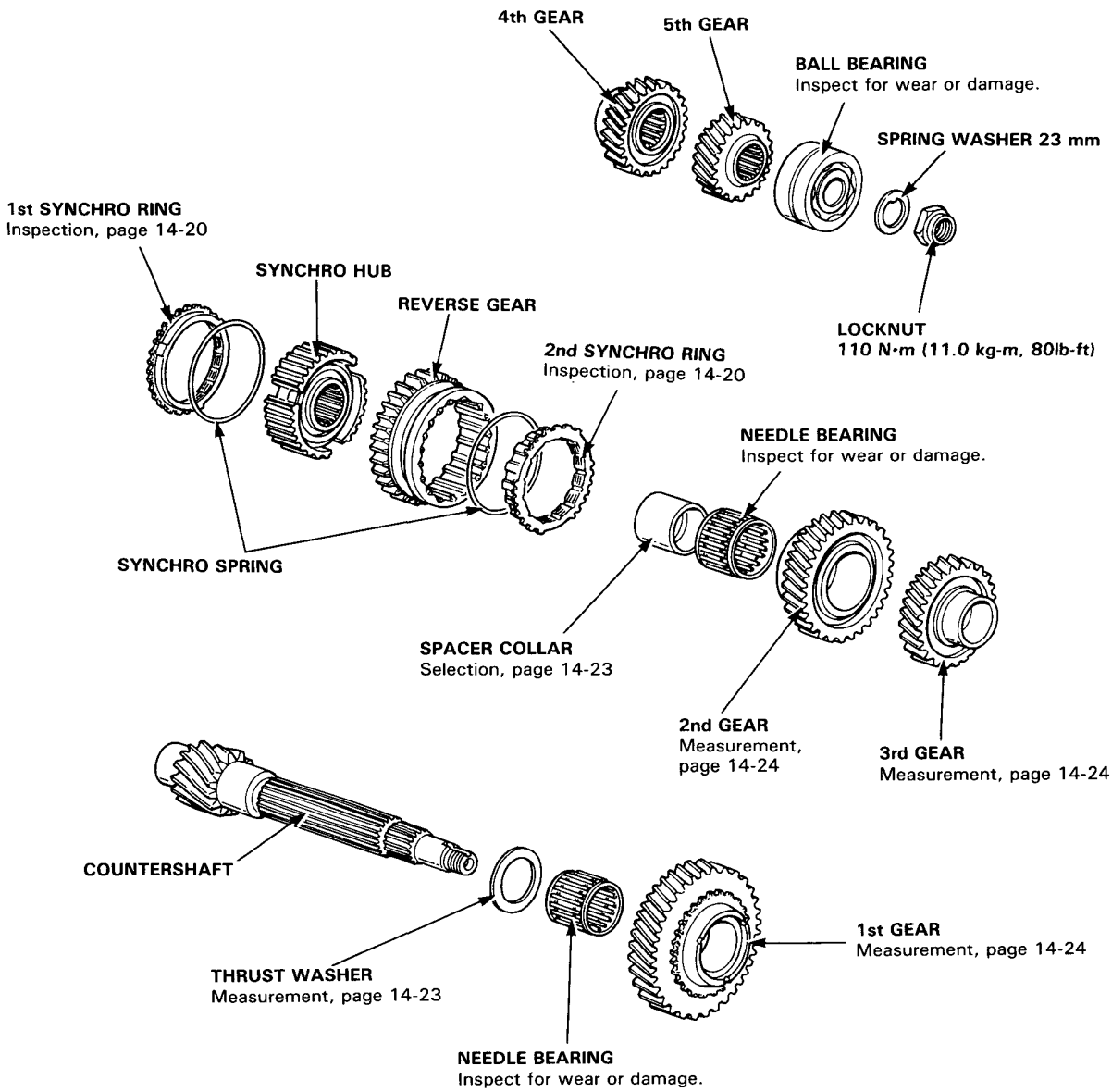


Countershaft Assembly

Index

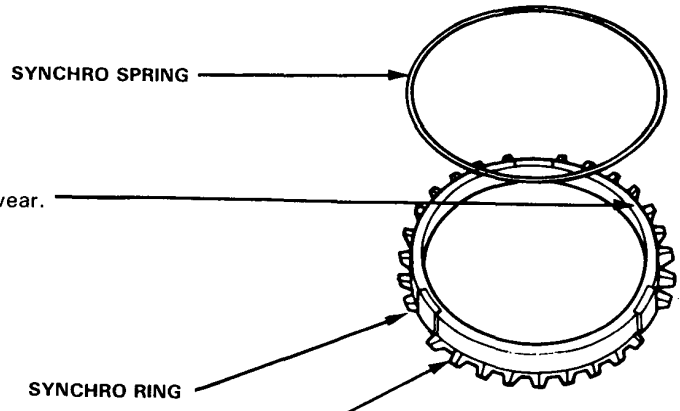
NOTE: The needle bearings are of the same size.

Before assembling, clean all parts in solvent, dry them with compressed air, then coat them with clean oil.



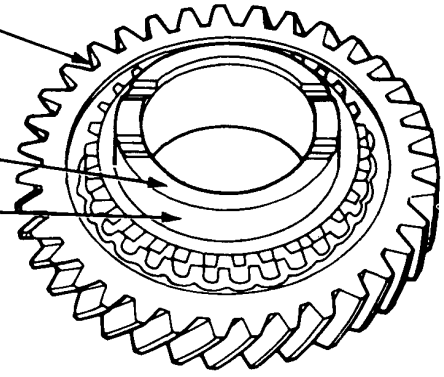
Gear and Synchro Ring

Inspection



1. Inspect the inside of synchro ring for wear.

2. Inspect the synchro ring teeth and matching teeth on gear for wear (rounded off).



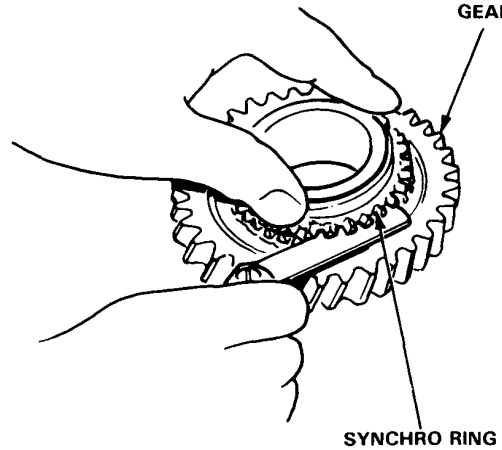
3. Inspect the gear hub thrust surface for wear.

4. Inspect the cone surface for wear on 1st, 2nd, 3rd and 4th countershaft gears; 5th mainshaft gear.

5. Inspect the teeth on all gears for uneven wear, scoring, galling, cracks.

6. Place the synchro ring on matching gear cone and rotate until it stops (approx. 10 to 20 degrees), then measure the clearance between ring and gear.

   Ring-to-Gear Clearance:
   Standard (New): 0.85—1.1 mm (0.033—0.043 in.)
   Service Limit: 0.4 mm (0.016 in.)



7. Separate the synchro ring and gear, and coat them with oil.

8. Install the synchro spring on synchronizer ring.

9. Put the synchro ring on gear cone again, rotate until it stops, then set it aside for later reassembly.

Shift Fork/Synchro Sleeve/Synchro Hub/Shift piece

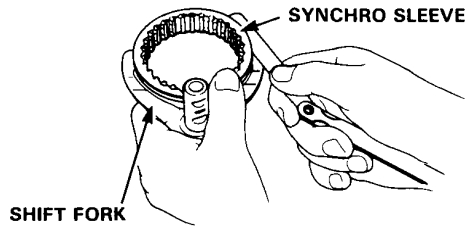
Shift Fork to Synchro Sleeve Clearance

1. Check the clearance between each shift fork and its matching synchro sleeve.

	1st, 2nd, 3rd, 4th	5th
Standard	0.45—0.65 mm (0.018—0.026 in.)	1.0 mm (0.039 in.)
Service Limit	0.25—0.45 mm (0.010—0.018 in.)	0.8 mm (0.032 in.)

2. If the clearance exceeds the service limit, measure the thickness of the shift fork fingers.

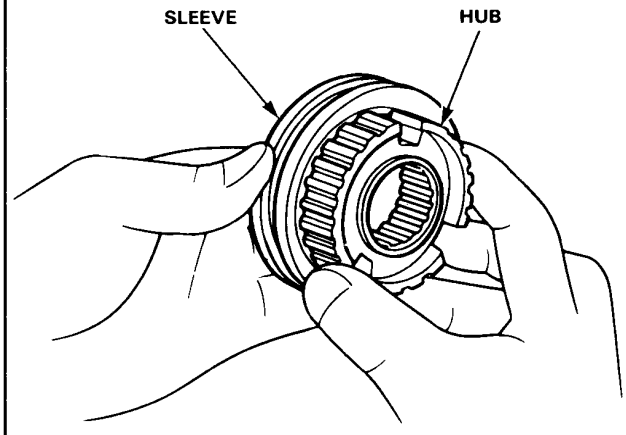
	1st, 2nd, 3rd, 4th	5th
Standard	7.95—8.05 mm (0.313—0.317 in.)	5.75—5.85 mm (0.226—0.230 in.)



Synchro Sleeve and Hub Inspection

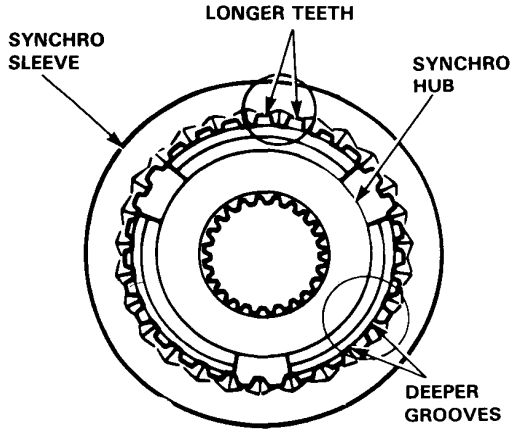
1. Inspect the gear teeth on all synchro hubs and sleeves for rounded off corners, indicating wear.
2. Install each hub in its mating sleeve and check for freedom of movement.

   NOTE: If replacement is required, always replace the synchro sleeve and hub as a unit.



Installing Synchro Hubs in Sleeves

Each synchro sleeve has three sets of longer teeth (120 degrees apart) that must be matched with the three sets of deeper grooves in the hub when assembled.



4th Shift Fork to Shift Piece Clearance

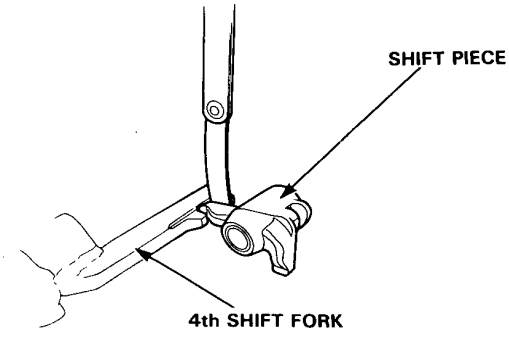
1. Measure the clearance between the 4th shift fork and the shift piece.

   Standard: 0.2—0.5 mm (0.008—0.020 in.)
   Service Limit: 0.8 mm (0.032 in.)

2. If the clearance exceeds the service limit, measure the width of the shift piece.

   Standard: 11.9—12.0 mm (0.469—0.472 in.)

3. Replace the shift piece if the width is outside the standard value with a new one.

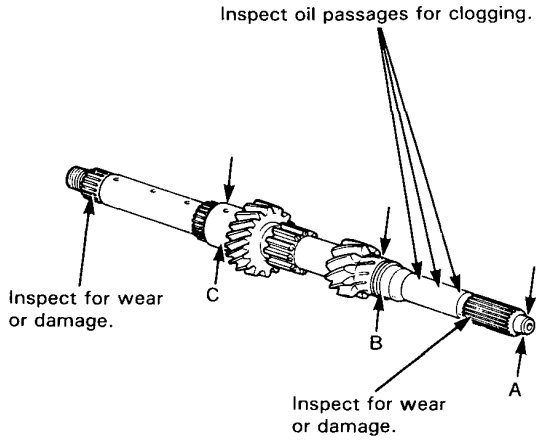


Mainshaft

Inspection

1. Measure gear and bearing O.D.s.

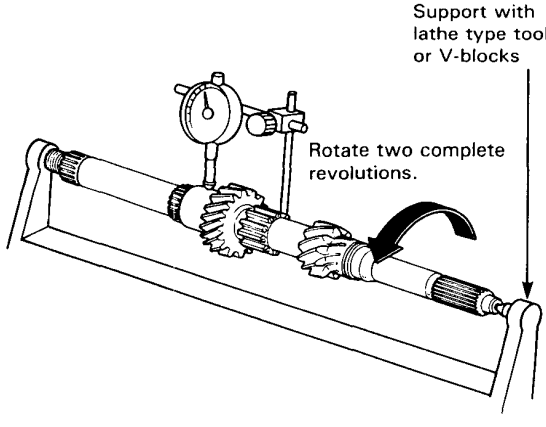
Standard: **A: 27.987–28.000 mm (1.102–1.102 in.)**
B: 37.984–38.000 mm (1.495–1.496 in.)
C: 27.987–28.000 mm (1.102–1.102 in.)
Service Limit **A: 27.94 mm (1.099 in.)**
B: 37.93 mm (1.493 in.)
C: 27.94 mm (1.099 in.)



2. Replace the mainshaft if any readings are out of tolerance.

3. Inspect for runout.

Standard: **0.02 mm (0.0008 in.)**
Service Limit: **0.05 mm (0.0020 in.)**



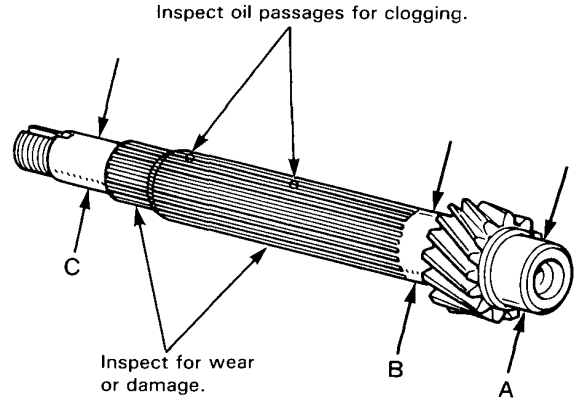
4. Replace the mainshaft if the reading is out of tolerance.

Countershaft

Inspection

1. Measure gear and bearing O.D.s.

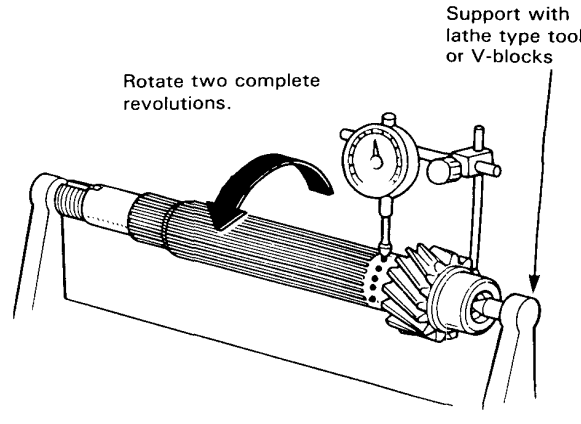
Standard: **A: 33.000–33.015 mm (1.299–1.230 in.)**
B: 39.984–40.000 mm (1.574–1.575 in.)
C: 24.987–25.000 mm (0.984–0.984 in.)
Service Limit: **A: 32.95 mm (1.295 in.)**
B: 39.93 mm (1.572 in.)
C: 24.94 mm (0.980 in.)



2. Replace the countershaft if any readings are out of tolerance.

3. Inspect for runout.

Standard: **0.02 mm (0.0008 in.)**
Service Limit: **0.05 mm (0.0019 in.)**



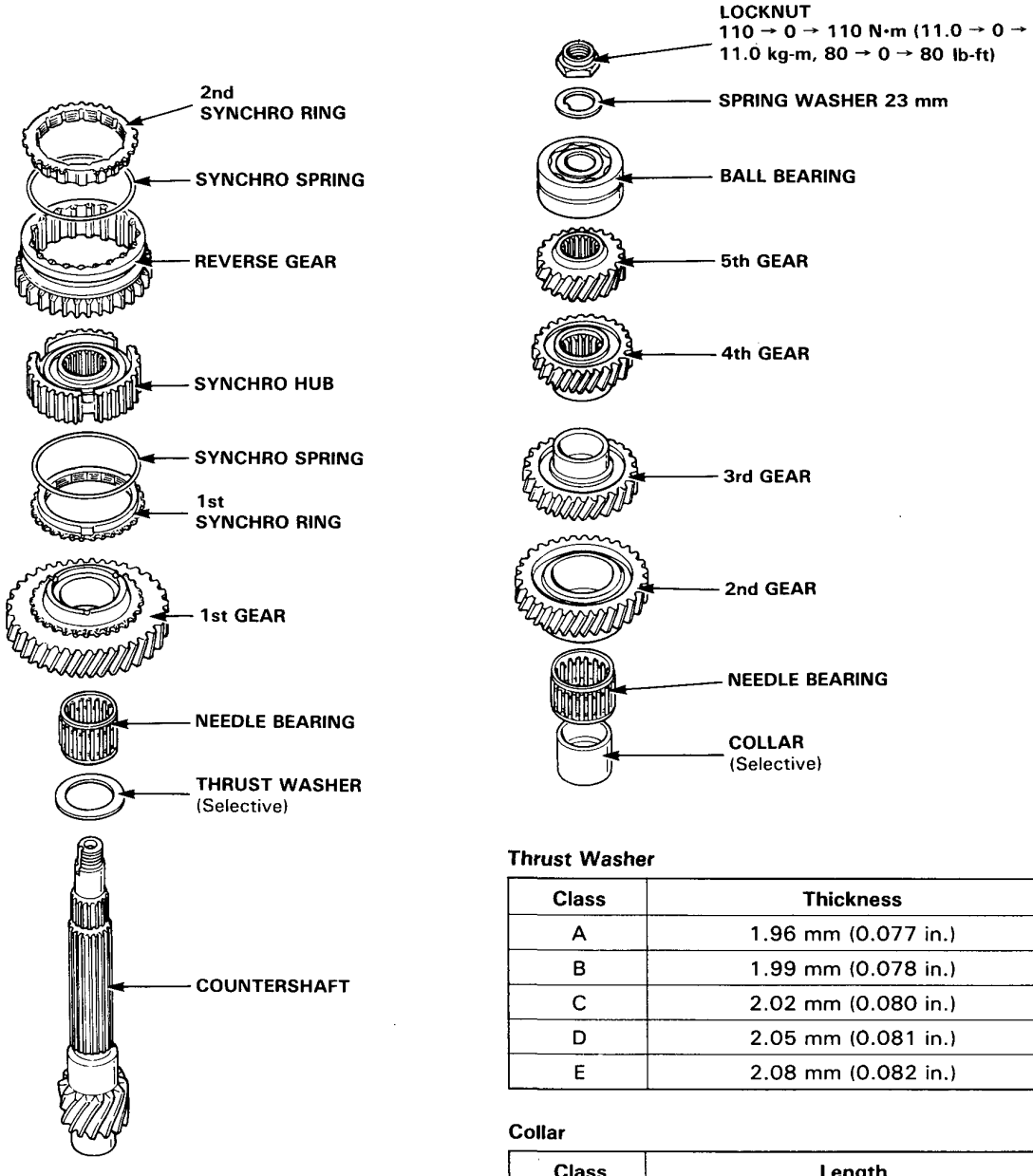
4. Replace the countershaft if the reading is out of tolerance.

Countershaft Assembly

Clearance Inspection

NOTE: Two types of 36 x 44 x 29 mm collars and four types of thrust washers for 1st gear are available for the adjustment of the clearance between the gears on the countershaft.

1. Assemble the gears, spacer collars, thrust washer, synchro hub, synchro ring, etc. as shown below.



Thrust Washer

Class	Thickness
A	1.96 mm (0.077 in.)
B	1.99 mm (0.078 in.)
C	2.02 mm (0.080 in.)
D	2.05 mm (0.081 in.)
E	2.08 mm (0.082 in.)

Collar

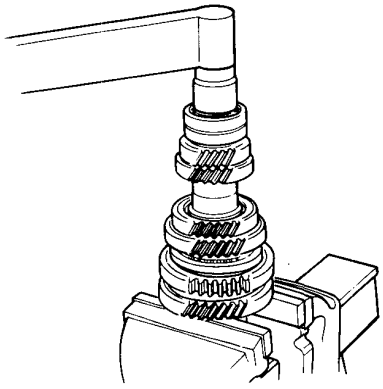
Class	Length
A	29.03–29.05 mm (0.143–0.144 in.)
B	28.98–29.00 mm (1.141–1.142 in.)

(cont'd)

Clearance Inspection (cont'd)

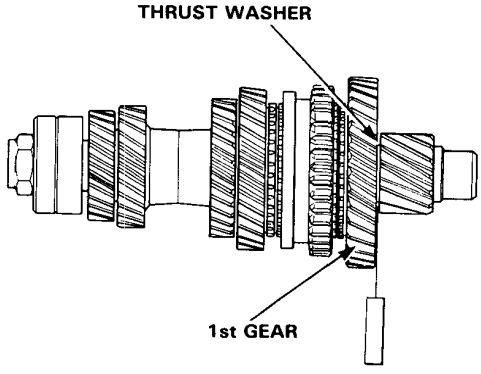
2. Torque the countershaft locknut to 110 → 0 → 110 N•m (11.0 → 0 → 11.0 kg-m, 80 → 0 → 80 lb-ft) before checking clearance.

   NOTE: Put a piece of wood between the vise and the mainshaft.



3. Measure the clearance between 1st gear and the thrust washer.

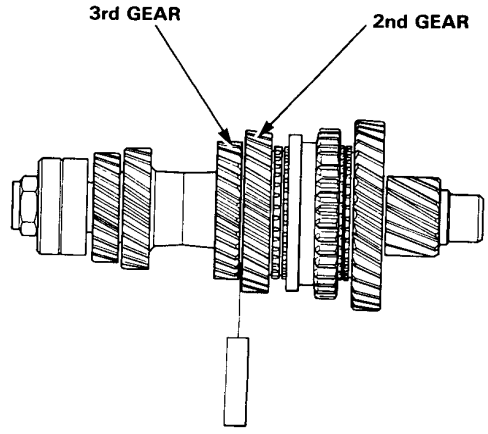
   Standard: **0.03–0.08 mm (0.001–0.003 in.)**
   Service Limit: **0.18 mm (0.007 in.)**



4. If the clearance is out of tolerance, select the appropriate thrust washer or spacer collar for the correct clearance from the charts on page 14-23.

5. Measure the clearance between the 2nd gear and 3rd gear.

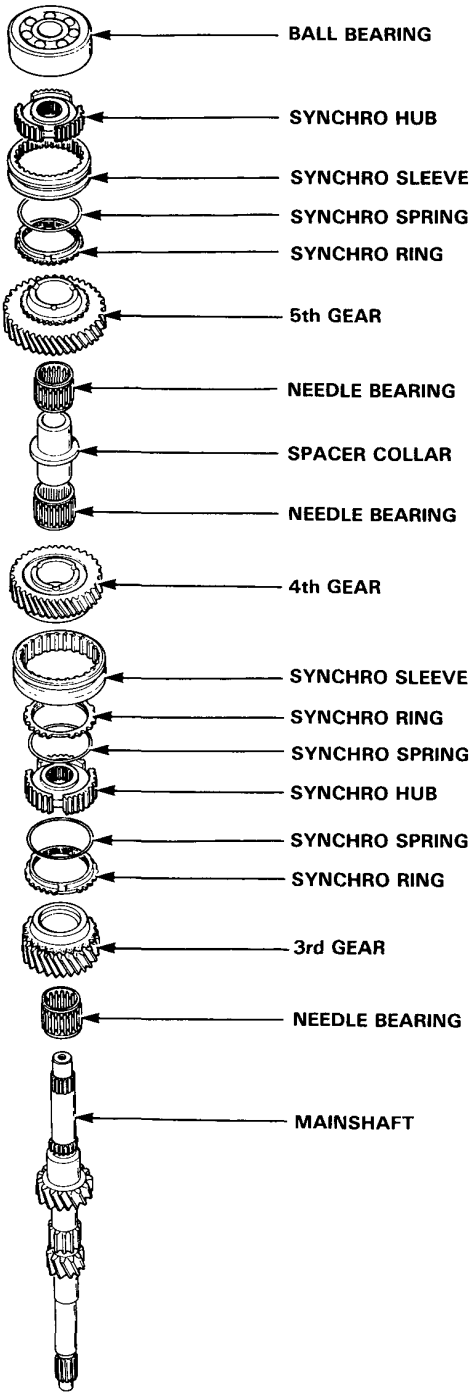
   Standard: **0.03–0.08 mm (0.001–0.003 in.)**
   Service Limit: **0.18 mm (0.007 in.)**



6. If the clearance is out of tolerance, select the appropriate thrust washer or spacer collar for the correct clearance from the charts on page 14-23.

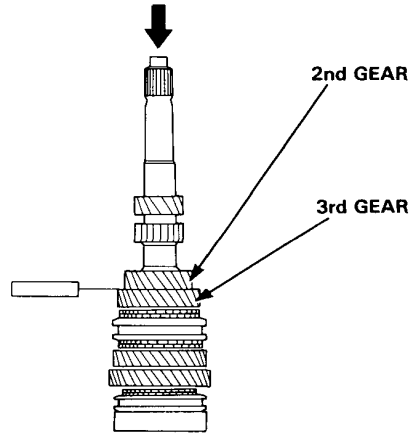
Clearance Inspection

1. Assemble the bearings, synchro hub, synchro sleeve, gears, spacer collar, etc. on the mainshaft as instructed below.



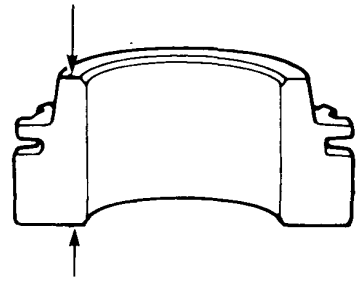
2. Measure the clearance: push down on the bearing race with a socket, and measure the clearance between 3rd and 2nd gears.

3rd Gear Clearance:
Standard: 0.06–0.21 mm (0.002–0.008 in.)
Service Limit: 0.3 mm (0.012 in.)



3. If the reading is outside specifications, measure the thickness of 3rd gear.

3rd Gear Thickness:
Standard: 32.42–32.47 mm (1.276–1.278 in.)
Service Limit: 32.3 mm (1.272 in.)



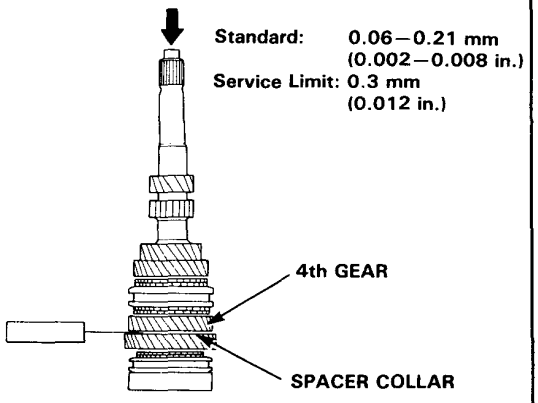
4. If the reading is within specifications, replace the synchro hub.

5. If the service limit is exceeded, replace the gear.

(cont'd)

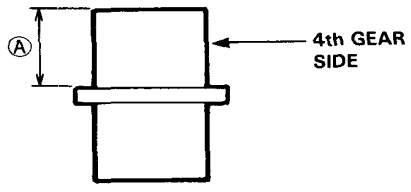
Clearance Inspection (cont'd)

6. Measure the clearance between 4th gear and the spacer collar.



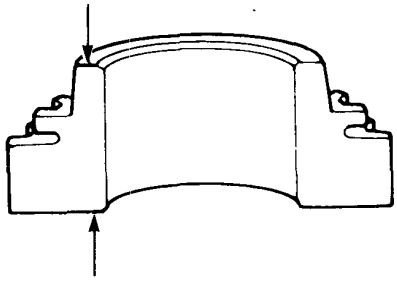
7. If the reading is out of specifications measure distance Ⓐ on the spacer collar.

Standard: 26.03–26.08 mm (1.025–1.027 in.)
Service Limit: 26.01 mm (1.024 in.)



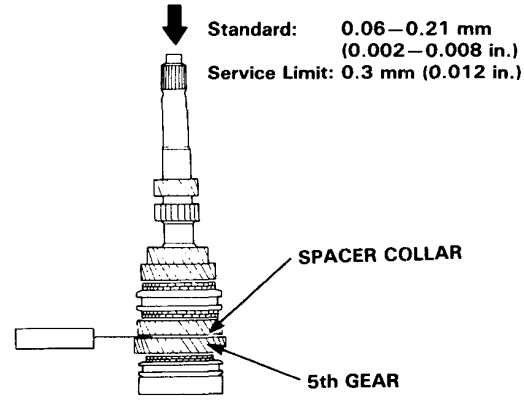
8. If distances Ⓐ are within specification, measure the thickness of 4th gear,

4th Gear Thickness:
Standard: 30.92–30.97 mm (1.217–1.220 in.)
Service Limit: 30.8 mm (1.213 in.)



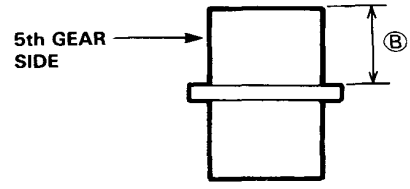
Replace the 4th gear if the respective measurement is out of specification.
Replace the 4th gear synchro hub if the respective measurement is within specification.

9. Measure the clearance between 5th gear and the spacer collar.



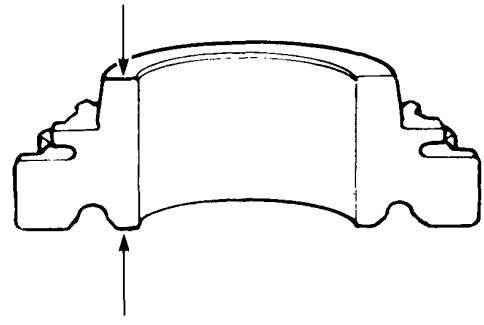
10. If the reading is out of specifications measure distance Ⓑ on the spacer collar.

Standard: 26.03–26.08 mm (1.025–1.027 in.)
Service Limit: 26.01 mm (1.024 in.)



11. If distance Ⓑ is within specification, measure the thickness of 5th gear.

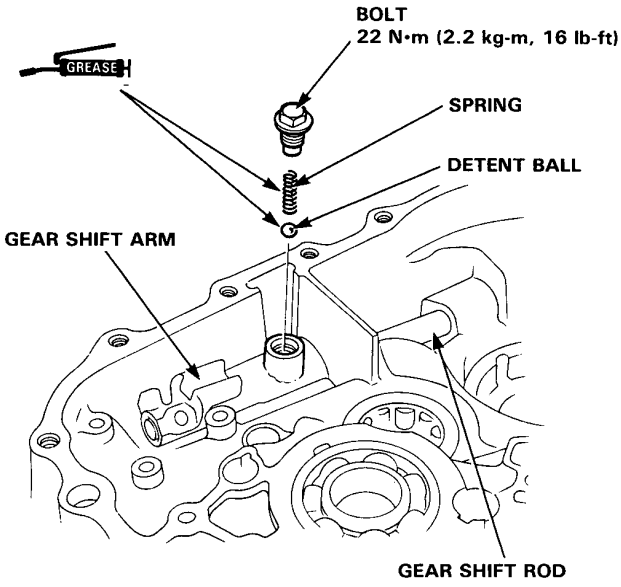
5th Gear Thickness:
Standard: 30.42–30.47 mm (1.198–1.200 in.)
Service Limit: 30.3 mm (1.193 in.)



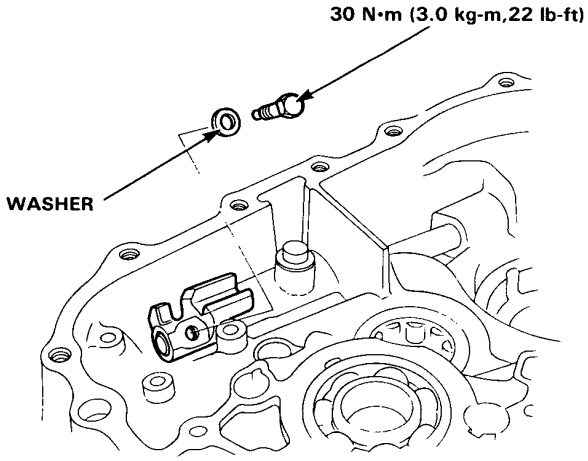
Replace 5th gear if the respective measurement is out of specification.
Replace the 5th gear synchro hub if the respective measurement is within specification.

Reassembly

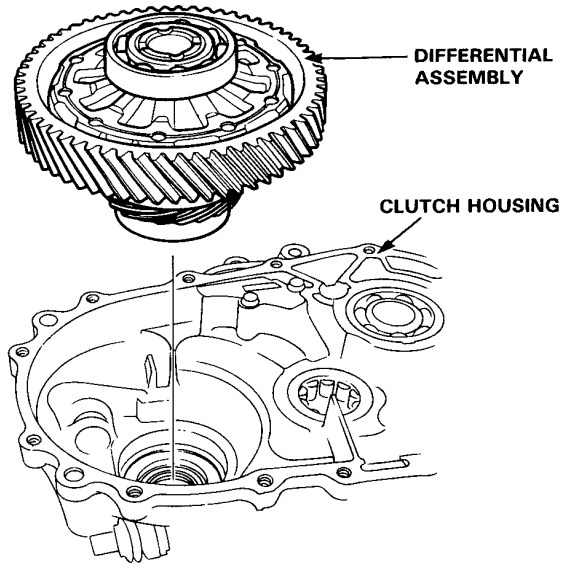
1. Set the gear shift arm.
2. Place the boot for the shift rod.
3. Install the shift rod with its detent hole up.
4. Grease the detent ball and spring, and them in the shift arm.



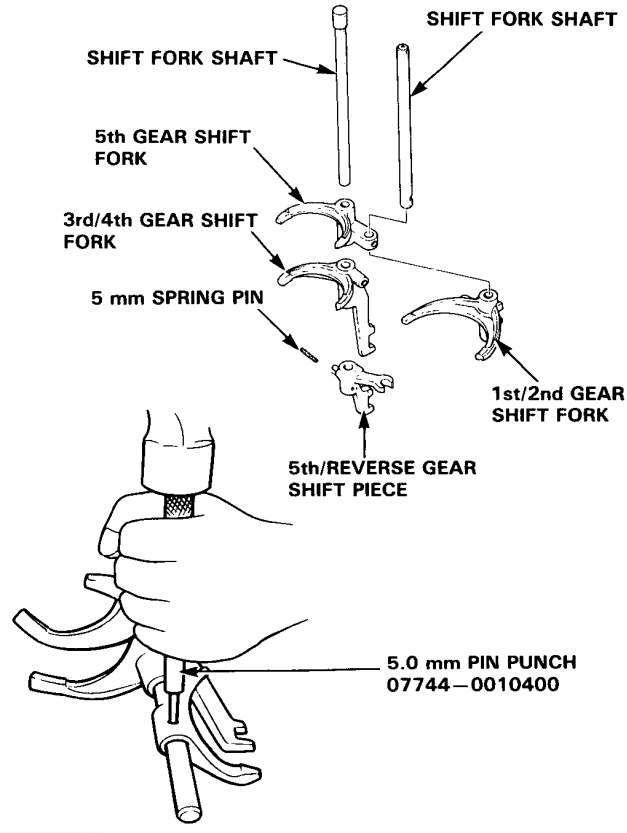
5. Place the bolt and washer holding the gear shift arm.



6. Install the differential assembly in the clutch housing.

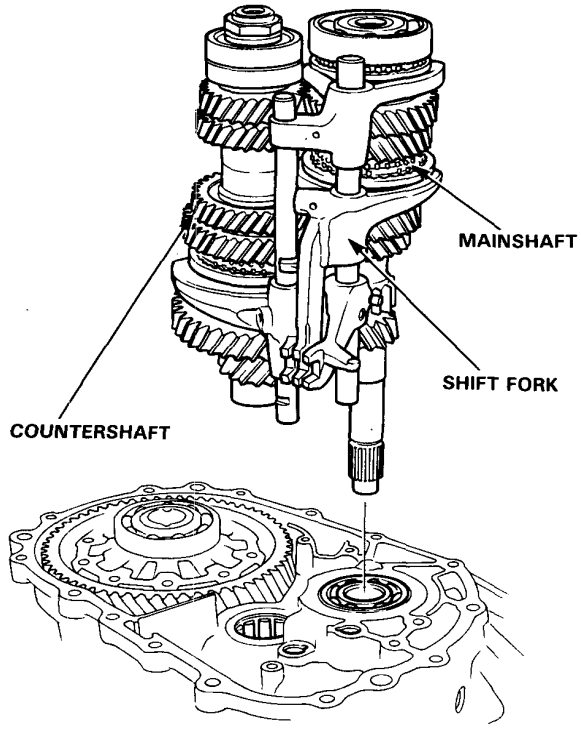


7. Insert the shift fork shafts into the shift forks and drive in the spring pin.

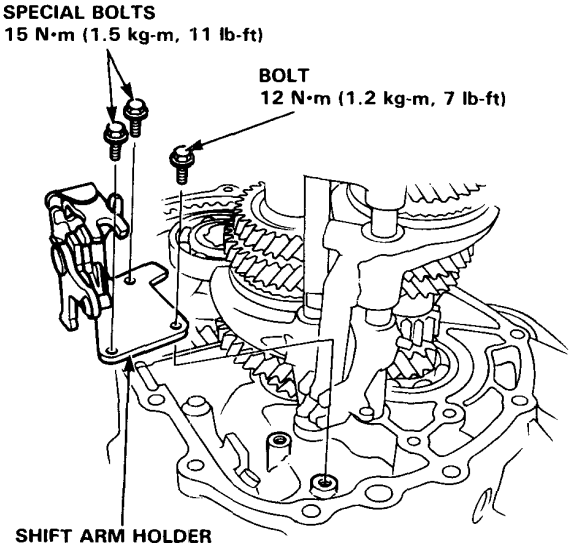


Reassembly (cont'd)

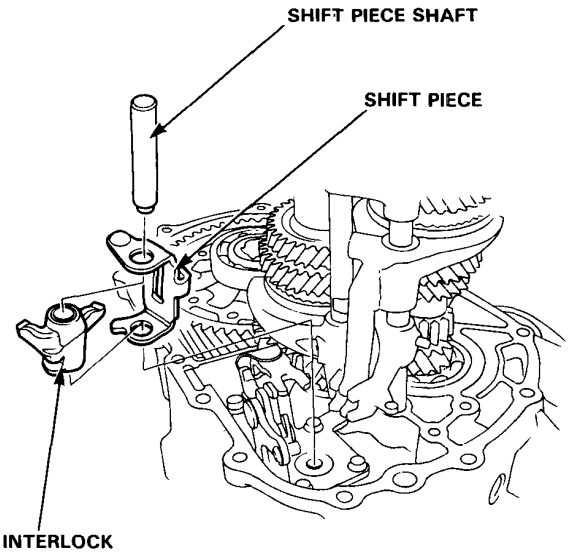
8. Insert the mainshaft and contershaft into the shift forks and install them as an assembly.



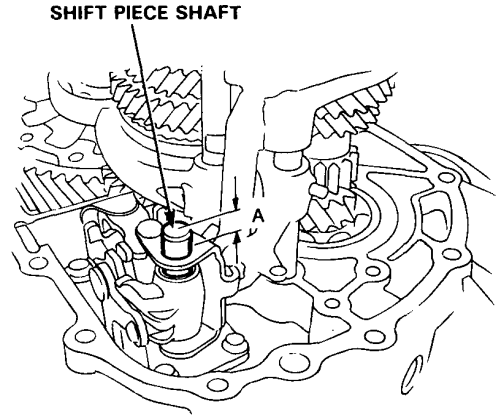
9. Install the gear shift arm holder in the clutch housing.



10. Assemble the shift piece and interlock, then insert the shift piece shaft.

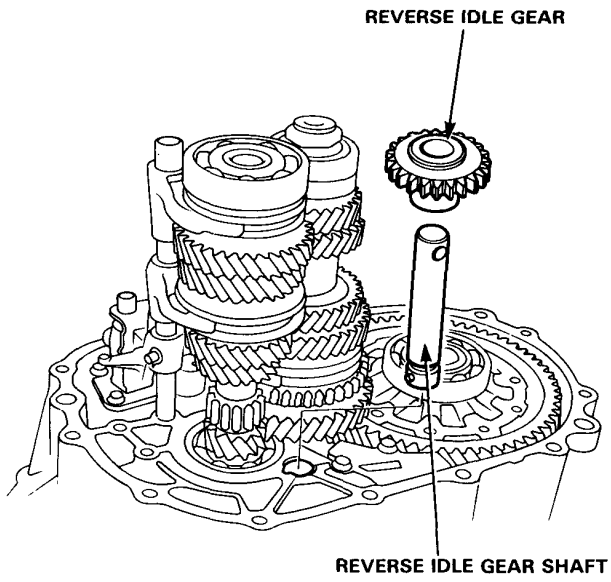


11. Measure the distance A after mounting the shift piece shaft assembly.

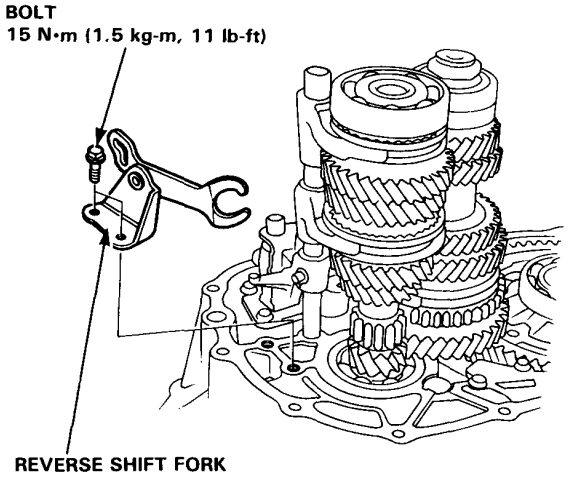


Distance A
Standard: 11.9–12.3 mm (0.468–0.484 in.)

12. Install the reverse idle gear and idle gear shaft in the clutch housing.

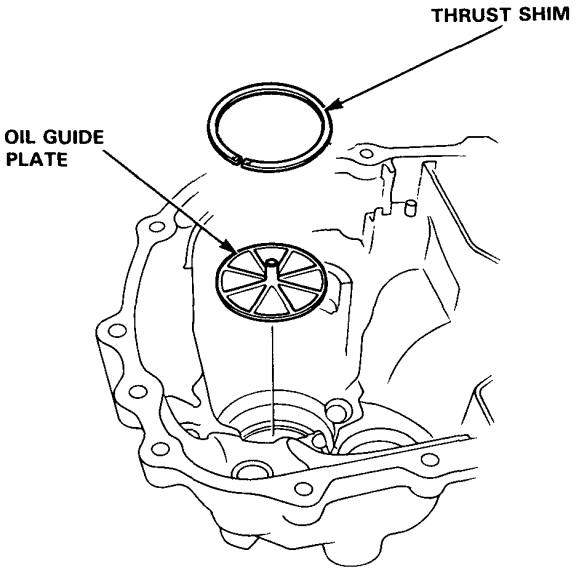


13. Install the reverse shift fork in the clutch housing with the 5th/reverse fork pin matched the groove of the reverse shift fork.

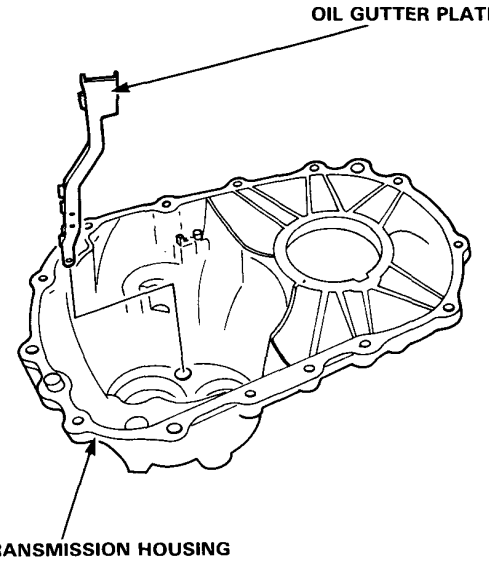


NOTE: Prepare the mainshaft thrust shim of which thrust clearance is set to appropriate value. (See page 14-16)

14. Install the oil guide plate and mainshaft thrust shim into the transmission housing.



15. Install the oil gutter plate into the transmission housing.

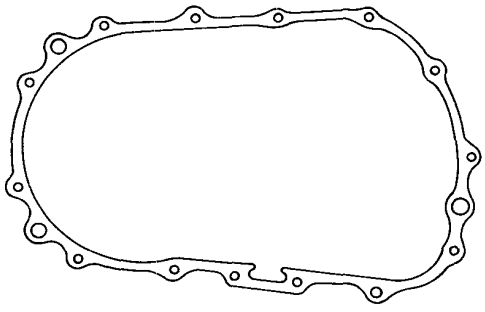


(cont'd)

Reassembly (cont'd)

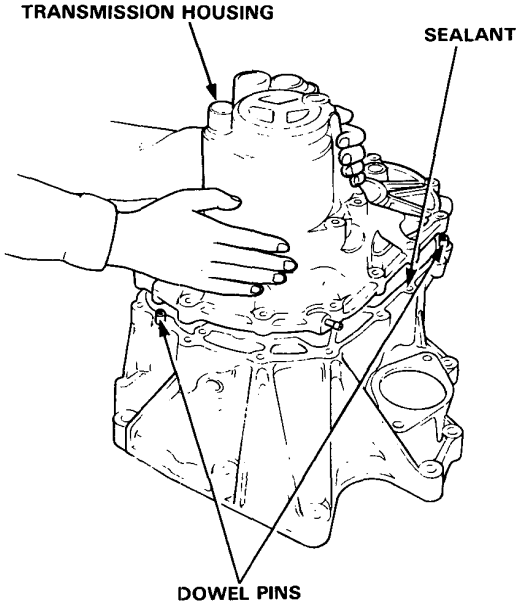
16. Apply sealant on the sealing surface of the transmission housing and clutch housing as shown.

    NOTE: This transmission uses no gasket between the major housings; use Honda P/N 08740–99986 sealant. Assemble the housings within 20 minutes after applying the sealant and allow it to cure at least 30 minutes after assembly before filling it with oil.

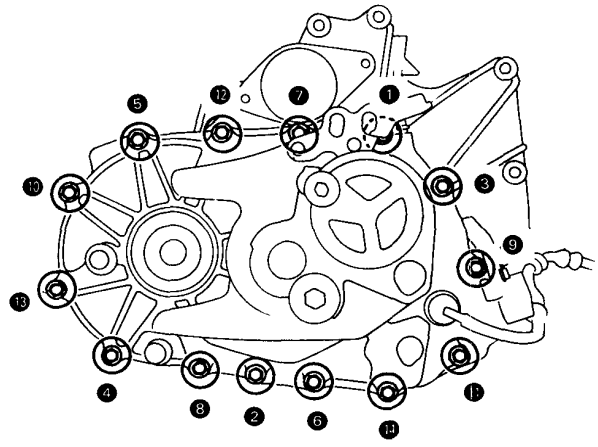


17. Install the dowel pins on the clutch housing.

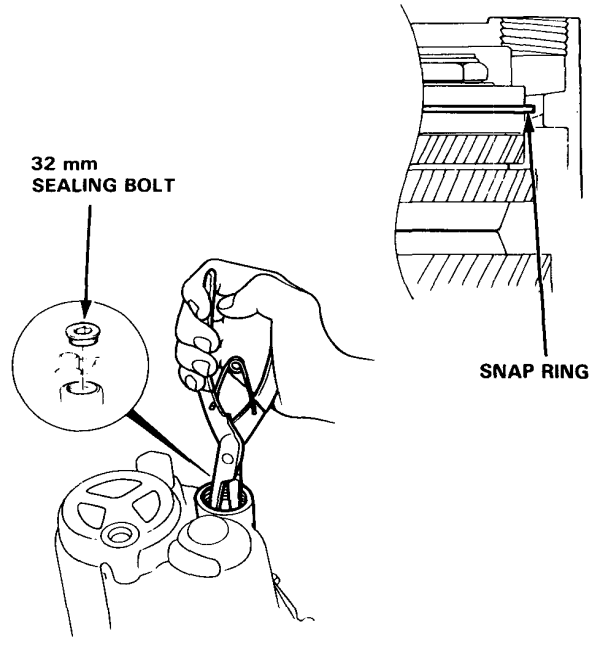
18. Mount the transmission housing to the clutch housing.



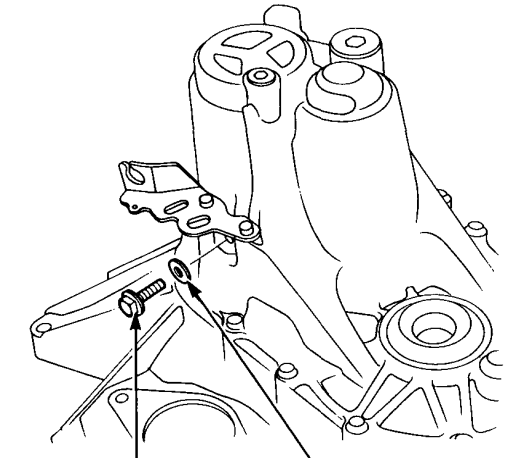
19. Torque bolts (8 x 1.25 mm) in sequence shown, 27 N·m (2.7 kg-m, 20 lb-ft).



20. Install the snap ring to the countershaft ball bearing and torque 32 mm sealing bolt.



21. Install the reverse idle shaft bolt.



Installation

Car Raised on Hoist

1. Place the transmission on transmission jack.

   NOTE: Clean and grease release bearing sliding surfaces.

2. Check that two 14 mm dowel pins are installed in the clutch housing.

3. Raise the transmission far enough to align dowel pins with matching holes in block.

4. *Roll the transmission toward engine and fit main*shaft into clutch disc splines. If driver's side suspension was left in place, install new spring clips on both axles, then carefully insert left axle into differential as you install transmission.

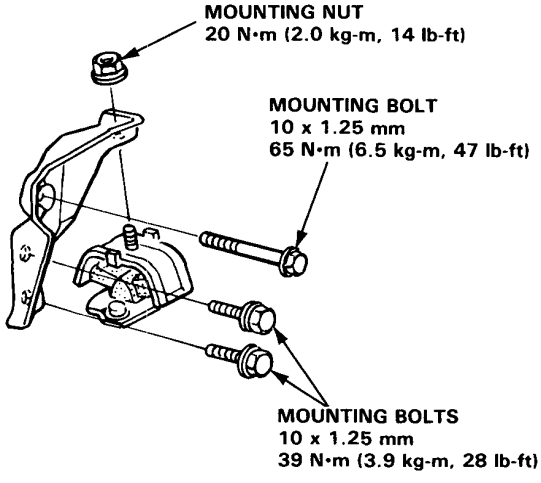
   NOTE: New spring clips must be used on both axles.

   CAUTION: Make sure that axles fully bottom. Slide axle in until you feel spring clips engage differential.

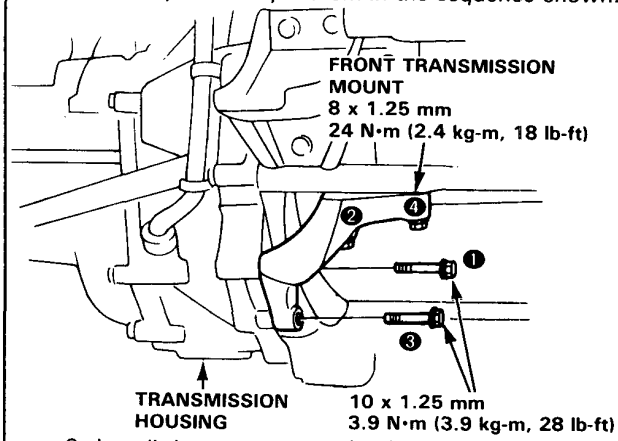
5. Push and wiggle the transmission until it fits flush with engine flange.

6. Secure transmission to engine with mounting bolts from the engine side (12 x 1.25 x 70 mm). Torque to 68 N·m (6.8 kg-m, 50 lb-ft).

7. Install the rear transmission mount on the transmission housing as shown.

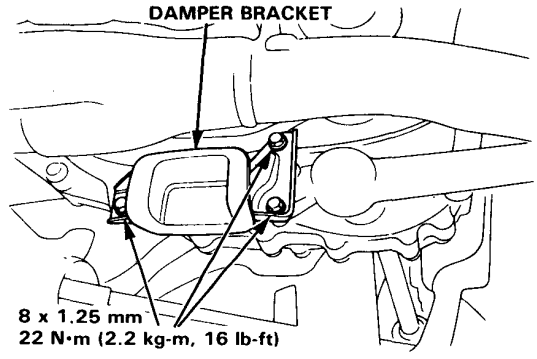


8. Loosely install the bolts for the front transmission mount, then torque them in the sequence shown.

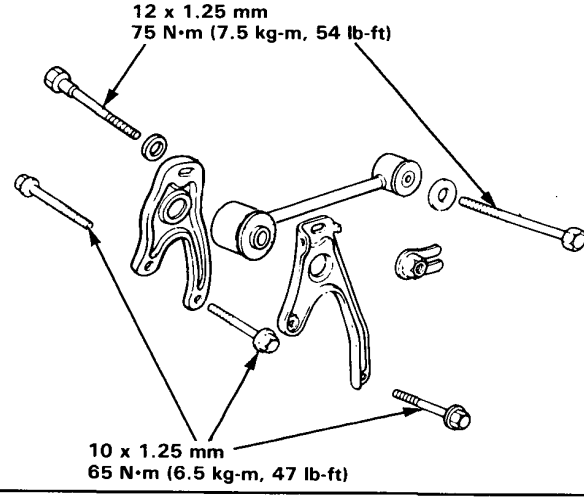


9. Install the starter mounting bolts and torque to 45 N·m (4.5 kg-m, 33 lb-ft).

10. Install the damper bracket in the transmission.



11. Install the upper torque arm and its brackets as shown.

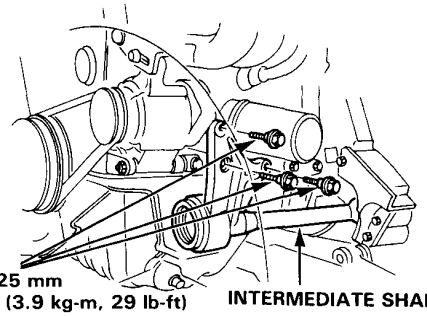


12. Remove the transmission jack.
13. Install the starter with its mounting bolts, 10 x 1.25 mm and torque to 45 N•m (4.5 kg-m, 33 lb-ft).
14. Turn right steering knuckle/axle assembly outward far enough to insert free end of axle into transmission. Repeat on opposite side.

    NOTE: New spring clips must be used on both axles.

    CAUTION: Make sure that axles fully bottom. Slide axle in until you feel spring clips engage differential.

15. Install lower arm ball joint bolts, tie-rod ball joint nuts and damper fork bolt.
16. Connect shift linkage.
17. Connect shift lever torque rod to clutch housing and torque 8 x 1.25 mm bolt to 22 N•m (2.2 kg-m, 16 lb-ft).
18. Install the Intermediate shaft.



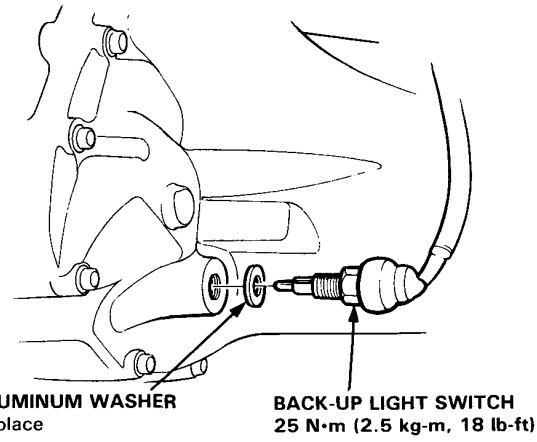
19. Install the front wheels.
20. Torque the 14 mm transmission drain plug to 40 N•m (4.0 kg-m, 29 lb-ft).

Car on Ground

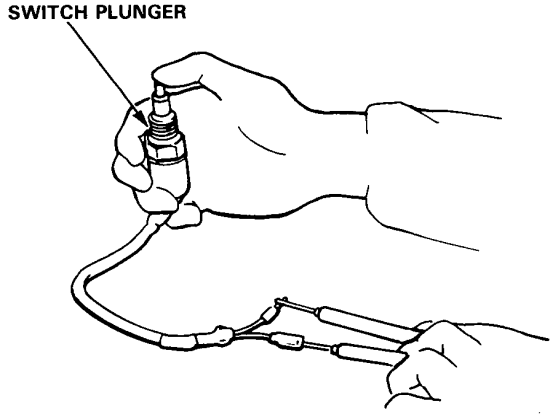
21. Install the clutch cable at the release arm.
22. Coat the new O-ring with oil, put it on speedometer gear holder, then install holder in transmission housing and secure with hold-down tab and bolt.
23. Install engine sub wire harness in clamp at clutch housing.
24. Connect the engine compartment wiring:
    - Battery positive cable to starter.
    - Black/white wire to starter solenoid.
    - Green/black and yellow wires to back-up light switch.
25. With ignition key OFF connect ground cable to battery and transmission.
26. Refill transmission with recommend oil (page 14-4).
27. Check transmission for smooth operation.

Test

1. Test the back-up light switch by placing the gear shift lever in reverse and turning the ignition switch to ON.



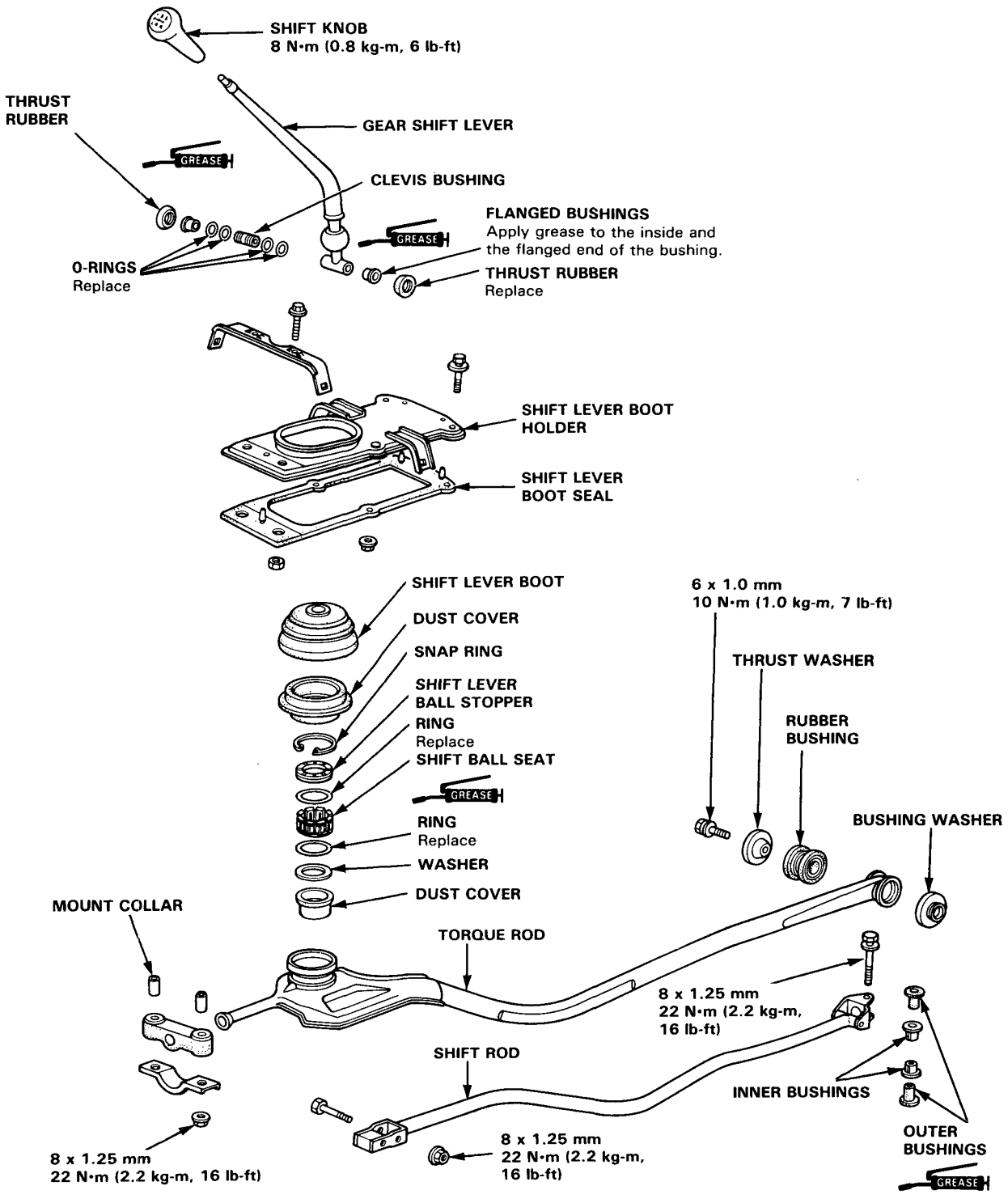
2. If back-up lights do not go on, remove the back-up light switch.
3. Using an ohmmeter check the switch for continuity while pushing in on the switch plunger.



Gearshift Mechanism

Overhaul

NOTE: Inspect rubber parts for wear or damage when disassembling.



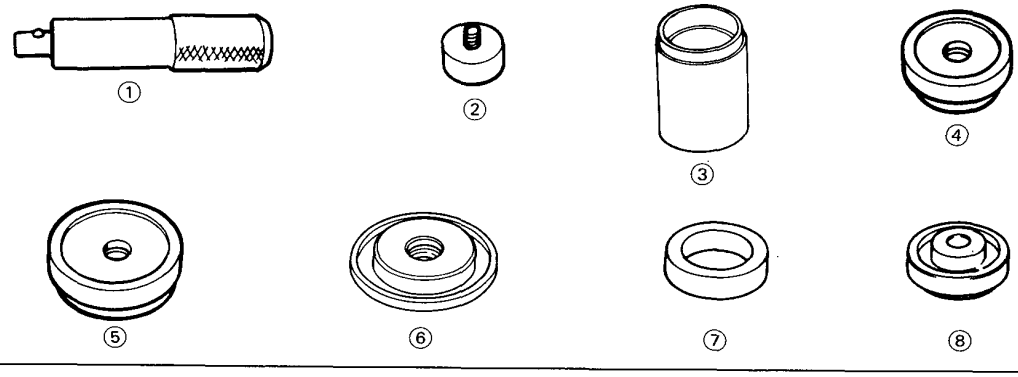
Driveshafts

Outline of Model Change

On models equipped with B20A2 engine, the intermediate shaft is newly used.

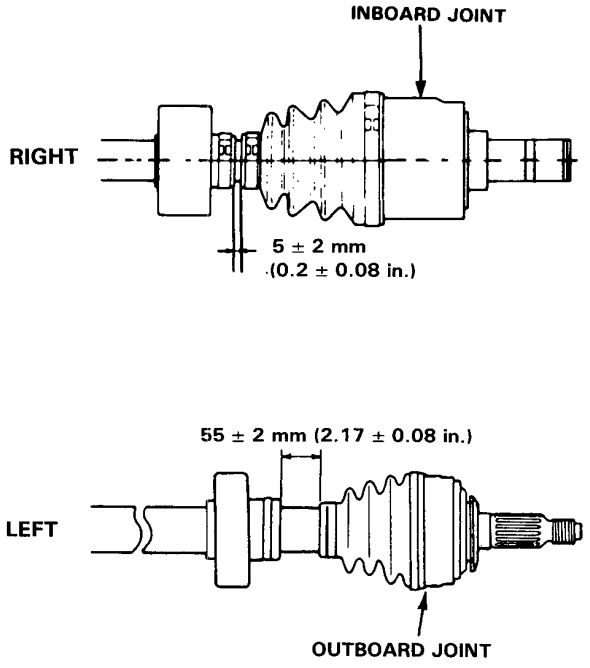
Special Tools

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07749—0010000	Driver	1	07949-6110000 may also be used
②	07746—0040900	Pilot, 40 mm	1	
③	07965—SD90100	Support Base	1	
④	07746—0010400	Attachment, 52 x 55 mm	1	
⑤	07746—0010500	Attachment, 62 x 68 mm	1	
⑥	07GAD—SE00100	Oil Seal Driver Attachment	1	
⑦	07965—SD90200	Support Collar	1	
⑧	07947—SD90200	Oil Seal Driver Attachment	1	



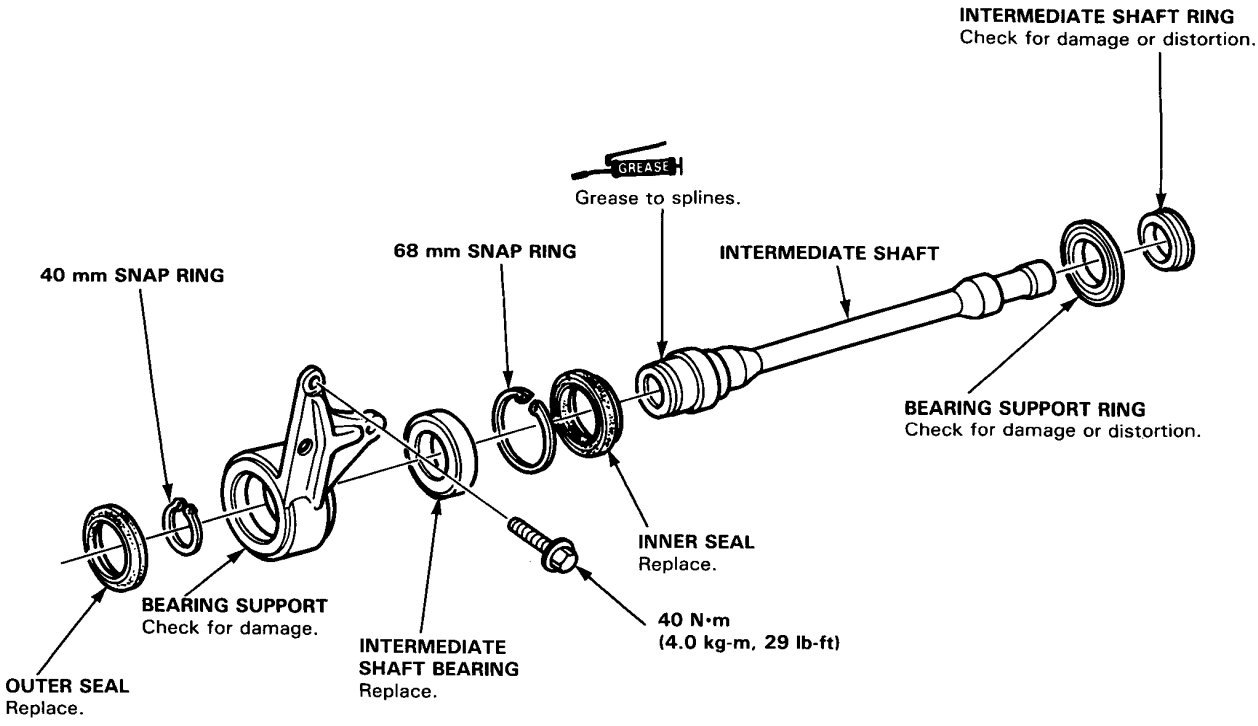
Installation Note

Dinamic Damper Installation



Intermediate Shaft

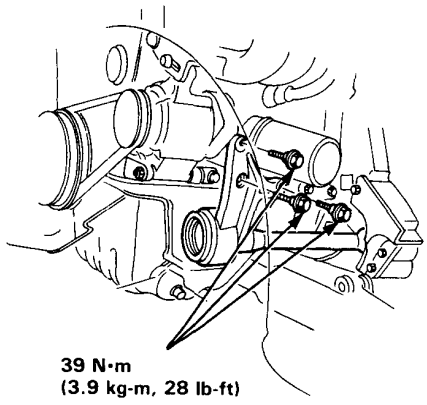
Inspection



Intermediate Shaft

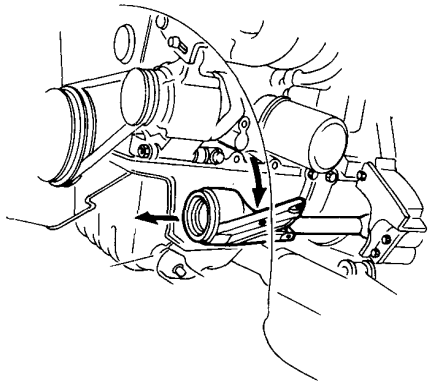
Replacement

1. Drain the transmission oil.
2. Remove the three 10 mm bearing support mounting bolts.



3. Lower the bearing support close to the steering gear box and remove the intermediate shaft from the differential.

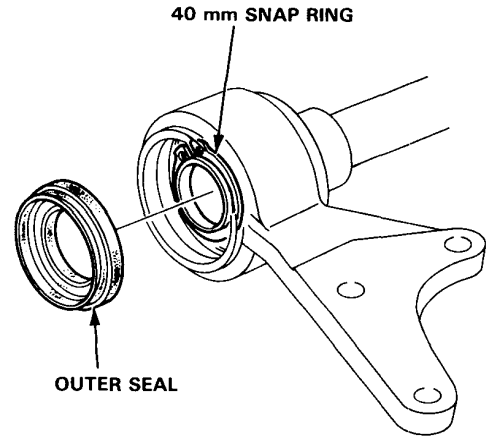
   CAUTION: To prevent damage to the differential oil seal, hold the intermediate shaft horizontal until it is clear of the differential.



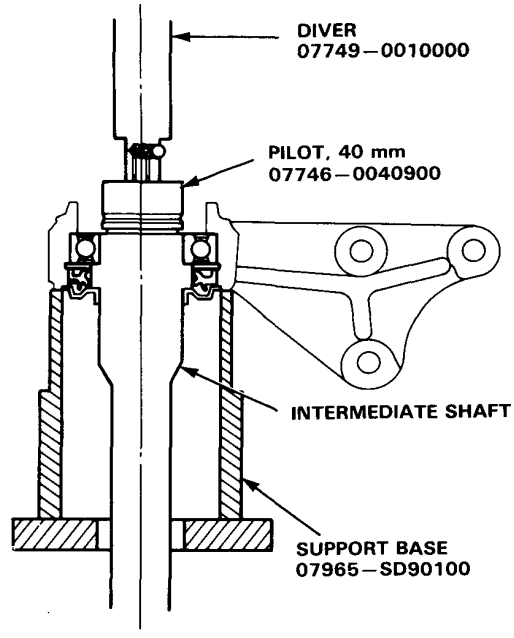
4. Install the intermediate shaft in the reverse order of removal.

Disassembly

1. Remove the intermediate shaft outer seal.
2. Remove the 40 mm snap ring.

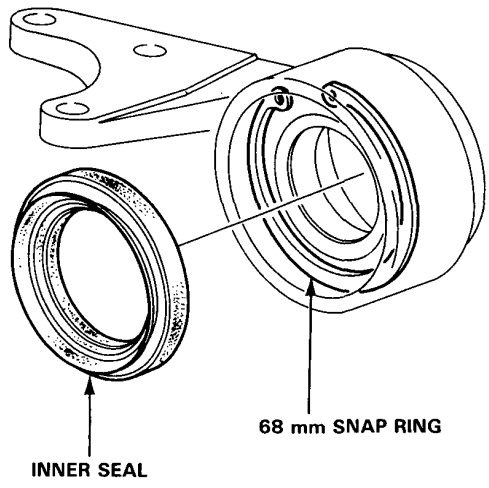


3. Press the intermediate shaft out of the bearing support using the special tools and hydraulic press.

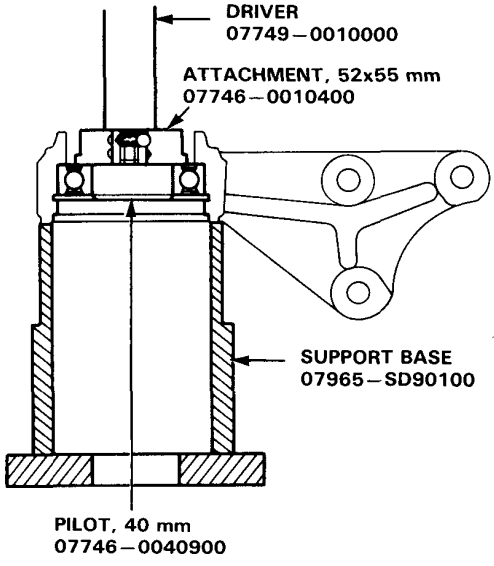


4. Remove the intermediate shaft inner seal.

5. Remove the 68 mm snap ring.

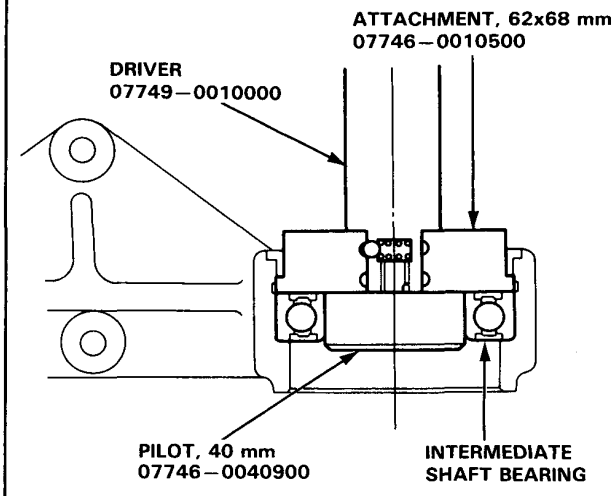


6. Remove the intermediate shaft bearing out of the bearing support using the special tools and hydraulic press as shown.



Reassembly

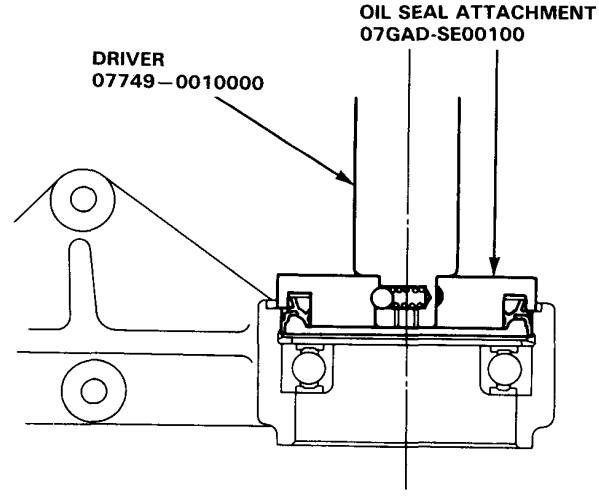
1. Press the intermediate shaft bearing into the bearing support using the special tool and hydraulic press as shown.



2. Install the 68 mm snap ring in the groove in the bearing support.

CAUTION: Install the snap ring with its tapered end facing out.

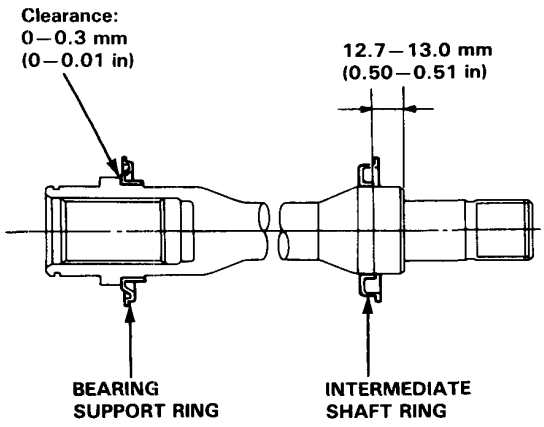
3. Press the intermediate shaft inner seal into the bearing support using the special tool as shown.



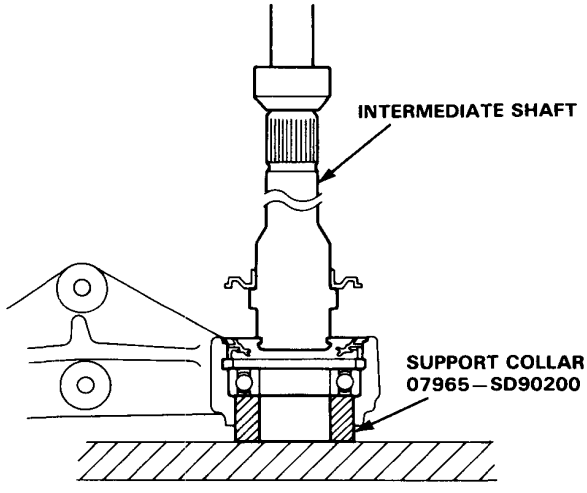
(cont'd)

Reassembly (cont'd)

4. Install the intermediate shaft ring and bearing support ring on the intermediate shaft and position them as shown using a soft hammer.



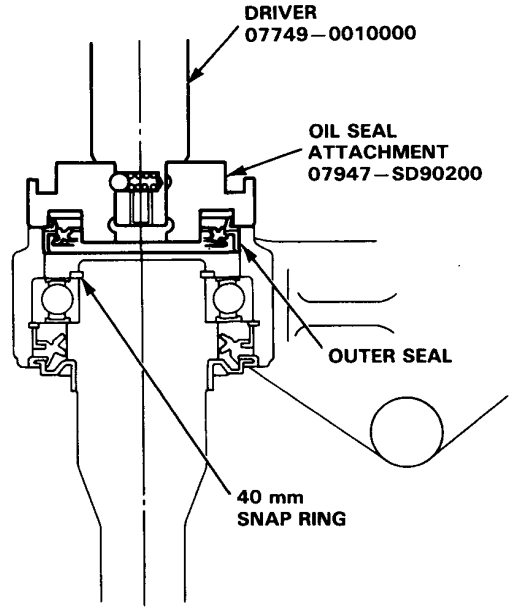
5. Press the intermediate shaft into the bearing support using the special tool and hydraulic press as shown.



6. Install the 40 mm snap ring in the groove in the sitermediate shaft.

   CAUTION: Install the snap ring with its tapered end facing out.

7. Press the intermediate shaft outer seal into the bearing support using the special tools as shown.



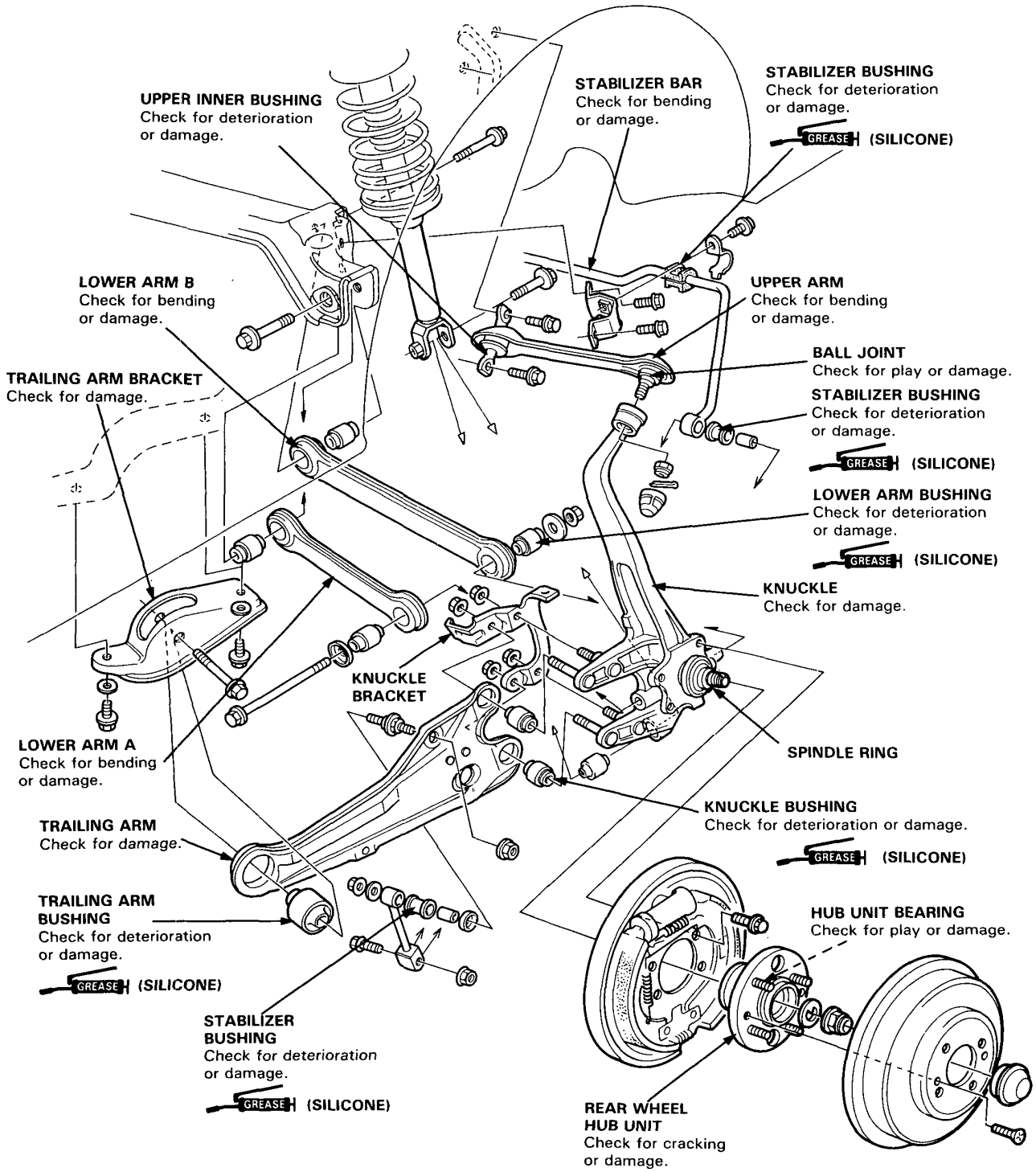
Suspention

Outline of Model Change

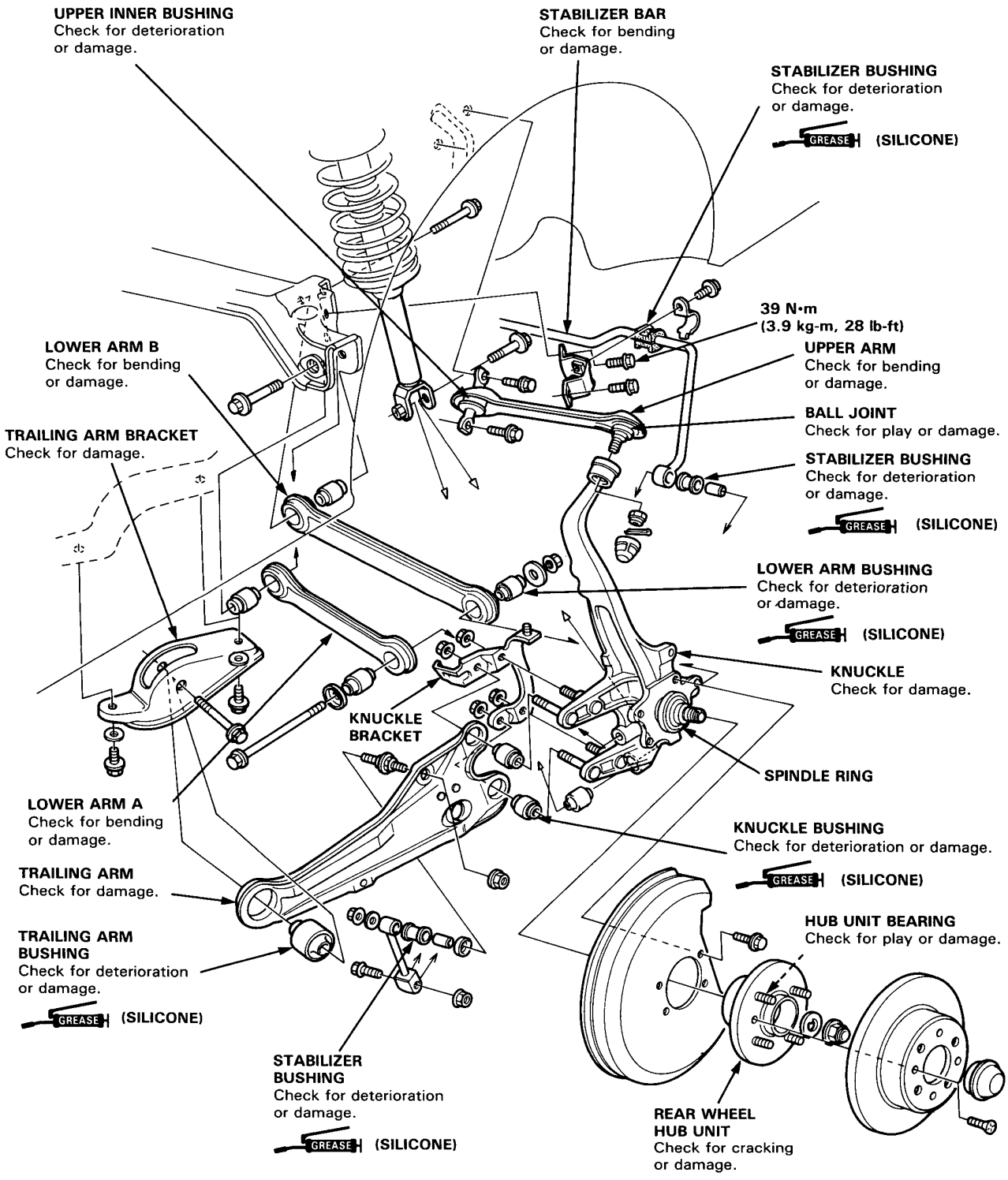
Installation method of the rear knuckle and trailing arm has been changed.

Rear Suspension

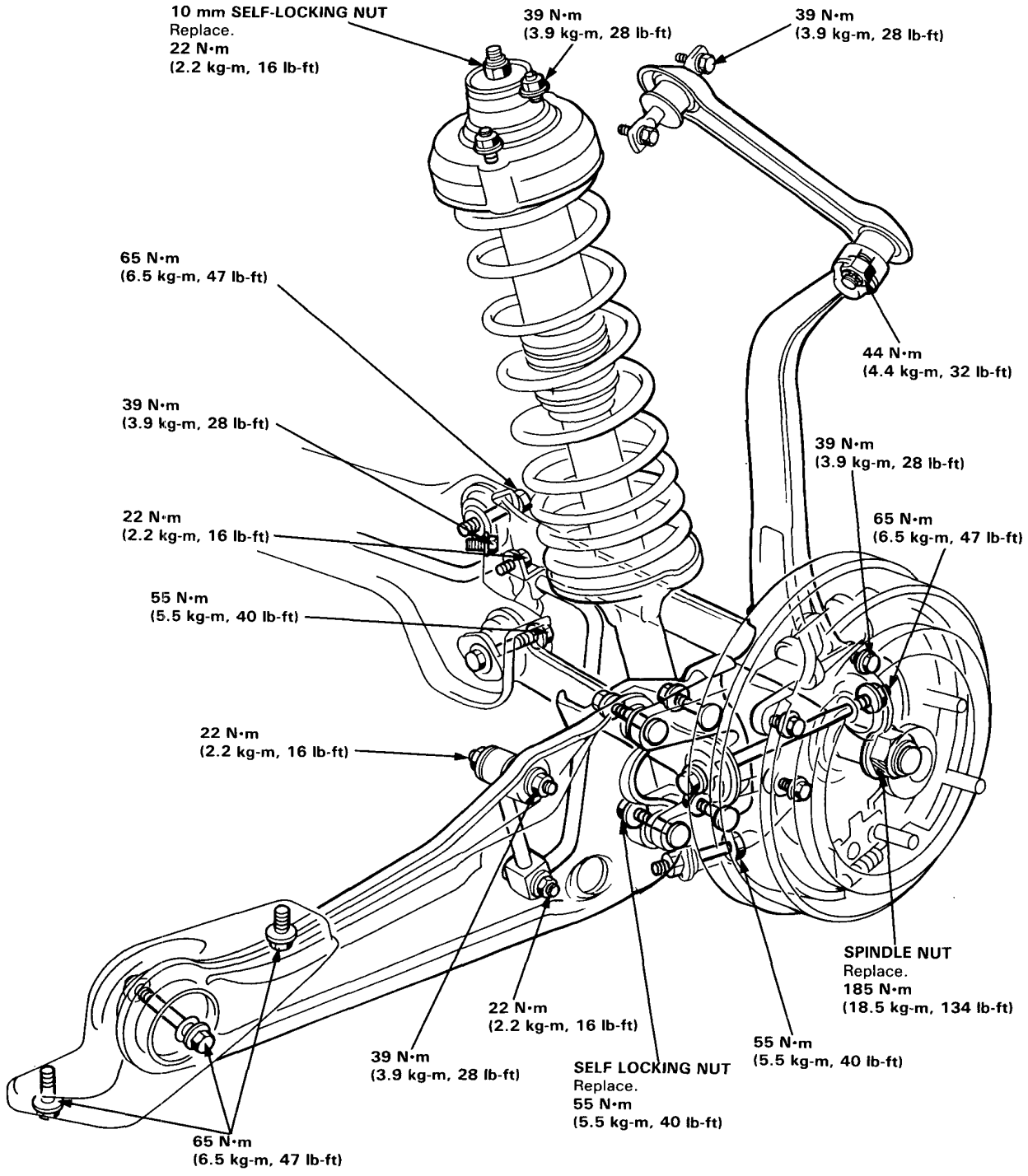
Inspection (Drum Brake Model)



Inspection (Disc Brake Model)

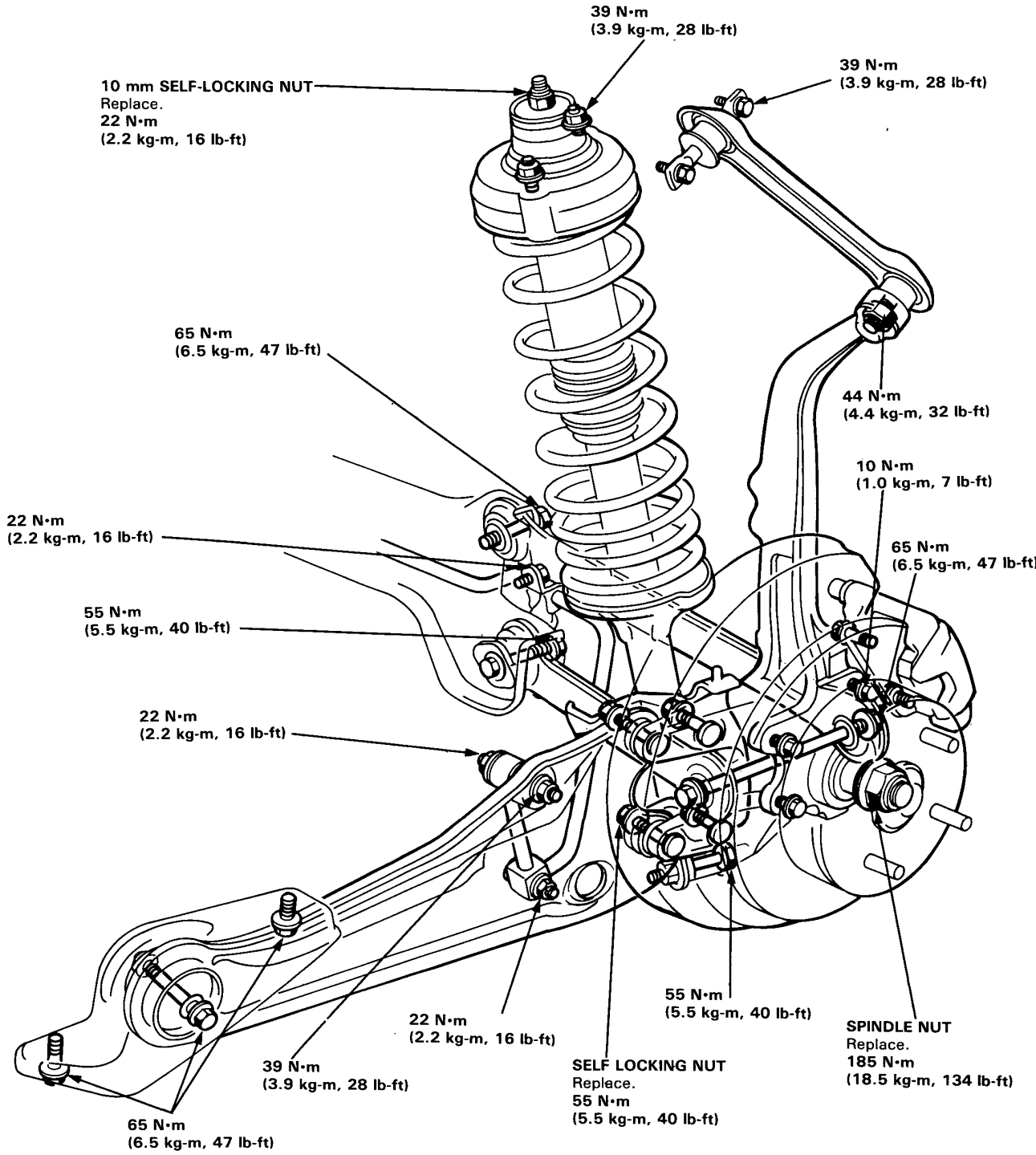


Torque Spec (Drum Brake Model)



CAUTION: Before tightening the bolts or nuts connected to the rubber mount or bushings, the vehicle should be on the ground.

Torque Spec (Disc Brake Model)



CAUTION: Before tightening the bolts or nuts connected to the rubber mount or bushings, the vehicle should be on the ground.

Brakes

Outline of Model Change

On models equipped with B20A2 engine or 4W-ALB (except KS model), the large front caliper and brake disc are newly used.

Front Brake

Inspection

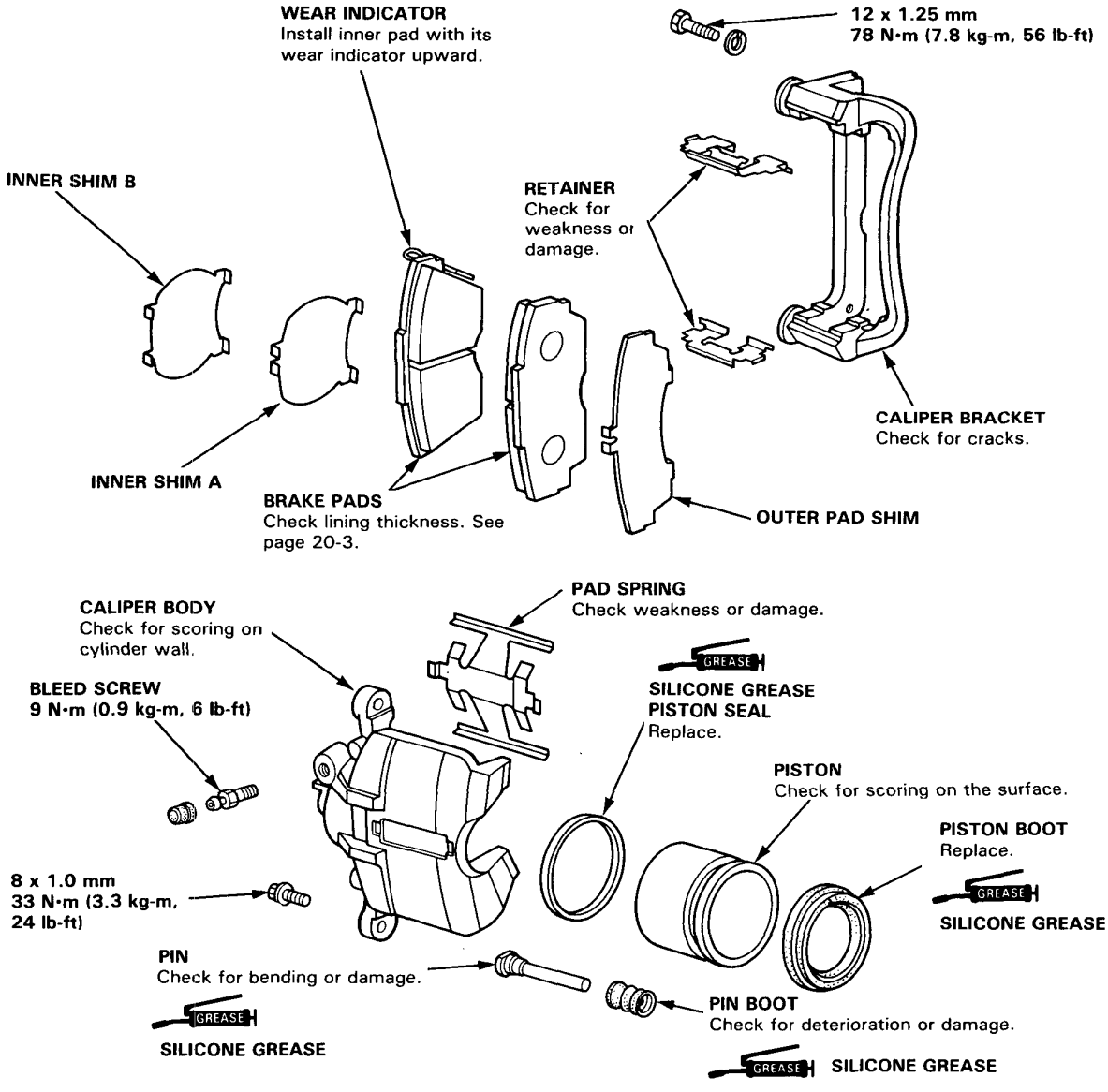
WARNING Do not use an air hose to blow the brake assembly clean.

CAUTION:

- **Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.**
- **To prevent spills, cover the hose joints with rags or shop towels.**
- **Clean all parts in brake fluid and air dry; blow out all passages with compressed air.**
- **Before reassembling, check that *all parts* are free of dust and other foreign particles.**
- **Replace parts with new ones whenever specified to do so.**
- **Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.**
- **Do not mix different brands of brake fluid as they may not be compatible.**
- **Do not reuse the drained fluid.**

NOTE:

- Coat piston, piston seal, and caliper bore with clean brake fluid.
- Replace all rubber parts with new ones whenever disassembled.

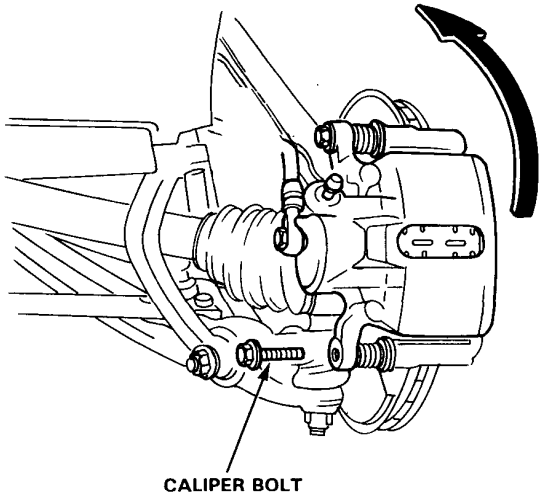


Brake Pad

Inspection/Replacement

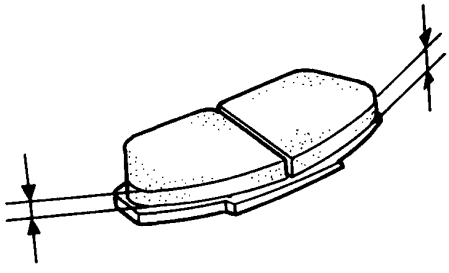
WARNING **Do not use an air hose to blow the brake assembly clean.**

1. Remove the front wheels and support the front of car on safety stands.
2. The brake hose clamp bolts and remove the caliper bolt, then pivot caliper up out of the way.



3. Remove the pad shim, pad retainers and pads.
4. Using a vernier caliper, measure the thickness of each brake pad lining.

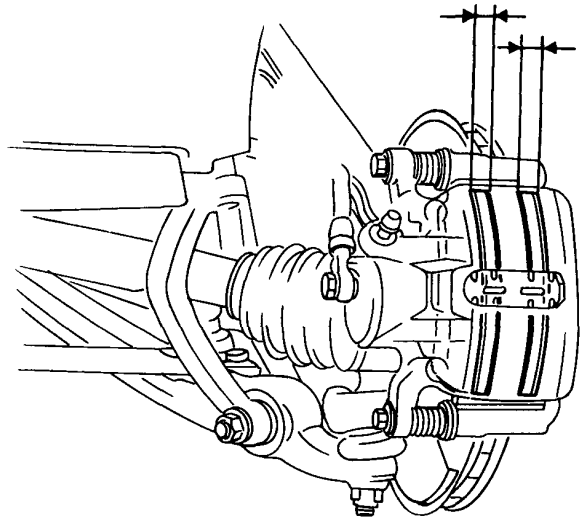
Brake Pad Thickness:
Standard: 11.5 mm (0.45 in)
Service Limit: 3 mm (0.12 in)



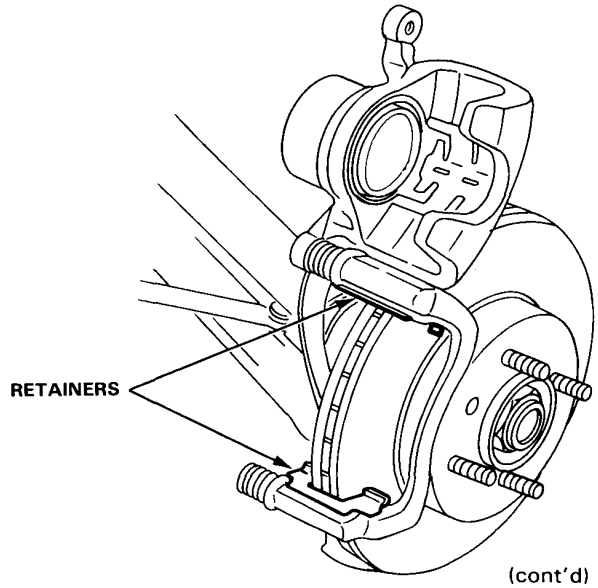
NOTE: Measurement does not include pad backing thickness.

5. If lining thickness is less than service limit, replace both pads as a set.

NOTE: Engagement of the brake may require a greater pedal stroke immediately after the brake pads have been replaced as a set. Several applications of the brake pedal will restore the normal pedal stroke.



6. Clean the caliper thoroughly; remove any rust, and check for grooves or cracks.
7. Install the pad retainers.



(cont'd)

Brake Pad

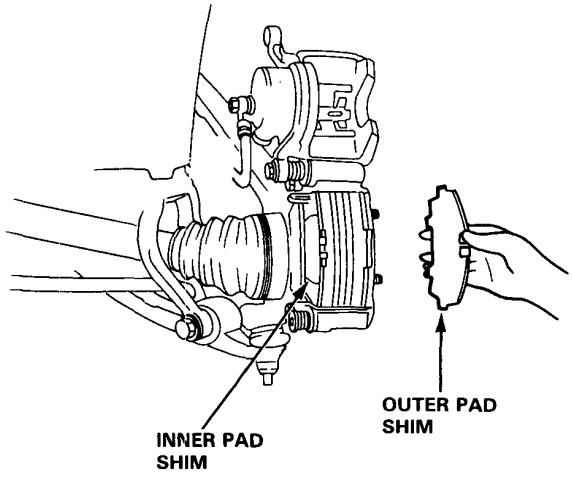
Inspection/Replacement (cont'd)

8. Apply anti-seize compound to both surfaces of the shim and back of the pads.

9. Install the brake pads.

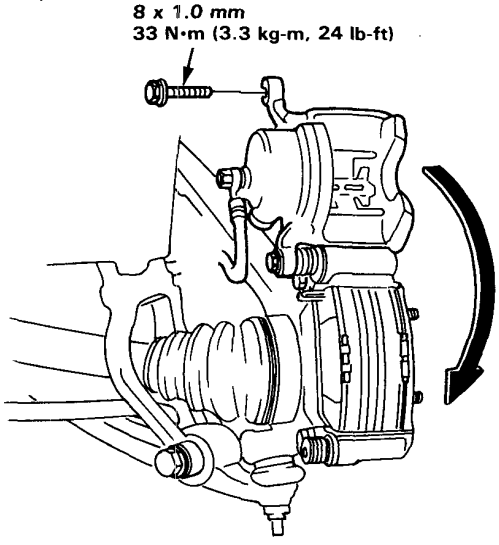
   NOTE: Apply anti-seize compound between the shims and pads.

10. Install the brake pad shims correctly.



11. Push in the piston so that the caliper will fit over the pads.

12. Pivot the caliper down into position, then install the caliper bolt and tighten to 33 N·m (3.3 kg-m, 24 lb-ft).



13. Depress the brake pedal several times to make sure the brakes work, then road-test.

Brake Caliper

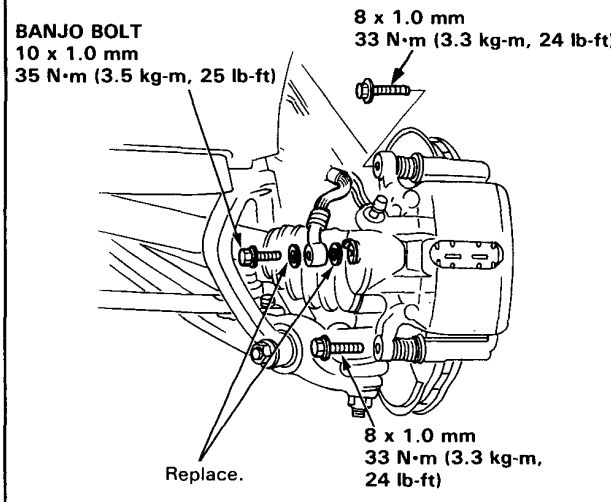
Disassembly

CAUTION:

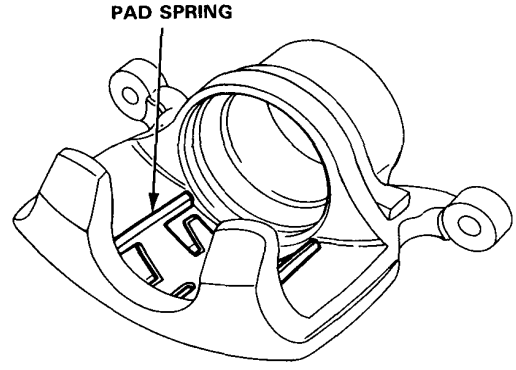
- **Before reassembling, check that all parts are free of dust and other foreign particles.**
- **Replace parts with new ones whenever specified to do so.**
- **Use only clean brake fluid.**
- **Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.**
- **Do not mix different brands of brake fluid as they may not be compatible.**
- **Do not spill brake fluid on the car, it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.**

1. Remove the banjo bolt and disconnect the brake hose from the caliper.

2. Remove the caliper bolts, then remove the caliper.



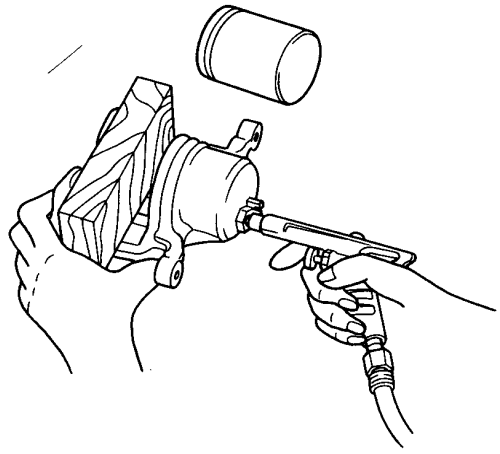
3. Remove the pad spring from the caliper body.



4. Place a wooden block or shop rag in the caliper opposite the piston, then carefully remove the piston from the caliper by applying air pressure through the brake line hole.

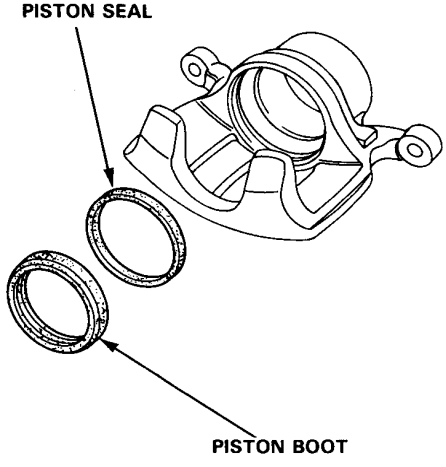
WARNING

- **Do not place your fingers in front of the piston.**
- **Do not use high air pressure.**



5. Remove the piston boot and piston seal.

CAUTION: Take care not to damage the cylinder.



Reassembly

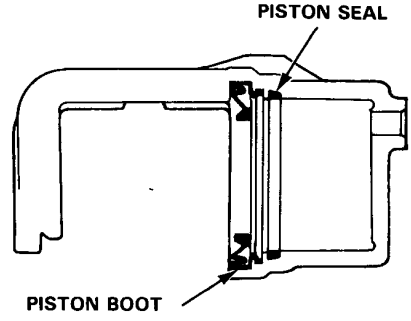
CAUTION:

- **Before reassembling, check that all parts are free of dust and other foreign particles.**
- **Replace parts with new ones whenever specified to do so.**
- **Use only clean brake fluid.**
- **Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.**
- **Do not mix different brands of brake fluid as they may not be compatible.**
- **Do not spill brake fluid on the car; it may damage the paint, if brake fluid does contact the paint; wash it off immediately with water.**

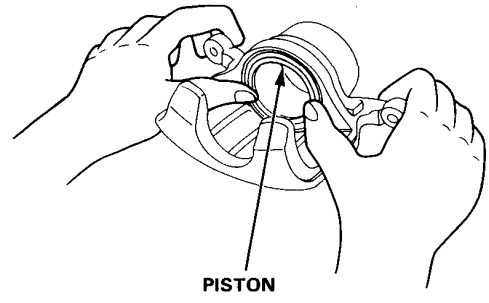
1. Clean the piston and caliper bore with brake fluid and inspect for wear or damage.

2. Apply silicone grease to a new piston seal, then install the piston seal in the cylinder groove.

3. Apply silicone grease to a new piston boot, then install the piston boot.



4. Lubricate the caliper cylinder and piston with brake fluid, then install the piston in the cylinder with the dished end facing in .



5. Reinstall the caliper in the reverse order of removal.

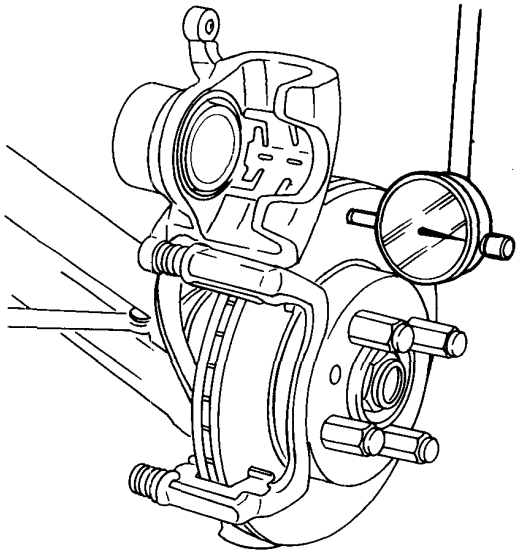
6. Fill the brake reservoir up and bleed the brake system.

Brake Disc

Run-Out Inspection

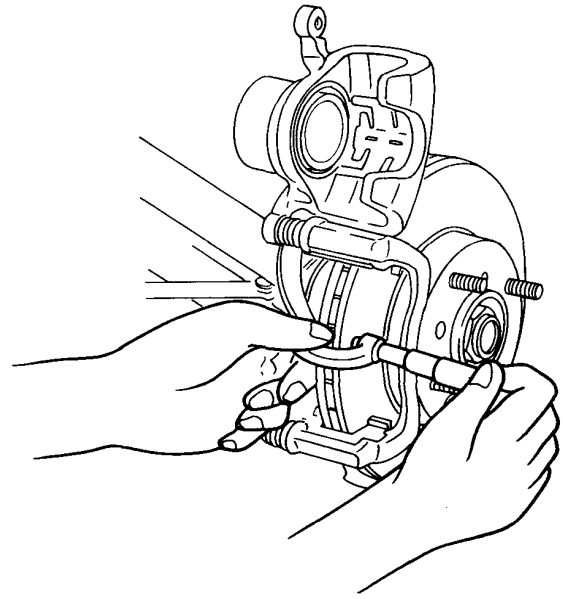
1. Remove the front wheels, and support the front of the car on safety stands.
2. Remove the brake hose clamp bolts and caliper pin bolt, then pivot the caliper up out of the way on the caliper pin bolt, and remove the pads and pad retainers.
3. Inspect the disc surface for grooves, cracks, and rust. Clean the disc thoroughly and remove all rust.
4. Use the lug nuts to hold the disc securely against the hub, then mount a dial indicator as shown.

   Brake Disc Runout:
   Service Limit: 0.1 mm (0.004 in.)
5. If the disc is beyond the service limit, remove it and install a new one.



Thickness and Parallelism Inspection

1. Remove the front wheels, and support the front of car on safety stands.
2. Move the caliper and pads out of the way as described in the preceding column.
3. Using a micrometer, measure disc thickness at eight points, approximately 45° apart and 10 mm (0.39 in.) in from the outer edge of the disc.



Brake Disc Thickness:
Standard: 21 mm (0.83 in.)
Max. Refinishing Limit: 19 mm (0.75 in.)

Brake Disc Parallelism:
The difference between any thickness measurements should not be more than 0.015 mm (0.0006 in.).

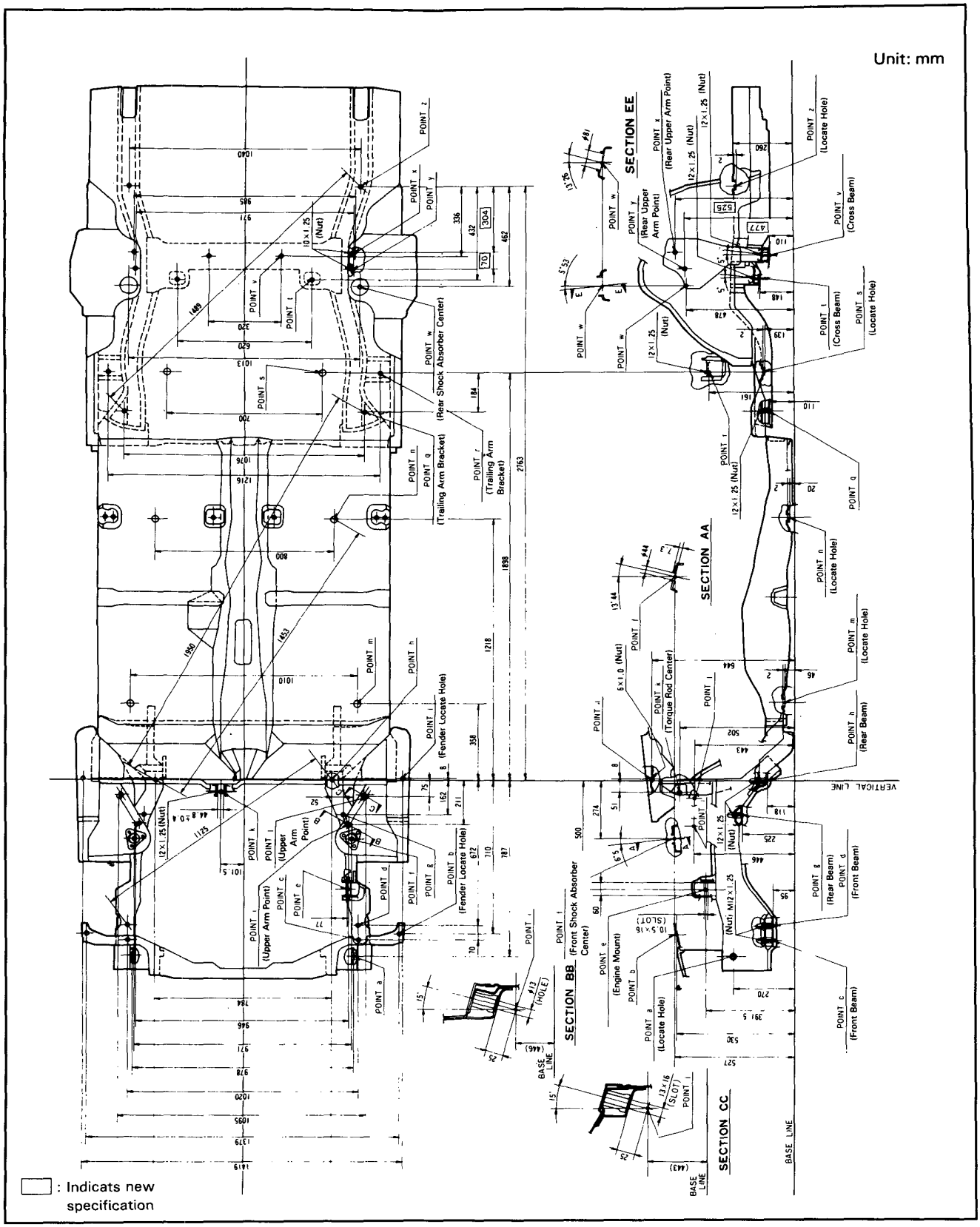
4. If the disc is beyond the limits for thickness or parallelism, remove it and install a new one.

Body

Outline of Model Change

Several specifications for the frame repair chart have been changed due to rear suspension design change.

Frame Repeair Chart



Electrical

Engine Electrical

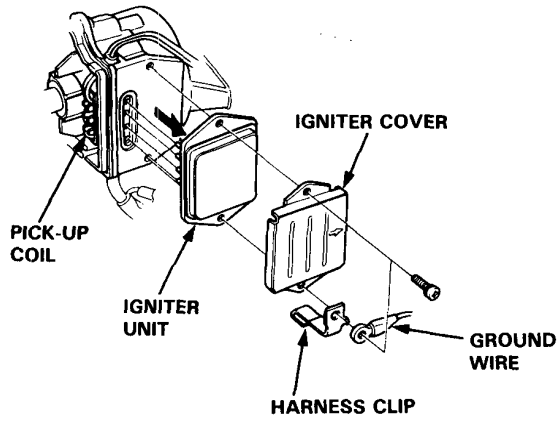
Outline of Model Change

- A20A1, A20A3 and B20A2 Engines have been added.

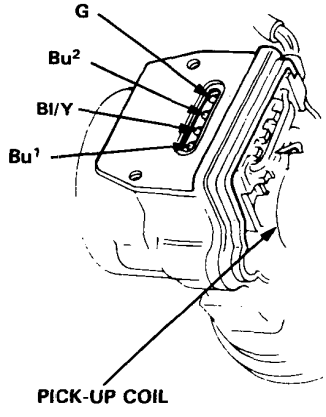
Igniter Unit Test

Toyo Denso:

1. Remove the igniter cover and pull out the igniter unit.



2. Check voltage between the Bu^1 terminal and body ground, then the Bl/Y terminal and body ground, with the ignition switch ON.
   There should be battery voltage.

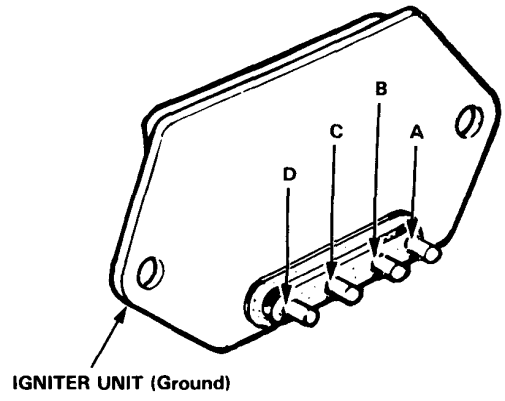


3. Measure resistance between the G and Bu^2 terminals on the pick-up coil. Replace the pick-up coil if the resistance is not within specifications.

   NOTE: Resistance will vary with the coil temperature.

   Pick-up Coil Resistance:
   Approx. 750 ohms at 20°C (70°F)

4. Check for continuity in both directions between A and B terminals on the igniter output. (RX100 scale).
   There should be continuity in only one direction.



5. Connect ohmmeter positive probe to D terminal, and negative probe to the igniter unit (ground), then measure resistance on the igniter input.

   NOTE: Resistance will vary with the unit temperature.

   Igniter Input Resistance:
   50 ,000 ohms or more at 20°C (70°F)

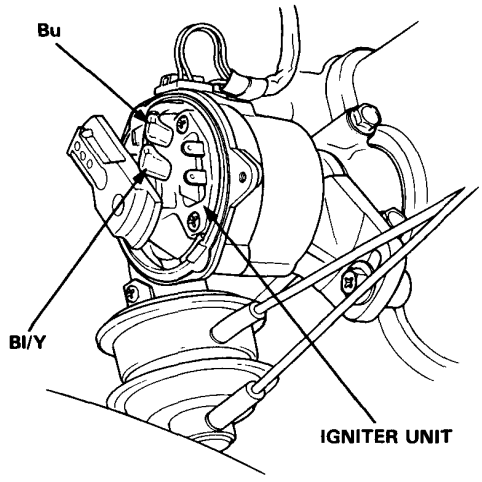
   NOTE: When installing the igniter, pack silicone grease in the connector housing.

Igniter Unit Test

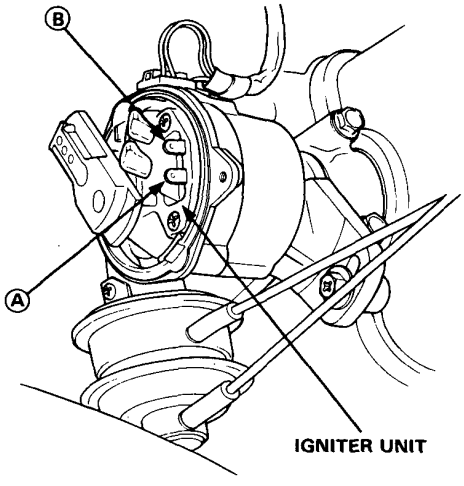
Hitachi:

1. Remove the distributor cap from the housing.

2. Disconnect the wires from the igniter unit. Check voltage between the Bu wire and body ground, then the Bl/Y wire and body ground, with the ignition switch ON.
   There should be battery voltage.



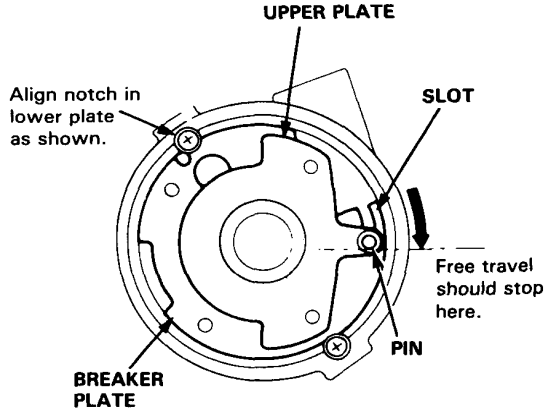
3. With the wires disconnected, check for continuity in both directions between A and B terminals. (RX100 scale)
   There should be continuity in only one direction.



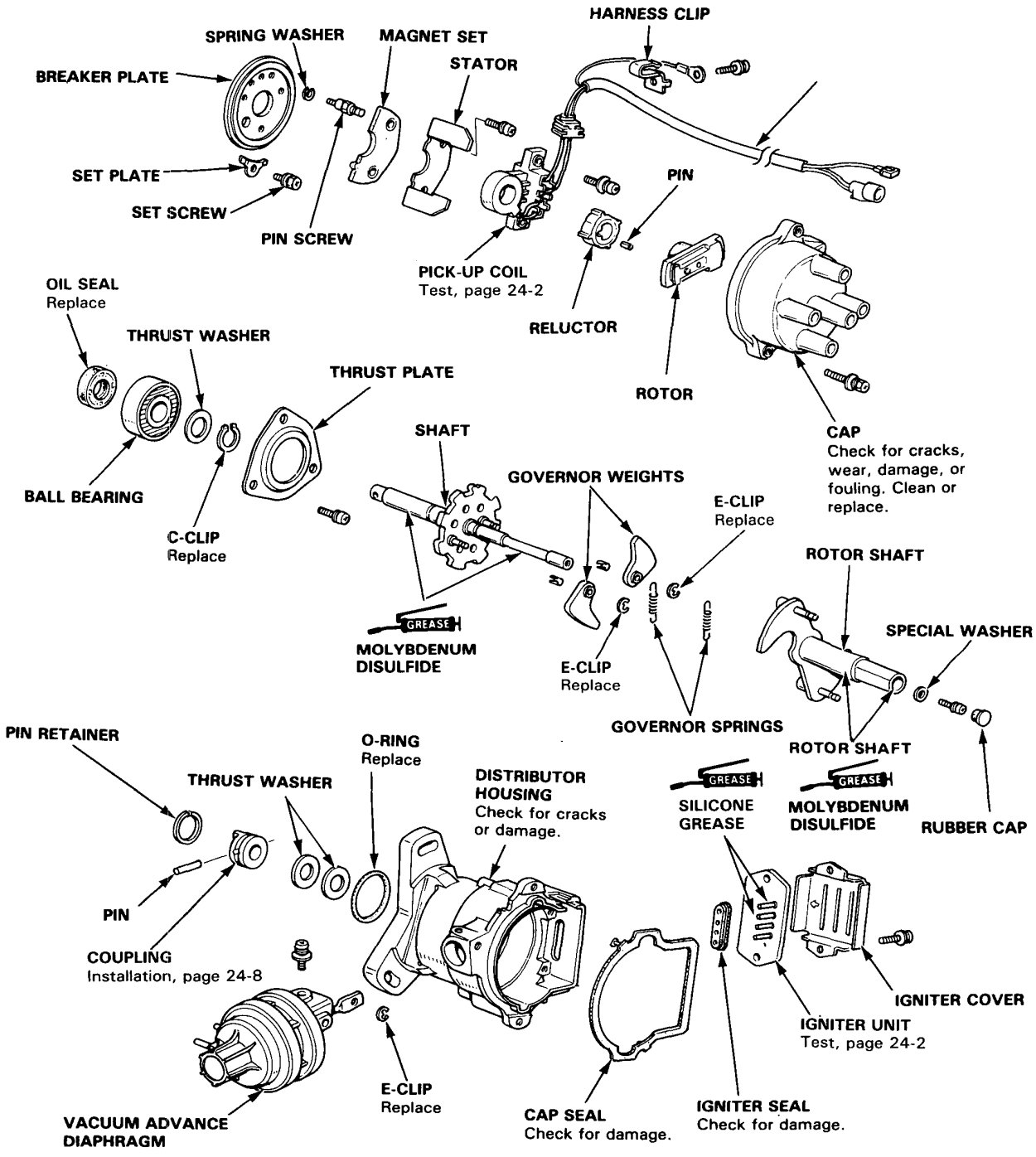
Breaker Plate Installation (Hitachi)

1. Align the breaker plate in the distributor housing as shown before tightening the hold-down screws.

2. Check that the upper plate moves freely. Be sure the diaphragm arm attachment pin does not rotate past the end of the slot in the lower plate. If it does, adjust the range of free travel by forcibly rotating the plate past its limit in the opposite direction, then recheck.

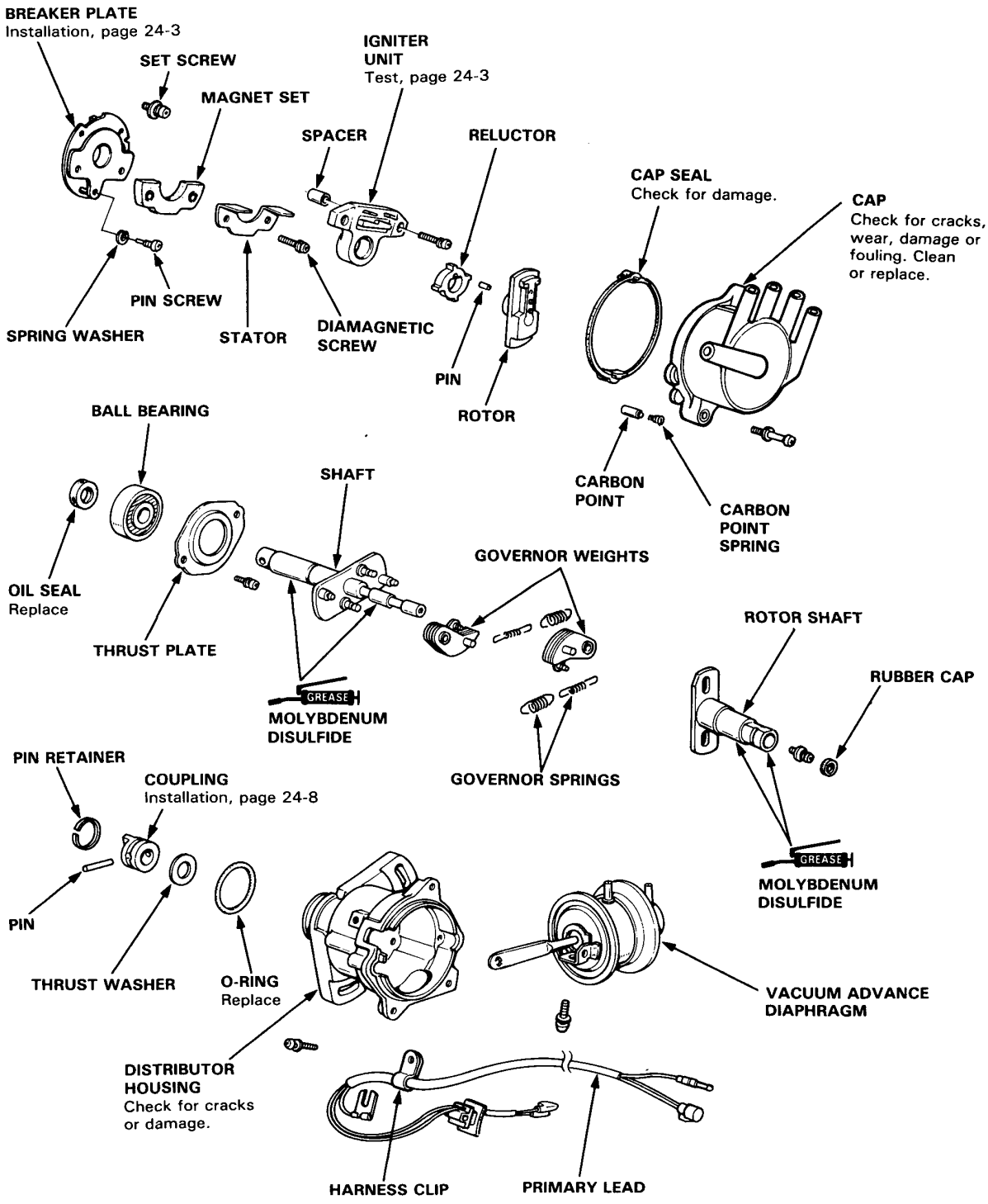


Distributor Overhaul (B20A2 engine)



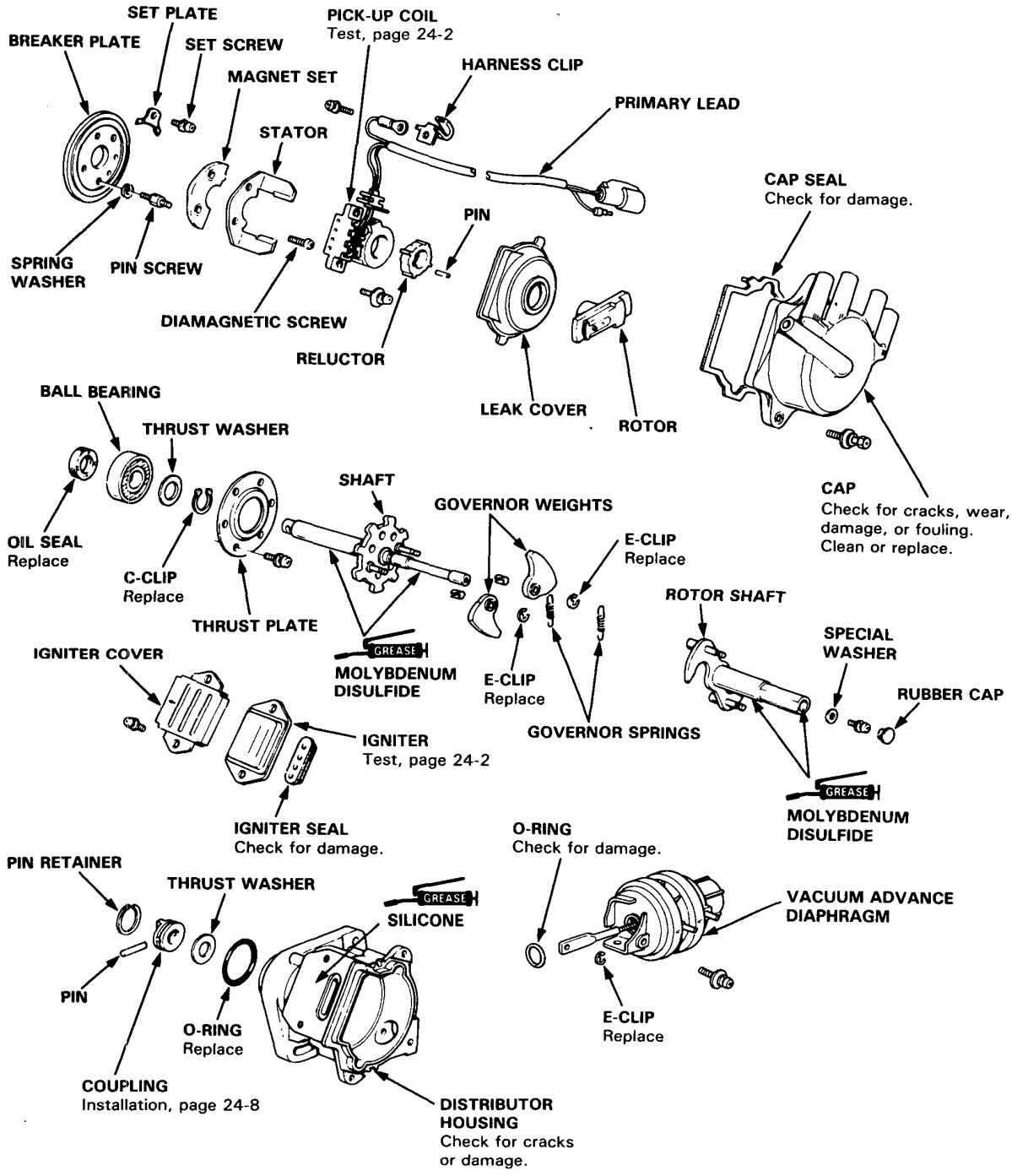
(A20A1 engine)

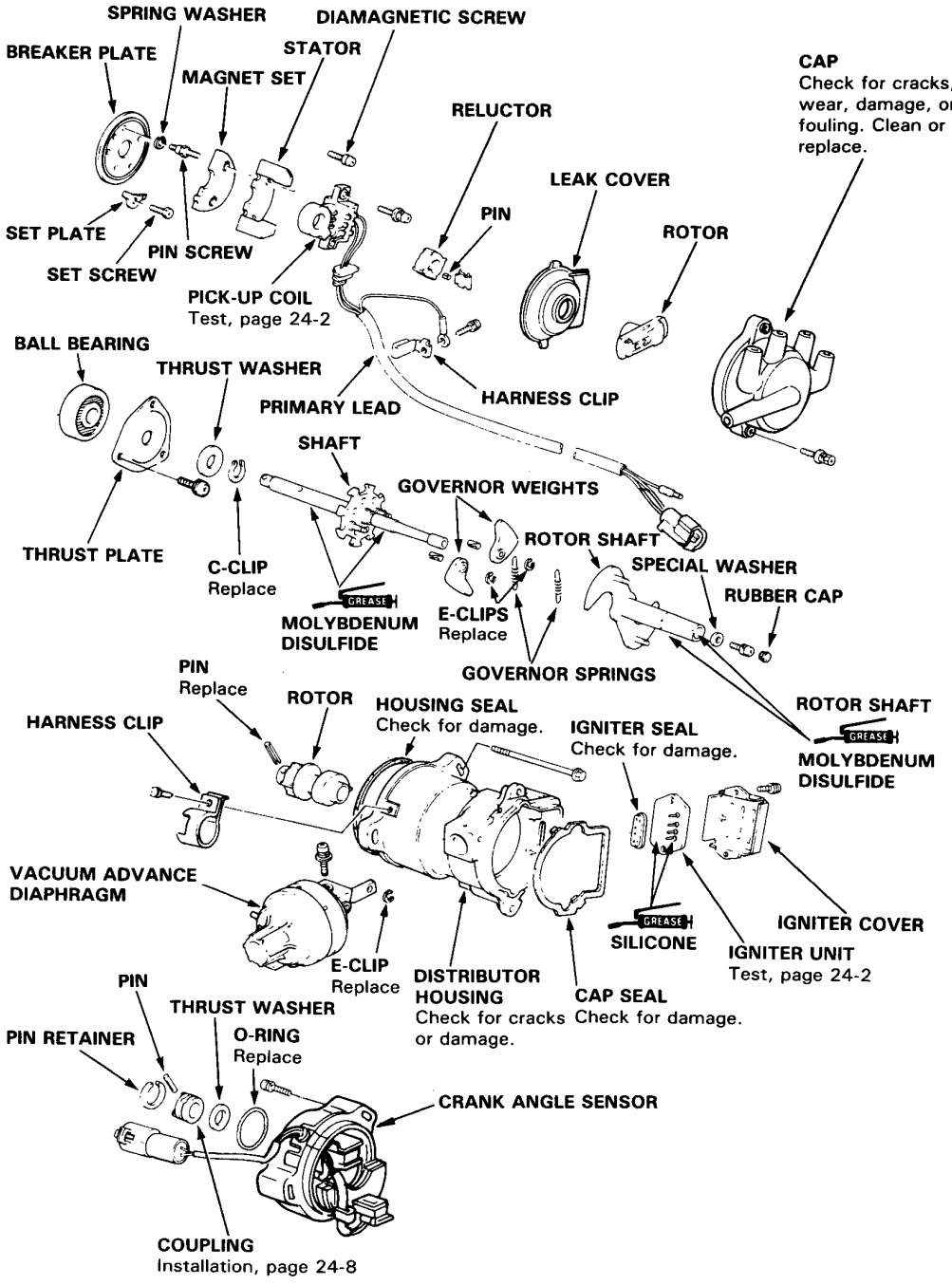
Hitachi:



A20A1 engine

Toyo Denso:

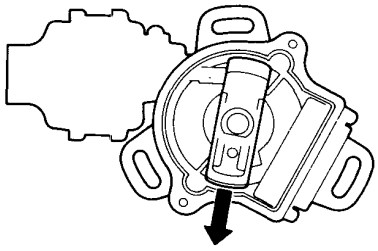



SPRING WASHER
DIAMAGNETIC SCREW
BREAKER PLATE
STATOR
MAGNET SET
RELUCTOR
CAP
Check for cracks, wear, damage, or fouling. Clean or replace.
LEAK COVER
PIN
ROTOR
SET PLATE
PIN SCREW
SET SCREW
PICK-UP COIL
Test, page 24-2
BALL BEARING
THRUST WASHER
PRIMARY LEAD
HARNESS CLIP
SHAFT
GOVERNOR WEIGHTS
ROTOR SHAFT
THRUST PLATE
C-CLIP
Replace
SPECIAL WASHER
RUBBER CAP
GREASE
MOLYBDENUM DISULFIDE
E-CLIPS
Replace
GOVERNOR SPRINGS
PIN
Replace
ROTOR
HOUSING SEAL
Check for damage.
IGNITER SEAL
Check for damage.
ROTOR SHAFT
HARNESS CLIP
GREASE
MOLYBDENUM DISULFIDE
VACUUM ADVANCE DIAPHRAGM
IGNITER COVER
GREASE
SILICONE
IGNITER UNIT
Test, page 24-2
E-CLIP
Replace
DISTRIBUTOR HOUSING
Check for cracks or damage.
CAP SEAL
Check for damage.
PIN
THRUST WASHER
PIN RETAINER
O-RING
Replace
CRANK ANGLE SENSOR
COUPLING
Installation, page 24-8

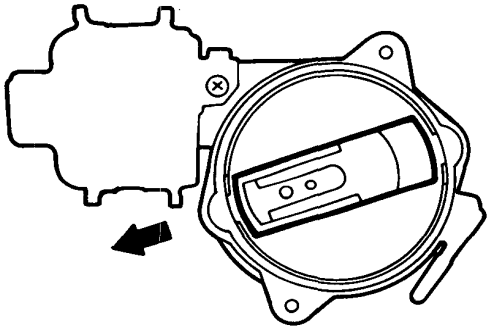
Distributor Coupling Installation

1. Install the rotor, then turn it so that it faces in the direction shown (toward the No. 1 cylinder).

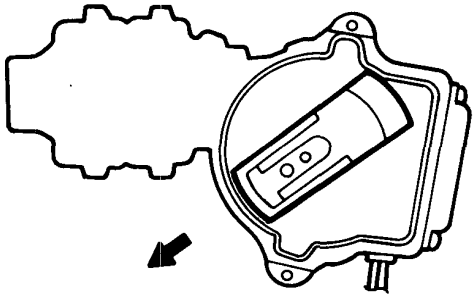
B20A2 engine:



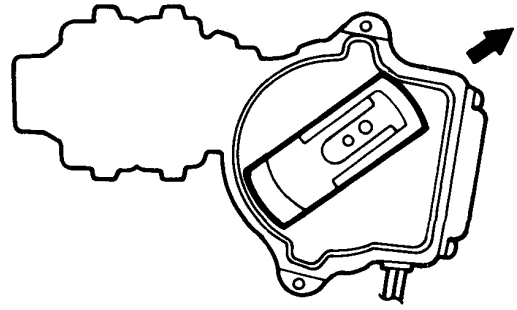
A20A1 engine (Hitachi):



A20A1 engine (Toyo Denso):



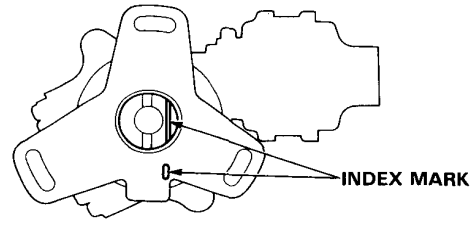
A20A3 engine:



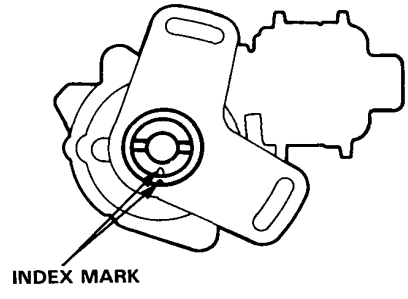
2. Set the thrust washer and coupling on the shaft.

3. Check that the rotor is still pointing toward the No. 1 cylinder, then align the index mark on the housing with the index mark on the coupling.

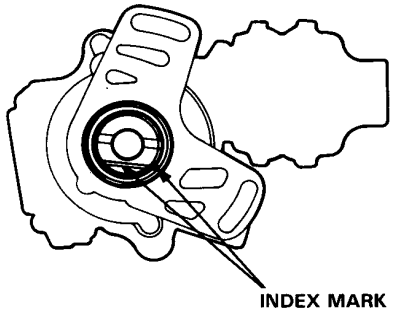
B20A2 engine:



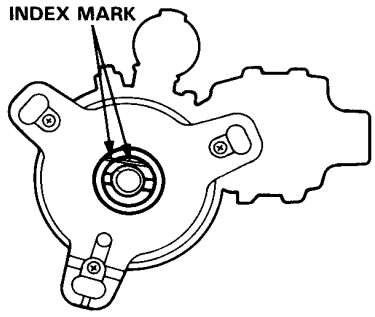
A20A1 engine (Hitachi):



A20A1 engine (Toyo Denso):



A20A3 engine:



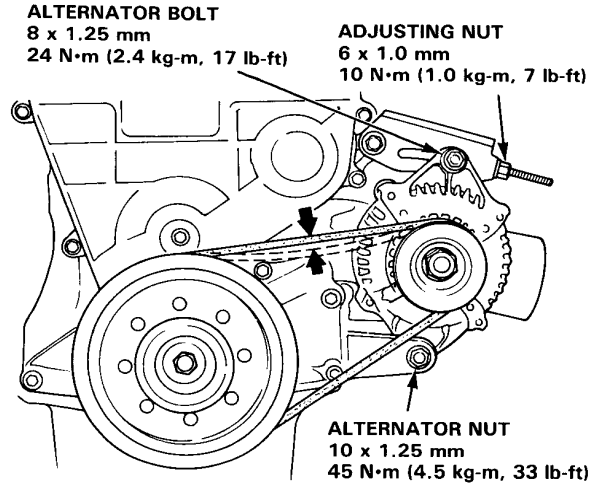
4. Drive in the pin and secure it with the pin retainer.

Alternator Belt Adjustment (B20A2 engine)

1. Apply a force of 98 N (10 kg, 22 lb) and measure the deflection between the alternator and the water pump pulley.

   Deflection: 10—13 mm (0.39—0.51 in.)

   NOTE: On a brand-new belt, the deflection should be 7—9 mm (0.28—0.35 in.) when first measured.



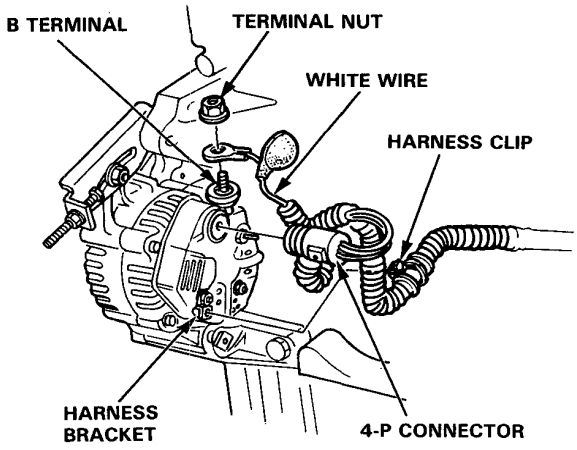
2. Loosen the alternator bolt and nut.

3. Move the alternator by turning the adjusting nut to obtain the proper belt tension, then retighten the bolt and nut.

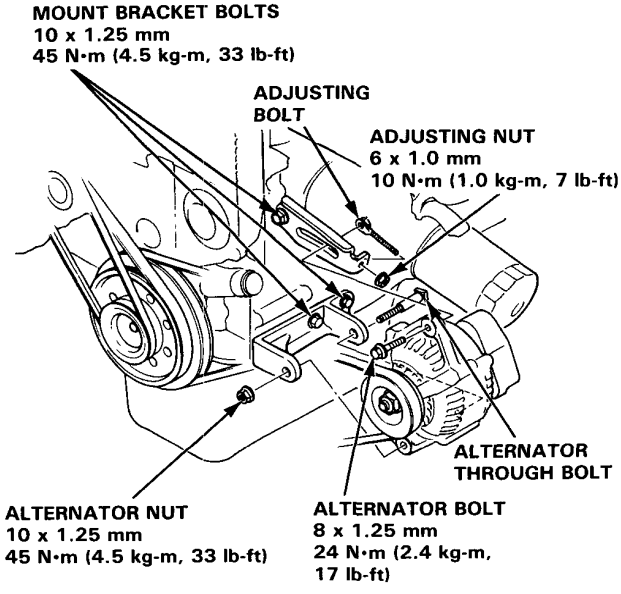
4. Recheck the deflection of the belt.

Alternator Replacement (B20A2 engine)

1. Disconnect the ground wire from the battery negative post (−).
2. Disconnect the left driveshaft from the steering knuckle.
3. Disconnect the 4-P connector from the alternator, and remove the clip from the harness bracket.



4. Remove the terminal nut and the white wire from the B terminal.
5. Remove the alternator bolt and nut, then remove the alternator belt from the alternator pulley.



6. Remove the alternator through bolt, then the alternator.
7. If necessary, remove the mount bracket bolts, and the upper and lower mount brackets.
8. Adjust the alternator belt tension after installing (see page 24-9).

Body Electrical

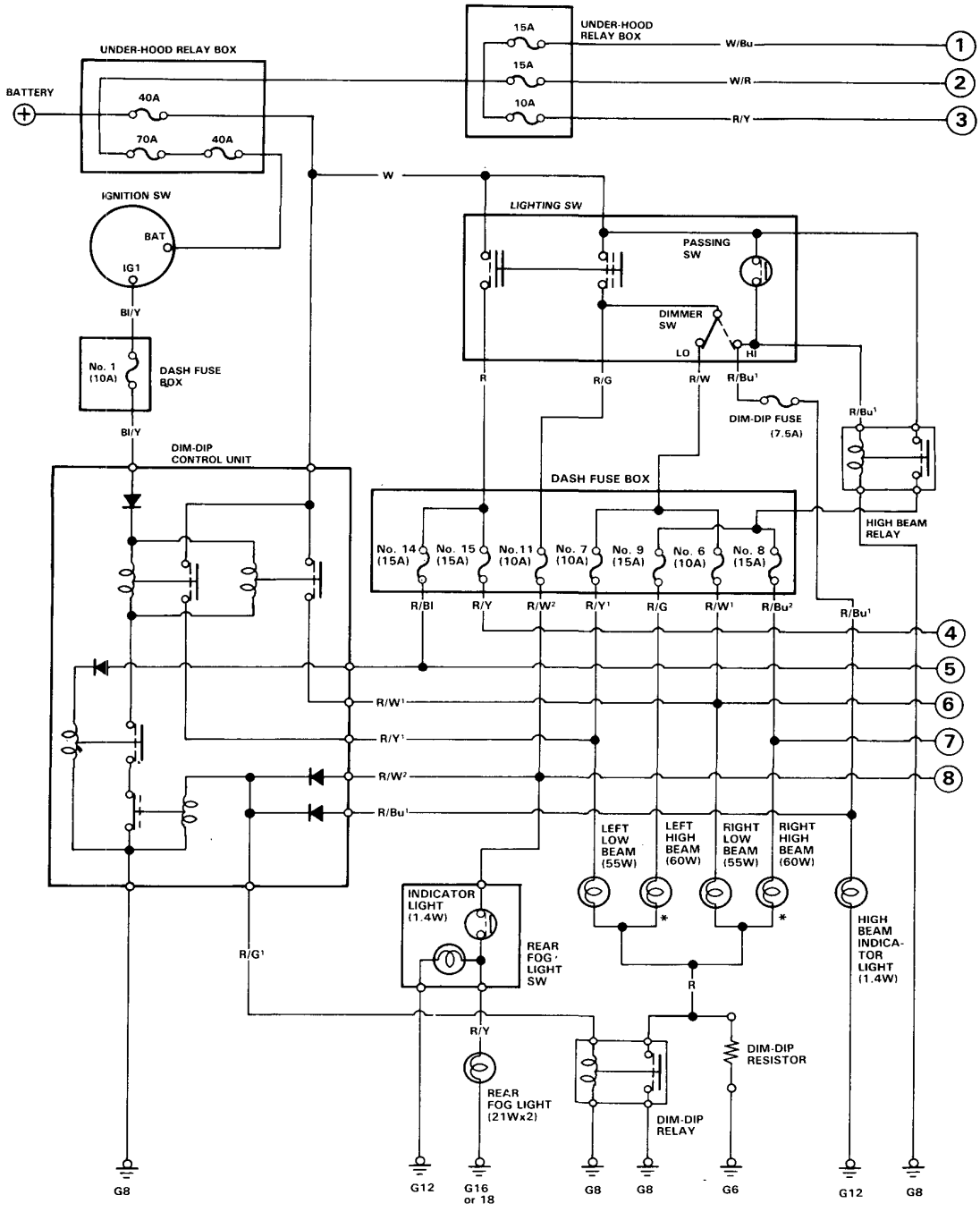
Outline of Model Changes

- Maintenance procedures for the lighting system newly equipped with DIM-DIP headlights (KE model only) are new.
- Fuel and coolant temperature gauges of the bobbin (cross coil) type has been newly adopted.

Lighting System (KE model)

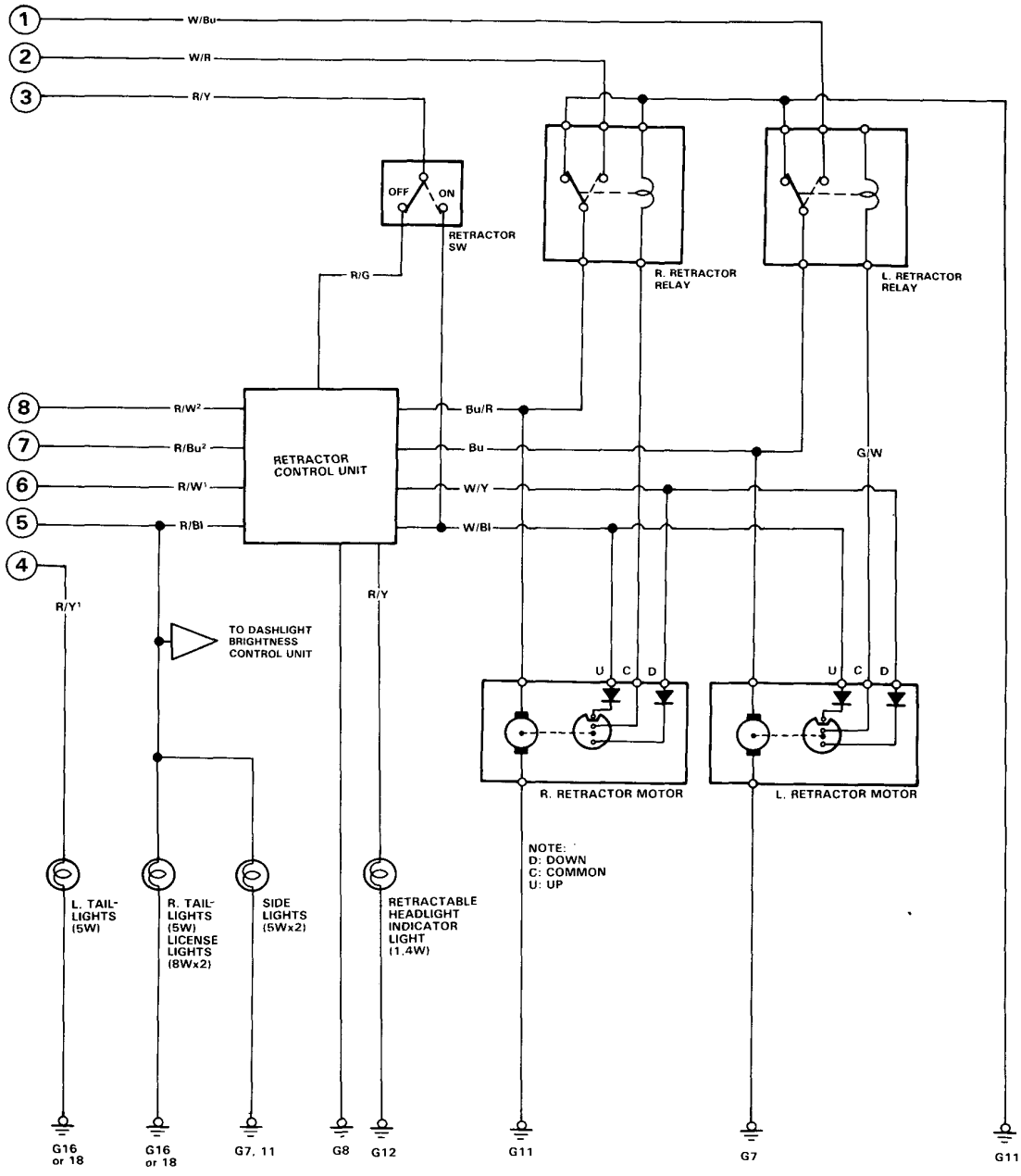
Circuit Diagram

Description:
When the lighting switch is set to the first position (•) with the ignition switch ON, the headlights will rise and light up as the DIM-DIP headlights. The light is dimmed to approx. ten percent of the headlights' brightness in the second position (●) of the lighting switch.



*: For 4D sedan, HIGH BEAM (55W) is added.

Function:
The retractor motors are controlled by their respective relays. The relays are energized by power to either the up wire (W/Bl) or down wire (W/Y), through the slip ring in the retractor motors. The up wire can be powered either by the headlight switch/control unit or via the retractor switch directly. The down wire can only be powered by the control unit via either the headlight switch or switch or the retractor switch.



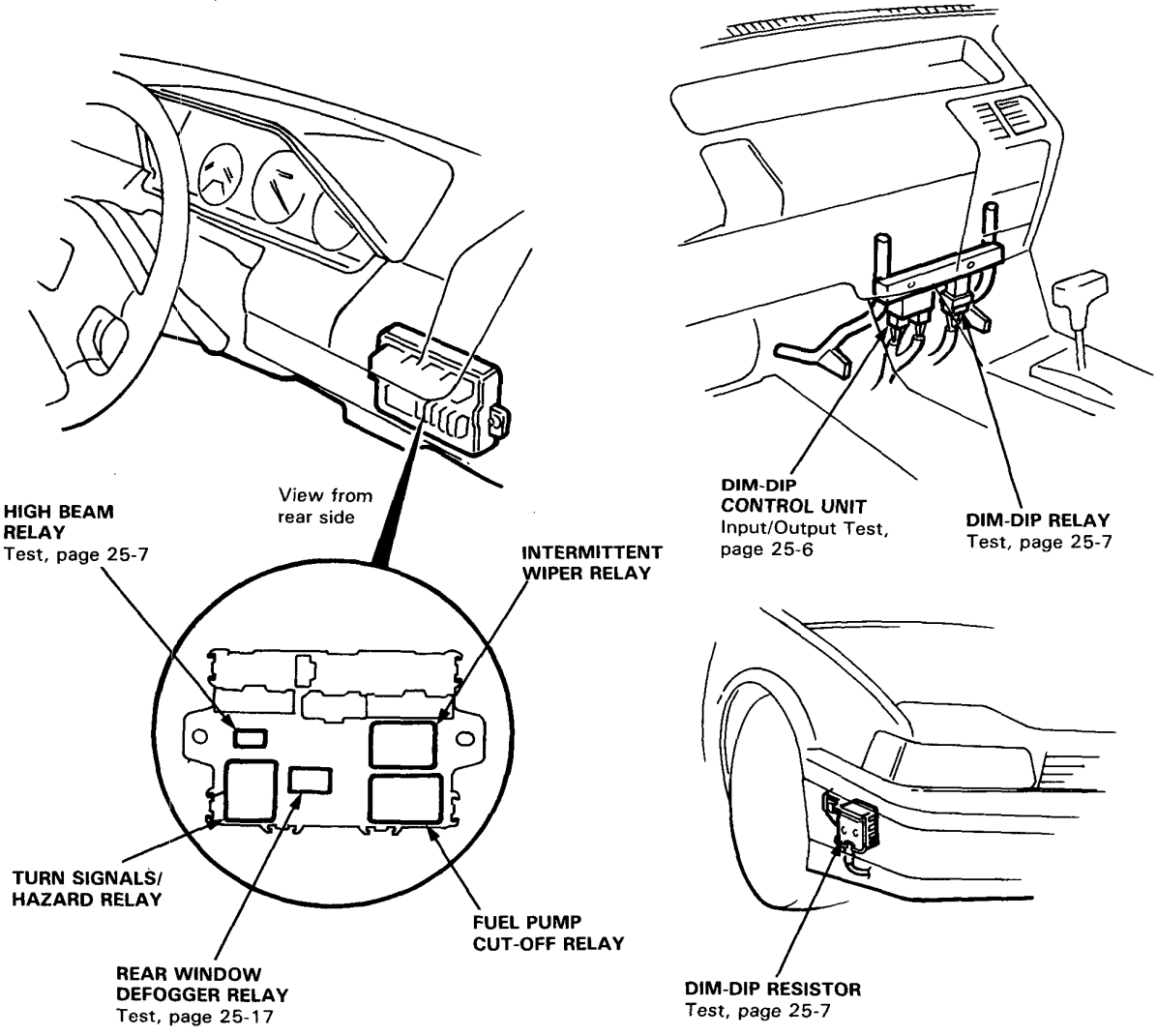
NOTE: Several different wire have the same color. They have been given a number suffix to distinguish them (for example R/W¹ and R/W² are not the same).

Lighting System (KE model)

Component Location Index

NOTE: Refer to the base manual (No. 62SE300) of Accord for service procedures indicated by page or section numbers with superscript "*"

- SYSTEM
  Troubleshooting, page 25-5
- LIGHTING SWITCH
  Test, page 25-10*
- RETRACTOR SWITCH
  Test, page 25-76*
- RETRACTOR MOTOR/RELAY
  Test, page 25-77*
- HEADLIGHTS (Sealed Beam Unit)
  Replacement, page 25-100*
  Adjustment, page 25-101*
- TAILLIGHTS/LICENSE PLATE LIGHTS/
  FRONT POSITION LIGHTS
  Bulb Replacement, page 25-102* thru 25-105*



Troubleshooting

CAUTION: DIM-DIP resistor becomes very hot in use of DIM-DIP headlights; do not touch it or the attaching hardware immediately after they have been turned off.

NOTE:

- The numbers in the table show the troubleshooting sequence.
- Before troubleshooting:
  - Check the No. 1, 6, 7 and 11 (10A) fuses, No. 8, 9, 14 and 15 (15A) fuses, DIM-DIP fuse (7,5A) in the dash fuse box.
  - Check 40A, 40A and 70A main fuses in the under-hood relay box.
- Several different wires have the same color. They have been given a number suffix to distinguish them (for example R/W[1] and R/W[2] are not the same).

Symptom	Items to be inspected		Retractor relay	DIM-DIP relay	Retractor motor	Lighting switch	Retractor switch	Passing switch	Retractor control unit	DIM-DIP control unit	DIM-DIP resistor	Blown bulb	Frozen, stuck, or improperly installed retractor linkage	Poor ground	Open circuit in wires or loose or disconnected terminals
Lighting switch "OFF" to "•"	Headlights rise up.	Any lights to be on do not light up.													R/G or R/Bl
		All lights except headlights light up.								2	1			G8 and G6	Bl/Y, W R/W[1] or R/Y[1]
	Headlights do not rise up.	All lights to be on light up.	4		3				1				2	G7, G8 and G11	R/W[1] or R/Bl
Lighting switch "•" to "●"	Headlight is still dimmed.			1		2				3				G8	R/W[2], R/Bu[1] or R/G[1]
Lighting switch "●" to "•"	Headlights retract.								1					G8	R/W[1] or R/Bl
Lighting switch "•" to OFF	Headlights do not retract.								1				2	G8	
Retractor switch ON	Headlights cannot be raised.						1		2					G8	R/Y or W/Bl
Retractor switch OFF	Headlights cannot be retracted.						1		2					G8	R/Y or R/G
Indicator light is not ON with retractor motors activated.									2			1		G12	R/Bu[2]
Indicator light is ON with retractor motors deactivated.									1						

Lighting System (KE model)

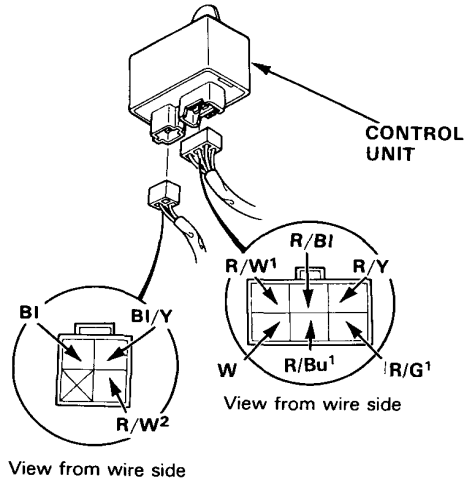
DIM-DIP Control Unit Input/Output Test

NOTE:

- Several different wires have the same color. They have been given a number suffix to distinguish them (for example R/W¹ and R/W² are not the same).
- Recheck connections between the 6-P connector and the control unit, or the 4-P connector and the control unit, then replace the control unit if all input tests prove OK.

Input Test:

Remove the dashboard lower panel to disconnect the 6-P and 4-P connectors from the control unit.
Make the following input tests at the harness pins.



No.	Wire	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	Bl	Under all conditions.	Check for continuity to ground: should be continuity.	• Poor ground (G8). • An open in the wire.
2	Bl/Y	Ignition switch ON.	Check for voltage to ground: should be battery voltage.	• Blown No. 1 (10A) fuse. • An open in the wire.
3	W	Under all conditions.	Check for voltage to ground: should be battery voltage.	• An open in the wire.
4	R/W²	Lighting switch "●"	Check for voltage to ground: should be battery voltage.	• Blown No. 11 (10A) fuse. • Faulty lighting switch. • An open in the R/Bu or R/W² wire.
5	R/Bu¹	Lighting switch "●" and dimmer switch Hi or passing switch ON.	Check for voltage to ground: should be battery voltage.	• Blown DIM-DIP fuse (7.5A). • Faulty lighting switch. • An open in the wire.
6	R/Bl	Lighting switch "•" or "◐"	Check for voltage to ground: should be battery voltage.	• Blown No. 14 (15A) fuse. • Faulty lighting switch. • An open in the wire.

Output Test:

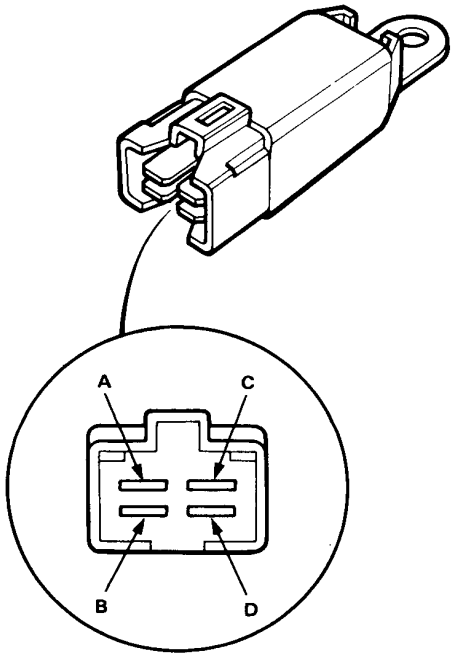
Reconnect the 4-P and 6-P connectors to the control unit.
Make the following output tests at the harness pins.

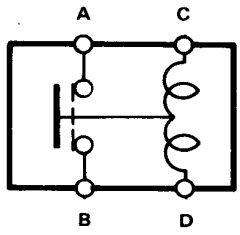
7	R/W¹	Lighting switch "•".	Check for voltage to ground: should be battery voltage.	Faulty DIM-DIP control unit.
8	R/Y			
9	R/G¹	Lighting switch "●"	Check for voltage to ground: should be battery voltage.	
		Lighting switch "●" and dimmer switch HI or passing switch ON.		

Relay Test

1. Remove the DIM-DIP (located on the back side of the CASSETTE case) or high beam relay (located on the dash fuse box).

2. There should be continuity between the A and B terminals when the battery is connected to the C and D terminals.
   There should be no continuity when the battery is disconnected.





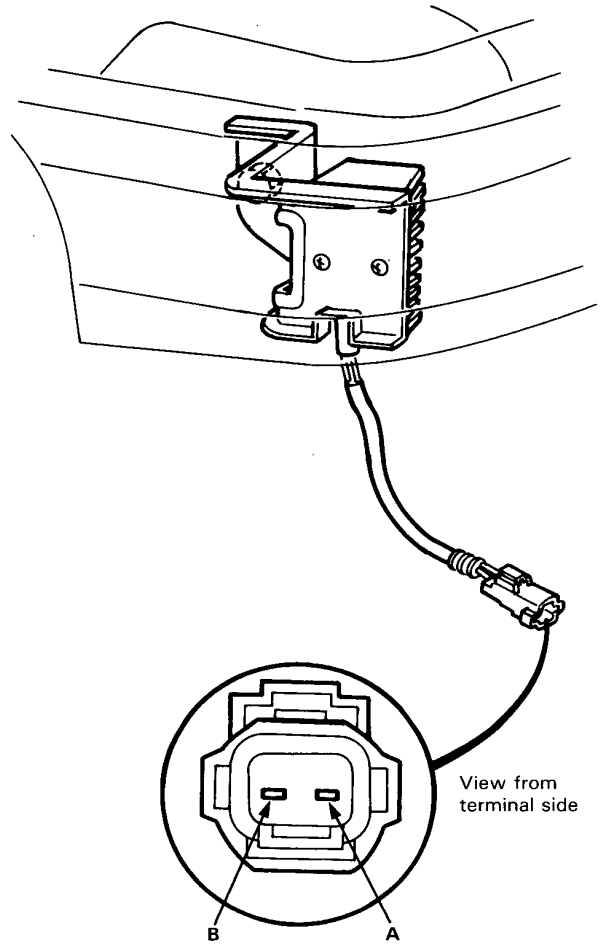
Resistor Test

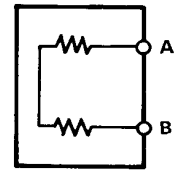
CAUTION: DIM-DIP resistor becomes very hot in use of DIM-DIP headlights; do not touch it or the attaching hardware immediately after they have been turned off.

1. Remove the right side inner fender.

2. Disconnect the 2-P connector from the resistor.

3. Check for continuity between the A and B terminals.
   (RX100 scale)
   There should be continuity.



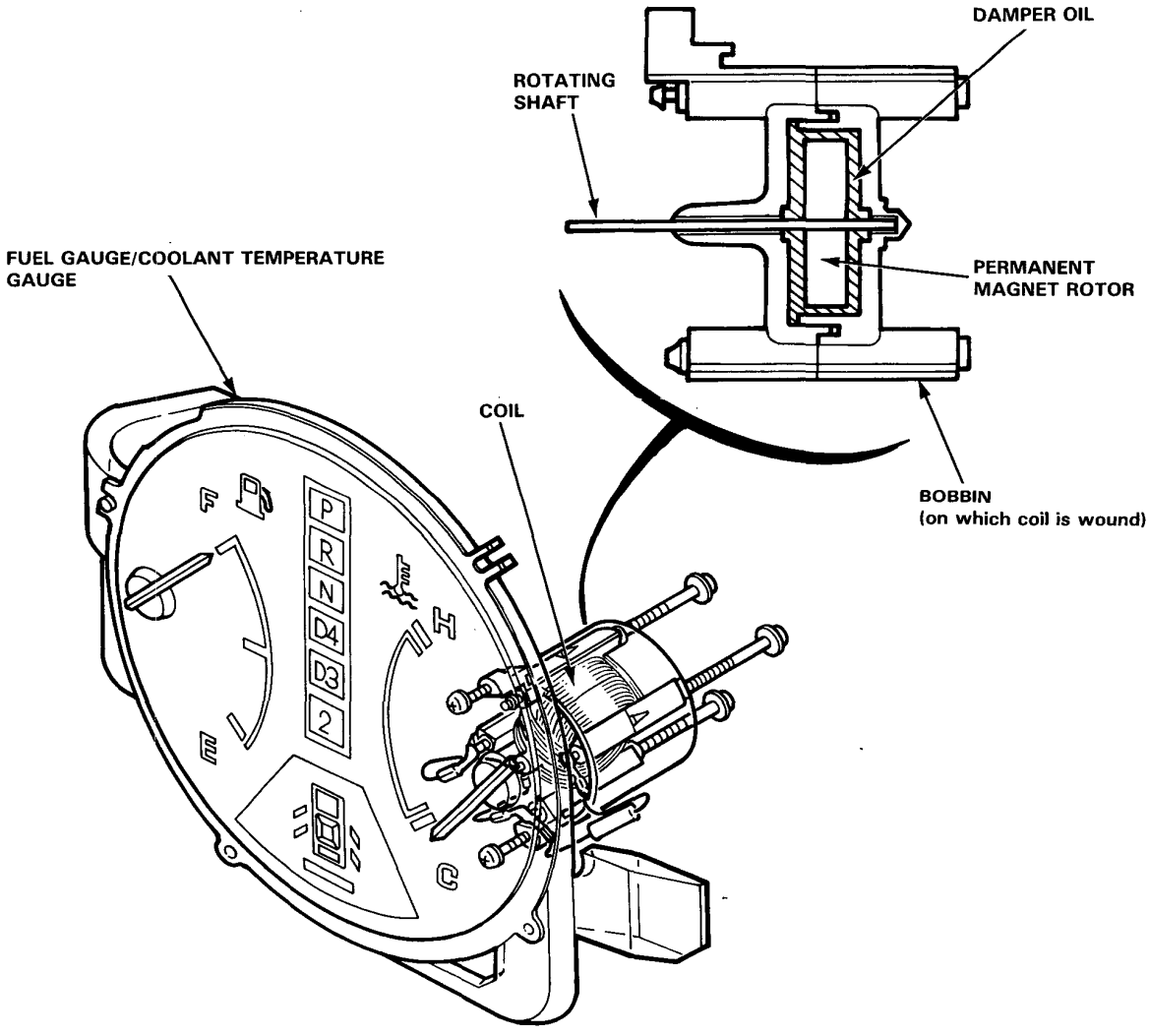


Gauge Assembly (Analog)

Description

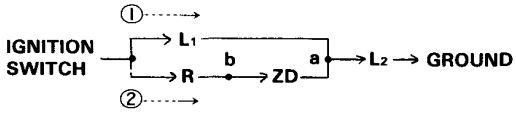
Bobbin type (cross coil type) gauges:

- A bobbin type gauge is an electromagnetic instrument in which two orthogonally intersecting coils are wound around the permanent magnet rotor. By varying the resistance of the unit to vary the current which flows through the coil, the magnetic force which excites the coil will vary, causing the rotor (pointer) to operate. A sliding resistance is employed in the fuel gauge just as in a bimetal type gauge, and a thermistor is used in the temperature gauge.
- The rotor of the fuel gauge is immersed in damper oil and its center of gravity lies roughly along the rotating shaft, hence the fuel level is indicated continuously even when the ignition switch is OFF.
- The coolant temperature gauge is a center point stable small indicating angle type which indicates the temperature of the cooling water over the range of between about 80 and 100°C.



<Coolant Temperature gauge>

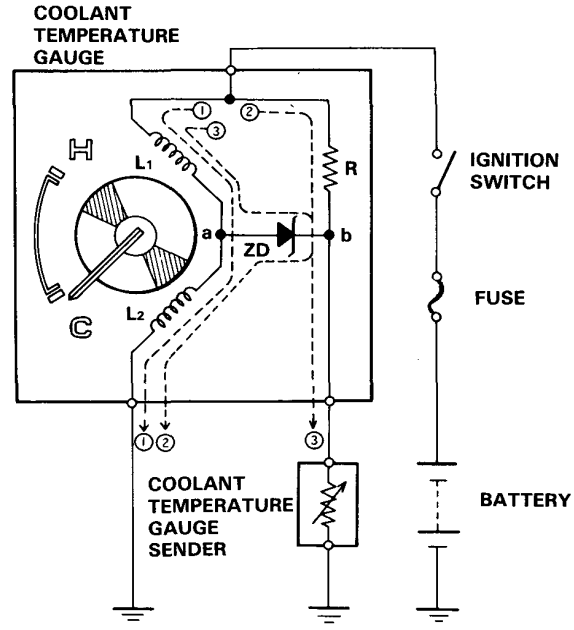
Operation:
When the temperature of the coolant is low, the electrical resistance of the coolant temperature gauge sender is large, hence the potential of point "b" in the figure at right becomes higher than the potential at point "a", and the potential difference (b-a) exceeds the *zener voltage of the zener diode (ZD).
The current which floes through each coil is current ① and ② shown in the figure.

