

# 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 section 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.

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HONDA MOTOR CO., LTD.  
Service Publication Office

General Info



Special Tools



Specifications

specs

Maintenance



Engine



Cooling



Fuel and  
Emission Controls



Transaxle



Steering



Suspension



Brakes



Body



Heater and  
Air Conditioner



Electrical





## General Information

Chassis and Engine Codes .....	1-2
Identification Number Locations .....	1-3
Label Locations .....	1-4
Lift and Support Points .....	1-5
Towing .....	1-8
Preparation of Work .....	1-9



# Chassis and Engine Codes

## Vehicle Identification Number

JHMCA53400C000001

### Model Name

CA4: Accord 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

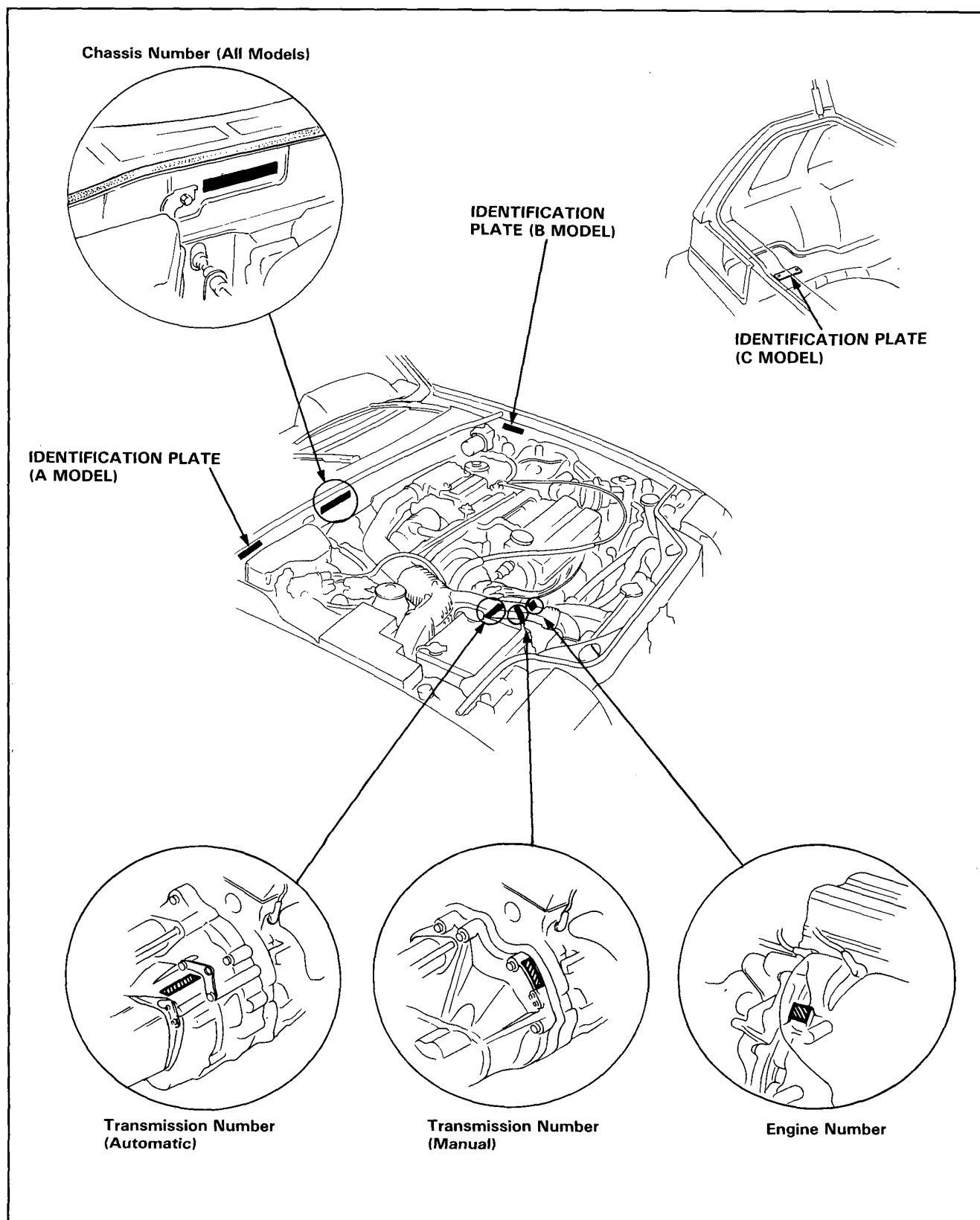
### Transmission Type

F4: with 2000 Engine  
C9: with 1600 Engine

### Serial Number



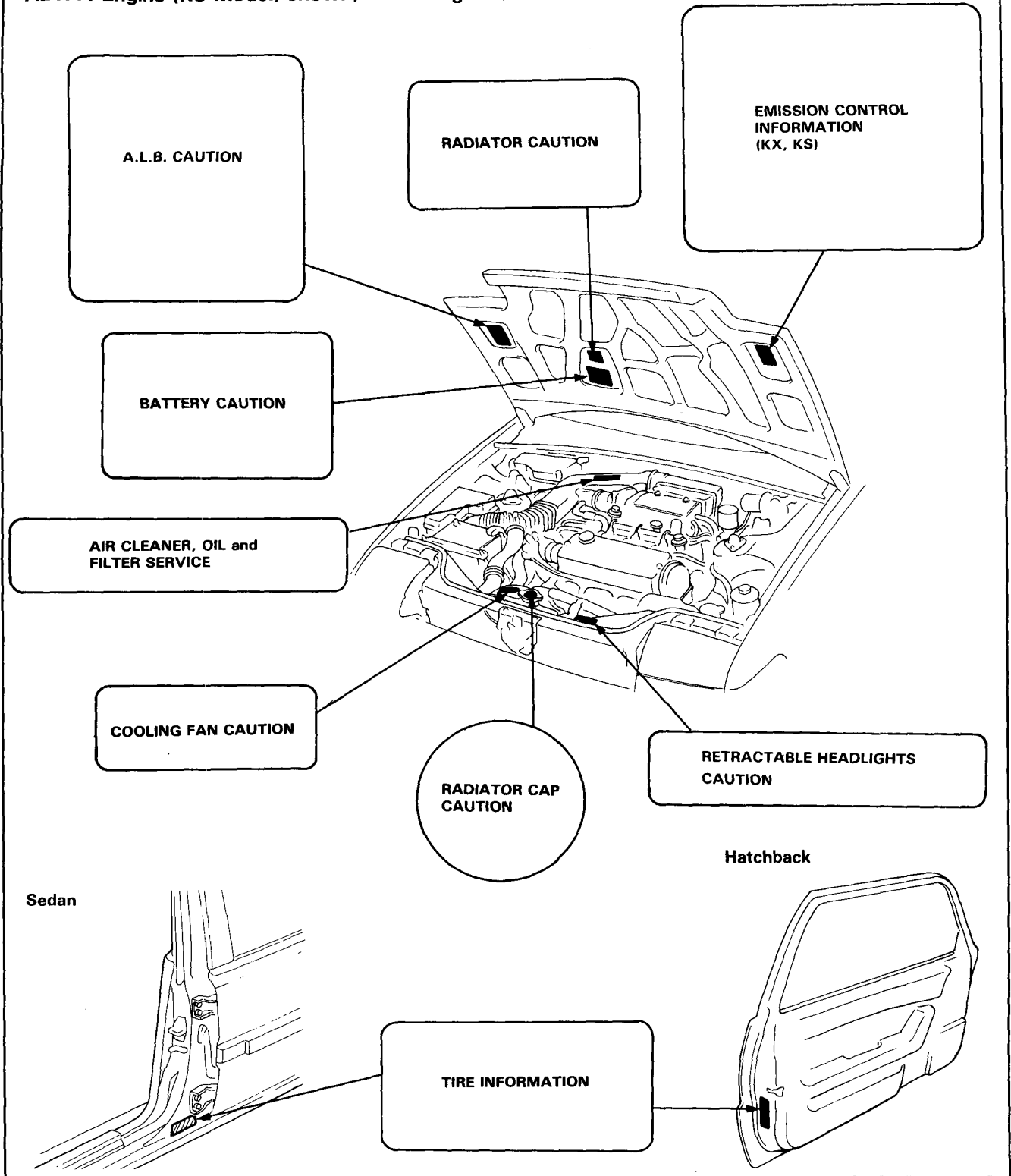
# Identification Number Locations





# Label Locations

A20A4 Engine (KS Model) shown; Other Engine similar





# Lift and Support Points

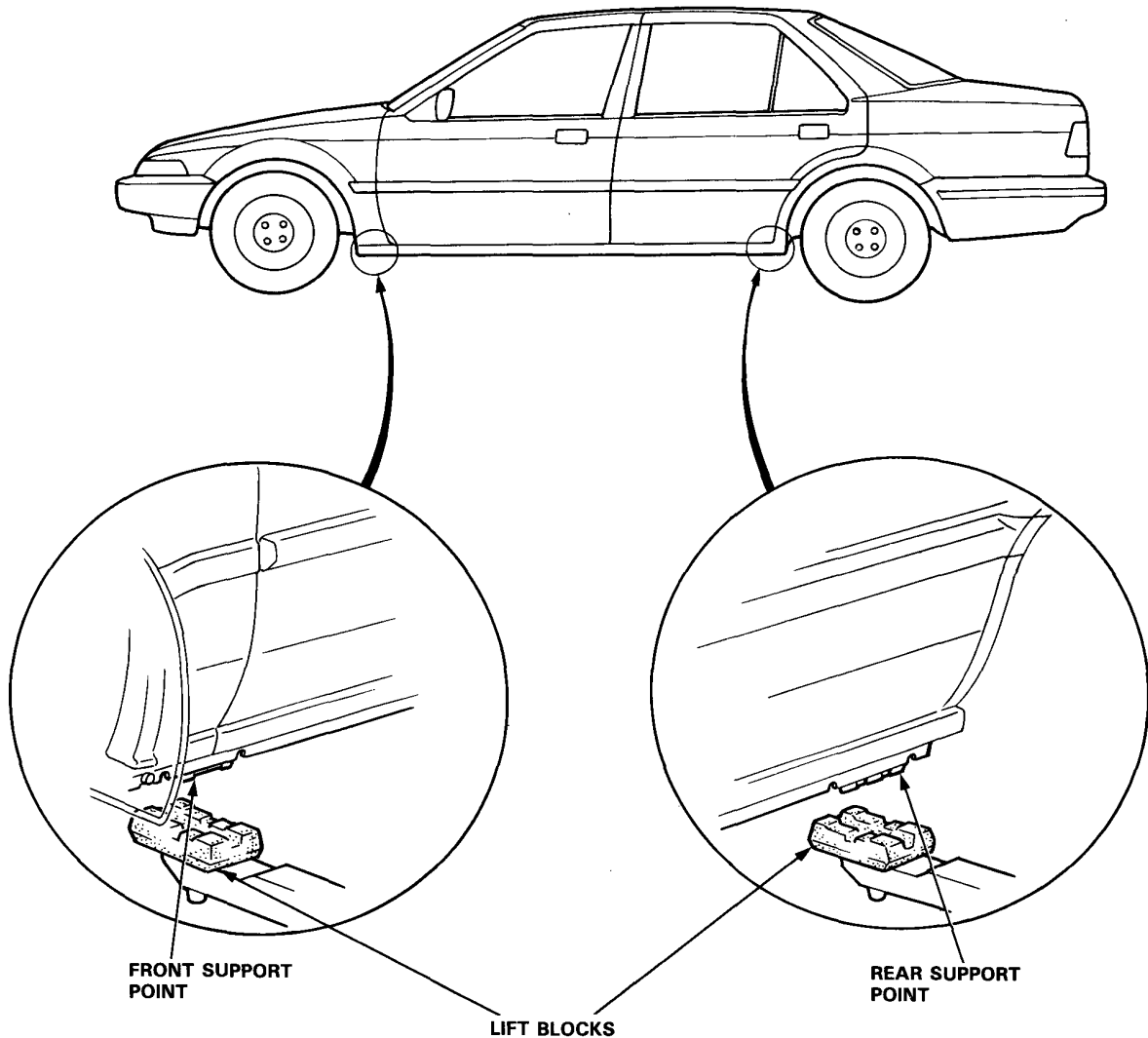


## Hoist

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)

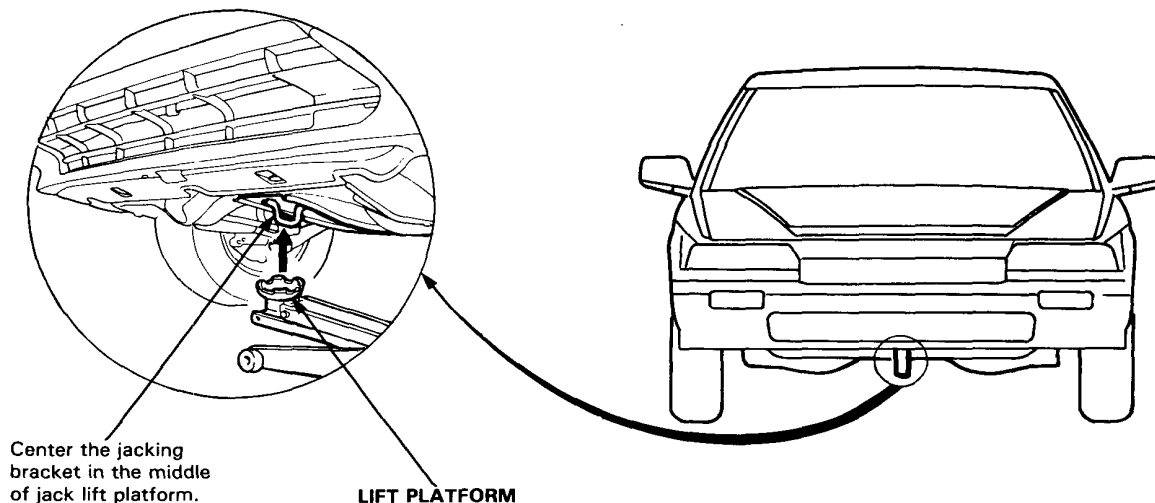
## Floor Jack

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.

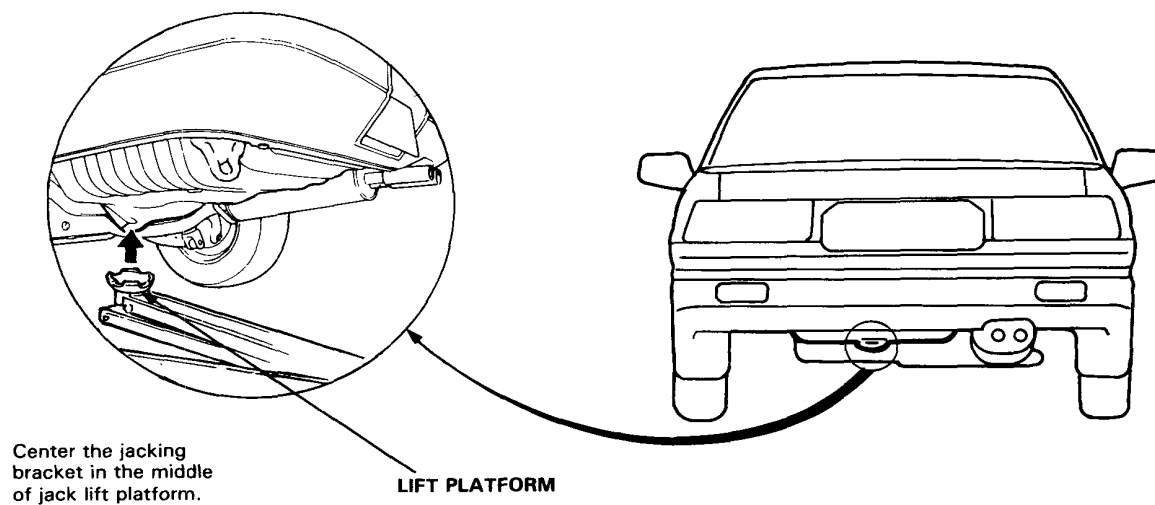
### WARNING

- 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



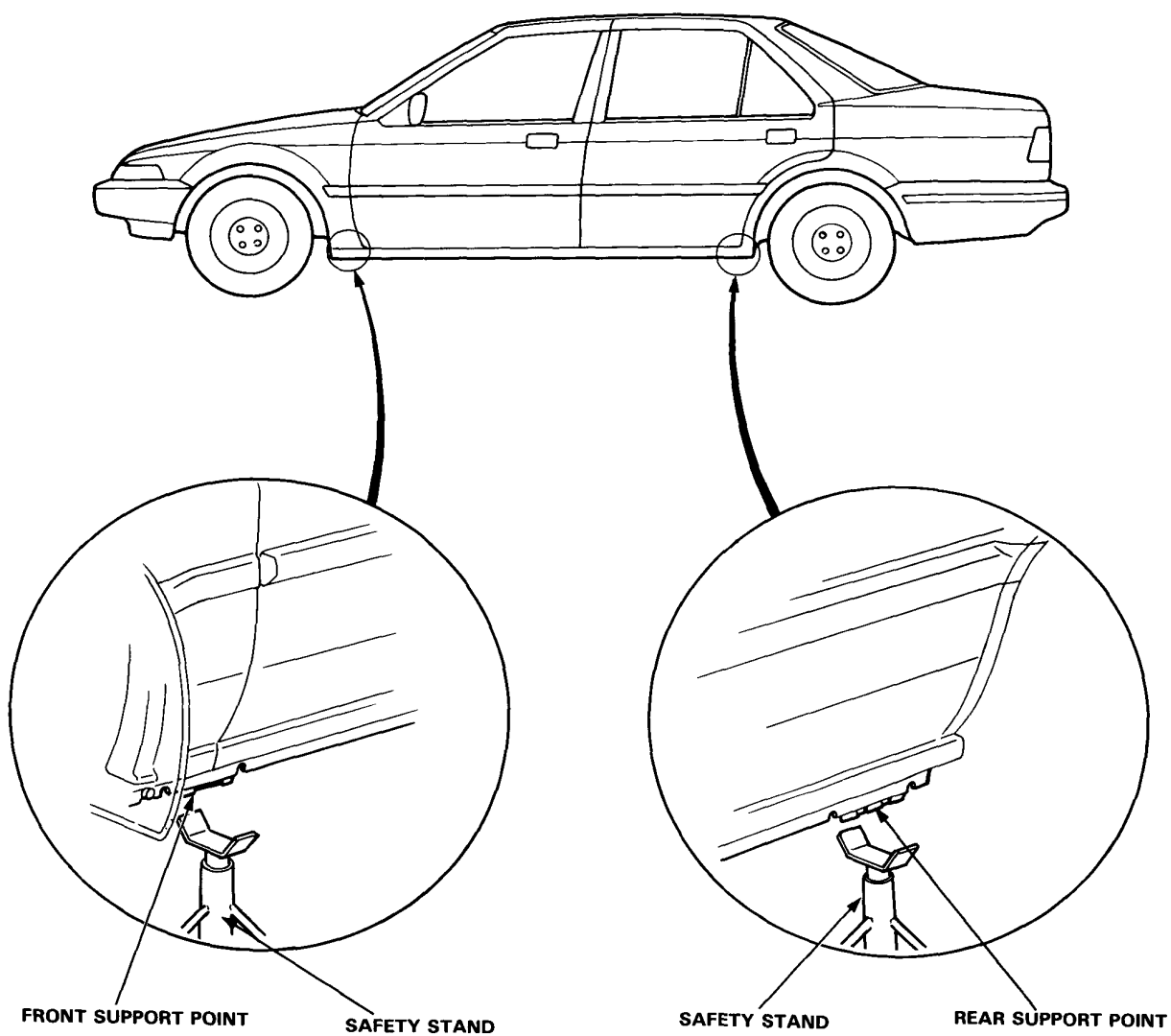
## Rear







## Safety Stands





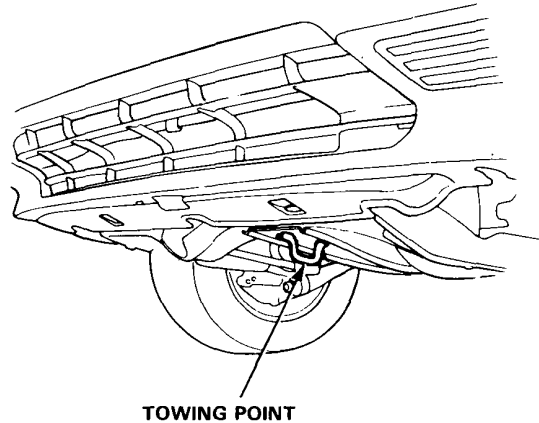
# Towing

## 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).

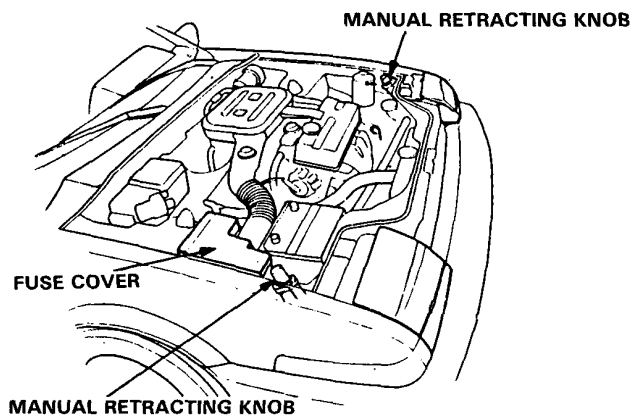




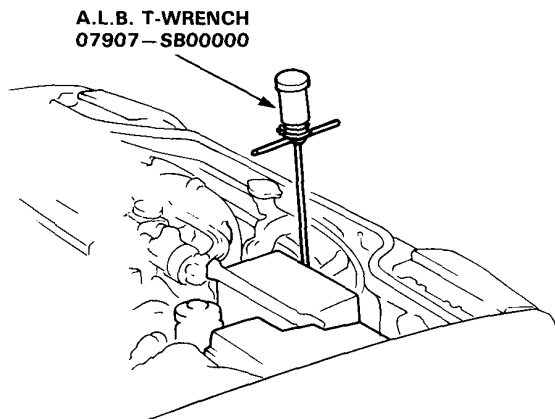
# Preparation of Work

## 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.

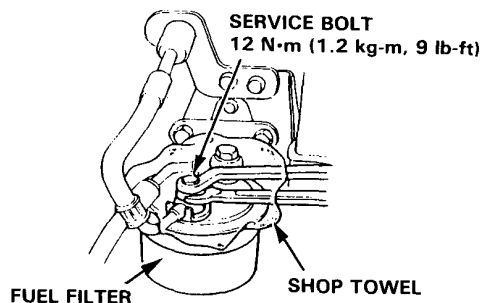


2. For cars equipped with A.L.B., the high-pressure brake fluid must be drained before disassembly of the A.L.B. piping system. When this is not done, danger may be caused by brake fluid squirting out under high pressure. For draining of the high-pressure brake fluid, refer to Section 20.

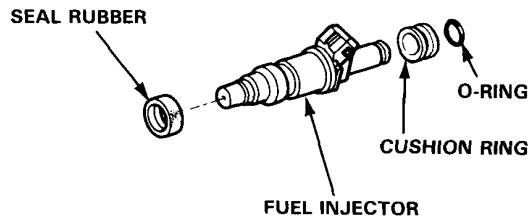


3. Fuel Line Servicing (A20A4 Engine)

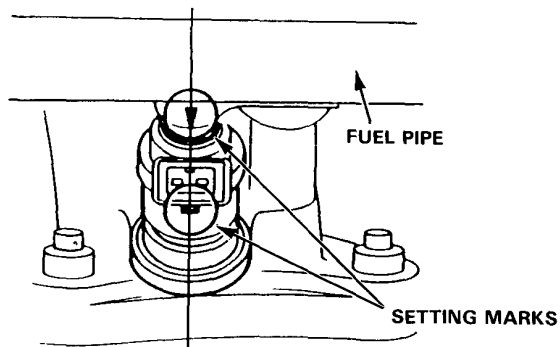
- Relieve fuel pressure by loosening the service bolt provided on the top of the fuel filter before disconnecting a fuel hose or a fuel pipe.



- 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)



# Preparation of Work

## Special Caution Items For This Car (cont'd)

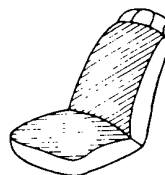
4. Inspection for fuel leakage
  - After assembling fuel line parts, turn ON the ignition switch (do not operate the starter) so that the fuel pump is operated for approximately two seconds and the fuel is pressurized. Repeat this operation two or three times and check whether any fuel leakage has occurred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

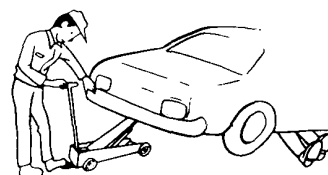
  - The antenna and the body of the radio must be at least 200 mm (7.9 in.) away from the computer. (The computer installation position is under the right side seat.)
  - Do not lead the antenna feeder and the coaxial cable over a long distance parallel to the wiring, and when crossing with the wiring 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.



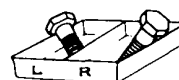
2. Work safely and give your work your undivided attention. When either the front or rear wheels are to be raised, block the remaining wheels securely. Exchange signals as frequently as possible when a work involves two or more workers. Do not run the engine unless the shop or working area is well ventilated.



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.



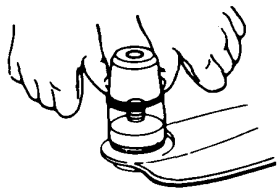
Mark or place all removed parts in order in a parts rack so they can be placed back to their original places or parts from which they were removed or with which they were mated.





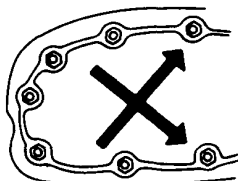


4. Use special tool when use of such a tool is specified.

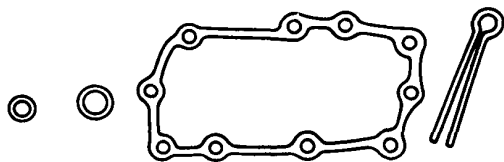


5. Parts must be assembled with the proper looseness or tightness according to the maintenance standards established.

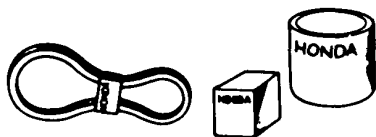
6. When tightening bolts or nuts, begin on center or large diameter bolts and tighten them in crisscross pattern in two or more steps if necessary.



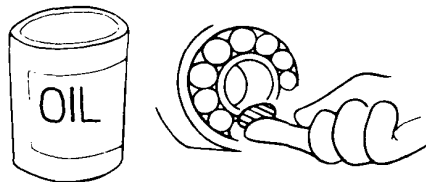
7. Use new packings, gaskets, O-rings and cotter pins whenever reassembling.



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

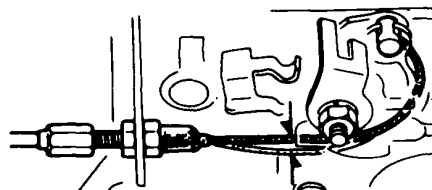
- When replenishing the system, use extreme care not to allow dust and dirt from entering the inside.
- Do not mix different brands of fluid as they may not be compatible.
- Do not reuse drained brake fluid.
- Brake fluid can cause damage to the painted surfaces. Wipe up spilled fluid at once.
- After 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 from 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.

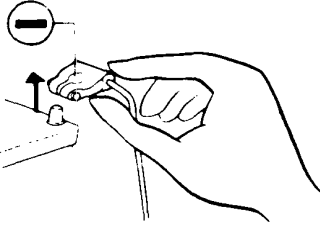




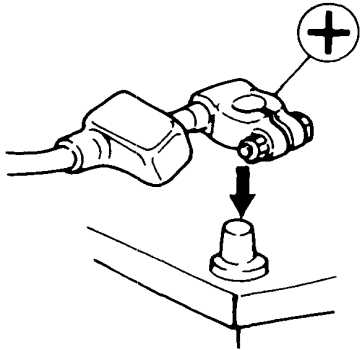
# Preparation of Work

## Electrical

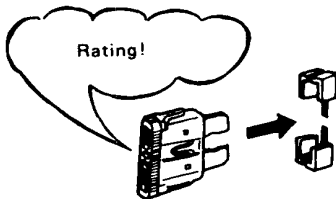
- Before making any repairs on electric wires or parts, disconnect the battery cables from the battery starting with the negative (-) terminal.



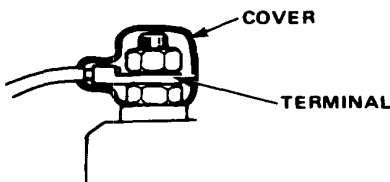
- After making repairs, check each wire or part for proper routing and installation. Also check to see that they are connected properly.
- Always connect the battery positive (+) cable first, then connect the negative (-) cable.



- 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.

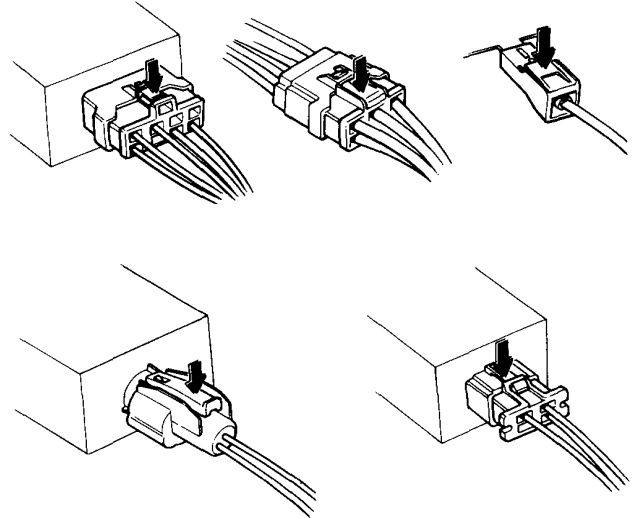


- Be sure to install the terminal cover over the connections after a wire or wire harness has been connected.

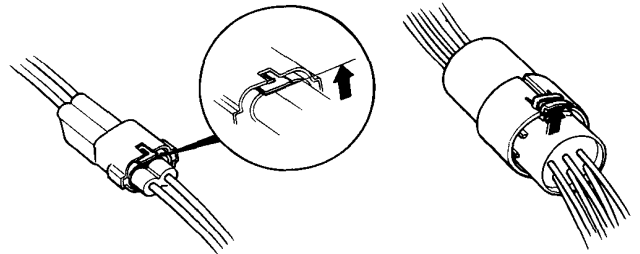


- When removing locking couplers, be sure to disconnect the lock before performing work.
- Couplers may be of two types, those in which the lock is pressed to remove, and those in which the lock is pulled up to remove. Be sure to ascertain the type of locking device before beginning work. The following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

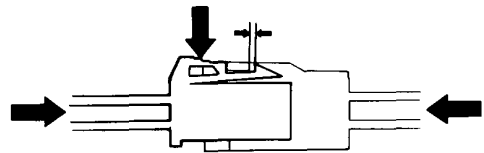
**Press to disengage:**



**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.



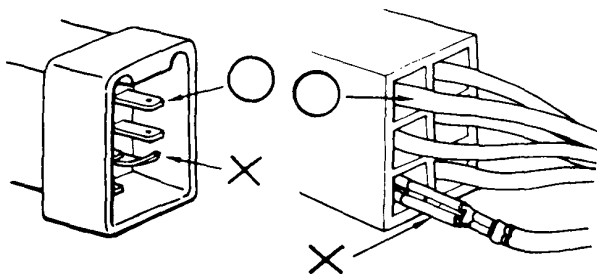




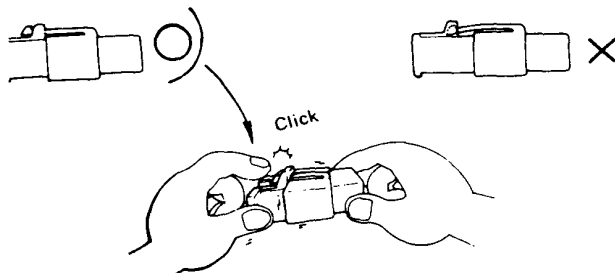
- When disconnecting a coupler, pull it off from the mating coupler by holding on both couplers.
- Never try to disconnect couplers by pulling on their wires.



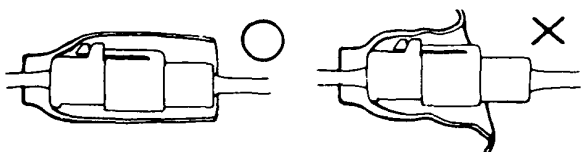
- Before connecting couplers, check to see that the terminals are in place and are not bent or distorted.



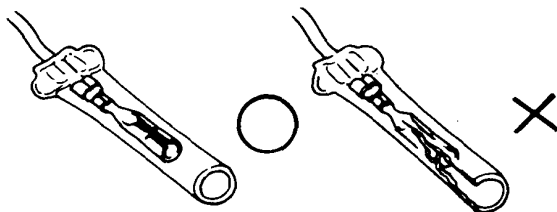
- Insert couplers fully until they will no longer go.
- Some couplers have locking tabs that must be aligned and engaged securely.
- Don't use wire harnesses with a loose wire or coupler.



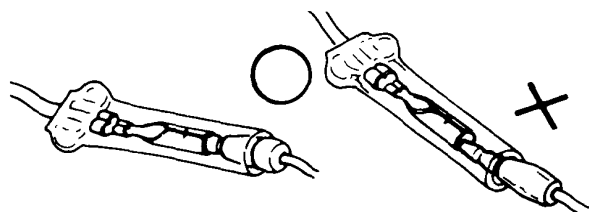
- Place the plastic cover over the mating coupler after reconnecting. Also check that the end is not inverted.



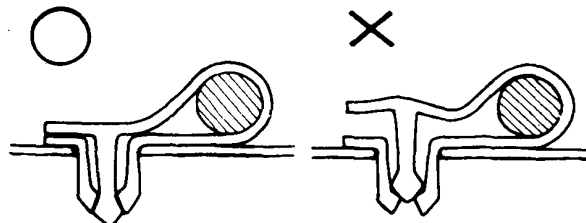
- Before connecting, check each connector cover for breakage. Also make sure that the female connector is tight and not pried open from the previous use.



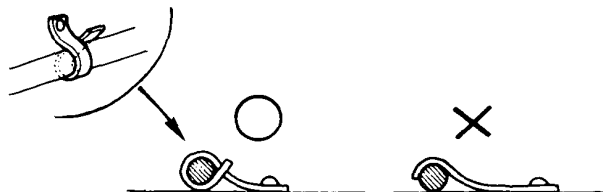
- Insert male connectors into the female connectors fully until they will no longer go.
- Be sure that plastic cover is placed over the connection.
- Don't place the opening of each plastic cover facing up.



- 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.



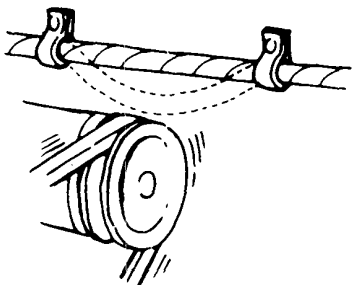
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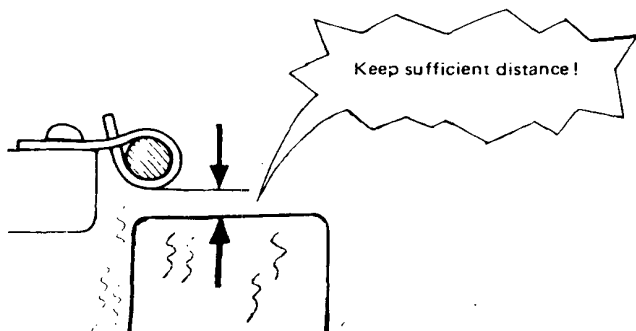
# Preparation of Work

## Electrical (cont'd)

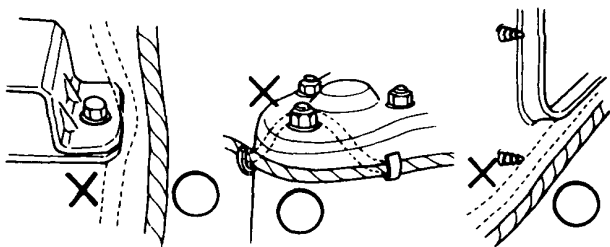
- After clamping, check each harness to be certain that it is not interfering with any moving or sliding parts of the vehicle.
- Keep wire harnesses away from the exhaust pipes and other hot parts.



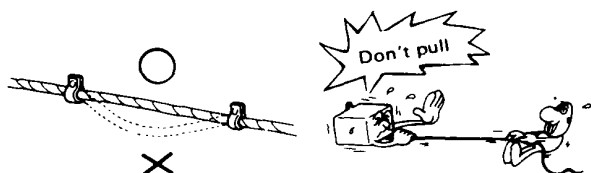
- Always keep a safe distance between wire harnesses and any heated parts.



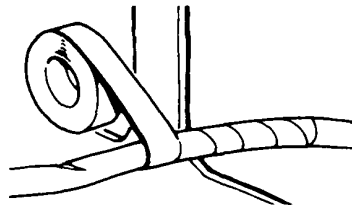
- Do not bring wire harnesses in direct contact with sharp edges or corners.
- Also avoid contact with the projected ends of bolts, screws and other fasteners.



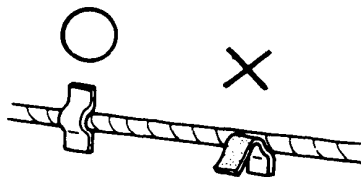
- Route harnesses so they are not pulled taut or slackened excessively.



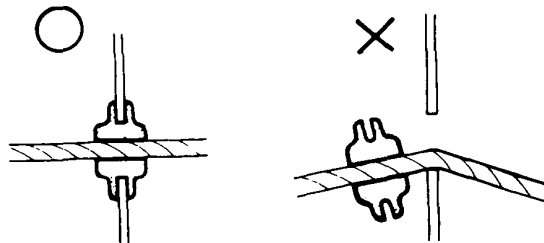
- Protect wires and harnesses with a tape or tube if they are in contact with a sharp edge or corner.



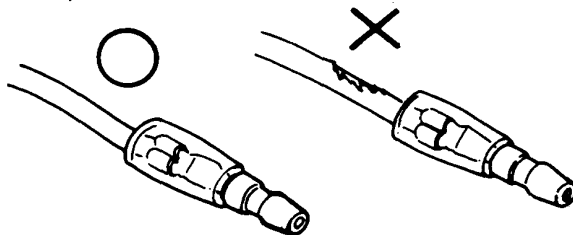
- Clean the attaching surface thoroughly if a plaster is used. Use a spirit wipe if necessary.



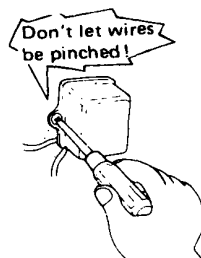
- Seat grommets in their grooves properly.



- 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.



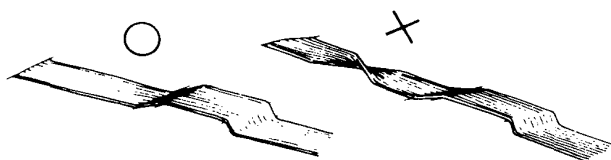
- After installing parts, make sure that wire harnesses are not pinched.



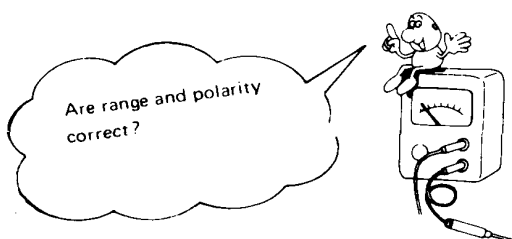




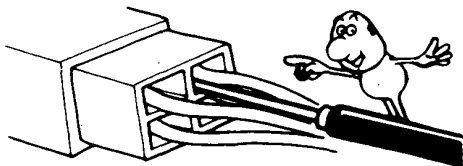
- After routing, check that the wire harnesses are not twisted or kinked.



- Wire harnesses should be routed so that they are not pulled taut, slackened excessively, pinched, or interfered 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 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

Newly Provided Tools ..... 2-2

Special Tools

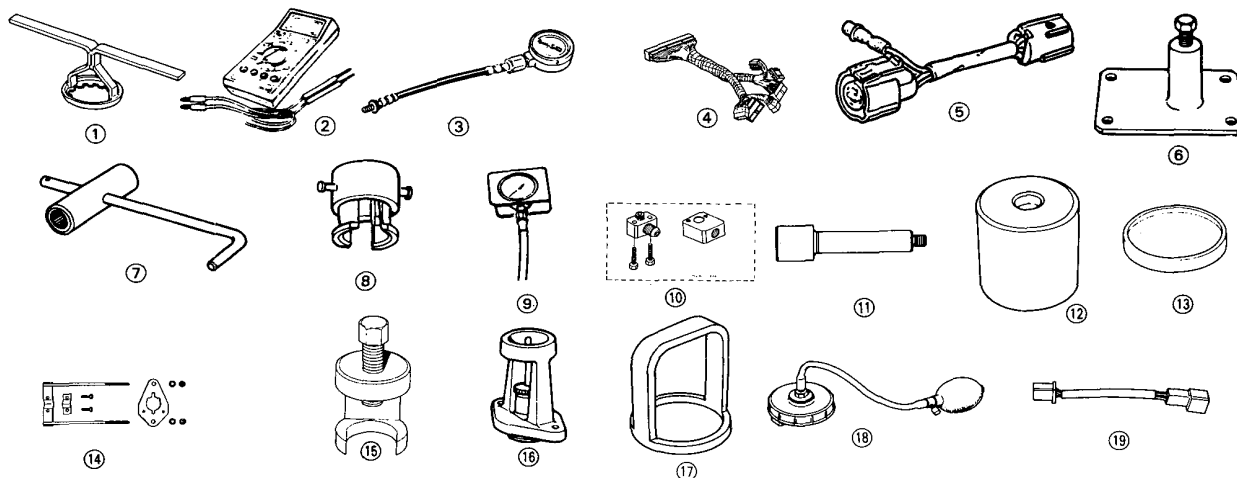
(Common with Other Models) ... 2-2



# Special Tools

## Newly Provided Tools

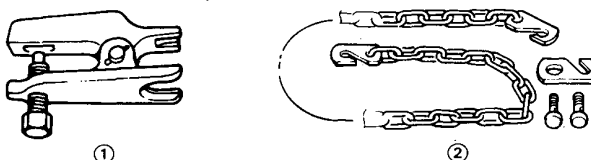
Ref. No.	Tool Number	Description	Q'ty	Remarks	Section
①	07GAC—SE00200	Fuel Sender Wrench	1		11
②	07411—0020000	Digital Circuit Tester	1		11
③	07406—0040000	Fuel Pressure Gauge Set	1		11
④	07999—PD6000A	System Checker Harness	1		11
⑤	07GAZ—SE00300	R.P.M. Connecting Adaptor	1		11
⑥	07GAC—PF40100	Transmission 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	



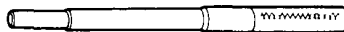
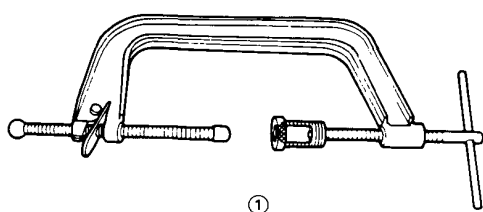




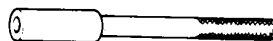
## Special Tools (Common with Other Models)

### 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 07742-0010200 may also be used
②	07942-6110000	Valve Guide Driver/Remover	1	
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



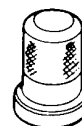
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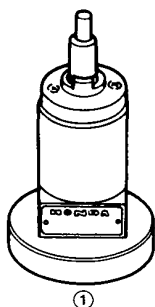
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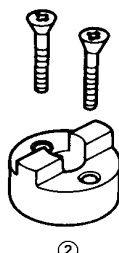
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### 7. Engine Block

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



①



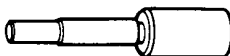
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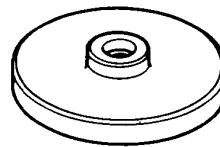
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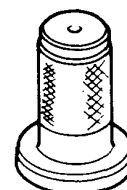
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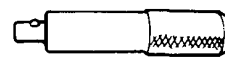
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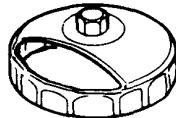


# Special Tools

## 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

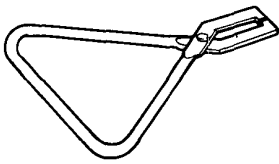


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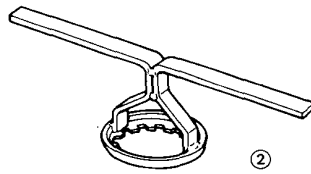
### 11. Fuel and Carburetor

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

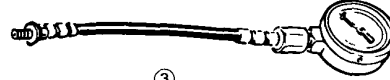
\* Newly Provided Tools



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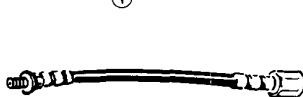
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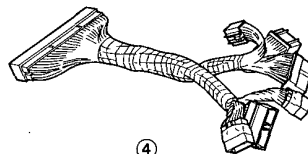
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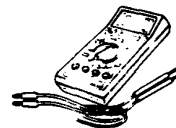
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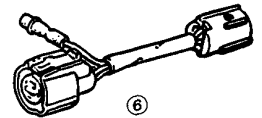
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④



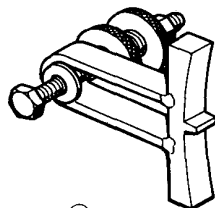
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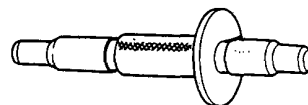
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### 13. Clutch

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

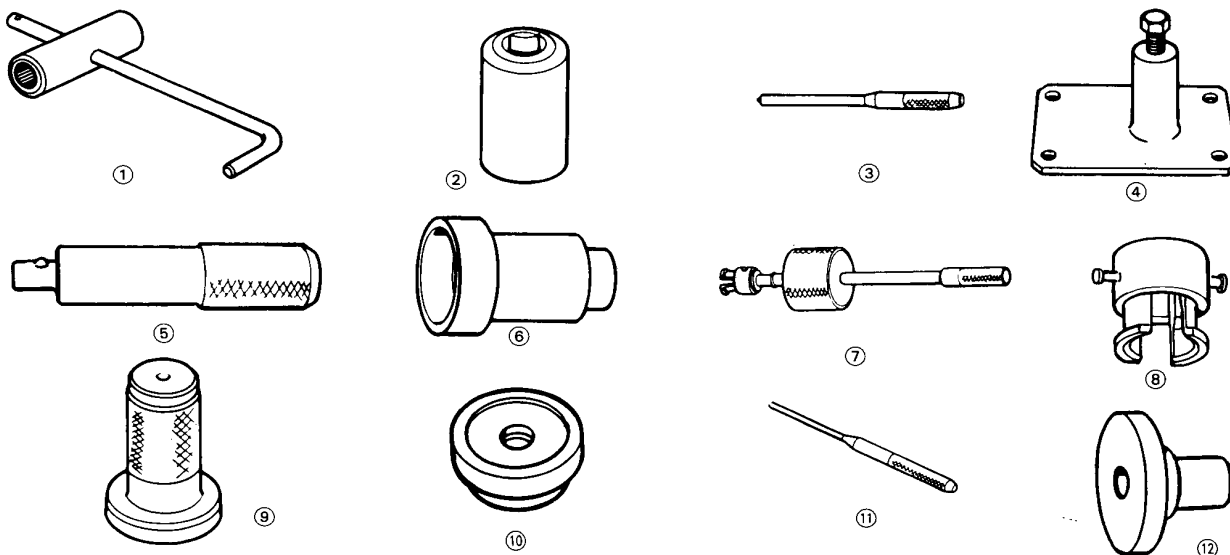




#### 14. Manual Transmission

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



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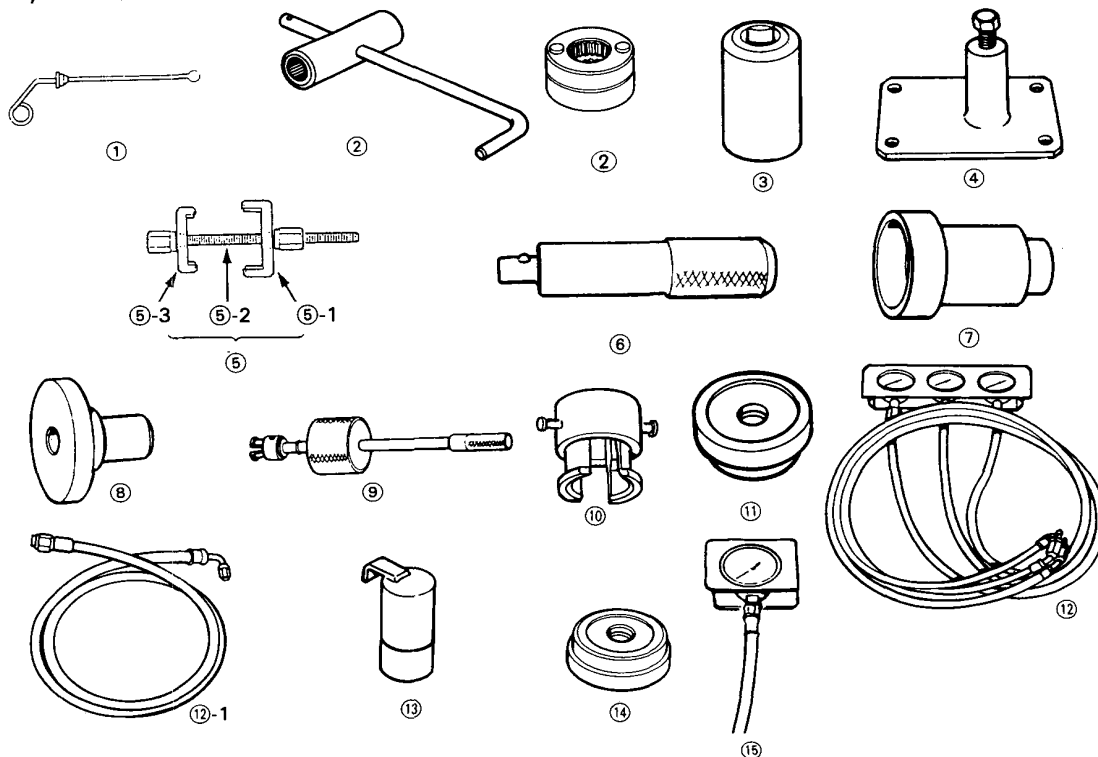
# Special Tools

## 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 with F4 Transmission (2000 Engine) with C9 Transmission (1600 Engine) 07907-6890100 may also be used
*②	07GAB-PF50100	Mainshaft Holder	1	
②	07923-6890202	Mainshaft Holder	1	
③	07907-PD10000	Socket Wrench 30 mm	1	
*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	
⑦	07947-6340500	Driver Attachment	1	07949-6110000 may also be used
⑧	07947-6110500	Driver Attachment E	1	
⑨	07936-6340000	Bearing Remover Set	1	Use changed to 07936-6340000 attachment
*⑩	07GAC-PF40210	Bearing Remover Attachment	1	
⑪	07746-0010500	Driver Attachment 62 x 68 mm	1	Component Tool Carbureted Engine Only
⑫	07406-0020003	Oil Pressure Gauge Set	1	
⑫-1	07406-0020201	Oil Pressure Gauge Hose	(3)	
⑬	07998-SA50000	Accelerator Pedal Weight Set 1.5 kg	1	
⑭	07947-6340201	Oil Seal Driver	1	
*⑮	07406-0070000	Low Pressure Gauge	1	