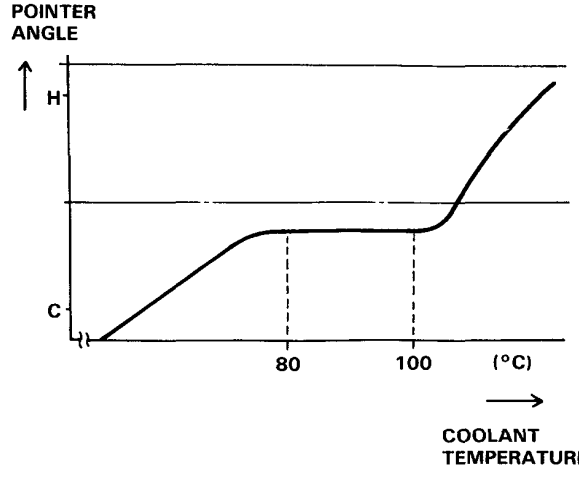


The current (① + ②) which flows from coil L_1 to coil L_2 increases, and the magnetic force generated by coil L_2 increases, causing the rotor to point to the C (cool) side.

When the coolant temperature rises, the electrical resistance of the sender gradually falls, and the potential of point "b" in the figure decreases. As a result, current ② in the figure decreases, and the magnetic force generated by coil L_2 decreases, causing the pointer to rise. When the potential difference (b-a) between points "a" and "b" falls below the zener voltage of ZD, current ② ceases to flow, and the current flowing through L_1 and L_2 will be current ① only. As a result, the forces generated by coils L_1 and L_2 act roughly equally on the pointer, causing the pointer to move to the vicinity of the center position. This condition will continue until the potential at point "b" becomes lower than the potential at point "a", and the pointer will remain stable. (center point stable indicator)

Zener Voltage:
When a voltage is applied in the reverse direction (b→a) and gradually increased, a point will be reached where current starts to flow in the direction (b→a). This voltage is called the zener voltage.

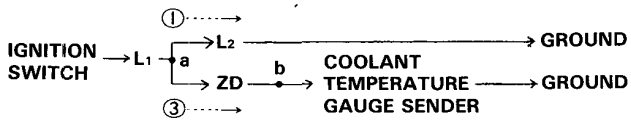




(cont'd)

Description (cont'd)

When the coolant temperature rises in summer, the electrical resistance of the sender will fall, causing the potential of point "b" in the figure to fall below the potential of point "a". By applying a voltage in the forward direction (a → b) to ZD, the current which flows through each coil will flow through ① and ③ in the figure.

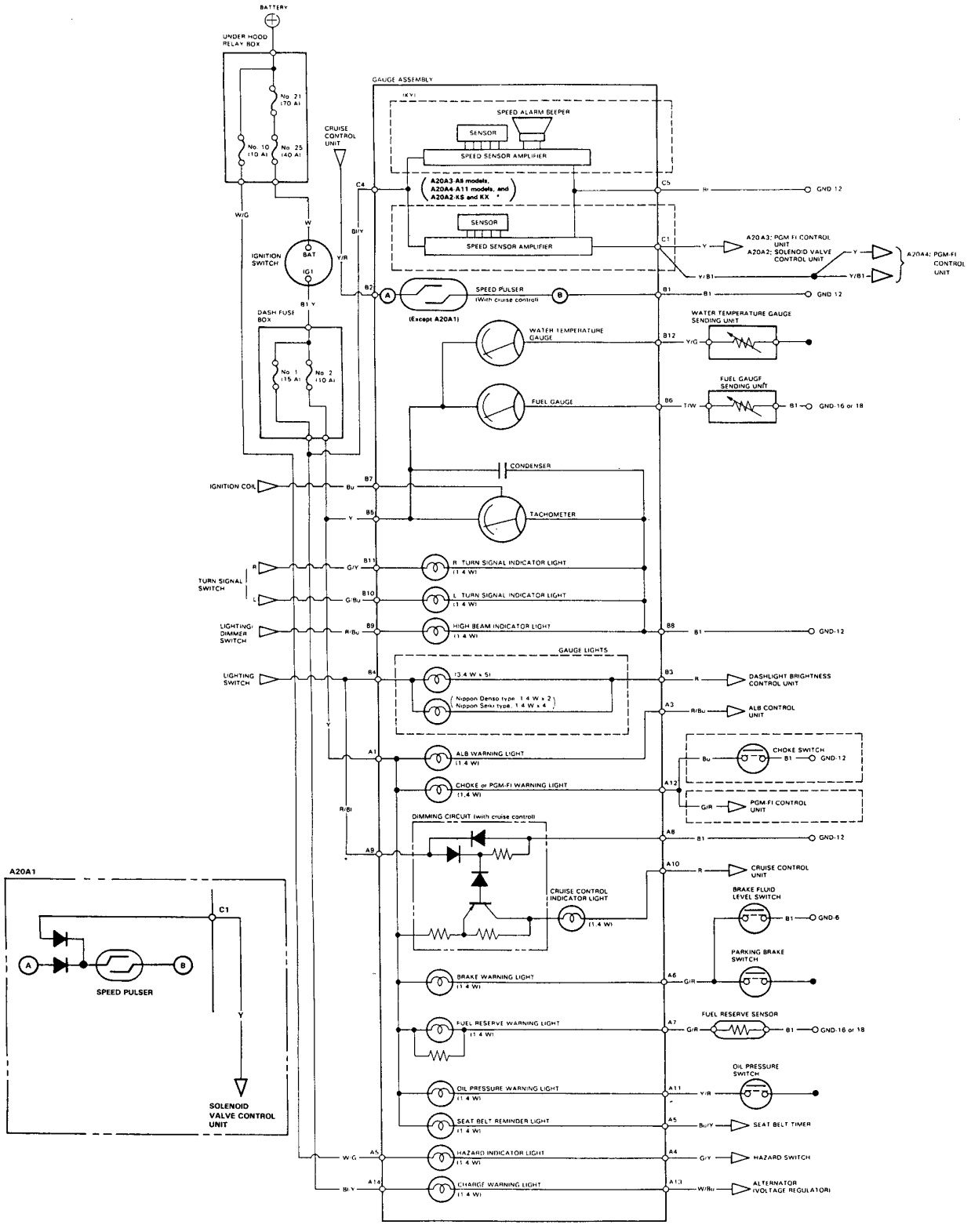


As the electrical resistance of the sender falls, the potential difference (a-b) increases and current ③ increases, hence the magnetic force generated by coil L_1 increases, and the pointer once again rises.

<Fuel Gauge>

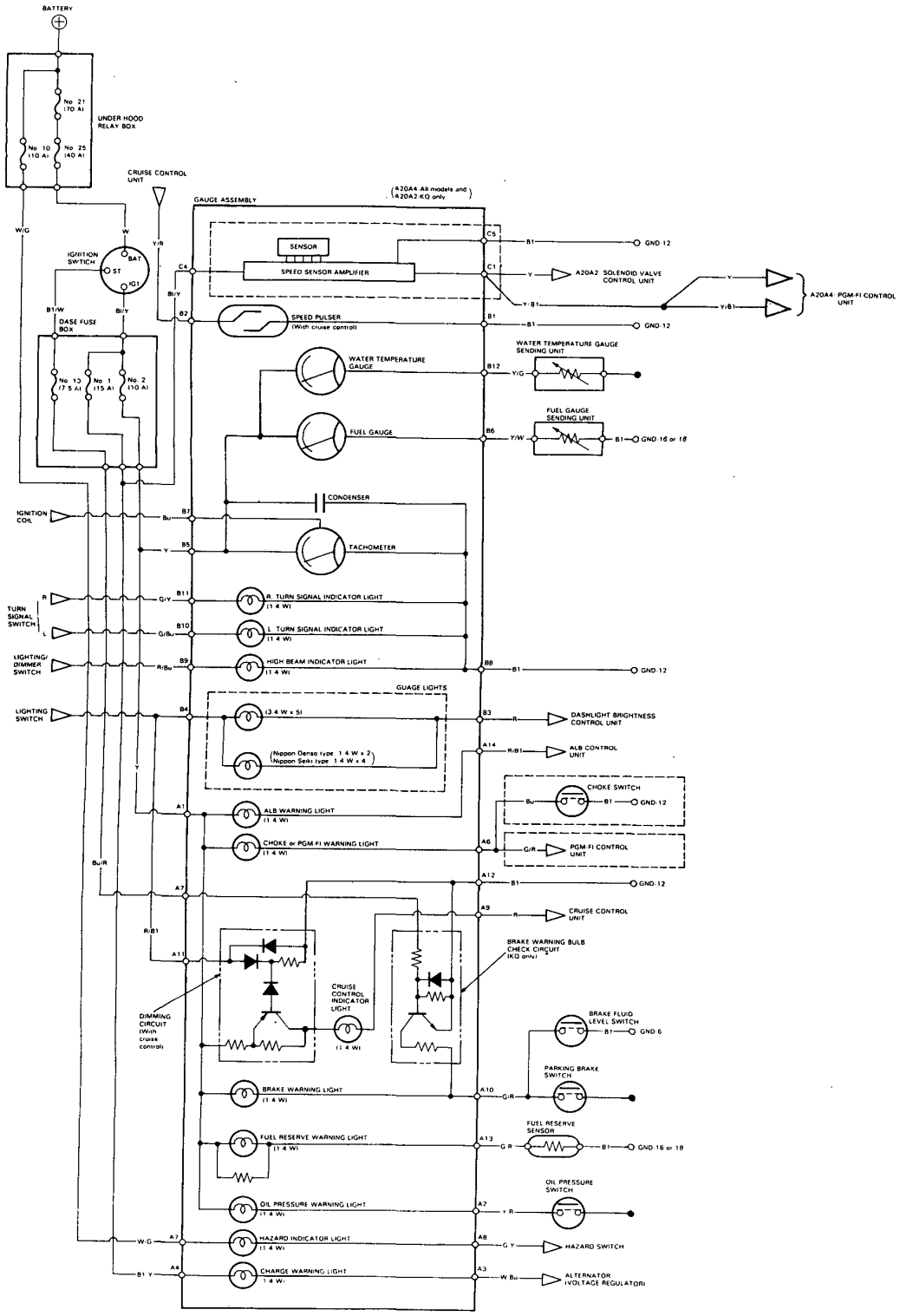
The basic operation of the fuel gauge is the same as that of the coolant temperature gauge except that a center point stable indication is not necessary. Consequently, a resistor is used instead of the zener diode (ZD) shown in the circuit diagram of the coolant temperature gauge. Along with the rise and fall of the fuel level, the electrical resistance of the fuel gauge sending unit, hence, like the coolant temperature gauge sender, current ② or ③ varies, causing the pointer to indicate the fuel level in accordance with the magnetic force generated in coils L_1 and L_2.

Circuit Diagram (L.H. Drive)



Gauge Assembly (Analog)

Circuit Diagram (R.H. Drive)



INTRODUCTION

How to Use This Manual

This supplement contains information specifically applicable to the 1988 ACCORD. Refer to following shop manuals for service procedures applicable to this model.

Description	Code No.
ACCORD Maintenance and Repair	62SE300
ACCORD Supplement	62SE320

The first page of each section is marked with a black tab that lines up with one of the thumb index tabs on this page. You can quickly find the first page of each section without looking through a full table of contents. The symbols printed at the top corner of each page can also be used as a quick reference system.

Special Information

WARNING Indicates a strong possibility of severe personal injury or loss of life if instructions are not followed.

CAUTION: Indicates a possibility of personal injury or equipment *damage if instructions are not followed.*

NOTE: Gives helpful information.

CAUTION: Detailed descriptions of *standard* workshop procedures, safety principles and service operations are not included. Please note that this manual does contain warnings and cautions against some specific service methods which could cause PERSONAL INJURY, or could damage a vehicle or make it unsafe. Please understand that these warnings cannot cover all conceivable ways in which service, whether or not recommended by Honda motor, *might be done, or of the possible hazardous consequences of each* conceivable way, nor could Honda motor investigate all such ways. Anyone using service procedures or tools, whether or not recommended by Honda motor, *must satisfy himself thoroughly* that neither personal safety nor vehicle safety will be jeopardized.

* (Asterisk) marked chapters are not included in this manual.

First Edition 1/88, 392 Pages
All Rights Reserved

HONDA MOTOR CO., LTD.
Service Publication Office

Outline of Model Changes

ITEM		87 MODEL						88 MODEL							DESCRIPTION	REF. SECTION
		KE	KF	KG	KQ	KW	KX	KE	KF	KG	KQ	KS	KW	KX		
Carbureted Engine Model, equipped with A20A1 Engine							O								Released in 1987 (KG model were released in 1986)	—
Fuel-Injected Engine Model	A20A3 Engine			O		O	O								Released in 1987	—
	A20A4 Engine				O										Released in 1987	—
	B20A2 Engine	O	O	O									O		New Release (KW) Released in 1987	—
	B20A8 Engine									O		O		O	New Release	—
Engine	B20A2 Type	O EXSi	O EXSi	O EXSi									O EXSi		New Release (KW) Release in 1987	—
	B20A8 Type									O EXSCi		O EXSCi		O EXSCi	New Type Engine	—
Fuel and Emission Control System	A20A1 Engine			O		O	O			O			O	O	Idle Control System does not apply	§12
	A20A3 Engine			O		O	O			O		O		O	New System	§12
	A20A4 Engine				O										Evaporative Emission Control System added	—
	B20A2 Engine	O	O	O											New System	—
	B20A8 Engine									O		O		O	New System	§12
Clutch		O EXSi	O EXSi	O EXSi											New Type	—
Manual Transmission															New Type B2	—
Driveshafts															Intermediate Shaft added	—
Front Brakes															Uses large Front Caliper and Disc	—
Distributor		O	O	O		O	O								Use New Type (for A20A1 and B20A2 Engines)	—
Headlights		O													Added with Dim-Dip Lighting System	—

ITEM	87 MODEL	88 MODEL	DESCRIPTION	REF. SECTION
Front Brakes	Model equipped with 4W-ALB (except KS model)		Use large Front Caliper and Disc	—
Frame shape	ALL		Frame shape near Rear Suspension were changed	—
Combination Meter	ALL		Changed	—
Intake and Exhaust Manifolds		ALL	Changed	§9
Water pump		ALL	Changed	§10
Secondary Valve Body		Models equipped with 2-1 Timing Valve (F4 Type)	New	§15
Power Steering Gear box		Models equipped with Power Steering	Changed of Steering rack bushing B installation	§18
ALB		Models equipped with ALB	Adopted 3 channel ALB	§20
Heater		ALL	Changed function control and recirculation control motors and control panel switches	§22
Air Conditioner		ALL	Changed fitting size on discharge hose	§23

General Information

Chassis and Engine Numbers

Vehicle Identification Number

JHMCA53400C200001

Manufacture, Make and Type of vehicle
JHM: HONDA MOTOR CO., LTD., JAPAN. HONDA Passenger car

Line/Body and Engine Type
CA4: Accord 1600
CA5: Accord 2000

Transmission and Body Type
3: Manual (3D)
4: Automatic (3D)
5: Manual (4D)
6: Automatic (4D)

Vehicle Grade
2: STD, GL, LX
3: EX
4: EXi
5: EXSi
6: EXR. LXC
7: EXC
8: EXCi
9: EXSCi

Fixed Code

Model Year
0: 1988

Plant
C: Saitama Factory Sayama plant

Serial Number

Engine Serial Number (DOHC Engine)

B20A2-1000001

Engine Type
B20A2: 2000 DOHC Fuel-Injected (without Catalytic Converter)
B20A8: 2000 DOHC Fuel-Injected (with Catalytic Converter)

Model Year
1: 1988 (with Catalytic Converter)
2: 1988 (without Catalytic Converter)

Serial Number

Engine Serial Number (SOHC Engine)

A20A2-3000001

Engine Type
A20A1: 2000 Carbureted (with catalytic converter)
A20A2: 2000 Carbureted (without catalytic converter)
A20A3: 2000 Fuel-Injected (with catalytic converter)
A20A4: 2000 Fuel-Injected (without catalytic converter)
A16A1: 1600 Carbureted (without catalytic converter)

Model Year
3: 1988

Emission Group
0: without catalytic converter (manual)
3: KQ (manual and Automatic)
5: without catalytic converter (Automatic)
9*: with catalytic converter (manual and Automatic)

Serial Number
9* with Automatic starting 50001.

Transmission Number (Manual)

E2K5-1000001

Transmission Type
E1M5: for A16A1 Engine
E2K5: for A20A (Ex. KX, A20A3) Engine
E2L5: for KX, A20A3 Engine Only
F2K5: for B20A (Ex. KX, B20A8) Engine
F2X5: for KX, B20A8 Engine Only

Model Year
1: 1988

Serial Number

Transmission Number (Automatic)

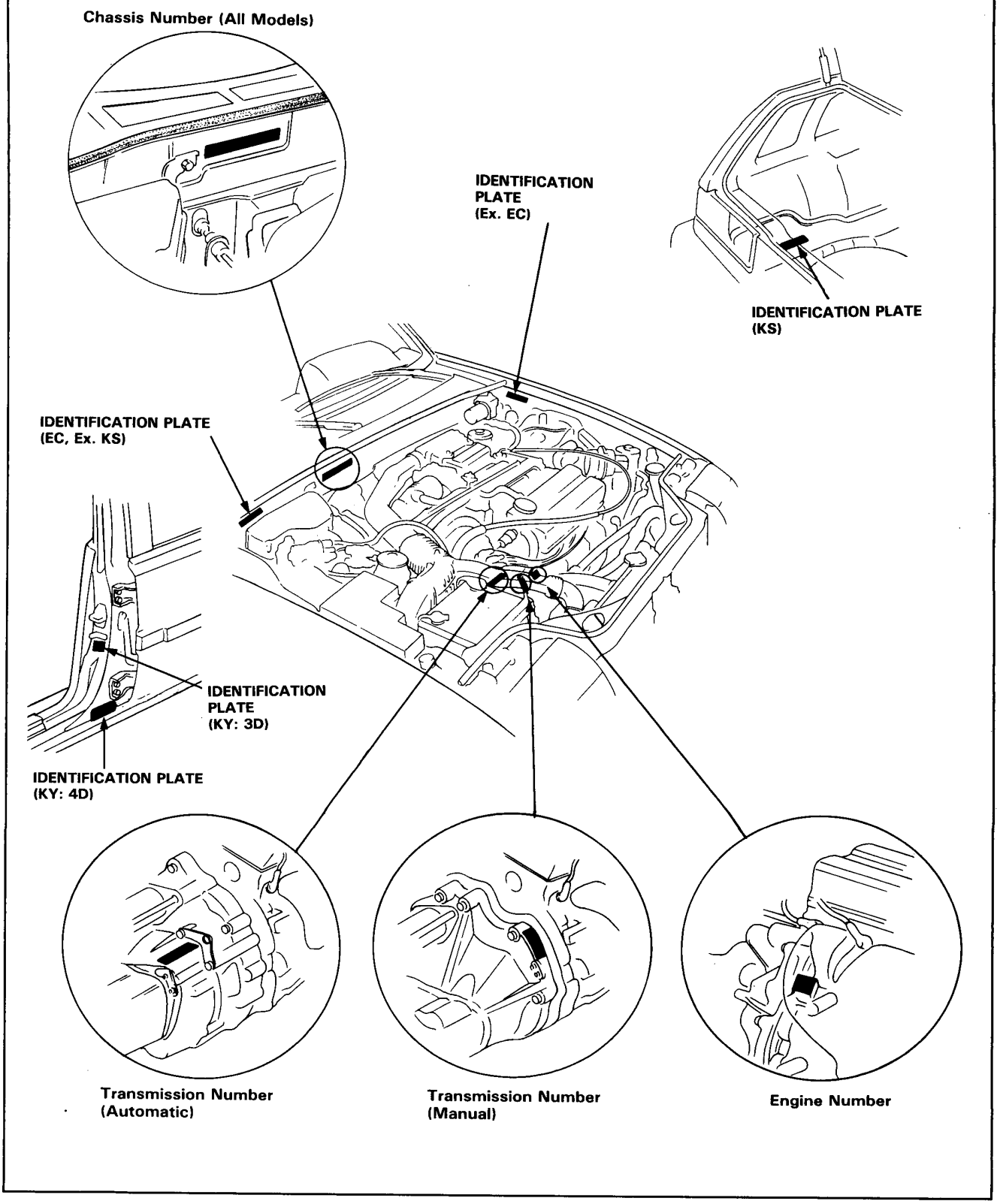
F4-8000001

Transmission Type
F4: for A20A Engine
C9: for A16A Engine

Model Year
8: 1988

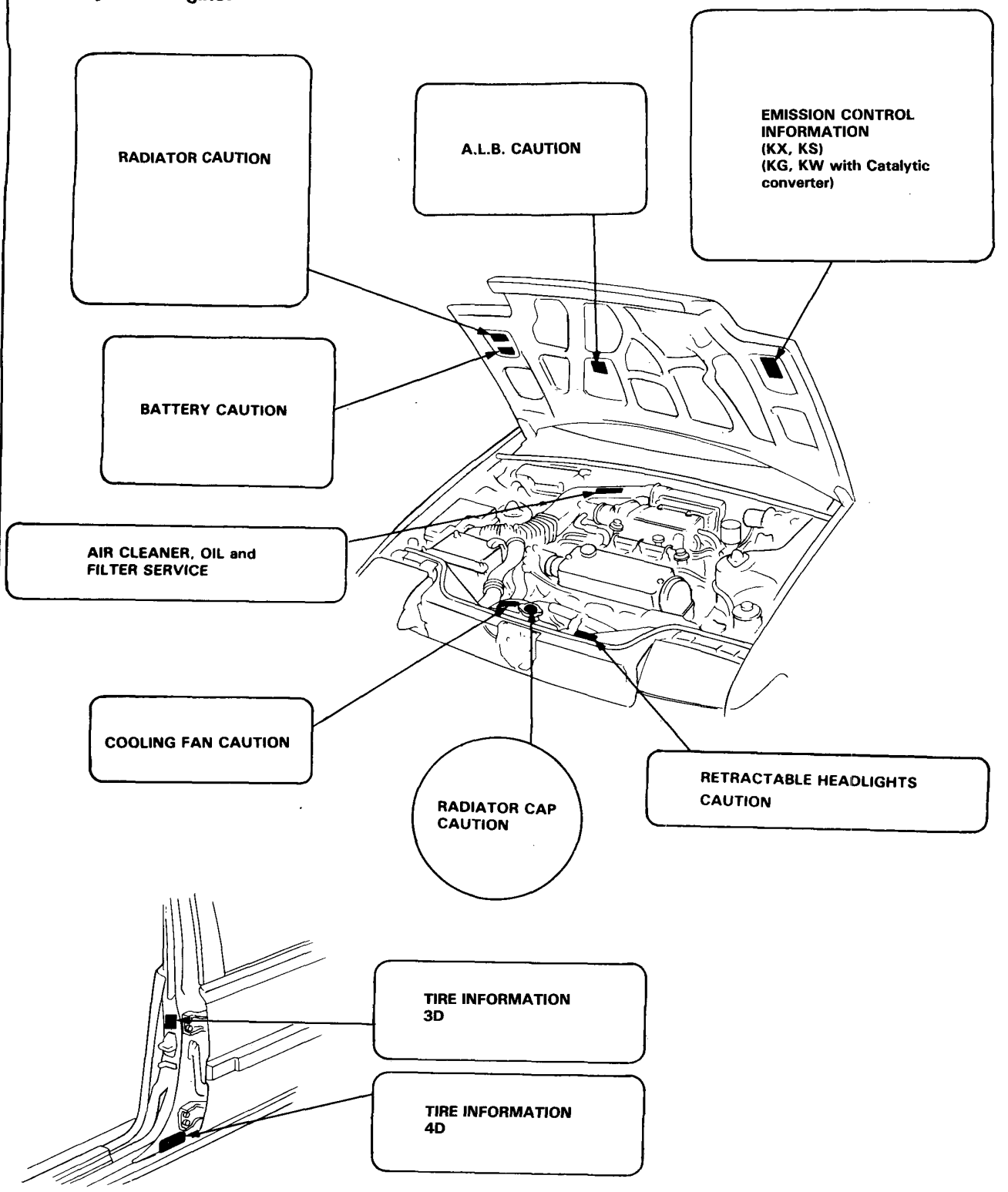
Serial Number

Identification Number Locations

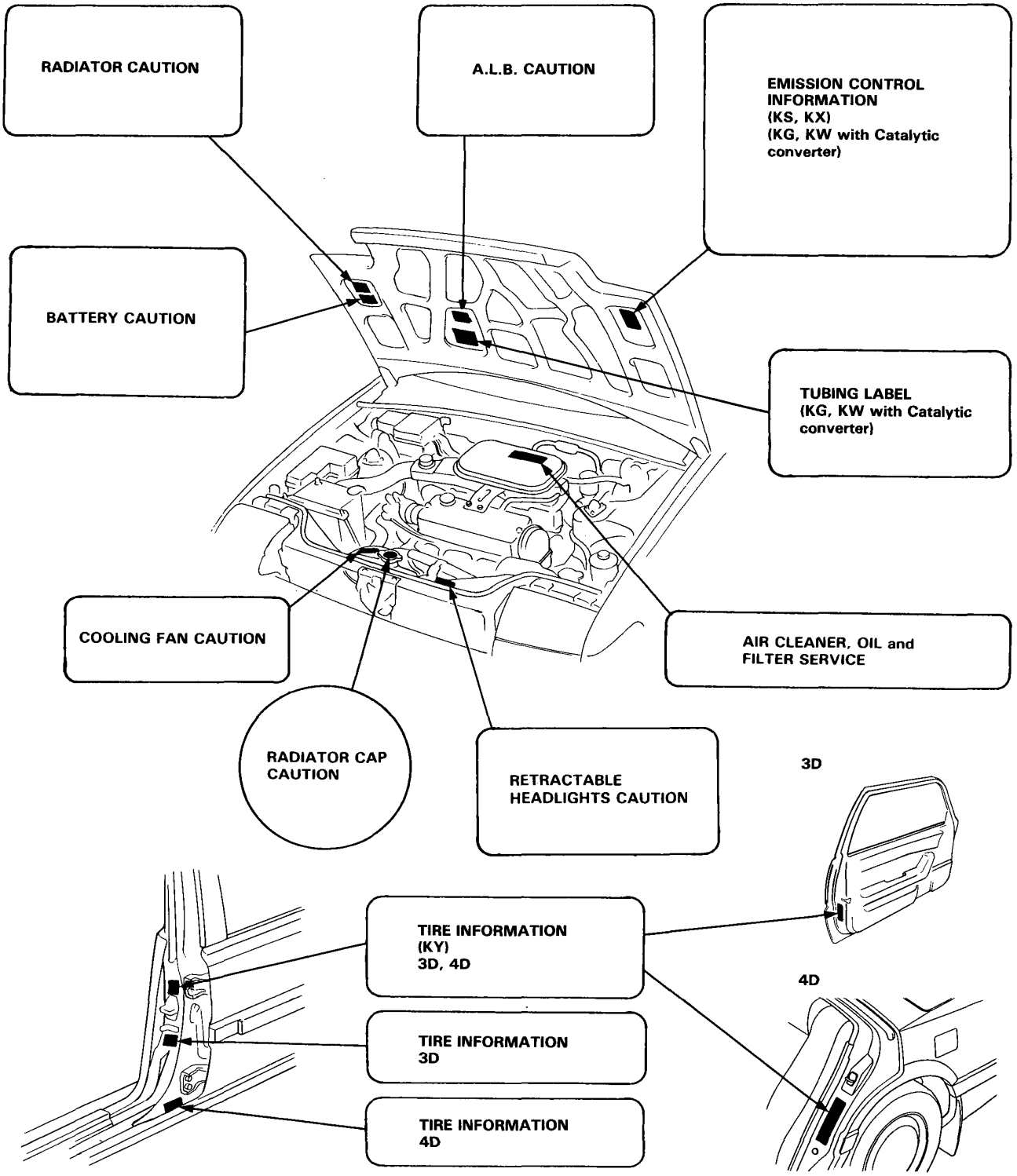


Label Locations

Fuel-Injected Engine:



Carbureted Engine:



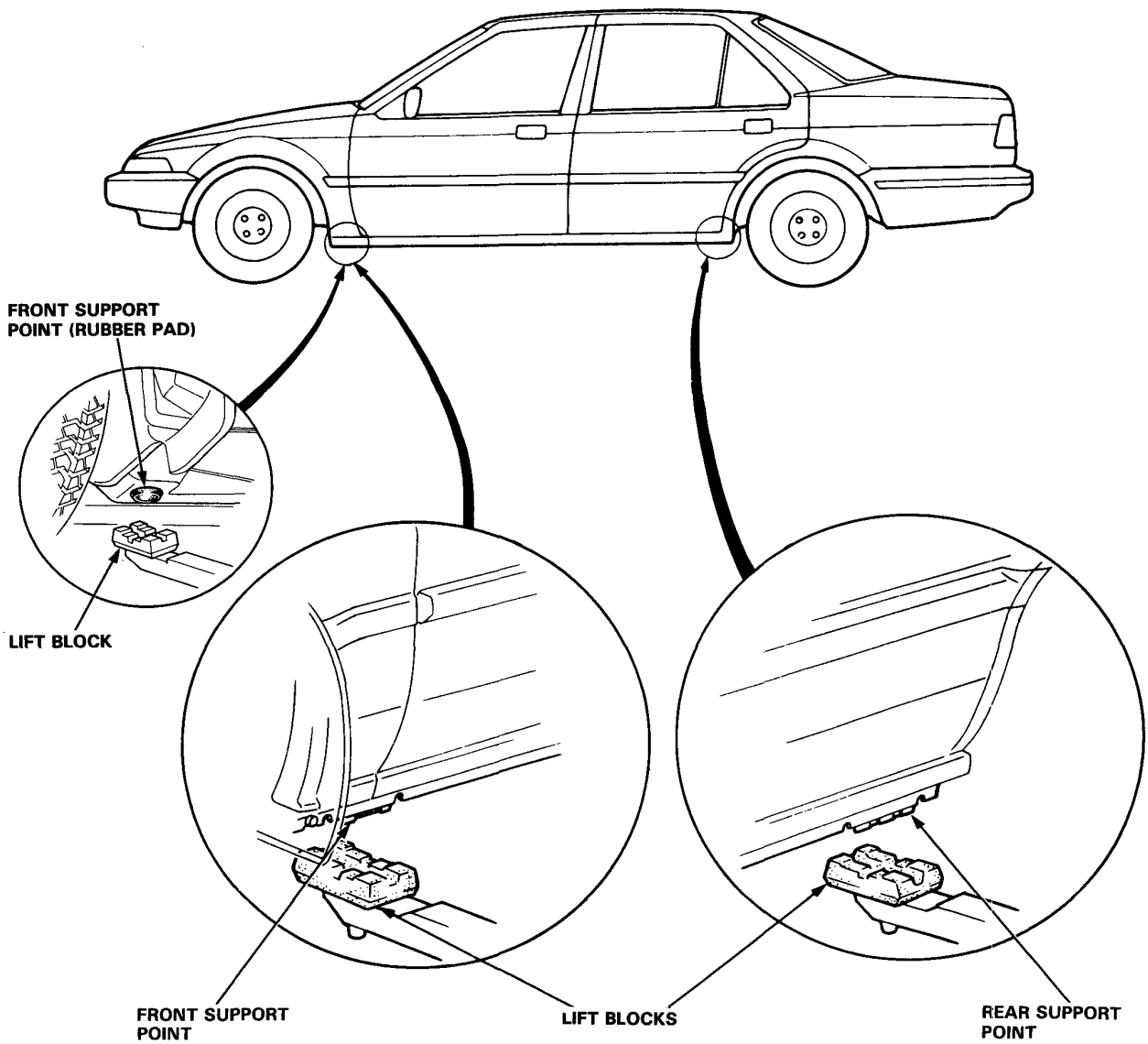
Lift and Support Points

Hoist

1. Place the lift blocks as shown.
2. Raise the hoist a few inches and rock the car to be sure it is firmly supported.
3. Raise the hoist to full height and inspect lift points for solid support.

WARNING When heavy rear components such as suspension, fuel tank, spare tire and trunk lid/hatch are to be removed, place additional weight in the trunk before hoisting. When substantial weight is removed from the rear of the car, the center of gravity may change and can cause the car to tip forward on the hoist.

NOTE: Since each tire/wheel assembly weights approximately 14 kg (30 lbs), placing the front wheels in the trunk can assist with the weight transfer.



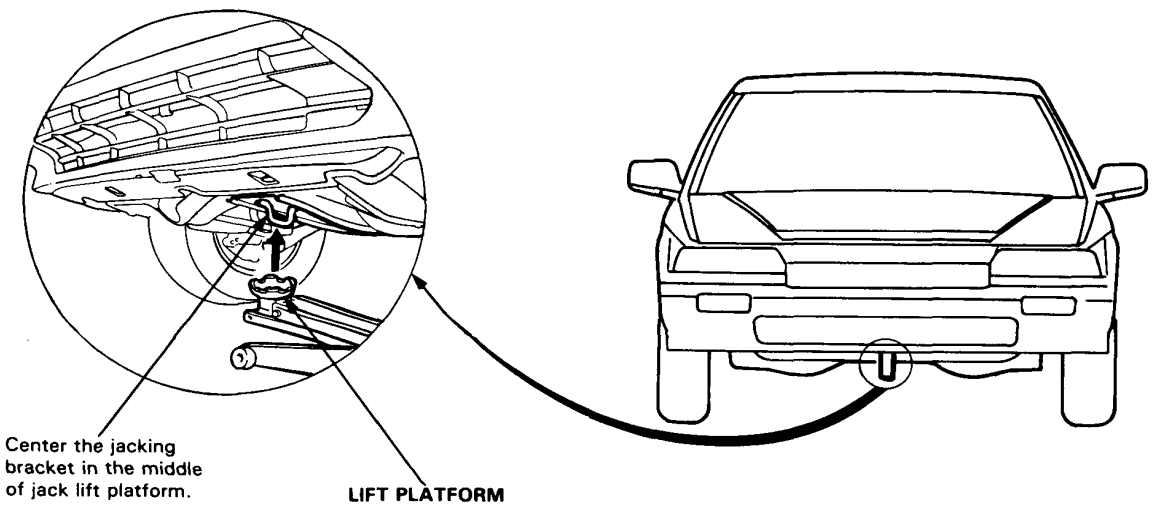
Floor Jack

1. Set the parking brake and block the wheels that are not being lifted.
2. When lifting the rear of the car, put the gearshift lever in reverse (Automatic in PARK).
3. Raise the car high enough to insert the safety stands.
4. Adjust and place the safety stands as shown on page 1-8 so the car will be approximately level, then lower the car onto them.

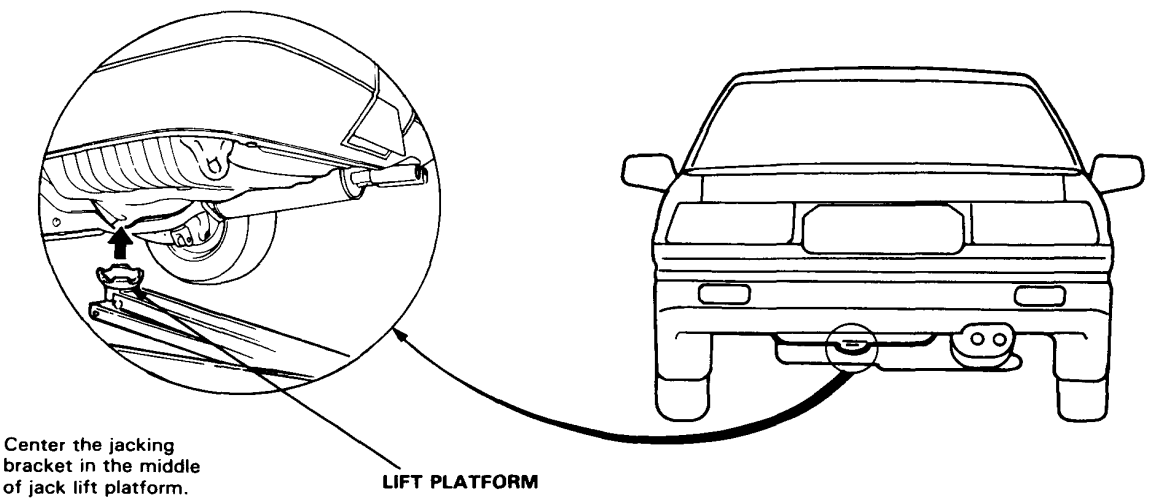
WARNING

- **Always use safety stands when working on or under any vehicle that is supported by only a jack.**
- **Never attempt to use a bumper jack for lifting or supporting the car.**

Front

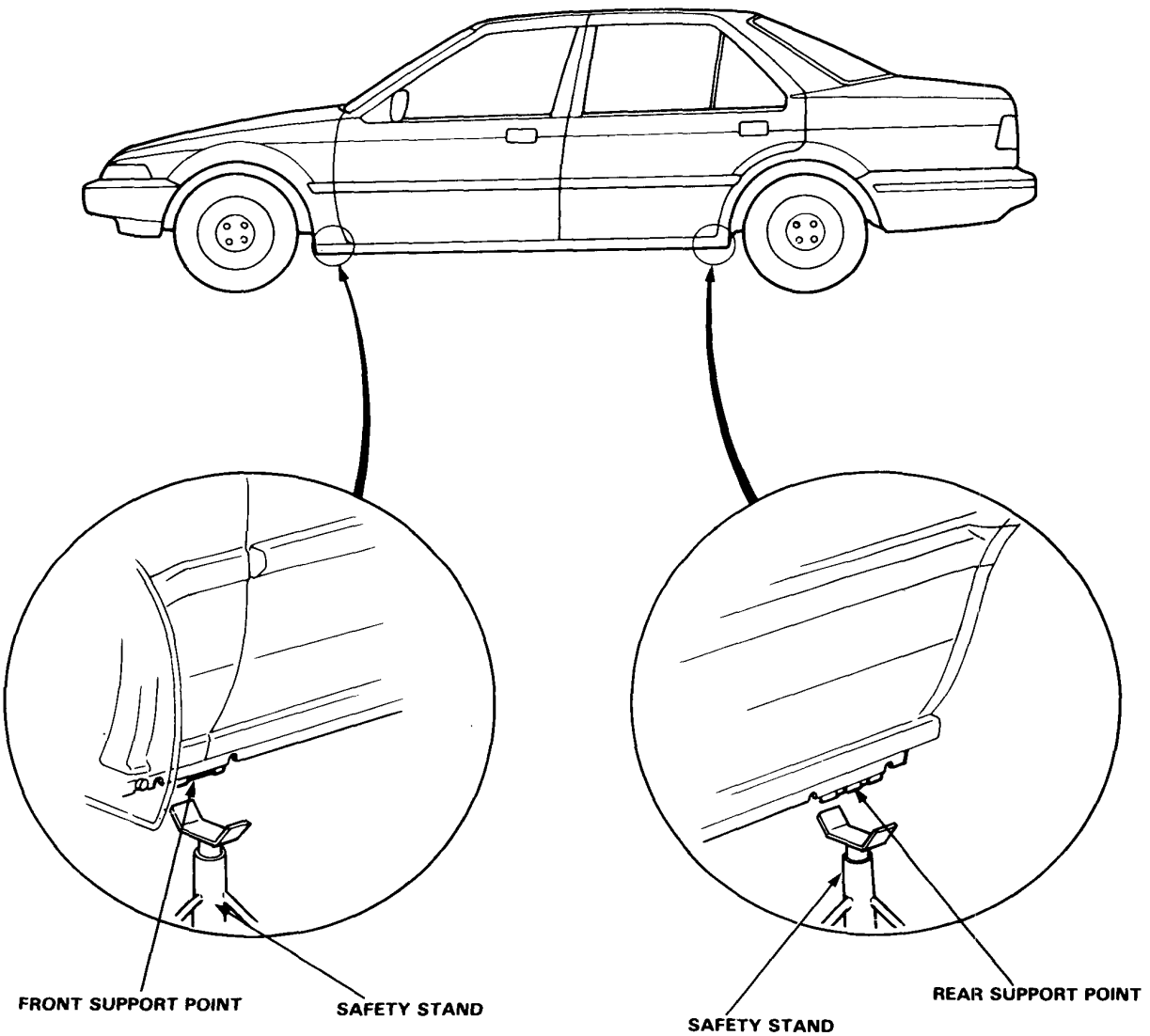


Rear



Lift and Support Points (cont'd)

Safety Stands



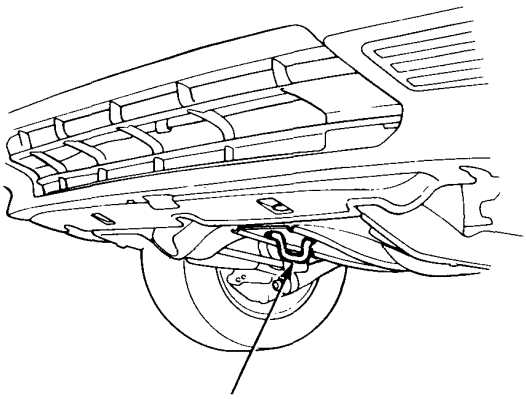
Towing

If possible, always tow the car with the front wheels off the ground. The tow truck driver should position wood spacer blocks between the car's frame and his chains and lift straps to avoid damaging the bumper and the body under it. Do not use the bumpers to lift the car or to support the car's weight while towing. Check local regulations for towing with a chain or frame-mounted tow bar. A chain may be attached to the hook shown in the illustration. Do not attach a tow bar to either bumper.

If the car is to be towed with four wheels on the ground, observe the following precautions:

1. Wheels and axles must not be touching the body or frame.
2. Turn the ignition key to the "I" position and make sure the steering wheel turns freely.
3. Place the transmission in NEUTRAL.
4. Release the parking brake.
5. DO NOT exceed 55 km/h (35 MPH) for distances of more than 80 km (50 miles).

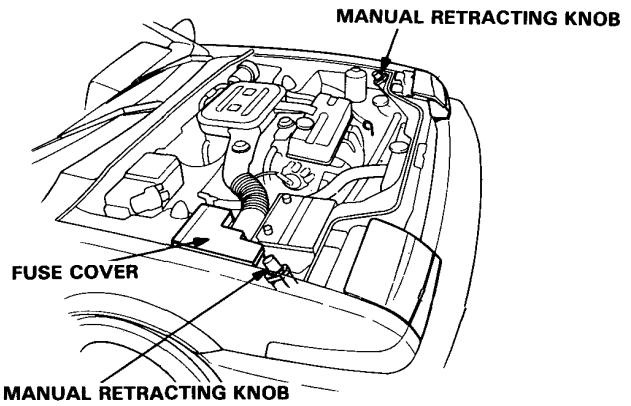
WARNING DO NOT push or tow a car to start it. The forward surge when the engine starts could cause a collision. Also, under some conditions, the catalytic converter (on some types) could be damaged. A car equipped with automatic transmission cannot be started by pushing or towing.



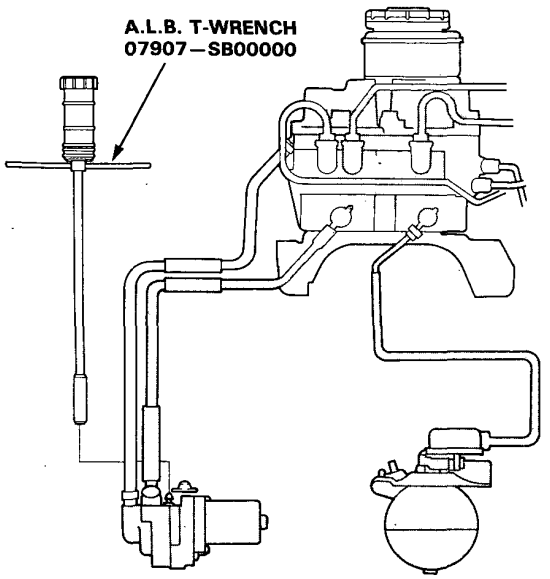
TOWING POINT

Special Caution Items For This Car

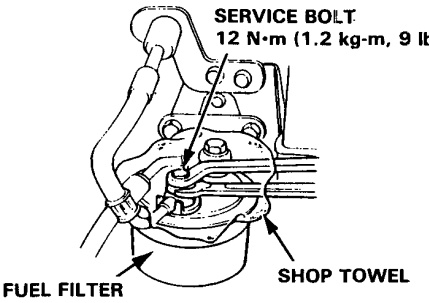
1. Retractable headlights are installed. Before manual raising and lowering, the fuse must be removed. When raising and lowering is executed without removing the fuse, injury may be caused by rapid turning of the manual retracting knob, if the motors accidentally start running.



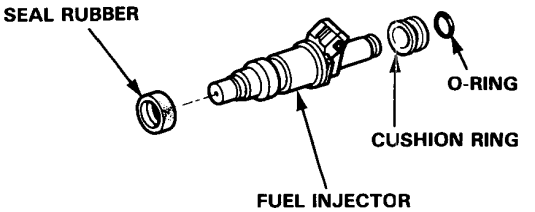
2. For cars equipped with A.L.B., the high-pressure brake fluid must be drained before disassembly of the A.L.B. piping system. When this is not done danger may be caused by brake fluid squirting out under high pressure. For draining of the high-pressure brake fluid, refer to Section 20.



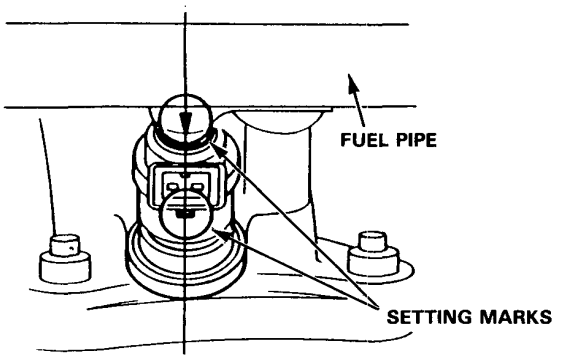
3. Fuel Line Servicing (Fuel-Injected Engine)
   - Relieve fuel pressure by loosening the service bolt provided on the top of the fuel filter before disconnecting a fuel hose or a fuel pipe.



   - Be sure to replace washers, O-rings, and rubber seals with new ones when servicing fuel line parts.
   - Always apply oil to the surfaces of O-rings and seal rings before installation. Never use brake fluid, radiator fluid, vegetable oils or alcohol-based oils.



   - When assembling the flare joint of the high-pressure fuel line, clean the joint and coat with new engine oil.
   - When installing an injector, check the angle of the coupler. The center line of the coupler should align with the setting mark on the injector holder.



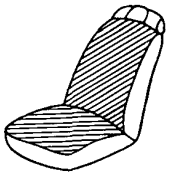
4. Inspection for fuel leakage
   - After assembling fuel line parts, turn ON the ignition switch (do not operate the starter) so that the fuel pump is operated for approximately two seconds and the fuel is pressurized. Repeat this operation two or three times and check whether any fuel leakage has occurred in any of the various points in the fuel line.
5. Installation of an amateur radio for cars equipped with PGM-FI, CRUISE CONTROL and A.L.B.
   Care has been taken for the PGM-FI, CRUISE CONTROL and A.L.B. control unit (computer) and its wiring to prevent erroneous operation from external interference, but erroneous operation of the computer may be caused by extremely strong radio waves. Attention must be paid to the following items to prevent erroneous operation of the computer.
   - The antenna and the body of the radio must be at least 200 mm (7.9 in.) away from the computer.

   The computer locations:
   - PGM-FI: Under the left side seat.
   - CRUISE CONTROL: Under the driver's side dashboard.
   - A.L.B. control unit: Under the passenger's side dashboard.
   - Do not lead the antenna feeder and the coaxial cable over a long distance parallel to the car's wiring. When crossing the wiring is required, execute crossing at a right angle.
   - Do not install a radio with a large output (max. 10 W).

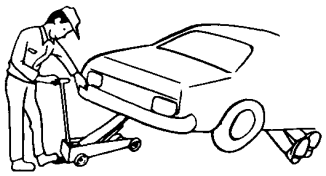
6. Apply liquid gasket to the transmission, oil pump cover, right side cover and water outlet. Use HONDA PART NO 08740—99986 as a liquid gasket.
   - Check that the mating surfaces are clean and dry before applying liquid gasket. Degrease the mating surfaces if necessary.
   - Apply liquid gasket evenly, being careful to cover all the mating surface.
   - To prevent leakage of oil, apply liquid gasket to the inner threads of the bolt holes.
   - Do not allow liquid gasket to stand for more than 20 minutes before assembly.
   - Wait at least 30 minutes before filling with the appropriate liquid (engine oil, coolant etc).

CAUTION: Observe all safety precautions and notes while working.

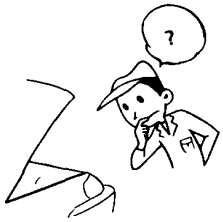
1. Protect all painted surfaces and seats against dirt and scratches with a clean cloth or vinyl cover.



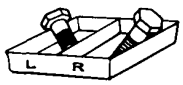
2. Work safely and give your work your undivided attention. When either the front or rear wheels are to be raised, block the remaining wheels securely. Communicate at frequently as possible when work involves two or more workers. Do not run the engine unless the shop or working area is well ventilated.



3. Prior to removing or disassembling parts, they must be inspected carefully to isolate the cause for which service is necessary. Observe all safety notes and precautions and follow the proper procedures as described in this manual.



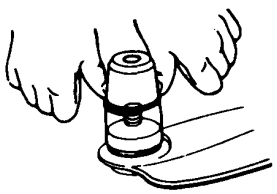
Mark or place all removed parts in order in a parts rack so they can be reassembled in their original places.



(cont'd)

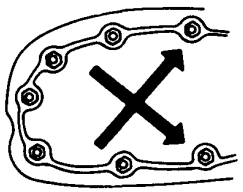
(cont'd)

4. Use the special tools when use of such is specified.

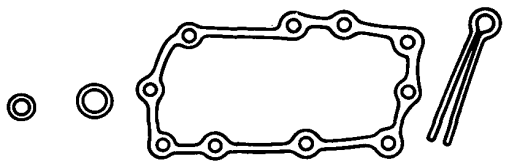


5. Parts must be assembled with the proper torque according to the maintenance standards established.

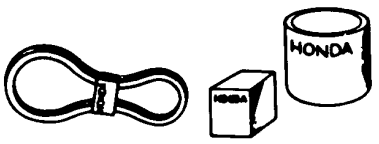
6. When tightening a series bolts or nuts, begin with the center or large diameter bolts and tighten them in crisscross pattern in two or more steps.



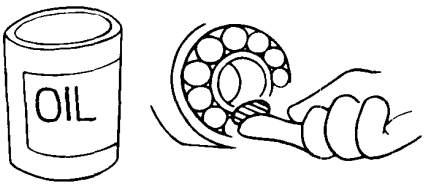
7. Use new packings, gaskets, O-rings and cotter pins whenever reassembling.



8. Use genuine HONDA parts and lubricants or those equivalent. When parts are to be reused, they must be inspected carefully to make sure they are not damaged or deteriorated and are in good usable condition.



9. Coat or fill parts with specified grease as specified (page 4-2). Clean all removed parts with solvent upon disassembly.

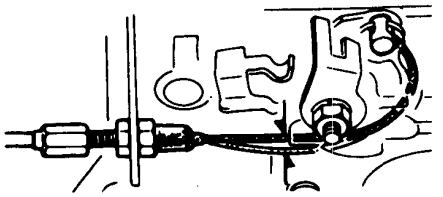


10. Brake fluid and hydraulic components
    - When replenishing the system, use extreme care to prevent dust and dirt from entering the system.
    - Do not mix different brands of fluid as they may not be compatible.
    - Do not reuse drained brake fluid.
    - Brake fluid can cause damage to painted surfaces. Wipe up spilled fluid at once.
    - After disconnecting brake hoses or pipes, be sure to plug the openings to prevent loss of brake fluid.
    - Clean all disassembled parts only in clean BRAKE FLUID. Blow open all holes and passages with compressed air.

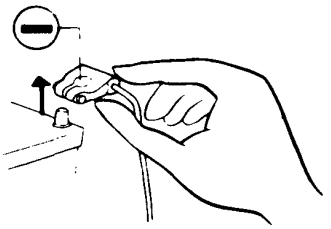
    - Keep disassembled parts from air-borne dust and abrasives.
    - Check that parts are clean before assembly.

11. Avoid oil or grease getting on rubber parts and tubes, unless specified.

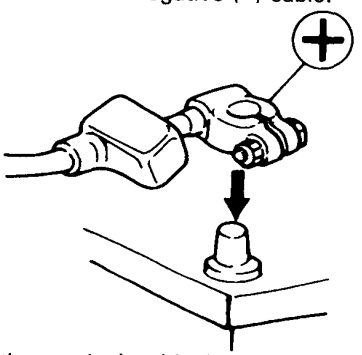
12. Upon assembling, check every part for proper installation and operation.



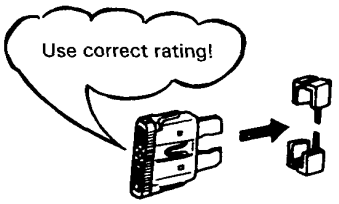
- Before making any repairs on electric wires or parts, disconnect the battery cables from the battery staring with the negative (−) terminal.



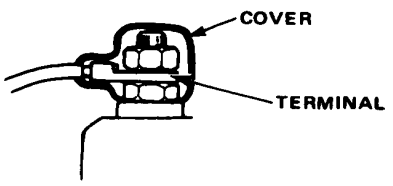
- After making repairs, check each wire or part for proper routing and installation. Also check to see that they are connected properly.
- Always connect the battery positive (+) cable first, then connect the negative (−) cable.



- Coat the terminals with clean grease after connecting the battery cables.
- Don't forget to install the terminal cover over the positive battery terminal after connecting.
- Before installing a new fuse, isolate the cause and take corrective measures, particularly when frequent fuse failure occurs.

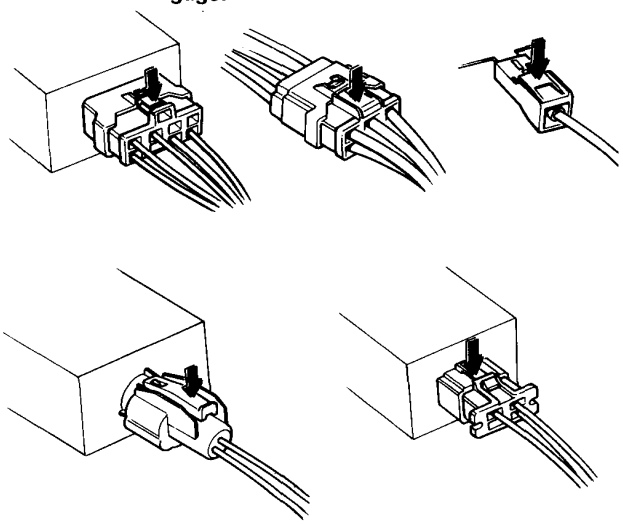


- Be sure to install the terminal cover over the connections after a wire or wire harness has been connected.

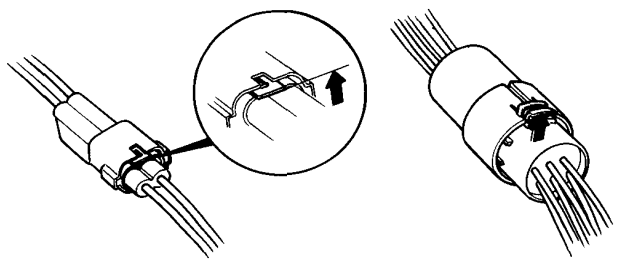


- When removing locking couplers, be sure to disengage the lock before disconnecting.
- Couplers may be of two types, those in which the lock is pressed to remove, and those in which the lock is pulled up to remove. Be sure to ascertain the type of locking device before beginning work. The following is a depiction of the means of disconnecting various typical couplers.

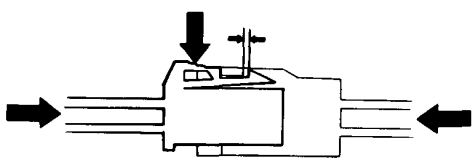
Press to disengage:



Pull up to disengage:



- When disconnecting locks, first press in the coupler tightly (to provide clearance to the locking device), then operated the tab fully and remove the coupler in the designated manner.

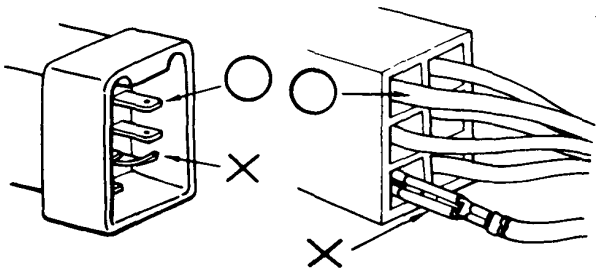


(cont'd)

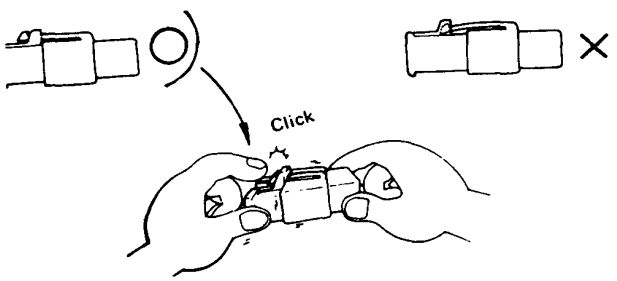
Electrical (cont'd)

- When disconnecting a coupler, pull it off from the mating coupler by holding on both couplers.
- Never try to disconnect couplers by pulling on their wires.

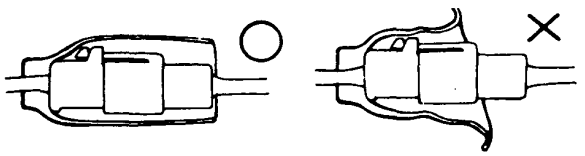
- Before connecting couplers, check to see that the terminals are in place and are not bent or distorted.



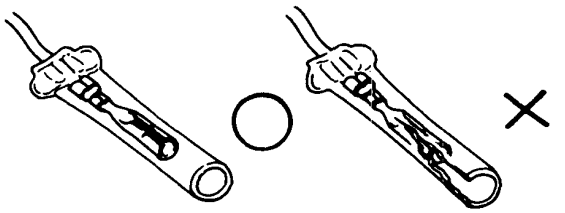
- Insert couplers fully until they will no longer go.
- Some couplers have locking tabs that must be aligned and engaged securely.
- Don't use wire harnesses with a loose wire or coupler.



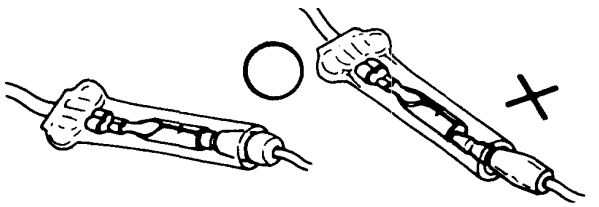
- Place the plastic cover over the mating coupler after reconnecting. Also check that the cover is not distorted.



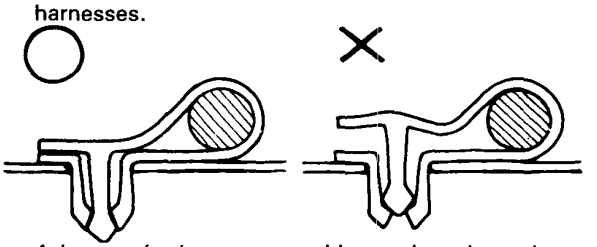
- Before connecting, check each connector cover for damage. Also make sure that the female connector is tight and not loosened from the previous use.



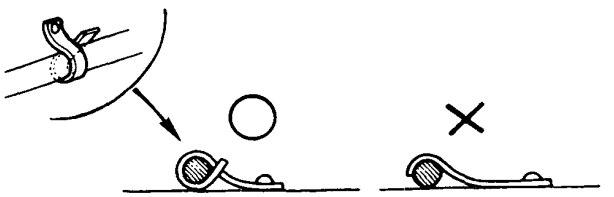
- Insert male connectors into the female connectors fully until they will no longer go.
- Be sure that plastic cover is placed over the connection.
- Position the wires so that the open end of the cover is not facing upward.



- Secure wires and wire harnesses to the frame with their respective wire bands at the designated locations. Position the wiring in the bands so that only the insulated surfaces contact the wires or wire harnesses.

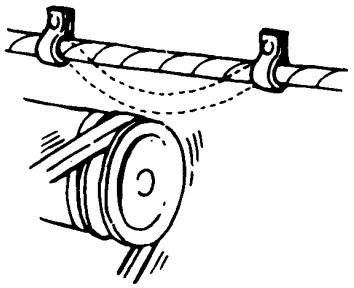


- A loose wire harness or cable can be a hazard to safety. After clamping, check each wire for security in its clamp.

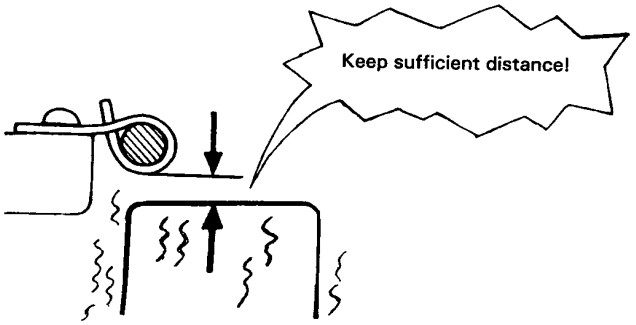


- Do not squeeze wires against the weld when a weld-on clamp is used.

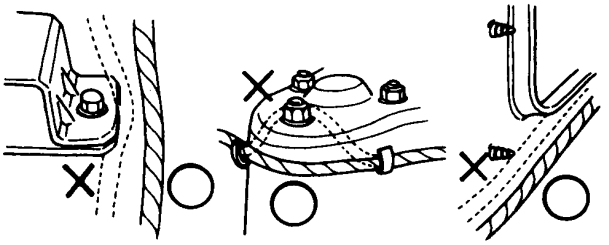
- After clamping, check each harness to be certain that it is not interferring with any moving or sliding parts of the vehicle.
- Keep wire harnesses away from the exhaust pipes and other hot parts.



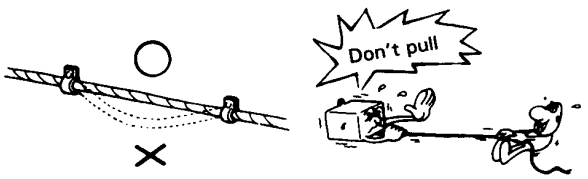
- Always keep a safe distance between wire harnesses and any heated parts.



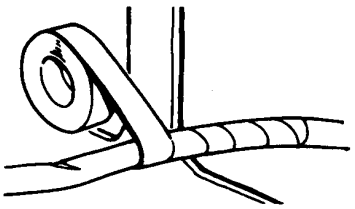
- Do not bring wire harnesses in direct contact with sharp edges or corners.
- Also avoid contact with the projected ends of bolts, screws and other fasteners.



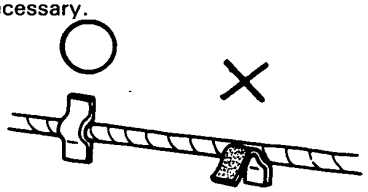
- Route harnesses so they are not pulled taut or excessively slackened.



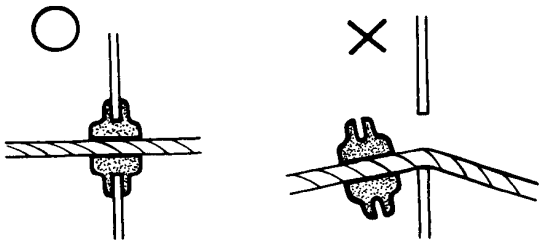
- Protect wires and harnesses with a tape or a tube if they are in contact with a sharp edge or corner.



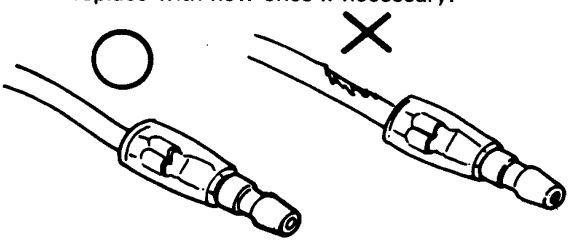
- Clean the attaching surface thoroughly if an adhesive is used. First, wipe with solvent or alcohol if necessary.



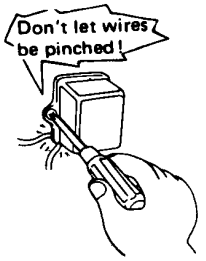
- Seat grommets in their grooves properly.



- Do not damage the insulation when connecting a wire.
- Do not use wires or harnesses with a broken insulation. Repair by wrapping with protective tape or replace with new ones if necessary.



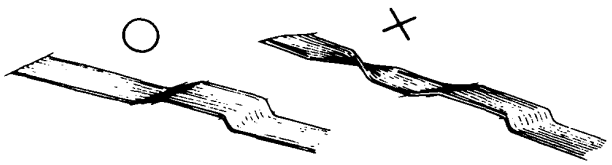
- After installing parts, make sure that wire harnesses are not pinched.



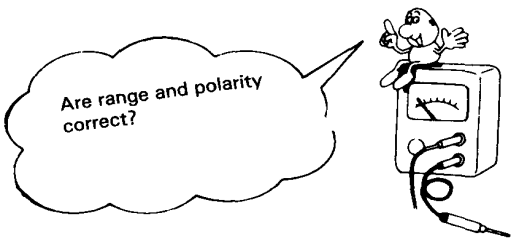
(cont'd)

Electrical (cont'd)

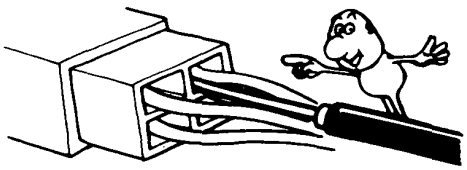
- After routing, check that the wire harnesses are not twisted or kinked.



- Wire harnesses should be routed so that they are not pulled taut, slackened excessively, pinched, or interfering with adjacent or surrounding parts in all steering positions.



- When using the Service Tester, follow the manufacturer's instructions and those described in the Shop Manual.



- Do drop parts.

- Rust is the enemy of all finished surfaces. Before connecting connectors and couplers, check the terminals and remove, if any, rust using a fine sand paper or emery cloth.

Symbol Marks

The following symbols stand for:

:Apply engine oil.

:Apply brake fluid.

:Apply *grease*.

:Apply Automatic Transmission Fluid.

:Apply Power Steering Fluid.

Abbreviation

A/C	Air Conditioner
ALB	Anti Lock Brake
A/T	Automatic Transmission
ATF	Automatic Transmission Fluid
EACV	Electronic Air Control Valve
ECU	Electronic Control Unit for Fuel-Injection System
EGR	Exhaust Gas Recirculation
Ex.	Except
EX	Exhaust
G	Ground
IG	Ignition
IN	Intake
INT	Intermittent operation
L.	Left Side
LHD	Left Hand Drive
M/T	Manual Transmission
PCV Valve	Positive Crankcase Ventilation Valve
PGM-FI	Programed Fuel Injection
P/S	Power Steering
R.	Right Side
RHD	Right Hand Drive
ST	Starter
TA Sensor	Intake Air Temperature Sensor

Special Tools

Special Tools

Existing Tools (Common with Other Models)

5. Engine Removal/Installation

No.	Tool Number	Description	Q'ty	Remarks
①	07941–6920002	Ball Joint Remover	1	
②	07966–6340011	Engine Block Hanger	1	

6. Cylinder head/Valve Train

No.	Tool Number	Description	Q'ty	Remarks
①	07743–0020000	Adj. Valve Guide Driver	1	
②	07757–PJ10100	Valve Spring Compressor Attachment	1	Use changed to 07757-0010000 attachment <B20 A Engine>
③	07757–0010000	Valve Spring Compressor	1	
④	07942–SA50000	Valve Guide Driver, 7.0 mm	1	07942–8230000 may also be used.
⑤	07942–6570100	Valve Guide Driver, 6.6 mm	1	07942–6110000 may also be used.
⑥	07947–SB00100	Camshaft Seal Driver	1	
⑦	07984–SA50000	Valve Guide Reamer, 7.0 mm	1	07984–6890100 may also be used.
⑧	07984–6570100	Valve Guide Reamer, 6.6 mm	1	07984–6110000 may also be used.

7. Engine Block

No.	Tool Number	Description	Q'ty	Remarks
①	07749–0010000	Driver	1	07949–6110000 may also be used.
②	07924–PD20002	Ring Gear Holder	1	
③	07947–SB00200	Oil Seal Driver	1	Crankshaft Seal <Carbureted Engine>
④	07948–SB00101	Driver Attachment	1	Crankshaft Seal (Clutch Side)
⑤	07973–SB00100	Piston Base Head	1	Not included in base set. Use each with the base set.
⑥	07973–SB00200	Pilot Collar	1	
⑦	07973–SB00400	Piston Pin Base Insert	1	
⑧	07973–PE00302	Adj. Piston Pin Driver	1	
⑨	07973–6570002	Piston Pin Insert Base Set	1	

8. Engine Lubrication

No.	Tool Number	Description	Q'ty	Remarks
①	07406–0030000	Oil Pressure Gauge Adaptor	1	
②	07746–0010100	Attachment, 32 x 35 mm	1	<A20A and A16A Engines>
③	07746–0010400	Attachment, 52 x 55 mm	1	<B20A Engine>
④	07749–0010000	Driver	1	07949–6110000 may also be used.
⑤	07912–6110001	Oil Filter Socket Wrench	1	

11, 12. Fuel and Emission Controls

No.	Tool Number	Description	Q'ty	Remarks
①	07GAC–SE00200	Fuel Sender Wrench	1	
②	07GAZ–SE00300	R.P.M. Connecting Adaptor	1	
③	07GMJ–ML80100	Test Harness	1	
④	07406–0040001	Fuel Pressure Gauge Set	1	<Fuel-Injected Engine>
④-1	07406–0040100	Pressure Gauge	(1)	Component Tool
④-2	07406–0040201	Hose Assembly	(1)	Component Tool
⑤	07411–0020000	Digital Circuit Tester	1	<Fuel-Injected Engine>
⑥	07614–0050100	Fuel Line Clamp	1	<Carbureted Engine>
⑦	07999–PD6000A	PGM-FI Test Harness	1	<Fuel-Injected Engine>

13. Clutch

No.	Tool Number	Description	Q'ty	Remarks
①	07GAG–PF50100	Clutch Disc Alignment Tool	1	<B20A Engine>
②	07708–0010102	10 mm T-Wrench	1	
③	07924–PD20003	Ring Gear Holder	1	
④	07974–6890101	Clutch Disc Alignment Tool	1	<A20A and A16A Engines>

14. Manual Transmission <B2>

No.	Tool Number	Description	Q'ty	Remarks
①	07936—6890101	Bearing Remover Attachment	1	
②	07744—0010200	Pin Driver, 3.0 mm	1	
③	07744—0010400	Pin Driver, 5.0 mm	1	07944—6110100 may also be used.
④	07746—0010200	Attachment, 37 x 40 mm	1	
⑤	07746—0010400	Attachment, 52 x 55 mm	1	07949—6340200 may also be used.
⑥	07746—0010500	Attachment, 62 x 68 mm	1	
⑦	07749—0010000	Driver	1	07949—6110000 may also be used.
⑧	07936—6340000	Bearing Remover Set	1	

14. Manual Transmission <A1/A2>

No.	Tool Number	Description	Q'ty	Remarks
①	07GAC—PG40100	Transmission Housing Puller	1	07GAC-PF40100 may also be used.
②	07936—6890101	Bearing Remover Attachment	1	
③	07744—0010200	Pin Driver, 3.0 mm	1	
④	07744—0010400	Pin Driver, 5.0 mm	1	07944—6110100 may also be used.
⑤	07746—0010400	Attachment, 52 x 55 mm	1	
⑥	07749—0010000	Driver	1	07949—6110000 may also be used.
⑦	07907—PD10000	Socket Wrench, 30 mm	1	
⑧	07923—6890101	Mainshaft Holder	1	
⑨	07936—6340000	Bearing Remover Set	1	07936—6340000 may also be used.
⑩	07947—6110500	Oil Seal Driver Attachment	1	Differential Oil seal
⑪	07947—6340000	Oil Seal Driver	1	
⑫	07947—6340500	Driver Attachment, E	1	

15. Automatic Transmission

No.	Tool Number	Description	Q'ty	Remarks
①	07GAB—PF50100	Mainshaft Holder, Automatic	1	<F4 Transmission>
②	07GAC—PF40210	Bearing Remover Attachment	1	
③	07GAC—PG40100	Transmission Housing Puller	1	07GAC—PF40100 may also be used.
④	07GAE—PG40000	Clutch Spring Compressor Set	1	07960—689000 may also be used.
④-1	07GAE—PG40100	Compressor Attachment	(1)	
④-2	07GAE—PG40200	Compressor Bolt Assembly	(1)	
④-3	07960—6120100	Compressor Attachment	(1)	
⑤	07960—6890100	Clutch Spring Compressor Attachment	1	
⑥	07406—0020003	Oil Pressure Gauge Set	1	
⑥-1	07406—0020201	Oil Pressure Hose	(3)	Component Tools
⑦	07406—0070000	Low Pressure Gauge	1	
⑧	07936—6890101	Bearing Remover Attachment	1	
⑨	07746—0010500	Attachment, 62 x 68 mm	1	
⑩	07749—0010000	Driver	1	07949—6110000 may also be used.
⑪	07907—PD10000	Socket Wrench, 30 mm	1	07907—6890100 may also be used.
⑫	07923—6890202	Mainshaft Holder	1	<C9 Transmission>
⑬	07936—6340000	Bearing Remover Set	1	
⑭	07947—6110500	Oil Seal Driver Attachment	1	
⑮	07947—6340201	Oil Seal Driver	1	
⑯	07947—6340500	Driver Attachment, E	1	
⑰	07974—6890300	Throttle Cable Adjustment Gauge	1	<Carbureted Engine>
⑱	07998—SA50000	Accelerator Pedal Weight Set	1	
⑱-1	07998—SA50100	Main Pedal Weight (1.0 kg)	(1)	Component Tool
⑱-2	07998—SA50200	Sub Pedal Weight (0.5 kg)	(1)	Component Tool

(cont'd)

Existing Tools (Common with Other Models)

16. Differential

No.	Tool Number	Description	Q'ty	Remarks
①	07746–0030100	Driver	1	
②	07749–0010000	Driver	1	07949–6110000 may also be used.
③	07944–SA00000	Pin Driver, 4.0 mm	1	
④	07947–6110500	Seal Driver Attachment	1	
⑤	07947–6340500	Driver Attachment, E	1	

17. Drivershaft

No.	Tool Number	Description	Q'ty	Remarks
①	07GAD–SE00100	Oil Seal Driver Attachment	1	
②	07746–0010400	Attachment, 52 x 55 mm	1	
③	07746–0010500	Attachment, 62 x 68 mm	1	
④	07746–0040900	Pilot, 40 mm	1	
⑤	07749–0010000	Driver	1	
⑥	07947–SD90200	Oil Seal Driver Attachment	1	
⑦	07965–SD90100	Support Base	1	
⑧	07965–SD90200	Support Collar	1	

18. Steering

No.	Tool Number	Description	Q'ty	Remarks
①	07746–0010300	Attachment, 42 x 47 mm	1	
②	07916–SA50001	Steering Gearbox Locknut Wrench, 40 mm	1	
③	07941–6920003	Ball Joint Remover	1	
④	07965–6340301	Hub Dis/Assembly Tool, Base A	1	
⑤	07974–SA50800	Ball Joint Boot Clip Installation Guide, B	1	

18. Power Steering

No.	Tool Number	Description	Q'ty	Remarks
①	07GAK–SE00100	P/S Joint Adaptor Set	1	
①-1	07GAK–SE00110	P/S Pump Joint Adaptor	(1)	Component tools
①-2	07GAK–SE00120	P/S Hose Joint Adaptor	(1)	
②	07406–0010001	P/S Pressure Gauge Set	1	
②-1	07406–0010101	Bypass Tube Joint	(1)	Component Tools
②-2	07406–0010200	P/S Pressure Gauge Assy	(1)	
②-3	07406–0010300	Oil Pressure Valve	(1)	
②-4	07406–0010400	Pressure Gauge	(1)	
③	07725–0030000	Universal Holder	1	07725–0010101 may also be used.
④	07746–0010300	Attachment, 42 X 47 mm	1	
⑤	07749–0010000	Driver	1	07949–6110000 may also be used.
⑥	07900–SA50000	P/S Seal Replacement Tool Set	1	
⑥-1	07974–SA50100	Piston Seal Ring Guide	(1)	Component Tools
⑥-2	07974–SA50200	Piston Seal Ring Sizing Tool	(1)	
⑥-3	07974–SA50300	Cylinder End Packing Slider	(1)	
⑥-4	07974–SA50400	End Seal Guide	(1)	
⑥-5	07974–SA50600	Dust Seal Guide	(1)	
⑥-6	07974–SA50900	P/S Tool Set Case	(1)	
⑦	07916–SA50001	Steering Gearbox Locknut Wrench, 40 mm	1	
⑧	07941–6920003	Ball Joint Remover	1	
⑨	07947–6340300	Driver Attachment	1	
⑩	07953–7190000	Collar Driver	1	

19. Suspension

No.	Tool Number	Description	Q'ty	Remarks
①	07GAE—SE00100	Shock Absorber Spring Compressor	1	
②	07GAF—SE00100	Hub Assembly Pin	1	
③	07GAF—SE00200	Hub Assembly Driver Attachment	1	
④	07GAF—SE00401	Front Hub Driver Base	1	
⑤	07410—0010200	Wheel Alignment Gauge ATT., B	1	
⑥	07746—0010100	Attachment, 32 x 35 mm	1	
⑦	07746—0010400	Attachment, 52 x 55 mm	1	
⑧	07746—0010600	Attachment, 72 x 75 mm	1	
⑨	07749—0010000	Driver	1	07949—6110000 may also be used.
⑩	07941—6920002	Ball Joint Remover	1	
⑪	07965—SB00000	Ball Joint Dis/Assebbly Tool Set	1	
⑪-1	07965—SB00100	Ball Joint Remover/Installer	(1)	Component tools
⑪-2	07965—SB00200	Ball Joint Remover Base	(1)	
⑪-3	07965—SB00300	Ball Joint Installer Base	(1)	
⑫	07965—6340301	Front Wheel Bearing Dis/Assembly Tool Base, A	2	
⑬	07965—6920201	Front Hub Dis/Assembly Tool, B	1	
⑭	07974—SA50700	Ball Joint Boot Clip Installation Guide, A	1	
⑮	07974—SA50800	Clip Guide, B	1	

20. Brake

No.	Tool Number	Description	Q'ty	Remarks
①	07GAF—SE00300	Pulser Driver Attachment	1	
②	07GAG—SE00100	Brake Booster Adjustment Gauge	1	
③	07HAJ—SG00300	Frequency Convert Adaptor	1	
④	07HAK—SG00110	Pressure Gauge Joint Pipe	1	
⑤	07504—6340100	Brake Booster Tool Set	1	
⑤-1	07404—5790300	Vacuum Gauge	(1)	Short parts of the Brake Booster Set 07504—6340100
⑤-2	07406—5790200	Oil Pressuer Gauge	(2)	
⑤-3	07410—5790100	Pressure Gauge Attachment, C	(1)	
⑤-4	07410—5790500	Tube joint Attachment, I	(2)	
⑤-5	07510—6340100	Pressuer Gauge Joint Pipe	(2)	
⑤-6	07510—6340300	Vacuum Joint Tube, A	(1)	
⑥	07508—SB00000	A.L.B. Checker	1	
⑦	07749—0010000	Driver	1	07494—611000 may also be used.
⑧	07907—SB00000	A.L.B. T-Wrench	1	
⑨	07914—SA50001	Snap-ring Pliers	1	
⑩	07921—0010001	Flare Nut Wrench	1	
⑪	07947—6890300	Driver Attachment, C	1	
⑫	07960—SA50002	Brake Spring Compressor	1	
⑬	07965—5790300	Cup Guide	1	
⑭	07965—6340301	Front Wheel Bearing Dis/Assembly Tool Base, A	2	
⑮	07967—SB00000	Pulser Driver	1	
⑯	07973—SA50000	Rear Caliper Guide	1	

(cont'd)

Special Tools

Existing Tools (Common with Other Models)

21. Body

No.	Tool Number	Description	Q'ty	Remarks
①	07GAZ—SE30100	Torsion Rod Assembly Tool	1	

23. Air Conditioner

No.	Tool Number	Description	Q'ty	Remarks
①	07GAB—PJ60100	A/C Clutch Holder	1	07923—PB80001 may also be used.
②	07703—0010200	Torx Bit Driver, T-30	1	
③	07749—0010000	Driver	1	07949—6110000 may also be used.
④	07934—PB80001	A/C Clutch Puller	1	
⑤	07934—SB20000	Shaft Seal Remover	1	
⑥	07947—6340300	Driver Attachment, A	1	

Optional Tools

No.	Tool Number	Description	Q'ty	Remarks
①	07780—0012300	Valve Seat Cutter 30°	1	IN (B20A)
②	07780—0012900	Valve Seat Cutter 30°	1	EX (B20A), IN (A16A, A20A)
③	07780—0012400	Valve Seat Cutter 30°	1	EX (A16A, A20A)
④	07780—0014000	Valve Seat Cutter 60°	1	EX (B20A)
⑤	07780—0014100	Valve Seat Cutter 60°	1	IN (ALL), EX (A16A, A20A)
⑥	07780—0010300	Valve Seat Cutter 45°	1	EX (B20A)
⑦	07780—0010400	Valve Seat Cutter 45°	1	IN (B20A)
⑧	07780—0010500	Valve Seat Cutter 45°	1	EX (A16A, A20A)
⑨	07780—0010800	Valve Seat Cutter 45°	1	IN (A16A, A20A)
⑩	07781—0010201	Valve Seat Cutter Holder, 6.6 mm	1	
⑪	07781—0010301	Valve Seat Cutter Holder, 7.0 mm	1	

Specifications

Standards and Service Limits

Cylinder Head/Valve Train <Except B20A Engine> — Section 6

MEASUREMENT			STANDARD (NEW)	SERVICE LIMIT
Compression	300 min^{-1} (rpm) and wide-open throttle		Nominal A20A3, A20A4 Engines (Except KS)	1,226 kPa (12.5 kg/cm², 178 psi)
			Other Engines	1,176 kPa (12.0 kg/cm², 171 psi)
			Minimum A20A3, A20A4 Engines (Except KS)	1,030 kPa (10.5 kg/cm², 149 psi)
			Other Engines	980 kPa (10.0 kg/cm², 142 psi)
			Maximum variation	196 kPa (2 kg/cm², 28 psi)
Cylinder head	Warpage		—	0.05 (0.002)
	Height		90 (3.54)	89.8 (3.54)
Camshaft	End play		0.05–0.15 (0.002–0.006)	0.5 (0.02)
	Oil clearance No. 1,3 and 5 Journals		0.050–0.089 (0.002–0.004)	0.15 (0.006)
	Oil clearance No. 2 and 4 Journals		0.130–0.169 (0.005–0.007)	0.23 (0.009)
	Runout		0.03 (0.001) max.	0.06 (0.002)
	Cam lobe height			
	A20A1 (KQ, KG, KW, KX)	IN	38.477 (1.5148)	—
		EX	38.353 (1.5100)	—
	A20A1, A20A2	IN	38.541 (1.5174)	—
		EX	38.607 (1.5200)	—
	A20A3	IN	38.731 (1.5248)	—
		EX	38.796 (1.5274)	—
	A20A4	IN	38.858 (1.5300)	—
		EX	38.607 (1.5200)	—
	A16A1	IN	38.157 (1.5029)	—
		EX	37.776 (1.4872)	—
	Other Engines	IN	38.541 (1.5174)	—
		EX	38.607 (1.5200)	—
Valve	Valve clearance	IN	0.12–0.17 (0.005–0.007)	—
		EX	0.25–0.30 (0.010–0.012)	—
	Valve stem O.D.	IN	6.58–6.59 (0.2591–0.2594)	6.55 (0.258)
		EX	6.94–6.95 (0.2732–0.2736)	6.91 (0.272)
	Stem-to-guide clearance	IN	0.02–0.05 (0.001–0.002)	0.08 (0.003)
		EX	0.06–0.09 (0.002–0.004)	0.12 (0.005)
	Stem installed height	IN	48.59 (1.913)	49.34 (1.943)
		EX	47.66 (1.876)	48.41 (1.906)
Valve seat	Width	IN and EX	1.25–1.55 (0.049–0.061)	2.0 (0.08)
Valve spring	Free length	IN	48.54 (1.91)	47.54 (1.87)
		EX Inner	42.42 (1.67)	41.42 (1.63)
		Outer	49.07 (1.93)	48.07 (1.89)
	Squareness Inner and Outer		—	1.75 (0.068)
Valve guide	I.D.	IN	6.61–6.63 (0.260–0.261)	6.65 (0.262)
		EX	7.01–7.03 (0.276–0.277)	7.05 (0.278)
Rocker arm	Arm-to-shaft clearance		0.008–0.054 (0.0003–0.0021)	0.08 (0.003)

Cylinder Head/Valve Train <B20A Engine> — Section 6

MEASUREMENT			STANDARD (NEW)	SERVICE LIMIT
Compression	300 min^{-1} (rpm) and wide-open throttle		Nominal	1,226 kpa (12.5 kg/cm², 178 psi)
			Minimum	1,030 kpa (10.5 kg/cm², 149 psi)
			Maximum variation	196 kpa (2 kg/cm², 28 psi)
Cylinder head	Warpage		—	0.05 (0.002)
	Height		132 (5.20)	131.8 (5.19)
Camshaft	End play		0.05–0.15 (0.002–0.006)	0.5 (0.02)
	Oil clearance		0.050–0.089 (0.002–0.004)	0.15 (0.006)
	Runout		0.03 (0.001) max.	0.06 (0.002)
	Cam lobe height	IN	37.716 (1.4849)	—
		EX	37.781 (1.4874)	—
Valve	Valve clearance	IN	0.08–0.12 (0.003–0.005)	—
		EX	0.16–0.20 (0.006–0.008)	—
	Valve stem O.D.	IN	6.58–6.59 (0.2591–0.2594)	6.55 (0.258)
		EX	6.55–6.56 (0.2579–0.2583)	6.52 (0.257)
	Stem-to-guide clearance	IN	0.02–0.05 (0.001–0.002)	0.08 (0.003)
		EX	0.05–0.08 (0.002–0.003)	0.11 (0.04)
	Stem installed height	IN and EX	42.75 (1.683)	43.54 (1.714)
Valve seat	Width	IN and EX	1.25–1.55 (0.049–0.061)	2.0 (0.08)
Valve spring	Free length	Inner	43.50 (1.713)	42.50 (1.673)
		Outer	47.45 (1.868)	46.45 (1.829)
	Squareness	Inner and Outer	—	1.6 (0.063)
Valve guide	I.D.	IN and EX	6.61–6.63 (0.260–0.261)	6.65 (0.262)

Engine Block <Except B20A Engine> — Section 7

*A16A1 Engine only Unit: mm (in.)

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Cylinder block	Warpage of deck surface		0.08 (0.003) max.	0.10 (0.004)
	Bore diameter	A	82.70–82.71 (3.2559–3.2563)	82.74 (3.2575)
		B	82.69–82.70 (3.2555–3.2559)	82.73 (3.2571)
		A	*80.01–80.02 (3.1500–3.1504)	80.05 (3.1516)
		B	*80.00–80.01 (3.1496–3.1500)	80.04 (3.1512)
	Bore taper		0.007–0.012 (0.0003–0.0005)	0.05 (0.002)
	Reboring limit		—	0.5 (0.02)
Piston	Skirt O.D. (At 21 mm (0.83 in) from bottom of skirt) A20A1, A20A2	A	82.675–82.685 (3.2549–3.2553)	
	A20A3, A20A4	B	82.665–82.675 (3.2545–3.2549)	
	A16A1	A	*79.98–79.998 (3.1488–3.1495)	79.97 (3.148)
		B	*79.97–79.98 (3.1484–3.1500)	79.96 (3.148)
	Clearance in cylinder		0.02–0.04 (0.0008–0.0016)	0.08 (0.003)
	Piston-to-ring clearance	Top	0.030–0.060 (0.0012–0.0024)	0.13 (0.005)
		2nd	0.030–0.055 (0.0012–0.0022)	0.13 (0.005)
		* Top and 2nd	*0.02–0.05 (0.0008–0.0020)	0.13 (0.005)
Piston ring	Ring end gap Top		0.20–0.35 (0.008–0.014)	0.6 (0.02)
	2nd	A16A1 Engine	0.25–0.40 (0.01–0.016)	0.6 (0.02)
		Others	0.30–0.45 (0.012–0.018)	0.6 (0.02)
	Oil	RIKEN	0.30–0.90 (0.012–0.035)	1.0 (0.04)
		TEIKOKU	0.20–0.70 (0.008–0.028)	0.8 (0.03)
Connecting rod	Pin-to-rod interference		0.013–0.032 (0.0005–0.0013)	0.013 (0.0005)
	Large end bore diameter		Nominal 48 (1.89) *45 (1.77)	—
	End play installed on crankshaft		0.15–0.30 (0.006–0.012)	0.40 (0.016)
Crankshaft	Main journal diameter		49.970–49.994 (1.9673–1.9683)	—
	Taper/out-of-round, main journal		0.005 (0.0002) max.	0.010 (0.0004)
	Rod journal diameter		44.976–45.000 (1.7707–1.7717)	—
			*41.976–42.000 (1.6530–1.6535)	—
	Taper/out-of-round, rod journal	Other Engine	0.005 (0.0002) max.	0.010 (0.0004)
	End play		0.10–0.35 (0.004–0.014)	0.45 (0.018)
	Runout		0.024 (0.0009) max.	0.04 (0.0016)
Bearings	Main bearing-to-journal	No. 1, 2, 4, and 5		
	Oil clearance	Journals	0.026–0.055 (0.0010–0.0022)	0.07 (0.003)
		No. 3 Journal	0.032–0.061 (0.0013–0.0024)	0.07 (0.003)
	Rod bearing-to-journal oil clearance		0.020–0.038 (0.0008–0.0015)	0.07 (0.003)

Engine Block <B20A Engine> — Section 7

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Cylinder block	Warpage of deck surface		0.07 (0.003) max.	0.10 (0.004)
	Bore diameter	A	81.01 – 81.02 (3.1894–3.1898)	81.05 (3.1909)
		B	81.00–81.01 (3.1890–3.1894)	81.04 (3.1905)
	Bore taper		0.007–0.012 (0.0003–0.0005)	0.05 (0.002)
	Reboring limit		—	0.05 (0.002)
Piston	Skirt O.D (At 21 mm (0.83 in) from bottom of skirt)	A	79.99–81.02 (3.1492–3.1898)	80.97 (3.188)
		B	79.97–81.02 (3.1484–3.1898)	80.96 (3.187)
	Clearance in cylinder		0.02–0.04 (0.0008–0.0016)	0.08 (0.003)
	Piston-to-ring clearance	Top	0.035–0.060 (0.0014–0.0024)	0.13 (0.005)
		2nd	0.030–0.055 (0.0012–0.0022)	0.13 (0.005)
Piston ring	Ring end gap	Top	0.20–0.35 (0.008–0.014)	0.6 (0.02)
		2nd	0.40–0.55 (0.016–0.022)	0.7 (0.03)
		Oil RIKEN	0.30–0.90 (0.012–0.035)	1.0 (0.04)
		TEIKOKU	0.20–0.70 (0.008–0.028)	0.8 (0.03)
Connecting rod	Pin-to-rod interference		0.013–0.032 (0.0005–0.0013)	0.013 (0.0005)
	Large end bore diameter		Nominal 51 (2.01)	—
	End play installed on crankshaft		0.15–0.30 (0.006–0.012)	0.40 (0.016)
Crankshaft	Main journal diameter		54.976–55.000 (2.1644–2.1654)	—
	Taper/out-of-round, main journal		0.005 (0.0002) max.	0.010 (0.0004)
	Rod journal diameter		47.976–48.000 (1.8888–1.8900)	—
	Taper/out-of-round, rod journal		0.005 (0.0002) max.	0.010 (0.0004)
	End play		0.10–0.35 (0.004–0.014)	0.45 (0.018)
	Runout		0.02 (0.0003) max.	0.030 (0.0012)
Bearings	Main bearing-to-journal	No. 1, 2, 4, and 5		
	Oil clearance	Journals	0.024–0.042 (0.0010–0.0017)	0.05 (0.002)
		No. 3 Journal	0.030–0.048 (0.0012–0.0019)	0.05 (0.002)
	Rod bearing-to-journal oil clearance		0.026–0.044 (0.0010–0.0017)	0.05 (0.002)

(cont'd)

Standards and Service Limits (cont'd)

Engine Lubrication <Except B20A Engine> — Section 8

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Engine oil	Capacity ℓ (US. qt., Imp. qt.)		4.0 (4.2, 3.5) After engine disassembly 3.5 (3.7, 3.1) After oil change, including oil filter 3.0 (3.2, 2.6) After oil change, without oil filter	
Oil pump	Displacement		40.3 ℓ (10.6 US. gal., 8.9 Imp. gal.) 5,500 min^{-1} (rpm)	
	Inner-to-outer rotor radial clearance		0.15 (0.006) max.	0.2 (0.008)
	Pump body-to-rotor radial clearance		0.10—0.18 (0.004—0.007)	0.2 (0.008)
	Pump body-to-rotor side clearance		0.30—0.108 (0.001—0.004)	0.15 (0.006)
Relief valve	Pressure setting 80°C (176°F)	Idle	98 kPa (1.0 kg/cm^2, 14 psi) min.	
		3,000 min^{-1} (rpm)	373—451 kPa (3.8—4.6 kg/cm^2, 54—65 psi)	

Engine Lubrication <B20A Engine> — Section 8

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Engine oil	Capacity ℓ (US. qt., Imp. qt.)		5.0 (5.3, 4.4) After engine disassembly 4.0 (4.2, 3.5) After oil change, including oil filter 3.5 (3.7, 3.1) After oil change, without oil filter	
Oil pump	Displacement		54 ℓ (10.6 US. gal., 8.9 Imp. gal.) 5,000 min^{-1} (rpm)	
	Inner-to-outer rotor radial clearance		0.04—0.16 (0.002—0.006)	0.2 (0.008)
	Pump body-to-rotor radial clearance		0.10—0.19 (0.004—0.007)	0.21 (0.008)
	Pump body-to-rotor side clearance		0.02—0.071 (0.001—0.003)	0.12 (0.005)
Relief valve	Pressure setting 80°C (176°F)	Idle	137 kPa (1.4 kg/cm^2, 20 psi) min.	
		3,000 min^{-1} (rpm)	470—559 kPa (4.8—5.7 kg/cm^2, 67—80 psi)	

Cooling — Section 10

	MEASUREMENT	STANDARD (NEW)	
Cooling fan belt	Deflection midway between pulleys/load	6—9 (0.24—0.35) /98N (10 kg, 22 lb) for used belt 5 (0.20) /98N (10 kg, 22 lb) after replacement of belt	
Radiator	Capacity (incl. heater) ℓ (US. Gal., Imp. Gal.) (Includes reservoir tank 0.8 (0.21, 0.18)	A20A3, A20A4 Engines	Manual 6.4 (1.7, 1.4) Automatic 7.0 (1.8, 1.5)
		A20A1, A20A2 Engines	Manual 6.3 (1.7, 1.4) Automatic 6.9 (1.8, 1.5)
		B20A2, B20A8 Engine	Manual 7.1 (1.9, 1.6)
		A16A1 Engine	Manual 6.3 (1.7, 1.4) Automatic 6.2 (1.6, 1.4)
	Pressure cap opening pressure	74—103 kPa (0.75—1.05 kg/cm^2, 11—15 psi)	
Thermostat	Starts to open	Primary: 82°C ±2 (180°F ±3) Secondary: 85°C ±2 (185°F ±3)	86—90°C (187—194°F)
	Full open	95°C (203°F)	100°C (212°F) OPTIONAL
	Valve lift at full open	8 (0.31) max.	8 (0.31) max.
Water pump	Gear ratio (crankshaft) Capacity: ℓ per min/at min^{-1} (rpm)	1.34 124/5,000 (32.7 US. gal/5,000 min^{-1} (rpm)	
Cooling fan	Fan-to-core clearance Thermoswitch "ON" temperature Thermoswitch "OFF" temperature	26.0 (1.02) 87°—93°C (188°—199°F) 83°C (181°F) or more (hysteresis 2°C (35°F) or more)	

Fuel and Emissions — Section 11

	MEASUREMENT		STANDARD (NEW)		
Fuel pump (Fuel-injected engine)	Delivery pressure Displacement		230—270 kPa (2.35—2.75 kg/cm^2, 33—39 psi) 230 cc/min in 10 seconds		
	Relief valve opening pressure		441—588 kPa (4.5—6.0 kg/cm^2, 64—85 psi)		
Pressure regulator (Fuel-injected engine)	Pressure		230—270 kPa (2.35—2.75 kg/cm^2, 33—39 psi)		
Fuel pump (Carbureted engine)	Delivery pressure Displacement		17.6—22.5 kPa (0.18—0.23 kg/cm^2, 2.6—3.3 psi) 760 cc at 12V (46 cu. in./12V)		
Fuel Tank	Capacity		60ℓ (15.9 US. Gal., 13.2 Imp. Gal.)		
Fuel injected engine	Fast idle		1,000—1,800 min^{-1} (rpm)		
	Idle Speed	with headlights and cooling fan off	Manual	A20A3	750 ± 50 min^{-1} (rpm)
				A20A4, B20A2	800 ± 50 min^{-1} (rpm)
			Automatic (in "N" or "P")	A20A3	750 ± 50 min^{-1} (rpm)
				A20A4	800 ± 50 min^{-1} (rpm)
					KQ: 750 ± 50 min^{-1} (rpm)
	idle CO		A20A3 and A20A4 KQ: 0.1 %		
Carbureted engine	Choke fast idle		A20A1 and A20A2: 2,000—3,000 min^{-1} (rpm) A16A1: 1,500—2,500 min^{-1} (rpm)		
	Idle Speed	with hedlights and cooling fan off	Manual	A16A1, A20A2	750 ± 50 min^{-1} (rpm)
				A20A1	800 ± 50 min^{-1} (rpm)
			Automatic (in gear)	A16A1, A20A2	700 ± 50 min^{-1} (rpm)
					KS: 750 ± 50 min^{-1} (rpm)
				A20A1	730 ± 50 min^{-1} (rpm)
	Idle CO		A20A1 and A20A2 KQ: 0.1 %		

Clutch — Section 13

Unit: mm (in.)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Clutch pedal	Pedal Height	CARB: 205 (8.1), EFI: 208 (8.2) to floor	—
		CARB: 178 (7.0), EFI: 181 (7.1) to carpet	—
	Stroke	CARB: 138 (5.4), EFI: 143 (5.6)	—
	Pedal play	15–25 (0.6–1.0)	—
	Disengagement height	73 (2.9) min. to floor	—
		49 (1.9) min. to carpet	—
Clutch arm	Release arm adjustment	5.2–6.4 (0.20–0.25)	—
Flywheel	Clutch surface runout	0.05 (0.002) max.	0.15 (0.006)
Clutch plate	Rivet head depth	1.3 (0.05) min.	0.2 (0.008)
	Surface runout	0.8 (0.03) max.	1.0 (0.04)
	Radial play in splines	0.7–2.1 (0.028–0.083)	4.0 (0.16)
	Thickness	8.1–8.8 (0.32–0.35)	5.7 (0.22)
Clutch release bearing holder	I.D.	31.00–31.059 (1.220–1.223)	31.09 (1.224)
	Holder-to-guide sleeve clearance	0.05–0.15 (0.002–0.006)	0.22 (0.009)
Clutch cover	Uneveness of diaphragm spring	0.8 (0.03) max.	1.0 (0.04)

Manual Transmission (A1/A2) — Section 14

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission oil	Capacity ℓ (US. qt., Imp. qt)	2.4 (2.5, 2.1) at assembly 2.3 (2.4, 2.0) at oil change	
Mainshaft	End play	0.10–0.35 (0.004–0.014)	0.5 (0.02)
	Diameter of needle bearing contact area	28.002–28.015 (1.1024–1.1030)	27.95 (1.100)
	Diameter of third gear contact area	31.984–32.000 (1.2592–1.2598)	31.93 (1.2571)
	Diameter of ball bearing contact area	24.980–24.993 (0.9835–0.9840)	24.93 (0.981)
	Runout	0.04 (0.0016) max.	0.10 (0.004)
Mainshaft third and fourth gears	I.D.	37.009–37.025 (1.4570–1.4577)	37.07 (1.459)
	End play	0.03–0.18 (0.0012–0.0071)	0.3 (0.012)
	Thickness	30.42–30.47 (1.1976–1.1996)	30.3 (1.193)
Mainshaft fifth gear	I.D.	37.009–37.025 (1.4570–1.4577)	37.07 (1.459)
	End play	0.03–0.13 (0.0012–0.0051)	0.3 (0.012)
	Thickness	29.92–29.97 (1.1780–1.1799)	29.8 (1.173)
Countershaft	End play	0.10–0.35 (0.004–0.014)	0.5 (0.02)
	Diameter of needle bearing contact area	33.000–33.015 (1.2992–1.2998)	32.95 (1.297)
	Diameter of ball bearing contact area	24.980–24.993 (0.9835–0.9840)	24.93 (0.981)
	Diameter of low gear contact area	33.984–34.000 (1.3380–1.3386)	33.93 (1.336)
	Runout	0.04 (0.0016)	0.10 (0.004)
Countershaft low gear	I.D.	39.008–39.025 (1.5357–1.5364)	39.07 (1.538)
	End play	0.03–0.08 (0.0012–0.0031)	0.18 (0.007)
Countershaft second gear	I.D.	43.008–43.025 (1.6932–1.6939)	43.07 (1.696)
	End play	0.03–0.10 (0.0012–0.0039)	0.18 (0.007)
	Thickness	30.42–30.47 (1.1976–1.1996)	30.3 (1.193)
Spacer collar (Countershaft second gear)	I.D.	30.98–30.99 (1.2197–1.2201)	31.4 (1.236)
	O.D.	37.989–38.000 (1.4956–1.4961)	37.93 (1.493)
	Length	30.53–30.55 (1.2020–1.2028)	30.51 (1.201)
Spacer collar (Mainshaft fourth and fifth gears)	I.D.	25.002–25.012 (0.9843–0.9847)	25.06 (0.987)
	O.D.	31.989–32.000 (1.2594–1.2598)	31.93 (1.257)
	Length	27.03–27.08 (1.0642–1.0661)	27.01 (1.063)
Reverse idler gear	I.D.	17.016–17.043 (0.6699–0.6710)	17.09 (0.673)
	Gear-to-reverse gear shaft clearance	0.032–0.077 (0.0013–0.0030)	0.15 (0.006)
Synchronizer ring	Ring-to-gear clearance (ring pushed against gear)	0.73–1.18 (0.031–0.046)	0.4 (0.016)
Shift fork	Synchronizer sleeve gear	6.75–6.85 (0.266–0.270)	6.0 (0.24)
	Fork-to-synchronizer sleeve clearance	0.35–0.65 (0.014–0.026)	1.0 (0.04)
Reverse shift fork	End gap	11.8–12.1 (0.46–0.48)	—
	Fork-to-reverse idler gear clearance	0.2–1.0 (0.008–0.039)	1.7 (0.07)
	Groove width	7.05–7.25 (0.278–0.285)	—
	Fork-to-fifth/reverse shift shaft clearance	0.05–0.35 (0.002–0.014)	0.5 (0.02)
Shift arm	Width of groove in shift rod guide	11.8–12.0 (0.46–0.47)	—
	Shift arm-to-shift rod guide clearance	0.05–0.35 (0.002–0.014)	0.8 (0.03)
	Width in shift guide	7.9–8.0 (0.311–0.315)	—
	Shift arm-to-shift guide clearance	0.1–0.3 (0.004–0.012)	0.6 (0.02)
Shift rod guide	I.D.	14.000–14.068 (0.5512–0.5539)	—
	Guide-to-shaft clearance	0.011–0.092 (0.0004–0.0036)	0.15 (0.006)
	O.D.	11.9–12.0 (0.469–0.472)	—
	Guide-to-fifth/reverse shift shaft clearance	0.2–0.5 (0.008–0.020)	0.8 (0.03)
Selector arm	Width	11.9–12.0 (0.469–0.472)	—
	Arm-to-shift rod guide clearance	0.05–0.25 (0.002–0.010)	0.5 (0.02)
	End gap	10.05–10.15 (0.396–0.400)	—
	Arm-to-interlock clearance	0.05–0.25 (0.002–0.010)	0.7 (0.03)
	Arm-to-holder clearance	0.01–0.20 (0.0004–0.0079)	Selection with 5 types of shims

(cont'd)

Standards and Service Limits (cont'd)

Manual Transmission<B2>- Section 14

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission oil	Capacity ℓ (US. qt., Imp. qt)	1.9 (2.0, 1.7) at assembly 2.0 (2.1, 1.8) at oil change	
Mainshaft	End play	0.14–0.21 (0.006–0.008)	Adjust with a shim.
	Diameter of needle bearing contact area	27.987–28.000 (1.1018–1.1024)	27.94 (1.100)
	Diameter of third gear contact area	37.984–38.000 (1.4954–1.4961)	37.93 (1.493)
	Diameter of ball bearing contact area	27.987–28.000 (1.1018–1.1024)	27.94 (1.100)
	Runout	0.04 (0.0016) max.	0.10 (0.004)
Mainshaft third and fourth gears	I.D.	43.009–43.025 (1.6933–1.6939)	43.08 (1.696)
	End play	0.06–0.21 (0.0024–0.0083)	0.3 (0.012)
	Thickness 3rd	32.42–32.47 (1.2764–1.2783)	32.3 (1.272)
	4th	30.92–30.97 (1.2173–1.2193)	30.8 (1.213)
Mainshaft fifth gear	I.D.	43.009–43.025 (1.6933–1.6939)	43.08 (1.696)
	End play	0.06–0.21 (0.0024–0.0083)	0.3 (0.0012)
	Thickness	30.42–30.47 (1.1976–1.1996)	30.3 (1.193)
Countershaft	End play	0.10–0.35 (0.004–0.014)	0.5 (0.02)
	Diameter of needle bearing contact area	33.000–33.015 (1.2992–1.2998)	32.95 (1.297)
	Diameter of ball bearing contact area	24.987–25.000 (0.9837–0.9843)	24.94 (0.982)
	Diameter of low gear contact area	33.984–40.000 (1.3380–1.5748)	33.93 (1.336)
	Runout	0.04 (0.0016)	0.10 (0.004)
Cuntershaft low gear	I.D.	46.009–46.025 (1.8114–1.8120)	46.08 (1.814)
	End play	0.03–0.08 (0.0012–0.0031)	Adjust with a shim
Countershaft Second gear	I.D.	50.009–50.025 (1.9689–1.9695)	50.08 (1.972)
	End play	0.03–0.08 (0.0012–0.0031)	Adjust with a collar.
	Thickness	32.92–32.97 (1.2961–1.2980)	32.8 (1.291)
Spacer collar (Countershaft second gear)	I.D.	36.48–36.49 (1.4362–1.4366)	36.5 (1.437)
	O.D.	43.989–44.000 (1.7318–1.7323)	43.94 (1.730)
	Length A	28.98–29.00 (1.1409–1.1417)	–
	B	29.03–29.05 (1.1429–1.1437)	
Spacer collar (Mainshaft fourth and fifth gears)	I.D.	28.002–28.012 (1.1024–1.1028)	28.06 (1.105)
	O.D.	34.989–35.000 (1.3775–1.3780)	34.94 (1.376)
	Length A	55.95–56.05 (2.2028–2.2067)	–
	B	26.03–26.08 (1.0248–1.0268)	
Reverse Idler gear	I.D.	20.016–20.043 (0.7880–0.7891)	20.09 (0.791)
	Gear-to-reverse gear shaft clearance	0.036–0.084 (0.0014–0.0033)	0.16 (0.006)
Synchronizer ring	Ring-to-gear clearance (ring pushed against gear)	0.85–1.10 (0.033–0.043)	0.4 (0.016)
Shift fork	Synchronizer sleeve gear 1, 2, 3 and 4th	7.95–8.05 (0.313–0.317)	–
	5th	5.75–5.85 (0.226–0.230)	–
	Fork-to-synchronizer sleeve 1, 2, 3 and 4th	0.45–0.65 (0.018–0.026)	1.0 (0.04)
	5th	0.25–0.45 (0.010–0.018)	0.8 (0.03)
Reverse shift fork	End gap	13.0–13.3 (0.51–0.52)	–
	Fork-to-reverse idler gear clearance	0.5–1.1 (0.020–0.043)	1.8 (0.07)
	Groove width	7.05–7.25 (0.278–0.285)	–
	Fork-to-fifth/reverse shift shaft clearance	0.05–0.35 (0.002–0.014)	0.5 (0.02)
Shift arm	Width of groove in shift rod guide	12.8–13.0 (0.50–0.51)	–
	Shift arm-to-shift rod guide clearance	0.05–0.35 (0.002–0.014)	0.8 (0.03)
	Width in shift guide	7.9–8.0 (0.311–0.315)	–
	Shift arm-to-shift guide clearance	0.1–0.3 (0.004–0.012)	0.6 (0.02)
Shift rod guide	I.D.	14.000–14.068 (0.5512–0.5539)	–
	Guide-to-shaft clearance	0.011–0.092 (0.0004–0.0036)	0.15 (0.006)
	O.D.	11.9–12.0 (0.469–0.472)	–
	Guide-to-fifth/reverse shift shaft clearance	0.2–0.5 (0.008–0.020)	0.8 (0.03)
Selector arm	Width	11.9–12.0 (0.469–0.472)	–
	Arm-to-shift rod guide clearance	0.05–0.25 (0.002–0.010)	0.5 (0.02)
	End gap	9.9–10.0 (0.390–0.394)	–
	Arm-to-interlock clearance	0.05–0.20 (0.002–0.008)	0.45 (0.018)

Unit: mm (in.)

Automatic Transmission (F4) — Section 15

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission oil	Capacity ℓ (US. qt., Imp.qt)	2.4 (2.5, 2.1) at oil change 5.4 (5.7, 4.8) at assembly	
Hydraulic pressure	Line pressure at 2,000 min^{-1} (rpm)	*834—883 kPa (8.5—9.0 kg/cm², 121—128 psi) 785—834 kPa (8.0—8.5 kg/cm², 114—121 psi)	785 kPa (8.0 kg/cm², 114 psi) 736 kPa (7.5 kg/cm², 107 psi)
	4th, 3rd, 2nd clutch pressure at 2,000 min^{-1} (rpm)	*441—883 kPa (4.5—9.0 kg/cm², 64—128 psi) 441—834 kPa (4.5—8.5 kg/cm², 64—121 psi)	392 kPa (4.0 kg/cm², 57 psi) with lever released 785 kPa (8.0 kg/cm², 114 psi) with lever in full throttle position
	1st clutch pressure at 2,000 min^{-1} (rpm)	*834—883 kPa (8.5—9.0 kg/cm², 121—128 psi) 785—834 kPa (8.0—8.5 kg/cm², 114—121 psi)	785 kPa (8.0 kg/cm², 114 psi) 736 kPa (7.5 kg/cm², 107 psi)
	Governor pressure at 60 km/h	181—191 kPa (1.85—1.95 kg/cm², 26—28 psi)	177 kPa (1.80 kg/cm², 25.6 psi)
	Throttle pressure A	485—500 kPa (4.95—5.1 kg/cm², 70—73 psi)	481 kPa (4.9 kg/cm², 69.7 psi)
	Throttle pressure B	834—883 kPa (8.5—9.0 kg/cm², 121—123 psi)	785 kPa (8.0 kg/cm², 114 psi)
Stall speed	Check with car on level ground	*2,500—2,800 min^{-1} (rpm) 2,650—2,950 min^{-1} (rpm)	— —
Clutch	Clutch initial clearance	1st 0.65—0.85 (0.026—0.033) 2nd 0.50—0.70 (0.020—0.028) 3rd, 4th 0.40—0.60 (0.016—0.024)	— — —
	Clutch return spring free length	31.0 (1.22)	29.0 (1.14)
	Clutch disc thickness	1.88—2.0 (0.074—0.079)	Until grooves worn out
	Clutch plate thickness	1.95—2.05 (0.077—0.081)	Discoloration
	Clutch end plate thickness Mark 1	2.05—2.10 (0.081—0.083)	↕
	Mark 2	2.15—2.20 (0.085—0.087)	
	Mark 3	2.25—2.30 (0.089—0.091)	
	Mark 4	2.35—2.40 (0.093—0.094)	
	Mark 5	2.45—2.50 (0.096—0.098)	
	Mark 6	2.55—2.60 (0.100—0.102)	
	Mark 7	2.65—2.70 (0.104—0.106)	
	Mark 8	2.75—2.80 (0.108—0.110)	
	Mark 9	2.85—2.90 (0.112—0.114)	
	Mark 10	2.95—3.00 (0.116—0.118)	Discoloration
Transmission	Diameter of needle bearing contact area on main and stator shaft	22.980—22.993 (0.9047—0.9052)	Wear or damage
	Diameter of needle bearing contact area on mainshaft 2nd gear	35.975—35.991 (1.4163—1.4170)	↕
	Diameter of needle bearing contact area on mainshaft 4th gear collar	31.975—31.991 (1.2589—1.2595)	
	Diameter of needle bearing contact area on mainshaft 1st gear collar	30.975—30.991 (1.2195—1.2201)	
	Diameter of needle bearing contact area on countershaft (L side)	38.505—38.515 (1.5159—1.5163)	
	Diameter of needle bearing contact area on countershaft 3rd gear	31.975—31.991 (1.2589—1.2595)	
	Diameter of needle bearing contact area on countershaft 4th gear	27.980—27.993 (1.1016—1.1021)	
	Diameter of needle bearing contact area on countershaft reverse gear collar	31.975—31.991 (1.2589—1.2595)	
	Diameter of needle bearing contact area on countershaft L gear collar	31.975—31.991 (1.2589—1.2595)	
	Diameter of needle bearing contact area on reverse idle gear	13.990—14.000 (0.5508—0.5512)	
	Reverse idler shaft holder diameter	14.416—14.434 (0.5676—0.5683)	
	Mainshaft 2nd gear I.D.	41.000—41.016 (1.6142—1.6148)	
	Mainshaft 1st gear I.D.	36.000—36.016 (1.4173—1.4179)	
	Countershaft 4th gear I.D.	33.000—33.016 (1.2992—1.2998)	
	Countershaft 3rd gear I.D.	38.000—38.016 (1.4961—1.4967)	
	Countershaft 2nd gear I.D.	31.000—31.016 (1.2205—1.2211)	
	Countershaft 1st gear I.D.	38.000—38.016 (1.4961—1.4967)	
	Countershaft reverse gear I.D.	38.000—38.016 (1.4961—1.4967)	
	Reverse idle gear I.D.	18.006—18.017 (0.7089—0.7093)	Wear or damage
	Mainshaft 4th gear end play	0.07—0.12 (0.003—0.005)	—
	Mainshaft 2nd gear end play	0.07—0.12 (0.003—0.005)	—
	Mainshaft 1st gear end play	0.08—0.24 (0.003—0.009)	—
	Countershaft 3rd gear end play	0.07—0.12 (0.003—0.005)	—
	Countershaft 2nd gear end play	0.07—0.12 (0.003—0.005)	—
	Reverse idler gear end play	0.05—0.18 (0.002—0.007)	—
	Countershaft reverse gear end play	0.10—0.20 (0.004—0.008)	—
	Reverse gear hub O.D.	51.87—51.90 (2.0421—2.0433)	Wear or damage

*Fuel Injected Engine

(cont'd)

Standards and Service Limits (cont'd)

Automatic Transmission (F4) — Section 15

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Transmission (cont'd)	Thrust washer thickness			
	Mainshaft 2nd gear	A	3.97–4.00 (0.156–0.157)	—
		B	4.02–4.05 (0.158–0.159)	—
		C	4.07–4.10 (0.160–0.161)	—
		D	4.12–4.15 (0.162–0.163)	—
		E	4.17–4.20 (0.164–0.165)	—
		F	4.22–4.25 (0.166–0.167)	—
		G	4.27–4.30 (0.168–0.169)	—
		H	4.32–4.35 (0.170–0.171)	—
		I	4.37–4.40 (0.172–0.173)	—
	Mainshaft bearing contact area (R side)		2.95–3.05 (0.116–0.120)	Wear or damage
	Mainshaft 1st gear		2.43–2.50 (0.096–0.098)	Wear or damage
	Countershaft 3rd gear	A	2.97–3.00 (0.1169–0.1181)	—
		B	3.02–3.05 (0.1189–0.1201)	—
		C	3.07–3.10 (0.1209–0.1220)	—
		D	3.12–3.15 (0.1228–0.1240)	—
		E	3.17–3.20 (0.1248–0.1260)	—
		F	3.22–3.25 (0.1268–0.1280)	—
		G	3.27–3.30 (0.1287–0.1299)	—
		H	3.32–3.35 (0.1307–0.1319)	—
		I	3.37–3.40 (0.1327–0.1339)	—
	Countershaft 4th gear collar thickness	A	38.97–39.00 (1.5342–1.5354)	—
		B	39.02–39.05 (1.5362–1.5374)	—
		C	39.07–39.10 (1.5382–1.5394)	—
		D	39.12–39.15 (1.5402–1.5413)	—
		E	39.17–39.20 (1.5421–1.5433)	—
		F	39.22–39.25 (1.5441–1.5453)	—
		G	39.27–39.30 (1.5461–1.5472)	—
	Thrust washer thickness (mainshaft 1st gear L side)		1.45–1.50 (0.057–0.059)	1.4 (0.055)
	Mainshaft 1st gear collar length		24.50–24.55 (0.9646–0.9665)	—
	Mainshaft 1st gear collar flange thickness		2.5–2.6 (0.098–0.102)	Wear or damage
	Countershaft reverse gear collar length		12.0–12.1 (0.472–0.476)	—
	Countershaft reverse gear collar flange thickness		2.4–2.6 (0.094–0.102)	Wear or damage
	Countershaft 1st gear collar length		12.0–12.1 (0.472–0.476)	—
	Countershaft 1st gear collar flange thickness		2.4–2.6 (0.094–0.102)	Wear or damage
	Diameter of countershaft one-way clutch contact area		83.339–83.365 (3.2811–3.2821)	Wear or damage
	Diameter of parking gear one-way clutch contact area		66.685–66.695 (2.6254–2.6258)	Wear or damage
	Mainshaft feed pipe O.D. (at 20 mm front end)		6.97–6.98 (0.2744–0.2748)	6.95 (0.2736)
	Countershaft feed pipe O.D. (at 20 mm from end)		7.97–7.98 (0.3138–0.3142)	7.95 (0.31)
	Mainshaft sealing ring 32 mm Thickness		1.980–1.995 (0.0780–0.0785)	1.8 (0.071)
	Mainshaft bushing I.D.		6.018–6.030 (0.2369–0.2374)	6.045 (0.238)
	Mainshaft bushing I.D.		9.000–9.015 (0.3543–0.3549)	9.03 (0.356)
	Mainshaft sealing ring groove width		2.025–2.060 (0.0797–0.0811)	2.08 (0.082)
Regulator valve body	Sealing ring contact area diameter		35.000–35.025 (1.3780–1.3789)	35.05 (1.38)
Shifting device and parking brake control	Reverse shift fork thickness		5.9–6.0 (0.232–0.236)	5.4 (0.21)
	Parking brake ratchet pawl		—	Wear or other defect
	Parking gear		—	Wear or other defect
	Throttle cam stopper		18.5–18.6 (0.728–0.732)	—
Servo body	Shift fork shaft bore I.D.	A	14.000–14.005 (0.5512–0.5514)	—
		B	14.006–14.010 (0.5514–0.5516)	—
		C	14.011–14.015 (0.5516–0.5518)	—
	Shift fork shaft valve bore I.D.		37.000–37.039 (1.4567–1.4582)	37.045 (1.4585)
Valve body	Oil pump gear side clearance		0.03–0.05 (0.0012–0.0020)	0.05 (0.002)
	Oil pump gear-to-body clearance	Drive:	0.240–0.265 (0.009–0.010)	—
		Driven:	0.125–0.175 (0.005–0.007)	—
	Stator camshaft needle bearing bore I.D.		27.000–27.021 (1.0630–1.0638)	Wear or damage
	Stator camshaft needle bearing contact and O.D.		29.000–29.013 (1.1417–1.1422)	Wear or damage
	Oil pump driven gear I.D.		14.016–14.034 (0.5518–0.5525)	Wear or damage
	Oil pump shaft O.D.		13.980–13.990 (0.5504–0.5508)	Wear or damage

Automatic Transmission (C9) — Section 15

Unit: mm (in.)

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Transmission oil	Capacity ℓ (US. qt., Imp.qt.)		2.2 (2.3, 1.9) at oil change 5.2 (5.5, 4.6) at assembly	
Hydraulic pressure	Line pressure at 2,000 min^{-1} (rpm)		785–834 kPa (8.0–8.5 kg/cm^2, 114–121 psi)	736 kPa (7.5 kg/cm^2, 107 psi)
	4th, 3rd, 2nd clutch pressure at 2,000 min^{-1} (rpm)		412–834 kPa (4.2–8.5 kg/cm^2, 60–121 psi)	392 kPa (4.0 kg/cm^2, 57 psi) with lever released 785 kPa (8.0 kg/cm^2, 114 psi) with lever in full throttle position
	1st clutch pressure at 2,000 min^{-1} (rpm)		785–834 kPa (8.0–8.5 kg/cm^2, 114–121 psi)	736 kPa (7.5 kg/cm^2, 107 psi)
	Governor pressure at 60 km/h		198–208 kPa (2.02–2.12 kg/cm^2, 29–30 psi)	193 kPa (1.97 kg/cm^2, 28 psi)
	Throttle pressure A		495–510 kPa (5.05–5.20 kg/cm^2, 72–74 psi)	490 kPa (5.0 kg/cm^2, 71 psi)
	Throttle pressure B		735–834 kPa (8.0–8.5 kg/cm^2, 114–121 pai)	736 kPa (7.5 kg/cm^2, 107 psi)
Stall speed	Check with car on level ground		2,600–2,900 min^{-1} (rpm)	—
Clutch	Clutch initial clearance	1st	0.65–0.85 (0.026–0.033)	—
		2nd	0.60–0.80 (0.024–0.031)	—
		3rd, 4th	0.4–0.6 (0.016–0.024)	—
	Clutch return spring free length	1st	31.0 (1.22)	28.5 (1.12)
		2nd–4th	30.5 (1.20)	28.5 (1.12)
	Clutch disc thickness		1.88–2.0 (0.074–0.079)	Until grooves worn out
	Clutch plate thickness		1.95–2.05 (0.077–0.081)	Discoloration
	Clutch end plate thickness	Mark 1	2.3–2.4 (0.091–0.094)	
		Mark 2	2.4–2.5 (0.094–0.098)	
		Mark 3	2.5–2.6 (0.098–0.102)	
		Mark 4	2.6–2.7 (0.102–0.106)	
		Mark 5	2.7–2.8 (0.106–0.110)	
		Mark 6	2.8–2.9 (0.110–0.114)	
		Mark 7	2.9–3.0 (0.114–0.118)	
		Mark 8	3.0–3.1 (0.118–0.122)	
		Mark 9	3.1–3.2 (0.122–0.126)	
		Mark 10	3.2–3.3 (0.126–0.130)	Discoloration
Transmission	Diameter of needle bearing contact area on main and stator shaft		19.980–19.993 (0.7866–0.7871)	Wear or damage
	Diameter of needle bearing contact area on mainshaft 2nd gear		35.975–35.991 (1.4163–1.4170)	
	Diameter of needle bearing contact area on mainshaft 4th gear collar		31.975–31.991 (1.2589–1.2595)	
	Diameter of needle bearing contact area on mainshaft 1st gear collar		30.975–30.991 (1.2195–1.2201)	
	Diameter of needle bearing contact area on countershaft (L side)		38.505–38.515 (1.5159–1.5163)	
	Diameter of needle bearing contact area on countershaft 3rd gear		31.975–31.991 (1.2589–1.2595)	
	Diameter of needle bearing contact area on countershaft 4th gear		27.980–27.993 (1.1016–1.1021)	
	Diameter of needle bearing contact area on countershaft reverse gear collar		29.980–29.993 (1.1803–1.1808)	
	Diameter of needle bearing contact area on countershaft L gear collar		29.980–29.993 (1.1803–1.1808)	
	Diameter of needle bearing contact area on reverse idle gear		13.990–14.000 (0.5508–0.5512)	
	Reverse idler shaft holder diameter		14.416–14.434 (0.5676–0.5683)	
	Mainshaft 2nd gear I.D.		41.000–41.016 (1.6142–1.6148)	
	Mainshaft 1st gear I.D.		36.000–36.016 (1.4173–1.4179)	
	Countershaft 4th gear I.D.		33.000–33.016 (1.2992–1.2998)	
	Countershaft 3rd gear I.D.		38.000–38.016 (1.4961–1.4967)	
	Countershaft 2nd gear I.D.		31.000–31.016 (1.2205–1.2211)	
	Countershaft 1st gear I.D.		35.000–35.016 (1.3779–1.3786)	
	Countershaft reverse gear I.D.		36.000–36.016 (1.4173–1.4179)	
	Reverse idle gear I.D.		18.007–18.020 (0.7089–0.7094)	Wear or damage
	Mainshaft 4th gear end play		0.07–0.12 (0.003–0.005)	—
	Mainshaft 2nd gear end play		0.07–0.12 (0.003–0.005)	—
	Mainshaft 1st gear end play		0.08–0.24 (0.003–0.009)	—
	Countershaft 3rd gear end play		0.07–0.12 (0.003–0.005)	—
	Countershaft 2nd gear end play		0.07–0.12 (0.003–0.005)	—
	Reverse idler gear end play		0.05–0.18 (0.002–0.007)	—
	Countershaft reverse gear end play		0.10–0.20 (0.004–0.008)	—
	Reverse gear hub O.D.		51.87–51.90 (2.0421–2.0433)	Wear or damage

(cont'd)

Standards and Service Limits (cont'd)

Automatic Transmission (C9) — Section 15

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Transmission (cont'd)	Thrust washer thickness			
	Mainshaft 2nd gear	A	3.47–3.50 (0.137–0.138)	—
		B	3.52–3.55 (0.139–0.140)	—
		C	3.57–3.60 (0.141–0.142)	—
		D	3.62–3.65 (0.143–0.144)	—
		E	3.67–3.70 (0.144–0.146)	—
		F	3.72–3.75 (0.146–0.148)	—
		G	3.77–3.80 (0.148–0.150)	—
		H	3.82–3.85 (0.150–0.152)	—
		I	3.87–3.90 (0.152–0.154)	—
	Mainshaft bearing contact area (R side)		2.95–3.05 (0.116–0.120)	Wear or damage
	Mainshaft 1st gear		2.43–2.50 (0.096–0.098)	Wear or damage
	Countershaft 3rd gear	A	2.97–3.00 (0.1169–0.1181)	—
		B	3.02–3.05 (0.1189–0.1201)	—
		C	3.07–3.10 (0.1209–0.1220)	—
		D	3.12–3.15 (0.1228–0.1240)	—
		E	3.17–3.20 (0.1248–0.1260)	—
		F	3.22–3.25 (0.1268–0.1280)	—
		G	3.27–3.30 (0.1287–0.1299)	—
		H	3.32–3.35 (0.1307–0.1319)	—
		I	3.37–3.40 (0.1327–0.1339)	—
	Countershaft 4th gear collar thickness	A	38.97–39.00 (1.5342–1.5354)	—
		B	39.02–39.05 (1.5362–1.5374)	—
		C	39.07–39.10 (1.5382–1.5394)	—
		D	39.12–39.15 (1.5402–1.5413)	—
		E	39.17–39.20 (1.5421–1.5433)	—
		F	39.22–39.25 (1.5441–1.5453)	—
		G	39.27–39.30 (1.5461–1.5472)	—
	Thrust washer thickness (mainshaft 1st gear L side)		1.45–1.50 (0.057–0.059)	1.4 (0.055)
	Mainshaft 1st gear collar length		22.50–22.55 (0.886–0.888)	—
	Mainshaft 1st gear collar flange thickness		2.5–2.6 (0.098–0.102)	Wear or damage
	Countershaft reverse gear collar length		12.00–12.05 (0.472–0.474)	—
	Countershaft reverse gear collar flange thickness		2.45–2.55 (0.096–0.100)	Wear or damage
	Countershaft 1st gear collar length		11.0–11.1 (0.433–0.437)	—
	Countershaft 1st gear collar flange thickness		2.4–2.6 (0.094–0.102)	Wear or damage
	Diameter of countershaft one-way clutch contact area		74.414–74.444 (2.9298–2.9309)	Wear or damage
	Diameter of parking gear one-way clutch contact area		57.755–57.768 (2.2738–2.2743)	Wear or damage
	Mainshaft feed pipe O.D. (at 20 mm front end)		6.97–6.98 (0.2744–0.2748)	6.95 (0.2736)
	Countershaft feed pipe O.D. (at 20 mm from end)		7.97–7.98 (0.3138–0.3142)	7.95 (0.31)
	Mainshaft sealing ring 32 mm Thickness		1.980–1.995 (0.0780–0.0785)	1.8 (0.071)
	Mainshaft bushing I.D.		6.018–6.030 (0.2369–0.2374)	6.045 (0.238)
	Mainshaft bushing I.D.		9.000–9.015 (0.3543–0.3549)	9.03 (0.356)
	Countershaft bushing I.D.		8.000–8.015 (0.3150–0.3156)	8.03 (0.316)
	Mainshaft sealing ring groove width		2.025–2.060 (0.0797–0.0811)	2.08 (0.082)
Regulator valve body	Sealing ring contact area diameter		32.000–32.025 (1.2598–1.2608)	32.05 (1.262)
Shifting device and parking brake control	Reverse shift fork thickness		5.90–6.00 (0.232–0.236)	5.4 (0.21)
	Parking brake ratchet pawl		—	Wear or other defect
	Parking gear		—	Wear or other defect
	Throttle cam stopper		18.5–18.6 (0.728–0.732)	—
Servo body	Shift fork shaft bore I.D.	A	14.000–14.005 (0.5512–0.5514)	—
		B	14.006–14.010 (0.5514–0.5516)	—
		C	14.011–14.015 (0.5516–0.5518)	—
	Shift fork shaft valve bore I.D.		37.000–37.039 (1.4567–1.4582)	37.045 (1.4585)
Valve body	Oil pump gear side clearance		0.03–0.05 (0.0012–0.0020)	0.05 (0.002)
	Oil pump gear-to-body clearance	Drive:	0.240–0.265 (0.009–0.010)	—
		Driven:	0.125–0.175 (0.005–0.007)	—
	Stator camshaft needle bearing bore I.D.		24.000–24.021 (0.9449–0.9457)	Wear or damage
	Stator camshaft needle bearing contact and O.D.		26.000–26.013 (1.0236–1.0241)	Wear or damage
	Oil pump driven gear I.D.		14.016–14.034 (0.5518–0.5525)	Wear or damage
	Oil pump shaft O.D.		13.980–13.990 (0.5504–0.5508)	Wear or damage

Unit: mm (in.)

Differential — Section 16

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Ring gear	Backlash	0.085–0.149 (0.0033–0.0059)	0.2 (0.0079)
Differential carrier	Pinion shaft bore diameter	18.000–18.018 (0.7087–0.7094)	18.1 (0.71)
	Carrier-to-pinion shaft clearance	0.016–0.052 (0.0006–0.0020)	0.1 (0.004)
	Driveshaft bore diameter	28.000–28.021 (1.1024–1.1032)	—
		*1 26.000–26.021 (1.0236–1.0244)	—
	Carrier-to-driveshaft clearance	0.025–0.066 (0.0010–0.0026)	0.12 (0.005)
	Side clearance	0.10–0.20 (0.004–0.008)	0.15 (0.006)
Differential pinion gear	Backlash	0.05–0.15 (0.002–0.006)	Selection with 8 types of washers
	Pinion gear bore diameter	18.041–18.061 (0.7103–0.7111)	—
	Pinion gear-to-pinion shaft clearance	0.057–0.093 (0.0022–0.0037)	0.15 (0.006)

*1 A1 Transmission only

Driveshaft — Section 17

	MEASUREMENT			STANDARD (NEW)	SERVICE LIMIT
Driveshaft	Right boot	As installed		506.0–510.5 (19.9–20.1)	—
	Left boot	As installed	MT	805.0–809.5 (31.7–31.9)	—
			AT	812.0–816.5 (32.0–32.1)	—

Steering — Section 18

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Steering wheel	Play		10 (0.39) Max.	—
			15 (1.5, 3.31) Max	
	Steering assist N (kg, lb)	P/S	18 (1.8, 3.97) Max	
Power steering	Pump pressure with valve closed (Oil temp./ speed: 40°C (104°F) min/idle. Do not run for more than 5 seconds) kPa (kg/cm², psi)		7845–8826 (80–90, 1138–1280)	
	Fluid capacity	Reservoir	0.5ℓ (0.53 US. qt., 0.44 Imp. qt.)	—
		At change	approx 1.7ℓ (1.8 US. qt., 1.5 Imp. qt.)	—

Suspension — Section 19

	MEASUREMENT			STANDARD (NEW)	SERVICE LIMIT
Wheel alignment				Front / Rear	
	Camber			0° 00′ ± 1° / 0° 00′ ± 1°	
	Caster			0°31′± 1°	
	Toe-in			0 ± 3 (0 ± 0.118) / 0 ± 2 (0 ± 0.079)	
	Kingpin inclination			6° 50′	
	Steering angle	R/L	Inside	39°30′	
			Outside	30°30′	
Wheel	Rim runout	Steel	Axial	0–1.0 (0–0.039)	—
			Radial	0–1.0 (0–0.039)	—
		Aluminum	Axial	0–0.7 (0–0.028)	—
			Radial	0–0.07 (0–0.003)	—
Wheel bearing	Front wheel bearing axial play			0–0.05 (0–0.002)	—
	Rear wheel bearing axial play			0–0.05 (0–0.002)	—

(cont'd)

Standards and Service Limits (cont'd)

Unit: mm (in.)

Brake — Section 20

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Parking brake lever	Play in stroke 200N (20 kg, 44 lbs)	To be locked when pulled 7—11 notches	
Foot brake pedal	Pedal Height	LHD: 203 (8.0), RHD: 205 (8.1) from floor	——
	Free play	1—5 (0.04—0.20)	5 (0.20)
Master cylinder	Piston-to-push rod clearance	0—0.4 (0.016)	——
	with ALB	0—0.6 (0—0.024)	——
Brake drum	I.D.	200.0 (7.87)	201.0 (7.91)
Lining	Thickness	4.5 (0.18)	2.0 (0.08)
Disc brake	Disc thickness Front	19.0 (0.75) *21 (0.83)	17.0 (0.67) *19 (0.75)
	Rear	10.0 (0.39)	8 (0.31)
	Disc runout	——	0.15 (0.006) *0.1 (0.004)
	Disc parallelism	——	0.015 (0.0006)
	Pad thickness Front	9.0 (0.35) *11.5 (0.45)	3.0 (0.12)
	Rear	8.0 (0.31)	3.0 (0.12)

Brake booster	Characteristics	Vacuum (mm Hg)	Pedal Pressure kg (lbs)	Line Pressure kPa (kg/cm², psi) 9" Booster
		0	20 (44)	1.177 (12.0, 170.6) min
		300	20 (44)	4.766 (48.6, 691.1) min
		500	20 (44)	7.149 (72.9, 1,036.6) min

*EXSi model and cars equipped with ALB (Except KS type)

Engine Electrical — Section 24

	MEASUREMENT		STANDARD (NEW)		
Ignition coil	Rated voltage		12 Volts		
	Insulation resistance		10,000 ohms min.		
	Performance: Make sure strong sparks jump across electrodes (3-point tester)				
	Voltage	Camshaft	Secondary Voltage	3-point gap	Condition
	6 V	75 min⁻¹ (rpm)	30±4 kV	15—21 mm (0.59—0.83)	
	12 V	3,000 min⁻¹ (rpm)	22±4 kV	13—19 mm (0.51—0.75)	At 80°C (176°F)
Ignition wire	Resistance		25,000 ohms max.		
Spark plug	Type Standard	B20A	BCPR6E-11 (NGK), Q20PR-U11 (ND)		
		Others	BPR5EY-11 (NGK)*1, W16EXR-U11 (ND)*1 BCPR6EY-11 (NGK)*2, W20EXR-U11 (ND)*2		
	Gap		1.0—1.1 (0.039—0.043)		
Ignition timing	At idling Carbureted Engine	Manual	20±2° BTDC *24±2° BTDC		
		Automatic (in gear)	15±2°BTDC		
	At idling Fuel-injected Engine	Manual	15±2° BTDC		
		Automatic (in gear)	15±2° BTDC		
Battery	Lighting capacity (20-hour ratio)		47 Ampere Hours		
	Starting capacity (5-second ratio)		8.4 V minumum at 300 Ampere draw		
Alternator	Output at no-load		14 V at 1,000 rpm max.		
	Output		14 V/65 A at 5,500 rpm max.		
	Coil resistance (rotor)		2.8—3.0 ohms		±0.1 ohms
	Slip ring O.D.		32.5 (1.28)		32.1 (1.26)
	Brush length		10.5 (0.41)		5.5 (0.22)
	Brush spring tension		300—500 g (10.6—18.6 oz)		——

Starting motor	MEASUREMENT	ND 1.0 kW, 1.4 kW		MITSUBA 1.0 kW, 1.4 kW	
		STANDARD (NEW)	SERVICE LIMIT	STANDARD (NEW)	SERVICE LIMIT
	Mica depth	0.5—0.8 (0.020—0.031)	0.2 (0.008)	0.4—0.5 (0.016—0.020)	0.15 (0.006)
	Commutator runout	0—0.02 (0.0008)	0.05 (0.020)	0—0.02 (0.0008)	0.05 (0.020)
	Commutator O.D.	30.0 (1.18)	29.0 (1.14)	28.0 (1.10)	27.5 (1.08)
	Brush length	12.5—13.5 (0.49—0.53)	8.5 (0.33)	14.3—14.7 (0.56—0.58)	9.3 (0.37)
	Spring pressure (new)	1.75 kg (3.8 lb)	——	2.1 kg (4.6 lb)	——

*1: For cars used unleaded gasoline. *2: For cars used leaded gasoline.

Design Specifications

European Model

	ITEMS	METRIC	ENGLISH	NOTE
DIMENSION	Overall length 3D	4,335 mm	170.6 in	KW: 4,365 mm (171.9 in)
	4D	4,535 mm	178.5 in	KW: 4,565 mm (180.0 in)
	Overall width	1,695 mm	66.7 in	
	Overall height 3D	1,335 mm	52.6 in	
	4D	1,335 mm	52.6 in	
	Wheel base	2,600 mm	102.4 in	
	Thread Front	1,480 mm	58.3 in	
	Rear	1,475 mm	58.1 in	
	Ground clearance	160 mm	6.3 in	
	Seating capacity (F/R)	5 (2/3)		
WEIGHT	Curb weight			
On cars equipped	(M/T) 3D EX (A20A2)	1,045 kg	2,304 lb	Holland
with sunroof (S/R)		1,068 kg*	2,355 lb*	KG, KB
ALB or air conditioner (A/C), add		1,080 kg	2,381 lb	KF, KG, KB
		1,085 kg	2,392 lb	KW
S/R: 18 kg (40 lb)		1,090 kg	2,403 lb	Finland
ALB: KE		1,100 kg	2,425 lb	KE
19 kg (42 lb)		1,110 kg	2,447 lb	KS
except KE	EXi (A20A4)	1,065 kg	2,348 lb	Holland
14 kg (31 lb)		1,115 kg	2,458 lb	KF
A/C: 22 kg (49 lb)		1,120 kg	2,469 lb	KG, KB, KW
P/S: 12 kg		1,130 kg	2,491 lb	Finland
(26.5 lb)		1,135 kg	2,502 lb	KS, KE
	EXC (A20A1)	1,088 kg*	2,399 lb*	KG
		1,090 kg	2,403 lb	Holland
		1,100 kg	2,425 lb	KG
		1,105 kg	2,436 lb	Austria
		1,120 kg	2,469 lb	KX
	EXCi (A20A3)	1,115 kg	2,458 lb	Holland
		1,130 kg	2,491 lb	KG
		1,135 kg	2,502 lb	KX, Austria
	4D LX (A16A1)	1,025 kg	2,260 lb	Holland
		1,060 kg	2,337 lb	KG, KB, KW, Finland
	LX (A20A2)	1,045 kg	2,304 lb	Holland
		1,075 kg	2,370 lb	KG, KB
		1,090 kg	2,403 lb	KW, KS, Finland
	EX (A20A2)	1,065 kg	2,348 lb	Holland
		1,100 kg	2,425 lb	KG, KB
		1,110 kg	2,447 lb	KE
		1,115 kg	2,458 lb	KF, KW, Finland

*Cars equipped with manual steering.

(cont'd)

Design Specifications (cont'd)

European Model (cont'd)

ITEMS	METRIC	ENGLISH	NOTE
WEIGHT (cont'd)	(M/T) 3D EX (A20A2)	1,120 kg	2,469 lb	KS
On cars equipped	EXi (A20A4)	1,085 kg	2,392 lb	Holland
with sunroof (S/R)		1,120 kg	2,469 lb	KG, KB
ALB or air condi-		1,130 kg	2,491 lb	KS
tioner (A/C), add		1,135 kg	2,502 lb	KF
S/R: 18 kg (40 lb)		1,145 kg	2,524 lb	KW, KE, Finland
ALB: KE	LXC (A20A1)	1,100 kg	2,425 lb	Austria
19 kg (42 lb)	EXC (A20A1)	1,080 kg	2,381 lb	Holland
except KE		1,115 kg	2,458 lb	KG
14 kg (31 lb)		1,135 kg	2,502 lb	KX, Austria
A/C: 22 kg (49 lb)	EXCi (A20A3)	1,110 kg	2,447 lb	Holland
P/S: 12 kg		1,135 kg	2,502 lb	KG
(26.5 lb)		1,145 kg	2,524 lb	Austria
		1,155 kg	2,546 lb	KX
	EXSi (B20A2)	1,135 kg	2,502 lb	Holland
		1,155 kg	2,546 lb	KG, KB
		1,170 kg	2,579 lb	KF
		1,180 kg	2,601 lb	KW, KE, Finland
	EXCSi (B20A8)	1,140 kg	2,513 lb	Holland
		1,165 kg	2,568 lb	KG
		1,170 kg	2,579 lb	Austria
		1,175 kg	2,590 lb	KX
		1,180 kg	2,601 lb	KS
	(A/T) 3D EX (A20A2)	1,055 kg	2,326 lb	Holland
		1,088 kg*	2,399 lb*	KG, KB
		1,100 kg	2,425 lb	KG, KB, KF
		1,105 kg	2,436 lb	KW
		1,110 kg	2,447 lb	Finland
		1,120 kg	2,469 lb	KE
		1,130 kg	2,491 lb	KS
	EXi (A20A4)	1,138 kg*	2,509 lb*	KG
		1,135 kg	2,502 lb	KF
		1,140 kg	2,513 lb	KG, KB, KW
		1,150 kg	2,535 lb	Finland
		1,155 kg	2,546 lb	KS, KE
	EXC (A20A1)	1,110 kg	2.447 lb	Holland
		1,125 kg	2,480 lb	KG, Austria
		1,140 kg	2,513 lb	KX
	EXCi (A20A3)	1,135 kg	2,502 lb	Holland
		1,150 kg	2,535 lb	KG
		1,155 kg	2,546 lb	KX, Austria
		1,165 kg	2,568 lb	KS
	(A/T) 4D LX (A16A1)	1,040 kg	2,293 lb	Holland
		1,070 kg	2,359 lb	KG, KB, KW, Finland
	LX (A20A2)	1,060 kg	2,337 lb	Holland

*Cars equipped with manual steering.

	ITEMS	METRIC	ENGLISH	NOTE
WEIGHT	(A/T) 4D LX (A20A2)	1,095 kg	2,414 lb	KG, KB
On cars equipped		1,100 kg	2,425 lb	Finland
with Sunroof (S/R)		1,110 kg	2,447 lb	KW, KS
ALB or air	EX (A20A2)	1,080 kg	2,381 lb	Holland
conditioner		1,120 kg	2,469 lb	KG, KB
(A/C), add		1,130 kg	2,491 lb	KE
S/R: 18 kg (40 lb)		1,135 kg	2,502 lb	KF, KW, Finland
ALB: KE		1,140 kg	2,513 lb	KS
19 kg (42 lb)	EXi (A20A4)	1,140 kg	2,513 lb	KG, KB
except KE		1,150 kg	2,535 lb	KS
14 kg (31 lb)		1,155 kg	2,546 lb	KF
A/C: 22 kg (49 lb)		1,165 kg	2,568 lb	KW, KE, Finland
	LXC (A20A1)	1,120 kg	2,469 lb	Austria
	EXC (A20A1)	1,100 kg	2,425 lb	Holland
		1,135 kg	2,502 lb	KG
		1,155 kg	2,546 lb	KX, Austria
	EXCi (A20A3)	1,130 kg	2,491 lb	Holland
		1,155 kg	2,546 lb	KG
		1,165 kg	2,568 lb	Austria
		1,170 kg	2,579 lb	KS
		1,175 kg	2,590 lb	KX
On cars equipped	Weight Distribution (Fr/Rr)			
with sunroof (S/R)	(M/T) 3D EX (A20A2)	643/425 kg*	1,418/937 lb*	KG, KB
ALB or air		655/425 kg	1,444/937 lb	KF, KG, KB
conditioner		660/425 kg	1,455/937 lb	KW
(A/C), add		665/425 kg	1,466/937 lb	Finland
S/R: 9/9 kg		670/430 kg	1,477/948 lb	KE
(20/20 lb)		680/430 kg	1,499/948 lb	KS
ALB: KE	EXi (A20A4)	675/440 kg	1,488/970 lb	KF
12/7 kg		680/440 kg	1,499/970 lb	KG, KB, KW
(26/15 lb)		690/440 kg	1,521/970 lb	Finland
except KE		695/440 kg	1,532/970 lb	KS
12/2 kg		690/445 kg	1,521/981 lb	KE
(26/4 lb)	EXC (A20A2)	662/425 kg*	1,459/937 lb*	KG
A/C: 24/—2kg		675/425 kg	1,488/937 lb	KG
(53/—4 lb)		680/425 kg	1,499/937 lb	Austria
P/S: 12/0 kg		695/425 kg	1,532/937 lb	KX
(26.5/0 lb)	EXCi (A20A3)	690/440 kg	1,521/970 lb	KG
		695/440 kg	1,532/970 lb	KX, Austria
	4D LX (A16A1)	630/430 kg	1,388/948 lb	KG, KB, KW, Finland
	LX (A20A2)	645/430 kg	1,421/948 lb	KG, KB

*Cars equipped with manual steering.

(cont'd)

Design Specifications (cond'd)

European Model (cont'd)

	ITEMS	METRIC	ENGLISH	NOTE
WEIGHT (cont'd)	(M/T) 4D LX (A20A2)	655/435 kg	1,444/959 lb	KW, Finland
On cars equipped		650/440 kg	1,432/970 lb	KS
with sunroof (S/R)	EX (A20A2)	660/440 kg	1,455/970 lb	KG, KB
ALB or air condi-		665/445 kg	1,466/981 lb	KE
tioner (A/C), add		665/450 kg	1,466/992 lb	KF
S/R: 9/9 kg		670/445 kg	1,477/981 lb	KW, Finland
(20/20 lb)		665/455 kg	1,466/1,003 lb	KS
ALB: KE	EXi (A20A4)	670/450 kg	1,477/992 lb	KG, KB
12/7 kg		675/455 kg	1,488/1,003 lb	KS
(26/15 lb)		675/460 kg	1,488/1,014 lb	KF
except KE		690/455 kg	1,521/1,003 lb	KW, Finland
12/2 kg		685/460 kg	1,510/1,014 lb	KE
(26/4 lb)	LXC (A20A1)	660/440 kg	1,455/970 lb	Austria
A/C: 24/—2 kg	EXC (A20A1)	675/440 kg	1,488/970 lb	KG
(53/—4 lb)		690/445 kg	1,521/981 lb	KX, Austria
P/S: 12/0 kg	EXCi (A20A3)	685/450 kg	1,510/992 lb	KG
(26.5/0 lb)		690/445 kg	1,521/981 lb	Austria
		700/445 kg	1,543/981 lb	KX
	EXSi (B20A2)	695/460 kg	1,532/1,014 lb	KG, KB
		710/460 kg	1,565/1,014 lb	KF
		710/470 kg	1,565/1,036 lb	KW, KE, Finland
	EXCSi (B20A8)	700/465 kg	1,543/1,025 lb	KG
		705/465 kg	1,554/1,025 lb	Austria
		710/465 kg	1,565/1,025 lb	KX
		710/470 kg	1,565/1,036 lb	KS
	(A/T) 3D EX (A20A2)	663/425 kg*	1,462/937 lb*	KG, KB
		685/425 kg	1,510/937 lb	Finland
		675/425 kg	1,488/937 lb	KG, KB, KF
		680/425 kg	1,499/937 lb	KW
		685/425 kg	1,510/937 lb	Finland
		690/430 kg	1,521/948 lb	KE
		700/430 kg	1,543/948 lb	KS
	EXi (A20A4)	695/440 kg	1,532/970 lb	KF
		700/440 kg	1,543/970 lb	KG, KB, KW
		710/440 kg	1,565/970 lb	Finland
		715/440 kg	1,576/970 lb	KS
		710/445 kg	1,565/981 lb	KE
	EXC (A20A1)	690/425 kg	1,521/937 lb	KG
		700/425 kg	1,543/937 lb	Austria
		715/425 kg	1,576/937 lb	KX
	EXCi (A20A3)	710/440 kg	1,565/970 lb	KG
		715/440 kg	1,576/970 lb	KX, Austria
		725/440 kg	1,598/970 lb	KS

*Cars equipped with manual steering.

	ITEMS	METRIC	ENGLISH	NOTE
WEIGHT	(A/T) 4D LX (A16A1)	640/430 kg	1,411/948 lb	KG, KB, KW, KS
On cars equipped	LX (A20A2)	665/430 kg	1,466/948 lb	KG, KB
with sunroof (S/R)		675/435 kg	1,488/959 lb	KW, Finland
ALB or air		670/440 kg	1,477/970 lb	KS
conditioner	EX (A20A2)	680/440 kg	1,499/970 lb	KG, KB
(A/C), add S/R:		685/445 kg	1,510/981 lb	KE
9/9 kg		685/450 kg	1,510/992 lb	KF
(20/20 lb)		690/445 kg	1,521/981 lb	KW, Finland
ALB: KE		685/455 kg	1,510/1,003 lb	KS
12/7 kg	EXi (A20A4)	690/450 kg	1,521/992 lb	KG, KB
(26/15 lb)		695/455 kg	1,532/1,003 lb	KS
except KE		695/460 kg	1,532/1,014 lb	KF
12/2 kg		710/455 kg	1,565/1,003 lb	KW, Finland
(26/4 lb)		705/460 kg	1,554/1,014 lb	KE
A/C: 24/−2 kg	LXC (A20A1)	680/440 kg	1,499/970 lb	Austria
(53/−4 lb)	EXC (A20A1)	695/440 kg	1,532/970 lb	KG
P/S: 12/0 kg		710/445 kg	1,565/981 lb	KX, Austria
(26.5/0 lb)	EXCi (A20A3)	705/450 kg	1,554/992 lb	KG
		710/455 kg	1,565/1,003 lb	Austria
		715/455 kg	1,576/1,003 lb	KS
		720/455 kg	1,587/1,003 lb	KX
	Max loaded Vehicle M/T	1,590 kg	3,505 lb	
	Weight (ADR) A/T	1,610 kg	3,549 lb	
	Max. permissible 2000	1,660 kg	3,660 lb	
	Weight (EC) 1600	1,580 kg	3,484 lb	

*Cars equipped with manual steering.

(cont'd)

Design Specifications (cont'd)

European Model (cont'd)

	ITEMS		METRIC	ENGLISH	NOTE
ENGINE (Except B20A)	Type		Water cooled, gasoline fueled, 4-cycle OHC		
	Cylinder arrangement		4 cylinder in-line transverse		
	Bore and Stroke	1600	80.0 x 79.5 mm	3.15 x 3.13 in	
		2000	82.7 x 91.0 mm	3.25 x 3.58 in	
	Displacement	1600	1,598 cm³	97.8 cuin	
		2000	1,955 cm³	119 cuin	
	Compression Ratio	1600	9.0 : 1		
		2000	8.9 : 1 (A20A4: KS) 9.1 : 1 (A20A1) 9.2 : 1 (A20A2) 8.8 : 1 (A20A3) 9.4 : 1 (A20A4)		
	Valve Train		Belt driven, single overhead camshaft		
	Lubrication System		Pressure Fed		
	Fuel Required	1600	LEADED REGULAR 91RON OR HIGHER (A16A1) UNLEADED REGULAR 91RON OR HIGHER (A20A1, A20A3) LEADED REGULAR 91RON OR HIGHER (A20A2, A20A4)		
		2000			
ENGINE (B20A)	Type		Water Cooled 4-cycle D.O.H.C.		
	Cylinder arrangement		4-cylinder in-line, transverse		
	Bore and stroke		81.0 x 95 mm	3.18 x 3.74 in	
	Displacement		1.959 cm³	120 cuin	
	Compression Ratio		9.5 : 1 (B20A2), 9.4 : 1 (B20A8)		
	Valve Train		Belt driven, double overhead camshaft		
	Lubrication System		Pressure Fed		
	Fuel Required		LEADED PREMIUM 97RON OR HIGHER (B20A2) LEADED PREMIUM 95RON OR HIGHER (B20A8)		
TRANSMISSION	Clutch	A/T	Three element, one stage, two phase		
		M/T	Single dry plate, diaphragm spring		
	Transmission	A/T	Torque converter with lock up clutch		
		M/T	Synchromesh 5 forward speed, 1 reverse		

	A16A, A20A	A16A1	A20A1KS A20A2 A20A3 A20A4	A20A1 A20A2KS A20A4KS	B20A	NOTE
	5MT	AT	AT	AT	MT	
Primary Reduction	1.000	1.000	1.000	1.000	1.000	*1 A20A3 KX 1.208
Gear Ratio I	3.181	2.421	2.529	2.529	3.166	A20A3 KX
II	1.842	1.560	1.481	1.481*2	1.857*5	*2 1.428
III	1.250*1	0.969	1.060	1.030*3	1.259*6	*3 1.060
IV	0.937	0.729	0.743	0.700*4	0.967	*4 0.743
V	0.771	—	—	—	0.794	B20A8 KX
Reverse	3.000	1.955	1.904	1.904	3.000	*5 1.772
Final	4.066	3.933	4.066	4.066	4.066	*6 1.185

Clutch Facing Area	1600	160 cm²	24.8 sq. in	
	2000	176 cm³	27.3 sq. in	

	ITEMS		METRIC	ENGLISH	NOTE
STEERING SYSTEM	Type	Manual Steering	Rack and Pinion		
		Power Steering	Power assisted Rack and Pinion integral		
	Overall Ratio	Manual Steering	19.4		
		Power Steering	18.1		
	Turns, lock-to-lock	Manual Steering	3.78		
		Power Steering	3.52		
	Steering Wheel Dia.		375 mm	14.76	
	Power Steering Oil Tank Capacity	Reservoir	0.5 ℓ	0.53 US. qt., 0.44 Imp. qt.	
		At change	approx. 1.7 ℓ	1.8 US. qt., 1.5 Imp. qt.	
	Power Steering Oil		Honda Genuine power steering fluid		
SUSPENSION SYSTEM	Type, F		Double Wishbone		
	Type, R		Double Wishbone		
	Shock Absorber F/R		Telescopic hydraulic		
WHEEL ALIGNMENT	Wheel Alignment				
	Camber	Front	0°		
		Rear	0°		
	Caster	Front	0°30′		
	Toe	Front	0 mm	0.0 in.	
		Rear	0 mm	0.0 in.	
BRAKE SYSTEM	Type, F		Self-adjusting power assisted disc brake type		
	Type, R		Drum *1		*1 Disc for EX 2.0i and cans equipped with Anti-Lock Brake.
	Pad Surface Area (Front)	1.6 ℓ and 2.0 ℓ (EX.EC)	50.0 cm²	7.8 sq in	
		2.0 ℓ (EC)	43.3 cm²	6.7 sq in	
	Pad/Lining Surface Area (Rear)	1.6 ℓ/2.0 ℓ	21 (disc)/ 67.2 (drum) cm²	13.3 (disc)/ 10.4 (drum) sq in	
	Effective Disc Dia.		194/214 mm	7.6/8.4 in	
	Effective Brake Drum I.D.		200 mm	7.9 in	
	Parking Brake Type		Mechanical expanding, Rear two wheel brakes*2		*2 Mechanical to rear disc for equipped with Disc Brake.
TIRES	F/R		**165SR13, 165R13 82S, 185/70R13 85S, 185/65R14 85H, 195/60R14 85H, 195/60VR14 T135/70D15***		* Standard for some types.
		Spare			
ELECTRICAL SYSTEM	Battery		12V—50AH (Cold cranking current −17.7°C [0°F] 410A)		
	Starting Motor		12V—1.0/1.4KW		
	Generator		12V—65AH		
	Fuses		7.5A, 10A, 15A, 20A, 30A		
	Main Fuse		70A, 40A		
	Headlights		12V—60/55W		
	Turn signal lights	Front	12V—21W		
		Rear	12V—21W		
		Side	12V—5W		
	License Plate Lights		12V—5W		
	Back-up Lights		12V—21W		
	Stop Lights		12V—21W		
	Tail Lights		12V—5W		
	Rear Fog Light		12V—21W		

(cont'd)

Design Specifications (cont'd)

KQ Model

NOTE: Only the design specifications for models below different from those of the European model are listed. For the other items not given here, refer to the European Model design specification.

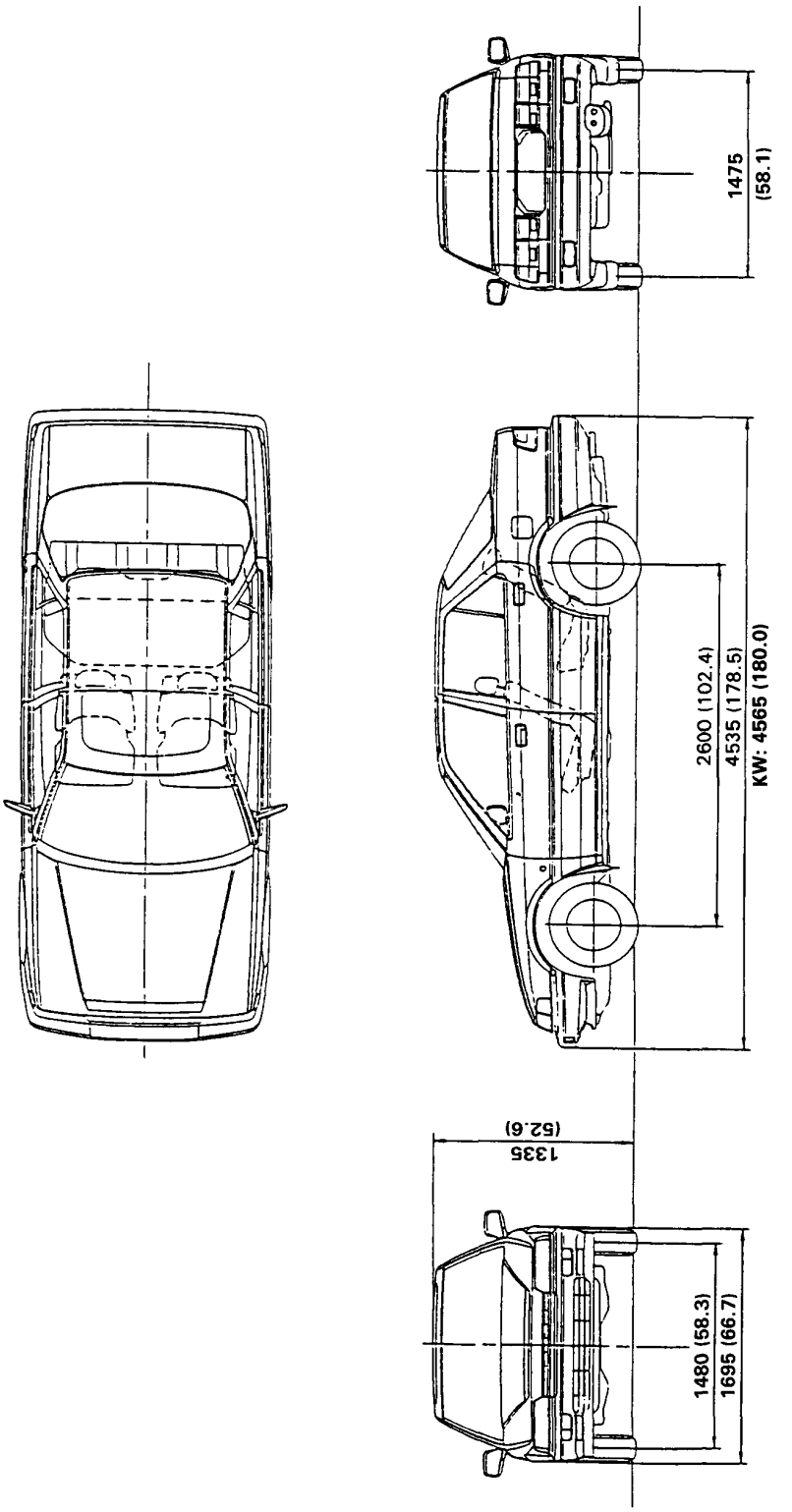
	ITEMS	METRIC	ENGLISH	NOTE
WEIGHT	Curb weight			
On cars equipped	(M/T) 3D EX (A20A2)	1,129 kg	2,489 lb	
with air condi-	2.0Si (A20A4)	1,134 kg	2,500 lb	
tioner, add 22 kg	4D EX (A20A2)	1,139 kg	2,511 lb	
(49 lb)		1,157 kg	2,551 lb	S/R
	2.0Si (A20A4)	1,148 kg	2,531 lb	
		1,166 kg	2,571 lb	S/R
	(A/T) 3D EX (A20A2)	1,149 kg	2,533 lb	
	2.0Si (A20A4)	1,154 kg	2,544 lb	
	4D EX (A20A2)	1,159 kg	2,555 lb	
		1,177 kg	2,595 lb	S/R
	2.0Si (A20A4)	1,168 kg	2,575 lb	
		1,186 kg	2,615 lb	S/R
On cars equipped	Weight Distribution (F/R)			
with air condi-	(M/T) 3D EX (A20A2)	675/454 kg	1,488/1,001 lb	
tioner, add 24/−2	2.0Si (A20A4)	681/453 kg	1,501/999 lb	
kg (53/−4 lb)	4D EX (A20A2)	678/461 kg	1,495/1,016 lb	
		687/470 kg	1,515/1036 lb	S/R
	2.0Si (A20A4)	685/463 kg	1,510/1,021 lb	
		694/472 kg	1,530/1,041 lb	S/R
	(A/T) 3D EX (A20A2)	695/454 kg	1,532/1,001 lb	
	2.0Si (A20A4)	701/453 kg	1,545/999 lb	
	4D EX (A20A2)	698/461 kg	1,539/1,016 lb	
		707/470 kg	1,559/1,036 lb	S/R
	2.0Si (A20A4)	705/463 kg	1,554/1,021 lb	
		714/472 kg	1,574/1,042 lb	S/R
ENGINE	*Compression ratio*	A20A2 9.1 A20A4 8.8		
TRANSMISSION	Clutch A/T	Three element one stage two phase.		
	M/T	Single dry plate, diaphragm spring.		
	Transmission A/T	Torque Converter with lock up clutch.		
	M/T	Synchromesh 5 forward speed. 1 reverse		
	Primary Reduction	1.000		
	Gear Ratio I	3.181 <2.529>		
	< >: A/T II	1.842 <1.481>		
	III	1.250 <1.060>		
	IV	0.937 <0.743>		
	V	0.771 ——		
	Reverse	3.000 <1.904>		
	Final	4.066 <4.066>		
TIRES	Tire size F/R EX	185/70 R13 86T		Optional 185/70 HR13
	2.0Si	185/70 R13 86H		
ELECTRICAL SYSTEM	Starting Motor Battery	12 V−1.0 KW 12 V−40 AH		

S/R: Cars equipped with sunroof.

Body Specifications

4D Sedan

Unit: mm (in.)

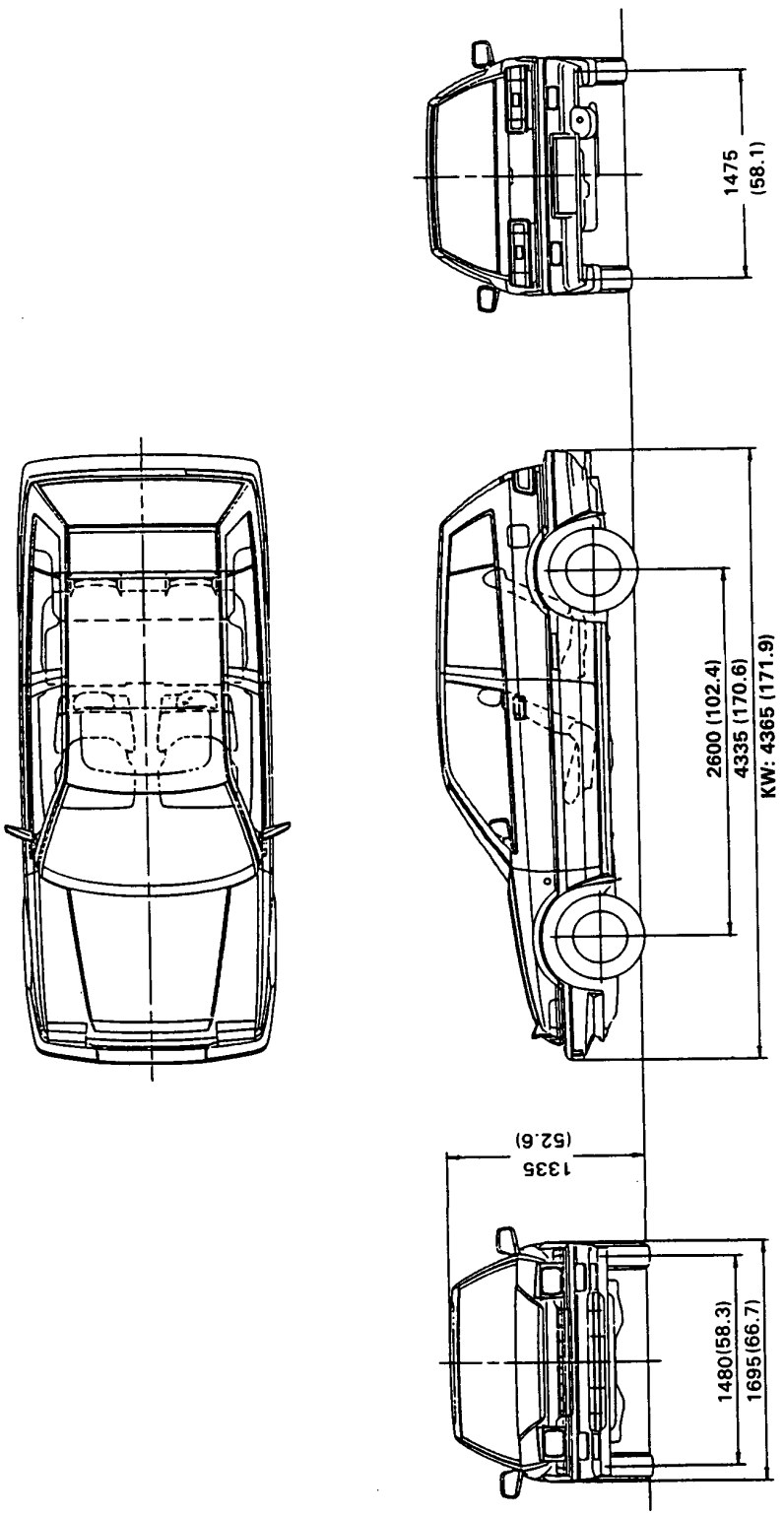


(cont'd)

Body Specifications (cont'd)

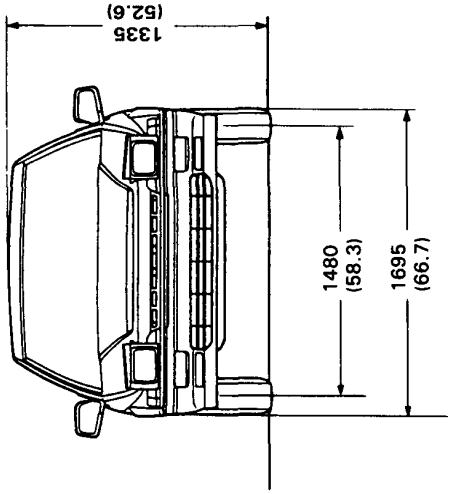
Aerodeck

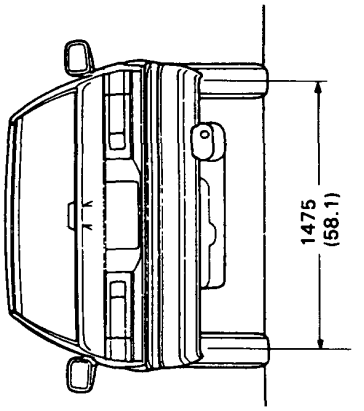
Unit: mm (in.)

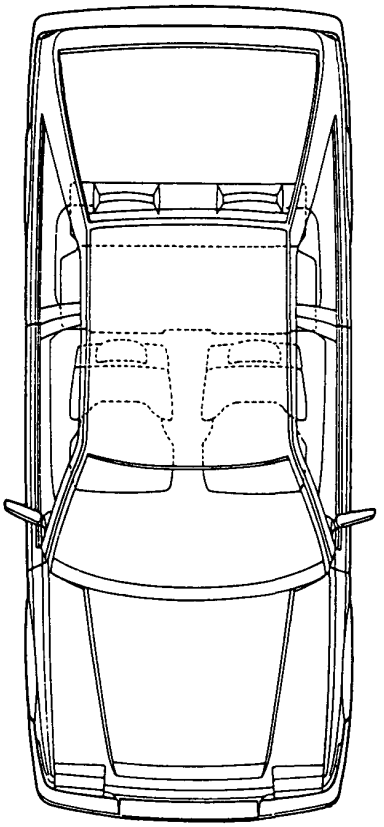


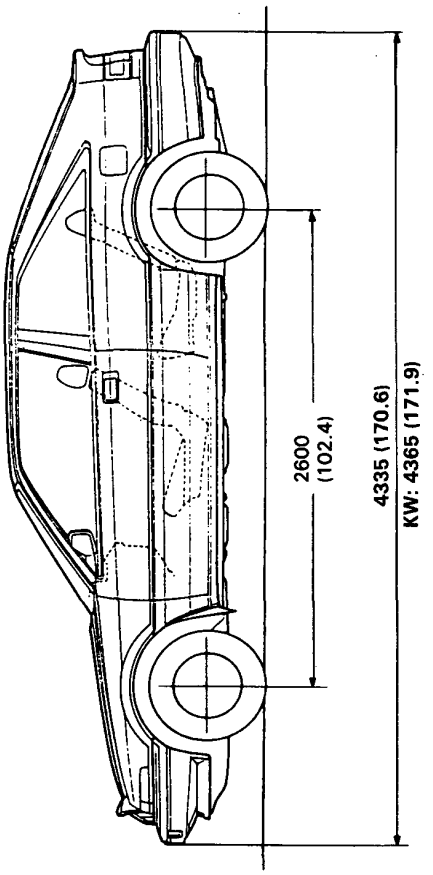
Glass Back

Unit: mm (in.)