\* Newly Provided Tools

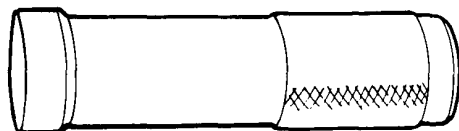




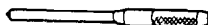


## 16. Differential

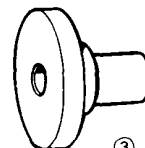
Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07746-0030100	Driver C	1	07949-6110000 may also be used
②	07944-SA00000	4 mm Pin Punch	1	
③	07947-6110500	Oil Seal Driver	1	
④	07749-0010000	Driver	1	
⑤	07947-6340500	Driver Attachment E	1	



①



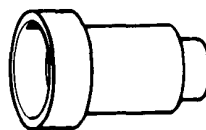
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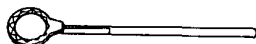
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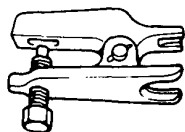
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## 17. Steering

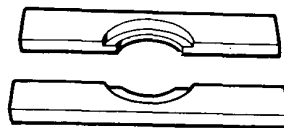
Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07916-SA50001	Steering Gearbox Locknut Wrench	1	
②	07941-6920002	Ball Joint Remover	1	
③	07965-6340301	Front Hub Dis/Assembly Tool Base A	1	
④	07746-0010300	Driver Attachment 42 x 47 mm	1	
⑤	07974-SA50800	Clip Guide (B)	1	



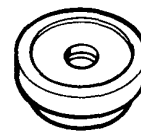
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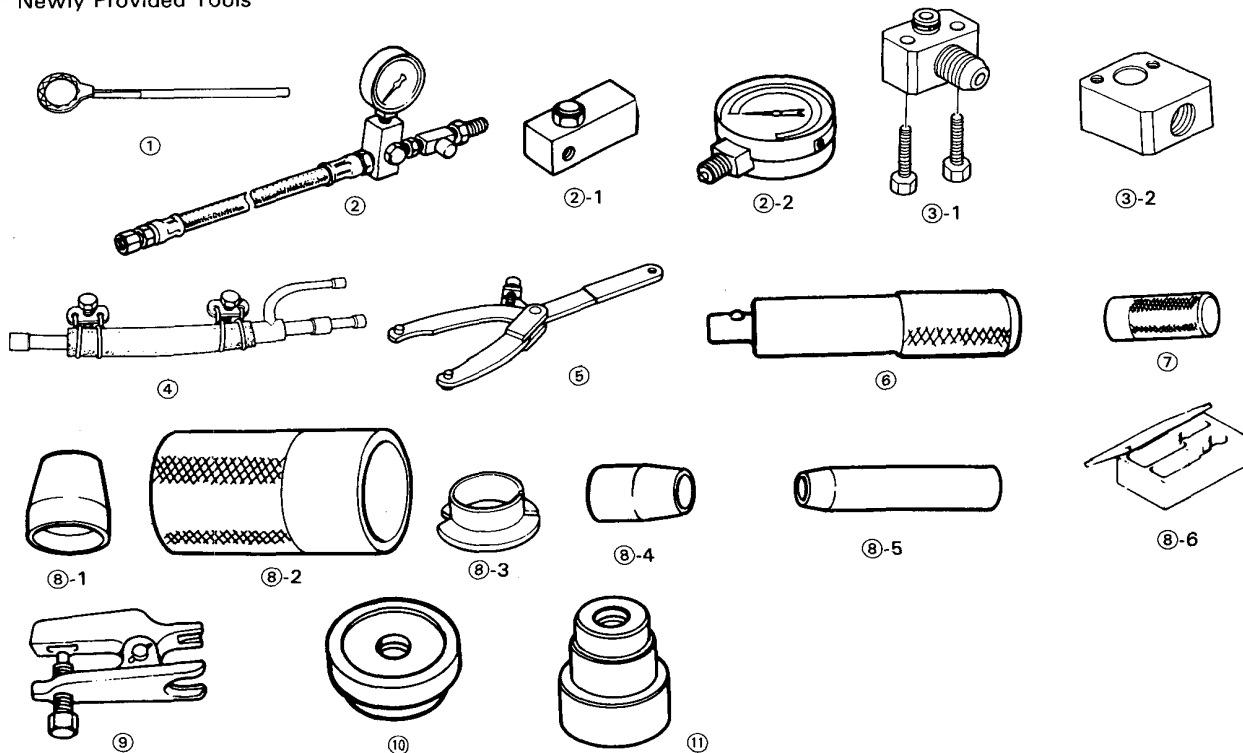
# Special Tools

## 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	Component tools
②	07406—0010200	PS. Pressure Gauge Assy.	1	
②-1	07406—0010300	Oil Pressure Control Valve	(1)	
②-2	07406—0010400	PS. Pressure Meter	(1)	
*③	07GAK—SE00100	Joint Adaptor Kit	1	Component tools
*③-1	07GAK—SE00110	Pump Joint Adaptor	(1)	
*③-2	07GAK—SE00120	Hose Joint Adaptor	(1)	
④	07406—0010101	Bypass Tube Joint	1	07725—0030000 may also be used 07949—6110000 may also be used  PS. Gearbox Overhaul Kit  Component tools
⑤	07725—0010100	Universal Holder	1	
⑥	07749—0010000	Driver	1	
⑦	07953—7190000	Collar Driver	1	
⑧	07900—SA50000	Power Steering Tool Kit	1	
⑧-1	07974—SA50100	Piston Seal-Ring Guide	(1)	
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



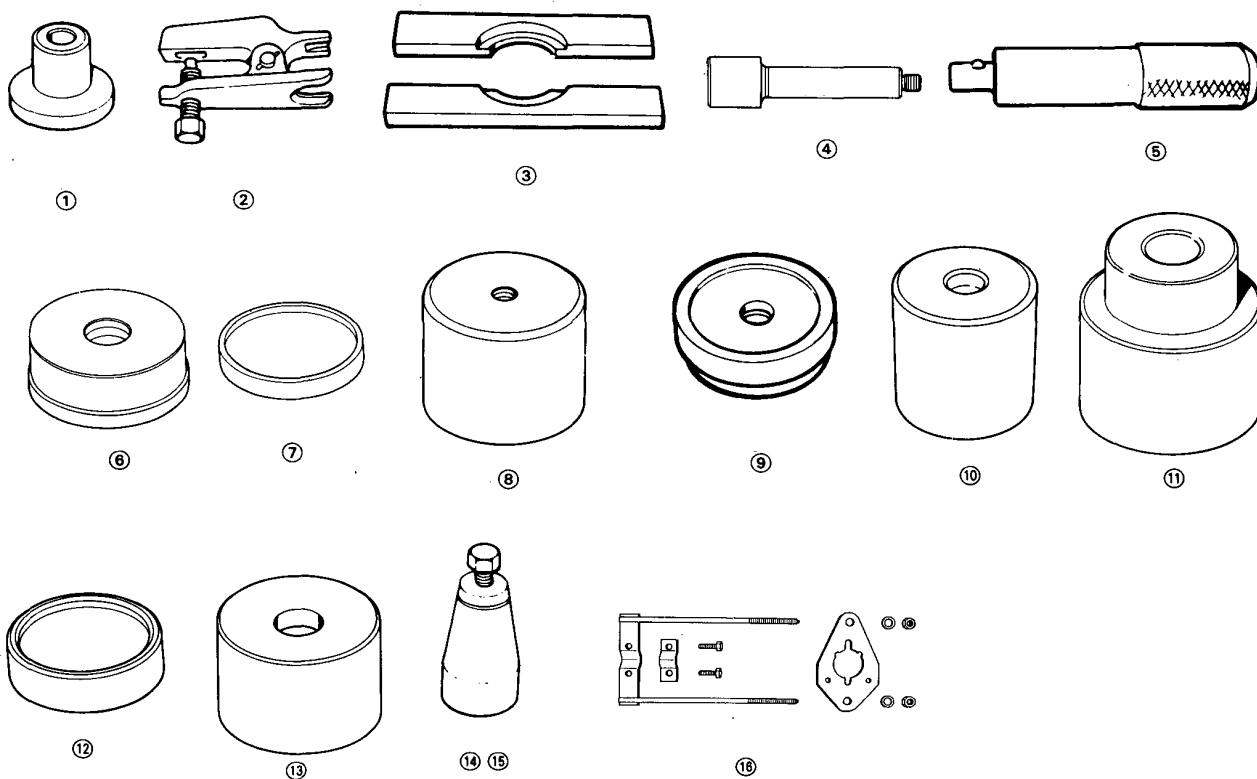




## 19. Suspension

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	Front 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



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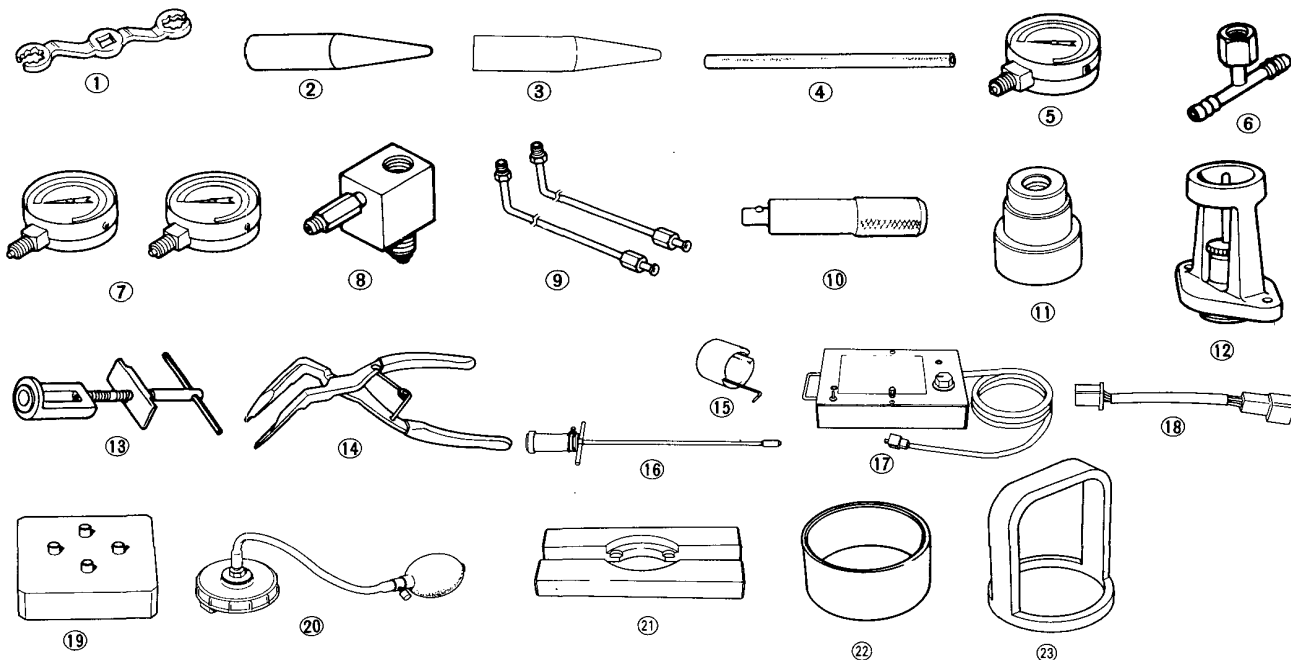


# Special Tools

## Special Tools (Common with Other Models)

20. Brake				
Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07921—0010100	Flare Nut Wrench	1	with 8" Master cylinder with 9" Master cylinder
②	07965—5790300	Cup Guide	1	
③	07965—5790400	Cup Guide	1	
④	07510—6340300	Vacuum Joint Tube A	1	
⑤	07404—5790300	Vacuum Gauge	1	Short parts of the brake power kit 07504—6340100
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	07949—6110000 may also be used
⑩	07749—0010000	Driver	1	
⑪	07947—6890300	Driver Attachment C	1	
*⑫	07GAG—SE00100	Brake Booster Adjusting Gauge	1	
⑬	07960—SA50002	Brake Spring Compressor	1	Rear Caliper
⑭	07914—SA50000	Snap Ring Pliers	1	
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

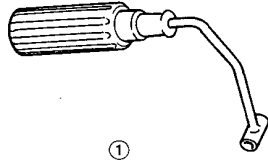






## 21. Body

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





## Specifications

Standards and Service Limits .....	3-2
Design Specifications .....	3-11
Body Specifications .....	3-19



# 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) Other Engines Minimum A20A4 Engine (Expect KS, KX) Other Engines Maximum variation	1,226 kPa (12.5 kg/cm <sup>2</sup> , 178 psi) 1,176 kPa (12.0 kg/cm <sup>2</sup> , 171 psi) 1,030 kPa (10.5 kg/cm <sup>2</sup> , 149 psi) 980 kPa (10.0 kg/cm <sup>2</sup> , 142 psi) 196 kPa (2 kg/cm <sup>2</sup> , 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	38.858 (1.5102)	—
		Automatic	38.604 (1.5198)	—
		IN A	38.796 (1.5274)	—
		IN B	38.858 (1.5102)	—
		EX	38.607 (1.5200)	—
		A20A4 Engine Others	38.858 (1.5102)	—
		EX	38.607 (1.5200)	—
		A20A1 Engine MT	38.477	—
		EX	38.353	—
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)

\* A16A1 Engine only

## Engine Block — Section 7

	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)
Piston	Reboring limit		—	0.5 (0.02)
		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)
			0.030—0.060 (0.0012—0.0024)	0.13 (0.005)
	Piston-to-ring clearance	Top	0.030—0.055 (0.0012—0.0022)	0.13 (0.005)
		2nd	*0.02—0.05 (0.0008—0.0020)	0.13 (0.005)
	* Top and 2nd			
Piston ring	Ring end gap	Top	A20A1 Engine A16A1 Engine	0.15—0.35 (0.006—0.014) 0.20—0.37 (0.008—0.015)
			Others	0.20—0.35 (0.008—0.014)
		2nd	A16A1 Engine	0.20—0.37 (0.008—0.015)
			Others	0.30—0.42 (0.012—0.017)
	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)
	Pin-to-rod interference		0.013—0.032 (0.0005—0.0013)	0.013 (0.0005)
Connecting rod	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	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)
	Rod bearing-to-journal oil clearance	No. 3 Journal	0.032–0.061 (0.0013–0.0024)
			0.020–0.038 (0.0008–0.0015)
			0.07 (0.003)
			0.07 (0.003)
			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 <sup>-1</sup> (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)
Relief valve	Pressure setting 80°C (176°F)	Pump body-to-rotor side clearance	0.03–0.108 (0.001–0.004)
		Idle	98 kPa (1.0 kg/cm <sup>2</sup> , 14 psi) min.
		3,000 min <sup>-1</sup> (rpm)	373–451 kPa (3.8–4.6 kg/cm <sup>2</sup> , 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)
Thermostat	Pressure cap opening pressure	74–103 kPa (0.75–1.05 kg/cm <sup>2</sup> , 11–15 psi)
	Starts to open	Primary: 82°C ±2 (180°F ±3) Secondary: 85°C ±2 (185°F ±3)
	Full open Valve lift at full open	95°C (203°F) 8 (0.31) max.
Water pump	Gear ratio (crankshaft)	1.34
	Capacity: ℓ per min/at min <sup>-1</sup> (rpm)	124/5,000 (32.7 US. gal/5,000 min <sup>-1</sup> (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 A20A4	Delivery pressure	230–270 kPa (2.35–2.75 kg/cm <sup>2</sup> , 33–39 psi)
	Displacement	230 cc/min in 10 seconds
	Relief valve opening pressure	441–588 kPa (4.5–6.0 kg/cm <sup>2</sup> , 64–85 psi)
Pressure regulator A20A4	Pressure	230–270 kPa (2.35–2.75 kg/cm <sup>2</sup> , 33–39 psi)
Fuel pump A16A1 and A20A2	Delivery pressure	17.6–22.5 kPa (0.18–0.23 kg/cm <sup>2</sup> , 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.)
Throttle Body A20A4	Fast idle	1,000–1,800 min <sup>-1</sup> (rpm)
	Idle Speed	with headlights and cooling fan off Manual 800±50 min <sup>-1</sup> (rpm) KX: 750±50 min <sup>-1</sup> (rpm) Automatic 800±50 min <sup>-1</sup> (rpm) KX: 750±50 min <sup>-1</sup> (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 <sup>-1</sup> (rpm) A16A1: 1,500–2,500 min <sup>-1</sup> (rpm)
	Idle Speed	with headlights and cooling fan off Manual 750±50 min <sup>-1</sup> (rpm) Automatic 700±50 min <sup>-1</sup> (rpm) KS: 750±50 min <sup>-1</sup> (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	— —
		2.5–4.5 (0.098–0.177)	—
Clutch arm	Release arm adjustment		
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	Unevenness 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 <sup>-1</sup> (rpm) in <b>N</b> or <b>P</b>	834–883 kPa (8.5–9.0 kg/cm <sup>2</sup> , 121–128 psi)	785 kPa (8.0 kg/cm <sup>2</sup> , 114 psi)
	4th, 3rd, 2nd clutch pressure at 2,000 min <sup>-1</sup> (rpm) in <b>D3</b> or <b>D4</b>	441–834 kPa (4.5–8.5 kg/cm <sup>2</sup> , 64–121 psi)	392 kPa (4.0 kg/cm <sup>2</sup> , 57 psi) with lever released 736 kPa (7.5 kg/cm <sup>2</sup> , 107 psi) with lever in full throttle position
	1st clutch pressure at 2,000 min <sup>-1</sup> (rpm) in <b>D4</b> 2nd clutch pressure at 2,000 min <sup>-1</sup> (rpm) in <b>2</b>	785–883 kPa (8.0–9.0 kg/cm <sup>2</sup> , 114–128 psi)	785 kPa (8.0 kg/cm <sup>2</sup> , 114 psi)
	Governor pressure at 60 km/h in <b>D3</b> or <b>D4</b>	* 191–201 kPa (1.75–2.05 kg/cm <sup>2</sup> , 28–29 psi) 211–221 kPa (2.15–2.25 kg/cm <sup>2</sup> , 31–32 psi)	* 186 kPa (1.90 kg/cm <sup>2</sup> , 27 psi) 206 kPa (2.10 kg/cm <sup>2</sup> , 30 psi)
	Throttle pressure A at 1,000 min <sup>-1</sup> in <b>D3</b> or <b>D4</b>	* 495–510 kPa (5.05–5.2 kg/cm <sup>2</sup> , 72–74 psi) 485–500 kPa (4.95–5.1 kg/cm <sup>2</sup> , 70–73 psi)	* 490 kPa (5.0 kg/cm <sup>2</sup> , 71 psi) 481 kPa (4.9 kg/cm <sup>2</sup> , 70 psi)
	Throttle pressure B at 1,000 min <sup>-1</sup> in <b>D3</b> or <b>D4</b>	834–883 kPa (8.5–9.0 kg/cm <sup>2</sup> , 121–123 psi)	785 kPa (8.0 kg/cm <sup>2</sup> , 114 psi)
Stall speed	Check with car on lever ground	2,500–2,800 min <sup>-1</sup> (rpm)	—
Clutch	Clutch initial clearance	0.65–0.85 (0.026–0.033) 0.4–0.6 (0.016–0.024)	—
	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	2.05–2.10 (0.081–0.083)	
	Mark 1	2.15–2.20 (0.085–0.087)	
	Mark 2	2.25–2.30 (0.089–0.091)	
	Mark 3	2.35–2.40 (0.093–0.094)	
Transmission	Mark 4	2.45–2.55 (0.096–0.098)	
	Mark 5	2.55–2.60 (0.100–0.102)	
	Mark 6	2.65–2.70 (0.104–0.106)	
	Mark 7	2.75–2.80 (0.108–0.110)	
	Mark 8	2.85–2.90 (0.112–0.114)	
	Mark 9	2.95–3.00 (0.116–0.118)	
	Mark 10		
	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)	
	Mainshaft 4th gear end play	0.10–0.22 (0.004–0.009)	Wear or damage
	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 <sup>-1</sup> (rpm) in [N] or [P]	785–834 kPa (8.0–8.5 kg/cm <sup>2</sup> , 114–121 psi)	736 kPa (7.5 kg/cm <sup>2</sup> , 107 psi)
	4th, 3rd, 2nd clutch pressure at 2,000 min <sup>-1</sup> (rpm) in [D3] or [D4]	441–834 kPa (4.5–8.5 kg/cm <sup>2</sup> , 64–121 psi)	392 kPa (4.0 kg/cm <sup>2</sup> , 57 psi) with lever released 736 kPa (7.5 kg/cm <sup>2</sup> , 107 psi) with lever in full throttle position
	1st clutch pressure at 2,000 min <sup>-1</sup> (rpm) in [D4] 2nd clutch pressure at 2,000 min <sup>-1</sup> (rpm) in [2]	736–834 kPa (7.5–8.5 kg/cm <sup>2</sup> , 107–121 psi)	736 kPa (7.5 kg/cm <sup>2</sup> , 107 psi)
	Governor pressure at 60 km/h in [D3] or [D4]	198–208 kPa (2.02–2.12 kg/cm <sup>2</sup> , 29–30 psi)	193 kPa (1.97 kg/cm <sup>2</sup> , 28 psi)
	Throttle pressure A at 1,000 min <sup>-1</sup> (rpm) in [D3] or [D4]	495–510 kPa (5.05–5.20 kg/cm <sup>2</sup> , 72–74 psi)	490 kPa (5.0 kg/cm <sup>2</sup> , 71 psi)
	Throttle pressure B at 1,000 min <sup>-1</sup> (rpm) in [D3] or [D4]	735–834 kPa (8.0–8.5 kg/cm <sup>2</sup> , 114–121 psi)	736 kPa (7.5 kg/cm <sup>2</sup> , 107 psi)
Stall speed	Check with car on lever ground	2,600–2,900 min <sup>-1</sup> (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) 2nd–4th 30.5 (1.20)	28.5 (1.12) — 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)	
	Mainshaft 4th gear end play	0.10–0.22 (0.004–0.009)	Wear or damage
	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 Throttle cam stopper	18.5—18.6 (0.728—0.732)	Wear or other defect
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	0.240—0.265 (0.009—0.010)	—
	Drive:	0.125—0.175 (0.005—0.007)	—
	Driven:	24.000—24.021 (0.9449—0.9457)	Wear or damage
	Stator camshaft needle bearing bore I.D.	26.000—26.013 (1.0236—1.0241)	Wear or damage
	Stator camshaft needle bearing contact and O.D.	14.016—14.034 (0.5518—0.5525)	Wear or damage
	Oil pump driven gear I.D.	13.980—13.990 (0.5504—0.5508)	Wear or damage
	Oil pump shaft O.D.		



**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)	—
Differential pinion gear	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)
	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	805.0–809.5 (31.7–31.9)	—
		MT 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 At change	0.5ℓ (0.53 US. qt., 0.44 Imp. qt.) 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'	
Wheel	Steering angle	R/L	Inside 39° 30'	Outside 30° 30'
	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

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	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)		
Brake booster	Characteristics	Vacuum (mm Hg)	Pedal Pressure kg (lbs)	Line Pressure kPa (kg/cm <sup>2</sup> , psi)		
				8" Booster		9" Booster
		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

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 <sup>-1</sup> (rpm)	30 ± 4 kV	15—21 mm (0.59—0.83)	At 80°C (176°F)
	12V	3,000 min <sup>-1</sup> (rpm)	22 ± 4 kV	13—19 mm (0.51—0.75)	
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 <sup>-1</sup> (rpm) max.		
	Output		14V/65A at 5,500 min <sup>-1</sup> (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	1.0 KW, 1.4 KW (ND)		1.0 KW, 1.4 KW (MITSUBA)	
		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)	8.5 (0.33)	14.3—14.7 (0.56—0.58)	9.3 (0.37)
		1.4 KW: 14.5—15.5 (0.57—0.61)	10.0 (0.39)		
	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
			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
			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
	EXi (A20A4)	700/440 kg	1543/992 lb.	KS
		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 <sup>3</sup>	97.8 cuin	
	2000	1.955 cm <sup>3</sup>	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 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		
		KB, KE, KF		
	Primary Reduction	1.62 KW	KG, KW	KS, KX
	Gear Ratio I	1.000	1.000	1.000
	< > : 4—AT II	3.181	<2.421>	<2.529>
	III	1.842	<1.560>	<1.481>
	IV	1.250	<0.969>	<1.060>
	V	0.937	<0.729>	<0.743>
	Reverse	0.711	—	—
	Final	3.000	<1.954>	<1.904>
	Clutch Facing Area (2.02) 1600	4.066	<3.933>	<4.066>
	2000	160 cm <sup>2</sup>	24.8 sq. in.	
		176 cm <sup>2</sup>	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	1.42	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 cars 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, 185/70HR13							
	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	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	10° ATDC	A16A1	10° ATDC	A20A1	10° ATDC (No.1)	A20A2	KX 5MT
		IN close	30° ABDC	35° ABDC		35° ATDC (No.2)				
		EX open	35° BBDC	40° BBDC		40° BBDC				
		EX close	10° BTDC	5° BTDC		10° BTDC				
		IN open	10° ATDC	10° ATDC (No.1)		5° ATDC				
		IN close	35° ABDC	20° ATDC (No.2)	A20A4	35° ABDC	A20A4			
		EX open	40° BBDC	35° ABDC	KX	40° BBDC				
		EX close	10° BTDC	10° BTDC		5° BTDC				
		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
<b>SERVICE DATA</b> <b>(Engine)</b> <b>(cont'd)</b>	Idling Speed (with headlights off and cooling fan off.)			
	4—AT	700 ± 50 min <sup>-1</sup> (rpm)		
	5—MT	750 ± 50 min <sup>-1</sup> (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			
<b>(Chassis)</b>	A20A4 Except KS, KX	1,225 kPa (12.5 kg/cm <sup>2</sup> , 178 psi) at 250 min <sup>-1</sup> (rpm)		
	Others	1,177 kPa (12.0 kg/cm <sup>2</sup> , 170 psi) at 250 min <sup>-1</sup> (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		
	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.	(SR): Sunroof
			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.	
		(4—AT)	3D	STD	1,085 kg	
	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  < >: 4AT	I	3.181 <2.529>			
		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 Battery			12V—1.0KW		
				12V—40AH		
SERVICE DATA (Engine)	Idling Speed (with headlight on and cooling fan off)	4—AT	15° ± 2° BTDC 750 ± 50 min <sup>-1</sup> (rpm)			
		5—MT	20° ± 2° BTDC 750 ± 50 min <sup>-1</sup> (rpm)			
SERVICE DATA	Idling Speed (with headlights on and cooling fan off)		10° ± 2° BTDC 750 ± 50 min <sup>-1</sup> (rpm)			
			10° ± 2° BTDC 750 ± 50 min <sup>-1</sup> (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.	KP,KT KU with P/S,P/W with P/S,P/W,A/C with P/S,P/W,A/C
			EX	1,080 kg	2,381 lb.	
			EX	1,130 kg	2,491 lb.	
			EXR	1,140 kg	2,513 lb.	
		4D (A16A1)	STD	1,048 kg	2,310 lb.	with P/S,P/W with P/S,P/W,S/R
			EX	1,068 kg	2,354 lb.	
			EX	1,086 kg	2,394 lb.	
		4D (A20A2)	STD	1,060 kg	2,337 lb.	with P/S,P/W with P/S,P/W,S/R
			EX	1,085 kg	2,392 lb.	
			EX	1,103 kg	2,432 lb.	
			GL	1,130 kg	2,491 lb.	
			EX	1,140 kg	2,513 lb.	
			EX	1,160 kg	2,557 lb.	
			EXR	1,170 kg	2,579 lb.	
	(4—AT)	3D (A20A2)	STD	1,075 kg	2,370 lb.	KP,KT, KU with P/S,P/W with P/S,P/W,A/C with P/S,P/W,S/R, A/C
			EX	1,095 kg	2,414 lb.	
			EX	1,150 kg	2,535 lb.	
			EXR	1,160 kg	2,557 lb.	
		4D (A16A1)	STD	1,058 kg	2,332 lb.	with P/S,P/W with P/S,P/W,S/R
			EX	1,078 kg	2,376 lb.	
			EX	1,096 kg	2,416 lb.	
		4D (A20A2)	STD	1,080 kg	2,381 lb.	KP KT KU with P/S,P/W with P/S,P/W,S/R
			EX	1,105 kg	2,436 lb.	
			EX	1,123 kg	2,476 lb.	
			GL	1,150 kg	2,535 lb.	
			EX	1,160 kg	2,557 lb.	
			EX	1,180 kg	2,601 lb.	
			EXR	1,190 kg	2,623 lb.	
	Weight Distribution (Fr/Rr)					
	(5—MT)	3D (A20A2)	STD	645/415 kg	1,422/915 lb.	with P/S,P/W with P/S,P/W with P/S,P/W,A/C
			EX	660/420 kg	1,455/926 lb.	
			EX	690/440 kg	1,521/970 lb.	
			EXR	695/445 kg	1,532/981 lb.	
		4D (A16A1)	STD	625/324 kg	1,378/932 lb.	with P/S,P/W with P/S,P/W,S/R
			EX	640/428 kg	1,411/943 lb.	
			EX	649/437 kg	1,431/963 lb.	
			EX			

(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.	with P/S,P/W } KP with P/S,P/W,S/R } KT with P/S,A/C } KU		
			EX	650/435 kg	1,433/959 lb.			
			EX	659/444 kg	1,453/979 lb.			
			GL	690/440 kg	1,521/970 lb.	with P/S,P/W,A/C } KY with P/S,P/N,S/R,A/C } with P/S,P/W,S/R,A/C }		
			EX	695/445 kg	1,532/981 lb.			
			EX	705/455 kg	1,554/1,003 lb.			
		(4-AT)	EXR	710/460 kg	1,565/1,014 lb.	with P/S,P/W,S/R,A/C }		
			3D (A20A2)	STD	660/415 kg		1,445/915 lb.	with P/S,P/W } KP,KT with P/S,P/W,A/C } KU with P/S,P/W,A/C }
				EX	675/420 kg		1,488/926 lb.	
				EX	710/440 kg	1,565/970 lb.		
			4D (A16A1)	EXR	715/445 kg	1,576/981 lb.		
		STD		635/423 kg	1,400/932 lb.	with P/S,P/W } KT with P/S,P/W,S/R }		
				EX	650/428 kg		1,433/943 lb.	
			EX	659/437 kg	1,453/963 lb.			
	4D (A20A2)	STD	655/425 kg	1,444/937 lb.	with P/S,P/W } KP with P/S,P/W,S/R } KT with P/S,A/C } KY			
			EX	670/435 kg		1,477/959 lb.		
			EX	679/444 kg		1,497/979 lb.		
		EX	GL	710/440 kg	1,565/970 lb.	with P/S,P/W,A/C } with P/S,P/W,S/R,A/C }		
			EX	715/445 kg	1,576/981 lb.			
			EX	725/455 kg	1,598/1,003 lb.			
		EXR	EX	730/460 kg	1,609/1,104 lb.	with P/S,P/W,S/R,A/C }		
			EXR	730/460 kg	1,609/1,104 lb.			
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)					
		IV	0.937 <0.743> (0.729)					
		V	0.771 ————					
	< >: 4AT with 2000	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				

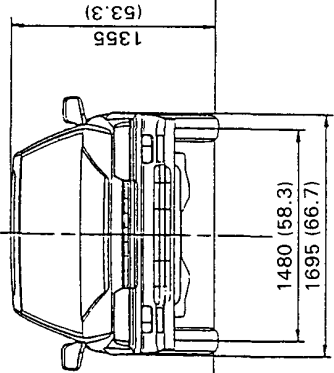
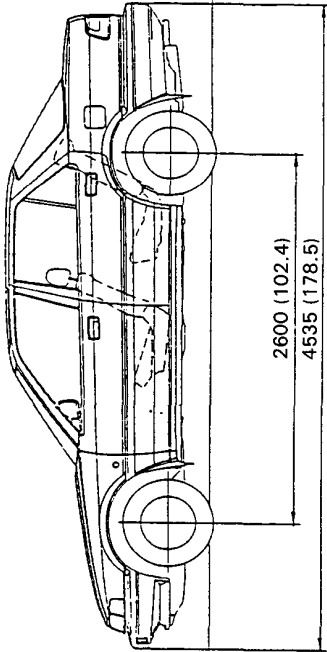
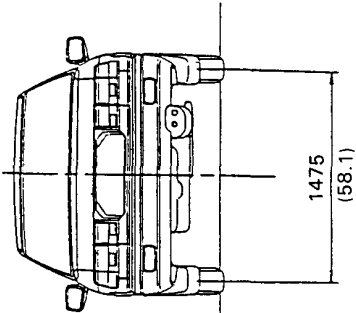
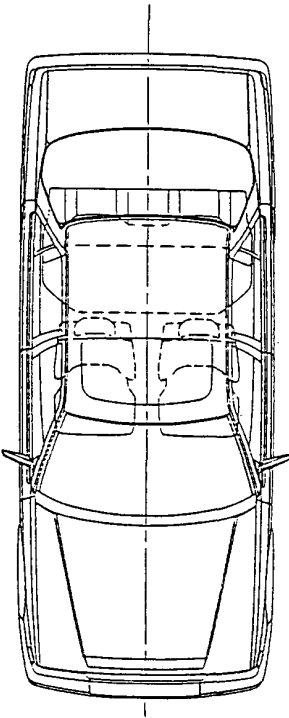


# Body Specifications

specs

4 D Sedan

Unit: mm (in)

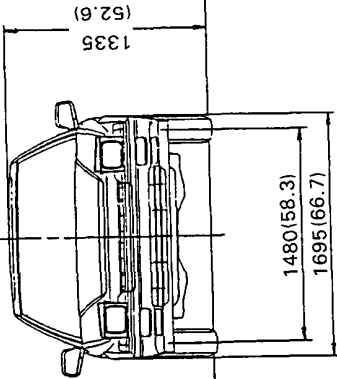
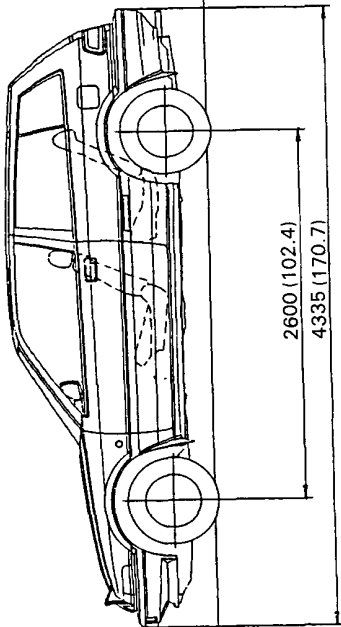
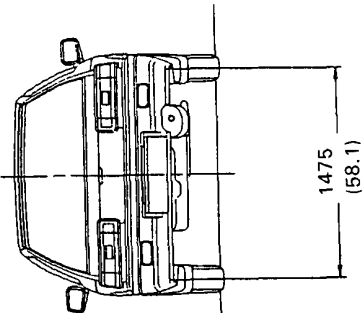
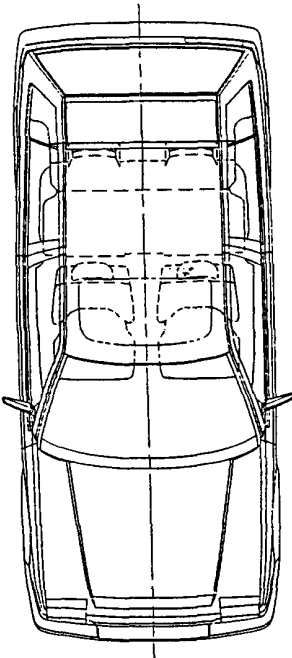




# Body Specifications

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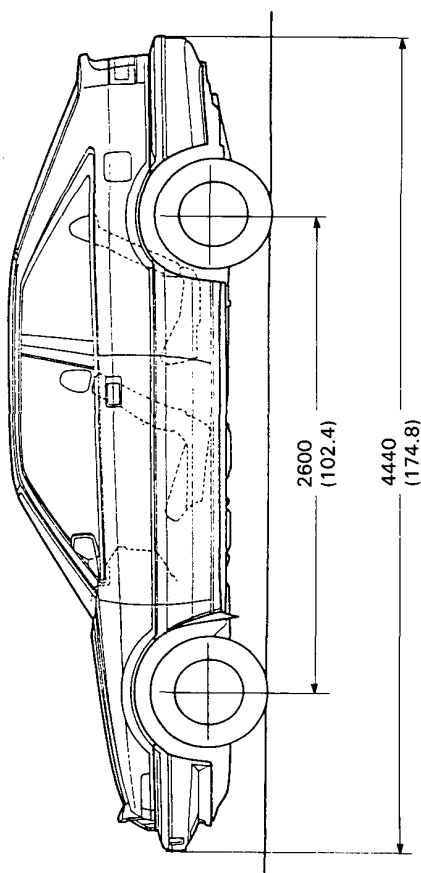
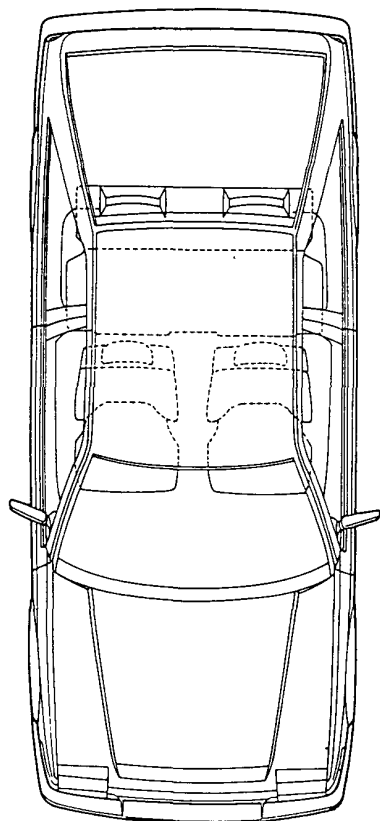
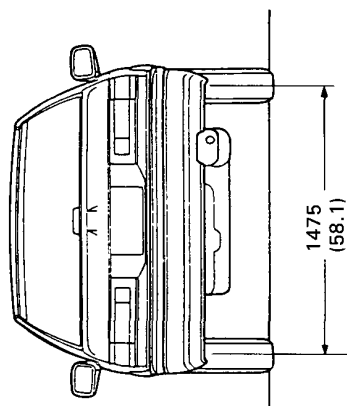
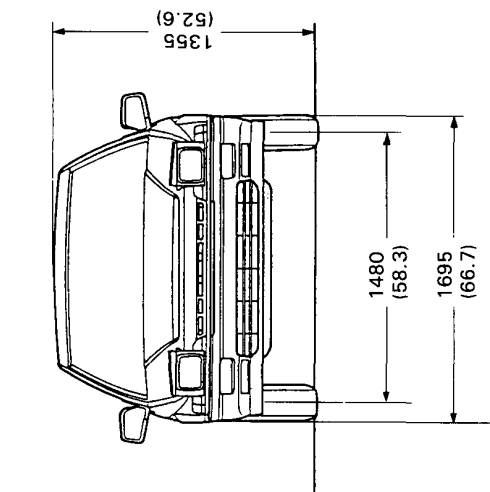
Unit: mm (in.)





# Glass Back

Unit: mm (in.)





## Maintenance

Lubrication Points .....	4-2
Maintenance Schedule .....	4-4



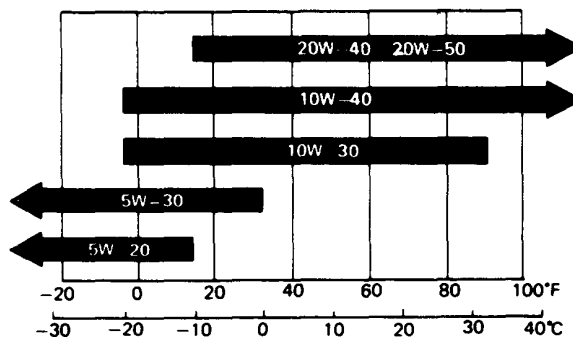


# Lubrication Points

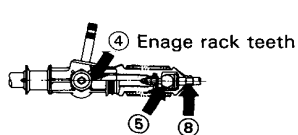
No	LUBRICATION POINTS		LUBRICANT
1	Engine		API Service Grade: SE or SF SAE Viscosity: See chart below
2	Transmission	Manual  Automatic	API Service Grade: SE or SF SAE30, 10W—30, 10W—40 or 20W—40 grade oil DEXRON® Automatic transmission fluid
3	Brake reservoir		Brake fluid DOT 3
4	Steering gearbox (Power)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

Recommended Engine Oil  
(SE or SF Grade only)

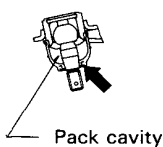
Engine oil viscosity for  
ambient temperature ranges.



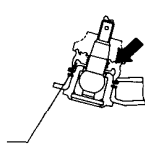




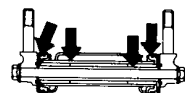
④ STEERING GEARBOX  
⑤ STEERING BALL JOINT  
⑧ STEERING BOOT



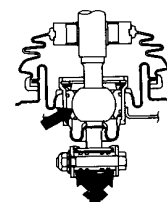
⑥ FRONT SUSPENSION  
BALL JOINTS



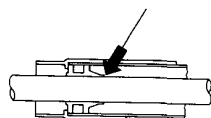
⑥ REAR SUSPENSION  
BALL JOINTS



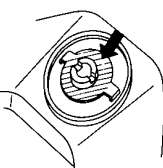
⑦ FRONT UPPER ARM



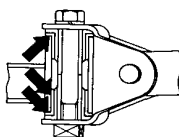
⑨ SHIFT LEVER PIVOT



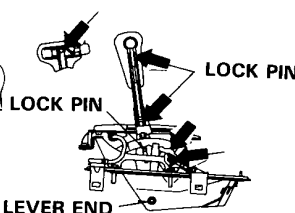
⑩ STEERING COLUMN  
BUSHING



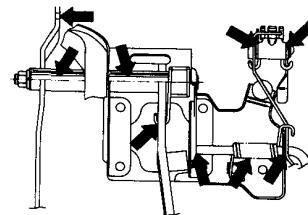
⑪ HORN CONTACT



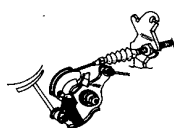
⑫ SHIFT ROD CLEVIS  
BUSHINGS



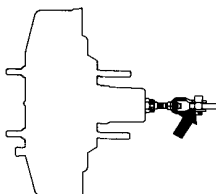
⑬ SELECT LEVER



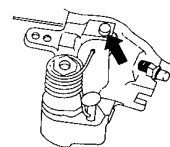
⑭ PEDAL LINKAGE



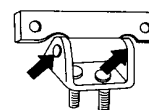
⑮ THROTTLE CABLE  
END



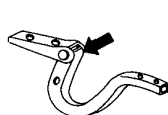
⑯ BRAKE MASTER  
CYLINDER PUSH ROD



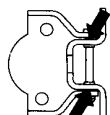
⑰ REAR CALIPER



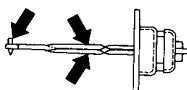
⑱ TAILGATE  
HINGES



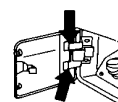
⑲ TRUNK HINGES



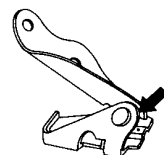
⑳ DOOR HINGES



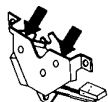
㉑ DOOR OPENING  
DETENTS



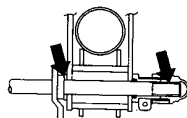
㉒ FUEL FILLER LID



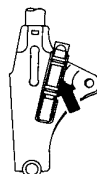
㉓ ENGINE HOOD  
HINGES



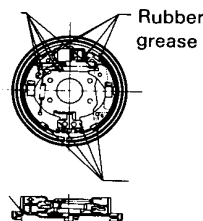
㉔ ENGINE HOOD  
LATCH



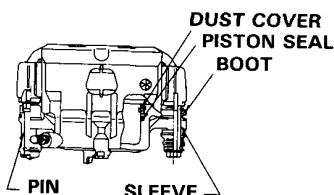
㉕ TILT LEVER



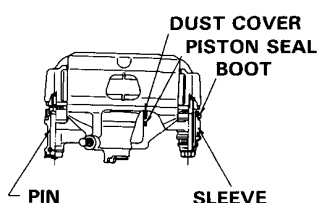
㉖ SELECT LEVER



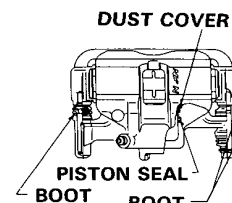
㉗ REAR BRAKE



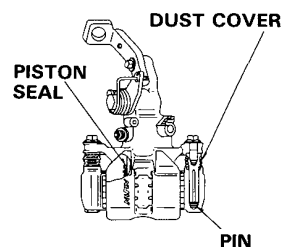
㉘ FRONT CALIPER



㉘ FRONT CALIPER



㉘ FRONT CALIPER



㉙ REAR CALIPER



# Required Maintenance Schedule

SERVICE AT THE INTERVAL OF LISTED KM (MILES) OR MONTHS, WHICHEVER OCCURS FIRST.							
ITEMS		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	
■	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
	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 callipers	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 .....	5-1
Cylinder Head/Valve Train .....	6-1
Engine Block .....	7-1
Engine Lubrication .....	8-1
Intake Manifold/Exhaust System .....	9-1





## 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.

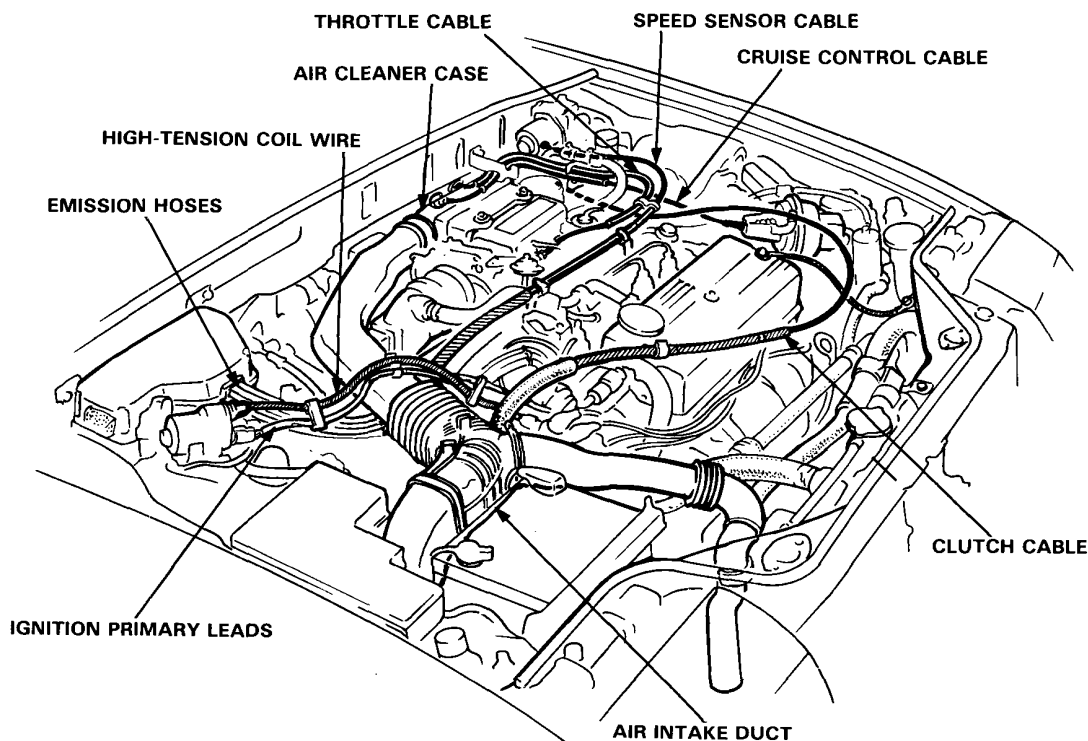
3. Drain the engine oil. Remove the oil filler cap to speed draining. Reinstall the drain plug with a new washer.