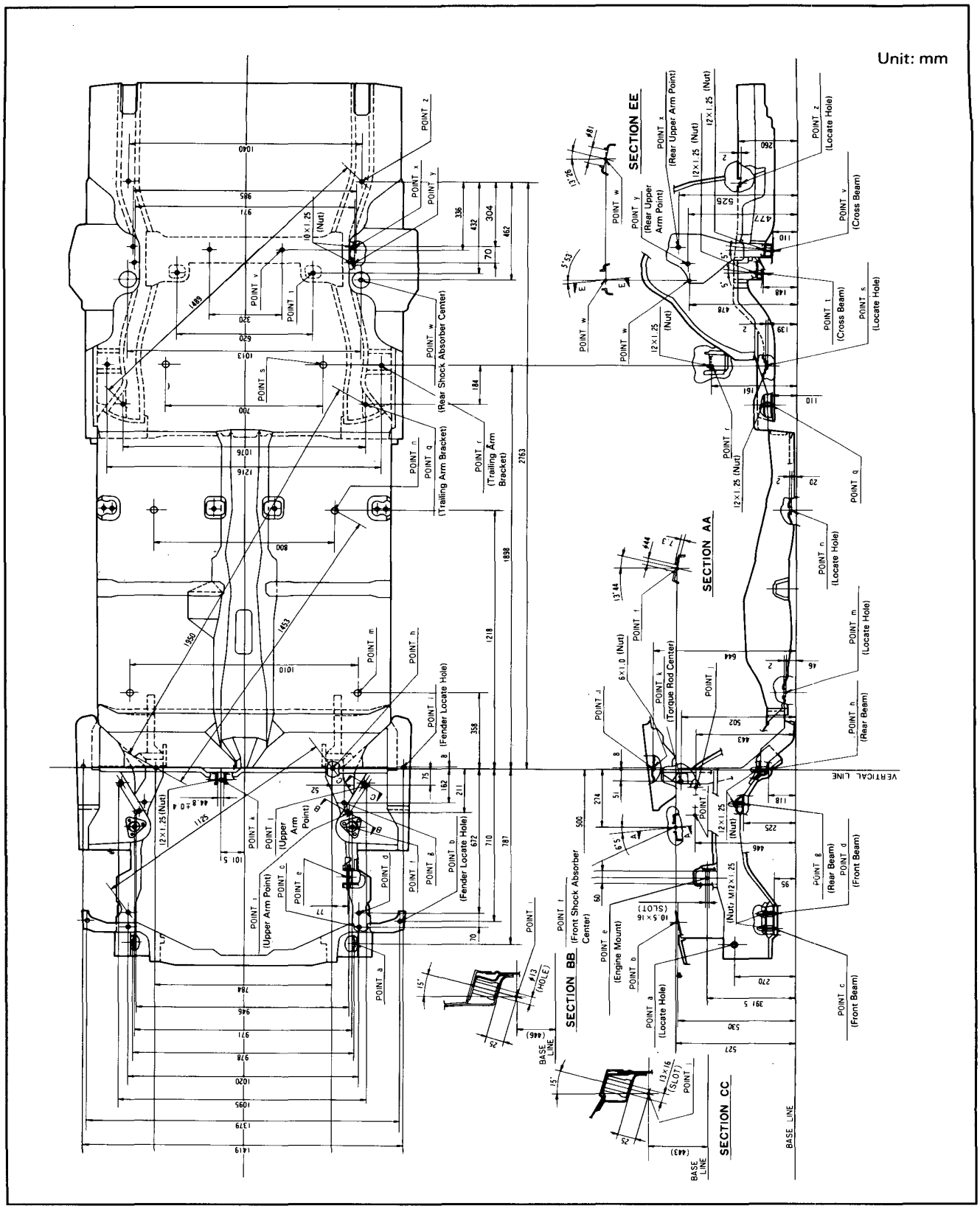








Frame Repair Chart

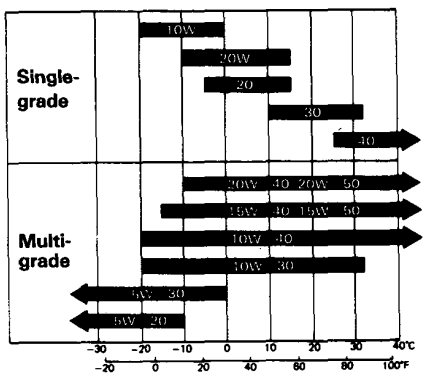


Maintenance

Lubrication Points

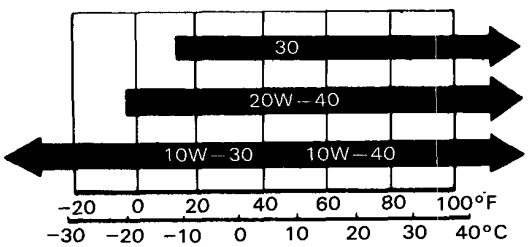
No	LUBRICATION POINTS		LUBRICANT
1	Engine		API Service Grade: SE or SF SAE Viscosity: See chart below
2	Transmission	Manual Automatic	API Service Grade: SE or SF SAE30, 10W—30, 10W—40 or 20W—40 grade oil DEXRON® or DEXRON® II Automatic transmission fluid
3	Brake reservoir		Brake fluid DOT 3
4	Steering gearbox (Power)		Honda steering grease P/N 08704—99969
4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27	Steering gearbox (Manual) Steering ball joint Suspension ball joints Front upper arm Steering Boot Shift lever pivot (Manual) Steering column bushings Horn contact Shift rod clevis bushings Select lever (Automatic) Pedal linkage Throttle cable end Brake master cylinder push rod Rear caliper Tailgate hinges (Hatchback) Trunk hinges (Sedan) Door hinges upper and lower Door opening detents Fuel filler lid Engine hood hinges Engine hood latch Tilt lever Select lever (Automatic) Retractable complete		Multipurpose Grease
28 29 30	Rear brake shoe linkage Caliper	Piston seal Dust seal Caliper pin Piston	Silicone Grease
31	Power steering reservoir		Honda power steering fluid P/N 08208—99961

Recommended Engine Oil (SE or SF Grade only)

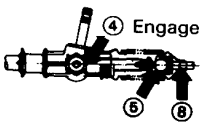


Engine oil viscosity for ambient temperature ranges.

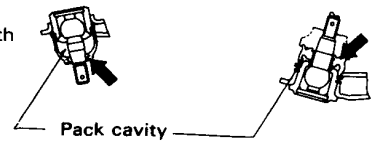
Recommended Manual Transmission Oil



Transmission oil viscosity for ambient temperature ranges.

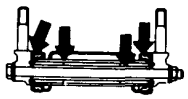


④ STEERING GEARBOX
⑤ STEERING BALL JOINT
⑧ STEERING BOOT

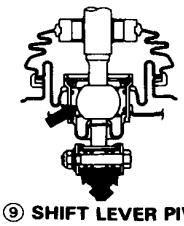


⑥ FRONT SUSPENSION BALL JOINTS

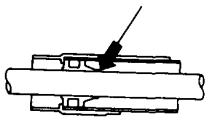
⑥ REAR SUSPENSION BALL JOINTS



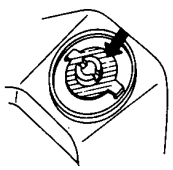
⑦ FRONT UPPER ARM



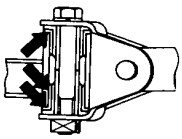
⑨ SHIFT LEVER PIVOT



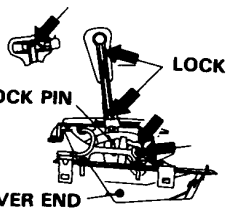
⑩ STEERING COLUMN BUSHING



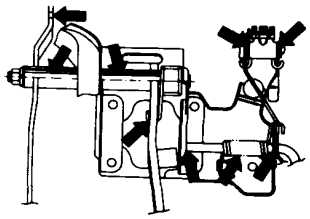
⑪ HORN CONTACT



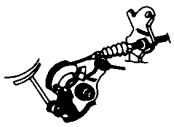
⑫ SHIFT ROD CLEVIS BUSHINGS



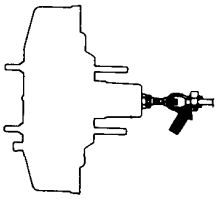
⑬ SELECT LEVER



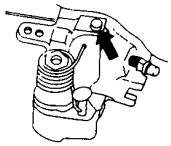
⑭ PEDAL LINKAGE



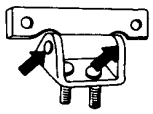
⑮ THROTTLE CABLE END



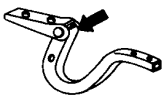
⑯ BRAKE MASTER CYLINDER PUSH ROD



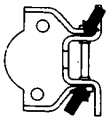
⑰ REAR CALIPER



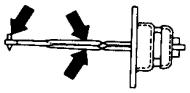
⑱ TAILGATE HINGES



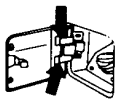
⑲ TRUNK HINGES



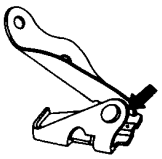
⑳ DOOR HINGES



㉑ DOOR OPENING DETENTS

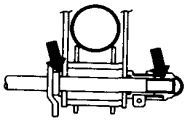


㉒ FUEL FILLER LID



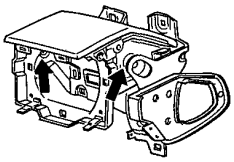
㉓ ENGINE HOOD HINGES

㉔ ENGINE HOOD LATCH

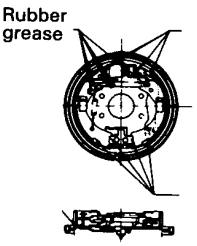


㉕ TILT LEVER

㉖ SERECT LEVER



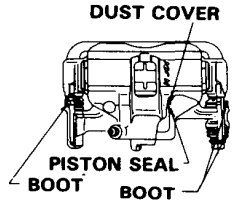
㉗ RETRACTABLE COMPLETE



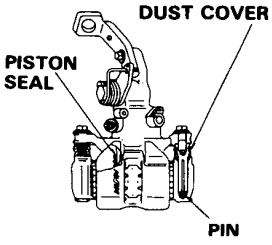
㉘ REAR BRAKE

㉙ FRONT CALIPER

㉙ FRONT CALIPER



㉙ FRONT CALIPER



㉚ REAR CALIPER

Maintenance Schedule

	ITEMS	SERVICE AT THE INTERVAL OF LISTED KM (MILES) OR MONTHS, WHICHEVER OCCURS FIRST.				
		x 1,000 km	20	40	60	80	100
		x 1,000 miles	12	24	36	48	60
		months	12	24	36	48	60
	IDLE SPEED AND IDLE CO		I	I	I	I	I
	VALVE CLEARANCE		I	I	I	I	I
	ALTERNATOR DRIVE BELT			I		I	
■	ENGINE OIL AND OIL FILTER		Replace every 10,000 km (6,000 miles) or 6 months				
■	TRANSMISSION OIL			R		R	
■	RADIATOR COOLANT					R*1	
	COOLING SYSTEM, HOSES AND CONNECTIONS			I		I	
	E.G.R. SYSTEM (For cars using unleaded gasoline)*7						I
	SECONDARY AIR SUPPLY SYSTEM (For carburetor type)*2						I
	AIR CLEANER ELEMENT*5		R	R	R	R	R
	AIR CLEANER ELEMENT*6			R		R	
	FUEL FILTER (Including aux. filter for carburetor type)			R		R	
	INTAKE AIR TEMP. CONTROL SYSTEM (For carburetor type)						I
	TANK, FUEL LINE AND CONNECTIONS			I		I	
	THROTTLE CONTROL SYSTEM (For carburetor type)			I		I	
	CHOKE MECHANISM (For carburetor type)			I		I	
	CHOKE OPENER OPERATION (For carburetor type)*3						I
	EVAPORATIVE EMISSION CONTROL SYSTEM*4						I
	IGNITION TIMING AND CONTROL SYSTEM			I		I	
	SPARK PLUGS (For cars using leaded gasoline)		R	R	R	R	R
	SPARK PLUGS (For cars using unleaded gasoline)			R		R	
	DISTRIBUTOR CAP AND ROTOR			I		I	
	IGNITION WIRING			I		I	
	CRANKCASE EMISSION CONTROL SYSTEM			I		I	
	BRAKE HOSES AND LINES (Including ALB hoses and pipes for ALB models)		I	I	I	I	I
	BRAKE FLUID (including ALB fluid for ALB models)			R		R	
	FRONT BRAKE DISCS AND CALIPERS		I	I	I	I	I
	FRONT BRAKE PADS		Inspect every 10,000 km (6,000 miles) or 6 months				
	REAR BRAKE DISCS, CALIPERS AND PADS (For disc type brakes)			I		I	
	REAR BRAKE DRUMS, WHEEL CYLINDERS AND LININGS (For drum type brakes)			I		I	
	PARKING BRAKE		I	I		I	
	CLUTCH RELEASE ARM TRAVEL		I	I	I	I	I
	EXHAUST PIPE AND MUFFLER		I	I	I	I	I
	SUSPENSION MOUNTING BOLTS		I	I	I	I	I
	FRONT WHEEL ALIGNMENT		I	I	I	I	I
	STEERING OPERATION, TIE ROD ENDS, STEERING GEAR BOX AND BOOTS		I	I		I	
	ALB HIGH PRESSURE HOSES					R	
	ALB OPERATION		I	I		I	
	POWER STEERING SYSTEM		I	I	I	I	I
	POWER STEERING PUMP BELT			I		I	
	CATALYTIC CONVERTER HEAT SHIELD (Cars equipped with Catalytic Converter)						I

R—Replace I—Inspect. After inspection, clean, adjust, repair or replace if necessary

■ *REMARK: These service intervals assume routine checking and replenishment has been done, as needed, by the customer.*

*1 Thereafter, replace every 2 years or 40,000 km (24,000 miles), whichever comes first.

*2 Only for cars using unleaded gasoline (KG, KW, KX, KS, KQ).

*3 Only for 2.0 ℓ model.

*4 Only for KQ, KY, KX, KS types and for KG, KW types using unleaded gasoline.

*5 Except KQ type and for European types.

*6 Only for KQ type and for European types.

*7 Only for KG, KW, KX, KS, KQ types using carbureted Engine and KG, KW, KX, KS using *Fuel-Injected Engine.*

CAUTION: The following items must be serviced more frequently on cars normally used under severe driving conditions. Refer to the chart below for the appropriate maintenance intervals.

"Severe driving conditions" include:

A: Repeated short distance driving
B: Driving in dusty conditions
C: Driving in severe, cold weather
D: Driving in areas using road salt or other corrosive materials
E: Driving on rough and/or muddy roads
F: Towing a trailer

R—Replace
I—Inspect. After inspection, clean, adjust, repair or replace if necessary.

Condition	Maintenance item	Maintenance operation	Interval
A B • • • F	Engine oil and oil filter	R	*Every 5,000 km (3,000 miles) or 3 months*
• • • • • F	Transmission oil	R	Every 20,000 km (12,000 miles) or 12 months
A B • D E F	Front brake discs and calipers	I	Every 10,000 km (6,000 miles) or 6 months
A B • D E F	Rear brake discs, calipers and pads *(Only for four wheel disc type brakes)*	I	*Every 20,000 km (12,000 miles) or 12 months*
A B C • E F	Clutch release arm travel	I	Every 10,000 km (6,000 miles) or 6 months
• B C • E •	Power steering system	I	Every 10,000 km (6,000 miles) or 6 months

Intake Manifold/Exhaust System

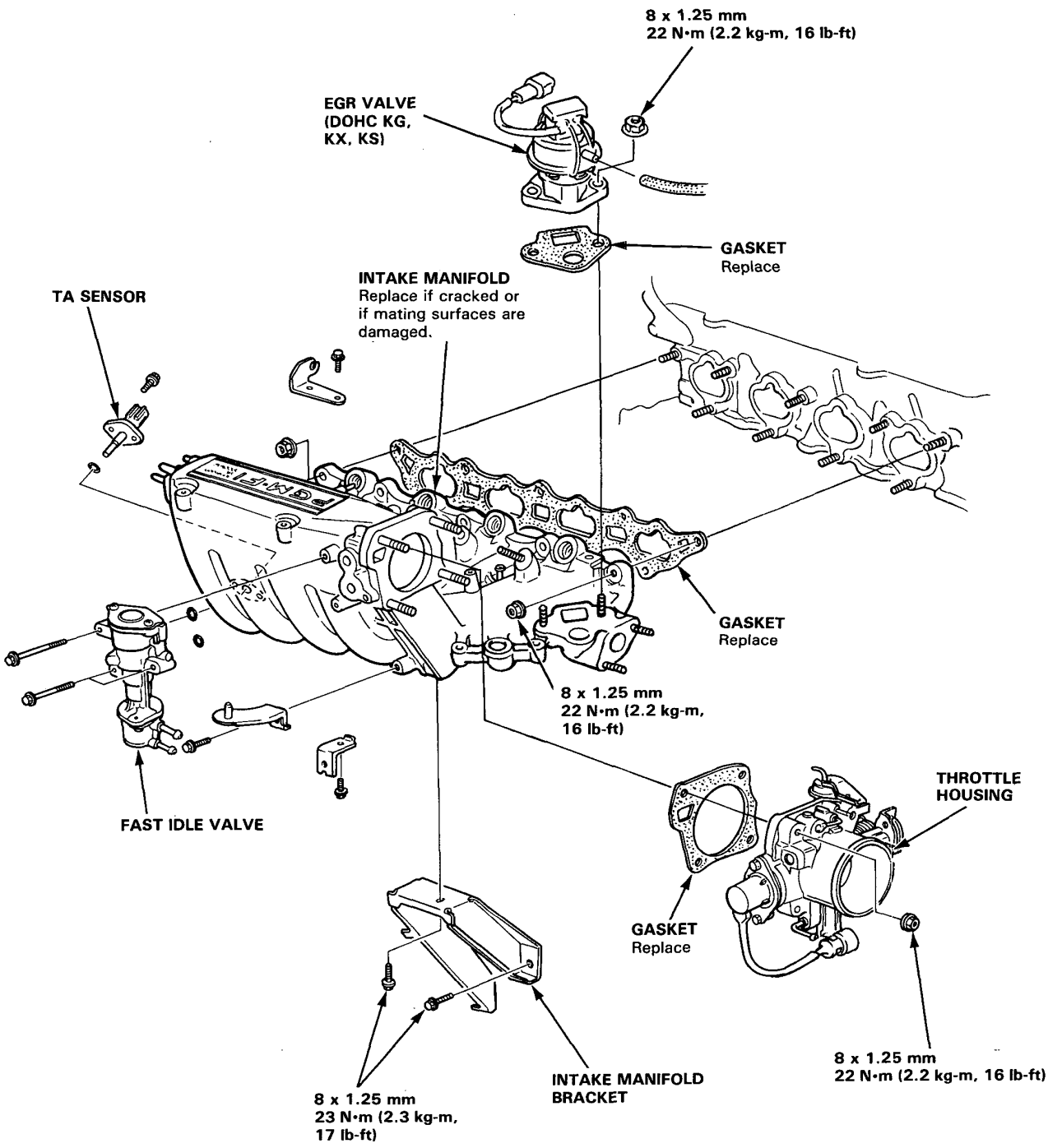
Outline of Model Changes

1. Replacement of the intake manifold have been changed for new application of the Fuel-Injected Engine and the Carbureted Engine.
2. Replacement of the exhaust manifold have been changed for new application of the Fuel-Injected Engine and the Carbureted Engine.

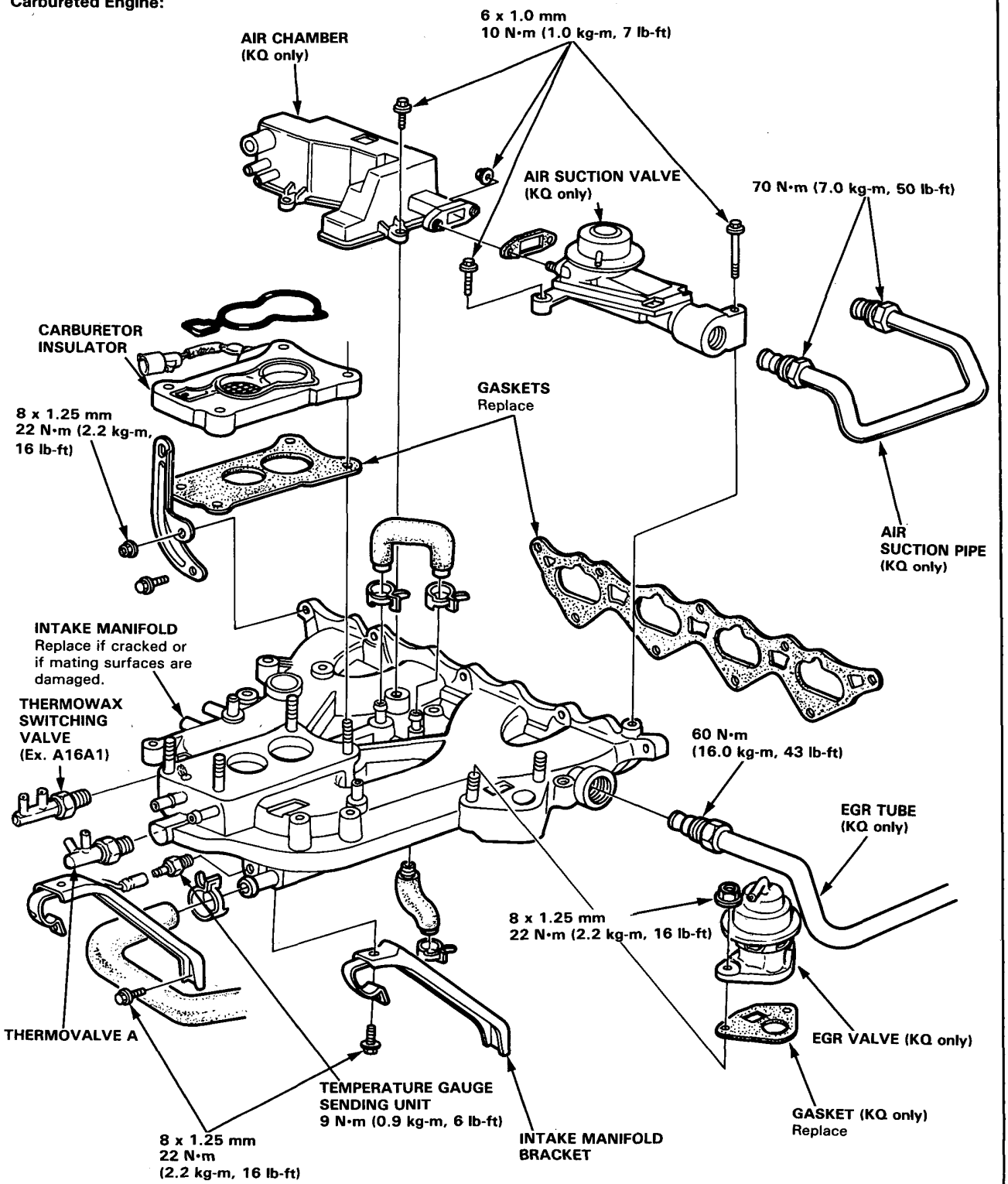
Intake Manifold

Replacement

Fuel-Injected Engine:



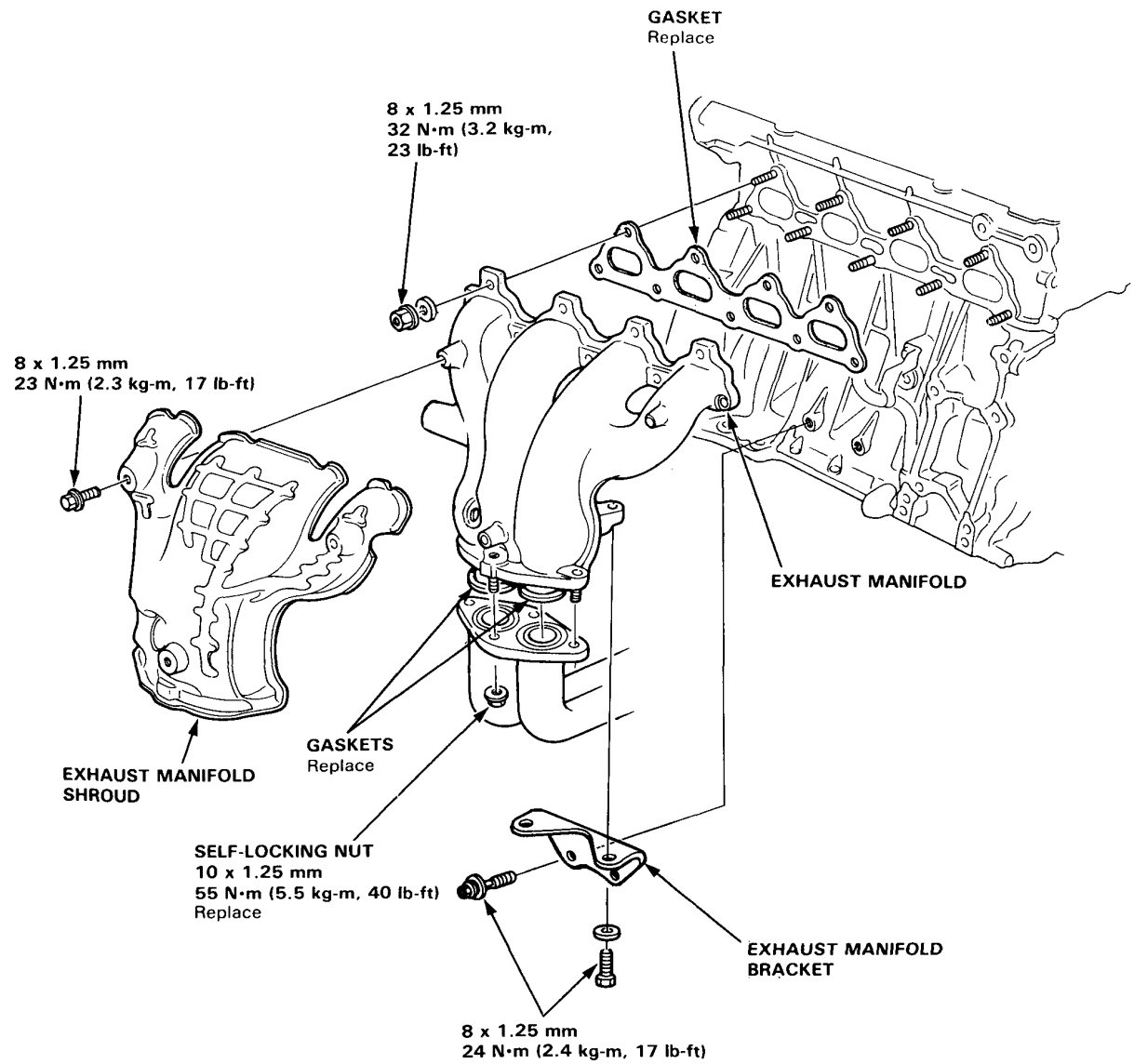
Carbureted Engine:



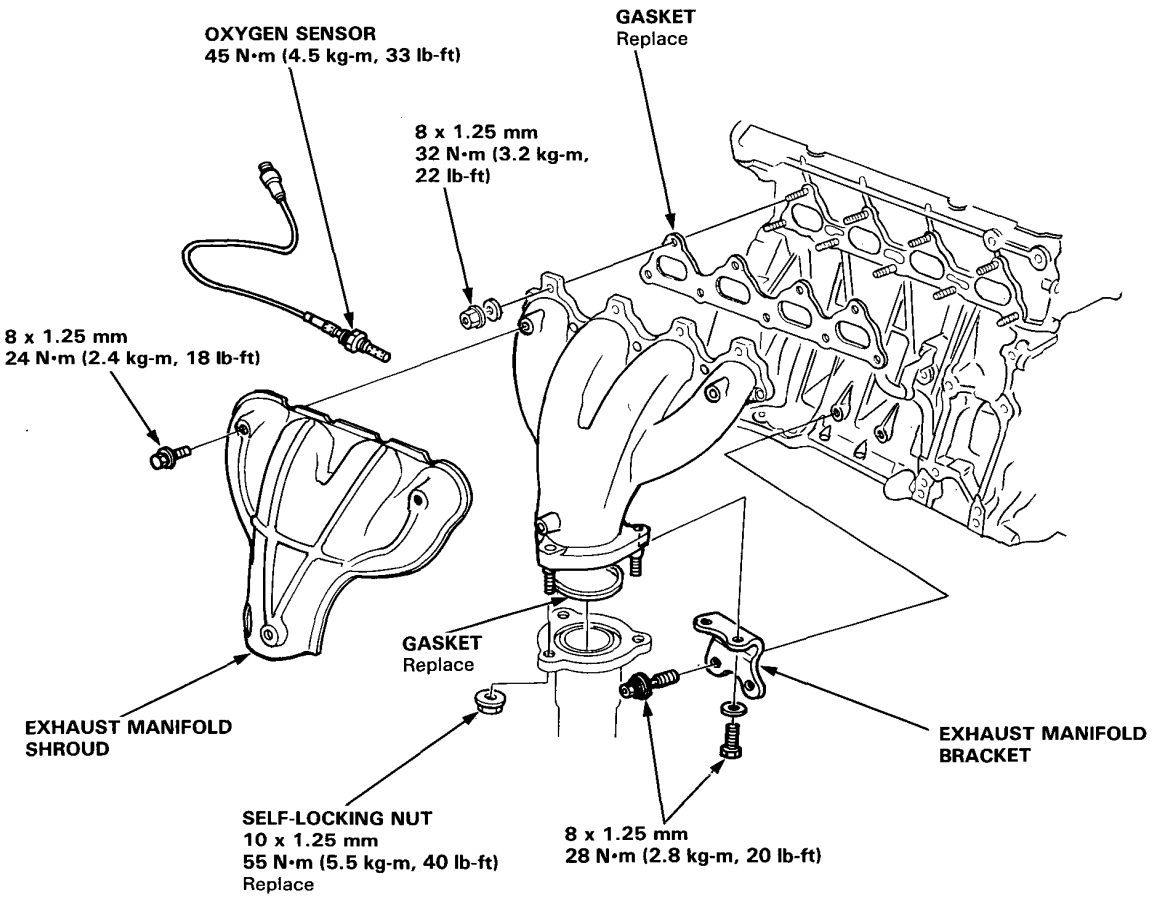
Exhaust Manifold

Replacement

B20A2 Engine:



B20A8 Engine:

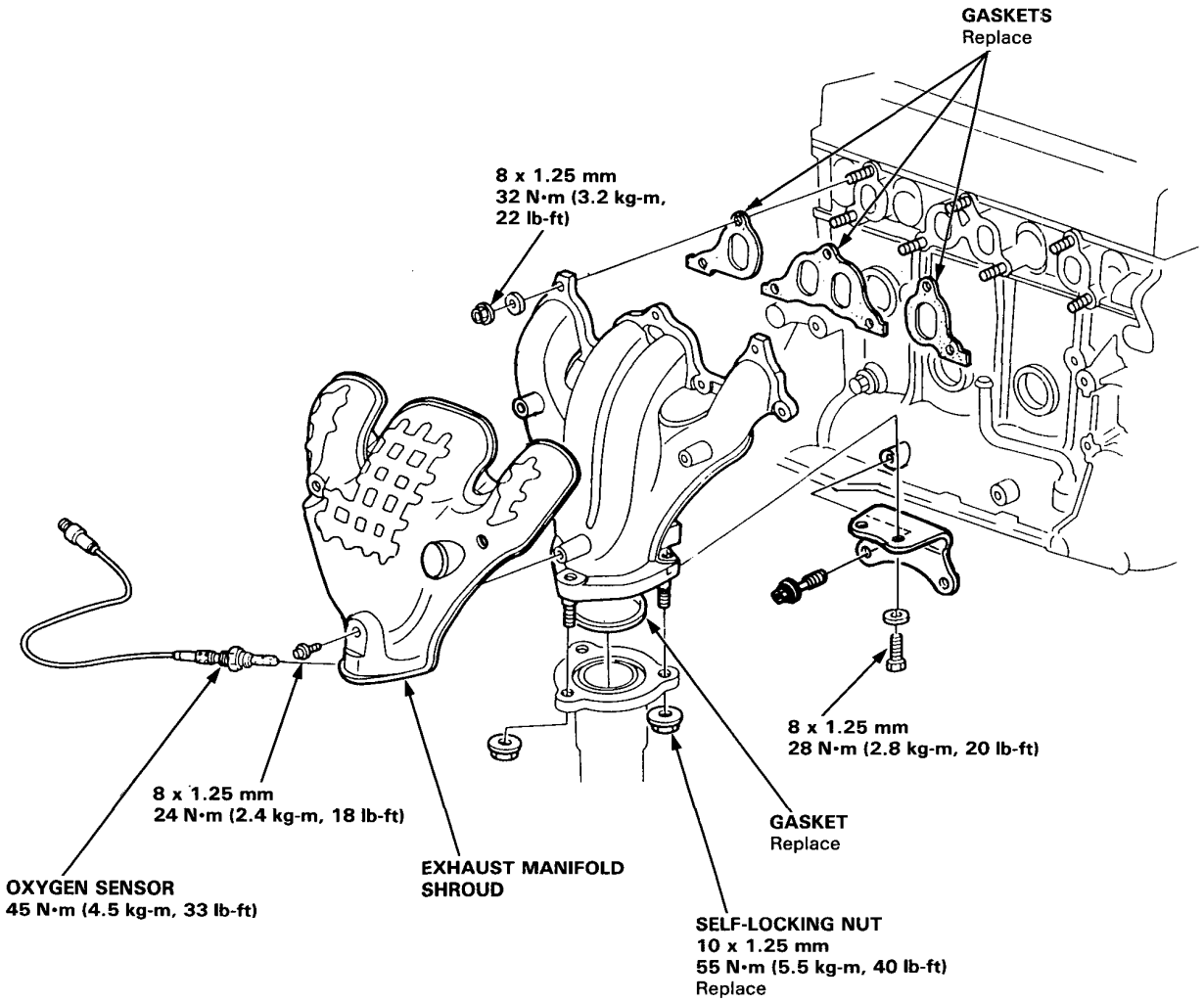


(cont'd)

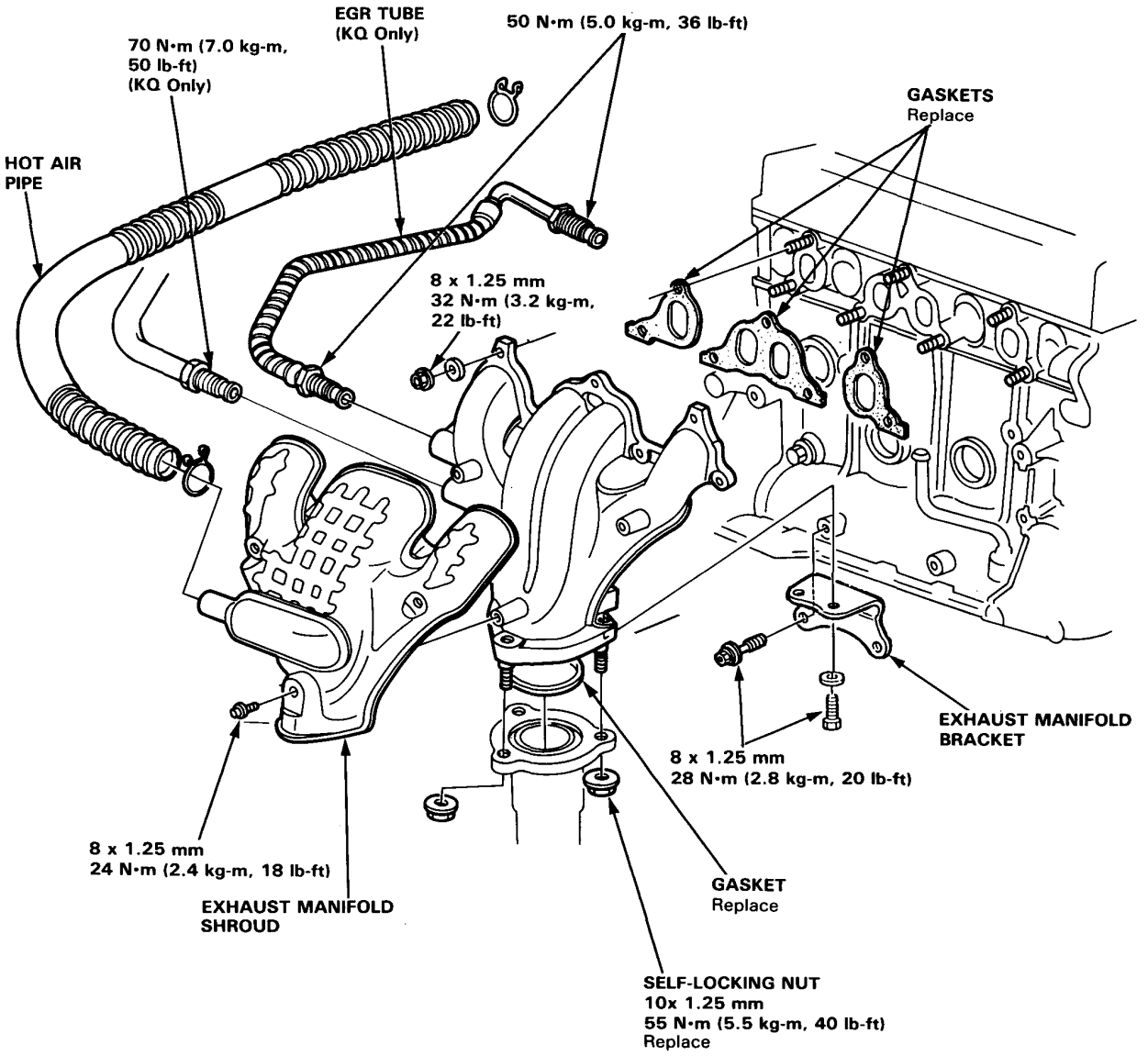
Exhaust Manifold

Replacement (cont'd)

A20A4 (KQ) Engine:



A16A1 Engine and A20A2 (KP, KQ, KT) Engine:



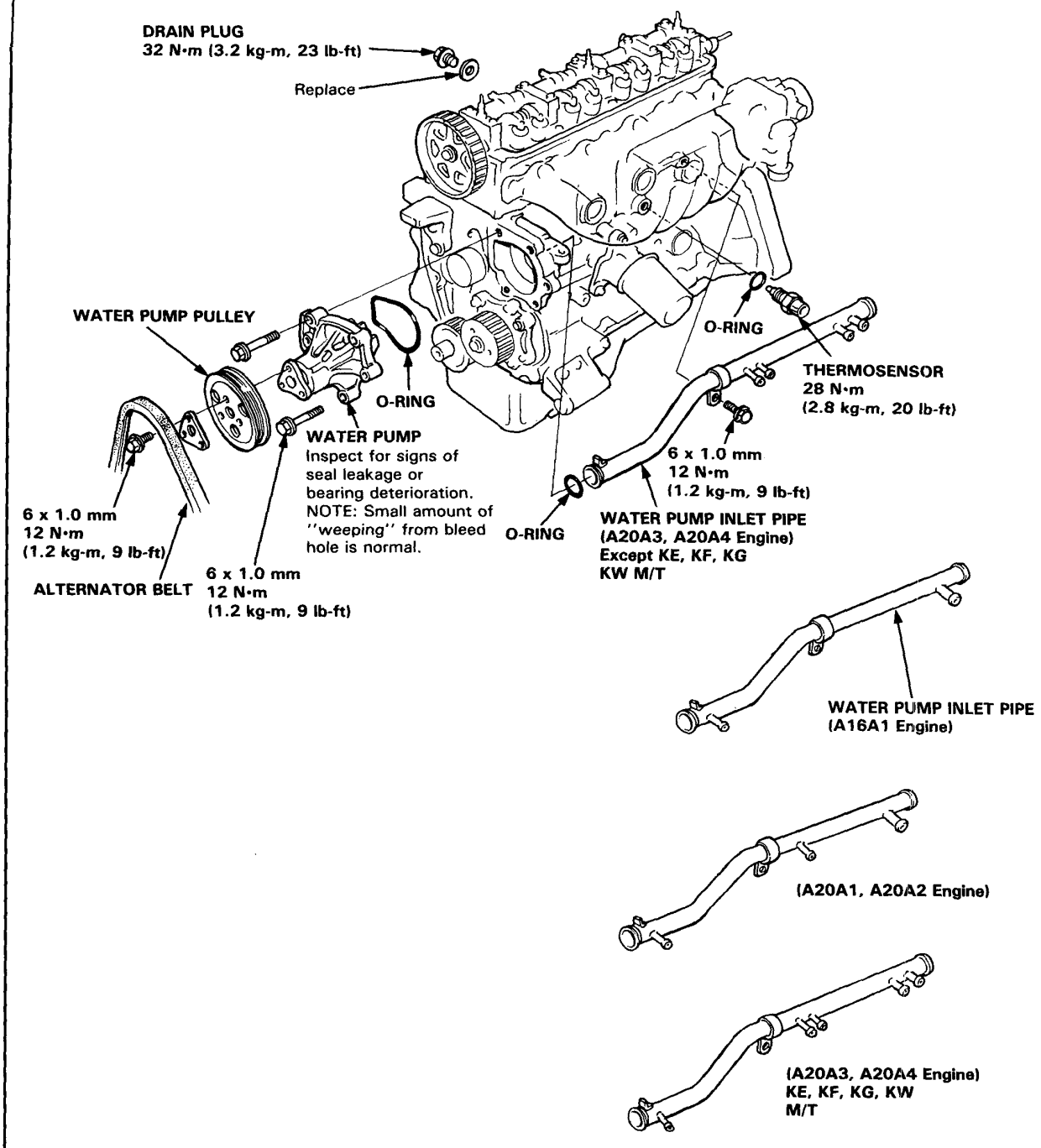
Cooling

Outline of Model Change

1. Replacement of the water pump have been changed for new application of the Fuel-Injected Engine and the Carbureted Engine.

Water Pump

Replacement

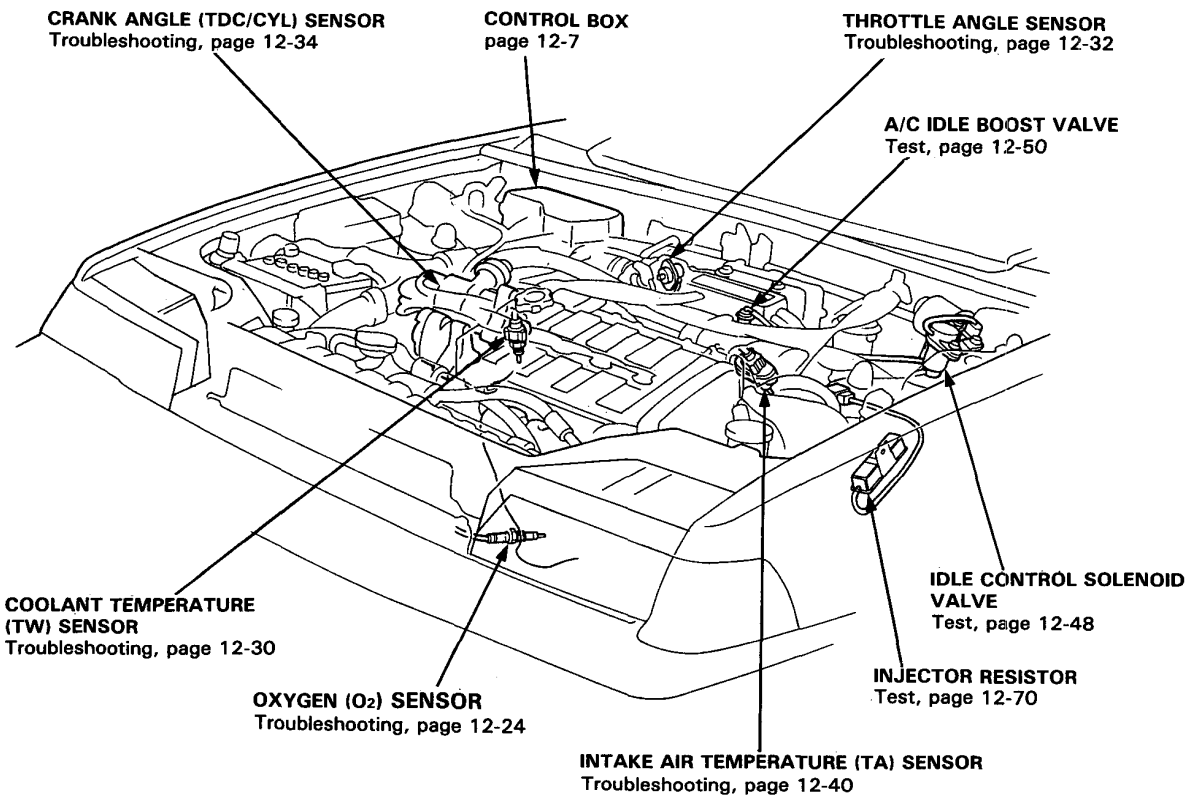


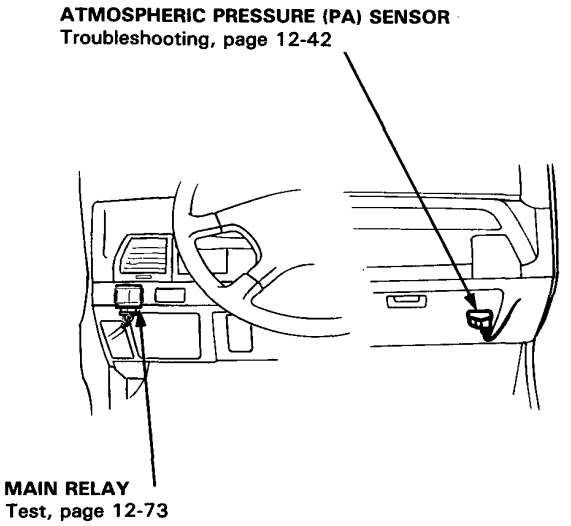
Fuel and Emissions

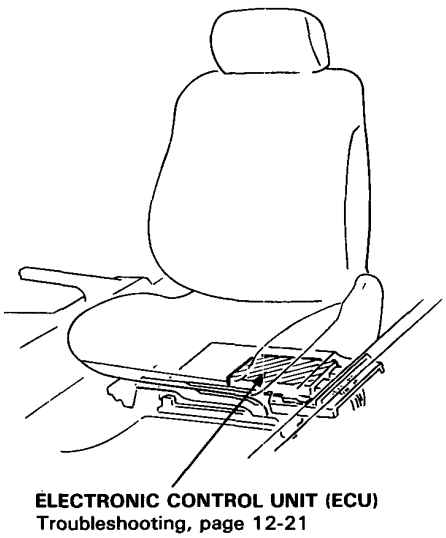
Fuel-Injected Engine (B20A8, A20A3)

Component Locations

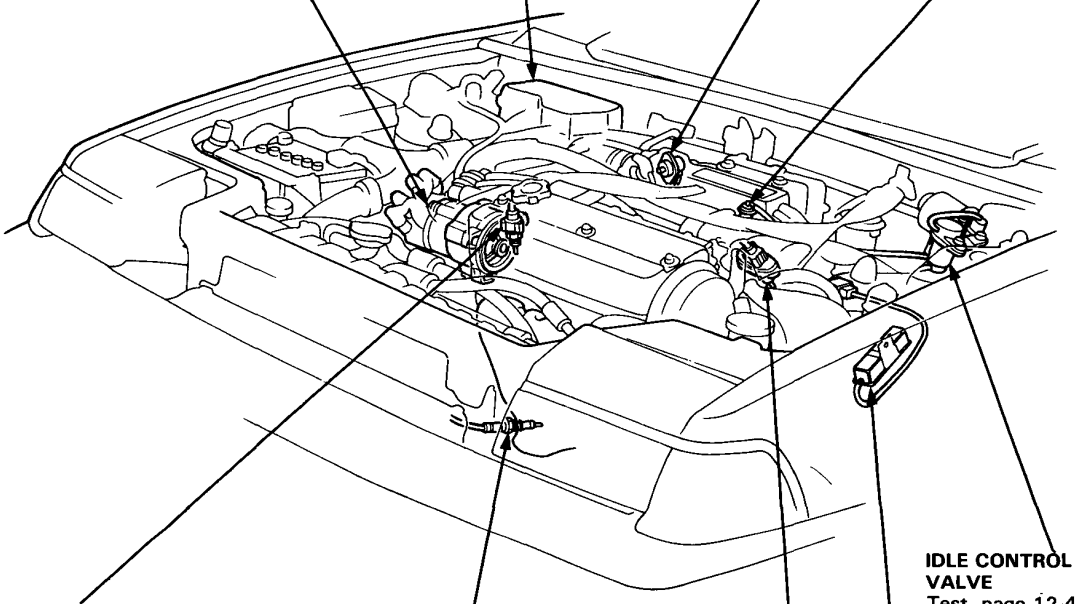
B20A8

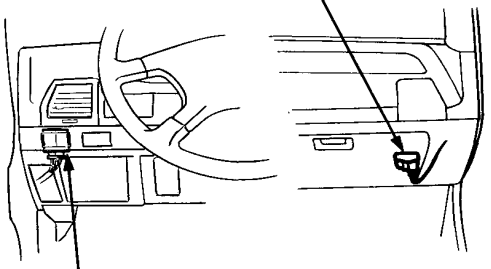


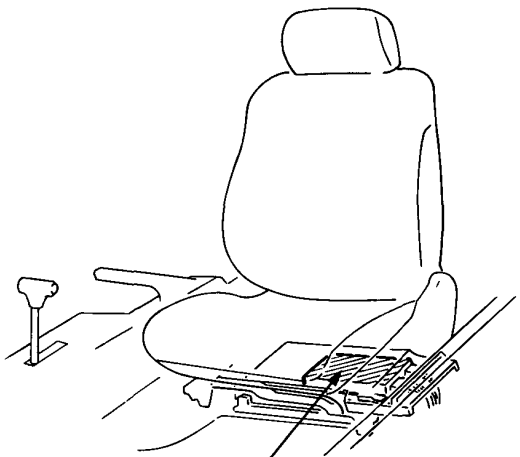




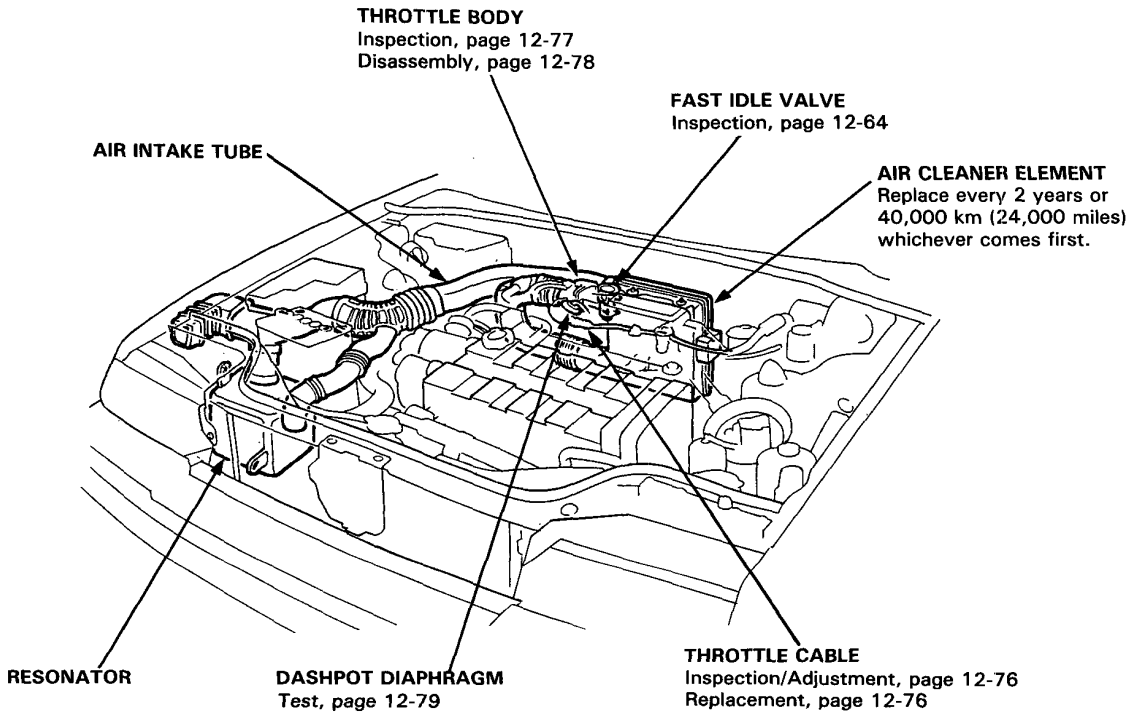
A20A3

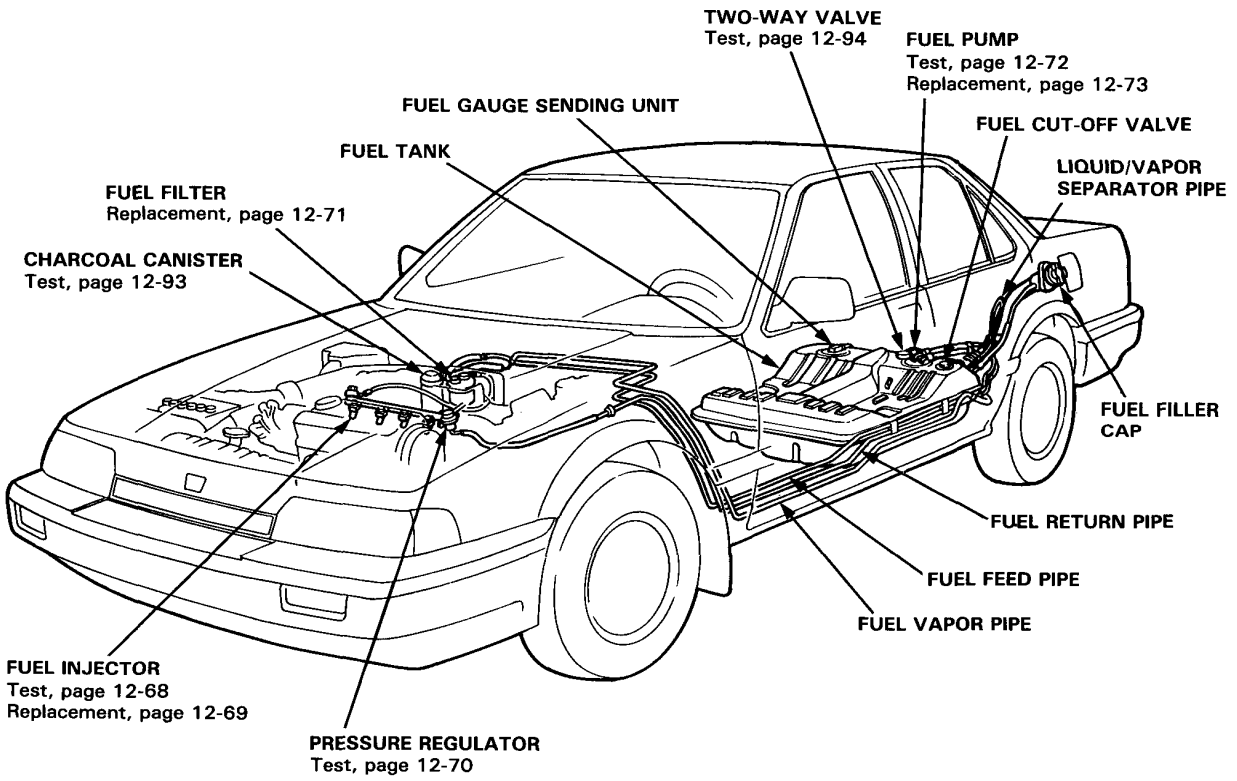

CRANK ANGLE (TDC/CYL) SENSOR
Troubleshooting, page 12-34
CONTROL BOX
page 12-9
THROTTLE ANGLE SENSOR
Troubleshooting, page 12-32
A/C IDLE BOOST VALVE
Test, page 12-50
IDLE CONTROL SOLENOID VALVE
Test, page 12-48
COOLANT TEMPERATURE (TW) SENSOR
Troubleshooting, page 12-30
OXYGEN (O_2) SENSOR
Troubleshooting, page 12-24
INJECTOR RESISTOR
Test, page 12-70
INTAKE AIR TEMPERATURE (TA) SENSOR
Troubleshooting, page 12-40


ATMOSPHERIC PRESSURE (PA) SENSOR
Troubleshooting, page 12-42
MAIN RELAY
Test, page 12-73


ELECTRONIC CONTROL UNIT (ECU)
Troubleshooting, page 12-21

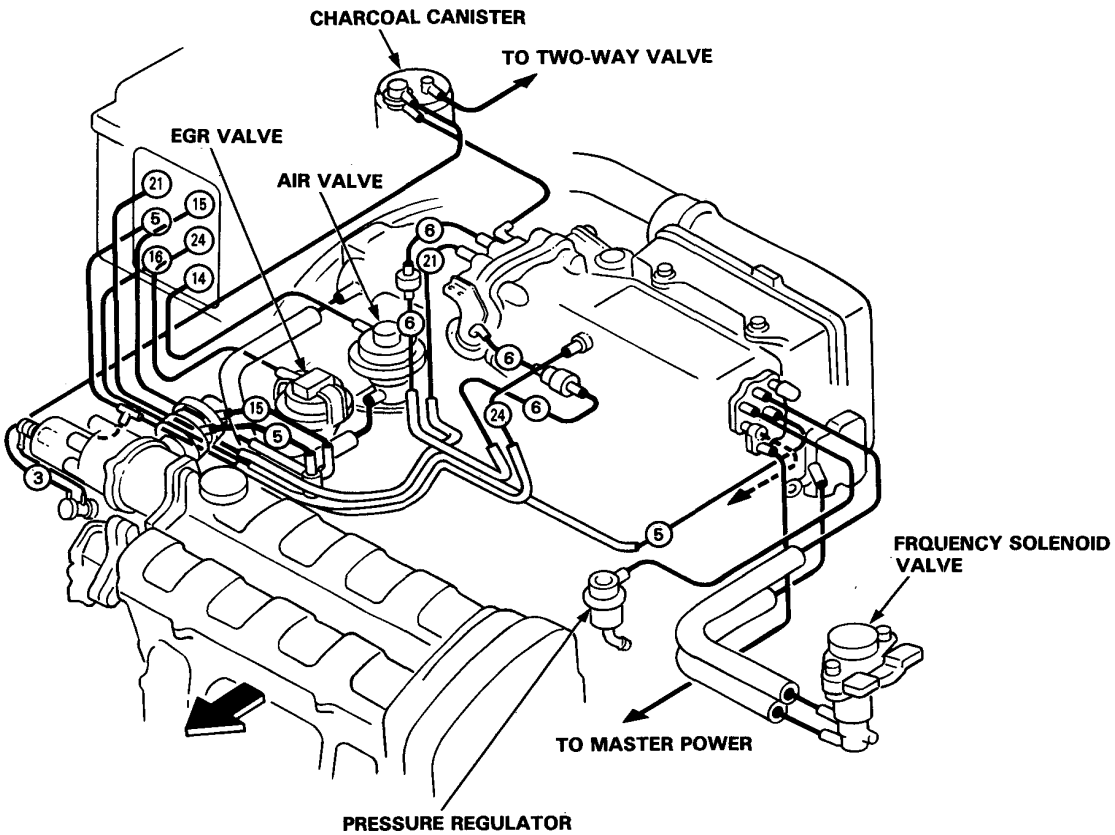
Component Locations



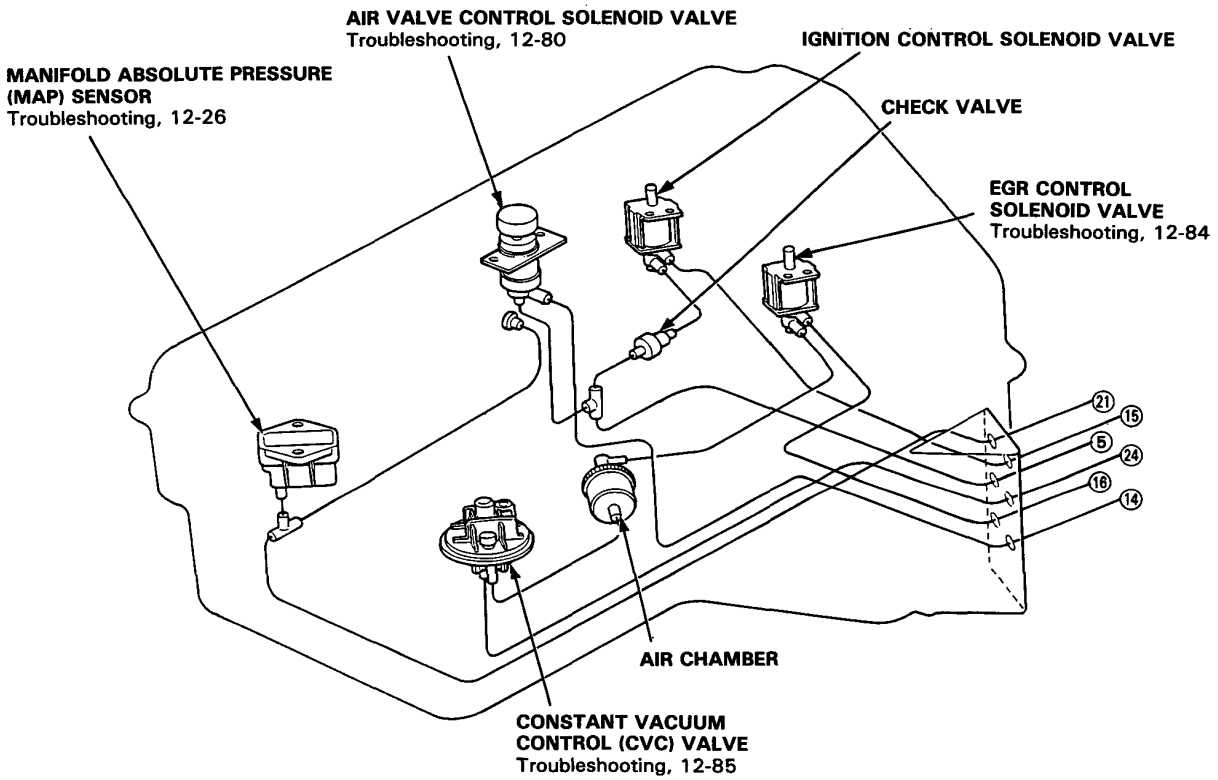

TWO-WAY VALVE
Test, page 12-94
FUEL PUMP
Test, page 12-72
Replacement, page 12-73
FUEL GAUGE SENDING UNIT
FUEL CUT-OFF VALVE
FUEL TANK
LIQUID/VAPOR
SEPARATOR PIPE
FUEL FILTER
Replacement, page 12-71
CHARCOAL CANISTER
Test, page 12-93
FUEL FILLER
CAP
FUEL RETURN PIPE
FUEL FEED PIPE
FUEL VAPOR PIPE
FUEL INJECTOR
Test, page 12-68
Replacement, page 12-69
PRESSURE REGULATOR
Test, page 12-70

Vacuum Connections

B20A8

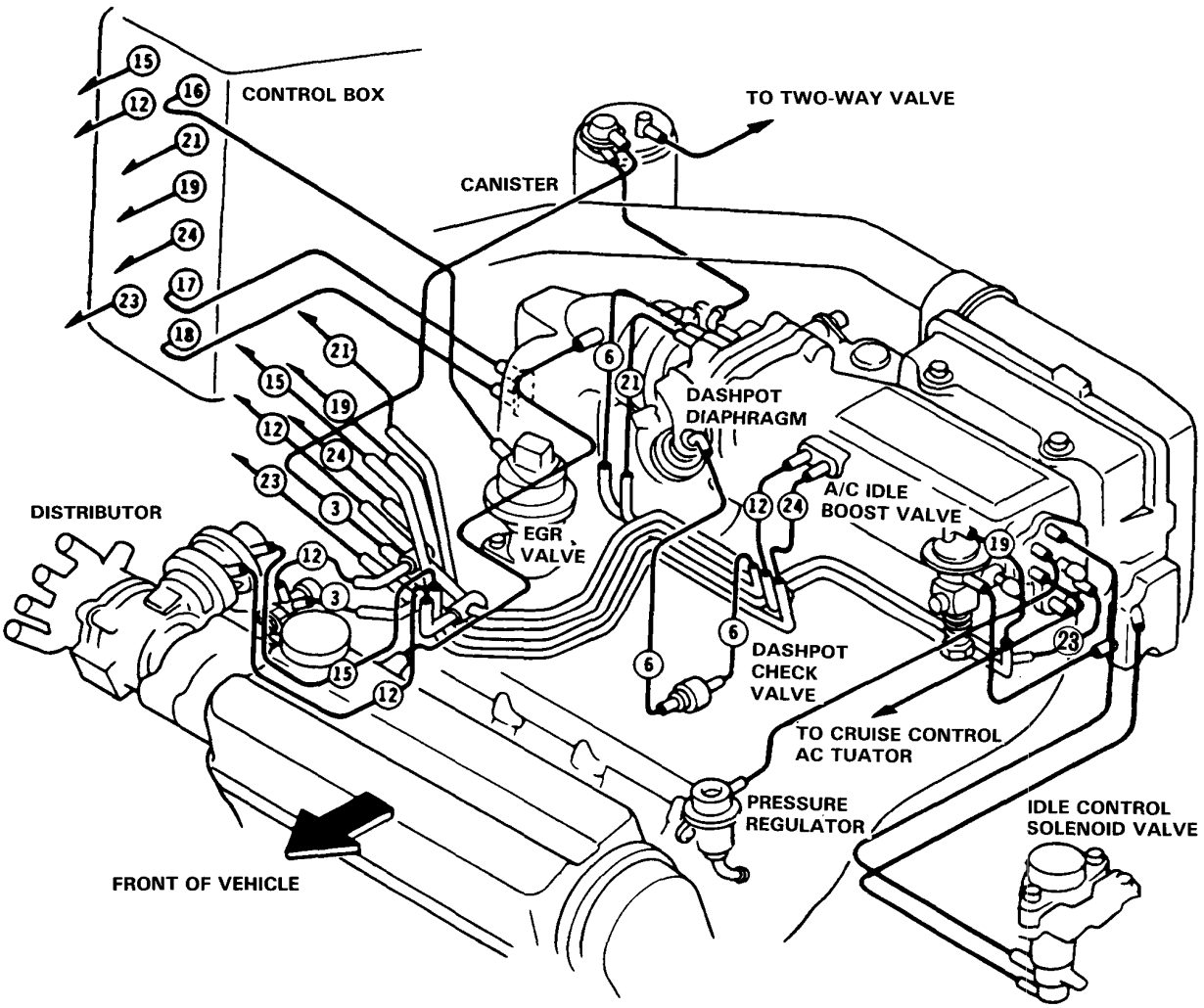


B20A8

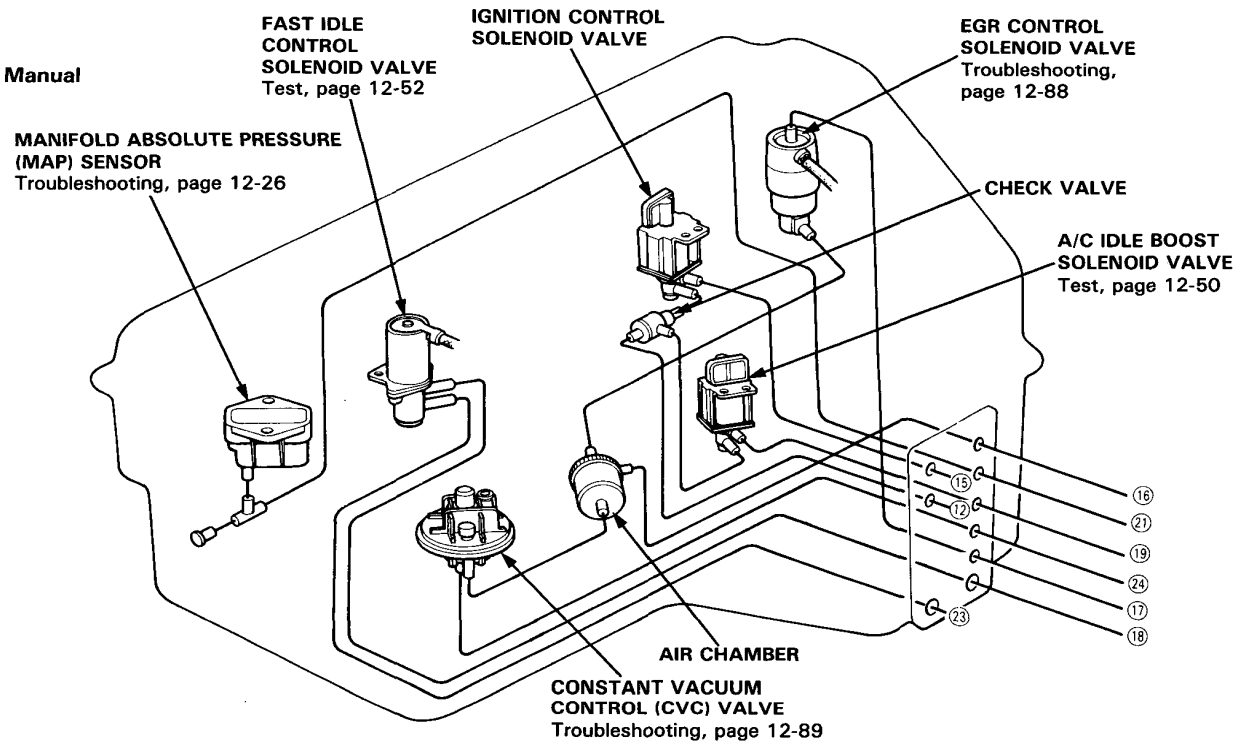

AIR VALVE CONTROL SOLENOID VALVE
Troubleshooting, 12-80
IGNITION CONTROL SOLENOID VALVE
MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR
Troubleshooting, 12-26
CHECK VALVE
EGR CONTROL SOLENOID VALVE
Troubleshooting, 12-84
21
15
5
24
16
14
AIR CHAMBER
CONSTANT VACUUM CONTROL (CVC) VALVE
Troubleshooting, 12-85

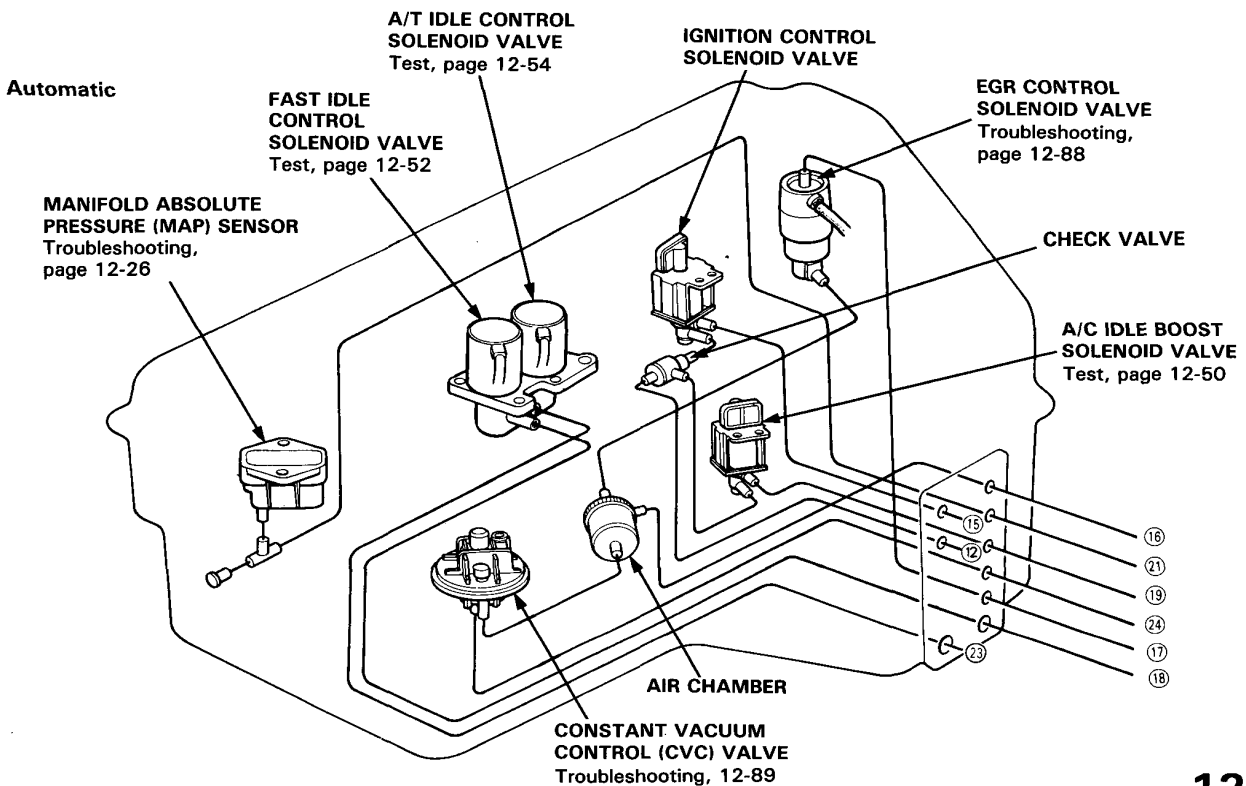
Vacuum Connections

A20A3



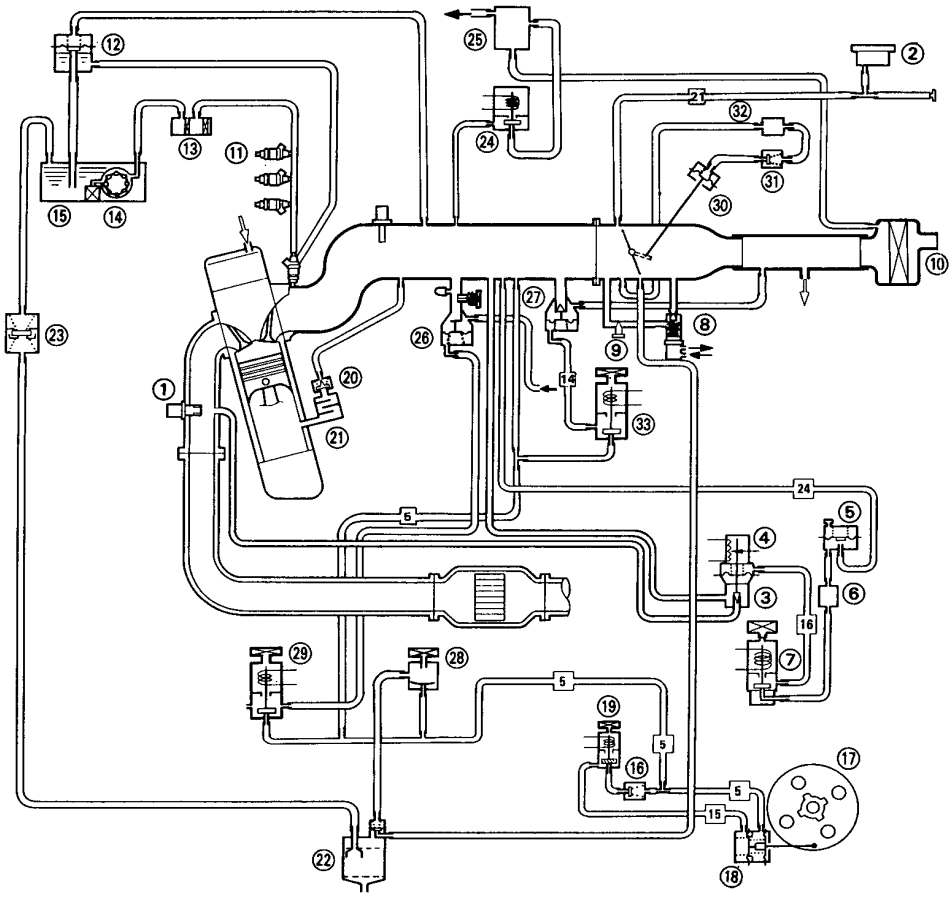
Control Box


Manual
FAST IDLE CONTROL SOLENOID VALVE Test, page 12-52
IGNITION CONTROL SOLENOID VALVE
EGR CONTROL SOLENOID VALVE Troubleshooting, page 12-88
MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR Troubleshooting, page 12-26
CHECK VALVE
A/C IDLE BOOST SOLENOID VALVE Test, page 12-50
15
12
16
21
19
24
17
18
23
AIR CHAMBER
CONSTANT VACUUM CONTROL (CVC) VALVE Troubleshooting, page 12-89


Automatic
A/T IDLE CONTROL SOLENOID VALVE Test, page 12-54
IGNITION CONTROL SOLENOID VALVE
FAST IDLE CONTROL SOLENOID VALVE Test, page 12-52
EGR CONTROL SOLENOID VALVE Troubleshooting, page 12-88
MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR Troubleshooting, page 12-26
CHECK VALVE
A/C IDLE BOOST SOLENOID VALVE Test, page 12-50
15
12
16
21
19
24
17
18
23
AIR CHAMBER
CONSTANT VACUUM CONTROL (CVC) VALVE Troubleshooting, 12-89

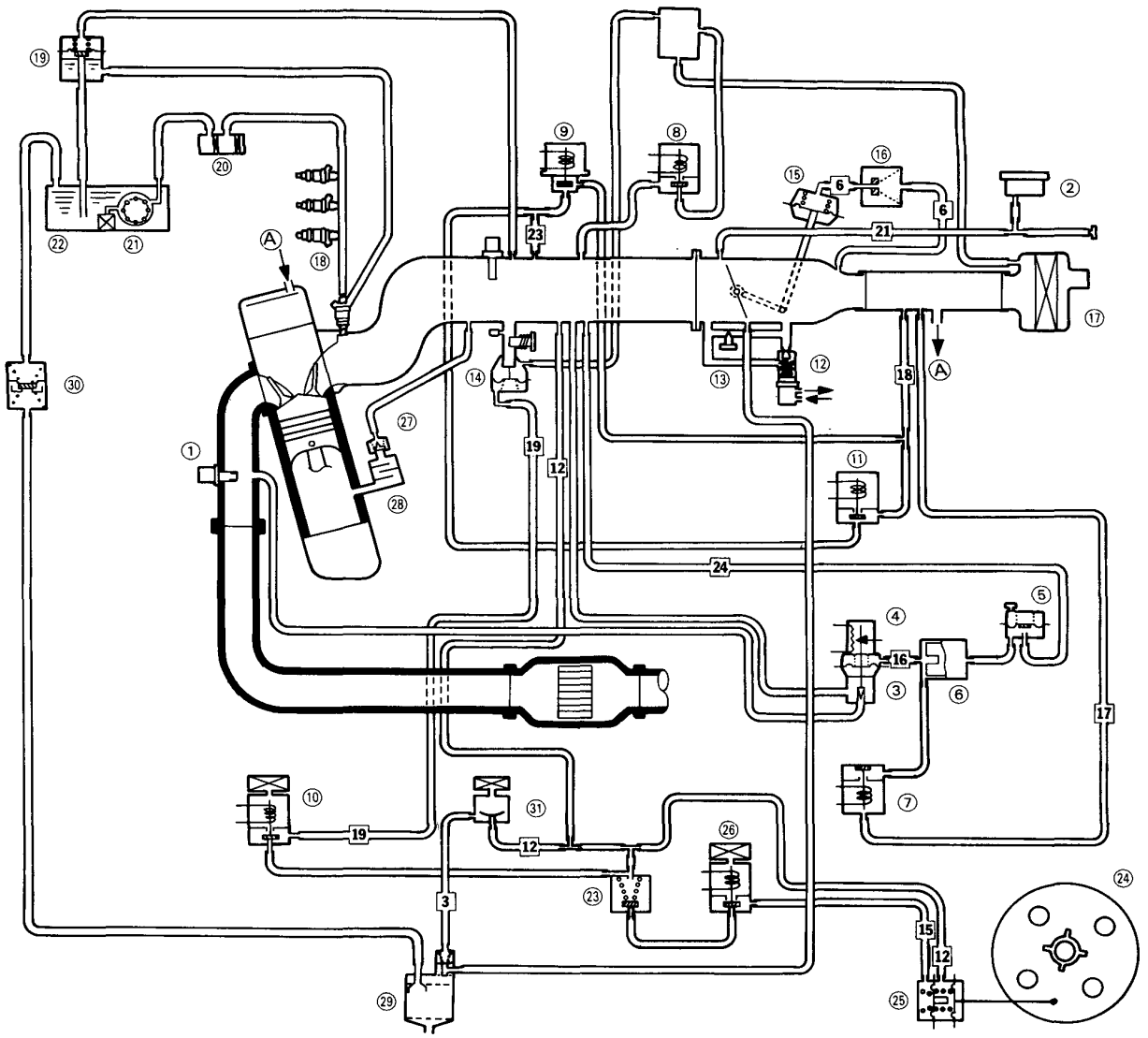
Vacuum Connections

B20A8



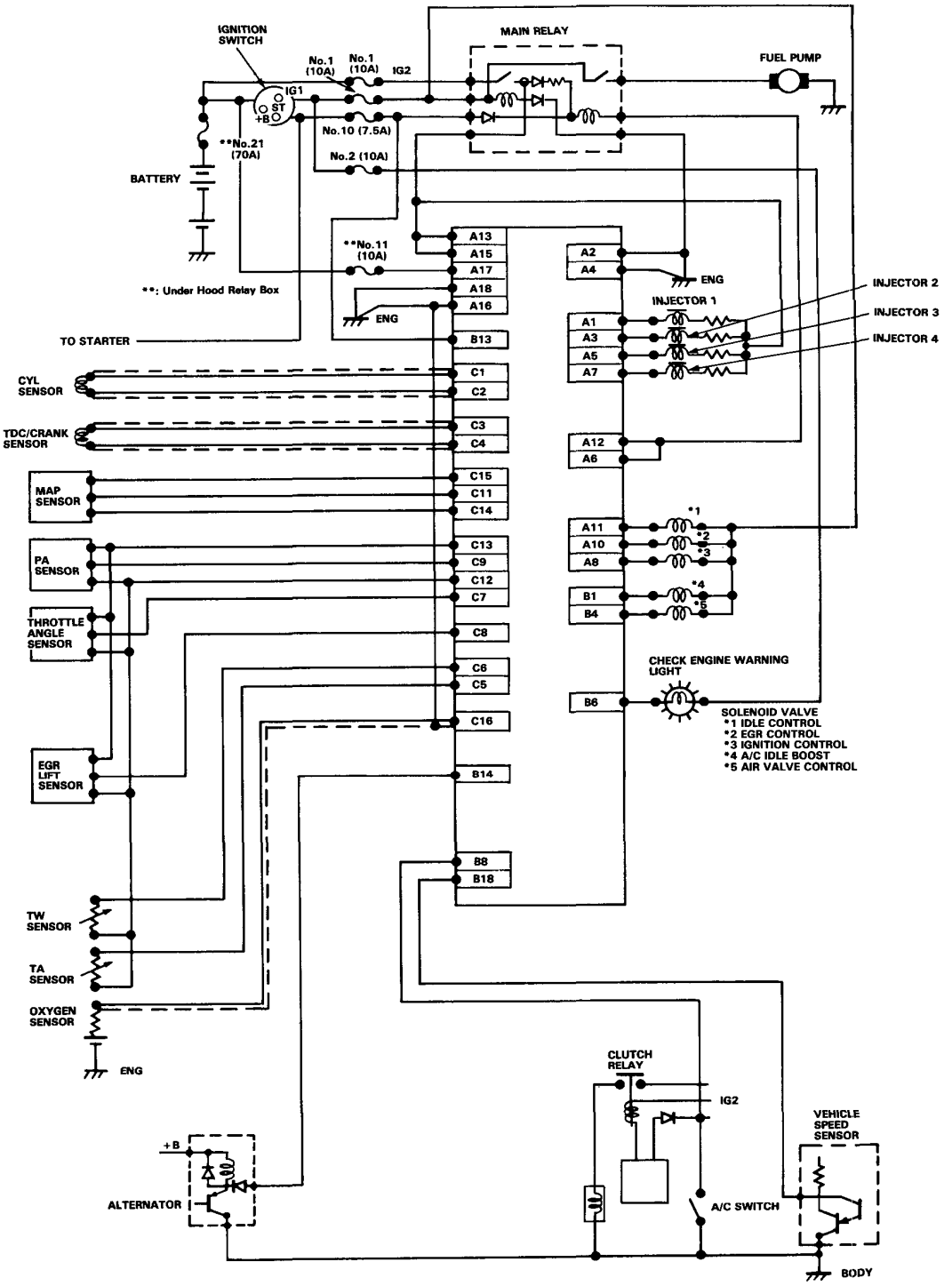
① OXYGEN (O_2) SENSOR
② MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR
③ EGR VALVE
④ EGR VALVE LIFT SENSOR
⑤ CONSTANT VACUUM CONTROL (CVC) VALVE
⑥ AIR CHAMBER
⑦ EGR CONTROL SOLENOID VALVE
⑧ FAST IDLE VALVE
⑨ IDLE ADJUSTING SCREW
⑩ AIR CLEANER
⑪ FUEL INJECTOR
⑫ PRESSURE REGULATOR
⑬ FUEL FILTER
⑭ FUEL PUMP
⑮ FUEL TANK
⑯ CHECK VALVE
⑰ DISTRIBUTOR
⑱ VACUUM ADVANCE DIAPHRAGM
⑲ IGNITION CONTROL SOLENOID VALVE
⑳ PCV VALVE
㉑ BREATHER CHAMBER
㉒ CHARCOAL CANISTER
㉓ TWO-WAY VALVE
㉔ IDLE CONTROL SOLENOID VALVE
㉕ AIR CHAMBER
㉖ A/C IDLE BOOST VALVE
㉗ AIR VALVE
㉘ THERMO VALVE
㉙ A/C IDLE BOOST SOLENOID VALVE
㉚ DASHPOT DIAPHRAGM
㉛ CHECK VALVE
㉜ AIR CHAMBER
㉝ AIR VALVE CONTROL SOLENOID VALVE

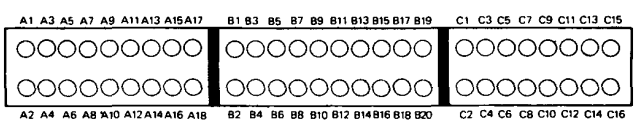
A20A3



① OXYGEN (O_2) SENSOR
② MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR
③ EGR VALVE
④ EGR VALVE LIFT SENSOR
⑤ CONSTANT VACUUM CONTROL (CVC) VALVE
⑥ AIR CHAMBER
⑦ EGR CONTROL SOLENOID VALVE
⑧ IDLE CONTROL SOLENOID VALVE
⑨ A/T IDLE CONTROL SOLENOID VALVE
⑩ A/C IDLE BOOST SOLENOID VALVE
⑪ FAST IDLE CONTROL SOLENOID VALVE
⑫ FAST IDLE VALVE
⑬ IDLE ADJUSTING SCREW
⑭ A/C IDLE BOOST VALVE
⑮ DASHPOT DIAPHRAGM
⑯ DASHPOT CHECK VALVE
⑰ AIR CLEANER
⑱ FUEL INJECTOR
⑲ PRESSURE REGULATOR
⑳ FUEL FILTER
㉑ FUEL PUMP
㉒ FUEL TANK
㉓ CHECK VALVE
㉔ DISTRIBUTOR
㉕ VACUUM ADVANCE DIAPHRAGM
㉖ IGNITION CONTROL SOLENOID VALVE
㉗ PCV VALVE
㉘ BREATHER CHAMBER
㉙ CHARCOAL CANISTER
㉚ TWO-WAY VALVE
㉛ THERMOVALVE

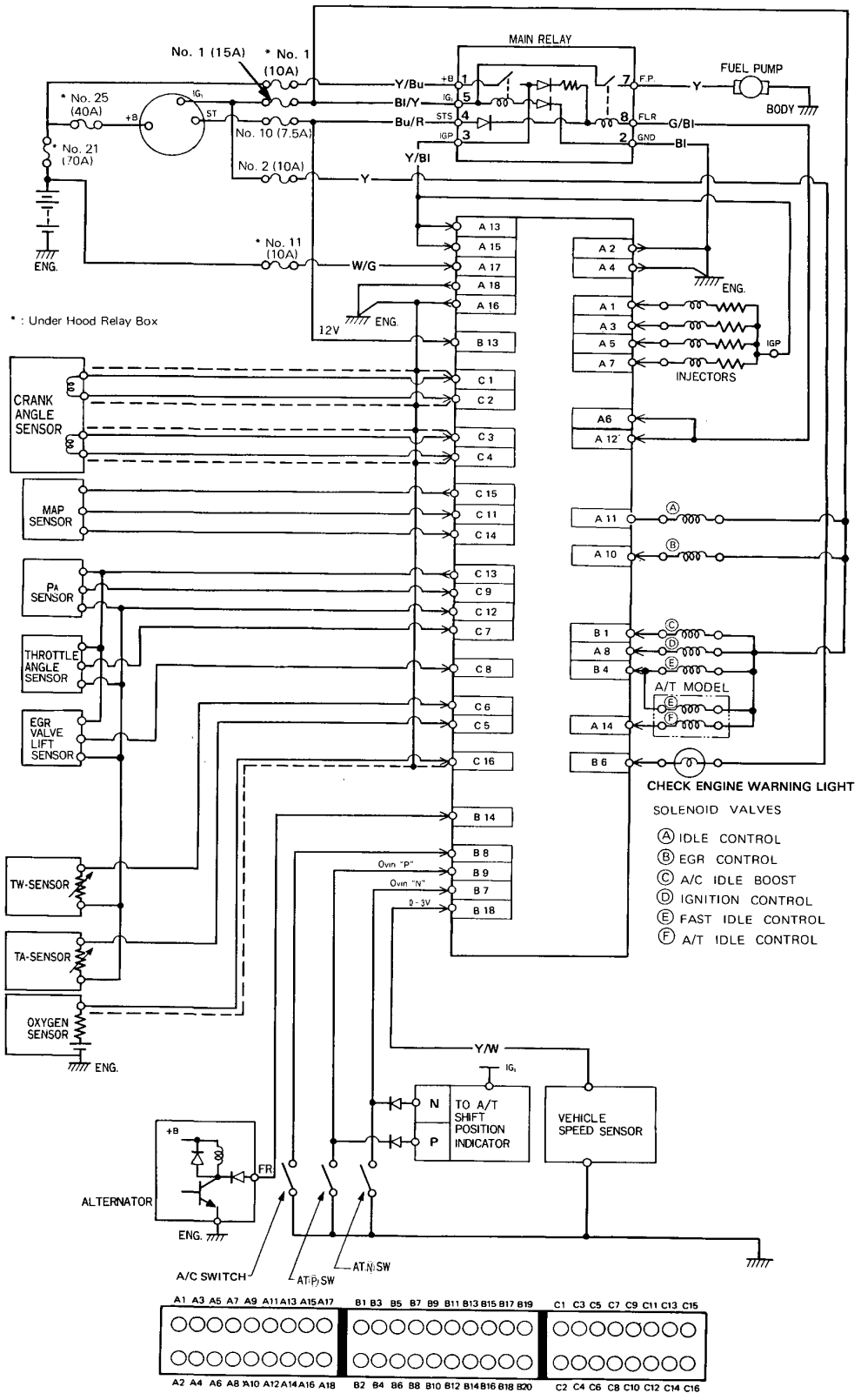
B20A8





TERMINAL LOCATION

A20A3

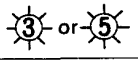
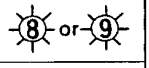


TERMINAL LOCATION

Symptom-to-System Chart

B20A8

NOTE: Across each row in the chart, the systems that could be sources of a symptom are ranked in the order they should be inspected starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next most likely system ②, etc.

PAGE / SYSTEM / SYMPTOM		PGM-FI					
		ELECTRONIC CONTROL UNIT	OXYGEN SENSOR	MANIFOLD ABSOLUTE PRESSURE SENSOR	COOLANT TEMPERATURE SENSOR	THROTTLE ANGLE SENSOR	CRANK ANGLE SENSOR
		21, 22	24	26, 28	30	32	34, 36
CHECK ENGINE WARNING LIGHT TURNS ON		□ or 					
SELF-DIAGNOSIS INDICATOR (LED) BLINKS		⓪ or 					
ENGINE WON'T START		②					③
DIFFICULT TO START ENGINE WHEN COLD		Ⓑⓤ			①		
IRREGULAR IDLING	WHEN COLD FAST IDLE OUT OF SPECIFICATION				②		
	ROUGH IDLE			①			②
	WHEN WARM RPM TOO HIGH		Ⓕⓢ	Ⓕⓢ	Ⓕⓢ	Ⓕⓢ	Ⓕⓢ
	WHEN WARM RPM TOO LOW						
FREQUENT STALLING	WHILE WARMING UP	Ⓑⓤ					
	AFTER WARMING UP	Ⓑⓤ					
POOR PERFORMANCE	MISFIRE OR ROUGH RUNNING	Ⓑⓤ	③	②		③	③
	FAILS TEST EMISSION	Ⓑⓤ	①				
	LOSS OF POWER	Ⓑⓤ		③			

* CODE 2, 4, 11 or exceeds 13: count the number of blinks again. If the indicator is in fact, blinking these codes, substitute a known—good ECU and re-check. If the indication goes away, replace the original ECU.

Ⓕⓢ : When the Check engine warning light is on the idle speed will increase due to failsafe operation.

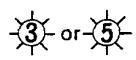
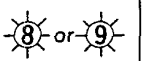
Ⓑⓤ : When the Check engine warning light is on with no blinks on the self-diagnosis indicator, the back-up system is in operation.

PGM-FI		IDLE CONTROL	FUEL SUPPLY	AIR INTAKE	SECONDARY AIR SUPPLY SYSTEM	EMISSION CONTROL	
INTAKE AIR TEMPERATURE SENSOR	ATMOSPHERIC PRESSURE SENSOR					EGR CONTROL SYSTEM	OTHER EMISSION CONTROLS
40	42	44	66	75	80	84	82
							
							
			①				
③		①					
						②	②
FS	FS	①			②		③
		①		②			
		①				②	
						①	
			①				
							②
			①				②

Symptom-to-System Chart

A20A3

NOTE: Across each row in the chart, the systems that could be sources of a symptom are ranked in the order they should be inspected starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next most likely system ②, etc.

PAGE / SYSTEM / SYMPTOM		PGM-FI					
		ELEC-TRONIC CONTROL UNIT	OXYGEN SENSOR	MANIFOLD ABSOLUTE PRESSURE SENSOR	COOLANT TEMPE-RATURE SENSOR	THROTTLE ANGLE SENSOR	CRANK ANGLE SENSOR
		21, 22	24	26, 28	30	32	34, 36
CHECK ENGINE WARNING LIGHT TURNS ON		☐ or 					
SELF-DIAGNOSIS INDICATOR (LED) BLINKS		⓪ or 					
ENGINE WON'T START		②					③
DIFFICULT TO START ENGINE WHEN COLD		ⓑⓤ			①		
IRREGULAR IDLING	WHEN COLD FAST IDLE OUT OF SPECIFICATION				②		
	ROUGH IDLE			①			②
	WHEN WARM RPM TOO HIGH		ⓕⓢ	ⓕⓢ	ⓕⓢ	ⓕⓢ	ⓕⓢ
	WHEN WARM RPM TOO LOW						
FREQUENT STALLING	WHILE WARMING UP	ⓑⓤ					
	AFTER WARMING UP	ⓑⓤ					
POOR PERFORM-ANCE	MISFIRE OR ROUGH RUNNING	ⓑⓤ	③	②		③	③
	FAILS TEST EMISSION	ⓑⓤ	①				
	LOSS OF POWER	ⓑⓤ		③			

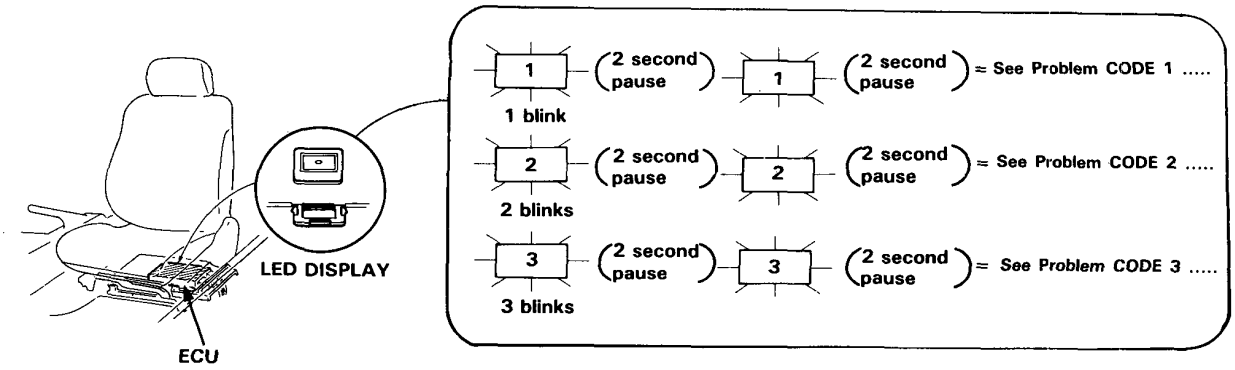
* CODE 2, 4, 11 or exceeds 13: count the number of blinks again. If the indicator is in fact, blinking these codes, substitute a known—good ECU and re-check. If the indication goes away, replace the original ECU.

ⓕⓢ : When the Check engine warning light is on the idle speed will increase due to failsafe operation.

ⓑⓤ : When the Check engine warning light is on with no blinks on the self-diagnosis indicator, the back-up system is in operation.

PGM-FI		IDLE CONTROL	FUEL SUPPLY	AIR INTAKE	EMISSION CONTROL	
INTAKE AIR TEMPERATURE SENSOR	ATMOSPHERIC PRESSURE SENSOR				EGR CONTROL SYSTEM	OTHER EMISSION CONTROLS
40	42	44	66	75	88	82
						
						
			①			
③		①				
					②	②
FS	FS	①		②		③
		①		②		
		①			②	
					①	
			①			
						②
			①			②

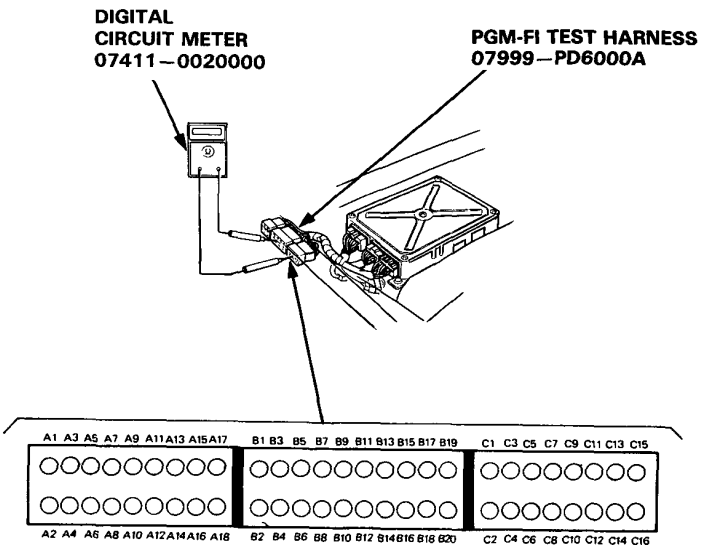
When the Check engine warning light has been reported on, turn the ignition on, move the front driver's seat to the rear position and observe the LED on the front of the ECU. The LED indicates a system failure code by its blinking frequency.



SELF-DIAGNOSIS INDICATOR BLINKS	SYSTEM INDICATED	PAGE
0	ECU	12-21, 22
1	OXYGEN CONTENT	12-24
3	MANIFOLD ABSOLUTE PRESSURE	12-26
5		12-28
6	COOLANT TEMPERATURE	12-30
7	THROTTLE ANGLE	12-32
8	CRANK ANGLE (TDC)	12-34
9	CRANK ANGLE (CYL)	12-36
10	INTAKE AIR TEMPERATURE	12-40
12	EXHAUST GAS RECIRCULATION SYSTEM	12-84, 88
13	ATMOSPHERIC PRESSURE	12-42

CODE 2, 4, 11, or exceeds 13, count the number of blinks again, if the indicator is in fact, blinking these codes, substitute a known-good ECU and re-check. If the indication goes away, replace the original ECU.
The Check engine warning light and ECU LED may come on, indicating a system problem, when, in fact, there is a poor or intermittent electrical connection. First, check the electrical connections, clean or repair connections if necessary.

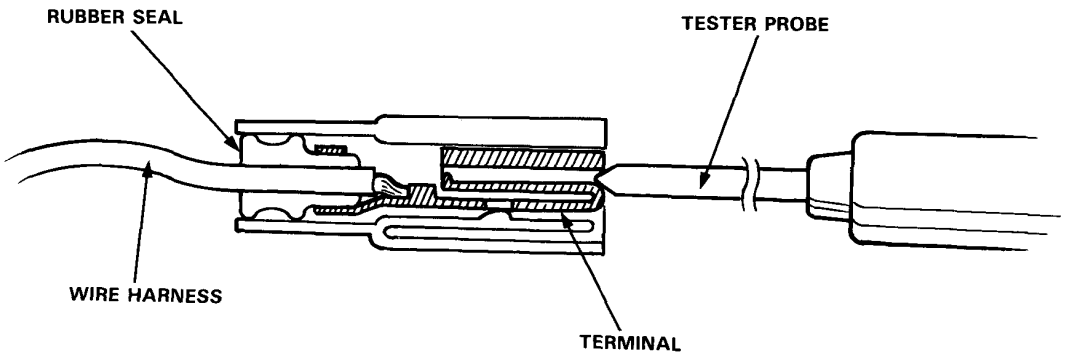
If the inspection for a particular failure code requires the PGM-FI test harness, remove the front driver's seat and connect the PGM-FI test harness and digital circuit meter as shown. Then check the system according to the procedure described for the appropriate code(s) listed on the following pages.



TERMINAL LOCATION

CAUTION :

- Puncturing the insulation on a wire can cause poor or intermittent electrical connections.
- **For testing at connectors other than the PGM-FI test harness, bring the tester probe into contact with the terminal *from the connector side of wire harness connectors* in the engine compartment. For female connectors, just touch lightly with the tester probe and do not insert the probe.**



(cont'd)

Troubleshooting Procedures

A flow chart is designed to be used from start to final repair. It's like a map showing you the shortest distance. But beware; if you go off the "map" anywhere but a "shop" symbol, you can easily get lost.

START (bold type): Describes the conditions or situation to start a troubleshooting flow chart.

ACTION: Asks you to do something; perform a test, set up a condition, etc.

DECISION: Asks you about the result of an action by giving an "answer" and asking did you get the same answer: Yes or No.

STOP: The end of a series of actions and decisions, describes a final repair action and sometimes directs you to an earlier part of the flow to confirm your repair.

NOTE:

- The term "Intermittent Failure" is used several times in these charts. It simply means a system may have had a failure, but it checks out OK through all your tests. You may need to road test the car to reproduce the failure or if the problem was a loose connection, you may have unknowingly solved it while doing the tests.
- "Open" and "Short" are common electrical terms. An open is a break in wire or at a connection. A short is an accidental connection of a wire to ground. In simple electronics, this usually means something won't work at all. In complex electronics (like electronic control units), this can sometimes mean something works, but not the way it's supposed to.
- If the electrical readings are not as specified when using the PGM-FI test harness, check the PGM-FI test harness connections proceeding.

Troubleshooting Flow Chart — ECU

Check engine warning light isn't on for 2 seconds after ignition is first turned on.

Check oil pressure warning light is on with ignition switch on.

Is oil pressure warning light on? NO → Inspect No. 2 fuse.

YES

Is No. 2 fuse OK? NO → Replace fuse.

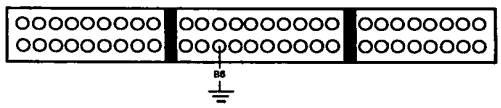
YES

Repair open in Yellow wire between No. 2 fuse and combination meter.

Turn the ignition switch OFF.

Connect the PGM-FI test harness between the ECU and connector (page 12-19).

Connect B6 terminal to body ground.

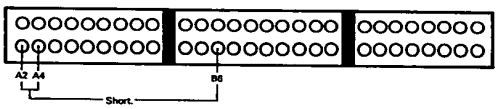


Turn the ignition switch ON.

Is Check engine warning light on? NO →
- Replace warning light bulb.
- Repair open in Green/Red wire between ECU (B6) and combination meter.

YES

Connect the following terminals individually to B6: • A2, • A4



Is Check engine warning light on? NO → Repair the individual ground connection that did not make the light come on.

YES

Substitute a known-good ECU and re-check. If symptom/indication goes away, replace the original ECU.

(cont'd)

Troubleshooting Flow Chart —— ECU (cont'd)

— Check engine warning light is on.
— LED doesn't blink.

Turn the ignition switch ON.

Disconnect the 3P connector of each sensor one at a time:
- MAP sensor
- Throttle angle sensor
- EGR valve lift sensor

Does Check engine warning light remain on? — NO → Replace the sensor that caused the light to go out upon its disconnection.

YES

Reconnect all connectors.

Disconnect the 3P connector of PA sensor.

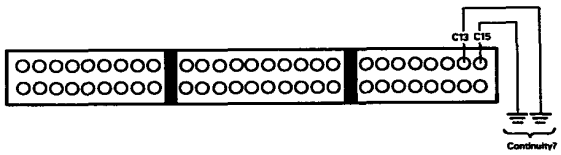
Does LED indicate CODE 13? — YES → Replace PA sensor.

NO

Reconnect the connector.

Turn the ignition switch OFF.

Connect the PGM-FI test harness between the ECU and connector (page 12-19). But disconnect "C" connector from ECU only, not the main wire harness.



Check for continuity between the body ground and the following terminals individually: • C13, • C15

Does continuity exist? — YES → Repair short to ground in Red/White wire between ECU (C15) and MAP sensor, or in Yellow/White wire between ECU (C13) and the throttle angle sensor, the EGR valve lift sensor or the PA sensor.

NO

(To page 12-23)

(From page 12-22)

Reconnect "C" connector to ECU and disconnect "B" connector from the ECU only, not the main wire harness.

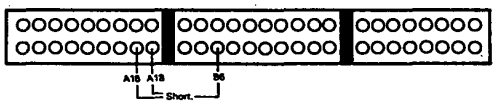
Turn the ignition switch ON.

Is Check engine warning light on?

YES → Repair short to ground in Green/Red wire between ECU (B6) and combination meter.

NO

Connect the following terminals individually to B6: • A16, • A18

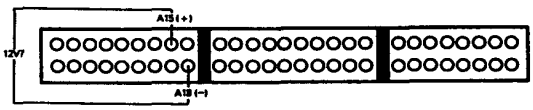


Is Check engine warning light on?

NO → Repair the individual ground connection that did not make the light come on.

YES

Measure voltage between A15 (+) terminal and A18 (–) terminal.



Is there battery voltage?

NO →
- Repair open in Yellow/Black wire between ECU (A15) and main relay.
- Check main relay and wiring connectors at main relay (page 12-73).

YES

Substitute a known-good ECU and re-check. If symptom/indication goes away, replace the original ECU.

Troubleshooting Flow Chart —— Oxygen Sensor

— Check engine warning light has been reported on.
— LED indicates CODE 1.

Turn the ignition switch OFF.

Remove No.11 fuse in the under-hood relay box for 10 seconds to reset ECU.

Warm up engine to normal operating temperature (cooling fan comes on).

Hold engine at 1500—2000 rpm for 10 minutes.
NOTE: Do not close throttle completely during this time.

Is Check engine warning light on? NO → Intermittent failure (test drive may be neccessary).

YES

Inspect fuel pressure at the fuel filter (page 12-71).

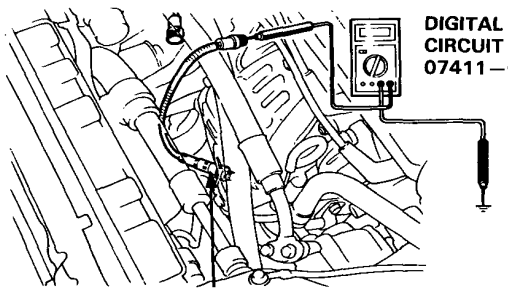
Is pressure as specified? NO → **Repair fuel supply system (page 12-66 thru. 12-74).**

YES

Disconnect engine wire harness from O_2 sensor.

Warm up engine to normal operating temperature again.

(To page 12-25)



DIGITAL CIRCUIT METER 07411—0020000

OXYGEN SENSOR
45 N·m (4.5 kg-m, 33 lb-ft)

(From page 12-24)

Measure voltage between the connector terminal and body ground.

Is voltage above 0.6 V at wide open throttle and below 0.4 V at idle?

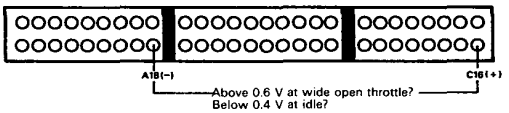
NO → Replace O_2 sensor.

YES

Stop engine.

Connect the PGM-FI test harness between the ECU and connector (page 12-19).

Restart and warm up engine to normal operating temperature.



Measure voltage between C16 (+) and A18 (−) terminals.

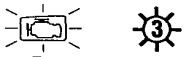
Is voltage above 0.6 V at wide open throttle and below 0.4 V at idle?

NO → Repair short or open in White wire between ECU (C16) and O_2 sensor.

YES

Substitute a known-good ECU and re-check. If symptom/indication goes away, replace the original ECU.

Troubleshooting Flow Chart —— MAP Sensor



– Engine is warm and running.
– Check engine warning light is on.
– LED indicates CODE 3.

Turn the ignition switch OFF.

Remove No.11 fuse in the under-hood relay box for 10 seconds to reset ECU.

Warm up engine to normal operating temperature (cooling fan comes on).

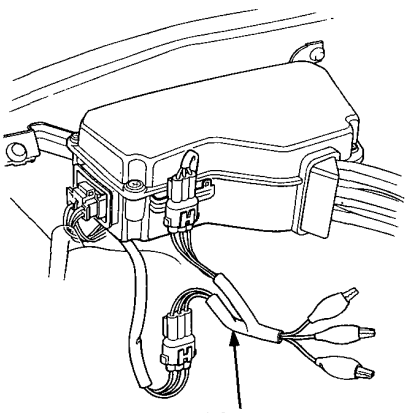
Is Check engine warning light on? NO → Intermittent failure (test drive may be necessary).

YES

Turn the ignition switch OFF.

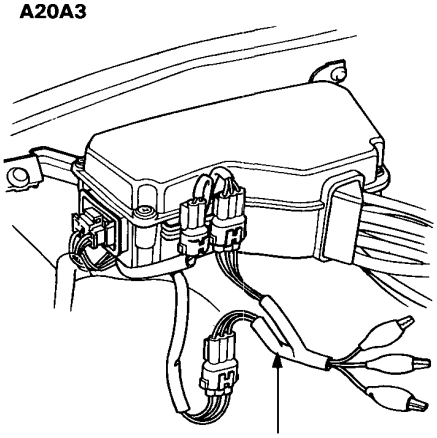
Connect the test harness between the MAP sensor and main wire harness.

B20A8



TEST HARHESS 07GMJ-ML80100

A20A3



TEST HARNESS 07GMJ–ML80100

Turn the ignition switch ON.

Measure voltage between Red (+) terminal and Green (–) terminal.

Is there approx. 5 V? NO → Measure voltage between Red (+) terminal and body ground.

YES

Measure voltage between White (+) terminal and Green (–) terminal.

Is there approx. 5 V? YES → Repair open in Green/White wire between ECU (C14) and MAP sensor.

NO

Turn the ignition switch OFF.

(To page 12-27)

(To page 12-27)

(From page 12-26)

Is there approx. 3 V?

NO

- Replace MAP sensor.
- Repair short in White/Blue wire between ECU (C11) and MAP sensor.

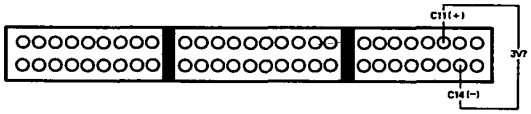
YES

Turn the ignition switch OFF.

Connect the PGM-FI test harness between the ECU and connector (page 12-19).

Turn the ignition switch ON.

Measure voltage between C11 (+) terminal and C14 (–) terminal.



Is there approx. 3 V?

NO

Repair open in White/Blue wire between ECU (C11) and MAP sensor.

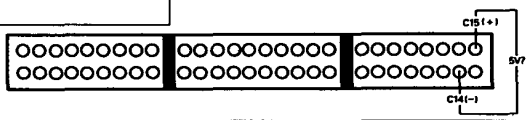
YES

Substitute a known-good ECU and re-check. If symptom/indication goes away, replace the original ECU.

(From page 12-26)

Connect the PGM-FI test harness between the ECU and connector (page 12-19).

Measure voltage between C15 (+) terminal and C14 (–) terminal.



Is there approx. 5 V?

YES

Repair open in Red/White wire between ECU (C15) and MAP sensor.

NO

Substitute a known-good ECU and re-check. If prescribed voltage is now available, replace the original ECU.

(cont'd)

Troubleshooting Flow Chart —— MAP Sensor (cont'd)

— Check engine warning light has been reported on.
— LED indicates CODE 5.

Turn the ignition switch OFF.

Remove No. 11 fuse in the under-hood relay box for 10 seconds to reset ECU.

Start engine and keep engine rpm at idle.

Is Check engine warning light on?
Does LED indicate CODE 5?

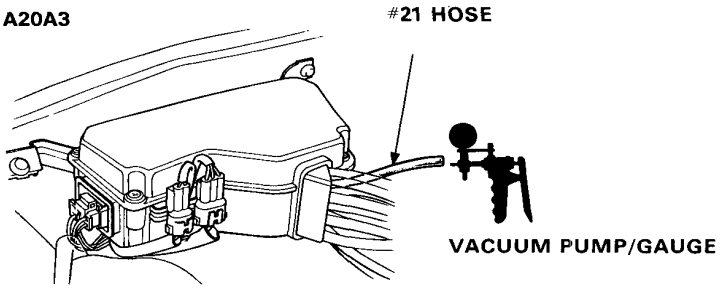
NO → Intermittent failure (test drive may be necessary).

YES

Stop engine.

Remove #21 hose from the throttle body and connect a T-fitting from a vacuum gauge between the throttle body and the MAP sensor.

A20A3



Start engine.

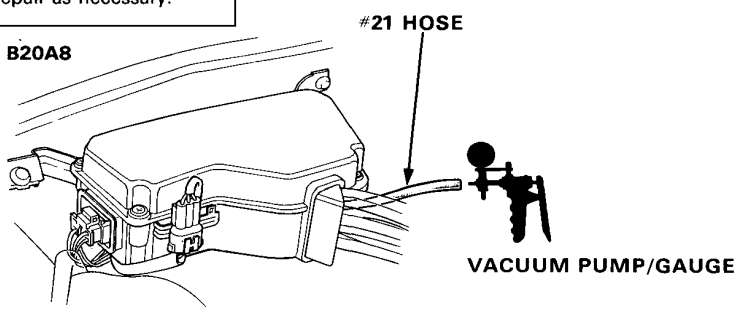
Is there vacuum?

NO → Repair as necessary.

YES

Connect vacuum pump to #21 hose .

B20A8



Apply vacuum and check for a leak.

Is vacuum maintained?

NO → Replace #21 hose.

YES

(To page 12-29)

(From page 12-28)

Stop engine.

Connect the test harness between the MAP sensor and main wire harness.

Turn the ignition switch ON.

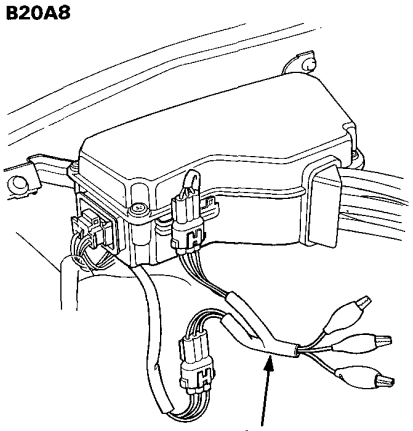
Measure voltage between White (+) terminal and Green (–) terminal.

Is there approx. 3 V? NO → Replace MAP sensor.

YES

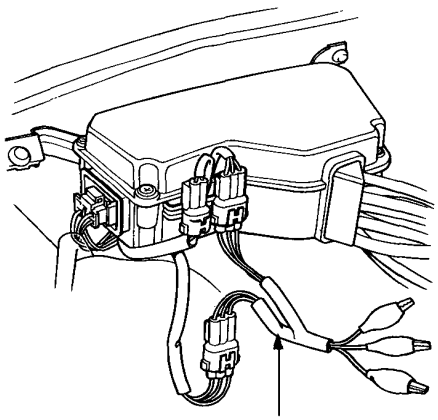
Substitute a known-good ECU and re-check. If symptom/indication goes away, replace the original ECU.

B20A8



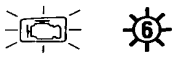
TEST HARNESS
07GMJ-ML80100

A20A3



TEST HARNESS
07GMJ—ML80100

Troubleshooting Flow Chart —— TW Sensor



— Check engine warning light is on.
— LED indicates CODE 6.

Turn the ignition switch OFF.

Remove No.11 fuse in the under-hood relay box for 10 seconds to reset ECU.

Turn the ignition switch ON.

Is Check engine warning light on? NO → Intermittent failure. (test drive may be necessary).

YES

Warm up engine to normal operating temperature (cooling fan comes on).

Disconnect the 2P connector on the TW sensor.

Measure resistance between the 2 terminals on the TW sensor.

Is there 200—400 Ω? NO → Replace TW sensor.

YES

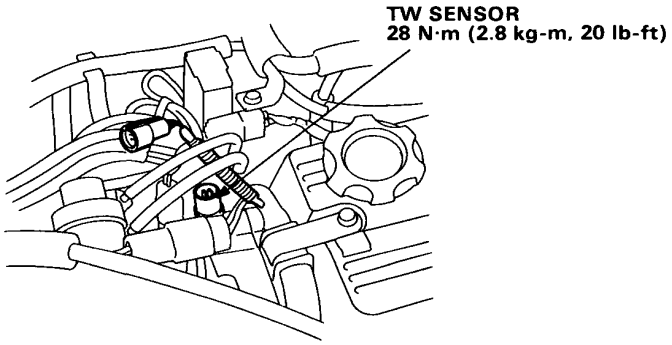
Measure voltage between Yellow/Green (+) terminal and body ground.

Is there approx. 5 V? NO → Turn the ignition switch OFF.

YES

(To page 12-31)

(To page 12-31)



(From page 12-30)

Measure voltage between Yellow/Green (+) terminal and Green/White (–) terminal.

Is there approx. 5 V?

NO → Repair open in Green/White wire between ECU (C12) and TW sensor.

YES

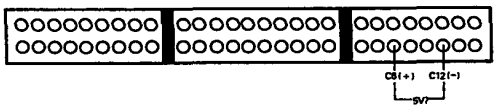
Substitute a known-good ECU and re-check. If symptom/indication goes away, replace the original ECU.

(From page 12-30)

Connect the PGM-FI test harness between the ECU and connector (page 12-19).

Turn the ignition switch ON.

Measure voltage between C6 (+) terminal and C12 (–) terminal.



Is there approx. 5 V?

YES → Repair open in Yellow/Green wire between ECU (C6) and TW sensor.

NO

Disconnect "C" connector from the main wire harness only, not the ECU.

Measure voltage between C6 (+) terminal and C12 (–) terminal.

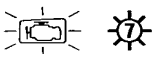
Is there approx. 5 V?

YES → Repair short in Yellow/Green wire between ECU (C6) and TW sensor.

NO

Substitute a known-good ECU and re-check. If prescribed voltage is now available, replace the original ECU.

Troubleshooting Flow Chart —— Throttle Angle Sensor



– Engine is running.
– Check engine warning light is on.
– LED indicates CODE 7.

Turn the ignition switch OFF.

Remove No.11 fuse in the under-hood relay box for 10 seconds to reset ECU.

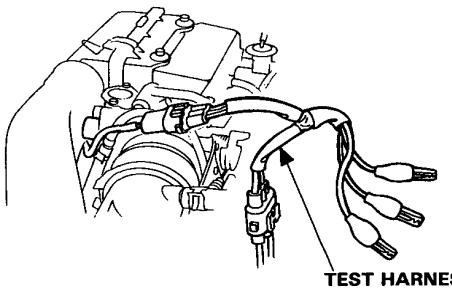
Start engine.

Is Check engine warning light on? NO → Intermittent failure. (test drive may be necessary.)

YES

Turn the ignition switch OFF.

Connect the test harness between the throttle angle sensor and engine wire harness.



TEST HARNESS 07GMJ-ML80100

Turn the ignition switch ON.

Measure voltage between Red (+) terminal and Green (–) terminal.

Is there approx. 5 V? NO → Measure voltage between Red (+) terminal and body ground.

YES

(To page 12-33)

Is there approx. 5 V? YES → Repair open in Green/White wire between ECU (C12) and throttle angle sensor.

NO

Turn the ignition switch OFF.

(To page 12-33)

(From page 12-32)

Measure voltage between White (+) terminal and Green (–) terminal at fully open throttle.

Is there approx. 4 V? NO

- Replace throttle angle sensor.
- Repair short in Red/Yellow wire between ECU (C7) and throttle angle sensor.

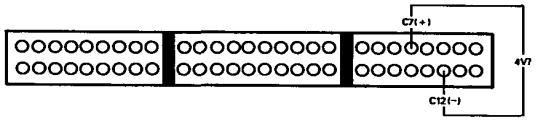
YES

Turn the ignition switch OFF.

Connect the PGM-FI test harness between the ECU and connector (page 12-19).

Turn the ignition switch ON.

Measure voltage between C7 (+) terminal and C12 (–) terminal at fully open throttle.



Is there approx. 4 V? NO

Repair open in Red/Yellow wire between ECU (C7) and throttle angle sensor.

YES

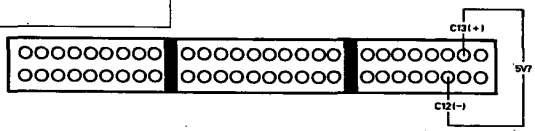
Substitute a known-good ECU and re-check. If symptom/indication goes away, replace the original ECU.

(From page 12-32)

Connect the PGM-FI test harness between the ECU and connector (page 12-19).

Turn the ignition switch ON.

Measure voltage between C13 (+) terminal and C12 (–) terminal.



Is there approx. 5 V? YES

Repair open in Yellow/White wire between ECU (C13) and throttle angle sensor.

NO

Substitute a known-good ECU and re-check. If prescribed voltage is now available, replace the original ECU.

Troubleshooting Flow Chart —— Crank Angle Sensor

— Check engine warning light has been reported on.
— LED indicates CODE 8.

Turn the ignition switch OFF.

Remove No.11 fuse in the under-hood relay box for 10 seconds to reset ECU.

Start engine.

Is Check engine warning light on?

NO → Intermittent failure (test drive may be necessary).

YES

Stop engine.

Disconnect the 4P connector on the crank angle sensor.

Measure resistance between White/Blue terminal and Orange/Blue terminal.

Is there 650—850 Ω?

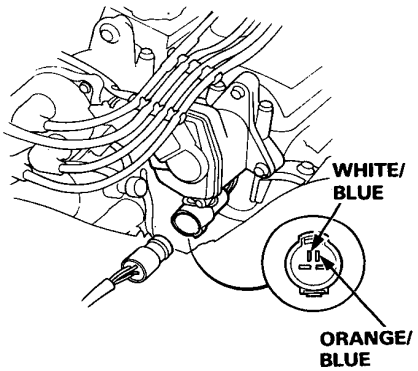
NO → A20A3: Overhaul crank angle sensor (page 12-37). B20A8: Replace crank angle sensor.

YES

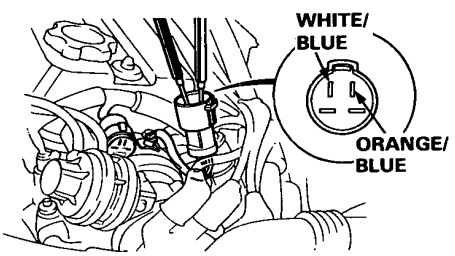
Check for continuity to body ground on White/Blue terminal and Orange/Blue terminal individually.

(To page 12-35)

B20A8



A20A3



(From page 12-34)

Does continuity exist?

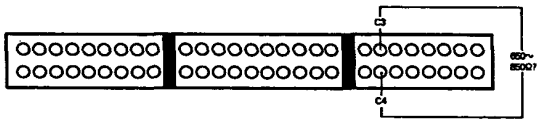
YES → A20A3:
Overhaul crank angle sensor (page 12-37).
B20A8:
Replace crank angle sensor.

NO

Reconnect the connector.

Connect the PGM-FI test harness only to the main wire harness, but not to the ECU (page 12-11).

Measure resistance between C3 terminal and C4 terminal.



Is there 650—850 Ω?.

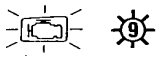
NO → Repair open in Orange/Blue and/or White/Blue wires.

YES

Substitute a known-good ECU and re-check. If symptom/indication goes away, replace the original ECU.

(cont'd)

Troubleshooting Flow Chart —— Crank Angle Sensor (cont'd)



— Check engine warning light has been reported on.
— Led indicates CODE 9.

Turn the ignition switch OFF.

Remove No.11 fuse in the under-hood relay box for 10 seconds to reset ECU.

Start engine.

Is Check engine warning light on? NO → Intermittent failure (test drive may be necessary).

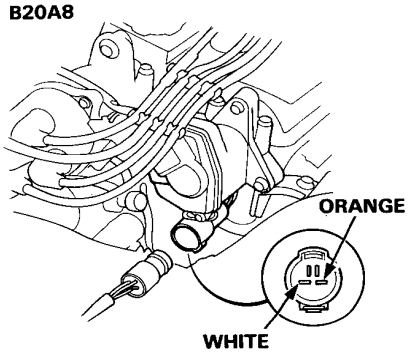
YES

Stop engine.

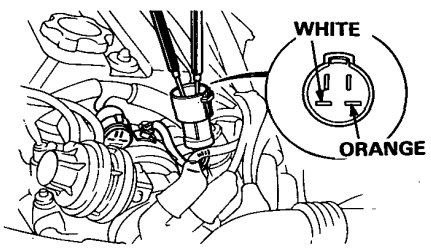
Disconnect the 4P connector on the crank angle sensor.

Measure resistance between Orange terminal and White terminal.

B20A8



A20A3



Is there 650—850 Ω? NO →
A20A3:
Overhaul crank angle sensor (page 12-37).
B20A8:
Replace crank angle sensor.

YES

Check for countinuity to body ground on Orange terminal and White terminal individually.

Does continuity exist? YES →
A20A3:
Overhaul crank angle sensor (page 12-37).
B20A8:
Replace crank angle sensor.

NO

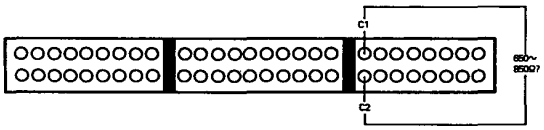
Reconnect the connector.

Connect the PGM-FI harness only to the main wire harness, but not to the ECU (page 12-19).

(To page 12-37)

(From page 12-36)

Measure resistance between C1 terminal and C2 terminal.



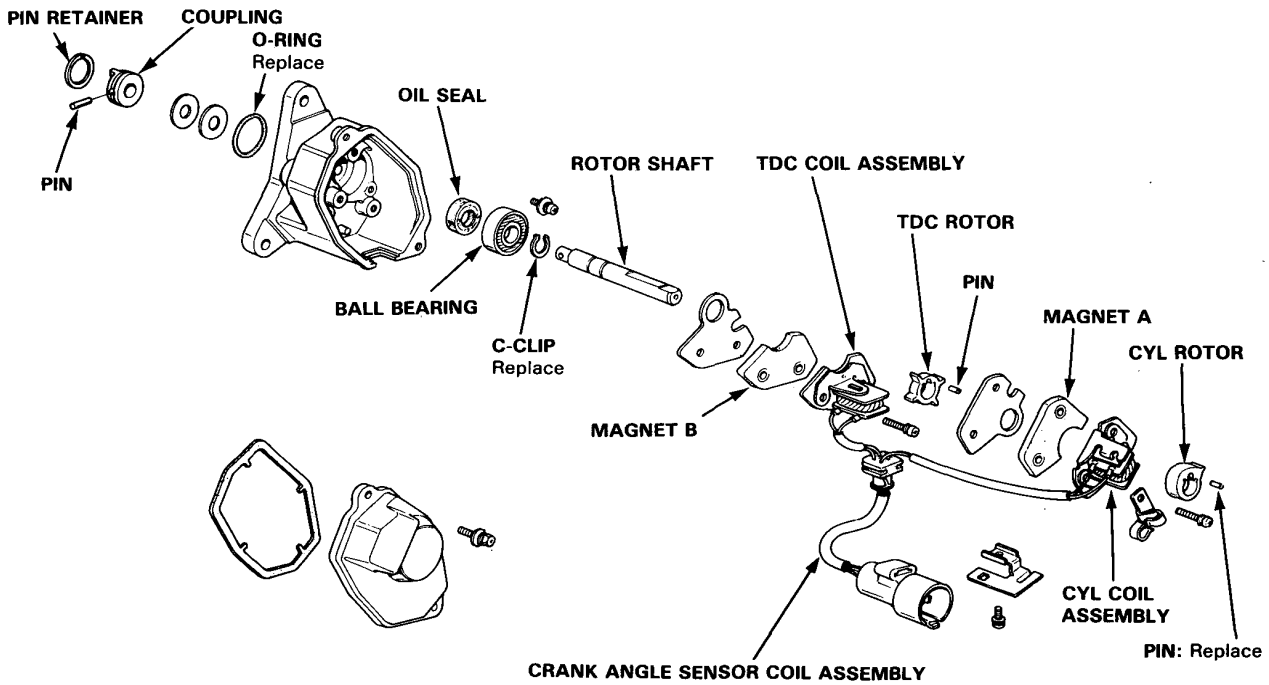
Is there 650—850 Ω?

NO → Repair open in Orange and/or White wires.

YES

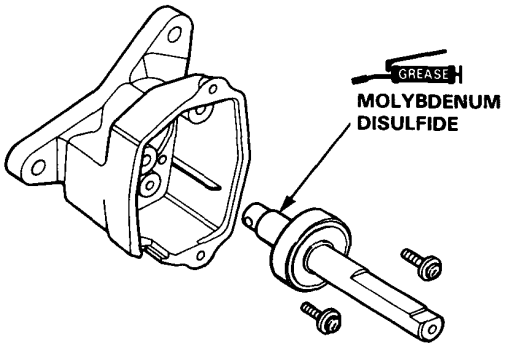
Substitute a known-good ECU and re-check. If symptom/indication goes away, replace the original ECU.

Crank Angle Sensor Disassembly (A20A3)

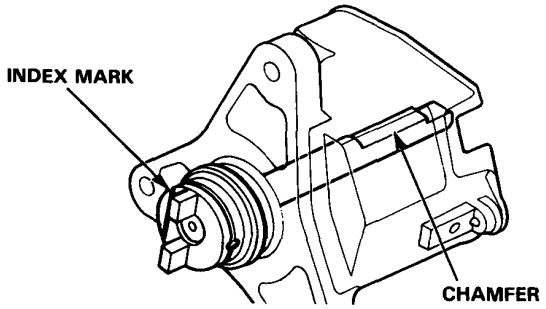


Crank Angle Sensor Reassembly

1. Apply a molybdenum disulfide grease to the tip of the rotor shaft, then install it on the sensor housing with 4 mm screws.

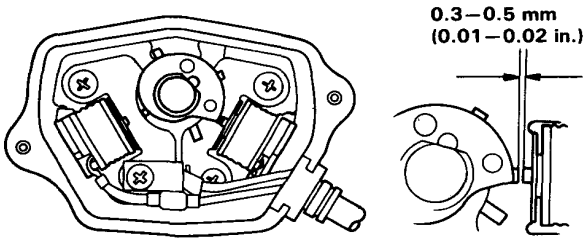


2. Install the coupling with its index mark facing in the direction shown, install the pin, and install the pin ratainer.

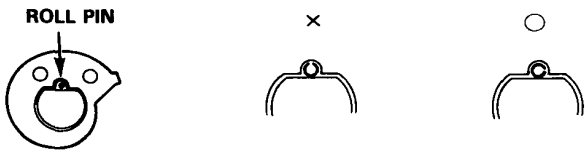


3. Install a new C-clip on the rotor shaft.

4. Install the TDC coil assembly and TDC rotor so that the air gap is 0.3—0.5 mm (0.01—0.02 in.), then install the CYL coil assembly and CYL rotor in the same way.



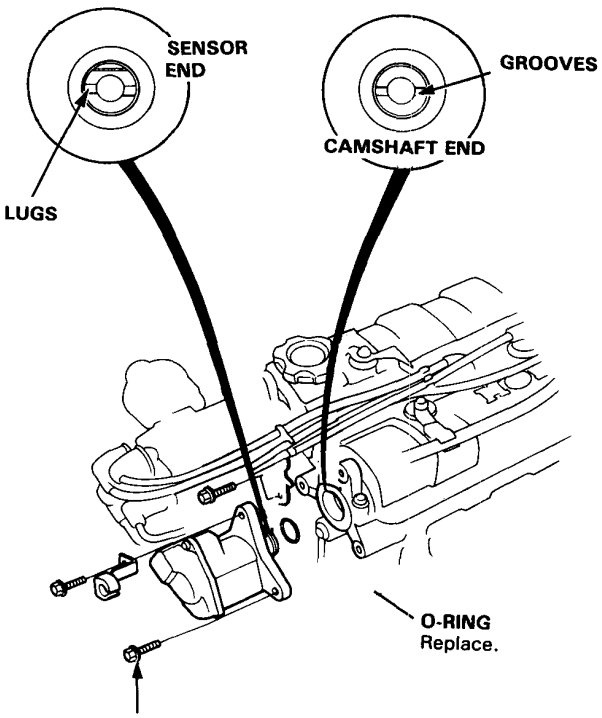
NOTE:
- Install the rotors with the part number facing up.
- Install the roll pin so that if faces as shown below.



Crank Angle Sensor Installation

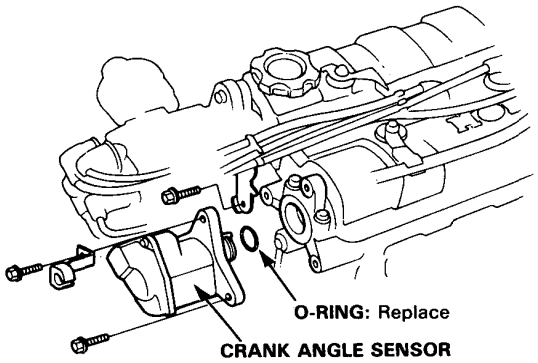
1. Install a new O-ring on the sensor housing.
2. Slip the sensor into the position.

NOTE: The lugs on the end of the sensor and its mating grooves in the camshaft end are both offset to eliminate the possibility of installing the distributor 180° out of time.

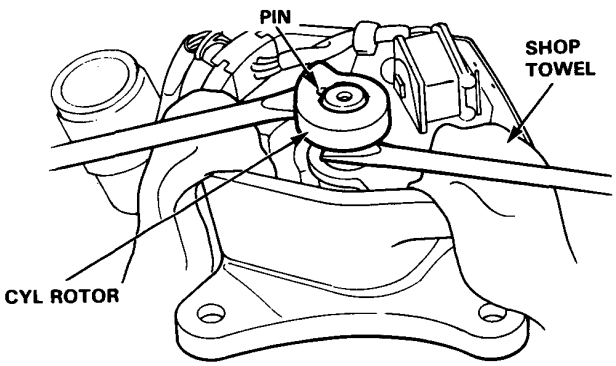


Crank Angle Sensor Disassembly

1. Remove the crank angle sensor from the engine.



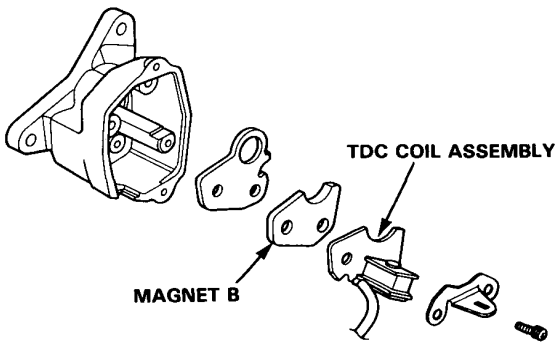
2. Carefully pry up the CYL rotor by using two screwdrivers as shown. Do not damage the CYL rotor.



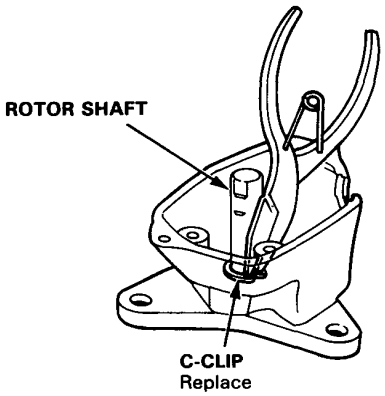
3. Pull the CYL coil assembly and magnet A out from the rotor shaft by removing the screws.

4. Pry up the TDC rotor in the same order of prying up the CYL rotor.

5. Pull the TDC coil assembly and magnet B out from the rotor shaft by removing the screws.

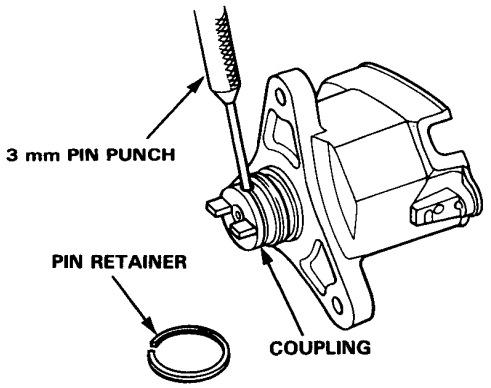


6. Remove the C-clip.

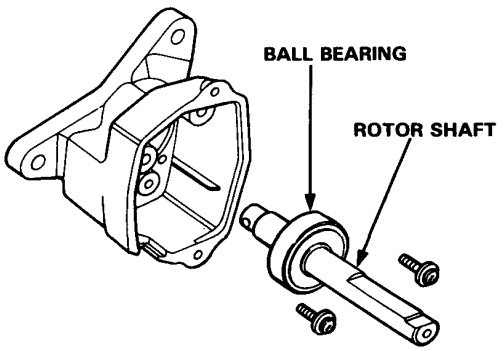


7. Slide off the pin ratainer being careful not to stretch it.

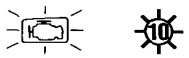
8. Separate the coupling from the shaft by removing the roll pin as shown.



9. Remove the ball bearing and rotor shaft as an assembly by removing the screws.



Troubleshooting Flow Chart —— TA Sensor



– Check engine warning light is on.
– LED indicates CODE 10.

Turn the ignition switch OFF.

Remove No.11 fuse in the under-hood relay box for 10 seconds to reset ECU.

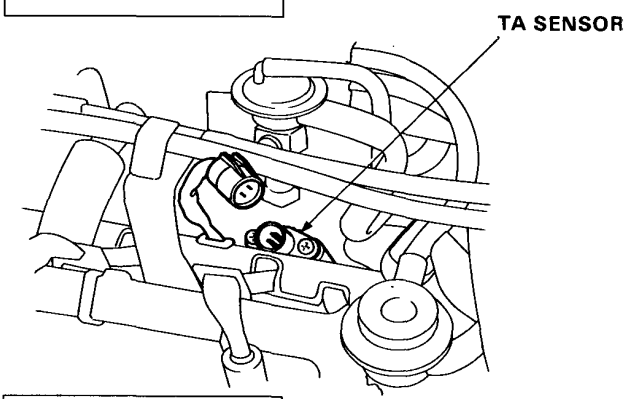
Turn the ignition switch ON.

Is Check engine warning light on? NO → Intermittent failure (test drive may be necessary).

YES

Disconnect the 2P connector on the TA sensor.

Measure resistance between the 2 terminals on the TA sensor.



Is there 1—4 kΩ? NO → Replace TA sensor.

YES

Measure voltage between White/Red (+) terminal and body ground.

Is there approx. 5 V? NO → Turn the ignition switch OFF.

YES

Measure voltage between White/Red (+) terminal and Green/White (–) terminal.

(To page 12-41)

Connect the PGM-FI test harness between the ECU and connector (page 12-19).

(To page 12-41)

(From page 12-40)

Is there approx. 5 V?

NO

Repair open in Green/White wire between ECU (C12) and TA sensor.

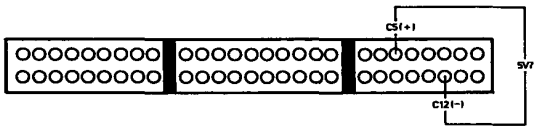
YES

Substitute a known-good ECU and re-check. If symptom/indication goes away, replace the original ECU.

(From page 12-40)

Turn the ignition switch ON.

Measure voltage between C5 (+) terminal and C12 (–) terminal.



Is there approx. 5 V?

YES

Repair open in White/-Red wire between ECU (C5) and TA sensor.

NO

Disconnect "C" connector from the main wire harness only, not the ECU.

Measure voltage between C5 (+) terminal and C12 (–) terminal.

Is there approx. 5 V?

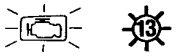
YES

Repair short in White/Red wire between ECU (C5) and TA sensor.

NO

Substitute a known-good ECU and re-check. If prescribed voltage is now available, replace the original ECU.

Troubleshooting Flow Chart —— PA Sensor



— Check engine warning light is on.
— LED indicates CODE 13.

Turn the ignition switch OFF.

Remove No.11 fuse in the under-hood relay box for 10 seconds to reset ECU.

Turn the ignition switch ON.

Is Check engine warning light on? NO → Intermittent failure (test drive may be necessary).

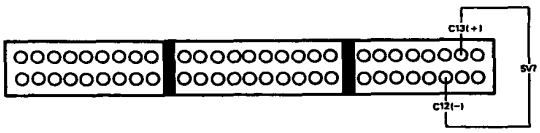
YES

Turn the ignition switch OFF.

Connect the PGM-FI test harness between the ECU and connector (page 12-19).

Turn the ignition switch ON.

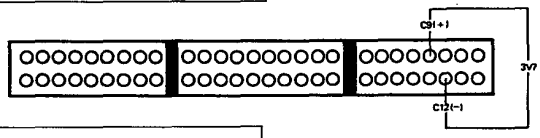
Measure voltage between C13 (+) terminal and C12 (–) terminal.



Is there approx. 5 V? NO → Substitute a known-good ECU and recheck. If prescribed voltage is now available replace the original ECU.

YES

Measure voltage between C9 (+) terminal and C12 (–) terminal.



Is there approx. 3 V? YES → Substitute a known-good ECU and recheck. If symptom/indication goes away, replace the original ECU.

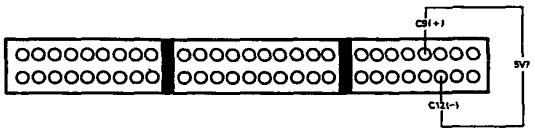
NO

Disconnect the main wire harness from PA sensor.

(To page 12-43)

(From page 12-42)

Measure voltage between C9 (+) terminal and C12 (–) terminal.



Is there approx. 5 V?

NO → Repair short in Red wire between ECU (C9) and PA sensor.

YES

Measure voltage between Yellow/White (+) terminal and Green/White (–) terminal.

Is there approx. 5 V?

NO → Measure voltage between Yellow/White (+) terminal and body ground.

YES

Measure voltage between Red (+) terminal and Green/White (–) terminal.

Is there approx. 5 V?

NO → Repair open in Red wire between ECU (C9) and PA sensor.

YES

Replace PA sensor.

Is there approx. 5 V?

NO → Repair open in Yellow/White wire between ECU (C13) and PA sensor.

YES

Repair open in Green/White wire between ECU (C12) and the sensor.

Idle Control System

Symptom-to-Sub System Chart

B20A8

NOTE: Across each row in the chart, the sub systems that could be sources of a symptom are ranked in the order they should be inspected, starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next system ②, etc.

PAGE / SUB SYSTEM / SYMPTOM		IDLE ADJUSTING SCREW	IDLE CONTROL	A/C IDLE BOOST
		65	48	50
WHEN COLD	Fast idle speed is not as specified [1,200—2,000 min^{-1} (rpm)]			
WHEN WARM RPM TOO HIGH	Idle spped is above specified min^{-1} (rpm)		③	③
WHEN WARM RPM TOO LOW	Idle speed is below sprcified min^{-1} (rpm)		①	
	Idle speed does not increase after initial start up.		①	
	Idle speed drops when blipping throttle with electrical load			
	Idle speed drops when air conditioner is ON			①

* — If by-pass passages are blocked, a low idle speed will result.
— If hoses or by-pass passages are leaking, a high idle speed will result.

STARTER SIGNAL	ALTERNATOR FR SIGNAL	AIR CONDITIONING SIGNAL	VEHICLE SPEED SIGNAL	FAST IDLE VALVE	HOSES AND CONNECTIONS
56	57	59	61	64	*
				①	
				②	①
					②
②					
	①				
		②			

Idle Control System

Symptom-to-Sub System Chart

A20A3

NOTE: Across each row in the chart, the sub systems that could be sources of a symptom are ranked in the order they *should be inspected*, starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next system ②, etc.

PAGE / SUB SYSTEM / SYMPTOM		IDLE ADJUSTING SCREW	IDLE CONTROL	FAST IDLE CONTROL	A/T IDLE CONTROL	A/C IDLE BOOST
		65	48	52	54	50
WHEN COLD	Fast idle speed is not as specified [1,200—2,000 min^{-1} (rpm)]			②		
WHEN WARM RPM TOO HIGH	Idle speed is above specified rpm		③	③	③	③
WHEN WARM RPM TOO LOW	Idle speed is below specified rpm		①			
	Idle speed does not increase after initial start up.		①			
	Idle speed drops when blipping throttle with electrical load					
	On models with automatic transmission, the idle speed drops in gear				①	
	Idle speed drops when air conditioner is ON					①

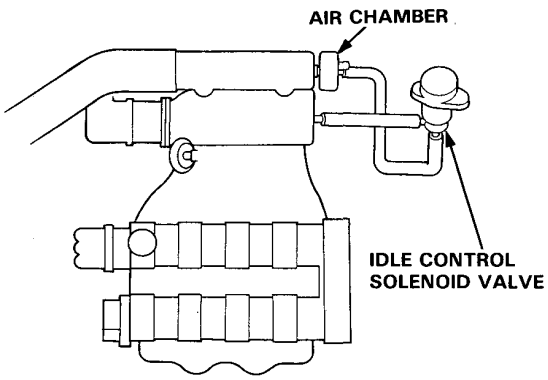
* — If by-pass passages are blocked, a low idle speed will result.
— If hoses or by-pass passages are leaking, a high idle speed will result.

STARTER SIGNAL	ALTERNATOR FR SIGNAL	A/T SHIFT POSITION SIGNAL	AIR CONDITIONING SIGNAL	FAST IDLE VALVE	HOSES AND CONNECTIONS
56	57	62	59	64	*
				①	
				②	①
					②
②					
	①				
		②			
			②		

Idle Control System

Idle Control Test

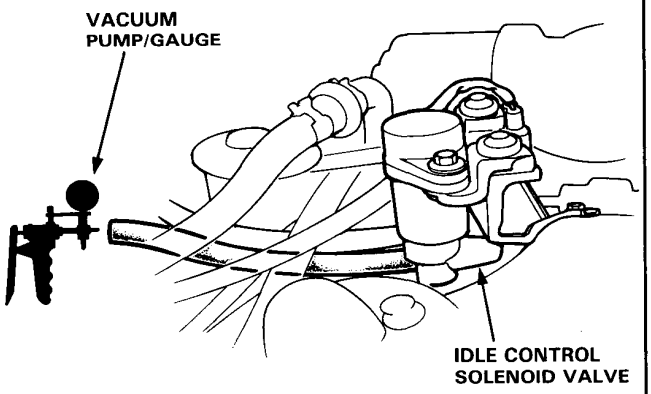
1. Check the vacuum line for proper connection, cracks, blockage or disconnected hoses.



2. Disconnect the lower vacuum hose of the idle control solenoid valve from the air chamber and connect a vacuum gauge to the vacuum hose.

3. Start the engine and check for vacuum.
   NOTE: Check within 10 seconds.

   There should be vacuum.



- If there is no vacuum, go to solenoid valve test I (page 12-49).

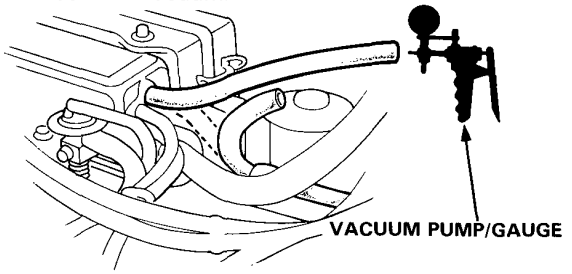
4. Raise engine speed above 1,500 min^{-1} (rpm).

   There should be no vacuum.

- If there is vacuum, go to solenoid valve test II (page 12-49).
- If there is no vacuum, the test is complete.

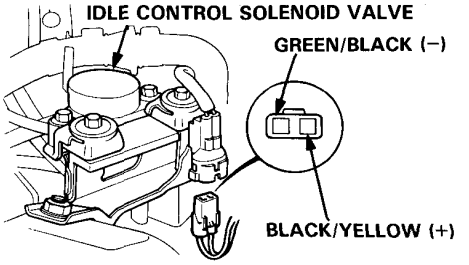
Solenoid Valve Test I:

1. Start the engine and allow to idle.
2. Disconnect the upper vacuum hose of the idle control solenoid valve from the intake manifold and check the vacuum.



- If there is no vacuum, check the vacuum port.

3. Stop the engine.
4. Disconnect the 2P connector on the idle control solenoid valve.
5. Attach the positive probe of the voltmeter to the Black/Yellow terminal and the negative probe to the Green/Black terminal.



6. Within 10 seconds after restarting the engine, check the voltage at idle.

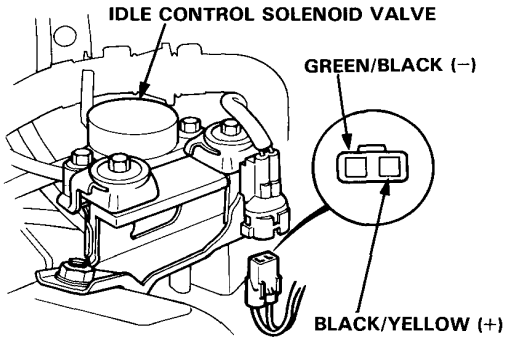
- If there is voltage, replace the solenoid valve and re-test.
- If there is no voltage, attach the positive probe of the voltmeter to the Black/Yellow terminal of the connector, and the negative probe to body ground. Within 10 seconds after restarting the engine, check the voltage.

— If there is no voltage, repair the open in the Black/Yellow wire between the solenoid valve and the No.1 fuse.

— If there is voltage, inspect for an open in the Green/Black wire between the solenoid valve and the ECU. If the wire is OK, see ECU troubleshooting (page 12-21).

Solenoid Valve Test II:

1. Start the engine.
2. Disconnect the 2P connector on the idle control solenoid valve.
3. Attach the positive probe of the voltmeter to the Black/Yellow terminal, and the negative probe to the Green/Black terminal.

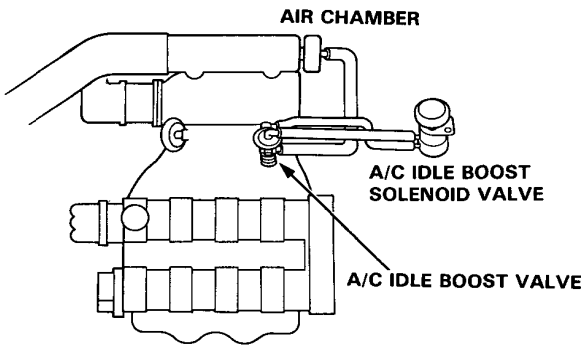


4. Hold engine above 1,500 min^{-1} (rpm) and check the voltage.

- If there is voltage, inspect for a short in the Green/Black wire between the solenoid valve and the ECU. If the wire is OK, see ECU troubleshooting (page 12-21).
- If there is no voltage, replace the solenoid valve and re-test.

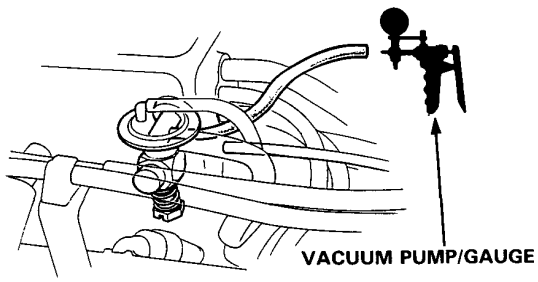
A/C Idle Boost Test

1. Check the vacuum line for improper connection, cracks, blockage or disconnected hoses.

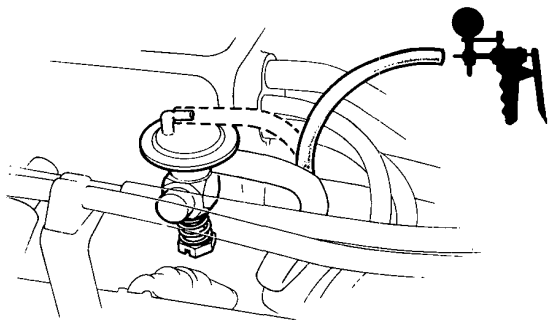


2. Start the engine and allow to idle.
3. Disconnect the vacuum hose between the A/C idle boost valve and the air chamber from the A/C idle boost valve and connect a vacuum gauge to the valve.

   There should be no vacuum.



   - If there is no vacuum, disconnect the vacuum hose from the A/C idle boost valve and connect the vacuum gauge to the hose.



   — If there is no vacuum, replace the A/C idle boost valve and re-test.
   — If there is vacuum, go to solenoid valve test II (page 12-51).

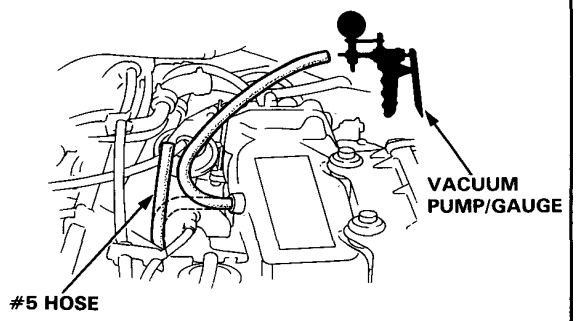
4. Turn the A/C switch and blower switch ON, then check that the compressor and the condenser cooling fan work.

   There should be vacuum.

   - If there is no vacuum, disconnect the vacuum hose from the A/C idle boost valve and connect the vacuum gauge to the hose.
   — If there is vacuum, replace the A/C idle boost valve and re-test.
   — If there is no vacuum, go to solenoid valve test I (page 12-51).

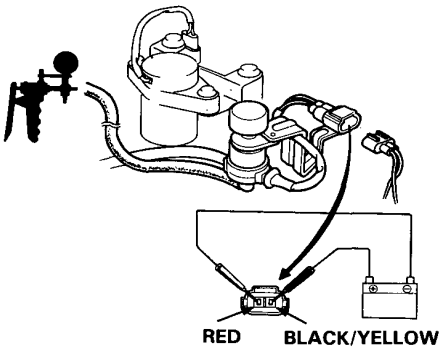
Solenoid Valve Test I:

1. Start the engine and allow to idle.
2. Disconnect the #5 vacuum hose from the intake manifold and check the vacuum.



- If there is no vacuum, check the vacuum port.

3. Disconnect the 2P connector.
4. Attach the positive probe of the voltmeter to the Black/Yellow terminal, and the negative probe to the Red terminal.



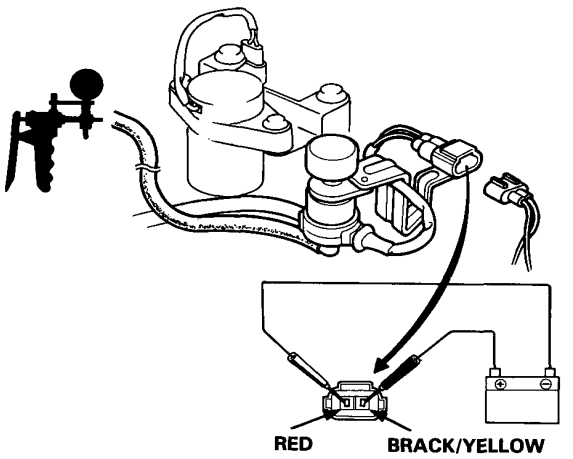
5. Turn the A/C switch and blower switch ON, then check that the compressor and the condenser cooling fan work.

- If there is voltage, replace the solenoid valve and re-test.
- If there is no voltage, attach the positive probe of the voltmeter to the Black/Yellow terminal, and the negative probe to body ground. Check for voltage.

— If there is no voltage, repair the open in the Black/Yellow wire between the solenoid valve and No. 1 fuse.
— If there is voltage, inspect for an open in the Red wire between the solenoid valve and the ECU. If the wire is OK, see ECU troubleshooting (page 12-21).

Solenoid Valve Test II

1. Start the engine.
2. Disconnect the 2P connector.
3. Attach the positive probe of the voltmeter to the Black/Yellow terminal, and the negative probe to the Red terminal.

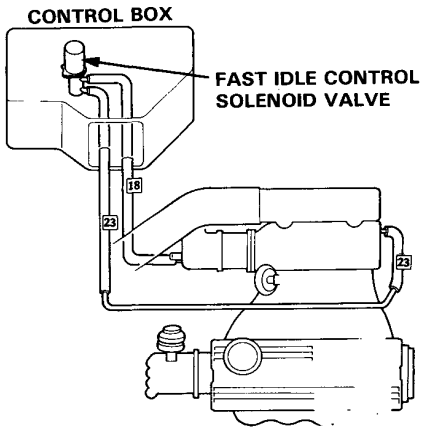


- If there is voltage, inspect for a short in the Red wire between the solenoid valve and the ECU. If the wire is OK, see ECU troubleshooting (page 12-21).
- If there is no voltage, replace the solenoid valve and re-test.

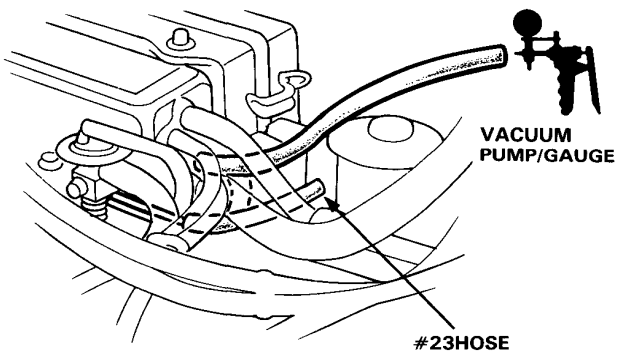
Idle Control System

Fast Idle Control Test (A20A3)

1. Check the vacuum line for proper connection, cracks, blockage or disconnected hoses.

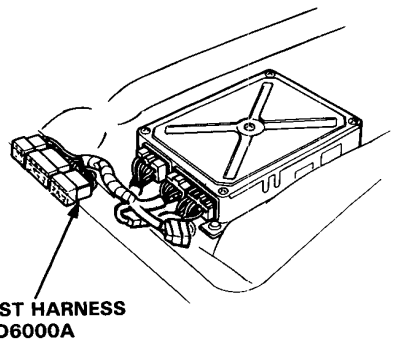


2. Start the engine and allow to idle.
3. Disconnect the #23 vacuum hose from the intake manifold and check the vacuum.

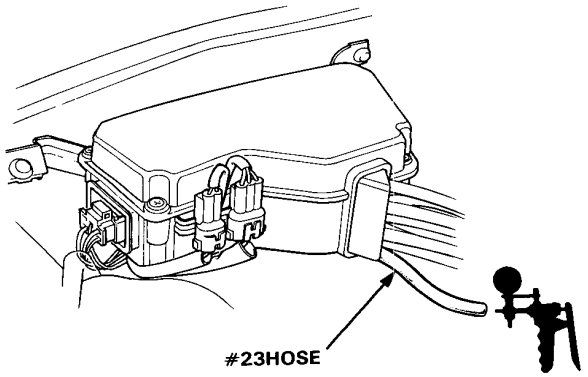


- If there is no vacuum, check the vacuum port.

4. Turn the ignition switch OFF.
5. Connect the PGM-FI test harness "B" connector to the main wire harness only, not the ECU.



6. Disconnect the #23 vacuum hose from the vacuum hose manifold and connect a vacuum pump to the hose.



7. Apply vacuum to the hose.

   It should hold vacuum.

   - If it does not hold vacuum, replace the solenoid valve and re-test.

8. Turn the ignition switch ON.

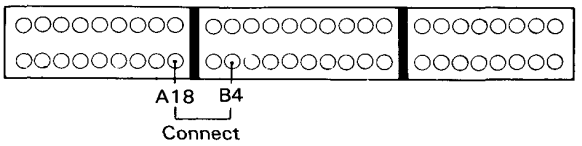
9. Apply vacuum to the hose.

   It should hold vacuum.

   - If it does not hold vacuum, repair short in Red/Green wire between the solenoid valve and ECU.

   NOTE: On cars with automatic transmission, also inspect short in Green wire between the A/T idle control solenoid valve and ECU.

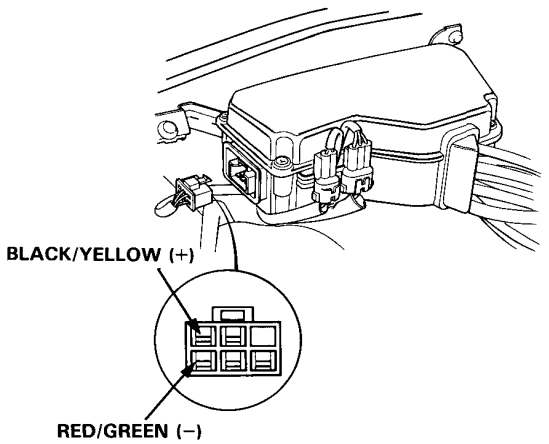
10. Connect B4 terminal to A18 terminal.



11. Apply vacuum to the hose.

    It should not hold vacuum.

    - If it holds vacuum, turn the ignition switch OFF. Disconnect the 6P connector, then attach the positive probe of the voltmeter to the Black/Yellow terminal, and the negative probe to the Red/Green terminal. Turn the ingition switch ON.



   — If there is voltage, replace the solenoid valve and re-test.
   — If there is no voltage, attach the positive probe of the voltmeter to the Black/Yellow terminal, and the negative probe to body ground.

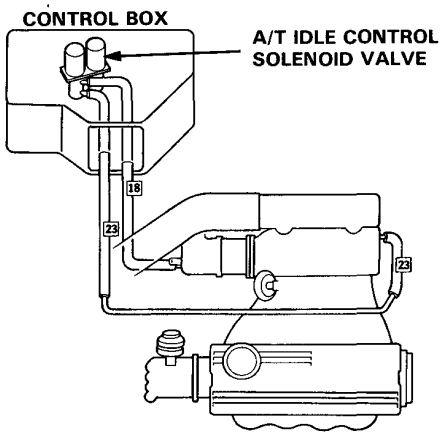
   - If there is no voltage, repair the open in the Black/Yellow wire between the solenoid valve and the No.1 fuse.

   - If there is voltage, repair the open in the Red/Green wire between the solenoid valve and the ECU.

Idle Control System

A/T Idle Control Test (A20A3)

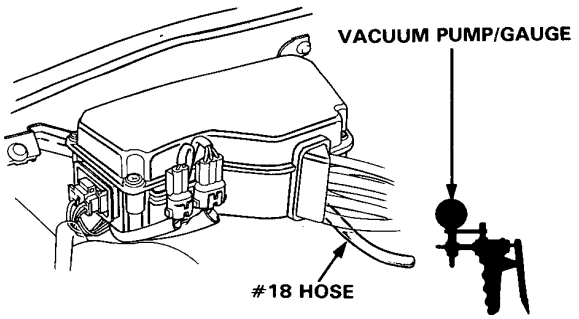
1. Check the vacuum line for proper connection, cracks, blockage or disconnected hoses.



2. Warm up the engine to normal operating temperature (the cooling fan comes on).
   NOTE: Apply parking brake securely.

3. Disconnect the #18 vacuum hose from the air flow tube and connect a vacuum gauge to the hose.

   There should be no vacuum.



- If there is vacuum, go to solenoid valve test II (page 12-55).

4. Shift transmission into "D_3" or "D_4".

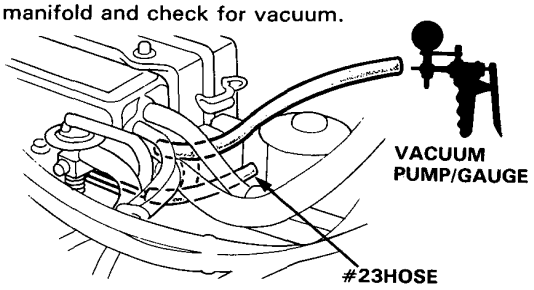
   There should be vacuum.

- If there is no vacuum, go to solenoid valve test I (page 12-55).
- If there is vacuum, the test is complete.

Solenoid Valve Test I:

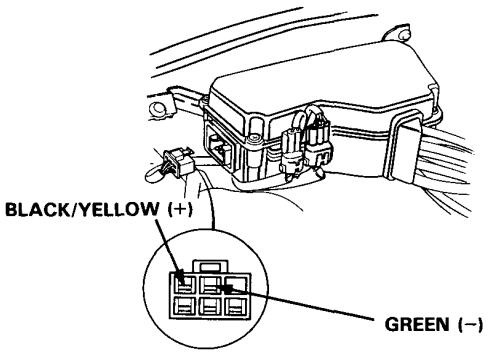
NOTE: Apply parking brake securely.

1. Start the engine and allow to idle.
2. Disconnect #23 vacuum hose from the intake manifold and check for vacuum.



- If there is no vacuum, check the vacuum port.

3. Disconnect the 6P connector.
4. Attach the positive probe of the voltmeter to the Black/Yellow terminal, and the negative probe to the Green terminal.



5. Shift transmission into "D_3" or "D_4".

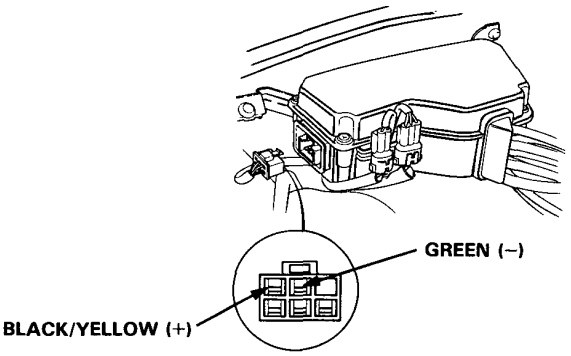
- If there is voltage, replace the solenoid valve and re-test.
- If there is no voltage, attach the positive probe of the voltmeter to the Black/Yellow terminal, and the negative probe to body ground. Check for voltage.

– If there is no voltage, repair the open in the Black/Yellow wire between the solenoid valve and No. 1 fuse.

– If there is voltage, inspect for an open in the Green wire between the solenoid valve and the ECU.
If the wire is OK, see ECU troubleshooting (page 12-21).

Solenoid Valve Test II:

1. Start the engine.
2. Disconnect the 6P connector.
3. Attach the positive probe of the voltmeter to the Black/Yellow terminal, and the negative probe to the Green terminal.



- If there is voltage, inspect for a short in the Green wire between the solenoid valve and the ECU.
If the wire is OK, see ECU troubleshooting (page 12-21).
- If there is no voltage, replace the solenoid valve and re-test.

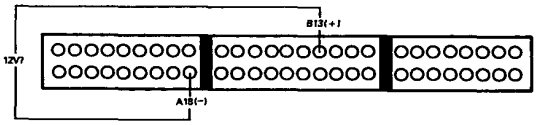
Troubleshooting Flow Chart —— Starter Signal

This signals the PGM-FI ECU when the engine is cranking. The ECU controls the idle control solenoid valve to promote easy starting.

Inspection of Starter Switch Signal.

Connect the PGM-FI test harness between the ECU and connector (page 12-19).

Measure voltage B13 (+) terminal and A18 (–) terminal with ignition switch in the start position.



Is there battery voltage?

NO → Inspect No.10 fuse.

YES → Starter signal is OK.

Is No. 10 fuse OK?

NO → Replace fuse.

YES → Repair open in Blue/Red wire between ECU (B13) and No. 10 fuse.

Troubleshooting Flow Chart —— Alternator FR Signal

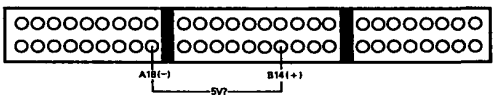
This signals the PGM-FI ECU when the alternator is charging.

Inspection of Alternator FR Signal.

Connect the PGM-FI test harness between the ECU and connector (page 12-19). But disconnect "B" connector from the main wire harness only, not the ECU.

Turn the ignition switch ON.

Measure voltage between B14 (+) terminal and A18 (–) terminal.



Is there approx. 5 V?

NO — Substitute a known-good ECU and recheck. If prescribed voltage is now available, replace the original ECU.

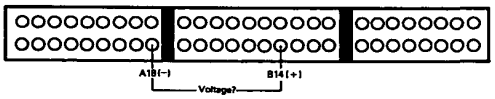
YES

Turn the ignition switch OFF.

Reconnect "B" connector to the main wire harness.

Warm up engine to normal operating temperature (cooling fan comes on).

Measure voltage between B14 (+) terminal and A18 (–) terminal.



Does the voltage decrease when headlight and rear defogger are turned on?

NO — Stop engine.

YES

Alternator FR signal is OK.

(To page 12-58)

(cont'd)

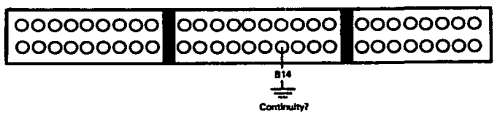
Troubleshooting Flow Chart — Alternator FR Signal (cont'd)

(From page 12-57)

Disconnect "B" connector from ECU only, not the main wire harness.

Disconnect the negative battery cable from the battery.

Check for continuity between B14 terminal and body ground.

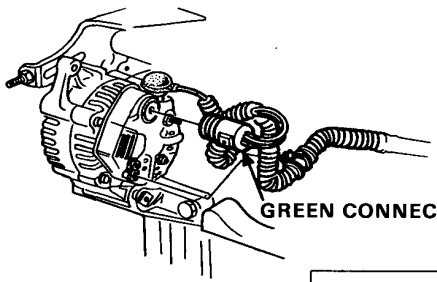


Does continuity exist?

YES → Disconnect Green connector from the alternator.

NO

Disconnect Green connector from the alternator.



Check for continuity between B14 terminal and body ground.

Does continuity exist?

NO → See Alternator Inspection.

YES → Repair short in White/Red wire between ECU (B14) and alternator.

Connect White/Red wire to body ground.

Check for continuity between B14 terminal and body ground.

Does continuity exist?

YES → See Alternator Inspection.

NO → Repair open in White/Red wire between ECU (B14) and alternator.

Troubleshooting Flow Chart —— Air Conditioning Signal

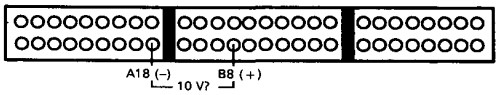
This signals the PGM-FI ECU when there is a demand for cooling from the air conditioning circuits (A/C switch).

Inspection of Air Conditioning Signal.

Connect the PGM-FI test harness between the ECU and connector (page 12-19). But disconnect "B" connector from the main wire harness only, not the ECU.

Turn the ignition switch ON.

Measure voltage between B8 (+) terminal and A18 (–) terminal.



Is there approx. 10 V?

NO → Substitute a known-good ECU and recheck. If prescribed voltage is now available, replace the original ECU.

YES

Reconnect "B" connector to the main wire harness.

Start engine.

Blower switch ON.

A/C switch ON.

Does A/C operate?

NO → **See Air conditioner inspection.**

YES

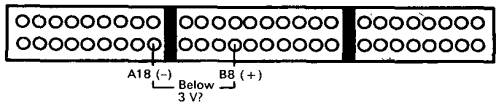
(To page 12-60)

(cont'd)

Troubleshooting Flow Chart — Air Conditioning Signal (cont'd)

(From page 12-59)

Measure voltage between B8 (+) terminal and A18 (–) terminal.



Is there below 3 V?

YES → Repair open in Blue/Red wire between ECU (B8) and A/C diode connector.

NO → Air conditioning signal is OK.

Troubleshooting Flow Chart —— Vehicle Speed Signal

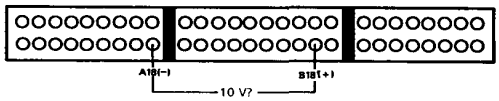
This signals the PGM-FI ECU when the vehicle speed is above 10 mph.

Inspection of Vehicle Speed Signal.

Connect the PGM-FI test harness between the ECU and connector (page 12-19). But disconnect "B" connector from the main wire harness only, not the ECU.

Turn the ignition switch ON.

Measure voltage between B18 (+) terminal and A18 (–) terminal.



Is there approx. 10 V?

NO → Substitute a known-good ECU and recheck. If prescribed, voltage is now available replace the original ECU.

YES

Turn the ignition switch OFF.

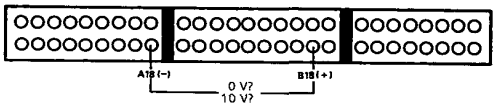
Reconnect "B" connector to the main wire harness.

Block rear wheels and set the parking brake. Jack up the front of the car and support with safety stands.

WARNING Block rear wheels before jacking up front of car.

Start engine, put transmission in 2nd gear, let the clutch out.

Measure voltage between B18 (+) terminal and A18 (–) terminal.



Is there approx. 10 V above 10 mph and below 3 V below 10 mph?

NO → Repair open or short in Yellow wire between ECU (B18) and speed sensor amplifier. If wire is OK, replace the sensor.

YES

Speed vehicle signal is OK.

Troubleshooting Flow Chart — A/T Shift Position Signal (A20A3)

This signals the PGM-FI ECU when the transmission is in Neutral or Park.

Inspection of A/T Shift Position Signal

Turn the ignition switch ON.

Observe the A/T shift indicator and select each position separately.

Does the indicator light properly? NO → See A/T shift position Indicator Inspection.

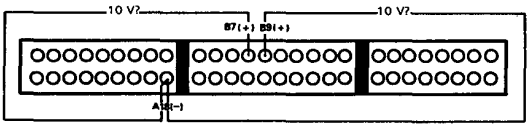
YES

Turn the ignition switch OFF.

Connect the PGM-FI test harness between the ECU and connector (*page* 12-19). But *disconnect* "B" connector from the main wire harness only, not the ECU.

Turn the ignition switch ON.

Measure voltage between B7 (+) and B9 (+) terminal individually, and A18 (–) terminal.

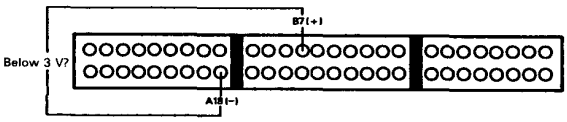


Is there approx. 10 V? NO → Substitute a known-good ECU and recheck. If prescribed voltage is now available, replace the original ECU.

YES

Reconnect "B" connector to the main wire harness.

Measure voltage between B7 (+) terminal and A18 (–) terminal in Neutral position.



(To page 12-63)

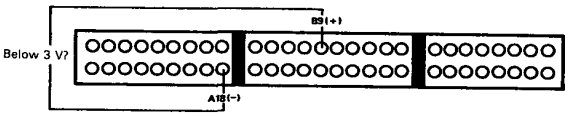
(From page 12-62)

Is there below 3 V?

NO → Repair open Green wire between ECU (B7) and A/T shift position indicator switch.

YES

Measure voltage between B9 (+) terminal and A18 (–) terminal in Park position.



Is there below 3 V?

NO → Repair open Green/White wire between ECU (B9) and A/T shift position indicator switch.

YES

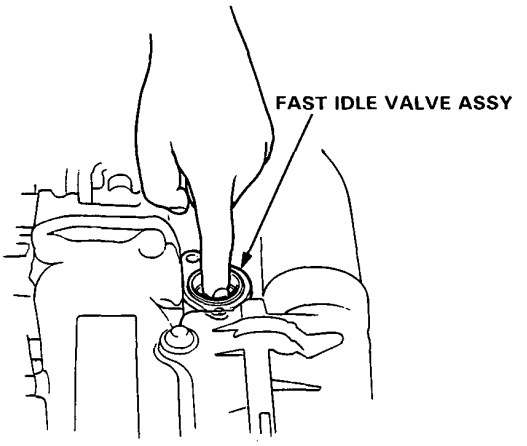
A/T shift position signal is OK.

Fast Idle Control

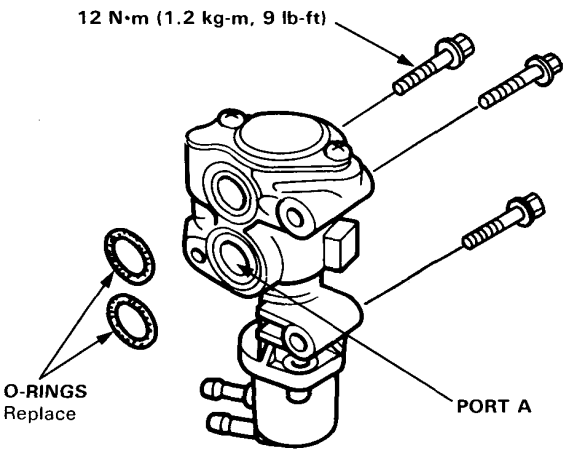
Inspection

NOTE: The fast idle valve is factory adjusted; it should not be disassembled.