**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.



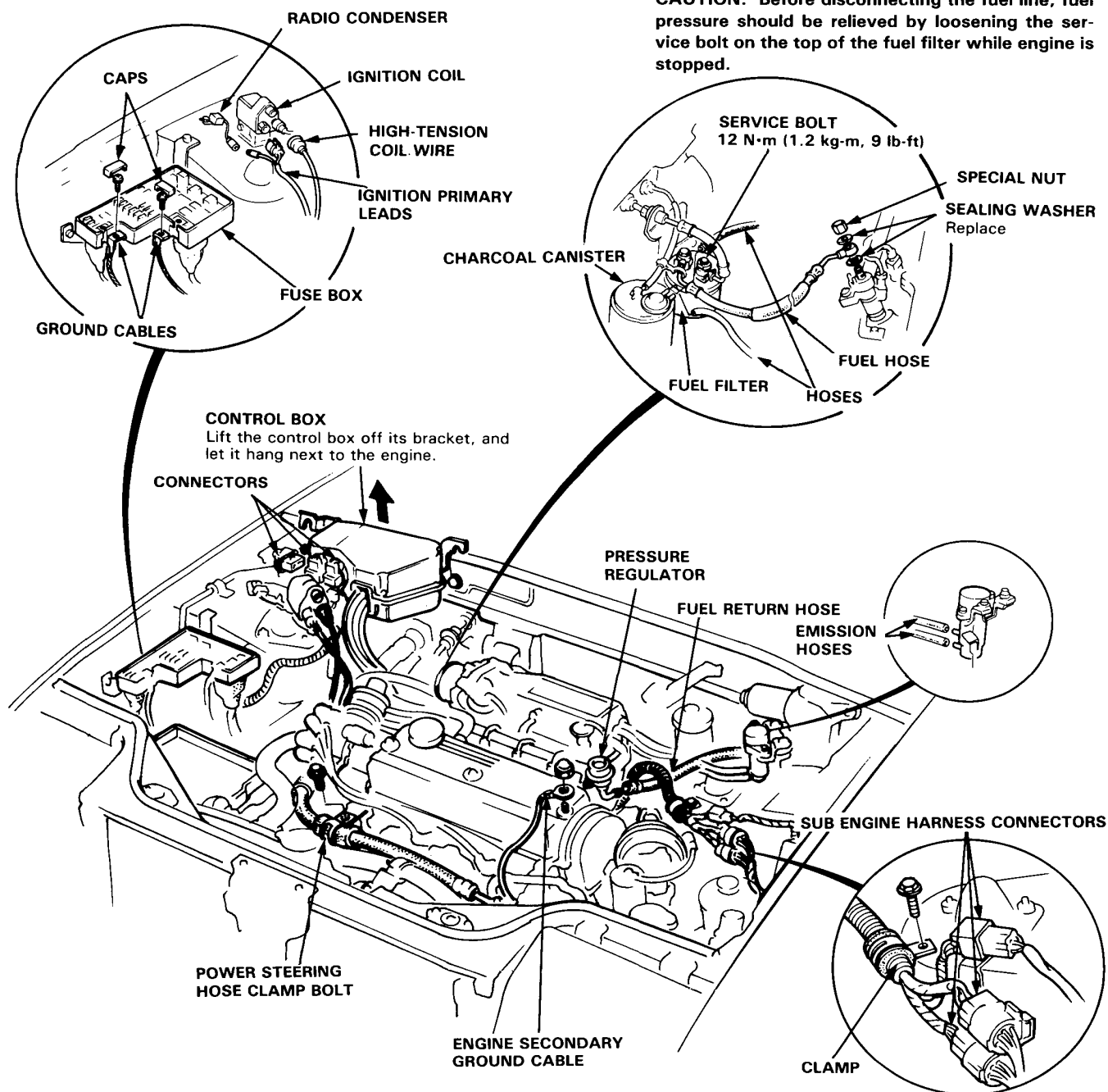




7. Relieve fuel pressure.

**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.



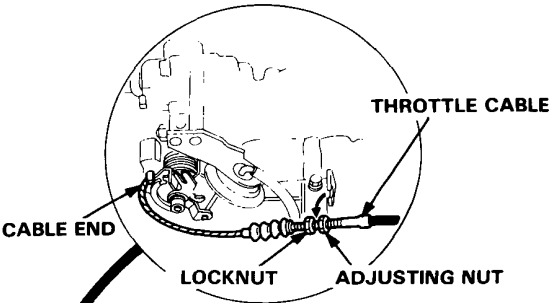
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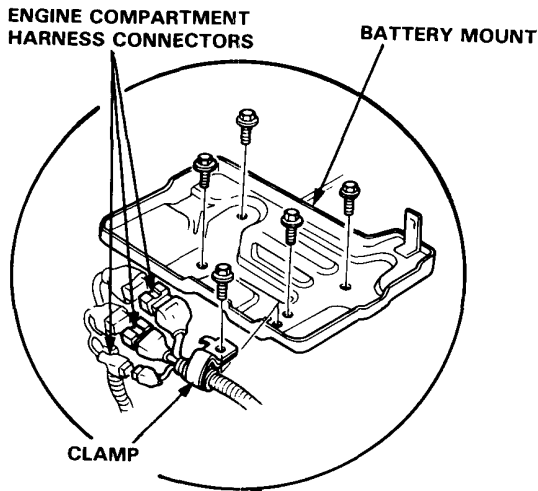
# Engine Removal/Installation (cont'd)

## THROTTLE CABLE

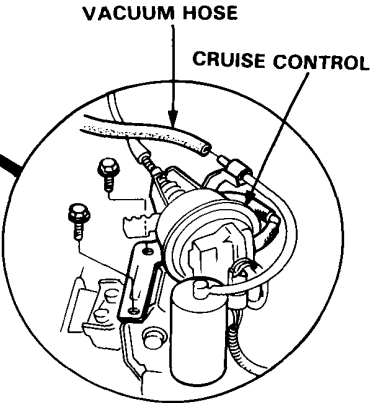
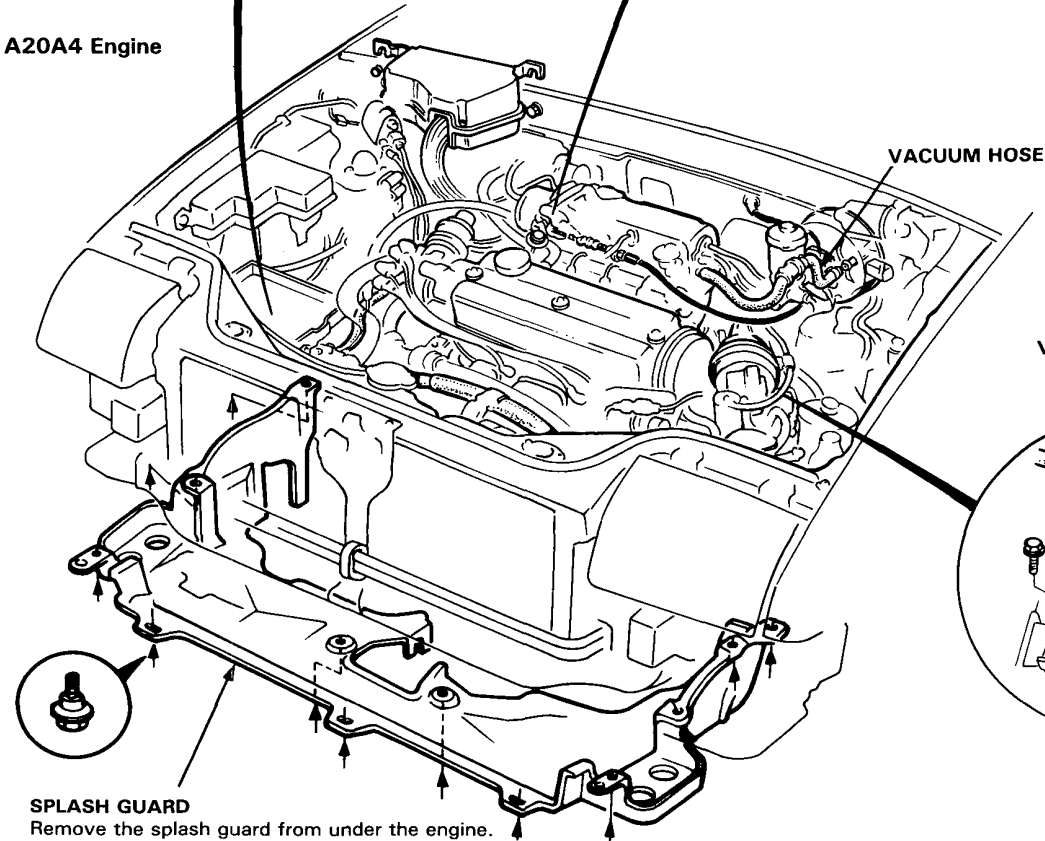
Remove the throttle cable by loosening the locknut and adjusting nut, then slip the cable and out the bracket and linkage.



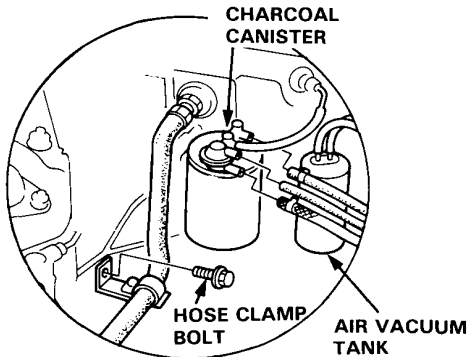
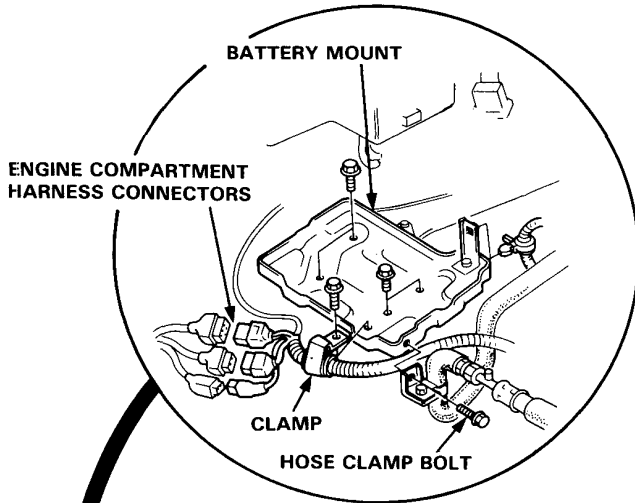
NOTE: Take care not to bend the cable when removing it. Do not use pliers to remove the cable from the linkage. Always replace a kinked cable with a new one.



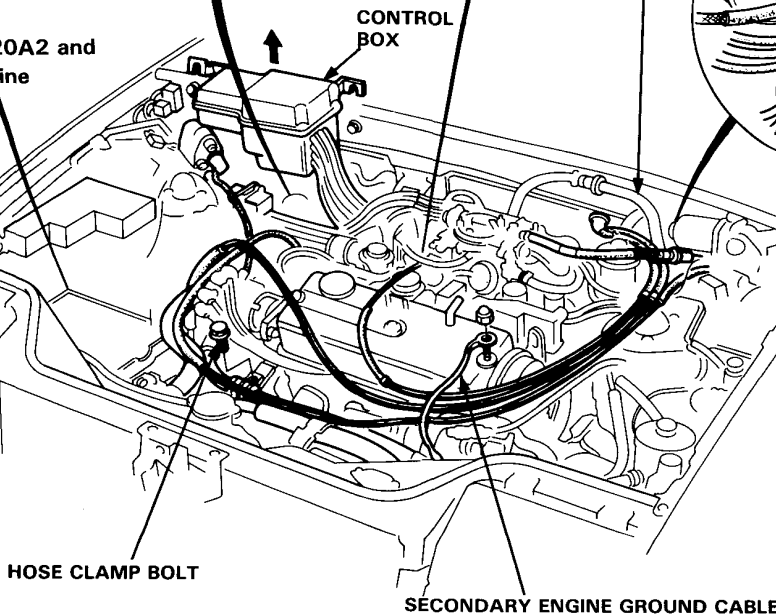
A20A4 Engine





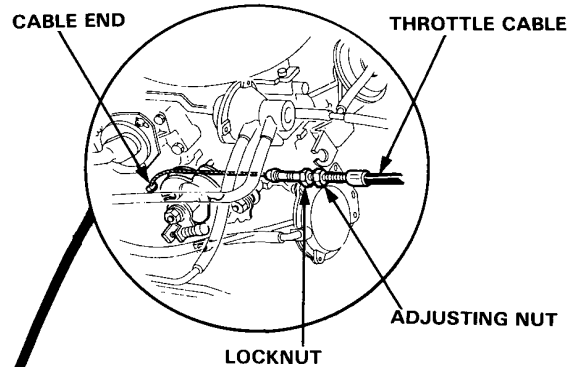


A20A1, A20A2 and  
A16A1 Engine



### THROTTLE CABLE

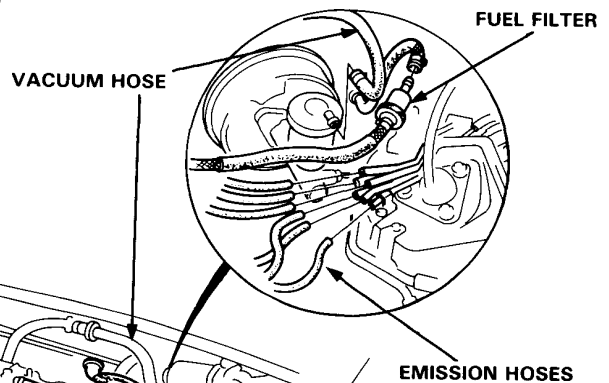
Remove the throttle cable by loosening the locknut and adjusting nut, then slip the cable end out of the throttle bracket and carburetor linkage.



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.

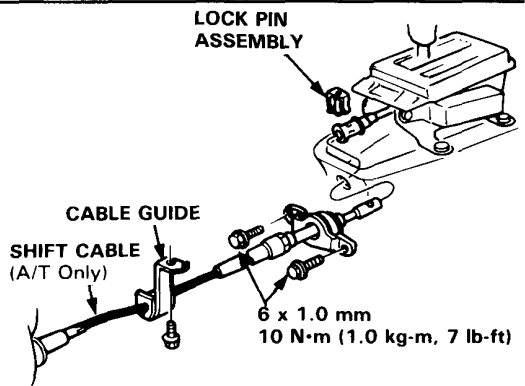
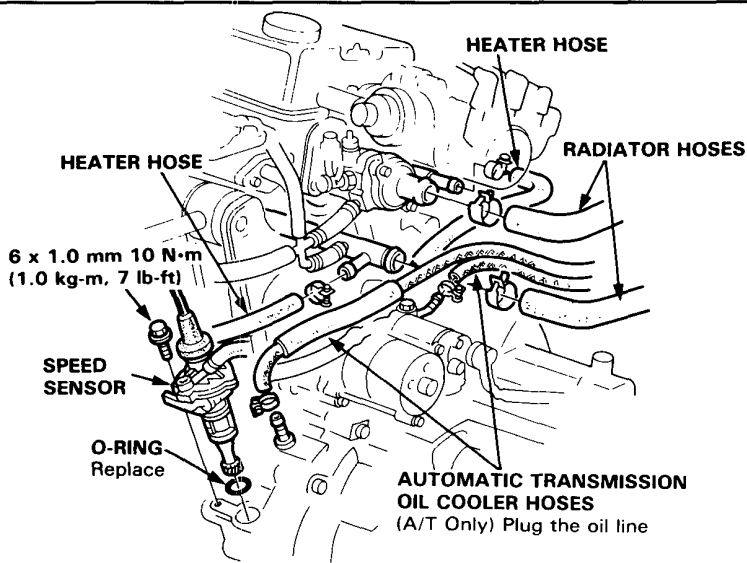


NOTE: Before disconnecting, mark hoses and pipes to ensure original connection

(cont'd)



# Engine Removal/Installation (cont'd)



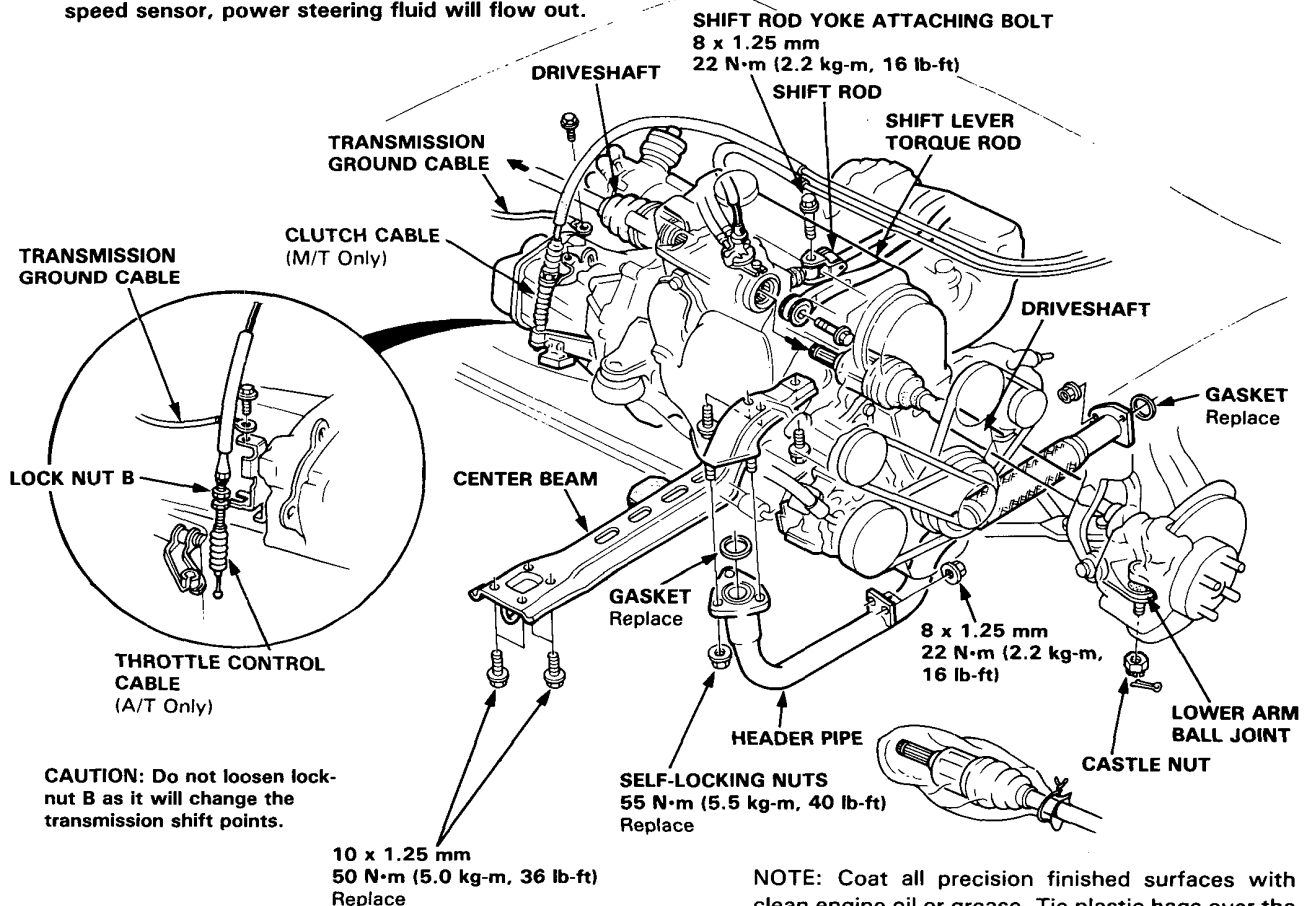
- Remove speed sensor complete with hoses.

**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 lock-nut B as it will change the transmission shift points.

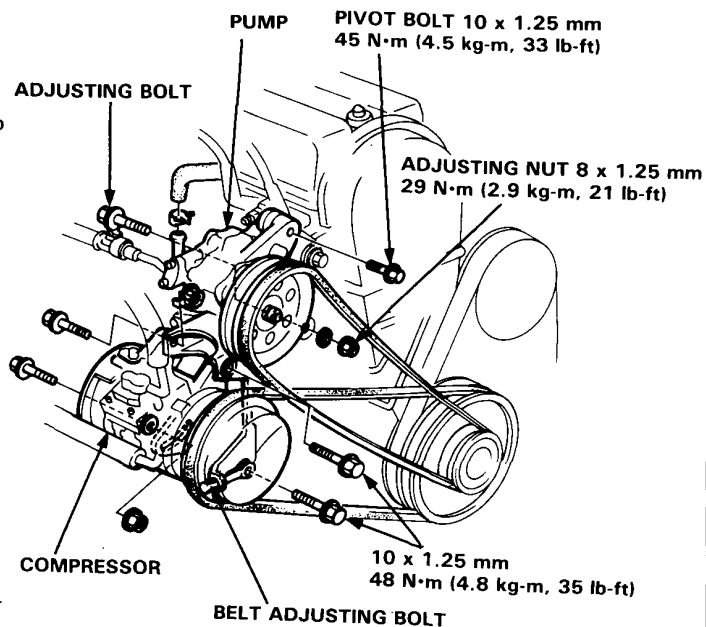
**NOTE:** Coat all precision finished surfaces with clean engine oil or grease. Tie plastic bags over the drive shaft ends.





### 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.

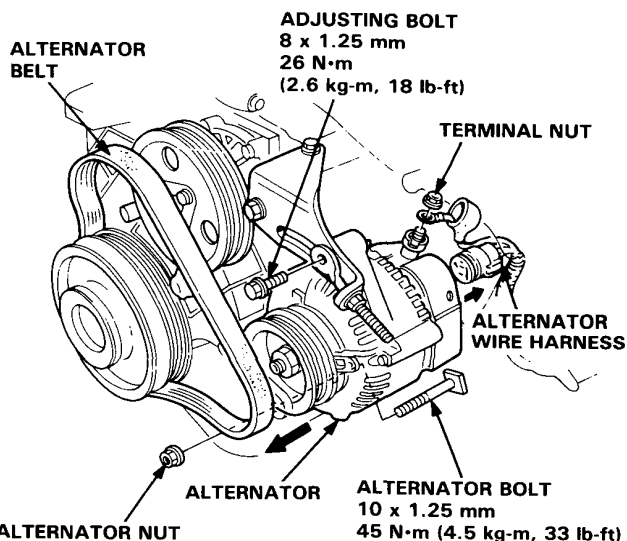


### A/C COMPRESSOR

- Remove the compressor clutch lead wire.
- Loosen the compressor mount bolts and adjusting bolt then 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)



## Engine Removal/Installation (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.

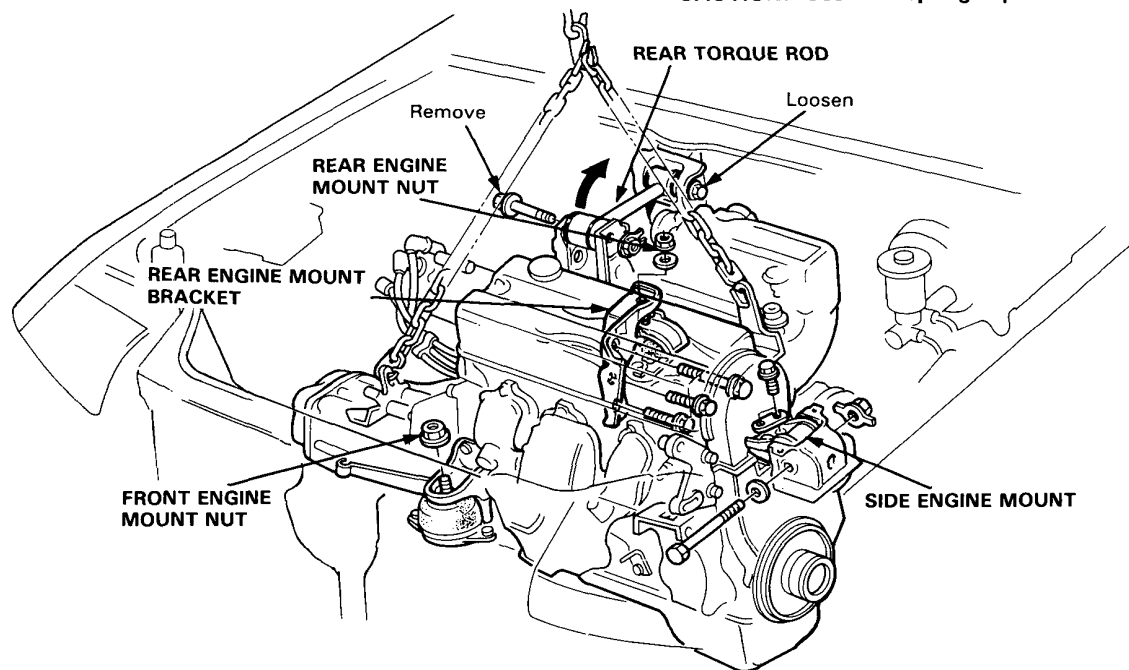
12. Install the engine in the reverse order of removal. After the engine is in place:

- 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.

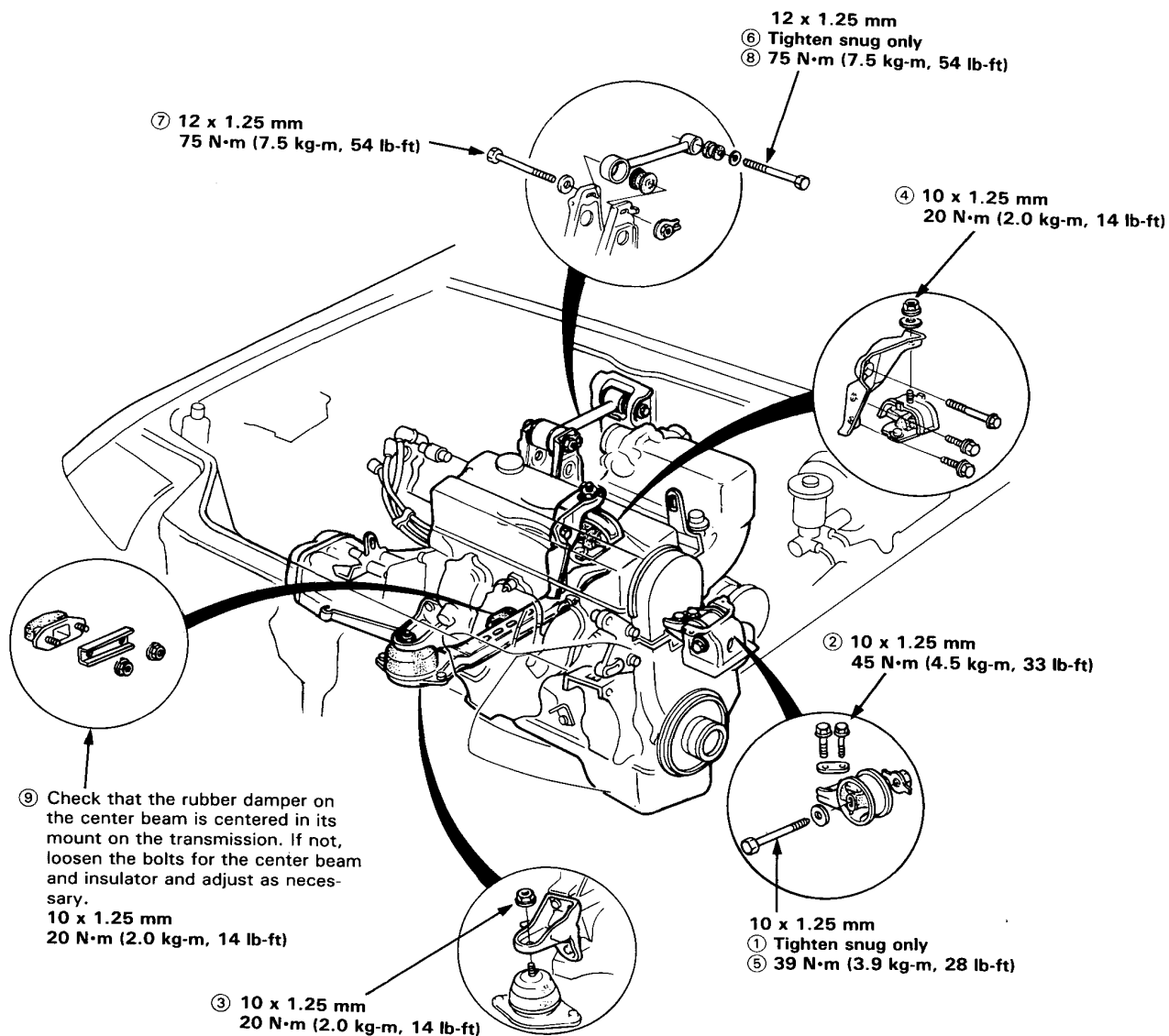
- Bleed air from the cooling system at the bleed bolt with the heater valve open.
- Adjust the throttle cable tension.
- Adjust the alternator belt tension.
- Check the clutch pedal free play.
- Check that the transmission shifts into gear smoothly.
- Connect the air conditioning hoses, wiring and V-belt.
- 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

Illustrated Index .....	6-2
Cylinder Head .....	6-4
Camshaft Pulley .....	6-5
Camshaft .....	6-5
Rocker Arms .....	6-7
Intake and Exhaust Valves .....	6-8
Valve Guide .....	6-11
Valve Spring .....	6-12
Timing Belt .....	6-15
Valve Adjustment .....	6-18





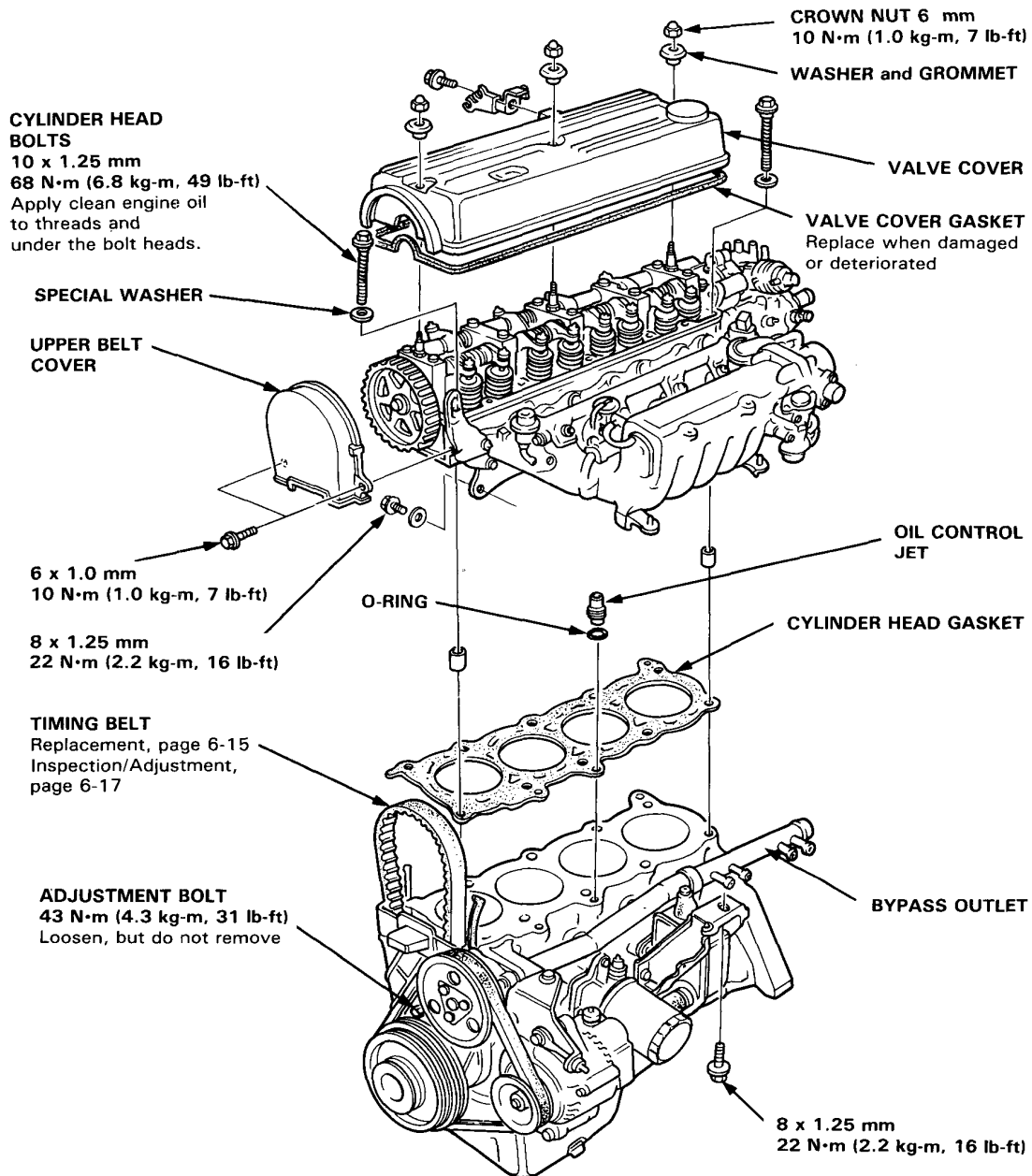
# Cylinder Head/Valve Train

## Illustrated Index

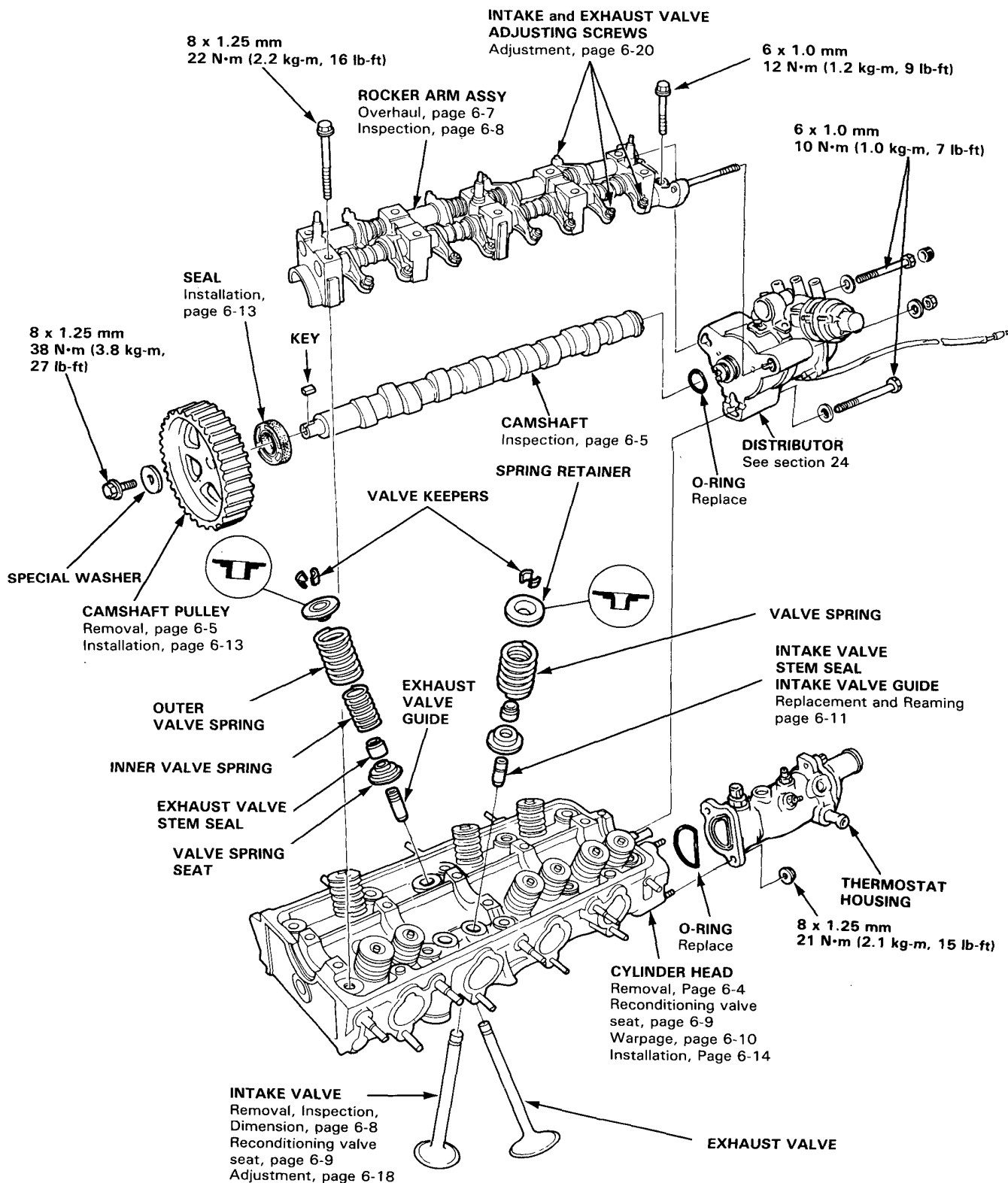
A20A4 Engine shown; A20A1, A20A2, A16A1 Engine similar

**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









# 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 sensor coupler
  - Four wire harness clamps
12. Disconnect the oxygen sensor coupler.

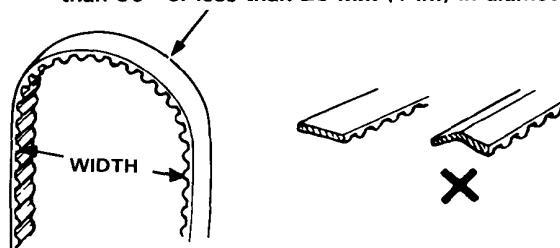
### Other Engines (A20A4 engine, go to 20)

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 thermosensor 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.

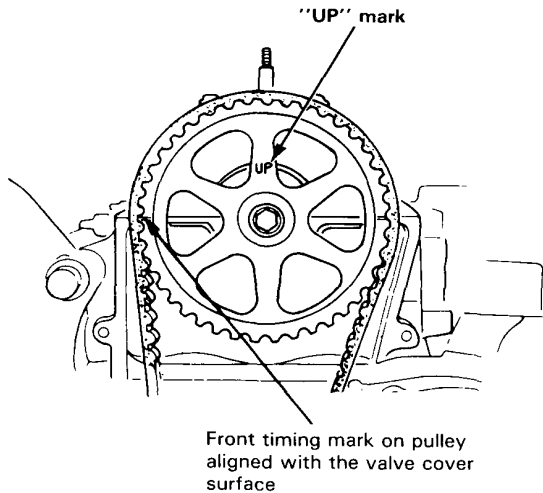
35. Remove the exhaust manifold from the cylinder head.
36. Remove the air cleaner base from the intake manifold.
37. Remove the carburetors.
38. Remove the intake manifold from the cylinder head.



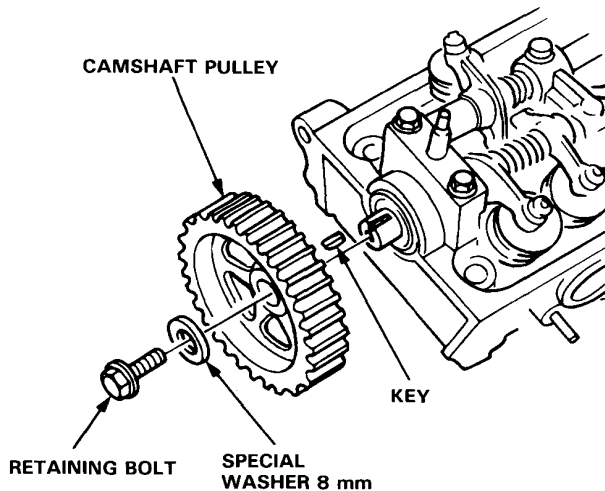
# Camshaft Pulley

## 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.

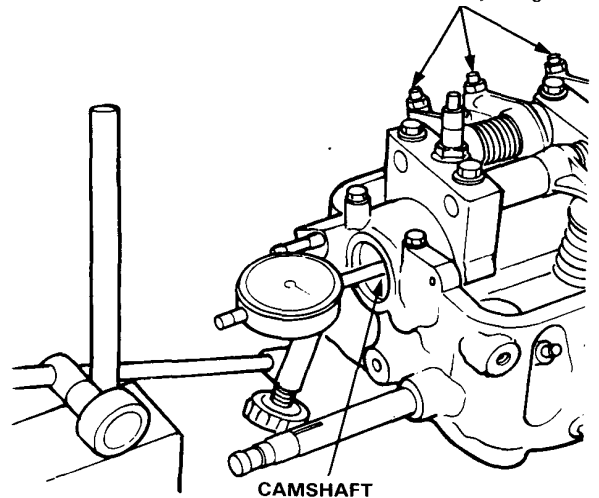
1. Seat camshaft by prying it toward distributor end of head with screwdriver.
2. Zero dial indicator against end of distributor drive, then pry camshaft back and forth, and read end play.

### 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)



# Camshaft

## Inspection (cont'd)

4. Measure widest portion of plastigage on each journal.

### No. 1, 3 and 5 JOURNALS

#### Camshaft Bearing Radial Clearance:

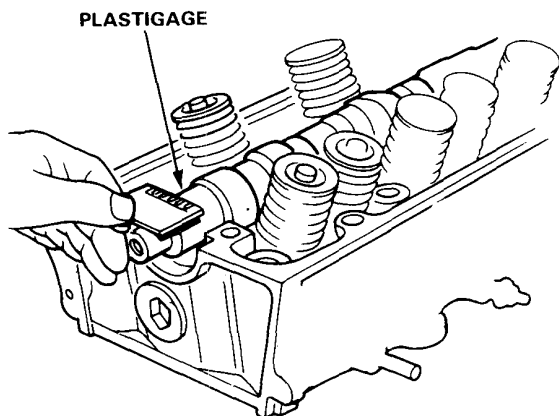
Standard (New): 0.050–0.089 mm  
(0.002–0.004 in.)

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.)



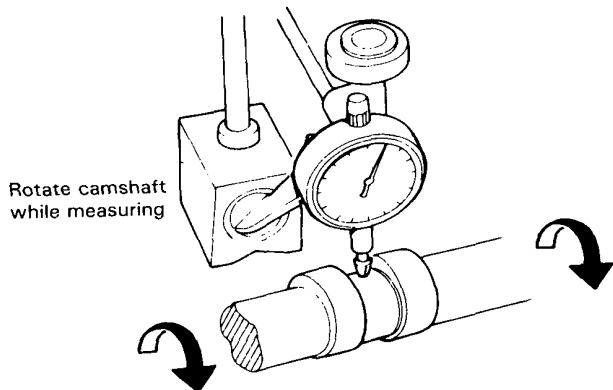
5. If camshaft bearing radial clearance is out of tolerance:

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

#### Camshaft Total Runout:

Standard (New): 0.03 mm (0.001 in.)

Service Limit: 0.06 mm (0.002 in.)



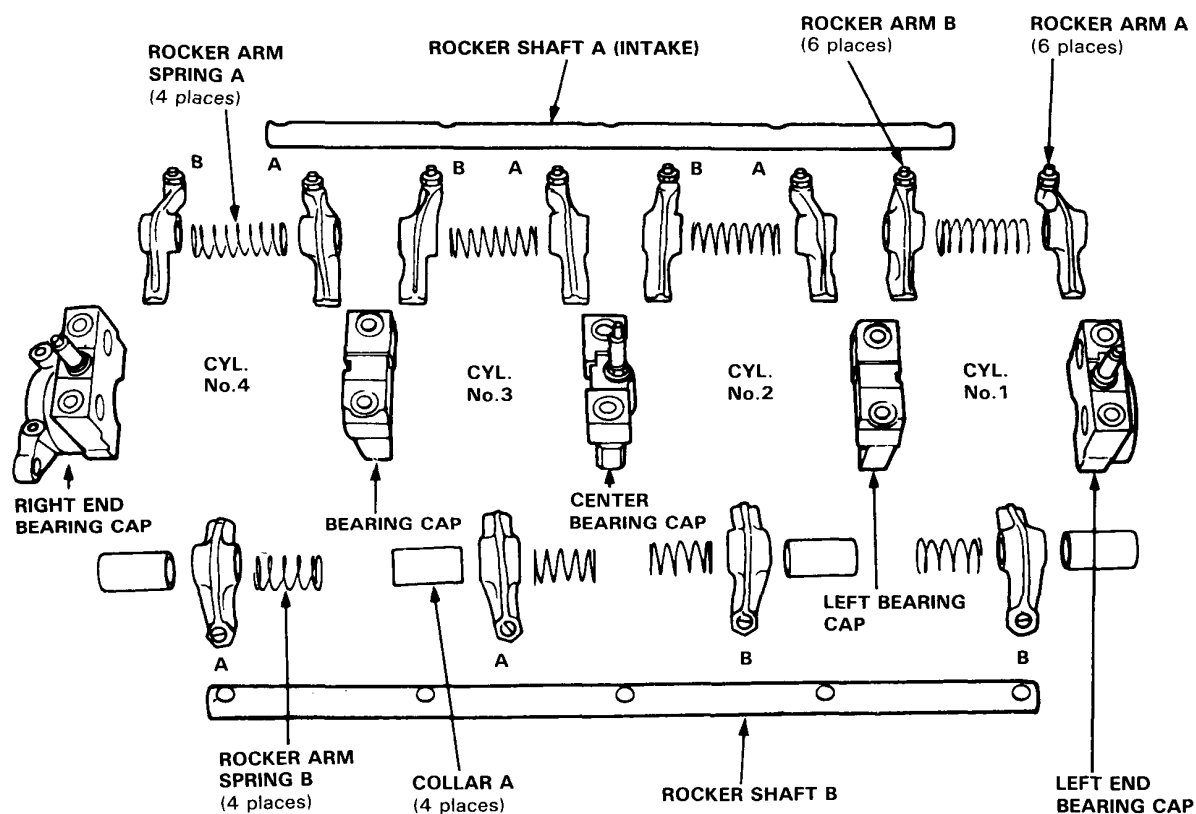
- If the total runout of the camshaft is within tolerance, replace the cylinder head.
- If the total runout is out of tolerance replace the camshaft and recheck. If the bearing clearance is still out of tolerance, replace the cylinder head.





# Rocker Arms

## 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.

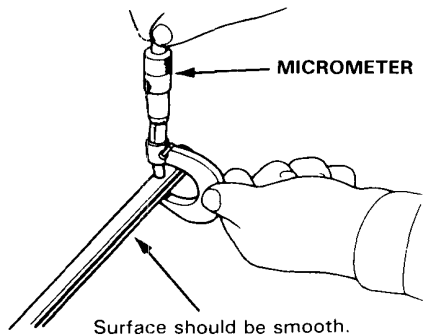


# Rocker Arms

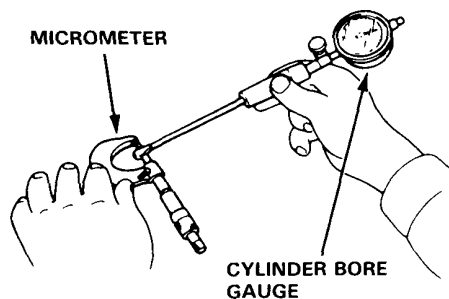
## Clearance

Measure both the intake rocker shaft and exhaust rocker shaft.

1. Measure diameter of shaft at first rocker location.

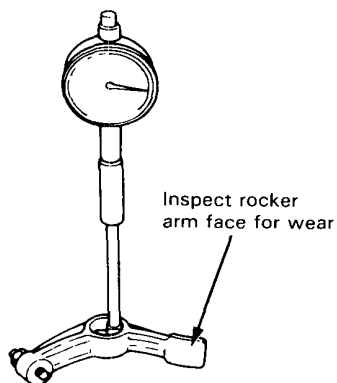


2. Zero gauge to shaft diameter.



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.)



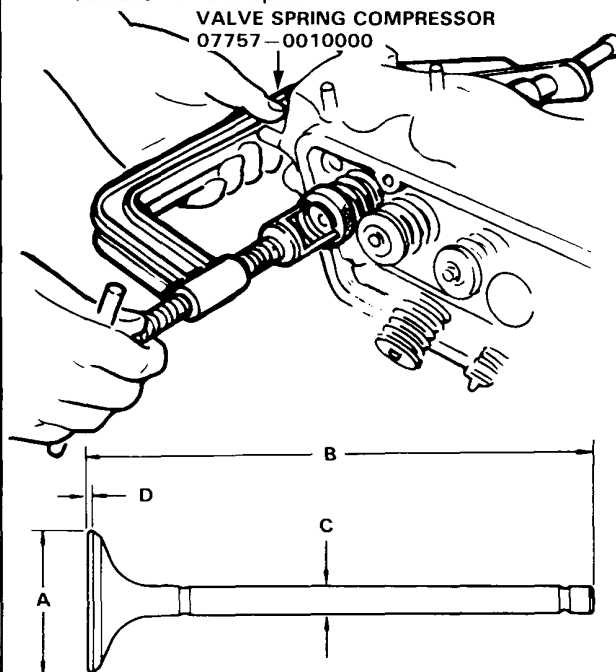
Repeat for all rockers. If over limit, replace rocker shaft and all over-tolerance rocker arms.

# 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

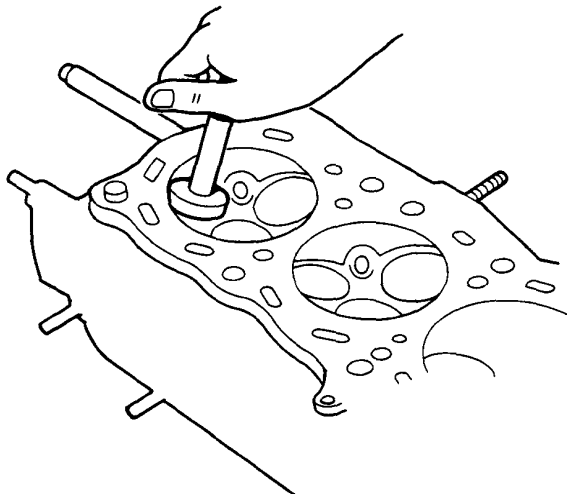




## Valve Seat Reconditioning

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.



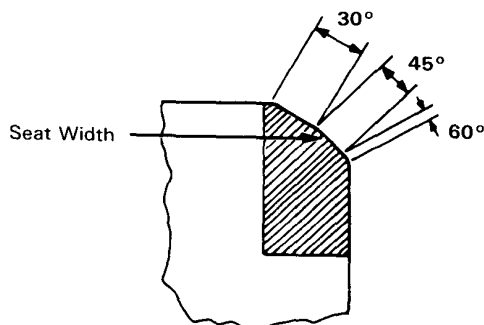
CUTTER	INTAKE	EXHAUST
30°	07780-0012900	07780-0012300
60°	07780-0014000	07780-0014100
45°	07780-0010800	07780-0010400
HOLDER	07781-0010201 and 07781-0010301	

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.)

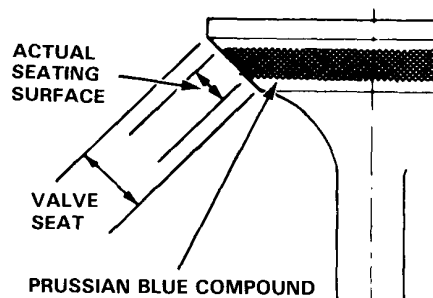
### Valve Seat Width:

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:

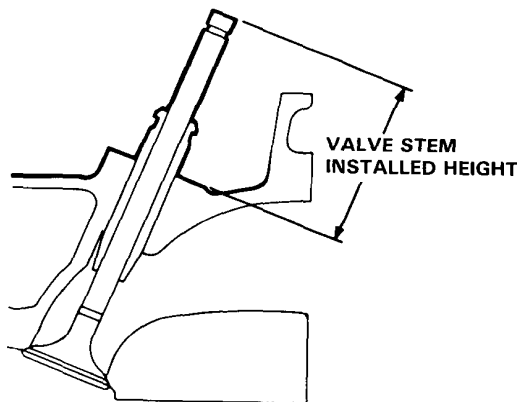
Standard (New): 48.59 mm (1.913 in.)

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.)

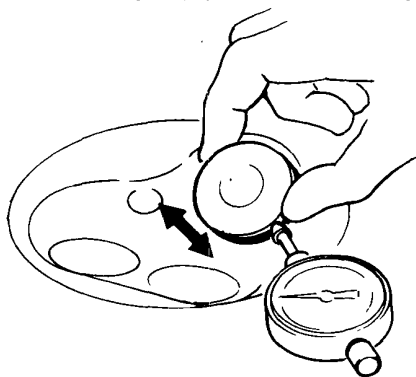
### Exhaust Valve Stem-to-Guide Clearance

**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, re-check using new valve.
- If measurement is now within service limit, re-assemble 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

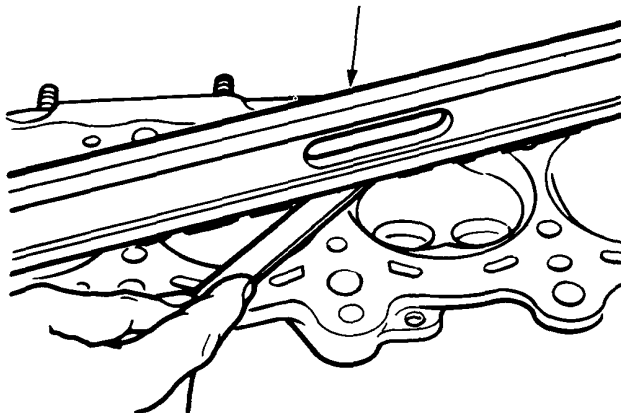
## Warpage

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

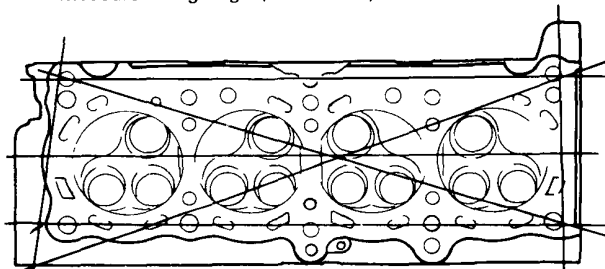
If camshaft bearing radial clearances are within specifications, check head for warpage.

- 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.).

**PRECISION STRAIGHT EDGE**



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



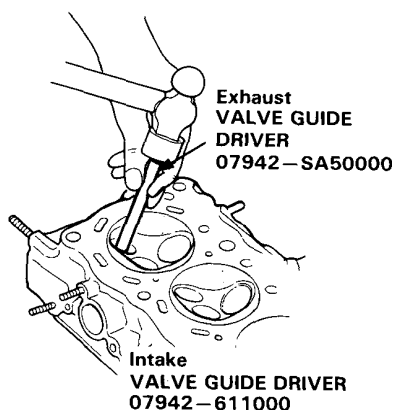
## Replacement

### 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.

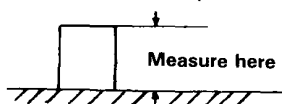
1. Drive the valve guide out from the bottom of the cylinder head.