1. Start the engine.
2. Remove the cover of the fast idle valve.
3. Put your finger on the valve seat area and make sure that there is air flow with the engine cold (coolant temperature below 30°C, 86°F) and idling.



- If not, replace the fast idle valve and re-test.

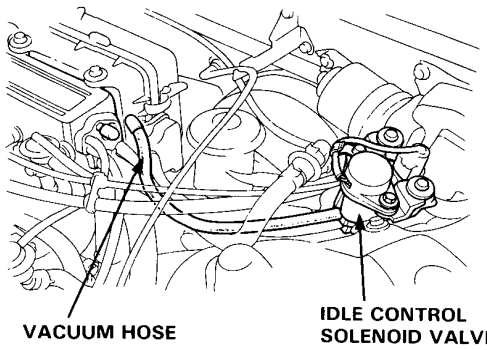


4. *Warm up the engine (cooling fan comes on).*
5. Check that the valve is completely closed. If not, an air suction sound can be heard in the valve seat area.
   - If any suction is heard, the valve is leaking. Replace the fast idle valve and re-check.

Idle Speed

Inspection/Adjustment

1. Start the engine and warm it up to normal operating temperature (the cooling fan goes on twice).
2. Connect a tachometer.
3. Disconnect the upper vacuum hose of the idle control solenoid valve (between the valve and intake manifold) from the intake manifold.
4. Cap the end of the hose and intake manifold.

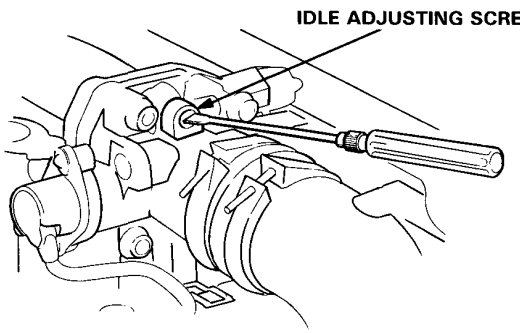


5. Adjust the idle speed with headlights, heater blower, rear window defroster, cooling fan and air conditioner off.

   Idle Speed should be:

Manual	750 ± 50 min^{-1} (rpm)
Automatic	750 ± 50 min^{-1} (rpm) (in "N" or "P")

   Adjust the idle speed, if necessary, by turning the adjusting screw on the top of the throttle body.

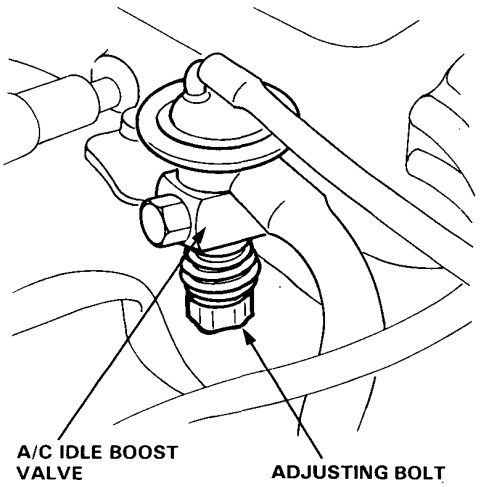


6. Check the idle speed with heater fan switch at HI (right end) and air conditioner on.

   Idle Speed should be:

Manual	750 ± 50 min^{-1} (rpm)
Automatic	750 ± 50 min^{-1} (rpm) (in "N" or "P")

   Adjust idle speed, if necessary, by turning the adjusting bolt on the A/C idle boost valve.



7. After adjustment, connect the idle control solenoid valve vacuum hose.
8. On Automatic Transmission model, after adjusting the idle speed, check that it remains within the specified limit when shifted in gear ("D_3" or "D_4").

   Idle speed should remain:
   750 ± 50 min^{-1} (rpm) (in "D_3" or "D_4")

9. Check the idle speed with headlights, heater blower, rear window defroster, and cooling fan on but air conditioner off.
   It should be the same as normal idle speed.

   NOTE: If the idle speed is not within specifications, see Symptom-to-Sub System Chart on page 12-44 and 47.

Fuel Supply System

Symptom-to-Sub System Chart

NOTE: Across each row in the chart, the sub systems that could be sources of a symptom are ranked in the order they should be inspected, starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next system ②, etc.

PAGE / SUB SYSTEM	FUEL INJECTORS	INJECTOR RESISTOR	PRESSURE REGULATOR	FUEL FILTER	FUEL PUMP	MAIN RELAY	FUEL TANK	CONTAMI-NATED FUEL
SYMPTOM	68	70	71	71	72	73	—	*
ENGINE WON'T START	②	③		③	①	②		
MISFIRE	①	②						③
LOSS OF POWER				①				②

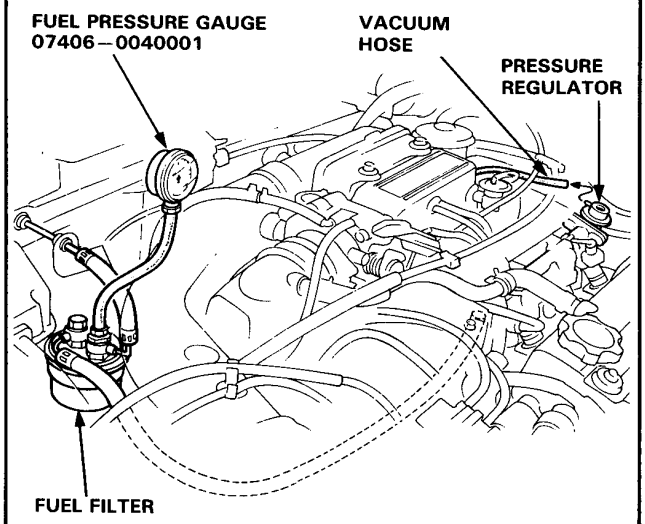
* Fuel with dirt, water or a high percentage of alcohol is considered contaminated.

Fuel Pressure

Inspection

1. Relieve fuel pressure.
2. Remove the service bolt on the top of the fuel filter while holding the banjo bolt with another wrench and attach the fuel pressure gauge.
3. Start the engine. Measure the fuel pressure with the engine idling and the vacuum hose of the pressure regulator disconnected.

   Pressure should be:
   250–279 kPa (2.55–2.85 kg/cm², 36-41 psi)



- If the fuel pressure is not as specified, first check the fuel pump (page 12-72). If the pump is OK, check the following.

– If the pressure is higher than specified, inspect for:
  - Pinched or clogged fuel return hose or piping.
  - Faulty pressure regulator (page 12-70).

– If the pressure is lower than specified, inspect for:
  - Clogged fuel filter.
  - Pressure regulator failure (page 12-70).
  - Leakage in the fuel line.

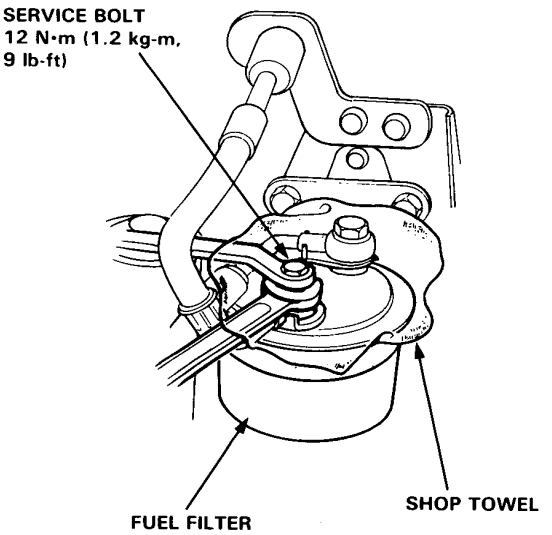
Relieving

WARNING

- **Do not smoke while working on the fuel system. Keep open flames or sparks away from the work area.**
- **Be sure to relieve fuel pressure while the engine is off.**

NOTE: Before disconnecting fuel pipes or hoses, release pressure from the system by loosening the 6 mm service bolt at top of the fuel filter.

1. Disconnect the battery negative cable from the battery negative terminal.
2. Use a box end wrench on the 6 mm service bolt at top of the fuel filter, while holding the special banjo bolt with another wrench.
3. Place a rag or shop towel over the 6 mm service bolt.
4. Slowly loosen the 6 mm service bolt one complete turn.



NOTE:
- A fuel pressure gauge can be attached at the 6 mm service bolt hole.
- Always replace the washer between the service bolt and the special banjo bolt, whenever the service bolt is loosened to relieve fuel pressure.
- Replace all washers whenever the bolts are removed to disassemble parts.

Fuel Injectors

Test

NOTE: Check the following items before testing: idle speed, ignition timing and idle CO %

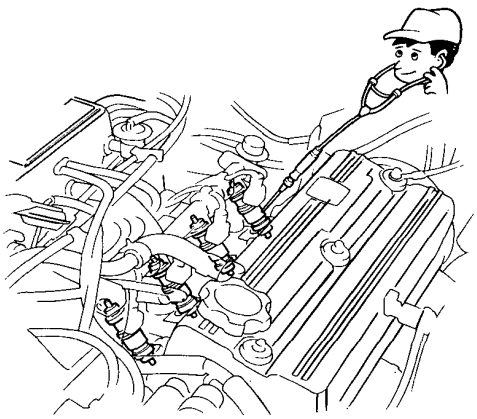
If the engine will run:

1. With th engine idling, disconnect each injector connector individually and inspect the change in the idling speed.

   - If the idle speed drop is almost the same for each cylinder, the injectors are normal.

   - If the idle speed or quality remains the same when you disconnect a particular injector, replace the injector and re-test.

2. Check the clicking sound of each injector by means of a stethoscope when the engine is idling.



- If any injector fails to make the typical clicking sound, check the sound again after replacing the injector.

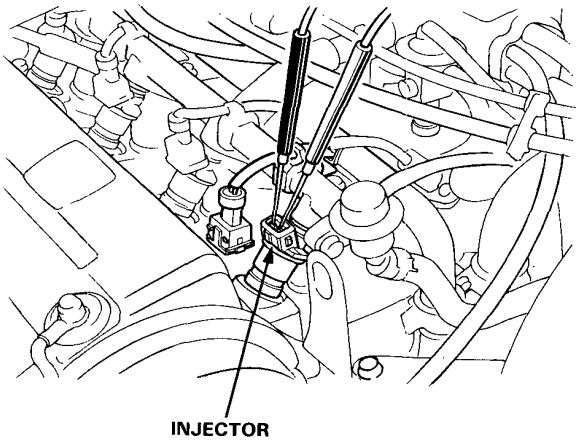
— If clicking sound is still absent, check the following:
  - Whether there is any short-circuiting, wire breakage or poor connection in the Yellow/Black wire between the main relay and the resistor.
  - Whether the resistor is open or corroded (page 12-70).
  - Whether there is any short-circuiting, wire breakage or poor connection in the Red/Black wire between the resistor and the injector.
  - Whether there is any short-circuiting, wire breakage or poor connection in the wire between the injector and the ECU.

  If all is OK, check the ECU (page 12-18).

If the engine cannot be started:

1. Remove the connector of the injector, and measure the resistance between the 2 terminals of the injector.

   Resistance should be: 1.5—2.5 Ω



- If the resistance is not as specified, replace the injector.

- If the resistance is as specified, check the fuel pressure (page 12-67).

— If the fuel pressure is as specified, check the following:
  - Whether there is any short-circuiting, wire breakage or poor connection in the Yellow/Black wire between the main relay and the resistor.
  - Whether the resistor is open or corroded (page 12-70).
  - Whether there is any short-circuiting, wire breakage, or poor connection in the Red/Black wire between the resistor and the injector.
  - Whether there is any short-circuiting, wire breakage or poor connection in the wire between the injector and the ECU.

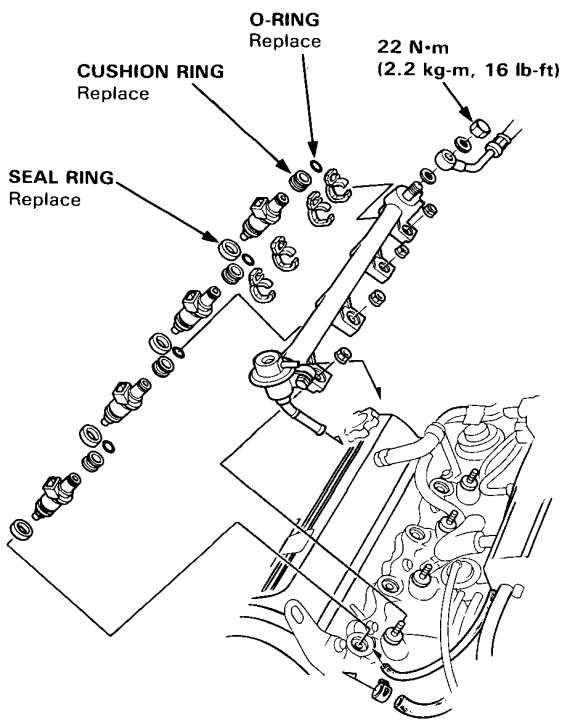
  If all is OK, check the ECU (page 12-18).

Replacement

WARNING Do not smoke during the work. Keep open flames away from your work area.

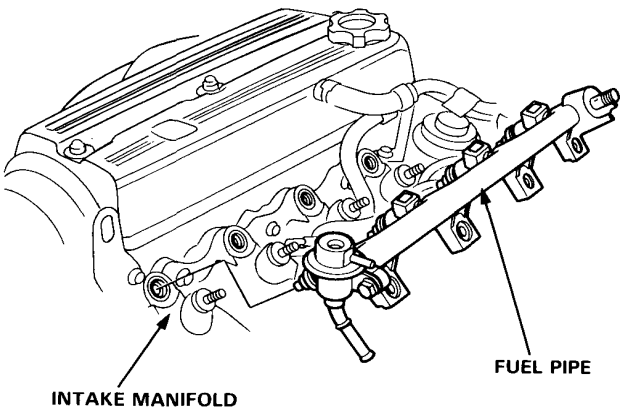
1. Disconnect the battery negative cable from the battery negative terminal.
2. Relieve fuel pressure (page 12-67).
3. Disconnect the connectors of the injectors.
4. Disconnect the vacuum hose and fuel return hose from the pressure regulator.

   NOTE: Place a rag or shop towel over the hose and tube before disconnecting them.
5. Loosen the retainer nuts on the fuel pipe and remove the fuel line.
6. Disconnect the fuel pipe.
7. Remove the injectors from the intake manifold.

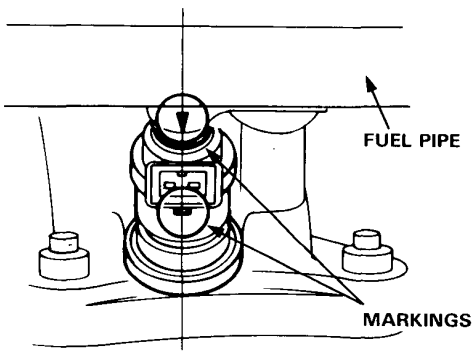


8. Slide new cushion rings onto the injectors.
9. Coat new O-rings with clean engine oil and put them on the injectors.
10. Insert the injectors into the fuel pipe first.
11. Coat new seal rings with clean engine oil and press them into the intake manifold.
12. Install the injectors and fuel pipe assembly in the manifold.

    CAUTION: To prevent damage to the O-ring, install the injectors in the fuel pipe first, then install them in the intake manifold.



13. Align the center line on the connector with the mark on the fuel pipe.



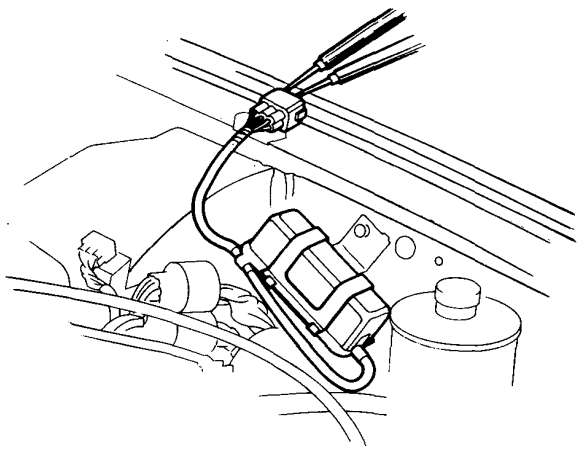
14. Install and tighten the retainer nuts and the fuel line.
15. Connect the vacuum hose and fuel return hose to the pressure regulator.
16. Install the connectors on the injectors.
17. Turn the ignition switch ON but do not operate the starter. After the fuel pump runs for approximately two seconds, the fuel pressure in the fuel line rises. Repeat this two or three times, then check whether there is any fuel leakage.

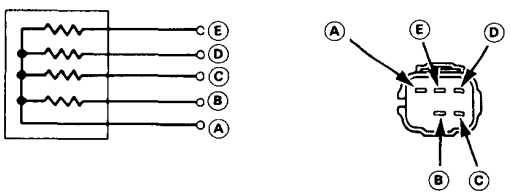
Injector Resistor

Test

1. Disconnect the resistor connector.
2. Check for resistance between each of the resistor terminals (E, D, C, and B) and the power terminal (A).

   Resistance should be: 5—7 Ω





- Replace the resistor with a new one if any of the resistances are outside of the specification.

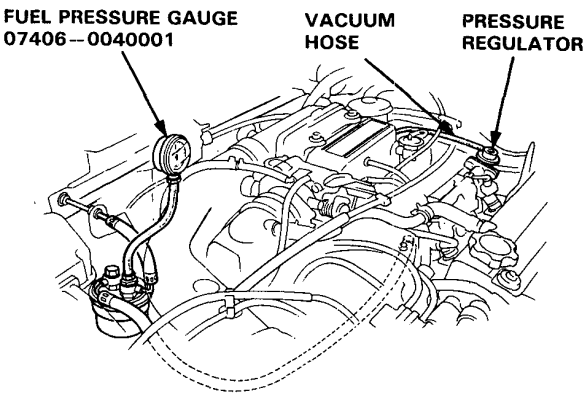
Pressure Regurator

Test

WARNING **Do not smoke during the test. Keep open flames away from your work area.**

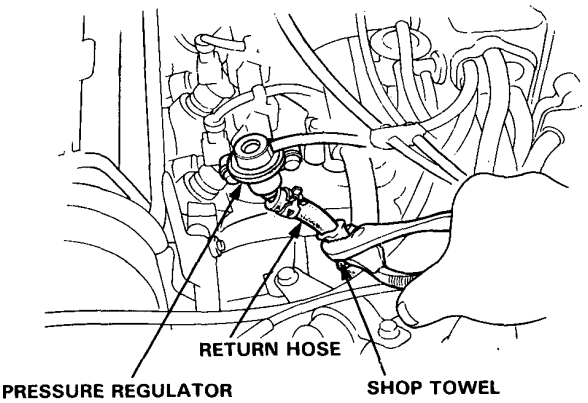
1. Attach a pressure gauge to the service port of the fuel filter (page 12-67).

   Pressure should be:
   250—279 kPa (2.55—2.85 kg/cm², 36—41 psi)



2. Check that fuel pressure rises by disconnecting the vacuum hose from the regulator.

   - If the fuel pressure does not rise, check whether it rises when the return hose is lightly pinched.



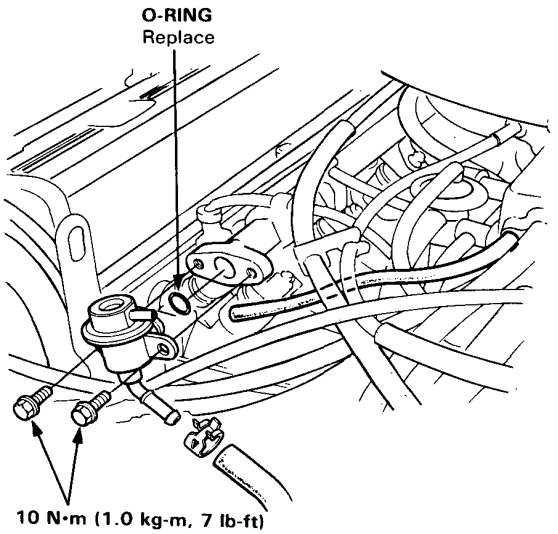
   — If the pressure does not rise, replace the regulator and re-test.

Fuel Filter

Replacement

WARNING **Do not smoke while working on fuel system. Keep open flame away from work area.**

1. Disconnect the negative terminal of the battery.
2. Place a shop towel under the pressure regulator, then relieve fuel pressure (page 12-67).
3. Disconnect the vacuum hose and fuel return hose.
4. Remove the two 6 mm retainer bolts.



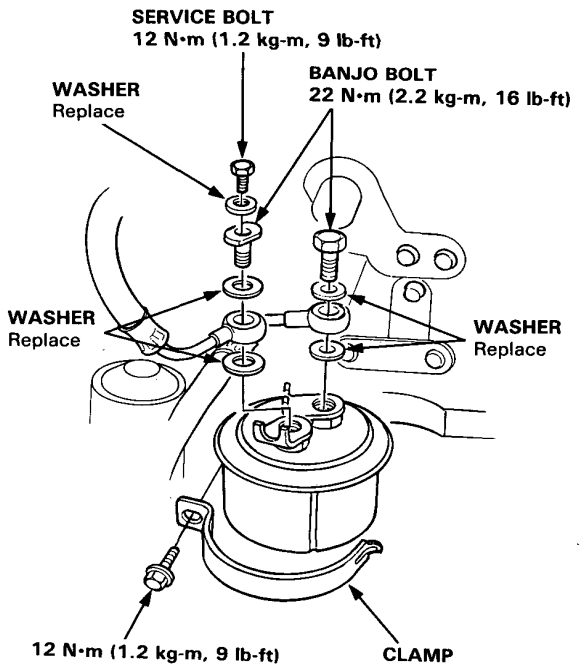
NOTE:
- Replace the O-ring.
- When assembling the regulator, apply clean engine oil to the O-ring and assemble it into its proper position, taking care not to damage the O-ring.

Replacement

WARNING **Do not smoke while working on fuel system. Keep open flame away from work area.**

The filter should be replaced: every 2 years or 24,000 miles (40,000 km) whichever comes first, or whenever the fuel pressure drops below the specified value (250—279 kPa, 2.55—2.85 kg/cm², 36—41 psi with the vacuum pressure hose disconnected) after making sure that the fuel pump and the pressure regulator are OK.

1. Disconnect the battery cable from the negative terminal.
2. Place a shop towel under and around the fuel filter.
3. Relieve fuel pressure (page 12-67).
4. Remove the two 12 mm banjo bolts from the filter.
5. Remove the fuel filter clamp and fuel filter.
6. When assembling, use new washers, as shown.

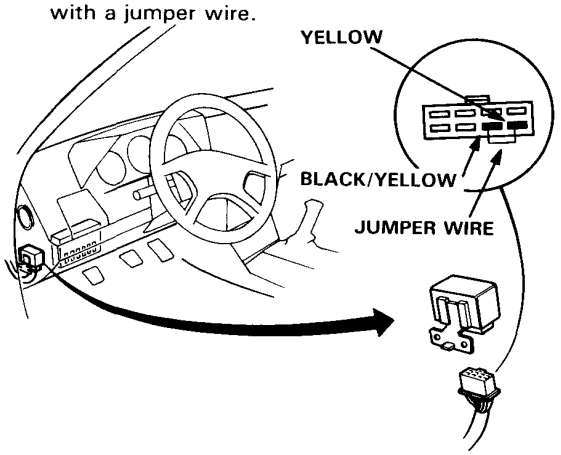


Fuel Pump

Test

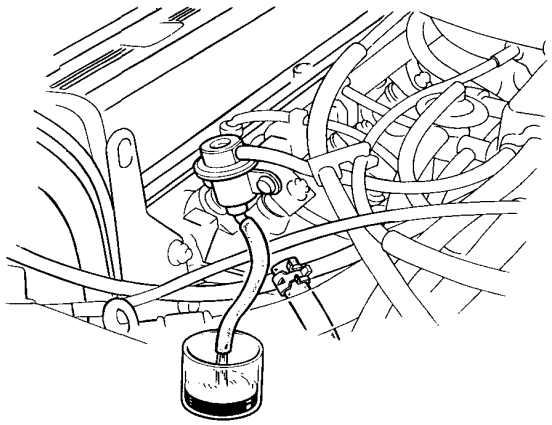
WARNING **Do not smoke during the test. Keep open flame away from your work area.**

1. With the ignition switch OFF, disconnect the connector from the main relay behind the fuse box.
2. Connect the Yellow wire and Black/Yellow wire with a jumper wire.



3. Relieve fuel pressure as described on page 12-59 then tighten the service bolt.
4. Disconnect the fuel return hose from the regulator.
5. Turn the ignition switch ON for 10 seconds. Then measure the amount of fuel flow.

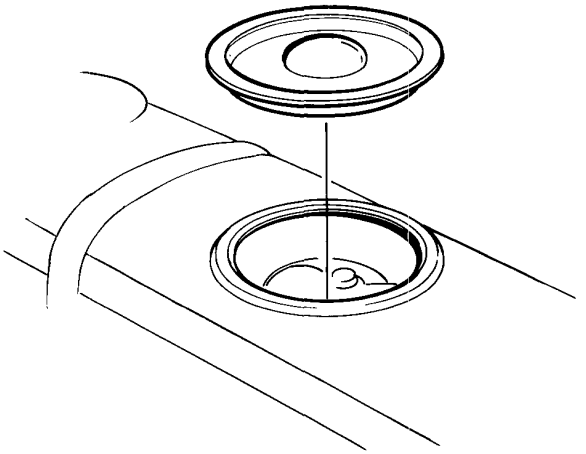
Amount should be:
230 cc (7.8 oz) min. in 10 seconds at 12V



- If fuel flow is less than 230 cc (7.8 oz), or there is no fuel flow, check for:
  - Clogged fuel filter.
  - Clogged fuel line.
  - Pressure regulator failure (page 12-71).

If you suspect a problem with the fuel pump, check that the fuel pump actually runs; when it is ON, you will hear some noise if you hold the fuel filler port to your ear with the fuel filler cap removed. If the pump does not make noise, check as follows:

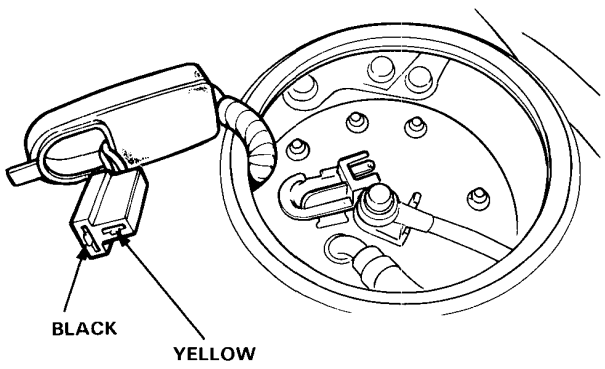
1. Remove the left maintenance access cover in the luggage area.



2. Disconnect the coupler.

CAUTION: Be sure to turn the ignition switch OFF before disconnecting the wires.

3. Check that battery voltage is available at the fuel pump connector when the ignition switch is turned ON (Positive probe to the Yellow wire, negative probe to the Black wire).



- If battery voltage is available, replace the fuel pump.
- If there is no voltage, check the main relay and wire harness (page 12-73).

NOTE: When installing the maintenance access cover, make sure the seal is attached to the cover.

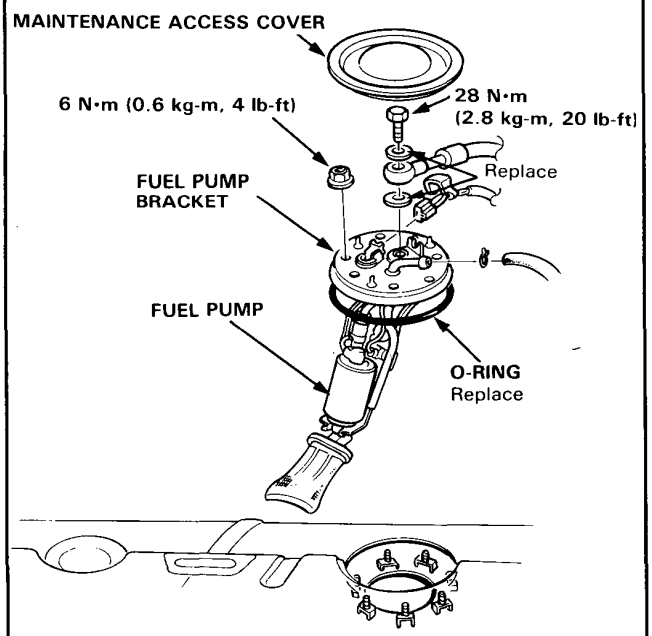
Main Relay

Replacement

WARNING **Do not smoke while working on fuel system. Keep open flames away from your work area.**

1. Relieve fuel pressure (page 12-67).
2. Remove the left maintenance access cover in the luggage area.
3. Disconnect the fuel lines and connector.
4. Remove the fuel pump mounting nuts.
5. Remove the fuel pump from the fuel tank. (If it is hard to remove, slightly lower the fuel tank by loosening the fuel tank mounting nuts).

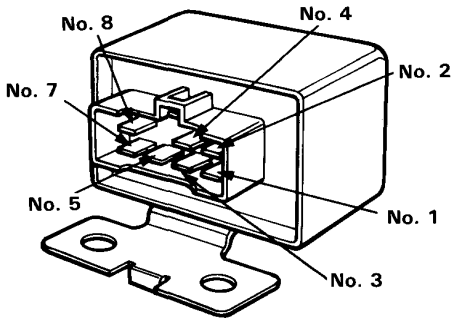
   NOTE: When installing the maintenance access cover, make sure the seal is attached to the cover.

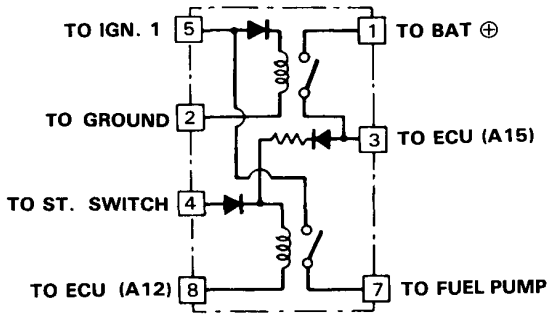


CAUTION: Do not disassemble the pump

Test

1. Remove the main relay, near the under-dash fuse box.
2. Attach the battery positive terminal to the No. 4 terminal and the battery negative terminal to the No. 8 terminal of the main relay. Then check for continuity between the No. 5 terminal and No. 7 terminal of the main relay.
   - If there is continuity, go on to step 3.
   - If there is no continuity, replace the relay and retest.



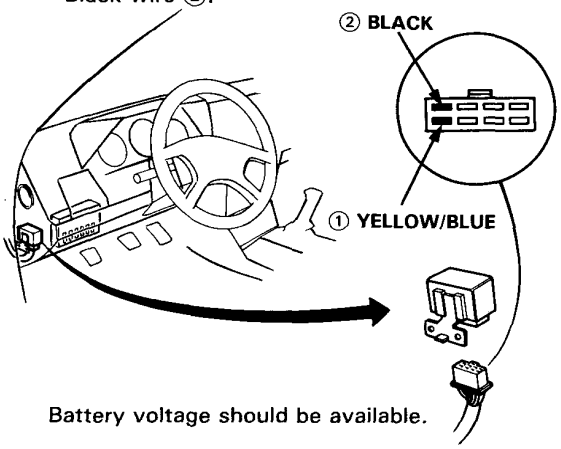


3. Attach the battery positive terminal to the No. 5 terminal and the battery negative terminal to the No. 2 terminal of the main relay. Then check that there is continuity between the No. 1 terminal and No. 3 terminal of the main relay.
   - If there is continuity, go on to step 4.
   - If there is no continuity, replace the relay and retest.
4. Attach the battery positive terminal to the No. 3 terminal and battery negative terminal to the No. 8 terminal of the main relay. Then check that there is continuity between the No. 5 terminal and No. 7 terminal of the main relay.
   - If there is continuity, the relay is OK;
     If the fuel pump still does not work, go to Harness Testing in the next column.
   - If there is no continuity, replace the relay and retest.

Main Relay

Harness Test

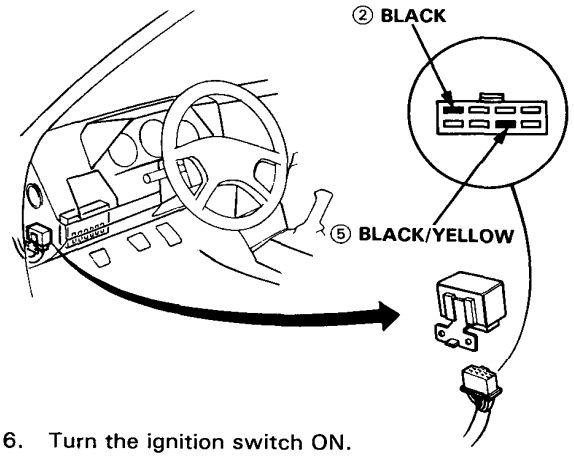
1. Keep the ignition switch in the OFF position.
2. Disconnect the main relay connector.
3. Check for continuity between the Black wire ② in the connector and body ground.
4. Attach the positive probe of voltemeter to the Yellow/Blue wire ① and the negative probe to the Black wire ②.



Battery voltage should be available.

- If there is no voltage, check the wiring between the battery and the main relay as well as No. 1 fuse (10 A) in the under-hood relay box.

5. Attach the positive probe of voltmeter to the Black/Yellow wire ⑤ and the negative probe to the Black wire ②.

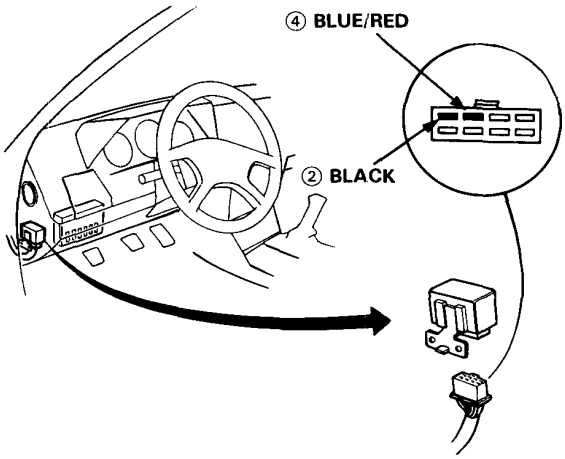


6. Turn the ignition switch ON.

   Battery voltage should be available.

   - If there is no voltage, check the wiring from the ignition switch and the main relay as well as No. 1 fuse (15 A).

7. Attach the positive probe of voltmeter to the Blue/Red wire ④ and the negative probe to the Black wire ②.

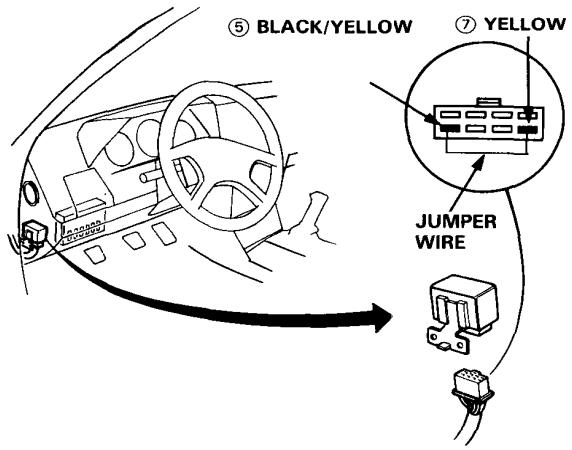


8 Turn the ignition switch to START position.

   Battery voltage should be available.

   - If there is no voltage, check the wiring between the ignition switch and main relay as well as No. 10 fuse (10 A).

9. Connect a jumper wire between the Black/Yellow wire ⑤ and Yellow wire ⑦.



10. Turn the ignition switch ON.

    The fuel pump should work.

    - If the fuel pump does not work, check the wiring between the battery and fuel pump, and the wiring from the fuel pump to the ground (Black wire).

Symptom-to-Sub System Chart

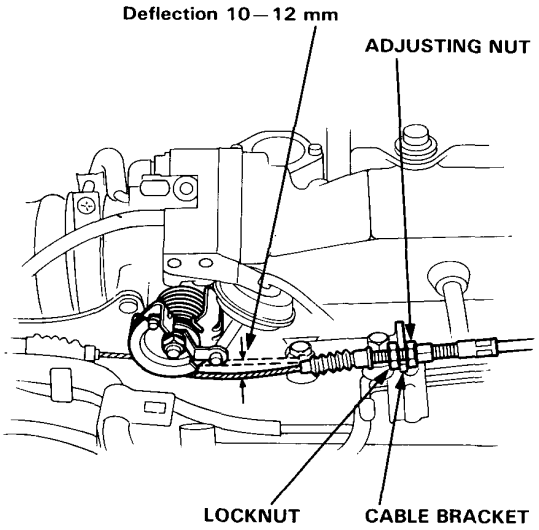
NOTE: Across each row in the chart, the sub systems that could be sources of a symptom are ranked in the order they should be inspected, starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next system ②, etc.

PAGE / SUB SYSTEM / SYMPTOM		THROTTLE CABLE	THROTTLE BODY	DASHPOT SYSTEM
		76	77	79
WARM ENGINE	IDLE SPEED OUT OF SPECIFIED RPM (750 ± 50 min^{-1} (rpm))	①	②	

Throttle Cable

Inspection/Adjustment

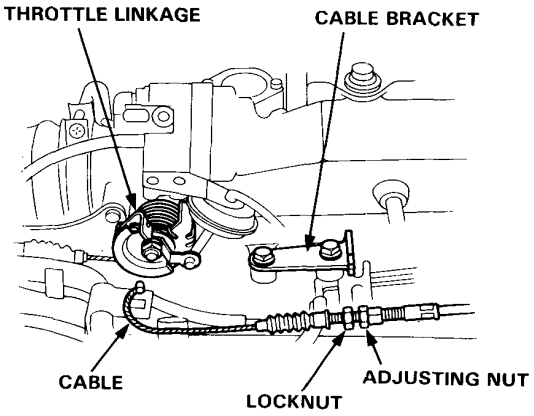
1. Warm up the engine to normal operating temperature (cooling fan comes on).
2. Check that the throttle cable operates smoothly with no binding or sticking. Repair as necessary.
3. Check cable free play at the throttle linkage. Cable deflection should be 10—12 mm (0.39—0.47 in.)



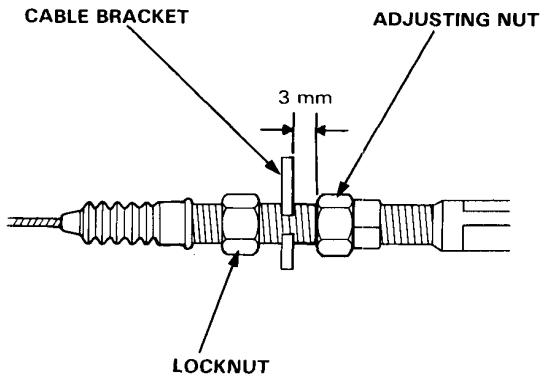
4. If deflection is not within specs, loosen the locknut and turn the adjusting nut until the deflection is as specified.
5. With the cable properly adjusted, check the throttle valve to be sure it opens fully when you push the accelerator pedal to the floor. Also check the throttle valve to be sure it returns to the idle position whenever you release the accelerator.

Replacement

1. Loosen the locknut and remove the throttle cable from the cable bracket.
2. Remove the cable from the throttle linkage.



3. Hold the cable sheath, removing all slack from the cable.
4. Turn the adjusting nut until it is 3 mm away from the cable bracket.
5. Tighten the locknut. The cable deflection should now be 10—12 mm (0.39—0.47 in.). If not, see Inspection/Adjustment.

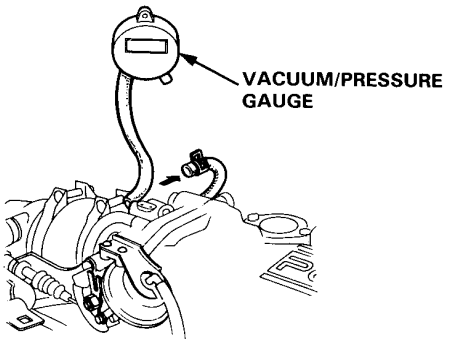


Throttle Body

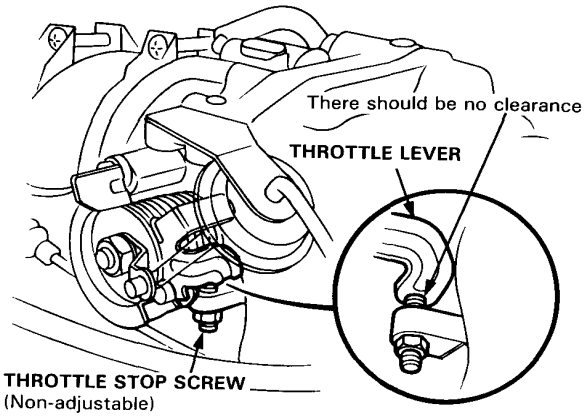
Inspection

CAUTION: Do not adjust the throttle stop screw since it can not be reset except at the factory.

1. Start the engine and allow to reach normal operating temperature (cooling fan comes on).
2. Disconnect the vacuum hose (to the canister) from the top of the throttle body; connect a vacuum gauge to the throttle body.



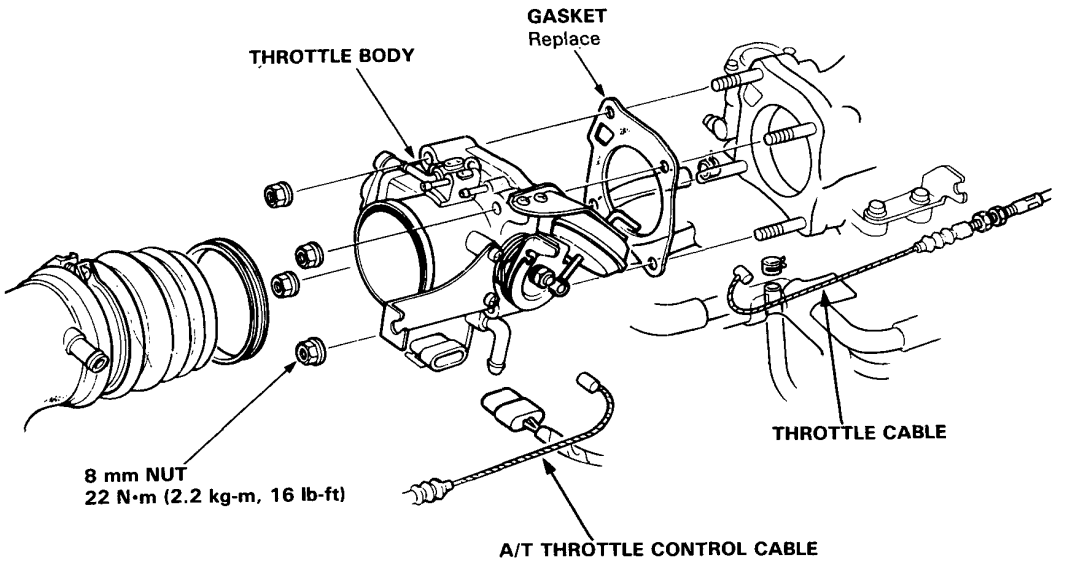
3. Allow the engine to idle and check that the gauge indicates no vacuum.
4. Check that vacuum is indicated on the gauge when the throttle is opened slightly from idle.
   - If the gauge indicates no vacuum, check the canister port. If the canister port is clogged, clean it with carburetor cleaner.
5. Stop the engine and check that the throttle cable operates smoothly without binding or sticking.
   - If there are any abnormalities in the above steps, check for:
   - Excessive wear or play in the throttle valve shaft.
   - Sticky or binding throttle lever at full close position.
   - Clearance between throttle stop screw and throttle lever at full close position.



Replace the throttle body if there is excessive play in the throttle valve shaft or if the shaft is binding or sticking.

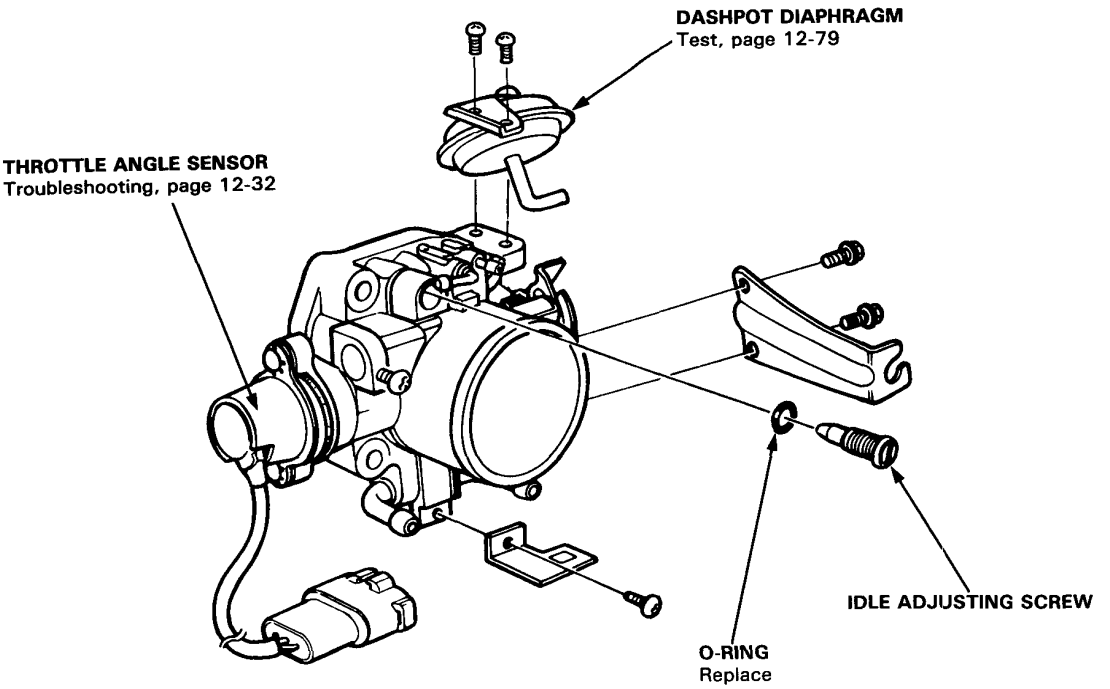
Throttle Body

Disassembly



CAUTION:

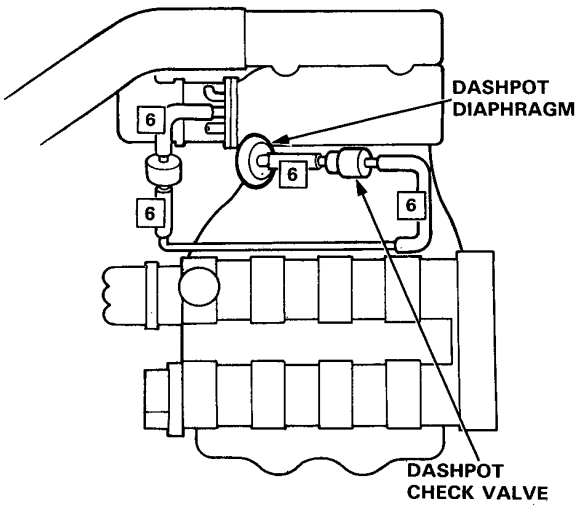
- The throttle stop screw is non-adjustable.
- **After re-assembly, adjust the throttle cable (page 12-76).**



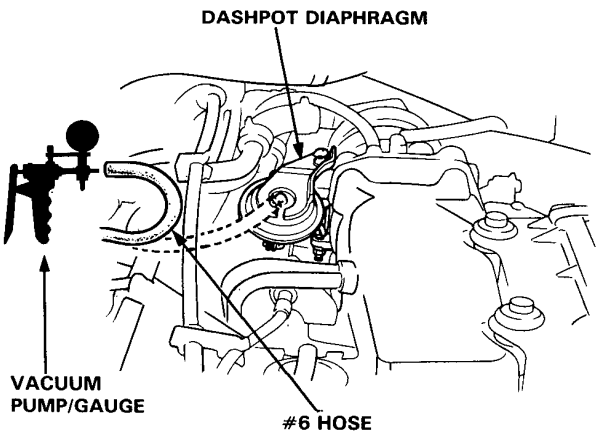
Dashpot System

Test

1. Check the vacuum line for leaks, blockage or a disconnected hose.



2. Disconnect #6 vacuum hose from the dashpot diaphragm, and connect a vacuum pump/gauge to the hose.



3. Start the engine.

4. **Raise engine speed to 3,500 min^{-1} (rpm).**
   Vacuum should appear on gauge.

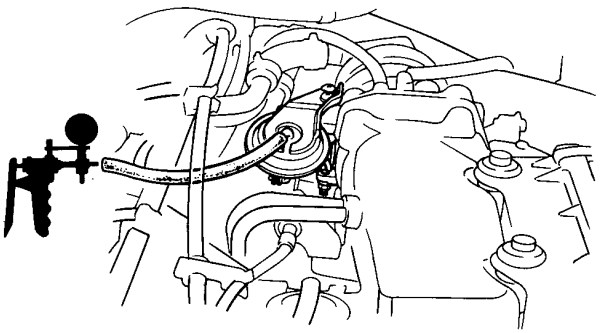
   - If no vacuum, check that the vacuum port on the throttle body.

5. Release the throttle.

   Vacuum should go out slowly.

   - If the vacuum holds or goes out quickly, replace the dashpot check valve and re-test.

6. Connect a vacuum pump to the dashpot diaphragm.



7. Apply vacuum and check that the rod pulls in and vacuum holds.

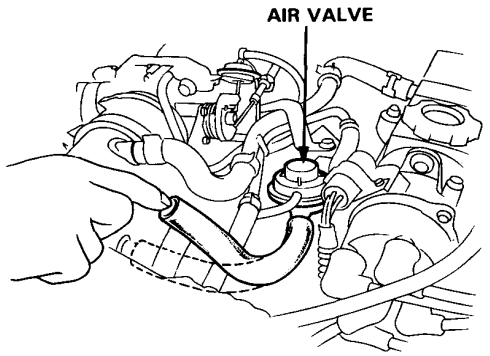
   The rod should pull in and vacuum should hold.

   - If the vacuum does not hold or the rod does not move, replace the dashpot diaphragm and retest.

Secondary Air Supply System

System Inspection

1. Warm up the engine and make sure that the idle speed is steady.
2. Raise the engine speed to around 4,000 min^{-1} (rpm) and release the accelerator pedal suddenly.
3. Make sure that the vacuum appears in the vacuum hose of the air valve after the accelerator pedal released.

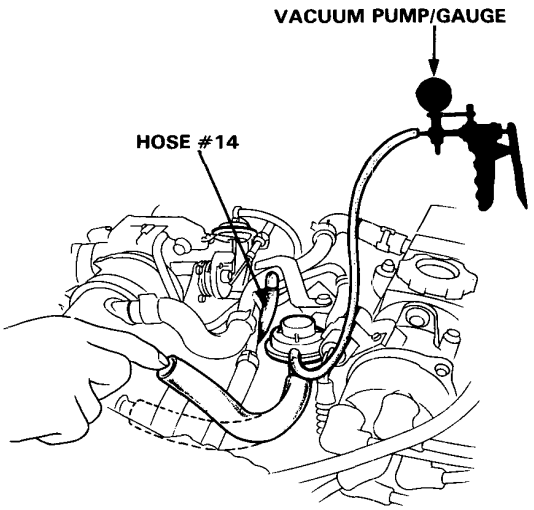


- If no vacuum, check for:

— each vacuum hose for clog, pinch, or disconnection.
— air valve.
— air valve control solenoid valve.

Air Valve Inspection

1. Disconnect the vacuum hose #14 from the air valve and connect a vacuum pump to the valve.
2. Start the engine and make sure that the vacuum appears in the vacuum hose of the air valve while operating the vacuum pump.



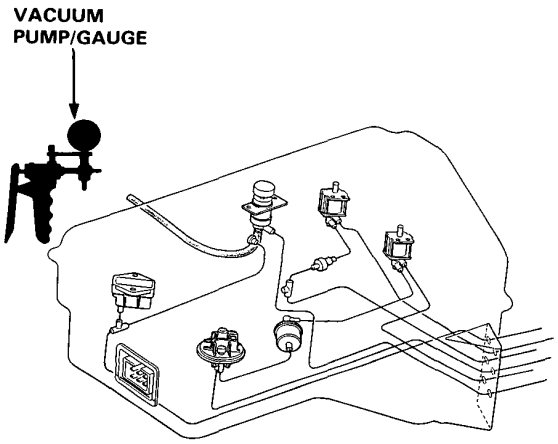
3. Make sure that the vacuum disappears in the hose when the vacuum pump is removed.

Air Valve Control Solenoid Valve Inspection

1. Open the control box lid and disconnect the rectangular connector from the control box.
2. Disconnect the lower vacuum hose of the air valve control solenoid valve (between the solenoid valve and the three-way joint) from the joint.
3. Apply vacuum to the hose.

   It should hold vacuum.

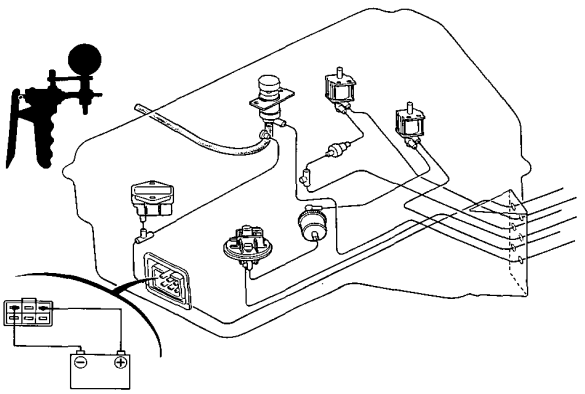
   - If it does not hold vacuum, replace the valve.



4. Connect the battery positive terminal to the Black/Yellow terminal of the control box coupler, and the negative terminal to the Orange terminal.
5. Apply vacuum to the hose.

   It should not hold vacuum.

   - If it holds vacuum, replace the valve.



Emission Control System

Symptom-to-Sub System Chart

NOTE: Across each row in the chart, the sub systems that could be sources of a symptom are ranked in the order they should be inspected, starting with ① Find the system in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next system ②, etc.

PAGE / SUB SYSTEM / SYMPTOM	CATALYTIC CONVERTER	EGR SYSTEM	POSITIVE CRANKCASE VENTILATION SYSTEM	EVAPORATIVE EMISSION CONTROLS
	83	84	92	93
IRREGULAR IDLING		①	②	
FREQUENT STALLING		①		
FAILS EMISSION TEST	①	①		②
IDLE SPEED ABOVE SPECIFIED rpm			①	
LOSS OF POWER	①	②		

Tailpipe Emission

Inspection

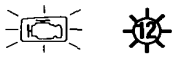
WARNING Do not smoke during this procedure. Keep any open flame away from your work area.

1. Start the engine and warm up to normal operating temperature (cooling fan comes on).
2. Connect a tachometer.
3. Check idle speed and adjust the idle speed, if necessary (page 12-65).
4. Warm up and calibrate the CO meter according to the meter manufacturer's instructions.
5. Check idle CO with the headlights, heater blower, rear window defroster, cooling fan, and air conditioner off.

   CO meter should indicate 0.1% maximum.

Exhaust Gas Recirculation System

Troubleshooting Flow Chart — EGR System (B20A8)



— Check engine warning light has been reported.
— LED indicates CODE 12.

Verify that all connectors between the EGR valve lift sensor and the PGM-FI ECU are securely connected.

Warm up engine to normal operating temperature (cooling fan comes on).

Disconnect #16 hose from EGR valve.

Connect vacuum pump to EGR valve and apply vacuum.

Does EGR valve hold vacuum? Did engine stall?

NO → Replace EGR valve.

YES

Disconnect the #24 hose from the intake manifold and connect vacuum gauge to intake manifold.

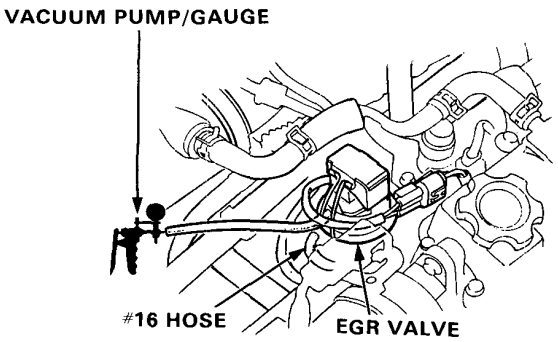
Restart engine and check for vacuum.

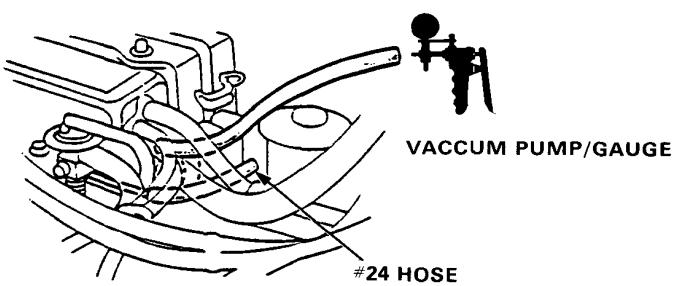
Is there vacuum?

NO → Repair blockage at port or pinch in the #24 hose.

YES

(To page 12-85)





(From page 12-84)

Reconnect the #24 hose.

Disconnect the lower EGR control solenoid valve hose and connect vacuum gauge to the hose. Check for vacuum.

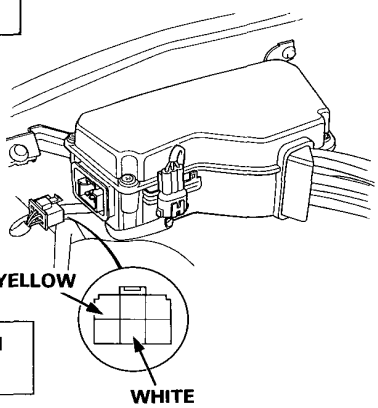
Is there vacuum approx. 8"?
- NO → Replace CVC valve.
- YES →

Reconnect the lower EGR control solenoid valve hose.

Is there vacuum below 1.2"?
- NO → Check the lower EGR control solenoid hose for blockage or pinch. If hose is OK, replace EGR control solenoid valve.
- YES →

Disconnect 6P connector on the control box.

Connect the battery positive terminal to the Black/Yellow terminal and the negative terminal to the Red terminal.



Is vacuum approx. 8"?
- NO → Replace EGR control solenoid valve.
- YES →

Measure voltage between Black/Yellow (+) terminal on the main wire harness and body ground.

Is there battery voltage?
- NO → Repair open in Black/Yellow wire between the solenoid valve and No. 1 fuse.
- YES →

(To page 12-86)

(cont'd)

Troubleshooting Flow Chart — EGR System (B20A8) (cont'd)

(From page 12-85)

Turn the ignition switch OFF.

Connect the test harness between the EGR valve lift sensor and engine wire harness.

Turn the ignition switch ON.

Measure voltage between Red (+) terminal and Green (–) terminal.

Is there approx. 5 V?

NO → Measure voltage between Red (+) terminal and body ground.

Measure voltage between Red (+) terminal and body ground.

Is there approx. 5 V?

YES → Repair open in Green/White wire between ECU (C12) and the sensor.

NO

Turn the ignition switch OFF.

YES

Measure voltage between White (+) terminal and Green (–) terminal.

Is there approx. 1 V?

NO → – Replace EGR valve.
– Repair short in Red wire between ECU (A10) and EGR control solenoid valve.

YES

Turn the ignition switch OFF.

Connect the PGM-FI test harness between the ECU and connector (page 12-19).

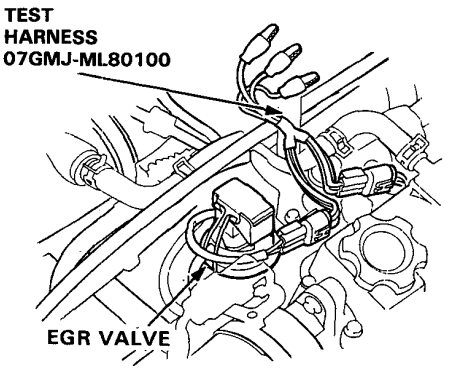
Turn the ignition switch ON.

Connect the PGM-FI test harness between the ECU and connector (page 12-19).

Measure voltage between C13 (+) terminal and C12 (–) terminal.

(To page 12-87)

(To page 12-87)



(From page 12-86)

Measure voltage between C8 (+) terminal and C12 (–) terminal.

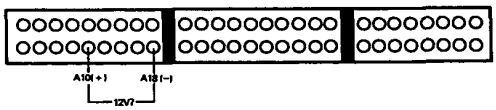
Is there approx. 1 V?

NO → Repair open in Yellow wire between ECU (C8) and the sensor.

YES

Disconnect "A" connector from the ECU only, not main wire harness.

Measure voltage between A10 (+) terminal and A18 (–) terminal.



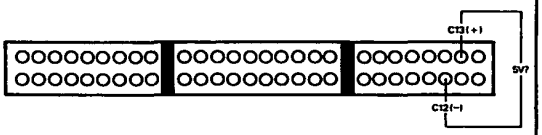
Is there battery voltage?

NO → Repair open or short in Red wire between ECU (A10) and EGR control solenoid valve.

YES

Substitute a known-good ECU and re-check. If symptom/indication goes away, replace the original ECU.

(From page 12-86)

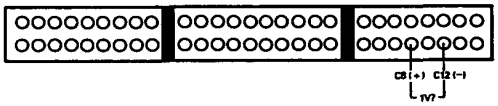


Is there approx. 5 V?

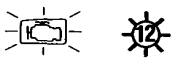
YES → Repair open in Yellow/White wire between ECU (C13) and the sensor.

NO

Substitute a known-good ECU and re-check. If prescribed voltage is now available, replace the original ECU.



Troubleshooting Flow Chart — EGR System (A20A3)



—Check engine warning light has been reported.
—LED indicates CODE 12.

Verify that all connectors between the EGR valve lift sensor and the PGM-FI ECU are securely connected.

Warm up engine to normal operating temperature (cooling fan comes on).

Disconnect #16 hose from EGR valve.

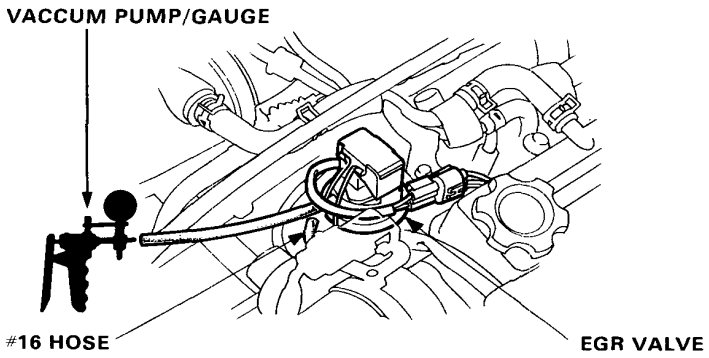
Connect vacuum pump to EGR valve and apply vacuum.

Does EGR valve hold vacuum? Did engine stall?

NO → Replace EGR valve.

YES

(To page 12-89)



(From page 12-88)

Remove #16 hose from EGR valve and substitute a vacuum gauge.

Restart engine and pinch #17 hose.

Is vacuum reading greater than zero?

NO → Stop engine. Disconnect #24 hose from the CVC valve inside the emissions box. Substitute a vacuum gauge. Restart engine.

YES

Is vacuum greater than 6" and less than 10"?

NO → Replace CVC valve.

YES

Release #17 and pinch it again.

Does vacuum exceed 6" within 1 sec?

NO → Clean orifices in air chamber in emissions box.

YES

Release #17 hose.

Is vacuum below 1.2"?

NO → Check #17 for blockage; if hose is OK, replace EGR solenoid valve and retest.

YES

Disconnect 2P connector on the control box.

Connect the battery positive terminal to the Black/Yellow terminal and the negative terminal to the Red terminal.

Is vacuum approx. 8"?

NO → Replace EGR control solenoid valve.

YES

(To page 12-90)

Is manifold vacuum available?

NO → Repair blockage in #24 hose or plenum port.

YES

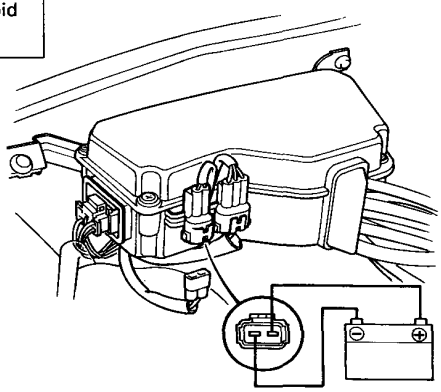
Stop engine. Deconnect #24 hose to the CVC valve, disconnect the unnumbered hose from the CVC valve. Attach a vacuum gauge to the open CVC port. Restart engine.

Is vacuum greater than 6" and less than 10"?

NO → Replace CVC valve.

YES

Clean orifices in air chamber in emissions box.



(cont'd)

Troubleshooting Flow Chart — EGR System (A20A3) (cont'd)

(From page 12-89)

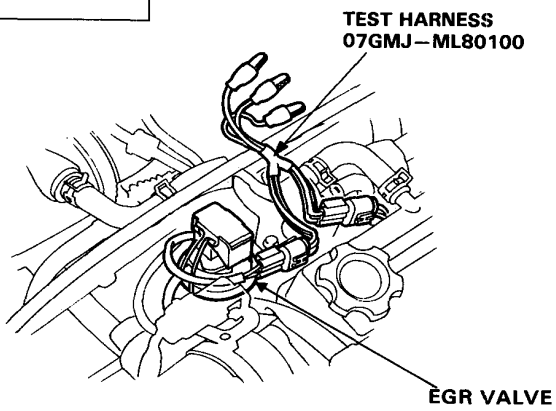
Measure voltage between Black/Yellow (+) terminal on the main wire harness and body ground.

Is there battery voltage? NO → Repair open in Black/Yellow wire between the solenoid valve and No. 1 fuse.

YES

Turn the ignition switch OFF.

Connect the test harness between the EGR valve lift sensor and engine wire harness.



Turn the ignition switch ON.

Measure voltage between Red (+) terminal and Green (–) terminal.

Is there approx. 5 V? NO → Measure voltage between Red (+) terminal and body ground.

YES

Is there approx. 5 V? YES → Repair open in Green/White wire between ECU (C12) and the sensor.

NO

Turn the ignition switch OFF.

Measure voltage between White (+) terminal and Green (–) terminal.

Is there approx. 1 V? NO → – Replace EGR valve. – Repair short in Red wire between ECU (A10) and EGR control solenoid valve.

YES

(To page 12-91)

(To page 12-91)

(From page 12-90)

Turn the ignition switch OFF.

Connect the PGM-FI test harness between the ECU and connector (page 12-19).

Turn the ignition switch ON.

Measure voltage between C8 (+) terminal and C12 (–) terminal.

Is there approx. 1 V? NO → Repair open in Yellow wire between ECU (C8) and the sensor.

YES

Disconnect "A" connector from the ECU only, not main wire harness.

Measure voltage between A10 (+) terminal and A18 (–) terminal.

Is there battery voltage? NO → Repair open or short in Red wire between ECU (A10) and EGR control solenoid valve.

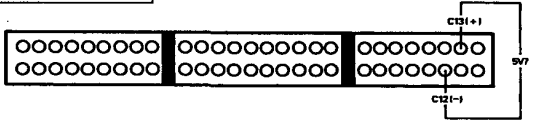
YES

Substitute a known-good ECU and re-check. If symptom/indication goes away, replace the original ECU.

(From page 12-90)

Connect the PGM-FI test harness between the ECU and connector (page 12-19).

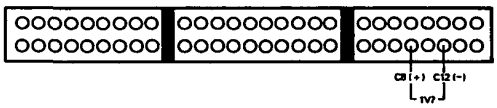
Measure voltage between C13 (+) terminal and C12 (–) terminal.

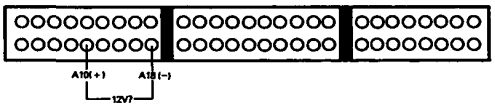


Is there approx. 5 V? YES → Repair open in Yellow/White wire between ECU (C13) and the sensor.

NO

Substitue a known-good ECU and re-check. If prescribed voltage is now available, replace the original ECU.

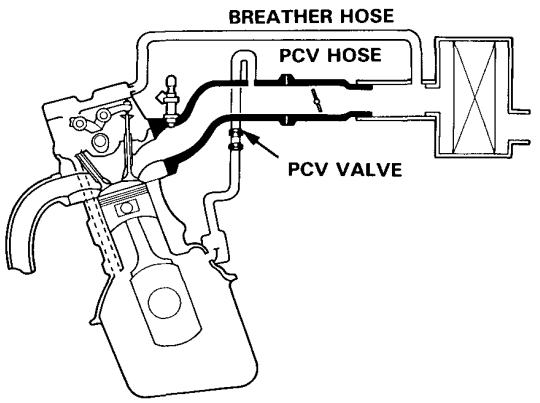




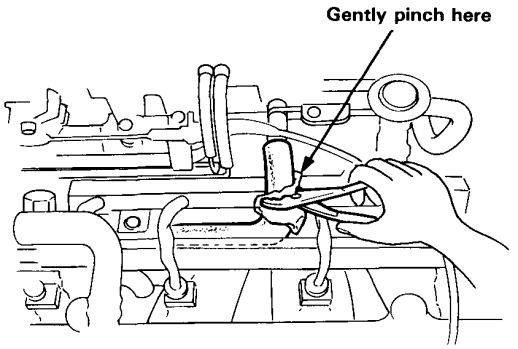
Positive Crankcase Ventilation System

Inspection

1. Check the crankcase ventilation hoses and connections for leaks and clogging.



2. At idling, make sure there is a clicking sound from the PCV valve when the hose between PCV valve and intake manifold is lightly pinched with your fingers or pliers.

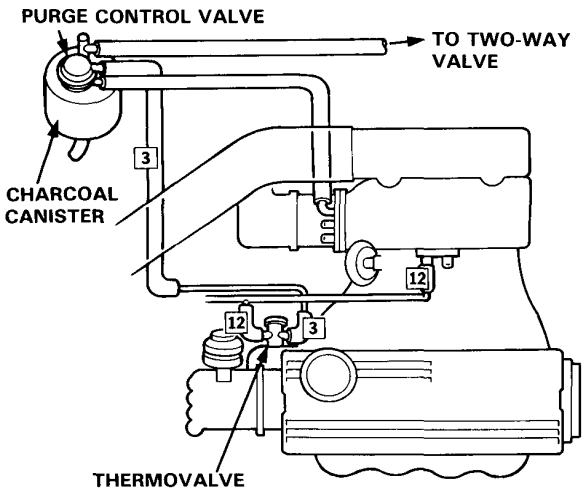


- If there is no clicking sound, check the PCV valve grommet for cracks or damage. If the grommet is OK, replace the PCV valve and recheck.

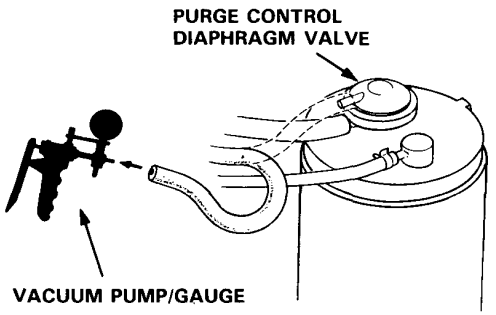
Test

COLD ENGINE

1. Check the vacuum line for proper connection, cracks, blockage or disconnected hose.



2. Disconnect the #3 vacuum hose at the purge control diaphragm valve (on the charcoal canister) and connect a vacuum gauge to the hose.



3. Start the engine and allow to idle.

   NOTE: Engine coolant temperature must be below 55°C (131°F)

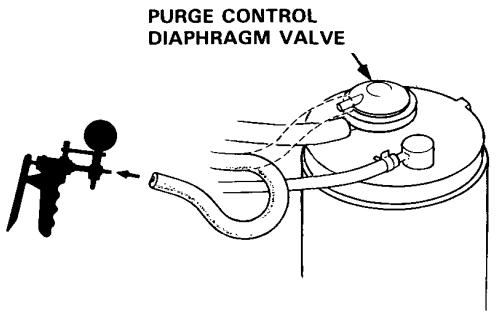
   Vacuum should not be available.

   - If there is vacuum, replace the thermovalve and re-test.

HOT ENGINE

1. Disconnect the #3 vacuum hose at the purge control diaphragm valve (on the charcoal canister) and connect a vacuum gauge to the hose.

2. Warm up the engine to normal operating temperature (cooling fan comes on).



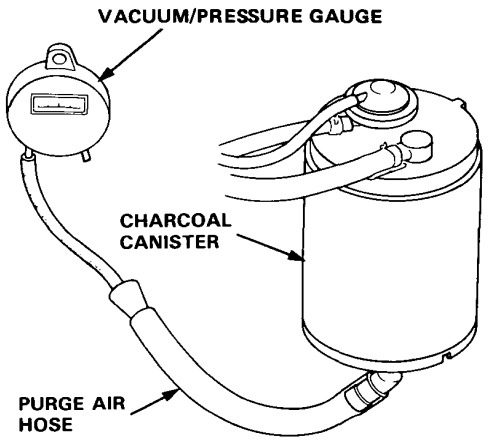
   There should be vacuum at idle, once the engine is warm.

   - If there is no vacuum, replace the thermovalve and re-test.

3. Disconnect vacuum gauge and reconnect the hose.

4. Remove fuel filler cap.

5. Remove canister purge air hose from frame and connect hose to vacuum gauge as shown.

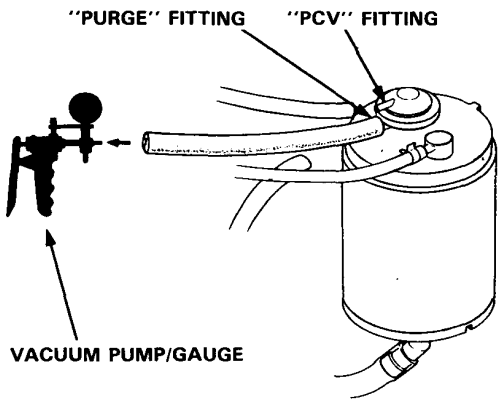


(cont'd)

Test (cont'd)

6. Raise engine speed to 3,500 min^{-1} (rpm). Vacuum should appear on gauge within 1 minute.
   - If vacuum appears on gauge in 1 minute, remove gauge, test is complete.
   - If no vacuum, disconnect vacuum gauge and re-install fuel filler cap.
7. Remove charcoal canister and check for signs of damage or defects.
   - If defective, replace canister.
8. Stop engine. Disconnect #3 vacuum hose from canister "PCV" fitting.
   Connect a vacuum pump to canister "purge" fitting as shown, and apply vacuum.

   Vacuum should remain steady.

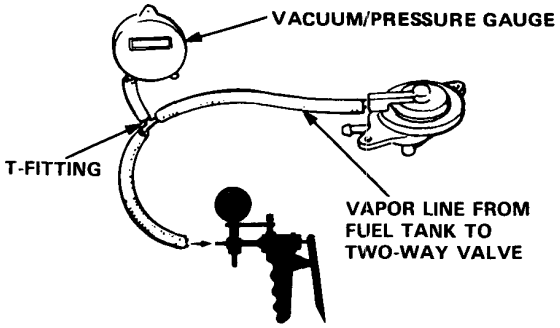


   - If vacuum drops, replace canister and re-test.
9. Restart engine. Reconnect hose to canister "PCV" fitting.

   "PURGE" side vacuum should drop to zero.
   - If "PURGE" side vacuum does not drop to zero, replace the canister and re-test.

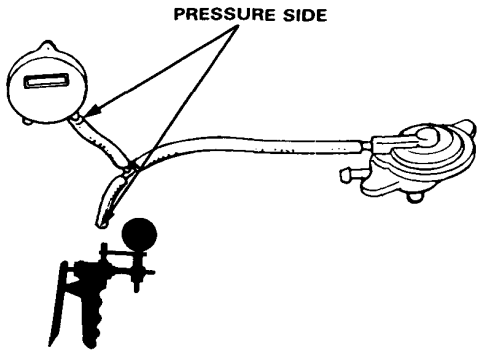
Two-Way Valve

1. Remove the fuel filler cap.
2. Remove vapor line from the fuel tank and connect to T-fitting from vacuum gauge and vacuum pump as shown.



3. Slowly apply vacuum while watching the gauge.

   Vacuum should stabilize momentarily at 5 to 15 mmHg (0.2 to 0.6 in. Hg).
   - If vacuum stabilizes (valve opens) below 5 mmHg (0.2 in. Hg) or above 15 mmHg (0.6 in. Hg), install new valve and re-test.
4. Move vacuum pump hose from vacuum to pressure fitting, and move vacuum gauge hose from vacuum to pressure side as shown.

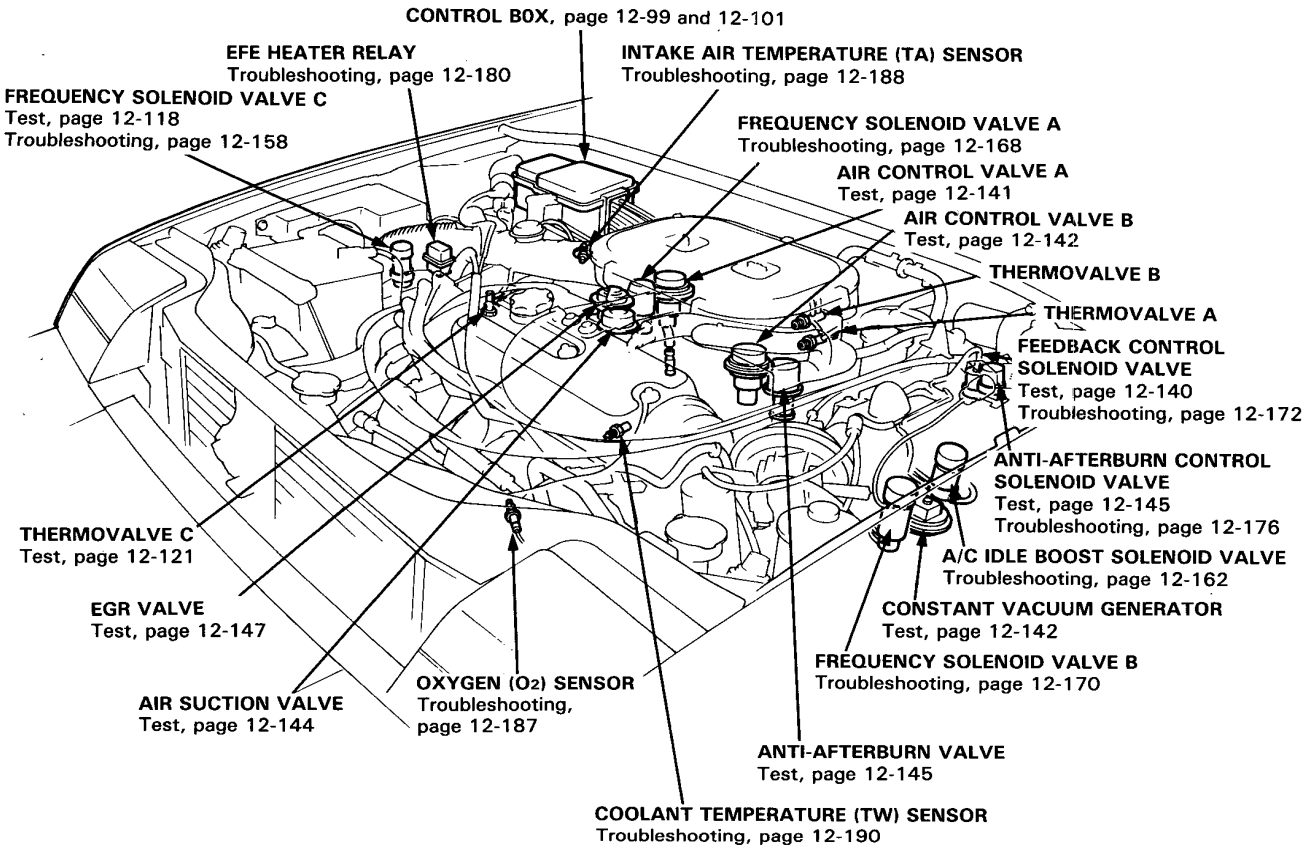


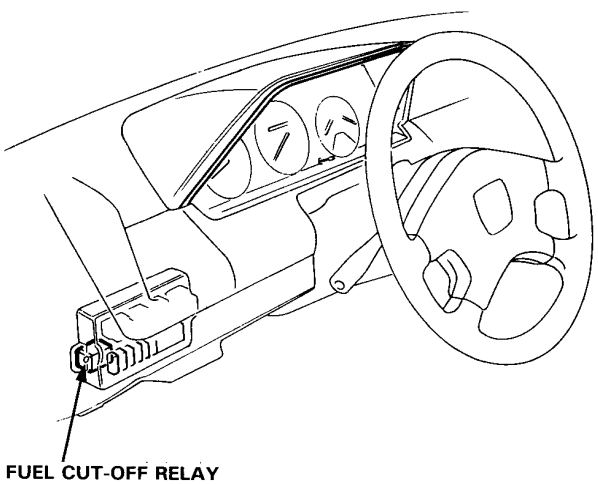
5. Slowly pressurize the vapor line while watching the gauge.

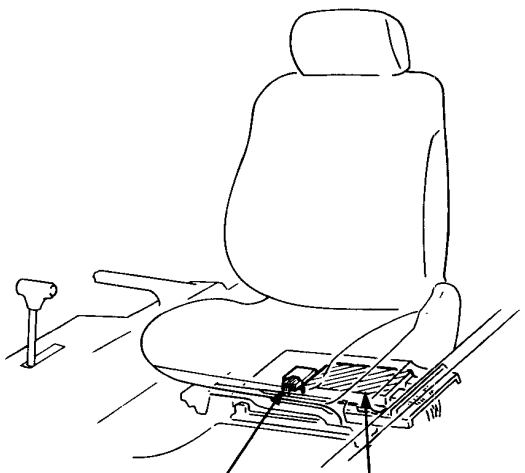
   Pressure should stabilize at 25 to 55 mmHg (1.0 to 2.2 in. Hg).
   - If pressure momentarily stabilizes (valve opens) at 25 to 55 mmHg (1.0 to 2.2 in. Hg), the valve is OK.
   - If pressure stabilizes below 25 mmHg (1.0 in. Hg) or above 55 mmHg (2.2 in. Hg), install a new valve and re-test.

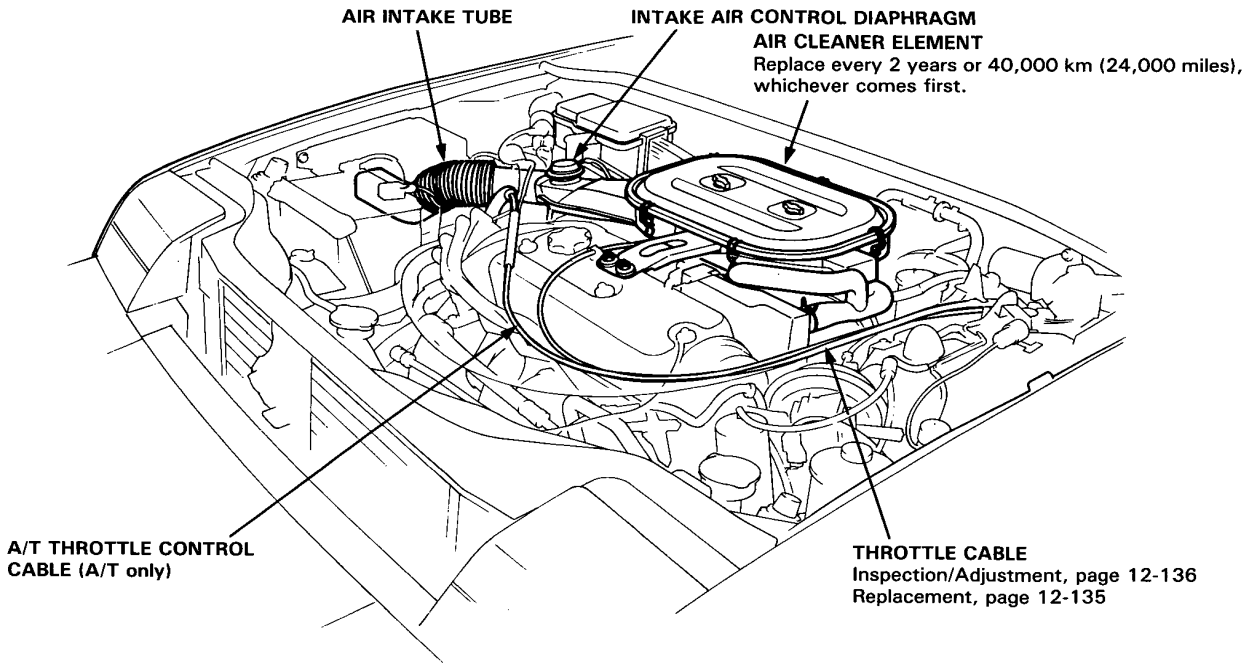
Fuel and Emissions (Carbureted Engine)

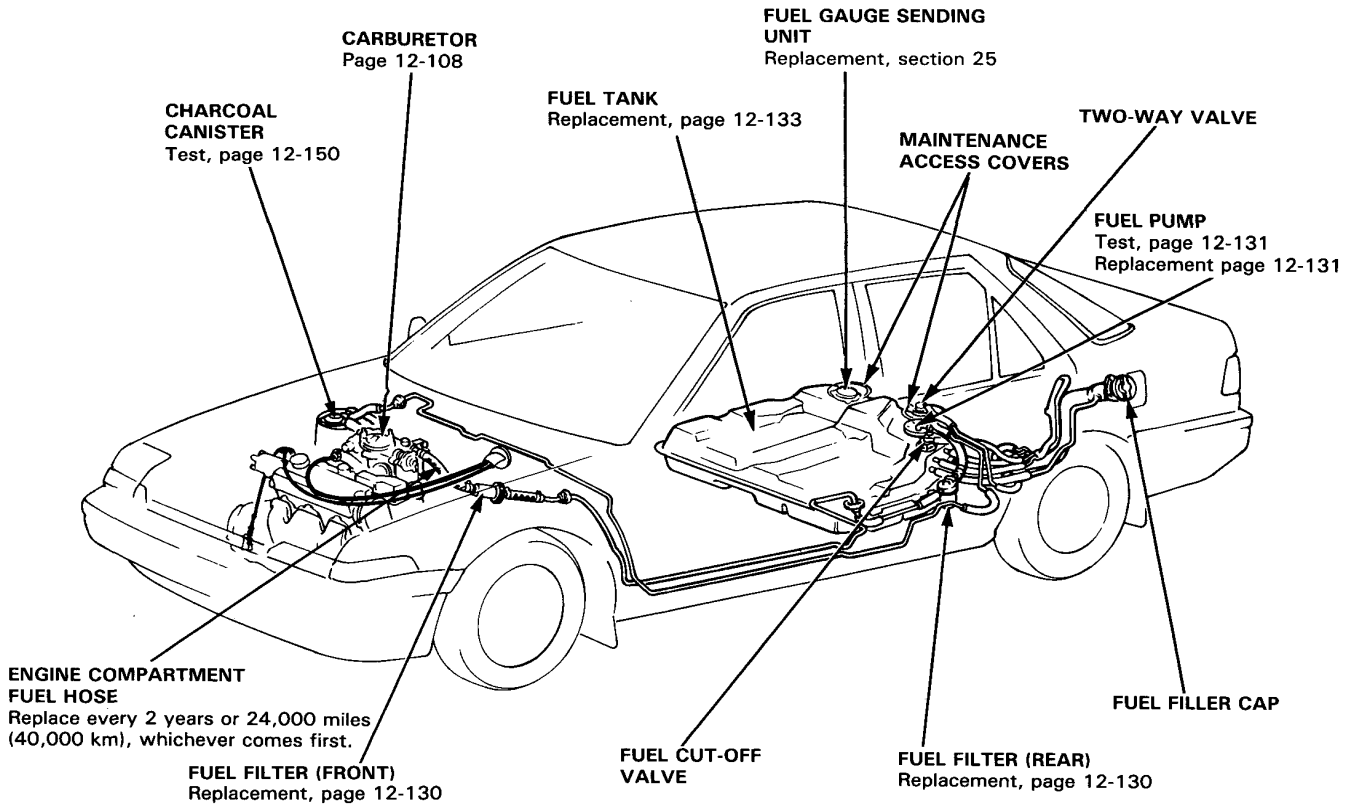
Component Locations





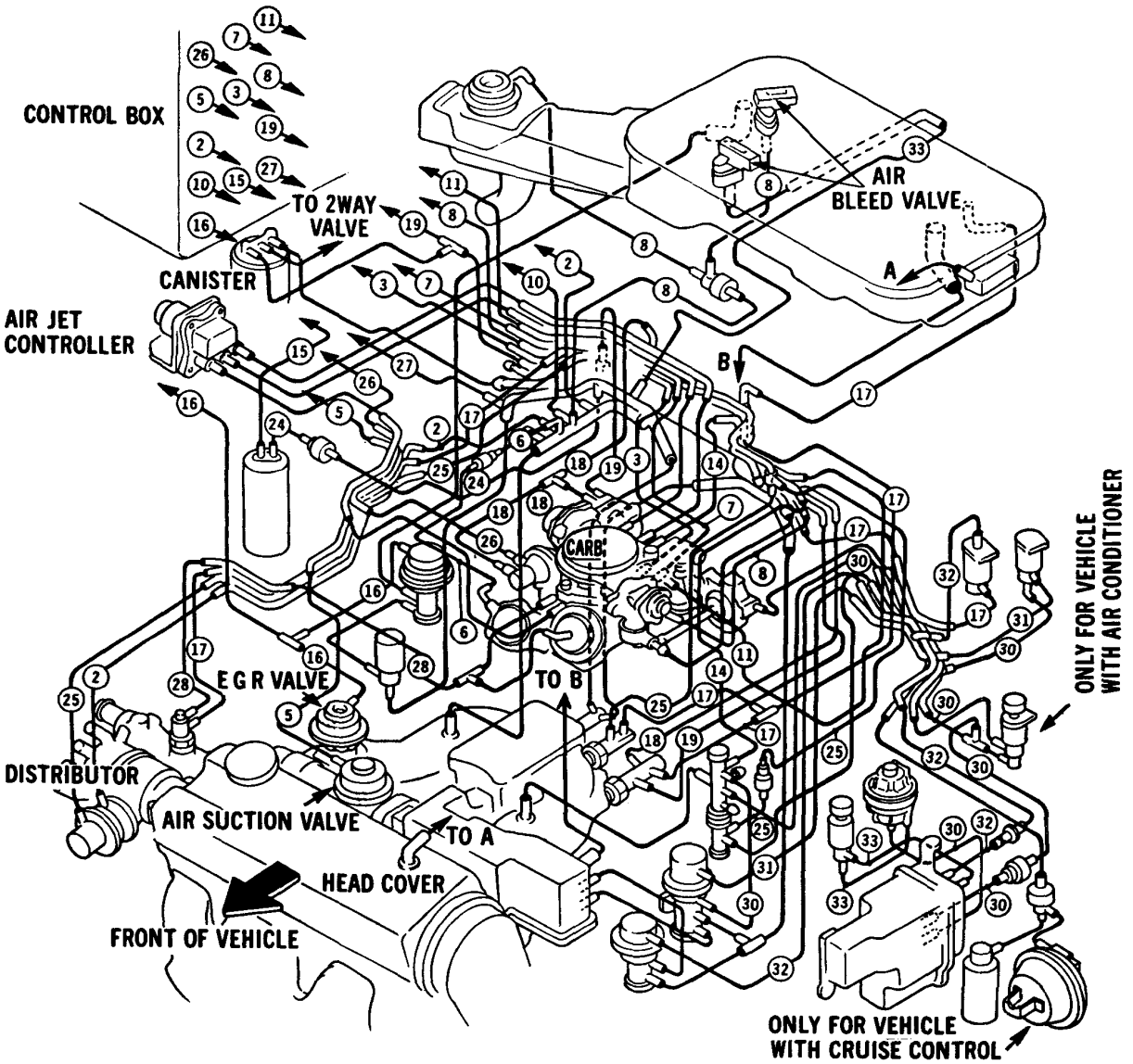



AIR INTAKE TUBE
INTAKE AIR CONTROL DIAPHRAGM
AIR CLEANER ELEMENT
Replace every 2 years or 40,000 km (24,000 miles), whichever comes first.
A/T THROTTLE CONTROL CABLE (A/T only)
THROTTLE CABLE
Inspection/Adjustment, page 12-136
Replacement, page 12-135

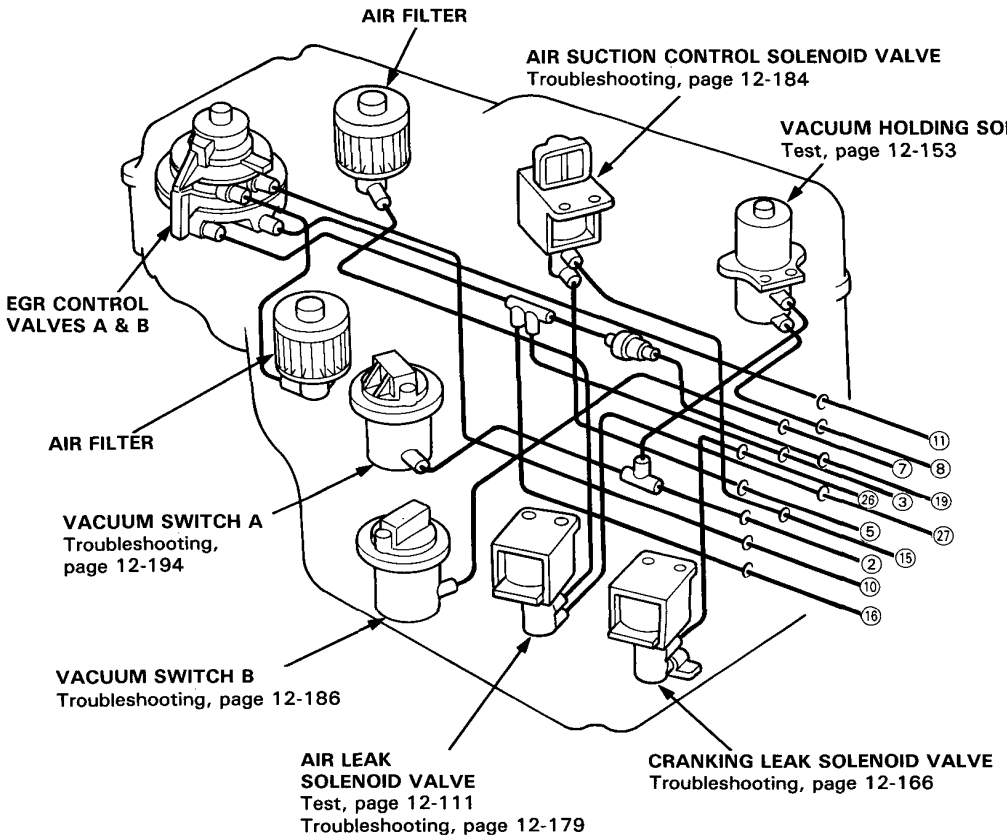

CARBURETOR
Page 12-108
FUEL GAUGE SENDING UNIT
Replacement, section 25
CHARCOAL CANISTER
Test, page 12-150
FUEL TANK
Replacement, page 12-133
TWO-WAY VALVE
MAINTENANCE ACCESS COVERS
FUEL PUMP
Test, page 12-131
Replacement page 12-131
ENGINE COMPARTMENT FUEL HOSE
Replace every 2 years or 24,000 miles (40,000 km), whichever comes first.
FUEL FILTER (FRONT)
Replacement, page 12-130
FUEL CUT-OFF VALVE
FUEL FILTER (REAR)
Replacement, page 12-130
FUEL FILLER CAP

Vacuum Connections

Manual

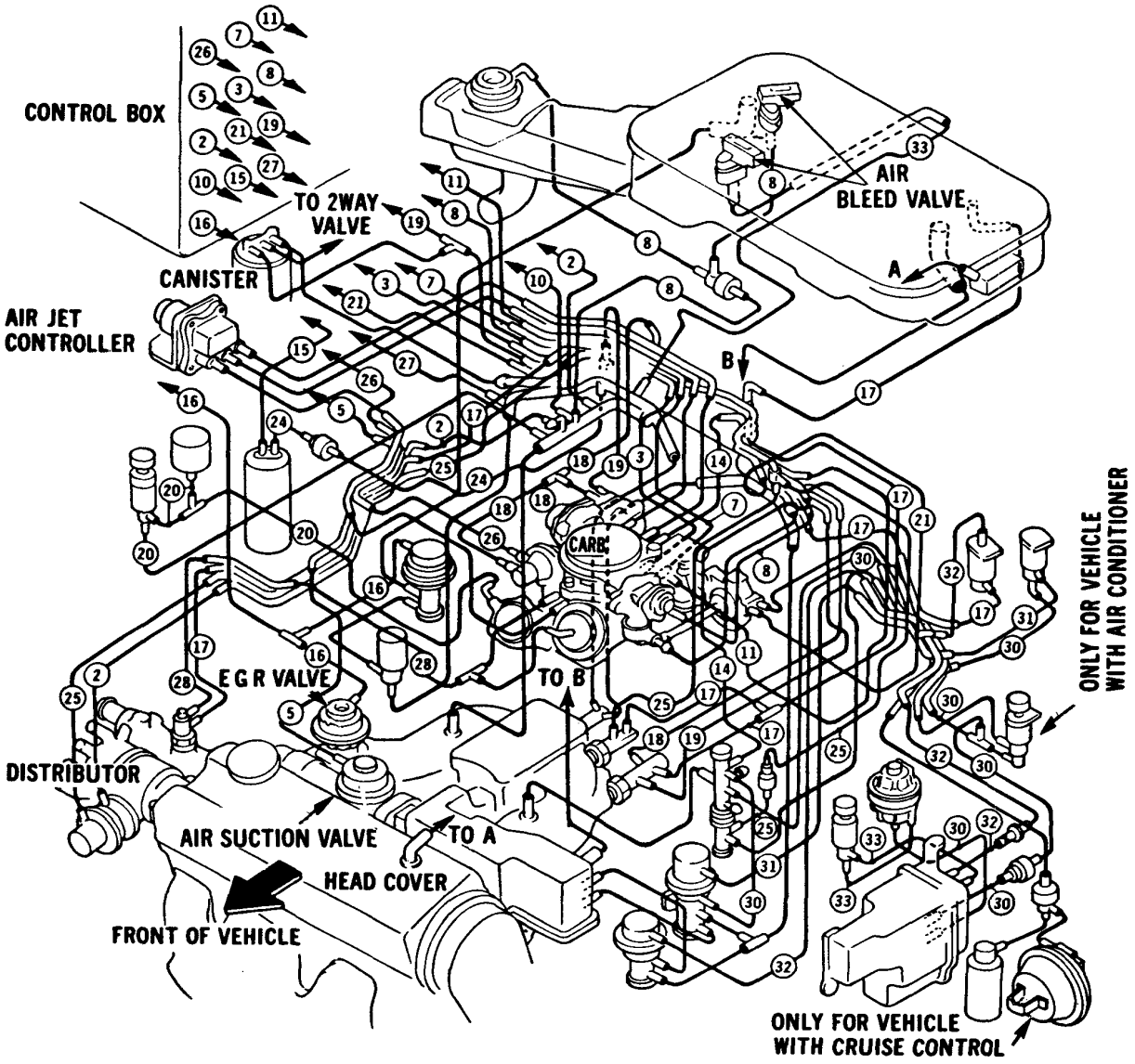


Control Box

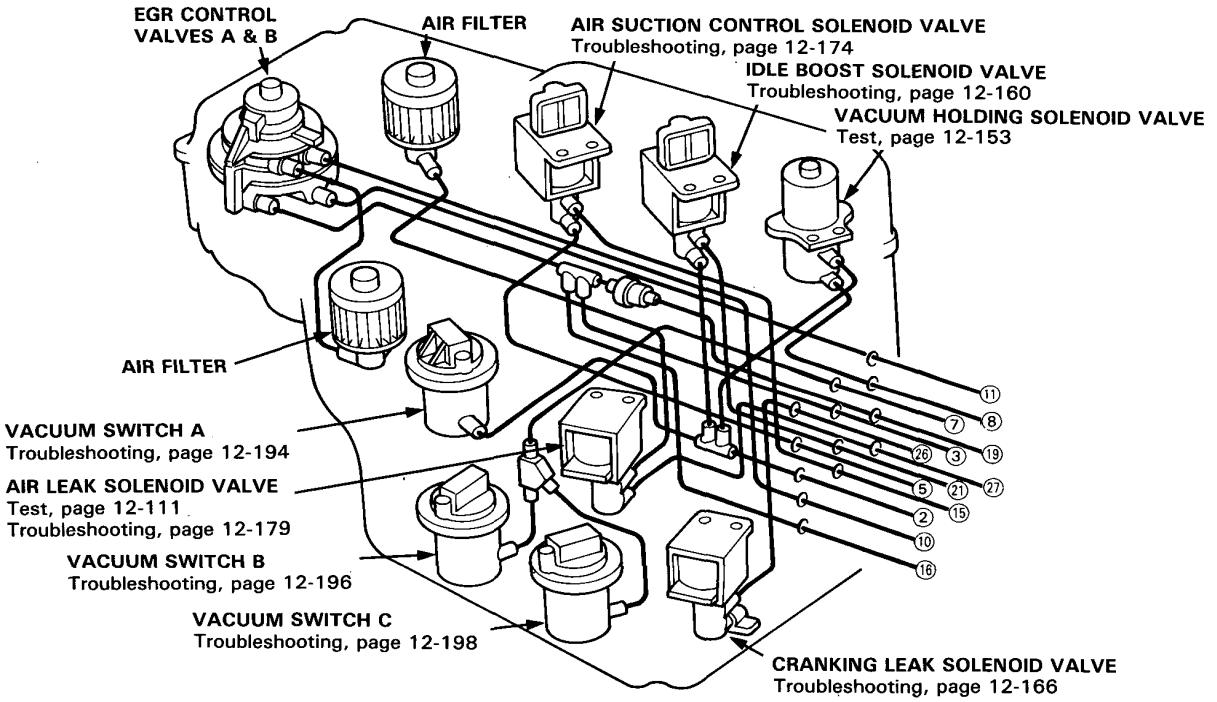

AIR FILTER
AIR SUCTION CONTROL SOLENOID VALVE
Troubleshooting, page 12-184
VACUUM HOLDING SOLENOID VALVE
Test, page 12-153
EGR CONTROL VALVES A & B
AIR FILTER
VACUUM SWITCH A
Troubleshooting, page 12-194
VACUUM SWITCH B
Troubleshooting, page 12-186
AIR LEAK SOLENOID VALVE
Test, page 12-111
Troubleshooting, page 12-179
CRANKING LEAK SOLENOID VALVE
Troubleshooting, page 12-166
11
7
8
26
3
19
5
27
2
15
10
16

Vacuum Connections

Automatic

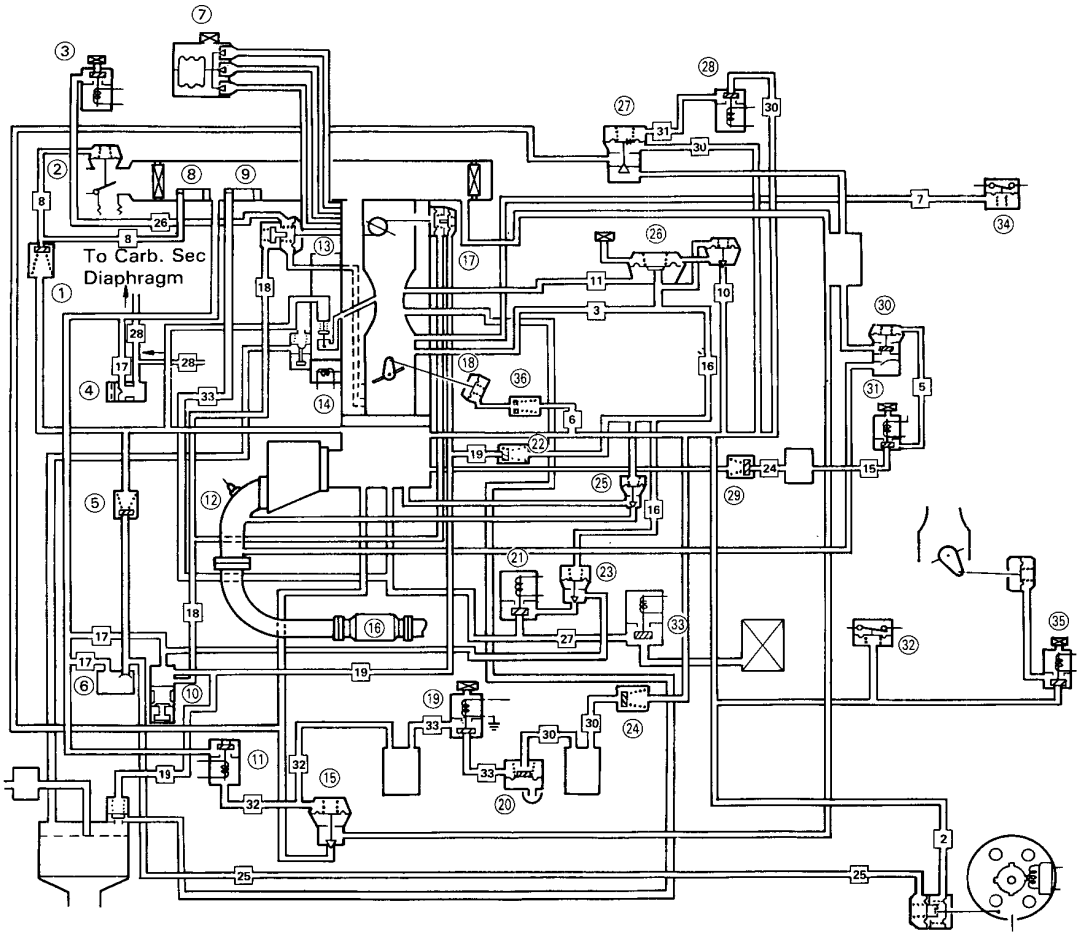


Control Box


EGR CONTROL VALVES A & B
AIR FILTER
AIR SUCTION CONTROL SOLENOID VALVE
Troubleshooting, page 12-174
IDLE BOOST SOLENOID VALVE
Troubleshooting, page 12-160
VACUUM HOLDING SOLENOID VALVE
Test, page 12-153
AIR FILTER
VACUUM SWITCH A
Troubleshooting, page 12-194
AIR LEAK SOLENOID VALVE
Test, page 12-111
Troubleshooting, page 12-179
VACUUM SWITCH B
Troubleshooting, page 12-196
VACUUM SWITCH C
Troubleshooting, page 12-198
CRANKING LEAK SOLENOID VALVE
Troubleshooting, page 12-166
11
7
8
26
3
19
5
21
27
2
15
10
16

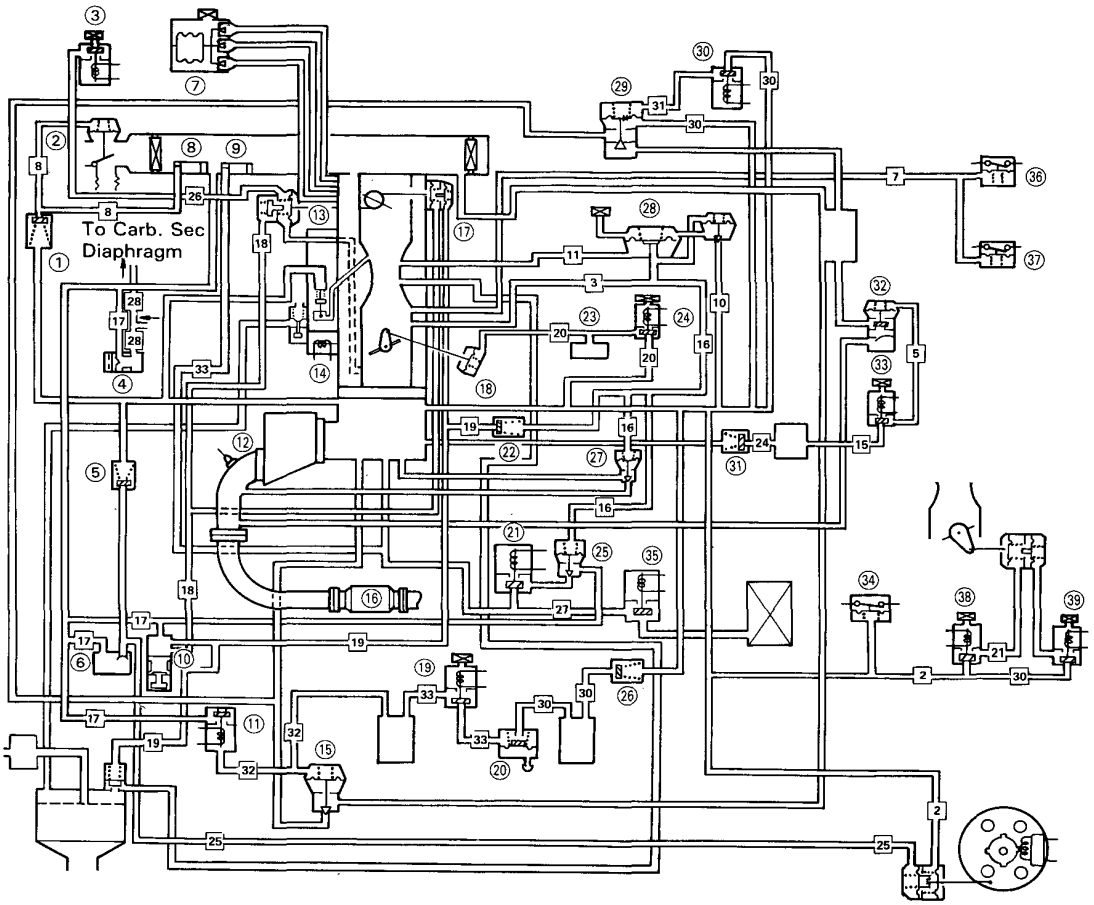
Vacuum Connections

Manual

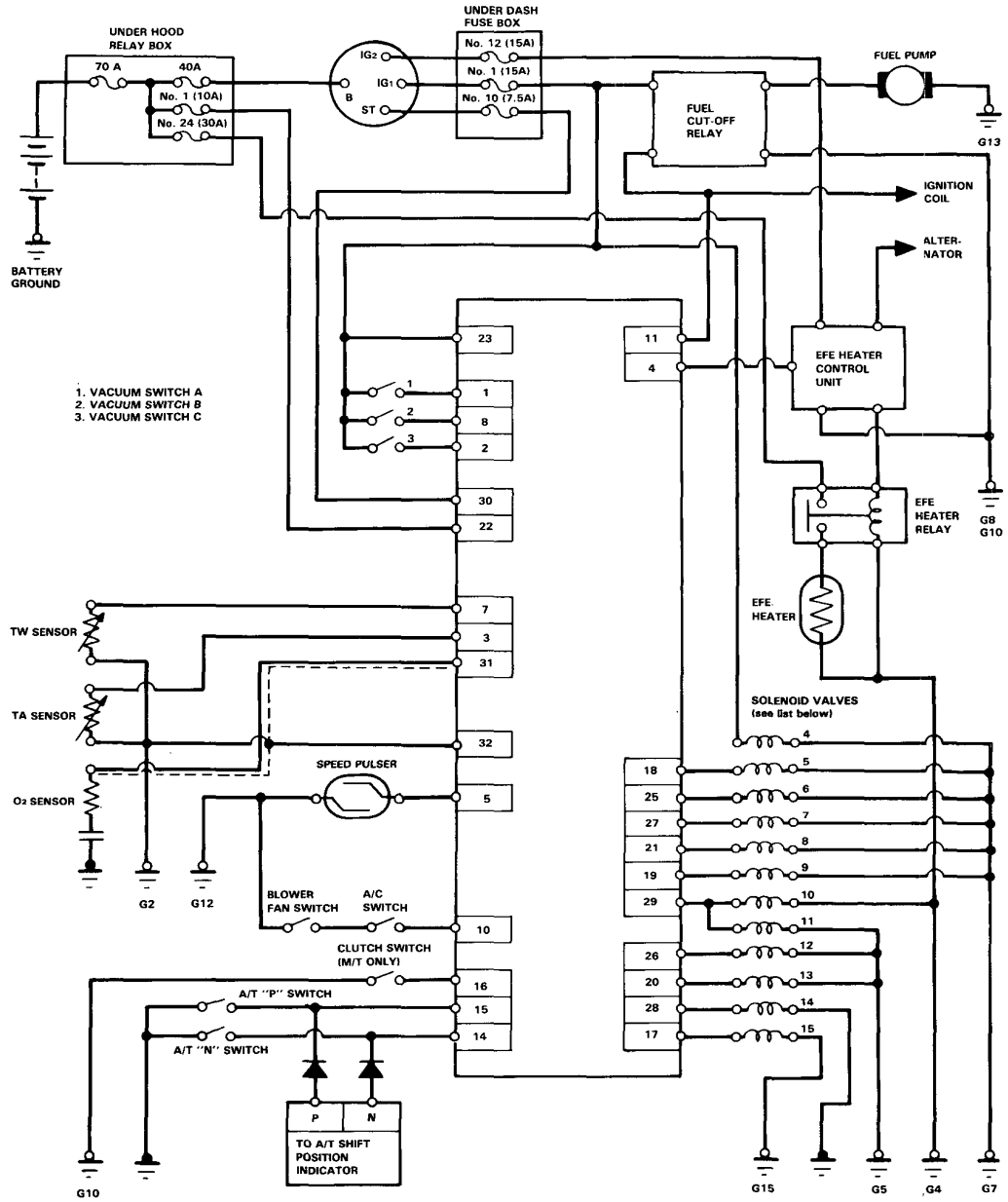


① CHECK VALVE (INTAKE AIR TEMP. CONTROL)
② INTAKE AIR CONTROL DIAPHRAGM
③ CRANKING LEAK SOLENOID VALVE
④ THERMOVALVE C
⑤ CHECK VALVE E
⑥ THERMOVALVE B
⑦ AIR JET CONTROLLER
⑧ AIR BLEED VALVE A
⑨ AIR BLEED VALVE B
⑩ THERMOVALVE A
⑪ FEEDBACK CONTROL SOLENOID VALVE
⑫ OXYGEN SENSOR
⑬ CHOKE OPENER
⑭ PRIMARY SLOW MIXTURE CUT-OFF SOLENOID VALVE
⑮ AIR CONTROL VALVE B
⑯ CATALYTIC CONVERTER
⑰ FAST IDLE UNLOADER
⑱ THROTTLE CONTROLLER
⑲ FREQUENCY SOLENOID VALVE B
⑳ CV GENERATOR
㉑ FREQUENCY SOLENOID VALVE A
㉒ CHECK VALVE A
㉓ AIR CONTROL VALVE A
㉔ CHECK VALVE B
㉕ EGR VALVE
㉖ EGR CONTROL VALVES A & B
㉗ ANTI-AFTERBURN VALVE
㉘ ANTI-AFTERBURN CONTROL SOLENOID VALVE
㉙ CHECK VALVE C
㉚ AIR SUCTION VALVE
㉛ AIR SUCTION CONTROL SOLENOID VALVE
㉜ VACUUM SWITCH A
㉝ AIR LEAK SOLENOID VALVE
㉞ VACUUM SWITCH B
㉟ A/C IDLE BOOST SOLENOID VALVE
㊱ DASHPOT CHECK VALVE

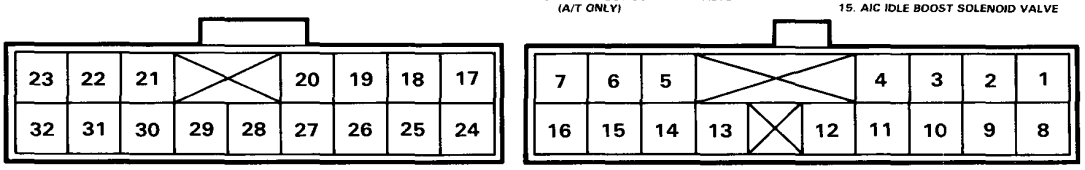
Automatic



① CHECK VALVE (INTAKE AIR TEMP. CONTROL)
② INTAKE AIR CONTROL DIAPHRAGM
③ CRANKING LEAK SOLENOID VALVE
④ THERMOVALVE C
⑤ CHECK VALVE E
⑥ THERMOVALVE B
⑦ AIR JET CONTROLLER
⑧ AIR BLEED VALVE A
⑨ AIR BLEED VALVE B
⑩ THERMOVALVE A
⑪ FEEDBACK CONTROL SOLENOID VALVE
⑫ OXYGEN SENSOR
⑬ CHOKE OPENER
⑭ PRIMARY SLOW MIXTURE CUT-OFF SOLENOID VALVE
⑮ AIR CONTROL VALVE B
⑯ CATALYTIC CONVERTER
⑰ FAST IDLE UNLOADER
⑱ THROTTLE CONTROLLER
⑲ FREQUENCY SOLENOID VALVE B
⑳ CV GENERATOR
㉑ FREQUENCY SOLENOID VALVE A
㉒ CHECK VALVE A
㉓ PULSE RECTIFIER
㉔ FREQUENCY SOLENOID VALVE C
㉕ AIR CONTROL VALVE A
㉖ CHECK VALVE B
㉗ EGR VALVE
㉘ EGR CONTROL VALVES A & B
㉙ ANTI-AFTERBURN VALVE
㉚ ANTI-AFTERBURN CONTROL SOLENOID VALVE
㉛ CHECK VALVE C
㉜ AIR SUCTION VALVE
㉝ AIR SUCTION CONTROL SOLENOID VALVE
㉞ VACUUM SWITCH A
㉟ AIR LEAK SOLENOID VALVE
㊱ VACUUM SWITCH B
㊲ VACUUM SWITCH C
㊳ IDLE BOOST SOLENOID VALVE
㊴ A/C IDLE BOOST SOLENOID VALVE



4. VACUUM HOLDING SOLENOID VALVE
5. AIR LEAK SOLENOID VALVE
6. AIR SUCTION CONTROL SOLENOID VALVE
7. CRANKING LEAK SOLENOID VALVE
8. FREQUENCY SOLENOID VALVE C (A/T ONLY)
9. IDLE BOOST SOLENOID VALVE (A/T ONLY)
10. FREQUENCY SOLENOID VALVE A
11. FREQUENCY SOLENOID BALVE B
12. ANTI-AFTERBURN CONTROL SOLENOID VALVE
13. FEEDBACK CONTROL SOLENOID VALVE
14. PRIMARY SLOW MIXTURE CUT-OFF SOLENOID VALVE
15. AIC IDLE BOOST SOLENOID VALVE



TERMINAL LOCATION

Symptom-to-System Chart

NOTE: Across each row in the chart, the systems that could be sources of a symptom are ranked in the order they should be inspected starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next most likely system ②, etc.

PAGE / SYSTEM / SYMPTOM		CARBURETOR	FUEL SUPPLY	AIR INTAKE	EMISSION CONTROLS	CONTROL UNIT INPUTS AND OUTPUTS
		106	129	134	139	155
ENGINE WON'T START			①			②
DIFFICULT TO START ENGINE	WHEN COLD	①			②	③
	WHEN WARM	①				②
IRREGULAR IDLING	WHEN COLD FAST IDLE OUT OF SPECIFICATION	①			③	②
	WHEN WARM RPM TOO HIGH	①				②
	WHEN WARM RPM TOO LOW	①				②
	ROUGH IDLE/ FLUCTUATION	①			②	②
FREQUENT STALLING	WHILE WARMING UP	①				②
	AFTER WARMING UP	①				②
POOR PERFORMANCE	MISFIRE OR ROUGH RUNNING	①	②			
	LOSS OF POWER	③	②	①	②	
	AFTERBURN	②		①	②	③
	HESITATION/ SURGE				②	①
	FAILS EMISSION TEST	②		①	③	③
	SULFUR SMELL	②			①	③

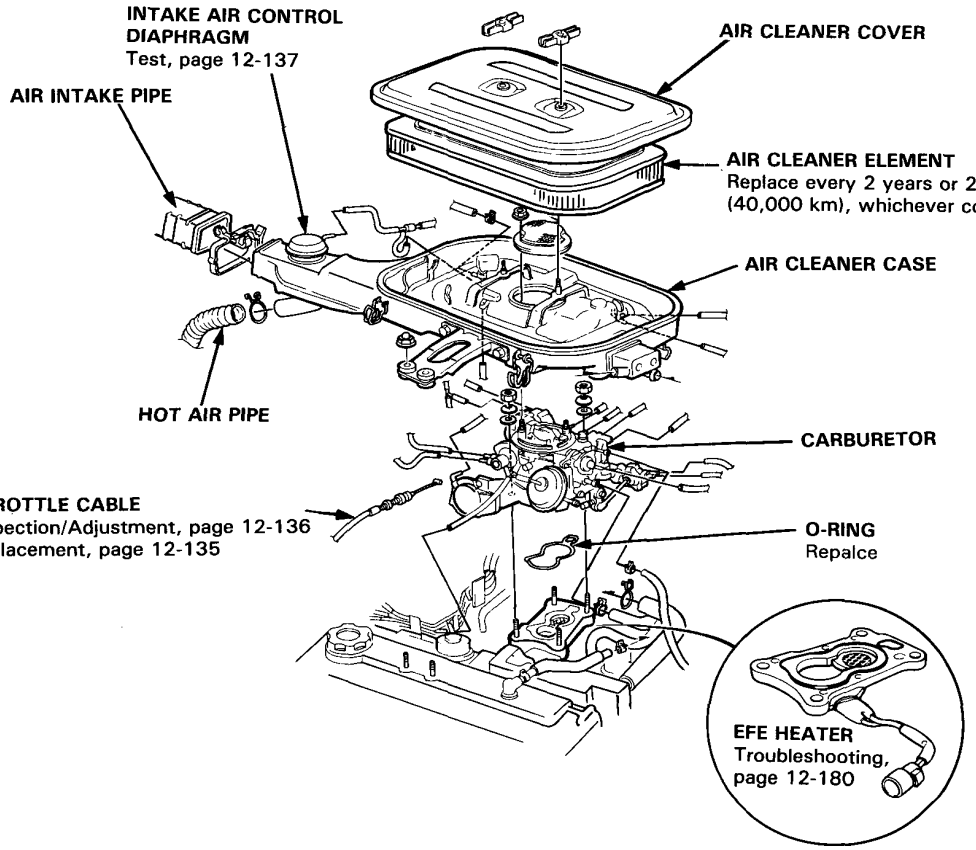
Carburetor

Symptom-to-Sub System Chart

NOTE: Across each row in the chart, the sub systems that could be sources of a symptom are ranked in the order they should be inspected, starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next system ②, etc.

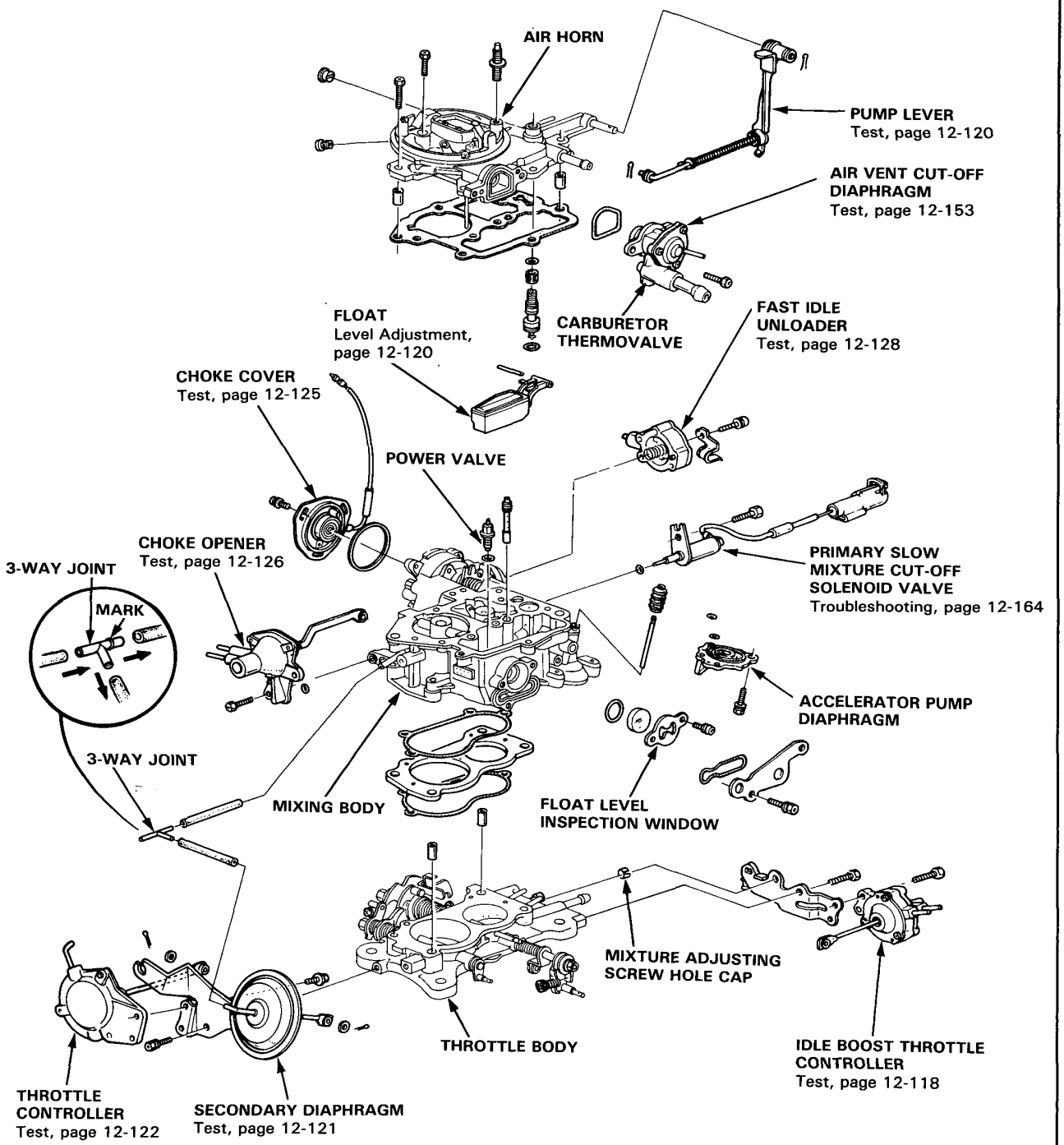
PAGE / SYSTEM / SYMPTOM		IDLE SPEED/ MIXTURE	AIR JET CONTROLLER	PRIMARY SLOW MIXTURE CUT-OFF SOLENOID VALVE	IDLE CONTROL SYSTEM	POWER VALVE
		110	119	164	118	119
DIFFICULT TO START ENGINE	WHEN COLD			②		
	WHEN WARM			①	②	
IRREGULAR IDLING	WHEN COLD FAST IDLE OUT OF SPECIFICATION			②		
	WHEN WARM RPM TOO HIGH	①			②	
	WHEN WARM RPM TOO LOW	①			②	
	ROUGH IDLE/ FLUCTUATION	①			②	
FREQUENT STALLING	WHILE WARMING UP			①		
	AFTER WARMING UP	①		②		
POOR PERFORMANCE	MISFIRE OR ROUGH RUNNING					
	LOSS OF POWER					
	AFTERBURN		②			
	FAILS EMISSION TEST	①				
	SULFUR SMELL	①				

ACCELE-RATOR PUMP	FLOAT LEVEL	HEAT RISER	VACUUM CONTROLLED SECONDARY	DASHPOT SYSTEM	AUTOMATIC CHOKE/ FAST IDLE SYSTEM
120	120	125	121	122	123
③					①
		③			①
					③
		③			②
			②		①
①			①		
				①	
					②



NOTE: Use new gaskets and O-rings whenever re-assembling. Be sure that no foreign material falls on the EFE heater while replacing the air cleaner or servicing around the EFE heater.

NOTE: Be sure that no foreign material gets on the EFE heater when reinstalling the carburetor.



Inspection/Adjustment (KG, KS)

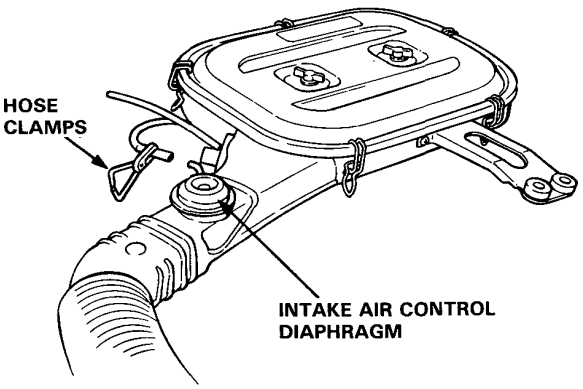
Propane Enrichment Method

WARNING Do not smoke during this procedure. Keep any open flame away from your work area.

NOTE: This procedure requires a propane enrichment kit.

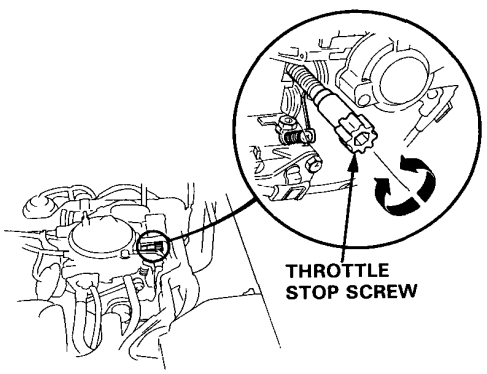
Manual Transmission

1. Start engine and warm up to normal operating temperature; the cooling fan will come on.
2. Remove the vacuum hose from the intake air control diaphragm and clamp the hose end.



3. Connect tachometer.
4. Check idle speed with the headlights, heater blower, rear window defogger, cooling fan and air conditioner off.

Idle speed should be: 800 ± 50 min^{-1} (rpm)

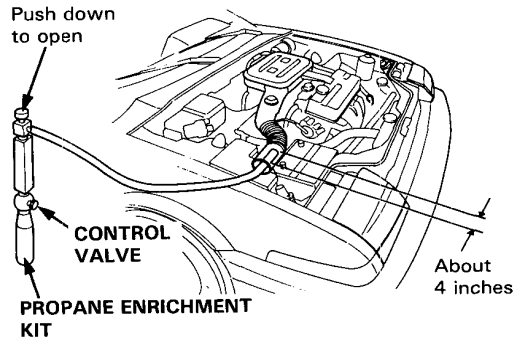


Adjust the idle speed, if necessary, by turning the throttle stop screw.

NOTE: If the idle speed is excessively high, check the dashpot system (page 12-122).

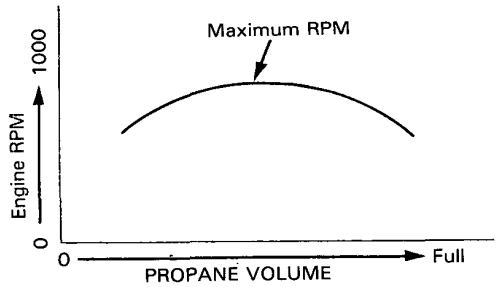
5. Disconnect air cleaner intake tube from air intake duct.
6. Insert the hose of the propane enrichment kit into the intake tube about 4-inches.

NOTE: Check that propane bottle has adequate gas before beginning test.



7. With engine idling, depress push button on top of propane device, then slowly open the propane control valve to obtain maximum engine speed. Engine speed should increase as percentage of propane injected goes up.

NOTE: Open the propane control valve slowly; a sudden burst of propane may stall the engine.



RPM increase should be: 50 ± 20 min^{-1} (rpm)

- If engine speed does not increase per specification, mixture is improperly adjusted. Go to step 8.
- If engine speed increases per specification, go to step 21.

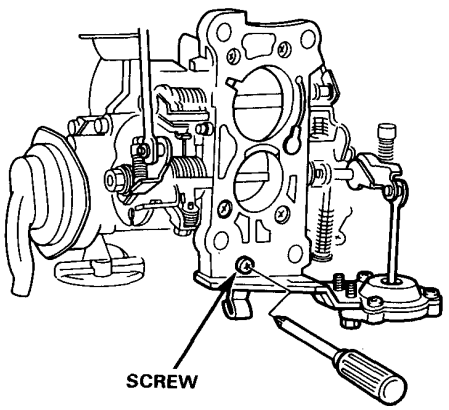
8. Remove the air cleaner and close the propane control valve.
9. Disconnect the vacuum hose to the fast idle unloader.

10. Pull the throttle cable out of its bracket.

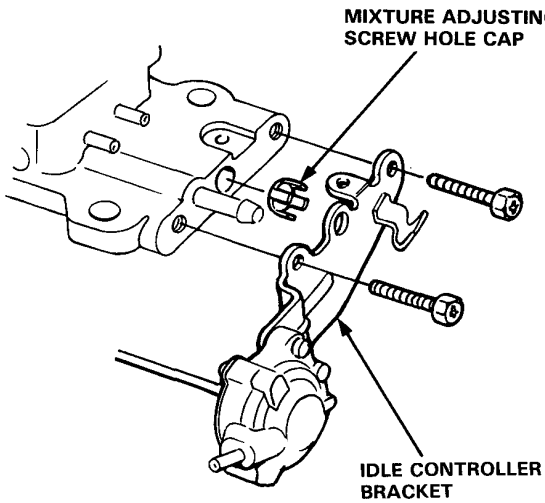
11. Remove the carburetor nuts and the bolt securing the steel vacuum manifold.

12. Lift the carburetor clear of its studs, then tilt it backwards so you can remove the idle controller bracket screws.

13. Remove the idle controller bracket.



14. Remove the mixture adjusting screw hole cap, then reinstall the idle controller bracket.



15. Reinstall the carburetor, but first check the insulator block for damage.

16. Reconnect the vacuum hose to the fast idle unloader.

17. Reinstall the air cleaner.
18. Start engine and warm up to normal operating temperature; the cooling fan will come on.
19. Remove the vacuum hose from intake air control diaphragm and clamp the hose end.
20. Reinstall the propane enrichment kit and recheck maximum propane enriched rpm.

    - If the propane enriched speed is too low, mixture is too rich: turn the mixture screw 1/4-turn clockwise and recheck.
    - If the propane enriched speed is too high, mixture is too lean: turn the mixture screw 1/4-turn counterclockwise and recheck.

21. Close the propane control valve and recheck idle speed.

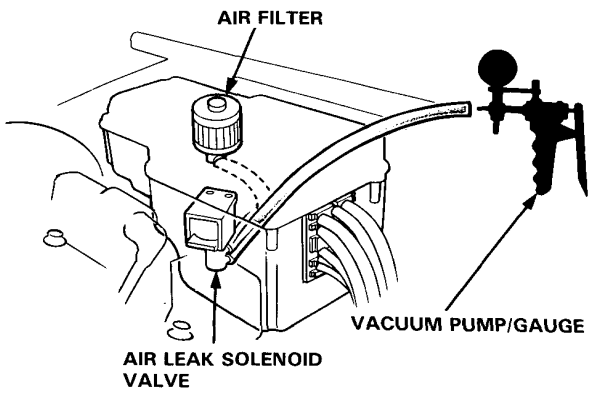
    Idle speed should be: 800 ± 50 min^{-1} (rpm)

    - If idle speed is as specified (step 4), go to step 22.
    - If idle speed is not as specified, adjust by turning throttle stop screw, then repeat steps 20 and 21.

22. If the intake air temperature is above 65°C (149°F), go on to step 23 through 26.

23. Disconnect #5 vacuum hose from the air suction valve and plug the hose.

24. Open the control box lid. Disconnect the lower vacuum hose of the air leak solenoid valve (between the solenoid valve and the air filter) from the air filter and connect a vacuum gauge to the hose.



(cont'd)

Inspection/Adjustment (cont'd)

25. With the engine idling, depress the push button on top of propane device, then slowly open the propane control valve and check for vacuum.

    There should be vacuum.

    - If there is no vacuum, check the air leak solenoid valve (page 12-179).

26. Reconnect all hoses.

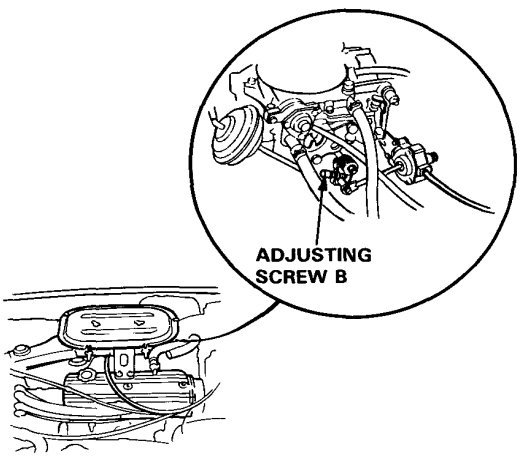
27. Check the air bleed valve B (page 12-141)

28. Remove propane enrichment kit and reconnect air cleaner intake tube on the air intake duct.

29. Reinstall the mixture adjusting screw hole cap.

30. If equipped with air conditioner, check the idle speed with the A/C on.

    Idle speed should be: 750 ± 50 min^{-1} (rpm)

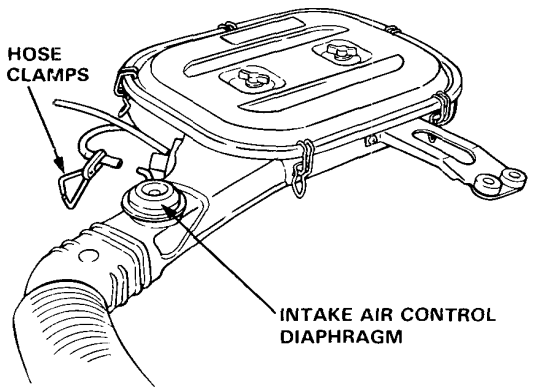


Adjust the idle speed, if necessary, by turning the adjusting screw B.

Automatic Transmission

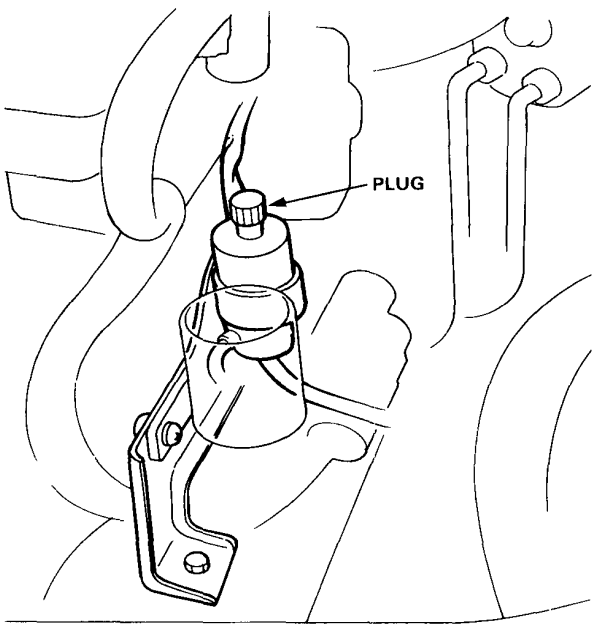
1. Start engine and warm up to normal operating temperature; the cooling fan will come on.

2. Remove the vacuum hose from the intake air control diaphragm and clamp the hose end.

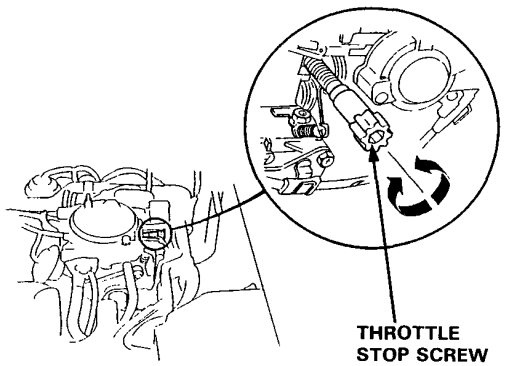


3. Connect tachometer.

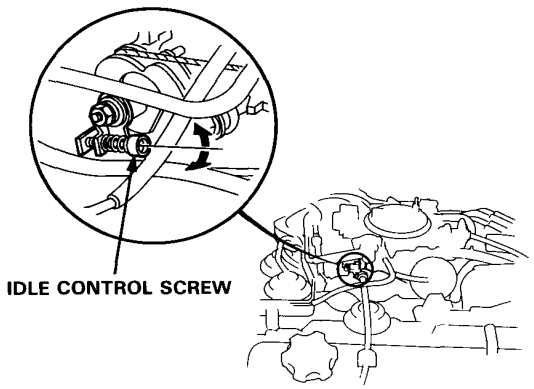
4. Remove the air filter from frequency solenoid valve C and plug the opening in the solenoid valve.



5. With the headlights, heater blower, rear window defogger, cooling fan and air conditioner off, and transmission in "N" or "P", lower the idle speed as much as possible by turning the throttle stop screw.



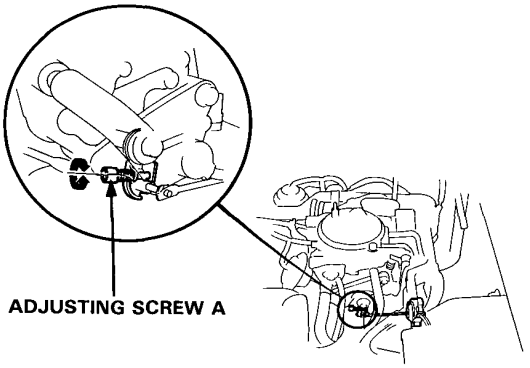
6. Adjust the idle speed by turning the idle control screw to 630 ± 50 min^{-1} (rpm).



7. Adjust the idle speed by turning the throttle stop screw to 700 ± 50 min^{-1} (rpm).

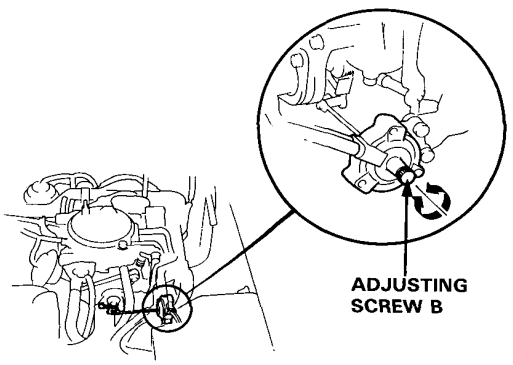
8. With transmission in gear (except "P" or "N"), adjust the idle speed by turning adjusting screw A.

Idle speed should be:
675 ± 50 min^{-1} (rpm) (at high altitude)
700 ± 50 min^{-1} (rpm) (at low altitude)



9. Shift transmission to "N" or "P" position.

10. If equipped with air conditioner, adjust the idle speed by turning adjusting screw B to 700 ± 50 min^{-1} (rpm) with A/C on.



11. Stop the engine, remove the inside vacuum hose from the idle boost throttle controller and plug the hose.

(cont'd)

Inspection/Adjustment (cont'd)

12. Check the maximum engine speed by the propane enrichment method (page 12-110, steps 5 through 7).

    RPM increase should be: 30 ± 10 min^{-1} (rpm) (in gear)

    - If engine speed increases per specification, go to step 13.
    - If engine speed does not increase per specification, adjust the enriched speed by turning the mixture screw (page 12-110, steps 8 through 20).

13. Stop engine. Close the propane control valve, remove all plugs, and reconnect all hoses.

14. Restart the engine and recheck idle speed.

    NOTE: Raise the engine speed to 2,500 rpm 2 or 3 times in 10 seconds, and then check the idle speed.

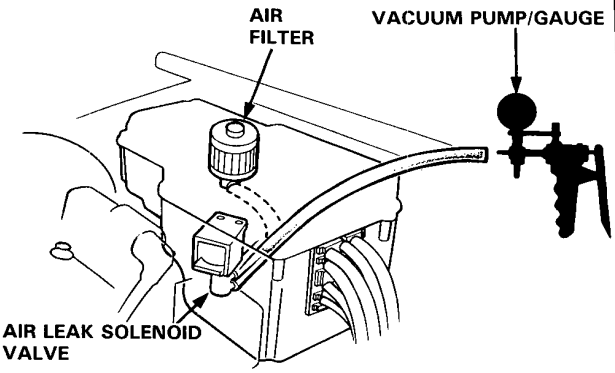
    Idle speed should be: 730 ± 50 min^{-1} (rpm) (in "N" or "P")

    - If the idle speed is as specified, go to step 16.
    - If the idle speed is not as specified, return to steps 4 through 12.

15. If the intake air temperature is above 65°C (149°F), go on to step 17 through 20.

16. Disconnect #5 vacuum hose from the air suction valve and plug the hose.

17. Open the control box lid. Disconnect the lower vacuum hose of the air leak solenoid valve (between the solenoid valve and the air filter) from the air filter and connect a vacuum gauge to the hose.



18. With the engine idling, depress the push button on top of the propane device, then slowly open the propane control valve and check for vacuum.

    There should be vacuum.

    - If there is no vacuum, check the air leak solenoid valve (page 12-179).

19. Reconnect all hoses.

20. Check the air bleed valve B (page 12-141).

21. Remove propane enrichment kit and reconnect air cleaner intake tube on the air intake duct.

22. Reinstall the mixture adjusting screw hole cap.

23. Recheck the idle speed with the A/T shift lever in gear.

    Idle speed should be: 730 ± 50 min^{-1} (rpm)

24. Recheck the idle speed with the A/C on and with the shift lever in "P" or "N" position.

    Idle speed should be: 750 ± 50 min^{-1} (rpm)

25. Recheck the idle speed with the A/C on and in gear.

    Idle speed should be: 750 ± 50 min^{-1} (rpm)

26. If the idle rpm does not reach the specified idle speeds in steps 15 and 24 through 26, inspect the idle control system (page 12-118).

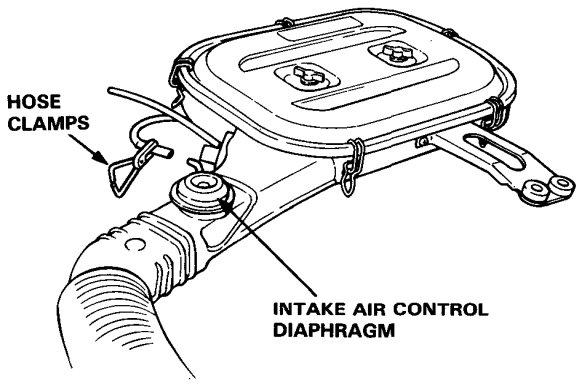
Propane Enrichment Method

WARNING Do not smoke during this procedure. Keep any open flame away from your work area.

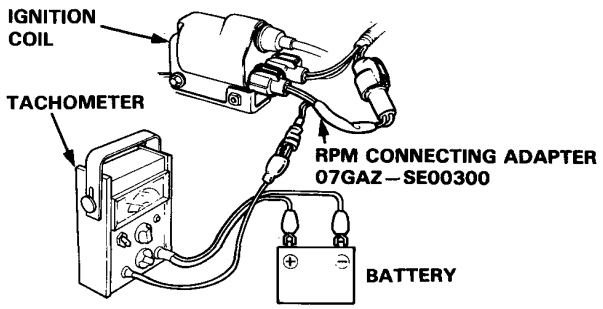
NOTE: This procedure requires a propane enrichment kit.

Manual Transmission

1. Start engine and warm up to normal operating temperature; the cooling fan will come on.
2. Remove the vacuum hose from the intake air control diapharagm and clamp the hose end.

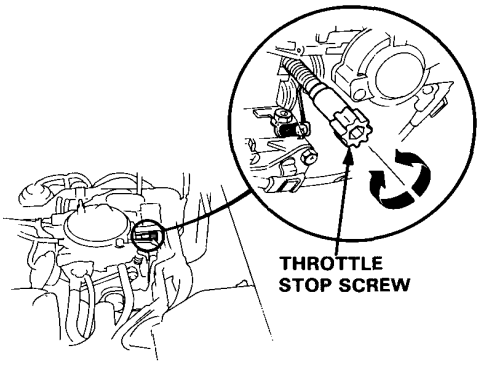


3. Connect tachometer.



4. Check idle speed with the headlights, heater blower, rear window defogger, cooling fan and air conditioner off.

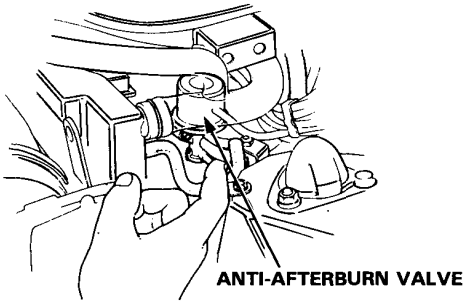
Idle speed should be: 800 ± 50 min^{-1} (rpm)



Adjust the idle speed, if necessary, by turning the throttle stop screw.

NOTE: If the idle speed is excessively high, check the dashpot system (page 12-122).

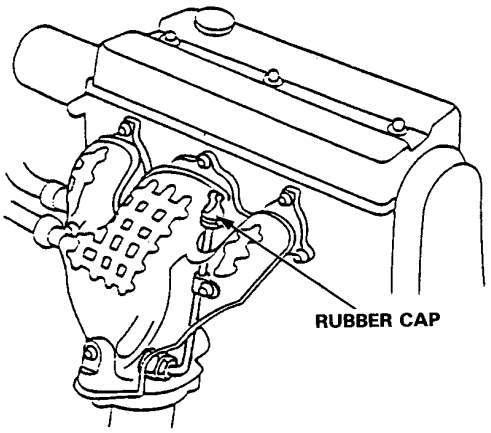
5. Disconnect the air suction lower hose at the anti-afterburn valve.



(cont'd)

Inspection/Adjustment (KX) (cont'd)

6. Remove the rubber cap from the gas pipe and set the CO meter.



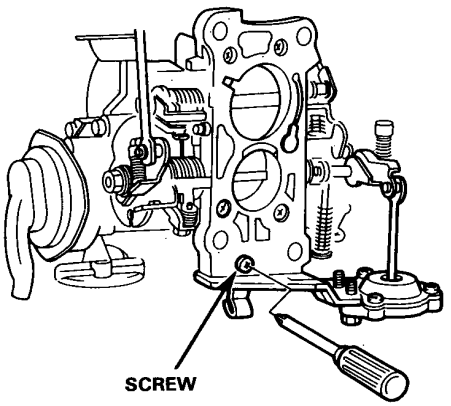
7. Warm up and check the idle CO with the headlights, heater blower, window defogger, cooling fan and air conditioner off.
   CO meter should indicate 1.0 ± 1.0 % CO.
   If the idle Co is not within the specification, adjust the following the steps.

8. Disconnect the vacuum hose to the fast idle unloader.

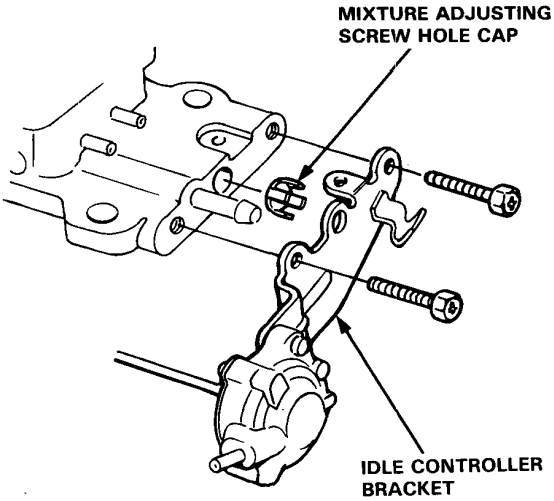
9. Pull the throttle cable out of its bracket.

10. Lift the carburetor cleaner of its studs, then tilt it backwards so you can remove the idle controller bracket screws.

11. Remove the idle controller bracket.



12. Remove the mixture adjusting screw hole cap, then reinstall the idle controller bracket.



13. Reinstall the carburetor, but first check the insulator block for damage.

14. Reconnect the vacuum hose to fast idle unloader.

15. Reinstall the air cleaner.

16. Remove the CO meter and install the rubber cap to the gas pipe.

17. Restart the engine and warm up normal operating temperature (the cooling fan comes on).

18. Remove the rubber cap and set the CO meter.

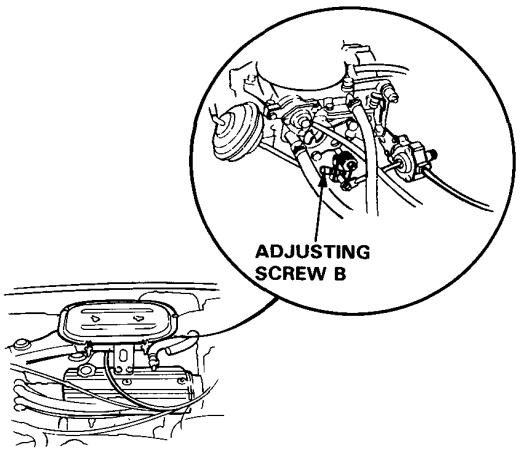
19. Adjust the mixture screw to the CO meter indicating 1.0 ± 1.0 % CO.

20. Remove the CO meter and install the rubber cap to the gas pipe.

21. Reinstall the mixture adjusting screw hole cap and carburetor.

22. If equipped with the air conditioner, check the idle speed with the A/C on.

    Idle speed should be: 750 ± 50 min^{-1} (rpm)



    Adjust the idle speed, if necessary, by turning the adjusting screw B.

23. Connect the air suction lower hose at the anti-afterburn valve.

24. Restart the engine and warm up (with 2,000 min^{-1} (rpm) in no-load condition and the cooling fan comes on).

25. Remove the rubber cap and set the CO meter.

26. Check the CO, HC, CO_2 with the headlights, heater blower, window defogger, cooling fan and air conditioner off (shift position A: automatic)
    CO: 0.1—2.0 %
    HC: 1,000 ppm Maximum
    CO_2: 7 % Minimum

27. Remove the CO meter and install the rubber cap to the gas pipe.

28. Set the CO meter to the tail pipe and check the CO, HC, CO_2.
    CO: 0.0—0.1 %
    HC: 100 ppm Maximum
    CO_2: 7 % Minimum

29. Remove the CO meter.

Idle Control System (A/T only)

Test

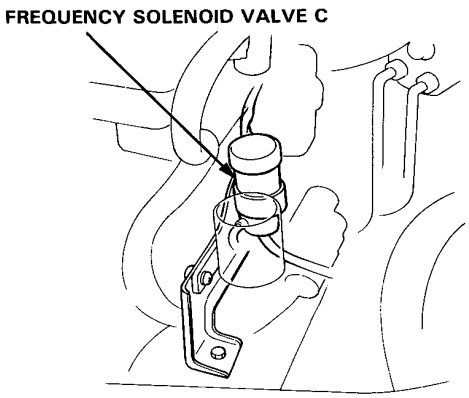
1. Check the idle speed with the headlights, heater blower, rear window defogger, cooling fan and air conditioner off, and the shift lever in "P" or "N" position.

   Idle speed should be: 730 ± 50 min^{-1} (rpm)

   - If the specified idle speed is available, go on to step 4.
   - If the specified idle speed is not available, go on to step 2.

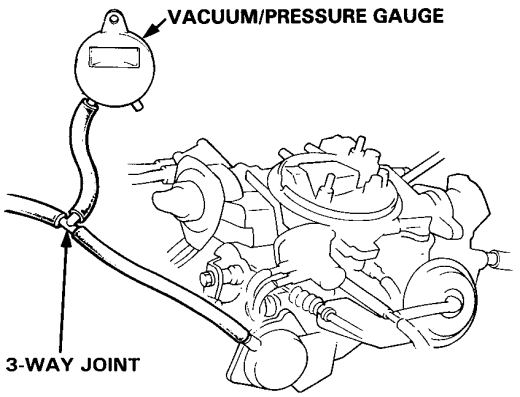
2. Check that the frequency solenoid valve C is operating.
   NOTE: It may be easier to determine if the valve is working by placing your hand on it.

   The solenoid valve should be clicking on and off continuously.



   - If the solenoid valve doesn't operate properly, go to output troubleshooting (page 12-158).

   - If the solenoid valve operates properly, connect the throttle controller hose to a 3-way joint, with a vacuum gauge in-line, as shown.

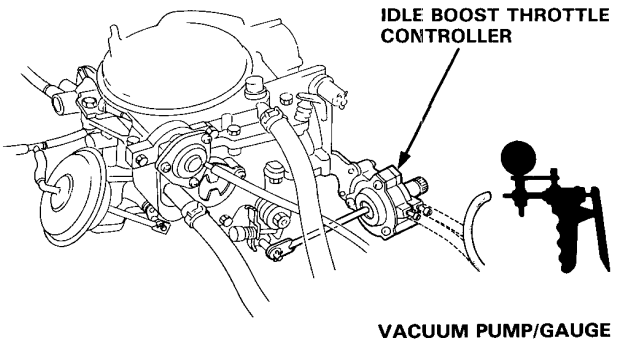


   - If there is vacuum, go on to step 3.

   - If there is no vacuum, check the vacuum hose for proper connection and condition.

3. Disconnect the two vacuum hoses at idle boost throttle controller and check each for vacuum.

   There should be no vacuum in both hoses.

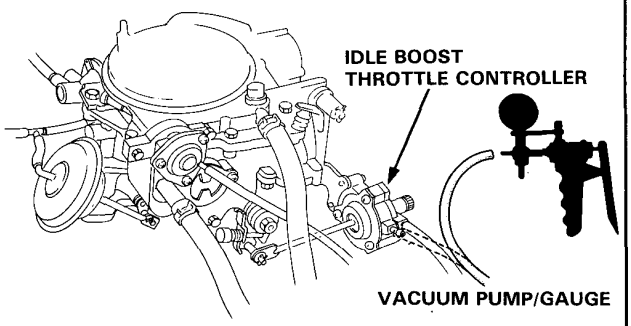


   - If there is no vacuum, replace the throttle controller and retest.
   - If there is vacuum at either hose, go to output troubleshooting for idle boost (page 12-160) or A/C idle boost solenoid valve (page 12-162 or 64).

4. Check the idle speed in "D$_3$" or "D$_4$."

   Idle speed should be: 730 ± 50min^{-1} (rpm)

   - If the specified idle speed is not available, disconnect the inner vacuum hose on the idle boost throttle controller and check for vacuum.

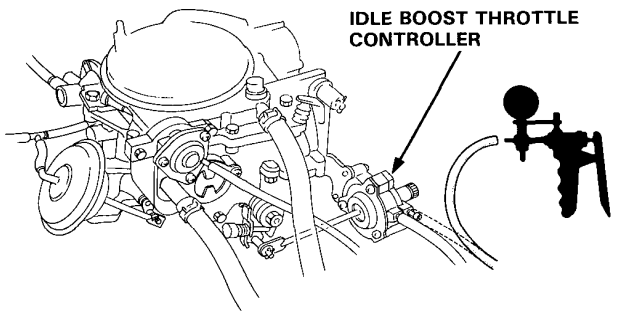


— If there is vacuum, first check the throttle valve for smooth operation, then replace the idle boost throttle controller and recheck.
— If there is no vacuum, go to output troubleshooting (page 12-160).

5. Check the idle speed with the transmission set to "N" or "P," and the air conditioner ON. No other load on the engine at this time.

Idle speed should be: 750 ± 50 min^{-1} (rpm)

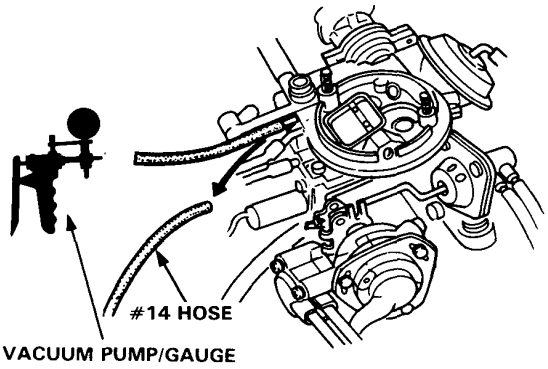
- If the specified idle speed is not available, disconnect the two vacuum hoses at idle boost throttle controller and check each for vacuum.



— If there is vacuum in each hose, replace the idle boost throttle controller and recheck.
— If there is no vacuum only at the inside hose, go to output troubleshooting (page 12-160).
— If there is no vacuum only at the outside hose, go to output troubleshooting (page 12-162).

Test

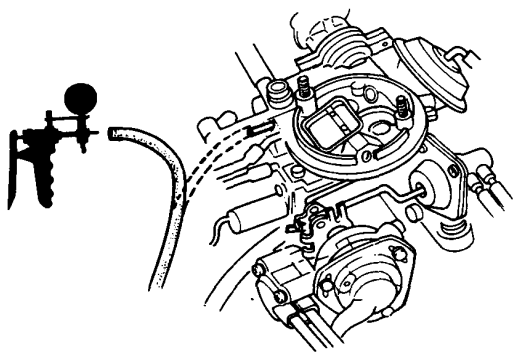
1. Disconnect the #14 vacuum hose from the power valve and connect a vacuum pump to the valve. Apply vacuum and listen for a clicking noise from the power valve.



- If a clicking sound is heard, go on to step 2.
- If no sound is heard, replace the carburetor and retest.

2. Start the engine and wait for it to warm up.

3. Disconnect the #14 vacuum hose from the power valve and connect a vacuum gauge to the hose. Check that there is vacuum at idling.

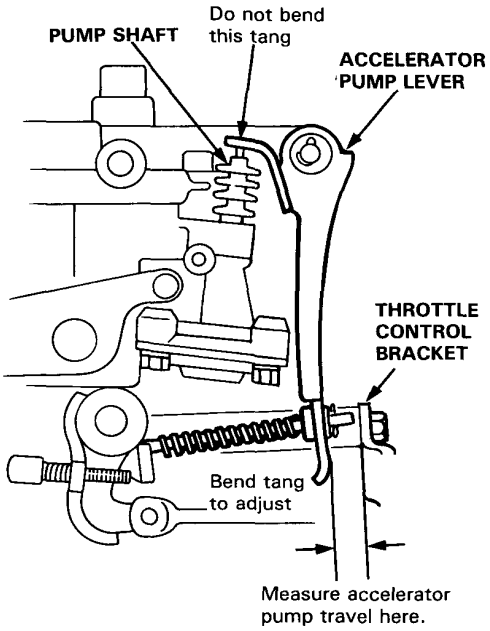


- If there is no vacuum, check the vacuum hose for disconnection, tears and clogging.

Accelerator Pump

Inspection

1. Before measuring the accelerator pump linkage travel, make sure the pump shaft travels freely throughout the pump stroke. Make sure the pump lever is in contact with the pump shaft.



2. To check linkage travel, measure gap between bottom end of pump lever (tang) and stop as shown.

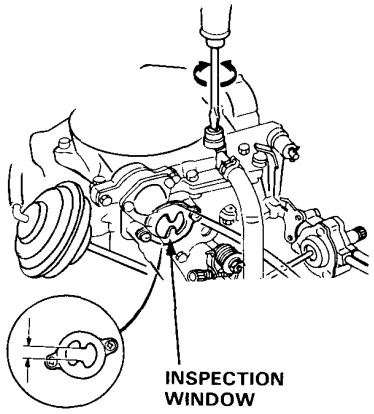
   Limits: 11.5 to 12.0 mm (29/64" to 31/64")

Float Level

Adjustment

WARNING Do not smoke while working on fuel system. Keep open flame away from work area.

1. Place the car on level ground.
2. Start and warm up the engine, snap the throttle between idle and 3,000 min^{-1} (rpm) several times then allow it to idel.
3. When the fuel level stabilizes, check that it is centered in the inspection window.



4. If the fuel level is not centered, adjust it by slowly turning the adjusting screw.
5. Paint the adjustment screw with white paint after adjustment.

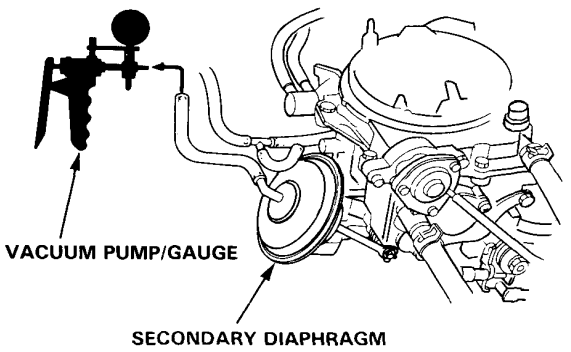
   NOTE: Do not turn the adjusting screw more than 1/8-turn every 15-seconds.

Vacuum Controlled Secondary

Test

1. Disconnect the secondary diaphragm vacuum hose and attach a spare piece of hose between the diaphragm and a vacuum pump.

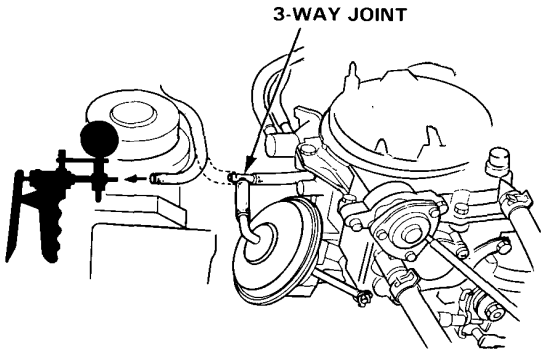
2. Open the throttle valve fully and apply a vacuum. Check that the diaphragm rod moves as vacuum is applied and that the vacuum then remains steady.



- If the vacuum does not hold or the rod does not move, first check the hose for proper connection and condition, then replace the diaphragm and recheck

3. With the engine cold [water temperature below 50°C (122°F)] disconnect the vacuum hose from the 3-way joint, connect a vacuum pump and apply a vacuum.

   Vacuum should not hold.



- If vacuum holds, first make sure the hose is not clogged, then replace thermovalve C.

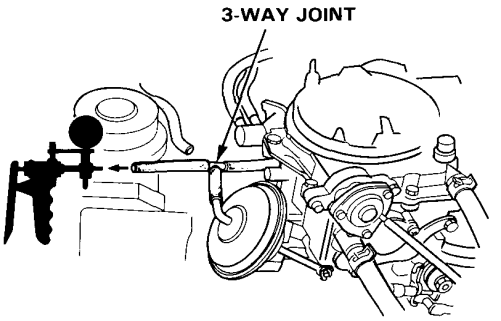
4. After the engine has warmed up, disconnect the vacuum hose from the 3-way joint, connect a vacuum pump, and apply vacuum.

   Vacuum should remain steady.

- If it does not remain steady, check the hose for proper connection and condition and replace thermovalve C.

5. Disconnect the vacuum hose from the 3-way joint and connect to a vacuum pump/gauge. Apply a vacuum.

   It should not hold vacuum.



- If vacuum does not hold, test is complete.

- If vacuum is held, check the hose, the 3-way joint and clean the vacuum port.

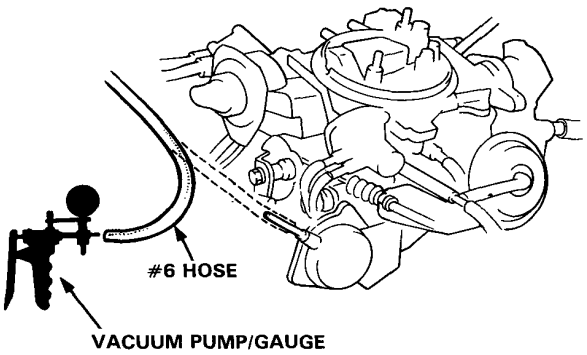
Dashpot System (M/T only)

Test

HOT ENGINE

NOTE: If the dashpot diaphragm in the throttle controller is damaged or vacuum to the dashpot diaphragm is blocked or leaks, correct idle speed can not be obtained. The idle speed will be excessively high after warming up the engine.

1. Connect a tachometer, start the engine and allow it to reach normal operating temperature (the cooling fan comes on).
2. Check that the idle speed is not excessively high.
   - If the idle speed is within specification, go on to step 3.
   - If the idle speed is excessively high, disconnect #6 vacuum hose from the throttle controller and check for vacuum at the hose.

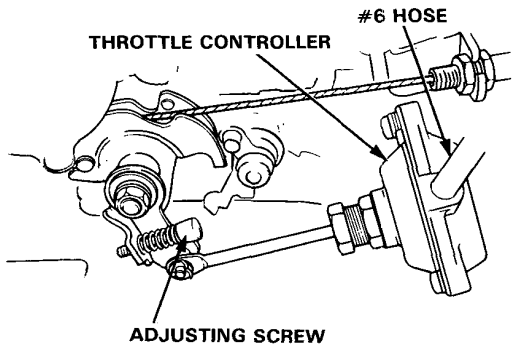


   — If there is no vacuum, check #6 vacuum line for leaks or blockage. Repair, clean or replace as necessary and retest.

   — If there is vacuum, replace the throttle controller and retest.

3. With the engine idling, disconnect #6 vacuum hose from the throttle controller.

   Engine speed should rise to 1700 ± 300 min^{-1} (rpm).
   - If the rpm is not within 1700 ± 300 min^{-1} (rpm), adjust by turning the adjusting screw.



   - If the rpm does not change, check the throttle controller linkage for free movement. If there is no problem, replace the throttle controller and retest.

Fast Idle

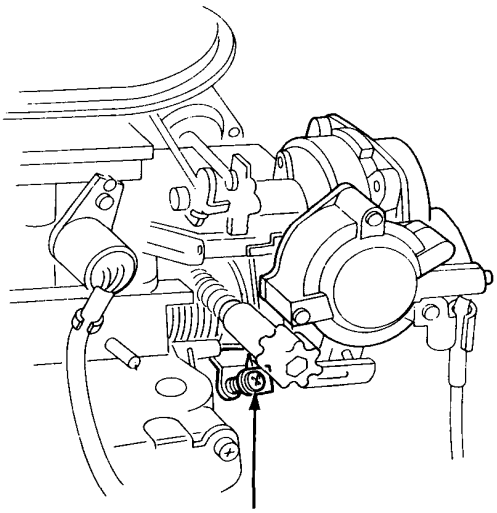
Inspection/Adjustment

HOT ENGINE

1. Start the engine and warm it up to normal operating temperature (the cooling fan comes on).
2. Stop the engine and connect a tachometer to it.
3. Disconnect and plug the inside vacuum hose of the fast idle unloader.
4. To engage the fast idle cam, open and close the throttle fully while holding the choke valve closed.
5. Restart the engine.

Fast idle should be: 2500 ± 500 min^{-1} (rpm)

- If not OK, reset the fast idle speed by turning the screw shown.



FAST IDLE ADJUSTING SCREW

Choke Coil Tension and Linkage

Inspection

COLD ENGINE

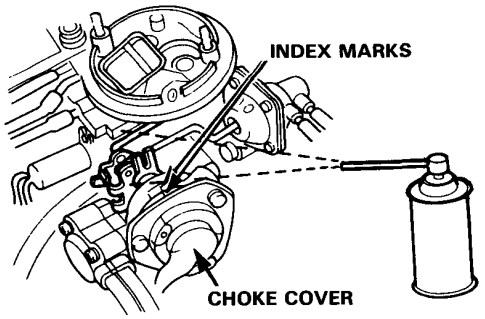
1. Remove the air cleaner.
2. Open and close the throttle fully to let the choke close.

   The choke valve should close completely.

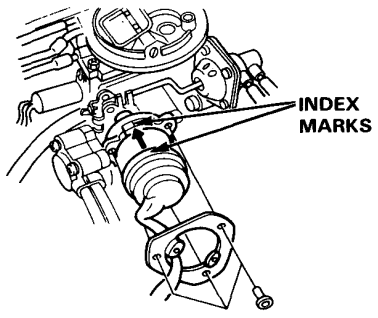
   NOTE: Above about 28°C (82°F) the choke will not close completely, but should still close to less than 3 mm (1/8 in.).

   - If the choke closes properly, go on to the fast idle unloader test on page 12-128.
   - If the choke does not close properly, spray its linkage with carburetor cleaner, and check the linkage for signs of mechahical binding (use a spray can with an extension on the nozzle to reach the linkage).

   CAUTION: Carburetor cleaner is very caustic; always wear safety goggles or a face shield when spraying.



   - If the choke still does not close properly, remove the choke cover (page 12-125) and inspect the linkage for free movement. Repair or replace parts as necessary. Then reinstall the cover and adjust it so the index marks line up, and retest.
   - If the choke still does not close properly, replace the cover. (page 12-125).



Choke Coil Tension and Linkage

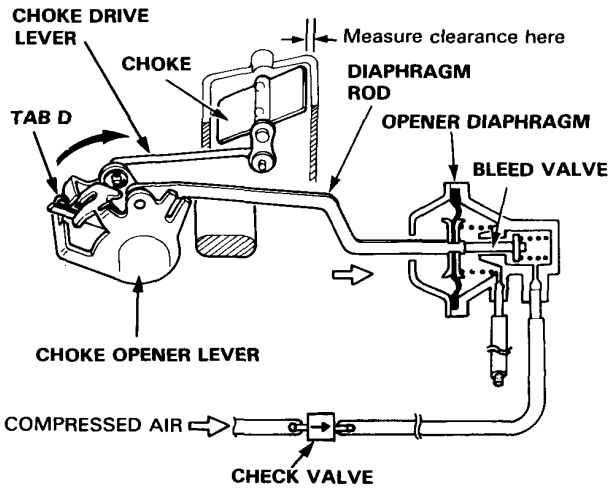
Check/Adjustment

NOTE:
- *This check is not necessary unless the linkage has* been bent, choke opener has been replaced, or the car has poor cold starting.
- This check can be made with the engine HOT or COLD.

1. Remove the choke cover (page 12-125).

2. While holding the choke valve closed, open and close the throttle fully to engage the choke and fast idle linkage.

3. Disconnect the choke opener hose from the steel vacuum manifold, and attach a check valve to it as shown. Then pressurize the choke opener with low pressure compressed air, 103–586 kPa (15–85 psi) is OK, to hold the bleed valve in it closed.



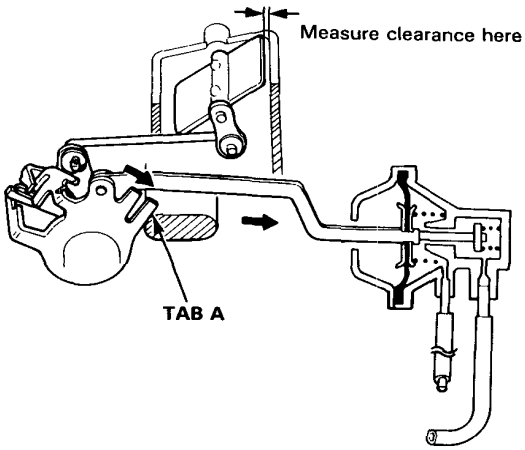
4. Gently push the choke opener lever towards the opener until it stops (until you feel the opener rod seat against the pressurized bleed valve), then pull the choke drive lever down against the opener lever (to take all free play out of the linkage), and measure the clearance between the choke blade and casting:

1st Stage Clearance
M/T: 1.54 ± 0.07 mm (0.061 ± 0.003 in.)
A/T: 1.46 ± 0.07 mm (0.057 ± 0.003 in.)