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

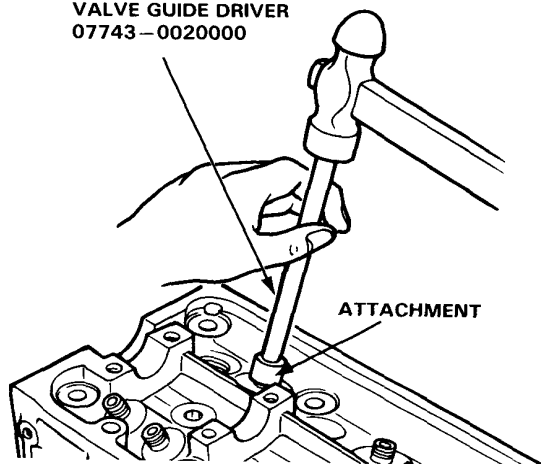
Intake: 15.5 mm (0.61 in.)

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.

VALVE GUIDE DRIVER  
07743-0020000



## Reaming

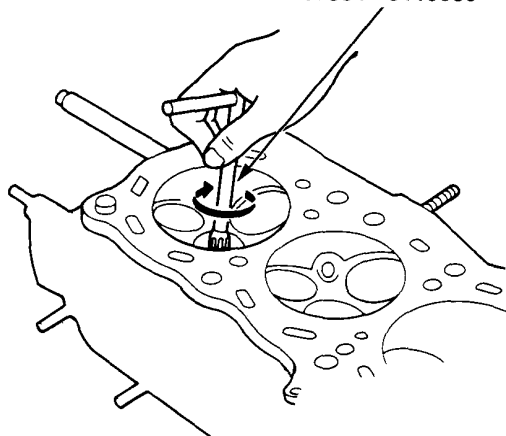
NOTE: For new valve guides only.

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

Turn reamer in clockwise direction only

[Exhaust]  
VALVE GUIDE REAMER  
07984-SA50000

[Intake]  
07984-6110000



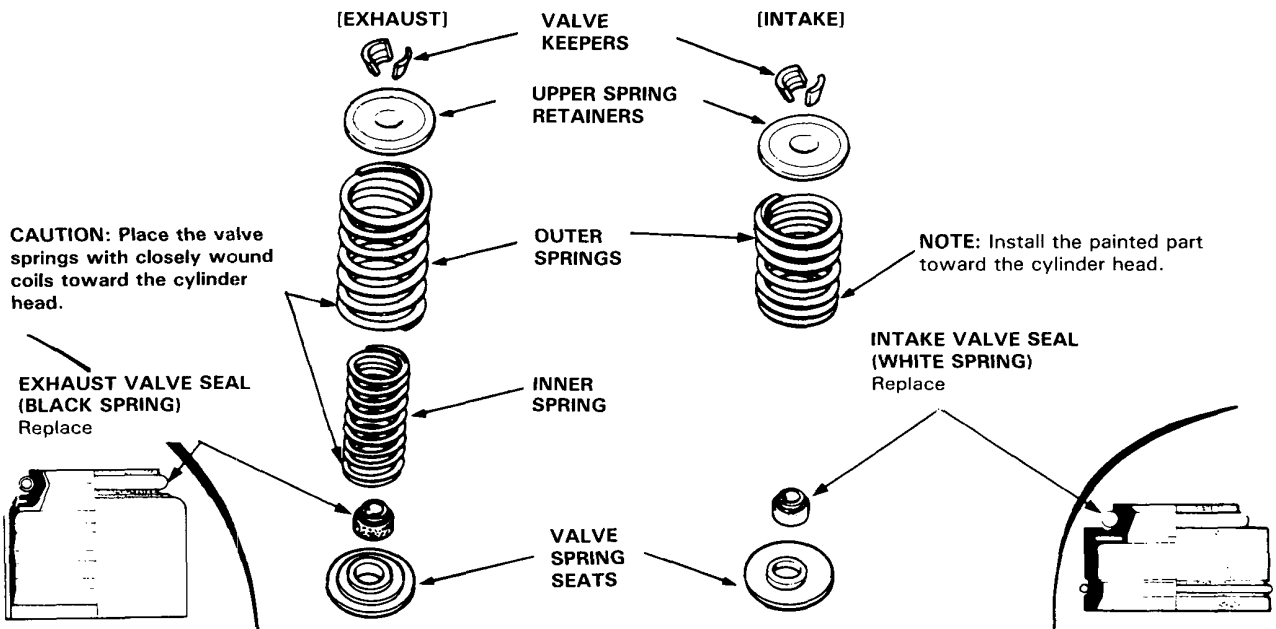
3. Continue to rotate reamer clockwise while removing.
4. Thoroughly wash the guide in detergent and water to remove any cutting residue.
5. Check clearance with valve (page 6-10).



# Valve Spring, Valve

## Valve Spring Installation Sequence

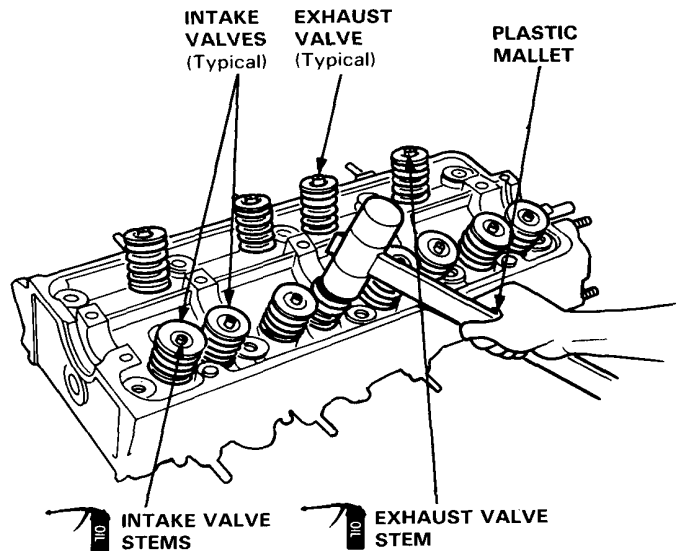
NOTE: Exhaust and intake valve guide seals are NOT interchangeable.



## 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.





# Cam/Rocker Arm and Camshaft Seal/Pulley



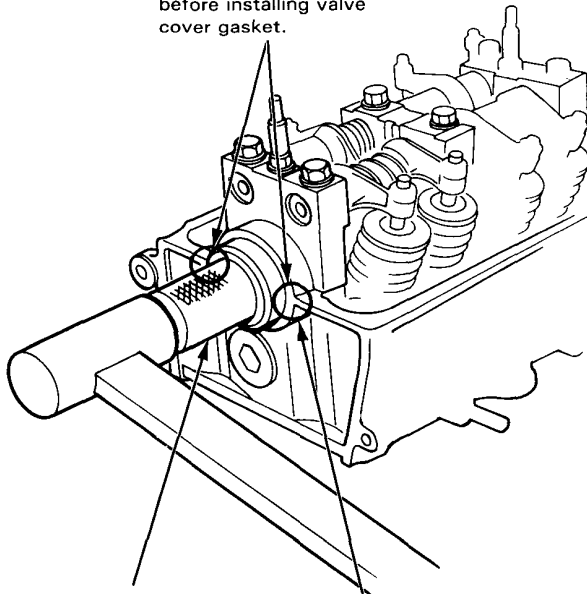
## Installation

### 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.

Apply non-hardening sealant to these areas before installing valve cover gasket.



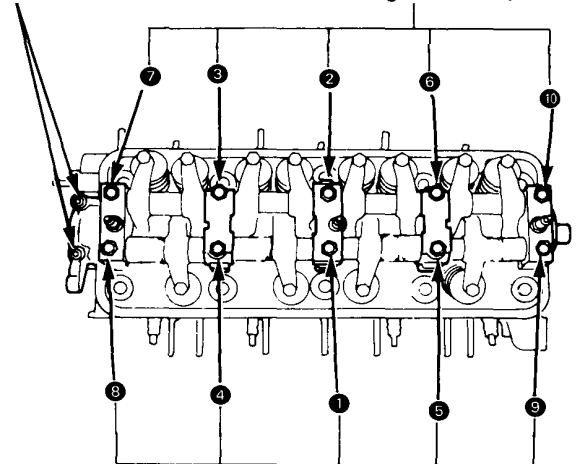
**CAMSHAFT SEAL DRIVER**  
07947-SB00100

Seal housing surface should be dry. Apply a light coat of oil to camshaft and inner lip of seal.

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.

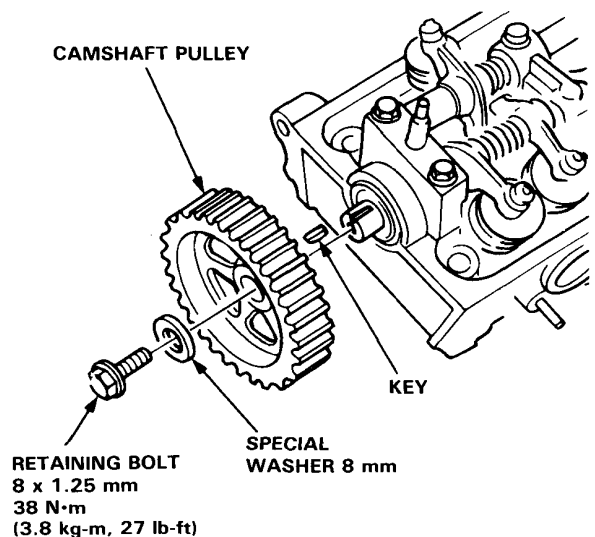
6 x 1.0 x 40 mm  
12 N·m  
(1.2 kg-m, 9 lb-ft)

8 x 1.25 x 77 mm  
22 N·m  
(2.2 kg-m, 16 lb-ft)



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

**CAMSHAFT PULLEY**



**RETAINING BOLT**  
8 x 1.25 mm  
38 N·m  
(3.8 kg-m, 27 lb-ft)

**SPECIAL WASHER 8 mm**



# Cylinder Head

## Installation

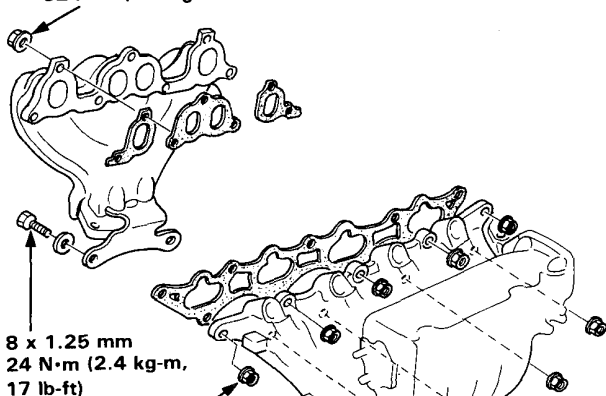
1. Install the cylinder head in reverse order of removal:

- 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.

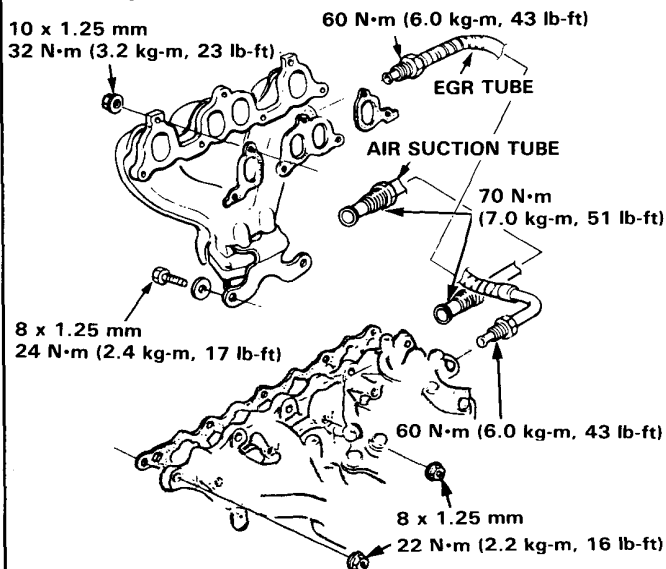
### A20A4 Engine

10 x 1.25 mm  
32 N·m (3.2 kg-m, 23 lb-ft)

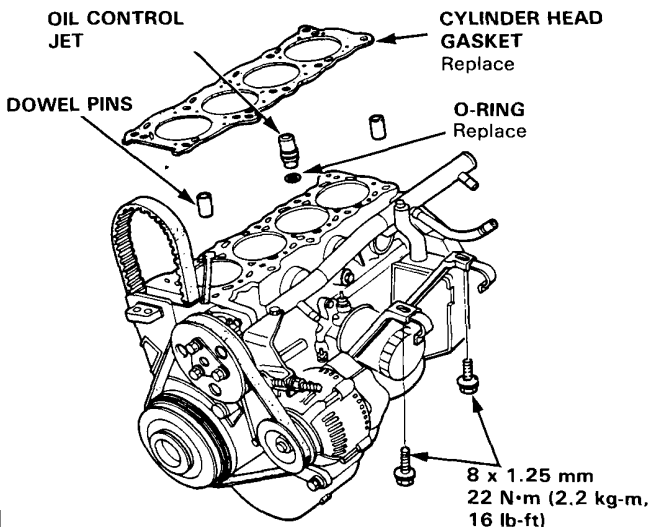


### Other Engine

10 x 1.25 mm  
32 N·m (3.2 kg-m, 23 lb-ft)

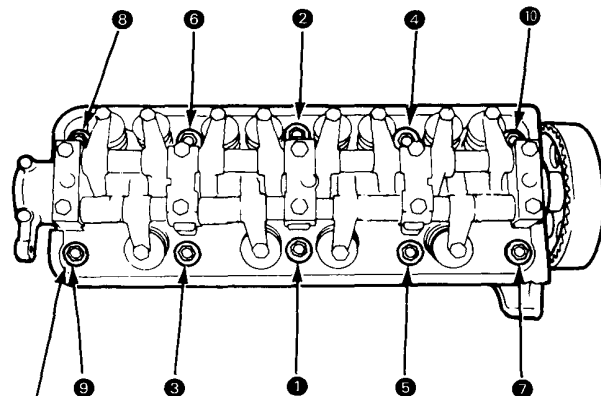


3. Cylinder head dowel pins and oil control jet must be aligned.



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).



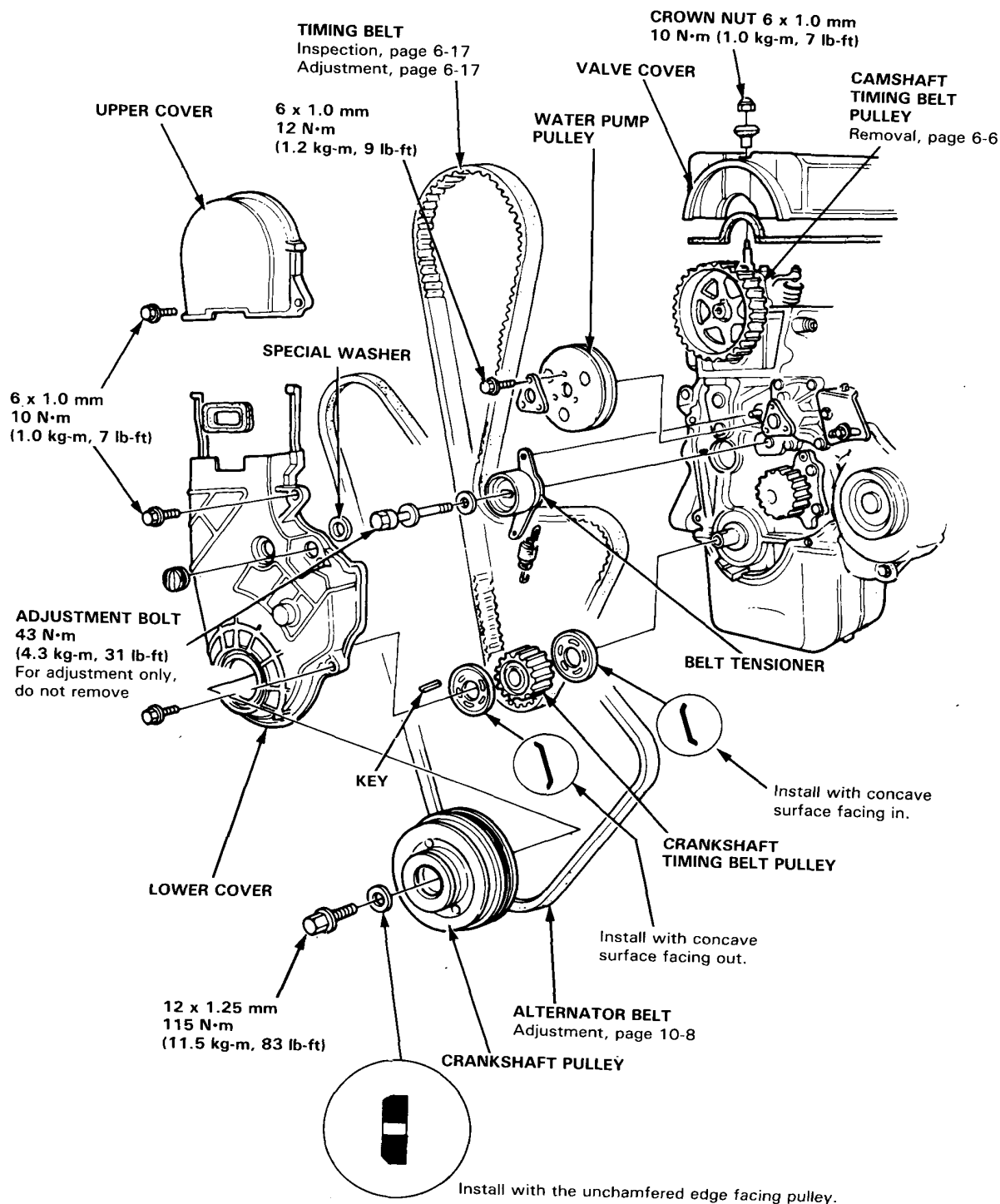
# Timing Belt



## 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.

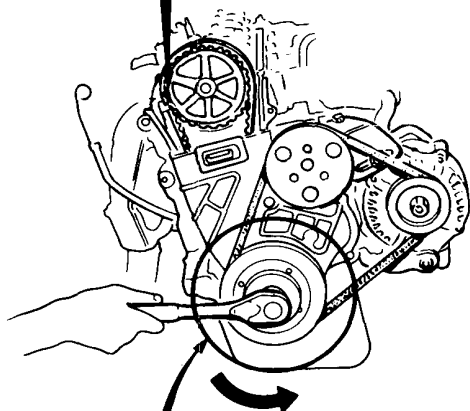
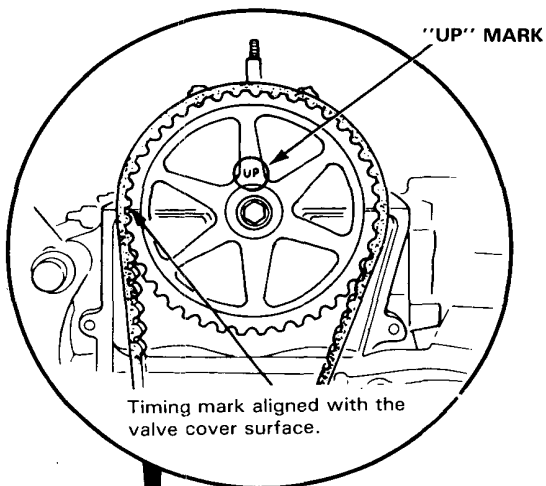




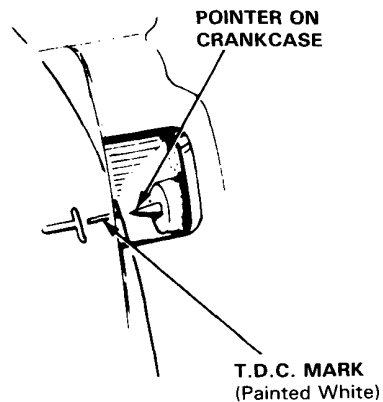
# Timing Belt

## Positioning Crankshaft Before Installing Timing Belt

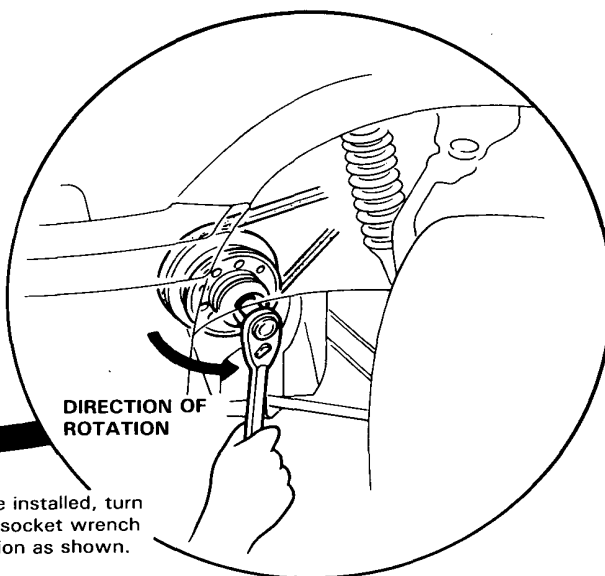
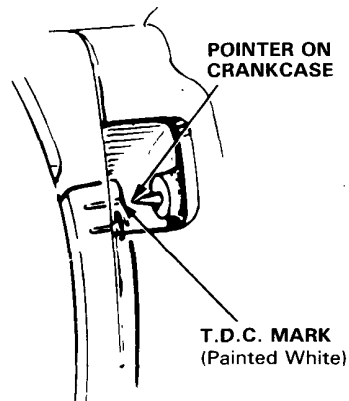
NOTE: Install the timing belt with the No. 1 piston at TDC (Top Dead Center) of the compression stroke.



### MANUAL TRANSMISSION



### AUTOMATIC TRANSMISSION



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

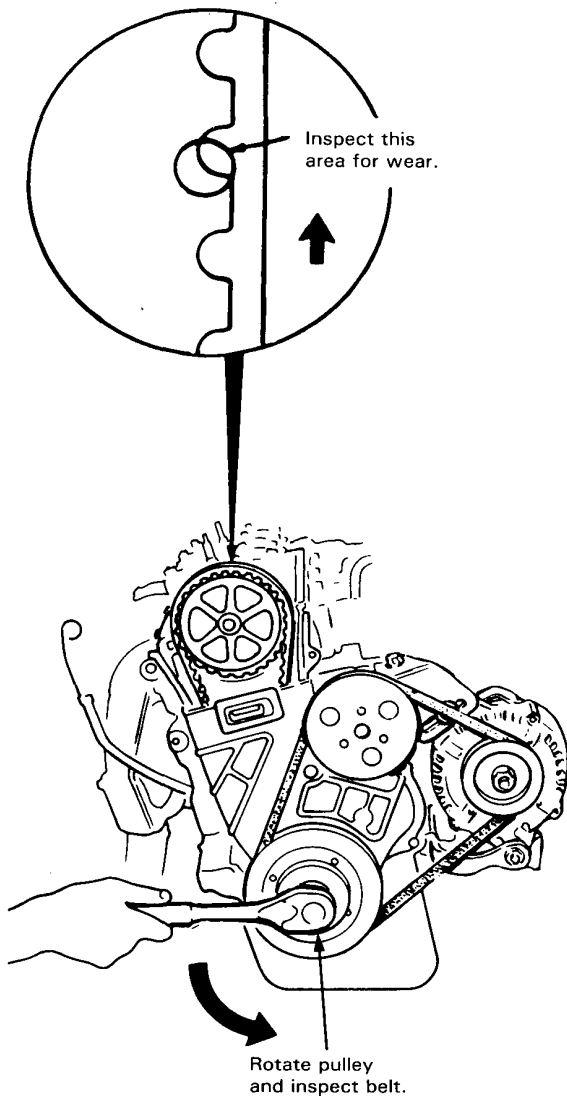




## Inspection

### NOTE:

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

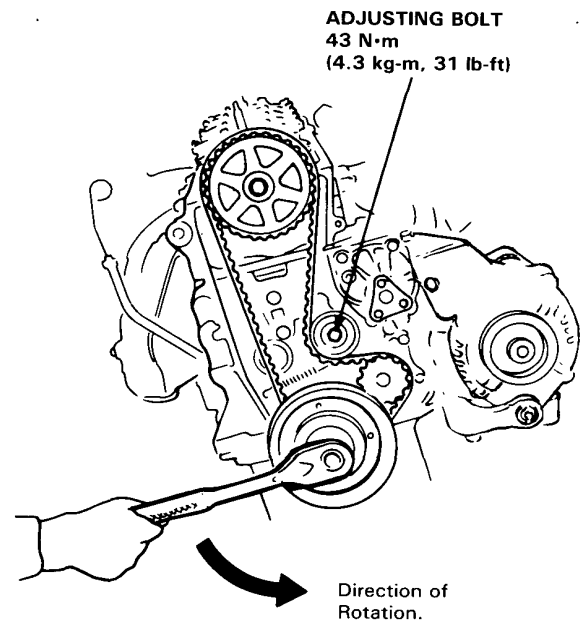


## Tension Adjustment

**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, retorque 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.

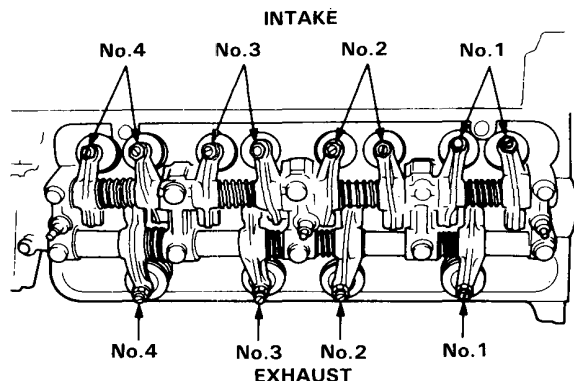


# Valve

## Adjustment

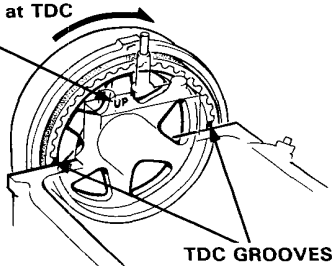
NOTE: Valves should be adjusted cold when the cylinder head temperature less than 38°C (100°F). Adjustment is the same for intake and exhaust valves.

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.

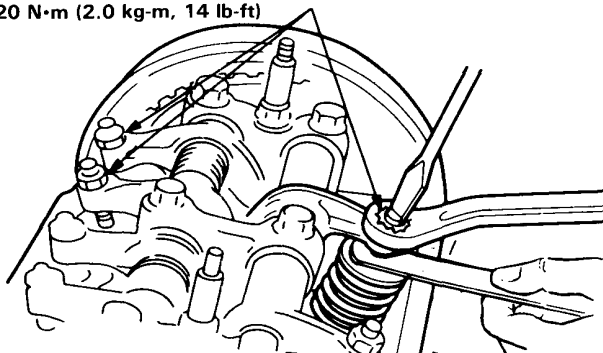
Number 1 Piston at TDC  
UPPER MARK



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.

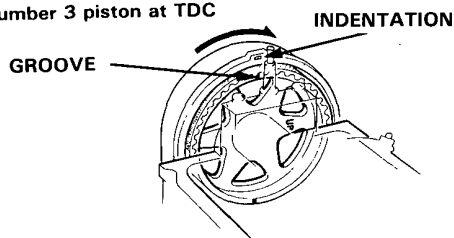
LOCKNUTS 7 x 0.75 mm  
20 N·m (2.0 kg-m, 14 lb-ft)

INTAKE and EXHAUST VALVE



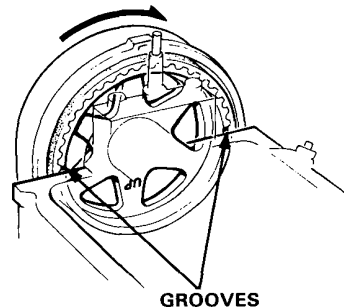
5. Tighten locknut and check clearance again. Repeat adjustment if necessary.
6. Rotate crankshaft 180° counterclockwise (cam pulley turns 90°). TDC groove should be aligned with the indentation in the belt cover. "UP" mark should not be visible. Distributor rotor should point to No.3 plug wire. Adjust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

Number 3 piston at TDC



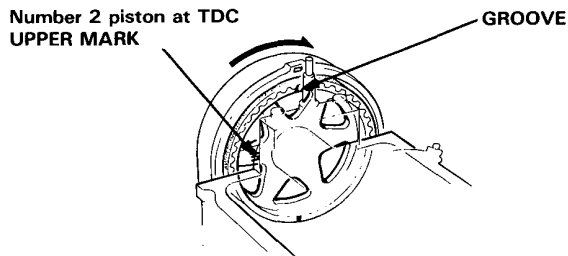
7. Rotate crankshaft 180° counterclockwise to bring No. 4 piston to TDC. Both TDC grooves are once again visible and distributor rotor points to No.4 plug wire. Adjust valves on No.4 cylinder.

Number 4 piston at TDC



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.

Number 2 piston at TDC  
UPPER MARK





## Engine Block

Illustrated Index .....	7-2
Flywheel and Drive Plate .....	7-4
Main Bearing and Rod Bearing .....	7-5
Crankshaft .....	7-8
Piston .....	7-9
Cylinder Block .....	7-10
Piston Ring .....	7-14
Oil Seal .....	7-17




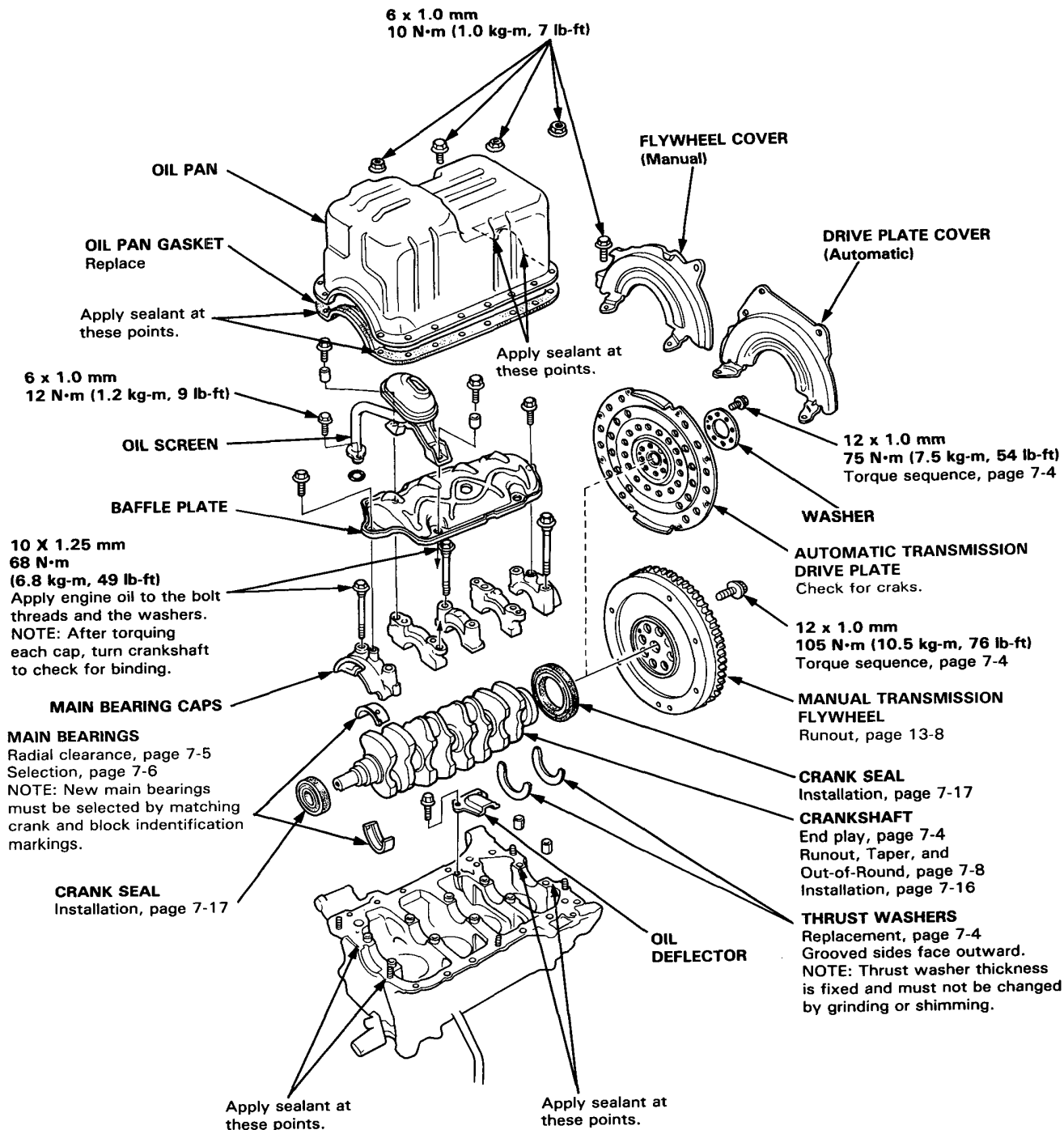


# Engine Block

## Illustrated Index

A20A Engine shown; A16A Engine similar

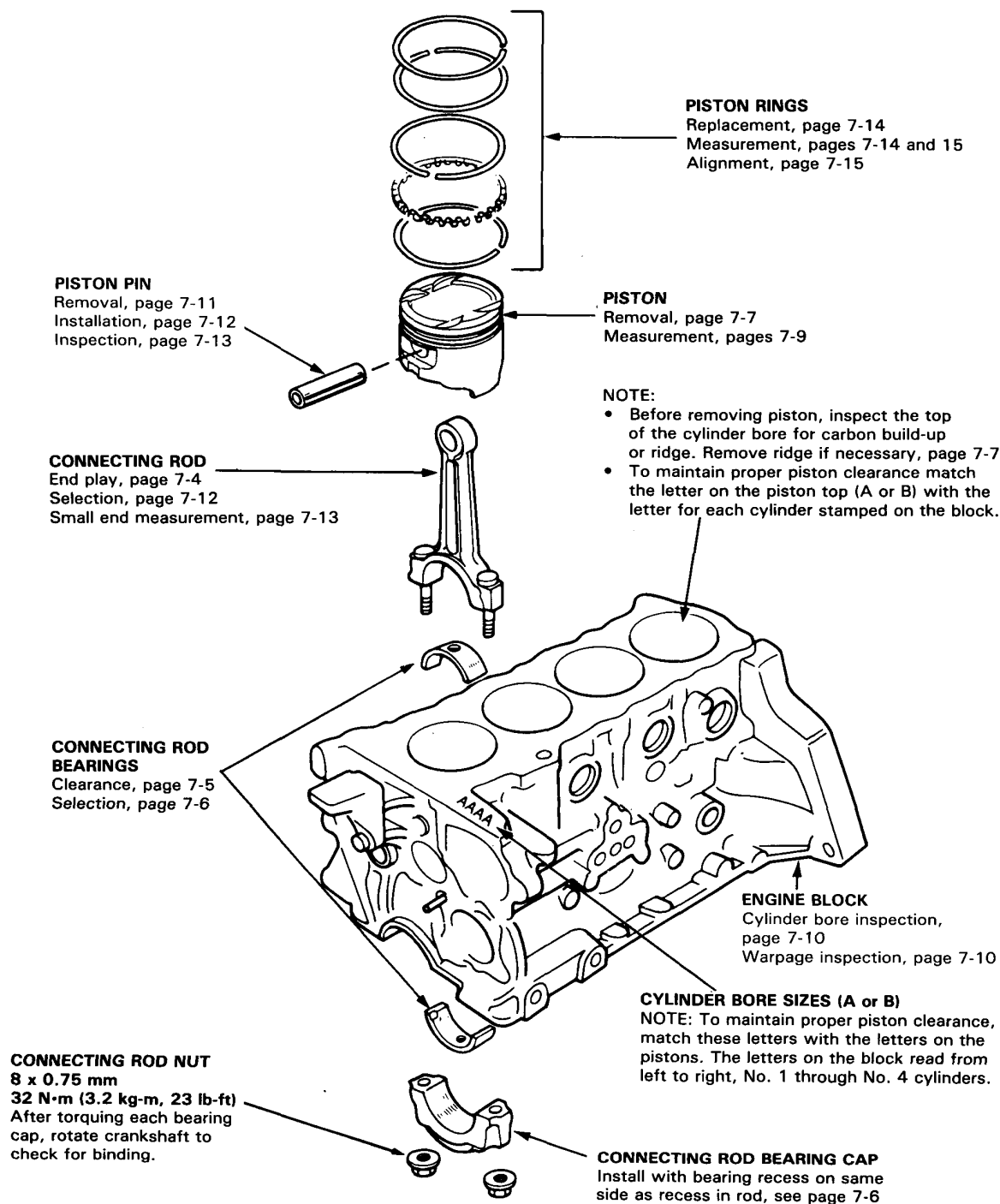
 Lubricate all internal parts with engine oil during reassembly.







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

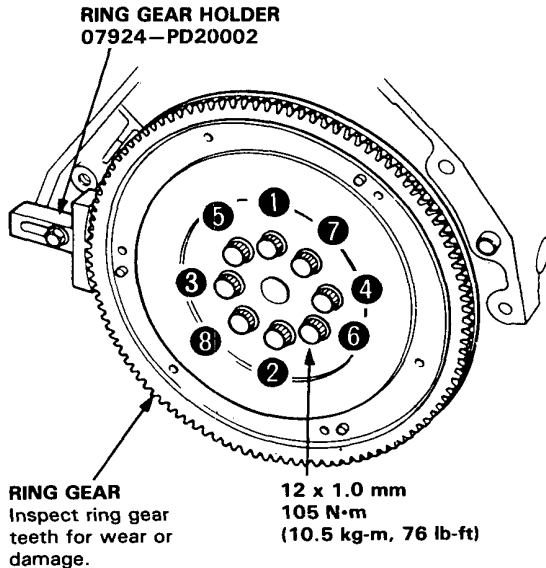




# Engine Block

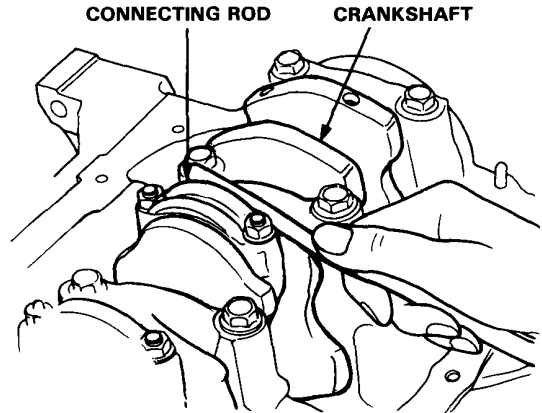
## Flywheel Replacement (Manual Transmission)

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



## Connecting Rod End Play

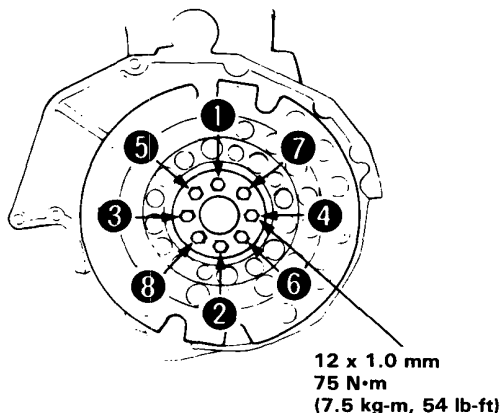
**Standard (New):** 0.15—0.30 mm  
(0.006—0.012 in.)  
**Service Limit:** 0.40 mm (0.016 in.)



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

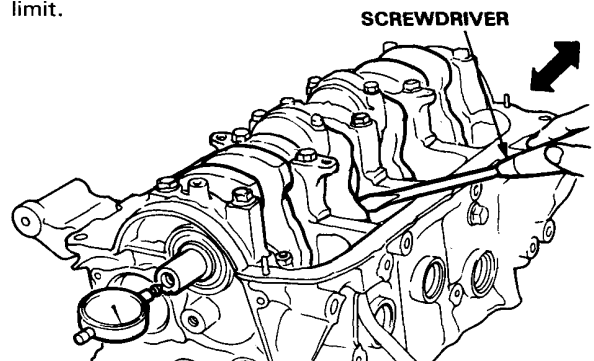
## Drive Plate Replacement (Automatic Transmission)

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



## 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.

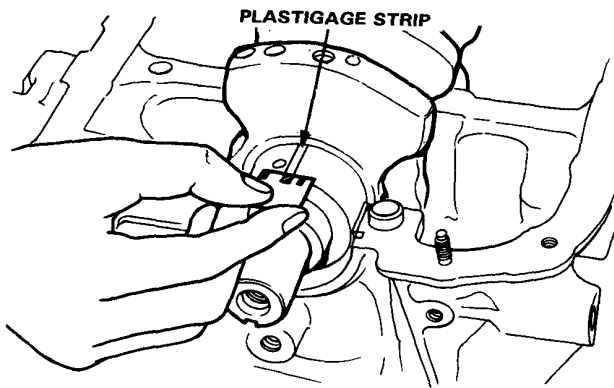
### Main Bearing Clearance:

#### 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).

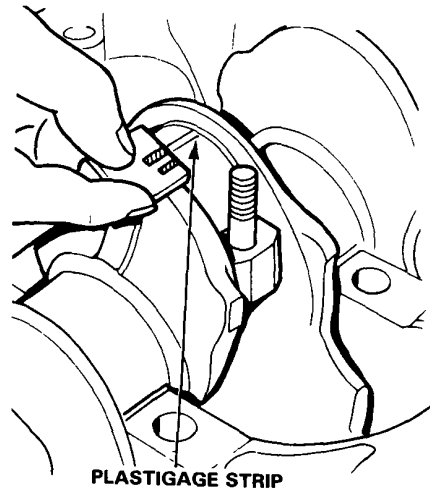
NOTE: Do not rotate the crank during inspection.

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.

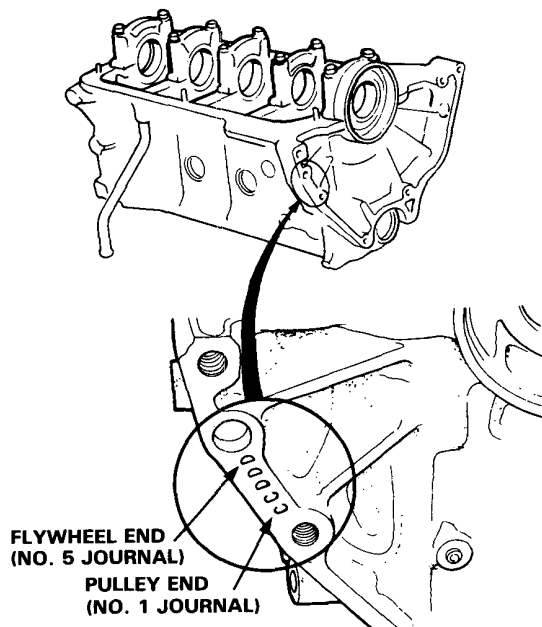


# Main Bearing

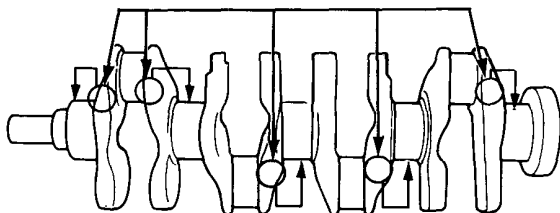
## Selection

### 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)			

↓	1	↓
↓	2	↓
↓	3	↓
↓	4	↓
Smaller main journal		Smaller bearing (thicker)

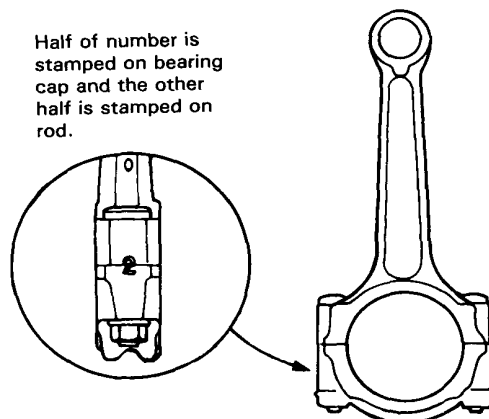
Red	Pink	Yellow	Green
Pink	Yellow	Green	Brown
Yellow	Green	Brown	Black
Green	Brown	Black	Blue

# Rod Bearing

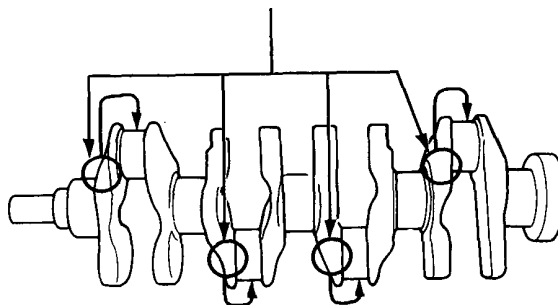
## Selection

### 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)			

↓	A	↓
↓	B	↓
↓	C	↓
↓	D	↓
Smaller rod journal		Smaller bearing (thicker)

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

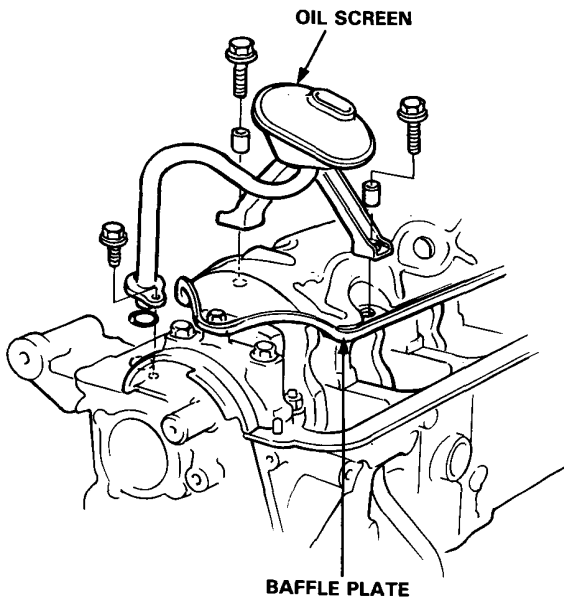


# Crankshaft/Piston

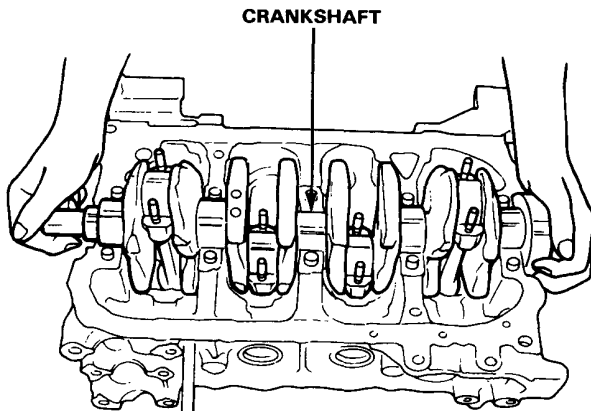


## Removal

1. Remove the oil screen.

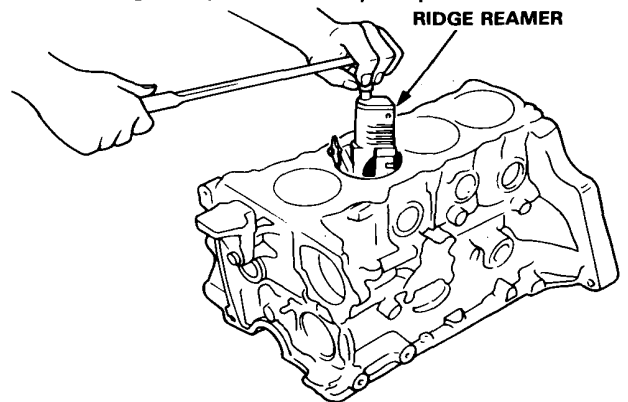


2. Remove the baffle plate.
3. Turn the crankshaft so No. 2 and 3 crankpins are at the bottom.
4. Remove the rod caps/bearings and main caps/bearings. Keep all caps/bearings in order.
5. Lift the crankshaft out of engine, being careful not to damage journals.

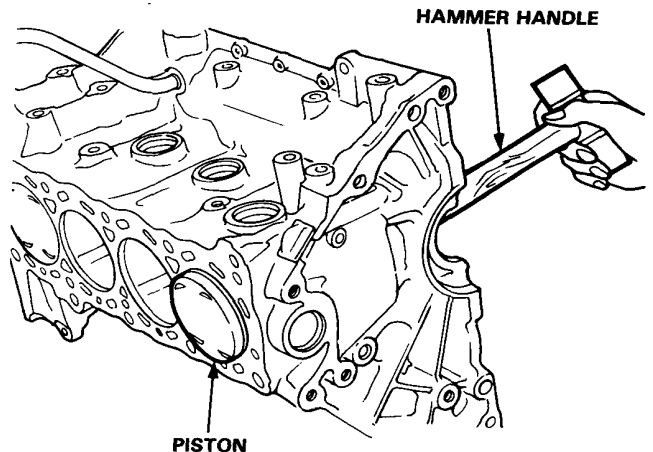


6. Remove upper bearing halves from connecting rods and set aside with their respective caps.
7. Reinstall main cap and bearings on engine in proper order.
8. If you can feel a ridge of metal or hard carbon around the top of each cylinder, remove it with a ridge reamer. Follow reamer manufacturer's instructions.

**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.



# Crankshaft

## 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 service limit.

#### Crankshaft Total Indicated Runout:

##### A20A Engine:

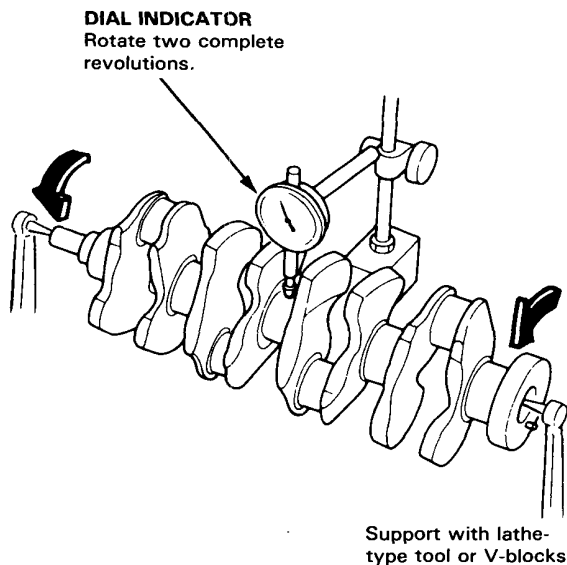
Standard (New): 0.024 mm (0.0009 in.)

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.)



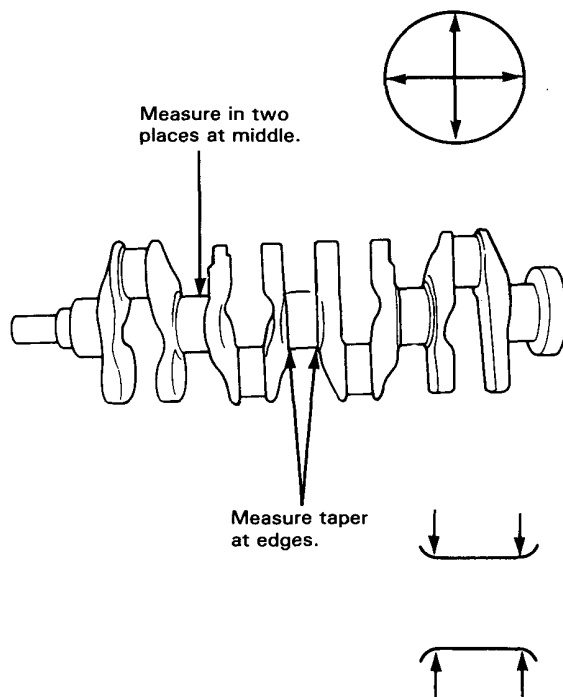
### Out-of-Round and Taper

- 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 limit.