Adjust clearance by bending Tab D.

5. Remove the check valve, and reconnect the choke opener hose.

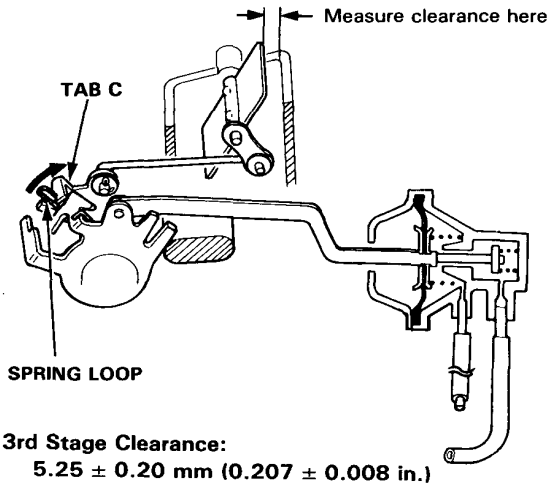
6. Hold both levers together, then push them toward the diaphragm again until they stop (Tab A on the opener lever seats against the carburetor), and measure the clearance at the choke valve.



2nd Stage clearance:
M/T and CAL A/T: 3.28 ± 0.09 mm (0.129 ± 0.004 in.)
49 ST and HI ALT A/T: 3.54 ± 0.09 mm (0.139 ± 0.004 in.)

Adjust clearance by bending Tab A.

7. While still holding opener lever Tab A against its seat, release the choke drive lever, and measure the clearance at the choke valve (Tab C on the drive lever should stay seated against the spring loop; if not, repeat step 2 and recheck):



3rd Stage Clearance:
5.25 ± 0.20 mm (0.207 ± 0.008 in.)

Choke Coil Heater

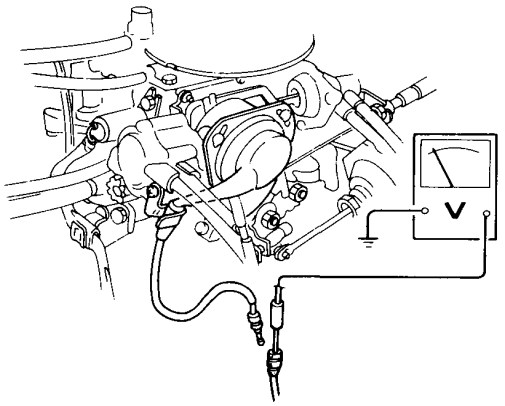
Test

COLD ENGINE

Start the engine and let it run. As the engine reaches normal operating temperature, the choke valve should fully open:

- If it does, go on to the fast idle unloader test on page 12-128.
- If it doesn't, inspect the linkage, and clean or repair it as necessary (page 12-123).
- If the choke still does not open all the way, disconnect the white/blue choke cover wire from the engine compartment wire harness and check for voltage.

There should be battery voltage with the engine running.



— If the voltmeter reads O volts, check for an open circuit in the white/blue wire between the choke cover connector and voltage regulator connector, then check the alternator (section 24).

Replacement

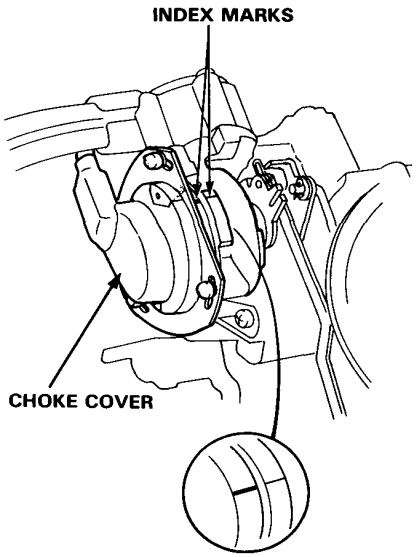
Removal:

1. Remove the air cleaner.
2. Using a 5/32"or 4.1 mm diameter drill, drill out the rivets and remove the choke cover.

   CAUTION: Cover the carburetor with a clean shop rag to prevent chips from falling into the carburetor throat.

Installation:

1. Reinstall the cover and adjust it so that index marks align, then secure it with rivets.
2. Reinstall the air cleaner.



Choke Opener

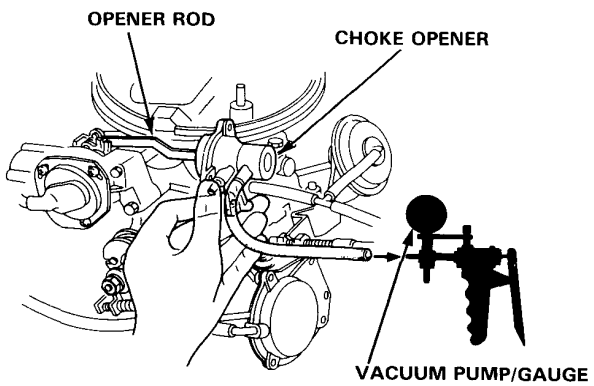
Test

COLD ENGINE

1. Disconnect the choke heater wire.
2. Open and close the throttle fully to let the choke close.
3. Start the engine.

   The choke valve should partially open.

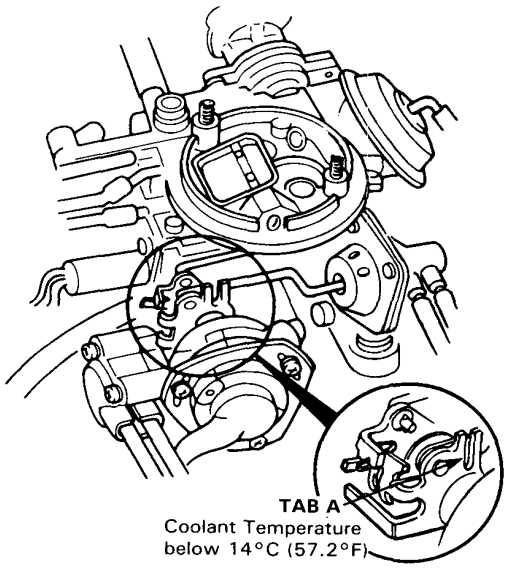
   - If the choke partially opens, go on to step 4 or step 5, depending on coolant temperature.
   - If the choke does not open partially, check the linkage for free movement, repair as necessary, and retest.
   - If the choke valve still does not open partially, check the choke opener diaphragm: Remove its two bolts, and attach a vacuum pump to the upper hose fitting. Block the lower fitting and the orifice in the opener while you apply enough vacuum to pull the opener rod all the way in, then stop.



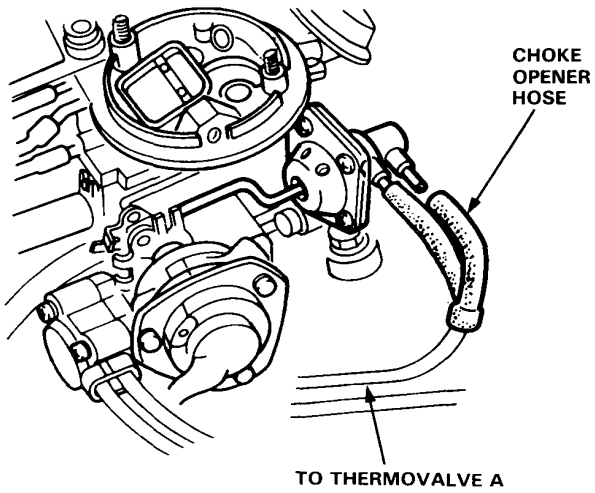
   — If the rod will not stay in, replace the opener.
   — If the rod stays in, check the vacuum port in the carburetor for blockage. If it is clean, go on to step 6.

   NOTE: After replacing or reinstalling the choke opener, retest it, then adjust it if necessary (page 12-124).

4. If coolant temperature is below about 14°C (57.2°F), Tab A on the choke opener lever should not be seated against the carburetor.

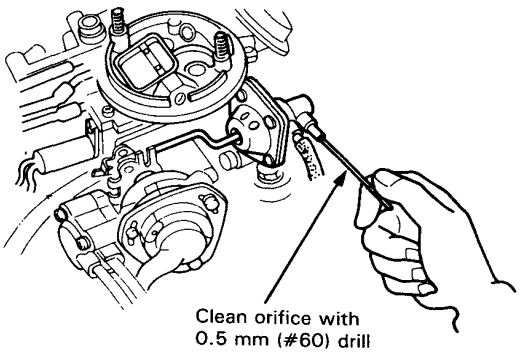


   - If Tab A is not seated, go on to step 5.
   - If Tab A is seated, disconnect the choke opener hose #18 from upper fitting.



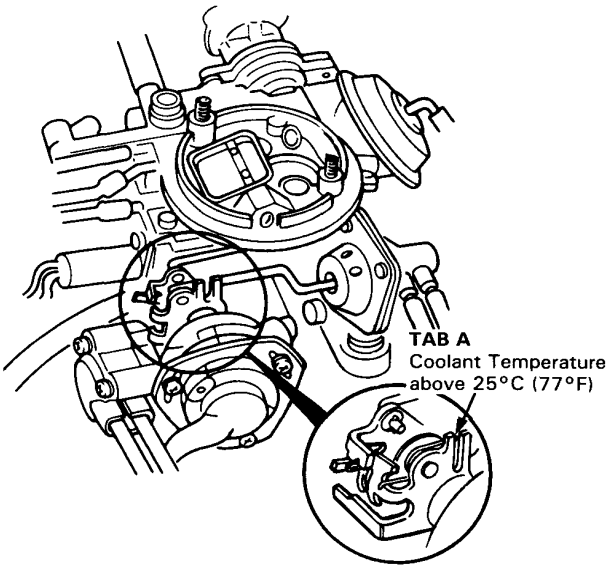
   — If Tab A comes off its seat, check #18 line thermovalve A for blockage and check that the thermovalve is open.

— If Tab A does not come off its seat, press down on the choke opener lever until it does; if it won't stay off, clean out the choke opener fitting with a 0.5 mm (#60) drill bit, then retest.



— If Tab A still does not come off its seat, replace the choke opener.

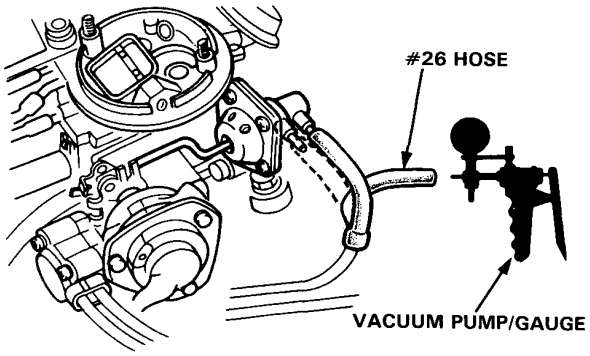
5. If coolant temperature is above about 25°C (77°F), Tab A on the choke opener lever should be seated against the carburetor.



- If Tab A is seated, reconnect the choke heater wires, then go on to the step 6.
- If Tab A is not seated, check line #18 for leaks and check that thermovalve A is closed.

6. Disconnect #26 vacuum hose from the choke opener and connect a vacuum pump to the hose, and apply vacuum.

   Vacuum should remain steady.



- If vacuum drops, go to output troubleshooting (page 12-166).

7. Turn the ignition switch to the START position.
   NOTE: Coolant temperature, must be below 40°C (104°F)

   Vacuum should not remain.

- If vacuum remains, go to output troubleshooting. (page 12-166).

Fast Idle Unloader

Test

COLD ENGINE

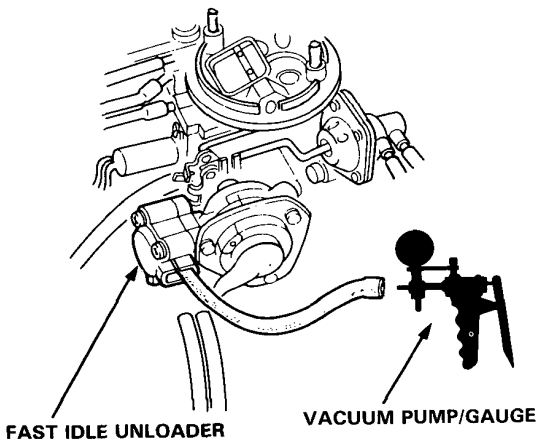
1. Disconnect the two hoses from the fast idle unloader.
2. Open and close the throttle fully to engage the fast idle cam.
3. Start the engine.

   The engine should run at fast idle.

   - If the engine runs at fast idle, go on to step 4.
   - If the engine does not run at fast idle, remove the choke cover (page 12-125) and check the operation of the fast idle cam.

4. Connect a vacuum pump to the inside fitting of the unloader and apply vacuum.

   The fast idle speed should drop



   - If idle speed drops, go on to right column for hot engine inspection.
   - If idle speed does not drop, check the unloader for leaks, blockage or damaged diaphragm. Remove the choke cover and check the unloader rod for free movement. Repair or replace as necessary.

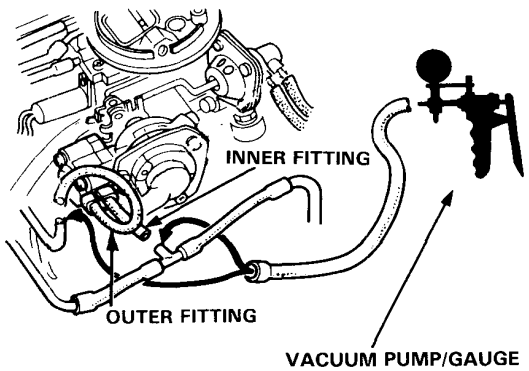
5. Reconnect the hoses.

HOT ENGINE

When the engine warms up, its speed should drop below 1,400 min^{-1} (rpm) as the unloader pulls the internal choke linkage off the fast idle cam.

- If fast idle drops below 1,400 min^{-1} (rpm), go on to the fast idle check on page 12-123.
- If fast idle does not drop below 1,400 rpm, disconnect the two unloader hoses, and check that vacuum is present.

— If vacuum is present, check the unloader for leaks or blockage. Remove the choke cover, and check the unloader rod for free movement.
Repair or replace parts as necessary, and retest.
— If there is no vacuum at the inner fitting, check for vacuum at the choke opener (page 12-126) and thermovalve A.
— If there is no vacuum at the outer fitting, check thermovalve A.
— Repair or replace as necessary.



Fuel Supply System

Symptom-to-Sub System Chart

NOTE: Across each row in the chart, the sub systems that could be sources of a symptom are ranked in the order they should be inspected, starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next system ②, etc.

PAGE / SYSTEM / SYMPTOM		FUEL FILTERS	FUEL PUMP	FUEL CUT-OFF RELAY	FUEL TANK	CONTAMI-NATED FUEL
		130	131	132	133	*
ENGINE WON'T START		③	①	②		
POOR PERFORMANCE	MISFIRE OR ROUGH RUNNING	②				①
	LOSS OF POWER	①				②

* Fuel with dirt, water or a high percentage of alcohol is considered contaminated.

Fuel Filters

Replacement

Replace both front and rear filters at every 2 years or 24,000 miles (40,000 km) whichever comes first.

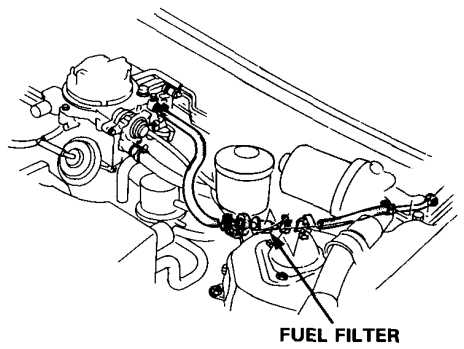
WARNING Do not smoke while working on the fuel system. Keep open flame away from work area.

Front

1. Use fuel line clamps to pinch off the fuel lines.
2. Disconnect the fuel lines and remove the fuel filter.

   CAUTION: When disconnecting the fuel lines, slide back the clamps then twist the lines as you pull, to avoid damaging them.

3. Install the new fuel filter.
4. Remove the fuel line clamps.

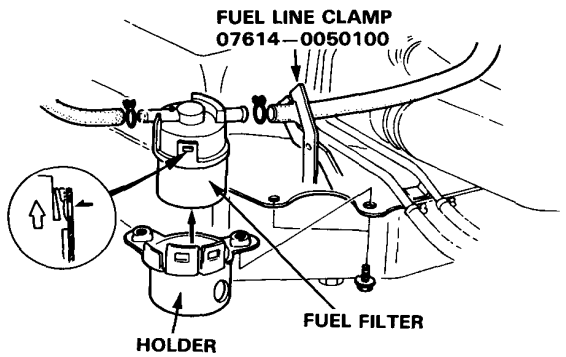


Rear

1. Block front wheels. Jack up the rear of the car and support with jackstands.
2. Push in the tab of the fuel filter to release the holder, then remove the filter from its bracket.
3. Attach fuel line clamps to the fuel lines and disconnect the lines from the filter.

   CAUTION: To avoid damaging the fuel lines when disconnecting, slide back the clamps then twist the lines as you pull.

4. Install in the reverse order of removal.

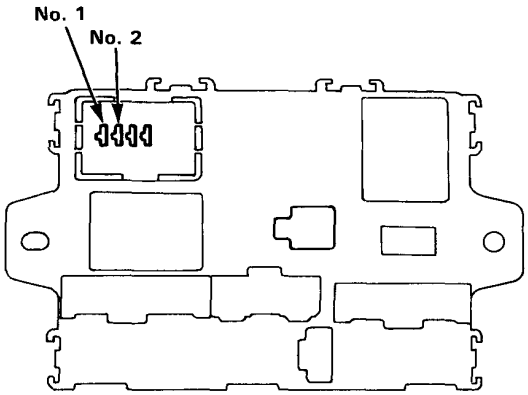


Test

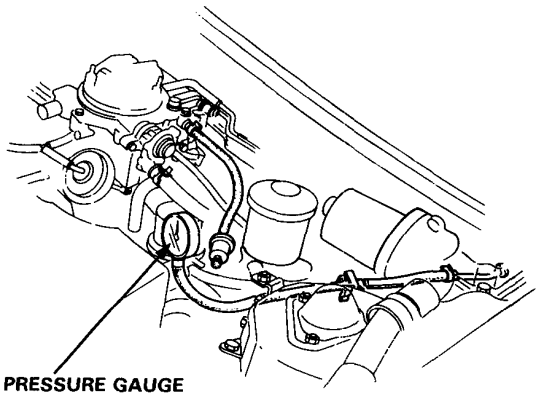
WARNING Do not smoke during the test. Keep any open flame away from your work area.

NOTE: Check for a clogged fuel filter and/or fuel line before checking fuel pump pressure.

1. Remove the fuel cut-off relay from the fuse box.
2. Connect the No.1 terminal to the No.2 terminal located at the fuse box side of the fuel cut-off relay.



3. Disconnect the fuel line at the fuel filter in the engine compartment, and connect a pressure gauge to it as shown.



4. Turn ignition ON until pressure stabilizes, then turn key off.

   Pressure should be 17.7—22.6 kPa (2.6—3.3 psi).

   - If gauge shows at least 17.7 kPa (2.6 psi) go on to step 5.
   - If gauge shows less than 17.7 kPa (2.6 psi), replace pump and retest.

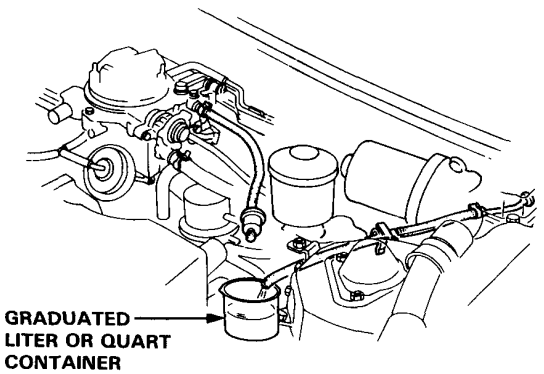
5. Remove pressure gauge and hold a graduated container under the hose.

6. Turn ignition ON for 60 seconds, then turn ignition OFF and measure amount of fuel flow.

   Fuel flow should be more than 760 cc (25.7 oz.) in 60 seconds.

   - If fuel flow is 760 cc (25.7 oz.), or more in 60 seconds, reconnect cut-off relay and fuel hose.
   - If fuel flow is less than 760 cc (25.7 oz.), replace the fuel pump and retest.

   NOTE: Check for a clogged fuel filter and/or fuel line before replacing pump.



Replacement

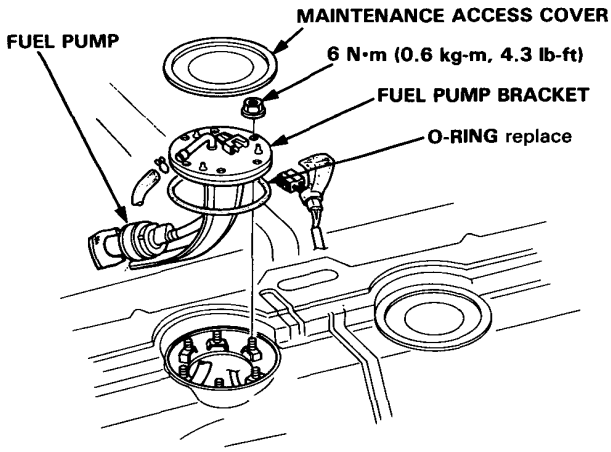
WARNING Do not smoke while working on fuel system. Keep open flames away from your work area.

1. Remove the left maintenance access cover in the luggage area.
2. Disconnect the fuel lines and coupler.
3. Remove the fuel pump mounting bolts.
4. Remove the fuel pump from the fuel tank.

   NOTE: If it is hard to remove, slide the fuel tank down by loosening the fuel tank mounting nuts.

5. Install the fuel pump in the reverse order of removal.

   NOTE: When installing the access cover, make sure the seal is in place.



Fuel Cut-off Relay

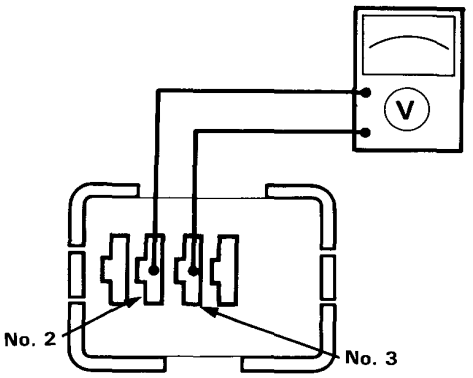
Test

1. With the ignition switch off, remove the dashboard under cover, and pull down the fuse box/relay panel.
2. Remove the fuel cut-off relay.
3. Check for continuity between the No.3 terminal and body ground.

   Continuity should exist.

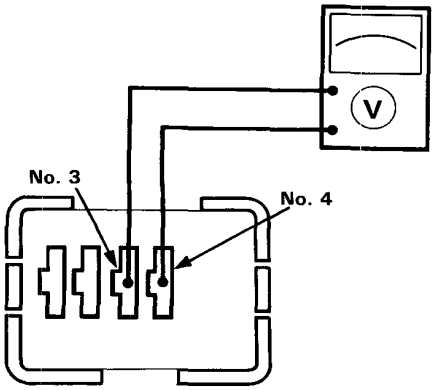
   - If there is no continuity, check the Black wire.
4. Attach the positive probe of the voltmeter to the No.2 terminal and the negative probe to the No.3 terminal. Then turn the ignition switch ON.

   Battery voltage should be available.

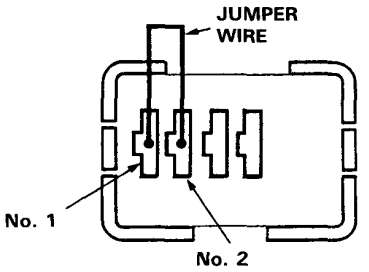


   - If there is no voltage, check the Black/Yellow wire from the ignition switch and fuel cut-off relay as well as No.1 fuse (15 A).
5. Turn the ignition switch OFF.
   Attach the positive probe of the voltmeter to the No.4 terminal and the negative probe to the No.3 terminal.
   Then turn the ignition switch ON.

   Battery voltage should be available.



   - If there is no voltage, check the Blue wire from the ignition coil and fuel cut-off relay.
6. Turn the ignition switch OFF.
   Connect a jumper wire between the No.1 terminal and the No.2 terminal.



7. Turn the ignition switch ON.

   The fuel pump should run.

   - If the fuel pump does not run, check the Yellow wire between the fuel pump and fuel cut-off relay, and check the Black wire from the fuel pump to ground.

If the wires are OK, replace the fuel cut-off relay and retest.

Fuel Tank

Replacement

WARNING **Do not smoke while working on fuel system. Keep open flame away from area.**

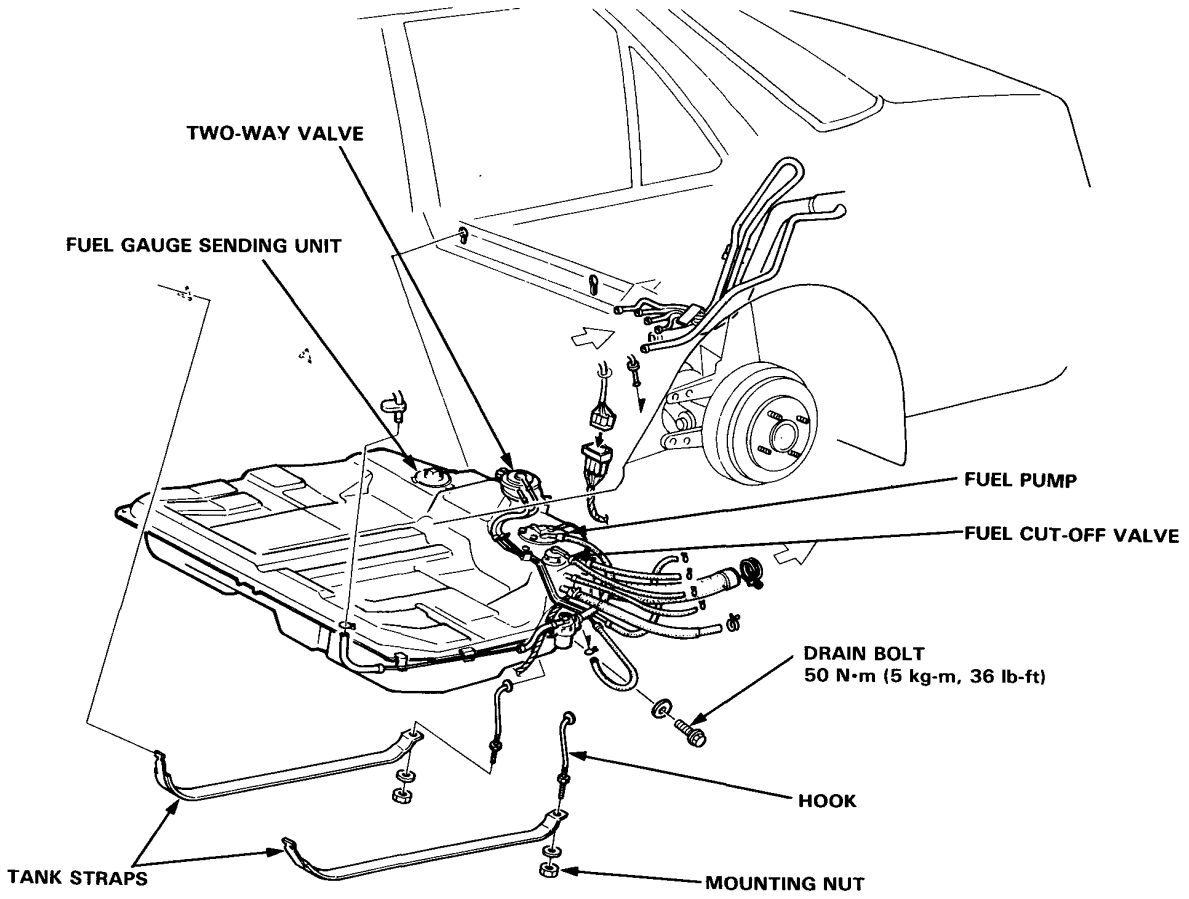
1. Block front wheels. Jack up the rear of the car and support with jackstands.
2. Remove the drain bolt and drain the fuel into an approved container.
3. Disconnect the fuel gauge sending unit connectors.
4. Disconnect the hoses.

   CAUTION: When disconnecting the hoses, slide back the clamps, then twist hoses as you pull, to avoid damaging them.

5. Place a jack, or other support, under the tank.
6. Remove the strap nuts and let the straps fall free.
7. Remove the fuel tank.

   NOTE: The tank may stick on the undercoat applied to its mount. To remove, carefully pry it off the mount.

8. Install a new washer on the drain bolt, then install parts in the reverse order of removal.



Air Intake System

Symptom-to-Sub System Chart

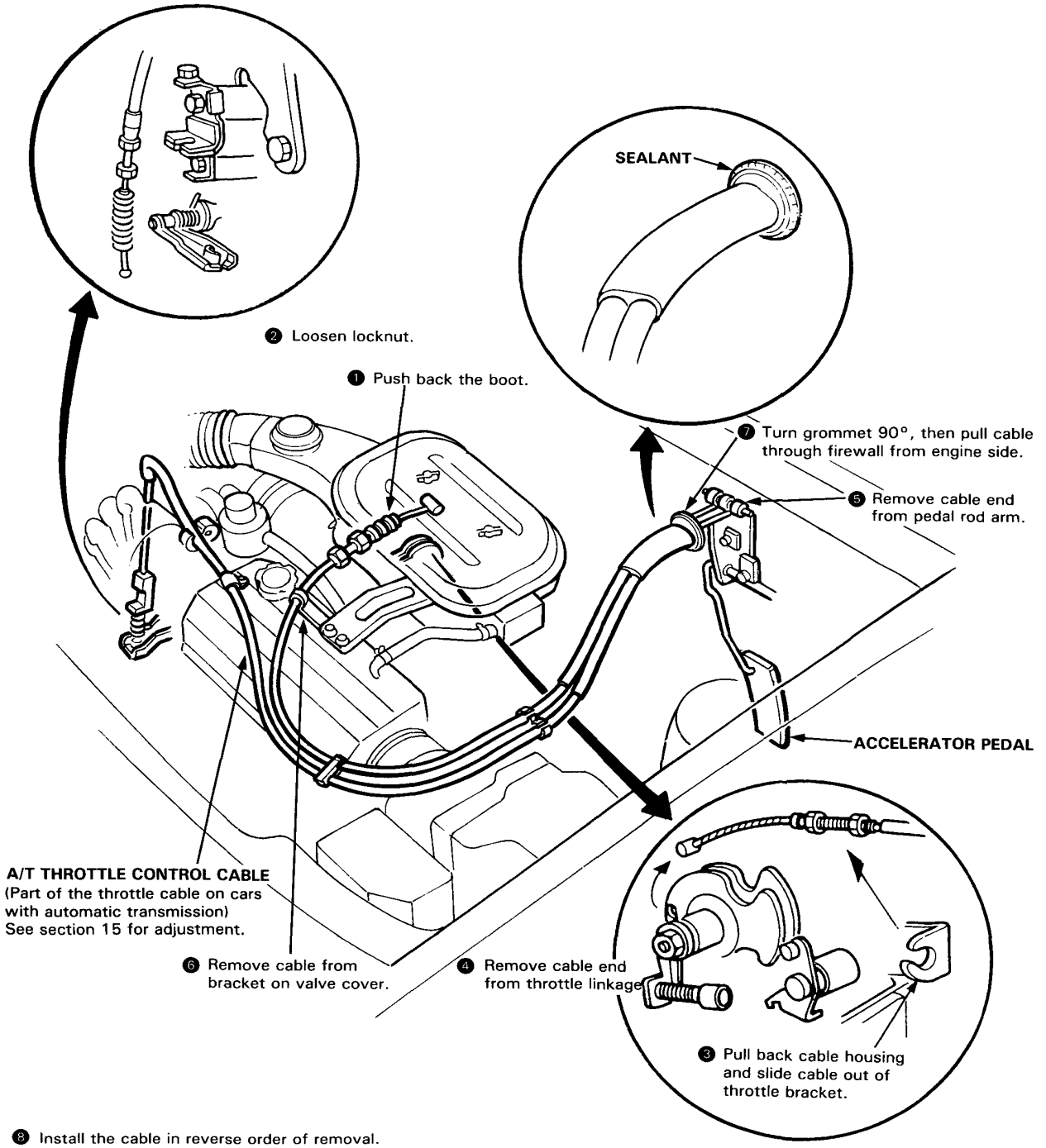
NOTE: Across each row in the chart, the sub systems that could be sources of a symptom are ranked in the order they should be inspected, starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next system ②, etc.

PAGE / SYSTEM / SYMPTOM	THROTTLE CABLE	AIR INTAKE CONTROL
	135	137
LOSS OF POWER		①
AFTERBURN		①
FAILS EMISSION TEST		①

Throttle Cable

Replacement

NOTE: Detach parts in the numbered sequence shown.

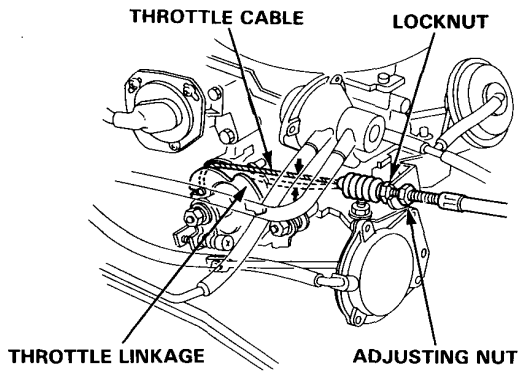


❽ Install the cable in reverse order of removal.
Apply sealant to grommet mating surface, when installing cable.

Throttle Cable

Inspection/Adjustment

1. Warm up the engine to normal operating temperature (the cooling fan comes on).
2. Check that throttle cable operates smoothly with no binding or sticking. Repair as necessary.
3. Start the engine and check cable free-play at throttle linkage at idle. Cable deflection should be 4—10 mm (3/16—3/8 in.).

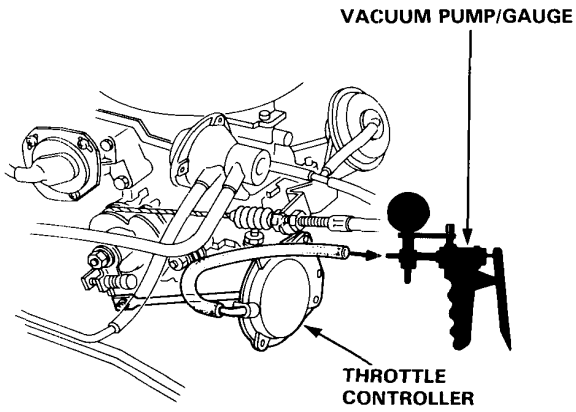


4. If deflection is not within specs, loosen locknut and turn adjusting nut until you can deflect cable as specified. Then tighten locknut.
5. With cable properly adjusted, check throttle valve to be sure it opens fully when you push accelerator pedal to the floor.

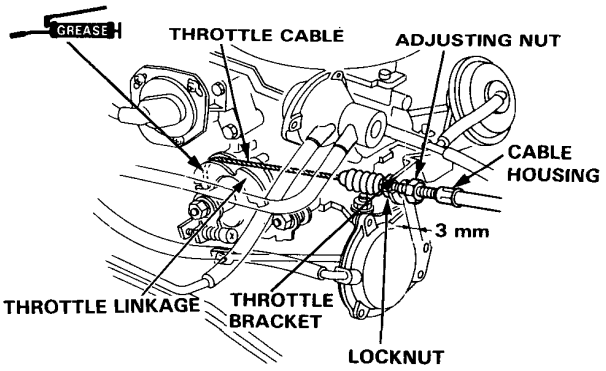
   CAUTION: Check throttle valve to be sure it returns to idle position whenever you release accelerator.

Installation

1. Disconnect the hose from the throttle controller and connect a vacuum pump to the controller, then apply vacuum.



2. Fully open the throttle and choke valves, then close the throttle valve. Now, release the choke valve; the throttle linkage will be off the fast idle cam.
3. Install the throttle cable in the throttle linkage.

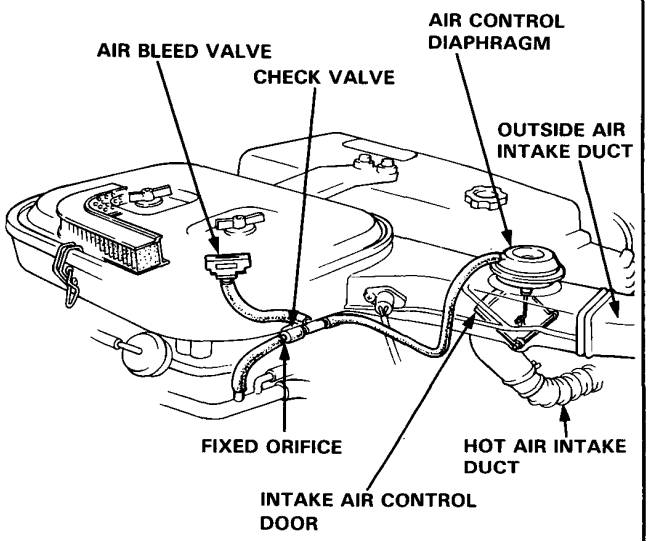


4. Turn the adjusting nut until it is 3 mm (1/8 in.) away from the cable bracket.
   Tighten the locknut.
5. Disconnect the vacuum pump and reconnect the throttle controller hose.
6. On models with automatic transmission, adjust the throttle control cable. See section 15.

Test

COLD ENGINE

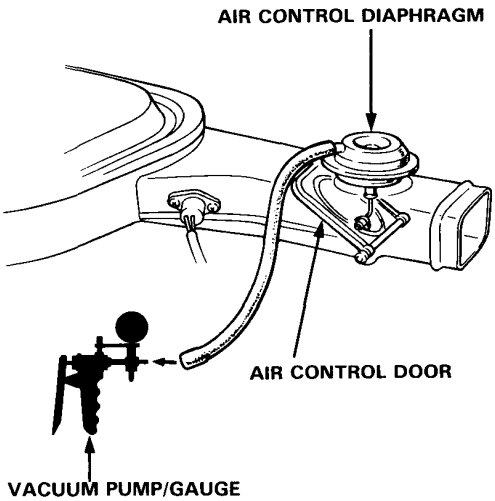
1. Disconnect the air intake duct.
2. With the engine cold, start the engine and let it run for about 5 seconds and stop. The air control door should rise on start-up and remain fully open for at least 3 seconds after stopping the engine.



- If the door rises, the intake air control is OK, reconnect the air intake duct. If performing the inspection on intake air controls only, go on to page 12-138 for hot engine inspection.
- If the door does not rise, check to see if the door is binding. If the door is not binding but fails to rise, or it rises but fails to stay up for 3 seconds after the cold cranking test, go to step 3.

3. Disconnct and plug the hose leading to the air bleed valve.
4. Crank the engine for approximately 5 seconds.
   - If the air control door does not rise or stay open for at least 3 seconds, proceed to step 5.
   - If the door rises and stays up for at least 3 seconds, replace the air bleed valve and retest (step 2).
5. Disconnect the vacuum hose from the air control diaphragm, connect a vacuum pump to the diaphragm inlet pipe and apply vacuum.

   The air control door should rise and stay up.



- If the door stays up, replace the check valve and retest.
- If the door does not rise or stay up, replace the air control diaphragm and retest.

6. Reconnect the air intake duct.

(cont'd)

Intake Air Control System

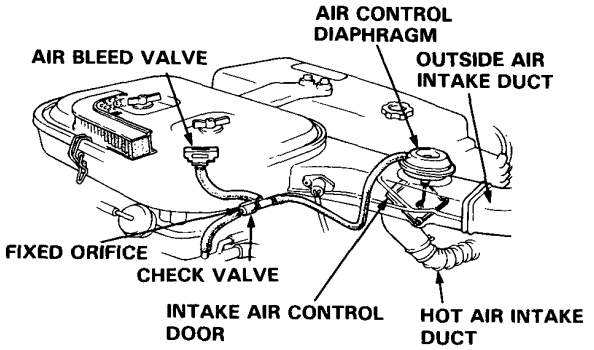
Test (cont'd)

HOT ENGINE

NOTE: As the outside air temperature drops, the bimetal spring in the bleed valve closes, causing the air control door to rise and allowing pre-heated air into the air cleaner; consistent intake air temperature (approximately 100°F) is maintained in this way.

1. With the engine running and the cooling fan on, disconnect the air intake duct from the air cleaner case and immediately check the control door position.

   The air control door should be down.



   - If the control door has dropped down to fully close the hot air intake duct: stop the engine and reconnect the air intake duct. Test is complete.
   - If the control door has not dropped to the fully closed position, go on to step 2.

2. Disconnect the vacuum hose from the air control diaphragm.
   - If the control door now closes, replace the air bleed valve and retest.
   - If the control door does not close, correct whatever is causing the door to bind, and/or replace the air control diaphragm. Retest.

3. Stop the engine and reconnect the air intake duct. Test is complete.

Symptom-to-Sub System Chart

NOTE: Across each row in the chart, the sub sytems that could be sources of a symptom are ranked in the order they should be inspected, starting with ① Find the system in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next system ②, etc.

PAGE / SYSTEM / SYMPTOM		FEEDBACK CONTROL SYSTEM	CATALYTIC CONVERTER	AIR INJECTION SYSTEM	MIXTURE CONTROL SYSTEM	EGR SYSTEM	POSITIVE CRANKCASE VENTILATION SYSTEM	EVAPORATIVE EMISSION CONTROLS
		140	143	144	145	147	149	151
DIFFICULT TO START ENGINE WHEN COLD					①	②		③
WHEN COLD FAST IDEL OUT OF SPECIFICATION						①		
POOR PERFORMANCE	LOSS OF POWER					②		①
	AFTERBURN				①			
	HESITATION/ SURGE					①		
	FAILS EMISSION TEST	①	③	②				
	SULFUR SMELL	①	②	①				

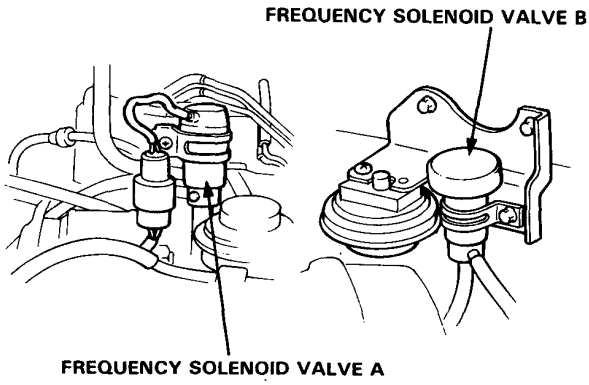
Test

HOT ENGINE

1. Disconnect #14 hose from the power valve and install a plug in the hose.
2. Start the engine and check that the frequency solenoid valves A and B are operating while running the engine at approx. 2,500 min^{-1} (rpm).

   The frequency solenoid valves should go on and off continuously (a continuous clicking noise should be heard).

   NOTE: It may be easier to determine if the valves are working by placing your hand on each valve individually.



   - If both solenoid valves operate properly, go on to step 3.
   - If either solenoid valve A or B does not operate properly, replace it and retest.
   - If both solenoid valves do not operate properly, go to output troubleshooting (page 12-168 and 170).

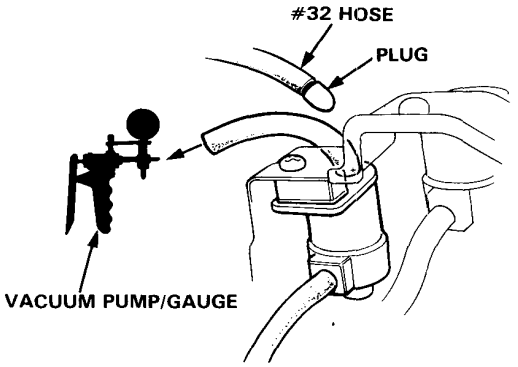
3. Connect #14 hose to the power valve.
   With the air conditioner off, if so equipped, check that frequency solenoid valves A and B are not operating while idling the engine.

   The solenoid valves should not operate.

   - If the solenoid valves operate, go to input troubleshooting (page 12-184).

Feedback Control Solenoid Valve

1. Disconnect #32 hose from feedback control solenoid valve and plug the end of the hose.
2. Connect a vacuum pump/gauge as shown.



3. Start the engine and apply vacuum to the valve.

   It should not hold vacuum.

   - If it does not hold vacuum, go on to step 4.
   - If it holds vacuum, go to output troubleshooting (page 12-172).

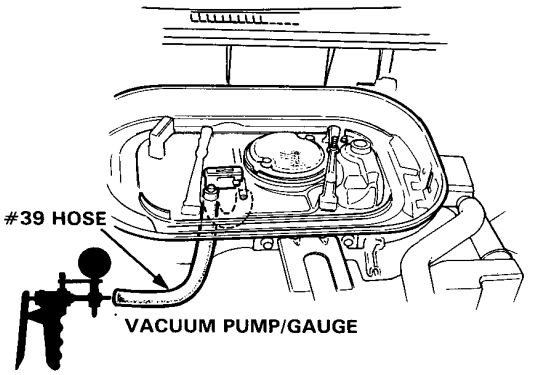
4. Raise speed to 2,500 min^{-1} (rpm) and apply vacuum to the valve.

   It should hold vacuum.

   - If it does not hold vacuum, go to output troubleshooting (page 12-172).

Air Bleed Valve B

1. Disconnect #39 hose from the vacuum hose manifold and connect a vacuum pump to the hose.



2. Apply vacuum to the hose.

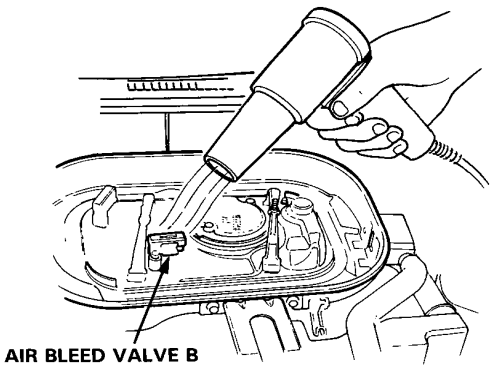
   It should hold vacuum.

   - If it does not hold vacuum, replace the air bleed valve B and retest.

3. Warm the air bleed valve B with a dryer and apply vacuum to the hose.

   It should not hold vacuum.

   NOTE: Air bleed valve B opens at 65°C (149°F)



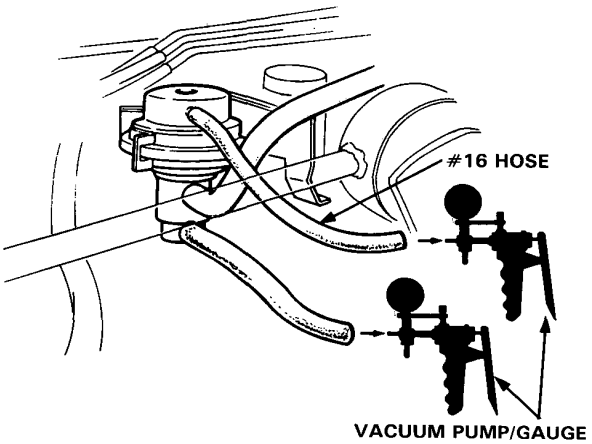
   - If it holds vacuum, replace the air bleed valve B and retest.

Air Control Valve A

1. Disconnect #16 hose from air control valve A and connect a vacuum pump to the hose.

2. Disconnect the lower hose from air control valve A, connect a vacuum pump to the hose.
   Apply vacuum to the valve.

   It should have a restricted leak.



3. Now apply vacuum with the vacuum pump attached to #16 hose.

   The lower hose should not hold vacuum at all (unrestricted leak).

If the valve fails either check, replace it.

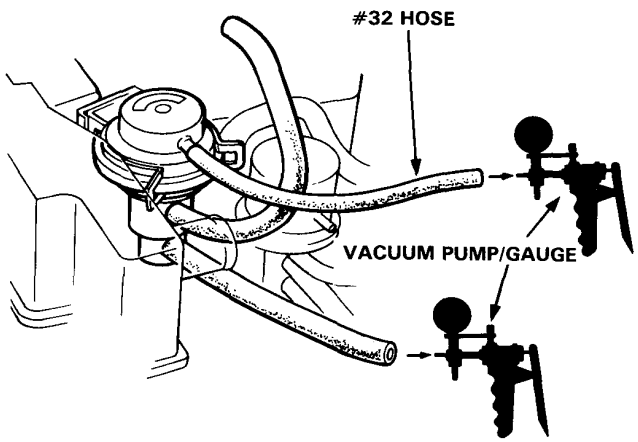
(cont'd)

Test (cont'd)

Air Control Valve B

1. Disconnect #32 hose from air control valve B and connect a vacuum pump to the hose.
2. Disconnect the lower hose from air control valve B, connect a vacuum pump to the hose. Apply vacuum to the valve.

   It should hold vacuum.



3. Now apply vacuum with the vacuum pump attached to #32 hose.

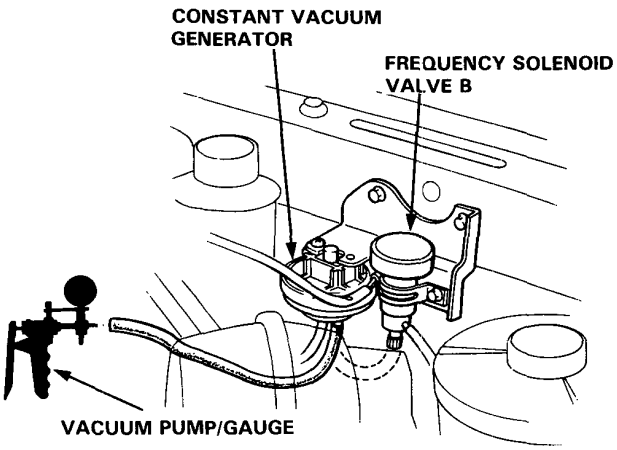
   Vacuum should now release at the lower hose.

If the valve fails either check, replace it.

Constant Vacuum Generator

1. Disconnect #33 hose from frequency solenoid valve B and connect a vacuum gauge to the hose.
2. Start the engine, allow it to idle, then check for vacuum.

   Vacuum should stabilize at;
   180—280 mmHg 7.1—11.0 in. Hg

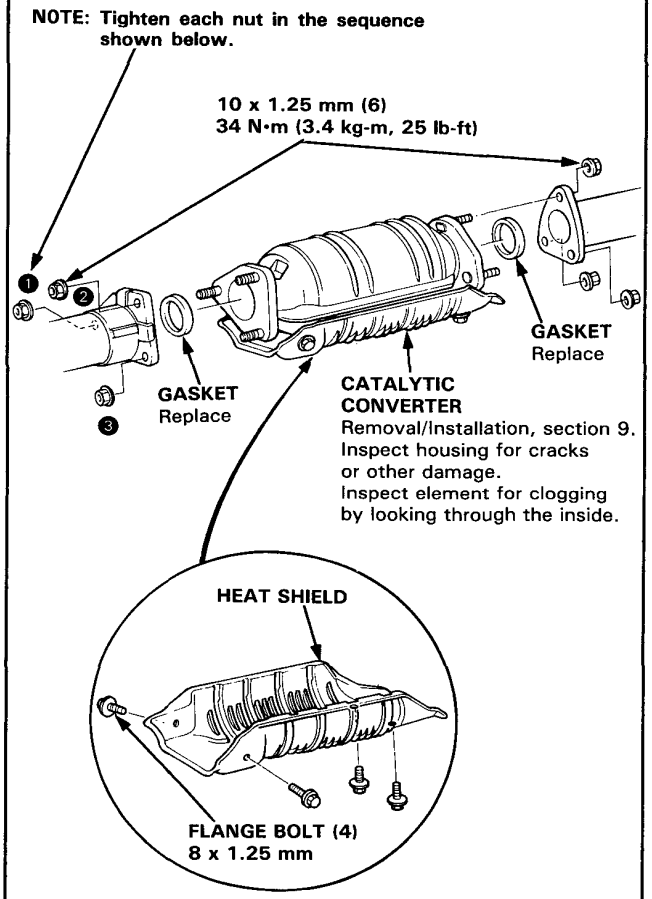


- If the vacuum stabilizes within the specified vacuum, the constant vacuum generator is OK. Reconnect the hose to frequency solenoid valve B.
- If the vacuum does not stabilize, or stabilizes outside the specified vacuum range, replace the constant vacuum generator.

Catalytic Converter

Inspection

If excessive exhaust system back-pressure is suspected, remove the catalytic converter from the car and make a visual check for plugging, melting or cracking of the catalyst. Replace the catalytic converter if more than 50% of the visible area is damaged or plugged.



Tailpipe Emissions

Inspection

NOTE: It is not possible to use a CO meter to adjust the idle mixture; the effect of the catalytic converter prevents accurate tracking of such small changes in air-fuel ratio.

WARNING Do not smoke during this procedure. Keep any open flame away from your work area.

1. Follow steps the propane enrichment method.
2. Warm up and calibrate the CO meter according to the meter manufacturer's instructions.
3. Check idle CO with the headlights, heater blower, rear window defroster, cooling fan, and air conditioner off.

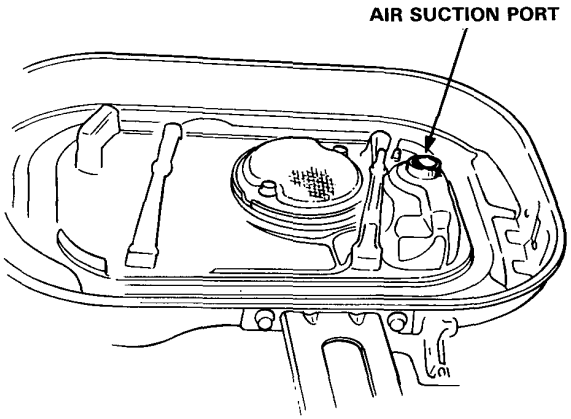
   CO meter should indicate 0.1% maximum.

Air Injection System

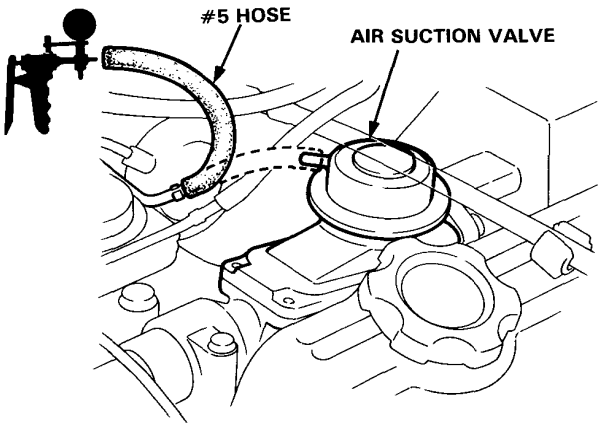
Test

HOT ENGINE

1. Remove the air cleaner cover and filter.
2. Start the engine and check for air suction noise (bubbling noise) from the air suction port at idle. Bubbling noise should be heard.



- If bubbling noise is not heard, disconnect #5 hose from the air suction valve and check for vacuum.



— If there is vacuum, replace the air suction valve and retest.

— If there is no vacuum, reconnect #5 hose and go to output troubleshooting (page 12-174).

4. Raise the engine speed above 2,000 min^{-1} (rpm).

There should be no bubbling noise.

- If a bubbling noise is heard, disconnect #5 hose from the air suction valve and check for vacuum.

— If there is vacuum, go to output troubleshooting (page 12-174).

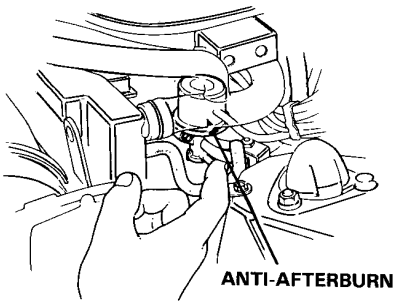
— If there is no vacuum, replace the air suction valve and retest.

Test

COLD ENGINE

1. Disconnect the air suction lower hose at the anti-afterburn valve.
2. Check for vacuum at idle.

   There should be no vacuum.



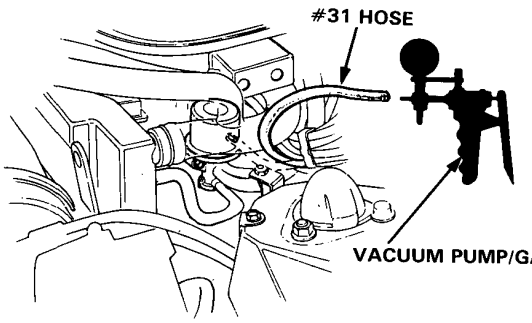
   - If there is vacuum, replace the anti-afterburn valve and retest.

3. Quickly raise engine speed to 3,500 min^{-1} (rpm) and close the throttle suddenly.

   There should be no vacuum.

   - If there is vacuum, disconnect #31 vacuum hose at the anti-afterburn valve and check for vacuum at #31 hose.

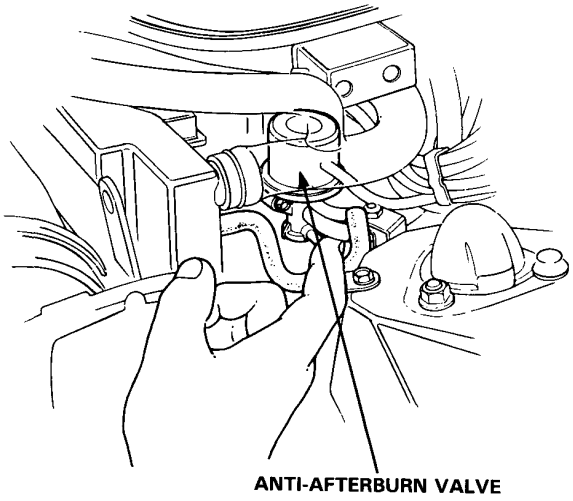
     There should be no vacuum.



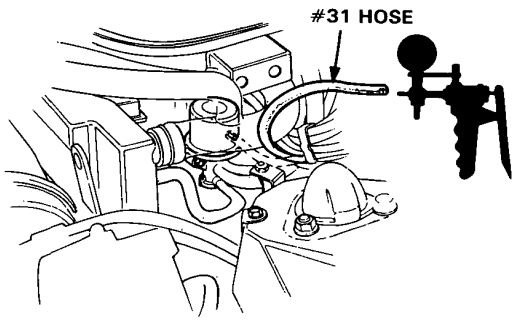
   — If there is no vacuum, replace the anti-afterburn valve and retest.
   — If there is vacuum, go to output troubleshooting (page 12-176).

4. Block rear wheels and set the parking brake. Jack up the front of the car and support with safety stands.
5. Place the shift or selector lever in second or 2 position and accelerate, then suddenly release the throttle and check for vacuum during deceleration above 15 mph.

   There should be vacuum.



   - If there is vacuum, go on to page 12-146 for hot engine inspection.
   - If no vacuum, disconnect #31 vacuum hose at the anti-afterburn valve and check for vacuum at #31 hose above 15 mph.



   — If there is no vacuum, replace the anti-afterburn valve and retest.
   — If there is vacuum, go to output troubleshooting (page 12-176).

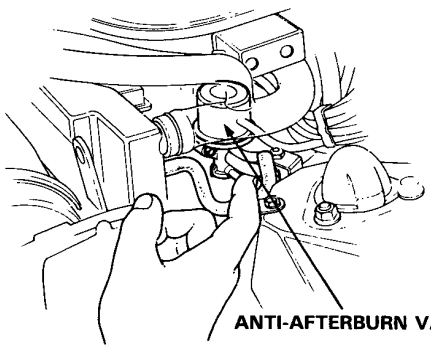
(cont'd)

Test (cont'd)

HOT ENGINE

1. Disconnect the air suction lower hose at the anti-afterburn valve.
2. Start the engine and quickly raise engine speed to 3,500 min^{-1} (rpm) and close the throttle suddenly.

   There should be vacuum.



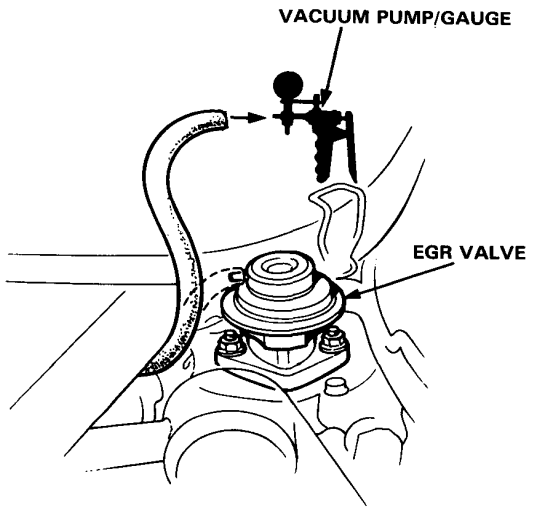
- If no vacuum, go to output troubleshooting (page 12-176).

Test

COLD ENGINE

NOTE: The engine coolant temperature must be below the thermovalve A set temperature (55°C, 131°F).

1. Disconnect the vacuum hose from the EGR valve and connect a vacuum gauge to the hose.



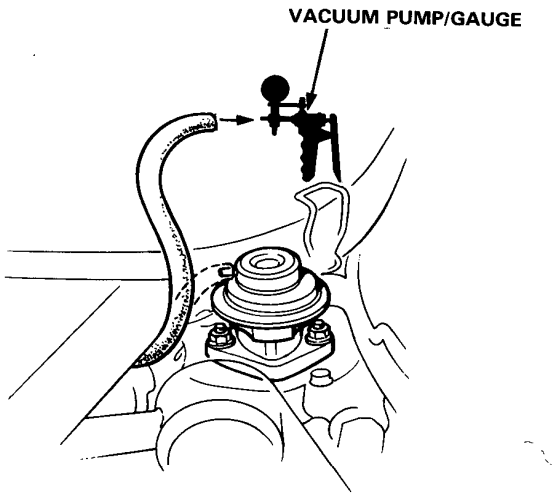
2. Start the engine and raise the engine speed to 3,000 min^{-1} (rpm).

   Vacuum should not be available.

   - If vacuum is not available, go on to the hot engine inspection (right column).
   - If vacuum is available, replace thermovalve A and retest.

HOT ENGINE

1. Disconnect the vacuum hose from the EGR valve and connect a vacuum gauge to the hose.



2. Start the engine and wait for the cooling fan to come on.

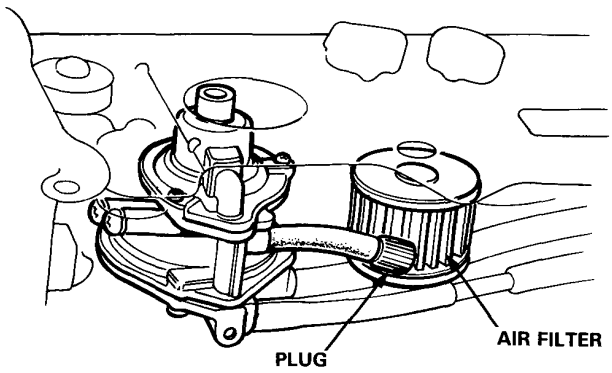
3. Remove the control box from the firewall by removing the two bolts, then remove the control box cover by removing the four screws.

   Vacuum should be as shown below:

	Condition	Vacuum at EGR hose
1	Idle	No
2	3,000 min^{-1} (rpm)	Yes, 2—6'' Hg
3	3,000 min^{-1} (rpm) with blocked vacuum bleed (shown next column)	Less than 2'' Hg
4	Rapid acceleration	Yes, 2—6'' Hg
5	Deceleration	No

(cont'd)

Test (cont'd)



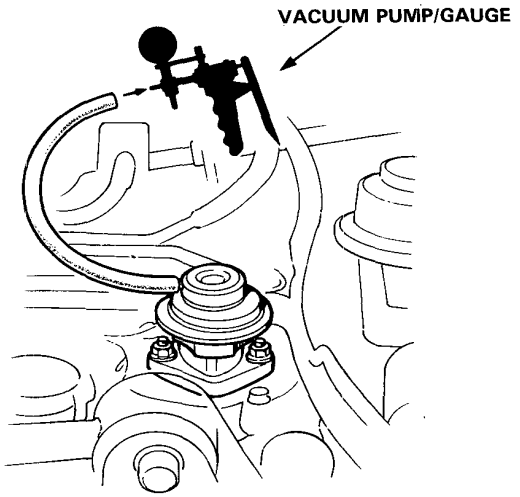
- If vacuum is available at idle (condition 1) check the vacuum hoses for proper routing and connections, then check for correct idle speed and idle mixture, and make adjustment as necessary.

- If there is no vacuum in conditions 2 and 4, check the thermovalve A.
  Disconnect the #18 vacuum hose from the thermovalve A. Check for vacuum at the #18 hose.
  — If there is no vacuum, check the routing for the #18 vacuum hose and repair or replace as necessary.
  — If there is vacuum, replace the thermovalve A and retest.

- If vacuum is more than 2'' Hg in condition 3, replace the EGR control valve and check the vacuum hoses for proper routing and connections.

EGR Valve

1. Start engine and allow to idle.
2. Disconnect vacuum hose from EGR Valve and connect a vacuum pump to EGR Valve.



3. Apply 150 mm Hg (6 in. Hg) vacuum to EGR Valve. Vacuum should remain steady and engine should die.

   - If vacuum remains steady and engine dies, EGR valve is working properly. Remove the vacuum pump and reconnect EGR vacuum hose; test is complete.

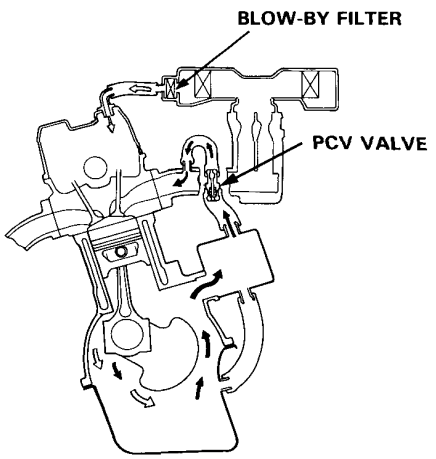
   - If vacuum does not remain steady and engine does not die, replace EGR valve and retest.

   - If vacuum remains steady but engine does not die: Remove EGR valve; check EGR valve and manifold for blockage, clean or replace as necessary and retest.

Test

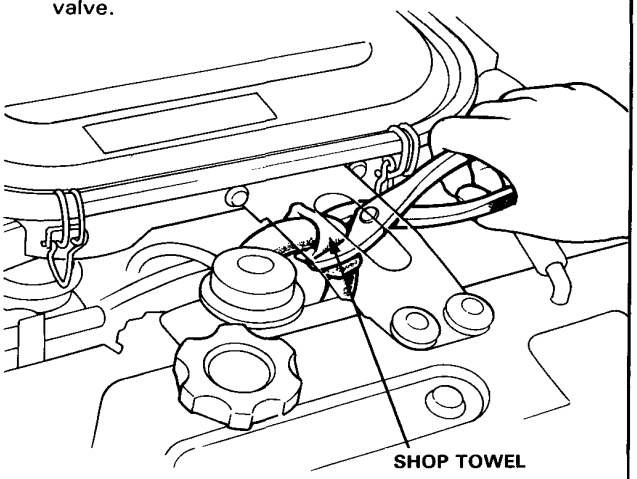
PCV Valve

1. Check the crankcase ventilation hoses and connections for leaks, cracks or clogging.



2. Start the engine and allow it to idle.
3. Lightly pinch the breather hose between the PCV valve and intake manifold, with your fingers or pliers.

   There should be a clicking sound from the PCV valve.



- If no sound is heard, replace the PCV valve and retest.

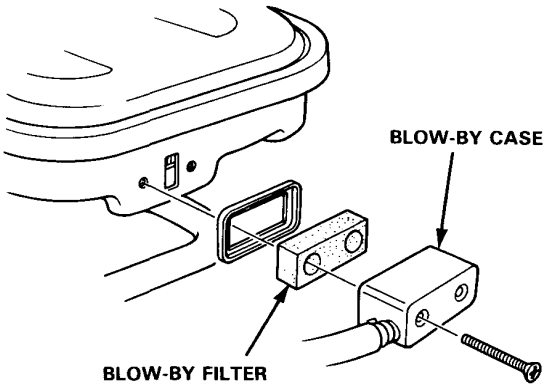
Blow-by Filter

Inspect the condition of the blow-by filter.

- Replace the filter in the following instances:

  — When the filter is stuck fast and oil is dripping or seeping through.

  — When the filter is covered with dust and dirt so that clogging is evident.

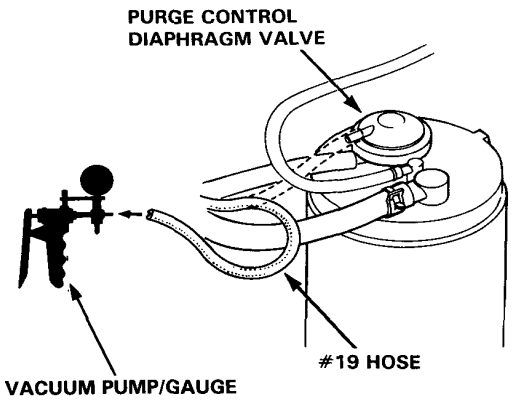


Test

COLD ENGINE

NOTE: Engine coolant temperature must be below thermovalve A set temperature (55°C, 131°F).

1. Disconnect the #19 vacuum hose at purge control diaphragm valve and connect vacuum pump/gauge to the hose.



2. Start the engine and allow to idle.

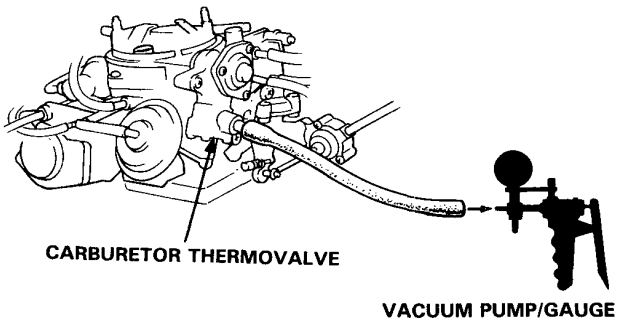
   Vacuum should not be available.

   - If there is no vacuum, disconnect the vacuum gauge and reconnect hose.
   - If there is vacuum, replace thermovalve A and re-test.

Carburetor Thermovalve

NOTE: Carburetor temperature must be below the carburetor thermovalve set temperature (30°C, 86°F).

1. Disconnect the hose at the carburetor thermovalve and connect a vacuum pump to the thermovalve.

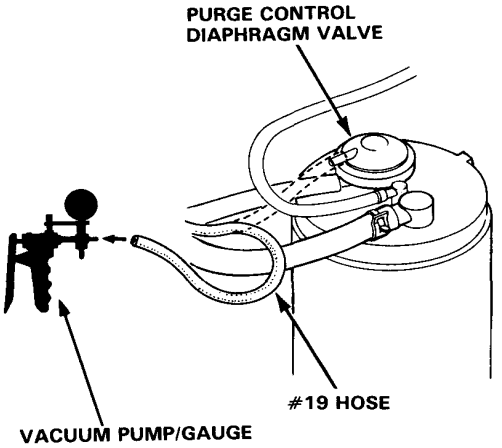


2. Apply 200 mmHg (7.8 inHg) vacuum to the thermovalve. Vacuum should remain steady.

   - If vacuum remains steady, the carburetor thermovalve is working properly. Remove the vacuum pump and reconnect the hose; test is complete.
   - If vacuum does not remain steady, replace the carburetor thermovalve and re-test.

HOT ENGINE

1. Disconnect the #19 vacuum hose at the purge control diaphragm valve and connect a vacuum pump/gauge to the hose.



2. Wait for the engine to warm up.

   There should be vacuum at idle, once engine is warm.

   - If vacuum is available, go on to step 3.
   - If no vacuum, disconnect #18 vacuum hose at the thermovalve A and check for vacuum at the #18 hose.

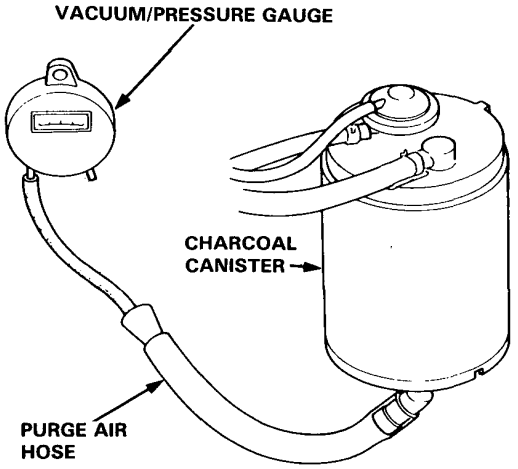
   — If there is no vacuum, check the routing for the #18 vacuum hose and repair or replace as necessary.

   — If there is vacuum, replace the thermovalve A and retest.

3. Disconnect the vacuum pump/gauge and reconnect hose.

4. Remove fuel filler cap.

5. Remove the canister purge air hose from frame and connect hose to a vacuum gauge as shown.



6. Raise engine speed to 3,500 min^{-1} (rpm).

   Vacuum should appear on the gauge within 1 minute.

   - If vacuum appears on the gauge in 1 minute, remove the gauge and go on to step 8.
   - If no vacuum, disconnect the vacuum gauge and reinstall the fuel filler cap.

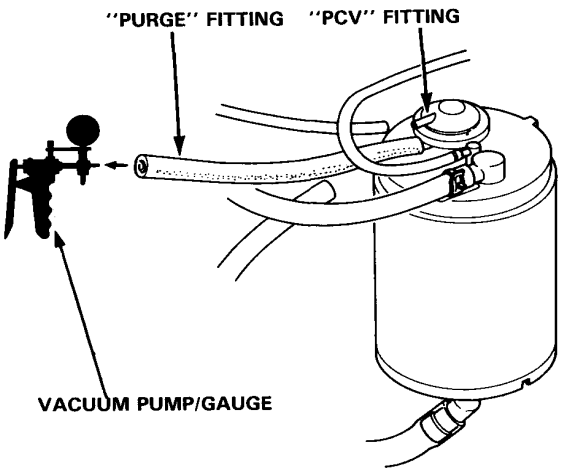
7. Remove the charcoal canister and check for signs of damage.
   If damaged, replace the canister.
   If OK, go on to step 8.

(cont'd)

Test (cont'd)

8. Stop the engine. Disconnect the hose from the canister PCV fitting.
   Connect a vacuum pump to the canister PURGE fitting as shown, and apply vacuum.

   Vacuum should remain steady.



- If vacuum remains steady, go on to step 7.
- If vacuum drops, replace the canister and retest.

9. Restart the engine. Reconnect the hose to the canister PCV fitting.

   PURGE side vacuum should drop to zero.

- If PURGE side vacuum does not drop to zero, replace the canister and retest.
- If PURGE side vacuum drops to zero, connect a vacuum pump to canister the PCV fitting, and apply vacuum.

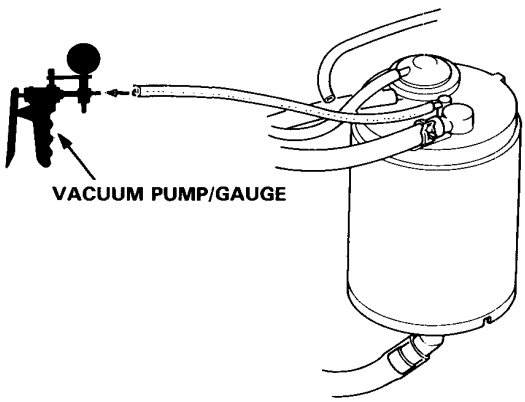
  Vacuum should remain steady.

  — If vacuum remains steady, disconnect the vacuum pump. Recheck thermovalve A operation on the previous page.

  — If vacuum drops, replace the canister and retest.

10. Connect a vacuum pump to TANK fitting as shown, and apply vacuum.

    There should not be any vacuum.

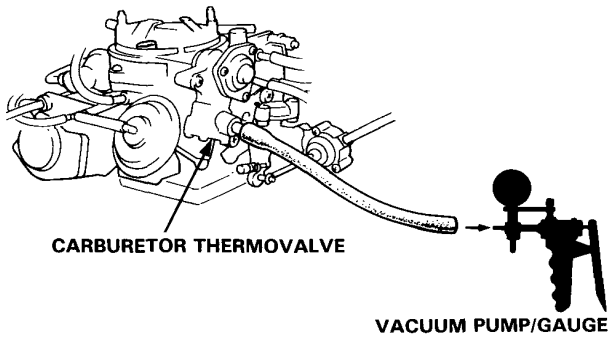


- If no vacuum, reinstall fuel filler cap and canister; test is complete.
- If there is vacuum, replace canister and retest.

Carburetor Thermovalve

NOTE: Carburetor temperature must be above the carburetor thermovalve set temperature (40°C, 104°F).

1. Disconnect the hose at the carburetor thermovalve and connect a vacuum pump to the thermovalve.



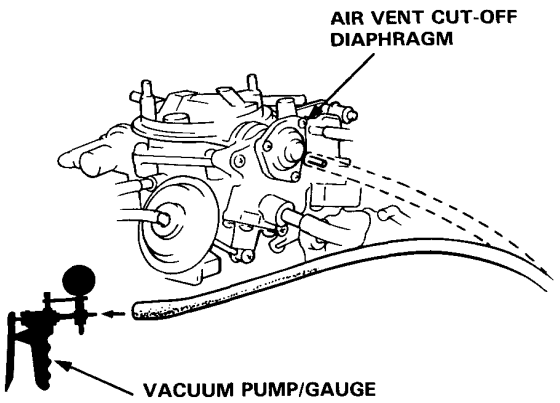
2. Apply vacuum to the thermovalve.

   The valve should not hold vacuum.

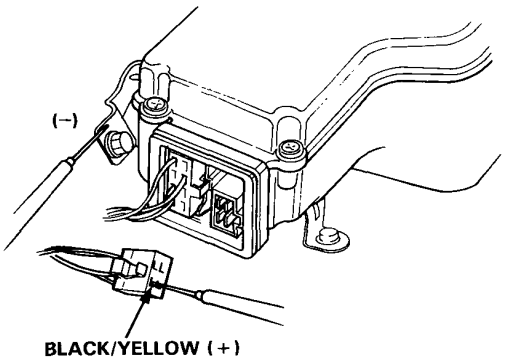
   - If vacuum does not hold, the thermovalve is OK. Reconnect the hose to the valve.
   - If vacuum is held, replace the thermovalve and retest.

Air Vent Cut-Off Diaphragm

1. Disconnect the hose at the air vent cut-off diaphragm and install a vacuum pump to the hose.



2. Apply vacuum. Vacuum should not be hold.
3. Turn ignition switch on.
4. Apply vacuum. Vacuum should remain steady.
   - If vacuum holds go on to step 5.
   - If vacuum does not hold, check for leaks in hose connections. If vacuum is still does not hold, check for voltage at vacuum holding solenoid valve.



   — If there is voltage, replace vacuum holding solenoid valve and retest.

   — If no voltage, check the wiring (Black/Yellow).

(cont'd)

Test (cont'd)

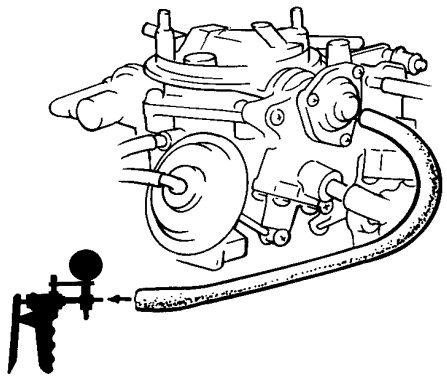
5. Start engine allow to idle and check for vacuum. Vacuum should be available.

   — If vacuum is available, go to step 6.

   — If vacuum is not available, check for blockage in hose. If vacuum is still not available, replace vacuum holding solenoid valve and retest.

6. Turn ignition off. Vacuum should drop to zero.

7. Disconnect the vacuum pump from vacuum holding solenoid valve hose and connect to air vent cut-off diaphragm. Apply a vacuum.



VACUUM PUMP/GAUGE

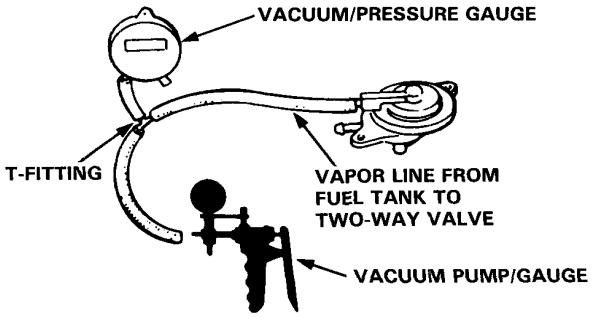
Vacuum should remain steady.

- If vacuum remains stable, diaphragm is OK.
- If vacuum decreases, replace diaphragm and retest.

8. Remove the vacuum pump and reconnect hose between the air vent cut-off diaphragm and the vacuum holding solenoid valve.

Two-Way Valve

1. Remove the fuel filler cap.
2. Remove the vapor line from the fuel tank and connect a T-fitting for a vacuum gauge and vacuum pump as shown.

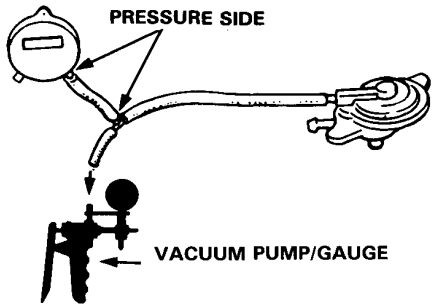


3. Slowly apply vacuum while watching the gauge.

   Vacuum should stabilize momentarily at 5 to 15 mmHg (0.2 to 0.6 in. Hg).

   - If vacuum stabilizes (valve opens) below 5 mmHg (0.2 in. Hg) or above 15 mmHg (0.6 in. Hg), install new valve and retest.

4. Move vacuum pump hose from vacuum to pressure fitting, and move vacuum gauge hose from vacuum to pressure side as shown.



5. Slowly pressurize the vapor line while watching the gauge.

   Pressure should stabilize at 25 to 55 mmHg (1.0 to 2.2 in. Hg).

   - If pressure momentarily stabilizes (valve opens) at 25 to 55 mmHg (1.0 to 2.2 in. Hg), the valve is OK.
   - If pressure stabilizes below 25 mmHg (1.0 in. Hg) or above 55 mmHg (2.2 in. Hg), install a new valve and retest.

Control Unit

Symptom-to-Sub System Chart

NOTE: Across each row in the chart, the sub systems that could be sources of a symptom are ranked in the order they should be inspected, starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next system ②, etc.

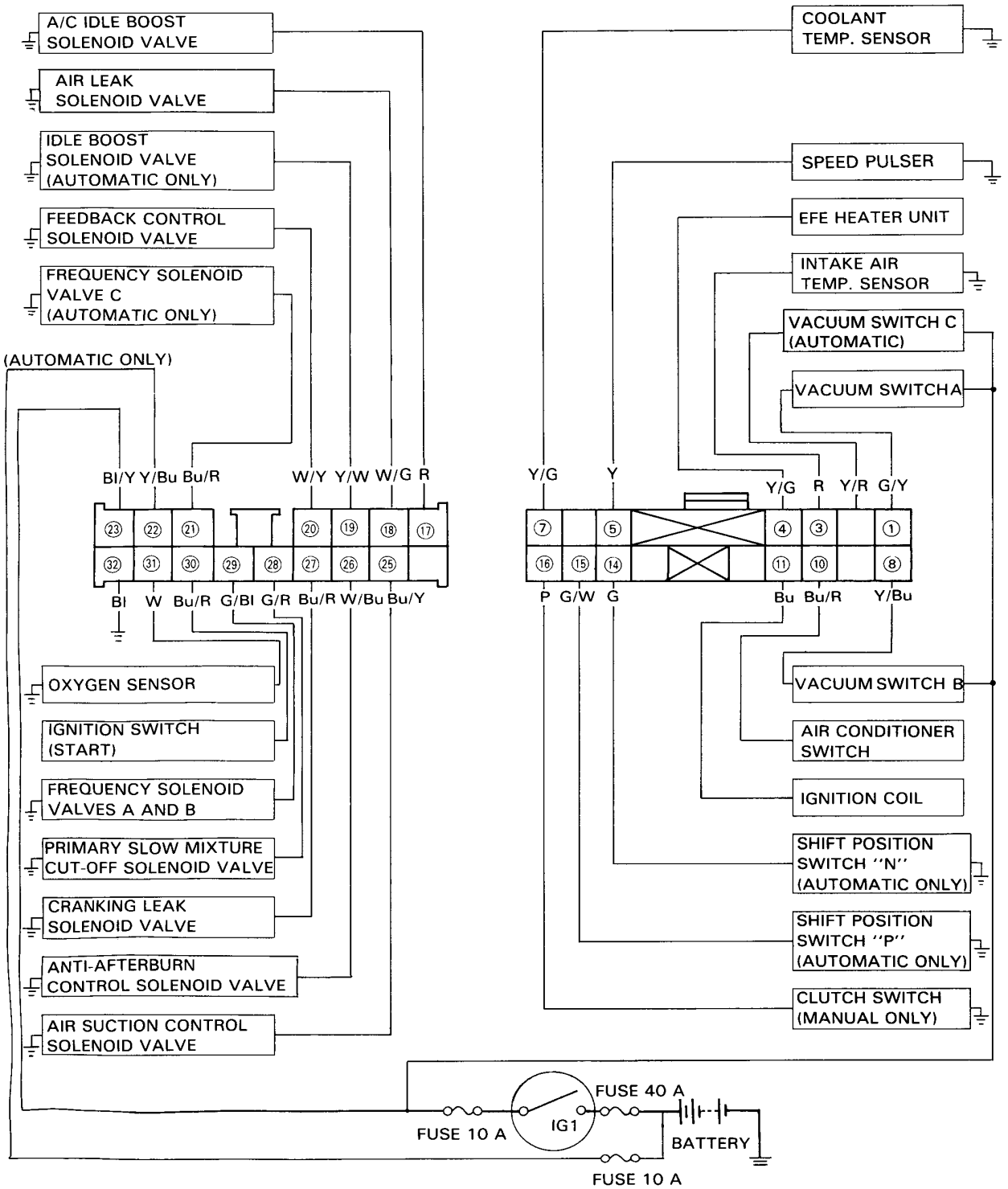
PAGE / SYMPTOM	OUTPUT	FREQUENCY SOLENOID VALVE C	IDLE BOOST SOLENOID VALVE	A/C IDLE BOOST SOLENOID VALVE	PRIMARY SLOW MIXTURE CUT-OFF SOLENOID VALVE	CRANKING LEAK SOLENOID VALVE
		158	160	162	164	166
ENGINE WON'T START	WHEN COLD				②	①
	WHEN WARM				①	
DIFFICULT TO START ENGINE	WHEN COLD				①	①
	WHEN WARM	①			①	
IRREGULAR IDLING	WHEN COLD FAST IDLE OUT OF SPECIFICATION		①		①	
	WHEN WARM RPM TOO HIGH	①	①	①		
	WHEN WARM RPM TOO LOW	①	①	①		
	ROUGH IDLE/ FLUCTUATION	①				
FREQUENT STALLING	WHILE WARMING UP				①	
	AFTER WARMING UP		②	②	①	
POOR PERFORMANCE	AFTERBURN					
	HESITATION/ SURGE					
	FAILS EMISSION TEST					
	SULFUR SMELL					

(cont'd)

Symptom-to-Sub System Chart (cont'd)

FREQUENCY SOLENOID VALVE A	FREQUENCY SOLENOID VALVE B	FEEDBACK CONTROL SOLENOID VALVE	AIR LEAK SOLENOID VALVE	AIR SUCTION CONTROL SOLENOID VALVE	ANTI-AFTERBURN CONTROL SOLENOID VALVE	EFE HEATER SYSTEM
168	170	172	179	174	176	180
					①	①
					①	
					①	
①	①					
②	②	②	②	①		
②	②	②	②	①		

Output/Input Summary



Control Unit Output Troubleshooting

Frequency Solenoid Valve C (A/T Only)

The frequency solenoid valve C is energized when the engine speed is above or below 730 min^{-1} (rpm) and the coolant temperature is above 60°C (140°F). It controls the vacuum to the throttle controller.

Inspection of Frequency Solenoid Valve C

Disconnect the lower vacuum hose of the solenoid valve from the vacuum hose manifold and connect a vacuum pump.

Disconnect the upper vacuum hose of the solenoid valve from the 3-way joint.

Disconnect the 2P connector near the solenoid valve.

Apply vacuum.

Does solenoid valve hold vacuum? NO → Replace the solenoid valve.

YES

Connect a vacuum gauge to the upper vacuum hose.

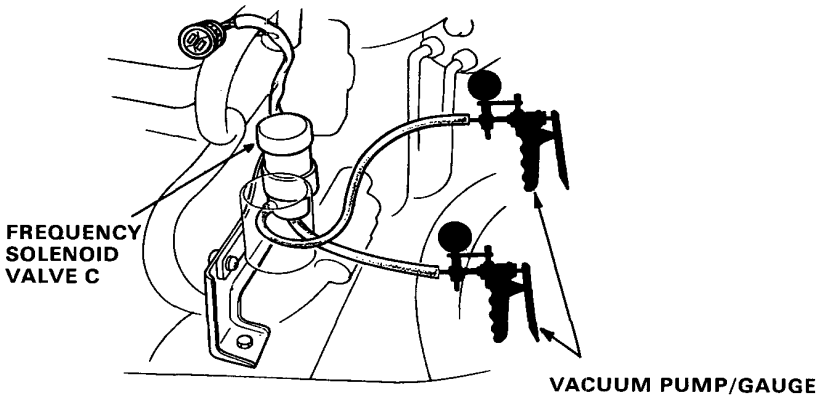
Connect the battery positive terminal to the Blue/Red terminal of the 2P connector and the battery negative terminal to the Black terminal.

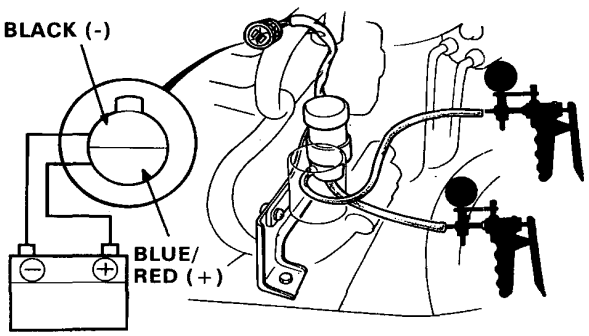
Apply vacuum.

Is vacuum indicated on the gauge? NO → Replace the solenoid valve.

YES

(To page 12-159)





(From page 12-158)

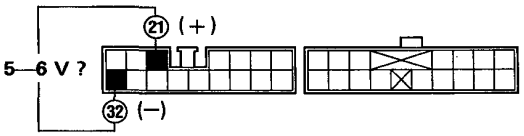
Disconnect the battery terminals from the 2P connector.

Is vacuum indicated on the gauge? YES → Replace the solenoid valve.

NO

Reconnect vacuum hose and 2P connector.

Start engine and warm up to normal operating temperature (cooling fan comes on).



Measure voltage between 21 (Blue/Red · +) terminal and 32 (Black · –) terminal of the control unit.

Is there 5—6 volts? NO → Go to Input Troubleshooting (page 12-184).

YES

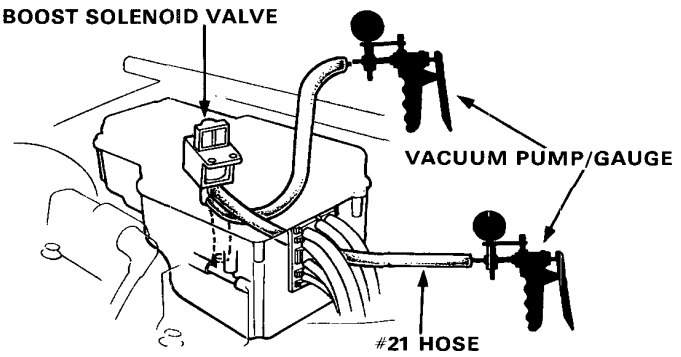
Inspect open in Blue/Red wire between control unit 21 and solenoid valve, and Black wire between the solenoid valve and G7.

Control Unit Output Troubleshooting

Idle Boost Solenoid Valve (A/T Only)

The idle boost solenoid valve is energized when the transmission is in gear or the engine is cold, applying vacuum to the inner diaphragm of the idle boost throttle controller to increase rpm when there is load on the engine.

Inspection of Idle Boost Solenoid Valve



Open the control box.

Disconnect the lower vacuum hose of the solenoid valve from the 4 way joint and connect a vacuum pump.

Disconnect #21 vacuum hose of the solenoid valve from the vacuum hose manifold and connect a vacuum gauge.

Start engine.

NOTE: The engine coolant temperature must be below 70°C (158°F)

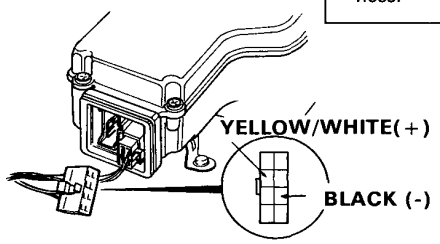
Apply vacuum.

Is vacuum indicated on the gauge?

NO → Disconnect the 8P connector on the control box.

YES

Measure voltage between Yellow/White (+) terminal and Black (–) terminal on the main wire harness.



Warm up engine to normal operating temperature (cooling fan comes on).

Is there battery voltage?

YES → Replace the solenoid valve.

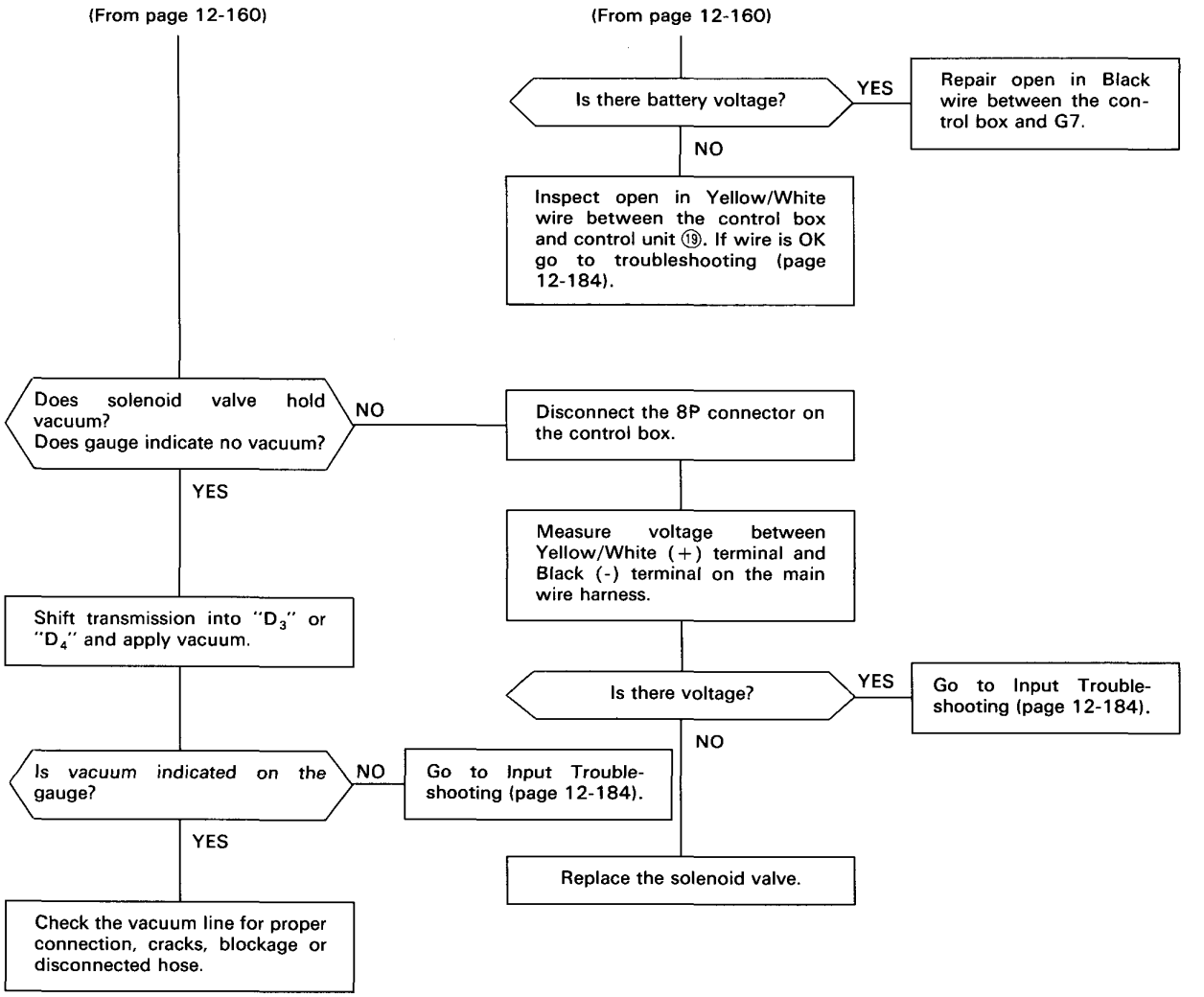
NO

Apply vacuum in Neutral or Park position.

Measure voltage between Yellow/White (+) terminal and body ground.

(To page 12-161)

(To page 12-161)


(From page 12-160)
(From page 12-160)
Is there battery voltage?
YES
Repair open in Black wire between the control box and G7.
NO
Inspect open in Yellow/White wire between the control box and control unit ⑲. If wire is OK go to troubleshooting (page 12-184).
Does solenoid valve hold vacuum?
Does gauge indicate no vacuum?
NO
Disconnect the 8P connector on the control box.
YES
Measure voltage between Yellow/White (+) terminal and Black (-) terminal on the main wire harness.
Shift transmission into "D3" or "D4" and apply vacuum.
Is there voltage?
YES
Go to Input Trouble-shooting (page 12-184).
NO
Is vacuum indicated on the gauge?
NO
Go to Input Trouble-shooting (page 12-184).
YES
Replace the solenoid valve.
Check the vacuum line for proper connection, cracks, blockage or disconnected hose.

Control Unit Output Troubleshooting

A/C Idle Boost Solenoid Valve

The A/C idle boost solenoid valve is energized when the A/C compressor is energized, applying vacuum to the outer diaphragm of the idle boost throttle controller. This increases the idle speed when the A/C compressor is on.

Inspection of A/C Idle Boost Solenoid Valve

Disconnect the lower vacuum hose of the solenoid valve from the 3-way joint and connect a vacuum pump.

Disconnect the upper vacuum hose of the solenoid valve from the vacuum hose manifold and connect a vacuum gauge.

Start engine.

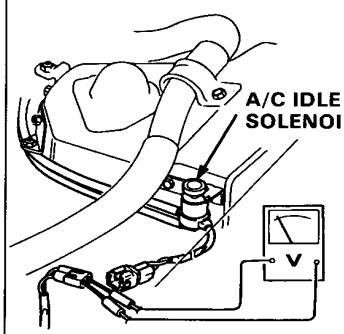
Apply vacuum.

Does solenoid valve hold vacuum?

NO

Disconnect the 2P connector near the solenoid valve.

Measure voltage between Red (+) terminal and Black (–) terminal on the A/C wire harness.



Is there voltage?

YES

Go to Input Troubleshooting (page 12-184).

NO

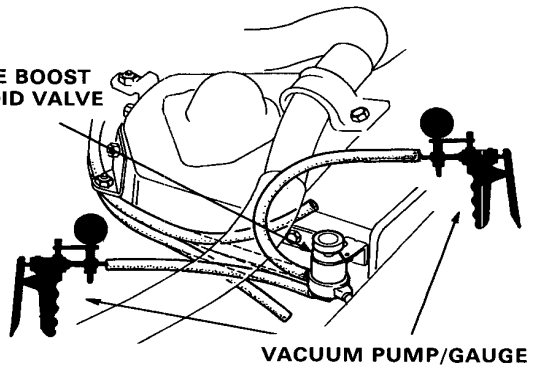
Replace the solenoid valve.

YES

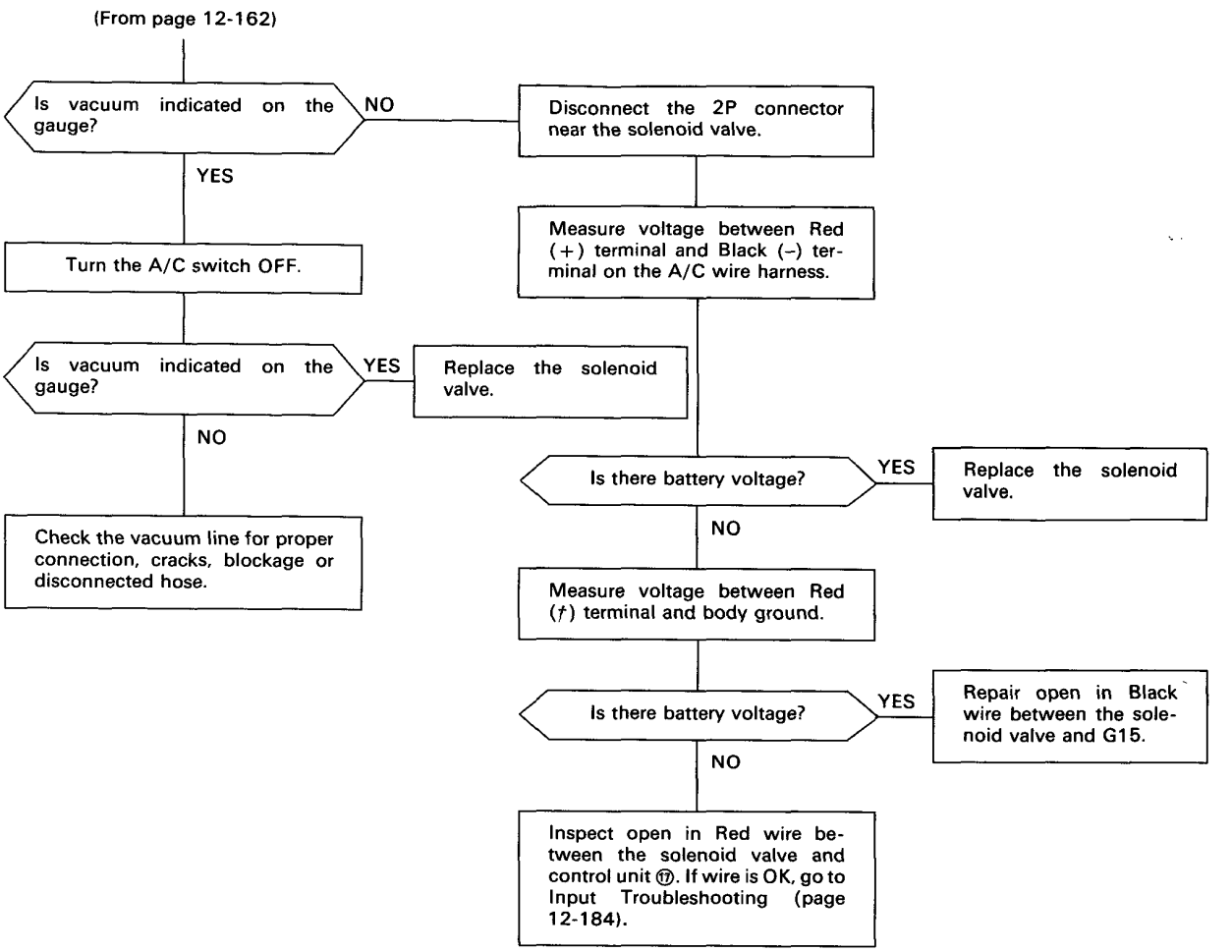
Turn the A/C switch ON.

Apply vacuum.

(To page 12-163)



(From page 12-162)



Control Unit Output Troubleshooting

Primary Slow Mixture Cut-off Solenoid Valve

Inspection of Primary Slow Mixture Cut-off Solenoid Valve

Place a clean towel around the solenoid valve, to soak up any gasoline, then loosen the screws and remove the solenoid valve.

Ground the valve as far from the carburetor as possible.

Turn the ignition switch ON.

Does the solenoid valve retract?

NO → Turn the ignition switch OFF.

Disconnect the 2P connector near the solenoid valve.

(To page 12-165)

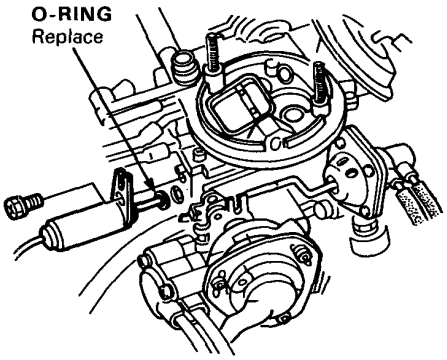
YES

Reinstall the solenoid valve.

(To page 12-165)

WARNING

- **Wipe up any spilled gasoline before testing.**
- **If cut-off valve is removed for testing, be sure you ground it to prevent sparking or fire when the key is turned on.**



(From page 12-164)

Start engine and warm up to normal operating temperature (cooling fan comes on).

Block rear wheels and set the parking brake. Jack up the front of the car and support with safety stands.

Place the transmission in second or 2 position and accelerate.

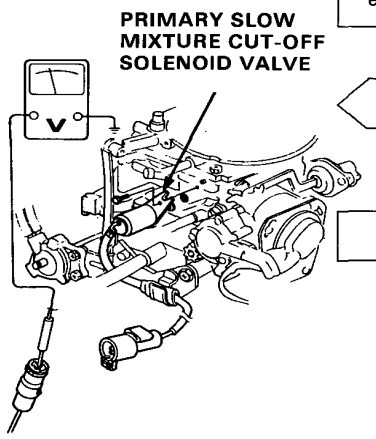
Suddenly release the throttle and measure voltage between ㉘ (Green/Red · +) terminal and ㉜ (Black · –) terminal of the control unit during deceleration above 12.5 mph .

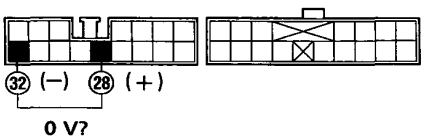
Is there voltage?

YES → Go to Input Troubleshooting (page 12-184).

NO

Solenoid valve is OK.





(From page 12-164)

Turn the ignition switch ON.

Measure voltage between Green/Red (+) and body ground on the engine wire harness.

Is there battery voltage?

NO → Inspect open in Green/Red wire between the solenoid valve and control unit ㉘. If wire is OK, go to Input Troubleshooting (page 12-184).

YES

Replace the solenoid valve.

Control Unit Output Troubleshooting

Cranking Leak Solenoid Valve

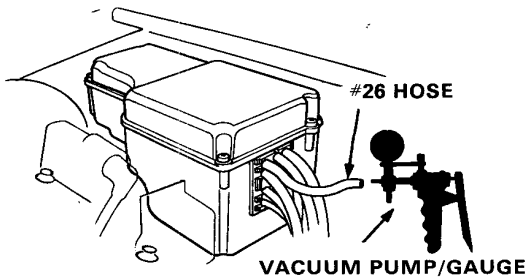
The cranking leak solenoid valve bleeds vacuum from choke opener during cranking.

Inspection of Cranking Leak Solenoid Valve

Disconnect #26 vacuum hose from the vacuum hose manifold.

Connect vacuum pump and apply vacuum.

Turn the ignition switch to the START position.



NOTE: The engine coolant temperature must be below 40 °C (104 °F)

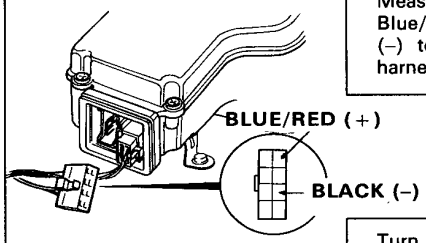
Does vacuum remain steady?

YES

Turn the ignition switch OFF.

Disconnect the 8P connector on the control box.

Measure voltage between Blue/Red (↑) terminal and Black (–) terminal on the main wire harness.



Turn the ignition switch to the START position.

Is there battery voltage?

YES

Replace the solenoid valve.

NO

Measure voltage between Blue/Red (+) terminal and body ground in the START position.

Is there battery voltage?

YES

Repair open in Black wire between the control box and G7.

NO

Inspect open in Blue/Red wire between the control box and control unit ㉗. If wire is OK, go to Input Troubleshooting (page 12-184).

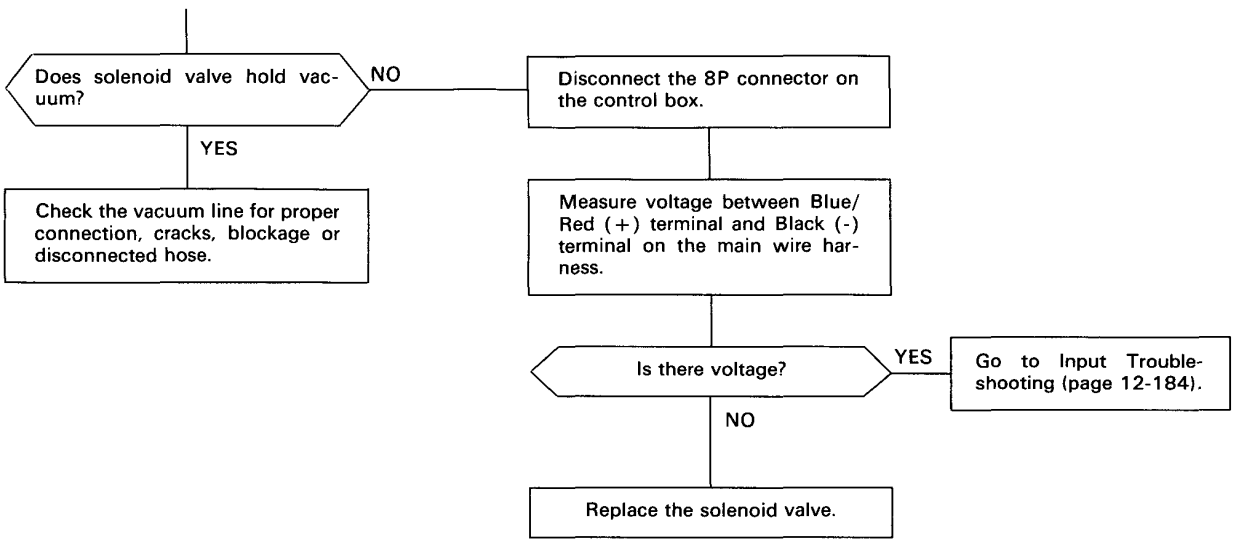
NO

Start engine and warm up to normal operating temperature (cooling fan comes on).

Apply vacuum

(To page 12-167)

(From page 12-166)



Control Unit Output Troubleshooting

Frequency Solenoid Valve A

The frequency solenoid valve A, a part of the M-system, gets signals from the oxygen sensor through the control unit and opens air control valve A whenever the air-fuel mixture is richer than stoichiometric.

Inspection of Frequency Solenoid Valve A

Disconnect the lower vacuum hose of the solenoid valve from the vacuum hose manifold and connect a vacuum pump.

Disconnect the upper vacuum hose of the solenoid valve from the air control valve A.

Disconnect the 2P connector near the solenoid valve.

Apply vacuum.

Does solenoid valve hold vacuum?

NO → Replace the solenoid valve.

YES

Connect the battery positive terminal to the Green/Black terminal of the 2P connector and battery negative terminal to the Black terminal.

Apply vacuum

Does solenoid valve hold vacuum?

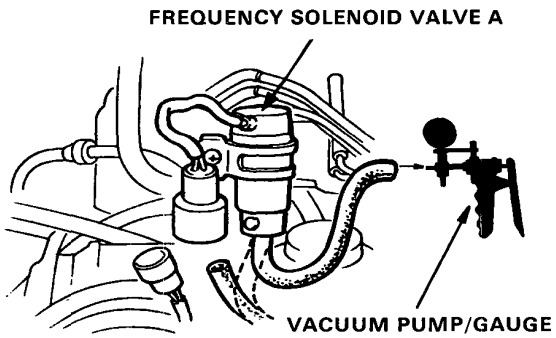
YES → Replace the solenoid valve.

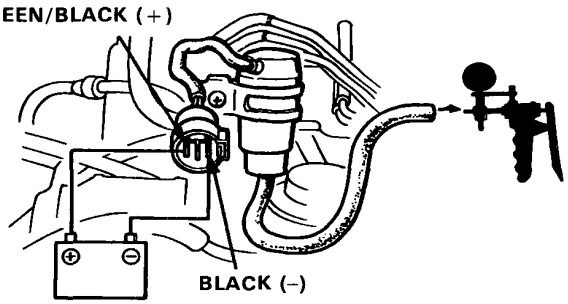
NO

Disconnect the battery terminals from the 2P connector.

Reconnect vacuum hose.

(To page 12-169)

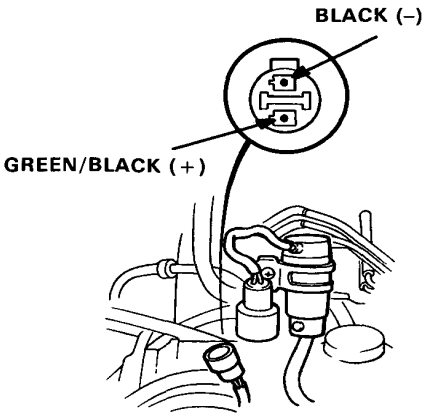




(From page 12-168)

Warm up engine to normal operating temperature (cooling fan comes on).

Measure voltage between Green/Black (+) terminal and Black (–) terminal on the main wire harness while running engine at approx. 2,500 rpm.



Is there 0 and 12 volts alternately?

NO

Measure voltage between Green/Black (+) terminal and body ground while running engine at approx. 2,500 min^{-1} (rpm).

YES

Check the vacuum line for proper connection, cracks, blockage or disconnected hose.

Is there 0 and 12 volts alternately?

YES

Repair open in Black wire between the solenoid valve and G4.

NO

Inspect open in Green/Black wire between the solenoid valve and control unit ㉙. If wire is OK, go to Input Troubleshooting (page 12-184).

Control Unit Output Troubleshooting

Frequency Solenoid Valve B

The frequency solenoid valve B, a part of the X-system, gets signals from the control unit to open air control valve B when there is a rich air-fuel mixture.

Inspection of Frequency Solenoid Valve B

Disconnect the lower vacuum hose of the solenoid valve from constant vacuum generator and connect a vacuum pump.

Disconnect the upper vacuum hose of solenoid valve from the pulse rectifier and connect a vacuum gauge.

Disconnect the 2P connector near the solenoid valve.

Apply vacuum.

Does solenoid valve hold vacuum? NO → Replace the solenoid valve.

YES

Connect the battery positive terminal to the Green/Black terminal of the 2P connector and battery negative terminal to the Black terminal.

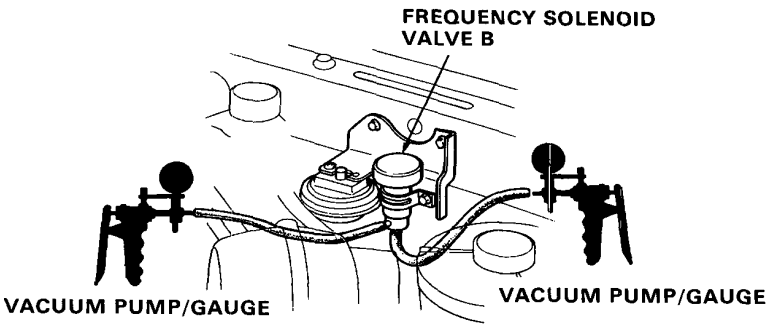
Apply vacuum

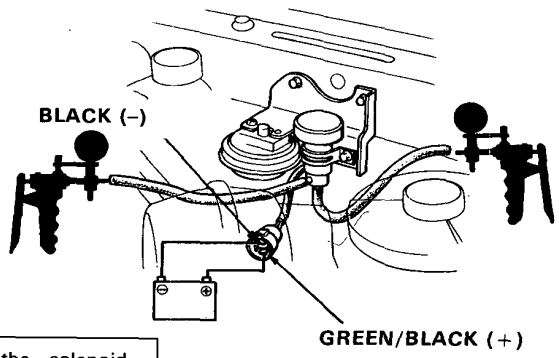
Is vacuum indicated on the gauge? NO → Replace the solenoid valve.

YES

Disconnect the battery terminals, from the 2P connector.

(To page 12-171)





(From page 12-170)

Is vacuum indicated on the gauge?

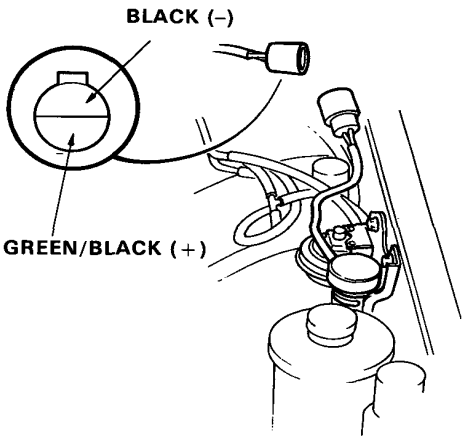
YES → Replace the solenoid valve.

NO

Reconnect vacuum hose.

Warm up engine to normal operating temperature (cooling fan comes on).

Measure voltage between Green/Black (+) terminal and Black (–) terminal on the main wire harness while running engine at approx. 2,500 min^{-1} (rpm).



Is there 0 and 12 volts alternately?

NO → Measure voltage between Green/Black (+) terminal and body ground while running engine at approx. 2,500 min^{-1} (rpm).

YES

Check the vacuum line for proper connection, cracks, blockage or disconnected hose.

Is there 0 and 12 volts alternately?

YES → Repair open in Black wire between the solenoid valve and G5.

NO

Inspect open in Green/Black wire between the solenoid valve and control unit ㉙. If wire is OK, go to Input Troubleshooting (page 12-184).

Control Unit Output Troubleshooting

Feedback Control Solenoid Valve

The feedback control system is designed to provide a stoichiometric air-fuel ratio, allowing the three-way catalyst's performance to give a simultaneous reduction of hydrocarbons, carbon monoxide and oxides of nitrogen. The feedback control solenoid valve is provided to stop feedback operation at low engine speed such as at engine idling.

Inspection of Feedback Control Solenoid Valve

Disconnect the upper vacuum hose of the solenoid valve from the vacuum hose manifold and connect a vacuum pump.

Plug the end of #32 hose.

Warm up engine to normal operating temperature (cooling fan comes on).

Does solenoid valve hold vacuum?

YES

Disconnect the 4P connector near the solenoid valve.

Measure voltage between White/Yellow (+) terminal and Black (–) terminal on the main wire harness.

Is there voltage?

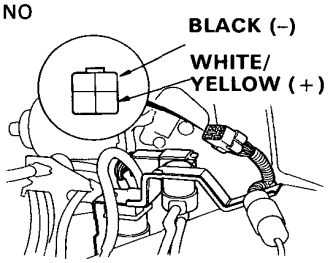
YES

Go to Input Troubleshooting (page 12-184).

NO

Replace the solenoid valve.

NO



Raise the engine speed to 2,500 min^{-1} (rpm) and apply vacuum.

Does the solenoid valve hold vacuum?

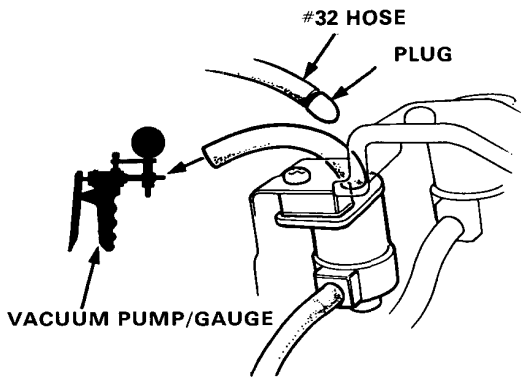
NO

Disconnect the 4P connector near the solenoid valve.

YES

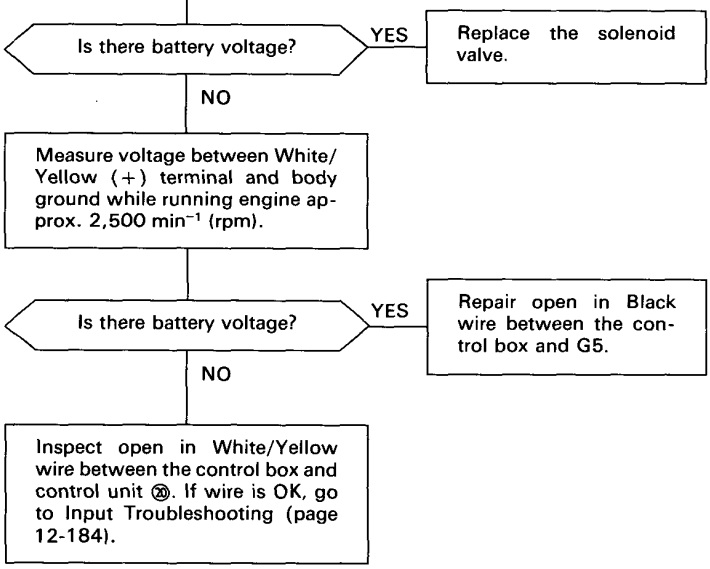
Check the vacuum line for proper connection, cracks, blockage or disconnected hose.

Measure voltage between White/Yellow (+) terminal and Black (–) terminal on the main wire harness while running engine at approx. 2,500 min^{-1} (rpm).



(To page 12-173)

(From page 12-172)



Control Unit Output Troubleshooting

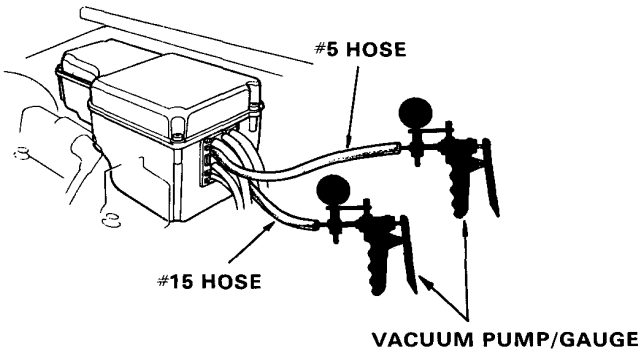
Air Suction Control Solenoid Valve

When the air suction control solenoid valve is activated, manifold vacuum raises the diaphragm valve of the air suction valve and fresh air from the air cleaner is induced to the exhaust manifold through the reed valve of the air suction valve by pulsation of the exhaust gas.

Inspection of Air Suction Control Solenoid Valve

Disconnect the #15 vacuum hose of the solenoid valve from the accumulator and connect a vacuum pump.

Disconnect the #15 vacuum hose of the solenoid valve from the vacuum hose manifold and connect a vacuum gauge.



Apply vacuum.

Does the solenoid valve hold vacuum?

NO → Replace the solenoid valve.

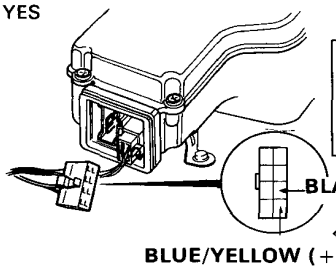
YES

Warm up engine to normal operating temperature (cooling fan comes on) and apply vacuum at idle

Is vacuum indicated on the gauge?

NO → Disconnect the 8P connector on the control box.

YES



Measure voltage between Blue/Yellow (+) terminal and Black (–) terminal on the main wire harness.

Is there battery voltage?

YES → Replace the solenoid valve.

NO

Measure voltage between Blue/Yellow (+) terminal and body ground.

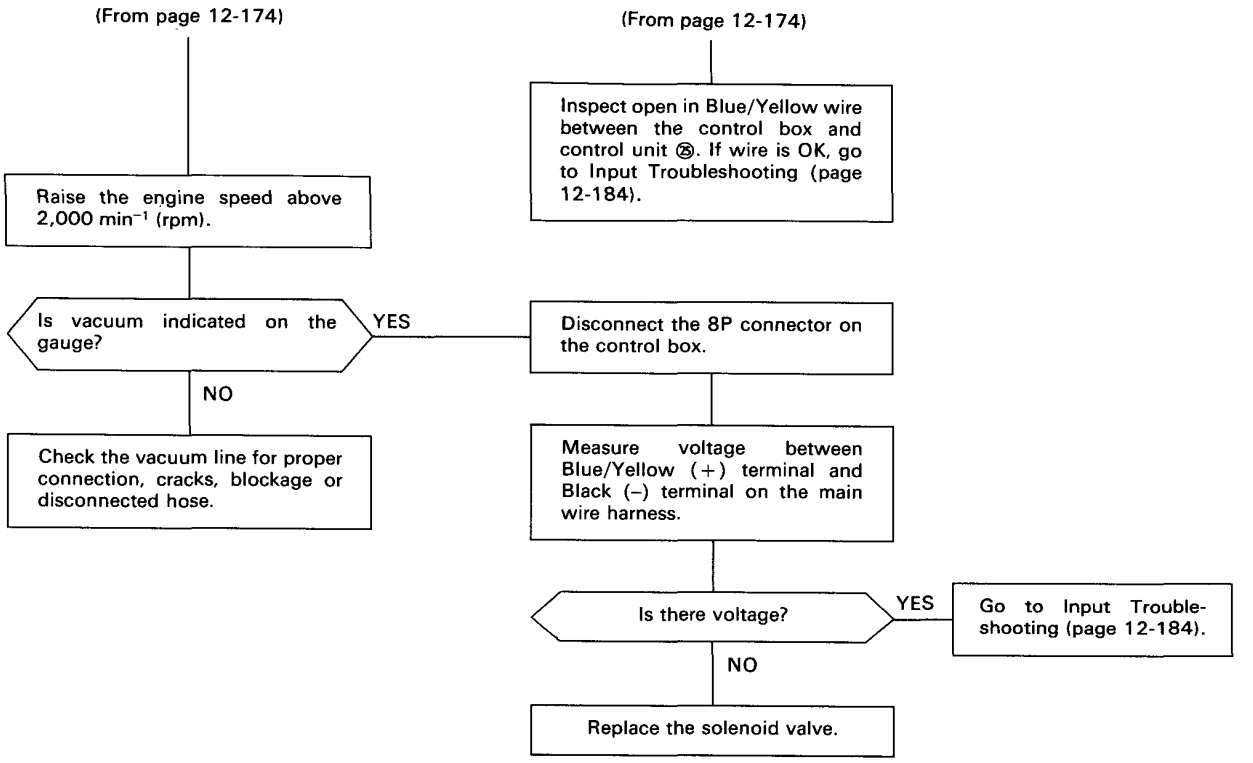
Is there battery voltage?

YES → Repair open in Black wire between the control box and G7.

NO

(To page 12-175)

(To page 12-175)

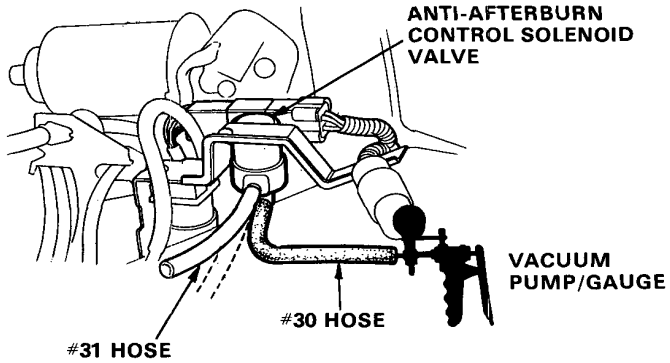

(From page 12-174)
Raise the engine speed above 2,000 min⁻¹ (rpm).
Is vacuum indicated on the gauge?
YES
NO
Check the vacuum line for proper connection, cracks, blockage or disconnected hose.
(From page 12-174)
Inspect open in Blue/Yellow wire between the control box and control unit ㉘. If wire is OK, go to Input Troubleshooting (page 12-184).
Disconnect the 8P connector on the control box.
Measure voltage between Blue/Yellow (+) terminal and Black (–) terminal on the main wire harness.
Is there voltage?
YES
Go to Input Trouble-shooting (page 12-184).
NO
Replace the solenoid valve.

Control Unit Output Troubleshooting

Anti- afterburn Control Solenoid Valve

The anti-afterburn control solenoid valve is provided to control the operation of the anti-afterburn valve by introducing vacuum to the diaphragm holding the valve closed. The anti-afterburn valve senses intake manifold vacuum changes during gear shifting or deceleration, and supplies fresh air to the intake manifold in order to prevent the escape of unburned fuel.

Inspection of Anti-afterburn Control Solenoid Valve



Disconnect #31 vacuum hose of the solenoid valve from vacuum hose manifold.

Disconnect #30 vacuum hose of the solenoid valve from vacuum hose manifold and connect a vacuum pump

Start the engine and apply vacuum.

NOTE: The engine coolant Temperature must be below 70° C (158° F)

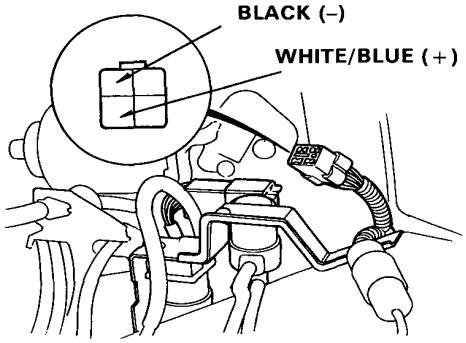
Does the solenoid valve hold vacuum?

YES → Stop engine.

Disconnect 4P connector near the solenoid valve.

Start engine.

Measure voltage between White/Blue (+) terminal and Black (–) terminal on the main wire harness.



(To page 12-177)

NO

Stop engine.

Block rear wheels and set the parking brake. Jack up the front of the car and support with safety stands.

Start engine.

(To page 12-177)

(From page 12-176)

Place the transmission in second or 2 position and accelerate above 15 mph.

Apply vacuum.

Does solenoid valve hold vacuum?

NO → Stop engine.

YES

Warm up engine to normal operating temperature (cooling fan comes on).

Apply vacuum.

(To page 12-178)

(From page 12-176)

Is there battery voltage?

YES → Replace the solenoid valve.

NO

Measure voltage between White/Blue (+) terminal and body ground.

Is there battery voltage?

YES → Repair open in Black wire between the solenoid valve and G5.

NO

Inspect open in White/Blue wire between the solenoid valve and control unit Ⓐ. If wire is OK, go to Input Troubleshooting (page 12-184).

Stop engine.

Disconnect 4P connector near the solenoid valve.

Start engine and accelerate above 15 mph.

Measure voltage between White/Blue (+) terminal and Black (–) terminal on the main wire harness.

Is there voltage?

YES → Go to Input Troubleshooting (page 12-184).

NO

Replace the solenoid valve.

(cont'd)

Anti-afterburn Control Solenoid Valve (cont'd)

(From page 12-177)

Does the solenoid valve hold vacuum?

NO → Go to Input Troubleshooting (page 12-184).

YES

Check the vacuum line for proper connection, cracks, blockage or disconnected hose.

Air Leak Solenoid Valve

The air leak solenoid valve supplies additional air to the intake manifold. The solenoid valve opens when the engine is running at idle with high intake air temperature. The solenoid valve operates to decrease idle emissions when the air injection to the exhaust manifold is cut off.

Inspection of Air Leak Solenoid Valve

Disconnect #27 vacuum hose from the vacuum hose manifold and connect a vacuum pump.

Disconnect the 8P connector on the control box.

Apply vacuum.

Does the solenoid valve hold vacuum?

NO → Replace the solenoid valve.

YES

Connect the battery positive terminal to the Gray terminal of the 8P connector and the battery negative terminal to the Black terminal.

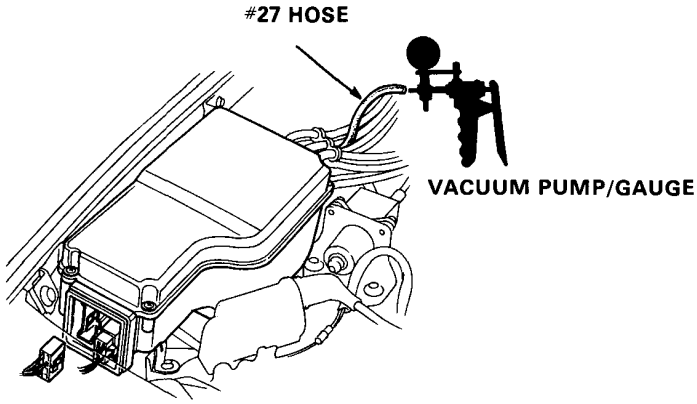
Apply vacuum.

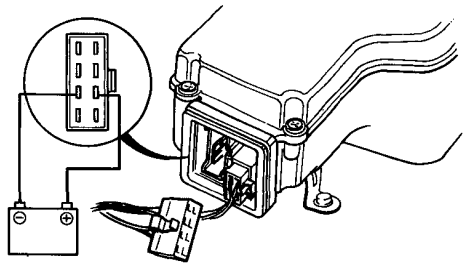
Does the solenoid valve hold vacuum?

NO → Replace the solenoid valve.

YES

Inspect open in White/Green between the control box and control unit ⑱, and Black wire between the control box and G7. If wire is OK, go to Input Troubleshooting (page 12-184).





Control Unit Output Troubleshooting

EFE (Early Fuel Evaporator) System

Inspection of EFE (Early Fuel Evaporator) System

Disconnect the 2P connector near the carburetor.

Measure resistance between White terminal and Black terminal on the EFE heater.

Does continuity exist? NO → Replace the EFE heater.

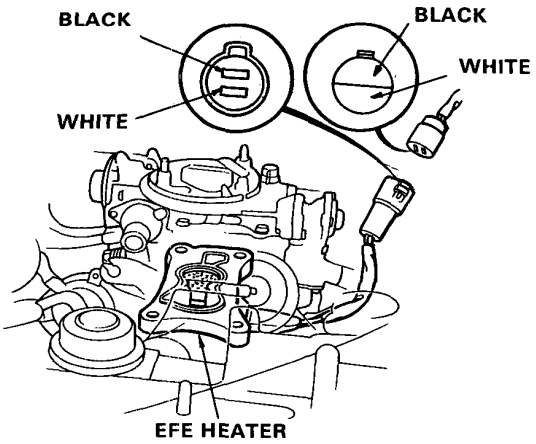
YES

Start engine.

NOTE: The engine coolant temperature must be below 60°C (140°F)

Measure voltage between White (+) terminal and Black (–) terminal on the engine wire harness.

(To page 12-181)



(From page 12-180)

Is there battery voltage?

NO

Measure voltage between White (+) terminal and body ground.

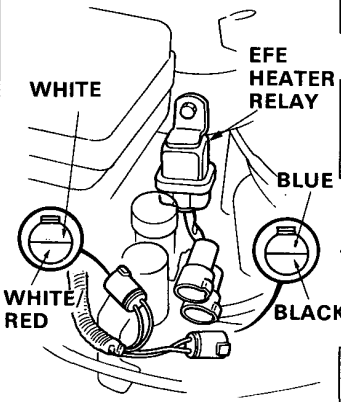
Is there battery voltage?

YES

Repair open in Black wire between the EFE heater and G4.

NO

Inspect open in White wire between the heater and the EFE heater relay. If wire is OK, disconnect the 2P connector near the EFE heater relay.



Measure voltage between White/Red (+) terminal and body ground.

Is there battery voltage?

NO

Inspect No. 24 fuse (30 A). If fuse is OK, repair open in White/Red wire between the relay and No.24 fuse .

YES

Disconnect the 2P connector near the EFE heater relay.

Measure voltage between Blue (+) terminal and Black (–) terminal on the main wire harness.

Is there battery voltage?

NO

Replace the relay.

YES

Warm up engine to normal operating temperature (cooling fan comes on).

Measure voltage between Blue (+) terminal and body ground .

Is there battery voltage?

YES

Repair open in Black wire between the relay and G4.

NO

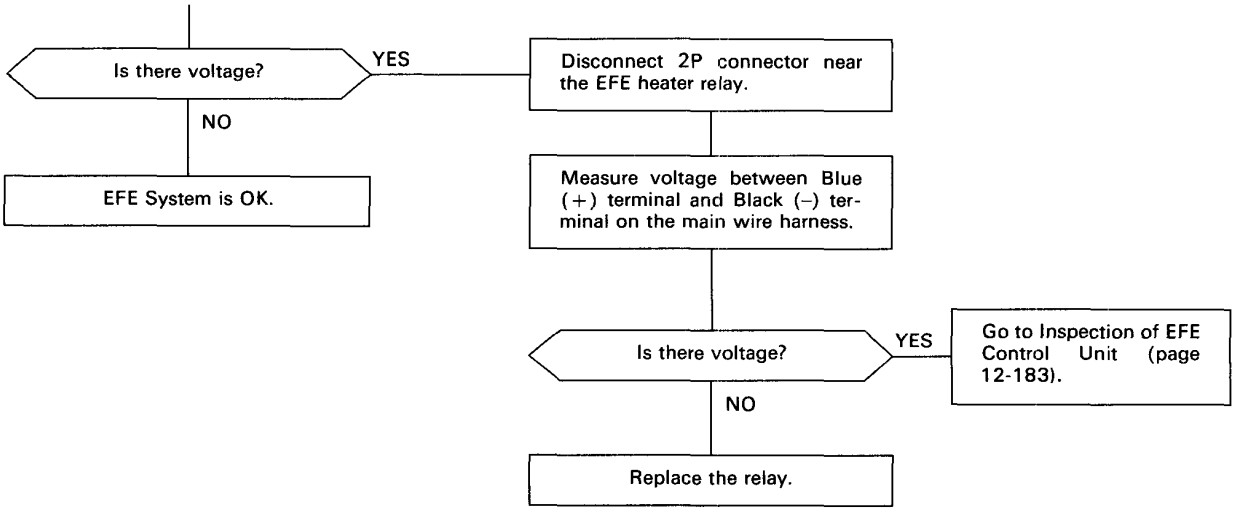
Inspect open in Blue wire between the relay and EFE control unit. If wire is OK, go to Inspection of EFE Control Unit.

(To page 12-182)

(cont'd)

EFE (Early Fuel Evaporator) System (cont'd)

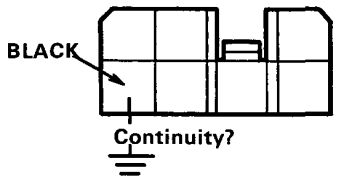
(From page 12-181)



Inspection of EFE Control Unit

Disconnect 7P connector from the EFE control unit.

Check for continuity between Black terminal and body ground on the main wire harness.



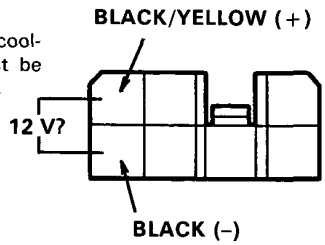
Does continuity exist?

NO → Repair open in Black wire between the control unit and G8, G10.

YES

Turn the ignition switch ON.

NOTE: The engine coolant temperature must be below 60°C (140°F).

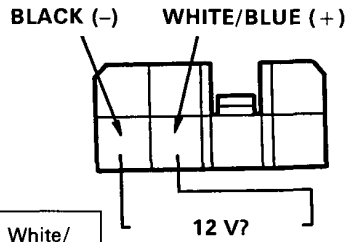


Measure voltage between Black/Yellow (+) terminal and Black (–) terminal on the main wire harness.

Is there battery voltage?

NO → Inspect No. 12 fuse (15 A). If fuse is OK, repair open in Black/Yellow wire between the control unit and No. 12 fuse

YES

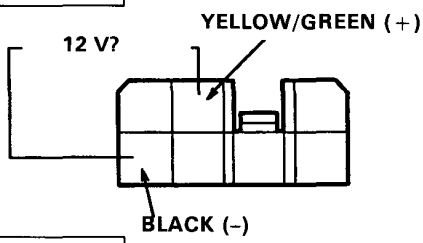


Measure voltage between White/Blue (+) terminal and Black (–) terminal on the main wire harness.

Is there battery voltage?

NO → Repair open in White/Blue wire between the control unit and alternator.

YES



Measure voltage between Yellow/Green (+) terminal and Black (–) terminal on the main wire harness.

Is there battery voltage?

NO → Inspect open in Yellow/Green wire between the control unit and EFE control unit. If wire is OK, go to Input Troubleshooting (page 12-184).

YES

Replace the EFE control unit and retest.

Control Unit Input Troubleshooting

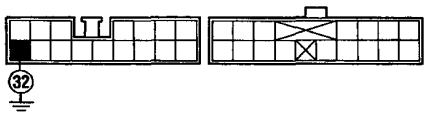
If there is no voltage from the control unit when there should be voltage or if there is voltage from the unit when there shouldn't be voltage, inspect as follows and if no defects can be found, replace the control unit and re-test.

PROBLEMATIC CIRCUIT	REFER TO CHECK:		CHECK
To frequency solenoid valves A and B (㉙ Green/Black)	M/T	1,4,6,7,8,10,11,12,13	1. Inspect the power source (IG 1) and ground (page 12-185). 2. Inspect the power source (Bat) (page 12-185). 3. Inspect the starter signal (page 12-186). 4. Inspect the ignition coil signal (page 12-192). 5. Inspect the A/T shift position signal (page 12-202). 6. Inspect the clutch switch signal (page 12-200). 7. Inspect vacuum switch A (page 12-194). 8. Inspect vacuum switch B (page 12-196). 9. Inspect vacuum switch C (page 12-198). 10. Inspect the speed pulser (page 12-193). 11. Inspect the coolant temperature (TW) sensor (page 12-190). 12. Inspect the intake air temperature (TA) sensor (page 12-188). 13. Inspect the oxygen (O_2) sensor (page 12-187). 14. Inspect the A/C switch signal (page 12-204).
	A/T	1,4,5,7,8,10,11,12,13	
To feedback control solenoid valve (⑳ White/Yellow)	M/T	1,4,6,8,11	
	A/T	1,4,5,8,9,11	
To frequency solenoid valve C (A/T only) (㉑ Blue/Red)	1,2,4,5,10,11,14		
To idle boost solenoid valve (A/T only) (⑲ Yellow/White)	1,4,5,7,10,11,14		
To air suction control solenoid valve (㉕ Blue/Yellow)	M/T	1,4,7,8,10,11,12	
	A/T	1,4,7,9,10,11,12	
To anti-afterburn control solenoid valve (㉖ White/Blue)	M/T	1,10,11	
	A/T	1,5,11	
To cranking leak solenoid valve (㉗ Blue/Red)	1,3,4,10,11,12		
To primary slow mixture cut-off solenoid valve (㉘ Green/Red)	M/T	1,4,6,7,8,10,11	
	A/T	1,4,5,7,8,10,11	
A/C idle boost solenoid valve (⑰ Red)	1,4,7,10,11,14		
To EFE heater unit (④ Yellow/Green)	1,11		

Power Sources and Ground

Inspection of Power Source (IG1) and Ground

Check for continuity between the body ground and ㉜ (Black) terminal.



Does continuity exist?

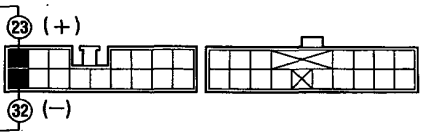
NO → Repair open in Black wire between G2 and control unit ㉜.

YES

Turn the ignition switch ON.

Measure voltage between ㉓ (Black/Yellow ·+) terminal and ㉜ (Black·–) terminal

12 V?



Is there battery voltage?

NO → Inspect No.1 (15A) fuse.

YES

Power source (IG1) and ground are OK.

Is No.1 fuse OK?

NO → Replace fuse.

YES

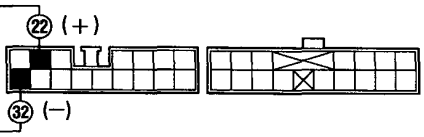
Repair open in Black/Yellow wire between No.1 fuse and control unit ㉓.

Inspection of Power Source (Bat)

Turn the ignition switch OFF.

Measure voltage between ㉒ (Yellow/Blue·+) terminal and ㉜ (Black·-) terminal.

12 V?



Is there battery voltage?

NO → Inspect No.1 (10A) fuse in the under hood relay box.

YES

Power source (Bat) is OK.

Is No.1 fuse OK?

NO → Replace fuse.

YES

Repair open in Yellow/Blue wire between No.1 fuse and control unit ㉒.

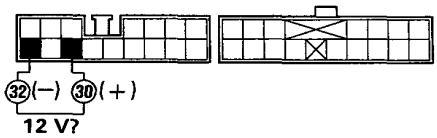
Control Unit Input Troubleshooting

Starter Signal

This signals the control unit when the engine is cranking.

Inspection of Starter Signal

Measure voltage between ㉚ (Blue/Red· +) terminal and ㉜ (Black· –) terminal with the ignition switch in the START position.



Is there battery voltage ?

NO → Inspect No. 10 (7.5 A) fuse.

YES → Starter signal is OK.

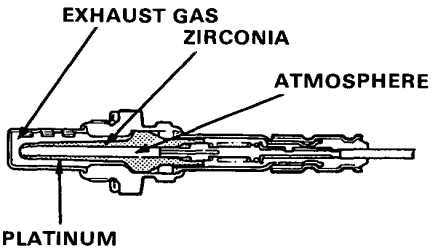
Is No. 10 fuse OK ?

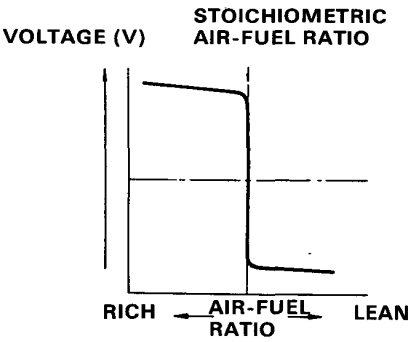
NO → Replace fuse.

YES → Repair open in Blue/Red wire between No. 10 fuse and control unit ㉚.

Oxygen Sensor

The oxygen (O_2) sensor detects the content in the exhaust gas and inputs the control unit.





Inspection of O_2 Sensor

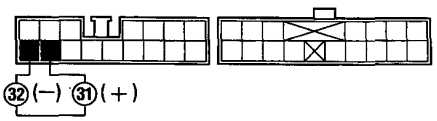
Warm up engine to normal operating temperature (cooling fan comes on).

Measure voltage between ㉛ (White·+) terminal and ㉜ (Black·–) terminal.

Is voltage above 0.6 V during wide open throttle acceleration? Is voltage below 0.4 V during closed throttle deceleration from 5000 rpm?

NO → Disconnect main wire harness from O_2 sensor.

YES → O_2 sensor is OK.



Above 0.6 V during wide open throttle acceleration?
Below 0.4 V during closed throttle deceleration from 5000 min^{-1} (rpm)?

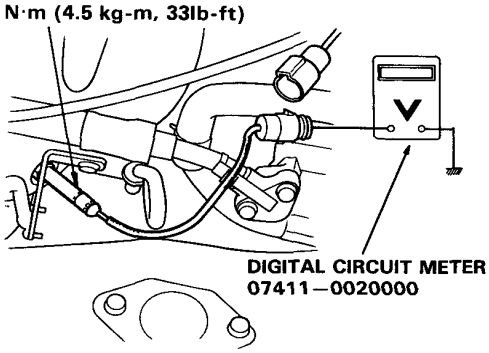
Measure voltage between the connector terminal and body ground.

Is voltage above 0.6 V during wide open throttle acceleration? Is voltage below 0.4 V during closed throttle deceleration from 5000 rpm?

NO → Replace O_2 sensor.

YES → Repair open or short in White wire between O_2 sensor and control unit ㉛

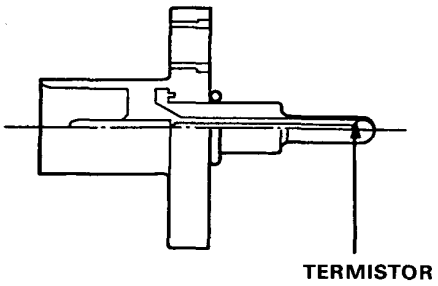
OXYGEN SENSOR
45 N·m (4.5 kg-m, 33lb-ft)

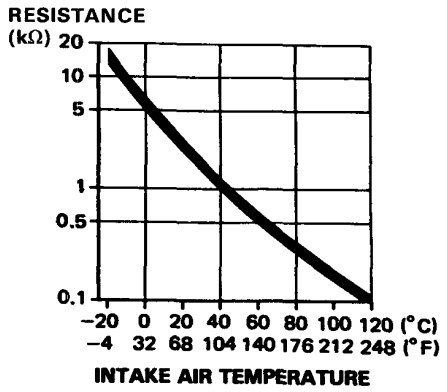


DIGITAL CIRCUIT METER
07411–0020000

TA Sensor

The intake air temperature (TA) sensor is a temperature dependant resistor (thermistor). The resistance of the thermistor decreases as the intake air temperature increases as shown below.

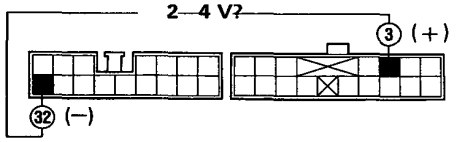




Inspection of TA Sensor

Turn the ignition switch ON.

Measure voltage between ③ (Red·+) terminal and ㉜ (Black·−) terminal.



Is there 2—4 V?

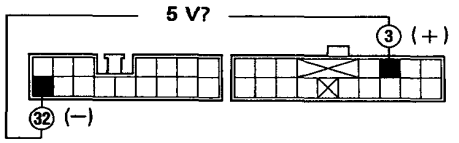
NO → Turn the ignition switch OFF.

YES → TA sensor is OK.

Disconnect the 2P connector on the TA sensor.

Turn the ignition switch ON.

Measure voltage between ③ (Red·+) terminal and ㉜ (Black·−) terminal.

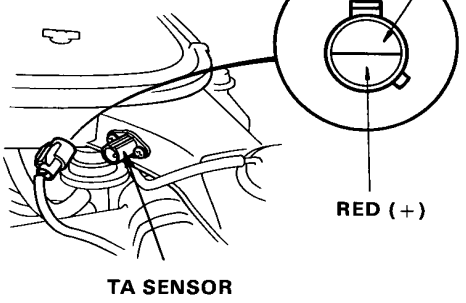


Is there approx. 5 V?

NO → Replace the control unit and retest.

YES

(To page 12-189)



(From page 12-188)

Measure resistance between the 2 terminals on the TA sensor.

Is there 1—4 KΩ? NO → Replace TA sensor.

YES

Measure voltage between Red (+) terminal and body ground.

Is there approx. 5 V? NO → Repair open or short in Red wire between the TA sensor and control unit ③.

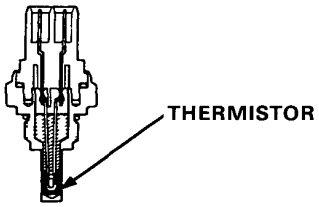
YES

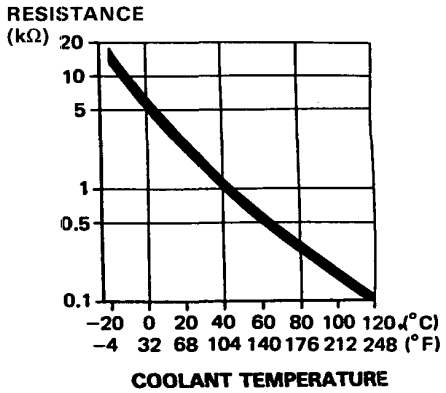
Repair open in Black wire between the TA sensor and G2.

Control Unit Input Troubleshooting

TW Sensor

The coolant temperature (TW) sensor is a temperature dependant resistor (thermistor). The resistance of the thermistor decreases as the coolant temperature increases as shown below.





Inspection of TW Sensor

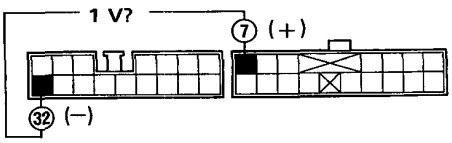
Warm up engine to normal operating temperature (cooling fan comes on).

Measure voltage between ⑦ (Yellow/Green·+) terminal and ㉜ (Black·–) terminal.

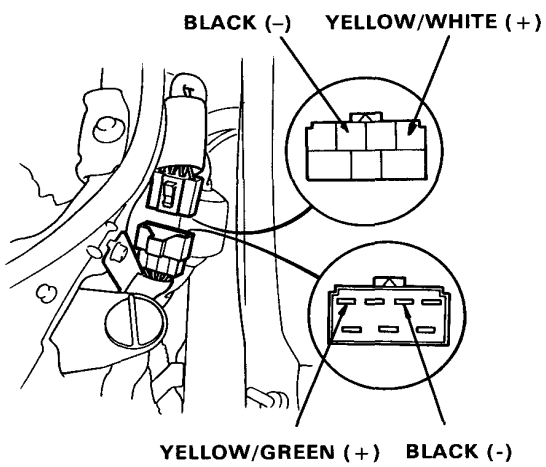
Is there approx. 1 V?

NO → Turn the ignition switch OFF.

YES → TW sensor is OK.

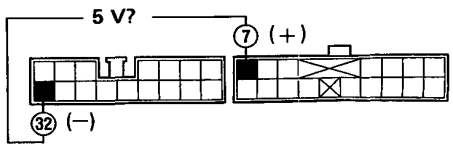


Disconnect the 7P connector at the right front engine compartment.



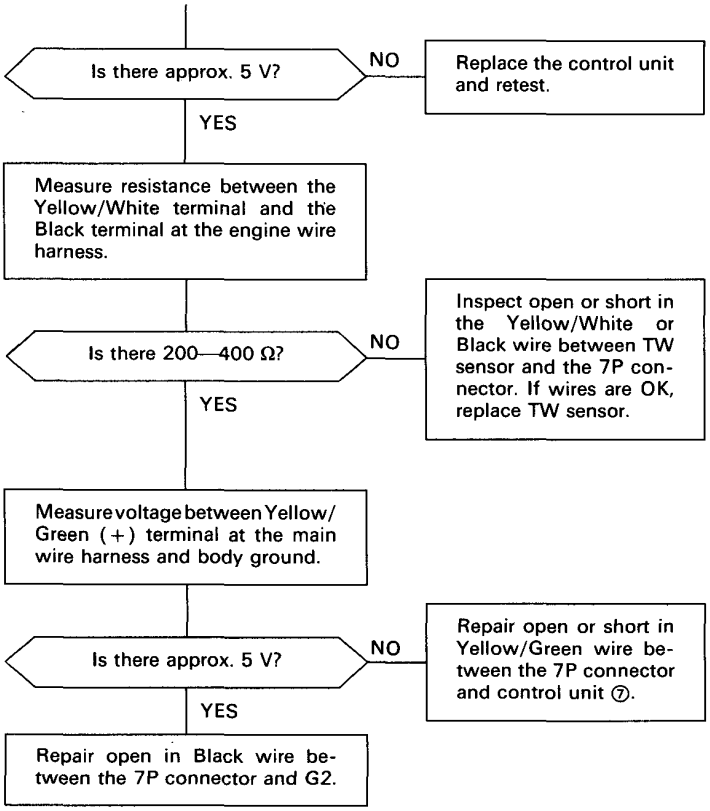
Turn the ignition switch ON.

Measure voltage between ⑦ (Yellow/Green·+) terminal and ㉜ (Black·–) terminal.



(To page 12-191)

(From page 12-190)

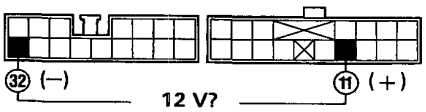


Control Unit Input Troubleshooting

Ignition Coil Signal

This signal allows the control unit to monitor the engine rpm.

Inspection of Ignition Coil Signal



Turn the ignition switch ON.

Measure voltage between ⑪ (Blue·+) terminal and ㉜ (Black·–) terminal.

Is there battery voltage?

NO → Inspect open in Blue wire between the ignition coil and control unit ⑪. If wire is OK, *check the ignition coil* (section 24).

YES

Ignition coil signal is OK.

Speed Pulser

The signal generated by the speed pulser produces 4 pulses for each revolution of the speedometer cable.

Inspection of Speed Pulser

Block rear wheels and set the parking brake. Jack up the front of the car and support with safety stands.

Drive vehicle and operate cruise control.

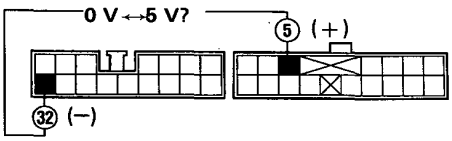
Does cruise control operate properly?

NO → See cruise control speed pulser inspection (section 25)

YES

Turn the ignition switch ON.

Slowly rotate the left front wheel and measure voltage between ⑤ (Yellow·+) terminal and ㉜ (Black·–) terminal.



Does voltage pulse 0 V and 5 V?

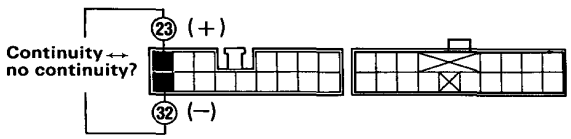
NO → Turn the ignition switch OFF.

YES

Speed pulser is OK.

Disconnect the connectors from the control unit.

Turn the ignition switch ON.



Slowly rotate left front wheel and check for continuity between ㉓ (Black/Yellow·+) terminal and ㉜ (Black·–) terminal.

Is there continuity or no continuity alternately?

NO → Repair open or short in Yellow wire between the combination meter and control unit ⑤.

YES

Replace the control unit and reset.

Control Unit Input Troubleshooting

Vacuum Switch A

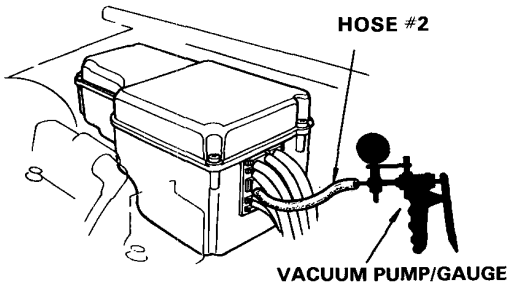
The vacuum switch A signals the control unit when the vacuum level is below 3.1" (80 mmHg).

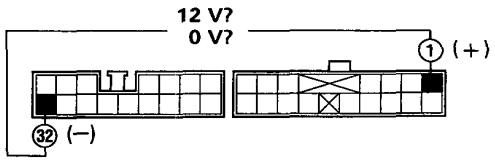
Inspection of Vacuum Switch A

Disconnect the #2 vacuum hose from the vacuum hose manifold and connect a vacuum pump to the hose.

Turn the ignition switch ON.

Measure voltage between ① (Green/Yellow·+) terminal and ㉜ (Black·–) terminal.





Is there battery voltage?

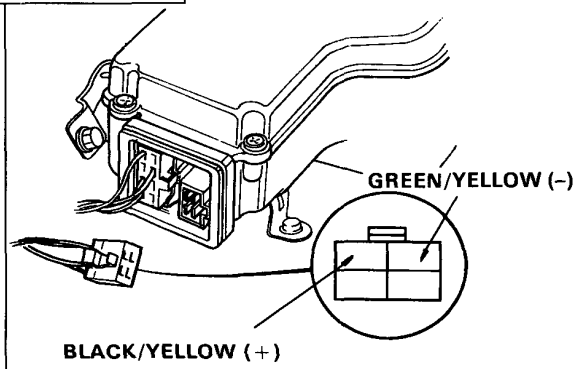
NO → Turn the ignition switch OFF.

YES

Disconnect 4P connector on the control box.

Turn the ignition switch ON.

Measure voltage between Black/Yellow (+) terminal and Green/Yellow (–) terminal on the main wire harness.



Is there battery voltage?

YES → Replace vacuum switch A.

NO

Apply vacuum above 3.1 (80 mmHg).

Measure voltage between ① (Green/Yellow·+) terminal and ㉜ (Black·–) terminal.

Is there voltage?

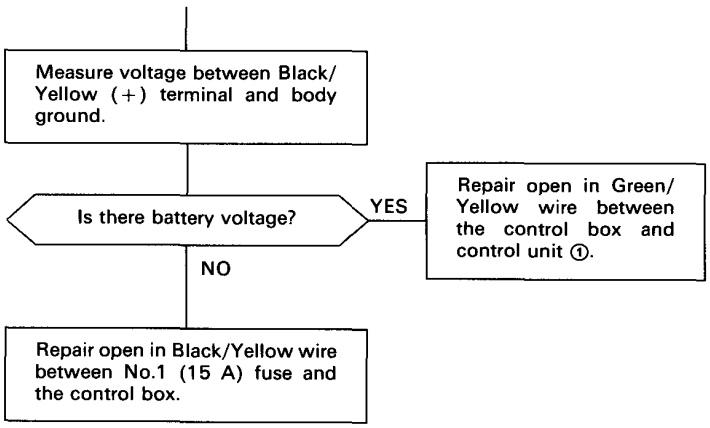
YES → Replace vacuum switch A.

NO

Vacuum switch A is OK.

(To page 12-195)

(From page 12-194)



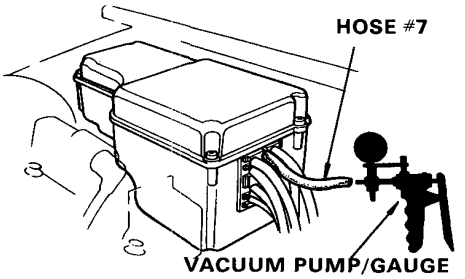
Control Unit Input Troubleshooting

Vacuum Switch B

The vacuum switch B signals the control unit when the vacuum level is below 1.2 (30 mmHg).

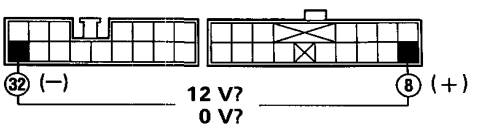
Inspection of Vacuum Switch B

Disconnect the #7 vacuum hose from the vacuum hose manifold and connect a vacuum pump to the hose.



Turn the ignition switch ON.

Measure voltage between ⑧ (Yellow/Blue·+) terminal and ㉜ (Black·–) terminal.



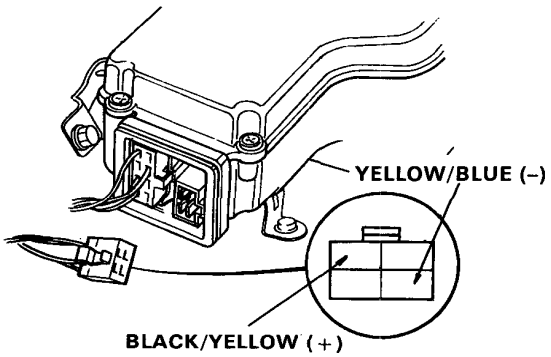
Is there battery voltage?

NO → Turn the ignition switch OFF.

Disconnect 4P connector on the control box.

Turn the ignition switch ON.

Measure voltage between Black/Yellow (+) terminal and Yellow/Blue (–) terminal on the main wire harness.



YES

Apply vacuum above 1.2 (30 mmHg.)

Measure voltage between ⑧ (Yellow/Blue·+) terminal and ㉜ (Black·–) terminal.

Is there voltage?

YES → Replace vacuum switch B.

NO

Vacuum switch B is OK.

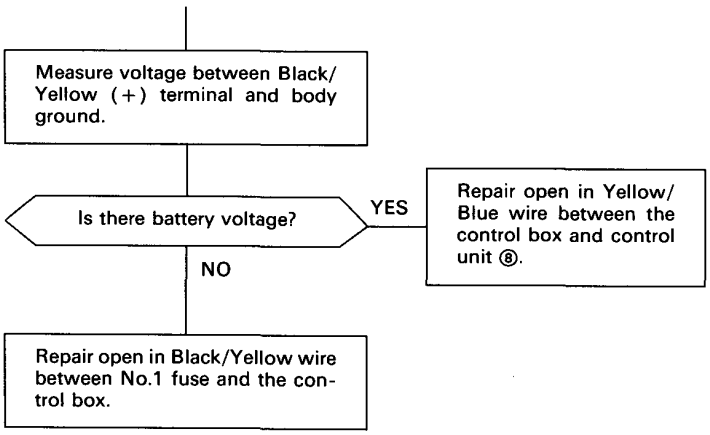
Is there battery voltage?

YES → Replace vacuum switch B.

NO

(To page 12-197)

(From page 12-196)



Control Unit Input Troubleshooting

Vacuum Switch C

The vacuum switch C signals the control unit when the vacuum level is below 2.4 in. Hg (60 mmHg).

Inspection of Vacuum Switch C

Disconnect the #7 vacuum hose from the vacuum hose manifold and connect a vacuum pump to the hose.

Turn the ignition switch ON.

Measure voltage between ② (Yellow/Red·+) terminal and ㉜ (Black·–) terminal.

Is there battery voltage?

NO → Turn ignition switch OFF.

YES

Apply vacuum above 2.4 in. Hg (60 mmHg).

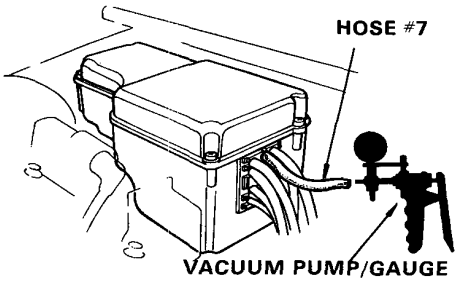
Measure voltage between ② (Yellow/Red·+) terminal and ㉜ (Black·—) terminal.

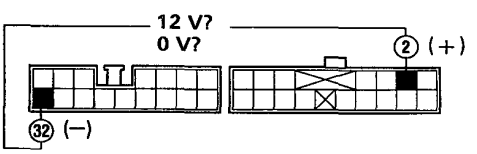
Is there voltage?

YES → Replace vacuum switch C.

NO

Vacuum switch C is OK.



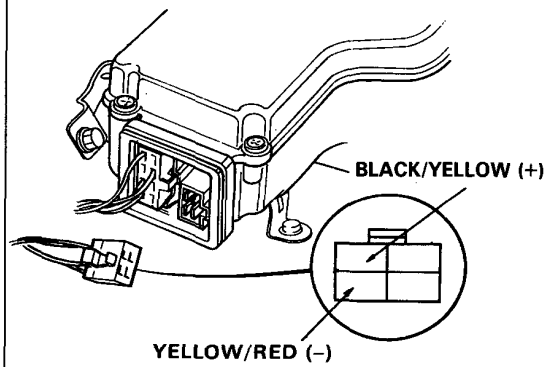


Turn ignition switch OFF.

Disconnect 4P connector on the control box.

Turn the ignition switch ON.

Measure voltage between Black/Yellow (+) terminal and Yellow/Red (–) terminal on the main wire harness.



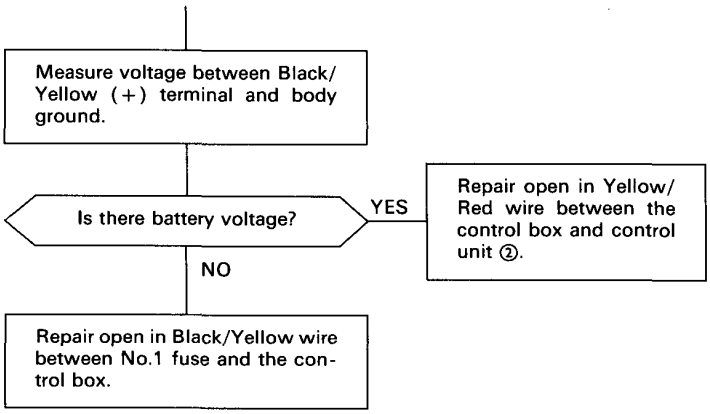
Is there battery voltage?

YES → Replace vacuum switch C.

NO

(To page 12-199)

(From page 12-198)



Control Unit Input Troubleshooting

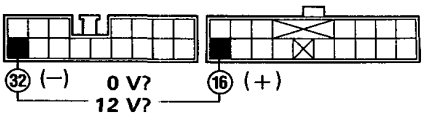
Clutch Switch Signal

This signals the control unit when the clutch is engaged.

Inspection of Clutch Switch Signal

Turn the ignition switch ON.

Measure voltage between ⑯ (Pink·+) terminal and ㉜ (Black·–) terminal.



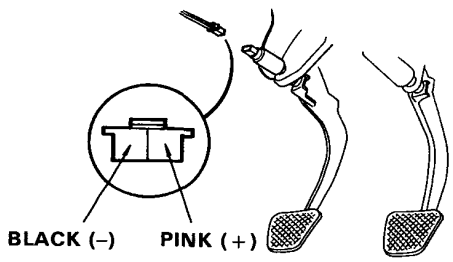
Is there below 3 V?

NO → Turn the ignition switch OFF.

YES

Disconnect the 2P connector on the clutch switch.

Check for continuity between the 2 terminals on the clutch switch.



Does continuity exist?

YES → Replace the clutch switch.

NO

Turn the ignition switch ON.

Measure voltage between Pink (+) terminal and body ground.

Is there battery voltage?

NO → Repair open in Pink wire between the clutch switch and control unit ⑯.

YES

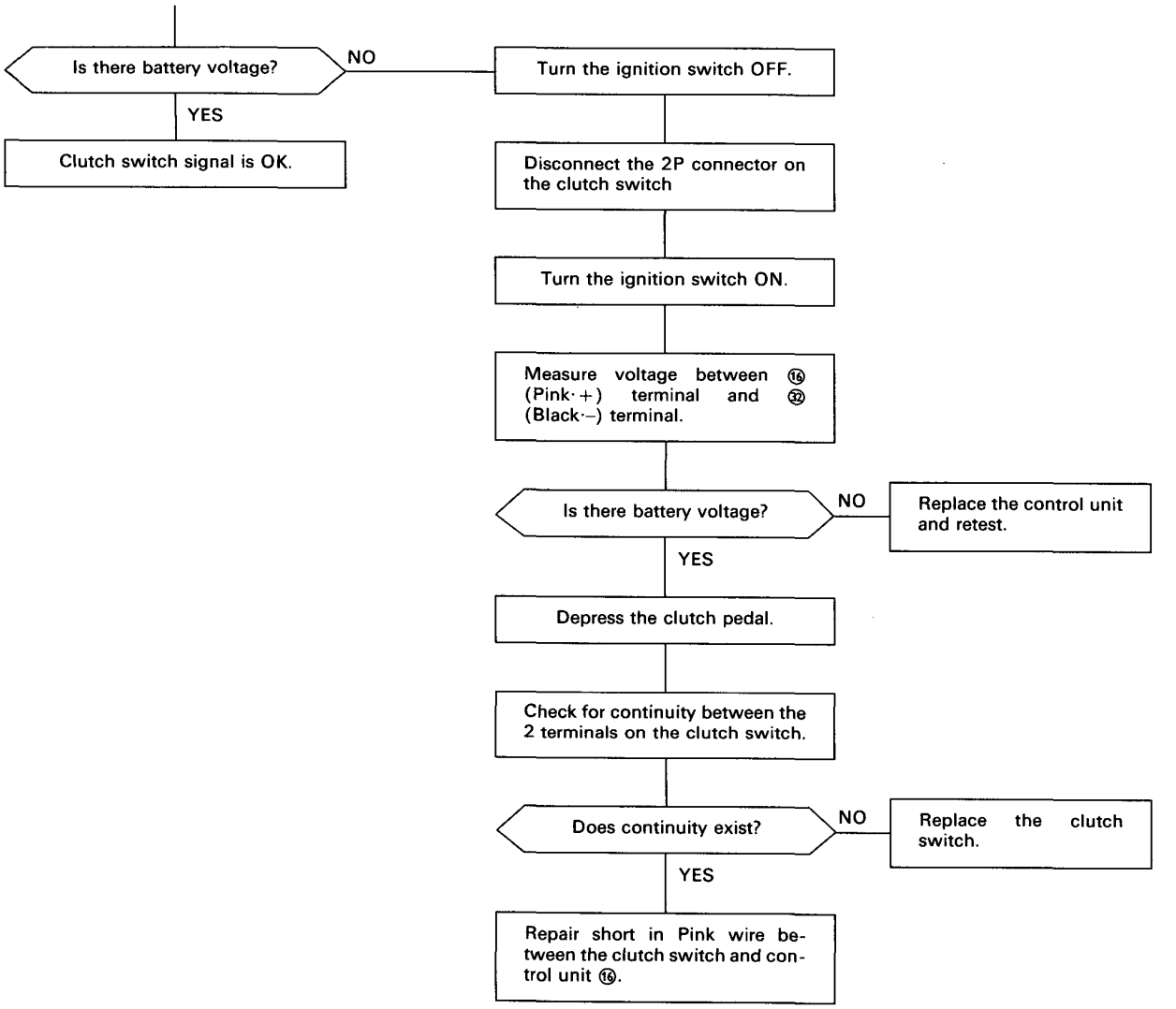
Repair open in Black wire between the clutch switch and G10.

Depress the clutch pedal.

Measure voltage between ⑯ (Pink·+) terminal and ㉜ (Black·–) terminal.

(To page 12-201)

(From page 12-200)



Control Unit Input Troubleshooting

A/T Shift Position Signal

This signals the control unit when the transmission is in Neutral or Park.

Inspection of A/T Shift Position Signal

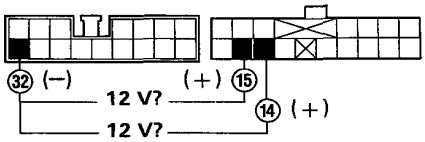
Turn the ignition switch ON.

Observe the A/T shift indicator and select each position separately.

Does the indicator light properly? NO → See A/T shift position Indicator inspection.

YES

Measure voltage between ㉜ (Black • −) terminal and, individually: ⑭ (Green • +), and ⑮ (Green/White • +) terminals, in gear (except Neutral or Park).



Is there battery voltage? NO → Turn the ignition switch OFF.

YES

Disconnect the connectors from the control unit.

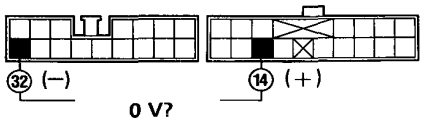
Check for continuity between ㉜ (Black) and, individually: ⑭ (Green), and ⑮ (Green/White) terminals.

Does continuity exist? YES → Repair short in Green or Green/White wire between the A/T shift position indicator switch and control unit ⑭ or ⑮.

NO

Replace the control unit.

Measure voltage between ⑭ (Green·+) terminal and ㉜ (Black·−) terminal in Neutral position.



(To page 12-203)

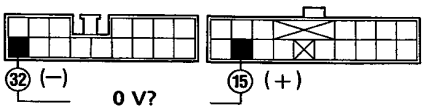
(From page 12-202)

Is there below 3 V?

NO → Repair open in Green wire between the A/T shift indicator switch and control unit ⑭.

YES

Measure voltage between ⑮ (Green/White·+) terminal and ㉜ (Black·–) terminal in Park position.



0 V?

Is there below 3 V?

NO → Repair open in Green/White wire between the A/T shift indicator switch and control unit ⑮.

YES

A/T shift position signal is OK.

Control Unit Input Troubleshooting

A/C Switch Signal

This signals the control unit when there is demand for the air conditioning circuits (A/C switch).

Inspection of A/C Switch Signal

Start engine.

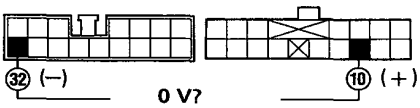
Turn the blower switch ON.

Turn the A/C switch ON.

Does the A/C operate? NO → See air conditioner inspection.

YES

Measure voltage between ⑩ (Blue/Red·+) terminal and ㉜ (Black·–) terminal.



0 V?

Is there below 3 V? NO → Repair open in Blue/Red wire between the A/C switch and control unit ⑩.

YES

A/C switch signal is OK.

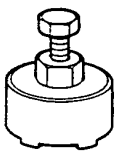
Automatic Transmission (F4 type)

Outline of Model Changes

- The secondary valve body is newly equipped with 2-1 TIMING VALVE. Change in the service procedure are discribed

Special Tool

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07HAF—PK40100	Gear Installer	1	



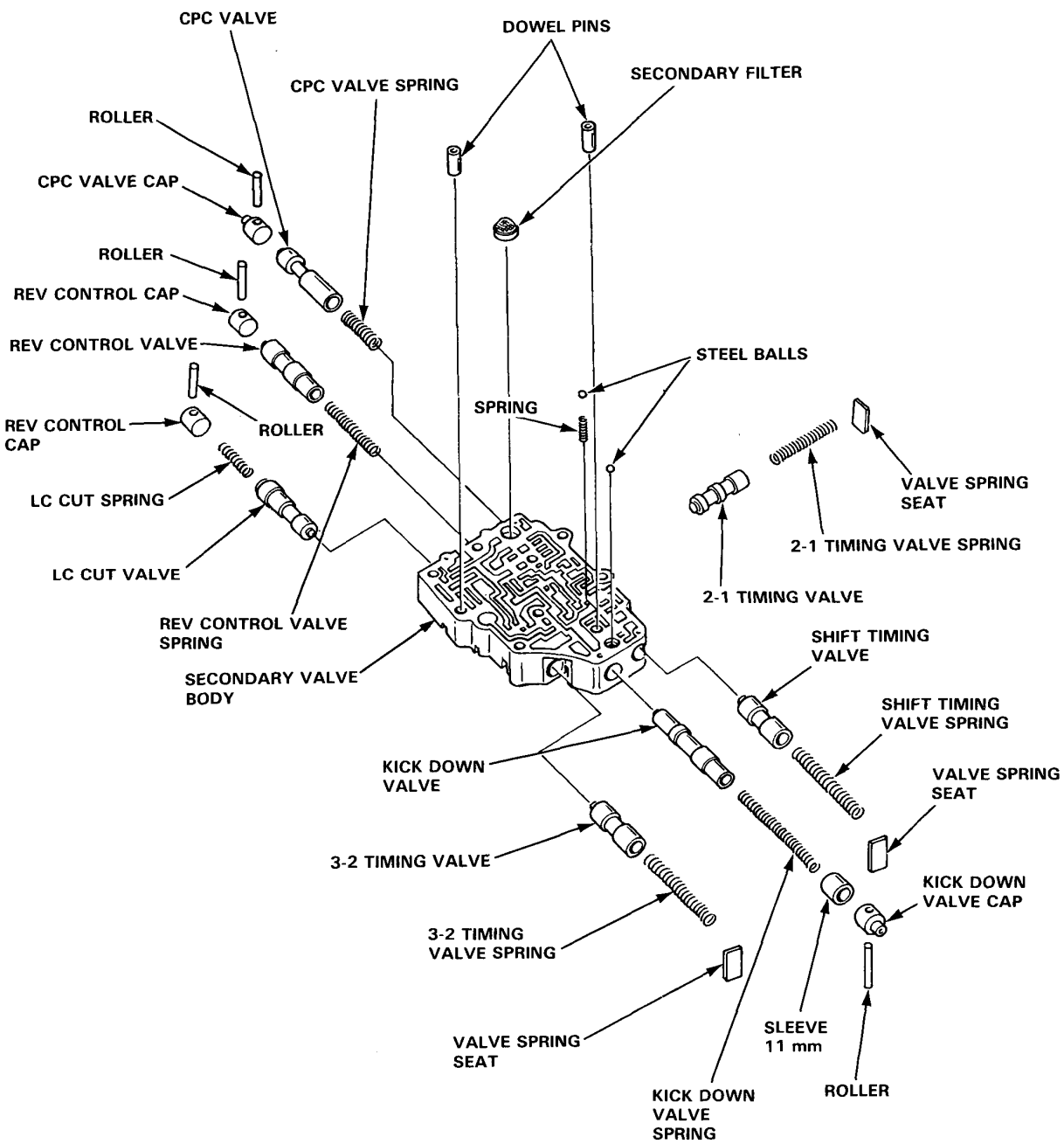
①

Secondary Valve Body

Disassembly/Inspection/Reassembly

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air. Blow out all passages.
- Check all valves for free movement. If any fail to slide freely.

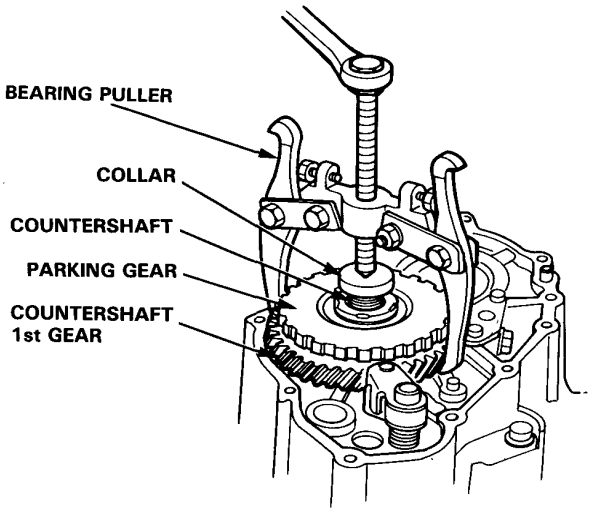


Parking Gear

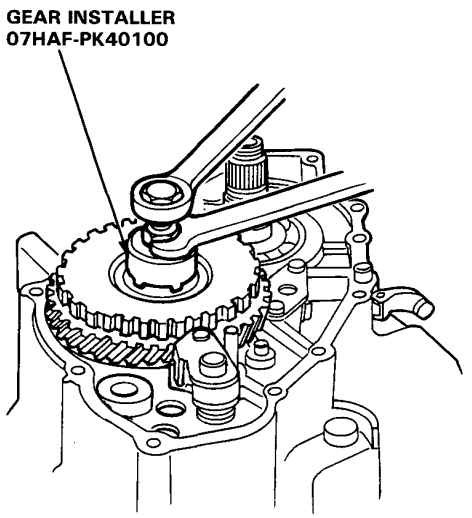
Removal/Installation

1. Remove the parking gear and countershaft 1st gear as a unit with the bearing puller.

   NOTE: Install the collar on the countershaft to prevent it from damage.



2. Install the parking gear and countershaft 1st gear on the countershaft with the parking gear installer. Loosely install a new lock nut on the countershaft.



Power Steering

Gearbox

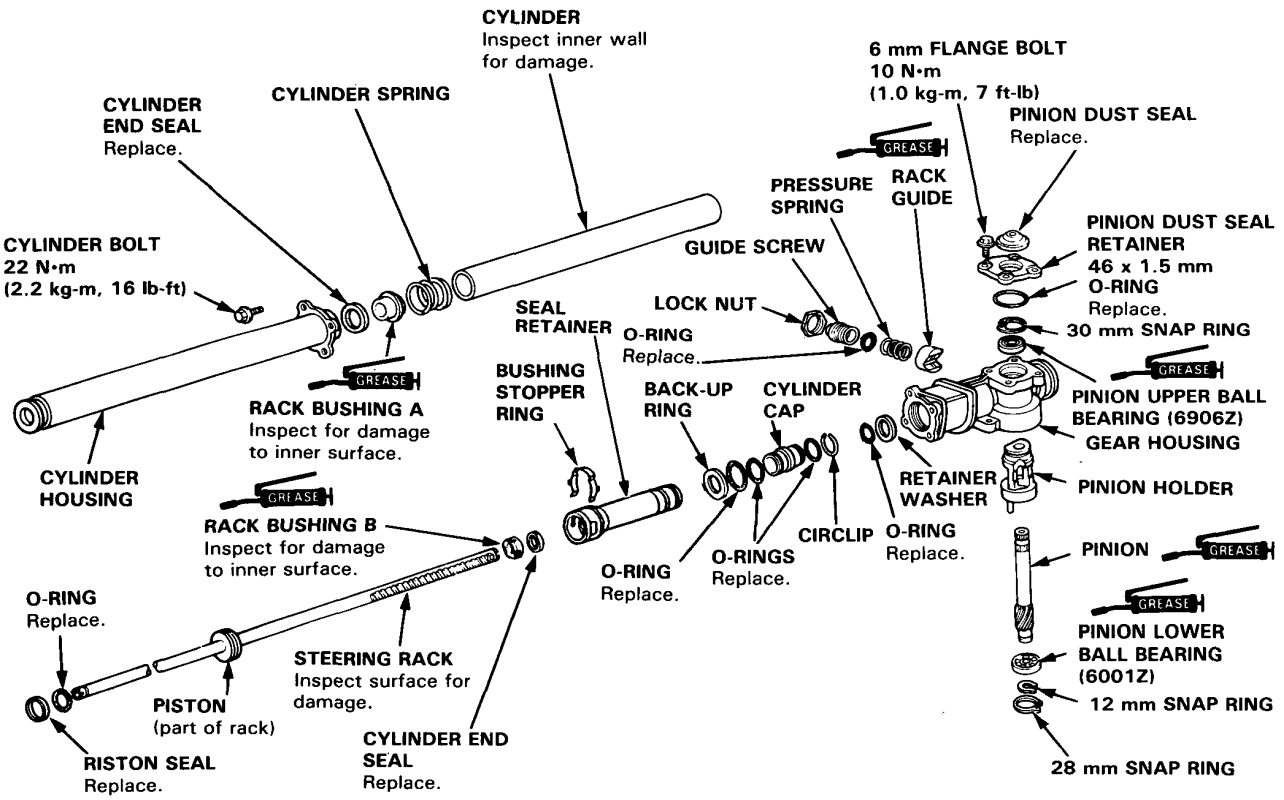
Outline of Model Changes

Due to the revision of the steering rack bushing installation B, the cylinder end seal replacement is included in this section.

Gearbox

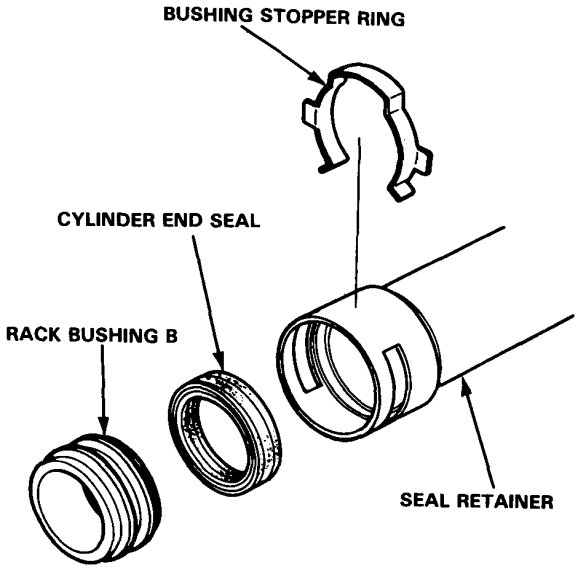
Inspection

- Before disassembling the gearbox, wash it off with solvent and a brush.
- Thoroughly clean all disassembled parts.
- Always replace O-rings and seals.
- Replace parts with damaged sliding surfaces.
- Do not dip seals and O-rings in solvent; coat O-rings with grease, and make sure they stay in position during reassembly.
- GREASE STEERING GREASE ..... Honda parts number 08740–99969

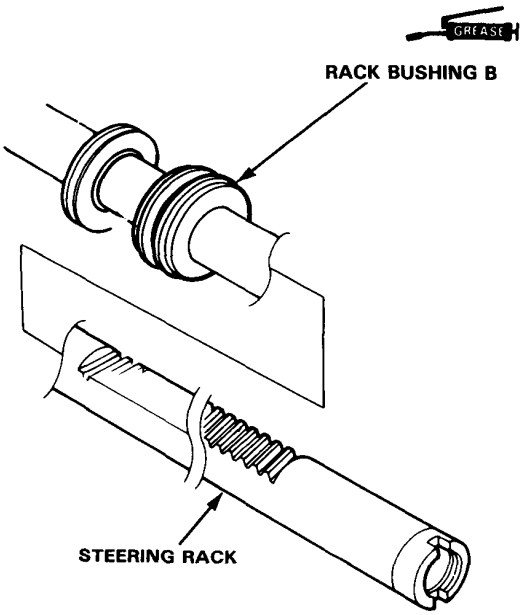


Cylinder End Seal Replacement

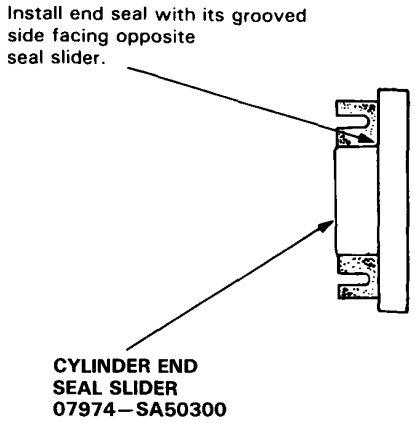
1. Remove the bushing stopper ring from the seal retainer.
2. Remove the cylinder end seal.



3. Grease the sliding surface of the steering rack bushing B, and install the bushing on the steering rack with the groove of the bushing facing the steering piston.

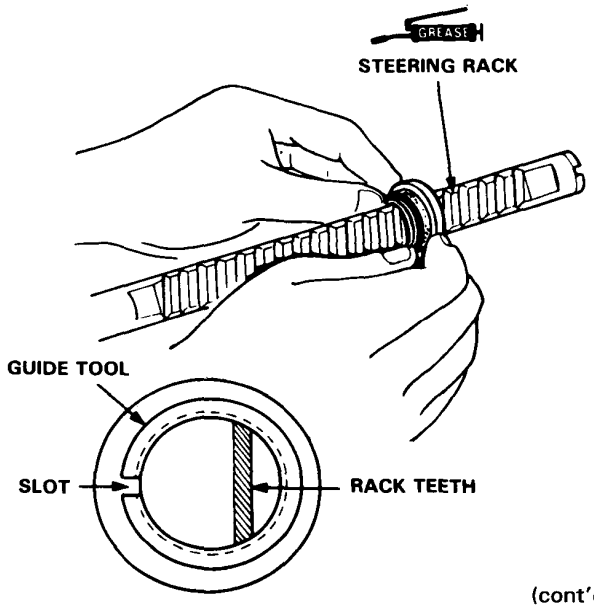


4. Grease the sliding surface of the new cylinder end seal, and the cylinder end seal slider, then set the seal on the seal slider with its grooved side facing opposite the slider.



5. Grease the steering rack, and install the cylinder end seal.

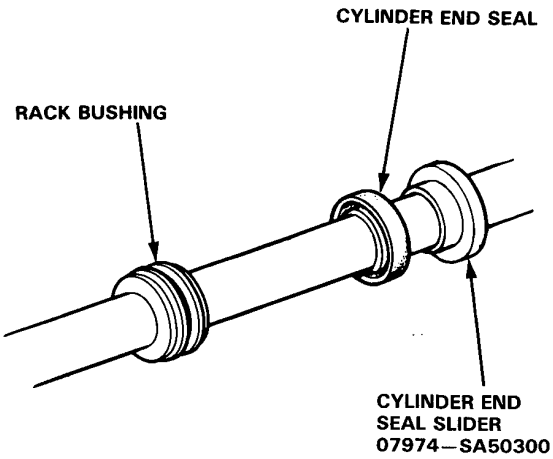
CAUTION: Make sure the rack teeth do not face the slot in the guide tool.



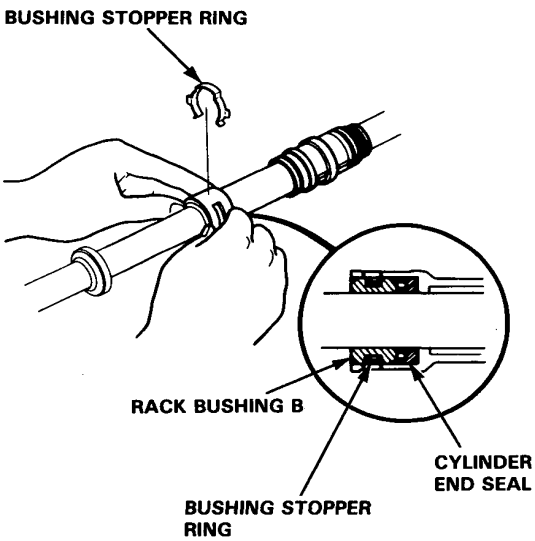
(cont'd)

Cylinder End Seal Replacement (cont'd)

6. Remove the guide tool from the cylinder end seal, then separate the ends of the tool and remove it from the rack.



7. Push the steering bushing B toward the seal retainer by hand until the cylinder end seal seated in the retainer. Fit the seal stopper ring in the groove of the seal retainer securely.



Brakes (ALB)

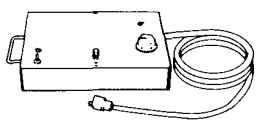
Outline of Model Changes

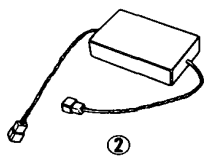
Due to the adoption of 3 channel (Front left and right and rear) standalone ALB, technical features, troubleshootings and service of the modulator-related parts are included in this section.

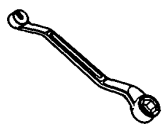
Special Tools

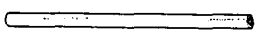
Special Tools

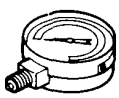
Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07508—SB00000	ALB Checker	1	
②	07HAJ—SG00300	ALB Checker Adaptor	1	
③	07907—SB00000	ALB-T Wrench	1	
④	07921—0010001	Flair Nut Wrench	1	
⑤	07965—5790300	Cup Guide	1	
⑥	07510—6340300	Vacuum Joint Tube A	1	
⑦	07404—5790300	Vacuum Gauge	1	
⑧	07410—5790500	Vacuum Tube Joint Adaptor	1	
⑨	07406—5790200	Pressure Gauges	2	
⑩	07410—5790100	Pressure Gauge Attachment	2	
⑪	07510—6340100	Pressure Gauge Joint Pipe	1	
⑫	07HAK—SG00110	Pressure Gauge Joint Pipe	1	

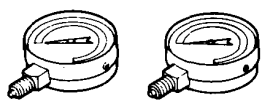


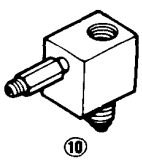


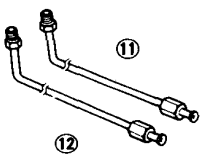










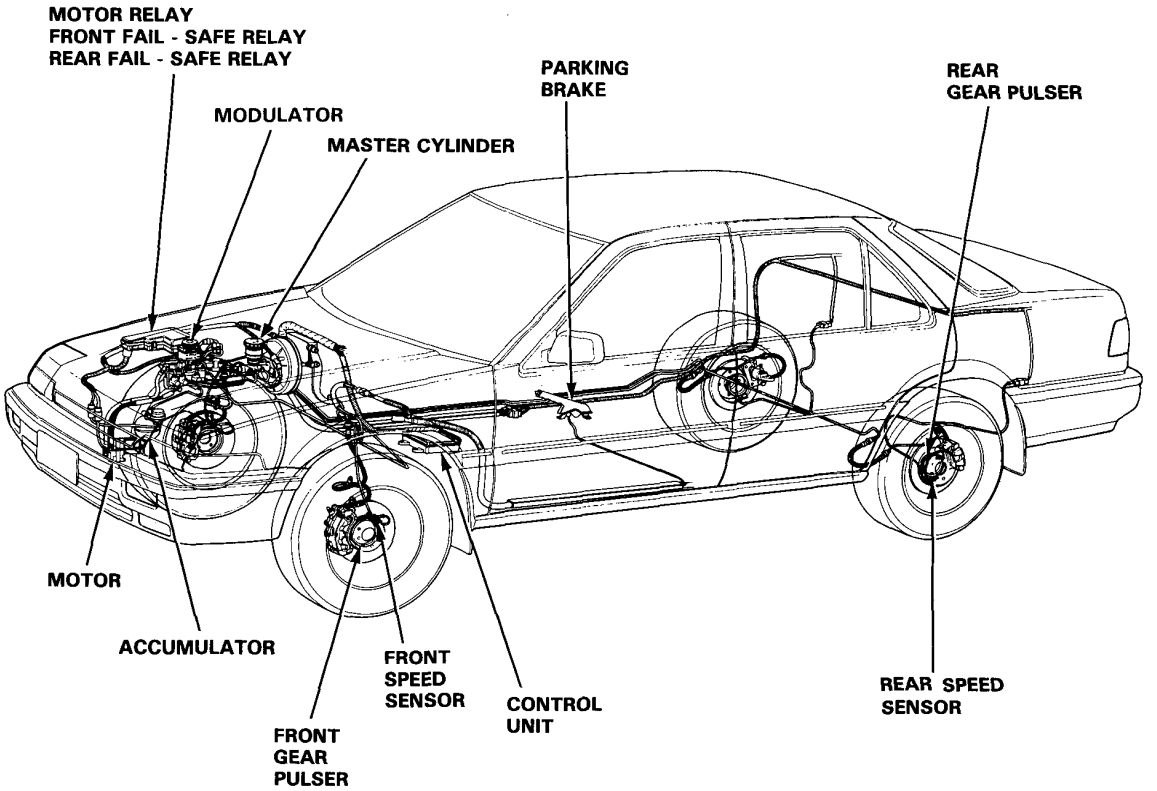


Outline

When operating the brakes hard during running, the wheels sometimes lock before the vehicle stops. Loss of stability will result if the rear wheels lock. Maneuverability will be impared in the case of the front wheel locking. To prevent wheel from locking it is necessary to instantly reduce the pressure in the caliper when the wheel is about to be locked. The pressure must be restored immediately after the possibility of locking is over. The ALB is a system for preventing the wheel from locking by automatically repeating application and relieving of brake pressures.

Features

- Stable braking performances are obtained regardless of road surfaces and loading conditions.
- Maneuverability is assured by preventing the wheel from locking.
- When the ALB system works, kickbacks on the brake pedal occur, allowing the driver to perceive the road surface conditions.
- With the fail-safe function incorporated, the braking performance or vehicle stability will not be impared much even if the ALB system fails.

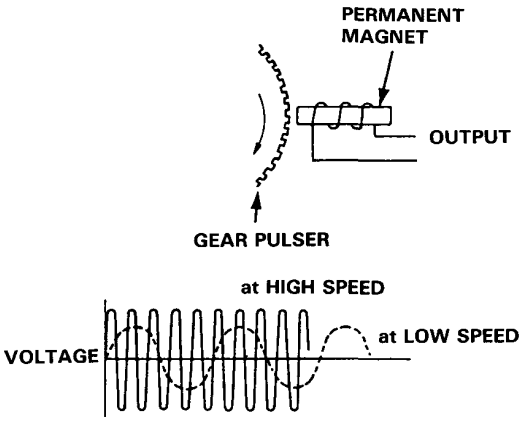


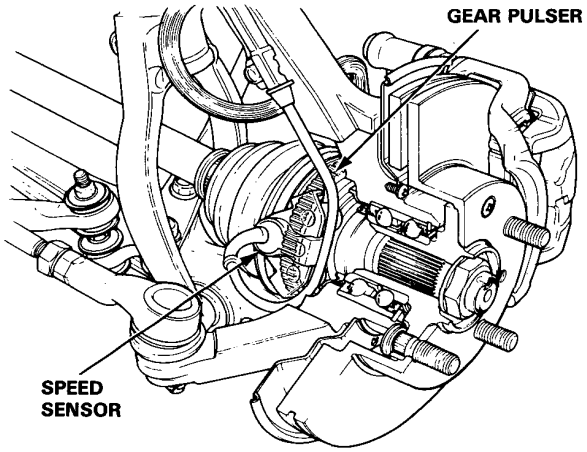
Construction

The ALB system consists of the following components: gear pulsers attached to the rotating part of each wheel; speed sensors for generating pulse signals in proportion to the rotation of the gear pulser; a control unit which computes signals from speed sensors and switches to control the ALB system; a modulator, which is operated by electric currents from the control unit, for regulating the hydraulic pressure to each caliper; an accumulator for storing high pressure fluid; a pressure switch for detecting the pressure in the accumulator and sending signals to the control unit; a power unit for feeding high pressure liquid to the accumulator by a pump; a motor relay for the power unit motor; a fail safe relay for stopping the operation of the solenoid valve when the fail safe system is operating, a warning lamp and others.

Speed Sensor

The speed sensor is a contactless type and it detects the rotating speeds of a wheel. It is composed of a permanent magnet and coil. When the gear pulsers attached to the rotatory parts of each wheel (front wheel: outboard joint of the driveshaft, rear: hub bearing unit) turn, the magnetic flux around the coil in the speed sensor alternates, generating voltages with frequency in proportion to wheel rotating speed. These pulses are inputted into the control unit and the control unit identifies the wheel speeds.



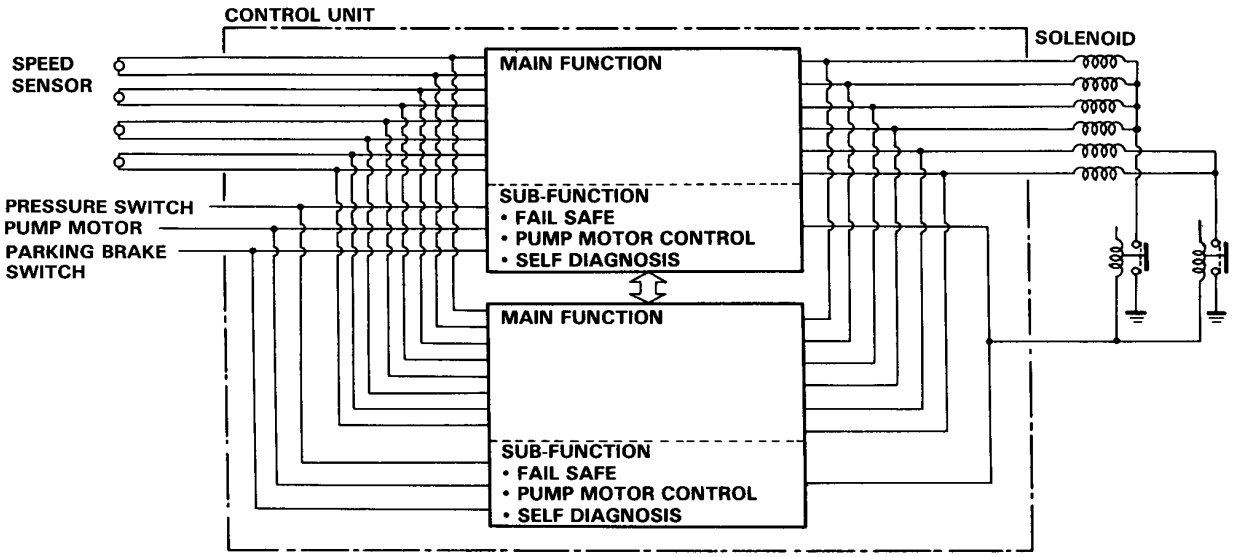


Control Unit

The control unit has the main function for commanding the ALB operations and the sub-function for pump motor control, self-diagnosis, etc.

(1) Main-function
By computing output signals from speed sensors, the control unit operates the solenoid valves in the modulator in order to control the ALB operations. The HONDA ALB system controls the front brakes independently. The rear brakes are controlled simultaneously. Either one of two rear wheels turning slower than the other is given priority to initiate ALB function. This method is termed "low select".

(2) Sub-function
The sub-function includes pump motor controls, self-diagnosis, etc. necessary to support the functions for ALB operations.

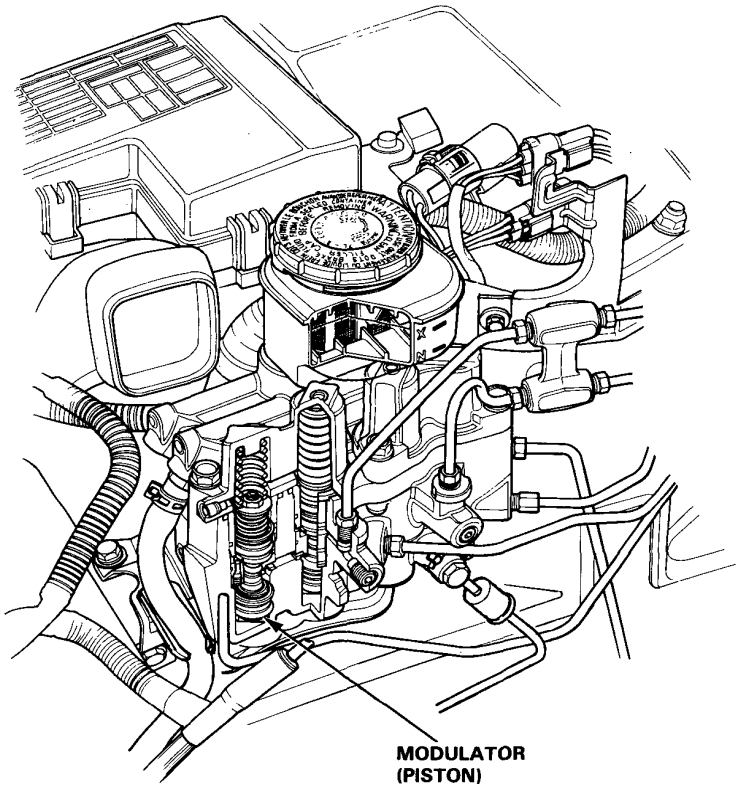


1. Self-Diagnosing Function
Since the ALB system reduces the brake pressure automatically regardless of the driver's intention, a failure in an ALB system would impare the braking performance or the ALB function. In order to prevent this, a self-diagnosing function is provided in the control unit as a sub-function.
Except when the vehicle speed is below 10 km/h, the self-diagnosing circuit monitors the main functions by sending signals at one second intervals. When abnormality is detected by the self-diagnosis, the ALB warning light is instantly turned on. If something abnormal happends to the solenoid valve, the ALB warning light is also lit. Even when the ALB warning light is lit, the main brake funcitons normally but the ALB system does not operate.

2. Fail-Safe Function
When abnormality is detected in the control system by the self-diagnosis, the solenoid operations are suspended by turning off the relay (fail safe relay) which disconnects the ground lines of all the solenoid valves to inhibit ALB operations. Under these conditions, the braking system functions just as an ordinary one, maintaining the necessary braking function. When the ALB warning light is turned on, it means the fail-safe is functioning.

Modulator Unit

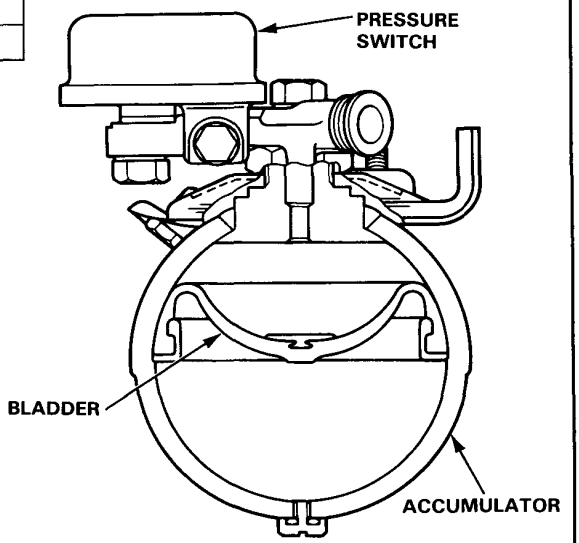
Modulators for each wheel and solenoid valves are integrated in the modulator unit.
The modulators for front and rear brakes are of independent construction and they are positioned vertically for improved maintainability. The modulators for rear brakes are provided with a PCV function (Proportioning Control Valve) in order to prevent the rear wheel from locking when the ALB is malfunctioning or the ALB is not activated.
The solenoid valve features quick response (5 ms or less).
The inlet and outlet valves are integrated in the solenoid valve unit. There are three solenoid valves provided, each one for the front-right wheel, for the front-left wheel and for the rear wheels.



Accuumlator

The accumulator is a pneumatic type which accumulates high pressure brake fluid fed from the pump incorporated in the power unit. When the ALB operates, the accumulator feeds high pressure brake fluid to the modulator valve via the inlet side of the solenoid valve.

Maximum Operating Pressure	230 kg/cm^2
Filled Gas	Nitrogen Gas
Charging Pressure	121 kg/cm (0°C)
Volume	290 cm^3

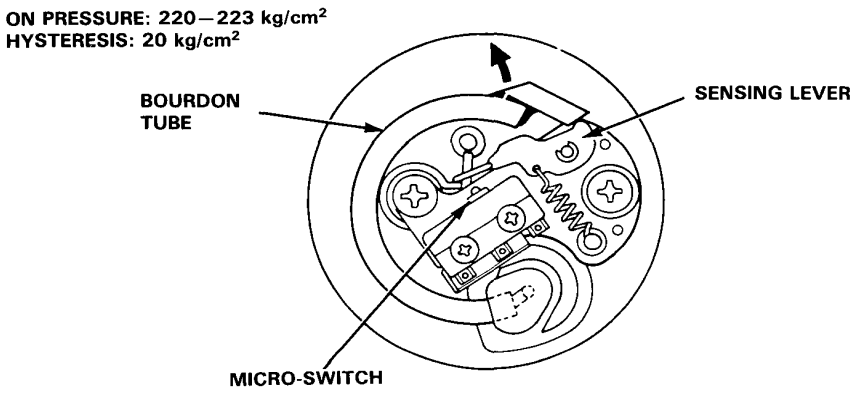


Pressure Switch

The pressure switch monitors the pressure accumulation (pressure from the pump) in the accumulator and is turned off when the pressure becomes lower than a prescribed level. When the pressure switch is turned off, the switching signal is sent to the control unit. Upon receiving the signal, the control unit activates the pump motor relay to operate the motor. If the pressure doesn't reach the prescribed value, the ALB warning lamp is turned on.

Operation

When the pressure in the accumulator rises, the Bourdon tube in the pressure switch deforms outwards. When the free end of the Bourdon tube moves more than the prescribed amount, the micro switch is activated by the force of the spring attached to the sensing lever. When the pressure in the accumulator decreases due to ALB operations, the Bourdon tube moves in the direction opposite to the one described above, and the micro-switch is eventually turned off. Upon receiving this signal, the control unit activates the motor relay to operate the motor.

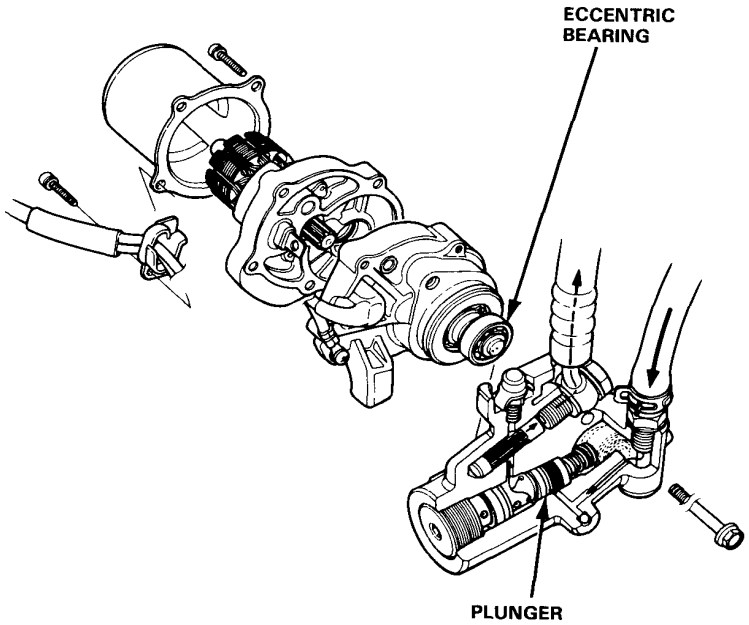


Technical Features

Power Unit

The power unit consists of a motor and a plunger pump. Since an eccentric bearing is positioned on the end of the motor shaft, the rotation of the motor provides the reciprocating motion of the plunger. The brake fluid is thus pressurized and fed to the accumulator.
As the motor rotates more and the pressure in the accumulator exceeds the prescribed level, the pressure switch is turned on. Approx. 3 seconds after receiving the ON- signal, the control unit stops the motor relay operation. In this state, the pressure in the accumulator reaches 230 kg/cm^2.
If the pressure doesn't reach the prescribed value after the motor has continuously operated for 120 seconds or more, the control unit stops the motor and activates the ALB warning light.

Output	200W
Plunger Diameter	6 ϕ
Plunger Stroke	5.8 mm
Discharge Rate	170 cm^3/min. (at 200 kg/cm^2)



ALB Warning Light

This warning system turns on the ALB warning light when one or more of the below described abnormalities is detected.

- When the operating time of the motor in the power unit exceeds 120 seconds.
- When vehicle running time exceeds 30 seconds without releasing the parking braking brake lever.
- When one of the rear wheels is locked during running.
- When absence of speed signals from anyone of the four speed sensors is detected.
- When the activation time of all solenoids exceeds a given time or an open circuit is detected in the solenoid system.
- When solenoid output is not detected in the simulated ALB operation carried out during running at speed of 10 km/h or more.

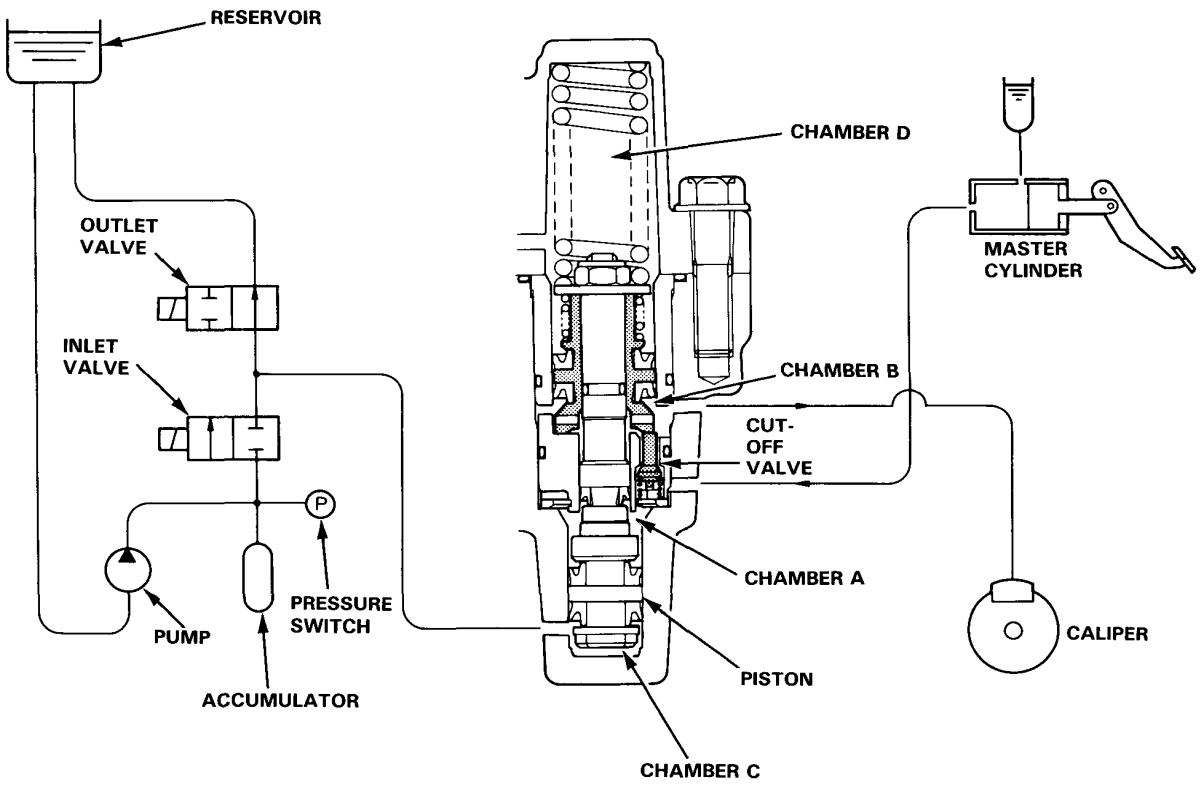
To check the bulb of the warning light, the light is activated when the ignition switch is turned on. It is turned off after the engine is started if there is no abnormality in the system.

Operation

Ordinary Braking Function

In ordinary brake operations, the cut-off out valve in the modulator is open to transmit the hydraulic pressure from the master cylinder to the brake calipers via the chamber A and the chamber B.

The chamber C is connected to the reservoir through the outlet valve which is normally open. It is also connected to the hydraulic pressure source (pump, accumulator, pressure switch, etc.) via the inlet valve which is normally closed. The chamber D serves as an air chamber. Under these conditions, the pressures of the chambers C and D are maintained at about the atmospheric pressure, permitting regular braking operations.



(cont'd)

Operation (cont'd)

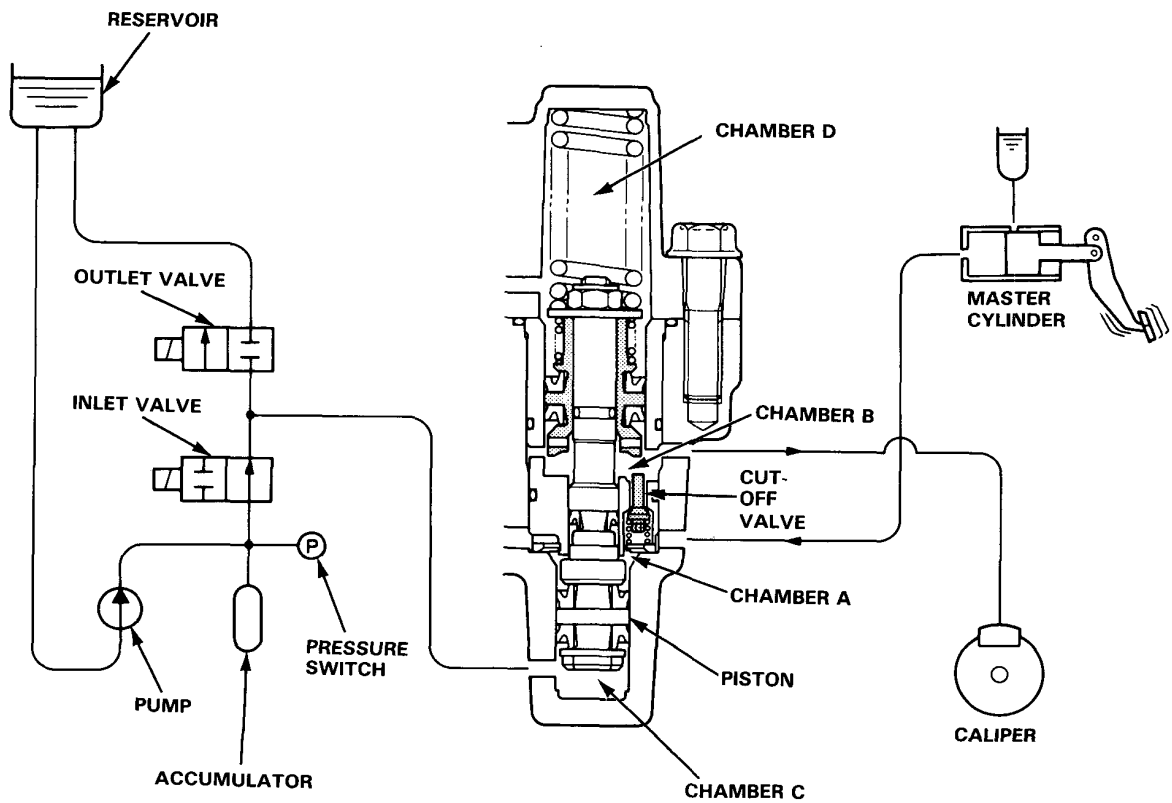
If brake inputs (force excerted on brake pedal) are excessively large and a possibility of wheel locking occurs, the control unit operates the solenoid valve, closing the outlet valve and opening the inlet valve. As a result, the high pressure is directed into chamber C, the piston is pushed upward, causing the slide piston to move upward and the cut-off valve to close.

As the cut-off valve closes, the flow from the master cylinder to the caliper is interrupted, the volume of the chamber B, which is connected to the caliper, increases, and the fluid pressure in the caliper declines.

When both of the two valves, inlet and outlet, are closed (this means when only the outlet valve is activated) the pressure in the caliper is maintained constant.

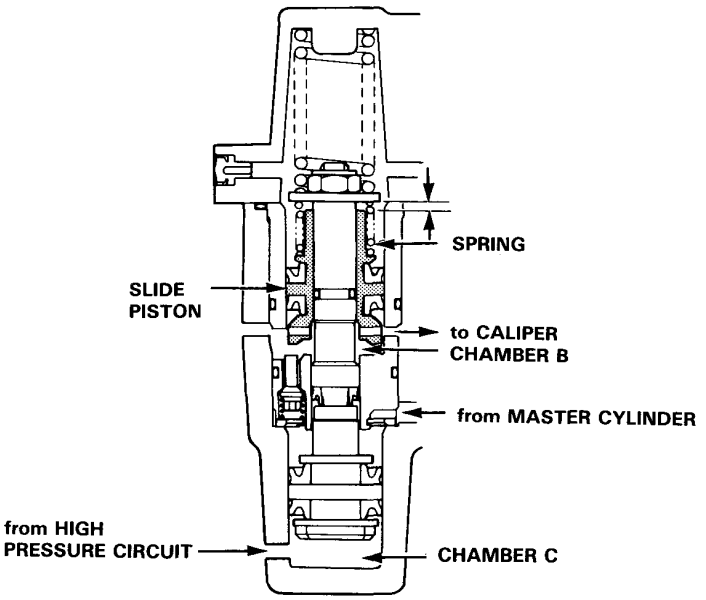
When the possibility of wheel locking ceases, it is necessary to restore the pressure in the caliper. The solenoid valve is therefore turned off (outlet valve: open, inlet valve closed).

Process	Caliper Pressure	Outlet Valve		Inlet Valve	
		Electric Power	Hydraulic Circuit	Electric Power	Hydraulic Circuit
Caliper pressure declining	→	ON	Close	ON	Open
Caliper pressure constant	→	ON	Close	OFF	Close
Caliper pressure increasing	→	OFF	Open	OFF	Close



Slide Piston Function

When the car is used under such condition as the tires bounce hard on rough roads or on gravel roads, the ALB may function excessively, causing an excessively large volume of brake fluid to flow into the chamber C. As this occurs, the piston is moved excessively, resulting in an abnormal loss of pressure in the chamber B. In order to overcome this problem, the slide piston is kept in a proper position by the spring force to avoid the pressure in the chamber B to become negative.



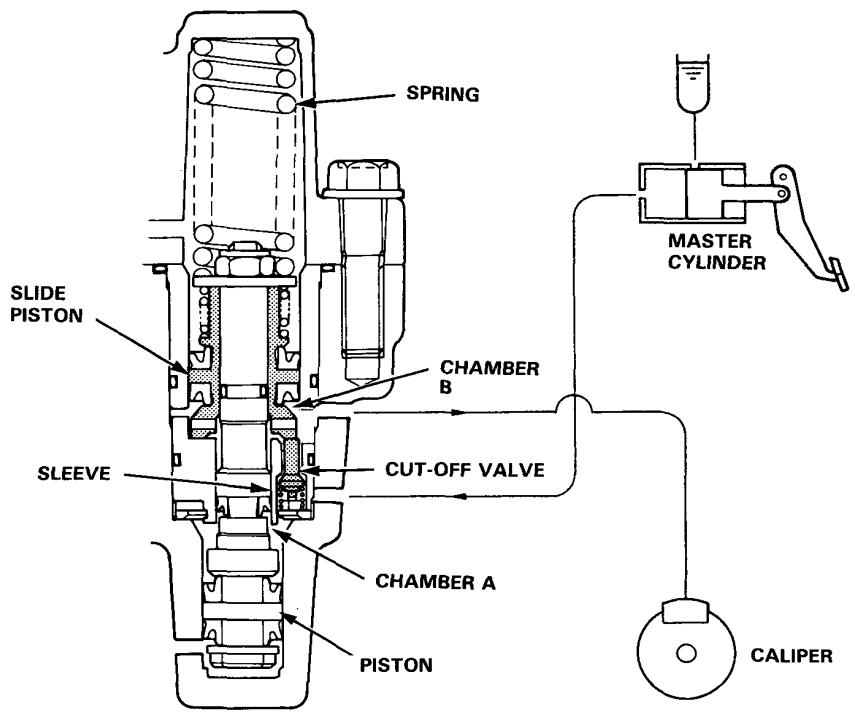
(cont'd)

Operation (cont'd)

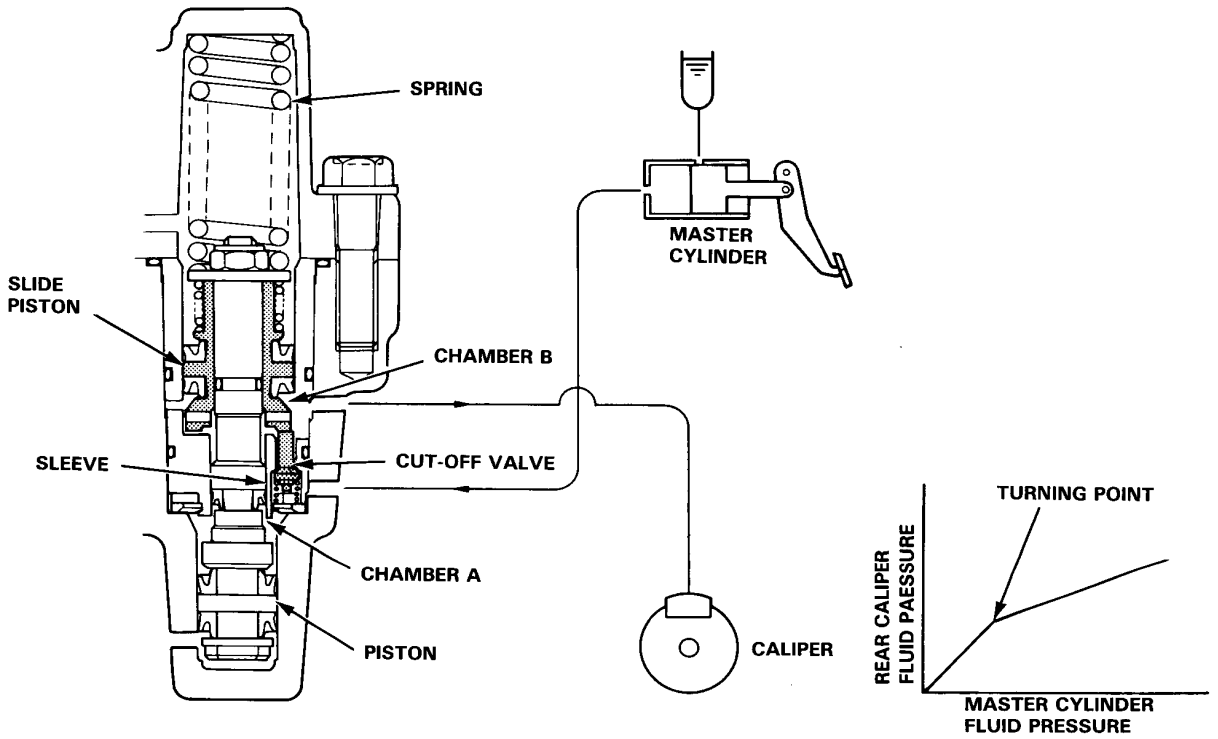
Kickback
When ALB is functioning, the piston moves upward, the volume of the chamber B increases, and the fluid pressure on the caliper side is reduced. At the same time, the volume of the chamber A is reduced and the brake fluid is returned to the master cylinder. When the brake fluid is pushed back to the master cylinder, the driver can feel the functioning of the ALB because the brake pedal is kicked back.

PCV (Proportioning Control Valve) Function
In the modulator for the rear wheels, the diameters of the piston and the slide piston are distinctly different. Provide by this construction is a PCV (Proportioning Control Valve) function for preventing the rear wheel from locking when an emergency braking is performed.

(1) Before the Turning Point
1) When the fluid pressure from the master cylinder is below the turning point, the cut-off valve is always pushed downward by the force of spring via the slide piston.
Under these conditions, there is a gap between the cut-off valve shoulder and the sleeve. The chamber A and the chamber B are therefore connected through the gap. The pressure from the master cylinder flows into the rear calipers through the chamber A and the chamber B.



2) When the fluid pressure from the master cylinder reaches the turning point, the force on the slide piston overcomes the force of spring, causing the slide piston to travel upward.
The cut-off valve, previously being in contact with the bottom of the slide piston, then moves upward and the cut-off valve shoulder hits the sleeve, blocking the fluid passages (the fluid pressure at this point is called the turning point).

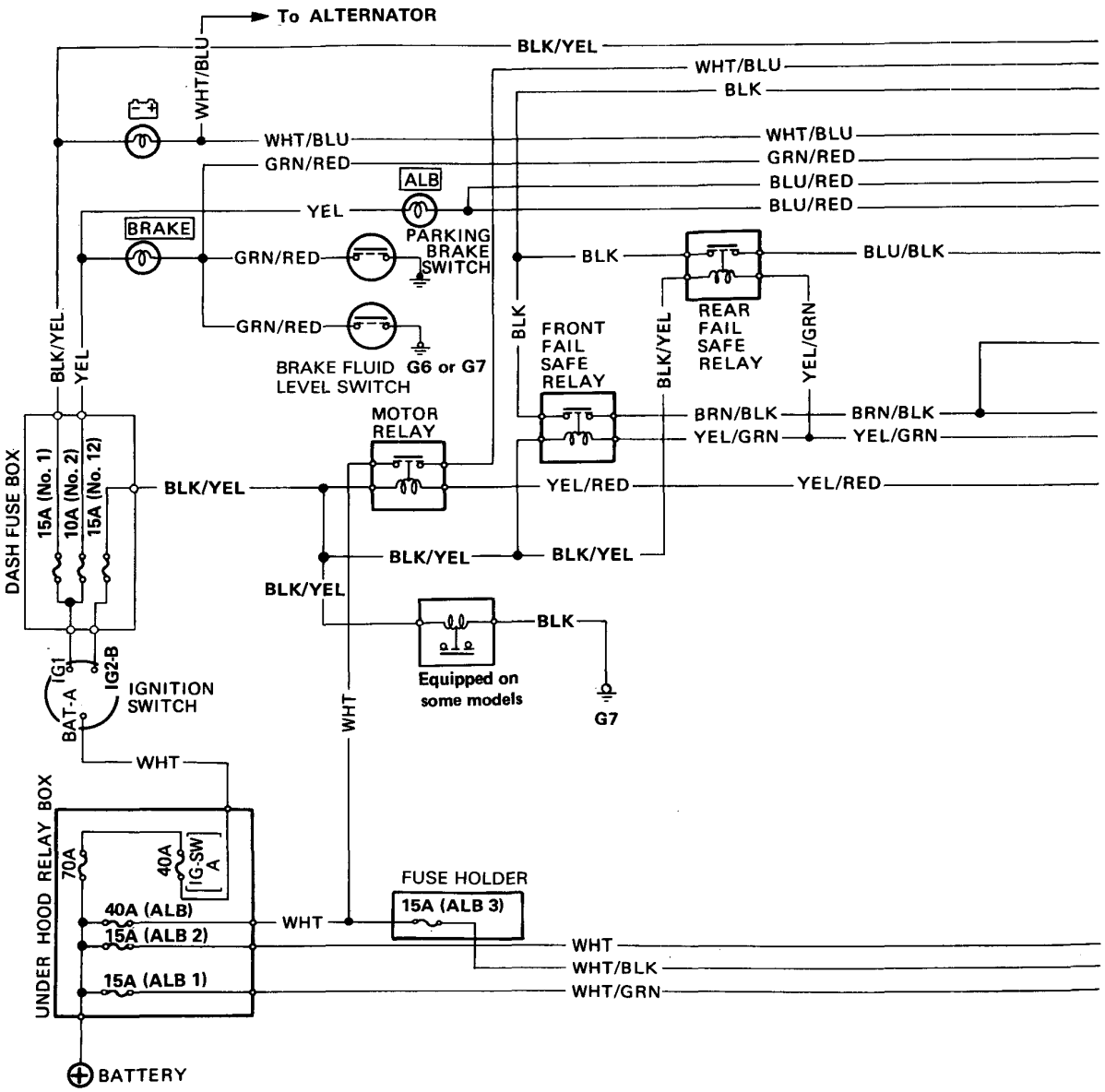


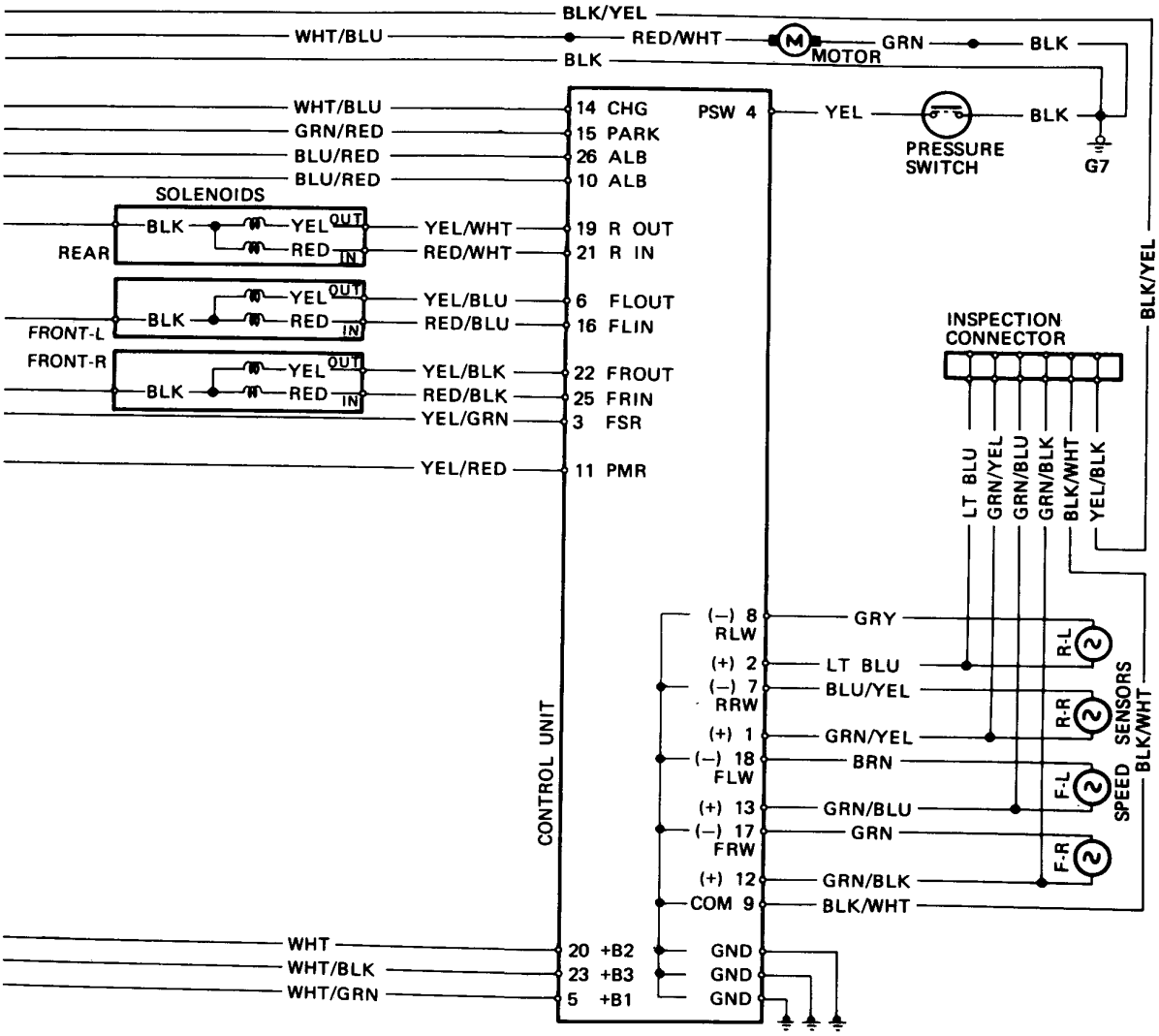
(2) After the turning point
As the fluid pressure from the master cylinder further increases, the pressure in the chamber A becomes higher, causing a force to push down the large diameter portion of the piston. Consequently, the slide piston comes down, the cut-off valve is pushed downward by the bottom of the slide piston, allowing the chambers A and B to connect through each other momentarily. As this occurs, pressure in the chamber B increases, the slide piston is pushed upward, the cut-off valve goes up, and the connection between the chamber A and the chamber B is blocked again. As described above, when the pressure in the master cylinder is above the turning point, the slide piston reduces the pressure in the rear caliper to the prescribed pressure by repeating these processes.

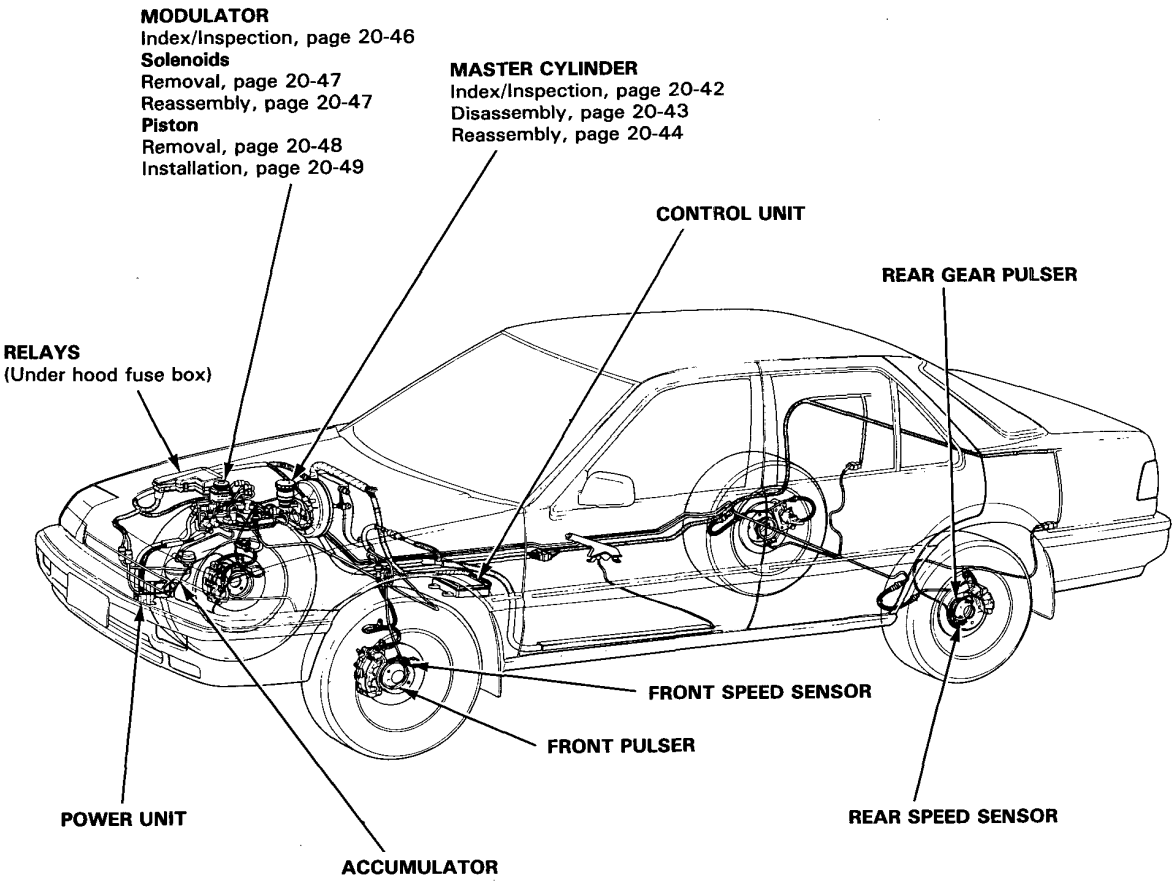
Let the terms be as follows:
F = Set load of spring
A_1 = Sectional area of cylinder at the slide piston
A_2 = Sectional area of cylinder measured at the large diameter portion of the piston
A_3 = Sectional area of cylinder measured at the small diameter portion of the piston
A_4 = Sectional area of the cut out valve sealing part
P_o = Input fluid pressure from the master cylinder

At the turning point,
$P_o = F/(A_1 - A_2)$
Since then, the reduction rate of pressure S in relation to an increase in P_o is expressed by;
$S = (A_2 - A_3 - A_4)/(A_1 - A_3 - A_4)$

Circuit Diagram




BLK/YEL
WHT/BLU
RED/WHT
MOTOR
GRN
BLK
BLK
WHT/BLU
GRN/RED
BLU/RED
BLU/RED
14 CHG
15 PARK
26 ALB
10 ALB
PSW 4
YEL
BLK
PRESSURE SWITCH
G7
SOLENOIDS
REAR
BLK
YEL
RED
OUT
IN
YEL/WHT
RED/WHT
19 R OUT
21 R IN
FRONT-L
YEL/BLU
RED/BLU
6 FLOUT
16 FLIN
FRONT-R
YEL/BLK
RED/BLK
22 FROUT
25 FRIN
YEL/GRN
3 FSR
YEL/RED
11 PMR
INSPECTION CONNECTOR
LT BLU
GRN/YEL
GRN/BLU
GRN/BLK
BLK/WHT
YEL/BLK
BLK/YEL
(–) 8 RLW
GRY
(+) 2
LT BLU
(–) 7 RRW
BLU/YEL
(+) 1
GRN/YEL
(–) 18 FLW
BRN
(+) 13
GRN/BLU
(–) 17 FRW
GRN
(+) 12
GRN/BLK
COM 9
BLK/WHT
R-L
R-R
F-L
F-R
SPEED SENSORS
BLK/WHT
CONTROL UNIT
WHT
WHT/BLK
WHT/GRN
20 +B2
23 +B3
5 +B1
GND
GND
GND


MODULATOR
Index/Inspection, page 20-46
Solenoids
Removal, page 20-47
Reassembly, page 20-47
Piston
Removal, page 20-48
Installation, page 20-49
MASTER CYLINDER
Index/Inspection, page 20-42
Disassembly, page 20-43
Reassembly, page 20-44
CONTROL UNIT
REAR GEAR PULSER
RELAYS
(Under hood fuse box)
FRONT SPEED SENSOR
FRONT PULSER
POWER UNIT
ACCUMULATOR
REAR SPEED SENSOR

ALB Checker

Function Test

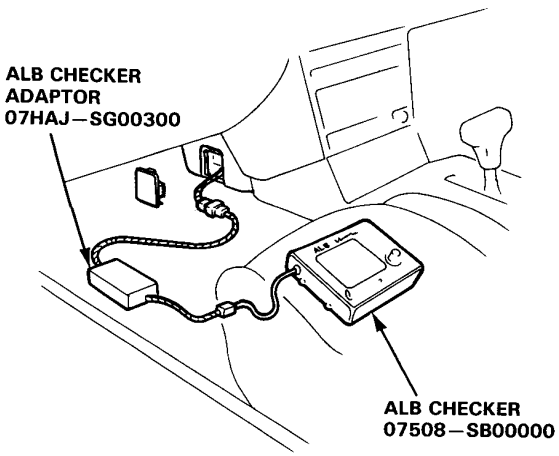
NOTE:

- The ALB checker is designed to confirm proper operation of the ALB system by simulating each system function and operating condition. Before using the checker, confirm that the dash [ALB] warning light is not indicating some other problem with the system. The light should go on when the ignition is first turned on and then go off and stay off two seconds after the engine is started.
- The checker should be used through all modes, 1 to 6, to confirm proper operation of the system, in any one of the following situations:

— After replacing any ALB system component.
— After replacing or bleeding the system fluid.
— After any body or suspension repair that may have affected the sensors or their wiring.
— As part of P.D.I.

WARNING Disconnect the ALB checker before driving the car. A collision can result from a reduction, or complete loss, of braking ability causing severe personal injury or death.

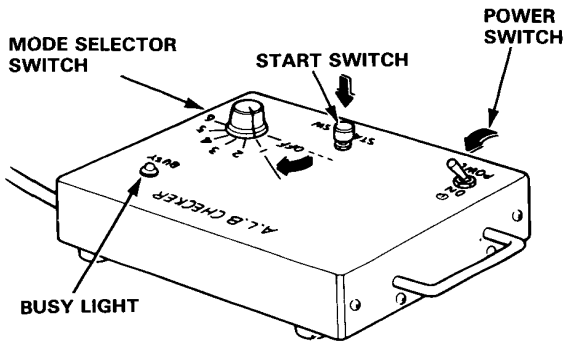
1. With the ignition switch off, disconnect the 6-P inspection connector from the connector cover on the right side of the front console and connect the 6-P inspection connector to the ALB checker and adaptor.



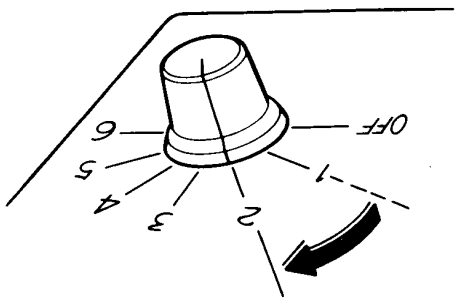
NOTE: Place the vehicle on level ground with the wheels blocked, put the transmission in neutral for manual transmission models, and in P for Automatic transmission models.

2. Start the engine and release the parking brake,

3. Operate the ALB checker as follows,
   (1) Turn the Power Switch ON.
   (2) Turn the Mode Selector switch to "1."
   (3) Push the Start Test switch:
   — The Busy light should come ON.
   — The dash [ALB] warning light should not come ON (If it comes on, follow the troubleshooting on page 20-19).



4. Turn the Mode Selector Switch futher to "2".



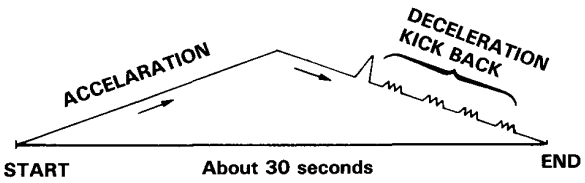
(cont'd)

ALB Checker

Function Test (cont'd)

5. Depress the brake pedal and push the Start Test switch.
   The dash ALB warning light should not go on while the Busy light is ON. There should be kickback on the brake pedal. If not as described, go to troubleshooting, page 20-19.

   NOTE: The operation sequence simulated by Modes 2, 3, 4, 5 and 6:



6. Turn the Mode Selector switch to 3, 4, 5 and 6. Perform step 5 for each of the test mode positions.

Mode 1:
Sends the simulated driving signal 0 km/h (0 mph) → 180 km/h (112.5 mph) → 0 km/h (0 mph) of each wheel to the control unit to check the control unit self diagnosis circuit. There should be NO kickback.

Mode 2:
Sends the driving signal of each wheel, then sends the lock signal of the rear left wheel to the control unit. There should be kickback.

Mode 3:
Sends the driving signal of each wheel, then sends the lock signal of the rear right wheel to the control unit. There should be kickback.

Mode 4:
Sends the driving signal of each wheel, then sends the lock signal of the front left wheel to the control unit. There should be kickback.

Mode 5:
Sends the driving signal of each wheel, then sends the lock signal of the front right wheel to the control unit. There should be kick back.

Mode 6:
Sends the driving signal of each wheel, then sends the lock signal of both front wheels to the control unit. There should be strong kickback.

NOTE: If little or no kickback is felt from the brake pedal in modes 2-6, repeat the function test of modes 1-6 several times before beginning to troubleshoot other parts of the system.

Inspection points:

1. The [ALB] warning light goes ON in mode 1.
   - Check the wiring. If there is good condition, the control unit is faulty.
     If [ALB] warning light goes on 120 seconds later but the power unit stops, refer to page 20-23.

2. There are no kickback in modes 2 through 6.
   - Faulty pressure switch (remains ON)
   - Shorted wires
   - Faulty or disconnected power unit coupler
   - Faulty power unit relay

3. Weak kickback in modes 2 through 6.
   - Bleed high pressure circuits.

4. Power unit stops in mode 1 but it does not stop and there are no kickback in modes 2 through 6.
   - Brake fluid leakage
   - Bleed power unit
   - Clogged power unit outlet
   - Clogged or deteriorated power unit hose

ALB Warning Light

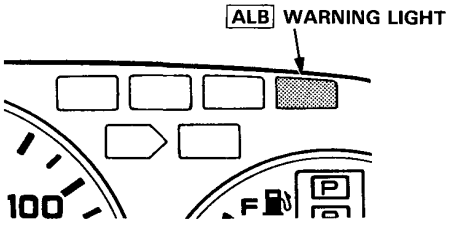
Temporary Driving Conditions:

1. The ALB warning light will come on and the control unit memorizes the problem under certain conditions.

   NOTE: Problem codes explained on page 20-21 and 20-22.

   - The tire(s) adhesion is lost due to excessive cornering speed.
     Problem codes: 4-4, 4-8, 4-12.
   - The vehicle loses traction when starting from a stuck condition on a muddy, snowy, or sandy road.
     Problem code: 5.
   - When the parking brake is applied for more than 30 seconds while the vehicle is being driven.
     Problem code: 2.
   - The vehicle is driven on extremely rough road.

   The ALB system is OK, if the ALB warning light goes off after the engine is restarted.



2. If you receive a customer's report that the ALB warning light sometimes comes on, check the System using the ALB checker to confirm whether there is any trouble in the system.
   See page 20-17.

3. The ALB warning light will come on and the LED (see page 20-18) will display a problem code when there is insufficient battery voltage to the control unit. An example would be when the battery is so weak that the car must be Jump-started.
   After the battery is sufficiently recharged, the ALB warning light will work normally after the engine is stopped and restarted.

   However, after recharging the battery, the LED problem code must be cleared from the control unit's memory by disconnecting the ALB 2 fuse for at least 3 seconds.

Warning Light Circuit:

1. The ALB warning light does not go on when the ignition switch is turned on.
   Check the following items. If they are OK, check the control unit connectors.
   If not loose or disconnected, install a known-good control unit and recheck:

   - Blown warning bulb.
   - Open circuit in YEL lead between No.2 fuse and combination meter.
   - Open circuit BLU/RED lead between combination meter and control unit.
   - Loose component grounding of the control unit to the body.

2. The ALB warning light remains ON or after the engine is started, however the LED on the control unit does not blink any code or sub-code, check for the following:

   - Loose or poor connection of the wire harness at the control unit.
   - Faulty ALB 2 fuse.
   - Open circuit in WHT lead between ALB 2 fuse and control unit.
   - Open circuit in YEL/BLK lead between fuse No.17 and fail safe relay(s).
   - Open or short circuit in the YEL/GRN lead between fail safe relay(s).
   - Short circuit in BLU/RED lead between combination meter and control unit.
   - Open circuit in WHT/BLU lead between alternator and control unit.
   - Check the relay (BLK/YEL and BLK wires side) or BLK/YEL wire.

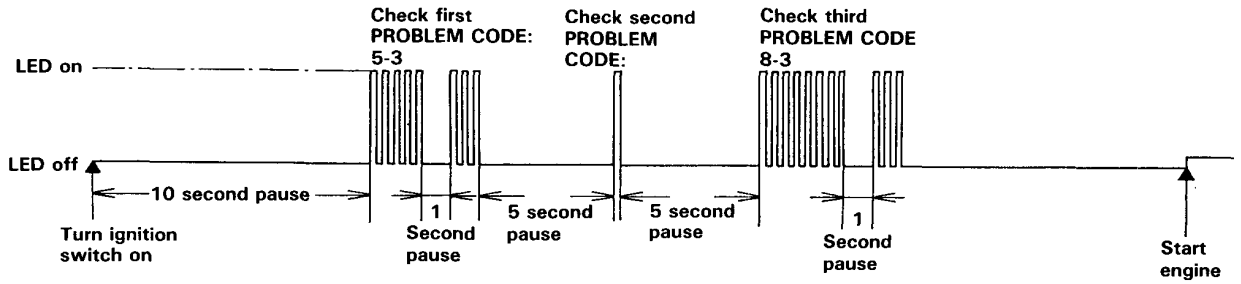
   If the problem is not found substitute a known-good control unit and recheck whether the warning light remains ON.

(cont'd)

ALB Warning Light (cont'd)

Comes on and remains on while running:

1. Stop the engine.
2. Turn the ignition switch on and make sure that the ALB warning light comes on.
3. Restart the engine and check the ALB warning light.
   - *There is no problem in the ALB system, if the ALB warning light goes off.*
   - Go to step 4, if the ALB warning light remains on.
4. Stop the engine.
5. Remove the inspection hole lid on the right of the front console.
6. Turn the ignition switch on, but do not start the engine.
7. Record the blinking frequency of the LED on the control unit. The blinking frequency indicates the problem code.



NOTE:

- The control unit can indicate three problem codes (one, two or three problems).
- If the LED does not light, see Troubleshooting of Warning Light Circuit page 20-19, except alternator signal (WHT/BLU).
- If you miscount the blinking frequency, turn the ignition switch off, then turn on to blink the LED again.
- The LED lights faintly after starting the engine as the control unit uses the LED circuit to intercommunicate between its internal computers.
- After the repair is completed, disconnect the ALB 2 fuse for at least 3 seconds to erase the control unit's memory. Then turn the ignition key on again and recheck.
- The memory is erased if the connector is disconnected from the control unit or the control unit is removed from the body.

Symptom-to-System Chart

PROBLEM CODE		PROBLEMATIC COMPONENT/ SYSTEM	AFFECTED				See page	OTHER COMPONENT	See page
MAIN CODE	SUB CODE		FRONT RIGHT	FRONT LEFT	REAR RIGHT	REAR LEFT			
1	—	Hydraulic Controlled Component	—	—	—	—	20-23	-ALB fuse -Motor relay -Pressure Switch -Accumulator -Modulator	Function Test
2	—	Parking brake switch-related problem	—	—	—	—	20-26	Brake fluid level switch BRAKE light	
3	1	Front fail safe relay	—	—	—	—	(Function Test)		
	2	Rear fail safe relay	—	—	—	—			
3	13	Pulser (s)	○				——		
	14			○					
	15				○	○			
4	4	Speed sensor(s)			○		20-27	Modulator	
	8					○			
	12				○	○			
5 or 6 or 7	1	Speed sensor	○				20-28		
	2			○					
	4				○				
	8					○			
8	1	Front solenoid related problem (Open)	IN				20-29		
	2		OUT					Front R speed sensor	20-28
	3		BOTH						
	4			IN					
	8			OUT				Front L speed sensor	20-28
	12			BOTH					
	15	Front fail safe relay	BOTH	BOTH			20-30	Solenoids misconnected	

(cont'd)

Symptom-to-system Chart (cont'd)

PROBLEM CODE		PROBLEMATIC COMPONENT/ SYSTEM	AFFECTED			See page	OTHER COMPONENT	See page
MAIN CODE	SUB CODE		FRONT RIGHT	FRONT LEFT	REAR			
9	—	Solenoid related problem (Open)			IN	20-32		
10	—				OUT		Rear speed sensors	20-28
11	—				BOTH	20-33	Rear fail safe relay	Function Test
11	3		BOTH		BOTH	——		
11	12			BOTH	BOTH			
11	15		BOTH	BOTH	BOTH		Front or rear fail safe relay	
12	1	Solenoid related problem (Short) Power supply problem	IN			20-35		
12	2		OUT					
12	3		BOTH			20-36	ALB 3 fuse	
12	4			IN		20-35		
12	8			OUT				
12	12			BOTH		20-37	ALB 1 fuse	
12	15		BOTH	BOTH		——	ALB 3 and/or ALB 1 fuse	
13	—	Solenoid related problem (Short) Power supply problem			IN	20-38		
14	—				OUT			
15	—				BOTH			
15	3		BOTH		BOTH		ALB 3 fuse	
15	12			BOTH	BOTH		ALB 1 fuse	
LED stays ON:			BOTH	BOTH	BOTH		ALB 3 and/or ALB 1 fuse	

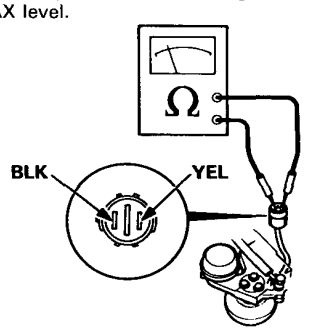
NOTE: The control unit can display a number of sub-codes other than those listed. Such sub-codes indicate unlikely combinations of multiple component failures, or more likely, a problem in a wire or connector common to a group of components. To troubleshoot, refer to the procedures for other sub-codes with the same main code.

Flow Chart

Problem Code 1: Hydraulic Controlled Components.

NOTE: The LED does not blink when the following failures occur.
- The contact points of the motor relay remain closed (The motor runs continuously even after the ignition key is removed).
- YEL/RED lead is shorted or the control unit is internally shorted (The motor stops when the ignition switch is turned off).

Pre test steps:
- **Check ALB (40A) Fuse.**
- Check all brake system hoses and pipes (low and high pressure) for signs of leaking, bending or kinking.
- Check reservoir fluid level, and if necessary, fill to the MAX level.



Disconnect the pressure switch connector and check the continuity between BLK and YEL terminals.

Is there continuity?

YES → Bleed high pressure fluid from the maintenance bleeder with the ALB T-wrench. See page 20-41.

Bleed high pressure fluid from the maintenance bleeder with the ALB T-wrench. See page 20-41.

Check the continuity of pressure switch between BLK and YEL terminals.

Is there continuity?

YES → Faulty pressure switch (closed).

NO

NO

Reconnect the pressure switch connector.

Bleed high pressure fluid from the maintenance bleeder with the ALB T-wrench (see page 20-41). Jack up the front of car and support with safety stands, then run the engine in gear above 6 mph (10 km/h).

WARNING Block rear wheels before jacking up front of car.

(To page 20-24)

(cont'd)

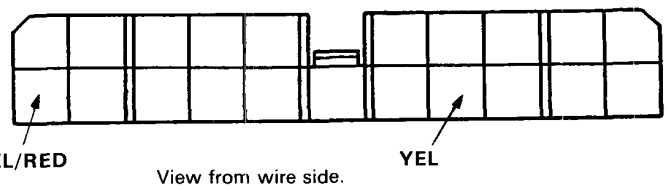
Flow Chart (cont'd)

(From page 20-23)

Does the pump motor run?
- YES → (To page 20-25)
- NO →

Disconnect the 21P connector from the control unit.

Check for continuity between the YEL terminal and body around.



View from wire side.

Is there continuity?
- YES → Repair short in YEL wire between the control unit and pressure switch.
- NO →

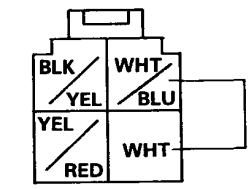
Connect the YEL/RED terminal to body ground using a jumper wire. Turn the ignition switch ON.

Does the pump motor run?
- YES → Faulty control unit.
- NO →

Remove the pump motor relay and check the pump motor relay.

Does it work properly?
- NO → Faulty pump motor relay.
- YES →

Connect the WHT/BLU and WHT terminals using a jumper wire.



View from terminal side.

CAUTION: If the motor runs disconnect the jumper wire immediately.

Does the pump motor run?
- NO → (To page 20-26)
- YES →

Check voltage between the BLK/YEL (+) and body ground (−).

Is there battery voltage?
- NO → Repair open in BLK/YEL wire between the No. 12 fuse and pump motor relay.
- YES →

Repair open in YEL/RED wire between the control unit and pump motor relay.

(From page 20-24)

Does the pump motor run with an increasingly loud, raspy sound?

NO → Pump runs with a constant soft sound:
Bleed air from ALB system using the procedure on page 20-50 and check the pump sound again.

YES

Does the pump motor stop after about 60 seconds?

NO → Pump stops about 120 seconds: faulty pressure switch (open).

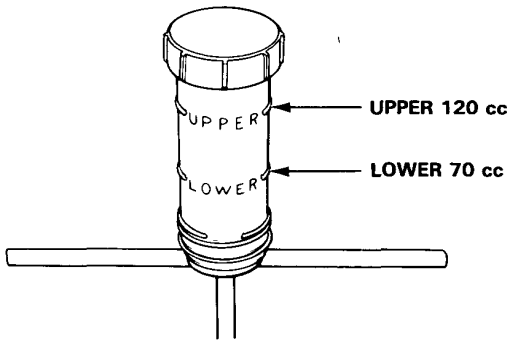
YES

Does the reservoir fluid level go down, and are there no bubbles in the modulator reservoir tank?

NO →
- If level stays the same and there are bubbles in the modulator reservoir tank, check the accumulator fluid quantity by bleeding the high pressure line with the ALB T-wrench:
  - If over 120 cc, faulty accumulator.
  - If under 70 cc, modulator inlet solenoid leak or accumulator leak.
- If level goes up: faulty modulator assembly.

YES

System is OK; recheck pump motor, to confirm no intermittent problem.



NOTE: The fluid enters the reservoir under pressure; wait 1 or 2 minutes for air bubbles to disappear and level to stabilize.

(cont'd)

Flow Chart (cont'd)

(From page 20-24)

Measure voltage between the WHT terminal (+) and body ground (–).

Is there battery voltage?

NO → Repair open in WHT wire between the fuse and pump motor relay.

YES

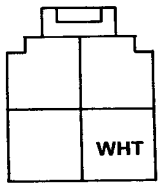
Measure voltage between the WHT/BLU terminal (+) of the pump motor and body ground (–).

Is there battery voltage?

NO → Repair open in WHT/BLU wire between motor relay and pump motor, or open in BLK wire between pump motor and ground or poor ground.

YES

Faulty pump motor.



View from terminal side.

View from terminal side.

Problem code2: Parking Brake Switch Related Problem

If the parking brake has been released, the following items are possible causes. If they are OK, check the control unit connectors for good connection. If not loose or disconnected, substitute a known-good control unit and recheck.

NOTE: Before Troubleshooting Problem Code 2, remove the ALB 2 fuse for three seconds to clear the control unit's memory, then test drive the car.

If the [ALB] warning light and LED stay off, the probability is that the car was driving with the parking brake applied.

- The parking brake is applied for more than 30 seconds while driving.
- The brake fluid level in the master cylinder is too low.
- GRN/RED lead is shorted between the [BRAKE] warning light and parking brake switch.
- GRN/RED lead is shorted between the [BRAKE] warning light and brake fluid level switch.
- The [BRAKE] warning light is blown.
- GRN/RED has an open between the [BRAKE] warning light and parking brake.
- GRN/RED has an open between the parking brake switch and control unit.

Problem code 4-4 to 4-12: Rear Speed Sensor

Disconnect wire harness from speed sensor.

Check for resistance between sensor terminals.

Is there 500 — 1,000 Ω? NO — Faulty speed sensor.

YES

Disconnect the 21P connector from the control unit.

Check the sensor wire for continuity between the control unit and each speed sensor:
BLU/YEL: Rear Right Negative
GRY: Rear Left Negative
GRN/YEL: Rear Right Positive
LT BLU: Rear Left Positive

Is there continuity? NO — Repair open in the sensor wire:
BLU/YEL: Rear Right Negative
GRY: Rear Left Negative
GRN/YEL: Rear Right Positive
LT BLU: Rear Left Positive

YES

Reconnect the 21P connector to the control unit and 2P connectors to the speed sensors.

Connect ALB checker to inspection connector.

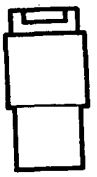
Check ALB function in MODE 2 and 3.

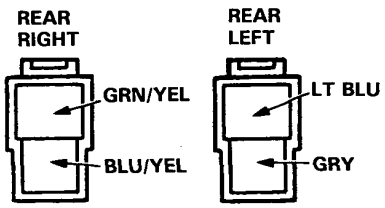
Does it work properly? NO — Faulty modulator.

YES

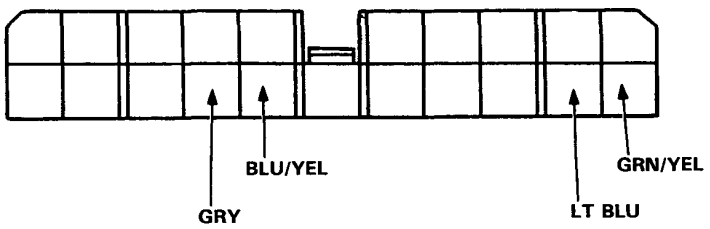
Faulty control unit.

SENSOR SIDE CONNECTOR





View from terminal side.



View from wire side.

(cont'd)

Flow Chart (cont'd)

Problem Code 5-1 to 7-8: Speed Sensor

Disconnect wire harness from speed sensor.

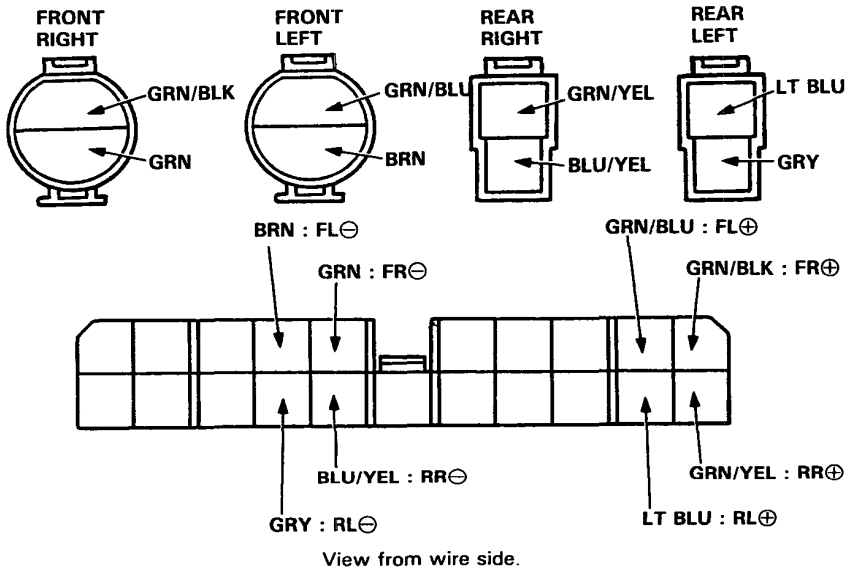
Check for resistance between sensor terminals.

Is there 500—1000 Ω? — NO → Faulty speed sensor.

YES

Disconnect the 21P connector from the control unit.

Check the each wires for continuity between the sensor and control unit:
GRN/BLK: Front Right Positive
GRN/BLU: Front Left Positive
GRN/YEL: Rear Right Positive
LT BLU: Rear Left Positive
GRN: Front Right Negative
BRN: Front Left Negative
BLU/YEL: Rear Right Negative
GRY: Rear Left Negative



View from wire side.

Is there continuity? — NO → Repair open in sensor wire:
GRN/BLK: Front Right Positive
GRN/BLU: Front Left Positive
GRN/YEL: Rear Right Positive
LT BLU: Rear Left Positive
GRN: Front Right Negative
BRN: Front Left Negative
BLU/YEL: Rear Right Negative
GRY: Rear Left Negative

YES

Check pulser air gap.

Is the air gap OK? — NO → Repair air gap or replace the pulser rotor and/or speed sensor

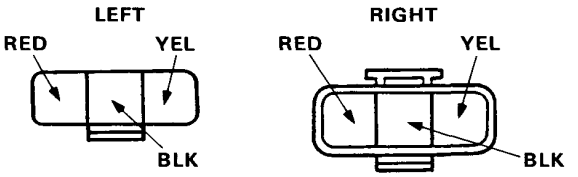
YES

Faulty control unit.

Problem Code 8-1 to 8-12: Front Solenoid Related Problem

NOTE: Problem Code 8-2 or 8-8, also perform troubleshooting of Problem Code 5-1 to 7-8 (page 20-28).

Disconnect wire harness from front solenoids.



View from terminal side.

Check for resistance between RED and BLK terminals of front solenoid.

Is there 1-3 Ω? NO — Faulty solenoid.

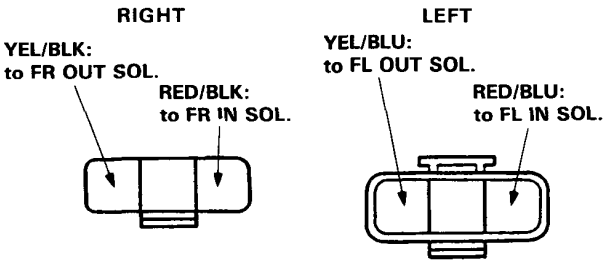
YES

Check for resistance between YEL and BLK terminals of front solenoid.

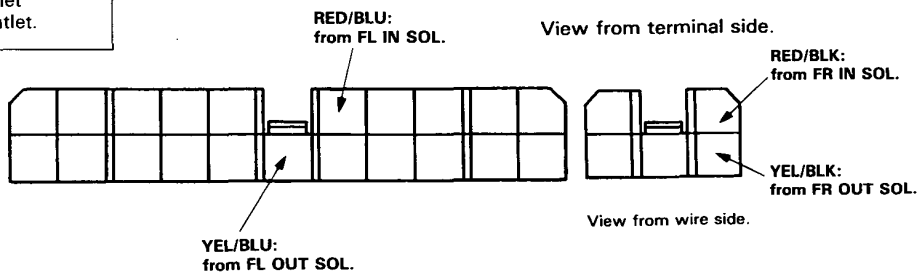
Is there 1-3 Ω? NO — Faulty solenoid.

YES

Disconnect the 21P and 5P connectors from the control unit.



Check for continuity between control unit and front solenoid:
RED/BLK: Front Right Inlet
YEL/BLK: Front Right Outlet
RED/BLU: Front Left Inlet
YEL/BLU: Front Left Outlet.



Is there continuity? NO — Repair open in wire:
RED/BLK: Front Right Inlet
YEL/BLK: Front Right Outlet
RED/BLU: Front Left Inlet
YEL/BLU: Front Left Outlet

YES

Faulty control unit.

(cont'd)

Flow Chart (cont'd)

Problem 8-15: Front Fail Safe Relay Circuit

Remove front fail safe relay.

↓

Check relay function.

↓

Does it work properly? — NO → Faulty front fail safe relay.

YES ↓

Check for continuity between BLK lead and body ground.

↓

Is there continuity? — NO → Repair open in BLK wire between the fail safe relay and ground or poor ground.

YES ↓

Turn ignition switch ON.

↓

Check for voltage between BLK/YEL lead (+) and body ground (−).

↓

Is battery voltage available? — NO → Repair open in BLK/YEL wire between the fail safe relay and No. 12 fuse.

YES ↓

Turn ignition switch OFF.

↓

Disconnect the 3P connectors from the front solenoids.

↓

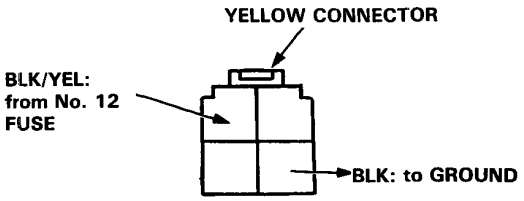
Check for continuity in BRN/BLK lead between fail safe relay and solenoids.

↓

Is there continuity? — NO → Repair open in BRN/BLK wire between the solenoids and fail safe relay.

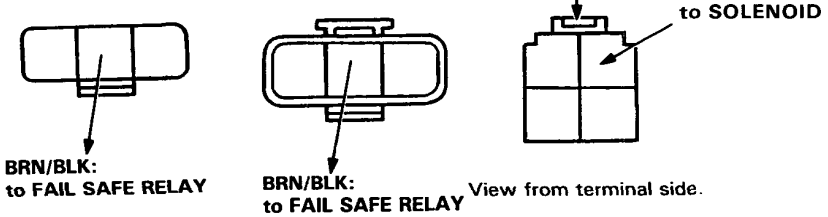
YES ↓

(To page 20-31)



View from terminal side.

View from terminal side.



View from terminal side.

(From page 20-30)

Check for resistance between RED and BLK terminals of front solenoid.

Is there 1-3 Ω? NO — Faulty solenoid.

YES

Check for resistance between YEL and BLK terminals of front solenoid.

Is there 1-3 Ω? NO — Faulty solenoid.

YES

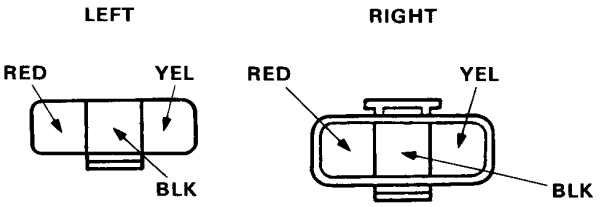
Disconnect the 21P and 5P connectors from the control unit.

Check for continuity between control unit and front solenoid:
RED/BLK: Front Right Inlet
YEL/BLK: Front Right Outlet
RED/BLU: Front Left Inlet
YEL/BLU: Front Left Outlet.

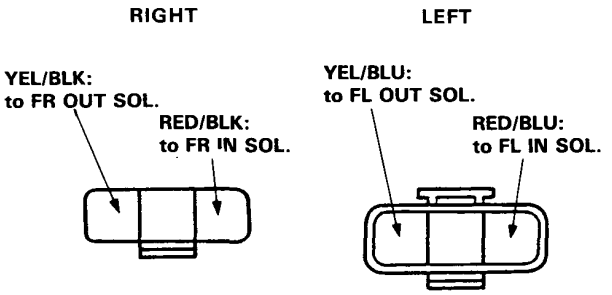
Is there continuity? NO — Repair open in wire:
RED/BLK: Front Right Inlet
YEL/BLK: Front Right Outlet
RED/BLU: Front Left Inlet
YEL/BLU: Front Left Outlet

YES

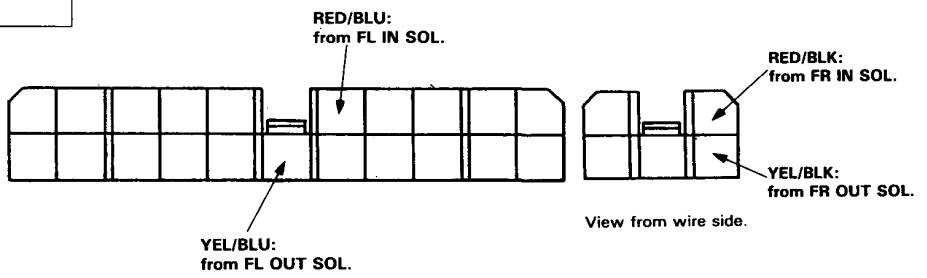
Faulty control unit.



View from terminal side.



View from terminal side.



View from wire side.

View from wire side.

(cont'd)

Flow Chart (cont'd)

Problem Code 9 or 10: Rear Solenoid Related Problem

NOTE: Problem Code 10, also perform troubleshooting of Problem Code 5-1 to 7-8 (page 20-28).

Disconnect wire harness from rear solenoid.

Check for resistance between RED and BLK terminals of rear solenoid.

Is there 1-3 Ω? — NO → Faulty solenoid.

YES

Check for resistance between YEL and BLK terminals of rear solenoid.

Is there 1-3 Ω? — NO → Faulty solenoid.

YES

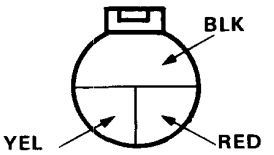
Disconnect the 21P connector from the control unit.

Check for continuity between control unit and rear solenoid:
RED/WHT: Rear Inlet
YEL/WHT: Rear Outlet

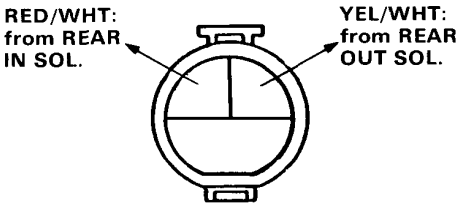
Is there continuity? — NO → Repair open in the wire between the rear solenoid and control unit
RED/WHT: Rear Inlet
YEL/WHT: Rear Outlet

YES

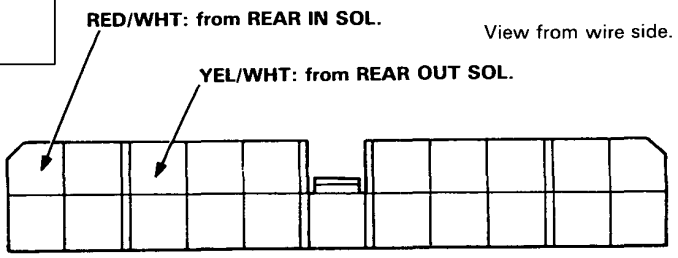
Faulty control unit.



View from terminal side.



View from wire side.



View from wire side.

Problem Code 11: Rear Fail Safe Relay Circuit

NOTE: Also perform Troubleshooting of Problem Code 9 or 10 (page 20-32).

Remove rear fail safe relay.

Check relay function.

Does it work properly? NO — Faulty fail safe relay.

YES

Check for continuity between BLK lead of wire harness and body ground.

Is there continuity? NO — Repair open in BLK wire between the relay and ground or poor ground.

YES

Turn ignition switch ON.

Check for voltage between BLK/YEL lead (+) of wire harness and body ground (−).

Is battery voltage available? NO — Repair open in BLK/YEL wire between the relay and No. 12 fuse.

YES

Turn ignition switch off.

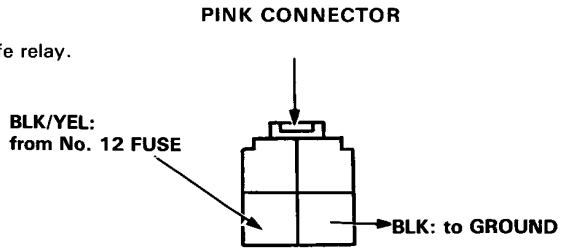
Disconnect the 3P connector (PNK) from the rear solenoid.

Check for continuity in BLU/BLK lead between fail safe relay and solenoid.

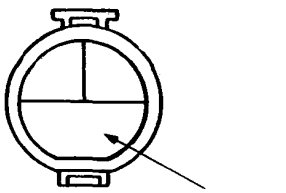
Is there continuity? NO — Repair open in BLU/BLK wire between the relay and solenoid.

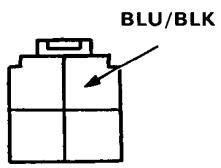
YES

(To page 20-34)



View from terminal side.





View from terminal side.

(cont'd)

Flow Chart (cont'd)

(From page 20-33)

Disconnect the 21P connector from the control unit.

Check for continuity in YEL/GRN lead between fail safe relay and control unit.

Is there continuity? NO — Repair open in YEL/GRN wire between the relay and control unit.

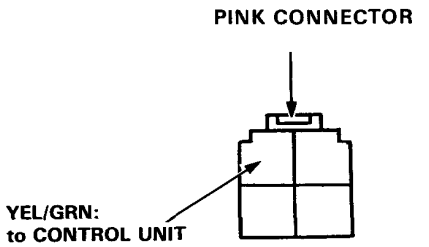
YES

Check for continuity between control unit and rear solenoid.
RED/WHT: Rear Inlet
YEL/WHT: Rear Outlet

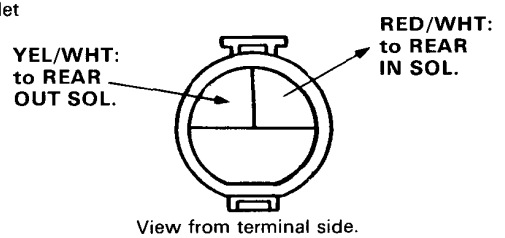
Is there continuity: NO — Repair open in wire between the solenoid and control unit.
RED/WHT: Rear Inlet
YEL/WHT: Rear Outlet

YES

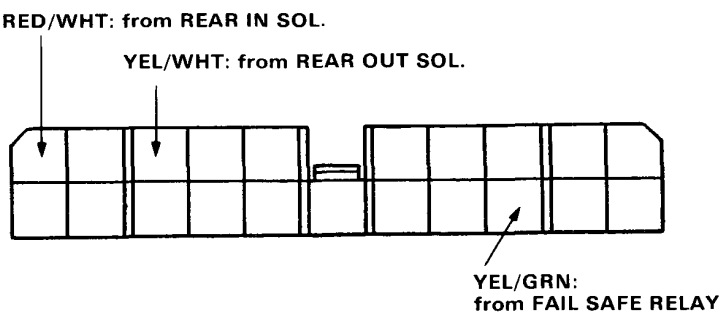
Faulty control unit.



View from terminal side.



View from terminal side.



View from wire side.

Problem Code 12-1, 12-2, 12-4 or 12-8: Front Solenoid

Disconnect wire harness from front solenoids.

Check for resistance between RED and BLK terminals of front solenoid.

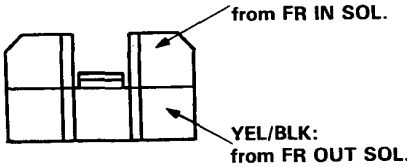
Is there 1-3 Ω?
- NO → Faulty solenoid.
- YES

Check for resistance between YEL and BLK terminals of front solenoid.

Is there 1-3 Ω?
- NO → Faulty solenoid.
- YES

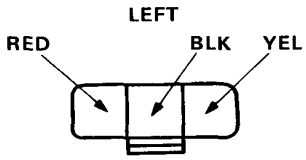
Disconnect the 21P and 5P connectors from the control unit.

Check for continuity between wire harness and body ground.
RED/BLK: front Right Inlet
YEL/BLK: Front Right Outlet
RED/BLU: Front Left Inlet
YEL/BLU: Front Left Outlet

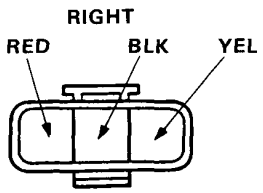


View from wire side.

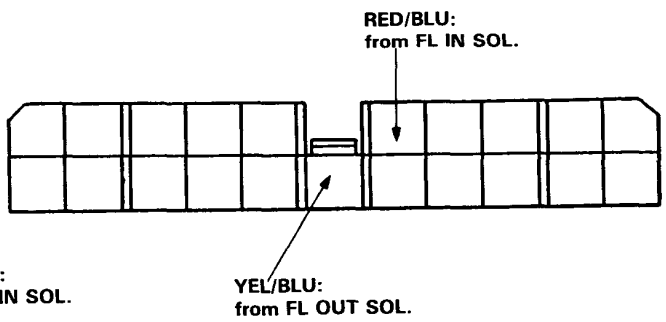
Is there continuity?
- YES → Repair short in wire between control unit and front solenoids.
  RED/BLK: Front Right Inlet
  RED/BLU: Front Left Inlet
  YEL/BLK: Front Right Outlet
  YEL/BLU: Front Left Outlet
- NO → Faulty control unit.



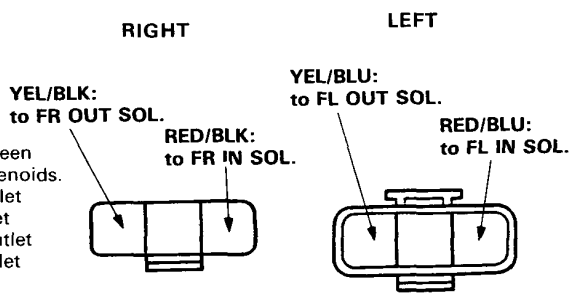
View from terminal side.



View from terminal side.



View from wire side.



View from terminal side.

(cont'd)

Flow Chart (cont'd)

Problem Code 12-3: Front Right Solenoid and/or Power Supply

Check ALB 3 fuse.

Is the fuse OK? NO — Replace the ALB 3 fuse.

YES

Disconnect wire harness from front solenoids.

Check for resistance between RED and BLK terminals of front solenoid.

Is there 1-3 Ω? NO — Faulty solenoid.

YES

Check for resistance between YEL and BLK terminals of front solenoid.

Disconnect the 5P connector from the control unit.

Check for voltage between WHT/BLK lead (+) and body ground (–).

Is battery voltage available? NO — Repair open in WHT/BLK wire between the ALB 3 fuse and control unit.

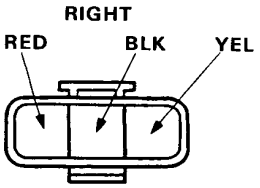
YES

Check for continuity between wire harness and body ground.
RED/BLK: Front Right Inlet
YEL/BLK: Front Right Outlet

Is there continuity? YES — Repair short in wire
RED/BLK: Front Right Inlet
YEL/BLK: Front Right Outlet

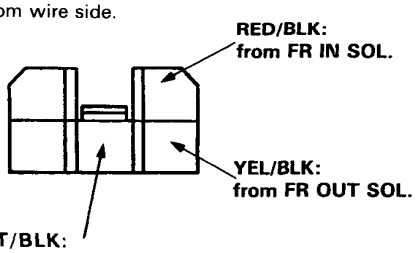
NO

Faulty control unit.



View from terminal side.

View from wire side.



Problem Code 12-12: Front Left Solenoid and/or Power Supply Problem

Check ALB 1 fuse.

Is the fuse OK? NO — Replace the fuse.

YES

Disconnect wire harness from front solenoid.

Check for resistance between RED and BLK terminals of front solenoid.

Is there 1—3 Ω? NO — Faulty solenoid.

YES

Check for resistance between YEL and BLK terminals of front solenoid.

Is there 1—3 Ω? NO — Faulty solenoid.

YES

Disconnect the 21P connector from the control unit.

Check for voltage between WHT/GRN lead (+) and body ground (–).

Is battery voltage available? NO — Repair open in WHT/GRN wire between the ALB 1 fuse and control unit.

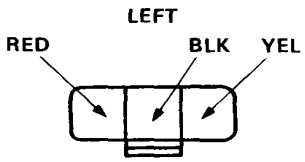
YES

Check for continuity between wire harness and body ground.
RED/BLU: Front Left Inlet
YEL/BLU: Front Left Outlet

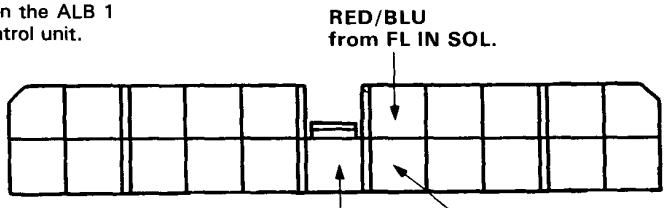
Is there continuity? YES — Repair short in wire between the control unit and solenoid.
RED/BLU: Front Left Inlet
YEL/BLU: Front Left Outlet

NO

Faulty control unit.



View from terminal side.



View from wire side.

(cont'd)

Flow Chart (cont'd)

Problem Code 13 or 14: Rear Solenoid Related Problem

Disconnect wire harness from rear solenoid.

Check for resistance between RED and BLK terminals of rear solenoid.

Is there 1—3 Ω?
- NO → Faulty solenoid.
- YES ↓

Check for resistance between YEL and BLK terminals of rear solenoid.

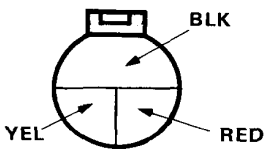
Is there 1—3 Ω?
- NO → Faulty solenoid.
- YES ↓

Disconnect the 21P connector from the control unit.

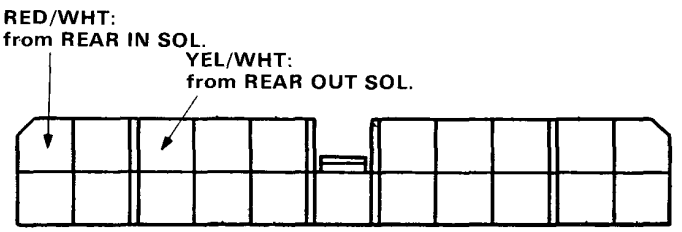
Check for continuity between wire harness and body ground.
RED/WHT: Rear Inlet
YEL/WHT: Rear Outlet

Is there continuity?
- YES → Repair short in wire between the solenoid and control unit.
  RED/WHT: Rear Inlet
  YEL/WHT: Rear Outlet
- NO ↓

Faulty control unit.



View from Terminal side.



View from wire side.

Brake Booster

Test

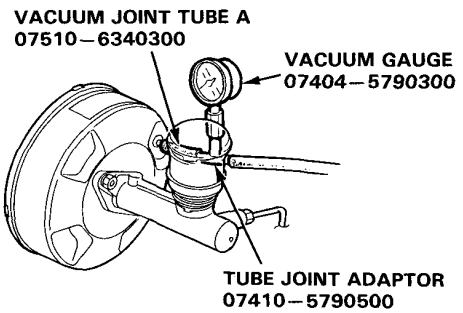
Leak Test

1. Install the Brake Power Kit (07504—6340100) as shown.

2. Start the engine, adjust the engine speed with the accelerator pedal so that the vacuum gauge readings show 300—500 mmHg (11.8—19.7 inHg), then stop the engine.

3. Read the vacuum gauge.

   If the vacuum readings decreases 20 mmHg (0.8 inHg) or more after 30 seconds, check following parts for leaks.
   - Check valve
   - Vacuum hose
   - Seals
   - Diaphragm
   - Master cylinder O-ring and cup



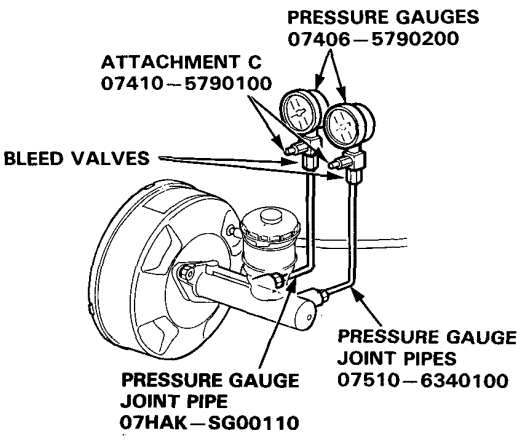
Function Test

1. Install the vacuum gauge as same the leak test.

2. Connect the oil pressure gauges to the master cylinder using the attachments as shown.

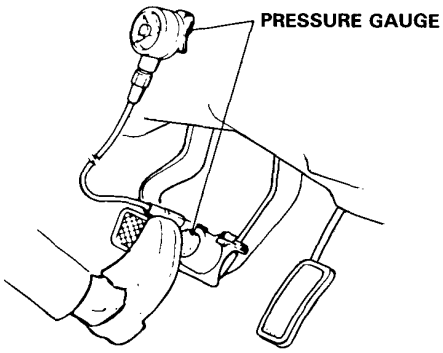
3. Bleed air through the valves.

   CAUTION: Avoid spilling brake fluid on painted, plastic or rubber partsas it may damage the finish.



4. Start the engine.

5. Depress the brake pedal with a 200 N (20 kg, 44 lbs) of pressure. The following pressures should be observed at the pressure gauges in each vacuum.

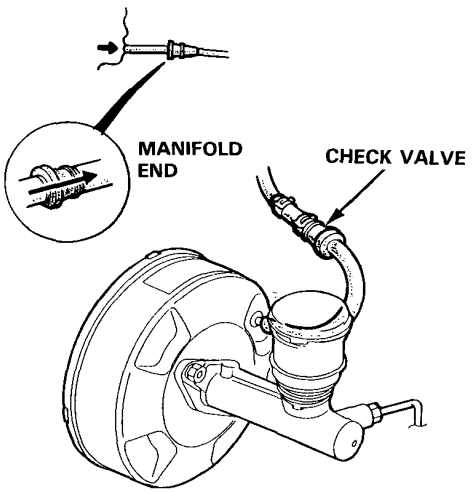


Vacuum mmHg	Line pressure kPa (kg/cm², psi)
0	1,176 (12.0, 171)
300	4,763 (48.6, 691)
500	7,144 (72.9, 1,036)

6. Inspect the master cylinder pistons and cups in the readings do not fall within the limits shown above.

Check Valve Test

1. Remove the check valve, blow on one end of the hose and then the other; if you can blow through the booster end, but not through the manifold end, the check valve is OK.

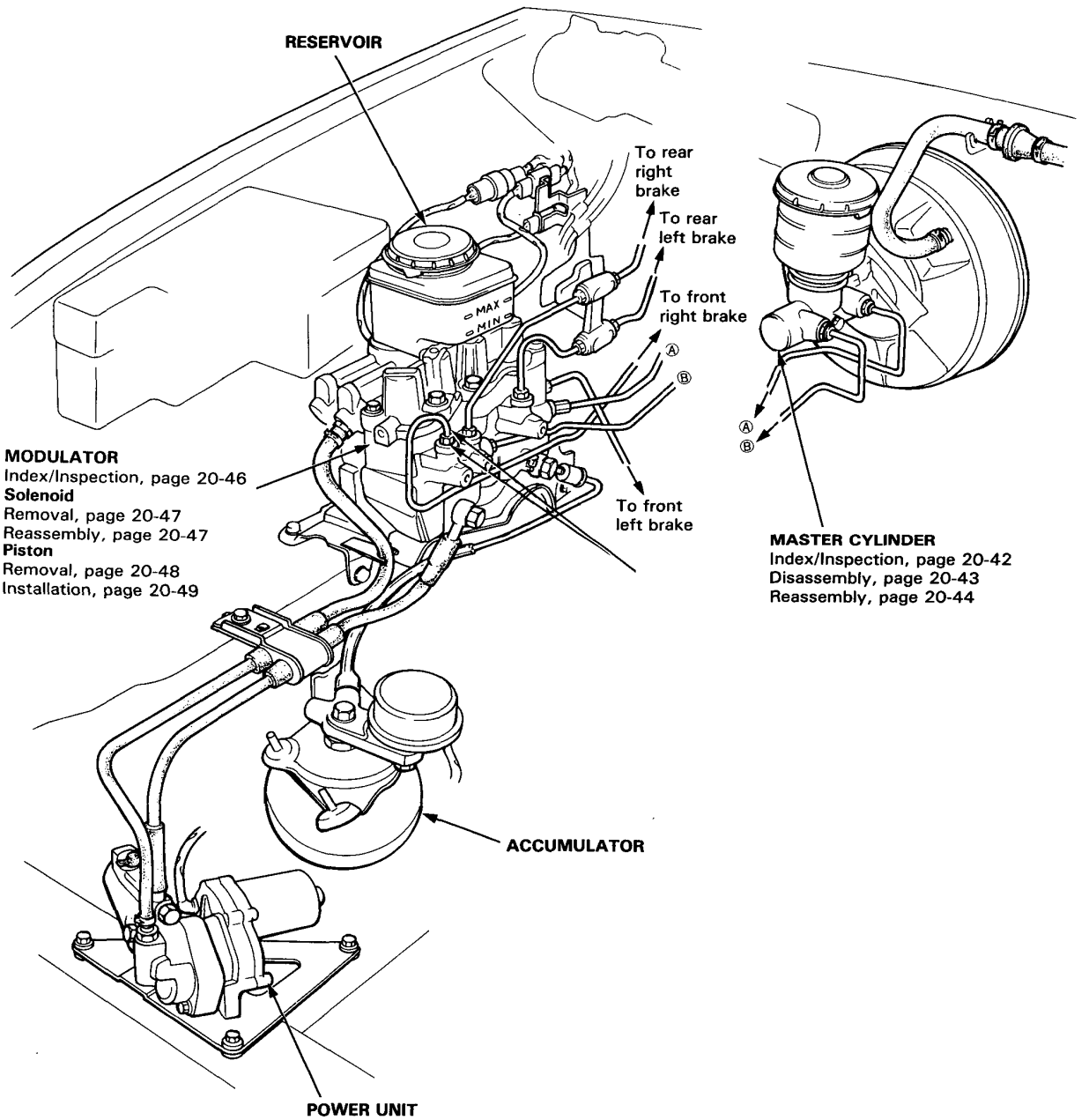


Hydraulic System

Index

CAUTION:

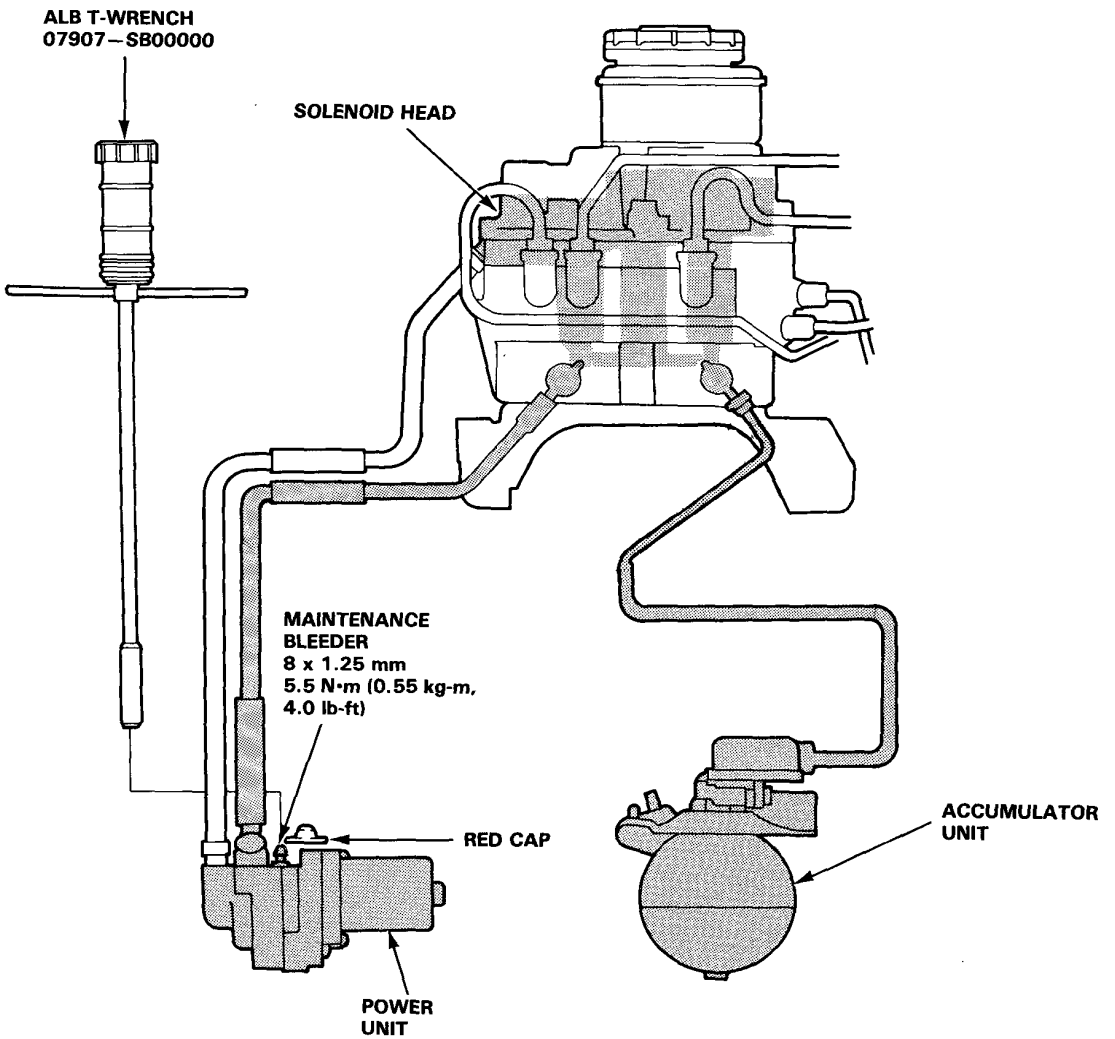
- **Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.**
- **The flare nuts should be tightened to 15 N·m (1.5 kg-m, 11 lb-ft).**
- **The brake pipes and modulator fittings are color coded.**



Relieving Accumulator/Line Pressure

WARNING USE the ALB T-WRENCH before disassembling the parts shaded in the illustration.

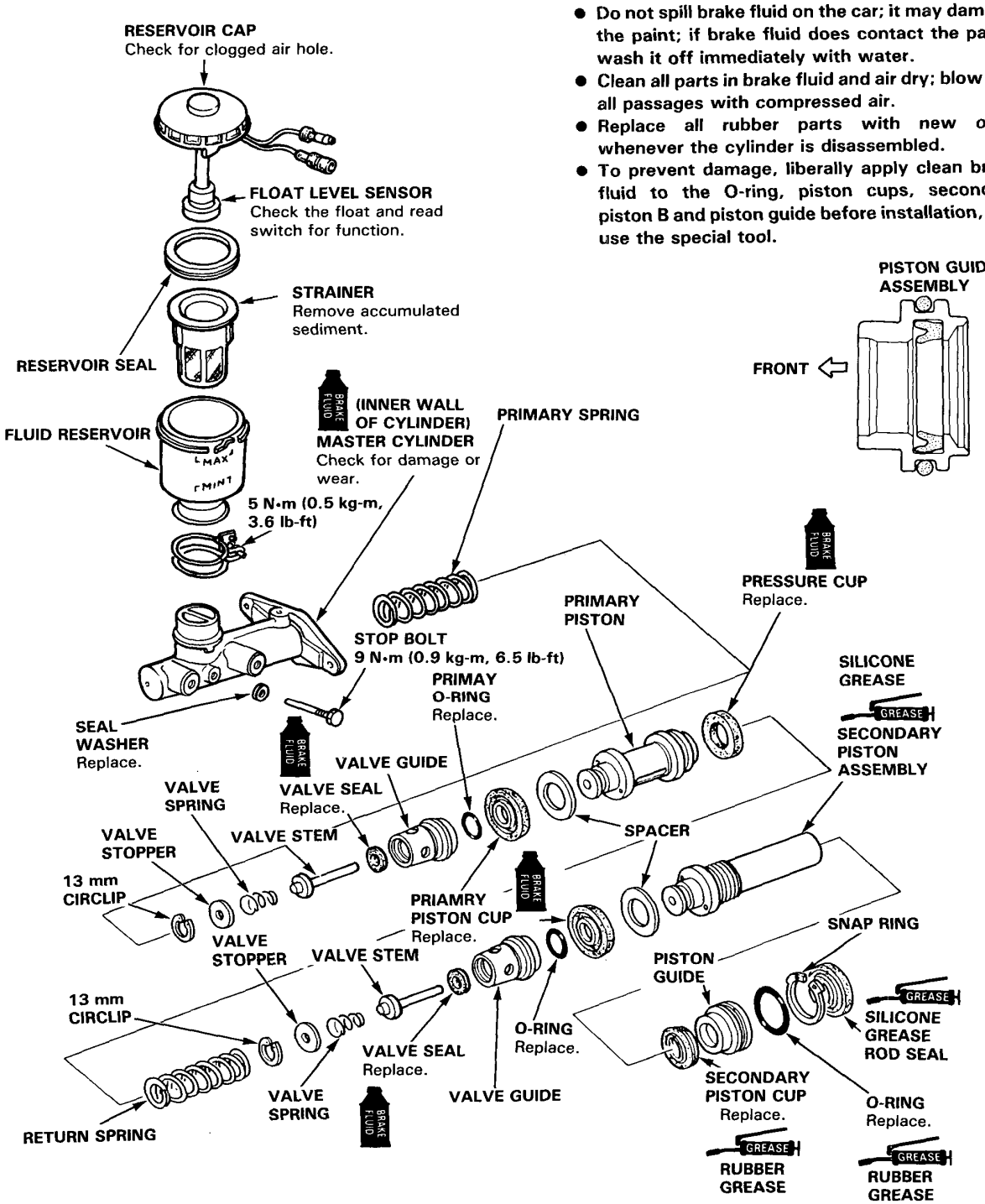
1. Drain the brake fluid from the master cylinder and modulator reservoir thoroughly.
2. Remove the red cap from the bleeder on the top of the power unit.
3. Install the ALB T-WRENCH on the bleeder screw and turn it out slowly 90° to collect high pressure fluid into the reservoir. Turn the T-WRENCH out one complete turn to drain the brake fluid thoroughly.
4. Retighten the bleeder screw and discard the fluid.
5. Reinstall the red cap.



Master Cylinder

Index/Inspection

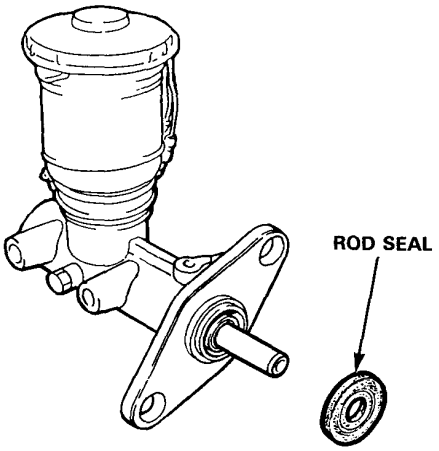
CAUTION:
- Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- Clean all parts in brake fluid and air dry; blow out all passages with compressed air.
- Replace all rubber parts with new ones whenever the cylinder is disassembled.
- To prevent damage, liberally apply clean brake fluid to the O-ring, piston cups, secondary piston B and piston guide before installation, and use the special tool.



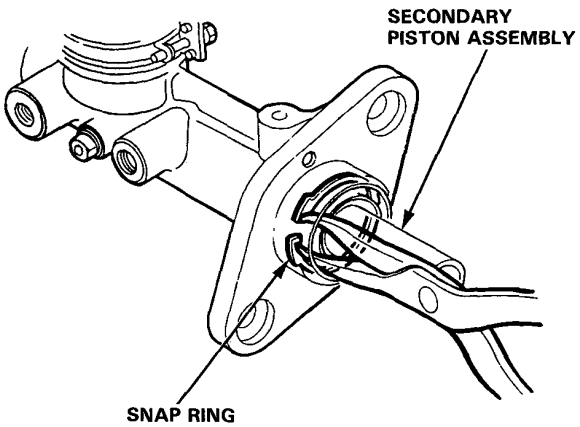
Disassembly

CAUTION:
- **Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.**
- **To prevent spills, cover the hose joints with rags or shop towels.**
- **Clean all parts in brake fluid and air dry; blow out all passages with compressed air.**
- **Use only new clean brake fluid.**
- **Replace parts with new ones whenever specified to do so.**
- **Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.**
- **Do not mix different brands of brake fluid as they may not be compatible.**
- **Do not bend or damage the brake pipes when disconnecting.**

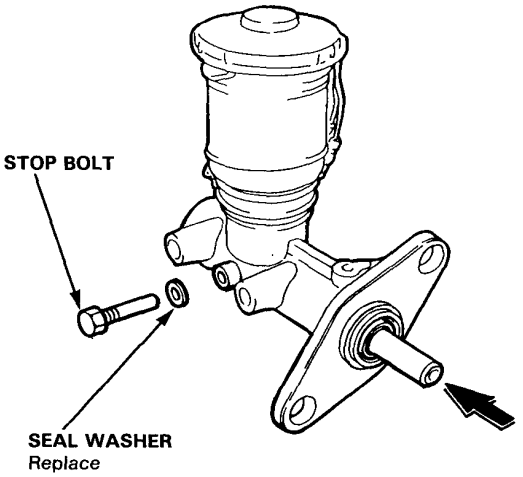
1. Remove the rod seal.



2. Press the secondary piston assembly in, then remove the snap ring.



3. Remove the stop bolt while pushing the secondary piston assembly.



4. Remove the piston guide assembly, secondary piston assembly and primary piston assembly.

   NOTE: If the primary piston assembly is difficult to remove, apply compressed air from the primary piston side outlet.

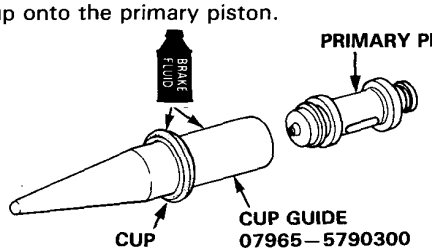
   CAUTION:
   Place a shop rag over the master cylinder to prevent the primary piston from becoming a projectile.

5. Clean each component in brake fluid.

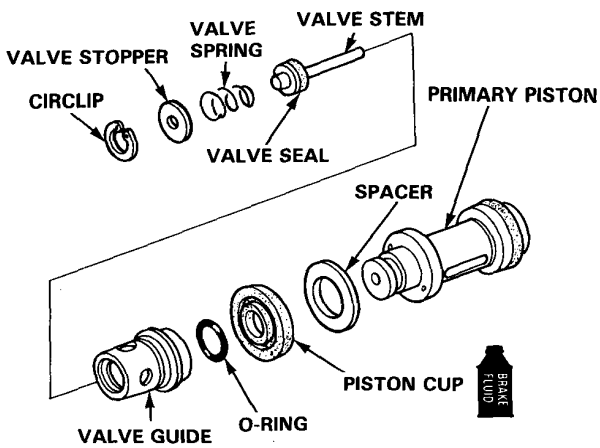
Reassembly

CAUTION:
- **Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.**
- **To prevent spills, cover the hose joints with rags or shop towels.**
- **Clean all parts in brake fluid and air dry; blow out all passages with compressed air.**
- **Use only new clean brake fluid.**
- **Before reassembling, check that all parts are free of dust and other foreign particles.**
- **Replace parts with new ones whenver specified to do so.**
- **Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.**
- **Do not mix different brands of brake fluid as they may not be compatible.**
- **Do not reuse the drained fluid.**

1. Coat the Cup Guide (special tool) with brake fluid, install the cup over the Cup Guide, then slide the cup onto the primary piston.

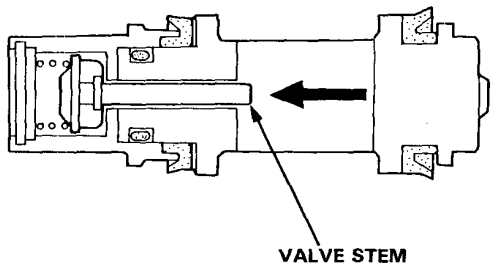


2. Install the spacer, piston cup and O-ring to the primary piston.
3. Install the valve seal on the valve stem with its flat face toward the front.
4. Install the valve stem, valve spring and valve stopper in the valve guide and secure them with the circlip.



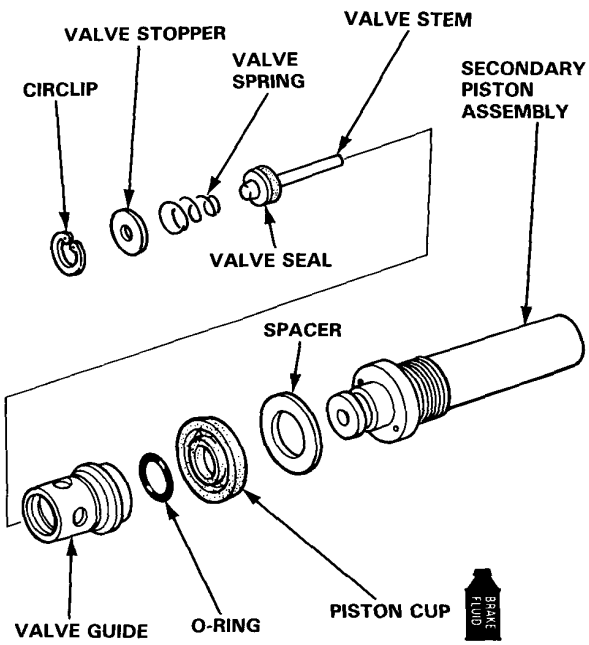
5. Install the valve guide to the primary piston.

PRIMARY PISTON ASSEMBLY

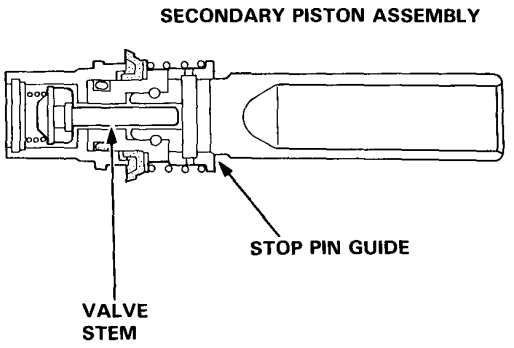


NOTE: Reaching through the primary piston stop bolt hole, lightly press on the valve stem to see if it moves smoothly.

6. Install the spacer, piston cup and O-ring on the secondary piston sub-assembly.
7. Install the valve seal on the valve stem with its flat face toward the front.
8. Install the valve stem, valve spring and valve stopper on the valve guide and secure with circlip.



7. Install the valve guide to the secondary piston assembly.



NOTE: Lightly press the stop pin guide to see if the valve stem moves smoothly.

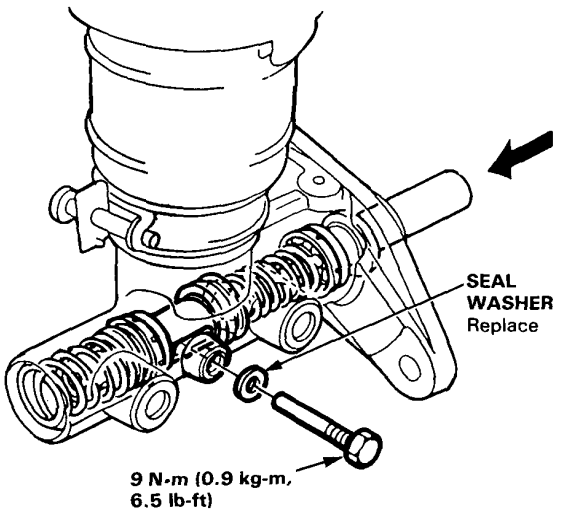
8. Assemble the primary piston assembly, secondary piston assembly and piston guide assembly in the master cylinder body.

NOTE: Install the primary piston with the slot on the cylinder facing the stop bolt hole side.

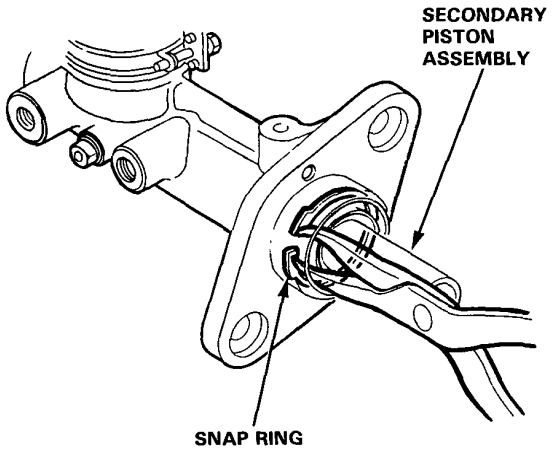
9. Push the secondary piston in until the slot aligns with the stop bolt hole, then install and tighten the stop bolt.

CAUTION:

- **Replace the stop bolt seal washer with a new one whenever disassembled.**
- **Apply brake fluid to the inner wall of the cylinder and piston cups, being careful that they are not turned inside out during installation.**

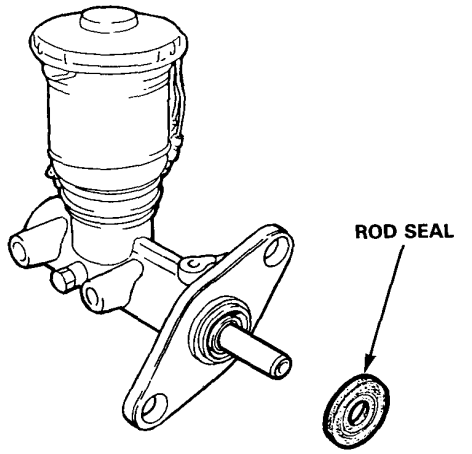


10. Press the secondary piston in and install the snap ring.



CAUTION: Avoid damaging the sliding surface of the secondary piston when installing the snap ring.

11. Install the rod seal.



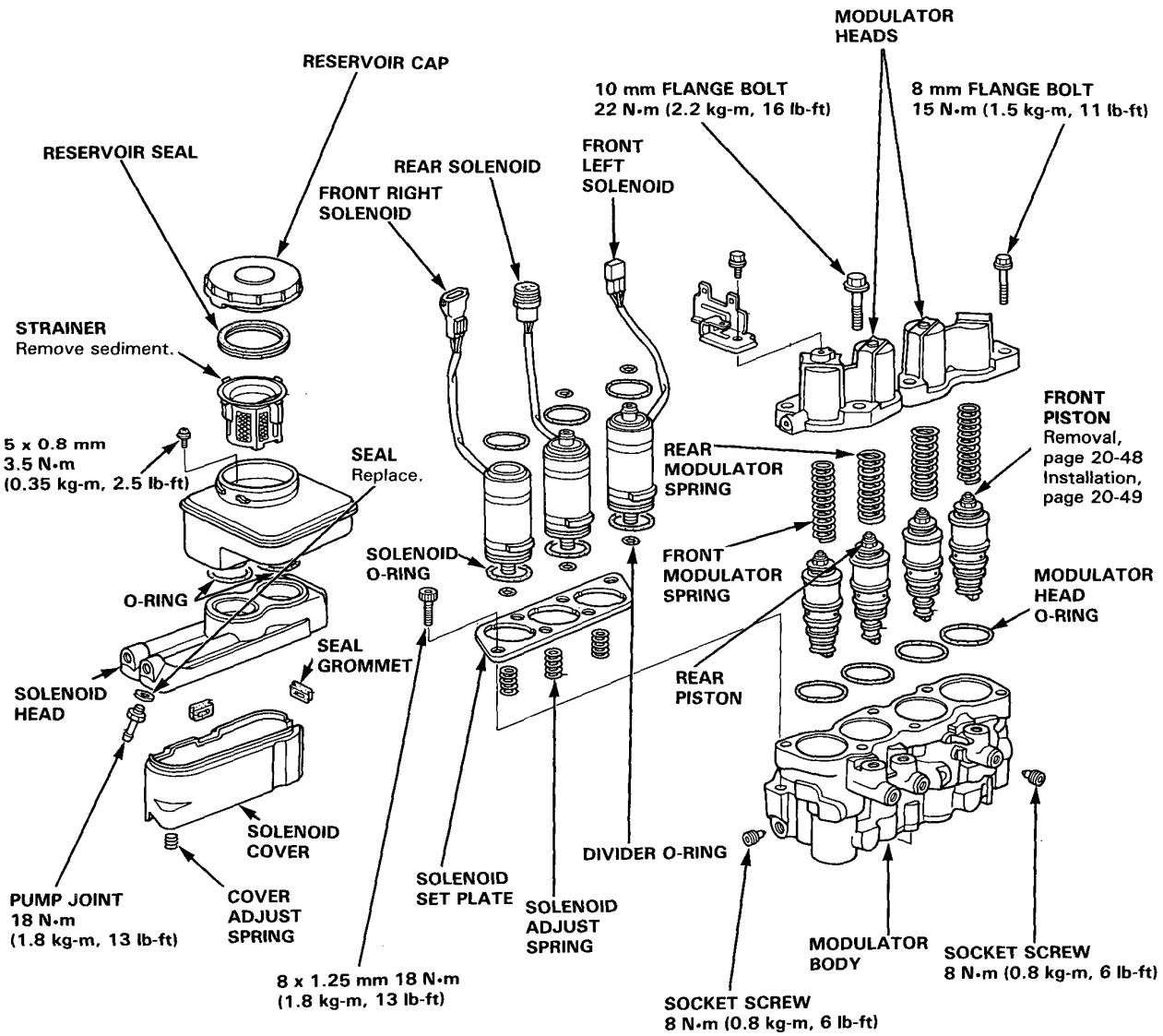
CAUTION: Make sure that there is no interference between the brake pipes and other parts when installing.

Modulator

Index/Inspection

CAUTION:

- Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- To prevent spills, cover the hose joints with rags or shop towels.
- Clean all parts in brake fluid and air dry; blow out all passages with compressed air.
- Use only new clean brake fluid.
- Before reassembling, check that all parts are free of dust and other foreign particles.
- Replace parts with new ones whenever specified to do so.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the drained fluid.
- Replace all rubber parts with new ones whenever the modulator is disassembled.

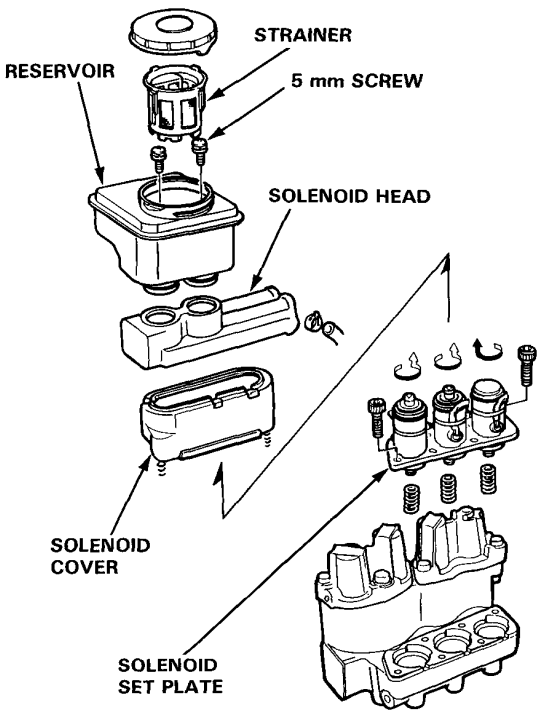


Solenoid

Removal

1. Drain the brake fluid from the modulator tank.
2. Drain the high pressure brake hose (page 20-41).
3. Disconnect the inlet hose.
4. Remove the reservoir strainer.
5. Remove the 5 mm screws and remove the reservoir.
6. Screw the 6 mm bolt into the threaded hole in the center of the solenoid head, reaise the solenoid head parallel to the ground and remove it.
7. Remove the solenoid cover.
8. Remove the hexagonal socket screws and loosen the solenoid set plate.
9. Turn the solenoid valves several times until they move freely and turn the solenoid valves 1/2 turn to align their projection with the cutout in the set plate.
   Remove the solenoid valves together with the set plate.

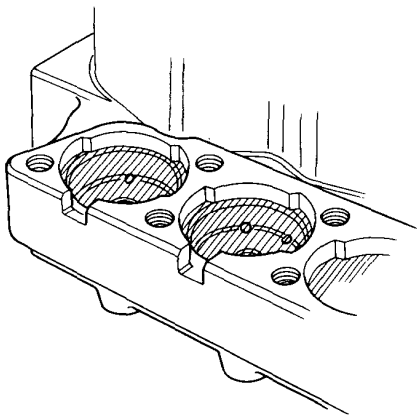
   CAUTION: The solenoid valves are delicate parts. Be careful not to drop them.



Reassembly

1. Fill the modulator body with brake fluid up to the step in the solenoid mounting hole.

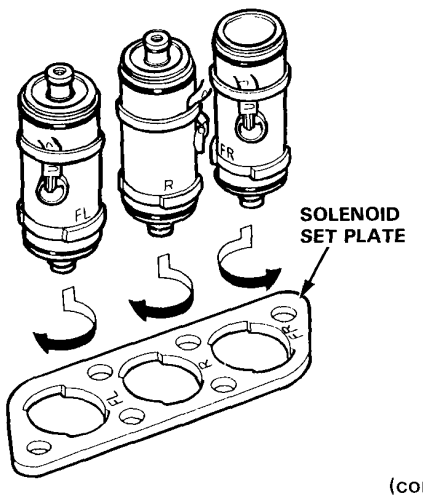
   NOTE: On solenoid valve assembly, place shop rags over the solenoid valve and under the modulator valve to prevent the brake fluid from spilling on the valve.



2. Coat the O-ring with the clean brake fluid and install the O-ring onto the solenoid valve.
3. Install the solenoid valves on the set plate.

   WARNING Each solenoid valve and set plate are marked for correct installation. If the solenoid valves are interchanged, the system will not work properly. Refer to the marks and be sure to install them in correct positions.

   - Align the projection on the solenoid valve with the cutout in the set plate and turn the valve 1/2 turn. The solenoid wire should face rearward.

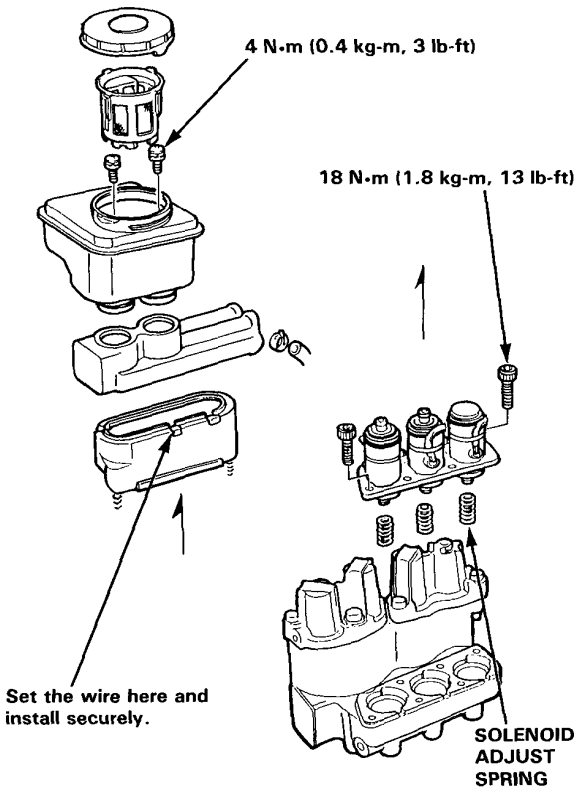


(cont'd)

Solenoid

Reassembly (cont'd)

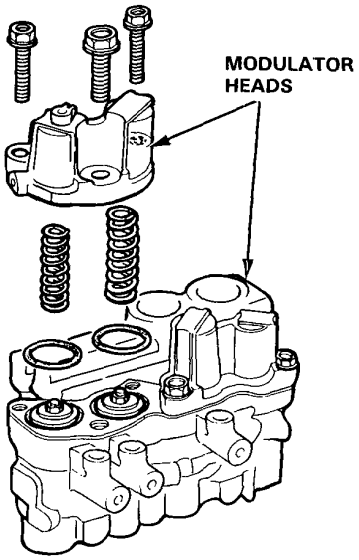
4. Install the solenoid adjust springs on the modulator body.
5. Install the solenoid valves and set plate and secure with the hexagonal socket screws.
6. Install the solenoid cover and solenoid head.
7. Install the reservoir tank.
8. Install the tank filter.
9. Connect the low pressure hose.



Piston

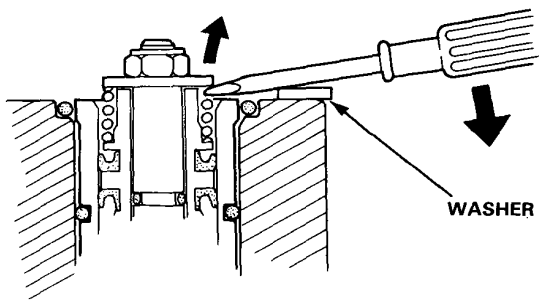
Removal

1. Remove the modulator heads.



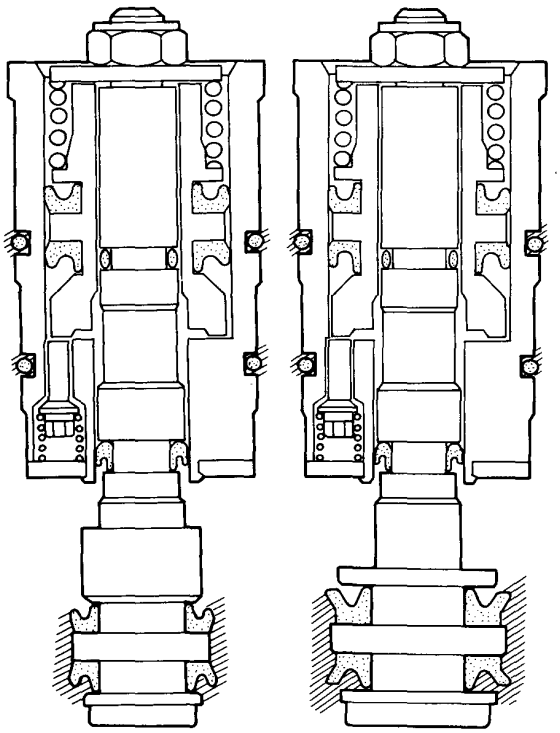
2. Insert the driver into the spring, pry off the piston assembly until it lifts up slightly and pull out the lock nut with a pair of pliers.

CAUTION:
- **Set the washer between the driver and modulator body to prevent damage to the body.**
- **Be careful not to damage the piston sleeve.**

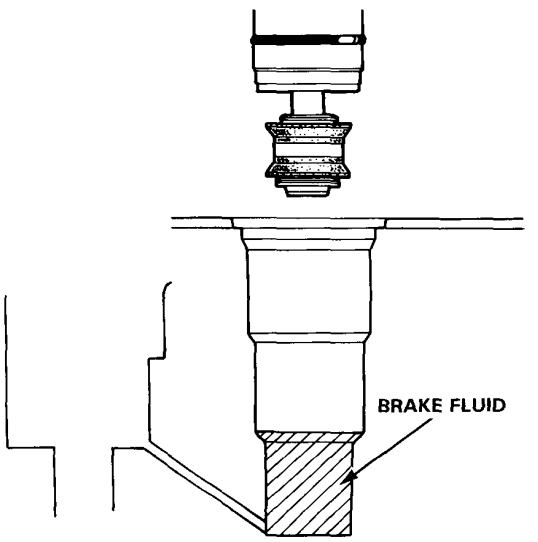


Installation

1. Apply rubber grease to the shaded sections of the piston assembly, shown in the drawing below.

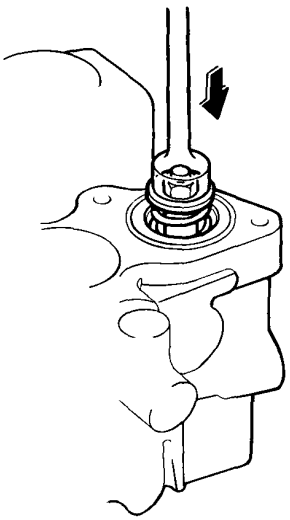


2. Adjust so that the brake fluid flows into the piston mounting hole in the modulator body.



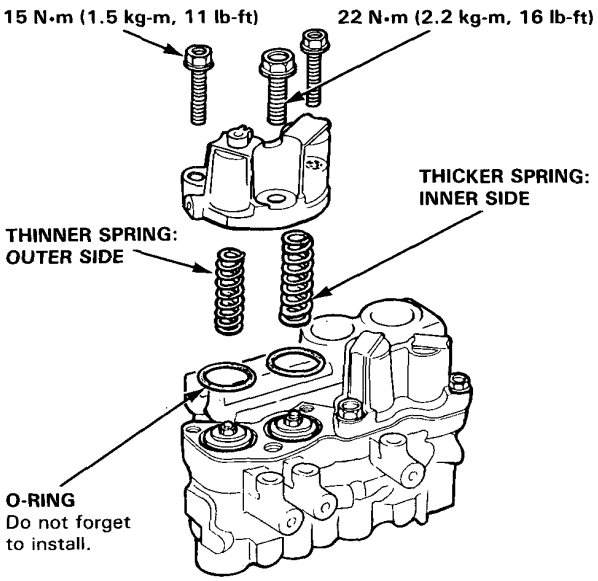
3. Set the piston assembly in the piston mounting hole in the modulator body and push down on the piston.

4. Push on the piston about 5 times until no bubbles come out of the solenoid side.



5. Install the modulator springs.

6. Install the solenoid heads with care not to pinch the O-rings.

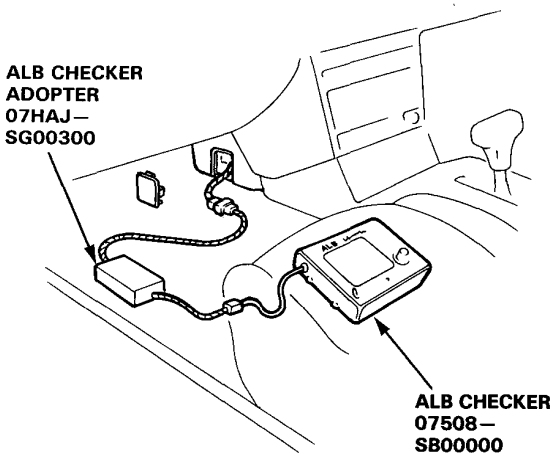


Bleeding

Air Bleeding with ALB Checker

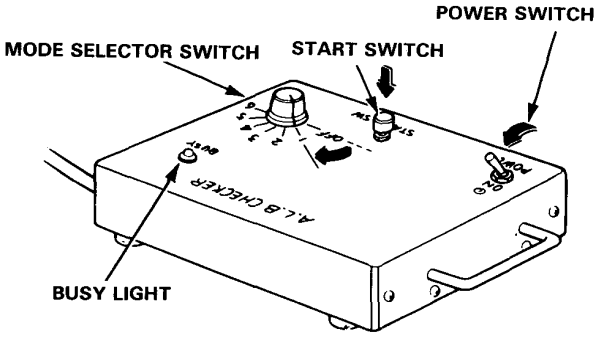
NOTE: Do not depress the brake pedal while using the ALB checker to bleed air from the system.

1. Fill the modulator reservoir with brake fluid up to the MAX level.
2. Disconnect the 6P coupler (PNK) from the cover mounted in front of the console and connect it to the ALB checker.

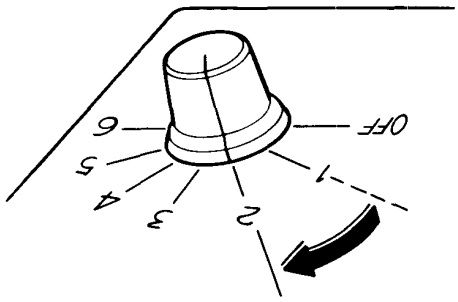


CAUTION: Place the car on level ground with the wheels blocked. Shift the transmission to P or Nutral.

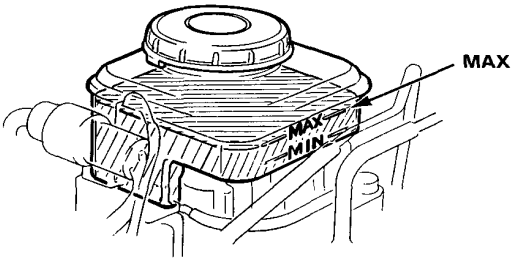
3. Start the engine.
4. Release the parking brake.
5. Turn the power switch of ALB checker ON.



6. Turn the mode selector switch to 1.
7. Press the start switch.
8. Make sure that the motor runs.
9. Wait for the motor to stop.
10. Turn the mode switch to 2.



11. Press the start switch.
12. Brake fluid in the reservoir will bubble briskly for 20 seconds after the switch is pressed. Wait for 4 to 5 minutes until the brake fluid stops bubbling.
13. Turn the mode switch to 6.
14. Repeat steps 11 and 12.
15. Repeat steps 10 through 14 two or three times.
16. Fill the reservoir with brake fluid up to the MAX level.



17. Install the cap.
18. Check the ALB function in all modes (page 20-17). There should be kickback in modes 2 through 6.

CAUTION: If the kickback is weak, re-bleed air from the system.

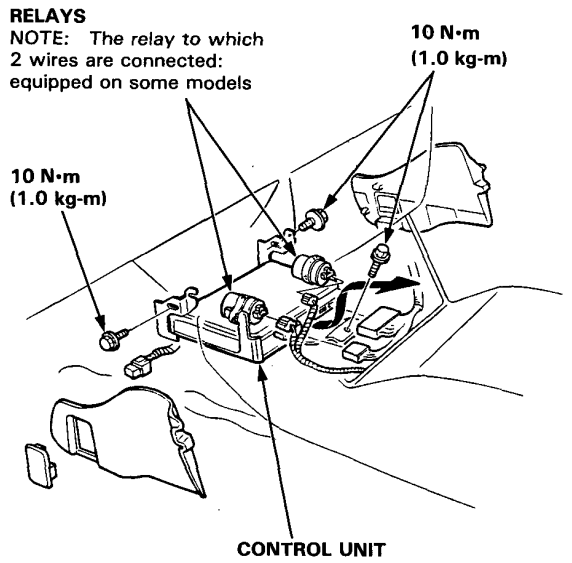
Control Unit

Replacement

1. Remove the center console and covers (section 20).

2. Remove the control unit attaching bolts, then remove the control unit.

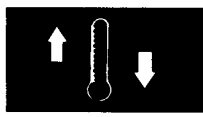
CAUTION:
- **If the control unit attaching bolts are removed, the control unit's memory is cleared.**
- **Handle the control unit with care.**



Installation is the reverse order of removal.

NOTE: Check the ALB warning light function by turning the ignition switch ON.

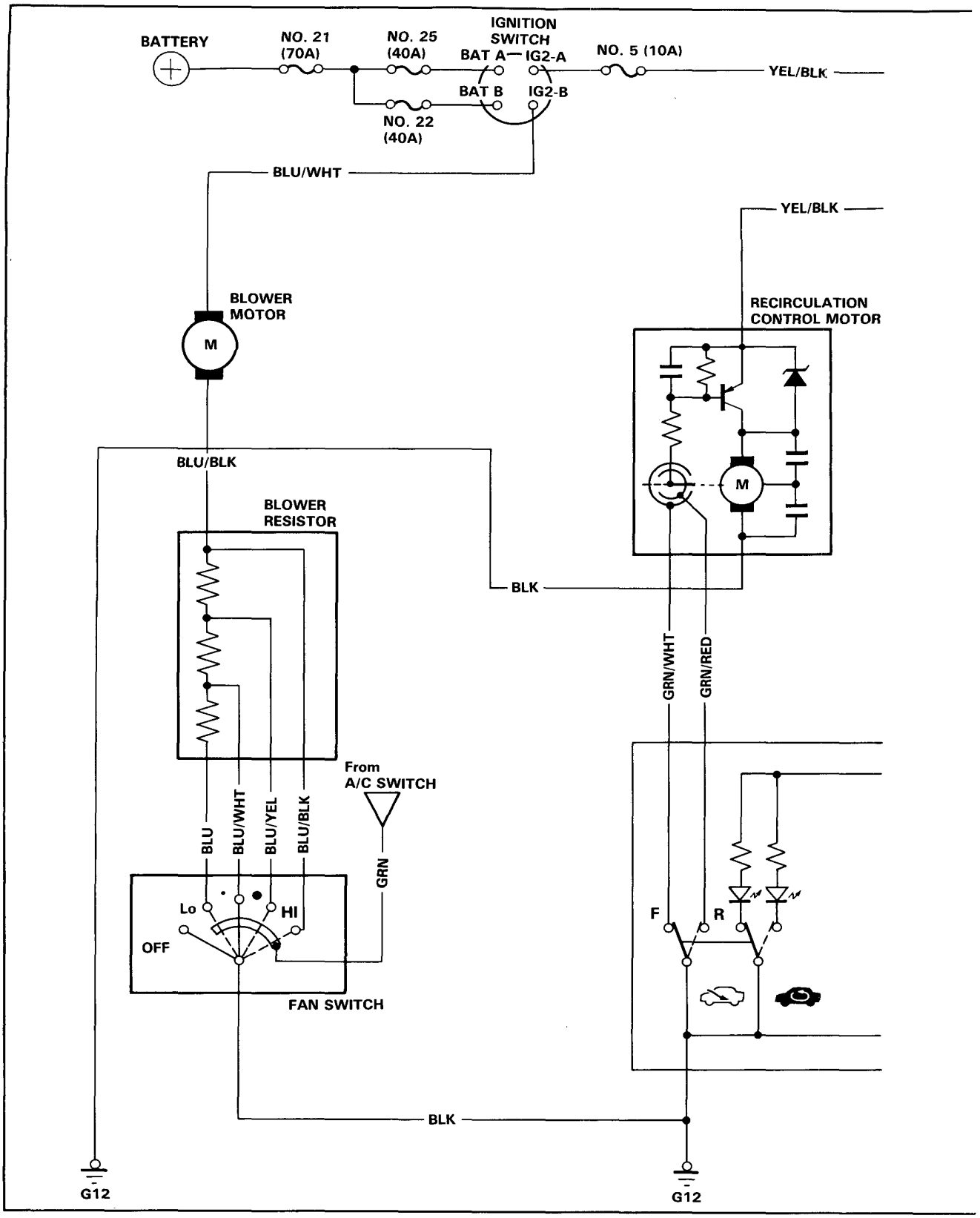
Heater

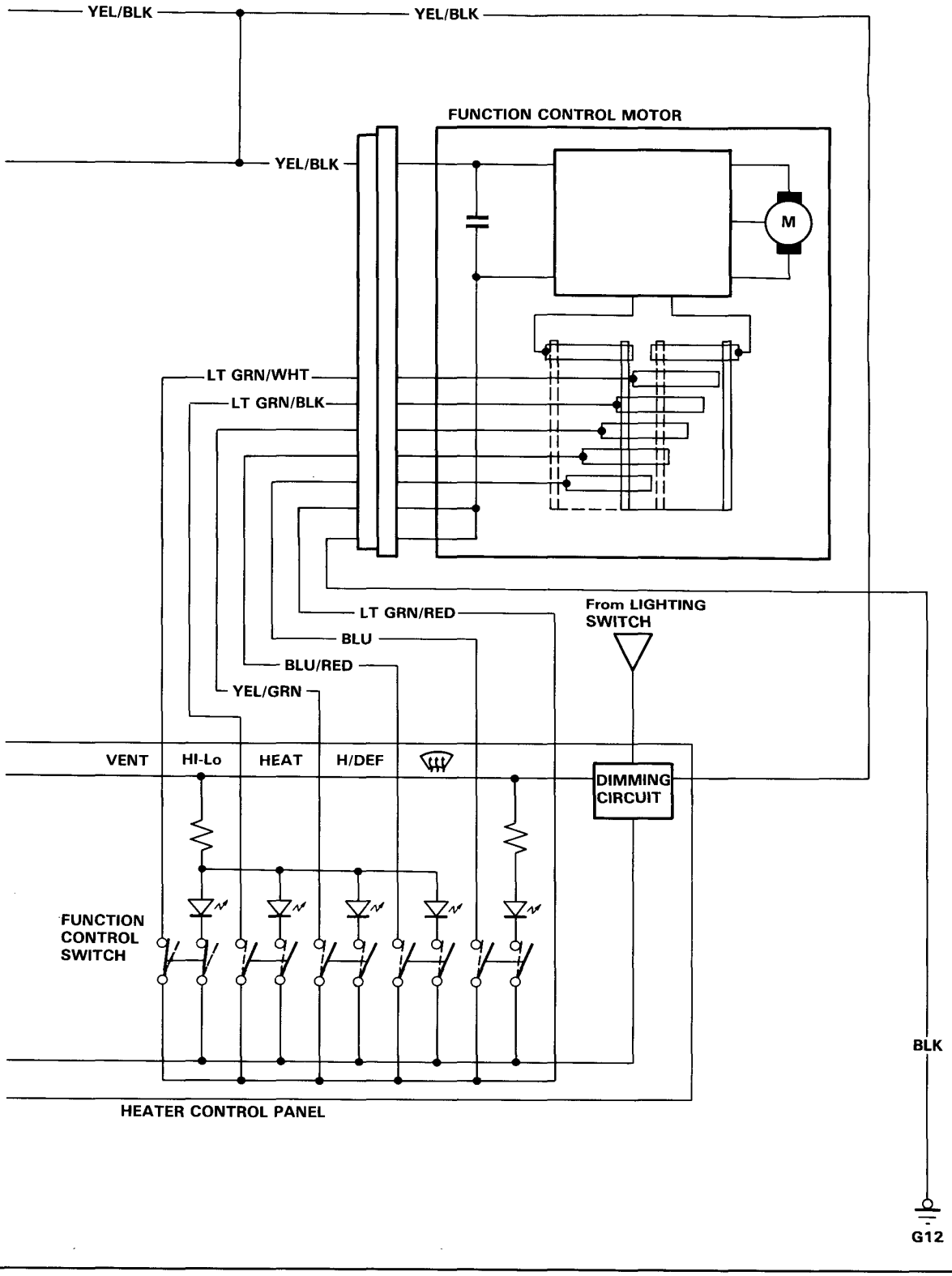


Outline of Model Changes

Function control motor, recirculation control motor and control panel switches have changed.

Circuit Diagram




YEL/BLK
YEL/BLK
FUNCTION CONTROL MOTOR
YEL/BLK
M
LT GRN/WHT
LT GRN/BLK
LT GRN/RED
From LIGHTING SWITCH
BLU
BLU/RED
YEL/GRN
VENT
HI-Lo
HEAT
H/DEF
DIMMING CIRCUIT
FUNCTION CONTROL SWITCH
BLK
G12
HEATER CONTROL PANEL

Troubleshooting

Symptom Chart

SYMPTOM		REMEDY
No hot air flow	Blower motor does not run	See flow chart (page 22-5)
	Blower motor runs	Check following: • Clogged heater duct • Clogged blower outlet • Clogged heater valve • Faulty air mix door • Air mix cable out of adjustment • Faulty thermostat (section 10)
Hot air flow is low	Blower speed does not change	See flow chart (page 22-7)
	Blower runs properly	Check following: • Clogged heater duct • Clogged blower outlet • Incorrect door position
Function does not change	Function control motor does not run	See flow chart (page 22-10)
	Function control motor runs	Check the heater door linkage and cable adjustments.
Recirculation door does not change	Recirculation motor does not run	See flow chart (page 22-8)
	Recirculation motor runs	Check the door linkage then see flow chart (page 22-8)

Flow Chart — Blower

Blower motor does not run at all.

Inspect the No.22 (40A) fuse.

Is the No.22 (40A) fuse OK? NO → **Replace fuse.**

YES

Disconnect the 2P connector from the blower motor.

Turn the ignition switch ON.

Measure voltage between BLU/WHT terminal (+) and body ground (–).

Is there battery voltage? NO → **Repair open in BLU/WHT wire between blower and ignition switch.**

YES

Turn the ignition switch OFF.

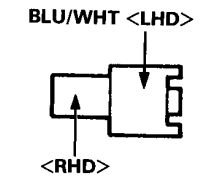
Reconnect the 2P connector to the blower motor.

Connect a jumper wire between the BLU/BLK terminal and body ground. Turn the ignition switch ON.

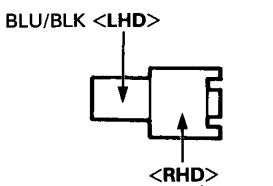
Does blower motor run? NO → **Replace the blower motor.**

YES

(To page 21-6)



View from wire side



View from wire side

(cont'd)

Flow Chart — Blower (cont'd)

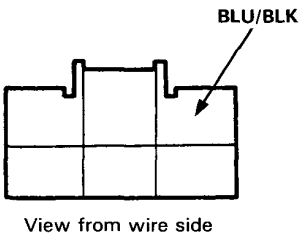
(From page 21-5)

Turn the ignition switch OFF.

Remove the jumper wire.

Disconnect the 6P connector from the fan switch.

Connect the jumper wire between the BLU/BLK terminal and body ground.



View from wire side

Turn the ignition switch ON.

Does the blower motor run?

NO → **Repair open in BLU/BLK wire between blower and fan switch.**

YES

Turn the ignition switch OFF.

Remove the jumper wire.

Inspect the fan switch.

Is the fan switch OK?

NO → **Replace the fan switch.**

YES

Repair open in BLK wire between the fan switch and body ground or poor ground.

Blower motor running speed does not change.

Disconnect the 4P connector from the blower resistor.

Check for continuity between the No. 2 and No. 4 terminals of the resistor.

Does continuity exist? NO → **Replace the resistor.**

YES

Reconnect the 4P connector to the resistor.

Disconnect the 6P connector from the fan switch.

Turn the ignition switch on.

Measure voltage between:
- BLU/YEL terminal and body ground.
- BLU/WHT terminal and body ground.
- BLU terminal and body ground.

Is there battery voltage? NO → **Repair open in BLU/YEL, BLU/WHT and/or BLU wire(s) between the fan switch and resistor.**

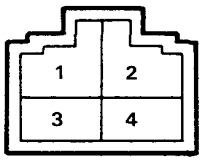
YES

Check for continuity from BLK terminal to body ground.

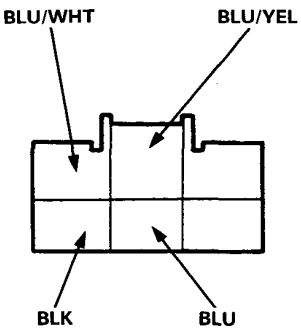
Is there continuity? NO → **Repair open in BLK wire between the fan switch and body ground or poor ground.**

YES

Replace the fan switch.



View from terminal side



View from wire side

Flow Chart — Recirculation Control

Recircuration control door does not change between FRESH and REC.

Inspect No. 5 (10A) fuse.

In the No. 5 fuse OK? — NO → **Replace the fuse.**

YES

Push the FRESH button and (REC OFF) and turn the ignition switch ON.

Does the motor run all the time? — YES → **· Repair short in GRN/RED wire between recirc. motor and switch. · Replace the control switch.**

NO

Push the REC button

Does the motor run all the time? — YES → **· Repair short in GRN/WHT wire between recirc. motor and switch. · Replace the control switch.**

NO

Turn off the ignition switch.

Disconnect the 6-P connector from the recirc. motor at the bottom of the blower assembly.

Turn the ignition switch on.

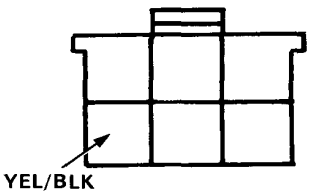
Measure the voltage between the YEL/BLK (+) and body ground (–).

Is there battery voltage? — NO → **Repair open in YEL/BLK wire between the fuse box and recirc. motor.**

YES

Turn the ignition switch off and reconnect the 6-P connector.

(To page 21-9)



View from wire side

(From page 21-8)

Connect the GRN/WHT and GRN/RED terminals to the body ground using a jumper wire. Turn the ignition switch on.

Does the motor run all the time?

NO

Turn the ignition switch off and check for continuity between the BLK terminal and body ground.

Is there continuity?

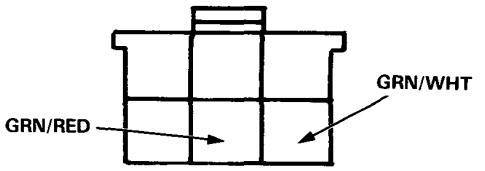
NO

Repair open in BLK wire between the blower and G12 or poor ground.

YES

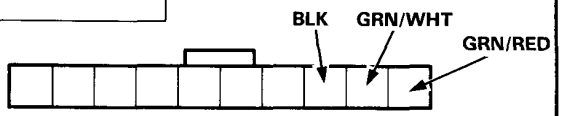
Replace the recirculation control motor.

YES



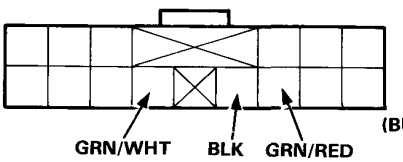
View from wire side

Turn the ignition switch OFF. Remove the heater control panel and disconnect the 14-P connector.



View from wire side **(LEVER TYPE)**

Connect the GRN/WHT and GRN/RED terminals to BLK terminal using a jumper wire.



(BUTTON Type)

Does the motor run all the time?