#### 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.)



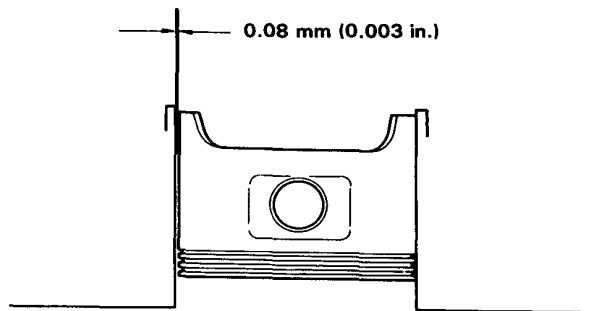
# Piston



## 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**

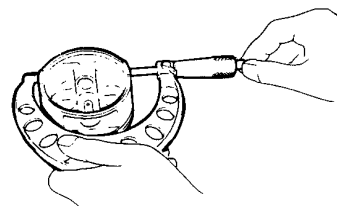
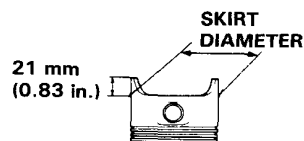
**Standard (New): 79.98–79.99 mm  
(3.1488–3.1492 in.)**

**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 Clearance:**

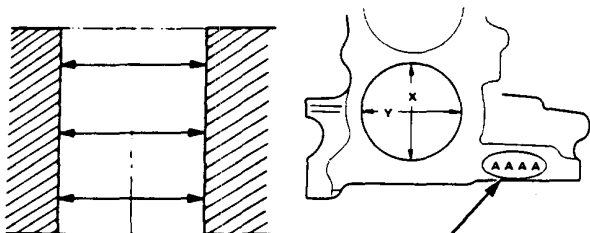
**Service limit: 0.012–0.024 mm  
(0.0005–0.0009 in.)**



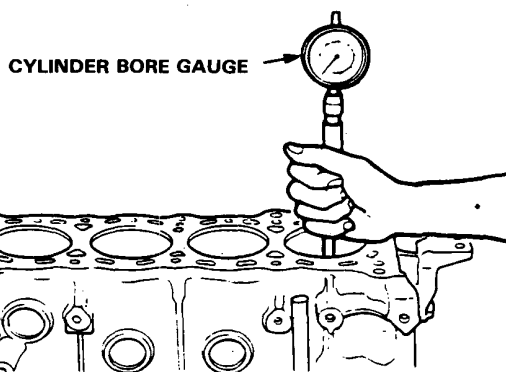
# Cylinder Block

## 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.

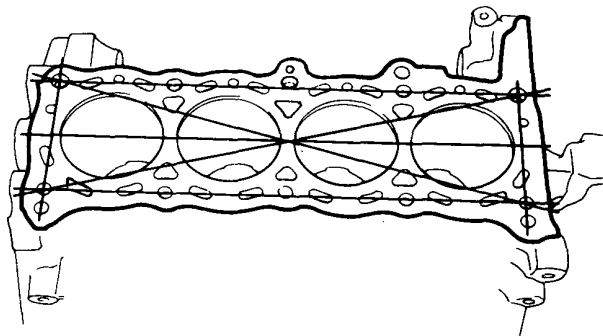
NOTE: Scored or scratched cylinder bores must be honed.

### 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

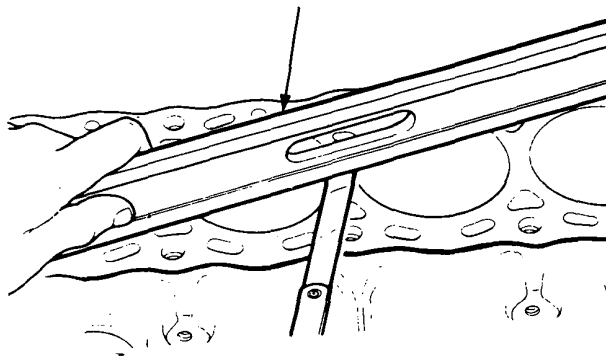


### Engine block Warpage:

Standard (New): 0.08 mm (0.003 in.)

Service Limit: 0.10 mm (0.004 in.)

### PRECISION STRAIGHT EDGE



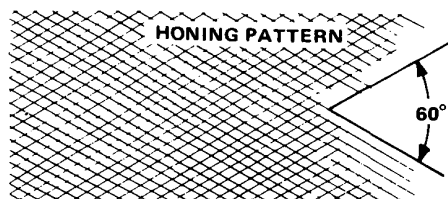




## Piston Pin

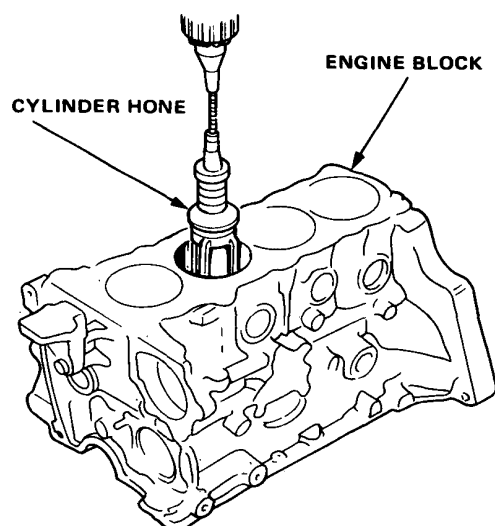
### Bore Honing

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.



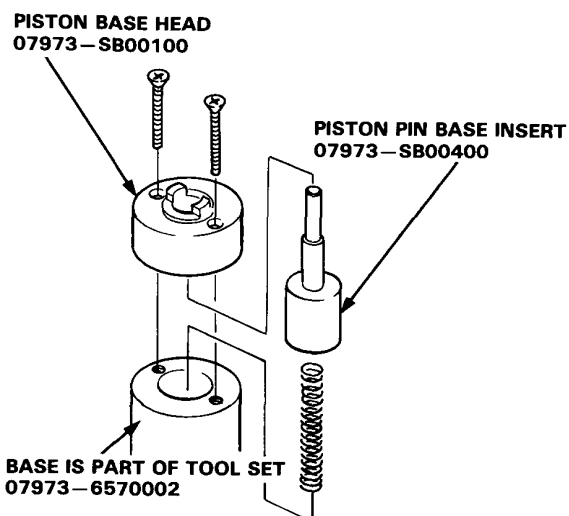
3. When honing is complete, thoroughly clean the engine block of all metal particles. Wash the cylinder bores with hot soapy water, then dry and oil immediately to prevent rusting.
4. If Scoring or scratches are still present in cylinder bores after honing to service limit, rebore the engine block.

**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.

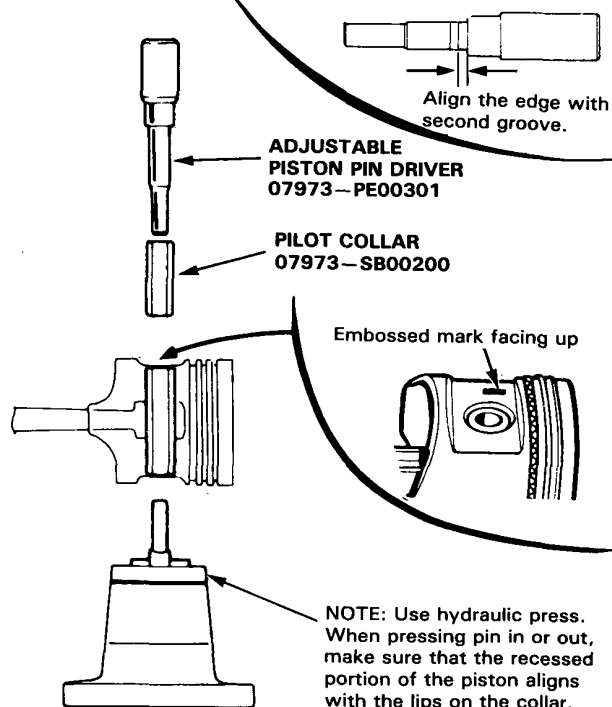


### Removal

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 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 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:

**A20A: 45 mm (1.77 in.)**

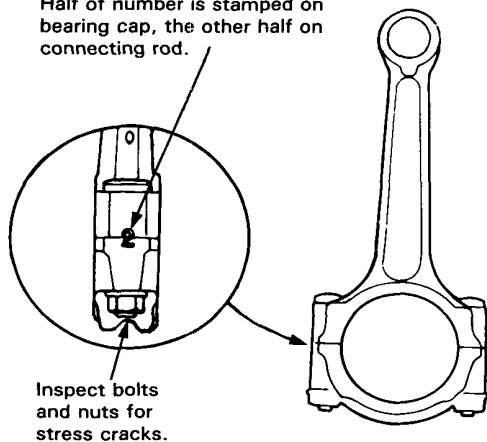
**A16A: 42 mm (1.65 in.)**

### NOTE:

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

### CONNECTING ROD BORE REFERENCE NUMBER

Half of number is stamped on bearing cap, the other half on connecting rod.



# Piston Pin

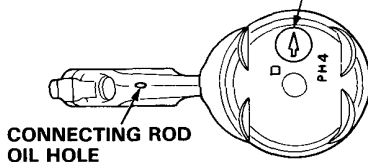
## Installation

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.

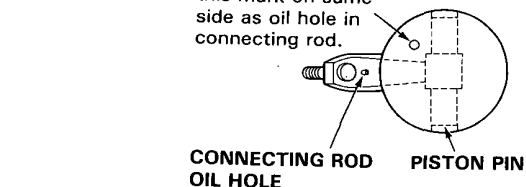
### A20A Engine:

The arrow must face the timing belt side of the engine and the connecting rod oil hole must face the intake manifold.



### A16A Engine:

Install piston with this mark on same side as oil hole in connecting rod.



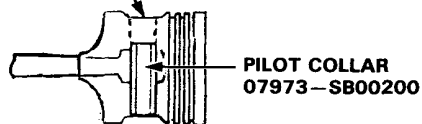
### ADJUSTABLE PISTON PIN DRIVER 07973-PE00301

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

REFERENCE MARKS

Embossed mark facing up.

PISTON PIN



PISTON PIN BASE INSERT 07973-SB00400

PISTON BASE HEAD 07973-SB00100

BASE IS PART OF TOOL SET 07973-6570002 or 07973-6570001

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





## Inspection

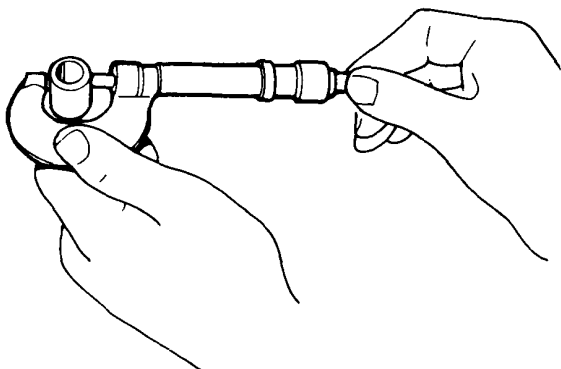
1. Measure the diameter of the piston pin.

### Piston Pin Diameter:

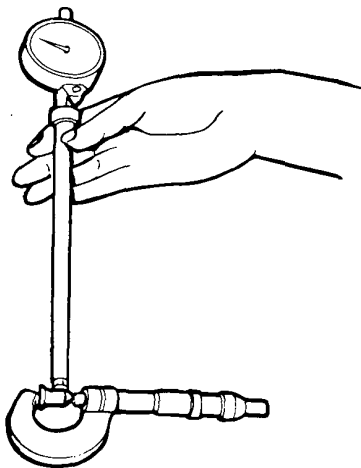
**Standard (New):** 19.994–20.0 mm  
(0.7872–0.7874 in.)

**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.



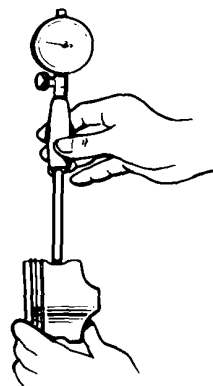
3. Measure the piston pin-to-piston clearance.

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:

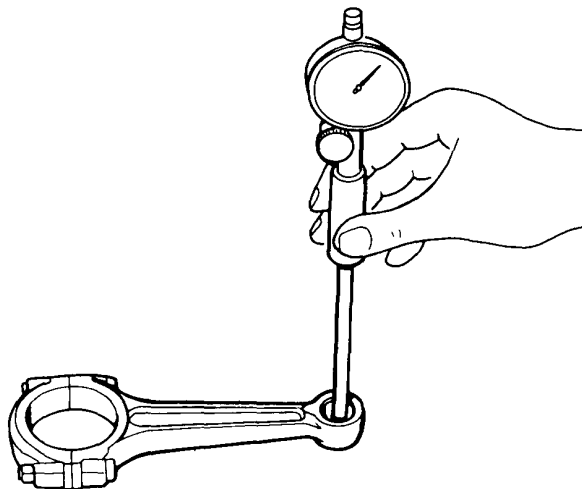
**Service Limit:** 0.012–0.024 mm  
(0.0005–0.0009 in.)



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:

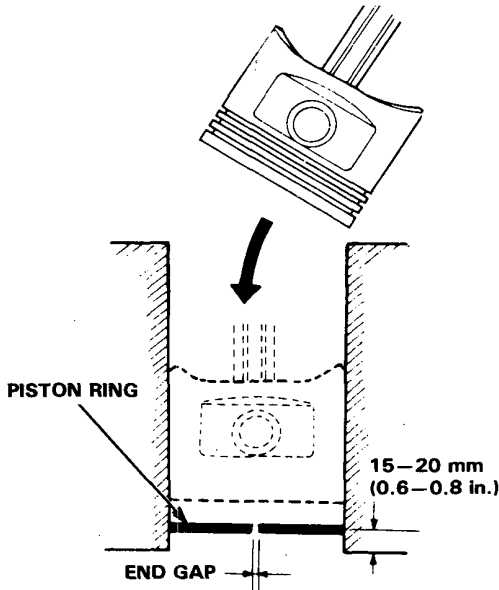
##### Top and Second Ring

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.

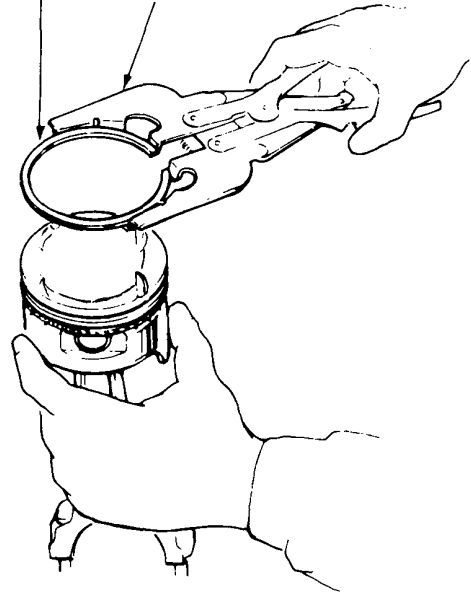
NOTE: If piston is to be separated from connecting rod, do not install new rings yet.

3. Install new rings in proper sequence and position (page 7-15).

NOTE: Do not re-use old piston rings.

### PISTON RING

### RING EXPANDER







## Land Clearances

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

### Top and Second Rings Clearance

#### A20A Engine:

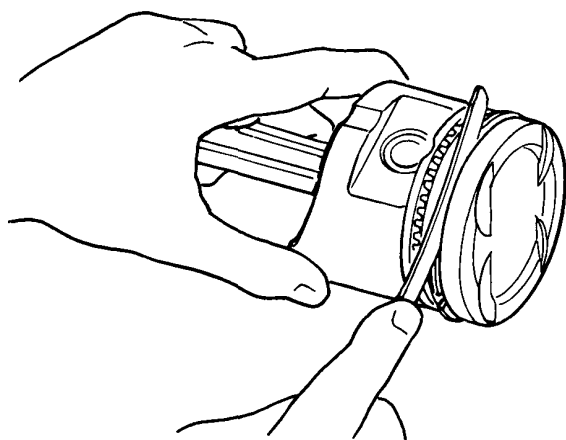
Standard (New): 0.030–0.055 mm  
(0.0012–0.0022 in.)

Service Limit: 0.13 mm (0.005 in.)

#### A16A Engine:

Standard (New): 0.020–0.040 mm  
(0.0008–0.0016 in.)

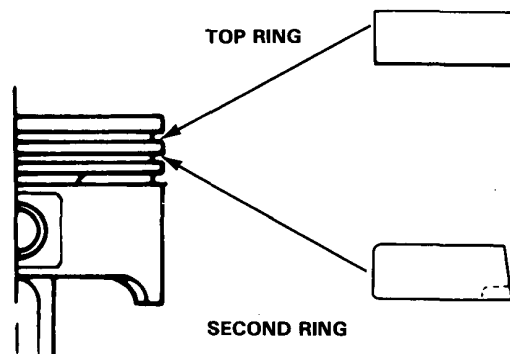
Service Limit: 0.13 mm (0.005 in.)



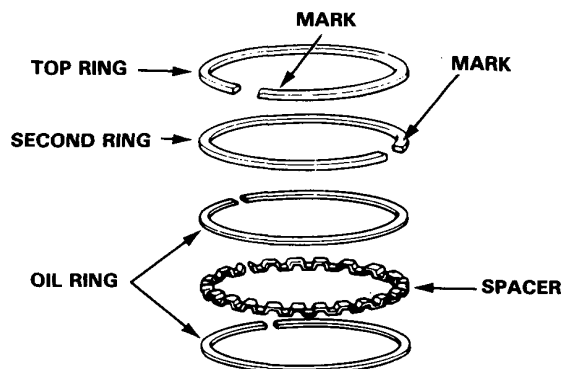
## Alignment

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

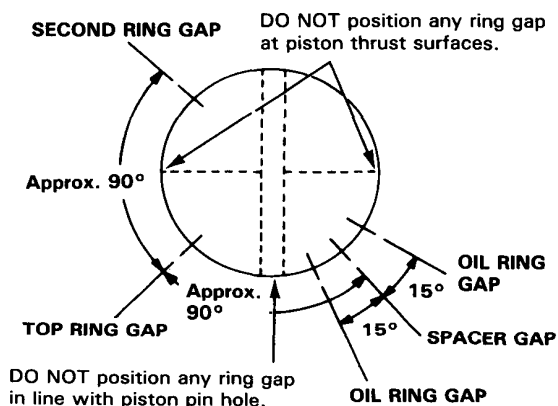
Identify top and second rings by the chamfer on the edge, and make sure they are in proper grooves on piston.



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:

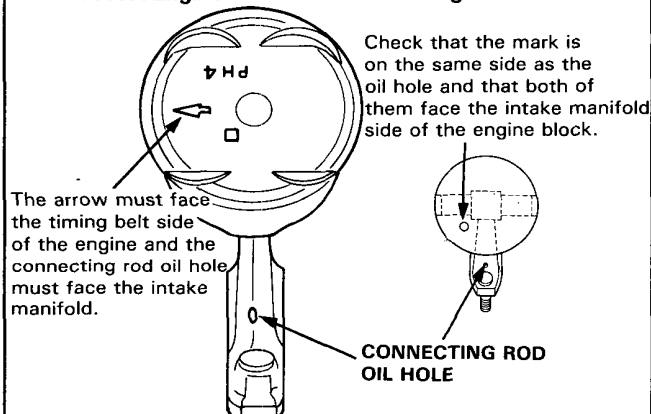
- Remove the connecting rod caps, then slip short sections of rubber hose over the threaded ends of the connecting rod bolts.
  - Install the ring compressor, check that the bearing is securely in place, then position the piston in the cylinder and drive it in using the wooden handle of a hammer.
- Stop 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.

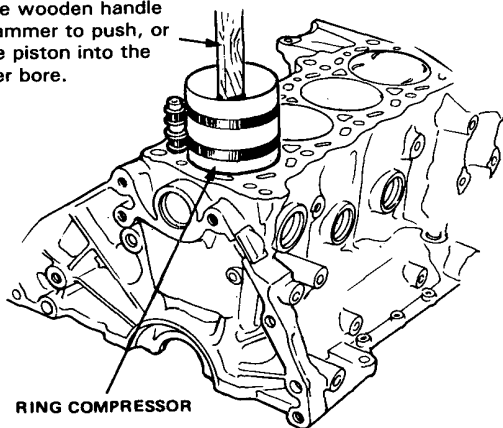
**A20A Engine:**

**A16A Engine:**




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

Use the wooden handle of a hammer to push, or tap the piston into the cylinder bore.

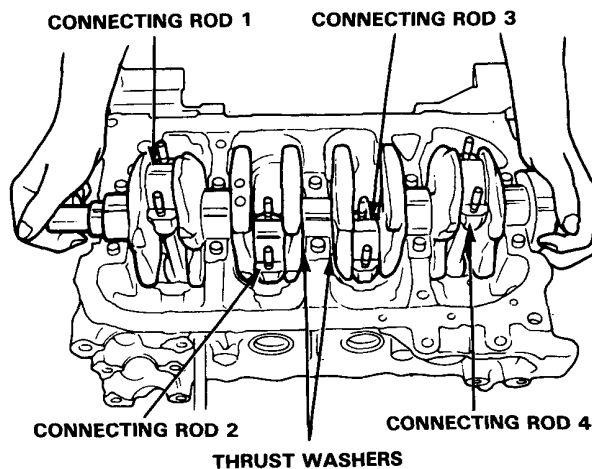


# Crankshaft

## 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.




# Oil Seal

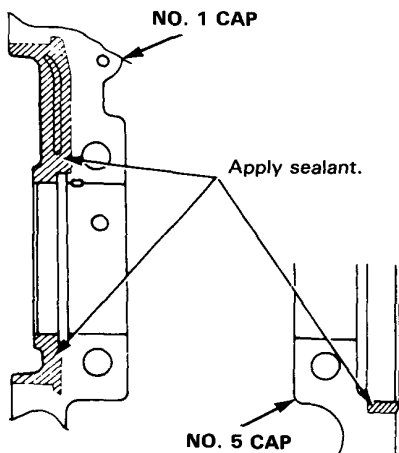
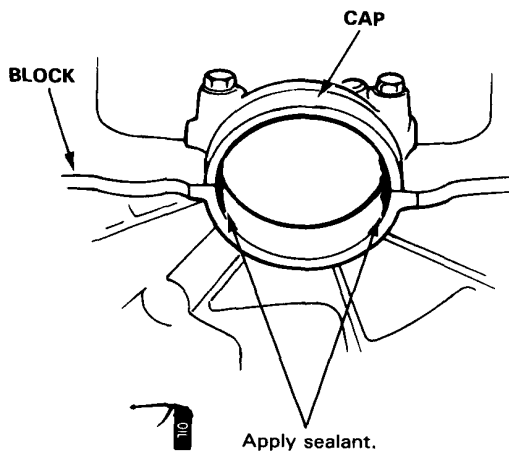


## Installation

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

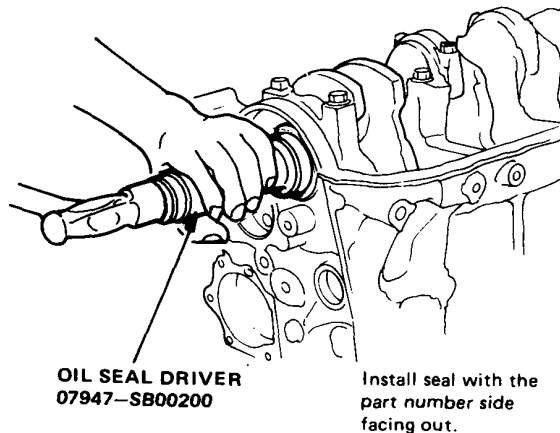
 The seal surface on the block should be dry. Apply a light coat of oil to the crankshaft and to the lip of seal.

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



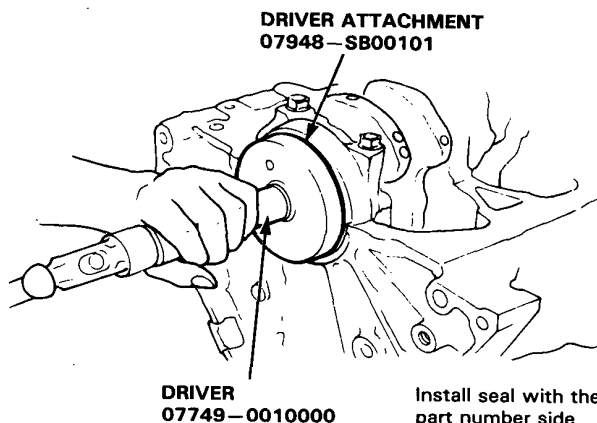
2. Apply a light coat of grease to the sealing surfaces of both oil seals. Also fill the back (the spring side) of each seal with grease to help keep the spring in place during installation.

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

Illustrated Index .....	8-2
Oil Level Inspection .....	8-3
Oil Replacement .....	8-3
Oil Filter Replacement .....	8-4
Oil Pressure Test .....	8-4
Oil Pump Illustrated Index .....	8-5
Oil Pump Removal/Inspection .....	8-6
Oil Filter Base Inspection .....	8-7

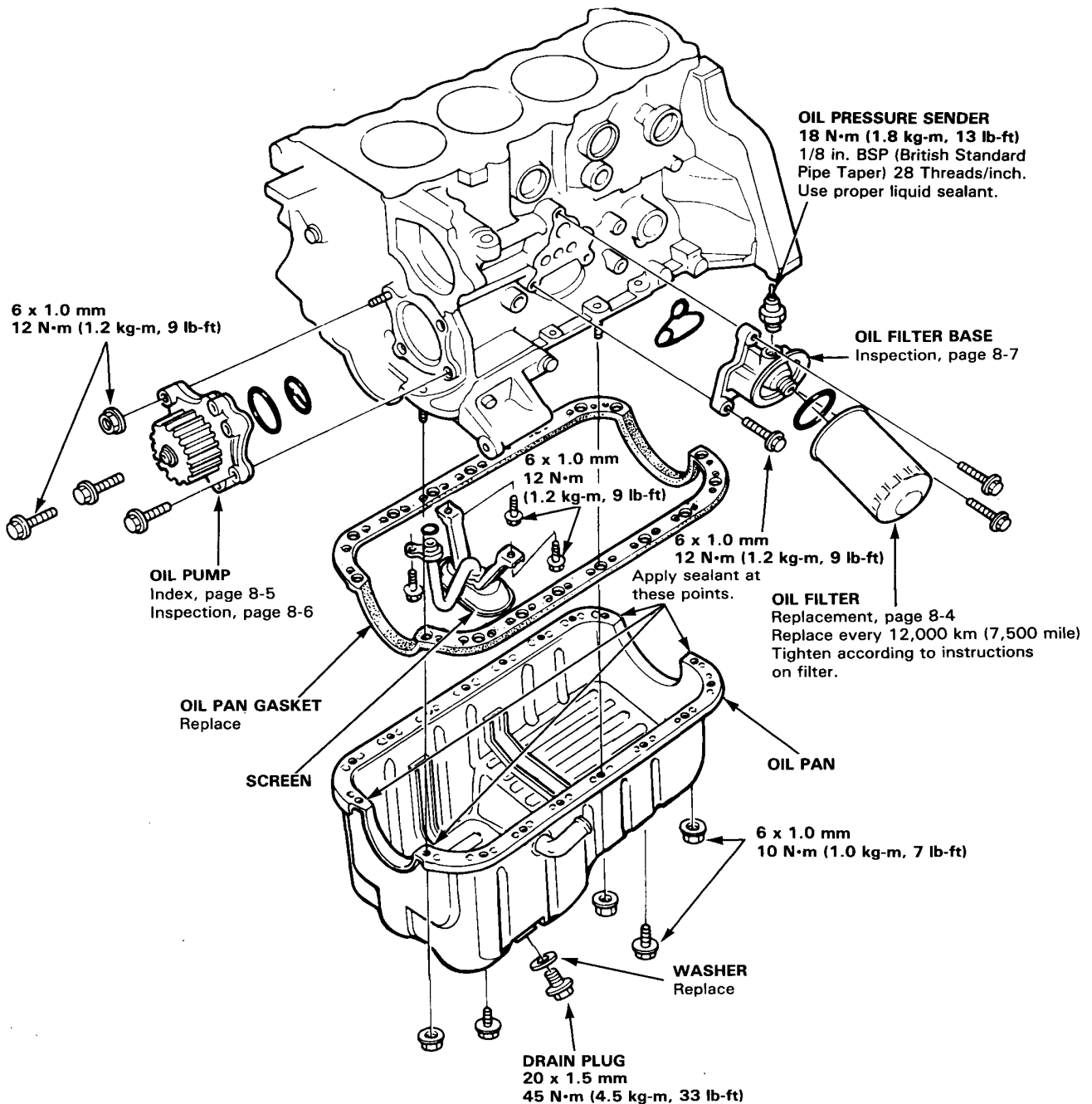




# Engine Lubrication

## Illustrated Index

NOTE: Use new O-rings whenever reassembling.

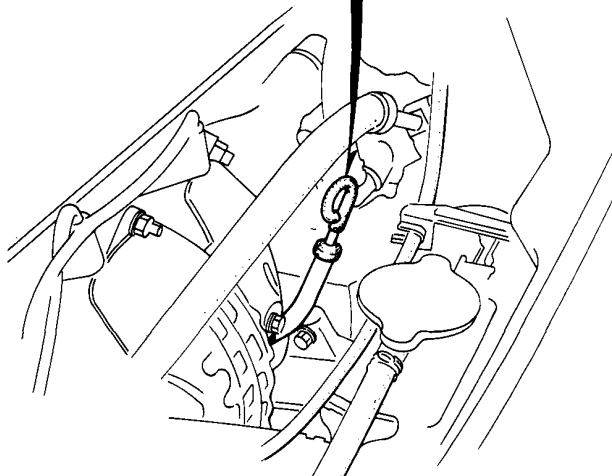
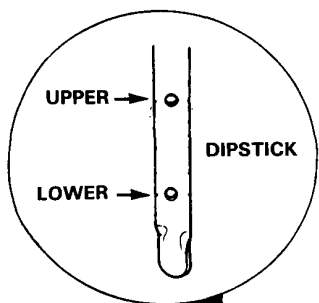




# Oil Level

## 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.



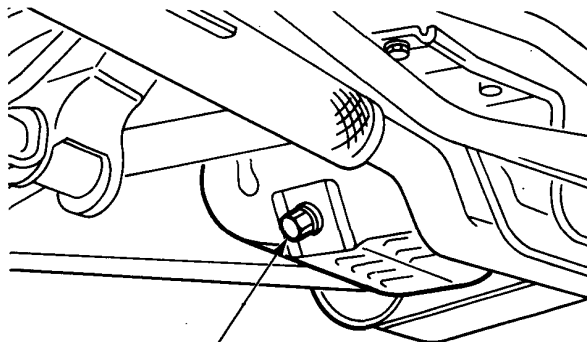
# Engine Oil



## Replacement

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

NOTE: Remove the filler cap to speed draining.



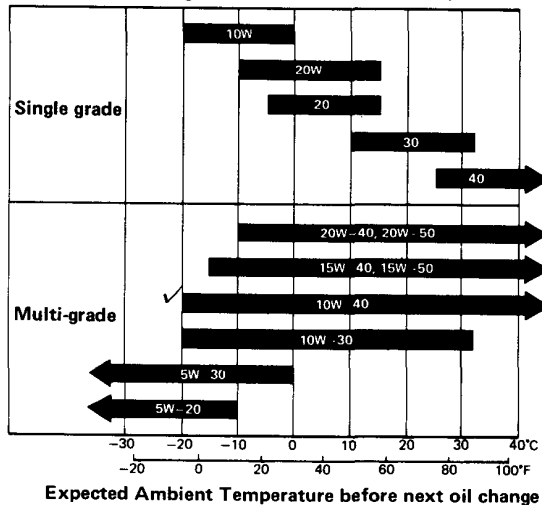
**OIL PAN DRAIN PLUG**  
45 N·m (4.5 kg-m, 33 lb-ft)

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

<b>Capacity</b>	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
<b>Change</b>	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)



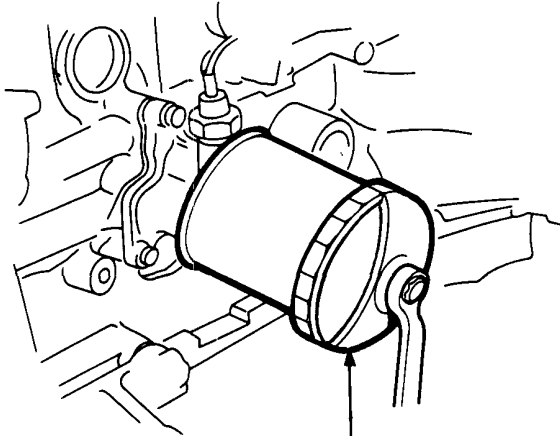


# Oil Filter

## Replacement

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

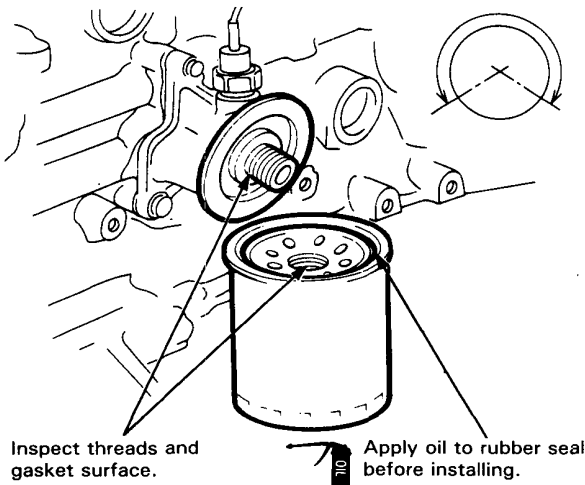
1. Remove the oil filter with the special oil filter socket.



**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 to 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

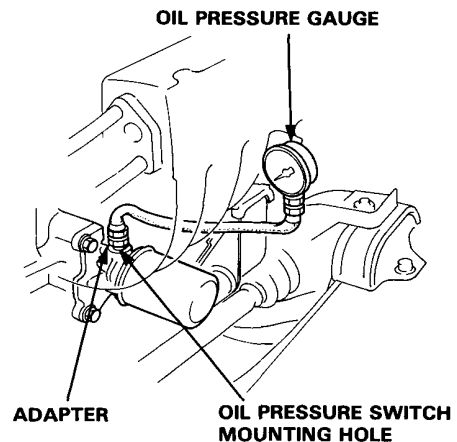
If the oil pressure warning light stays on with the engine running. Check the engine oil level. If the oil level is correct:

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:

Idle: 98 kPa (1.0 kg/cm<sup>2</sup>, 14 psi)  
minimum  
3,000 min<sup>-1</sup>(rpm): 373-451 kPa  
(3.8-4.6 kg/cm<sup>2</sup> 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).

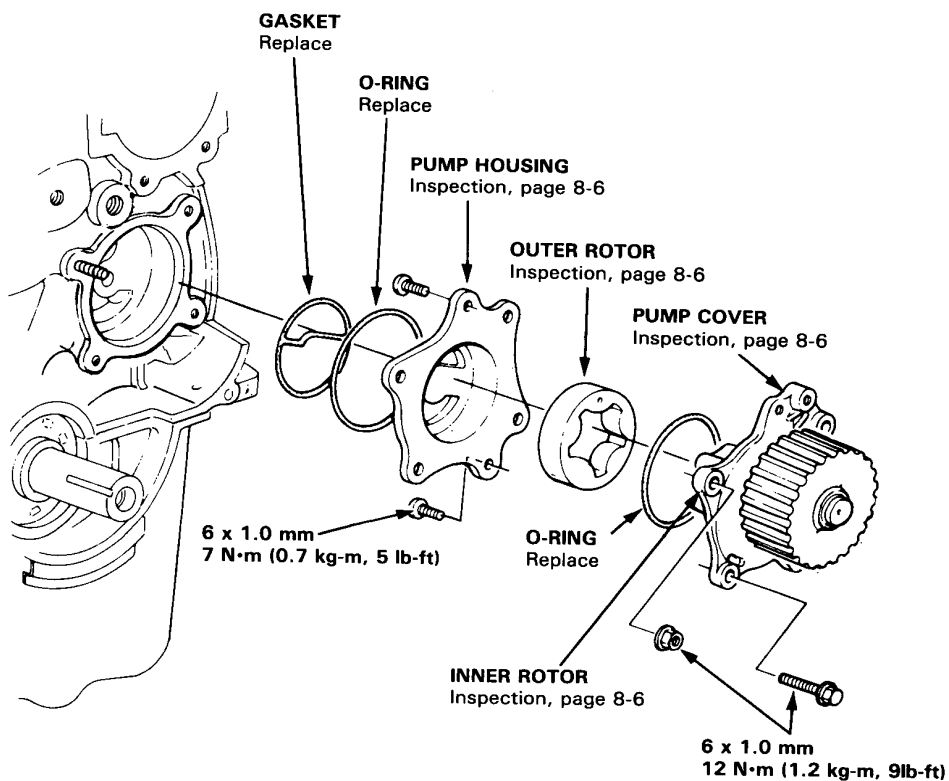




# Oil Pump



## Illustrated Index





# Oil Pump

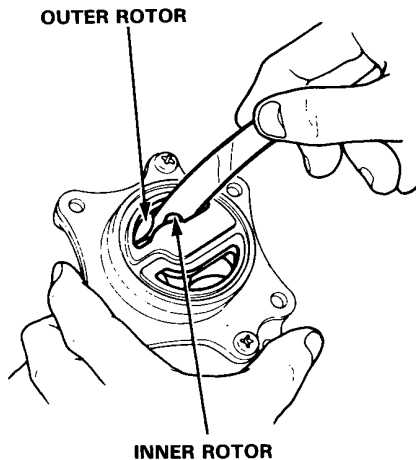
## Removal/Inspection

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.)

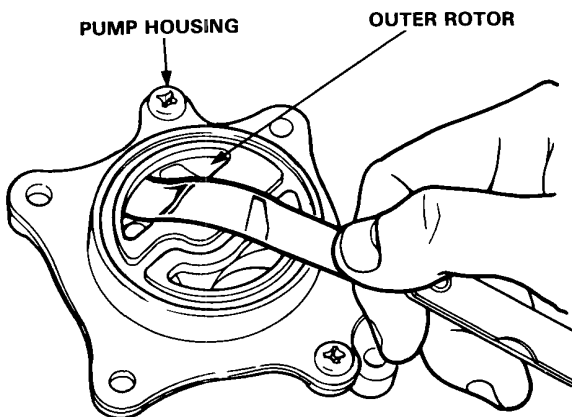


4. Check the axial clearance on the outer pump rotor.

### 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.)



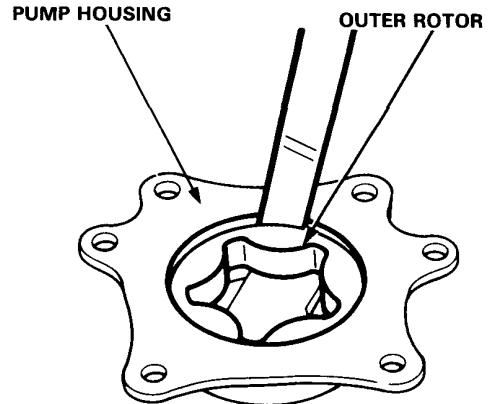
5. Remove the two screws from the pump housing, then separate the housing and cover.

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.)

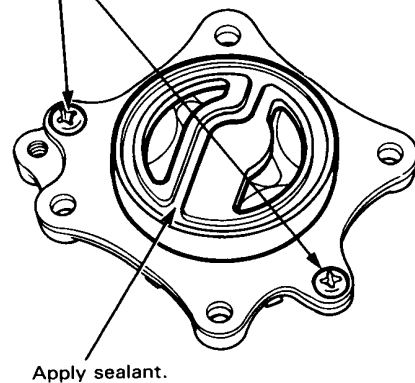
Service Limit: 0.2 mm (0.008 in.)



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.

Apply locking fluid.



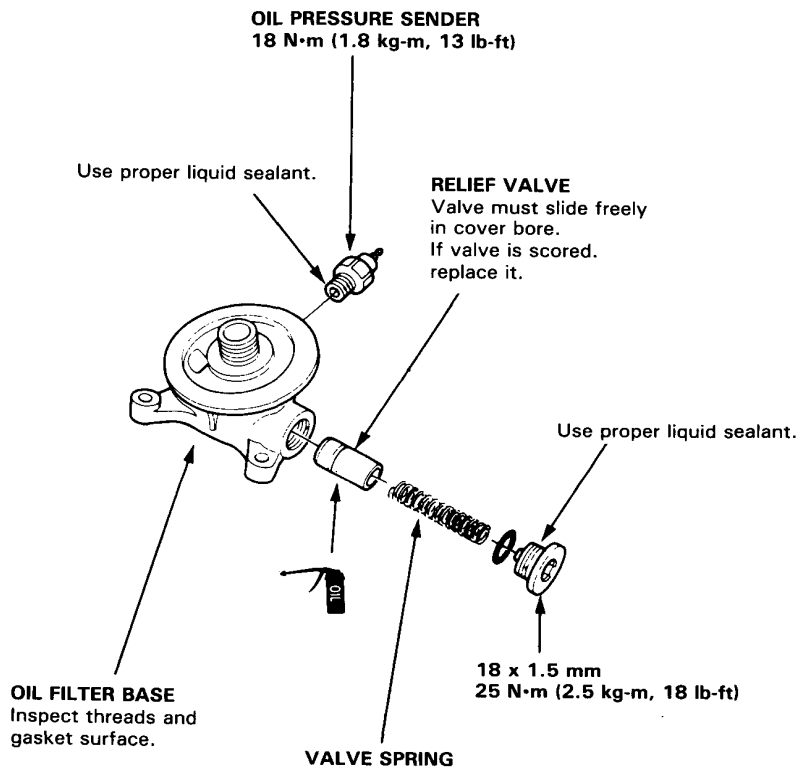
9. Apply sealant around the O-ring groove, then install the new O-ring.
10. Install a new gasket to the pump housing and re-install the oil pump.
11. Check that the oil pump turns freely.



# Oil Filter Base



## Inspection





## Intake Manifold/Exhaust System

Intake Manifold .....	9-2
Exhaust Manifold .....	9-4
Exhaust Pipe and Muffler .....	9-7
Catalytic Converter .....	9-9

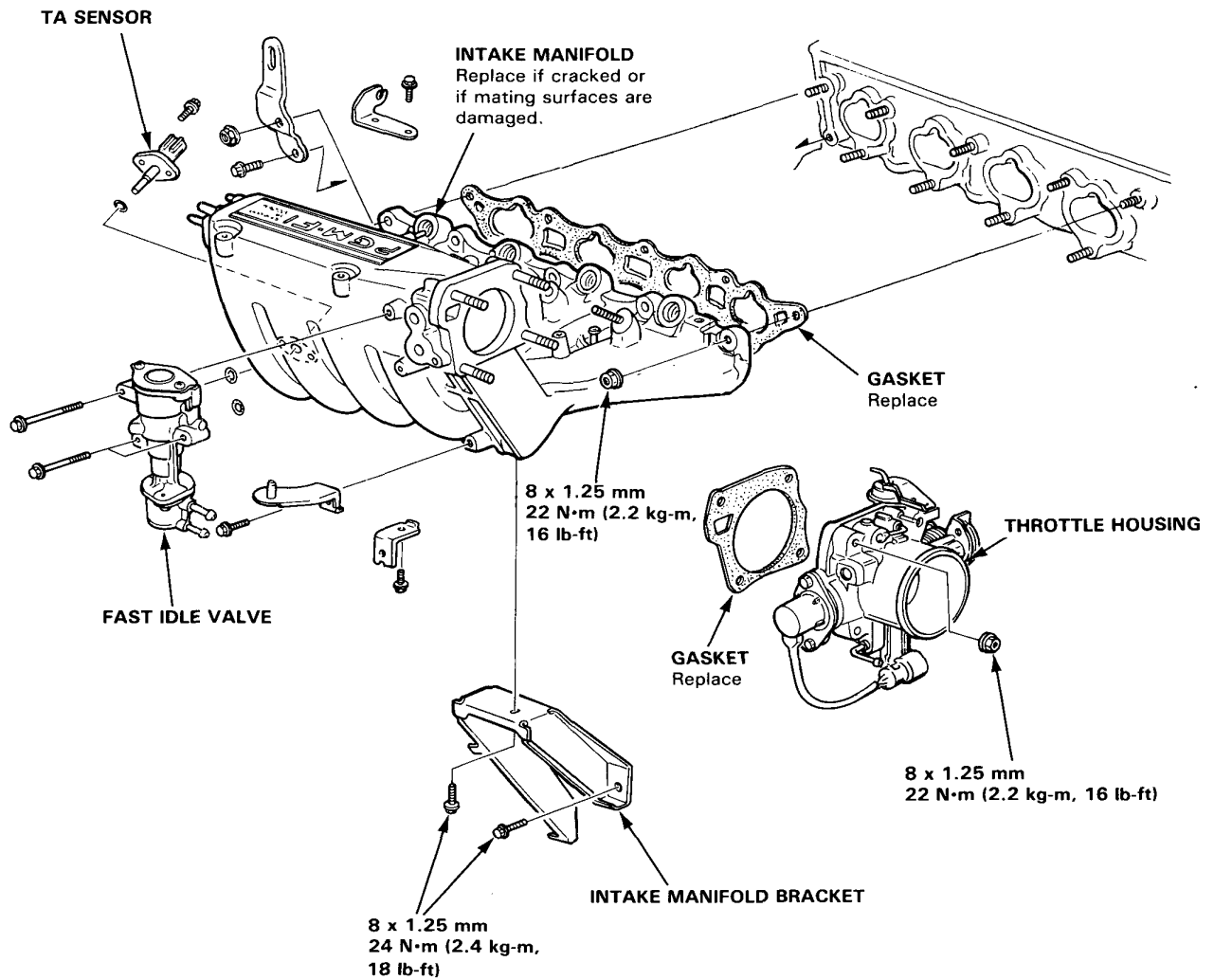




# Intake Manifold

## Illustrated Index

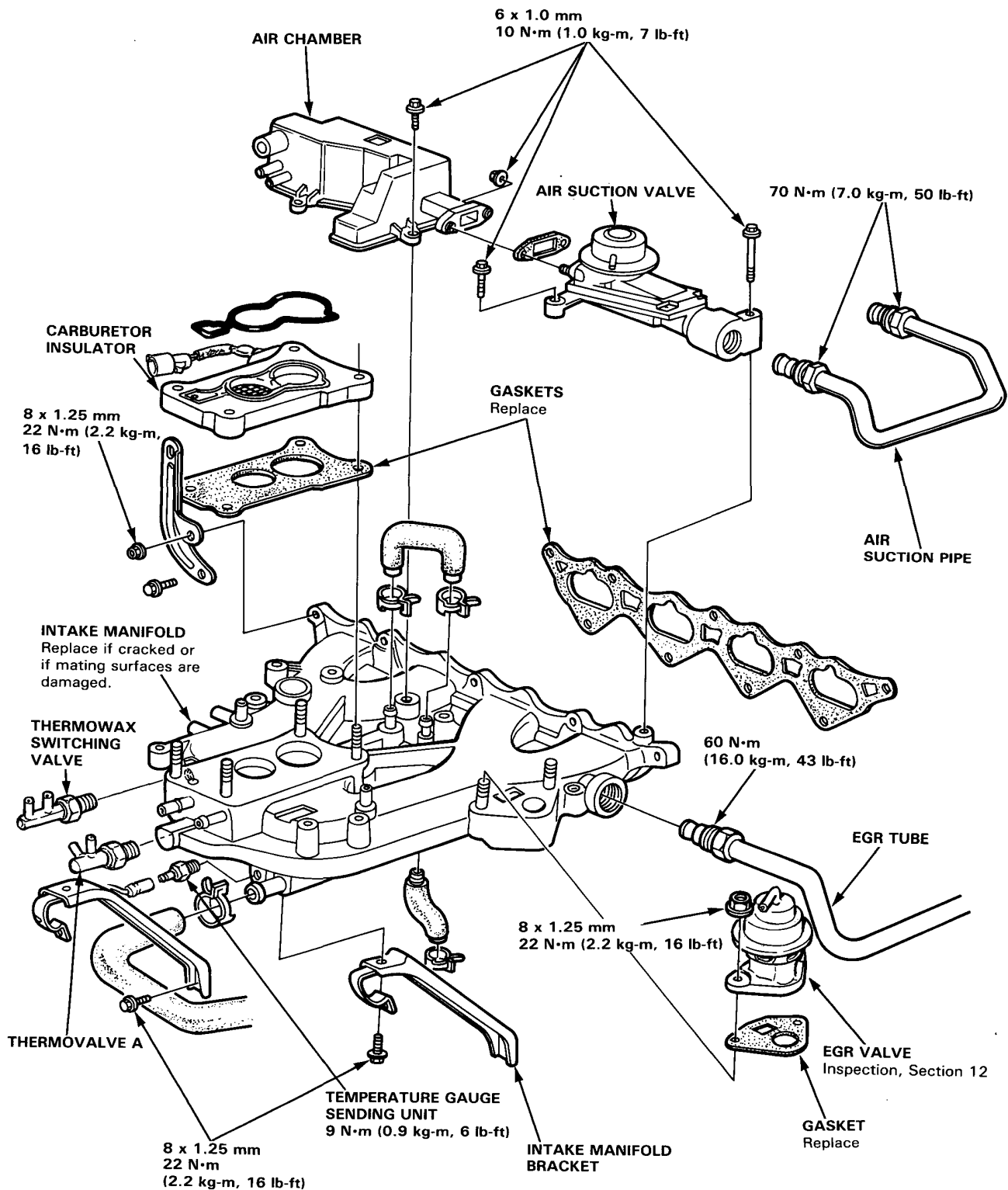
A20A4 Engine







**A20A1 Engine shown; A20A2 and A16A1 Engine similar**

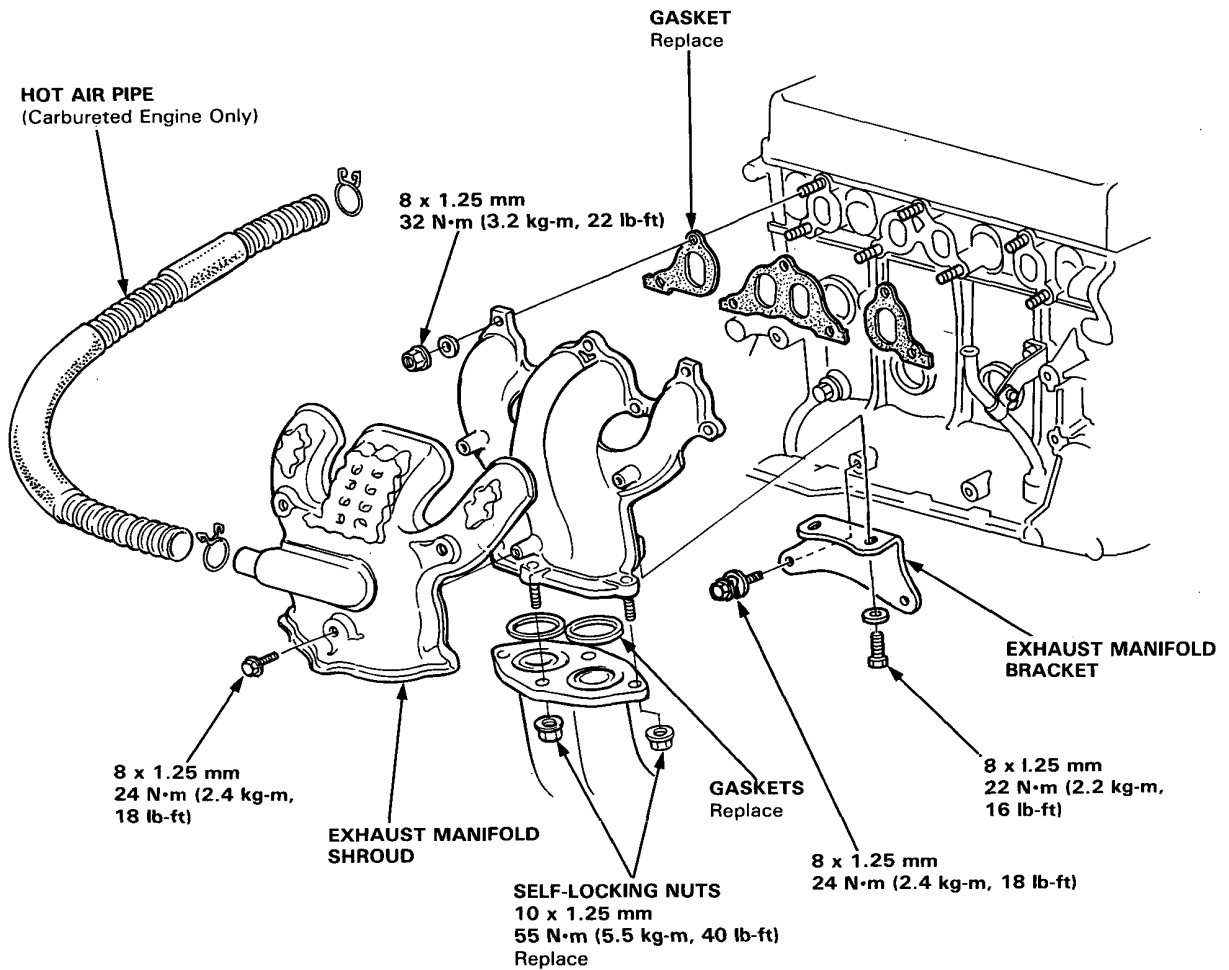




# Intake Manifold

## Illustrated Index

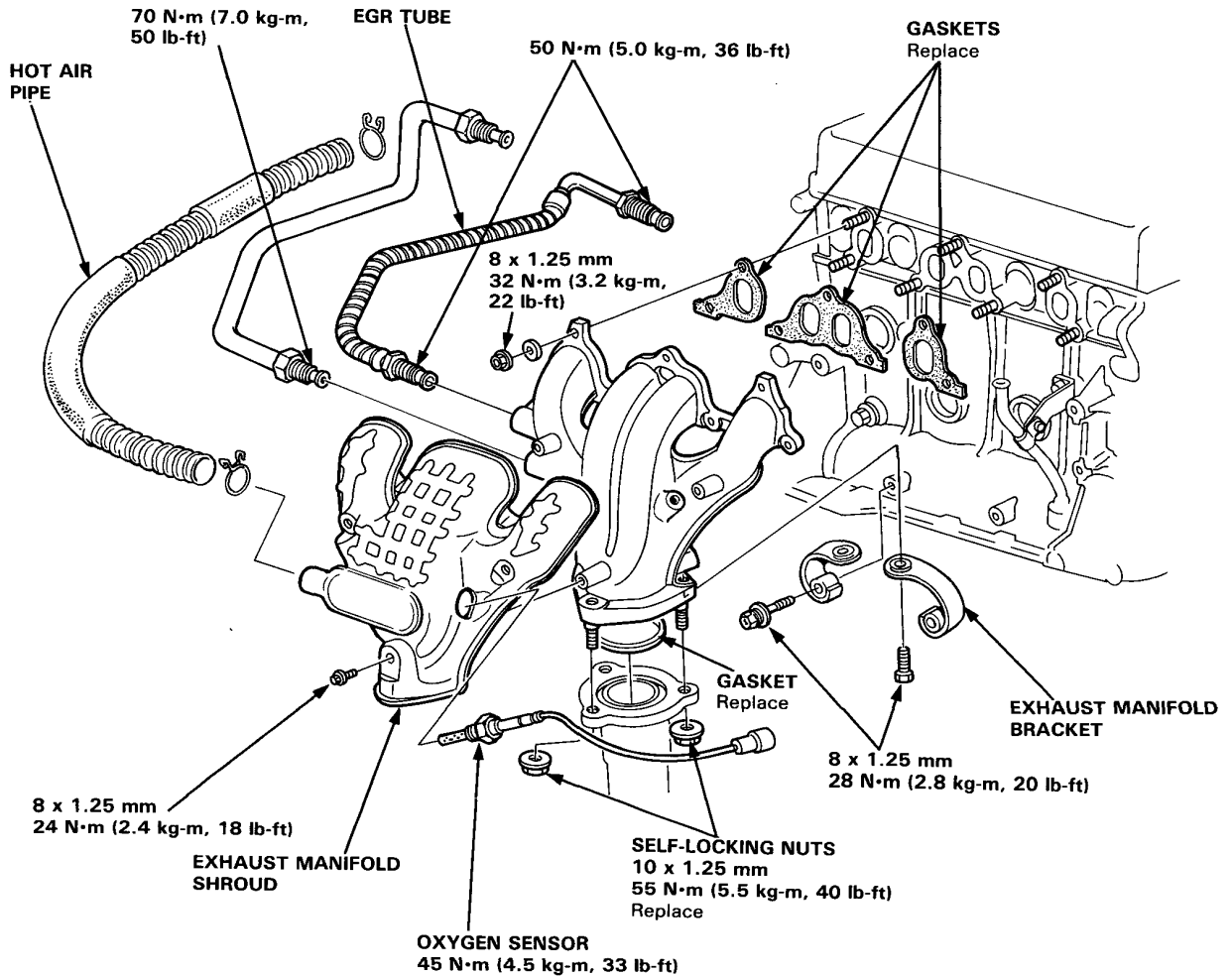
European Model Engine and KY Model Engine