YES

Replace the heater control panel.

NO

Check for continuity between the BLK terminal and body ground.

Is there continuity?

NO

Repair the poor ground or open in BLK wire between the heater control panel and body ground.

YES

Repair open in GRN/WHT or GRN/RED between the heater control panel and blower.

Flow Chart — Function Control

Function control motor does not run.

Inspect the No. 5 (10A) fuse.

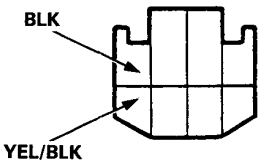
Is the No. 5 fuse OK? NO → **Replace the fuse.**

YES

Disconnect the 8P connector from the function control motor.

Turn the ignition switch ON.

Measure voltage between YEL/BLK terminal and body ground.



View from wire side

Is there battery voltage? NO → **Repair open in YEL/BLK wire between heater control and fuse box.**

YES

Turn the ignition switch OFF.

Check for continuity from BLK terminal to body ground.

Is there continuity? NO → **Repair open in BLK wire between the function control motor and body ground or poor ground (G12).**

YES

Inspect the function control motor (page 22-25).

Is the function control motor OK? NO → **Replace the function control motor.**

YES

(To pae 21-15)

(From page 21-14)

Disconnect the 14P connector from the heater control panel.

Check for continuity at each wire (LT GRN/RED, LT GRN/BLK, LT GRN/WHT, YEL/GRN, BLU/RED, BLU) between the 8P and 14P connectors.

Does continuity exist? NO → **Repair open wire.**

YES

Check for continuity from each wire (LT GRN/RED, LT GRN/BLK, LT GRN/WHT, YEL/GRN, BLU/RED, BLU) to body ground.

Is there continuity? YES → **Repair short to body ground in wire.**

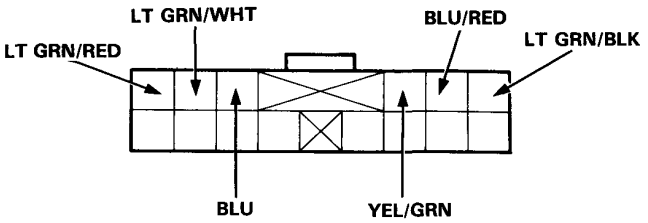
NO

Check for continuity between BLK terminal to body ground.

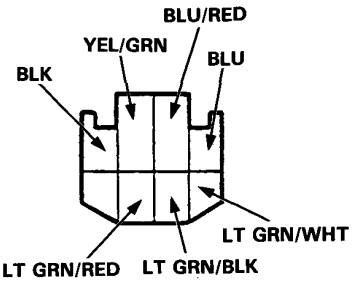
Is there continuity? NO → Repair open in BLK wire or poor ground

YES

Replace the heater control panel.

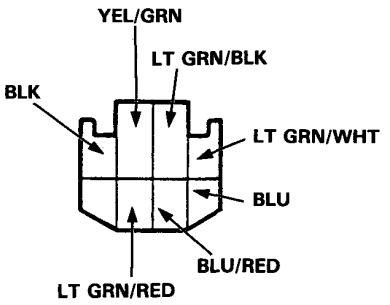


View from wire side



View from wire side <LHD>

NOTE: If any of the wires are shorted to ground, the function control motor will not change positions.



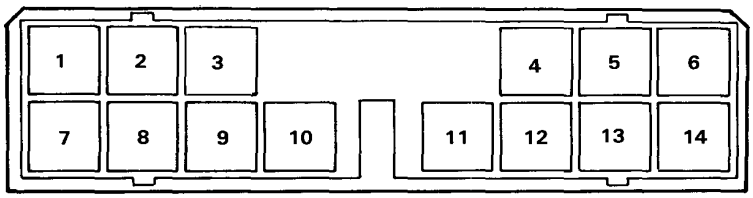
View from wire side <RHD>

Control Panel Switches (Button Type)

FRESH/REC Switch

Check for continuity between the terminals, as shown in the chart:

Position \ Terminal	12	11	10
REC	○——	——○	
FRESH		○——	——○



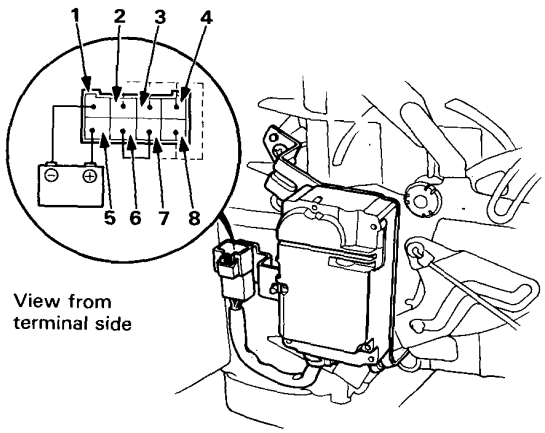
Function Switch

Check for continuity between the terminals, as shown in the chart:

Position \ Terminal	1	2	3	4	5	6
VENT	○——	——○				
HI-LO	○——		——○			
HEAT	○——			——○		
H/DEF	○——				——○	
DEF	○——					——○

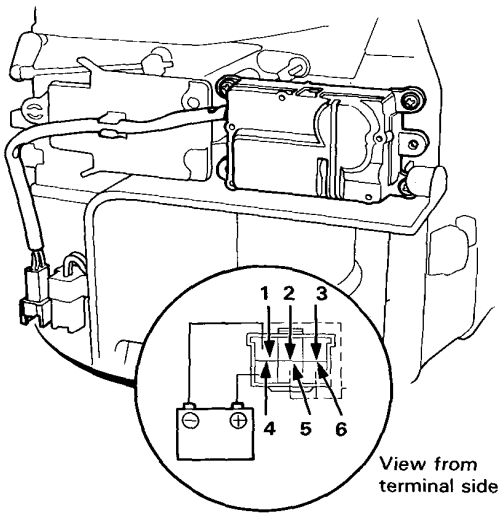
Function Control Motor

1. Connect the battery positive terminal to the 5 terminal of the function control motor and negative to the 1 terminal.
2. Using jumper wire short the 6 terminal to the 8, 7, 2, 3 and 4 terminals to follow the order.
   - The motor should run each time the short circuit is made.

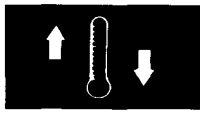


Recirculation Control Motor

1. Connect the battery positive to the 4 terminal of the recirculation control motor connector and negative to 1 terminal.
2. Using a jumper wire connect the 1 terminal and 5 or 6 terminal.
   - From the recirculation door REC position, the motor should turn with the 1 terminal connected to 4 terminal.
   - From the door FRESH position, the motor should turn with the 1 terminal connected to 5 terminal.
4. The motor automatically stops after half turn with the jumper wire connected.

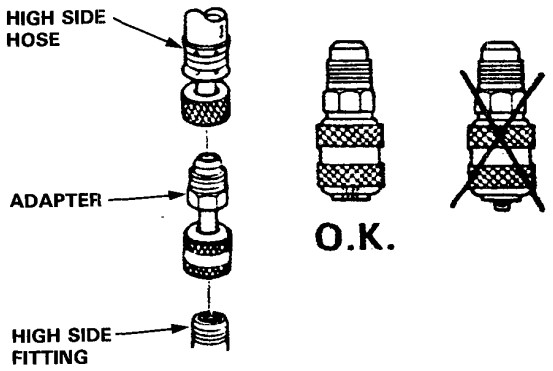


Air Conditioner



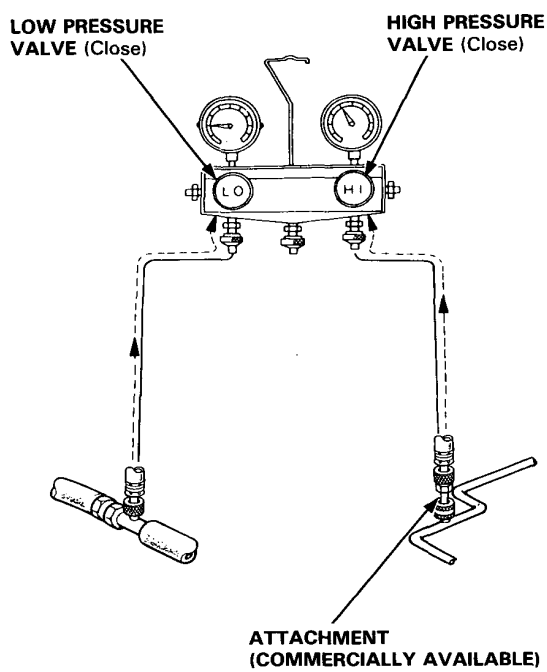
'88 A/C high side adaptor

The A/C high side charging fitting size is being changed on all '88 models.
The fitting's O.D. will be reduced from 7/16'' to 3/8'' to prevent you from accidentally connecting the low side hose to the high side fitting.
Consequently, you'll need an adapter for the existing hose on your charging station.
Use the adaptor with the short depressor; there is the possibility that the long depressor may allow the adapter to leak.

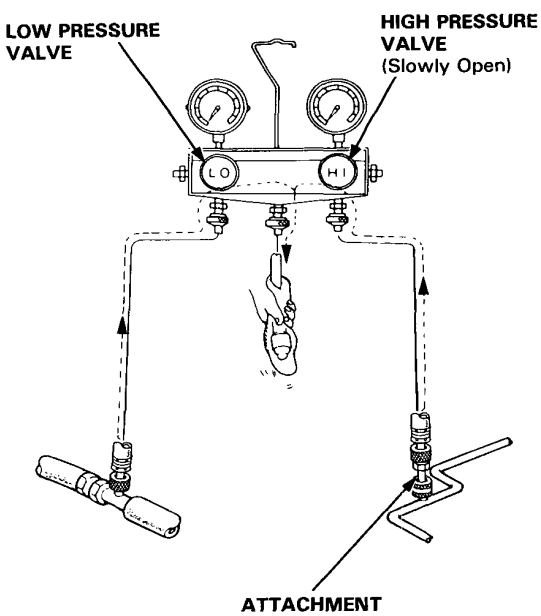


NOTE: Set the attachement to the gauge hose at high pressure side first, then install the gauge set as shown. When disconnecting the gauge hose at high pressure side, remove the attachment from the high pressure charging valve.

Pressure Test



Discharging



INTRODUCTION

How to Use This Manual

This supplement contains information for the 1989 ACCORD. Refer to following shop manuals for service procedures.

Description	Code No.
ACCORD Maintenance and Repair 86	62SE300
ACCORD Supplement 87	62SE320
ACCORD Supplement 88	62SE321

The first page of each section is marked with a black tab that lines up with one of the thumb index tabs on this page. You can quickly find the first page of each section without looking through a full table of contents. The symbols printed at the top corner of each page can also be used as a quick reference system.

Special Information

WARNING Indicates a strong possibility of severe personal injury or loss of life if instructions are not followed.

CAUTION: Indicates a possibility of personal injury or equipment damage if instructions are not followed.

NOTE: Gives helpful information.

CAUTION: Detailed descriptions of *standard* workshop procedures, safety principles and service operations are not included. Please note that this manual does contain warnings and cautions against some specific service methods which could cause PERSONAL INJURY, or could damage a vehicle or make it unsafe. Please understand that these warnings cannot cover all conceivable ways in which service, whether or not recommended by Honda Motor, might be done, or of the possible hazardous consequences of each conceivable way, nor could Honda Motor investigate all such ways. Anyone using service procedures or tools, whether or not recommended by Honda Motor, *must satisfy himself thoroughly* that neither personal safety nor vehicle safety will be jeopardized.

*(Asterisk) marked sections are not included in this manual.

First Edition 9/88, 196 pages
All Rights Reserved

HONDA MOTOR CO., LTD.
Service Publication Office

Outline of Model Changes

ITEM	87 MODEL	88 MODEL	89 MODEL	DESCRIPTION	REFERENCE SECTION
Engine	O			Modified	—
		O		Modified	—
			O	Modified	5, 6, 7
Distributor	O			Changed	—
Intake and Exhaust Manifolds		O		Changed	—
Water Pump		O		Changed	—
Oil Filter			O	Changed	8
Exhaust Muffler			O	Modified	9
PGM-FI	O			Modified	—
		O		Modified	—
Carburetion	O			Modified	—
		O		Modified	—
			O	Modified	12
Clutch	O			Modified	—
Manual Transmission	O			Modified	—
Automatic Transmission		O		Modified	—
			O	Modified	15
Intermediate Shaft	O			Added for some types	—
Power Steering Gearbox		O		Modified	—
Front Brake Caliper and Discs	O			Modified	—
ALB		O		3 channel ALB system adopted	—
			O	Master cylinder changed	20
Rear Wheel Cylinder			O	Modified	20
Rear Wheel House	O			Modified due to change in rear suspension	—
Heater		O		Modified	—
Air Conditioner		O		Modified	—
Combination Meter	O			Modified	—
Headlights	O			Added with Dim-Dip lighting system for some types	—
Headlight Washer			O	Circuit modified	25
Cruise Control			O	Clutch switch modified	25
High Mount Brake Light			O	Adopted for some type	25

General Information

Chassis and Engine Numbers

Vehicle Identification Number

JHMCA53400C300001

Manufacture, Make and Type of vehicle
JHM: HONDA MOTOR CO., LTD., JAPAN. HONDA Passenger car

Line/Body and Engine Type
CA4: Accord 1600
CA5: Accord 2000

Transmission and Body Type
3: Manual (3D)
4: Automatic (3D)
5: Manual (4D)
6: Automatic (4D)

Vehicle Grade
2: STD, GL, LX
3: EX
4: EXi
5: EXSi
6: EXR, LXC
7: EXC
8: EXCi
9: EXSCi

Fixed Code

Auxiliary Number

Factory Code
C: Saitama Factory Sayama Plant

Model Year
3: 1989

Serial Number

Engine Serial Number (DOHC Engine)

B20A2-2000001

Engine Type
B20A2: 2000 Fuel-Injected engine for KF, KG, KE, KW models
B20A8: 2000 Fuel-Injected engine for KG, KX, KS models

Model Year
2: 1989 with catalytic converter
3: 1989 without catalytic converter

Serial Number

Engine Serial Number (SOHC Engine)

A20A2-4000001

Engine Type
A20A1: 2000 Carbureted engine for KG, KS, KW models
A20A2: 2000 Carbureted engine for KG, KW, KF, KE, KP, KT, KU, KY, KQ models
A20A3: 2000 Fuel-Injected engine for KG, KW, KX, KS models
A20A4: 2000 Fuel-Injected engine for KG, KW, KF, KE, KQ models
A16A1: 1600 Carbureted engine for KF, KG, KW, KT, KZ models

Model Year
4: 1989

Transmission/Emission Group
0: Manual/without catalytic converter
3: Manual and Automatic/with catalytic coverter for KQ model
5: Automatic/without catalytic converter
9*: Manual and Automatic/with catalytic converter for KG, KW, KX models

Serial Number
9* with Automatic starting 50001.

Transmission Number (Manual)

E2K5-2000001

Transmission Type
E1M5: for A16A engine
E2K5: for A20A engine except KS, KX models
E2L5: for KX model with A20A engine
E2S5: for KS model with A20A engine
F2K5: for B20A engine except KX model
F2X5: for KX model with B20A engine

Model Year
2: 1989

Serial Number

Transmission Number (Automatic)

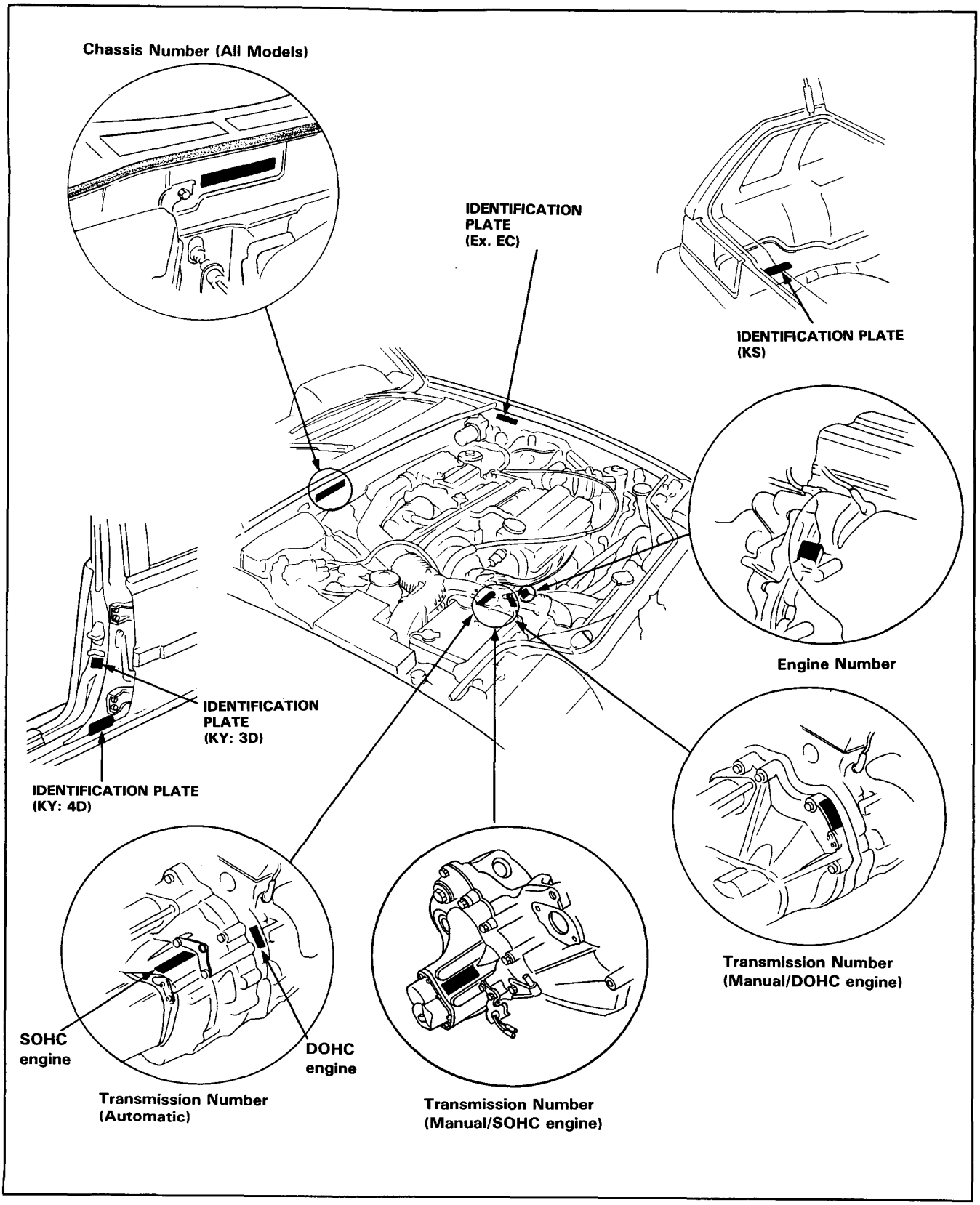
F4-9000001

Transmission Type
F4: for A20A Engine
C9: for A16A Engine

Model Year
9: 1989

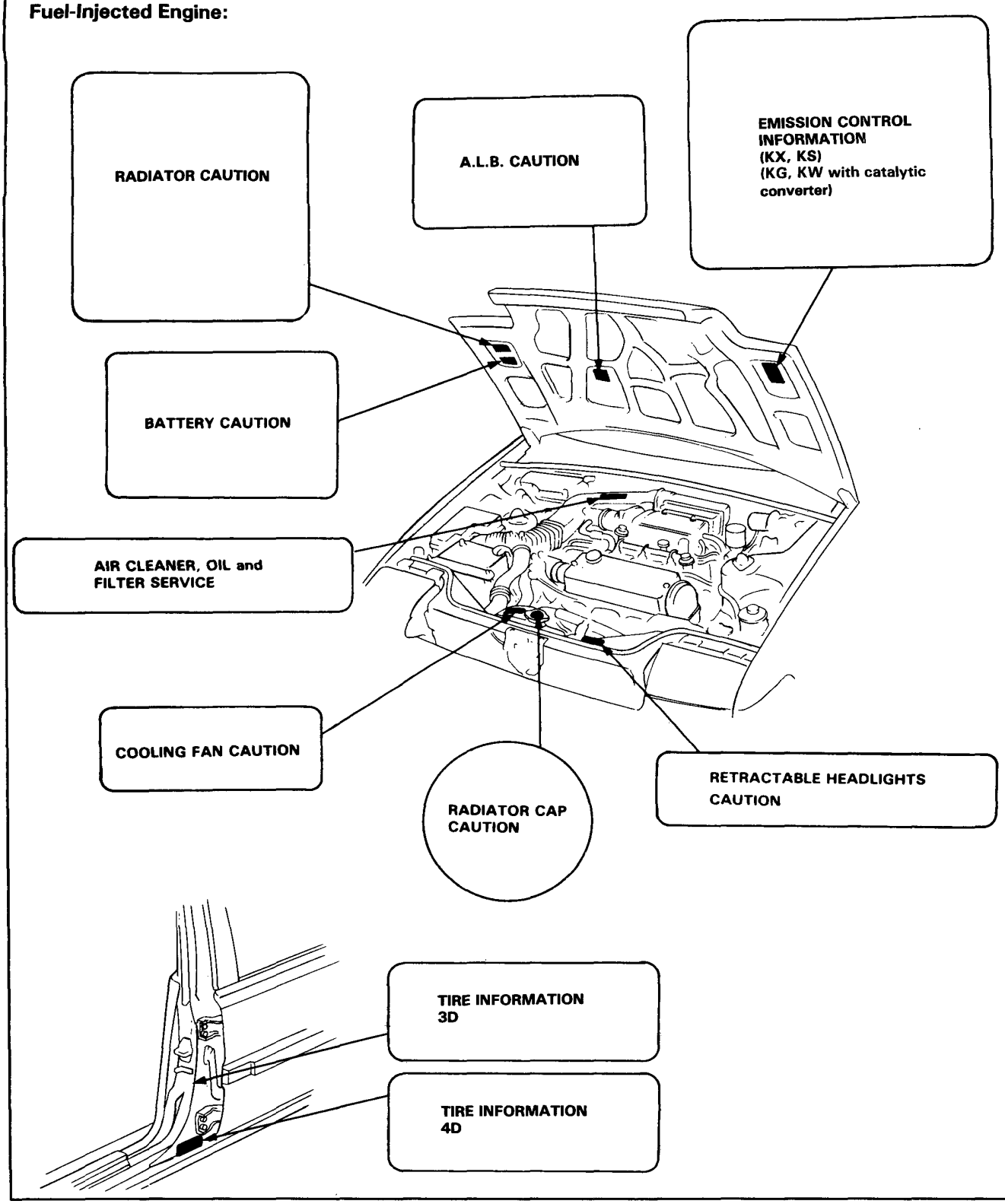
Serial Number

Identification Number Locations

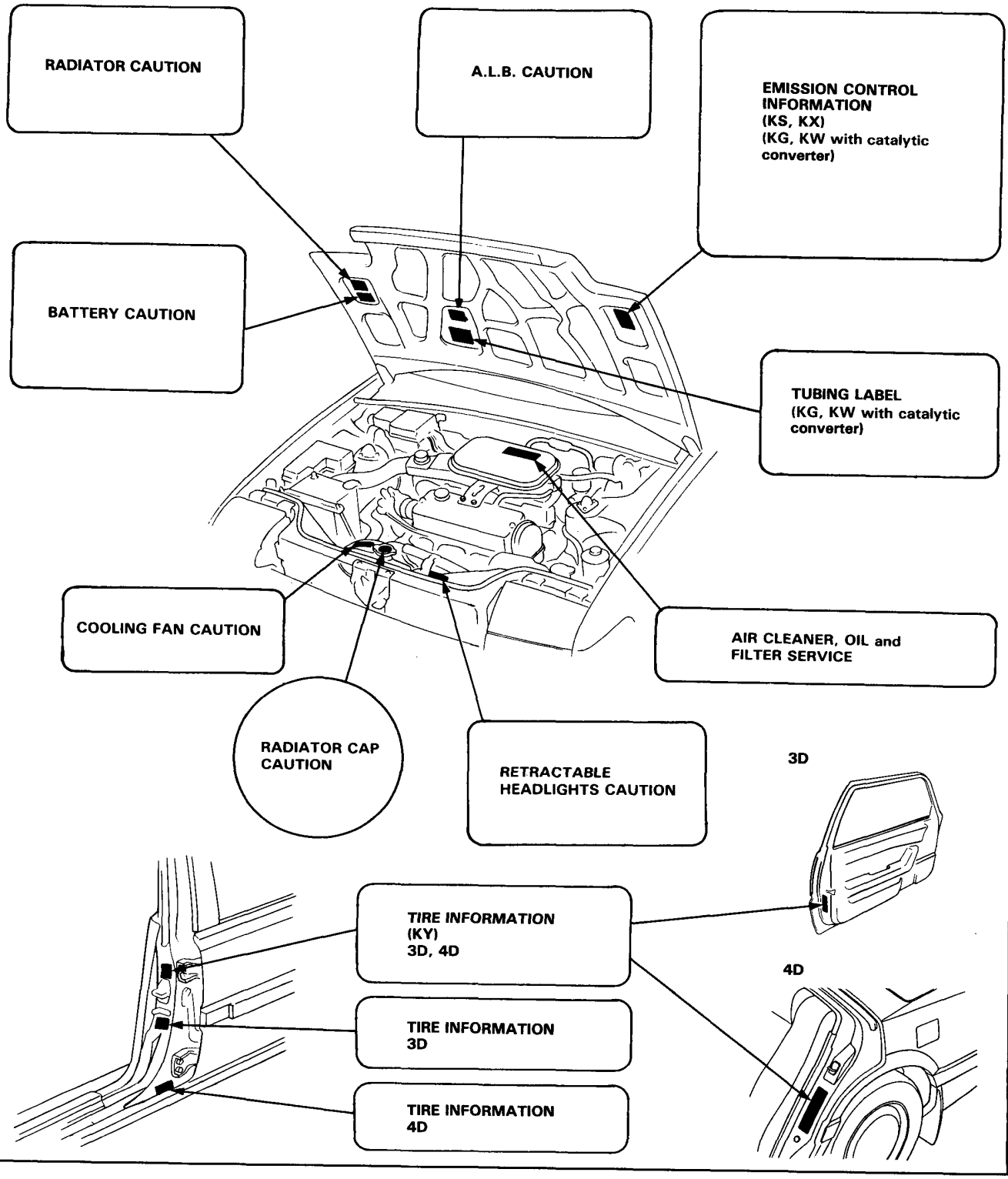


Label Locations

Fuel-Injected Engine:



Carbureted Engine:



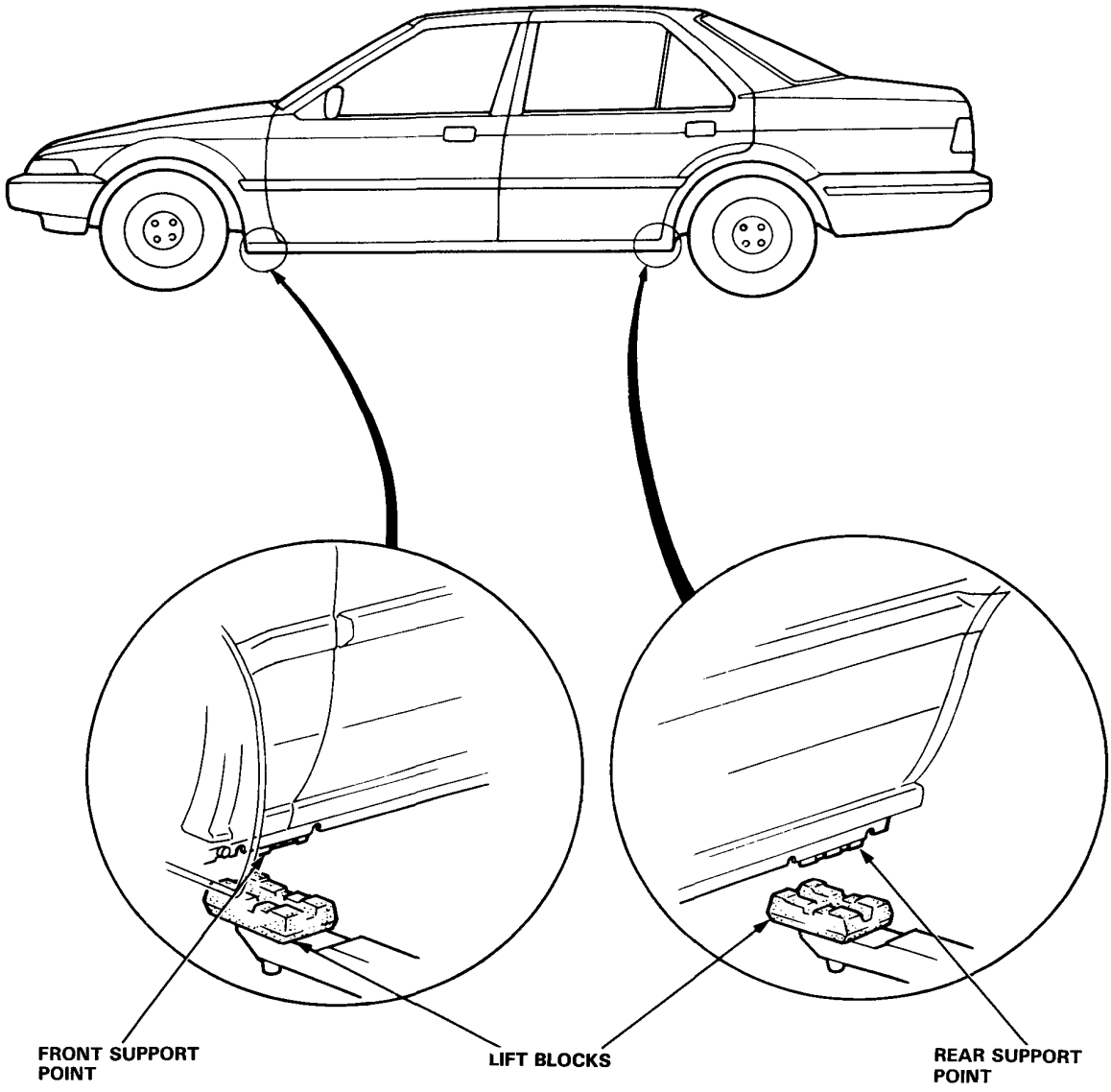
Lift and Support Points

Hoist

1. Place the lift blocks as shown.
2. Raise the hoist a few inches and rock the car to be sure it is firmly supported.
3. Raise the hoist to full height and inspect lift points for solid support.

WARNING When heavy rear components such as suspension, fuel tank, spare tire and trunk lid/hatch are to be removed, place additional weight in the trunk before hoisting. When substantial weight is removed from the rear of the car, the center of gravity may change and can cause the car to tip forward on the hoist.

NOTE: Since each tire/wheel assembly weighs approximately 14 kg (30 lbs), placing the front wheels in the trunk can assist with the weight transfer.



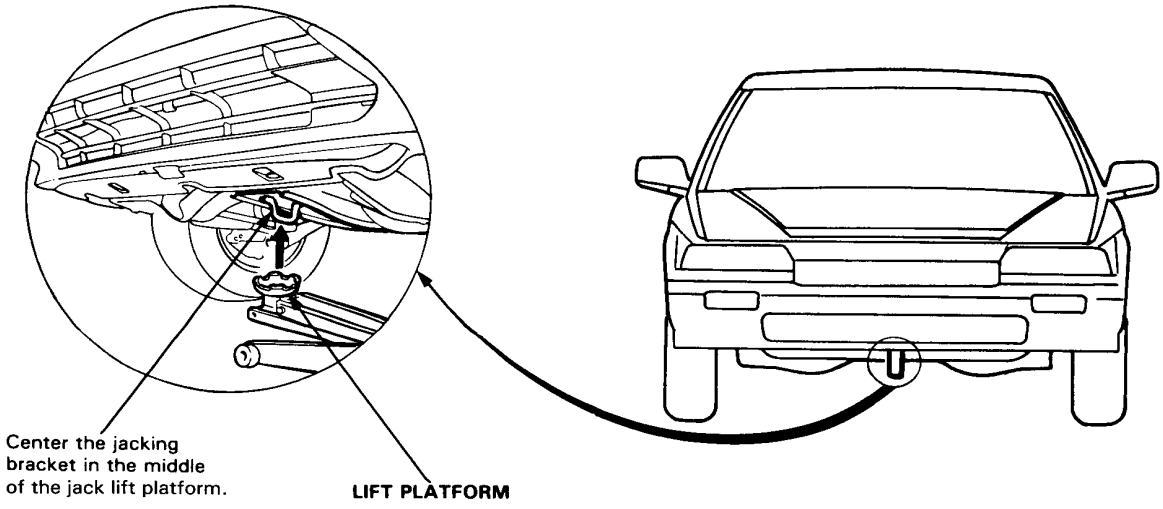
Floor Jack

1. Set the parking brake and block the wheels that are not being lifted.
2. When lifting the rear of the car, put the gearshift lever in reverse (Automatic in PARK).
3. Raise the car high enough to insert the safety stands.
4. Adjust and place the safety stands as shown on page 1-8 so the car will be approximately level, then lower the car onto them.

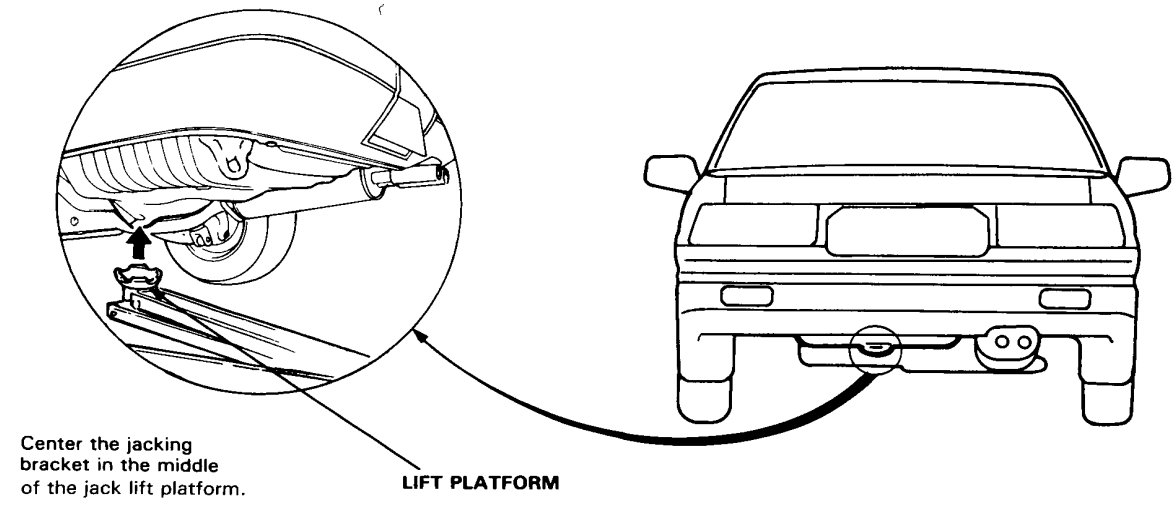
WARNING

- **Always use safety stands when working on or under any vehicle that is supported by only a jack.**
- **Never attempt to use a bumper jack for lifting or supporting the car.**

Front

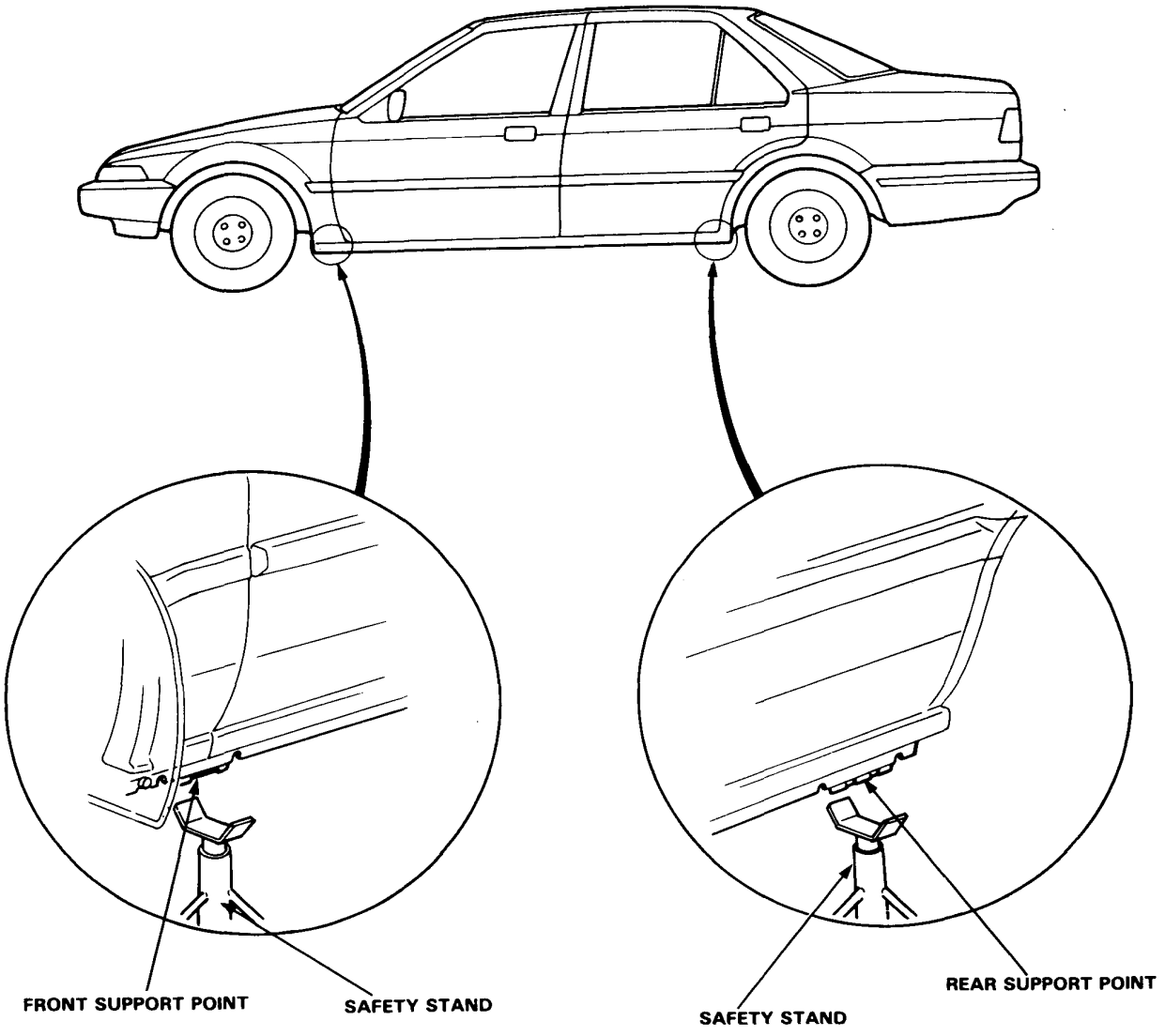


Rear



Lift and Support Points (cont'd)

Safety Stands



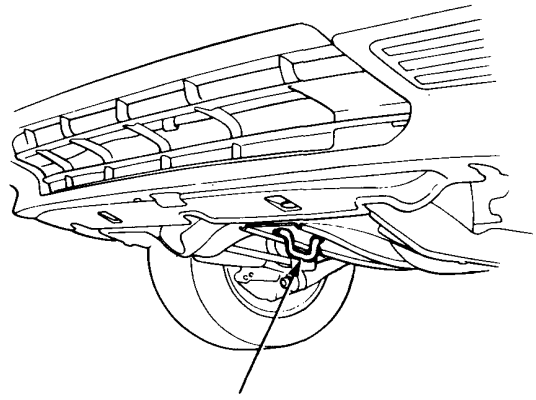
Towing

If possible, always tow the car with the front wheels off the ground. The tow truck driver should position wood spacer blocks between the car's frame and his chains and lift straps to avoid damaging the bumper and the body under it. Do not use the bumpers to lift the car or to support the car's weight while towing. Check local regulations for towing with a chain or frame-mounted tow bar. A chain may be attached to the hook shown in the illustration. Do not attach a tow bar to either bumper.

If the car is to be towed with four wheels on the ground, observe the following precautions:

1. Wheels and axles must not be touching the body or frame.
2. Turn the ignition key to the "I" position and make sure the steering wheel turns freely.
3. Place the transmission in NEUTRAL.
4. Release the parking brake.
5. DO NOT exceed 55 km/h (35 MPH) for distances of more than 80 km (50 miles).

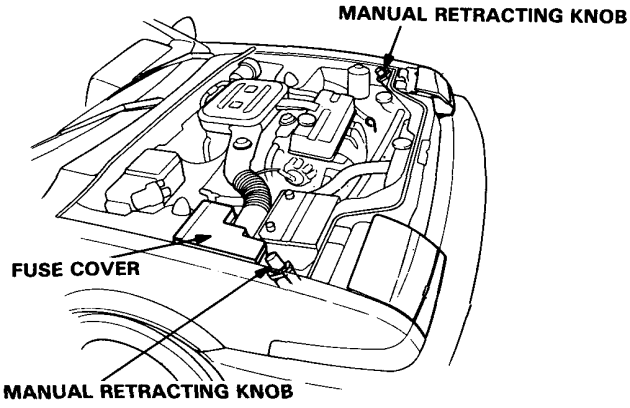
WARNING DO NOT push or tow a car to start it. The forward surge when the engine starts could cause a collision. Also, under some conditions, the catalytic converter (on some types) could be damaged. A car equipped with automatic transmission cannot be started by pushing or towing.



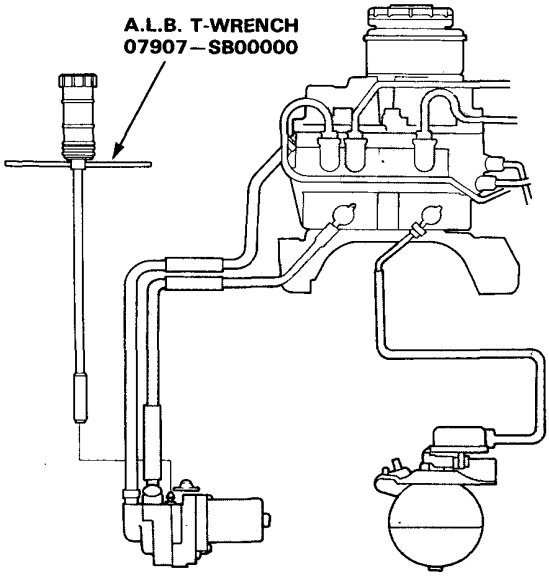
TOWING HOOK

Special Caution Items For This Car

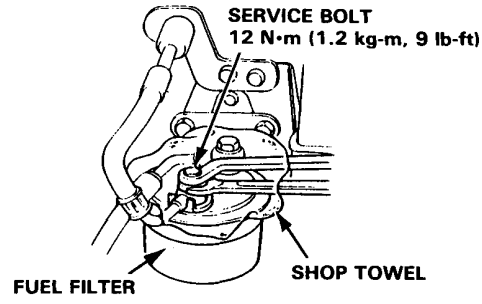
1. Retractable headlights are installed. Before manual raising and lowering, the fuse must be removed. When raising and lowering is executed without removing the fuse, injury may be caused by rapid turning of the manual retracting knob, if the motors accidentally start running.



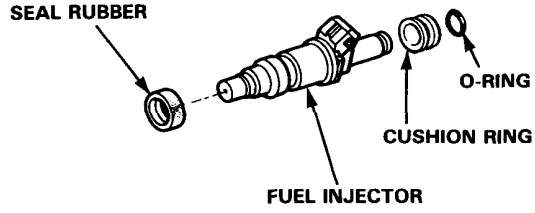
2. For cars equipped with A.L.B., the high-pressure brake fluid must be drained before disassembly of the A.L.B. piping system. When this is not done danger may be caused by brake fluid squirting out under high pressure. For draining of the high-pressure brake fluid, refer to base shop manual.



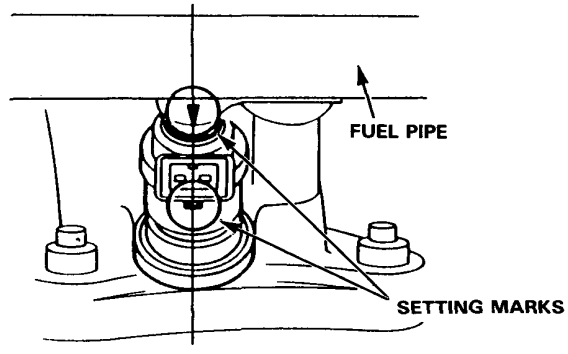
3. Fuel Line Servicing (Fuel-Injected Engine)
   - Relieve fuel pressure by loosening the service bolt provided on the top of the fuel filter before disconnecting a fuel hose or a fuel pipe.



   - Be sure to replace washers, O-rings, and rubber seals with new ones when servicing fuel line parts.
   - Always apply oil to the surfaces of O-rings and seal rings before installation. Never use brake fluid, radiator fluid, vegetable oils or alcohol-based oils.



   - When assembling the flare joint of the high-pressure fuel line, clean the joint and coat with new engine oil.
   - When installing an injector, check the angle of the coupler. The center line of the coupler should align with the setting mark on the injector holder.



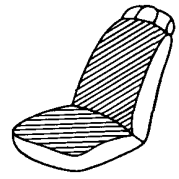
4. Inspection for fuel leakage
   - After assembling fuel line parts, turn ON the ignition switch (do not operate the starter) so that the fuel pump is operated for approximately two seconds and the fuel is pressurized. Repeat this operation two or three times and check whether any fuel leakage has occurred in any of the various points in the fuel line.
5. Installation of an amateur radio for cars equipped with PGM-FI, CRUISE CONTROL and A.L.B.
   Care has been taken for the control units of the PGM-FI, CRUISE CONTROL and A.L.B. and its wiring to prevent erroneous operation from external interference, but erroneous operation of the control units may be caused by extremely strong radio waves. Attention must be paid to the following items to prevent erroneous operation of the control units.
   - The antenna and the body of the radio must be at least 200 mm (7.9 in.) away from the control units.

   The control unit locations:
   - PGM-FI ECU: Under the left side seat.
   - CRUISE CONTROL: Under the driver's side dashboard.
   - A.L.B.: Under the passenger's side dashboard.
   - Do not lead the antenna feeder and the coaxial cable over a long distance parallel to the car's wiring. When crossing the wiring is required, execute crossing at a right angle.
   - Do not install a radio with a large output (max. 10 W).

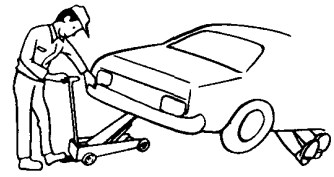
6. Apply liquid gasket to the transmission, oil pump cover, right side cover and water outlet. Use Honda Genuine liquid gasket, PART No. 0Y740—99986.
   - Check that the mating surfaces are clean and dry before applying liquid gasket. Degrease the mating surfaces if necessary.
   - Apply liquid gasket evenly, being careful to cover all the mating surface.
   - To prevent leakage of oil, apply liquid gasket to the inner threads of the bolt holes.
   - Do not install the parts if 20 minutes or more have passed after applying liquid gasket. In that case, reapply liquid gasket after removing old one.
   - After assembly, wait at least 30 minutes before filling with the appropriate liquid (engine oil, coolant and other similer fluid).

CAUTION: Observe all safety precautions and notes while working.

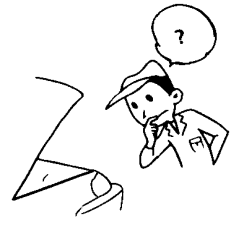
1. Protect all painted surfaces and seats against dirt and scratches with a clean cloth or vinyl cover.



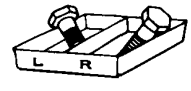
2. Work safely and give your work your undivided attention. When either the front or rear wheels are to be raised, block the remaining wheels securely. Communicate at frequently as possible when work involves two or more workers. Do not run the engine unless the shop or working area is well ventilated.



3. Prior to removing or disassembling parts, they must be inspected carefully to isolate the cause for which service is necessary. Observe all safety notes and precautions and follow the proper procedures as described in this manual.



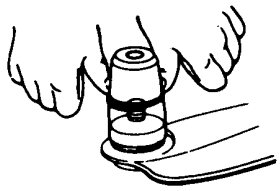
4. Mark or place all removed parts in order in a parts rack so they can be reassembled in their original places.



(cont'd)

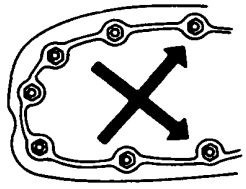
(cont'd)

5. Use the special tools when use of such is specified.

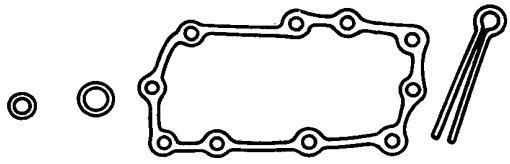


6. Parts must be assembled with the proper torque according to the maintenance standards established.

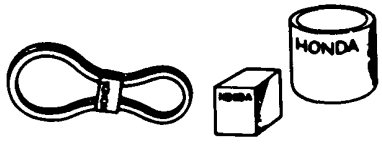
7. When tightening a series bolts or nuts, begin with the center or large diameter bolts and tighten them in crisscross pattern in two or more steps.



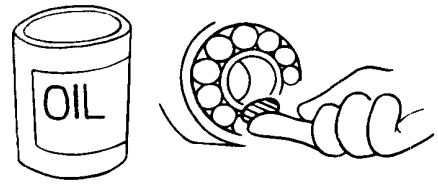
8. Use new packings, gaskets, O-rings and cotter pins whenever reassembling.



9. Use genuine HONDA parts and lubricants or those equivalent. When parts are to be reused, they must be inspected carefully to make sure they are not damaged or deteriorated and are in good usable condition.



10. Coat or fill parts with specified grease as specified (page 4-2). Clean all removed parts with solvent upon disassembly.

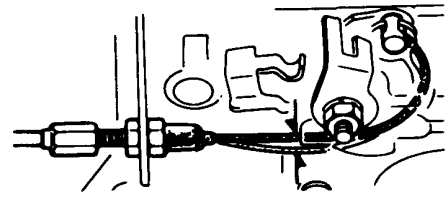


11. Brake fluid and hydraulic components
    - When replenishing the system, use extreme care to prevent dust and dirt from entering the system.
    - Do not mix different brands of fluid as they may not be compatible.
    - Do not reuse drained brake fluid.
    - Brake fluid can cause damage to painted surfaces. Wipe up spilled fluid at once.
    - After disconnecting brake hoses or pipes, be sure to plug the openings to prevent loss of brake fluid.
    - Clean all disassembled parts only in clean BRAKE FLUID. Blow open all holes and passages with compressed air.

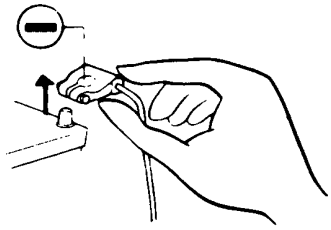
    - Keep disassembled parts from air-borne dust and abrasives.
    - Check that parts are clean before assembly.

12. Avoid oil or grease getting on rubber parts and tubes, unless specified.

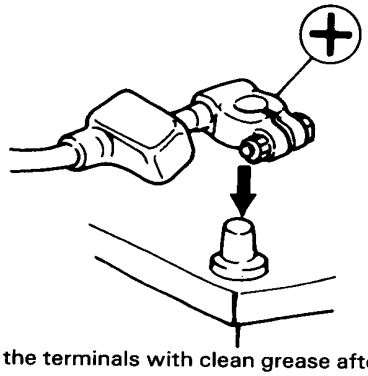
13. Upon assembling, check every part for proper installation and operation.



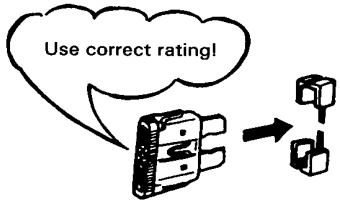
- Before making any repairs on electric wires or parts, disconnect the battery cables from the battery staring with the negative (−) terminal.



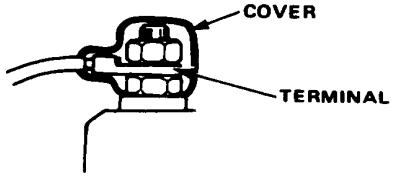
- After making repairs, check each wire or part for proper routing and installation. Also check to see that they are connected properly.
- Always connect the battery positive (+) cable first, then connect the negative (−) cable.



- Coat the terminals with clean grease after connecting the battery cables.
- Don't forget to install the terminal cover over the positive battery terminal after connecting.
- Before installing a new fuse, isolate the cause and take corrective measures, particularly when frequent fuse failure occurs.

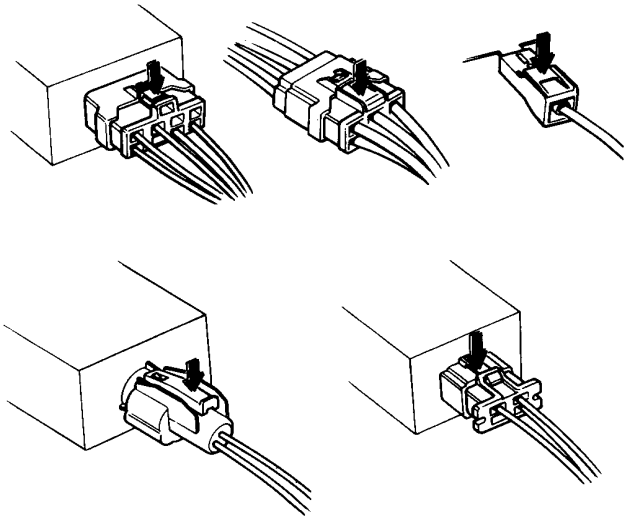


- Be sure to install the terminal cover over the connections after a wire or wire harness has been connected.

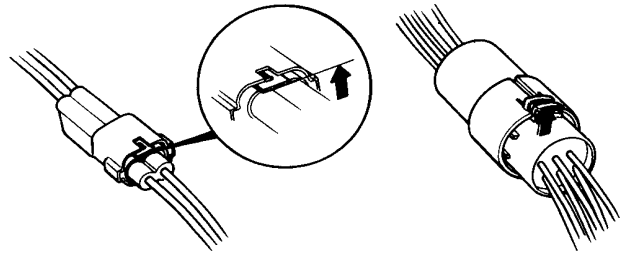


- When removing locking couplers, be sure to disengage the lock before disconnecting.
- Couplers may be of two types, those in which the lock is pressed to remove, and those in which the lock is pulled up to remove. Be sure to ascertain the type of locking device before beginning work. The following is a depiction of the means of disconnecting various typical couplers.

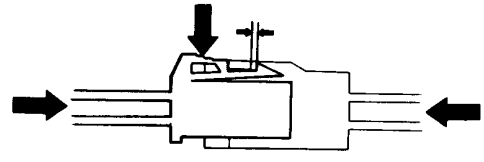
Press to disengage:



Pull up to disengage:



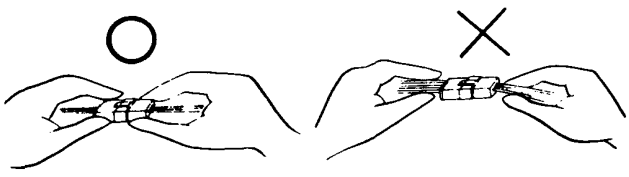
- When disconnecting locks, first press in the coupler tightly (to provide clearance to the locking device), then operated the tab fully and remove the coupler in the designated manner.



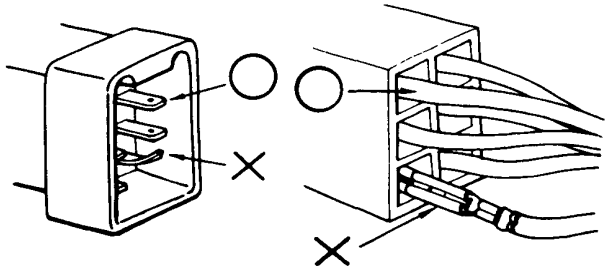
(cont'd)

Electrical (cont'd)

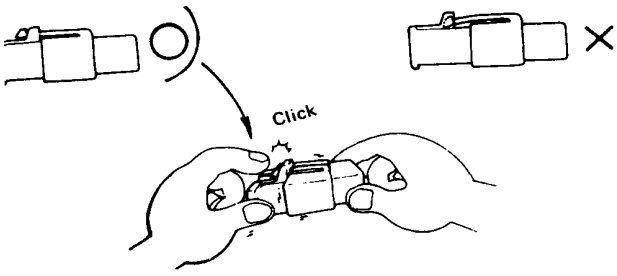
- When disconnecting a coupler, pull it off from the mating coupler by holding on both couplers.
- Never try to disconnect couplers by pulling on their wires.



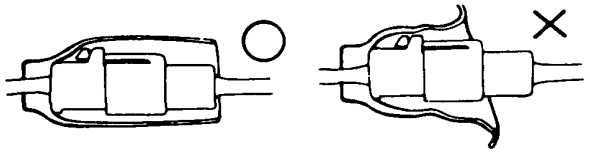
- Before connecting couplers, check to see that the terminals are in place and are not bent or distorted.



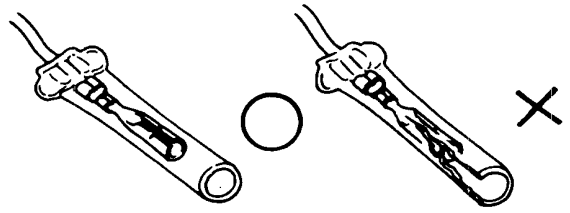
- Insert couplers fully until they will no longer go.
- Some couplers have locking tabs that must be aligned and engaged securely.
- Don't use wire harnesses with a loose wire or coupler.



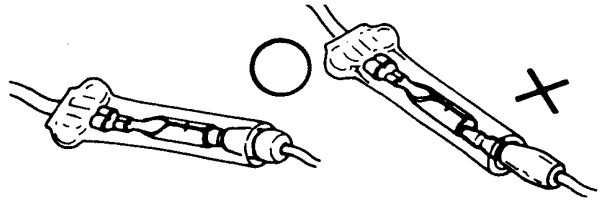
- Place the plastic cover over the mating coupler after reconnecting. Also check that the cover is not distorted.



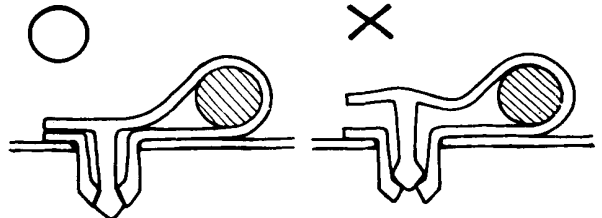
- Before connecting, check each connector cover for damage. Also make sure that the female connector is tight and not loosened from the previous use.



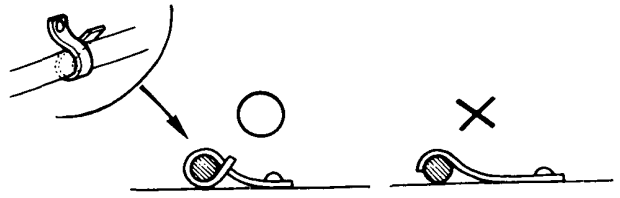
- Insert male connectors into the female connectors fully until they will no longer go.
- Be sure that plastic cover is placed over the connection.
- Position the wires so that the open end of the cover is not facing upward.



- Secure wires and wire harnesses to the frame with their respective wire bands at the designated locations. Position the wiring in the bands so that only the insulated surfaces contact the wires or wire harnesses.

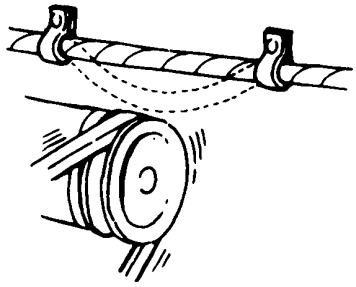


- A loose wire harness or cable can be a hazard to safety. After clamping, check each wire for security in its clamp.

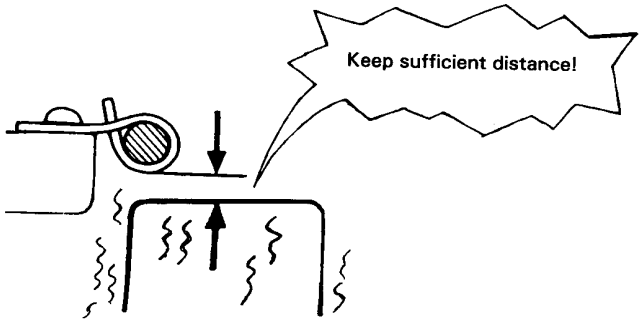


- Do not squeeze wires against the weld when a weld-on clamp is used.

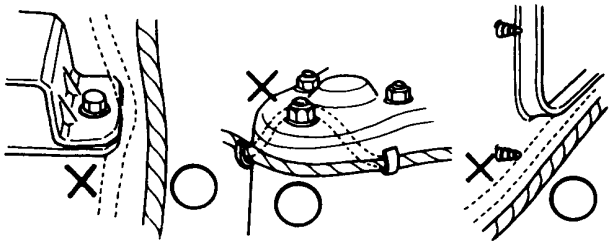
- After clamping, check each harness to be certain that it is not interferring with any moving or sliding parts of the vehicle.
- Keep wire harnesses away from the exhaust pipes and other hot parts.



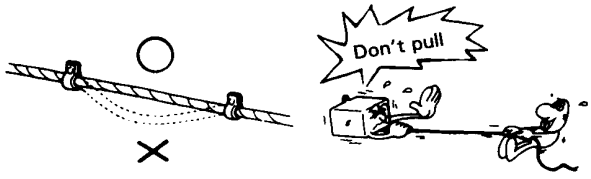
- Always keep a safe distance between wire harnesses and any heated parts.



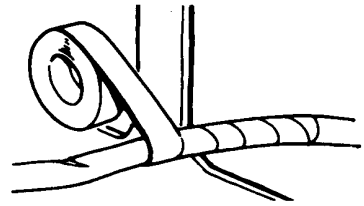
- Do not bring wire harnesses in direct contact with sharp edges or corners.
- Also avoid contact with the projected ends of bolts, screws and other fasteners.



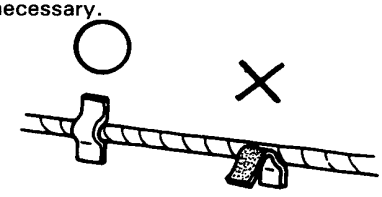
- Route harnesses so they are not pulled taut or slackened excessively.



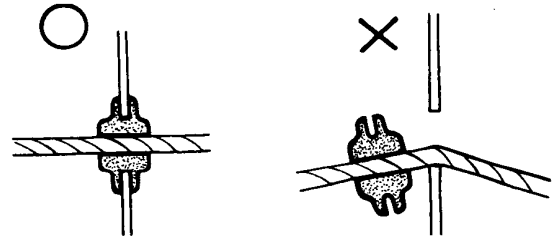
- Protect wires and harnesses with a tape or a tube if they are in contact with a sharp edge or corner.



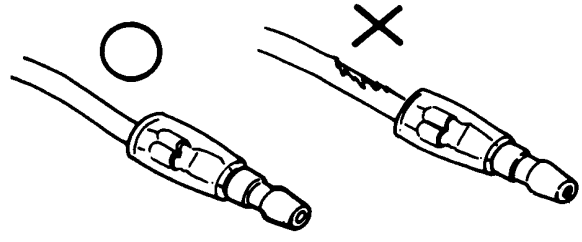
- Clean the attaching surface thoroughly if an adhesive is used. First, wipe with solvent or alcohol if necessary.



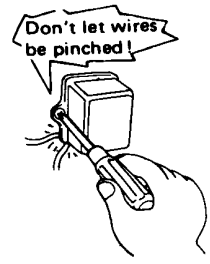
- Seat grommets in their grooves properly.



- Do not damage the insulation when connecting a wire.
- Do not use wires or harnesses with a broken insulation. Repair by wrapping with protective tape or replace with new ones if necessary.



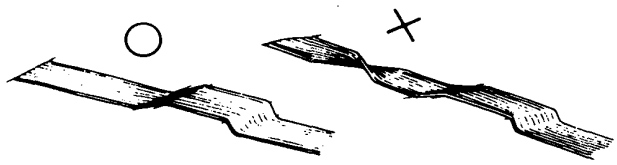
- After installing parts, make sure that wire harnesses are not pinched.



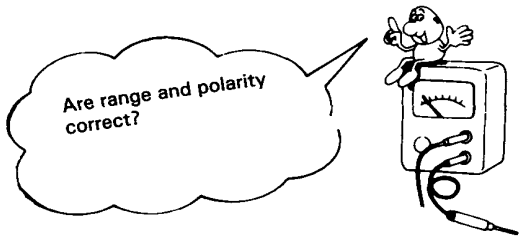
(cont'd)

Electrical (cont'd)

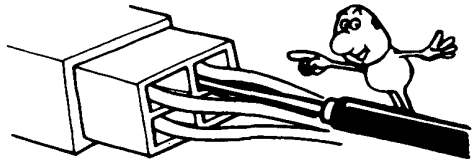
- After routing, check that the wire harnesses are not twisted or kinked.



- Wire harnesses should be routed so that they are not pulled taut, slackened excessively, pinched, or interfering with adjacent or surrounding parts in all steering positions.



- When using the Service Tester, follow the manufacturer's instructions and those described in the Shop Manual.



- Do not drop parts.

- Rust is the enemy of all finished surfaces. Before connecting connectors and couplers, check the terminals and remove, if any, rust using a fine sand paper or emery cloth.

Symbol Marks

The following symbols stand for:

 :Apply engine oil.

 :Apply brake fluid.

:Apply grease.

:Apply Automatic Transmission Fluid.

:Apply Power Steering Fluid.

①, ②, ③, ... } Sequence for removal or installation
❶, ❷, ❸, ... }

Abbreviation

A/C	Air Conditioner
ALB	Anti Lock Brake
Assy	Assembly
A/T	Automatic Transmission
ATF	Automatic Transmission Fluid
ATT	Attachment
EACV	Electronic Air Control Valve
ECU	Electronic Control Unit for Fuel-Injection System
EGR	Exhaust Gas Recirculation
Ex.	Except
EX	Exhaust
GND	Ground
IG	Ignition
IN	Intake
INT	Intermittent operation
L.	Left
LHD	Left Hand Drive
M/T	Manual Transmission
PCV Valve	Positive Crankcase Ventilation Valve
PGM-FI	Programed Fuel Injection
P/S	Power Steering
R.	Right
RHD	Right Hand Drive
ST	Starter
SW	Switch
TA Sensor	Intake Air Temperature Sensor

Automatic Transmission

P	Parking
R	Reverse
N	Neutral
D_4	Drive Position (1st-4th)
D_3	Drive Position (1st-3rd)
2	Second

Special Tools

Special Tools

5. Engine Removal/Installation

Number	Tool Number	Description	Q'ty	Remarks
①	07KAK—SJ40100	Engine Tilt Hanger Set	1	
②	07941—6920002	Ball Joint Remover	1	

6. Cylinder Head/Valve Train

Number	Tool Number	Description	Q'ty	Remarks
①	07JAB—0010000	Crank Pulley Holder Set	1	
①-1	07JAA—0010200	Socket Wrench, 19 mm	(1)	Component tools
①-2	07JAB—0010100	Pulley Holder Attachment	(1)	Component tools
①-3	07JAB—0010200	Handle	(1)	Component tools
②	07743—0020000	Valve Guide Driver	1	
③	07757—PJ10100	Valve Spring Compressor Attachment	1	B20A engine
④	07757—0010000	Valve Spring Compressor	1	07957—3290001 may also be used.
⑤	07942—SA50000	Valve Guide Driver/Remover	1	07942—8230000 may also be used.
⑥	07942—6110000	Valve Guide Driver/Remover	1	07942—6570100 may also be used.
⑦	07947—SB00100	Oil Seal Driver	1	Camshaft
⑧	07984—SA50001	Valve Guide Reamer, 7.0 mm	1	07984—6890100 may also be used.
⑨	07984—6110000	Valve Guide Reamer, 6.6 mm	1	07984—6570100 may also be used.

7. Engine Block

Number	Tool Number	Description	Q'ty	Remarks
①	07749—0010000	Driver	1	07949—6110000 may also be used.
②	07924—PD20003	Ring Gear Holder	1	07924—PD20002 may also be used.
③	07947—SB00200	Oil Seal Driver	1	Crankshaft Oil Seal (SOHC engine)
④	07948—SB00101	Driver Attachment	1	Crankshaft Oil Seal (DOHC engine)
⑤	07973—PE00302	Piston Pin Pilot Collar	1	Not included in base set. Use each with the base set.
⑥	07973—SB00100	Piston Pilot	1	Not included in base set. Use each with the base set.
⑦	07973—SB00200	Piston Pin Insert Attachment A	1	Not included in base set. Use each with the base set.
⑧	07973—SB00400	Piston Pin Insert Attachment B	1	Not included in base set. Use each with the base set.
⑨	07973—6570002	Piston Pin Insert Base Set	1	Not included in base set. Use each with the base set.

8. Engine Lubrication

Number	Tool Number	Description	Q'ty	Remarks
①	07406—0030000	Oil Pressure Gauge Adaptor	1	
②	07746—0010100	Attachment, 32 x 35 mm	1	A20A and A16A engines
③	07746—0010400	Attachment, 52 x 55 mm	1	B20A engine
④	07749—0010000	Driver	1	07949—6110000 may also be used.
⑤	07912—6110001	Oil Filter Socket Wrench	1	Used for Japan-Made Oil Filter
⑥	———	Oil Filter Wrench (Apply from LABINAL S.A.)	1	Used for France-Made Oil Filter

11, 12. Fuel and Emission Controls

Number	Tool Number	Description	Q'ty	Remarks
①	07GAC—SE00200	Fuel Sender Wrench	1	
②	07GAZ—SE00300	R.P.M. Connecting Adaptor	1	
③	07GMJ—ML80100	Test Harness	1	
④	07406—0040001	Fuel Pressure Gauge Set	1	Fuel-Injected engine
④-1	07406—0040100	Pressure Gauge	(1)	Component tools
④-2	07406—0040201	Hose Assembly	(1)	
⑤	07411—0020000	Digital Circuit Tester	1	Fuel-Injected engine
⑥	07614—0050100	Fuel Line Clamp	1	Carbureted engine
⑦	07999—PD6000A	PGM-FI Test Harness	1	Fuel-Injected engine

13. Clutch

Number	Tool Number	Description	Q'ty	Remarks
①	07GAG—PF50100	Clutch Disc Alignment Tool	1	B20A engine
②	07708—0010102	10 mm T-Wrench	1	
③	07924—PD20003	Ring Gear Holder	1	07924—PD20002 may also be used.
④	07974—6890101	Clutch Disc Alignment Tool	1	A20A and A16A engines

14. Manual Transmission <B2>

Number	Tool Number	Description	Q'ty	Remarks
①	07744—0010200	Pin Driver, 3.0 mm	1	
②	07744—0010400	Pin Driver, 5.0 mm	1	07944—6110100 may also be used.
③	07746—0010200	Attachment, 37 x 40 mm	1	
④	07746—0010400	Attachment, 52 x 55 mm	1	07949—6340200 may also be used.
⑤	07746—0010500	Attachment, 62 x 68 mm	1	
⑥	07749—0010000	Driver	1	07949—6110000 may also be used.
⑦	07936—6340000	Bearing Remover Set	1	
⑧	07936—6890101	Bearing Remover Attachment	1	

14. Manual Transmission <A1/A2>

Number	Tool Number	Description	Q'ty	Remarks
①	07GAC—PG40100	Transmission Housing Puller	1	
②	07744—0010200	Pin Driver, 3.0 mm	1	
③	07744—0010400	Pin Driver, 5.0 mm	1	07944—6110100 may also be used.
④	07746—0010400	Attachment, 52 x 55 mm	1	
⑤	07749—0010000	Driver	1	07949—6110000 may also be used.
⑥	07907—PD10000	Socket Wrench, 30 mm	1	
⑦	07923—6890101	Mainshaft Holder	1	
⑧	07936—6340000	Bearing Remover Set	1	
⑨	07936—6890101	Bearing Remover Attachment	1	
⑩	07947—6110500	Oil Seal Driver Attachment	1	Differential Oil seal
⑪	07947—6340000	Oil Seal Driver	1	
⑫	07947—6340500	Driver Attachment, E	1	

15. Automatic Transmission

Number	Tool Number	Description	Q'ty	Remarks
①	07GAB—PF50100	Mainshaft Holder	1	F4 transmission
②	07GAC—PG40100	Transmission Housing Puller	1	
③	07GAC—PF40210	Bearing Remover Attachment	1	
④	07GAE—PG40000	Clutch Spring Compressor Set	1	07960—689000 may also be used.
④-1	07GAE—PG40100	Compressor Attachment	(1)	Component tools
④-2	07GAE—PG40200	Compressor Bolt Assembly	(1)	
④-3	07960—6120100	Compressor Attachment	(1)	
⑤	07406—0020003	Oil Pressure Gauge Set	1	
⑤-1	07406—0020201	Oil Pressure Hose	(3)	Component tools
⑥	07406—0070000	Low Pressure Gauge	1	
⑦	07746—0010500	Attachment, 62 x 68 mm	1	
⑧	07749—0010000	Driver	1	07949—6110000 may also be used.
⑨	07907—PD10000	Socket Wrench, 30 mm	1	07907—6890100 may also be used.
⑩	07923—6890202	Mainshaft Holder	1	C9 transmission
⑪	07936—6340000	Bearing Remover Set	1	
⑫	07936—6890101	Bearing Remover Attachemnt	1	
⑬	07947—6110500	Oil Seal Driver Attachment	1	
⑭	07947—6340201	Oil Seal Driver	1	
⑮	07947—6340500	Driver Attachment, E	1	
⑯	07960—6890100	Clutch Spring Compressor Attachment	1	
⑰	07974—6890300	Throttle Cable Adjustment Gauge	1	Carbureted engine
⑱	07998—SA50000	Accelerator Pedal Weight Set	1	
⑱-1	07998—SA50100	Main Pedal Weight (1.0 kg)	(1)	Component tools
⑱-2	07998—SA50200	Sub Pedal Weight (0.5 kg)	(1)	

16. Differential

Number	Tool Number	Description	Q'ty	Remarks
①	07746—0030100	Driver, C	1	
②	07749—0010000	Driver	1	07949—6110000 may also be used.
③	07944—SA00000	Pin Driver, 4.0 mm	1	
④	07947—6110500	Seal Driver Attachment	1	
⑤	07947—6340500	Driver Attachment, E	1	

17. Drivershafts

Number	Tool Number	Description	Q'ty	Remarks
①	07GAD—SE00100	Oil Seal Driver Attachment	1	
②	07746—0010400	Attachment, 52 x 55 mm	1	
③	07746—0010500	Attachment, 62 x 68 mm	1	
④	07746—0040900	Pilot, 40 mm	1	
⑤	07749—0010000	Driver	1	
⑥	07947—SD90200	Oil Seal Driver Attachment	1	
⑦	07965—SD90100	Support Base	1	
⑧	07965—SD90200	Support Collar	1	

18. Manual Steering

Number	Tool Number	Description	Q'ty	Remarks
①	07746—0010300	Attachment, 42 x 47 mm	1	
②	07916—SA50001	Steering Gearbox Locknut Wrench, 40 mm	1	
③	07941—6920003	Ball Joint Remover	1	
④	07965—6340301	Hub Dis/Assembly Tool, Base A	1	
⑤	07974—SA50800	Clip Guide, B	1	

18. Power Steering

Number	Tool Number	Description	Q'ty	Remarks
①	07GAK—SE00100	P/S Joint Adaptor Set	1	
①-1	07GAK—SE00110	P/S Pump Joint Adaptor	(1)	Component tools
①-2	07GAK—SE00120	P/S Hose Joint Adaptor	(1)	
②	07406—0010001	P/S Pressure Gauge Set	1	
②-1	07406—0010101	Bypass Tube Joint	(1)	
②-2	07406—0010200	P/S Pressure Gauge Assy	(1)	Component tools
②-3	07406—0010300	Oil Pressure Valve	(1)	
②-4	07406—0010400	Pressure Gauge	(1)	
③	07725—0030000	Universal Holder	1	07725—0010101 may also be used.
④	07746—0010300	Attachment, 42 X 47 mm	1	
⑤	07749—0010000	Driver	1	07949—6110000 may also be used.
⑥	07900—SA50000	P/S Seal Replacement Tool Set	1	
⑥-1	07974—SA50100	Piston Seal Ring Guide	(1)	
⑥-2	07974—SA50200	Piston Seal Ring Sizing Tool	(1)	
⑥-3	07974—SA50300	Cylinder End Packing Slider	(1)	Component tools
⑥-4	07974—SA50400	End Seal Guide	(1)	
⑥-5	07974—SA50600	Dust Seal Guide	(1)	
⑥-6	07974—SA50900	P/S Tool Set Case	(1)	
⑦	07916—SA50001	Steering Gearbox Locknut Wrench, 40 mm	1	
⑧	07941—6920003	Ball Joint Remover	1	
⑨	07947—6340300	Driver Attachment	1	
⑩	07953—7190000	Collar Driver	1	

19. Suspension

Number	Tool Number	Description	Q'ty	Remarks
①	07GAE—SE00100	Shock Absorber Spring Compressor	1	
②	07GAF—SE00100	Hub Assembly Pin	1	
③	07GAF—SE00200	Hub Assembly Driver Attachment	1	
④	07GAF—SE00401	Front Hub Driver Base	1	
⑤	07410—0010200	Wheel Alignment Gauge ATT., B	1	
⑥	07746—0010100	Attachment, 32 x 35 mm	1	
⑦	07746—0010400	Attachment, 52 x 55 mm	1	
⑧	07746—0010600	Attachment, 72 x 75 mm	1	
⑨	07749—0010000	Driver	1	07949—6110000 may also be used.
⑩	07941—6920003	Ball Joint Remover	1	
⑪	07965—SB00000	Ball Joint Dis/Assembly Tool Set	1	
⑪-1	07965—SB00100	Ball Joint Remover/Installer	(1)	Component tools
⑪-2	07965—SB00200	Ball Joint Remover Base	(1)	
⑪-3	07965—SB00300	Ball Joint Installer Base	(1)	
⑫	07965—6340301	Front Wheel Bearing Dis/Assembly Tool Base, A	2	
⑬	07965—6920201	Front Hub Dis/Assembly Tool, B	1	
⑭	07974—SA50700	Clip Guide, A	1	
⑮	07974—SA50800	Clip Guide, B	1	

20. Brake

Number	Tool Number	Description	Q'ty	Remarks
①	07GAF—SE00300	Pulser Driver Attachment	1	
②	07GAG—SE00100	Brake Booster Adjustment Gauge	1	
③	07HAJ—SG00300	Frequency Convert Adaptor	1	
④	07HAK—SG00110	Pressure Gauge Joint Pipe	1	
⑤	07504—6340100	Brake Booster Tool Set	1	
⑤-1	07404—5790300	Vacuum Gauge	(1)	Short parts of the Brake Booster Set 07504—6340100
⑤-2	07406—5790200	Oil Pressure Gauge	(2)	
⑤-3	07410—5790100	Pressure Gauge Attachment, C	(1)	
⑤-4	07410—5790500	Tube Joint Attachment, I	(2)	
⑤-5	07510—6340100	Pressure Gauge Joint Pipe	(2)	
⑤-6	07510—6340300	Vacuum Joint Tube, A	(1)	
⑥	07508—SB00000	A.L.B. Checker	1	
⑦	07749—0010000	Driver	1	07494—611000 may also be used.
⑧	07907—SB00000	A.L.B. T-Wrench	1	
⑨	07914—SA50001	Snap-ring Pliers	1	
⑩	07921—0010001	Flare Nut Wrench	1	
⑪	07947—6890300	Driver Attachment, C	1	
⑫	07960—SA50002	Brake Spring Compressor	1	
⑬	07965—5790300	Cup Guide	1	
⑭	07965—6340301	Front Wheel Bearing Dis/Assembly Tool Base, A	2	
⑮	07967—SB00000	Pulser Driver	1	
⑯	07973—SA50000	Rear Caliper Guide	1	

21. Body

Number	Tool Number	Description	Q'ty	Remarks
①	07GAZ—SE30100	Torsion Rod Assembly Tool	1	

23. Air Conditioner

Number	Tool Number	Description	Q'ty	Remarks
①	07GAB—PJ60100	A/C Clutch Holder	1	07923—PB80001 may also be used.
②	07703—0010200	Torx Driver Bit, T-30	1	
③	07749—0010000	Driver	1	07949—6110000 may also be used.
④	07934—PB80001	A/C Clutch Puller	1	
⑤	07934—SB20000	Shaft Seal Remover	1	
⑥	07947—6340300	Driver Attachment, A	1	

Optional Tools

Number	Tool Number	Description	Q'ty	Remarks
①	07780—0010300	Valve Seat Cutter 45°	1	EX (B20A)
②	07780—0010400	Valve Seat Cutter 45°	1	IN (B20A)
③	07780—0010500	Valve Seat Cutter 45°	1	EX (A16A, A20A)
④	07780—0010800	Valve Seat Cutter 45°	1	IN (A16A, A20A)
⑤	07780—0012300	Valve Seat Cutter 30°	1	IN (B20A)
⑥	07780—0012400	Valve Seat Cutter 30°	1	EX (A16A, A20A)
⑦	07780—0012900	Valve Seat Cutter 30°	1	EX (B20A), IN (A16A, A20A)
⑧	07780—0014000	Valve Seat Cutter 60°	1	EX (B20A)
⑨	07780—0014100	Valve Seat Cutter 60°	1	IN (ALL), EX (A16A, A20A)
⑩	07781—0010201	Valve Seat Cutter Holder, 6.6 mm	1	
⑪	07781—0010301	Valve Seat Cutter Holder, 7.0 mm	1	

Specifications

Standards and Service Limits

Cylinder Head/Valve Train <Except B20A Engine> — Section 6

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Compression	300 min^{-1} (rpm) and wide-open throttle		Nominal A20A3, A20A4 Engines (Except KS)	1,226 kPa (12.5 kg/cm², 178 psi)
			Other Engines	1,176 kPa (12.0 kg/cm², 171 psi)
			Minimum A20A3, A20A4 Engines (Except KS)	1,030 kPa (10.5 kg/cm², 149 psi)
			Other Engines	980 kPa (10.0 kg/cm², 142 psi)
			Maximum variation	196 kPa (2 kg/cm², 28 psi)
Cylinder head	Warpage		—	0.05 (0.002)
	Height		90 (3.54)	89.8 (3.54)
Camshaft	End play		0.05–0.15 (0.002–0.006)	0.5 (0.02)
	Oil clearance No. 1,3 and 5 Journals		0.050–0.089 (0.002–0.004)	0.15 (0.006)
	No. 2 and 4 Journals		0.130–0.169 (0.005–0.007)	0.23 (0.009)
	Runout		0.03 (0.001) max.	0.06 (0.002)
	Cam lobe height			
	A20A1 (KG, KW, KX)	IN	38.477 (1.5148)	—
		EX	38.353 (1.5100)	—
	A20A1, A20A2	IN	38.541 (1.5174)	—
		EX	38.607 (1.5200)	—
	A20A3	IN	38.731 (1.5248)	—
		EX	38.796 (1.5274)	—
	A20A4	IN	38.858 (1.5300)	—
		EX	38.607 (1.5200)	—
	A16A1	IN	38.157 (1.5029)	—
		EX	37.776 (1.4872)	—
	Other Engines	IN	38.541 (1.5174)	—
		EX	38.607 (1.5200)	—
Valve	Valve clearance	IN	0.12–0.17 (0.005–0.007)	—
		EX	0.25–0.30 (0.010–0.012)	—
	Valve stem O.D.	IN	6.58–6.59 (0.2591–0.2594)	6.55 (0.258)
		EX	6.94–6.95 (0.2732–0.2736)	6.91 (0.272)
	Stem-to-guide clearance	IN	0.02–0.05 (0.001–0.002)	0.08 (0.003)
		EX	0.06–0.09 (0.002–0.004)	0.12 (0.005)
	Stem installed height	IN	48.59 (1.913)	49.34 (1.943)
		EX	47.66 (1.876)	48.41 (1.906)
Valve seat	Width	IN and EX	1.25–1.55 (0.049–0.061)	2.0 (0.08)
Valve spring	Free length	IN	48.54 (1.91)	47.54 (1.87)
		EX Inner	42.42 (1.67)	41.42 (1.63)
		Outer	49.07 (1.93)	48.07 (1.89)
	Squareness Inner and Outer		—	1.75 (0.068)
Valve guide	I.D.	IN	6.61–6.63 (0.260–0.261)	6.65 (0.262)
		EX	7.01–7.03 (0.276–0.277)	7.05 (0.278)
Rocker arm	Arm-to-shaft clearance		0.008–0.054 (0.0003–0.0021)	0.08 (0.003)

Cylinder Head/Valve Train <B20A Engine> — Section 6

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Compression	300 min^{-1} (rpm) and wide-open throttle		Nominal	1,226 kpa (12.5 kg/cm², 178 psi)
			Minimum	1,030 kpa (10.5 kg/cm², 149 psi)
			Maximum variation	196 kpa (2 kg/cm², 28 psi)
Cylinder head	Warpage		—	0.05 (0.002)
	Height		132 (5.20)	131.8 (5.19)
Camshaft	End play		0.05–0.15 (0.002–0.006)	0.5 (0.02)
	Oil clearance		0.050–0.089 (0.002–0.004)	0.15 (0.006)
	Runout		0.03 (0.001) max.	0.06 (0.002)
	Cam lobe height	IN	37.716 (1.4849)	—
		EX	37.781 (1.4874)	—
Valve	Valve clearance	IN	0.08–0.12 (0.003–0.005)	—
		EX	0.16–0.20 (0.006–0.008)	—
	Valve stem O.D.	IN	6.58–6.59 (0.2591–0.2594)	6.55 (0.258)
		EX	6.55–6.56 (0.2579–0.2583)	6.52 (0.257)
	Stem-to-guide clearance	IN	0.02–0.05 (0.001–0.002)	0.08 (0.003)
		EX	0.05–0.08 (0.002–0.003)	0.11 (0.04)
	Stem installed height	IN and EX	42.75 (1.683)	43.54 (1.714)
Valve seat	Width	IN and EX	1.25–1.55 (0.049–0.061)	2.0 (0.08)
Valve spring	Free length	Inner	43.50 (1.713)	42.50 (1.673)
		Outer	47.45 (1.868)	46.45 (1.829)
	Squareness	Inner and Outer	—	1.6 (0.063)
Valve guide	I.D.	IN and EX	6.61–6.63 (0.260–0.261)	6.65 (0.262)

Engine Block <Except B20A Engine> — Section 7

*A16A1 Engine only Unit: mm (in.)

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Cylinder block	Warpage of deck surface		0.08 (0.003) max.	0.10 (0.004)
	Bore diameter	A	82.70–82.71 (3.2559–3.2563)	82.74 (3.2575)
		B	82.69–82.70 (3.2555–3.2559)	82.73 (3.2571)
		A	*80.01–80.02 (3.1500–3.1504)	80.05 (3.1516)
		B	*80.00–80.01 (3.1496–3.1500)	80.04 (3.1512)
	Bore taper		0.007–0.012 (0.0003–0.0005)	0.05 (0.002)
	Reboring limit		—	0.5 (0.02)
Piston	Skirt O.D. (At 21 mm (0.83 in) from bottom of skirt) A20A1, A20A2	A	82.675–82.685 (3.2549–3.2553)	
	A20A3, A20A4	B	82.665–82.675 (3.2545–3.2549)	
	A16A1	A	*79.98–79.998 (3.1488–3.1495)	79.97 (3.148)
		B	*79.97–79.98 (3.1484–3.1500)	79.96 (3.148)
	Clearance in cylinder		0.02–0.04 (0.0008–0.0016)	0.08 (0.003)
	Piston-to-ring clearance	Top	0.030–0.060 (0.0012–0.0024)	0.13 (0.005)
		2nd	0.030–0.055 (0.0012–0.0022)	0.13 (0.005)
		* Top and 2nd	*0.02–0.05 (0.0008–0.0020)	0.13 (0.005)
Piston ring	Ring end gap Top		0.20–0.35 (0.008–0.014)	0.6 (0.02)
	2nd	A16A1 Engine	0.25–0.40 (0.01–0.016)	0.6 (0.02)
		Others	0.30–0.45 (0.012–0.018)	0.6 (0.02)
	Oil	RIKEN	0.30–0.90 (0.012–0.035)	1.0 (0.04)
		TEIKOKU	0.20–0.70 (0.008–0.028)	0.8 (0.03)
Connecting rod	Pin-to-rod interference		0.013–0.032 (0.0005–0.0013)	0.013 (0.0005)
	Large end bore diameter		Nominal 48 (1.89) *45 (1.77)	—
	End play installed on crankshaft		0.15–0.30 (0.006–0.012)	0.40 (0.016)
Crankshaft	Main journal diameter		49.970–49.994 (1.9673–1.9683)	—
	Taper/out-of-round, main journal		0.005 (0.0002) max.	0.010 (0.0004)
	Rod journal diameter		44.976–45.000 (1.7707–1.7717)	—
		Other Engine	*41.976–42.000 (1.6530–1.6535)	—
	Taper/out-of-round, rod journal		0.005 (0.0002) max.	0.010 (0.0004)
	End play		0.10–0.35 (0.004–0.014)	0.45 (0.018)
	Runout		0.024 (0.0009) max.	0.04 (0.0016)
Bearings	Main bearing-to-journal oil clearance			
	No. 1, 2, 4, and 5 journals		0.026–0.055 (0.0010–0.0022)	0.07 (0.003)
	No. 3 journal		0.032–0.061 (0.0013–0.0024)	0.07 (0.003)
	Rod bearing-to-journal oil clearance		0.020–0.038 (0.0008–0.0015)	0.07 (0.003)

Engine Block <B20A Engine> — Section 7

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Cylinder block	Warpage of deck surface		0.07 (0.003) max.	0.10 (0.004)
	Bore diameter	A	81.01 – 81.02 (3.1894–3.1898)	81.05 (3.1909)
		B	81.00–81.01 (3.1890–3.1894)	81.04 (3.1905)
	Bore taper		0.007–0.012 (0.0003–0.0005)	0.05 (0.002)
	Reboring limit		—	0.05 (0.002)
Piston	Skirt O.D (At 21 mm (0.83 in) from bottom of skirt)	A	79.99–81.02 (3.1492–3.1898)	80.97 (3.188)
		B	79.97–81.02 (3.1484–3.1898)	80.96 (3.187)
	Clearance in cylinder		0.02–0.04 (0.0008–0.0016)	0.08 (0.003)
	Piston-to-ring clearance	Top	0.035–0.060 (0.0014–0.0024)	0.13 (0.005)
		2nd	0.030–0.055 (0.0012–0.0022)	0.13 (0.005)
Piston ring	Ring end gap	Top	0.20–0.35 (0.008–0.014)	0.6 (0.02)
		2nd	0.40–0.55 (0.016–0.022)	0.7 (0.03)
		Oil RIKEN	0.30–0.90 (0.012–0.035)	1.0 (0.04)
		TEIKOKU	0.20–0.70 (0.008–0.028)	0.8 (0.03)
Connecting rod	Pin-to-rod interference		0.013–0.032 (0.0005–0.0013)	0.013 (0.0005)
	Large end bore diameter		Nominal 51 (2.01)	—
	End play installed on crankshaft		0.15–0.30 (0.006–0.012)	0.40 (0.016)
Crankshaft	Main journal diameter		54.976–55.000 (2.1644–2.1654)	—
	Taper/out-of-round, main journal		0.005 (0.0002) max.	0.010 (0.0004)
	Rod journal diameter		47.976–48.000 (1.8888–1.8900)	—
	Taper/out-of-round, rod journal		0.005 (0.0002) max.	0.010 (0.0004)
	End play		0.10–0.35 (0.004–0.014)	0.45 (0.018)
	Runout		0.02 (0.0003) max.	0.030 (0.0012)
Bearings	Main bearing-to-journal oil clearance			
	No. 1, 2, 4, and 5 journals		0.024–0.042 (0.0010–0.0017)	0.05 (0.002)
	No. 3 journal		0.030–0.048 (0.0012–0.0019)	0.05 (0.002)
	Rod bearing-to-journal oil clearance		0.026–0.044 (0.0010–0.0017)	0.05 (0.002)

(cont'd)

Standards and Service Limits (cont'd)

Engine Lubrication <Except B20A Engine> — Section 8

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Engine oil	Capacity ℓ (US. qt., Imp. qt.)		4.0 (4.2, 3.5) After engine disassembly 3.5 (3.7, 3.1) After oil change, including oil filter	
Oil pump	Displacement		40.3 ℓ (10.6 US. gal., 8.9 Imp. gal.) 5,500 min^{-1} (rpm)	
	Inner-to-outer rotor radial clearance		0.15 (0.006) max.	0.2 (0.008)
	Pump body-to-rotor radial clearance		0.10—0.18 (0.004—0.007)	0.2 (0.008)
	Pump body-to-rotor side clearance		0.30—0.108 (0.001—0.004)	0.15 (0.006)
Relief valve	Pressure setting 80°C (176°F)	Idle	98 kPa (1.0 kg/cm², 14 psi) min.	
		3,000 min^{-1} (rpm)	373—451 kPa (3.8—4.6 kg/cm², 54—65 psi)	

Engine Lubrication <B20A Engine> — Section 8

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Engine oil	Capacity ℓ (US. qt., Imp. qt.)		5.0 (5.3, 4.4) After engine disassembly 4.0 (4.2, 3.5) After oil change, including oil filter	
Oil pump	Displacement		54 ℓ (10.6 US. gal., 8.9 Imp. gal.) 5,000 min^{-1} (rpm)	
	Inner-to-outer rotor radial clearance		0.04—0.16 (0.002—0.006)	0.2 (0.008)
	Pump body-to-rotor radial clearance		0.10—0.19 (0.004—0.007)	0.21 (0.008)
	Pump body-to-rotor side clearance		0.02—0.071 (0.001—0.003)	0.12 (0.005)
Relief valve	Pressure setting 80°C (176°F)	Idle	137 kPa (1.4 kg/cm², 20 psi) min.	
		3,000 min^{-1} (rpm)	470—559 kPa (4.8—5.7 kg/cm², 67—80 psi)	

Cooling — Section 10

	MEASUREMENT	STANDARD (NEW)	
Cooling fan belt	Deflection midway between pulleys/load	6—9 (0.24—0.35) /98N (10 kg, 22 lb) for used belt 5 (0.20) /98N (10 kg, 22 lb) after replacement of belt	
Radiator	Capacity (includes heater) ℓ (US. Gal., Imp. Gal.) (Includes reservoir tank 0.8 (0.21, 0.18)	A20A3, A20A4 Engines	Manual 6.4 (1.7, 1.4) Automatic 7.0 (1.8, 1.5)
		A20A1, A20A2 Engines	Manual 6.3 (1.7, 1.4) Automatic 6.9 (1.8, 1.5)
		B20A2, B20A8 Engine	Manual 7.1 (1.9, 1.6)
		A16A1 Engine	Manual 6.3 (1.7, 1.4) Automatic 6.2 (1.6, 1.4)
	Pressure cap opening pressure	74—103 kPa (0.75—1.05 kg/cm², 11—15 psi)	
Thermostat	Starts to open	Primary: 82 ± 2°C (180 ± 35°F) Secondary: 85 ± 2°C (185 ± 35°F)	86—90°C (187—194°F)
	Full open	95°C (203°F)	100°C (212°F) OPTIONAL
	Valve lift at full open	8 (0.31) max.	8 (0.31) max.
Water pump	Gear ratio (crankshaft)	1.34	
	Capacity: ℓ per min/at min^{-1} (rpm)	124/5,000 (32.7 US. gal/5,000 min^{-1} (rpm)	
Cooling fan	Fan-to-core clearance	26.0 (1.02)	
	Thermoswitch "ON" temperature	87°—93°C (188°—199°F)	
	Thermoswitch "OFF" temperature	83°C (181°F) or more (hysteresis 2°C (35°F) or more)	

Fuel and Emissions — Section 11

	MEASUREMENT		STANDARD (NEW)		
Fuel pump (Fuel-injected engine)	Delivery pressure		230—270 kPa (2.35—2.75 kg/cm², 33—39 psi)		
	Displacement		230 cc/min in 10 seconds		
	Relief valve opening pressure		441—588 kPa (4.5—6.0 kg/cm², 64—85 psi)		
Pressure regulator (Fuel-injected engine)	Pressure		230—270 kPa (2.35—2.75 kg/cm², 33—39 psi)		
Fuel pump (Carbureted engine)	Delivery pressure		17.6—22.5 kPa (0.18—0.23 kg/cm², 2.6—3.3 psi)		
	Displacement		760 cc at 12V (46 cu. in./12V)		
Fuel Tank	Capacity		60ℓ (15.9 US. Gal., 13.2 Imp. Gal.)		
Fuel injected engine	Fast idle		1,000—1,800 min^{-1} (rpm)		
	Idle Speed	with headlights and cooling fan off	Manual	A20A3	750 ± 50 min^{-1} (rpm)
				A20A4, B20A2	800 ± 50 min^{-1} (rpm)
			Automatic (in "N" or "P")	A20A3	750 ± 50 min^{-1} (rpm)
				A20A4	800 ± 50 min^{-1} (rpm)
					KQ: 750 ± 50 min^{-1} (rpm)
	Idle CO		with catalytic converter: 0.1%, without catalytic converter: 2%		
Carbureted engine	Choke fast idle		A20A1 and A20A2: 2,000—3,000 min^{-1} (rpm) A16A1: 1,500—2,500 min^{-1} (rpm)		
	Idle Speed	with hedlights and cooling fan off	Manual	A16A1, A20A2	750 ± 50 min^{-1} (rpm)
				A20A1	800 ± 50 min^{-1} (rpm)
			Automatic (in gear)	A16A1, A20A2	700 ± 50 min^{-1} (rpm)
					KS: 750 ± 50 min^{-1} (rpm)
				A20A1	730 ± 50 min^{-1} (rpm)
	Idle CO		with catalytic converter: 0.1%, without catalytic converter: 2%		

Clutch — Section 13

Unit: mm (in.)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Clutch pedal	Pedal Height	208 (8.2) to floor 181 (7.1) to carpet	— —
	Stroke	145–150 (5.7–5.9)	—
	Pedal play	15–25 (0.6–1.0)	—
	Disengagement height	73 (2.9) min. to floor 49 (1.9) min. to carpet	— —
Clutch arm	Release arm adjustment	5.2–6.4 (0.20–0.25)	—
Flywheel	Clutch surface runout	0.05 (0.002) max.	0.15 (0.006)
	I.D. of pilot bushing	19.000–19.071 (0.7480–0.7508)	—
Clutch plate	Rivet head depth	1.3 (0.05) min.	0.2 (0.008)
	Surface runout	0.8 (0.03) max.	1.0 (0.04)
	Radial play in splines	0.7–2.1 (0.028–0.083)	4.0 (0.16)
	Thickness	8.1–8.8 (0.32–0.35)	5.7 (0.22)
Clutch release bearing holder	I.D.	31.00–31.059 (1.220–1.223)	31.09 (1.224)
	Holder-to-guide sleeve clearance	0.05–0.15 (0.002–0.006)	0.22 (0.009)
Clutch cover	Uneveness of diaphragm spring	0.8 (0.03) max.	1.0 (0.04)

Manual Transmission (A1/A2) — Section 14

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission oil	Capacity ℓ (US. qt., Imp. qt)	2.4 (2.5, 2.1) at assembly 2.3 (2.4, 2.0) at oil change	
Mainshaft	End play	0.10–0.35 (0.004–0.014)	0.5 (0.02)
	Diameter of pilot bushing contact area	18.80–18.85 (0.7402–0.7421)	—
	Diameter of needle bearing contact area	28.002–28.015 (1.1024–1.1030)	27.95 (1.100)
	Diameter of third gear contact area	31.984–32.000 (1.2592–1.2598)	31.93 (1.2571)
	Diameter of ball bearing contact area	24.980–24.993 (0.9835–0.9840)	24.93 (0.981)
	Runout	0.04 (0.0016) max.	0.10 (0.004)
Mainshaft third and fourth gears	I.D.	37.009–37.025 (1.4570–1.4577)	37.07 (1.459)
	End play	0.03–0.18 (0.0012–0.0071)	0.3 (0.012)
	Thickness	30.42–30.47 (1.1976–1.1996)	30.3 (1.193)
Mainshaft fifth gear	I.D.	37.009–37.025 (1.4570–1.4577)	37.07 (1.459)
	End play	0.03–0.13 (0.0012–0.0051)	0.3 (0.012)
	Thickness	29.92–29.97 (1.1780–1.1799)	29.8 (1.173)
Countershaft	End play	0.10–0.35 (0.004–0.014)	0.5 (0.02)
	Diameter of needle bearing contact area	33.000–33.015 (1.2992–1.2998)	32.95 (1.297)
	Diameter of ball bearing contact area	24.980–24.993 (0.9835–0.9840)	24.93 (0.981)
	Diameter of low gear contact area	33.984–34.000 (1.3380–1.3386)	33.93 (1.336)
	Runout	0.04 (0.0016)	0.10 (0.004)
Countershaft low gear	I.D.	39.008–39.025 (1.5357–1.5364)	39.07 (1.538)
	End play	0.03–0.08 (0.0012–0.0031)	0.18 (0.007)
Countershaft second gear	I.D.	43.008–43.025 (1.6932–1.6939)	43.07 (1.696)
	End play	0.03–0.10 (0.0012–0.0039)	0.18 (0.007)
	Thickness	30.42–30.47 (1.1976–1.1996)	30.3 (1.193)
Spacer collar (Countershaft second gear)	I.D.	30.98–30.99 (1.2197–1.2201)	31.4 (1.236)
	O.D.	37.989–38.000 (1.4956–1.4961)	37.93 (1.493)
	Length	30.53–30.55 (1.2020–1.2028)	30.51 (1.201)
Spacer collar (Mainshaft fourth and fifth gears)	I.D.	25.002–25.012 (0.9843–0.9847)	25.06 (0.987)
	O.D.	31.989–32.000 (1.2594–1.2598)	31.93 (1.257)
	Length	27.03–27.08 (1.0642–1.0661)	27.01 (1.063)
Reverse idler gear	I.D.	17.016–17.043 (0.6699–0.6710)	17.09 (0.673)
	Gear-to-reverse gear shaft clearance	0.032–0.077 (0.0013–0.0030)	0.15 (0.006)
Synchro ring	Ring-to-gear clearance (ring pushed against gear)	0.73–1.18 (0.031–0.046)	0.4 (0.016)
Shift fork	Synchro sleeve gear	6.75–6.85 (0.266–0.270)	6.0 (0.24)
	Fork-to-synchro sleeve clearance	0.35–0.65 (0.014–0.026)	1.0 (0.04)
Reverse shift fork	End gap	11.8–12.1 (0.46–0.48)	—
	Fork-to-reverse idler gear clearance	0.2–1.0 (0.008–0.039)	1.7 (0.07)
	Groove width	7.05–7.25 (0.278–0.285)	—
	Fork-to-fifth/reverse shift shaft clearance	0.05–0.35 (0.002–0.014)	0.5 (0.02)
Shift arm	Width of groove in shift rod guide	11.8–12.0 (0.46–0.47)	—
	Shift arm-to-shift rod guide clearance	0.05–0.35 (0.002–0.014)	0.8 (0.03)
	Width in shift guide	7.9–8.0 (0.311–0.315)	—
	Shift arm-to-shift guide clearance	0.1–0.3 (0.004–0.012)	0.6 (0.02)
Shift rod guide	I.D.	14.000–14.068 (0.5512–0.5539)	—
	Guide-to-shaft clearance	0.011–0.092 (0.0004–0.0036)	0.15 (0.006)
	O.D.	11.9–12.0 (0.469–0.472)	—
	Guide-to-fifth/reverse shift shaft clearance	0.2–0.5 (0.008–0.020)	0.8 (0.03)
Selector arm	Width	11.9–12.0 (0.469–0.472)	—
	Arm-to-shift rod guide clearance	0.05–0.25 (0.002–0.010)	0.5 (0.02)
	End gap	10.05–10.15 (0.396–0.400)	—
	Arm-to-interlock clearance	0.05–0.25 (0.002–0.010)	0.7 (0.03)
	Arm-to-holder clearance	0.01–0.20 (0.0004–0.0079)	Adjust with a shim

(cont'd)

Standards and Service Limits (cont'd)

Manual Transmission<B2>- Section 14

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission oil	Capacity ℓ (US. qt., Imp. qt)	1.9 (2.0, 1.7) at assembly 2.0 (2.1, 1.8) at oil change	
Mainshaft	End play	0.14–0.21 (0.006–0.008)	Adjust with a shim.
	Diameter of needle bearing contact area	27.987–28.000 (1.1018–1.1024)	27.94 (1.100)
	Diameter of third gear contact area	37.984–38.000 (1.4954–1.4961)	37.93 (1.493)
	Diameter of ball bearing contact area	27.987–28.000 (1.1018–1.1024)	27.94 (1.100)
	Runout	0.04 (0.0016) max.	0.10 (0.004)
Mainshaft third and fourth gears	I.D.	43.009–43.025 (1.6933–1.6939)	43.08 (1.696)
	End play	0.06–0.21 (0.0024–0.0083)	0.3 (0.012)
	Thickness 3rd	32.42–32.47 (1.2764–1.2783)	32.3 (1.272)
	4th	30.92–30.97 (1.2173–1.2193)	30.8 (1.213)
Mainshaft fifth gear	I.D.	43.009–43.025 (1.6933–1.6939)	43.08 (1.696)
	End play	0.06–0.21 (0.0024–0.0083)	0.3 (0.0012)
	Thickness	30.42–30.47 (1.1976–1.1996)	30.3 (1.193)
Countershaft	End play	0.10–0.35 (0.004–0.014)	0.5 (0.02)
	Diameter of needle bearing contact area	33.000–33.015 (1.2992–1.2998)	32.95 (1.297)
	Diameter of ball bearing contact area	24.987–25.000 (0.9837–0.9843)	24.94 (0.982)
	Diameter of low gear contact area	33.984–40.000 (1.3380–1.5748)	33.93 (1.336)
	Runout	0.04 (0.0016)	0.10 (0.004)
Cuntershaft low gear	I.D.	46.009–46.025 (1.8114–1.8120)	46.08 (1.814)
	End play	0.03–0.08 (0.0012–0.0031)	Adjust with a shim
Countershaft Second gear	I.D.	50.009–50.025 (1.9689–1.9695)	50.08 (1.972)
	End play	0.03–0.08 (0.0012–0.0031)	Adjust with a collar.
	Thickness	32.92–32.97 (1.2961–1.2980)	32.8 (1.291)
Spacer collar (Countershaft second gear)	I.D.	36.48–36.49 (1.4362–1.4366)	36.5 (1.437)
	O.D.	43.989–44.000 (1.7318–1.7323)	43.94 (1.730)
	Length A	28.98–29.00 (1.1409–1.1417)	–
	B	29.03–29.05 (1.1429–1.1437)	
Spacer collar (Mainshaft fourth and fifth gears)	I.D.	28.002–28.012 (1.1024–1.1028)	28.06 (1.105)
	O.D.	34.989–35.000 (1.3775–1.3780)	34.94 (1.376)
	Length A	55.95–56.05 (2.2028–2.2067)	–
	B	26.03–26.08 (1.0248–1.0268)	
Reverse Idler gear	I.D.	20.016–20.043 (0.7880–0.7891)	20.09 (0.791)
	Gear-to-reverse gear shaft clearance	0.036–0.084 (0.0014–0.0033)	0.16 (0.006)
Synchro ring	Ring-to-gear clearance (ring pushed against gear)	0.85–1.10 (0.033–0.043)	0.4 (0.016)
Shift fork	Synchro sleeve gear 1, 2, 3 and 4th	7.95–8.05 (0.313–0.317)	–
	5th	5.75–5.85 (0.226–0.230)	–
	Fork-to-synchro sleeve 1, 2, 3 and 4th	0.45–0.65 (0.018–0.026)	1.0 (0.04)
	5th	0.25–0.45 (0.010–0.018)	0.8 (0.03)
Reverse shift fork	End gap	13.0–13.3 (0.51–0.52)	–
	Fork-to-reverse idler gear clearance	0.5–1.1 (0.020–0.043)	1.8 (0.07)
	Groove width	7.05–7.25 (0.278–0.285)	–
	Fork-to-fifth/reverse shift shaft clearance	0.05–0.35 (0.002–0.014)	0.5 (0.02)
Shift arm	Width of groove in shift rod guide	12.8–13.0 (0.50–0.51)	–
	Shift arm-to-shift rod guide clearance	0.05–0.35 (0.002–0.014)	0.8 (0.03)
	Width in shift guide	7.9–8.0 (0.311–0.315)	–
	Shift arm-to-shift guide clearance	0.1–0.3 (0.004–0.012)	0.6 (0.02)
Shift rod guide	I.D.	14.000–14.068 (0.5512–0.5539)	–
	Guide-to-shaft clearance	0.011–0.092 (0.0004–0.0036)	0.15 (0.006)
	O.D.	11.9–12.0 (0.469–0.472)	–
	Guide-to-fifth/reverse shift shaft clearance	0.2–0.5 (0.008–0.020)	0.8 (0.03)
Selector arm	Width	11.9–12.0 (0.469–0.472)	–
	Arm-to-shift rod guide clearance	0.05–0.25 (0.002–0.010)	0.5 (0.02)
	End gap	9.9–10.0 (0.390–0.394)	–
	Arm-to-interlock clearance	0.05–0.20 (0.002–0.008)	0.45 (0.018)

Automatic Transmission (F4) — Section 15

Unit: mm (in.)

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Transmission oil	Capacity ℓ (US. qt., Imp.qt)		2.4 (2.5, 2.1) at oil change 5.4 (5.7, 4.8) at assembly	
Hydraulic pressure	Line pressure at 2,000 min^{-1} (rpm)		*834—883 kPa (8.5—9.0 kg/cm², 121—128 psi) 785—834 kPa (8.0—8.5 kg/cm², 114—121 psi)	785 kPa (8.0 kg/cm², 114 psi) 736 kPa (7.5 kg/cm², 107 psi)
	4th, 3rd, 2nd clutch pressure at 2,000 min^{-1} (rpm)		*441—883 kPa (4.5—9.0 kg/cm², 64—128 psi) 441—834 kPa (4.5—8.5 kg/cm², 64—121 psi)	392 kPa (4.0 kg/cm², 57 psi) with lever released 785 kPa (8.0 kg/cm², 114 psi) with lever in throttle position (3/8—8/8)
	1st clutch pressure at 2,000 min^{-1} (rpm)		*834—883 kPa (8.5—9.0 kg/cm², 121—128 psi) 785—834 kPa (8.0—8.5 kg/cm², 114—121 psi)	*785 kPa (8.0 kg/cm², 114 psi) 736 kPa (7.5 kg/cm², 107 psi)
	Governor pressure at 60 km/h		181—191 kPa (1.85—1.95 kg/cm², 26—28 psi)	177 kPa (1.80 kg/cm², 26 psi)
	Throttle pressure A	Fully closed	0	—
		Fully opened	485—500 kPa (4.95—5.1 kg/cm², 70—73 psi)	481 kPa (4.9 kg/cm², 70 psi)
	Throttle pressure B	Fully closed	0	—
		Fully opened	834—883 kPa (8.5—9.0 kg/cm², 121—128 psi)	785 kPa (8.0 kg/cm², 114 psi)
Stall speed	Check with car on level ground		*2,500—2,800 min^{-1} (rpm) 2,650—2,950 min^{-1} (rpm)	— —
Clutch	Clutch initial clearance	1st	0.65—0.85 (0.026—0.033)	—
		2nd	0.50—0.70 (0.020—0.028)	—
		3rd, 4th	0.40—0.60 (0.016—0.024)	—
	Clutch return spring free length		31.0 (1.22)	29.0 (1.14)
	Clutch disc thickness		1.88—2.0 (0.074—0.079)	Until grooves worn out
	Clutch plate thickness		1.95—2.05 (0.077—0.081)	Discoloration
	Clutch end plate thickness	Mark 1	2.05—2.10 (0.081—0.083)	
		Mark 2	2.15—2.20 (0.085—0.087)	
		Mark 3	2.25—2.30 (0.089—0.091)	
		Mark 4	2.35—2.40 (0.093—0.094)	
		Mark 5	2.45—2.50 (0.096—0.098)	
		Mark 6	2.55—2.60 (0.100—0.102)	
		Mark 7	2.65—2.70 (0.104—0.106)	
		Mark 8	2.75—2.80 (0.108—0.110)	
		Mark 9	2.85—2.90 (0.112—0.114)	
		Mark 10	2.95—3.00 (0.116—0.118)	Discoloration
Transmission	Diameter of needle bearing contact area on main and stator shaft		22.980—22.993 (0.9047—0.9052)	Wear or damage
	Diameter of needle bearing contact area on mainshaft 2nd gear		35.975—35.991 (1.4163—1.4170)	
	Diameter of needle bearing contact area on mainshaft 4th gear collar		31.975—31.991 (1.2589—1.2595)	
	Diameter of needle bearing contact area on mainshaft 1st gear collar		30.975—30.991 (1.2195—1.2201)	
	Diameter of needle bearing contact area on countershaft (L side)		38.505—38.515 (1.5159—1.5163)	
	Diameter of needle bearing contact area on countershaft 3rd gear		31.975—31.991 (1.2589—1.2595)	
	Diameter of needle bearing contact area on countershaft 4th gear		27.980—27.993 (1.1016—1.1021)	
	Diameter of needle bearing contact area on countershaft reverse gear collar		31.975—31.991 (1.2589—1.2595)	
	Diameter of needle bearing contact area on countershaft 1st gear collar		31.975—31.991 (1.2589—1.2595)	
	Diameter of needle bearing contact area on reverse idle gear		13.990—14.000 (0.5508—0.5512)	
	Reverse idler shaft holder diameter		14.416—14.434 (0.5676—0.5683)	
	Mainshaft 2nd gear I.D.		41.000—41.016 (1.6142—1.6148)	
	Mainshaft 1st gear I.D.		36.000—36.016 (1.4173—1.4179)	
	Countershaft 4th gear I.D.		33.000—33.016 (1.2992—1.2998)	
	Countershaft 3rd gear I.D.		38.000—38.016 (1.4961—1.4967)	
	Countershaft 2nd gear I.D.		31.000—31.016 (1.2205—1.2211)	
	Countershaft 1st gear I.D.		38.000—38.016 (1.4961—1.4967)	
	Countershaft reverse gear I.D.		38.000—38.016 (1.4961—1.4967)	
	Reverse idle gear I.D.		18.006—18.017 (0.7089—0.7093)	Wear or damage
	Mainshaft 4th gear end play		0.07—0.12 (0.003—0.005)	—
	Mainshaft 2nd gear end play		0.07—0.12 (0.003—0.005)	—
	Mainshaft 1st gear end play		0.08—0.24 (0.003—0.009)	—
	Countershaft 3rd gear end play		0.07—0.12 (0.003—0.005)	—
	Countershaft 2nd gear end play		0.07—0.12 (0.003—0.005)	—
	Reverse idler gear end play		0.05—0.18 (0.002—0.007)	—
	Reverse gear hub O.D.		51.87—51.90 (2.0421—2.0433)	Wear or damage

*Fuel Injected Engine

(cont'd)

Standards and Service Limits (cont'd)

Automatic Transmission (F4) — Section 15

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Transmission (cont'd)	Thrust washer thickness			
	Mainshaft 2nd gear	A	3.97–4.00 (0.156–0.157)	—
		B	4.02–4.05 (0.158–0.159)	—
		C	4.07–4.10 (0.160–0.161)	—
		D	4.12–4.15 (0.162–0.163)	—
		E	4.17–4.20 (0.164–0.165)	—
		F	4.22–4.25 (0.166–0.167)	—
		G	4.27–4.30 (0.168–0.169)	—
		H	4.32–4.35 (0.170–0.171)	—
		I	4.37–4.40 (0.172–0.173)	—
	Mainshaft bearing contact area (R side)		2.95–3.05 (0.116–0.120)	Wear or damage
	Mainshaft 1st gear		2.43–2.50 (0.096–0.098)	Wear or damage
	Countershaft 3rd gear	A	2.97–3.00 (0.1169–0.1181)	—
		B	3.02–3.05 (0.1189–0.1201)	—
		C	3.07–3.10 (0.1209–0.1220)	—
		D	3.12–3.15 (0.1228–0.1240)	—
		E	3.17–3.20 (0.1248–0.1260)	—
		F	3.22–3.25 (0.1268–0.1280)	—
		G	3.27–3.30 (0.1287–0.1299)	—
		H	3.32–3.35 (0.1307–0.1319)	—
		I	3.37–3.40 (0.1327–0.1339)	—
	Countershaft 4th gear collar thickness	A	38.97–39.00 (1.5342–1.5354)	—
		B	39.02–39.05 (1.5362–1.5374)	—
		C	39.07–39.10 (1.5382–1.5394)	—
		D	39.12–39.15 (1.5402–1.5413)	—
		E	39.17–39.20 (1.5421–1.5433)	—
		F	39.22–39.25 (1.5441–1.5453)	—
		G	39.27–39.30 (1.5461–1.5472)	—
	Thrust washer thickness (mainshaft 1st gear L side)		1.45–1.50 (0.057–0.059)	1.4 (0.055)
	Mainshaft 1st gear collar length		24.50–24.55 (0.9646–0.9665)	—
	Mainshaft 1st gear collar flange thickness		2.5–2.6 (0.098–0.102)	Wear or damage
	Countershaft reverse gear collar length		12.0–12.1 (0.472–0.476)	—
	Countershaft reverse gear collar flange thickness		2.4–2.6 (0.094–0.102)	Wear or damage
	Countershaft 1st gear collar length		12.0–12.1 (0.472–0.476)	—
	Countershaft 1st gear collar flange thickness		2.4–2.6 (0.094–0.102)	Wear or damage
	Diameter of countershaft one-way clutch contact area		83.339–83.365 (3.2811–3.2821)	Wear or damage
	Diameter of parking gear one-way clutch contact area		66.685–66.695 (2.6254–2.6258)	Wear or damage
	Mainshaft feed pipe O.D. (at 20 mm front end)		6.97–6.98 (0.2744–0.2748)	6.95 (0.2736)
	Countershaft feed pipe O.D. (at 20 mm from end)		7.97–7.98 (0.3138–0.3142)	7.95 (0.31)
	Mainshaft sealing ring 32 mm Thickness		1.980–1.995 (0.0780–0.0785)	1.8 (0.071)
	Mainshaft bushing I.D.		6.018–6.030 (0.2369–0.2374)	6.045 (0.238)
	Mainshaft bushing I.D.		9.000–9.015 (0.3543–0.3549)	9.03 (0.356)
	Counter shaft bushing I.D.		8.000–8.015 (0.3150–0.3156)	8.03 (0.3161)
	Mainshaft sealing ring groove width		2.025–2.060 (0.0797–0.0811)	2.08 (0.082)
Regulator valve body	Sealing ring contact area diameter		35.000–35.025 (1.3780–1.3789)	35.05 (1.38)
Shifting device and parking brake control	Reverse shift fork thickness		5.9–6.0 (0.232–0.236)	5.4 (0.21)
	Parking brake ratchet pawl		—	Wear or other defect
	Parking gear		—	Wear or other defect
	Throttle cam stopper		18.5–18.6 (0.728–0.732)	—
Servo body	Shift fork shaft bore I.D.	A	14.000–14.005 (0.5512–0.5514)	—
		B	14.006–14.010 (0.5514–0.5516)	—
		C	14.011–14.015 (0.5516–0.5518)	—
	Shift fork shaft valve bore I.D.		37.000–37.039 (1.4567–1.4582)	37.045 (1.4585)
Valve body	Oil pump gear side clearance		0.03–0.05 (0.0012–0.0020)	0.05 (0.002)
	Oil pump gear-to-body clearance	Drive:	0.240–0.265 (0.009–0.010)	—
		Driven:	0.125–0.175 (0.005–0.007)	—
	Stator camshaft needle bearing bore I.D.		27.000–27.021 (1.0630–1.0638)	Wear or damage
	Stator camshaft needle bearing contact and O.D.		29.000–29.013 (1.1417–1.1422)	Wear or damage
	Oil pump driven gear I.D.		14.016–14.034 (0.5518–0.5525)	Wear or damage
	Oil pump shaft O.D.		13.980–13.990 (0.5504–0.5508)	Wear or damage

Automatic Transmission (F4) — Section 15

Unit: mm (in.)

	MEASUREMENT	STANDARD (NEW)		SERVICE LIMIT	
Springs		Wire Diameter	O.D.	Free Length	Number of coils
	Low one-way ball spring	0.29 (0.01)	4.0 (0.16)	14.0 (0.55)	13
	Regulator valve outer spring	*1.8 (0.07)	*14.7 (0.58)	*88.6 (3.49)	*17
		1.8 (0.07)	14.7 (0.58)	86.5 (3.41)	17
	Regulator valve inner spring	1.8 (0.07)	9.6 (0.38)	44.0 (1.73)	7.5
	Stator reaction spring	6.0 (0.24)	38.4 (1.51)	30.3 (1.19)	2
	Throttle modulator valve spring	1.2 (0.05)	9.4 (0.37)	26.3 (1.04)	8
	Torque converter check valve spring A—E	1.2 (0.05)	8.4 (0.33)	37.0 (1.46)	15
	Relief valve spring	0.8 (0.03)	8.4 (0.33)	47.7 (1.88)	15
	Governor spring A	1.0 (0.04)	18.8 (0.74)	33.4 (1.31)	4
	Governor spring B	0.9 (0.04)	11.8 (0.46)	27.1 (1.07)	6.2
	2nd orifice control valve spring	*0.8 (0.03)	*6.6 (0.26)	*48.5 (1.91)	*27.6
		0.8 (0.03)	6.6 (0.26)	45 (1.77)	27.6
	Servo orifice control valve spring	0.9 (0.04)	6.1 (0.24)	35.9 (1.41)	20
	Throttle control valve A outer spring	1.0 (0.04)	8.5 (0.33)	21.0 (0.83)	5.8 and 5.4
	Throttle adjust spring A (Throttle B pressure)	0.8 (0.03)	6.2 (0.24)	27.0 (1.06)	8.5
		0.8 (0.03)	6.2 (0.24)	30.0 (1.18)	8
	Throttle control valve B inner spring	1.4 (0.06)	8.5 (0.33)	41.4 (1.63)	8.4
	1—2 shift spring	0.6 (0.02)	6.1 (0.24)	38 (1.50)	21
	1—2 shift spring Main	0.45 (0.02)	4.5 (0.18)	10.7 (0.42)	12.7
	1—2 shift ball spring Secondary	0.45 (0.02)	4.5 (0.18)	12.7 (0.50)	11
	2—3 shift spring	0.9 (0.04)	7.6 (0.30)	55.8 (2.20)	30
	2—3 shift ball spring	0.5 (0.02)	4.5 (0.18)	13.5 (0.53)	10.5
	3—4 shift spring	0.9 (0.04)	9.6 (0.38)	25.5 (1.00)	10.3
	3—4 shift ball spring	0.5 (0.02)	4.5 (0.18)	10.8 (0.43)	7.4
	Low accumulator A spring	2.8 (0.11)	21.5 (0.85)	55.4 (2.18)	6.2
	Low accumulator B spring	2.8 (0.11)	13.1 (0.52)	39 (1.54)	7.9
	4th accumulator spring	2.9 (0.11)	18.6 (0.73)	76.8 (3.02)	6.6
	2nd accumulator spring	3.5 (0.14)	20.0 (0.80)	77.1 (3.06)	12.5
	3rd accumulator spring	2.8 (0.11)	15.5 (0.61)	79.0 (3.11)	18.6
	L/C shift valve spring	1.1 (0.04)	8.1 (0.32)	51.8 (2.04)	22.3
	L/C control spring	0.8 (0.03)	6.6 (0.26)	47.0 (1.85)	22
	L/C timing valve A spring	0.9 (0.04)	8.6 (0.34)	51.6 (2.03)	18.7
	L/C timing valve B spring	1.0 (0.04)	6.6 (0.26)	56.5 (2.22)	31.6
	CPC valve spring A, B	1.4 (0.06)	9.4 (0.32)	31.6 (1.24)	10.9
	Shift timing valve spring	0.9 (0.04)	8.6 (0.34)	50.1 (1.97)	18.7
	Kick down valve spring	1.0 (0.04)	6.6 (0.26)	58.5 (2.3)	33.4
	REV control spring	0.8 (0.03)	7.6 (0.30)	33.4 (1.31)	17
	L/C cut valve spring	0.7 (0.03)	7.6 (0.30)	29.0 (1.14)	18
	Accumulator control spring	1.2 (0.05)	7.7 (0.30)	45.6 (1.80)	21.8
	Timing accumulator spring	1.1 (0.04)	11.7 (0.46)	28.2 (1.11)	6.6
	2—1 timing spring	1.1 (0.04)	6.6 (0.26)	52.4 (2.06)	26.5
	Servo return spring	2.6 (0.10)	28.8 (1.13)	40.3 (1.59)	3.3
	Servo control spring	0.8 (0.03)	6.6 (0.26)	55.3 (2.18)	22

*: Fuel-Injected Engine

Standards and Service Limits (cont'd)

Automatic Transmission (C9) — Section 15

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Transmission oil	Capacity ℓ (US. qt., Imp.qt.)		2.2 (2.3, 1.9) at oil change 5.2 (5.5, 4.6) at assembly	
Hydraulic pressure	Line pressure at 2,000 min^{-1} (rpm)		785–834 kPa (8.0–8.5 kg/cm², 114–121 psi)	736 kPa (7.5 kg/cm², 107 psi)
	4th, 3rd, 2nd clutch pressure at 2,000 min^{-1} (rpm)		412–834 kPa (4.2–8.5 kg/cm², 60–121 psi)	392 kPa (4.0 kg/cm², 57 psi) with lever released 785 kPa (8.0 kg/cm², 114 psi) with lever in throttle position (3/8–8/8)
	1st clutch pressure at 2,000 min^{-1} (rpm)		785–834 kPa (8.0–8.5 kg/cm², 114–121 psi)	736 kPa (7.5 kg/cm², 107 psi)
	Governor pressure at 60 km/h		198–208 kPa (2.02–2.12 kg/cm², 29–30 psi)	193 kPa (1.97 kg/cm², 28 psi)
	Throttle pressure A	Fully closed	0	—
		Fully opened	495–510 kPa (5.05–5.20 kg/cm², 72–74 psi)	490 kPa (5.0 kg/cm², 71 psi)
	Throttle pressure B	Fully closed	0	—
		Fully opened	735–834 kPa (8.0–8.5 kg/cm², 114–121 psi)	736 kPa (7.5 kg/cm², 107 psi)
Stall speed	Check with car on level ground		2,600–2,900 min^{-1} (rpm)	—
Clutch	Clutch initial clearance	1st	0.65–0.85 (0.026–0.033)	—
		2nd	0.60–0.80 (0.024–0.031)	—
		3rd, 4th	0.4–0.6 (0.016–0.024)	—
	Clutch return spring free length	1st	31.0 (1.22)	28.5 (1.12)
		2nd–4th	30.5 (1.20)	28.5 (1.12)
	Clutch disc thickness		1.88–2.0 (0.074–0.079)	Until grooves worn out
	Clutch plate thickness		1.95–2.05 (0.077–0.081)	Discoloration
	Clutch end plate thickness	Mark 1	2.3–2.4 (0.091–0.094)	
		Mark 2	2.4–2.5 (0.094–0.098)	
		Mark 3	2.5–2.6 (0.098–0.102)	
		Mark 4	2.6–2.7 (0.102–0.106)	
		Mark 5	2.7–2.8 (0.106–0.110)	
		Mark 6	2.8–2.9 (0.110–0.114)	
		Mark 7	2.9–3.0 (0.114–0.118)	
		Mark 8	3.0–3.1 (0.118–0.122)	
		Mark 9	3.1–3.2 (0.122–0.126)	
		Mark 10	3.2–3.3 (0.126–0.130)	
		Mark 11	2.0–2.1 (0.079–0.082)	
		Mark 12	2.1–2.2 (0.082–0.086)	
		Mark 13	2.2–2.3 (0.086–0.090)	Discoloration
Transmission	Diameter of needle bearing contact area on main and stator shaft		19.980–19.993 (0.7866–0.7871)	Wear or damage
	Diameter of needle bearing contact area on mainshaft 2nd gear		35.975–35.991 (1.4163–1.4170)	
	Diameter of needle bearing contact area on mainshaft 4th gear collar		31.975–31.991 (1.2589–1.2595)	
	Diameter of needle bearing contact area on mainshaft 1st gear collar		30.975–30.991 (1.2195–1.2201)	
	Diameter of needle bearing contact area on countershaft (L side)		38.505–38.515 (1.5159–1.5163)	
	Diameter of needle bearing contact area on countershaft 3rd gear		31.975–31.991 (1.2589–1.2595)	
	Diameter of needle bearing contact area on countershaft 4th gear		27.980–27.993 (1.1016–1.1021)	
	Diameter of needle bearing contact area on countershaft reverse gear collar		29.980–29.993 (1.1803–1.1808)	
	Diameter of needle bearing contact area on countershaft 1st gear collar		29.980–29.993 (1.1803–1.1808)	
	Diameter of needle bearing contact area on reverse idle gear		13.990–14.000 (0.5508–0.5512)	
	Reverse idler shaft holder diameter		14.416–14.434 (0.5676–0.5683)	
	Mainshaft 2nd gear I.D.		41.000–41.016 (1.6142–1.6148)	
	Mainshaft 1st gear I.D.		36.000–36.016 (1.4173–1.4179)	
	Countershaft 4th gear I.D.		33.000–33.016 (1.2992–1.2998)	
	Countershaft 3rd gear I.D.		38.000–38.016 (1.4961–1.4967)	
	Countershaft 2nd gear I.D.		31.000–31.016 (1.2205–1.2211)	
	Countershaft 1st gear I.D.		35.000–35.016 (1.3779–1.3786)	
	Countershaft reverse gear I.D.		36.000–36.016 (1.4173–1.4179)	
	Reverse idle gear I.D.		18.007–18.020 (0.7089–0.7094)	Wear or damage
	Mainshaft 4th gear end play		0.07–0.12 (0.003–0.005)	—
	Mainshaft 2nd gear end play		0.07–0.12 (0.003–0.005)	—
	Mainshaft 1st gear end play		0.08–0.24 (0.003–0.009)	—
	Countershaft 3rd gear end play		0.07–0.12 (0.003–0.005)	—
	Countershaft 2nd gear end play		0.07–0.12 (0.003–0.005)	—
	Reverse idler gear end play		0.05–0.18 (0.002–0.007)	—
	Countershaft reverse gear end play		0.10–0.20 (0.004–0.008)	—
	Reverse gear hub O.D.		51.87–51.90 (2.0421–2.0433)	Wear or damage

Automatic Transmission (C9) — Section 15

Unit: mm (in.)

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Transmission (cont'd)	*Thrust washer thickness*			
	Mainshaft 2nd gear	A	3.47–3.50 (0.137–0.138)	—
		B	3.52–3.55 (0.139–0.140)	—
		C	3.57–3.60 (0.141–0.142)	—
		D	3.62–3.65 (0.143–0.144)	—
		E	3.67–3.70 (0.144–0.146)	—
		F	3.72–3.75 (0.146–0.148)	—
		G	3.77–3.80 (0.148–0.150)	—
		H	3.82–3.85 (0.150–0.152)	—
		I	3.87–3.90 (0.152–0.154)	—
	Mainshaft bearing contact area (R side)		2.95–3.05 (0.116–0.120)	Wear or damage
	Mainshaft 1st gear		2.43–2.50 (0.096–0.098)	Wear or damage
	Countershaft 3rd gear	A	2.97–3.00 (0.1169–0.1181)	—
		B	3.02–3.05 (0.1189–0.1201)	—
		C	3.07–3.10 (0.1209–0.1220)	—
		D	3.12–3.15 (0.1228–0.1240)	—
		E	3.17–3.20 (0.1248–0.1260)	—
		F	3.22–3.25 (0.1268–0.1280)	—
		G	3.27–3.30 (0.1287–0.1299)	—
		H	3.32–3.35 (0.1307–0.1319)	—
		I	3.37–3.40 (0.1327–0.1339)	—
	Countershaft 4th gear collar thickness	A	38.97–39.00 (1.5342–1.5354)	—
		B	39.02–39.05 (1.5362–1.5374)	—
		C	39.07–39.10 (1.5382–1.5394)	—
		D	39.12–39.15 (1.5402–1.5413)	—
		E	39.17–39.20 (1.5421–1.5433)	—
		F	39.22–39.25 (1.5441–1.5453)	—
		G	39.27–39.30 (1.5461–1.5472)	—
	Thrust washer thickness (mainshaft 1st gear L side)		1.45–1.50 (0.057–0.059)	1.4 (0.055)
	Mainshaft 1st gear collar length		22.50–22.55 (0.886–0.888)	—
	Mainshaft 1st gear collar flange thickness		2.5–2.6 (0.098–0.102)	Wear or damage
	Countershaft reverse gear collar length		12.00–12.05 (0.472–0.474)	—
	Countershaft reverse gear collar flange thickness		2.45–2.55 (0.096–0.100)	Wear or damage
	Countershaft 1st gear collar length		11.0–11.1 (0.433–0.437)	—
	Countershaft 1st gear collar flange thickness		2.4–2.6 (0.094–0.102)	Wear or damage
	Diameter of countershaft one-way clutch *contact area*		74.414–74.444 (2.9298–2.9309)	Wear or damage
	Diameter of parking gear one-way clutch contact area		57.755–57.768 (2.2738–2.2743)	Wear or damage
	Mainshaft feed pipe O.D. (at 20 mm front end)		6.97–6.98 (0.2744–0.2748)	6.95 (0.2736)
	Countershaft feed pipe O.D. (at 20 mm from end)		7.97–7.98 (0.3138–0.3142)	7.95 (0.31)
	Mainshaft sealing ring 32 mm Thickness		1.980–1.995 (0.0780–0.0785)	1.8 (0.071)
	Mainshaft bushing I.D.		6.018–6.030 (0.2369–0.2374)	6.045 (0.238)
	Mainshaft bushing I.D.		9.000–9.015 (0.3543–0.3549)	9.03 (0.356)
	Countershaft bushing I.D.		8.000–8.015 (0.3150–0.3156)	8.03 (0.316)
	Mainshaft sealing ring groove width		2.025–2.060 (0.0797–0.0811)	2.08 (0.082)
Regulator valve body	Sealing ring contact area diameter		32.000–32.025 (1.2598–1.2608)	32.05 (1.262)
Shifting device and parking brake control	Reverse shift fork thickness		5.90–6.00 (0.232–0.236)	5.4 (0.21)
	Parking brake ratchet pawl		—	Wear or other defect
	Parking gear		—	Wear or other defect
	Throttle cam stopper		18.5–18.6 (0.728–0.732)	—
Servo body	Shift fork shaft bore I.D.	A	14.000–14.005 (0.5512–0.5514)	—
		B	14.006–14.010 (0.5514–0.5516)	—
		C	14.011–14.015 (0.5516–0.5518)	—
	Shift fork shaft valve bore I.D.		37.000–37.039 (1.4567–1.4582)	37.045 (1.4585)
Valve body	Oil pump gear side clearance		0.03–0.05 (0.0012–0.0020)	0.05 (0.002)
	Oil pump gear-to-body clearance	Drive:	0.240–0.265 (0.009–0.010)	—
		Driven:	0.125–0.175 (0.005–0.007)	—
	Stator camshaft needle bearing bore I.D.		24.000–24.021 (0.9449–0.9457)	Wear or damage
	Stator camshaft needle bearing contact and O.D.		26.000–26.013 (1.0236–1.0241)	Wear or damage
	Oil pump driven gear I.D.		14.016–14.034 (0.5518–0.5525)	Wear or damage
	Oil pump shaft O.D.		13.980–13.990 (0.5504–0.5508)	Wear or damage

Standards and Service Limits (cont'd)

Automatic Transmission (C9) — Section 15

	MEASUREMENT	STANDARD (NEW)		SERVICE LIMIT	
		Wire Diameter	O.D.	Free Length	Number of coils
Springs					
	Low one-way ball spring	0.29 (0.01)	4.0 (0.16)	14.0 (0.55)	13
	Regulator valve outer spring	1.8 (0.07)	14.7 (0.58)	86.5 (3.41)	17
	Regulator valve inner spring	1.8 (0.07)	9.6 (0.38)	44.0 (1.73)	7.5
	Stator reaction spring	6.0 (0.24)	38.4 (1.51)	30.3 (1.19)	2
	Throttle modulator valve spring	1.2 (0.05)	9.4 (0.37)	26.3 (1.04)	8
	Torque converter check valve spring A—D	1.1 (0.04)	8.4 (0.33)	36.4 (1.43)	12
	Relief valve spring	0.8 (0.03)	8.4 (0.33)	47.7 (1.88)	15
	Governor spring A	1.0 (0.04)	18.8 (0.74)	38.1 (1.50)	4
	Governor spring B	0.9 (0.04)	11.8 (0.46)	25.8 (1.02)	6.2
	2nd orifice control valve spring	0.8 (0.03)	6.6 (0.26)	45 (1.77)	27.6
	Servo orifice control valve spring	0.8 (0.03)	6.1 (0.24)	39.4 (1.55)	20.7
	Throttle control valve A outer spring	1.0 (0.04)	8.5 (0.33)	21.0 (0.83)	7.5 and 6.8
	Throttle/adjust spring A (Throttle B pressure)	0.8 (0.03)	6.2 (0.24)	27.0 (1.06)	8.5
		0.8 (0.08)	6.2 (0.24)	30.0 (1.18)	8
	Throttle control valve B inner spring	1.4 (0.06)	8.5 (0.33)	41.4 (1.63)	8.4
	1—2 shift spring	0.6 (0.02)	6.1 (0.24)	38 (1.50)	21
	1—2 shift ball spring Main	0.45 (0.02)	4.5 (0.18)	10.7 (0.42)	12.7
	1—2 shift ball spring Secondary	0.45 (0.02)	4.5 (0.18)	12.7 (0.50)	11
	2—3 shift spring	0.9 (0.04)	7.6 (0.30)	55.8 (2.20)	30
	2—3 shift ball spring	0.5 (0.02)	4.5 (0.18)	13.5 (0.53)	10.5
	3—4 shift spring	0.9 (0.04)	9.6 (0.38)	26.2 (1.03)	10.3
	3—4 shift ball spring	0.5 (0.02)	4.5 (0.18)	11.2 (0.44)	7
	Low accumulator A spring	1.71 x 3.5 (0.046 x 0.14)	22.5 (0.89)	69.2 (2.72)	10.3
	Low accumulator B spring	2.3 (0.09)	12.8 (0.50)	29.4 (1.16)	7.8
	4th accumulator spring	2.9 (0.11)	18.6 (0.73)	76.8 (3.02)	6.6
	2nd accumulator spring	3.5 (0.14)	20.0 (0.80)	75.8 (2.98)	11.8
	3rd accumulator spring	2.8 (0.11)	15.5 (0.61)	79.0 (3.11)	18.6
	L/C shift valve spring	1.1 (0.04)	8.1 (0.32)	51.8 (2.04)	22.3
	L/C control spring	0.8 (0.03)	6.6 (0.26)	46.3 (1.82)	36.9
	L/C timing valve A spring	0.9 (0.04)	8.6 (0.34)	51.6 (2.03)	18.7
	L/C timing valve B spring	1.0 (0.04)	6.6 (0.26)	57.2 (2.25)	31.6
	CPC valve spring A, B	1.4 (0.06)	9.4 (0.32)	31.2 (1.23)	10.9
	Shift timing valve spring	0.9 (0.04)	8.6 (0.34)	50.1 (1.97)	18.7
	Kick down valve spring	1.0 (0.04)	6.6 (0.26)	58.5 (2.3)	33.4
	REV control spring	0.8 (0.03)	7.6 (0.30)	33.4 (1.31)	17
	L/C cut valve spring	0.7 (0.03)	7.6 (0.30)	29.0 (1.14)	18
	Accumulator control spring	1.2 (0.05)	7.7 (0.30)	45.6 (1.80)	21.8
	Timing accumulator spring	1.1 (0.04)	11.7 (0.46)	28.2 (1.11)	6.6
	Servo return spring	2.6 (0.10)	28.8 (1.13)	40.3 (1.59)	3.3
	Servo control spring	0.8 (0.03)	6.6 (0.26)	55.3 (2.18)	22

Differential — Section 16

Unit: mm (in.)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Ring gear	Backlash	0.085–0.149 (0.0033–0.0059)	0.2 (0.0079)
Differential carrier	Pinion shaft bore diameter	18.000–18.018 (0.7087–0.7094)	18.1 (0.71)
	Carrier-to-pinion shaft clearance	0.016–0.052 (0.0006–0.0020)	0.1 (0.004)
	Driveshaft bore diameter	28.000–28.021 (1.1024–1.1032)	—
		*1 26.000–26.021 (1.0236–1.0244)	—
	Carrier-to-driveshaft clearance	0.025–0.066 (0.0010–0.0026)	0.12 (0.005)
	Side clearance	0.10–0.20 (0.004–0.008)	0.15 (0.006)
Differential pinion gear	Backlash	0.05–0.15 (0.002–0.006)	Adjust with a washer
	Pinion gear bore diameter	18.041–18.061 (0.7103–0.7111)	—
	Pinion gear-to-pinion shaft clearance	0.057–0.093 (0.0022–0.0037)	0.15 (0.006)

*1 A1 Transmission only

Driveshaft — Section 17

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Driveshaft	Right boot	As installed	506.0–510.5 (19.9–20.1)	—
	Left boot	As installed MT	805.0–809.5 (31.7–31.9)	—
		AT	812.0–816.5 (32.0–32.1)	—

Steering — Section 18

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Steering wheel	Play	10 (0.39) Max.	—
	Steering assist N (kg, lb)	15 (1.5, 3.31) Max	
	P/S	18 (1.8, 3.97) Max	
Power steering	Pump pressure with valve closed (Oil temp./ speed: 40°C (104°F) min/idle. Do not run for more than 5 seconds) kPa (kg/cm², psi)	7845–8826 (80–90, 1138–1280)	
	Fluid capacity Reservoir	0.5ℓ (0.53 US. qt., 0.44 Imp. qt.)	—
	At change	approx 1.7ℓ (1.8 US. qt., 1.5 Imp. qt.)	—

Suspension — Section 19

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Wheel alignment	Camber		Front 0° 00′ ± 1° / Rear 0° 00′ ± 1°	
	Caster		0°31′± 1°	
	Toe-in		0 ± 3 (0 ± 0.118) / 0 ± 2 (0 ± 0.079)	
	Kingpin inclination		6° 50′	
	Steering angle R/L	Inside	39°30′	
		Outside	30°30′	
Wheel	Rim runout Steel	Axial	0–1.0 (0–0.039)	—
		Radial	0–1.0 (0–0.039)	—
	Aluminum	Axial	0–0.7 (0–0.028)	—
		Radial	0–0.07 (0–0.003)	—
Wheel bearing	Front wheel bearing axial play		0–0.05 (0–0.002)	—
	Rear wheel bearing axial play		0–0.05 (0–0.002)	—

(cont'd)

Standards and Service Limits (cont'd)

Unit: mm (in.)

Brake — Section 20

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Parking brake lever	Play in stroke 200N (20 kg, 44 lbs)		To be locked when pulled 7—11 notches	
Foot brake pedal	Pedal Height		171 (6.73) from floor	—
	Free play		1—5 (0.04—0.20)	5 (0.20)
Master cylinder	Piston-to-push rod clearance		0—0.4 (0.016)	———
		with ALB	0—0.6 (0—0.024)	———
Brake drum	I.D.		200.0 (7.87)	201.0 (7.91)
Lining	Thickness		4.5 (0.18)	2.0 (0.08)
Disc brake	Disc thickness	Front	19.0 (0.75) *21 (0.83)	17.0 (0.67) *19 (0.75)
		Rear	10.0 (0.39)	8 (0.31)
	Disc runout	Front/Rear	———	0.1 (0.004)/0.15 (0.006)
	Disc parallelism		———	0.015 (0.0006)
	Pad thickness	Front	9.0 (0.35) *11.5 (0.45)	3.0 (0.12)
		Rear	8.0 (0.31)	3.0 (0.12)

		Vacuum (mm Hg)	Pedal Pressure kg (lbs)	Line Pressure kPa (kg/cm², psi)
				9" Booster
Brake booster	Characteristics	0	20 (44)	1,177 (12.0, 170.6) min
		300	20 (44)	4,766 (48.6, 691.1) min
		500	20 (44)	7,149 (72.9, 1,036.6) min

*EXSi model and cars equipped with ALB (Except KS type)

Engine Electrical — Section 24

	MEASUREMENT		STANDARD (NEW)		
Ignition coil	Rated voltage		12 Volts		
	Insulation resistance		10,000 ohms min.		
	Performance: Make sure strong sparks jump across electrodes (3-point tester)				
	Voltage	Camshaft	Secondary Voltage	3-point gap	Condition
	6 V	75 min⁻¹ (rpm)	30±4 kV	15—21 mm (0.59—0.83)	
	12 V	3,000 min⁻¹ (rpm)	22±4 kV	13—19 mm (0.51—0.75)	At 80°C (176°F)
Ignition wire	Resistance		25,000 ohms max.		
Spark plug	Type Standard	B20A	BCPR6E-11 (NGK), Q20PR-U11 (ND)		
		Others	BPR5EY-11 (NGK)*1, W16EXR-U11 (ND)*1 BCPR6EY-11 (NGK)*2, W20EXR-U11 (ND)*2		
	Gap		1.0—1.1 (0.039—0.043)		
Ignition timing	At idling Carbureted Engine	Manual	*1 24±2° BTDC *2 20±2° BTDC		
		Automatic (in gear)	15±2°BTDC		
	At idling Fuel-injected Engine	Manual	15±2° BTDC		
		Automatic (in gear)	15±2° BTDC		
Battery	Lighting capacity (20-hour ratio)		47 Ampere Hours		
	Starting capacity (5-second ratio)		8.4 V minumum at 300 Ampere draw		
Alternator	Output at no-load		14 V at 1,000 rpm max.		
	Output		14 V/65 A at 5,500 rpm max.		
	Coil resistance (rotor)		2.8—3.0 ohms		±0.1 ohms
	Slip ring O.D.		32.5 (1.28)		32.1 (1.26)
	Brush length		10.5 (0.41)		5.5 (0.22)
	Brush spring tension		300—500 g (10.6—18.6 oz)		———

Starting motor	MEASUREMENT	ND 1.0 kW, 1.4 kW		MITSUBA 1.0 kW, 1.4 kW	
		STANDARD (NEW)	SERVICE LIMIT	STANDARD (NEW)	SERVICE LIMIT
	Mica depth	0.5—0.8 (0.020—0.031)	0.2 (0.008)	0.4—0.5 (0.016—0.020)	0.15 (0.006)
	Commutator runout	0—0.02 (0.0008)	0.05 (0.020)	0—0.02 (0.0008)	0.05 (0.020)
	Commutator O.D.	30.0 (1.18)	29.0 (1.14)	28.0 (1.10)	27.5 (1.08)
	Brush length	12.5—13.5 (0.49—0.53)	8.5 (0.33)	14.3—14.7 (0.56—0.58)	9.3 (0.37)
	Spring pressure (new)	1.75 kg (3.8 lb)	———	2.1 kg (4.6 lb)	———

*1: For cars used unleaded gasoline. *2: For cars used leaded gasoline.

Design Specifications

European Model

	ITEMS	METRIC	ENGLISH	NOTE
DIMENSION	Overall length 3D	4,335 mm	170.7 in	KW: 4,365 mm (171.9 in)
	4D	4,535 mm	178.5 in	KW: 4,565 mm (179.7 in)
	Overall width	1,695 mm	66.7 in	
	Overall height 3D	1,335 mm	52.6 in	
	4D	1,355 mm	53.3 in	
	Wheel base	2,600 mm	102.4 in	
	Thread Front	1,480 mm	58.3 in	
	Rear	1,475 mm	58.1 in	
	Ground clearance	160 mm	6.3 in	
	Seating capacity (F/R)	5 (2/3)		
WEIGHT	Curb weight			
On cars equipped	(M/T) 3D EX (A20A2)	1,075 kg	2,370 lb	Holland
with sunroof (S/R)		1,095 kg *	2,414 lb*	KG, KB
ALB or air conditioner (A/C), add		1,110 kg	2,447 lb	KF, KG, KB
S/R: 18 kg (40 lb)		1,110 kg	2,447 lb	KW
ALB: KE		1,110 kg	2,447 lb	Finland
19 kg (42 lb)		1,110 kg	2,447 lb	KE
except KE	EXi (A20A4)	1,110 kg	2,447 lb	Holland
14 kg (31 lb)		1,130 kg	2,491 lb	KF
A/C: 22 kg (49 lb)		1,130 kg	2,491 lb	KG, KB, KW
P/S: 12 kg		1,135 kg	2,502 lb	Finland
(26.5 lb)		1,135 kg	2,502 lb	KE
	EXC (A20A1)	1,105 kg *	2,436 lb*	KG
		1,085 kg	2,392 lb	Holland
		1,115 kg	2,458 lb	KG
		1,120 kg	2,469 lb	Austria
	EXCi (A20A3)	1,110 kg	2,447 lb	Holland
		1,135 kg	2,502 lb	KG
		1,140 kg	2,513 lb	KX, Austria
	4D LX (A16A1)	1,055 kg	2,326 lb	Holland
		1,075 kg	2,370 lb	KG, KB, KW, Finland
	LX (A20A2)	1,070 kg	2,359 lb	Holland
		1,090 kg	2,403 lb	KG, KB
		1,095 kg	2,414 lb	KW, Finland
	EX (A20A2)	1,110 kg	2,425 lb	Holland
		1,120 kg	2,469 lb	KG, KB
		1,120 kg	2,469 lb	KE
		1,125 kg	2,480 lb	KF, KW, Finland

*Cars equipped with manual steering.

Design Specifications (cont'd)

European Model (cont'd)

	ITEMS	METRIC	ENGLISH	NOTE
WEIGHT (cont'd)	(M/T) 3D EXi (A20A4)	1,110 kg	2,447 lb	Holland
On cars equipped		1,130 kg	2,491 lb	KG, KB
with sunroof (S/R)		1,130 kg	2,491 lb	KF
ALB or air condi-		1,135 kg	2,502 lb	KW, KE, Finland
tioner (A/C), add	EXC (A20A1)	1,085 kg	2,391 lb	Holland
S/R: 18 kg (40 lb)		1,105 kg	2,436 lb	KG
ALB: KE	EXCi (A20A3)	1,115 kg	2,458 lb	Holland
19 kg (42 lb)		1,135 kg	2,502 lb	KG
except KE		1,140 kg	2,513 lb	Austria
14 kg (31 lb)		1,140 kg	2,513 lb	KX
A/C: 22 kg (49 lb)	EXSi (B20A2)	1,145 kg	2,524 lb	Holland
P/S: 12 kg		1,165 kg	2,568 lb	KG, KB
(26.5 lb)		1,180 kg	2,601 lb	KF
		1,180 kg	2,601 lb	KW, KE, Finland
	EXCSi (B20A8)	1,150 kg	2,535 lb	Holland
		1,170 kg	2,579 lb	KG
		1,180 kg	2,601 lb	Austria
		1,180 kg	2,601 lb	KX
		1,180 kg	2,601 lb	KS
	(A/T) 3D EX (A20A2)	1,095 kg	2,414 lb	Holland
		1,115 kg*	2,458 lb*	KG, KB
		1,130 kg	2,491 lb	KG, KB, KF
		1,130 kg	2,491 lb	KW
		1,130 kg	2,491 lb	Finland
		1,130 kg	2,491 lb	KE
	EXi (A20A4)	1,150 kg*	2,535 lb*	KG
		1,150 kg	2,535 lb	KF
		1,155 kg	2,546 lb	KW
		1,155 kg	2,546 lb	Finland
		1,155 kg	2,546 lb	KE
	EXC (A20A1)	1,105 kg	2,436 lb	Holland
		1,125 kg	2,480 lb	KG
		1,140 kg	2,513 lb	Austria
	EXCi (A20A3)	1,135 kg	2,502 lb	Holland
		1,155 kg	2,546 lb	KG
		1,160 kg	2,557 lb	KX, Austria
		1,160 kg	2,557 lb	KS
	(A/T) 4D LX (A16A1)	1,065 kg	2,348 lb	Holland
		1,085 kg	2,392 lb	KG, KB, KW, Finland
	LX (A20A2)	1,070 kg	2,359 lb	Holland

*Cars equipped with manual steering.

	ITEMS	METRIC	ENGLISH	NOTE
WEIGHT	(A/T) 4D LX (A20A2)	1,110 kg	2,425 lb	KG, KB
On cars equipped		1,115 kg	2,458 lb	Finland
with Sunroof (S/R)		1,115 kg	2,458 lb	KW, KS
ALB or air	EX (A20A2)	1,120 kg	2,469 lb	Holland
conditioner		1,140 kg	2,513 lb	KG, KB
(A/C), add		1,145 kg	2,524 lb	KE
S/R: 18 kg (40 lb)		1,145 kg	2,524 lb	KF, KW, Finland
ALB: KE	EXi (A20A4)	1,160 kg	2,557 lb	KG, KB
19 kg (42 lb)		1,160 kg	2,557 lb	KF
except KE		1,165 kg	2,568 lb	KW, Finland
14 kg (31 lb)		1,170 kg	2,579 lb	KE
A/C: 22 kg (49 lb)	LXC (A20A1)	1,125 kg	2,480 lb	*Austria*
	EXC (A20A1)	1,120 kg	2,469 lb	Holland
		1,150 kg	2,535 lb	KG
	EXCi (A20A3)	1,155 kg	2,546 lb	KX, Austria
		1,140 kg	2,513 lb	Holland
		1,165 kg	2,568 lb	KG
		1,170 kg	2,579 lb	Austria
		1,170 kg	2,579 lb	KS
		1,175 kg	2,590 lb	KX
On cars equipped	Weight Distribution (Fr/Rr)			
with sunroof (S/R)	(M/T) 3D EX (A20A2)	660/435 kg*	1,445/959 lb*	KG, KB
ALB or air		670/440 kg	1,447/970 lb	KF, KG, KB
conditioner		670/440 kg	1,447/970 lb	KW
(A/C), add		670/440 kg	1,447/970 lb	Finland
S/R: 9/9 kg		670/440 kg	1,447/970 lb	KE
(20/20 lb)	EXi (A20A4)	685/445 kg	1,510/981 lb	KF
ALB: KE		685/445 kg	1,510/981 lb	KG, KB, KW
12/7 kg		690/440 kg	1,521/970 lb	Finland
(26/15 lb)		715/445 kg	1,576/981 lb	KE
except KE	EXC (A20A2)	665/440 kg*	1,466/970 lb*	KG
12/2 kg		675/440 kg	1,488/970 lb	KG
(26/4 lb)		680/440 kg	1,499/970 lb	Austria
A/C: 24/−2kg	EXCi (A20A3)	690/445 kg	1,521/981 lb	KG
(53/−4 lb)		695/445 kg	1,532/981 lb	KX, Austria
P/S: 12/0 kg	4D LX (A16A1)	635/440 kg	1,399/970 lb	KG, KB, KW, Finland
(26.5/0 lb)	LX (A20A2)	650/440 kg	1,432/970 lb	KG, KB

*Cars equipped with manual steering.

Design Specifications (cont'd)

European Model (cont'd)

	ITEMS	METRIC	ENGLISH	NOTE
WEIGHT (cont'd)	(M/T) 4D LX (A20A2)	655/440 kg	1,444/970 lb	KW, Finland
On cars equipped	EX (A20A2)	670/450 kg	1,477/992 lb	KG, KB
with sunroof (S/R)		670/455 kg	1,477/1,003 lb	KE
ALB or air condi-		670/455 kg	1,477/1,003 lb	KF
tioner (A/C), add		675/450 kg	1,488/992 lb	KW, Finland
S/R: 9/9 kg	EXi (A20A4)	680/460 kg	1,499/1,014 lb	KG, KB
(20/20 lb)		680/460 kg	1,499/1,014 lb	KF
ALB: KE		685/460 kg	1,510/1,014 lb	KW, Finland
12/7 kg		685/465 kg	1,510/1,025 lb	KE
(26/15 lb)	LXC (A20A1)	665/440 kg	1,466/970 lb	Austria
except KE	EXC (A20A1)	680/450 kg	1,499/992 lb	KG
12/2 kg		685/450 kg	1,510/992 lb	Austria
(26/4 lb)	EXCi (A20A3)	685/460 kg	1,510/1,014 lb	KG
A/C: 24/—2 kg		690/460 kg	1,521/1,014 lb	Austria
(53/—4 lb)		695/460 kg	1,532/1,014 lb	KX
P/S: 12/0 kg	EXSi (B20A2)	705/465 kg	1,554/1,025 lb	KG, KB
(26.5/0 lb)		710/470 kg	1,565/1,036 lb	KF
		710/470 kg	1,565/1,036 lb	KW, KE, Finland
	EXCSi (B20A8)	705/465 kg	1,554/1,025 lb	KG
		710/470 kg	1,565/1,036 lb	Austria
		710/470 kg	1,565/1,036 lb	KX
		710/470 kg	1,565/1,036 lb	KS
	(A/T) 3D EX (A20A2)	680/435 kg*	1,499/959 lb*	KG, KB
		690/440 kg	1,521/970 lb	Finland
		690/435 kg	1,521/959 lb	KG, KB, KF
		690/440 kg	1,521/970 lb	KW
		690/440 kg	1,591/970 lb	Finland
		690/440 kg	1,591/970 lb	KE
	EXi (A20A4)	705/445 kg	1,554/981 lb	KF
		705/445 kg	1,554/981 lb	KG, KB, KW
		710/445 kg	1,565/981 lb	Finland
		710/445 kg	1,565/981 lb	KE
	EXC (A20A1)	685/440 kg	1,510/970 lb	KG
		700/440 kg	1,543/970 lb	Austria
	EXCi (A20A3)	705/445 kg	1,554/981 lb	KG
		715/445 kg	1,576/981 lb	KX, Austria
		715/445 kg	1,576/981 lb	KS

*Cars equipped with manual steering.

	ITEMS	METRIC	ENGLISH	NOTE
WEIGHT On cars equipped with sunroof (S/R) ALB or air conditioner (A/C), add S/R: 9/9 kg (20/20 lb) ALB: KE 12/7 kg (26/15 lb) except KE 12/2 kg (26/4 lb) A/C: 24/−2 kg (53/−4 lb) P/S: 12/0 kg (26.5/0 lb)	(A/T) 4D LX (A16A1)	645/440 kg	1,421/970 lb	KG, KB, KW, KS
	LX (A20A2)	670/440 kg	1,477/970 lb	KG, KB
		675/440 kg	1,488/970 lb	KW, Finland
	EX (A20A2)	690/450 kg	1,521/992 lb	KG, KB
		690/455 kg	1,521/1,003 lb	KE
		690/455 kg	1,521/1,003 lb	KF
		690/450 kg	1,532/992 lb	KW, Finland
	EXi (A20A4)	700/460 kg	1,543/1,014 lb	KG, KB
		700/460 kg	1,543/1,014 lb	KF
		705/460 kg	1,554/1,014 lb	KW, Finland
		705/460 kg	1,554/1,025 lb	KE
	LXC (A20A1)	685/440 kg	1,510/970 lb	Austria
	EXC (A20A1)	680/440 kg	1,499/970 lb	KG
		685/440 kg	1,510/970 lb	Austria
	EXCi (A20A3)	705/460 kg	1,554/1,014 lb	KG
		710/460 kg	1,565/1,014 lb	Austria
		710/460 kg	1,565/1,014 lb	KS
		715/460 kg	1,576/1,014 lb	KX
	Max. permissible Weight (EC) 2000	1,660 kg	3,660 lb	
	1600	1,580 kg	3,484 lb	

(cont'd)

Design Specifications (cont'd)

European Model (cont'd)

	ITEMS		METRIC	ENGLISH	NOTE
ENGINE (Except B20A)	Type		Water cooled, gasoline fueled, 4-cycle OHC		
	Cylinder arrangement		4 cylinder in-line transverse		
	Bore and Stroke	1600	80.0 x 79.5 mm	3.15 x 3.13 in	
		2000	82.7 x 91.0 mm	3.25 x 3.58 in	
	Displacement	1600	1,598 cm³	97.8 cuin	
		2000	1,955 cm³	119 cuin	
	Compression Ratio	1600	9.0 : 1		
		2000	9.1 : 1 (A20A1) 9.2 : 1 (A20A2) 8.8 : 1 (A20A3) 9.4 : 1 (A20A4)		
	Valve Train		Belt driven, single overhead camshaft		
	Lubrication System		Pressure feed		
	Fuel Required	1600	Leaded regular 91RON or higher (A16A1) Unleaded regular 91RON or higher (A20A1, A20A3)		
		2000	Leaded regular 91 RON or higher (A20A2, A20A4)		
ENGINE (B20A)	Type		Water cooled 4-cycle D.O.H.C.		
	Cylinder arrangement		4-cylinder in-line, transverse		
	Bore and stroke		81.0 x 95 mm	3.18 x 3.74 in	
	Displacement		1,958 cm³	120 cu in	
	Compression Ratio		9.5 : 1 (B20A2), 9.4 : 1 (B20A8)		
	Valve Train		Belt driven, double overhead camshaft		
	Lubrication System		Pressure feed		
	Fuel Required		Leaded premium 97RON or higher (B20A2) Unleaded premium 95RON or higher (B20A8)		
TRANSMISSION	Clutch	A/T	Three element, one stage, two phase		
		M/T	Single dry plate, diaphragm spring		
	Transmission	A/T	Torque converter with lock up clutch		
		M/T	Synchromesh 5 forward speed, 1 reverse		

	A16A A20A	A16A1	A20A2 A20A3 A20A4	A20A1	B20A
	5MT	AT	AT	AT	MT
Primary Reduction	1.000	1.000	1.000	1.000	1.000
Gear Ratio I	3.181	2.421	2.529	2.529	3.166
II	1.842	1.560	1.481*2	1.481	1.857*3
III	1.250*1	0.969	1.060	1.030	1.259*4
IV	0.937	0.729	0.743	0.700	0.967
V	0.771	—	—	—	0.794
Reverse	3.000	1.954	1.904	1.904	3.000
Final	4.066	3.933	4.066	4.066	4.066

Clutch Facing Area	1600	160 cm²	24.8 sq. in
	2000	176 cm³	27.3 sq. in

A20A3 KX
*1 1.208
A20A3 KX
*2 1.428
B20A8 KX
*3 1.772
*4 1.185

	ITEMS		METRIC	ENGLISH	NOTE
STEERING SYSTEM	Type	Manual Steering	Rack and Pinion		
		Power Steering	Power assisted Rack and Pinion integral		
	Overall Ratio	Manual Steering	19.4		
		Power Steering	18.1		
	Turns, lock-to-lock	Manual Steering	3.78		
		Power Steering	3.52		
	Steering Wheel Dia.		375 mm	14.76	
	Power Steering Oil Tank Capacity	Reservoir	0.5 ℓ	0.53 US. qt., 0.44 Imp. qt.	
		At change	approx. 1.7 ℓ	1.8 US. qt., 1.5 Imp. qt.	
	Power Steering Oil		Honda Genuine power steering fluid		
SUSPENSION SYSTEM	Type, Front		Double wishbone		
	Type, Rear		Double wishbone		
	Shock Absorber F/R		Telescopic hydraulic		
WHEEL ALIGNMENT	Wheel Alignment				
	Camber	Front	0°		
		Rear	0°		
	Caster	Front	0°30′		
	Toe	Front	0 mm	0.0 in.	
		Rear	0 mm	0.0 in.	
BRAKE SYSTEM	Type, Front		Self-adjusting power assisted disc brake type		
	Type, Rear		Drum *1		*1 Disc for EX 2.0i and cans equipped with Anti-Lock Brake.
	Pad Surface Area (Front)	1.6 ℓ and 2.0 ℓ (EX.EC)	50.0 cm²	7.8 sq in	
		2.0 ℓ (EC)	43.3 cm²	6.7 sq in	
	Pad/Lining Surface Area (Rear)	1.6 ℓ/2.0 ℓ	21 (disc)/ 67.2 (drum) cm²	13.3 (disc)/ 10.4 (drum) sq in	
	Effective Disc Dia.		194/214 mm	7.6/8.4 in	
	Effective Brake Drum I.D.		200 mm	7.9 in	
	Parking Brake Type		Mechanical expanding, Rear two wheel brakes*2		*2 Mechanical to rear disc for equipped with Disc Brake.
TIRES	Front, Rear		**165SR13, 165R13 82S, 185/70R13 85S, 185/65R14 85H, 195/60R14 85H, 195/60VR14 T135/70D15***		* Standard for some types.
		Spare			
ELECTRICAL SYSTEM	Battery		12V—50AH (Cold cranking current) −17.7°C (0°F) 410A)		
	Starting Motor		12V—1.0/1.4KW		
	Generator		12V—65AH		
	Fuses		7.5A, 10A, 15A, 20A, 30A		
	Main Fuse		70A, 40A		
	Headlights		12V—60/55W		
	Turn signal lights	Front	12V—21W		
		Rear	12V—21W		
		Side	12V—5W		
	License Plate Lights		12V—5W		
	Back-up Lights		12V—21W		
	Stop Lights		12V—21W		
	Tail Lights		12V—5W		
	Rear Fog Light		12V—21W		

(cont'd)

Design Specifications (cont'd)

KQ and KY Models

NOTE: Only the design specifications for models below different from those of the European model are listed. For the other items not given here, refer to the European Model design specification.

	ITEMS		METRIC	ENGLISH	NOTE
DIMENSION	Ground Clearance		170 mm	6.7 in.	KY
WEIGHT On cars equipped with air conditioner, add 22 kg (49 lb)	Curb weight KQ Model				
	(M/T) 3D EX (A20A2)		1,129 kg	2,489 lb	
	2.0Si (A20A4)		1,134 kg	2,500 lb	
	4D EX (A20A2)		1,139 kg	2,511 lb	
			1,157 kg	2,551 lb	S/R
	2.0Si (A20A4)		1,148 kg	2,531 lb	
			1,166 kg	2,571 lb	S/R
	(A/T) 3D EX (A20A2)		1,149 kg	2,533 lb	
	2.0Si (A20A4)		1,154 kg	2,544 lb	
	4D EX (A20A2)		1,159 kg	2,555 lb	
			1,177 kg	2,595 lb	S/R
	2.0Si (A20A4)		1,168 kg	2,575 lb	
			1,186 kg	2,615 lb	S/R
	Curb weight KY Model				
	(M/T) 3D (A20A2)	EX	1,150 kg	2,535 lb.	A/C
		EXR	1,155 kg	2,546 lb.	A/C
	4D (A20A2)	GL	1,140 kg	2,513 lb.	A/C
		EX	1,150 kg	2,535 lb.	A/C
			1,168 kg	2,575 lb.	S/R, A/C
		EXR	1,170 kg	2,579 lb.	S/R, A/C
	(A/T) 3D (A20A2)	EX	1,170 kg	2,579 lb.	A/C
		EXR	1,175 kg	2,590 lb.	A/C
	4D (A20A2)	GL	1,160 kg	2,557 lb.	A/C
		EX	1,170 kg	2,579 lb.	A/C
			1,188 kg	2,619 lb.	S/R, A/C
		EXR	1,190 kg	2,623 lb.	S/R, A/C
On cars equipped with air conditioner, add 24/−2 kg (53/−4 lb)	Weight Distribution (F/R) KQ Model				
	(M/T) 3D EX (A20A2)		675/454 kg	1,488/1,001 lb	
	2.0Si (A20A4)		681/453 kg	1,501/999 lb	
	4D EX (A20A2)		678/461 kg	1,495/1,016 lb	
			687/470 kg	1,515/1036 lb	S/R
	2.0Si (A20A4)		685/463 kg	1,510/1,021 lb	
			694/472 kg	1,530/1,041 lb	S/R
	(A/T) 3D EX (A20A2)		695/454 kg	1,532/1,001 lb	
	2.0Si (A20A4)		701/453 kg	1,545/999 lb	
	4D EX (A20A2)		698/461 kg	1,539/1,016 lb	
			707/470 kg	1,559/1,036 lb	S/R
	2.0Si (A20A4)		705/463 kg	1,554/1,021 lb	
			714/472 kg	1,574/1,042 lb	S/R
	Weight Distribution (F/R) KY Model				
	(M/T) 3D (A20A2)	EX	700/450 kg	1,543/992 lb.	A/C
		EXR	705/450 kg	1,554/992 lb.	A/C
	4D (A20A2)	GL	695/445 kg	1,532/981 lb.	A/C
		EX	700/450 kg	1,543/992 lb.	A/C
			709/459 kg	1,563/1,012 lb.	S/R, A/C
		EXR	710/460 kg	1,565/1,014 lb.	S/R, A/C
	(A/T) 3D (A20A2)	EX	720/450 kg	1,587/992 lb.	A/C
		EXR	725/450 kg	1,598/992 lb.	A/C
	4D (A20A2)	GL	715/445 kg	1,576/981 lb.	A/C
		EX	720/450 kg	1,587/992 lb.	A/C
			729/459 kg	1,607/1,012 lb.	S/R, A/C
		EXR	730/460 kg	1,609/1,014 lb.	S/R, A/C
	Max Loaded Vehicle Weight (ADR)				
		M/T	1,590 kg	3,505 lb.	KQ Model
		A/T	1,610 kg	3,549 lb.	
	Gross Vehicle Weight Rating (G.V.W.R.)		1,680 kg	3,704 lb.	KY Model

KQ and KY Models

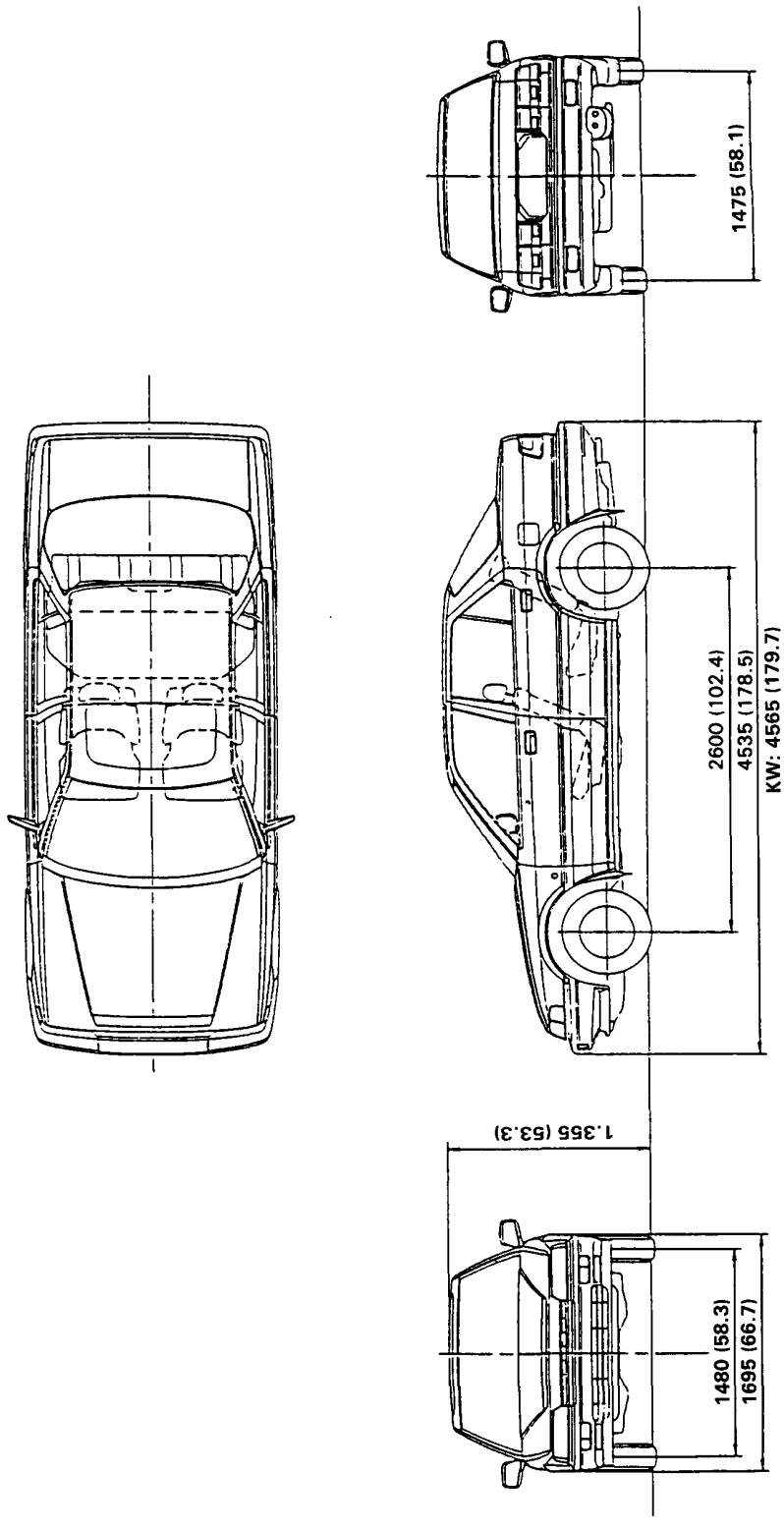
NOTE: Only the design specifications for models below different from those of the European model are listed. For the other items not given here, refer to the European Model design specification.