## KG and KW Model Engine (With Catalytic Converter)



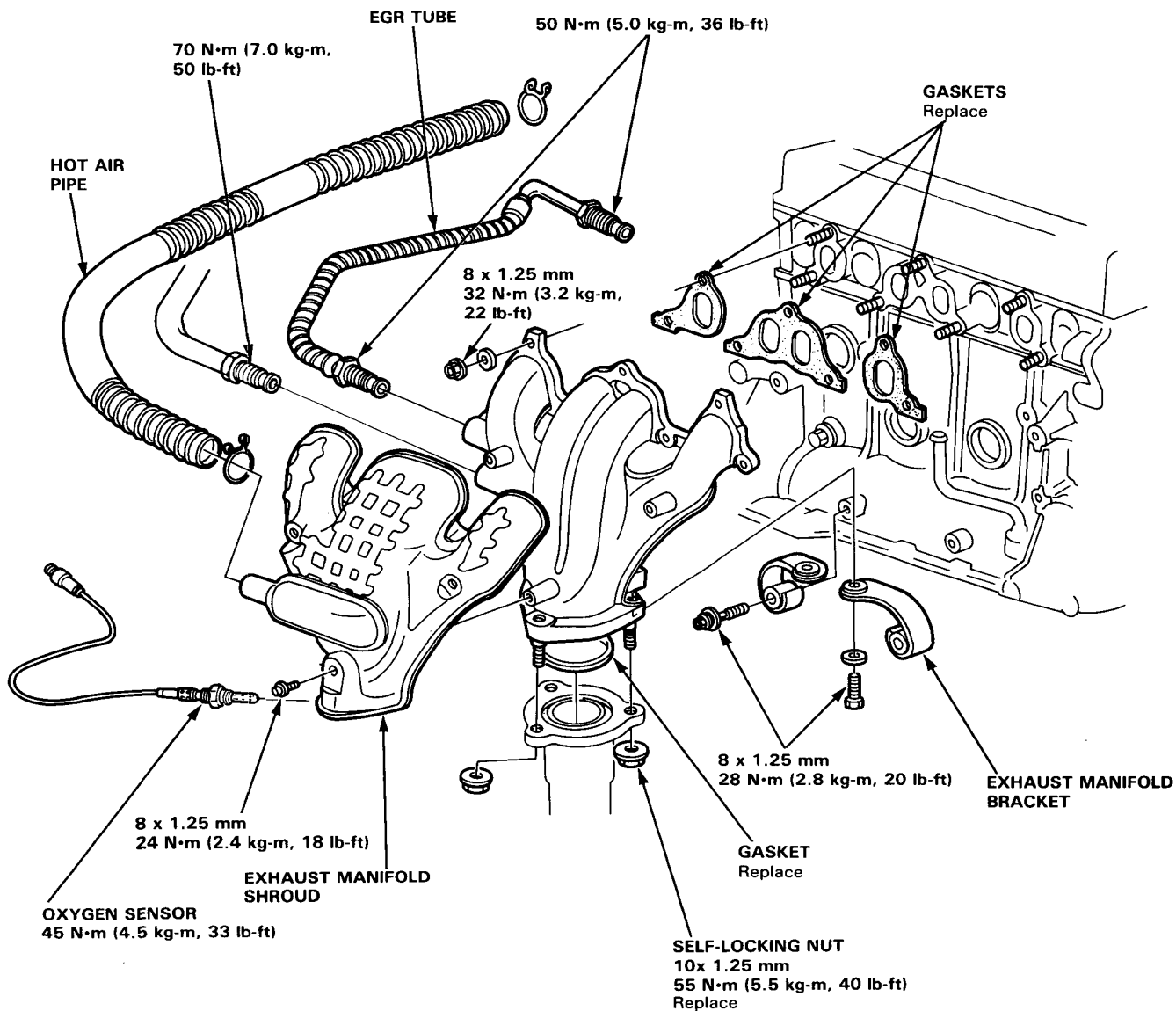
(cont'd)



# Exhaust Manifold

## Illustrated Index (cont'd)

Other Engine Model



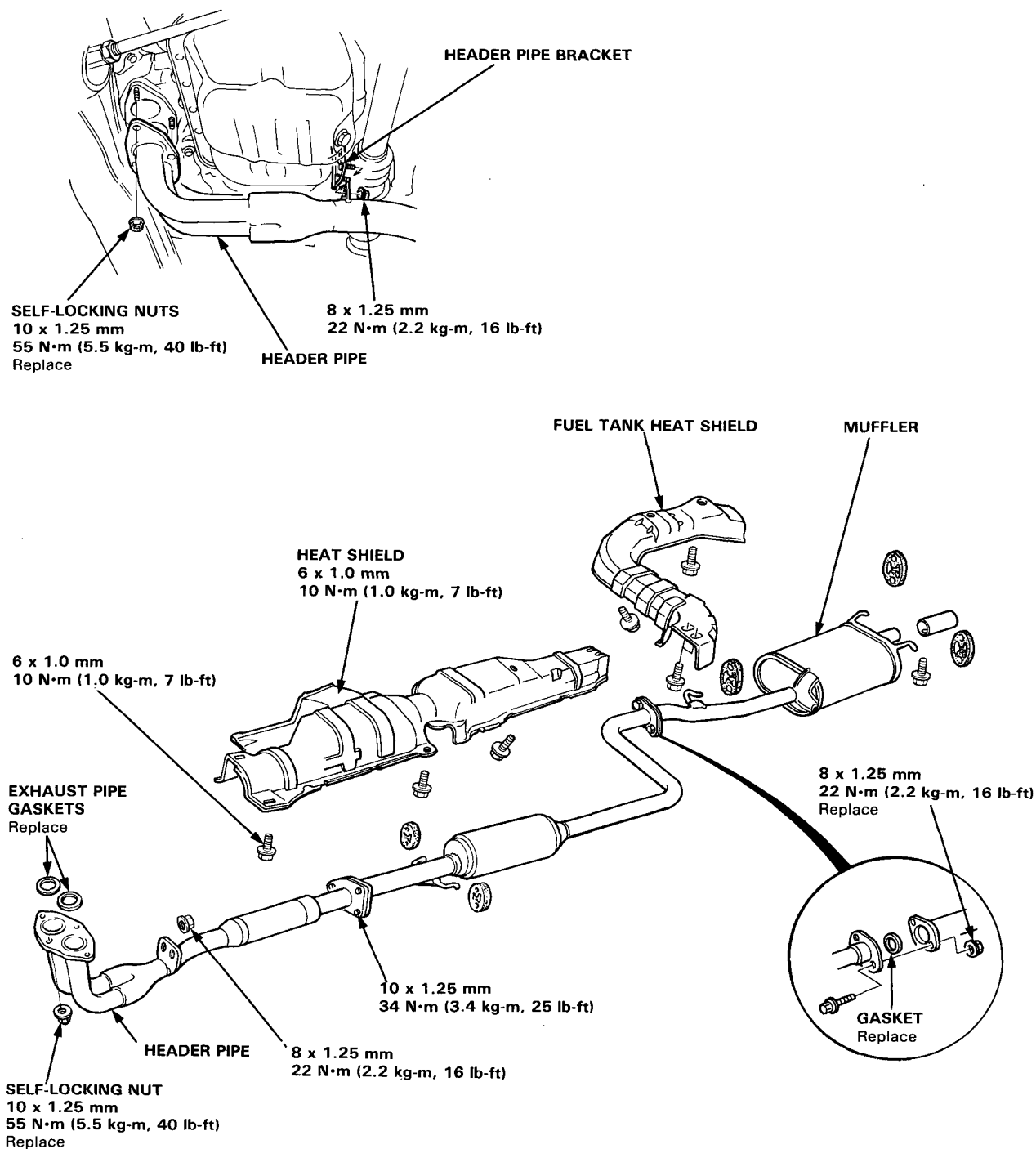




# Exhaust Pipe and Muffler

## Replacement

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





# Exhaust Pipe and Muffler

## Replacement

### Other Engine Model

#### SELF-LOCKING NUTS

10 x 1.25 mm

55 N·m (5.5 kg-m, 40 lb-ft)

Replace

#### HEADER PIPE BRACKET

#### HEADER PIPE

8 x 1.25 mm

22 N·m (2.2 kg-m, 16 lb-ft)

#### FUEL TANK HEAT SHIELD

#### HEAT SHIELD

6 x 1.0 mm

10 N·m (1.0 kg-m, 7 lb-ft)

#### MUFFLER

6 x 1.0 mm

10 N·m (1.0 kg-m, 7 lb-ft)

#### EXHAUST PIPE GASKET

Replace

10 x 1.25 mm

34 N·m (3.4 kg-m, 25 lb-ft)

8 x 1.25 mm

22 N·m (2.2 kg-m, 16 lb-ft)

Replace

#### GASKET

Replace

#### CATALYTIC CONVERTER

Inspection, section 12

Replacement, page 9-9

(KG, KW with

Catalytic converter Engine and KX only)

8 x 1.25 mm

22 N·m (2.2 kg-m, 16 lb-ft)

#### HEADER PIPE

#### SELF-LOCKING NUT

10 x 1.25 mm

55 N·m (5.5 kg-m, 40 lb-ft)

Replace



# Catalytic Converter

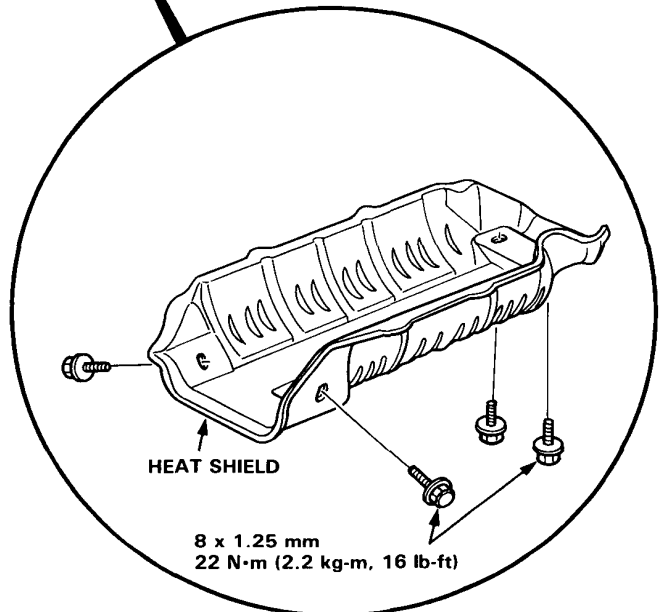
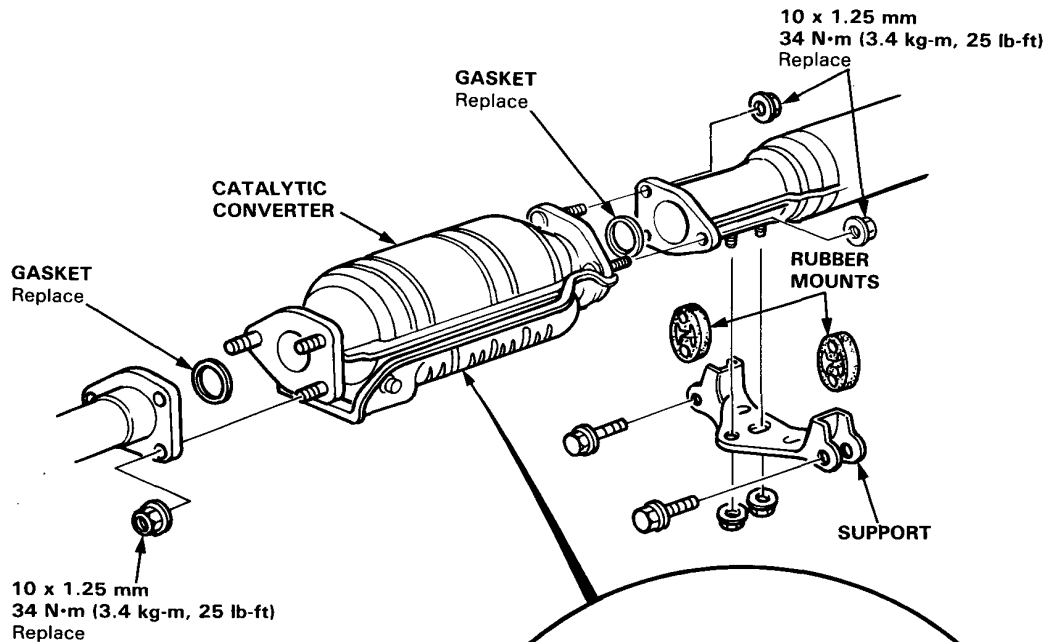
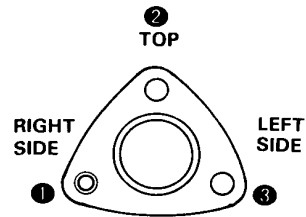


## Replacement

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 .....	10-2
Thermostat .....	10-6
Water Pump .....	10-7
Temperature Gauge .....	10-8
Fan Thermosensor .....	10-9
Temperature Gauge Sending Unit .....	10-10
Water Pump Belt Adjustment .....	10-10





# 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.

#### RADIATOR

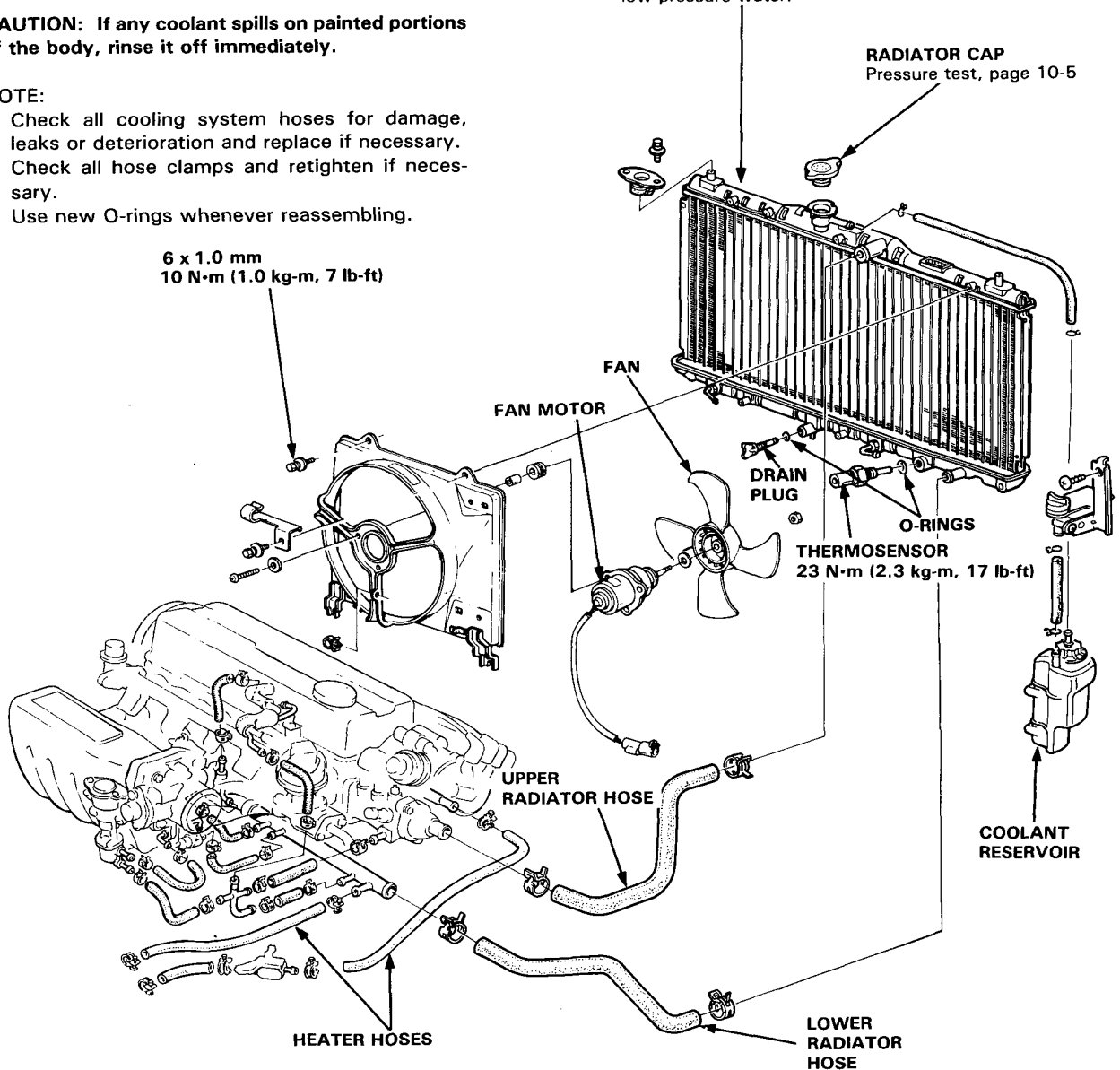
Leak test, page 10-5

Refilling, page 10-4

Inspect soldered joints and seams for leaks.

Blow dirt out from between core fins with compressed air.

If insects, etc., are clogging radiator, wash them off with low pressure water.







## 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.

### RADIATOR

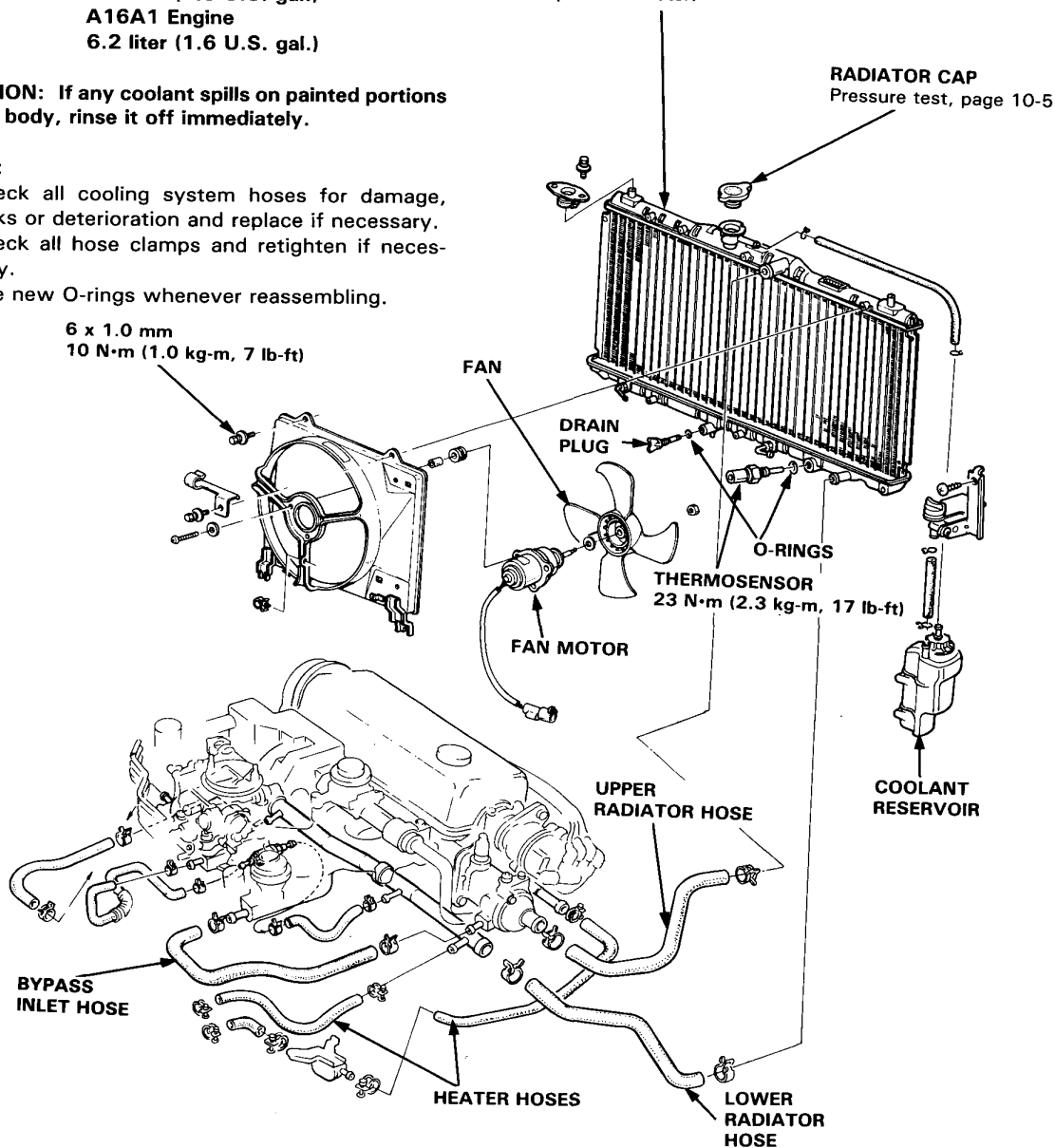
Leak test, page 10-5

Refilling, page 10-4

Inspect soldered joints and seams for leaks.

Blow dirt out from between core fins with compressed air.

If insects, etc., are clogging radiator, wash them off with low pressure water.





# Radiator

## 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.)

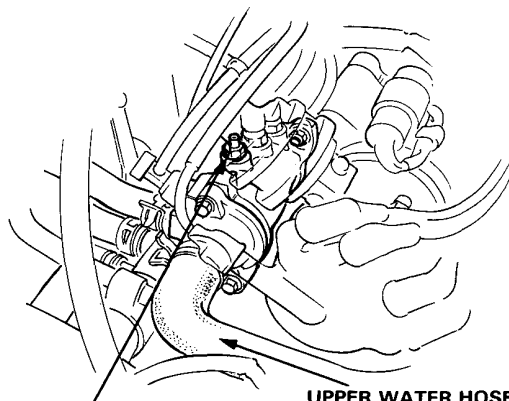
Automatic: 4.4 liters (1.2 U.S. gal.)

#### 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.



**BLEED BOLT**  
10 x 1.25 mm  
10 N·m (1.0 kg-m, 7 lb-ft)

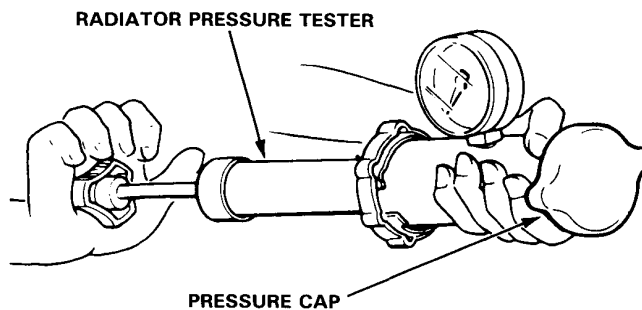
7. With the radiator cap off, start the engine and let it run until warmed up (fan goes on at least twice). Then, if necessary add more coolant mix to bring the level back up to the bottom of the filler neck.
8. Put the radiator cap on, then run the engine again and check for leaks.





## Cap Testing

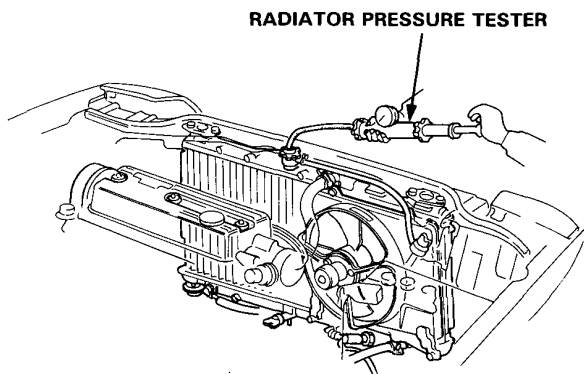
1. Remove the radiator cap, wet its seal with coolant, then install it on the pressure tester.
2. Apply a pressure of 0.75–1.05 kg/cm<sup>2</sup> (78–98 kPa, 11–14 psi).
3. Check for a drop in pressure.
4. If the pressure drops, replace the cap.



## 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/cm<sup>2</sup> (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.



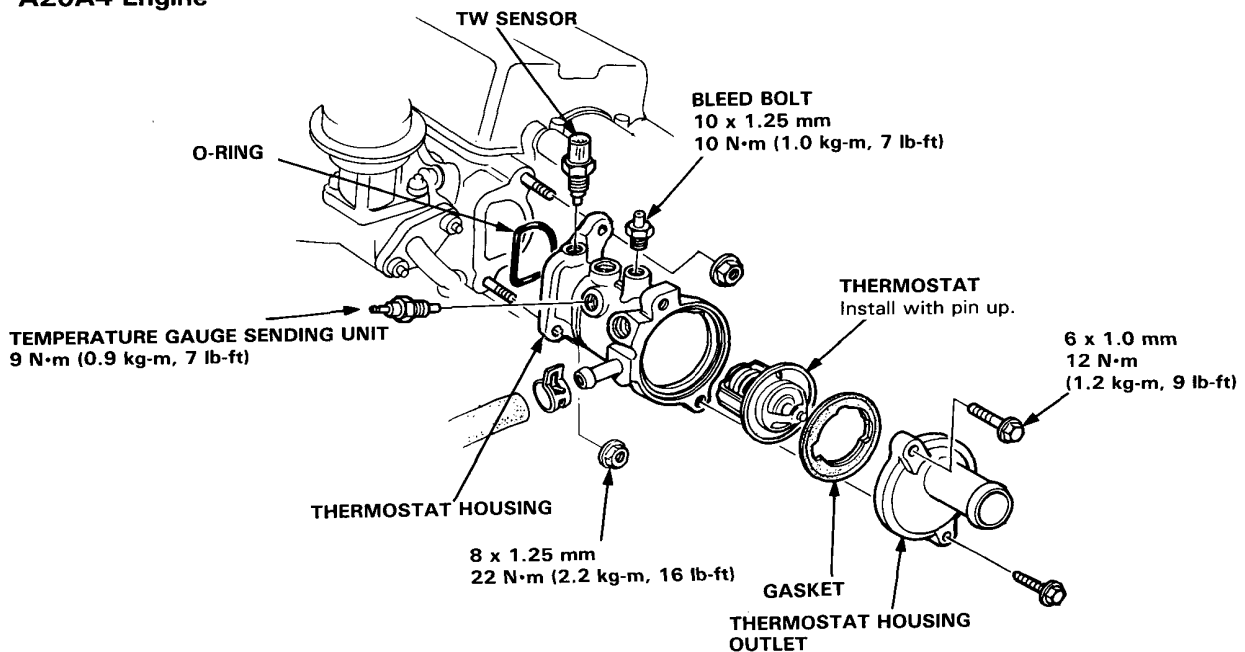


# Thermostat

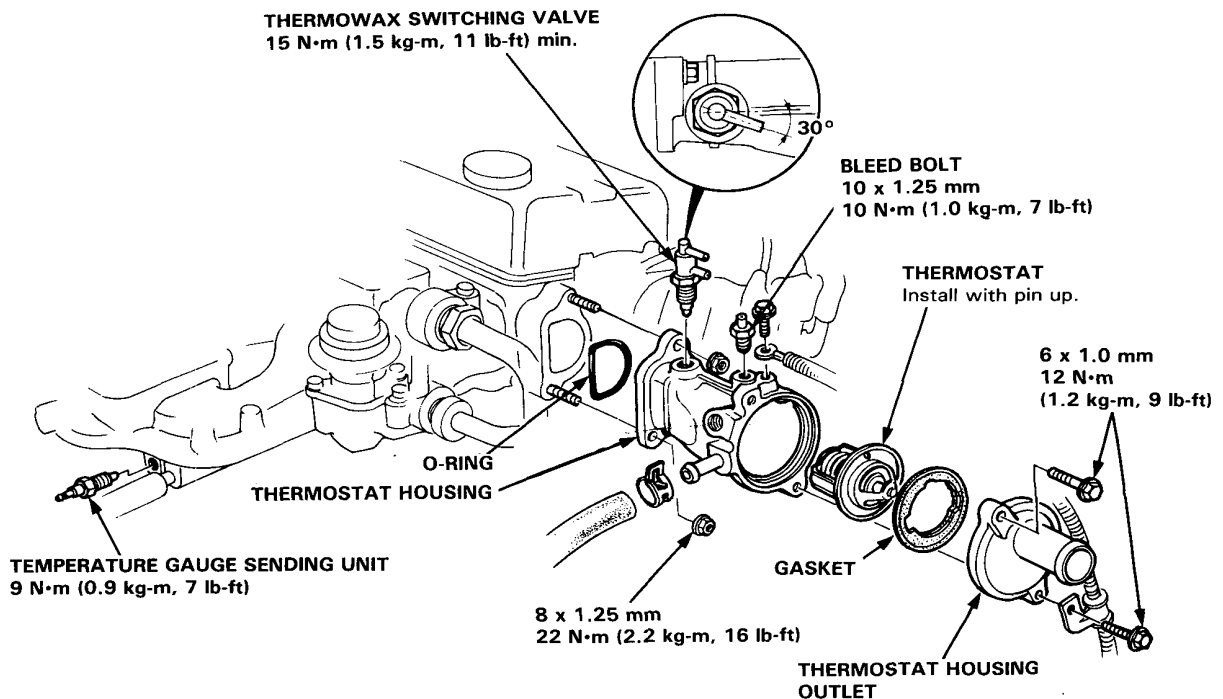
## Replacement

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:**  $82^{\circ}\text{C} \pm 2$  ( $180^{\circ}\text{F} \pm 3$ )

**Secondary: 85°C ± 2 (185°F ± 3)**

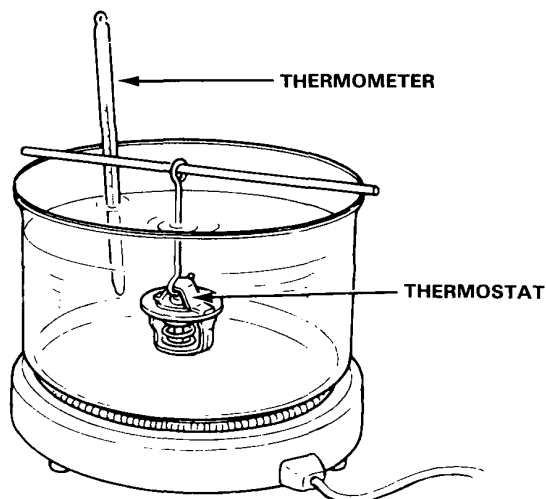
**Fully open: 95°C (203°F)**

**OPTIONAL THERMOSTAT**

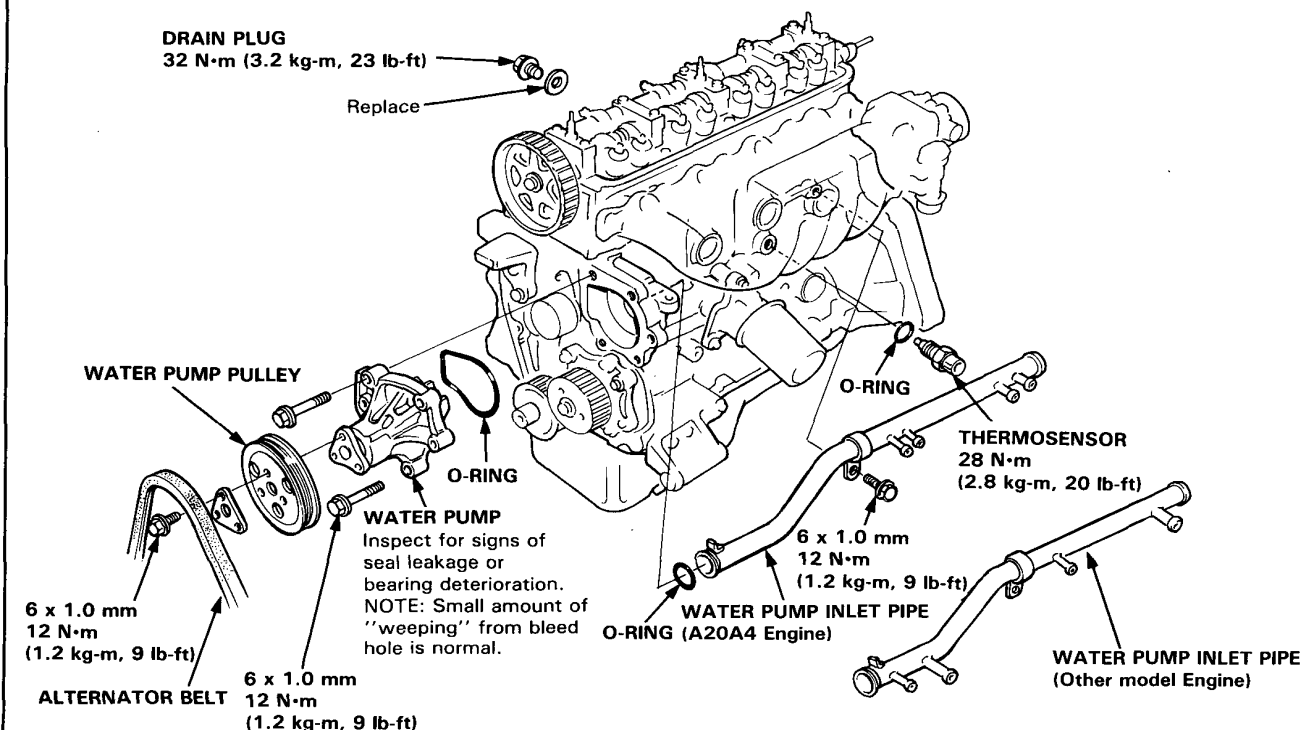
**Lift height:** 8 mm (0.31 in.)

**Starts opening: 86–90°C (187–194°F)**

**Fully open: 100°C (212°F)**



## Water Pump Replacement





# Temperature Gauge

## Temperature Gauge Testing

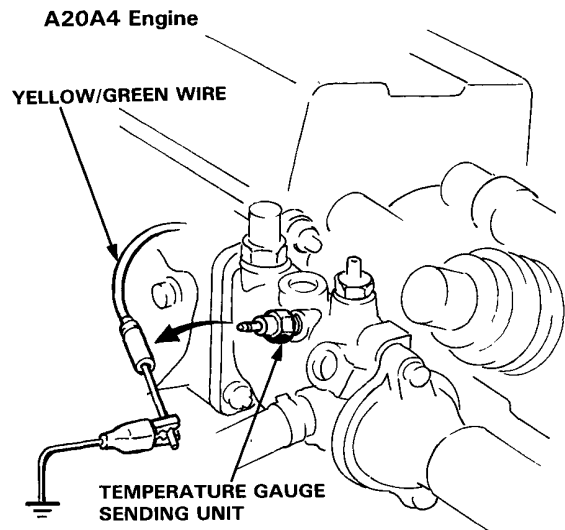
NOTE: If both the temperature gauge and fuel gauge malfunction simultaneously (and show H and F respectively), replace the fuel/temp gauge assembly.

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.

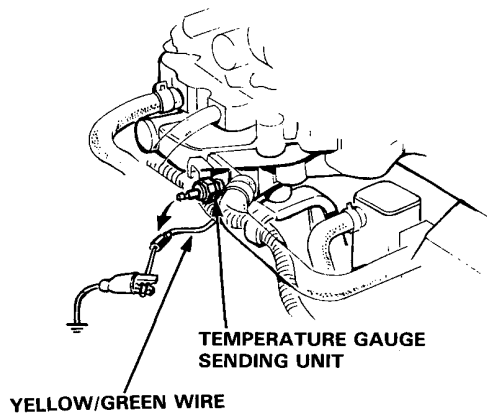
If not, check fuse, wiring and connections; if all are OK, replace gauge.

**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.



Other Engine







# Fan Thermosensor

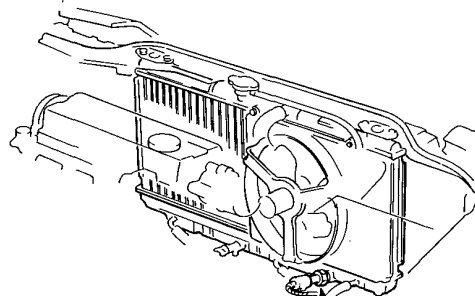
## Testing

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.

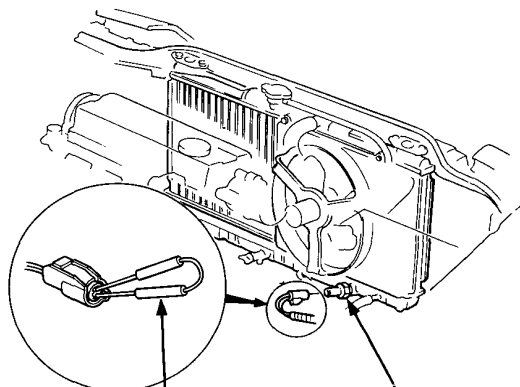
The fan motor should stop when the coolant temperature drops to 82–87°C (180–189°F).

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.

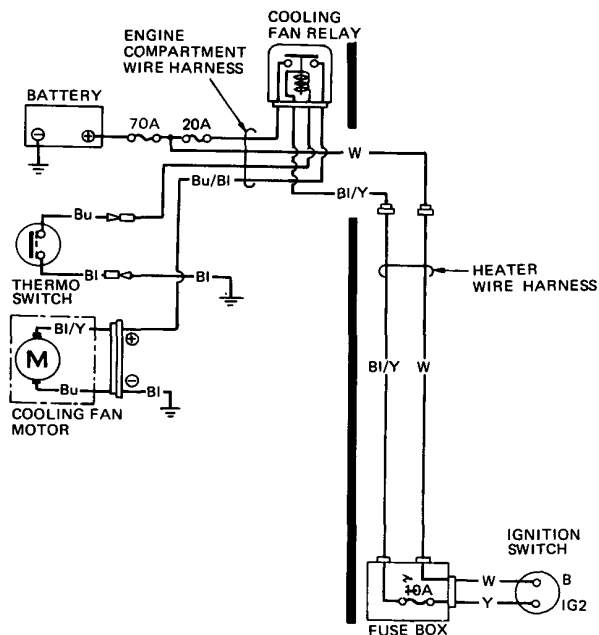


THERMOSENSOR



JUMPER WIRE

THERMOSENSOR

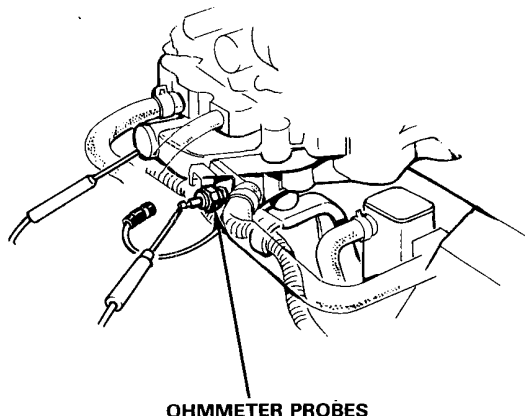




# Temperature Gauge Sending Unit, Belt Adjustment

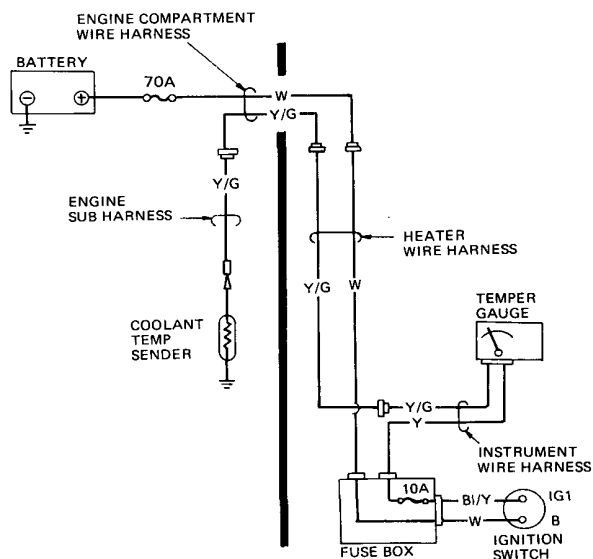
## Temperature Gauge Sending Unit Testing

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.