	ITEMS	SPECIFICATION	NOTE
ENGINE	Compression ratio	KQ: A20A2 9.1, A20A4 8.8 KY: A20A2 9.2	
TRANSMISSION	Clutch A/T M/T Transmission A/T M/T Primary Reduction Gear Ratio I < >: A/T II III IV V Reverse Final	Three element one stage two phase. Single dry plate, diaphragm spring. Torque converter with lock up clutch. Synchromesh 5 forward speed. 1 reverse 1.000 3.181 <2.529> 1.842 <1.481> 1.250 <1.060> 0.937 <0.743> 0.771 —— 3.000 <1.904> 4.066 <4.066>	
TIRES	Tire size	EX 185/70 R13 86T 2.0Si 185/70 R13 86H Optional 185/70 HR13	KQ Model
		GL 165 R13 82S EX, EXR 185 R13 85S	KY Model
ELECTRICAL SYSTEM	Starting Motor Battery	12 V—1.0 kW 12 V—40 AH	

Body Specifications

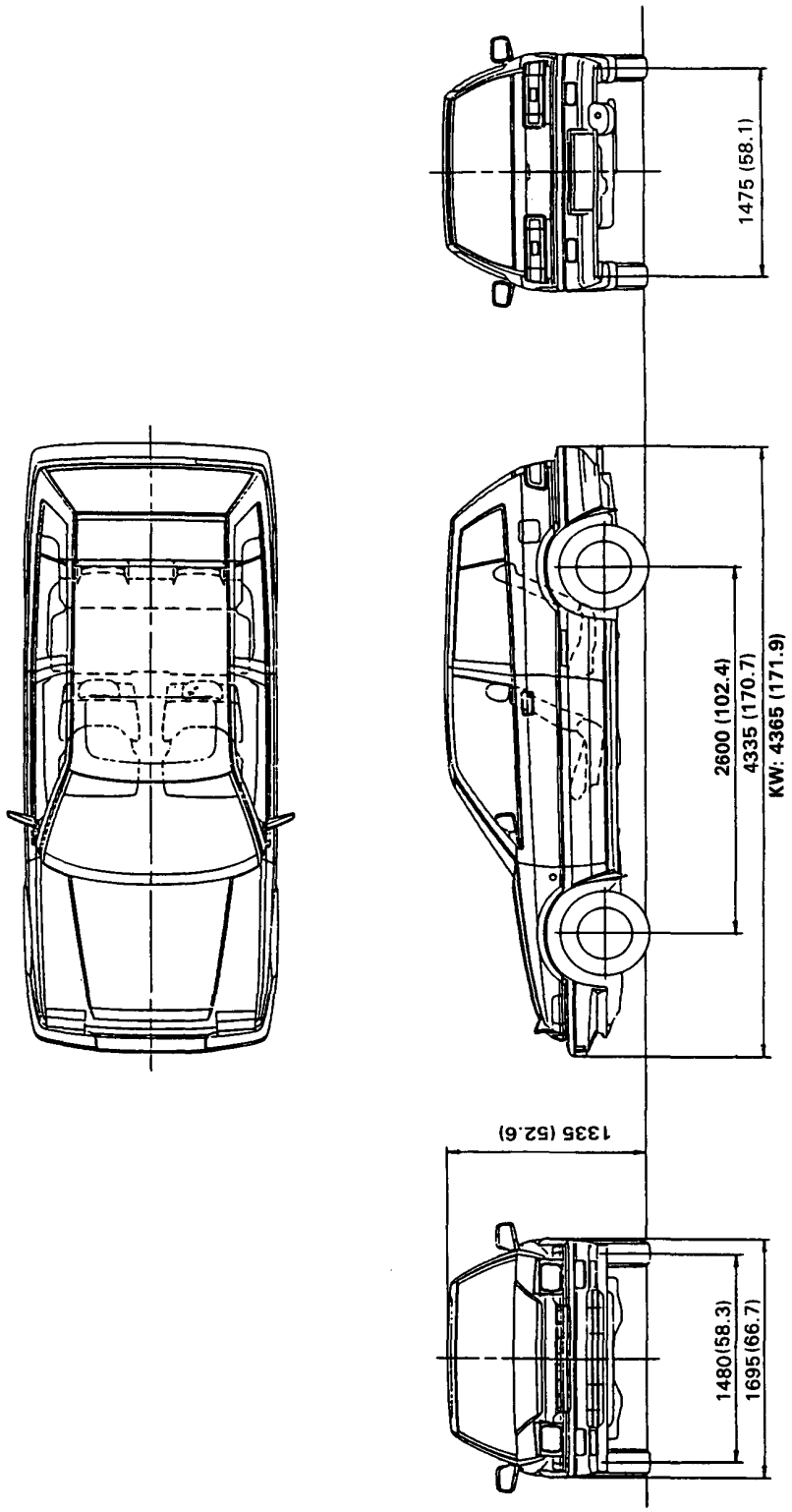
4D Sedan

Unit: mm (in.)



Aerodeck

Unit: mm (in.)

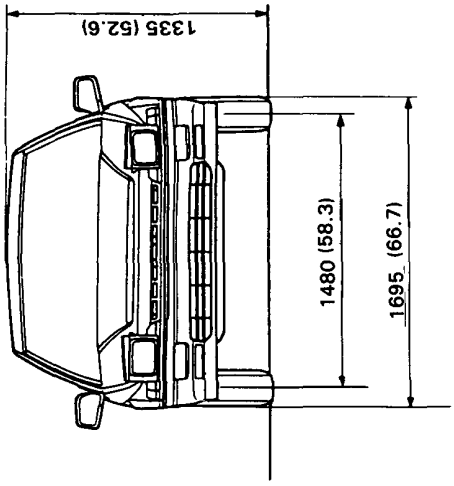


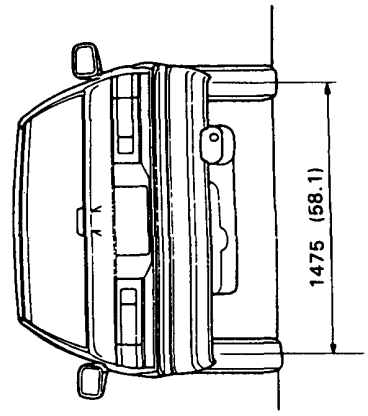
(cont'd)

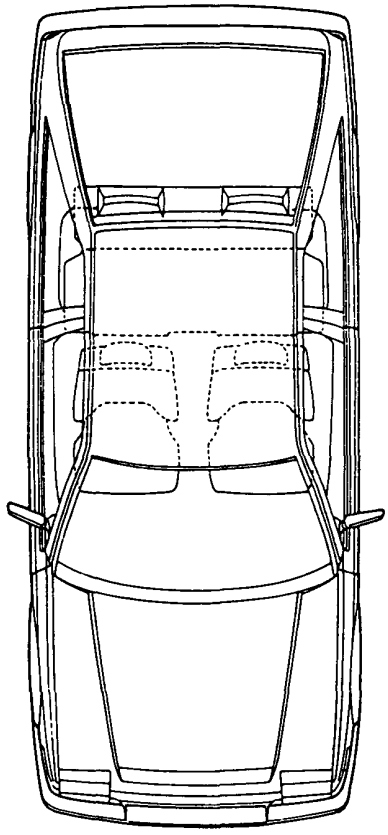
Body Specifications (cont'd)

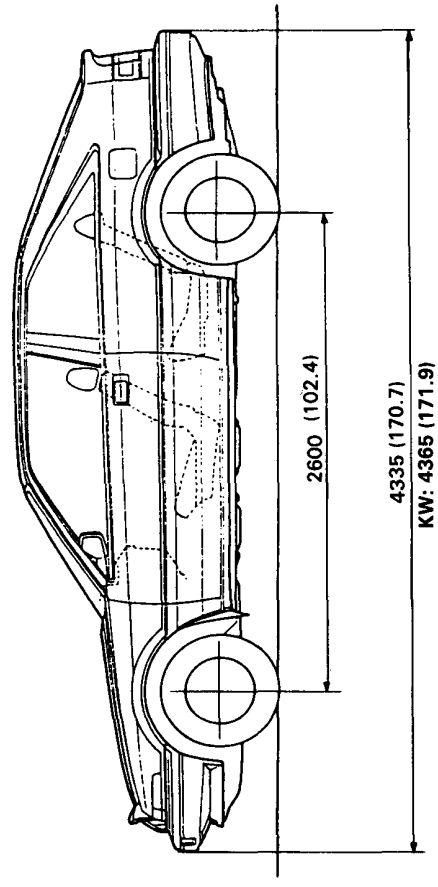
Glass Back

Unit: mm (in.)



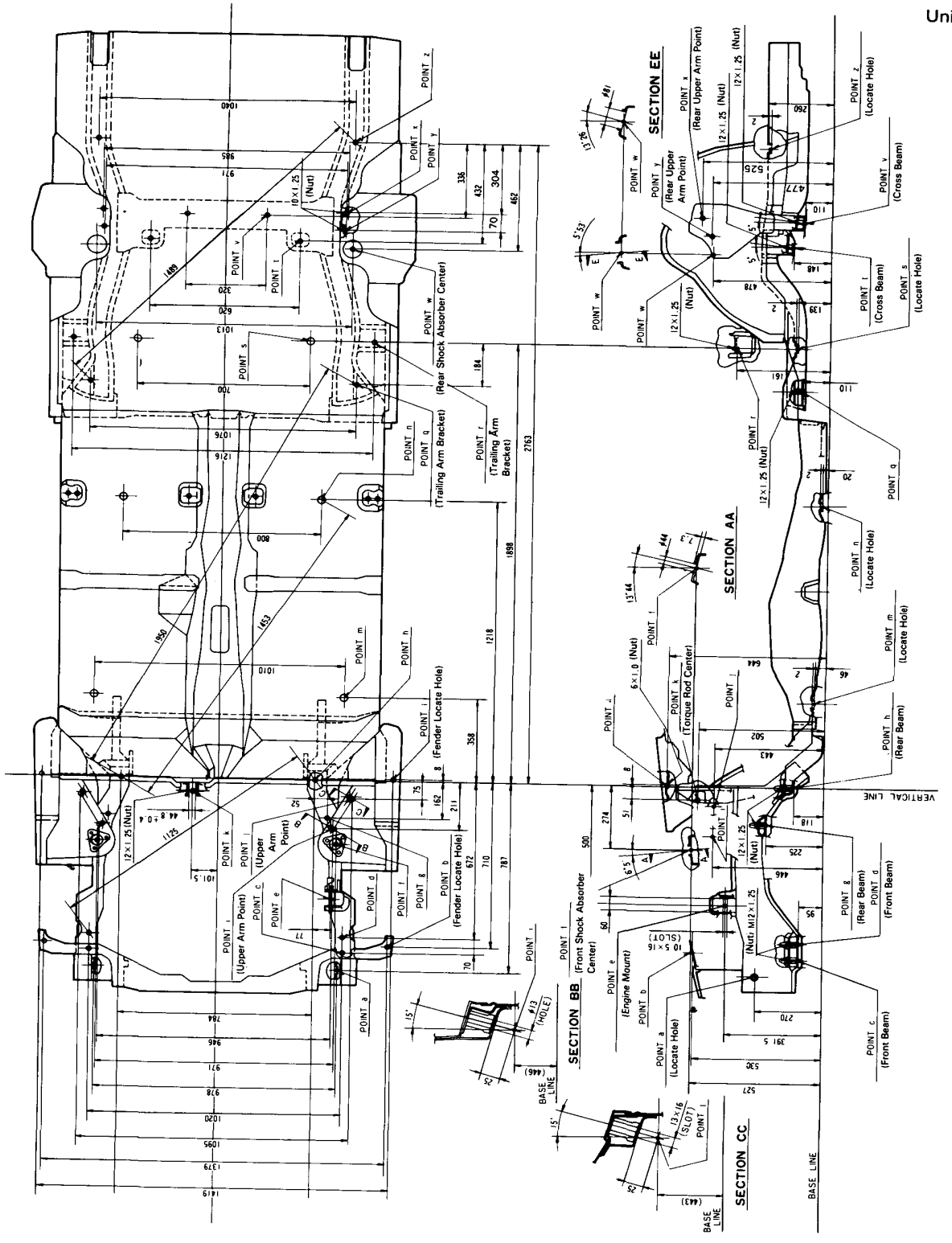






Frame Repair Chart

Unit: mm

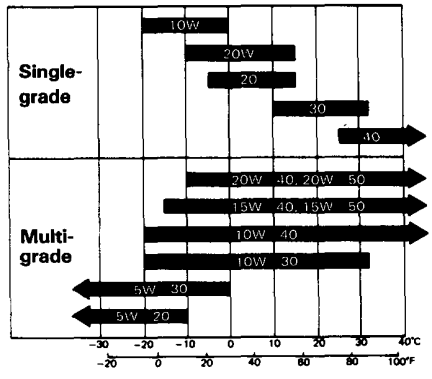


Maintenance

Lubrication Points

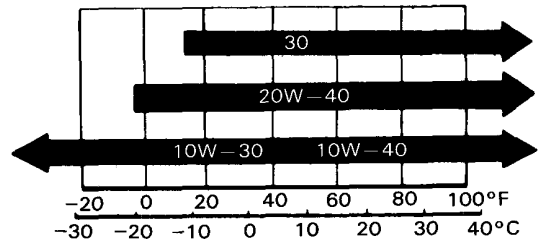
No	LUBRICATION POINTS		LUBRICANT
1	Engine		API Service Grade: SE or SF SAE Viscosity: See chart below
2	Transmission	Manual Automatic	API Service Grade: SE or SF SAE Viscosity: See chart below DEXRON® or DEXRON® II Automatic transmission fluid
3	Brake reservoir		Brake fluid DOT 3
4	Steering gearbox (Power steering)		Honda power steering grease P/N 08733–B070E
4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27	Steering gearbox (Manual steering) Steering ball joint Suspension ball joints Front upper arm Steering Boot Shift lever pivot (Manual transmission) Steering column bushings Horn contact Shift rod clevis bushings Select lever (Automatic transmission) Pedal linkage Throttle cable end Brake master cylinder push rod Rear caliper Tailgate hinges (Hatchback) Trunk hinges (Sedan) Door hinges upper and lower Door opening detents Fuel filler lid Engine hood hinges Engine hood latch Tilt lever Select lever (Automatic) Retractable headlight mechanism		Multipurpose Grease
28 29 30	Rear brake shoe linkage Caliper	Piston seal Dust seal Caliper pin Piston	Silicone Grease
31	Power steering reservoir		Honda power steering fluid P/N 08208–99961

Recommended Engine Oil (SE or SF Grade only)



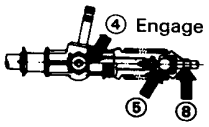
Engine oil viscosity for ambient temperature ranges.

Recommended Manual Transmission Oil

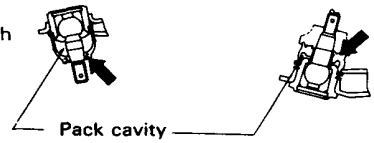


Transmission oil viscosity for ambient temperature ranges.

CAUTION: Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this is unlikely unless you handle used oil on a daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil.



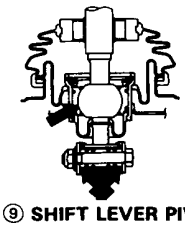
④ STEERING GEARBOX
⑤ STEERING BALL JOINT
⑧ STEERING BOOT



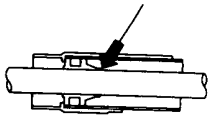
⑥ FRONT SUSPENSION BALL JOINTS

⑥ REAR SUSPENSION BALL JOINTS

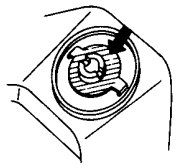
⑦ FRONT UPPER ARM



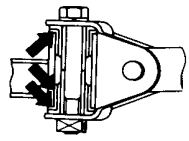
⑨ SHIFT LEVER PIVOT



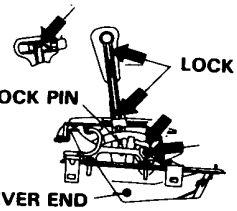
⑩ STEERING COLUMN BUSHING



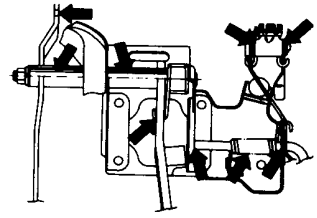
⑪ HORN CONTACT



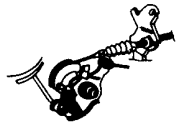
⑫ SHIFT ROD CLEVIS BUSHINGS



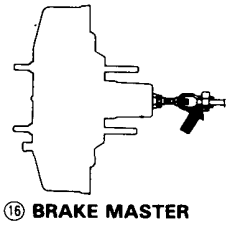
⑬ SELECT LEVER



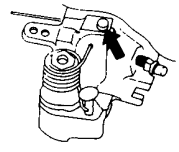
⑭ PEDAL LINKAGE



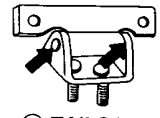
⑮ THROTTLE CABLE END



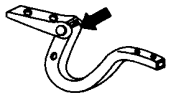
⑯ BRAKE MASTER CYLINDER PUSH ROD



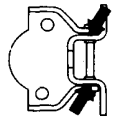
⑰ REAR CALIPER



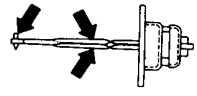
⑱ TAILGATE HINGES



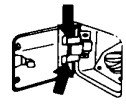
⑲ TRUNK HINGES



⑳ DOOR HINGES

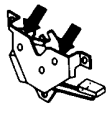


㉑ DOOR OPENING DETENTS

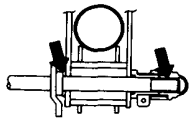


㉒ FUEL FILLER LID

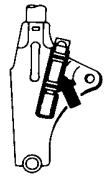
㉓ ENGINE HOOD HINGES



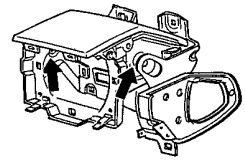
㉔ ENGINE HOOD LATCH



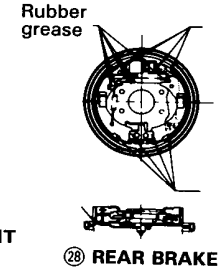
㉕ TILT LEVER



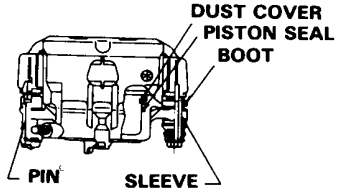
㉖ SERECT LEVER



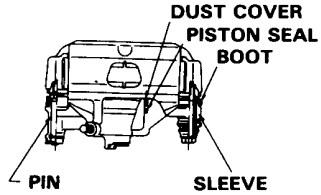
㉗ RETRACTABLE HEADLIGHT MECHANISM



㉘ REAR BRAKE

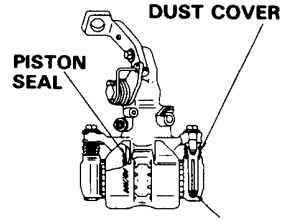


㉙ FRONT CALIPER



㉙ FRONT CALIPER

㉙ FRONT CALIPER



㉚ REAR CALIPER

Maintenance Schedule

Service at the interval listed x 1,000 km (or miles) or after that number of months, whichever comes first.	R—Replace I —Inspect. After inspection, clean, adjust, repair or replace if necessary					
ITEM	x 1,000 km	20	40	60	80	100
	x 1,000 miles	12	24	36	48	60
	months	12	24	36	48	60
Idle speed and idle CO (except KS, KX types)		I	I	I	I	I
Idle speed and idle CO (KS, KX types)						I
Valve clearance		I	I	I	I	I
Alternator drive belt			I		I	
■ Engine oil and oil filter		Replace every 10,000 km (6,000 miles) or 6 months				
■ Transmission oil			R		R	
■ Radiator coolant					R*1	
Cooling system hoses and connections			I		I	
E.G.R. system (for cars using unleaded gasoline, except KQ fuel-injection type)						I
Secondary air supply system (for carburetor type)						I
Air cleaner element (Viscous type, European and KQ types)			R		R	
Air cleaner element (Dry type, except European and KQ types)		R	R	R	R	R
Fuel filter (including aux. filter for carburetor type)			R		R	
Tank, fuel line and connections			I		I	
Intake air temp. control system (for carburetor type)						I
Throttle control system (for carburetor type, except KS, KX types)			I		I	
Throttle control system (for carburetor type, KS, KX types)						I
Choke mechanism (for carburetor type)			I		I	
Choke opener operation (for carburetor type with automatic choke)						I
Evaporative emission control system (for cars using unleaded gasoline and KY type)						I
Ignition timing and control system (except KS, KX types)			I		I	
Ignition timing and control system (KS, KX types)						I
Spark plugs (for cars using unleaded gasoline)			R*2		R*2	
Spark plugs (for cars using leaded gasoline)		R	R	R	R	R
Distributor cap and rotor (except KS, KX types)			I		I	
Distributor cap and rotor (KS, KX types)						I
Ignition wiring (except KS, KX types)			I		I	
Ignition wiring (KS, KX types)						I
Positive crankcase ventilation valve (except KS, KX types)			I		I	
Positive crankcase ventilation valve (KS, KX types)						I
Blow-by filter (for carburetor type)			I		I	

■ **REMARK:** These service intervals assume routine checking and replenishment has been done, as needed, by the customer.

*1 Thereafter, replace every 2 years or 40,000 km (24,000 miles), whichever comes first.

*2 For KS type, replace every 2 years or 40,000 km (24,000 miles) whichever comes first after 30,000 km (18,000 miles).

CAUTION: Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this is unlikely unless you handle used oil on a daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil.

Maintenance Schedule

Service at the interval listed x 1,000 km (or miles) or after that number of months, whichever comes first.	R—Replace I—Inspect. After inspection, clean, adjust, repair or replace if necessary					
ITEM	x 1,000 km	20	40	60	80	100
	x 1,000 miles	12	24	36	48	60
	months	12	24	36	48	60
Brake hoses and lines (including ALB hoses and pipes for ALB equipped models)		I	I	I	I	I
Brake fluid (including ALB fluid for ALB equipped models)			R		R	
Front brake discs and calipers		I	I	I	I	I
Front brake pads		Inspect every 10,000 km (6,000 miles) or 6 months				
Rear brake discs, calipers and pads (standard for some types)			I		I	
Rear brake drums, wheel cylinders and linings (standard for some types)			I		I	
Parking brake		I	I		I	
Clutch release arm travel		I	I	I	I	I
Exhaust pipe and muffler		I	I	I	I	I
Suspension mounting bolts		I	I	I	I	I
Front wheel alignment		I	I	I	I	I
Steering operation, tie rod ends, steering gear box and boots		I	I		I	
ALB high pressure hose (for ALB equipped models)					R	
ALB operation (for ALB equipped models)		I	I		I	
Power steering system (standard for some types)		I	I	I	I	I
Power steering pump belt (standard for some types)			I		I	
Catalytic converter heat shield (standard for some types)						I

CAUTION: ***The following items must be serviced more frequently on cars normally used under severe driving conditions.***
Refer to the chart below for the appropriate maintenance intervals.

Severe driving conditions include:
- A: Repeated short distance driving
- B: Driving in dusty conditions
- C: Driving in severe cold weather
- D: Driving in areas using road salt or other corrosive materials
- E: Driving on rough and/or muddy roads
- F: Towing a trailer

R—Replace
I—Inspect. After inspection, clean, adjust, repair or replace if necessary.

Condition	Maintenance item	Maintenance operation	Interval
A B • • • F	Engine oil and oil filter	R	Every 5,000 km (3,000 miles) or 3 months
• • • • • F	Transmission oil	R	Every 20,000 km (12,000 miles) or 12 months
A B • D E F	Front brake discs and calipers	I	Every 10,000 km (6,000 miles) or 6 months
A B • D E F	Rear brake discs, calipers and pads	I	Every 20,000 km (12,000 miles) or 12 months
A B C • E F	Clutch release arm travel	I	Every 10,000 km (6,000 miles) or 6 months
• B C • E •	Power steering system	I	Every 10,000 km (6,000 miles) or 6 months

Engine

Engine Removal/Installation

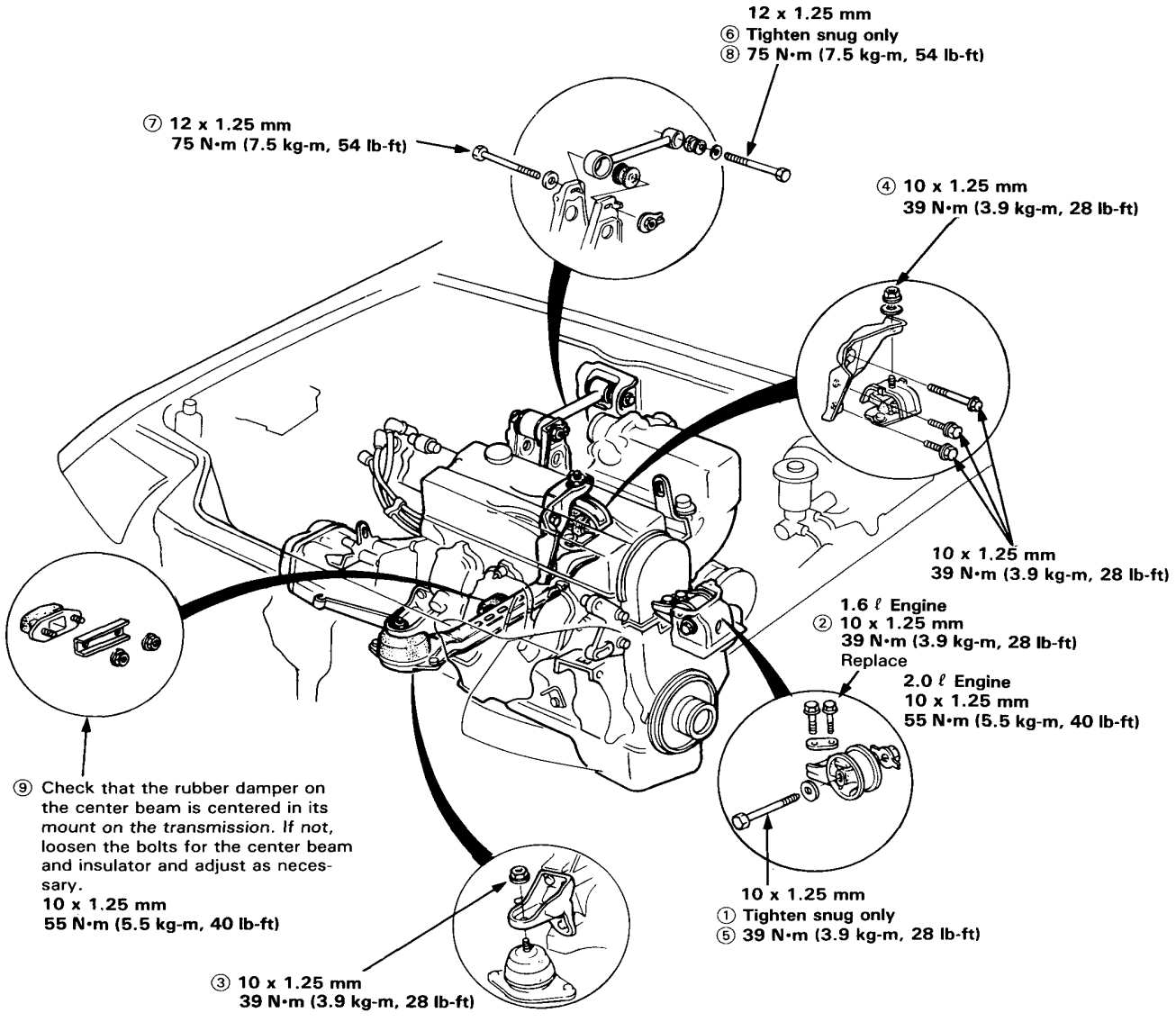
Outline of Model Change

The torque values of the engine mounting bolts and sub flame bolts have been changed.

ENGINE MOUNT TORQUE SEQUENCE:

NOTE:

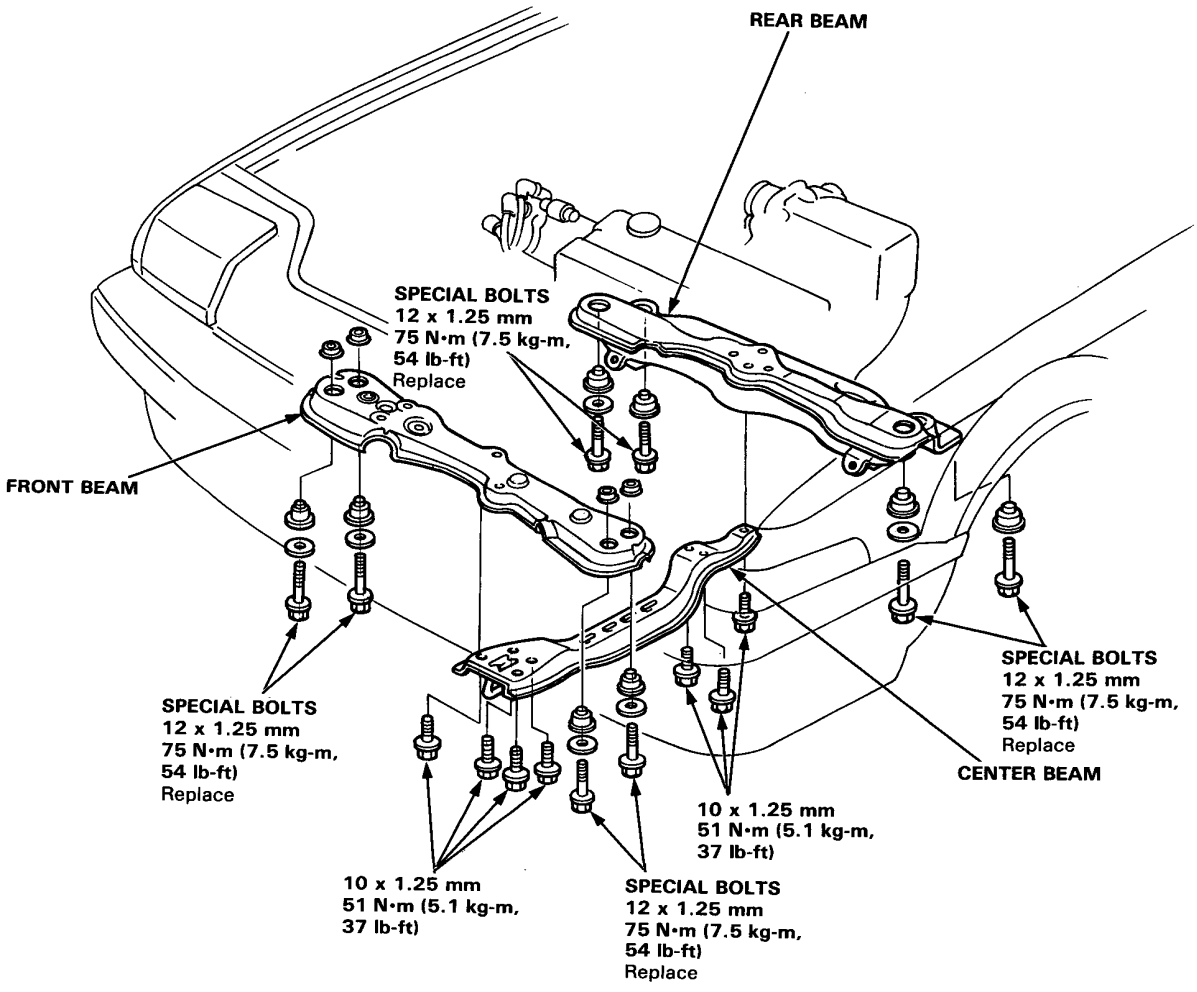
- For proper suppression of noise and vibration, and maximum bushing life, tighten the bolts in the sequence shown with the bushings centered in their mounts.
- From step 5 on, the car must be sitting level; make sure that the engine hoist is not holding up the engine and car.



SUB FRAME TORQUE SPECIFICATIONS:

NOTE:

- Do not loosen the bolts when remove the engine.
- If the Special bolts are loosend, replace the bolts.



Cylinder Head/Valve Train

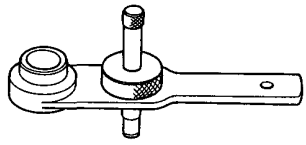
Outline of Model Change

The crankshaft pulley bolt has been changed.

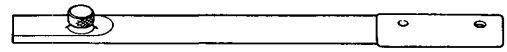
Special Tools

No.	Tool Number	Description	Q'ty	Remarks
①	07JAB—0010000	Crank Pulley Holder Set	1	for cranshaft pulley bolt
①-1	07JAA—0010200	Socket Wrench, 19 mm	(1)	Component Tools
①-2	07JAB—0010100	Pulley Holder Attachment	(1)	
①-3	07JAB—0010200	Handle	(1)	

①-1



①-2

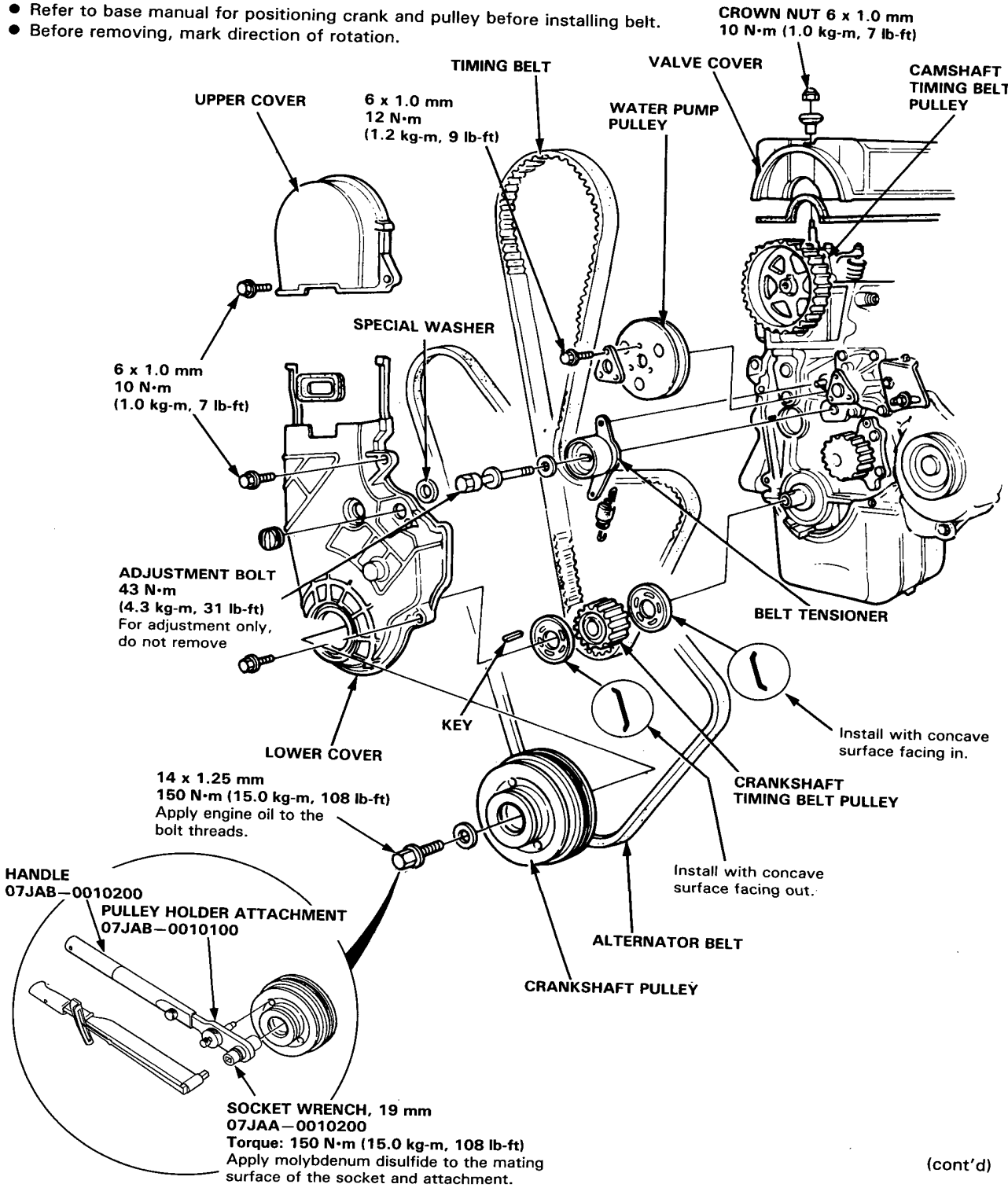


①-3

Crankshaft Pully Bolt

Replacement

NOTE:
- Refer to base manual for positioning crank and pulley before installing belt.
- Before removing, mark direction of rotation.



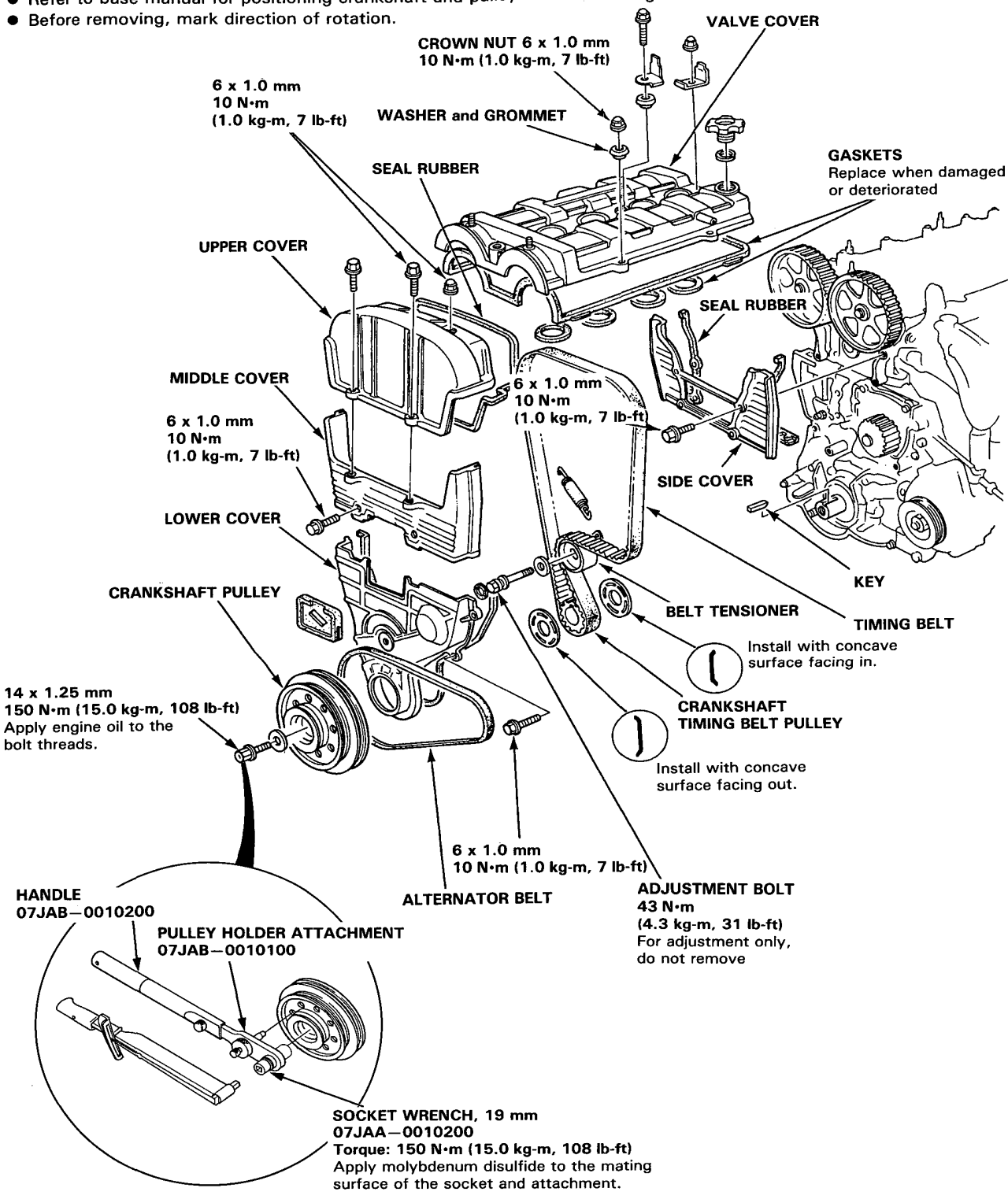
(cont'd)

Crankshaft Pulley Bolt

Replacement (cont'd)

NOTE:

- Refer to base manual for positioning crankshaft and pulley before installing belt.
- Before removing, mark direction of rotation.



Engine Block

Outline of Model Changes

- The torque value of the main bearing cap bolts has been changed.
- The torque value of the connecting rod bearing capnut has been changed.

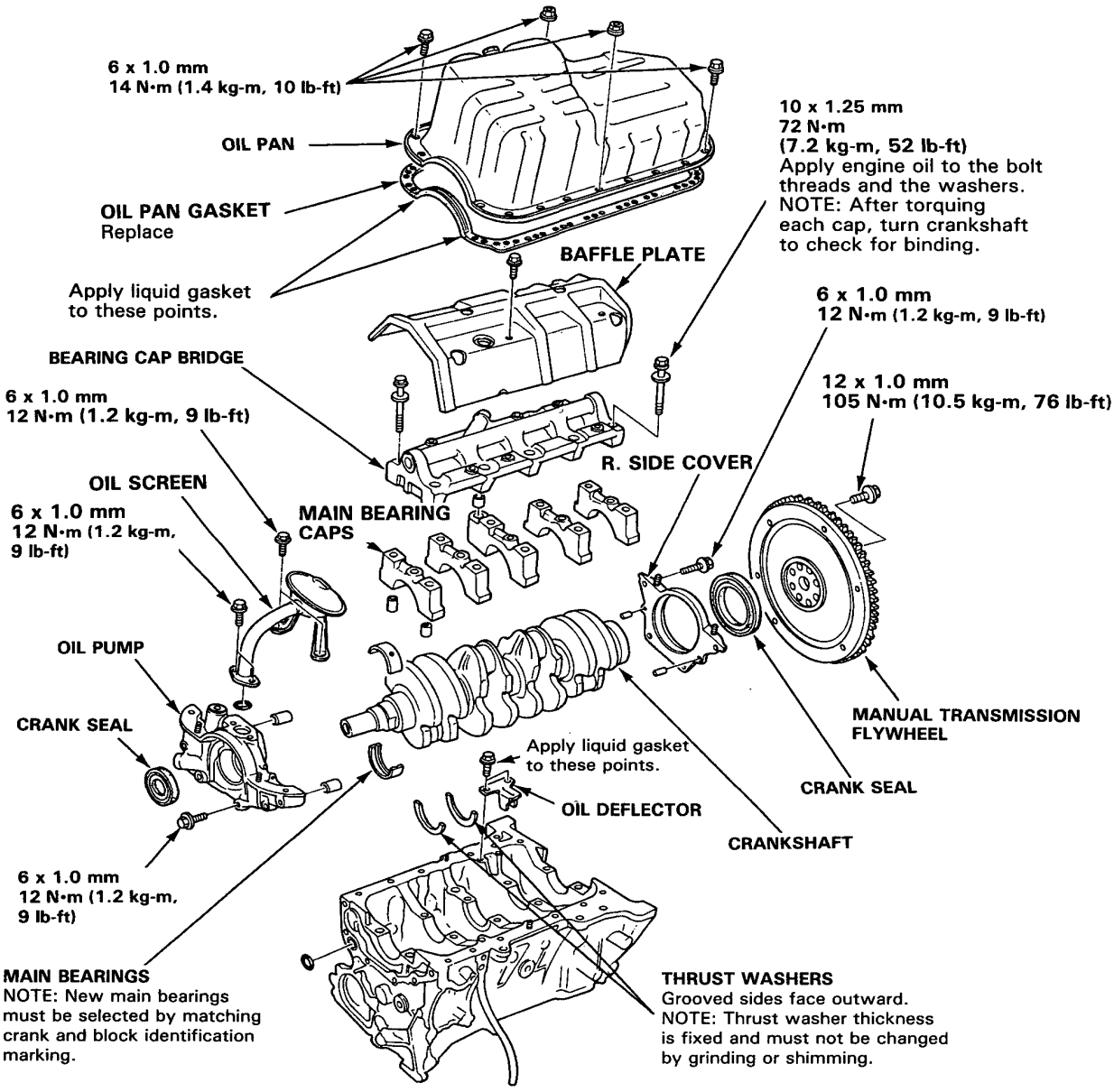
Engine Block

Illustrated Index

Lubricate all internal parts with engine oil druing reassembly.

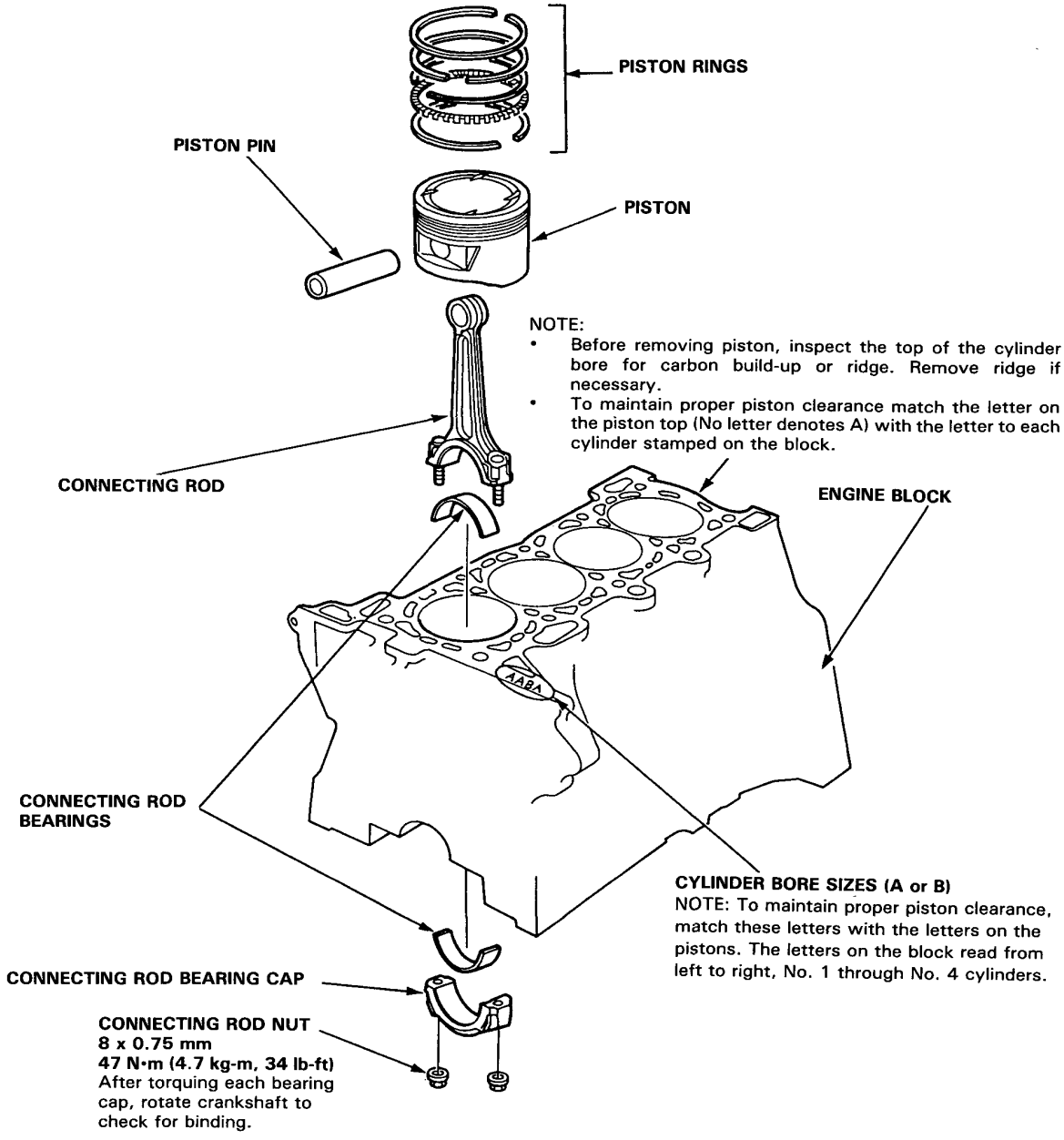
NOTE:

- Apply non-hardening liquid gasket to the mating surfaces of the right side cover and oil pump case, before installing them.
- Use Honda Genuine liquid gasket. PART NO. 08718—5500000E.

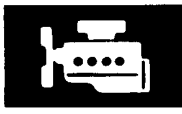


NOTE: New rod bearings must be selected by matching connecting rod and crankshaft identification markings.

CAUTION: The piston skirts is coated with molybdenum: handle the piston carfully to prevent any damage.



Engine Lubrication

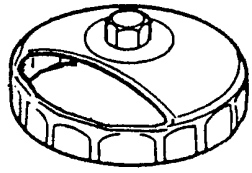


Outline of Model Change

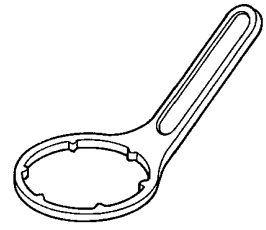
The oil filter has been changed.

Special Tools

No.	Tool Number	Description	Q'ty	Remarks
① ②	07912—6110001	Oil Filter Socket Oil Filter wrench (Apply from LABINAL S.A.)	1 1	 Used for FRANCE-MADE Oil Filter



①



②

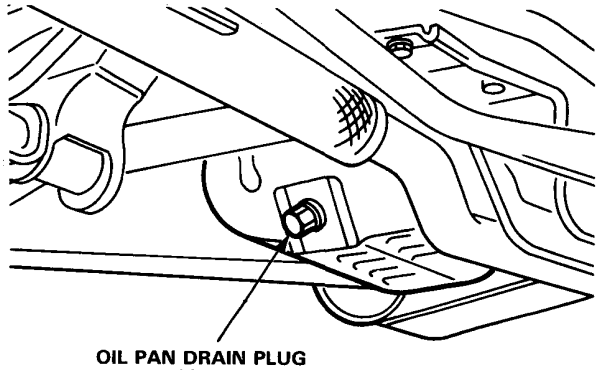
Engine Oil

Replacement

1. Warm up the engine.
2. Drain the engine oil.

   CAUTION: Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this is unlikely unless you handle used oil on a daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil.

NOTE: Remove the filler cap to speed draining.



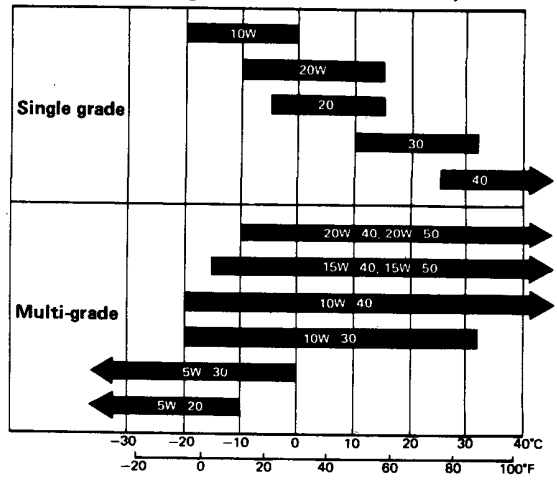
OIL PAN DRAIN PLUG
45 N·m (4.5 kg-m, 33 lb-ft)

3. Reinstall the drain plug with a new washer, and refill with the recommended oil.

Capacity (Except DOHC)	3.0 lit (3.2 US qt, 2.6 Imp. qt) Exclude Oil filter 3.5 lit (3.7 US qt, 3.1 Imp. qt) Adding replace oil filter 4.0 lit (4.2 US qt, 3.5 Imp. qt) Means designed value
(DOHC)	3.5 lit (3.7 US qt, 3.1 Imp. qt) Exclude oil filter 4.0 lit (4.2 US qt, 3.5 Imp. qt) Adding replace oil filter 5.0 lit (5.3 US qt, 4.4 Imp. qt) Means designed value
Change	Every 10,000 km (6,000 miles) or 6 months.

NOTE: Oil filter should be replaced at each oil change.

Recommended Engine Oil (SE or SF Grade only)



Expected Ambient Temperature before next oil change

Oil Filter

Replacement

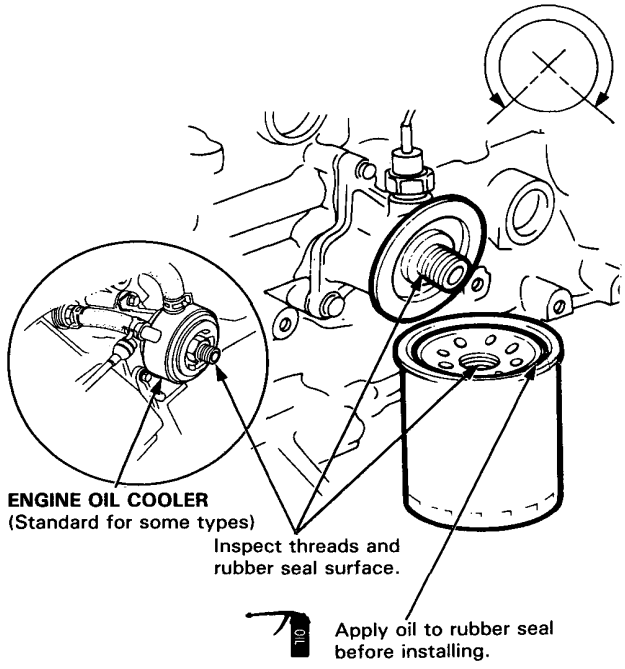
WARNING **After the engine has been run, the exhaust pipes will be hot; be careful when working around the exhaust manifold.**

CAUTION: Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this is unlikely unless you handle used oil on a daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil.

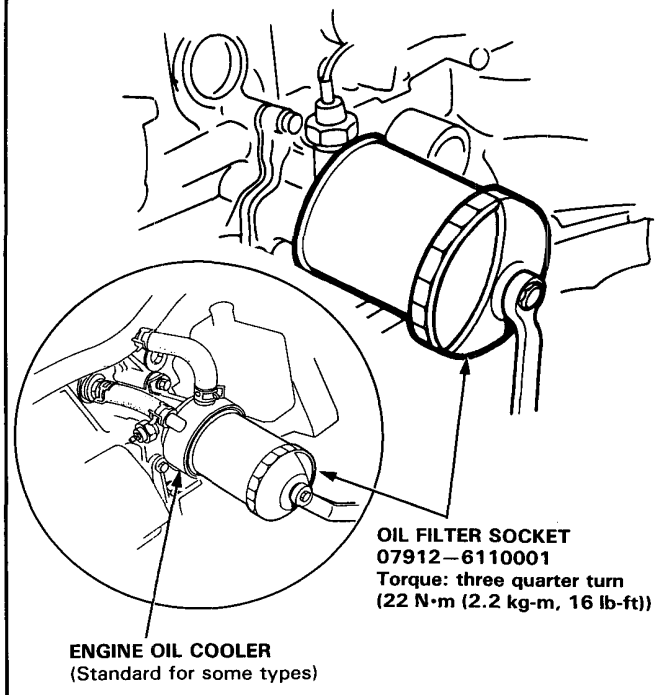
1. Remove the oil filter with the special oil filter socket.
2. Inspect the threads and rubber seal on the new filter. Wipe off seat on engine block, then apply a light coat of oil to the rubber seal, and install filter.
3. After the rubber seal is seated, tighten the oil filter by turning approximately three quarter turn.

   NOTE: Use only filters with a bult-in by pass system.

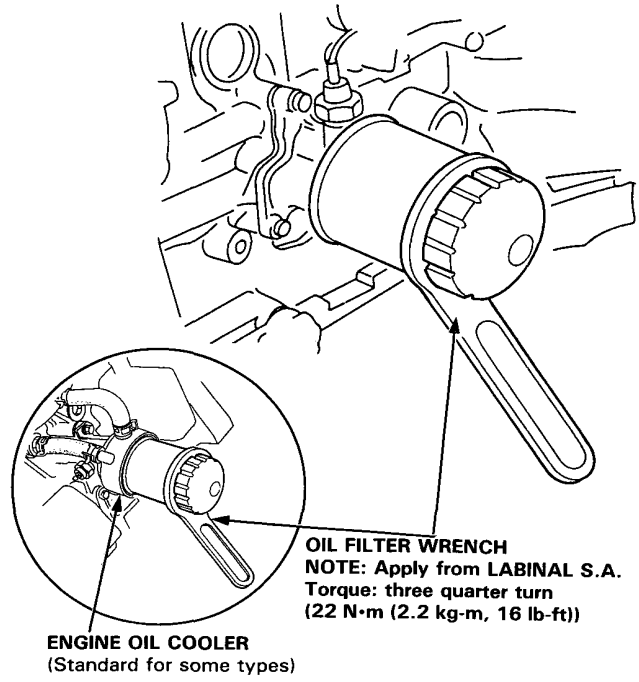
   Torque: three quarter turn (22 N·m (2.2 kg-m, 16 lb-ft))



JAPAN-MADE TYPE (Filter size 80 mm)



FRANCE-MADE TYPE (Filter size 76.2 mm)



Intake Manifold/Exhaust System

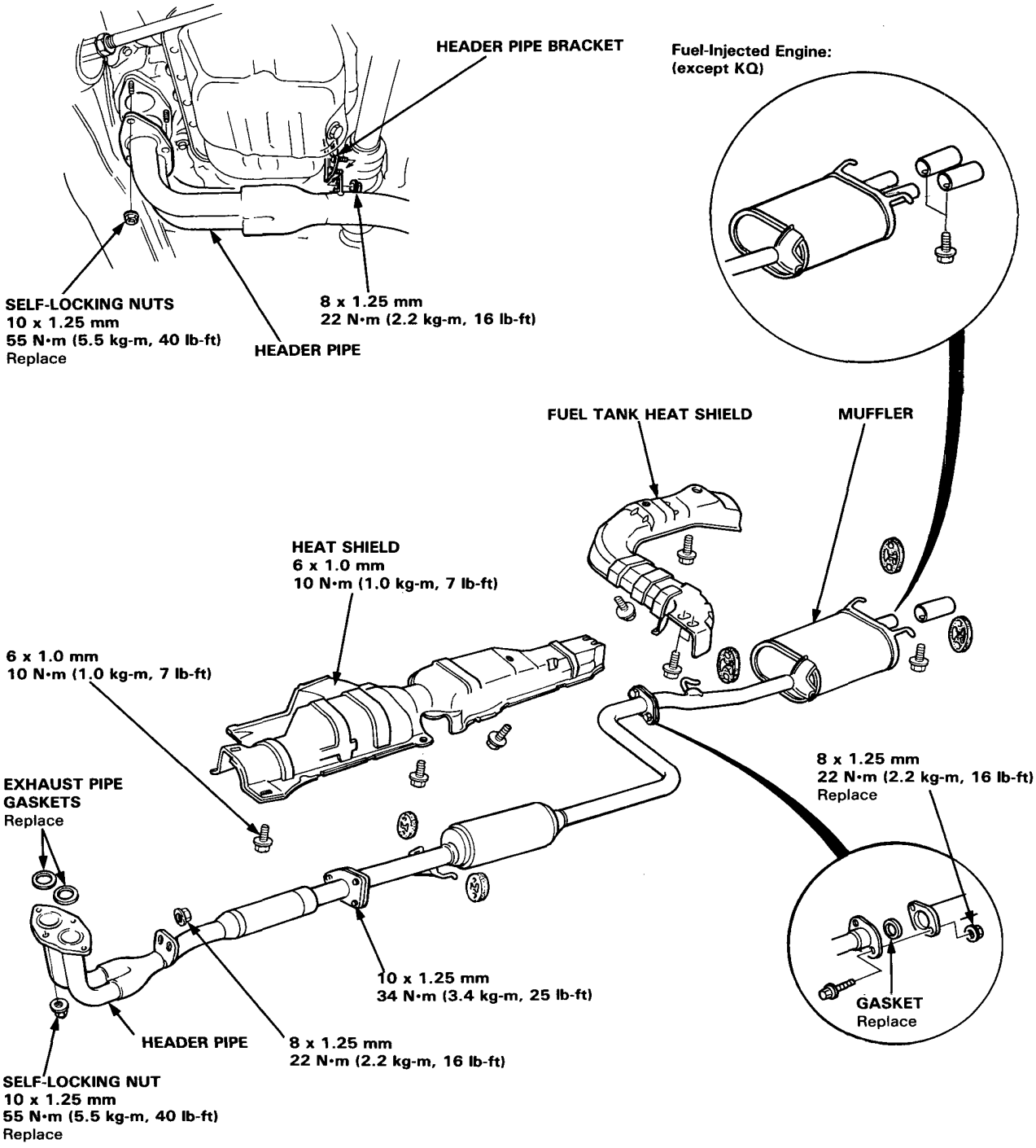
Outline of Model Change

The muffler has been changed.

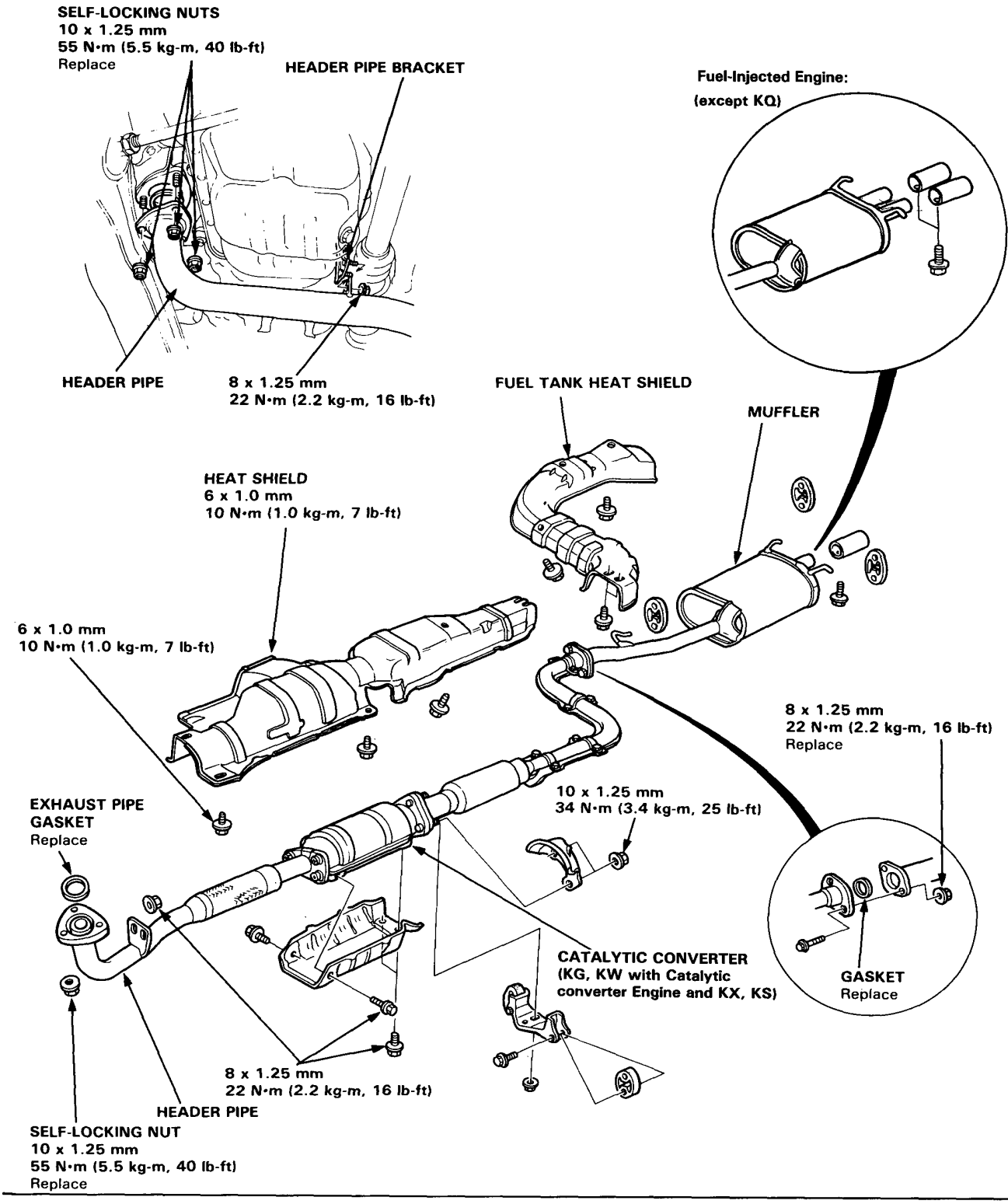
Exhaust Pipe and Muffler

Replacement

2.0 ℓ European and KY model Engine (except KG and KW with catalytic converter engine, KX and KS Model Engine)



Other Engine Model

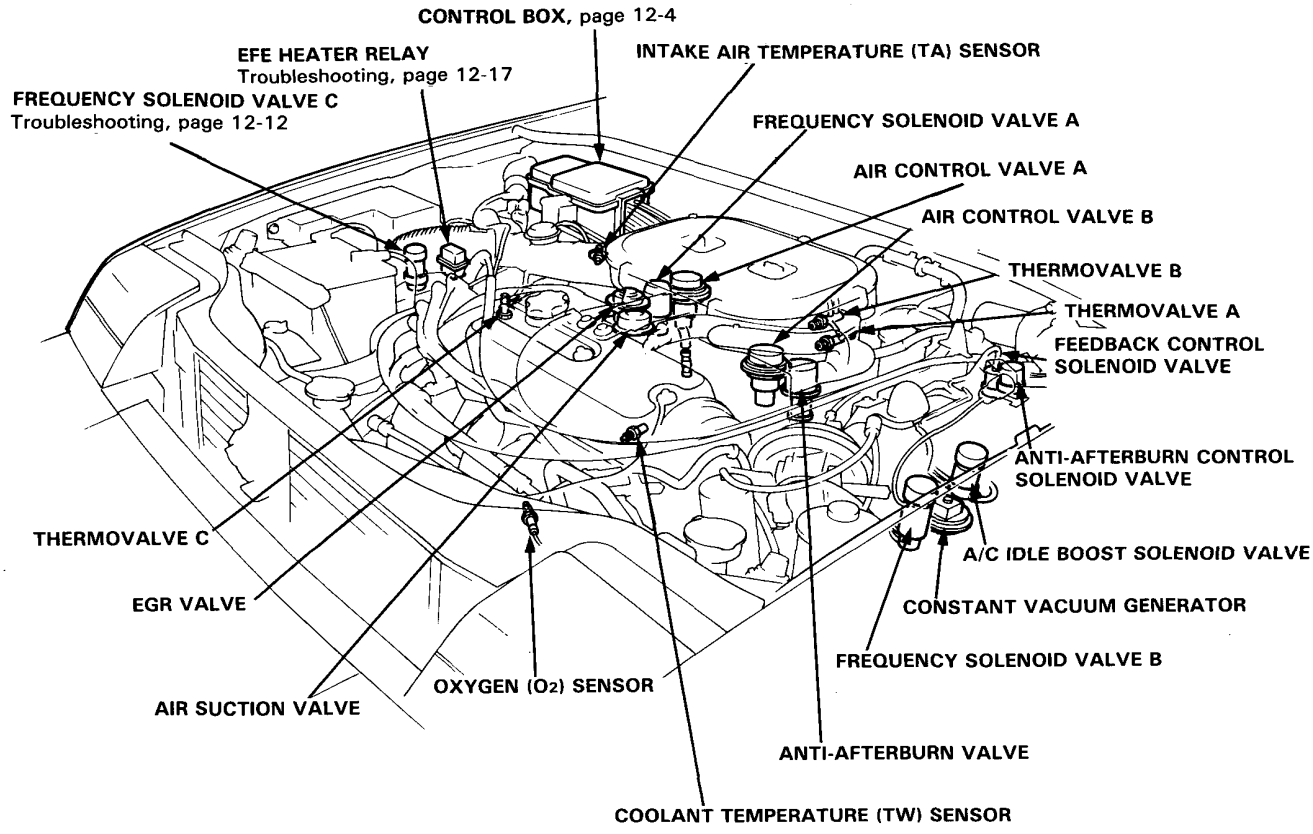


Fuel and Emissions

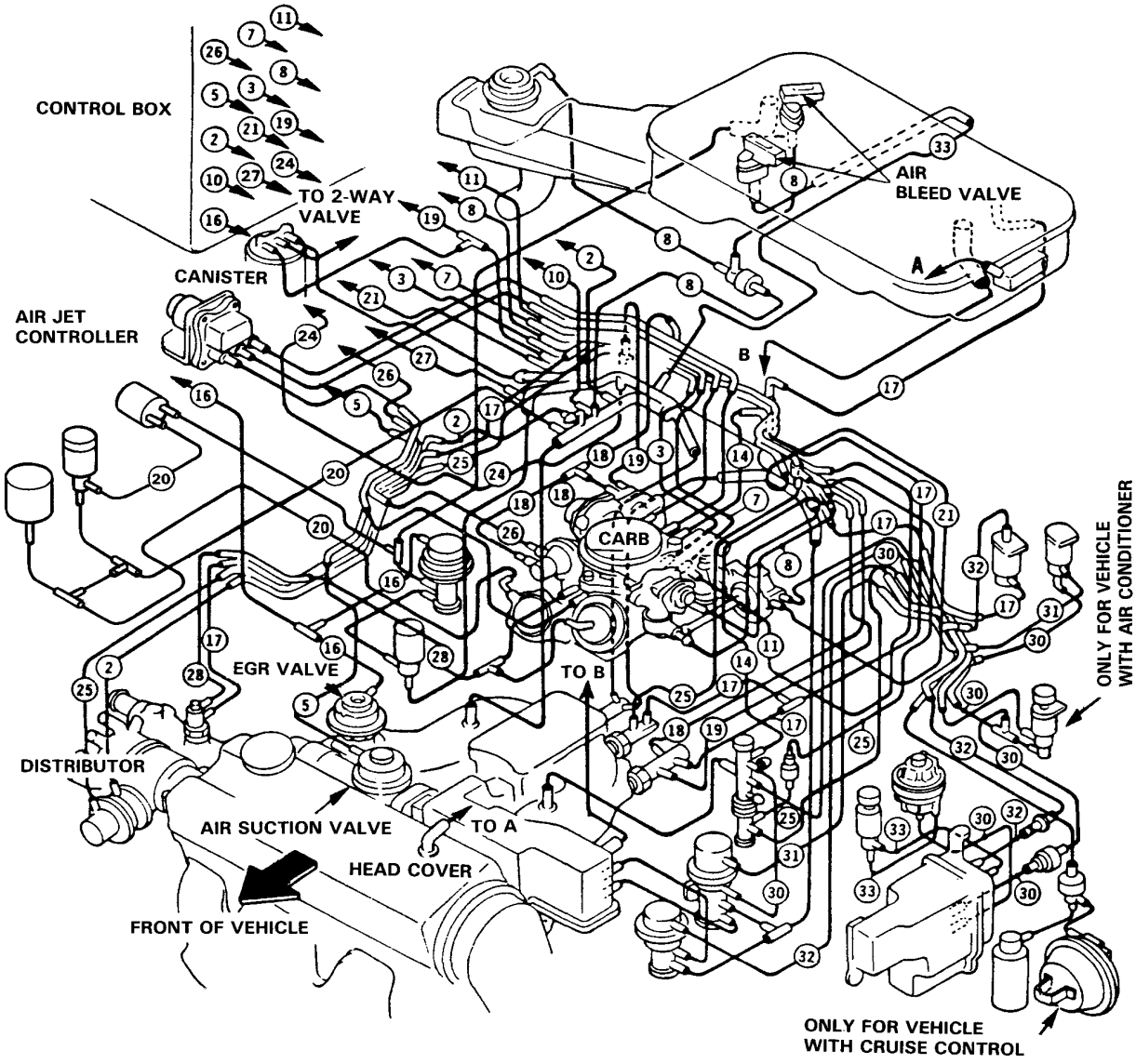
Outline of Model Changes

Carbureted Engine (A20A1)
- Throttle cable had been changed.
- Adjustment of the idle speed/mixture had been changed.
- EFE System had been changed.
- Clutch Switch had been changed.

Component Locations

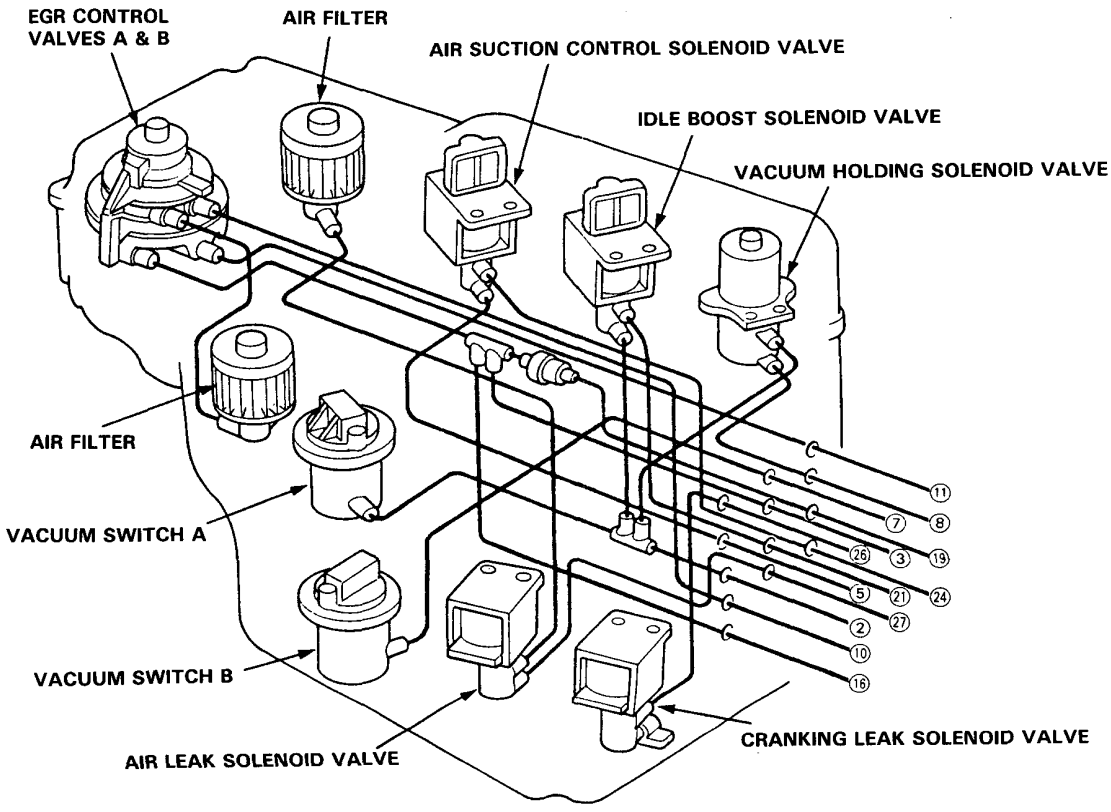


Automatic

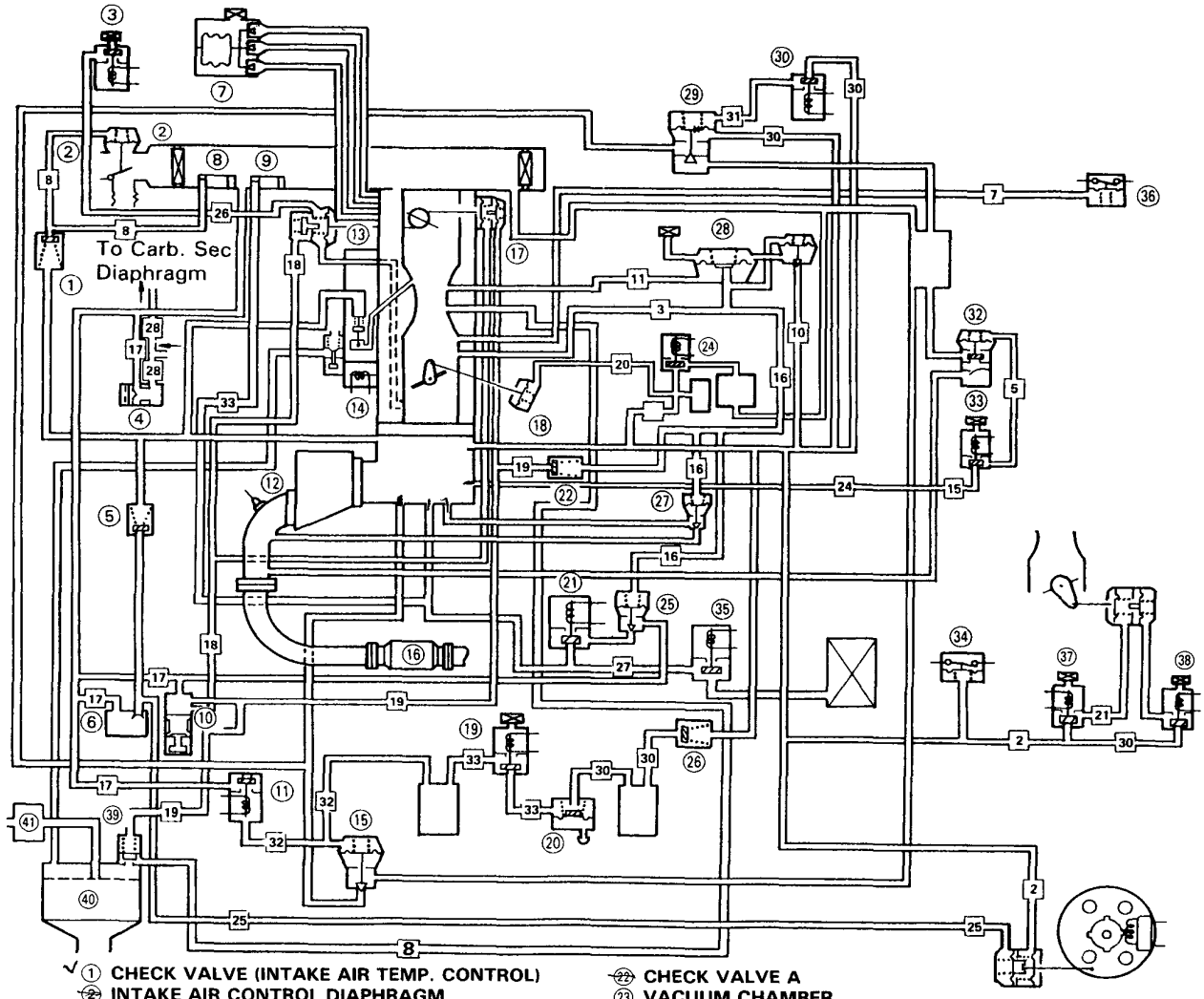

CONTROL BOX
TO 2-WAY VALVE
CANISTER
AIR JET CONTROLLER
AIR BLEED VALVE
A
B
CARB
EGR VALVE
TO B
TO A
DISTRIBUTOR
AIR SUCTION VALVE
HEAD COVER
FRONT OF VEHICLE
ONLY FOR VEHICLE WITH AIR CONDITIONER
ONLY FOR VEHICLE WITH CRUISE CONTROL

Vacuum Connections

Control Box (A/T only)

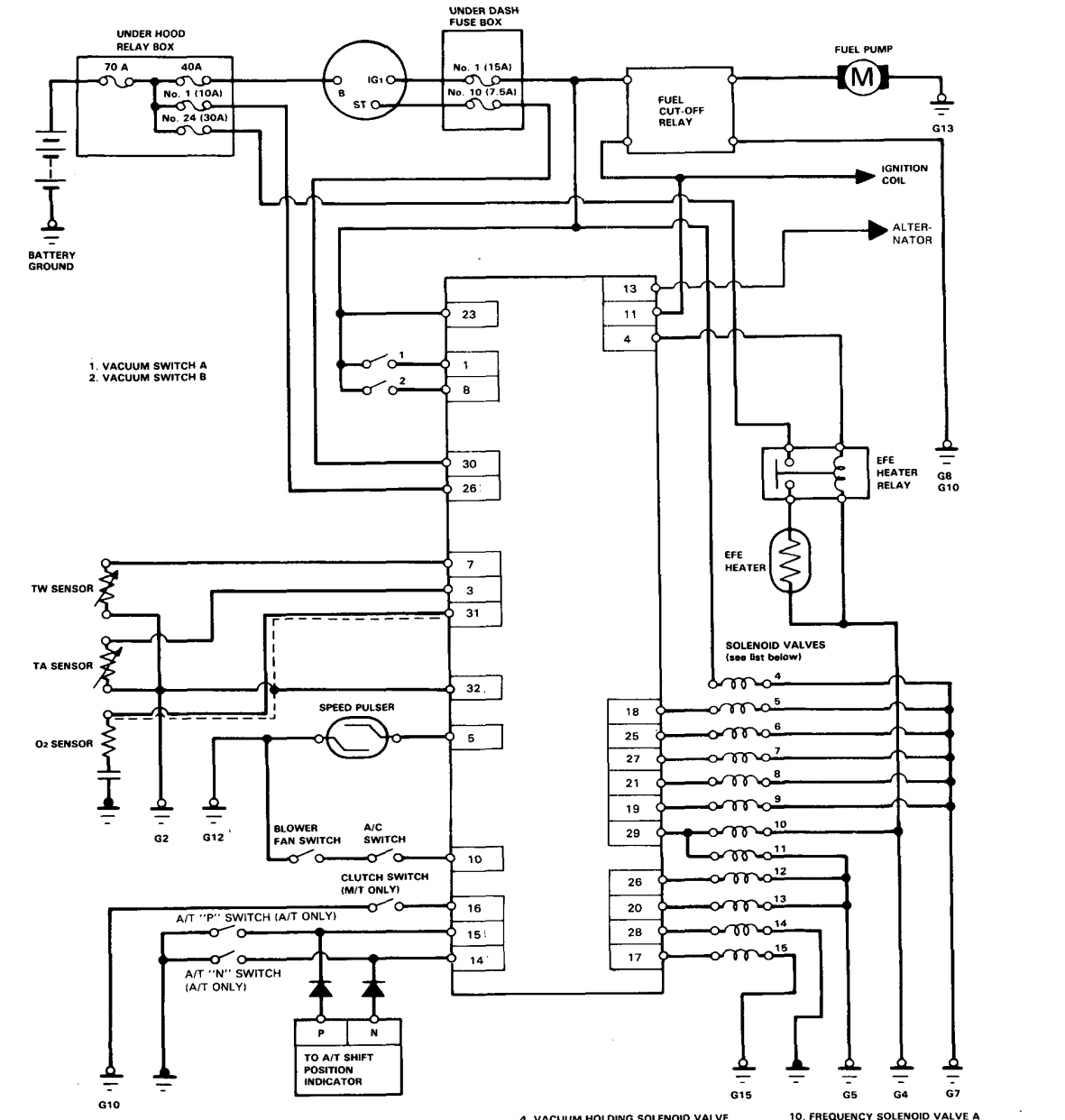


Automatic

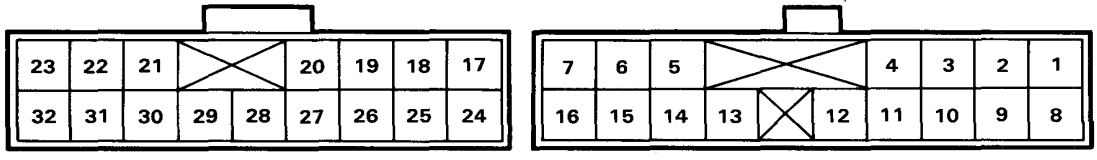


- ① CHECK VALVE (INTAKE AIR TEMP. CONTROL)
- ② INTAKE AIR CONTROL DIAPHRAGM
- ③ CRANKING LEAK SOLENOID VALVE
- ④ THERMOVALVE C
- ⑤ CHECK VALVE E
- ⑥ THERMOVALVE B
- ⑦ AIR JET CONTROLLER
- ⑧ AIR BLEED VALVE A
- ⑨ AIR BLEED VALVE B
- ⑩ THERMOVALVE A
- ⑪ FEEDBACK CONTROL SOLENOID VALVE
- ⑫ OXYGEN SENSOR
- ⑬ CHOKE OPENER
- ⑭ PRIMARY SLOW MIXTURE CUT-OFF SOLENOID VALVE
- ⑮ AIR CONTROL VALVE B
- ⑯ CATALYTIC CONVERTER
- ⑰ FAST IDLE UNLOADER
- ⑱ THROTTLE CONTROLLER
- ⑲ FREQUENCY SOLENOID VALVE B
- ⑳ CV GENERATOR
- ㉑ FREQUENCY SOLENOID VALVE A
- ㉒ CHECK VALVE A
- ㉓ VACUUM CHAMBER
- ㉔ FREQUENCY SOLENOID VALVE C
- ㉕ AIR CONTROL VALVE A
- ㉖ CHECK VALVE B
- ㉗ EGR VALVE
- ㉘ EGR CONTROL VALVES A & B
- ㉙ ANTI-AFTERBURN VALVE
- ㉚ ANTI-AFTERBURN CONTROL SOLENOID VALVE
- ㉛ VACUUM HOLDING SOLENOID VALVE
- ㉜ AIR SUCTION VALVE
- ㉝ AIR SUCTION CONTROL SOLENOID VALVE
- ㉞ VACUUM SWITCH A
- ㉟ AIR LEAK SOLENOID VALVE
- ㊱ VACUUM SWITCH B
- ㊲ IDLE BOOST SOLENOID VALVE
- ㊳ A/C IDLE BOOST SOLENOID VALVE
- ㊴ PURGE CONTROL VALVE
- ㊵ CHARCOAL CANISTER
- ㊶ TWO-WAY VALVE

Electrical Connections



4. VACUUM HOLDING SOLENOID VALVE
5. AIR LEAK SOLENOID VALVE
6. AIR SUCTION CONTROL SOLENOID VALVE
7. CRANKING LEAK SOLENOID VALVE
8. FREQUENCY SOLENOID VALVE C (A/T ONLY)
9. IDLE BOOST SOLENOID VALVE (A/T ONLY)
10. FREQUENCY SOLENOID VALVE A
11. FREQUENCY SOLENOID BALVE B (M/T ONLY)
12. ANTI-AFTERBURN CONTROL SOLENOID VALVE
13. FEEDBACK CONTROL SOLENOID VALVE
14. PRIMARY SLOW MIXTURE CUT-OFF SOLENOID VALVE
15. A/C IDLE BOOST SOLENOID VALVE

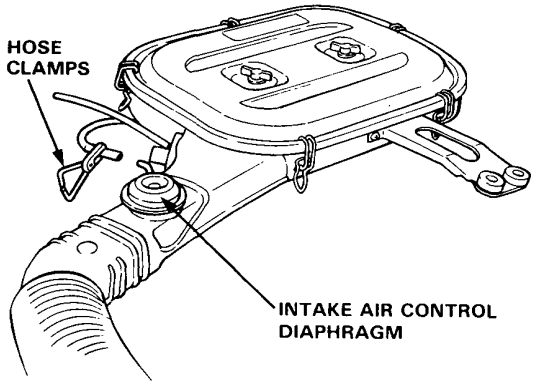


TERMINAL LOCATION

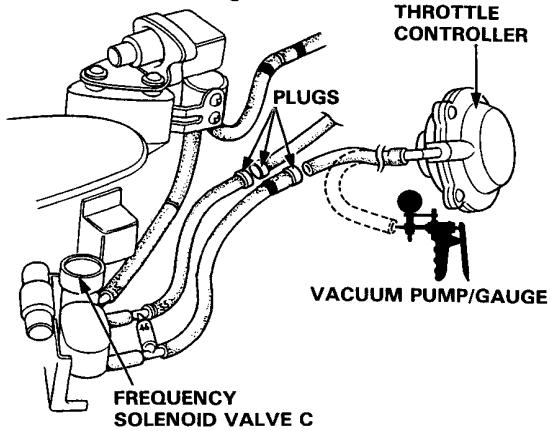
Inspection/Adjustment

Automatic Transmission

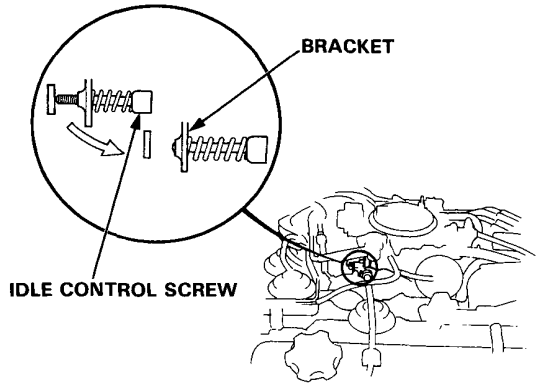
1. Start engine and warm up to normal operating temperature; the cooling fan will come on.
2. Remove the vacuum hose from the intake air control diaphragm and clamp the hose end.

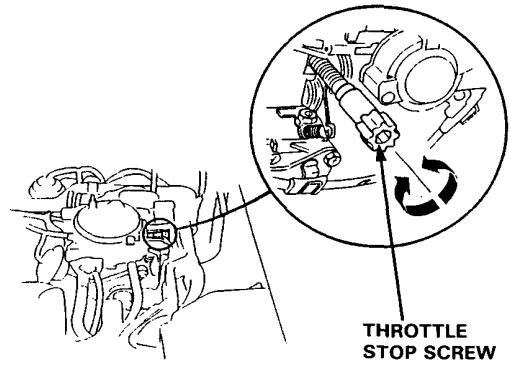


3. Connect a tachometer.
4. Disconnect #20 vacuum hose from 2-way joint between the frequency solenoid valve C and vacuum hose manifold, and plug the vacuum hose as shown.
   Disconnect #20 vacuum hose from 2-way joint between the frequency solenoid valve C and throttle controller, and plug the hose of the frequency solenoid valve side. Connect a vacuum pump to the hose of throttle controller and apply vacuum of more than 20 in. Hg.

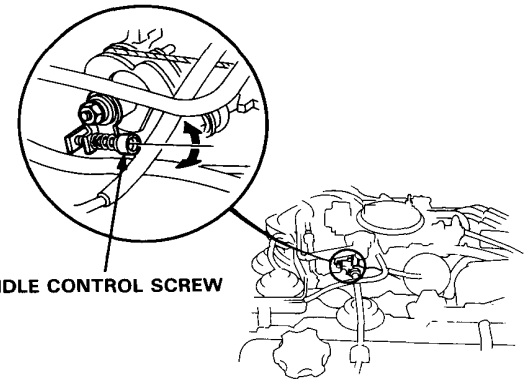


5. Turn back the idle control screw end is flush with the bracket as shown.
   With the headlights, heater blower, rear window defogger, cooling fan and air conditioner off, and transmission in "N" or "P", lower the idle speed as much as possible by turning the throttle stop screw.





6. Adjust the idle speed by turning the idle control screw to 630 ± 50 min^{-1} (rpm).



7. Adjust the idle speed by turning the throttle stop screw to 700 ± 50 min^{-1} (rpm).

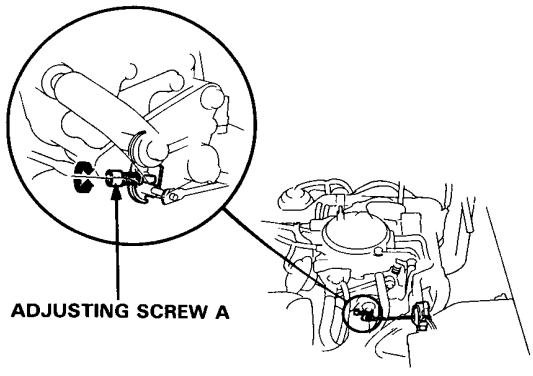
(cont'd)

Idle Speed/Mixture

Inspection/Adjustment (cont'd)

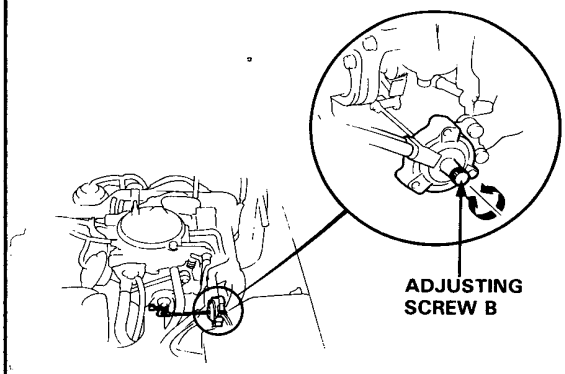
8. With transmission in gear (except "P" or "N"), adjust the idle speed by turning adjusting screw A.

   Idle speed should be:
   675 ± 50 min^{-1} (rpm) (at high altitude)
   700 ± 50 min^{-1} (rpm) (at low altitude)



9. Shift transmission to "N" or "P" position.

10. If equipped with air conditioner, adjust the idle speed by turning adjusting screw B to 700 ± 50 min^{-1} (rpm) with A/C on.



11. Stop the engine, remove the inside vacuum hose from the idle boost throttle controller and plug the hose.

12. Check the maximum engine speed by the propane enrichment method.

    RPM increase should be: 30 ± 10 min^{-1} (rpm) (in park)

    - If engine speed increases per specification, go to step 13.
    - If engine speed does not increase per specification, adjust the enriched speed by turning the mixture screw.

13. Stop engine. Close the propane control valve, remove all plugs, and reconnect all hoses.

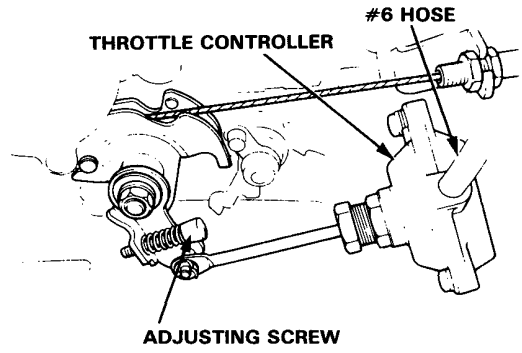
14. Restart the engine and recheck idle speed.

    NOTE: Raise the engine speed to 2,500 min^{-1} (rpm) 2 or 3 times in 10 seconds, and then check the idle speed.

    Idle speed should be: 730 ± 50 min^{-1} (rpm) (in "N" or "P")

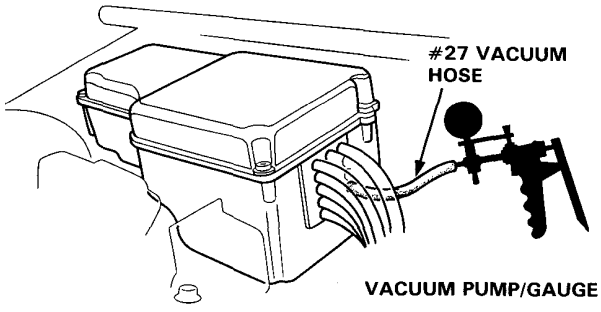
    - If the idle speed is as specified, go to step 16.
    - If the idle speed is not as specified, return to steps 4 through 12.

15. If the intake air temperature is above 65°C (149°F), go on to step 16 through 20.



16. Disconnect #5 vacuum hose from the air suction valve and plug the hose.

17. Disconnect the #27 vacuum hose from the pipe and plug the pipe.
Attach vacuum pump/gauge to the #27 hose and apply vacuum.



18. With the engine idling, depress the push button on top of the propane device, then slowly open the propane control valve and check for vacuum.

    There should be no vacuum.

    - If there is no vacuum, check the air leak solenoid valve.

19. Reconnect all hoses.

20. Check the air bleed valve B.

21. Remove propane enrichment kit and reconnect air cleaner intake tube on the air intake duct.

22. Reinstall the mixture adjusting screw hole cap.

23. Recheck the idle speed with the A/T shift lever in gear.

    Idle speed should be: 730 ± 50 min^{-1} (rpm)

24. Recheck the idle speed with the A/C on and with the shift lever in "P" or "N" position.

    Idle speed should be: 750 ± 50 min^{-1} (rpm)

25. Recheck the idle speed with the A/C on and in gear.

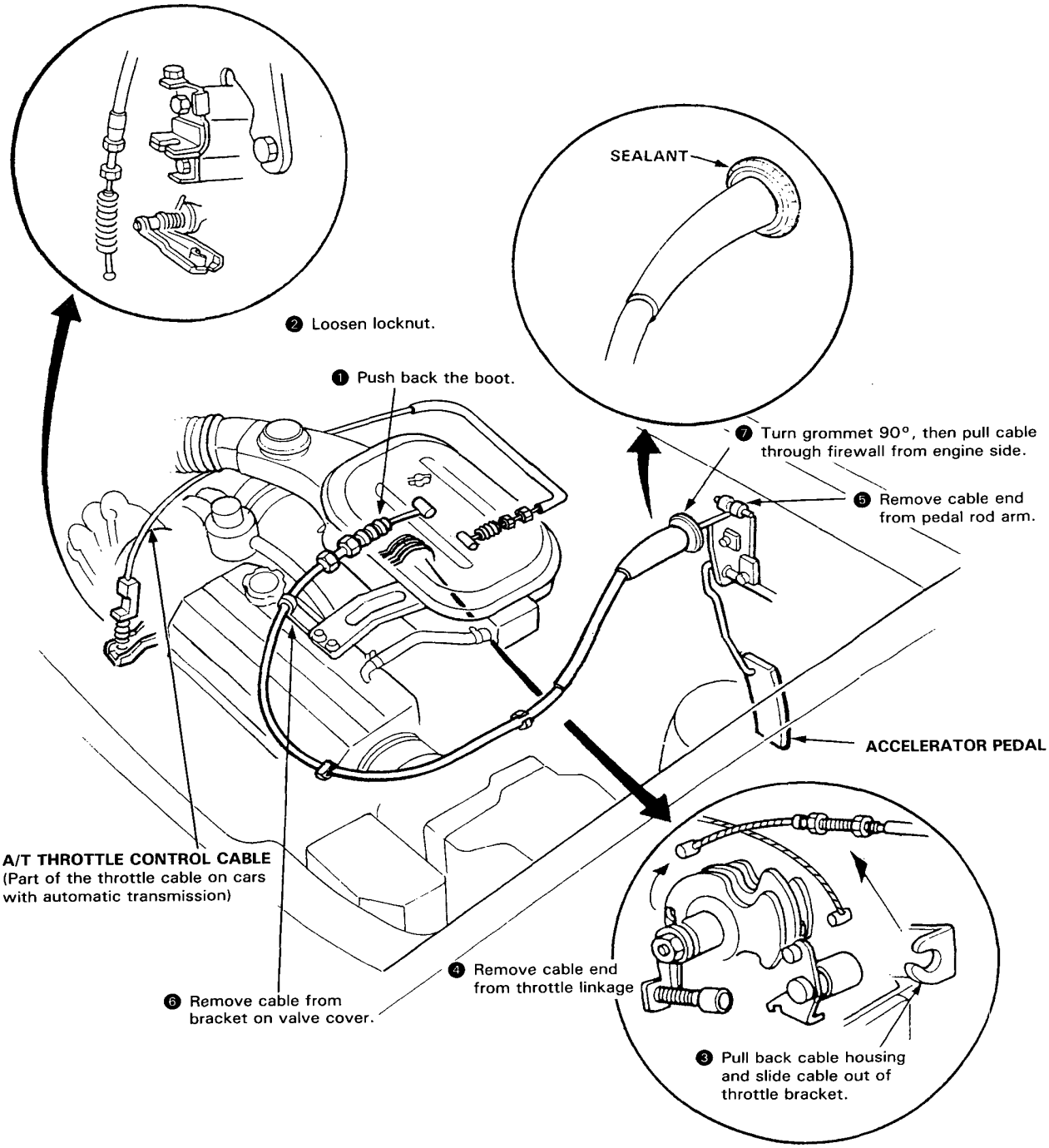
    Idle speed should be: 750 ± 50 min^{-1} (rpm)

26. If the idle rpm does not reach the specified idle speeds in steps 16 and 25 through 27, inspect the idle control system.

Throttle Cable

Replacement

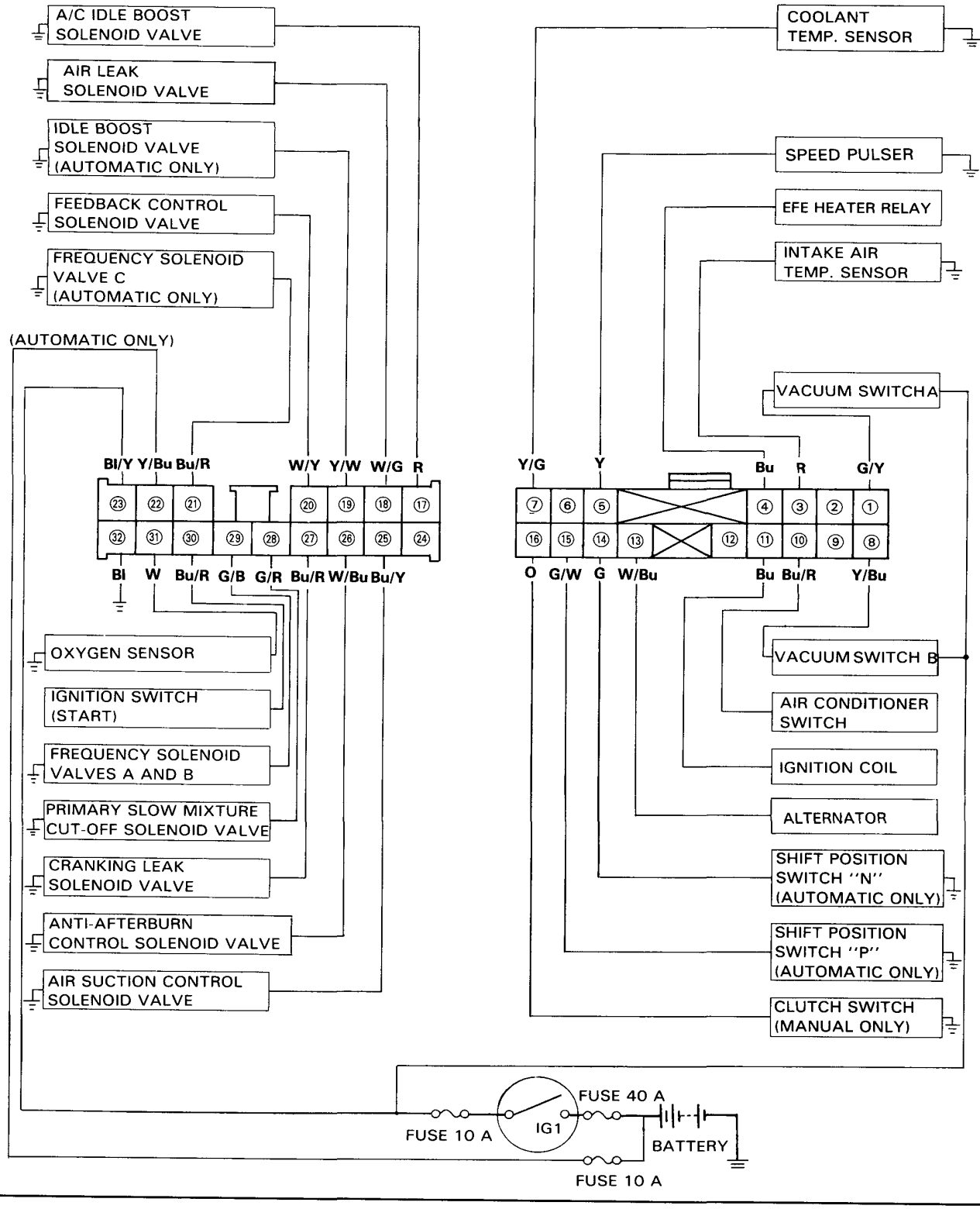
NOTE: Detach parts in the numbered sequence shown.



❽ Install the cable in reverse order of removal.
Apply sealant to grommet mating surface, when installing cable.

Control Unit

Output/Input Summary



Control Unit Output Troubleshooting

Frequency Solenoid Valve C (A/T Only)

The frequency solenoid valve C is energized when the engine speed is above or below 730 min^{-1} (rpm) and the coolant temperature is above 60°C (140°F). It controls the vacuum to the throttle controller.

Inspection of Frequency Solenoid Valve C

Disconnect the lower vacuum hose of the solenoid valve from the vacuum hose manifold and connect a vacuum pump.

Disconnect the upper vacuum hose of the solenoid valve from the 3-way joint.

Disconnect the 2P connector near the solenoid valve.

Apply vacuum.

Does solenoid valve hold vacuum? NO → Replace the solenoid valve.

YES

Connect a vacuum gauge to the upper vacuum hose.

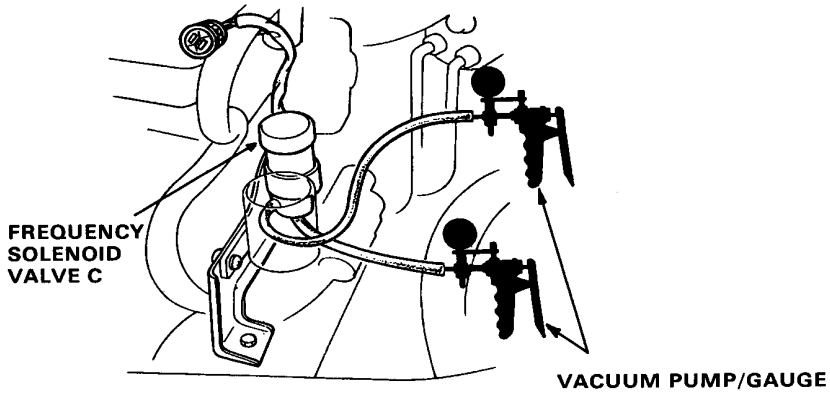
Connect the battery positive terminal to the Blue/Red terminal of the 2P connector and the battery negative terminal to the Black terminal.

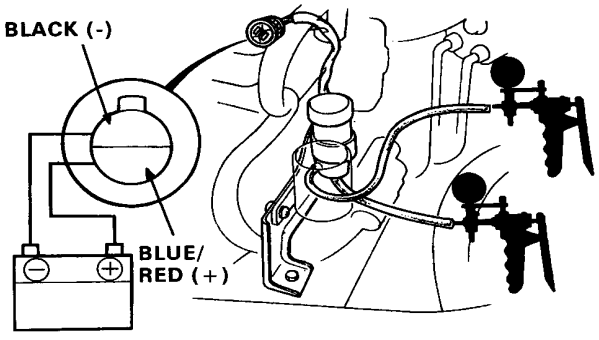
Apply vacuum.

Is vacuum indicated on the gauge? NO → Replace the solenoid valve.

YES

(To page 12-13)





(From page 12-12)

Disconnect the battery terminals from the 2P connector.

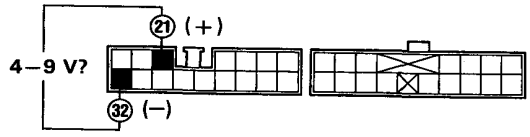
Is vacuum indicated on the gauge?

- Replace the solenoid valve.

Reconnect vacuum hose and 2P connector.

Start engine and warm up to normal operating temperature (cooling fan comes on).

Measure voltage between ㉑ (Blue/Red • +) terminal and ㉜ (Black • −) terminal of the control unit.



Is there 4−9 volts?

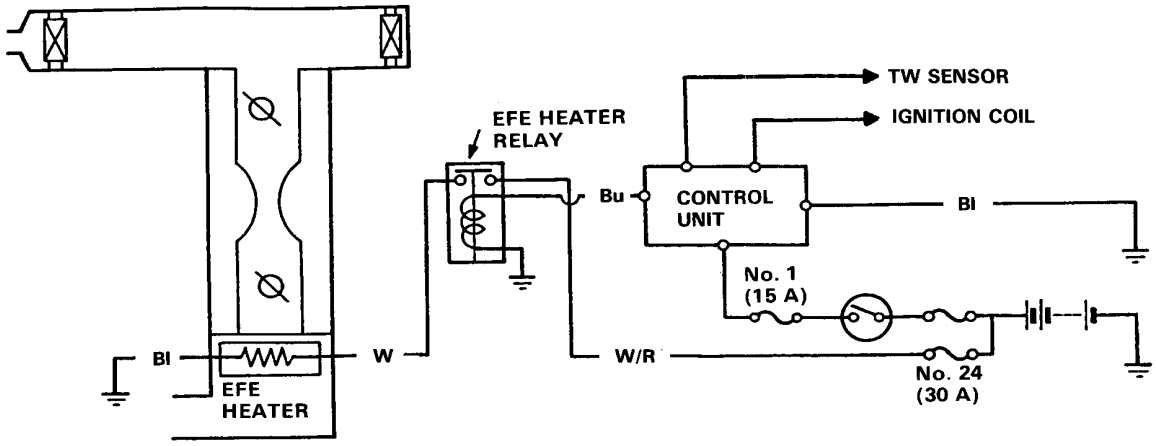
- Go to Input Troubleshooting (page 12-18).

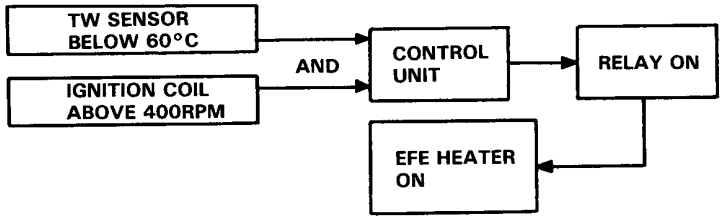
Inspect open in Blue/Red wire between control unit ㉑ and solenoid valve, and Black wire between the solenoid valve and G7.

Control Unit Output Troubleshooting

EFE (Early Fuel Evaporator) System

To promote improved engine operation while the engine is warming up, the carburetor insulator includes a heater in the primary bore. The maximum temperature of the heater is regulated by the electrical resistance of the heating element.





CAUTION:

- **Be careful not to damage the EFE Heater when servicing the carburetor.**
- **Make sure that there is no foreign matter on the EFE Heater after installing.**
- **Make sure that the O-ring and seal are properly installed.**
- **Do not pull the harness while removing/installing the EFE Heater.**
- **When removing, make sure to disconnect the connector to the engine sub harness.**

Inspection of EFE (Early Fuel Evaporator) System

Disconnect the 2P connector near the carburetor.

Measure resistance between White terminal and Black terminal on the EFE heater.

Does continuity exist? — NO → **Replace the EFE heater.**

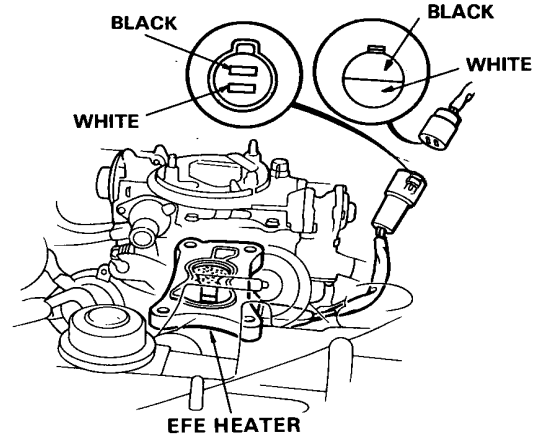
YES

Start engine.

NOTE: The engine coolant temperature must be below 60°C (140°F).

Measure voltage between White (+) terminal and Black (−) terminal on the engine wire harness.

(To page 12-15)



(From page 12-14).

Is there battery voltage?

NO → Measure voltage between White (+) terminal and body ground.

YES

Warm up engine to normal operating temperature (cooling fan comes on).

(To page 12-16)

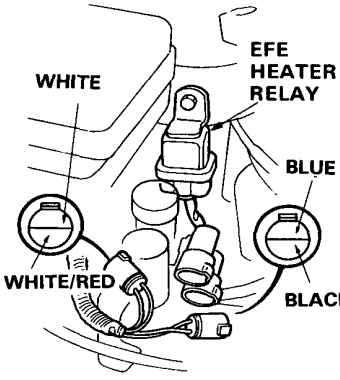
Measure voltage between White (+) terminal and body ground.

Is there battery voltage?

YES → **Repair open in Black wire between the EFE heater and G4.**

NO

Check for an open in White wire between the heater and the EFE heater relay. If wire is OK, disconnect the 2P connector near the EFE heater relay.



Measure voltage between White/Red (+) terminal and body ground.

Is there battery voltage?

NO → **Inspect No. 24 fuse (30A). If fuse is OK, repair open in White/Red wire between the relay and No. 24 fuse.**

YES

Disconnect the other 2P connector near the EFE heater relay.

Measure voltage between Blue (+) terminal and Black (−) terminal on the main wire harness.

Is there battery voltage?

YES → **Replace the relay.**

NO

Measure voltage between Blue (+) terminal and body ground.

Is there battery voltage?

YES → **Repair open in Black wire between the relay and G4.**

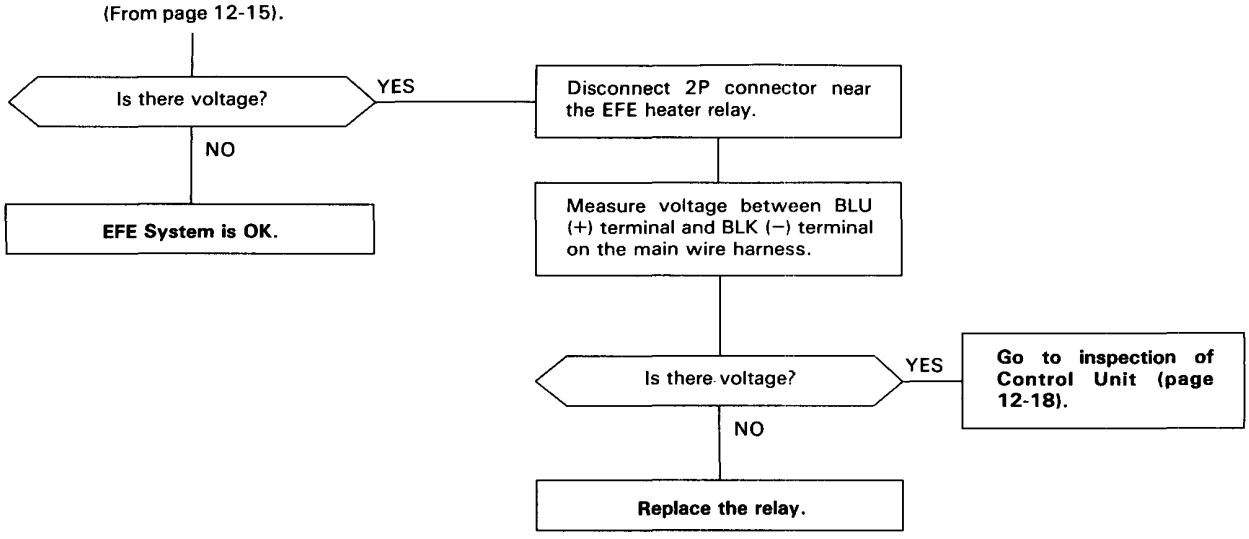
NO

Check for an open in Blue wire between the relay and control unit ④. If wire is OK, go to *Inspection of Control Unit input* troubleshooting 12-16.

(cont'd)

Control Unit Output Troubleshooting

EFE (Early Fuel Evaporator) System (cont'd)



Inspection of Control Unit (output to EFE relay)

Start the engine.

NOTE: The engine coolant temperature must be below 60°C (140°F).

Disconnect the 2P connector near the EFE heater relay.

Measure voltage between ④ (Blu • +) terminal and ㉜ (Black • −) terminal.

Is there battery voltage?

NO → **Check if:**
—Charge warning light is on.
—Tachometer is operating.
—TW sensor is OK.

YES

Warm up engine to normal operating temperature (cooling fan comes on).

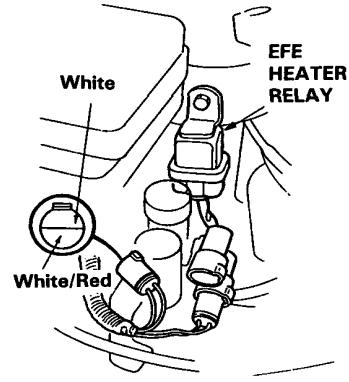
Measure voltage between ④ (Blue • +) terminal and ㉜ (Black • −) terminal.

Is there voltage?

YES → **Inspect the TW sensor.**

NO

Control Unit is OK.



Control Unit Input Troubleshooting

If there is no voltage from the control unit when there should be voltage or if there is voltage from the unit when there shouldn't be voltage, inspect as follows and if no defects can be found, replace the control unit and re-test.

PROBLEMATIC CIRCUIT	REFER TO CHECK		CHECK
To frequency solenoid valves A and B (㉙ Green/Black)	M/T	1,4,6,7,8,9,10,11,12	1. Inspect the power source (IG 1) and ground. 2. Inspect the power source. 3. Inspect the starter signal. 4. Inspect the ignition coil signal. 5. Inspect the A/T shift position signal. 6. Inspect the clutch switch signal (page 12-19). 7. Inspect vacuum switch A (page 12-194). 8. Inspect vacuum switch B (page 12-196). 9. Inspect the speed pulser. 10. Inspect the coolant temperature (TW) sensor. 11. Inspect the intake air temperature (TA) sensor. 12. Inspect the oxygen (O_2) sen sor. 13. Inspect the A/C switch signal.
	A/T	1,4,5,7,8,9,10,11,12	
To feedback control solenoid valve (⑳ White/Yellow)	M/T	1,4,6,8,10	
	A/T	1,4,5,8,9,10	
To frequency solenoid valve C (A/T only) (㉑ Blue/Red)	1,2,4,5,9,10,13		
To idle boost solenoid valve (A/T only) (⑲ Yellow/White)	1,4,5,7,9,10,13		
To air suction control solenoid valve (㉕ Blue/Yellow)	M/T	1,4,7,8,9,10,11	
	A/T	1,4,7,9,10,11	
To anti-afterburn control solenoid valve (㉖ White/Blue)	M/T	1,9,10	
	A/T	1,5,10	
To cranking leak solenoid valve (㉗ Blue/Red)	1,3,4,9,10,11		
To primary slow mixture cut-off solenoid valve (㉘ Green/Red)	M/T	1,4,6,7,8,9,10	
	A/T	1,4,5,7,8,9,10	
A/C idle boost solenoid valve (⑰ Red)	1,4,7,9,10,13		
To EFE heater unit (④ Blue)	1,4,10		

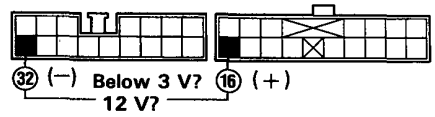
Clutch Switch Signal

This signals the control unit when the clutch is engaged.

Inspection of Clutch Switch Signal

Turn the ignition switch ON.

Measure voltage between ⑯ (Pink • +) terminal and ㉜ (Black • −) terminal.

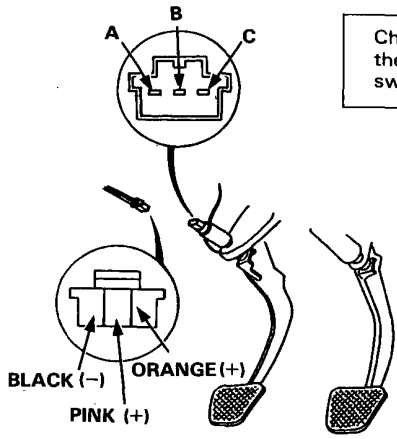


Is there below 3 V?

NO → Turn the ignition switch OFF.

Disconnect the 3P connector on the clutch switch.

Check for continuity between the 2 terminals on the clutch switch.



Does continuity exist?

YES → Replace the clutch switch.

NO → Turn the ignition switch ON.

Mesure voltage between Orange (+) terminal and body ground.

Is there battery voltage?

NO → Repair open in Orange wire between the clutch switch and control unit ⑯.

YES → Repair open in Black wire between the clutch switch and G10.

YES → Depress the clutch pedal.

Measure voltage between ⑯ (Orange • +) terminal and ㉜ (Black • −) terminal.

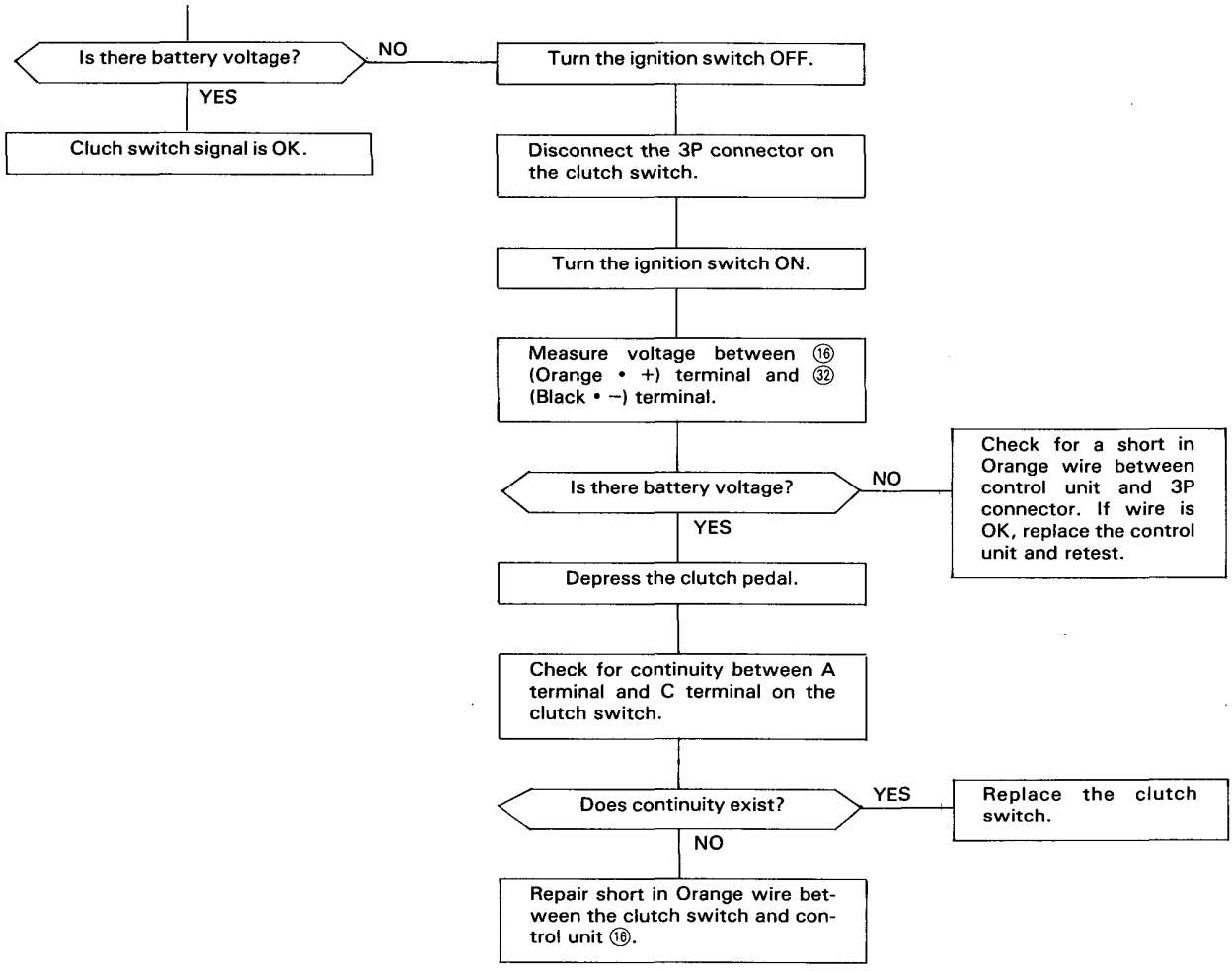
(To page 12-18)

(cont'd)

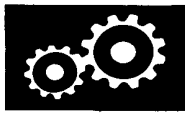
Control Unit Input Troubleshooting

Clutch Switch Signal (cont'd)

(From page 12-19)



Automatic Transmission



Outline of Model Changes

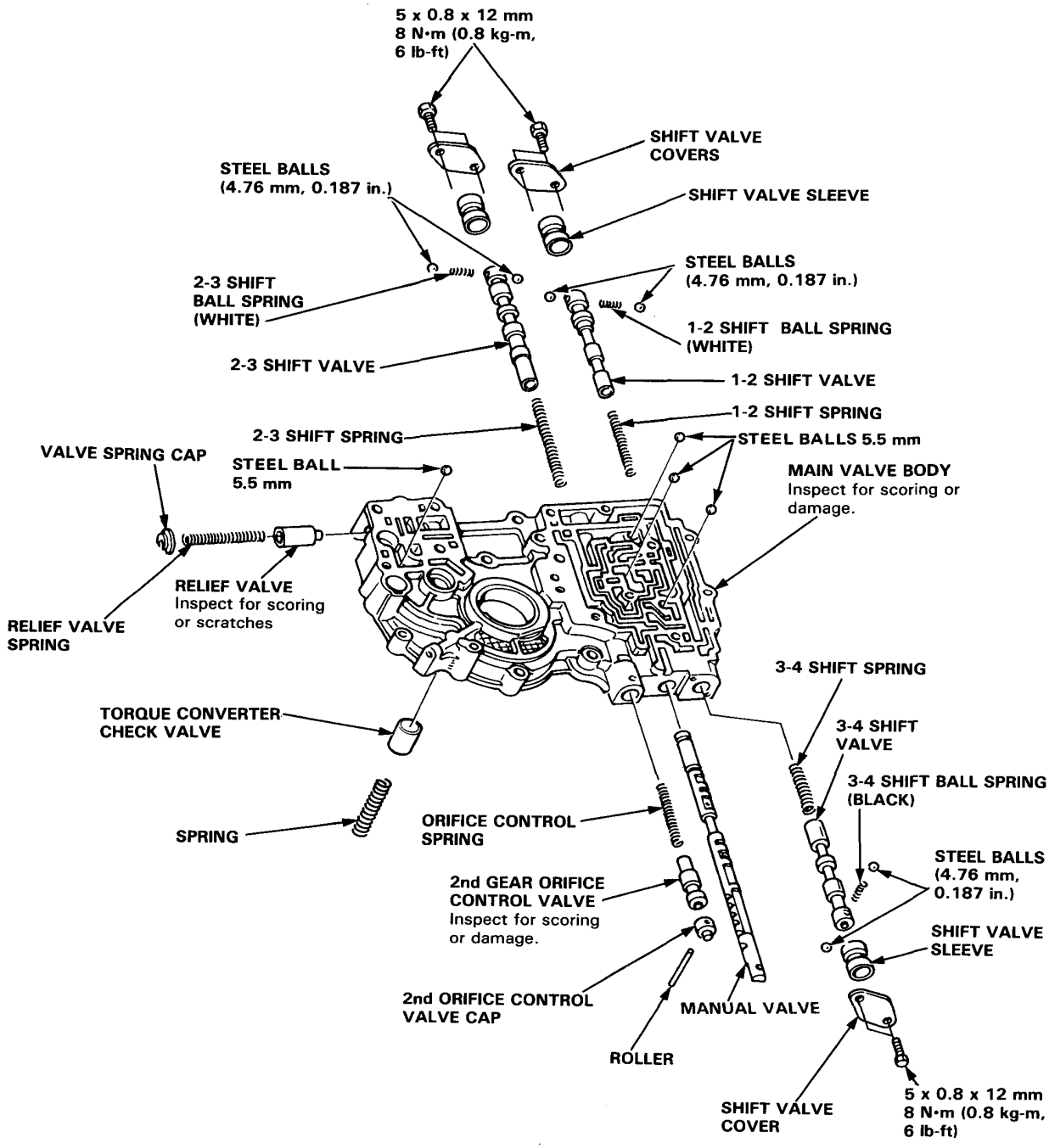
- Main valve body has been changed.
- Servo control valve in secondary valve body has been added.
- 4th exhaust valve in servo body has been added.
- Parking brake stopper adjustment has been added.

Main Valve Body

Disassembly

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air. Blow out all passages.
- Replace valve body as an assembly if any parts are worn or damaged.
- Check all valves for free movement. If any fail to slide freely, see Valve Body Repair.
- Coat all parts with ATF before reassembly.

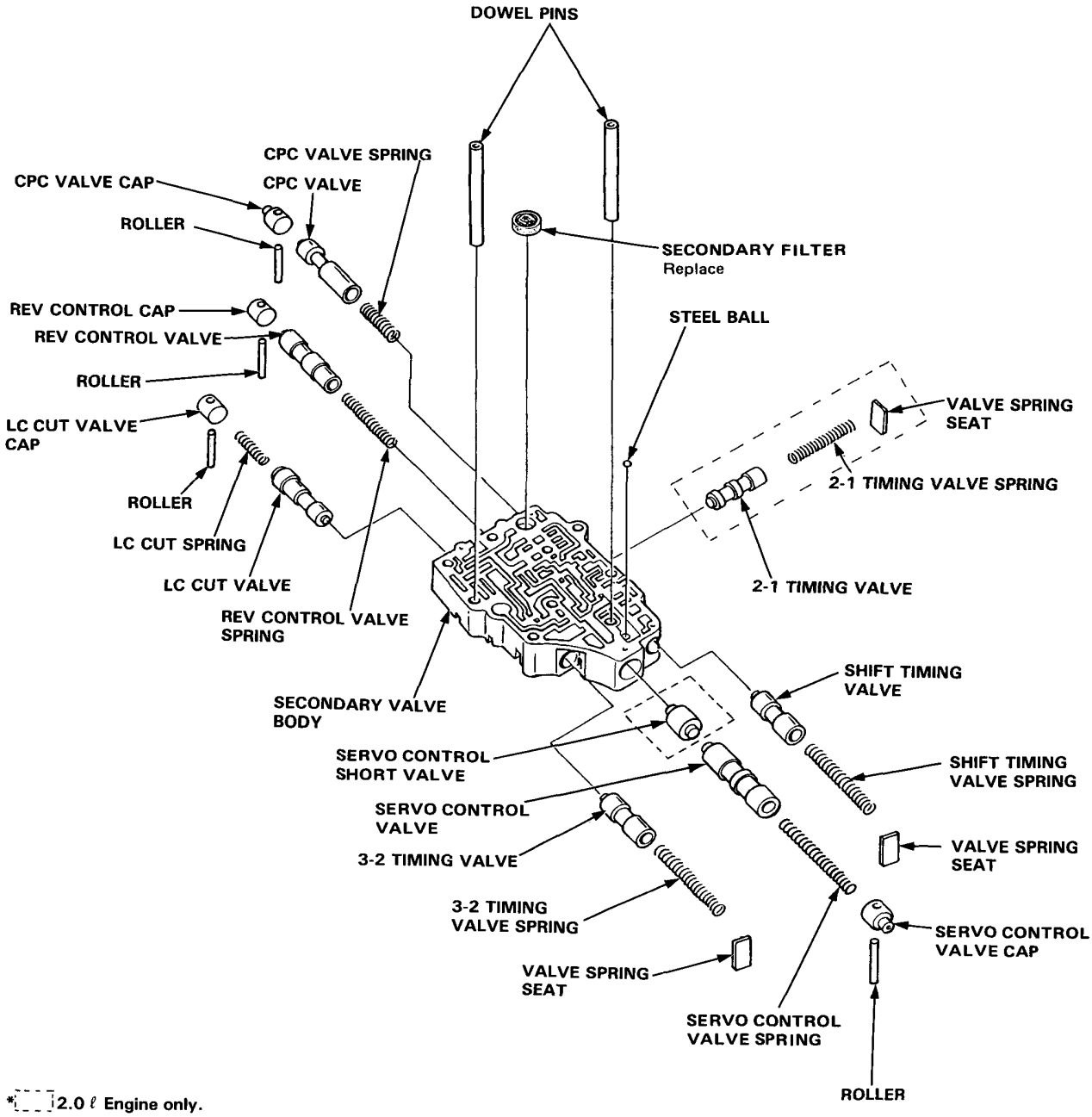


Secondary Valve Body

Disassembly/Inspection/Reassembly

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air. Blow out all passages.
- Check all valves for free movement. If any fail to slide freely, see Valve Body Repair.



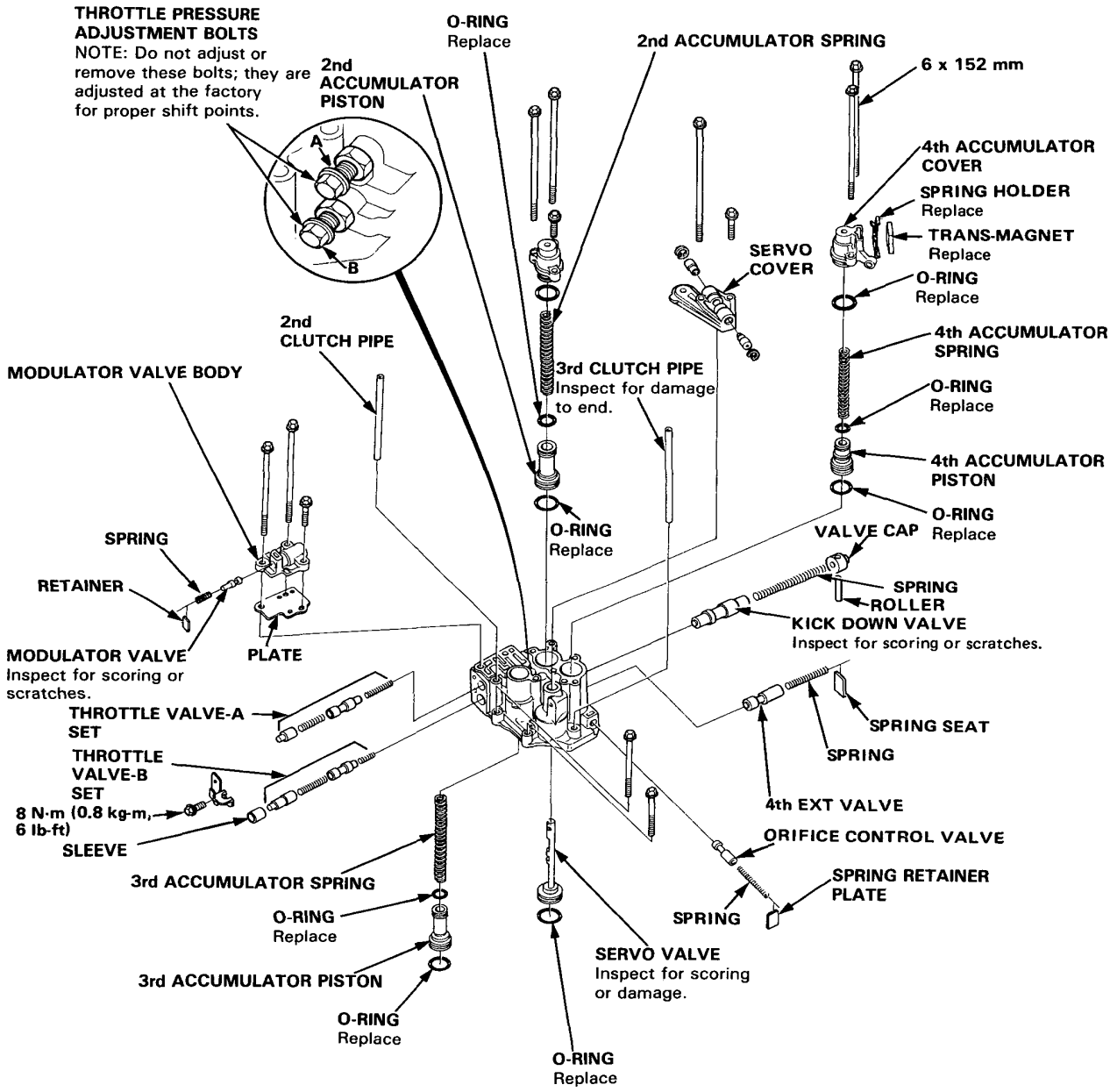
*[ ] 2.0 ℓ Engine only.

Servo Valve Body

Disassembly/Inspection/Reassembly

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air. Blow out all passages.
- Check all valves for free movement. If any fail to slide freely, see Valve Body Repair.

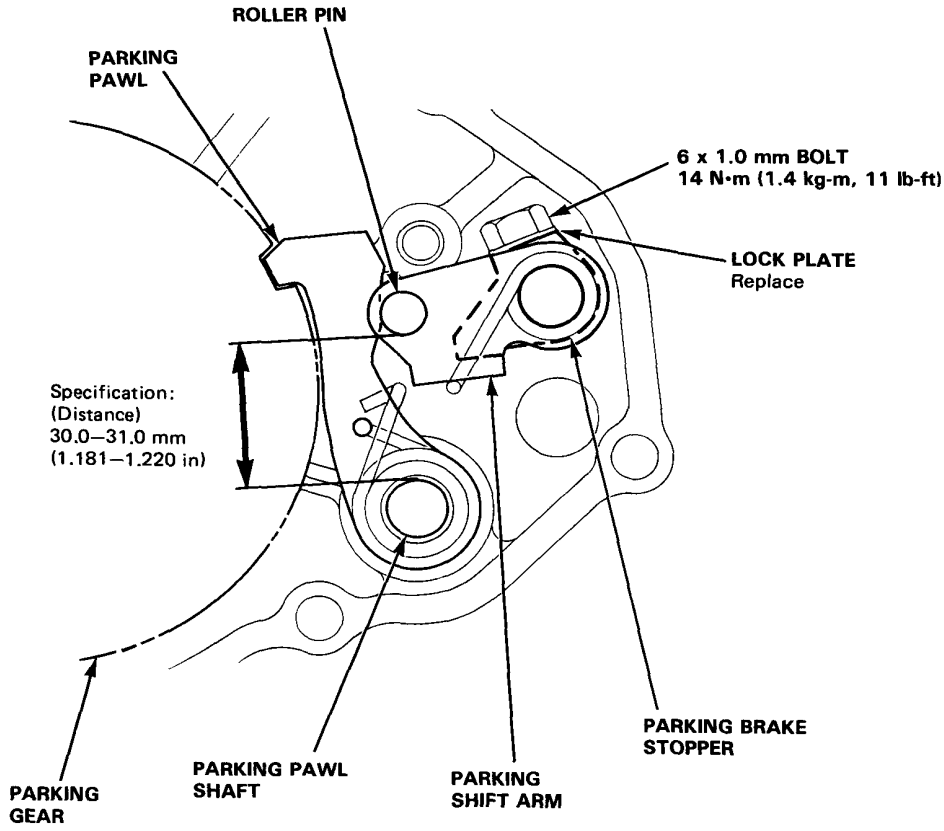


* All Bolts torque: 12 N·m (1.2 kg-m, 9 lb-ft)

Parking Brake Stopper

Inspection/Adjustment

1. Set the parking shift arm in the PARK position.
2. Measure the distance between the outer face of the parking pawl shaft and outer face of the parking shift arm roller pin.



3. If the measurement is out of specification (distance), select the appropriate parking brake stopper using the table below, and install it on the parking shift arm.

No.	PART NUMBER
1	24537–PA9–003
2	24538–PA9–003
3	24539–PA9–003

Brakes

Conventional Brake

Outline of Model Change

The wheel cylinder of rear brake has been changed.

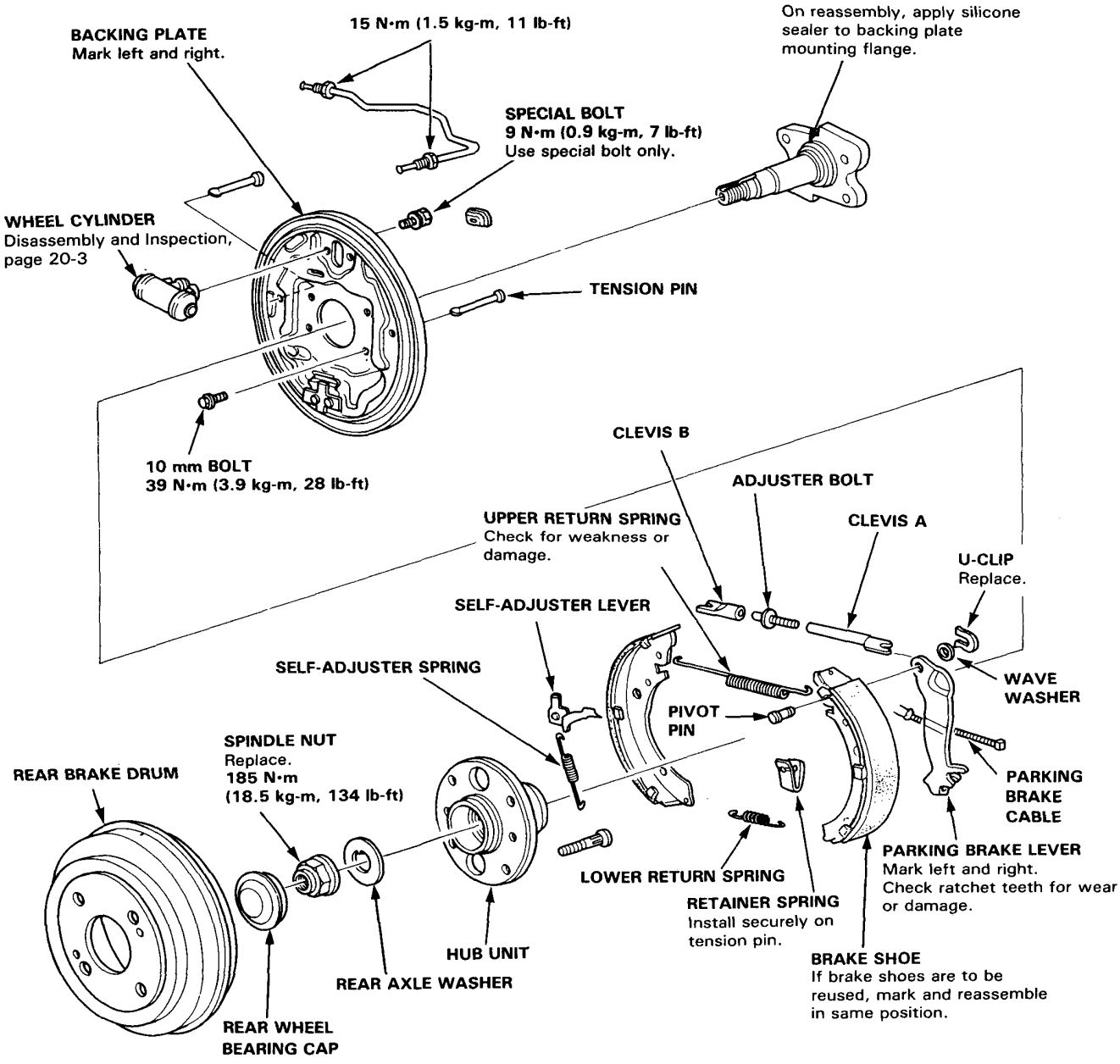
Rear Drum Brake

Index and Inspection

WARNING **Block the front wheels before jacking up the rear of the car.**

1. Raise the rear of the car and support with safety stands in proper locations.
2. Loosen the parking brake.
3. Remove the rear wheels and rear brake drum .

WARNING **Do not use an air hose to blow the brake assembly clean.**

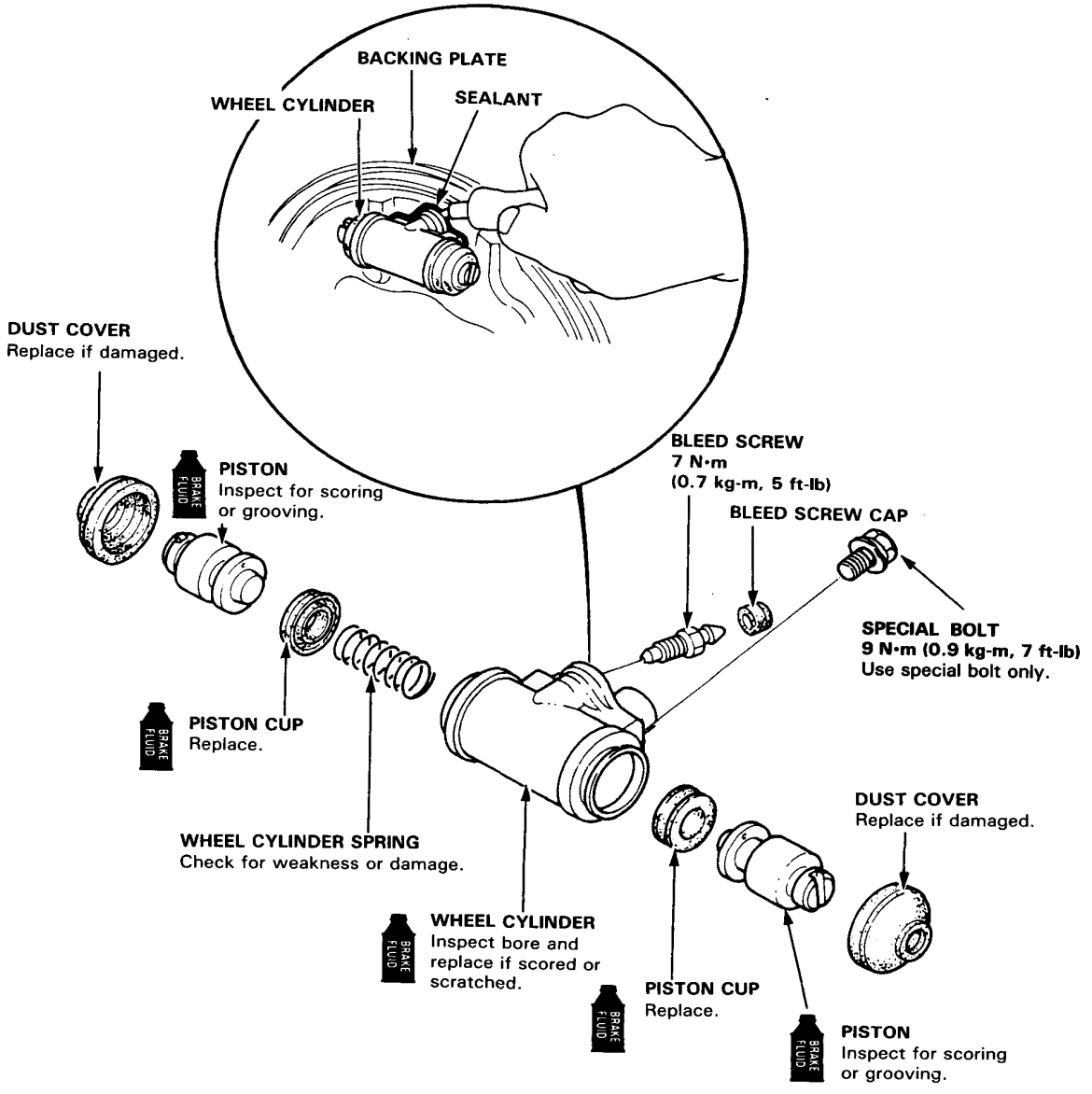


Wheel Cylinder

Disassembly and Inspection

CAUTION:

- Use only clean brake fluid.
- Use only new replacement parts.
- Brake fluid will damage the painted, plastic and rubber parts. Whenever handling brake fluid, protect the painted, plastic or rubber parts by covering with a rag. If fluid does get on these parts, wipe it off with a clean cloth.
- Blow all passages with compressed air before reassembling.
- Clean all parts thoroughly with the clean brake fluid.
- Do not allow dirt or other foreign matter to contaminate the brake fluid.
- Do not mix different types of fluid. They are not compatible.
- Never reuse the brake fluid once it has been drained.
- Lubricate all parts with clean brake fluid during reassembly.
- Apply sealant between the wheel cylinder and backing plate whenever the wheel cylinder has been removed.



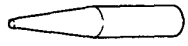
ALB

Outline of Model Change

The master cylinder has been changed.

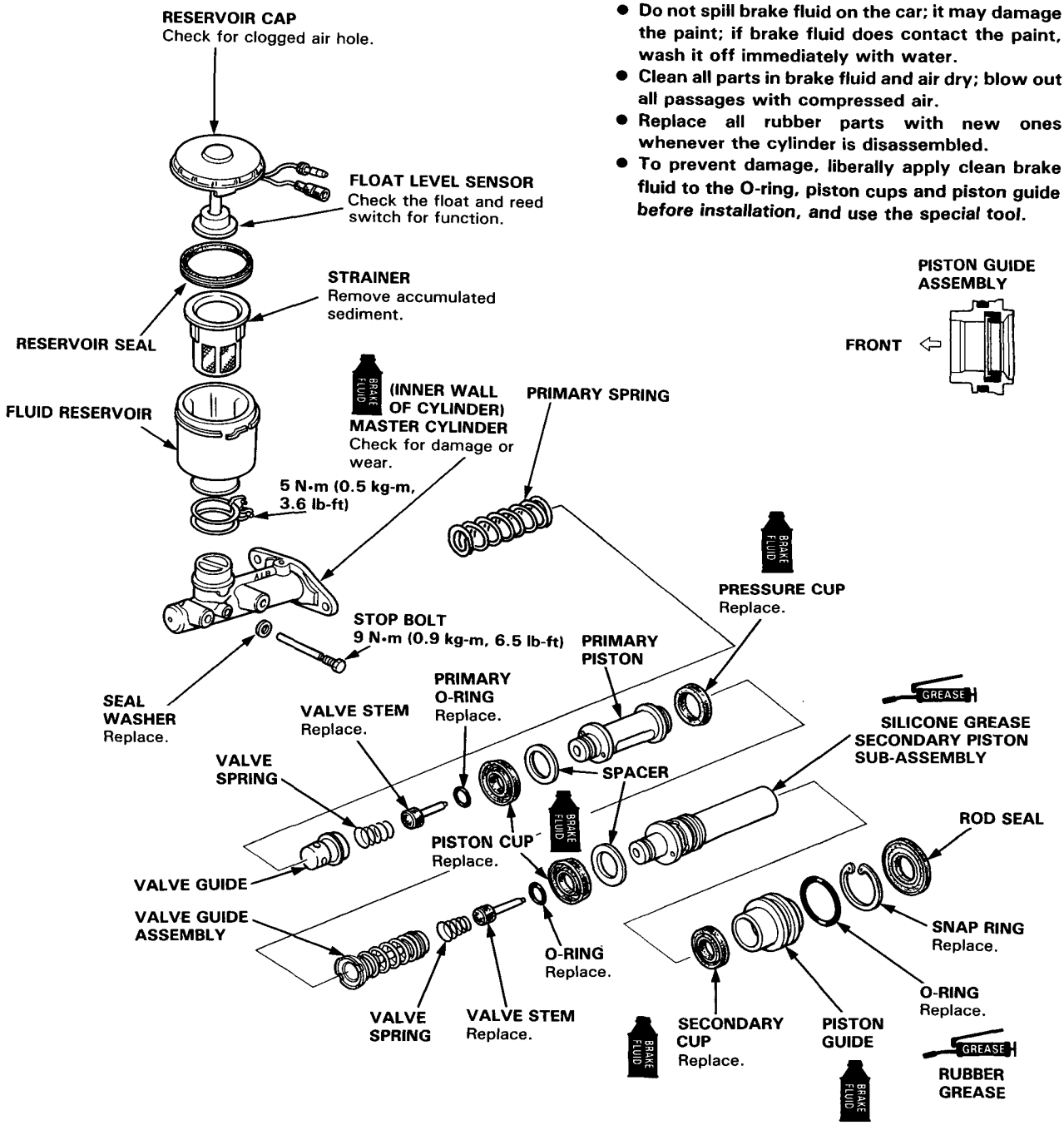
Special Tool

Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07965–5790300	Cup Guide	1	



①

CAUTION:
- **Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.**
- **Clean all parts in brake fluid and air dry; blow out all passages with compressed air.**
- **Replace all rubber parts with new ones whenever the cylinder is disassembled.**
- **To prevent damage, liberally apply clean brake fluid to the O-ring, piston cups and piston guide *before installation, and use the special tool.***



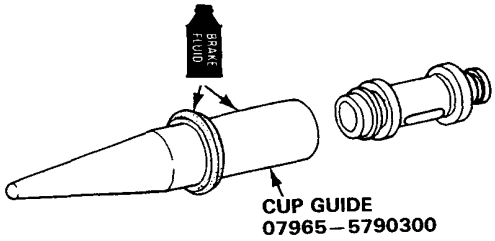
Master Cylinder

Assembly

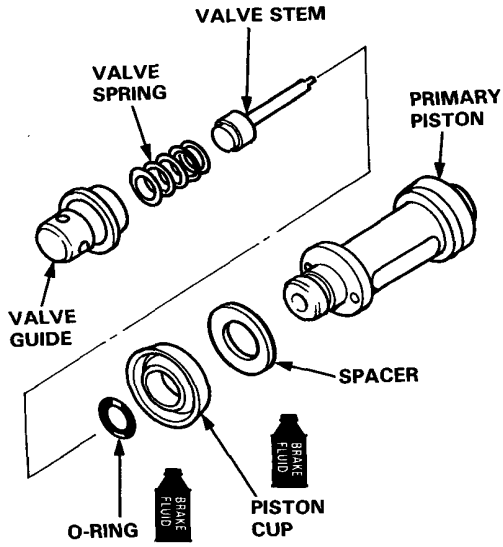
CAUTION:

- **Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.**
- **To prevent spills, cover the hose joints with rags or shop towels.**
- **Clean all parts in brake fluid and air dry; blow out all passages with compressed air.**
- **Use only new clean brake fluid.**
- **Before reassembling, check that all parts are free of dust and other foreign particles.**
- **Replace parts with new ones whenever specified to do so.**
- **Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.**
- **Do not mix different brands of brake fluid as they may not be compatible.**
- **Do not reuse the drained fluid.**

1. Coat the Cup Guide (special tool) with brake fluid, install the cup over the Cup Guide, then slide the cup onto the primary piston.

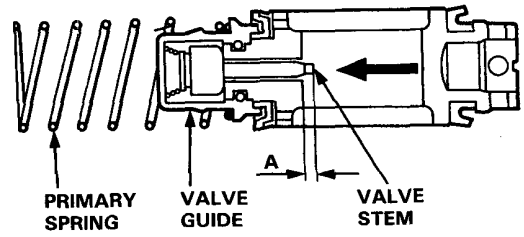


2. Install the spacer, piston cup, O-ring, valve stem and valve spring onto the primary piston.



3. Install the valve guide and primary spring to the primary piston.

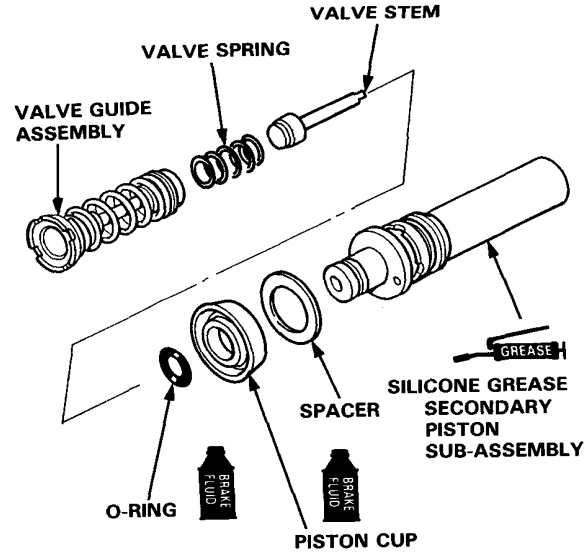
PRIMARY PISTON ASSEMBLY



NOTE:

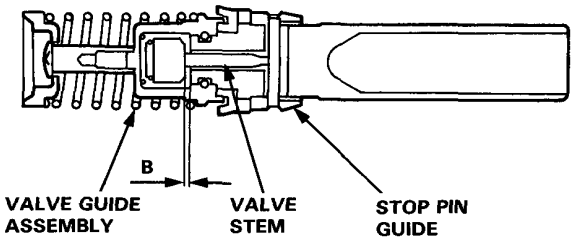
- Reaching through the primary piston stop bolt hole, lightly press on the valve stem to see if it moves smoothly.
- Make sure that the dimension A is 1.85—2.45 mm.

4. Install the spacer, piston cup, O-ring, valve stem and valve spring onto the secondary piston sub-assembly.



5. Install the valve guide assembly to the secondary piston sub-assembly.

SECONDARY PISTON ASSEMBLY



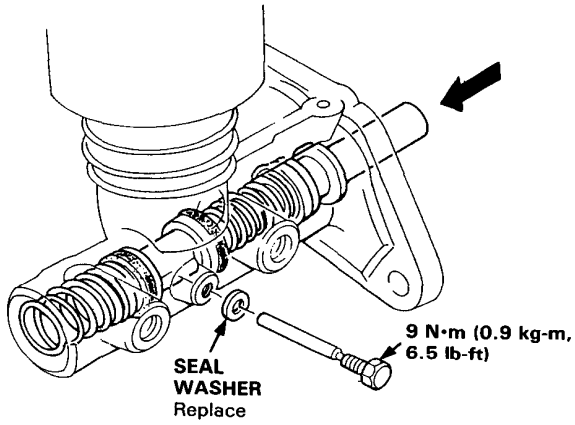
NOTE:
- Install the valve guide assembly after confirming that the dimension B is 0.9—1.5 mm.
- Lightly press the stop pin guide to see if the valve stem moves smoothly.

6. Assemble the primary piston assembly, secondary piston assembly and piston guide assembly in the master cylinder body.

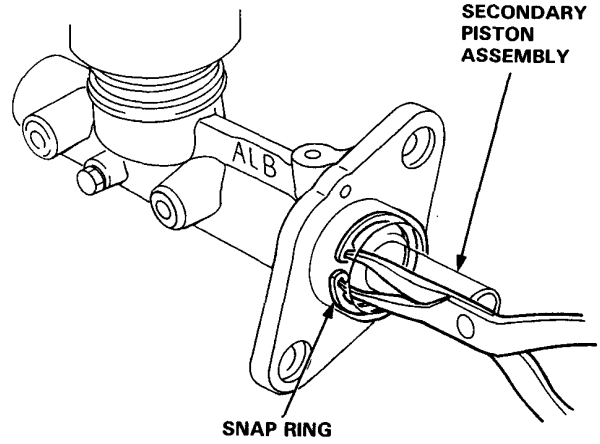
NOTE: Install the primary piston with the slot on the cylinder facing the stop bolt hole side.

7. Push the secondary piston in until the slot aligns with the stop bolt hole, then install and tighten the stop bolt.

CAUTION:
- **Replace the stop bolt seal washer with a new one whenever disassembled.**
- **Apply brake fluid to the inner wall of the cylinder and piston cups, being careful that they are not turned inside out during installation.**

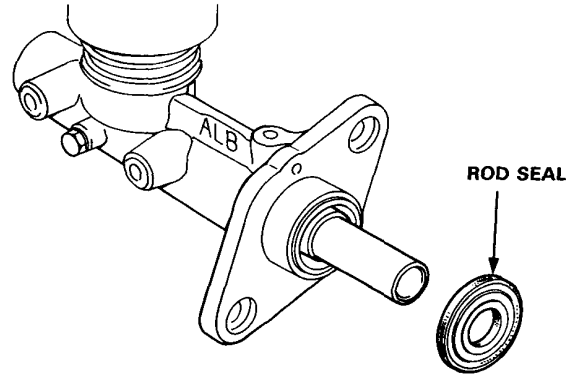


8. Press the secondary piston in and install the snap ring.



CAUTION: Avoid damaging the sliding surface of the secondary piston when installing the snap ring.

9. Install the rod seal.



CAUTION: Make sure that there is no interference between the brake pipes and other parts when installing.

Body Electrical

Outline of Model Changes

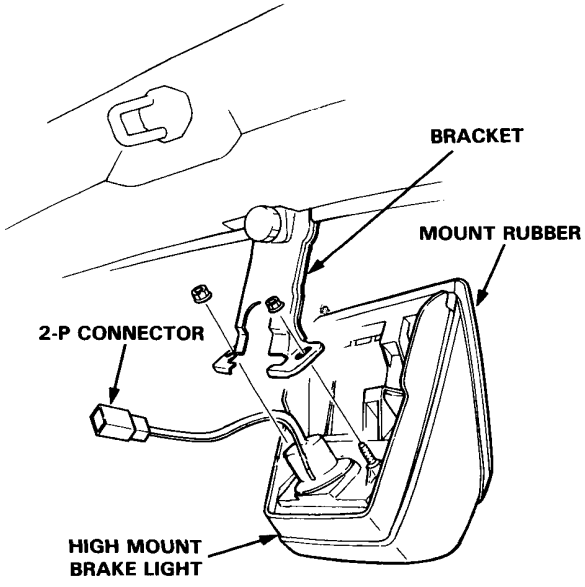
- The high mount brake light has been adopted to KQ model.
- The clutch switch of cruise control system has been changed.
- The headlight washer circuit has been modified.

High Mount Brake Light

Replacement

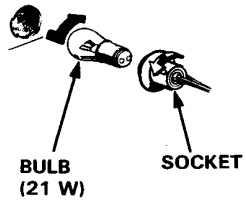
Hatchback:

1. Open the hatch.
2. Unscrew the 2 nuts and disconnect the 2-P connector, then remove the high mount brake light from the bracket.



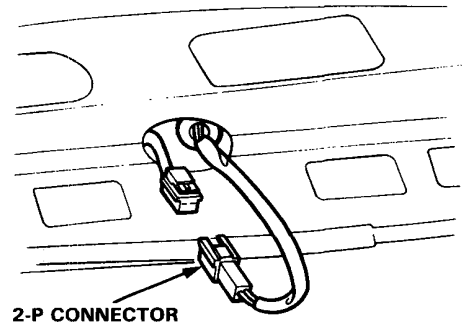
CAUTION: When installing the high mount brake light, make sure the mount rubber is sealed evenly to the rear window glass.

3. If necessary, replace the bulb.

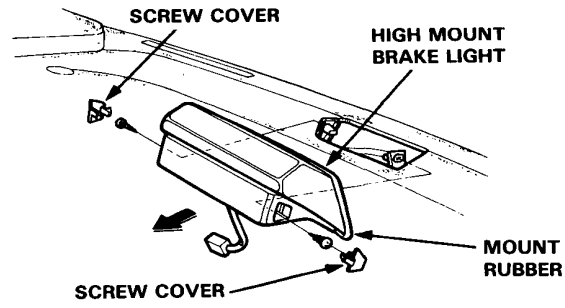


Sedan:

1. Open the trunk lid.
2. Disconnect the 2-P connector.

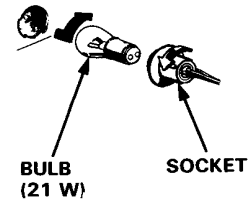


3. Remove the 2 screw covers and screws, then remove the high mount brake light on the rear shelf.

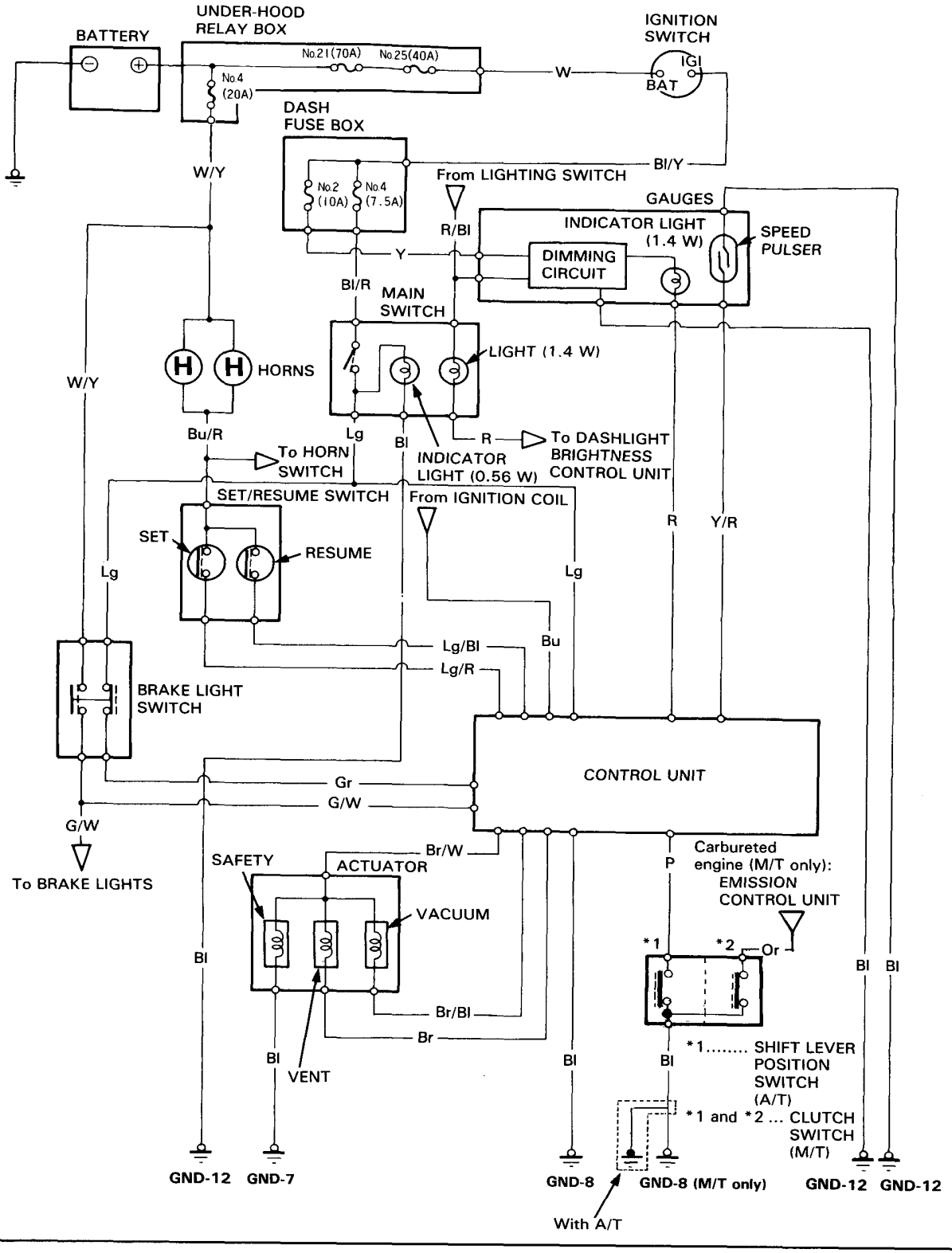


CAUTION: When installing the high mount brake light, make sure the mount rubber is sealed evenly to the rear window glass.

4. If necessary, replace the bulb.



Wiring Diagram

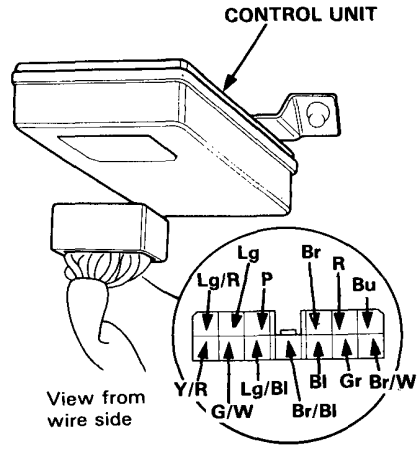


Cruise Control

Control Unit Input Test

Lower the fuse box and disconnect the 13-P connector from the control unit.
Make the following tests at the harness pins:

NOTE: Replace the control unit if all input tests prove OK.

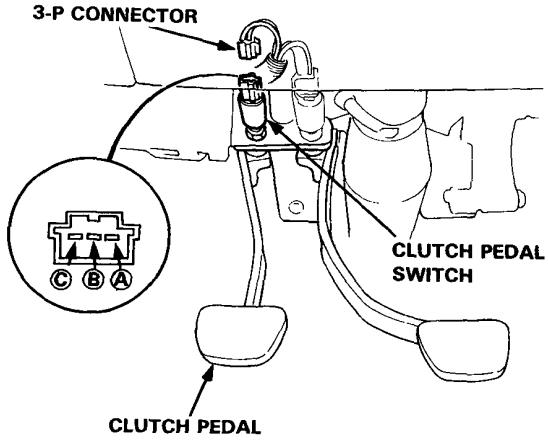


Wire	Test condition	Test: desired result	Possible cause (if result is not obtained)
Bl	Under all conditions	Check for continuity to ground: should be continuity.	Poor ground. An open in the wire.
Lg	Ignition switch ON and main switch ON	Check for voltage to ground: should have battery voltage.	An open in the wire. Faulty main switch. Blown No. 4 (7.5A) fuse.
Lg/Bl	Resume switch pushed	Ground each terminal: Horns should sound as the switch is pushed.	An open in the wire. Faulty SET/RESUME switch Faulty slip ring. Faulty horn. Blown No. 4 (20A) fuse
Lg/R	Set switch pushed		
P	M/T: Clutch pedal not pushed A/T: Shift lever in 2, D^3 or D^4	Check for continuity to ground: should be continuity.	Poor ground. An open in the wire. Faulty or misadjusted clutch switch (M/T). Faulty shift lever position switch.
Bu	Start the engine	Check for voltage to ground: should have battery voltage	An open in the wire. Faulty ignition system.
Y/R	Raise the front of the car and rotate one wheel. or remove the speedometer cable from the transmission and turn slowly by hand.	Check resistance in both directions between Y/R and Bl wires. There should be continuity in only one direction. 4 times per cable revolution or 23 times per 10 wheel revolutions.	Faulty speed pulser in speedometer. An open in the wire. Poor ground.
Gr	Ignition switch ON, main switch ON and brake pedal pushed, then released	Check for voltage to ground: There should be 0 V with the pedal pushed and battery voltage with the pedal released.	An open in Gr wire circuit. Faulty brake light switch.
G/W	Brake pedal pushed, then released	Check for voltage to ground: There should be battery voltage with the pedal pushed, and 0 V with the pedal released.	An open in G/W wire circuit. Blown No. 4 (20A) fuse. Faulty brake light switch.
R	Ignition switch ON	Attach R wire to ground: Indicator light in dash should come on.	Blown bulb. An open in R wire circuit. Faulty dimming circuit in gauges Blown No. 2 (10A) fuse.
Br	Under all conditions	Resistance to ground: should be 80—120 Ω.	Open or short in Br wire. Faulty actuator solenoid.
Br/Bl	Under all conditions	Resistance to ground: should be 80—120 Ω.	Open or short in Br/Bl wire. Faulty actuator solenoid.
Br/W	Under all conditions	Resistance to ground: should be 40—60 Ω.	Open or short in Br/W wire. Faulty actuator solenoid.

Clutch Switch Test

1. Disconnect the 3-P connector from the switch.
2. Check for continuity between the terminals according to the table.

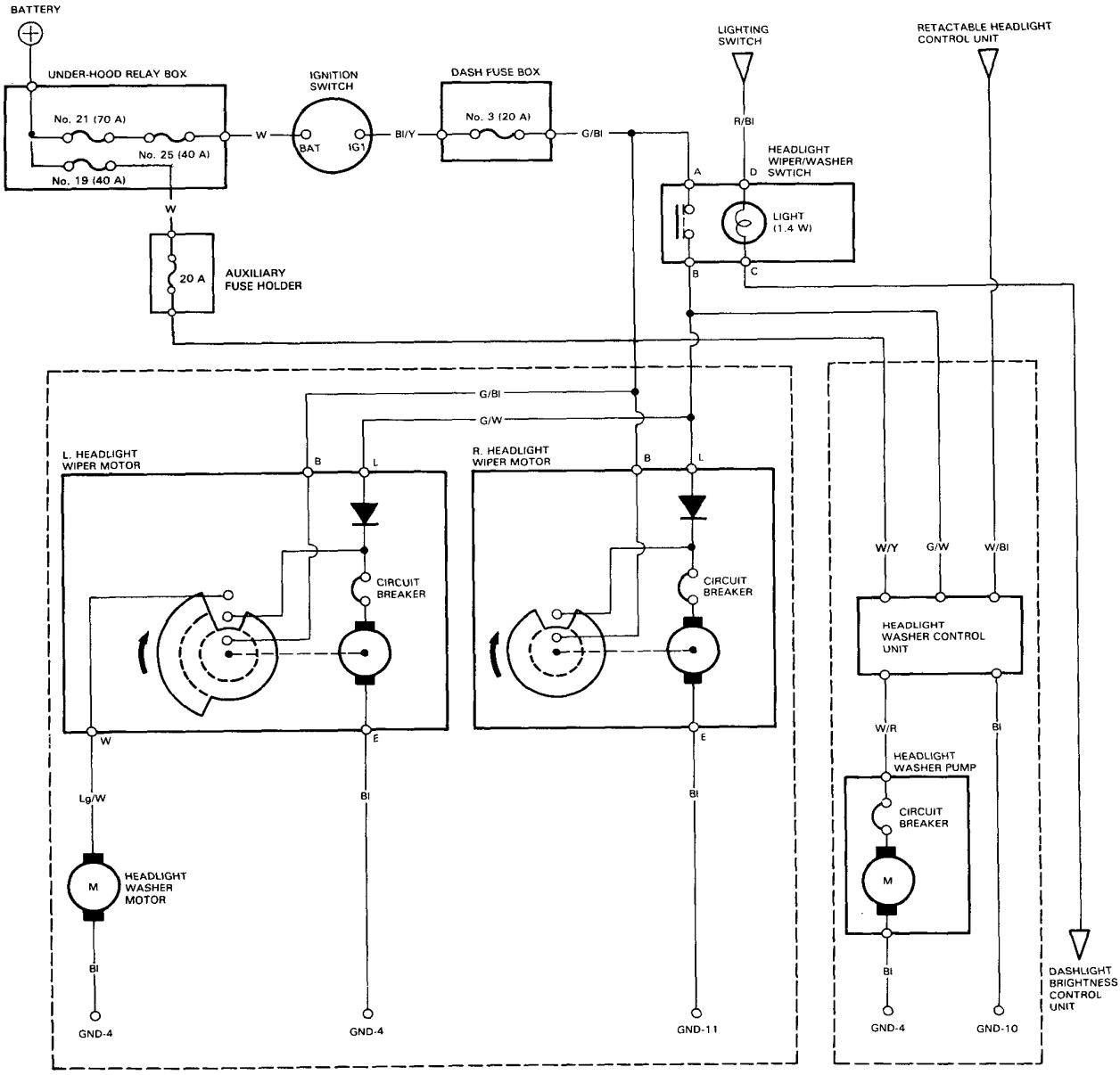
Terminal / Clutch Pedal	Ⓐ	Ⓑ	Ⓒ
RELEASED	○	○	○
PUSHED			



3. If necessary, adjust pedal height (section 13) or replace the switch.

Wiring Diagram

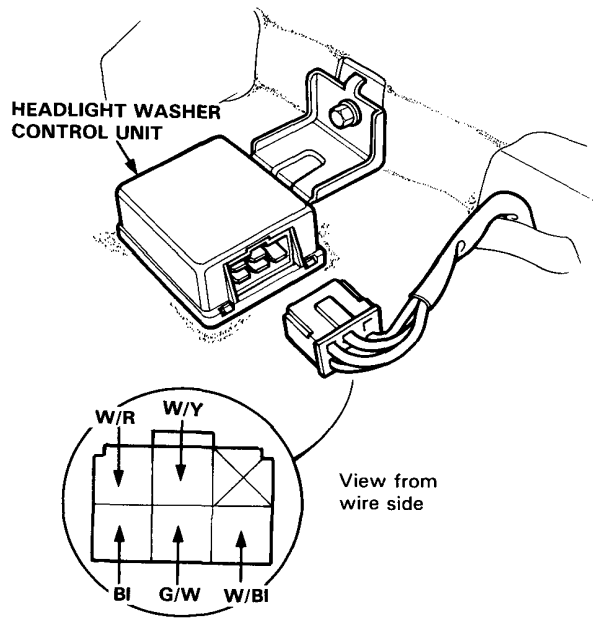
Headlight Wiper/Washer:



Headlight Washer Control Unit Input Test

Disconnect the 6-P connector from the control unit under the front passenger's seat.
Make the following input tests at the harness pins.
If all tests prove OK, yet the headlight washer still fails to work, replace the control unit.

NOTE: Before testing, check the No. 3 (20A) fuse in the dash fuse box.



No.	Wire	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	Bl	Under all conditions.	Check for continuity to ground: should be continuity.	• Poor ground. • An open in the wire.
2	W/Y	Under all conditions.	Check for voltage to ground: should be battery voltage.	• Blown Aux. fuse holder (20A) fuse. • An open in the wire.
3	G/W	Ignition switch and headlight washer switch ON.	Check for voltage to ground: should be battery voltage.	• Faulty headlight washer switch. • An open in the wire.
4	W/R	Connect battery positive wire to W/R terminal and negative to ground.	Check pump operation: Pump should run as the battery is connected.	• Faulty headlight washer pump. • An open in the wire. • Poor ground.
5	W/Bl	Headlight ON.	Check for voltage to ground: should be battery voltage.	• An open in the wire. • Faulty retractable headlight control unit.