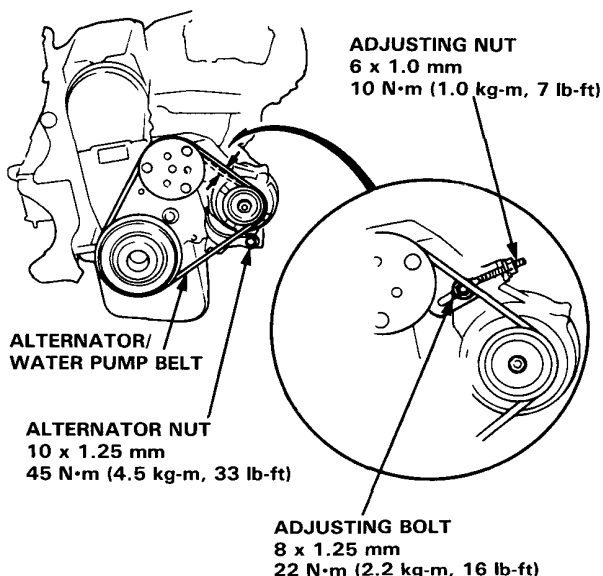
Temperature	50°C (122°F)	80°C (176°F)
Resistance (ohms)	154 +22 -20	52 +4.9 -4.4



## 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)

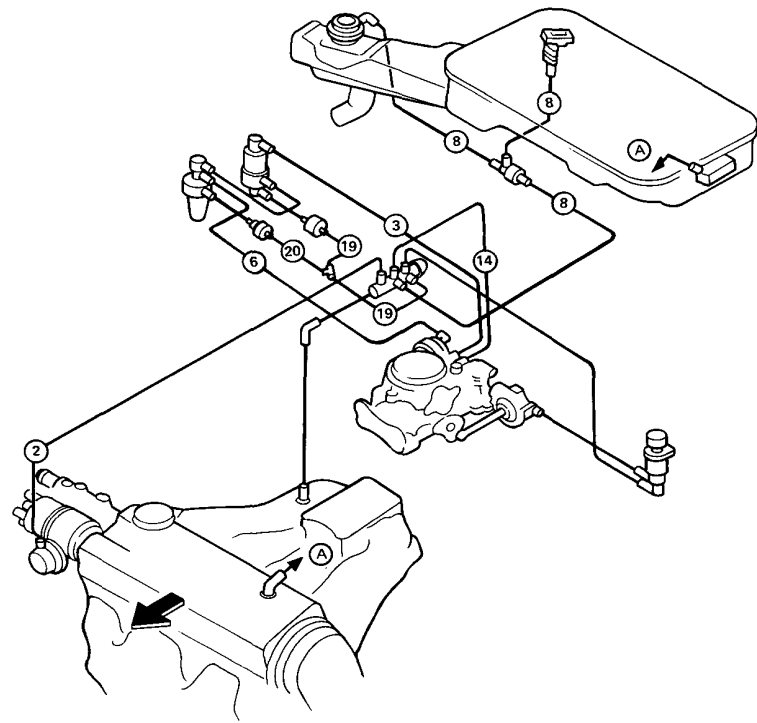
Interconnect Diagram .....	11-2
Vacuum and Electrical Connection .....	11-8
Wiring Diagram .....	11-17
Carburetor .....	11-20
Emission Controls .....	11-52
Fuel .....	11-75



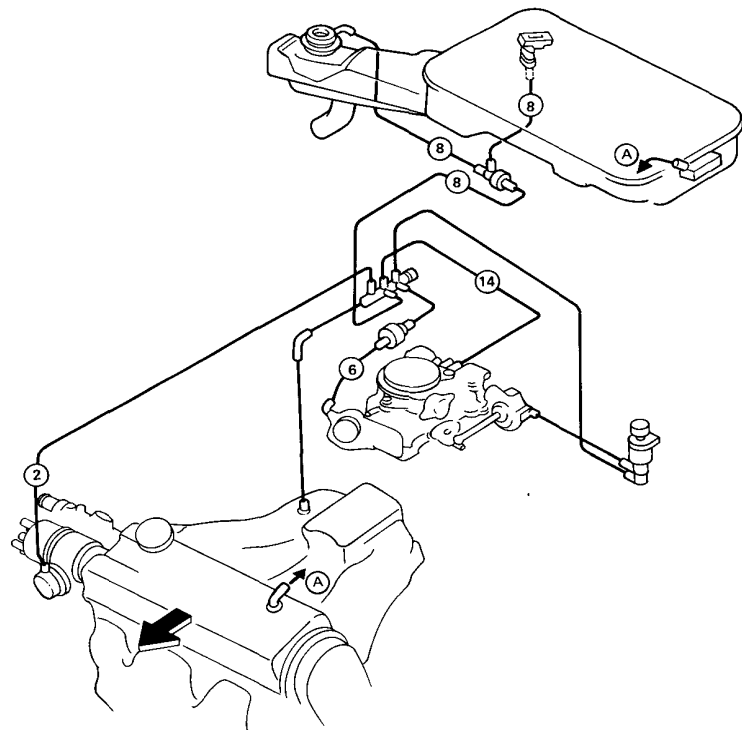


# Interconnect Diagram

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



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

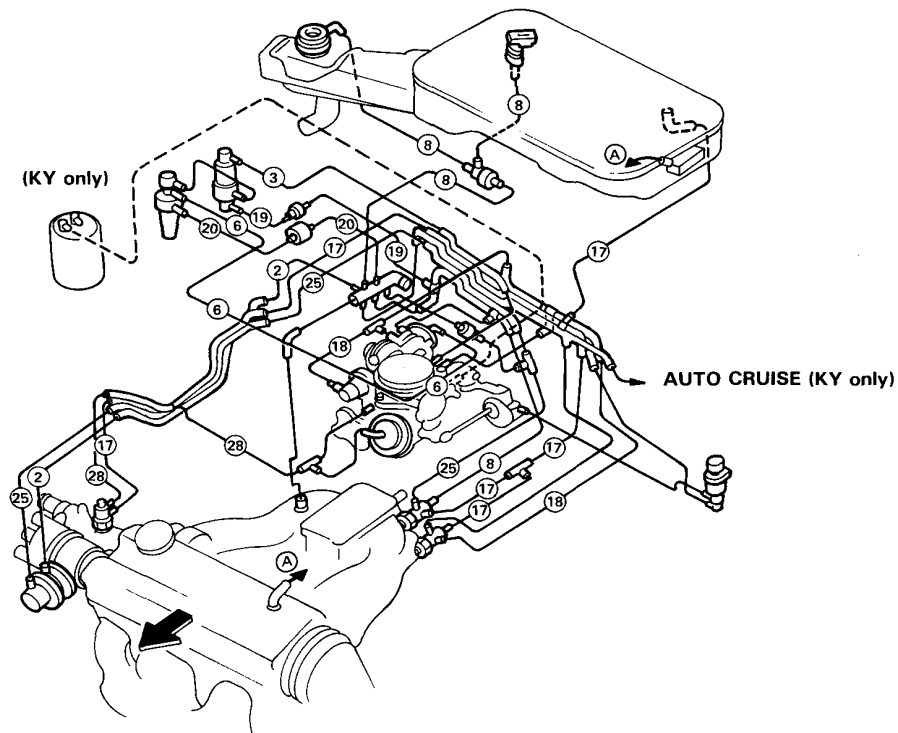




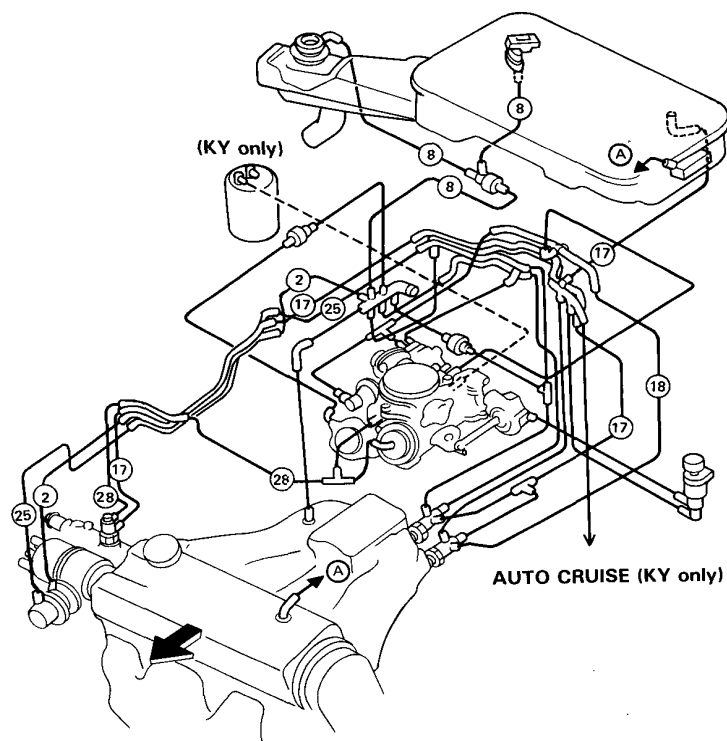


[A20A2 KF, KG, KW, KE, KY model]

(M/T)



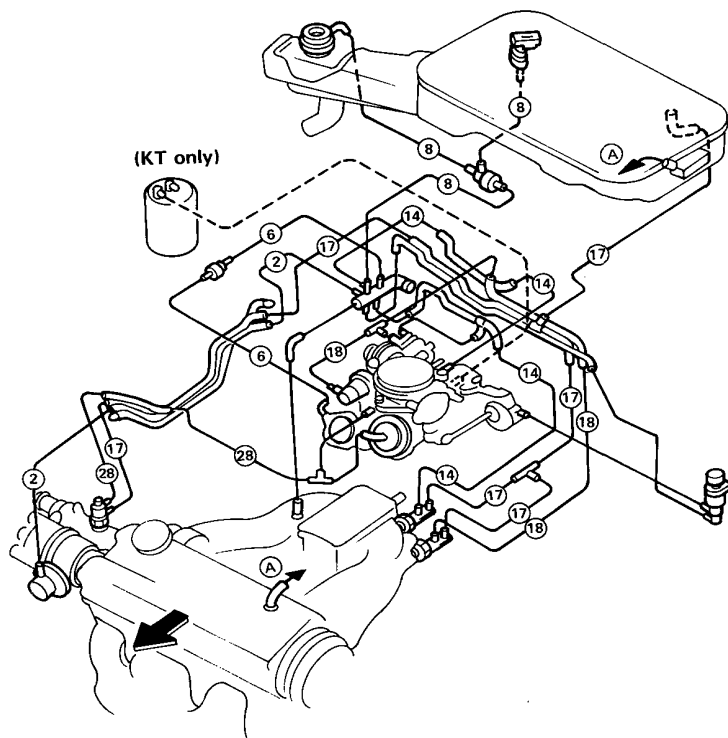
(A/T)



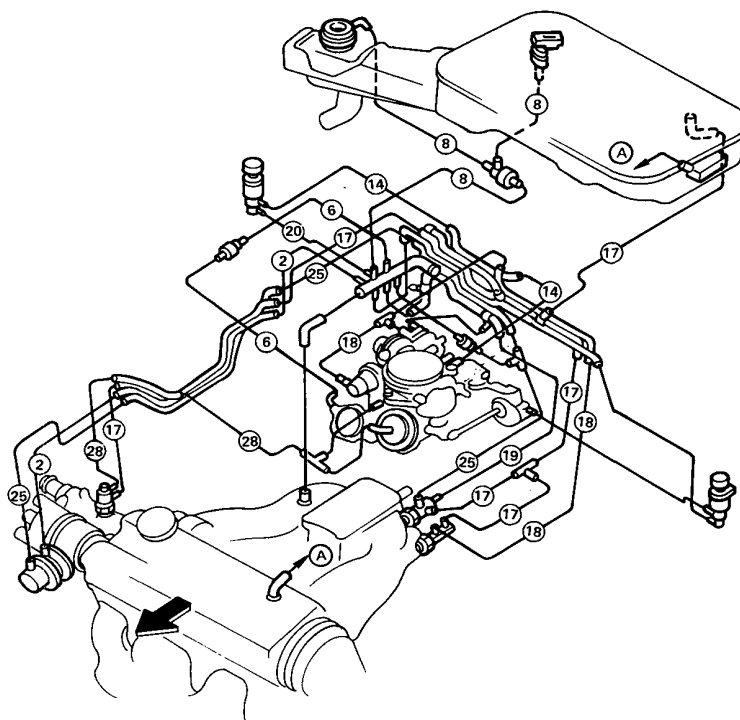


# Interconnect Diagram

[A20A2 KP, KT model]



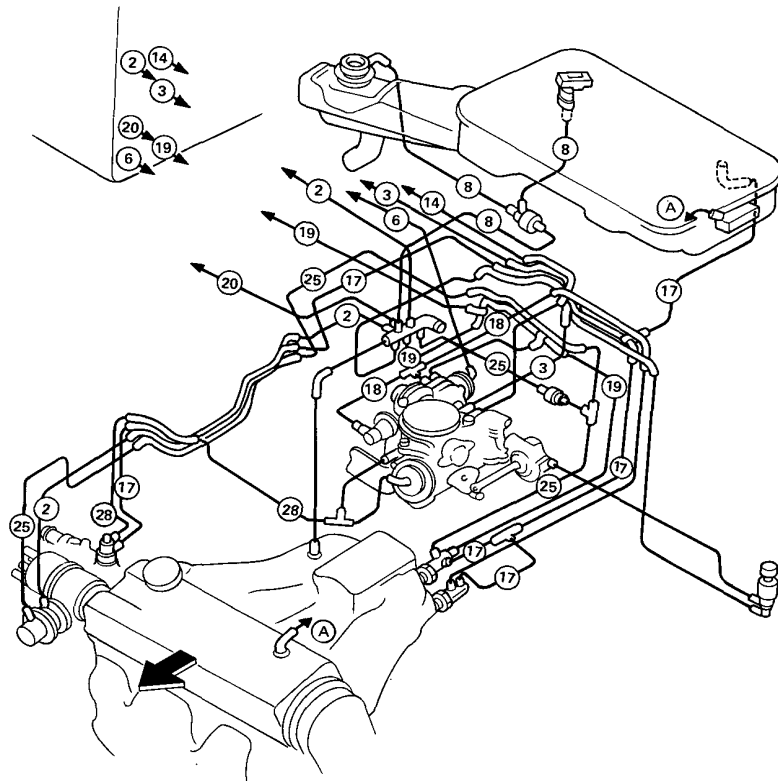
[A20A2 KS (A/T) model]



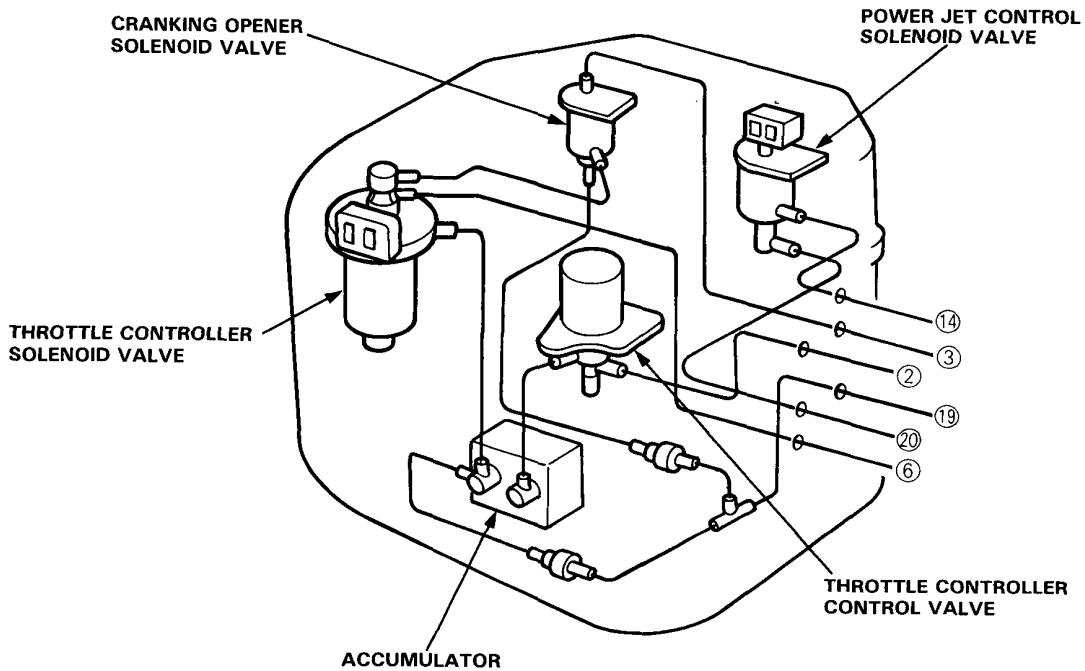




[A20A2 KS (M/T) model]



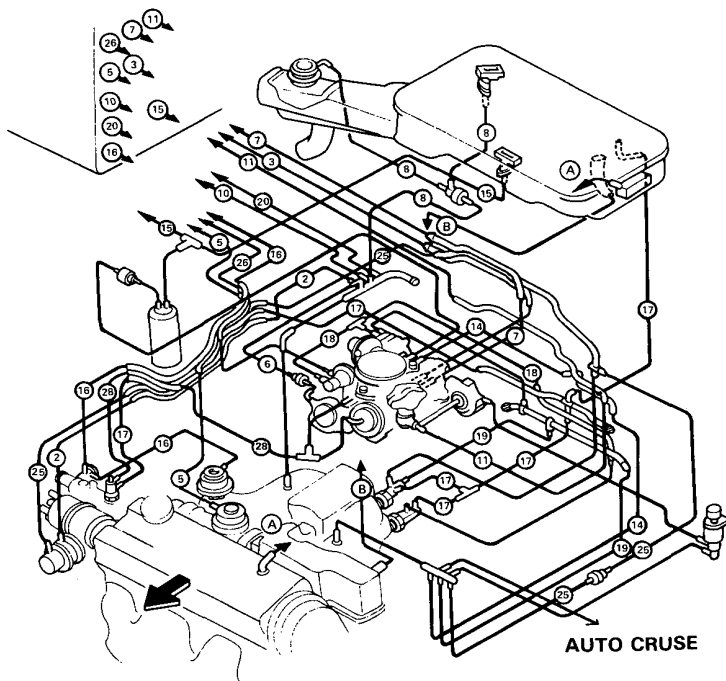
Control Box



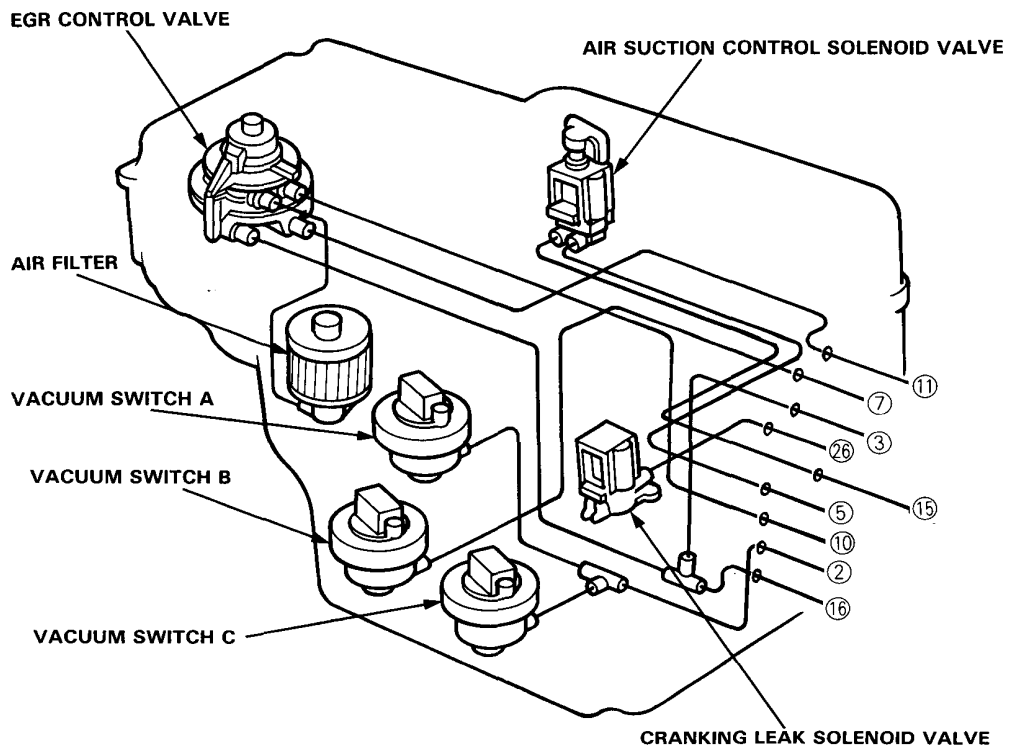


# Interconnect Diagram

[A20A2 KX model]



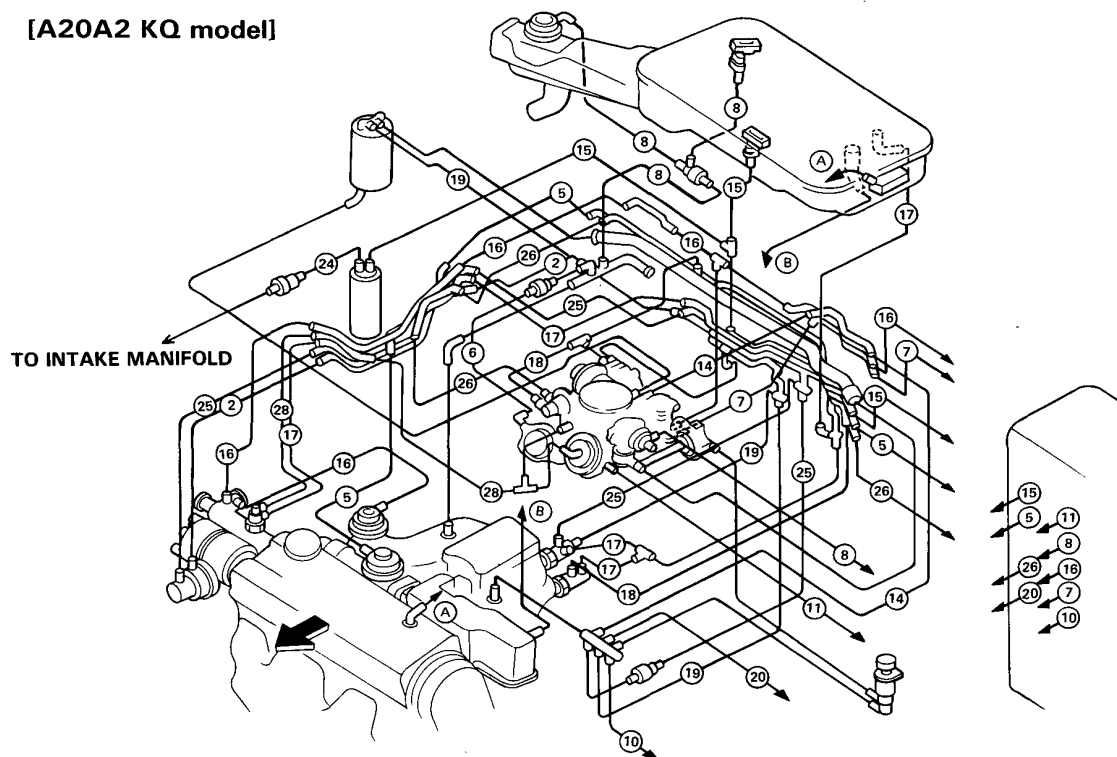
## Control Box



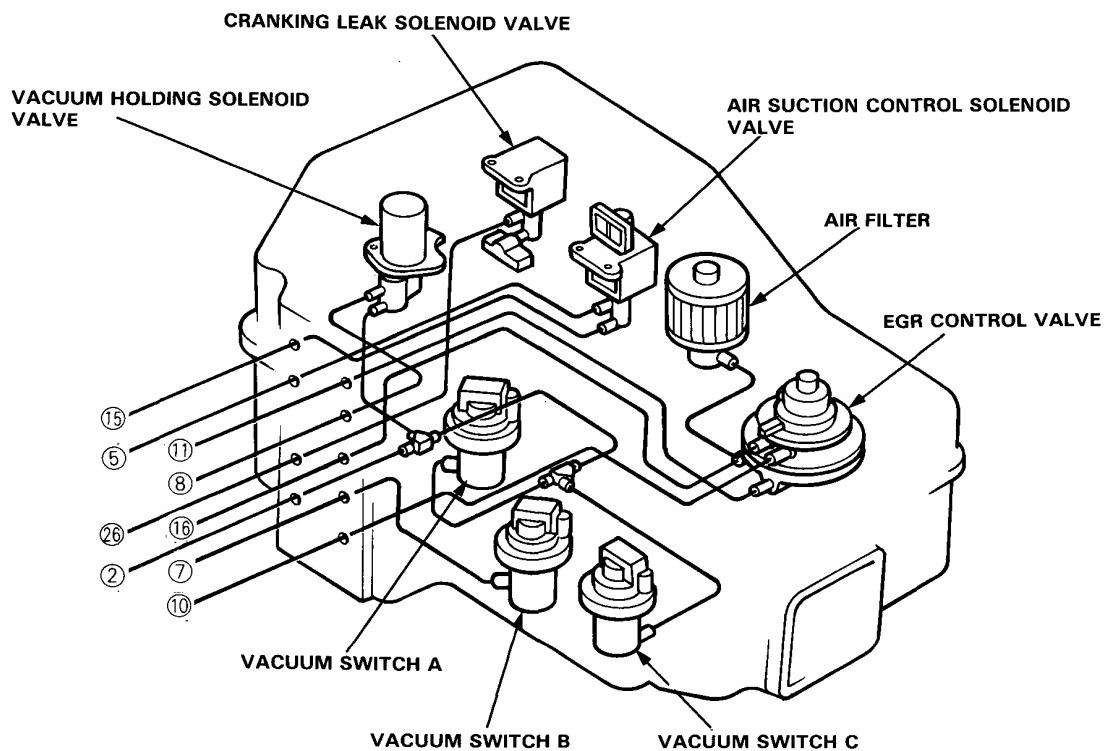




[A20A2 KQ model]



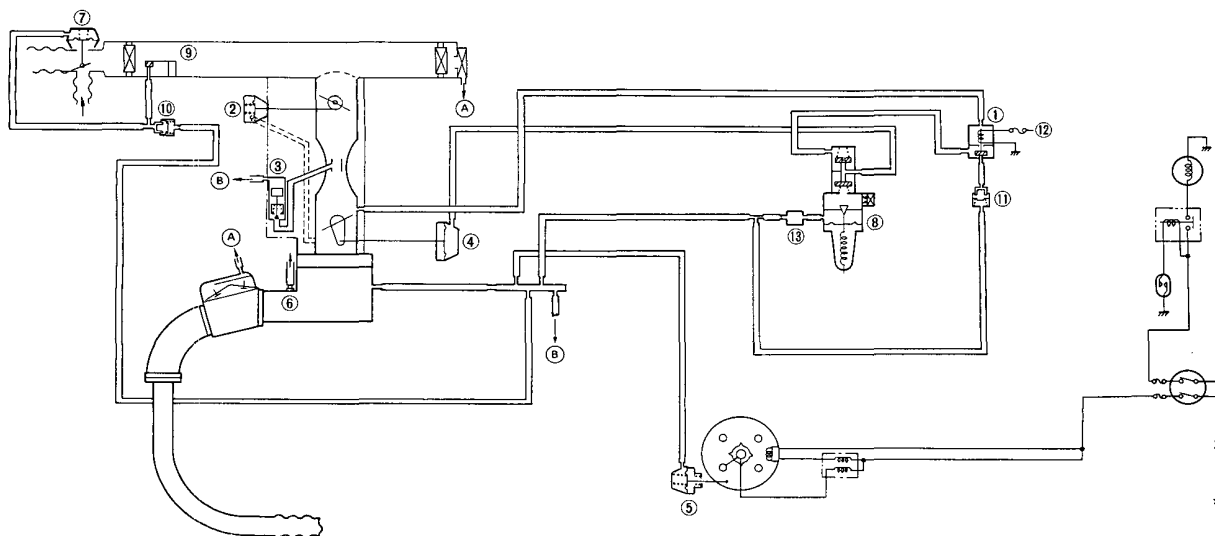
### Control Box





# Vacuum and Electrical Connections

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



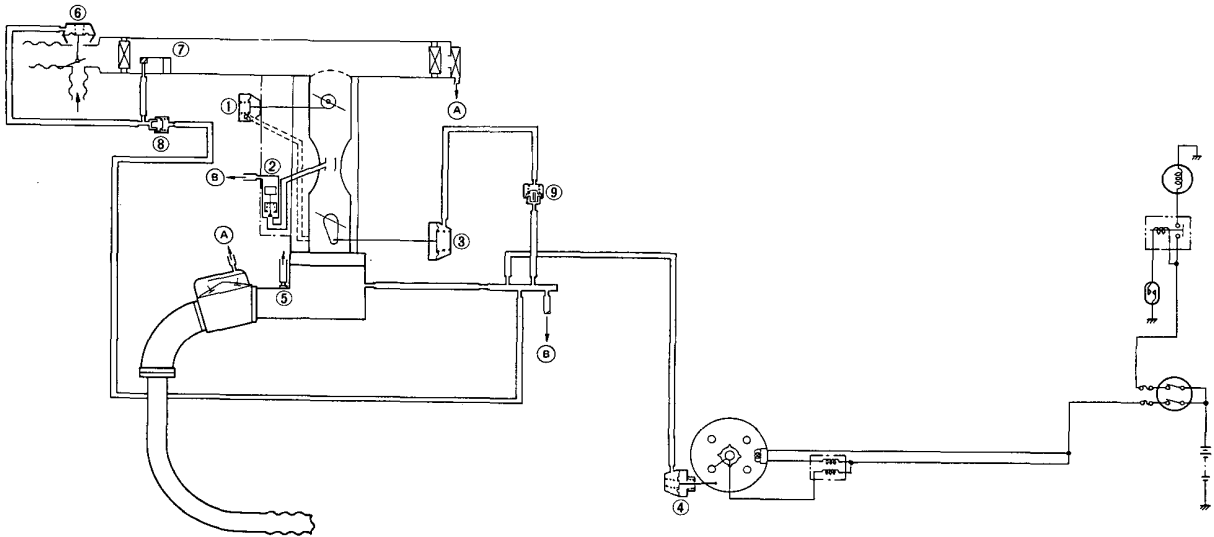
- ① CRANKING OPENER SOLENOID VALVE
- ② CHOKE OPENER
- ③ POWER VALVE
- ④ THROTTLE CONTROLLER
- ⑤ VACUUM ADVANCE DIAPHRAGM
- ⑥ PCV VALVE

- 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]



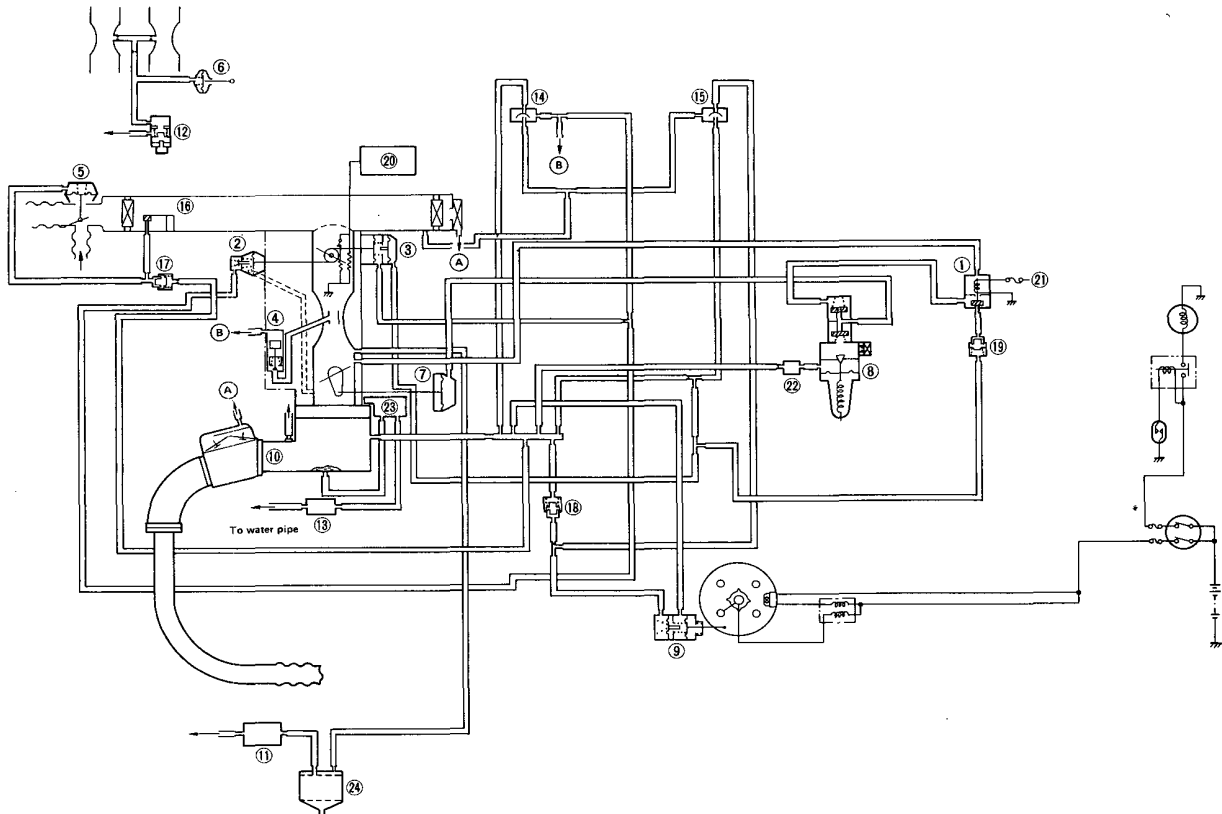
- ① CHOKE OPENER
- ② POWER VALVE
- ③ THROTTLE CONTROLLER
- ④ VACUUM ADVANCE DIAPHRAGM
- ⑤ PCV VALVE

- ⑥ AIR CONTROL VALVE
- ⑦ AIR BLEED VALVE A
- ⑧ CHECK VALVE A
- ⑨ CHECK VALVE C



# Vacuum and Electrical Connections

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



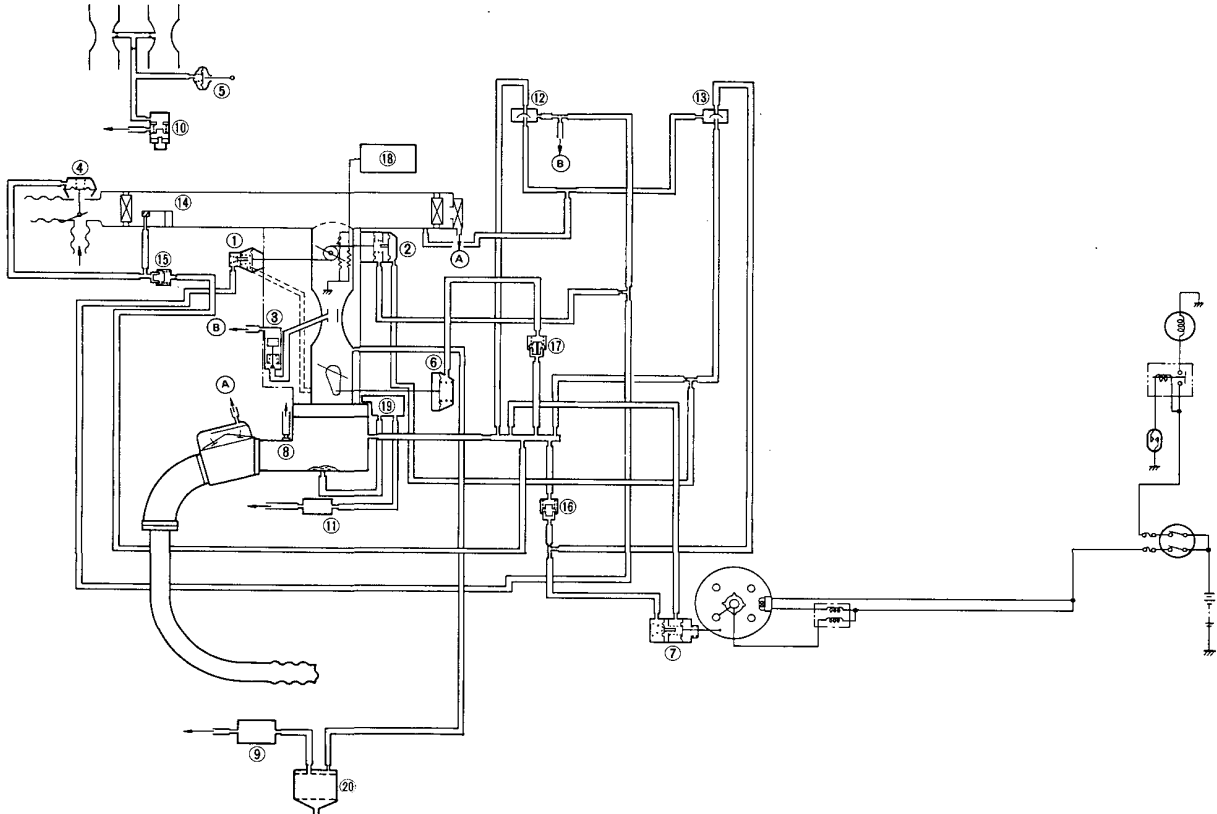
- ① CRANKING OPENER SOLENOID VALVE
- ② CHOKE OPENER
- ③ FAST IDLE UNLOADER
- ④ POWER VALVE
- ⑤ AIR CONTROL DIAPHRAGM
- ⑥ SECONDARY DIAPHRAGM
- ⑦ THROTTLE CONTROLLER
- ⑧ THROTTLE CONTROLLER CONTROL VALVE
- ⑨ VACUUM ADVANCE DIAPHRAGM
- ⑩ PCV VALVE
- ⑪ TWO-WAY VALVE
- ⑫ THERMO WAX VALVE A
- ⑬ THERMO WAX 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] ✓



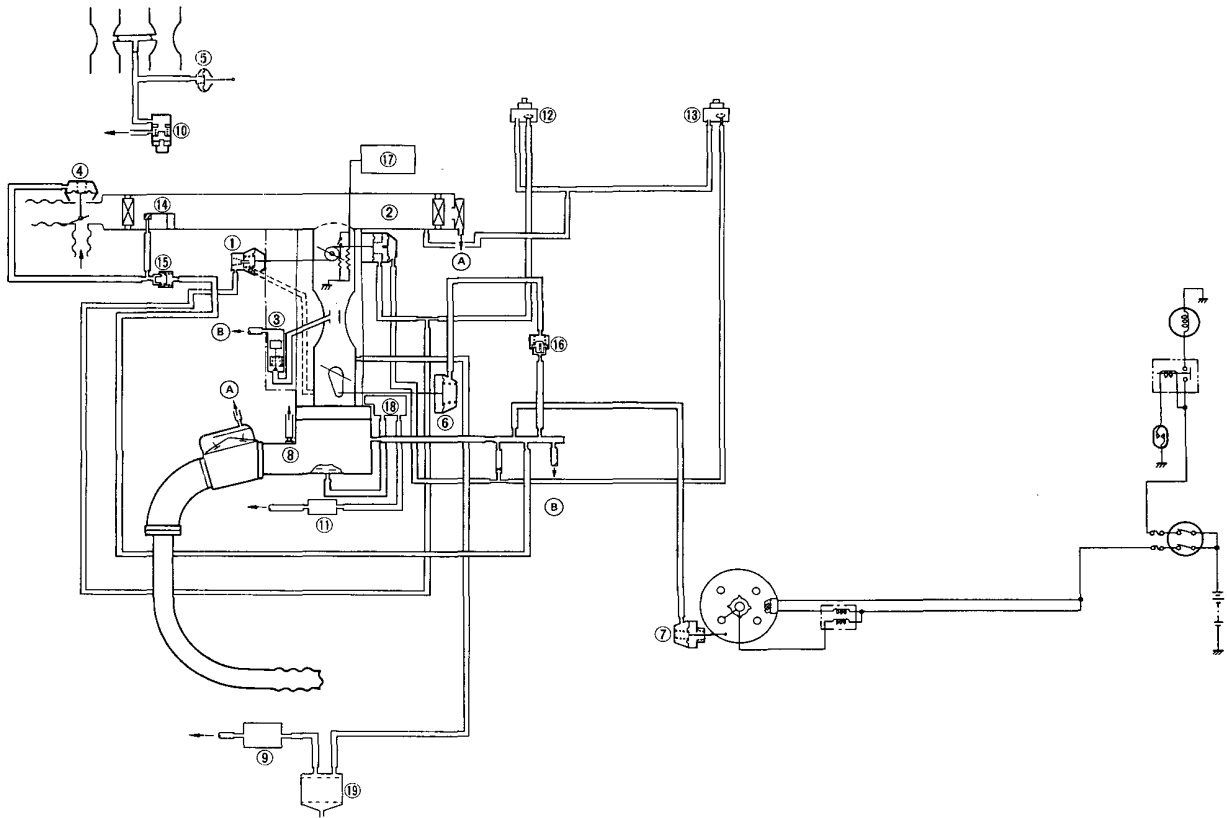
- ① CHOKE OPENER
- ② FAST IDLE UNLOADER
- ③ POWER VALVE
- ④ AIR CONTROL DIAPHRAGM
- ⑤ SECONDARY DIAPHRAGM
- ⑥ THROTTLE OPENER
- ⑦ VACUUM ADVANCE DIAPHRAGM
- ⑧ PCV VALVE
- ⑨ TWO-WAY VALVE
- ⑩ THERMO WAX VALVE A

- 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)



# Vacuum and Electrical Connections

[A20A2 KP, KT model]



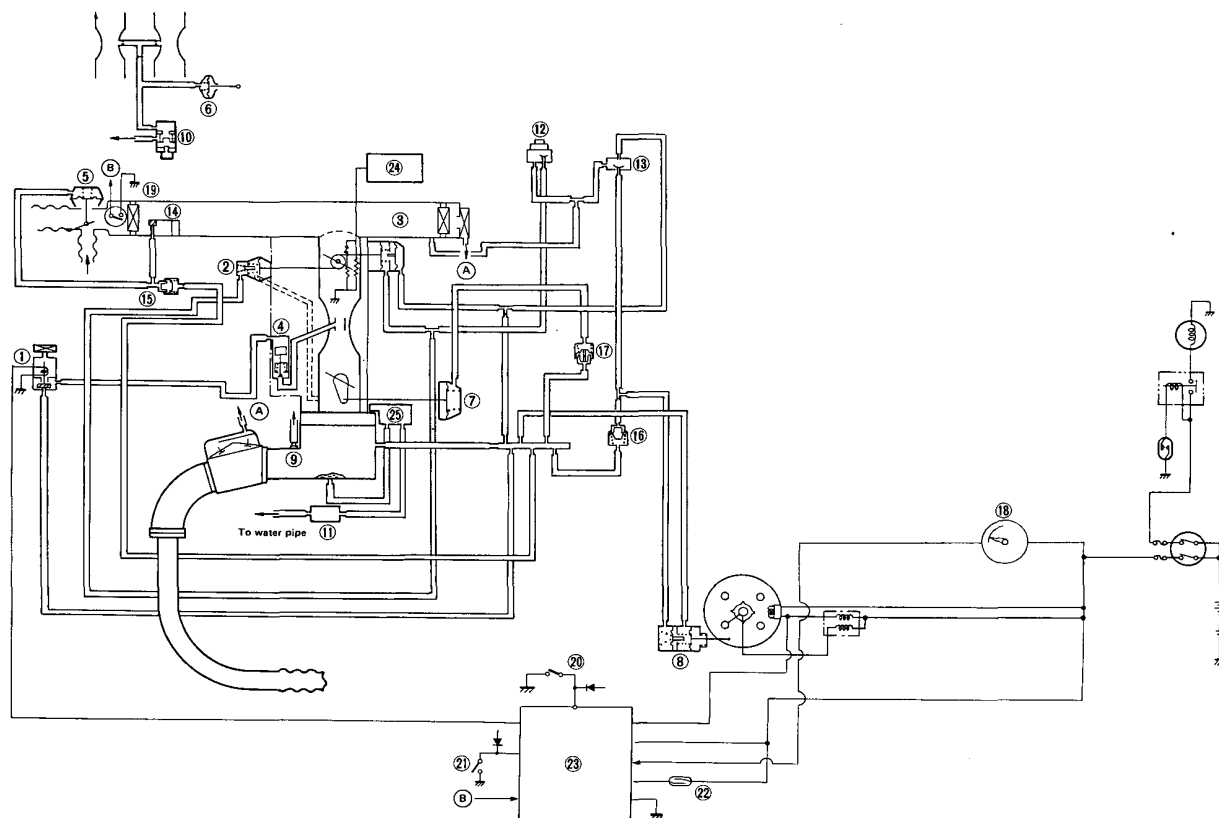
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- ② FAST IDLE UNLOADER
- ③ POWER VALVE
- ④ AIR CONTROL DIAPHRAGM
- ⑤ SECONDARY DIAPHRAGM
- ⑥ THROTTLE CONTROLLER
- ⑦ VACUUM ADVANCE DIAPHRAGM
- ⑧ PCV VALVE
- ⑨ TWO-WAY VALVE
- ⑩ THERMO WAX VALVE A

- 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]



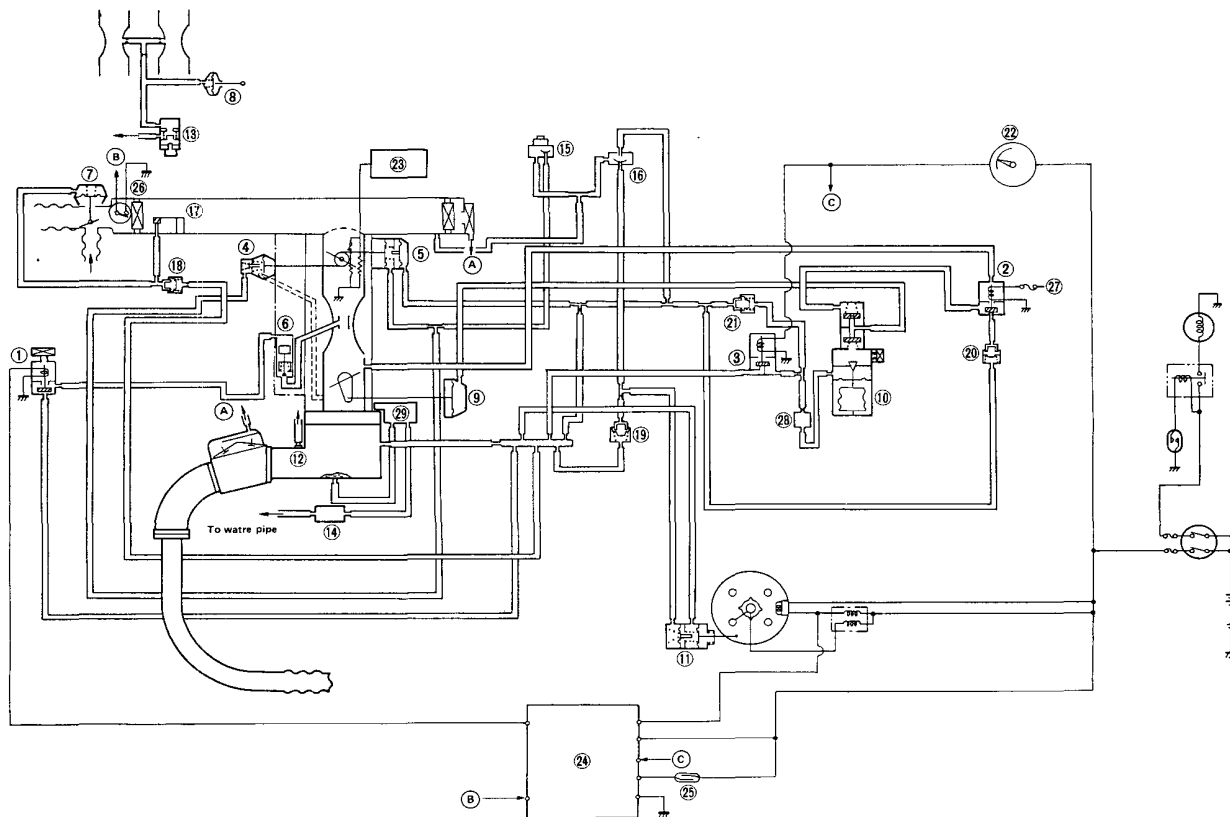
- ① POWER VALVE CONTROL SOLENOID VALVE
- ② CHOKE OPENER
- ③ FAST IDLE UNLOADER
- ④ POWER VALVE
- ⑤ AIR CONTROL VALVE
- ⑥ SECONDARY DIAPHRAGM
- ⑦ THROTTLE CONTROLLER
- ⑧ VACUUM ADVANCE DIAPHRAGM
- ⑨ PCV VALVE
- ⑩ THERMO WAX VALVE A
- ⑪ THERMO WAX VALVE B
- ⑫ THERMOVALVE A

- 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



# Vacuum and Electrical Connections

[A20A2 KS (M/T) model]



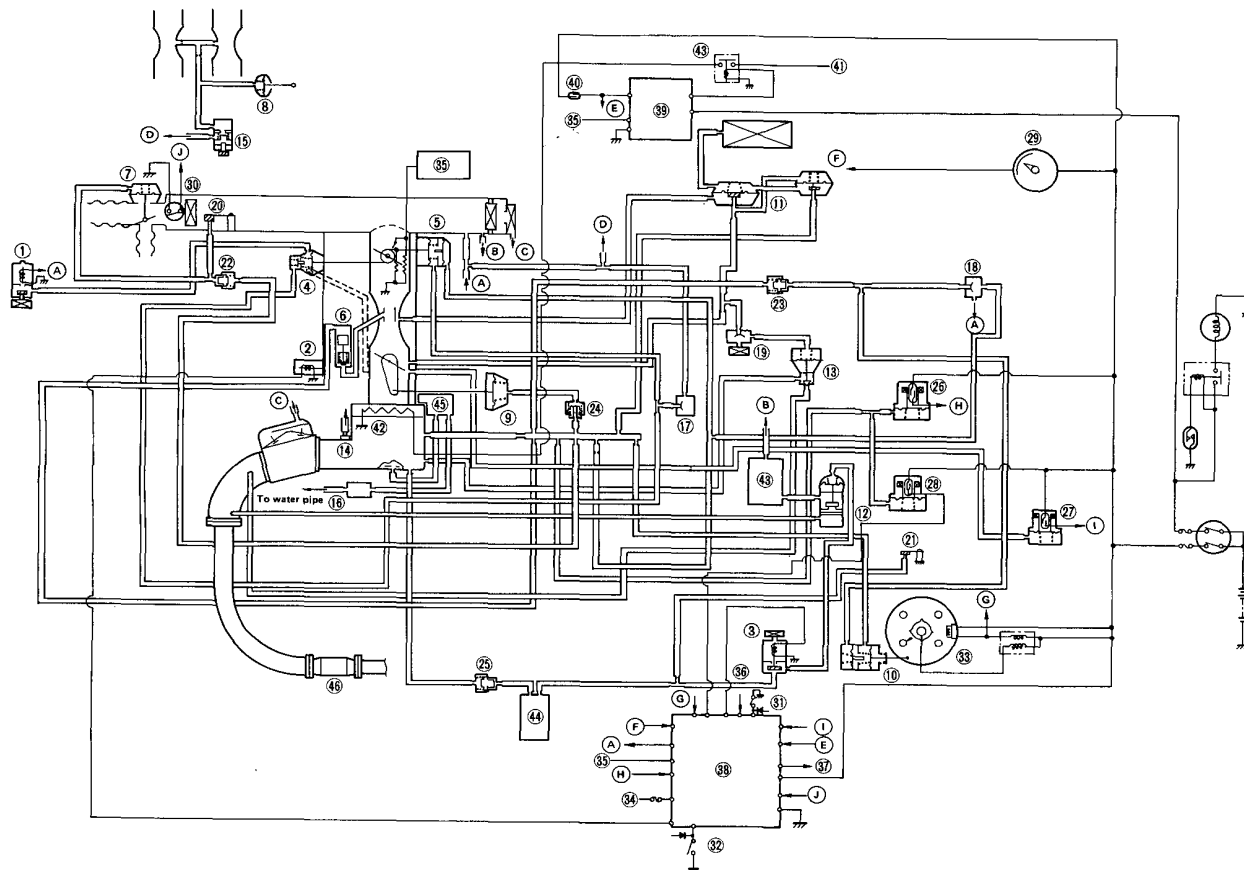
- ① POWER VALVE CONTROL SOLENOID VALVE
- ② CRANKING OPENER SOLENOID VALVE
- ③ THROTTLE CONTROLLER SOLENOID VALVE
- ④ CHOKE OPENER
- ⑤ FAST IDLE UNLOADER
- ⑥ POWER VALVE
- ⑦ AIR CONTROL DIAPHRAGM
- ⑧ SECONDARY DIAPHRAGM
- ⑨ THROTTLE CONTROLLER
- ⑩ THROTTLE CONTROLLER CONTROL VALVE
- ⑪ VACUUM ADVANCE DIAPHRAGM
- 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 ACCUMULATOR
- 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

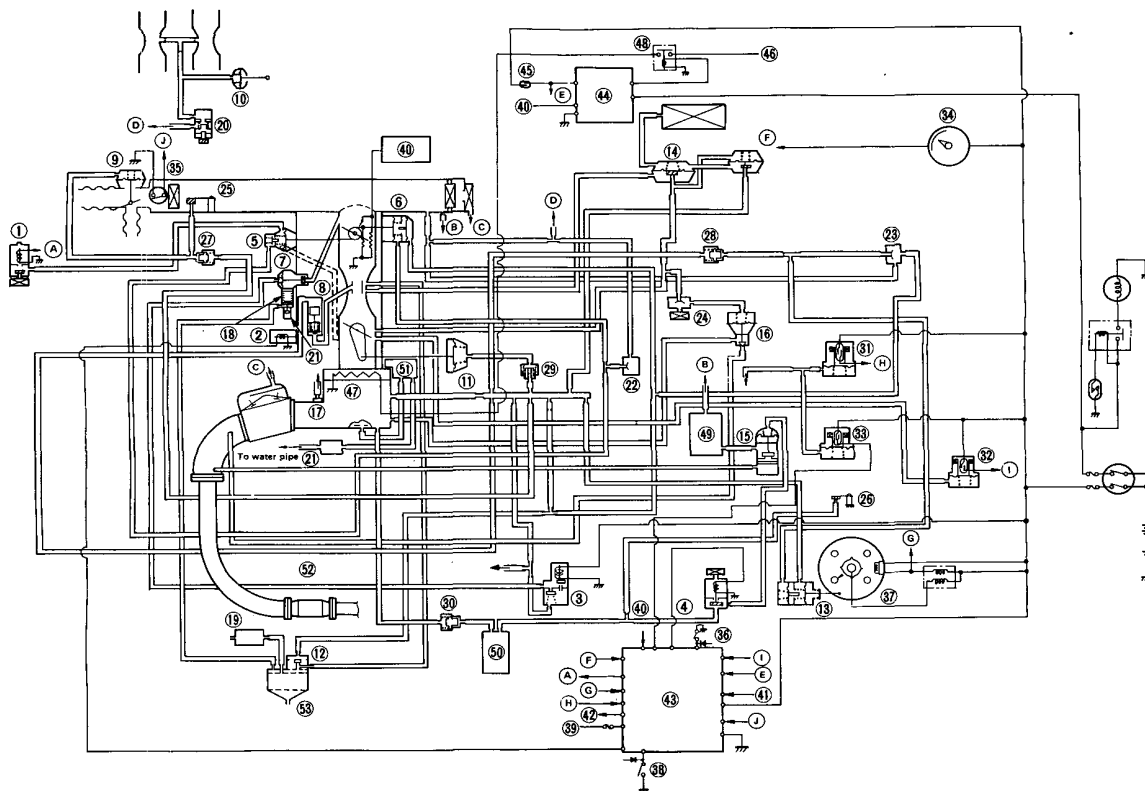
- ⑲ THERMOVALVE C
- ⑳ AIR BLEED VALVE A
- ㉑ AIR BLEED VALVE B
- ㉒ CHECK VALVE A
- ㉓ CHECK VALVE B
- ㉔ CHECK VALVE C
- ㉕ CHECK VALVE D
- ㉖ VACUUM SWITCH A
- ㉗ VACUUM SWITCH B
- ㉘ VACUUM SWITCH C
- ㉙ SPEED SENSOR
- ㉚ INTAKE AIR TEMP. SWITCH
- ㉛ SHIFT LEVER POSITION SWITCH (A/T ONLY)
- ㉜ CLUTCH SWITCH (M/T 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 CATHARTIC CONVERTER



# Vacuum and Electrical Connections

[A20A2 KQ model]



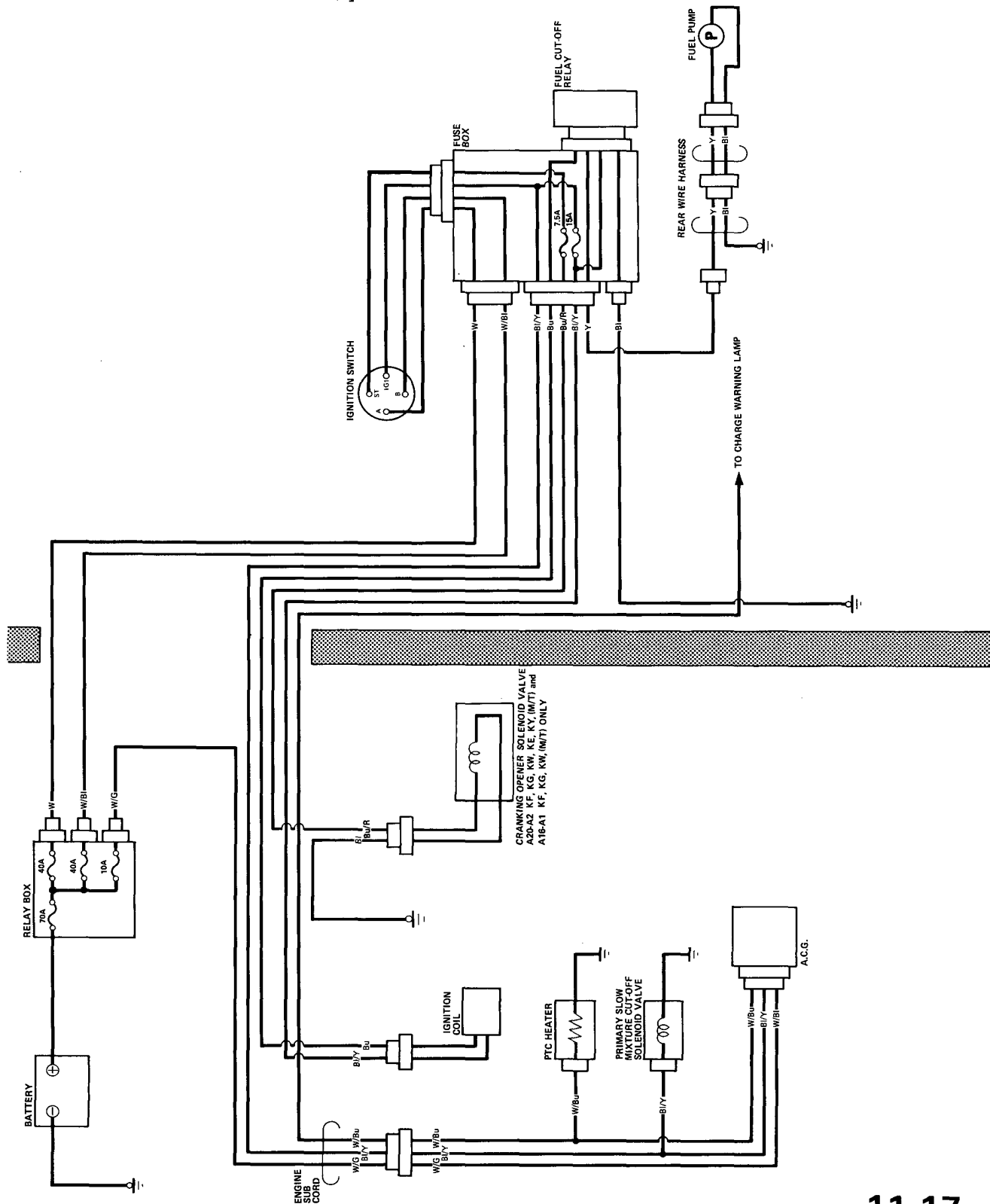
- |   |   |                                     |
|---|---|-------------------------------------|
| ① CRANKING LEAK SOLENOID VALVE                | ②① THERMO WAX VALVE B                     | ④① AIR CONDITIONER SWITCH SIGNAL    |
| ② PRIMARY SLOW MIXTURE CUT-OFF SOLENOID VALVE | ②② THERMOVALVE A                          | ④② TO A/C IDLE BOOST SOLENOID VALVE |
| ③ VACUUM HOLDING SOLENOID VALVE               | ②③ THERMOVALVE B                          | ④③ SOLENOID VALVE CONTROL UNIT      |
| ④ AIR SUCTION VALVE CONTROL SOLENOID VALVE    | ②④ THERMOVALVE C                          | ④④ EFE HEATER CONTROL UNIT          |
| ⑤ CHOKE OPENER                                | ②⑤ AIR BLEED VALVE A                      | ④⑤ THERMOSWITCH                     |
| ⑥ FAST IDLE UNLOADER                          | ②⑥ AIR BLEED VALVE B                      | ④⑥ BATTERY                          |
| ⑦ AIR VENT CUT-OFF DIAPHRAGM                  | ②⑦ CHECK VALVE A                          | ④⑦ EFE HEATER                       |
| ⑧ POWER VALVE                                 | ②⑧ CHECK VALVE B                          | ④⑧ EFE RELAY                        |
| ⑨ AIR CONTROL DIAPHRAGM                       | ②⑨ CHECK VALVE C                          | ④⑨ ACCUMULATOR                      |
| ⑩ SECONDARY DIAPHRAGM                         | ②⑩ CHECK VALVE D                          | ④⑩ VACUUM TANK                      |
| ⑪ THROTTLE CONTROLLER                         | ②⑪ VACUUM SWITCH A                        | ④⑪ HEAT RISER                       |
| ⑫ PURGE CONTROL DIAPHRAGM                     | ②⑫ VACUUM SWITCH B                        | ④⑫ CATRISTIC CONVERTER              |
| ⑬ VACUUM ADVANCE DIAPHRAGM                    | ②⑬ VACUUM SWITCH C                        | ④⑬ CHARCOAL CANISTER                |
| ⑭ EGR CONTROL VALVE                           | ②⑭ SPEED SENSOR                           |                                     |
| ⑮ AIR SUCTION VALVE                           | ②⑮ INTAKE AIR TEMP. SWITCH                |                                     |
| ⑯ EGR VALVE                                   | ②⑯ SHIFT LEVER POSITION SWITCH (A/T ONLY) |                                     |
| ⑰ PCV VALVE                                   | ②⑰ DISTRIBUTOR                            |                                     |
| ⑱ CARBURETOR THERMOVALVE                      | ②⑱ CLUTCH SWITCH (M/T ONLY)               |                                     |
| ⑲ TWO-WAY VALVE                               | ②⑲ IGNITION SWITCH STARTER SIGNAL         |                                     |
| ⑳ THERMO WAX VALVE A                          | ②⑳ "L" TERMINAL OF REGULATOR              |                                     |



# Wiring Diagram



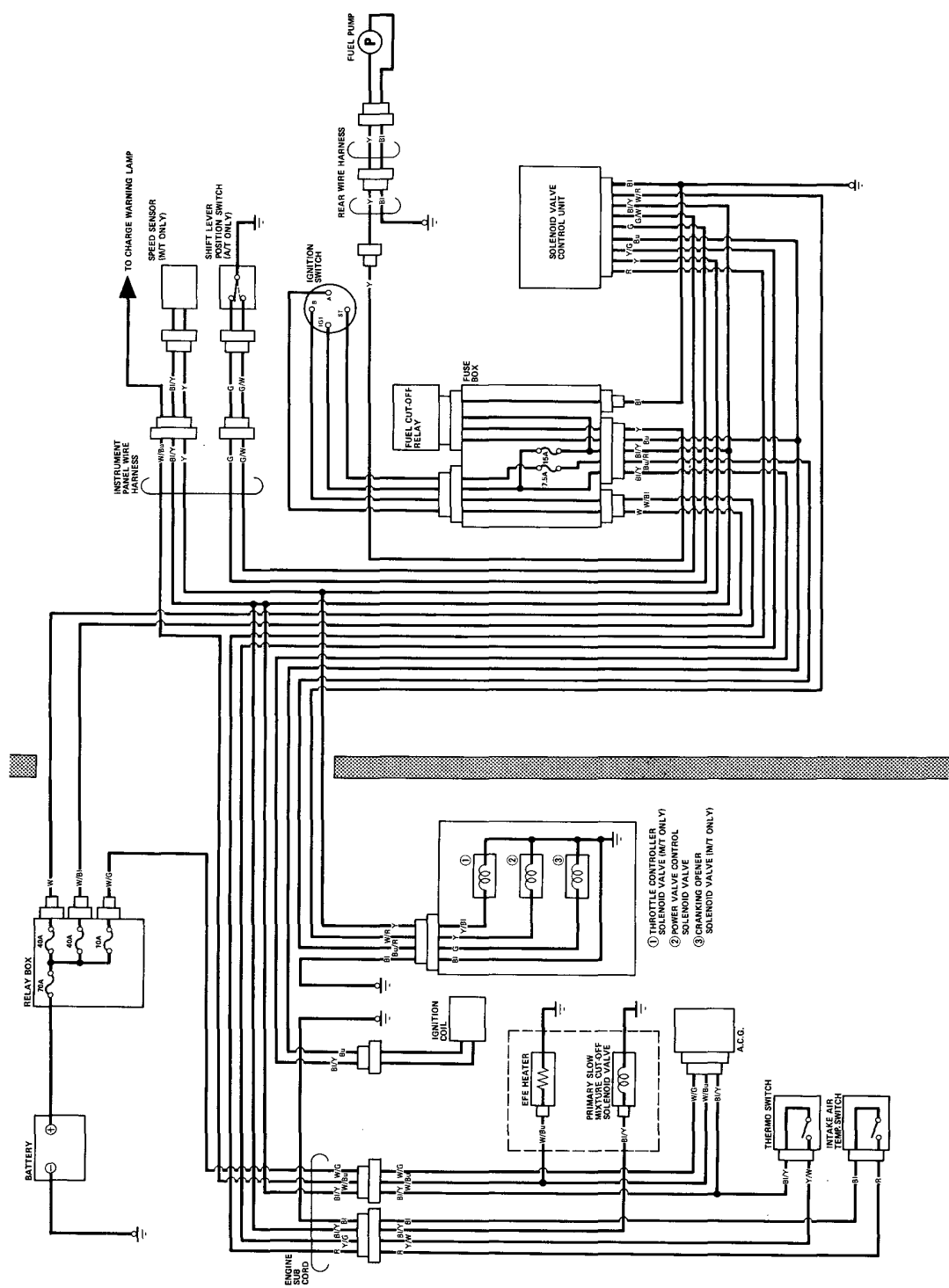
[Except A20A2 KQ, KX, KS model]





# Wiring Diagram

[A20A2 KS model]







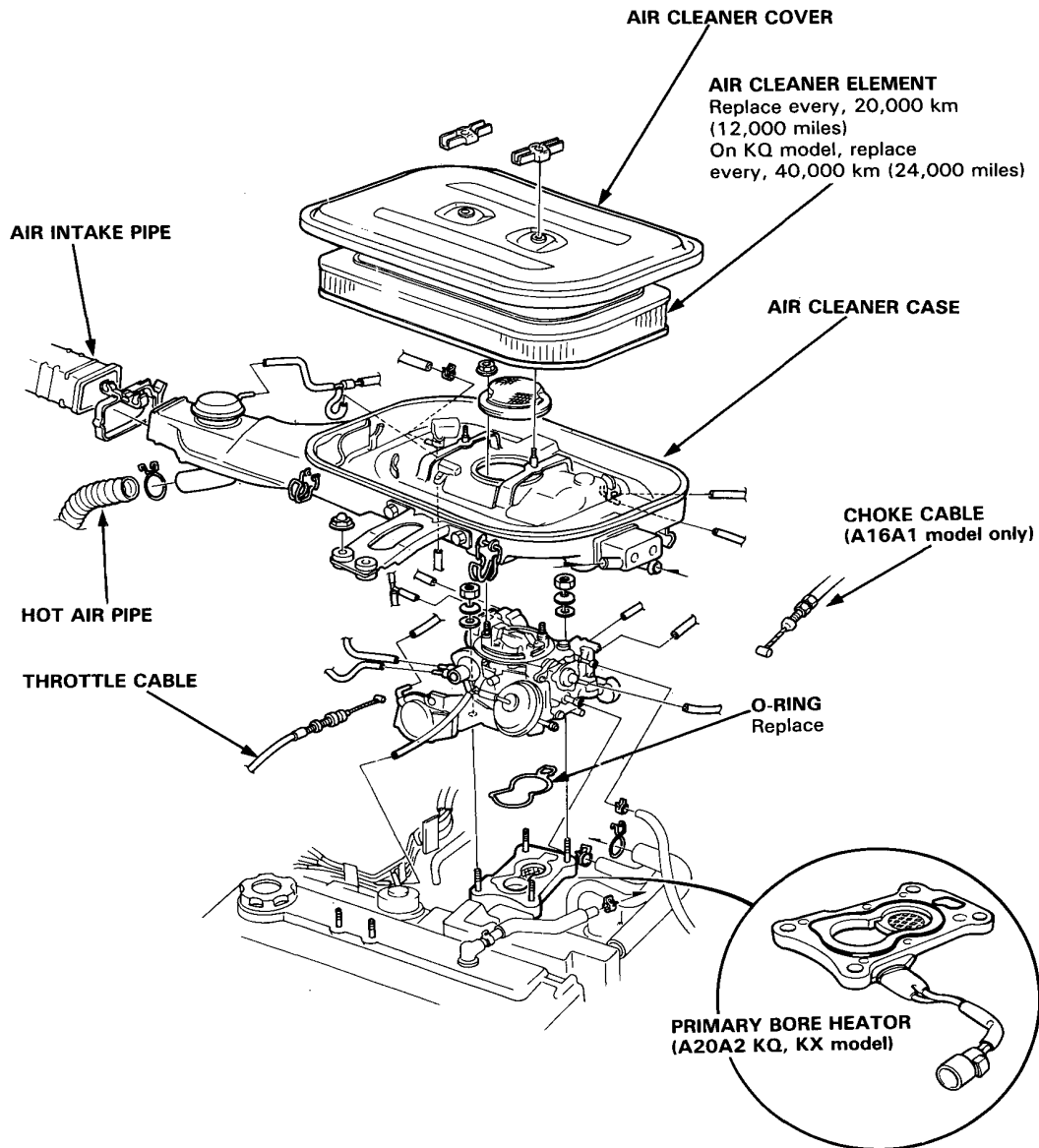


# Carburetor

## Index

Idle speed/Mixture .....	11-21
Throttle/Choke Cable .....	11-25
Float Level .....	11-28
Automatic Choke .....	11-28
Manual Choke .....	11-35
Power Valve .....	11-37

Primary Slow Mixture Cut-off Solenoid Valve ....	11-39
Vacuum Control Secondary .....	11-40
A/C Idle Boost Control System .....	11-41
Dashpot System .....	11-42
Primary Bore Heater .....	11-48
Carburetor .....	11-50





# Idle Speed/Mixture



## Inspection/Adjusting

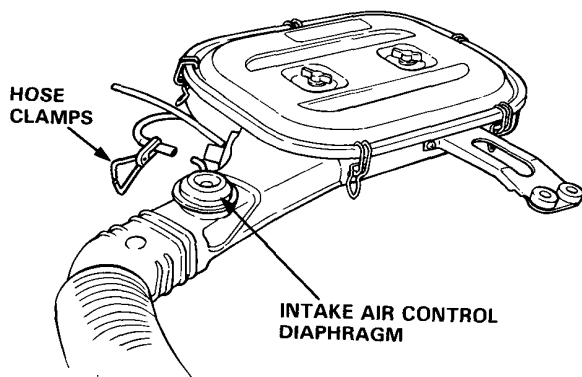
[A20A2 KQ, KX model]

### Propane Enrichment Method

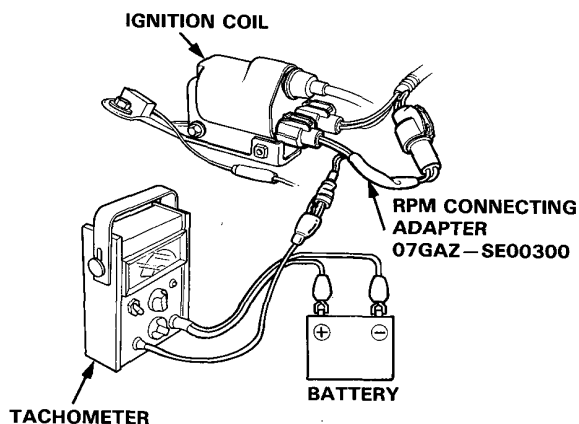
**WARNING** Do not smoke during this procedure. Keep any open flame away from your work area.

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.

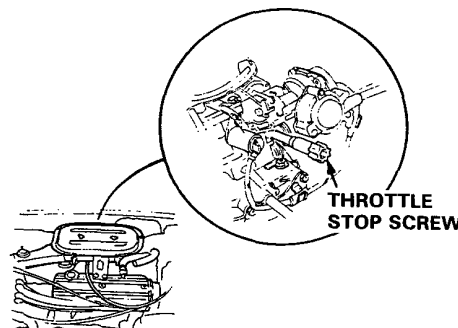


3. Connect a tachometer.



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 <sup>-1</sup> (rpm)
Automatic (in gear)	700 ± 50 min <sup>-1</sup> (rpm)

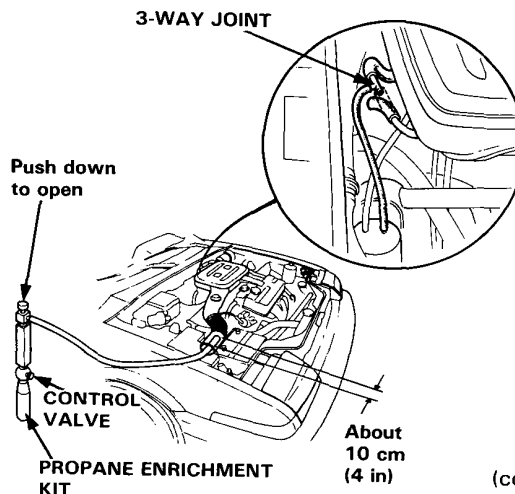


Adjust the idle speed, if necessary, by turning the throttle stop screw.

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)

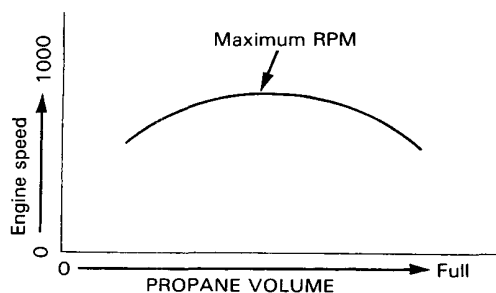


# Idle Speed/Mixture

## 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.



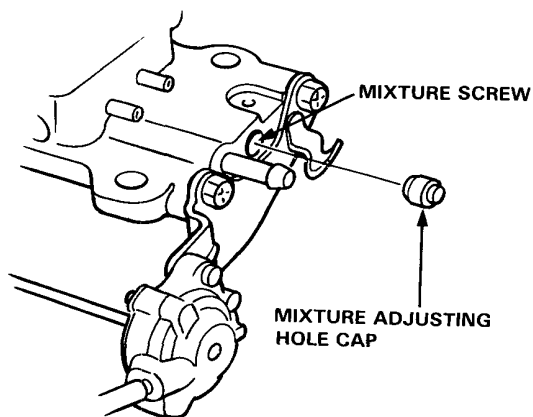
### Propane Enriched Maximum Engine Speed

Engine Speed increase should be:

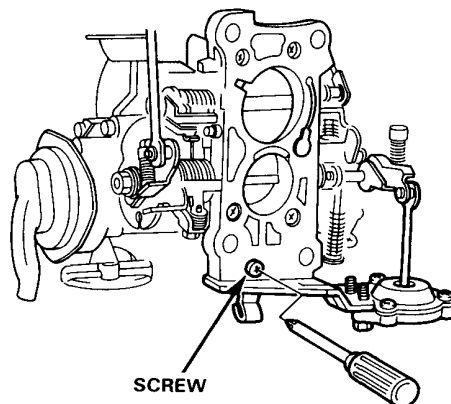
M/T  $60 \pm 20 \text{ min}^{-1} (\text{rpm})$

A/T  $30 \pm 20 \text{ min}^{-1} (\text{rpm})$

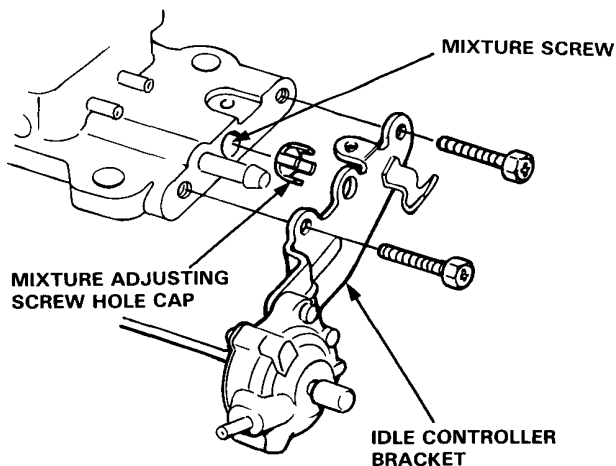
- If engine speed does not increase per specification, mixture is improperly adjusted. Go to step 8.
  - If engine speed increases per specification, go to step 21.
8. Close the propane control valve and remove mixture adjusting hole cap, then go on to step 20 (KX model) or remove the air cleaner (KQ 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, 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. 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.

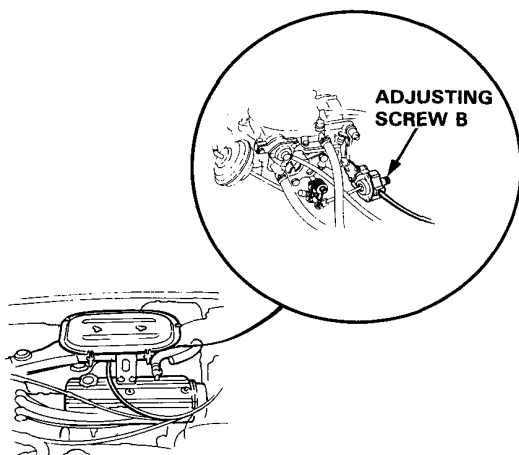
## 22. Recheck idle speed and, if necessary, adjust by turning throttle stop screw, then repeat steps 20 and 21.

## 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:  $750 \pm 50 \text{ min}^{-1} \text{ (rpm)}$



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

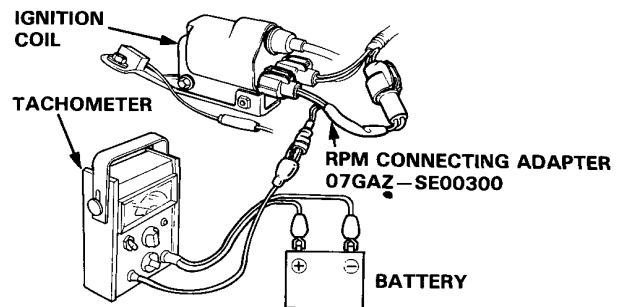
## [Other model]

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

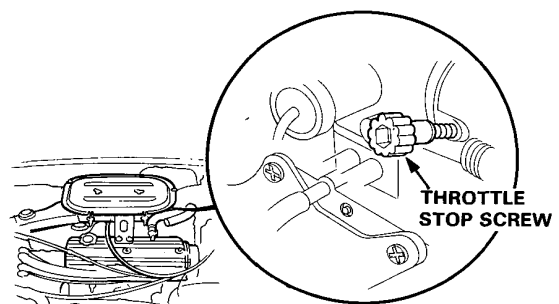
1. Warm-up and calibrate the NDIR CO Meter in accordance with the manufacturer's recommended procedures.
2. Insert exhaust gas sampling probe into the tail pipe at least 40 cm and connect a tachometer.



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

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

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)



# Idle Speed/Mixture

## Inspection/Adjusting (cont'd)

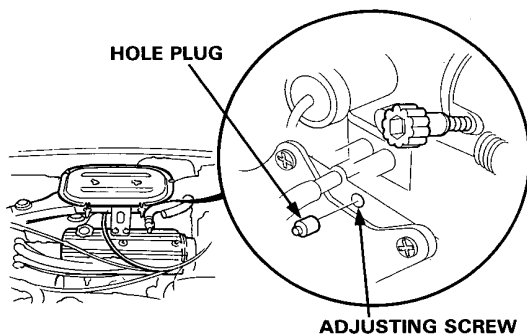
5. Check specification for idle CO with cooling fan, air conditioner OFF and (except for Swedish model) headlights OFF.

### Specified CO %:

KS model  $0.5 \pm 0.5\%$

Other models  $1.0 \pm 1.0\%$

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.

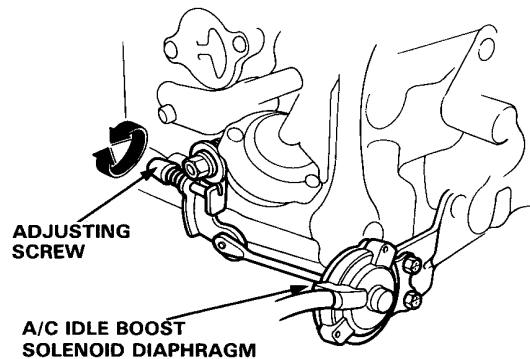
Vacuum is controlled by a solenoid valve that is energized whenever the air conditioner switch is turned on and compressor is energized.

When the air conditioner is OFF or the compressor is not engaged, the solenoid valve is deenergized and the vacuum in the idle boost diaphragm is relieved through the filter on the solenoid valve.

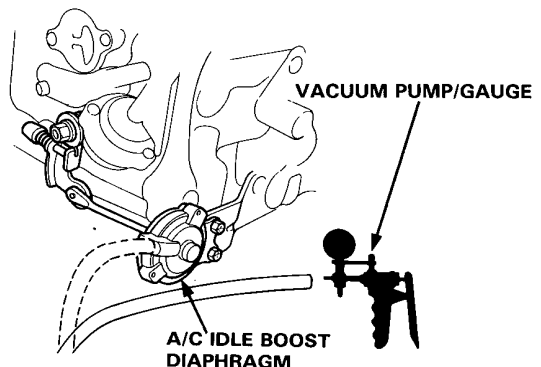
1. If car is equipped with air conditioning, recheck idle speed with air conditioner ON; Speed should still be within specification.

Idle speed should be:  $750 \pm 50 \text{ min.}^1 (\text{rpm})$

- If the speed is outside 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.

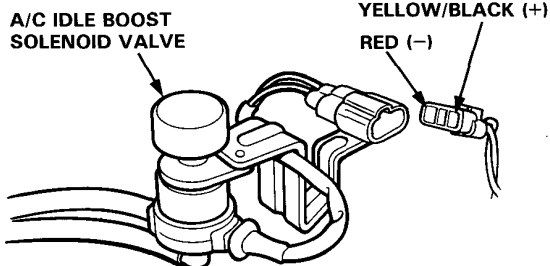




## Throttle/Choke Cable



- 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.

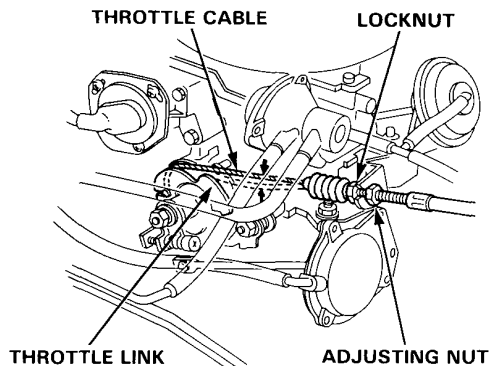
### Idle-Drop Method

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<sup>-1</sup> (rpm) (Manual Transmission in neutral) or 780 min<sup>-1</sup> (rpm) (Automatic in gear).
4. Turn the mixture adjusting screw clockwise until engine speed drops to 800 min<sup>-1</sup> (rpm) (M/T in neutral), 750 min<sup>-1</sup> (rpm) (KS A/T in gear) or 730 min<sup>-1</sup> (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.

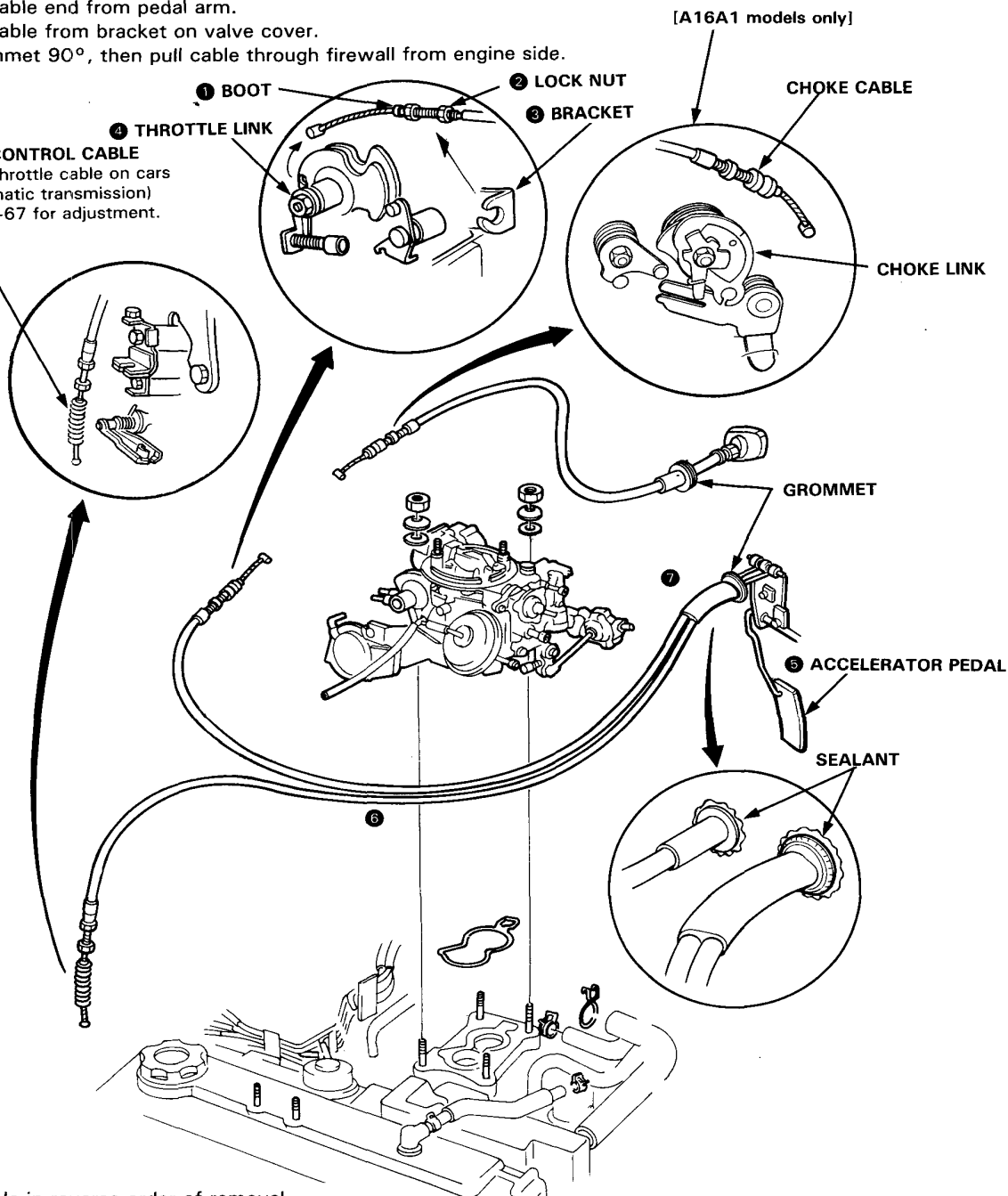


# Throttle/Choke Cable

## 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.

**THROTTLE CONTROL CABLE**  
(Part of the throttle cable on cars with Hondamatic transmission)  
See page 15-67 for adjustment.



### Installation

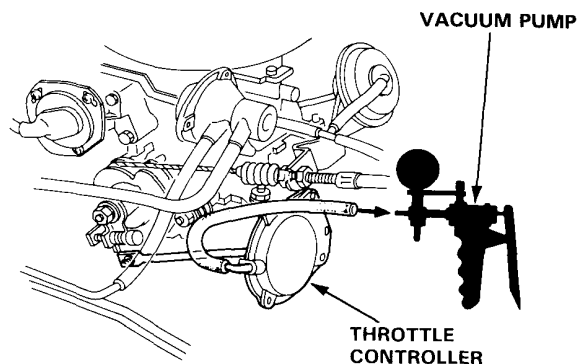
Install the cable in reverse order of removal.  
Apply sealant to grommet mating surface, when installing cable.



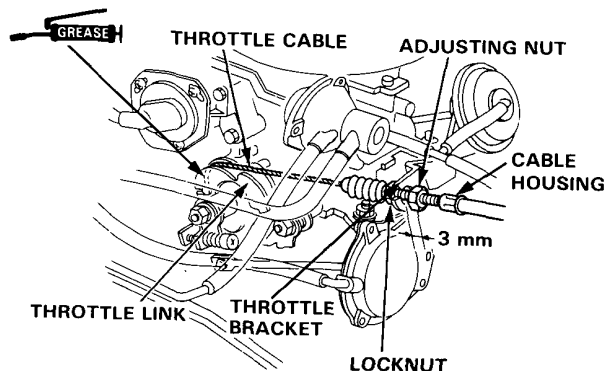


## Throttle Cable Installation

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.

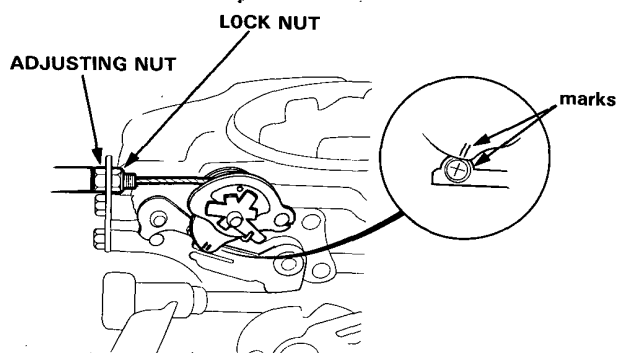


4. Turn the adjusting nut until it is 3 mm (1/8 in.) away from the cable bracket. Tighten the locknut.
5. Disconnect the vacuum pump and reconnect the throttle controller hose (A/T model and KT, KP, KQ, KX (M/T) model only).
6. On models with automatic transmission, adjust the throttle control cable. 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.

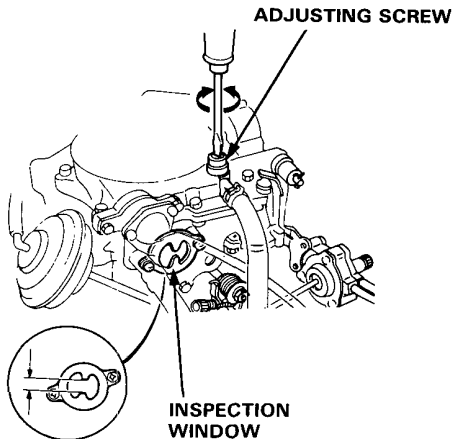


# Float Level

## 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<sup>-1</sup> (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]

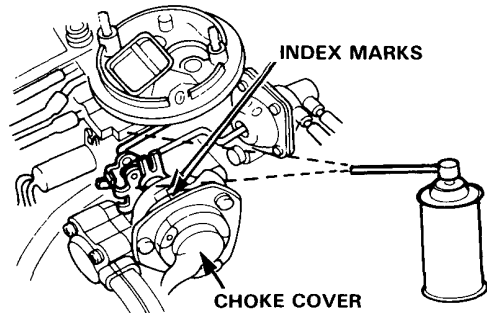
1. Remove the air cleaner.
2. Open and close the throttle fully to let the choke close.

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 mechanical 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

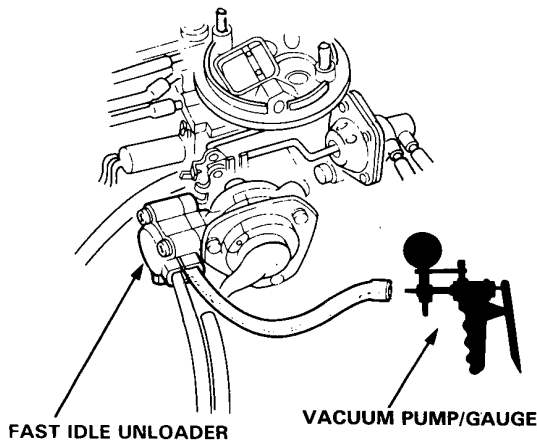
### [A20A2 model]

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.



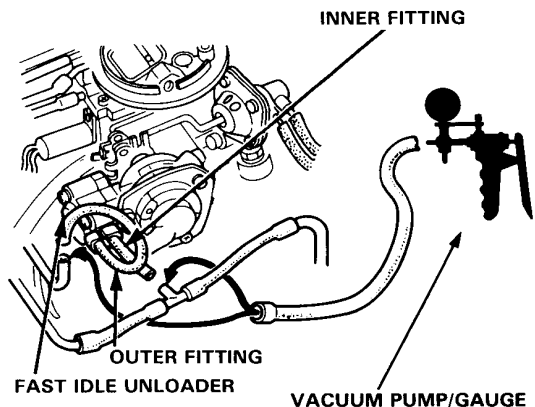
The fast idle speed should drop.

- 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<sup>-1</sup> (rpm) as the unloader pulls the internal choke linkage off the fast idle cam.

- If fast idle drops below 1,400 min<sup>-1</sup> (rpm), go on to the Fast Idle check on page 11-33.
- If fast idle does not drop below 1,400 min<sup>-1</sup> (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

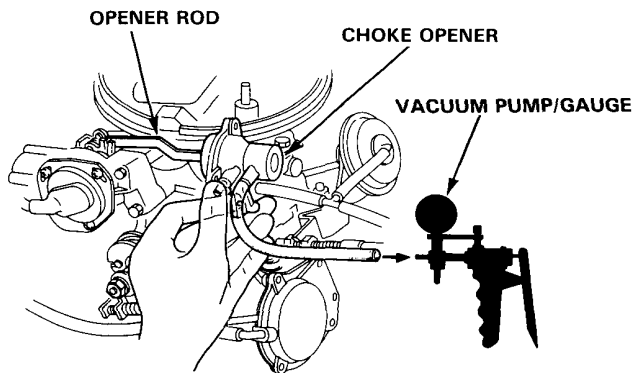
### [A20A2 model]

NOTE: Engine coolant temperature must be below Thermovalve A set temperature 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]

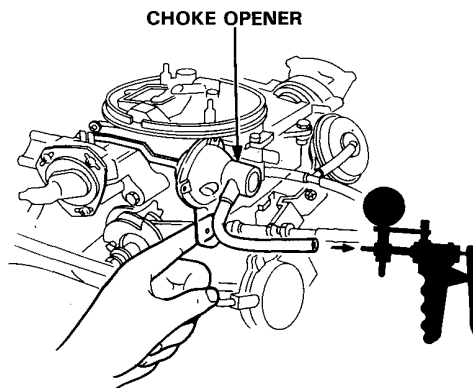
Remove diaphragms two bolts, and attach a vacuum pump to the upper hose fitting. Block the lower fitting and orifice in the opener while you apply enough vacuum to pull the opener rod all the way in, then stop.



- 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]

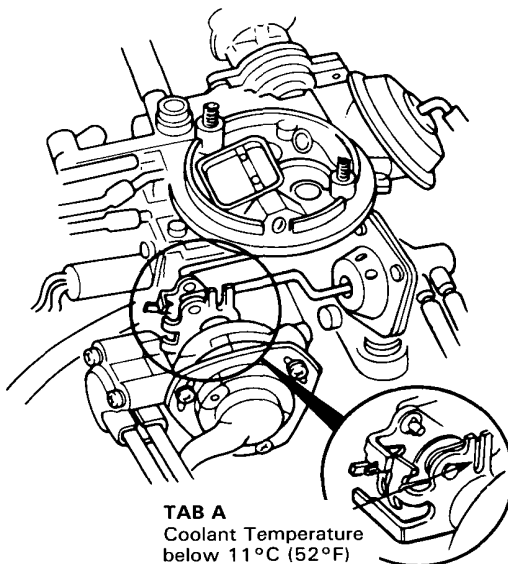
Remove diaphragms two bolts, and attach a vacuum pump to the hose fitting. Block the orifice in the opener while you apply enough vacuum to pull the opener rod all the way in, then stop.



- 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).

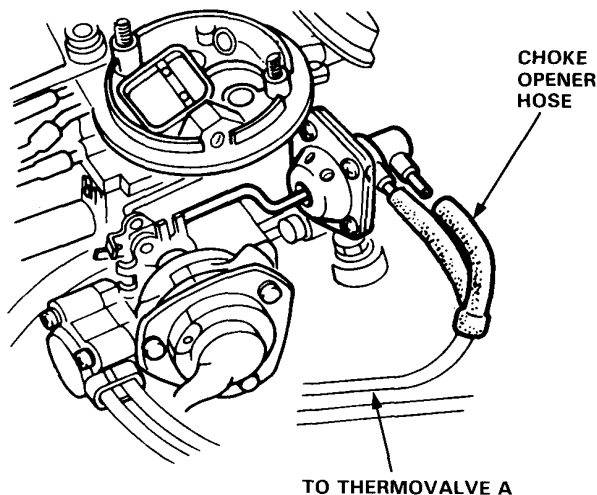
4. If coolant temperature is below about 11°C (52°F). Tab A on the choke opener lever should not be seated against the carburetor.



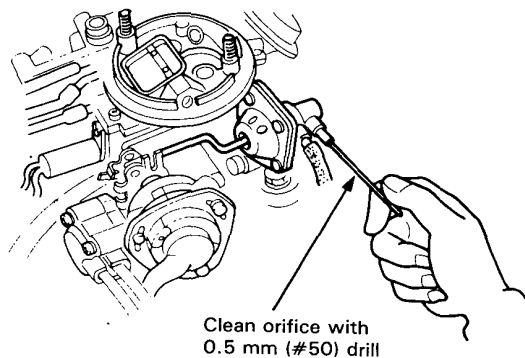




- If Tab A is not seated, go on to step 5.
- If Tab A is seated, disconnect the choke opener hose #18 from upper fitting.

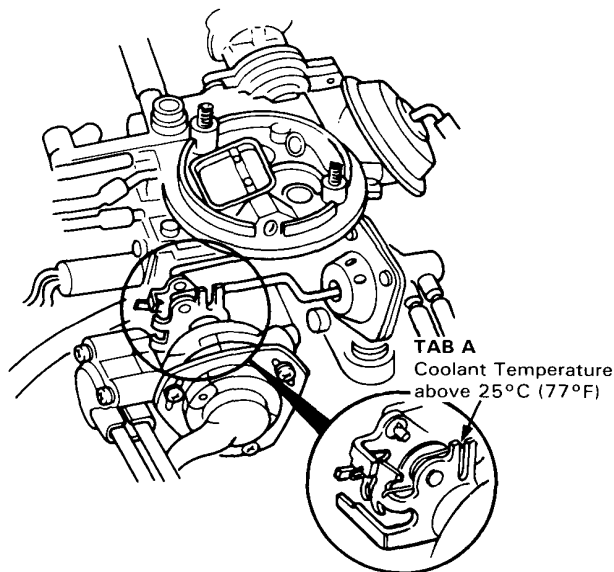


- If Tab A comes off its seat, check line #18 to thermovalve A blockage and check that the thermovalve is open.
- If Tab A does not come off its seat, press down on the choke opener lever until it does; if it won't stay off, clean out the choke opener fitting with a 0.5 mm (#50) drill bit, then re-test.



- 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]

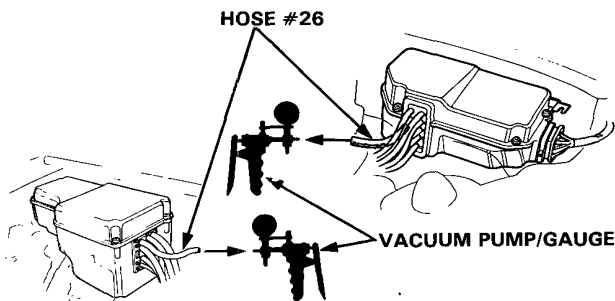
NOTE: Engine coolant temperature must be below 70°C (158°F) and intake air temperature must be below 18°C (64°F).

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]

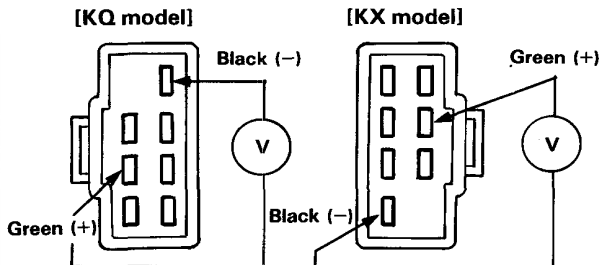
[KQ model]



- 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.



- 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.

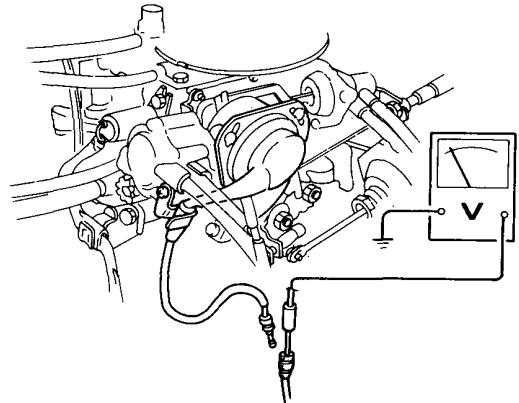
## Choke Coil Heater

[A20A2 model]

Start the engine and let it 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 voltmeter reads 0 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).





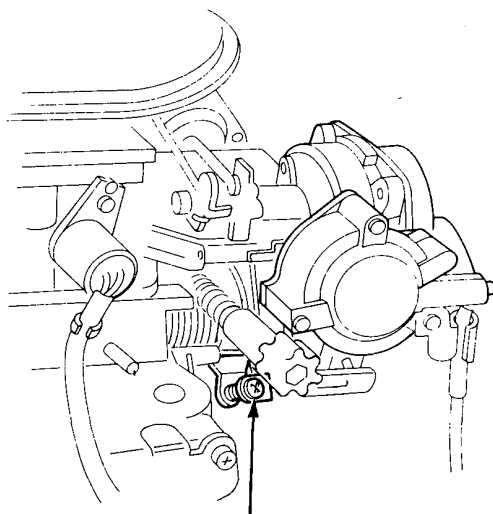
## Fast Idle Adjustment

### [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  $2500 \pm 500 \text{ min}^{-1} \text{ (rpm)}$ .

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



FAST IDLE ADJUSTING SCREW

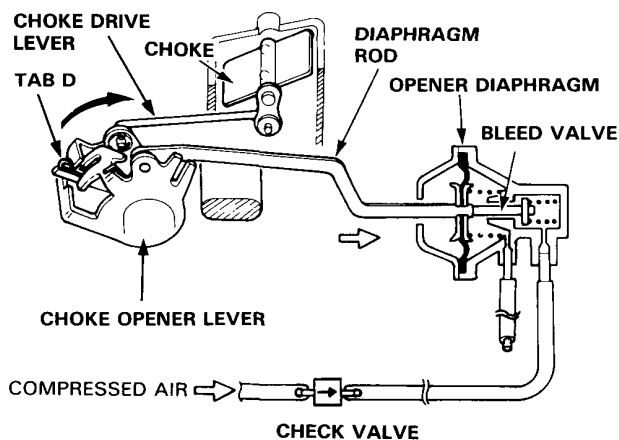
## Linkage Adjustment

### [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: min (in)

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

Adjust clearance by bending Tab D.

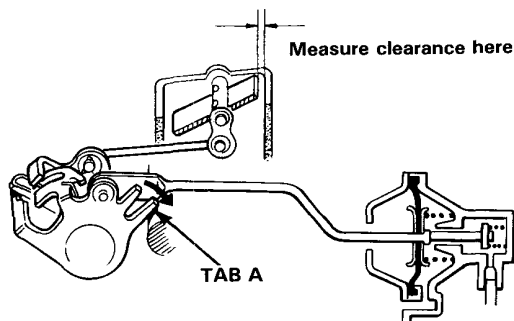
(cont'd)



# Automatic Choke

## Linkage Adjustment (cont'd)

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

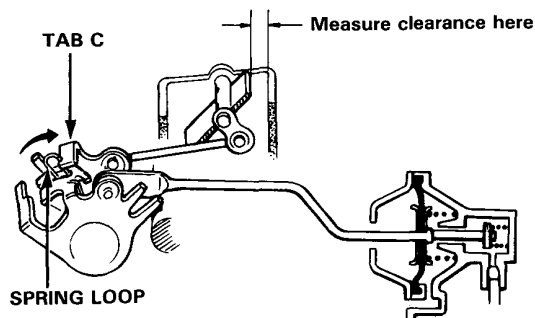


### 2nd Stage Clearance:

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

- 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:

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





## Manual Choke

### Choke Cover-Replacement

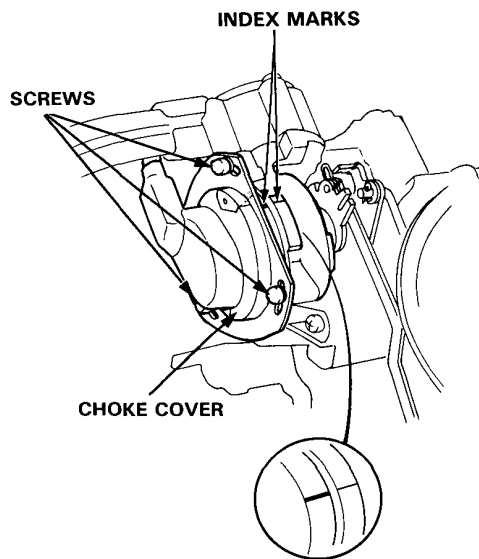
[A20A2 model]

#### 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.

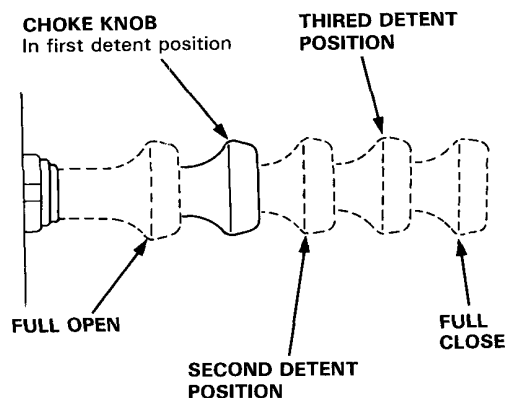


# Manual Choke

## Fast Idle Adjustment

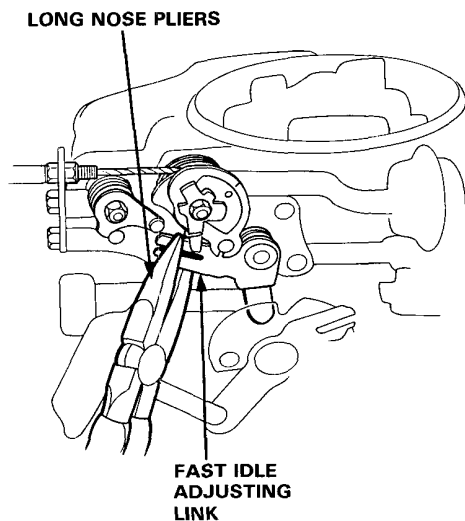
### [A16A1 model]

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.

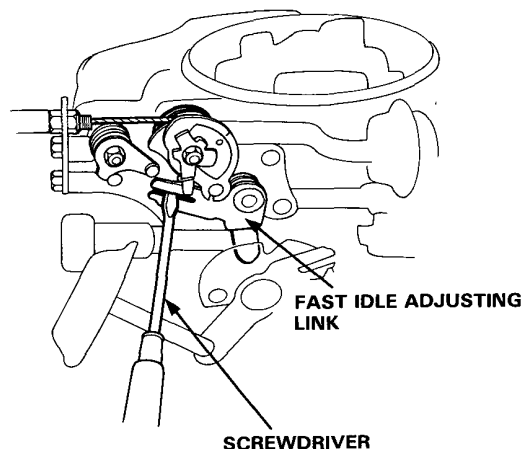


Fast idle should be: 1,500—2,500 min<sup>-1</sup> (rpm)

- 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.



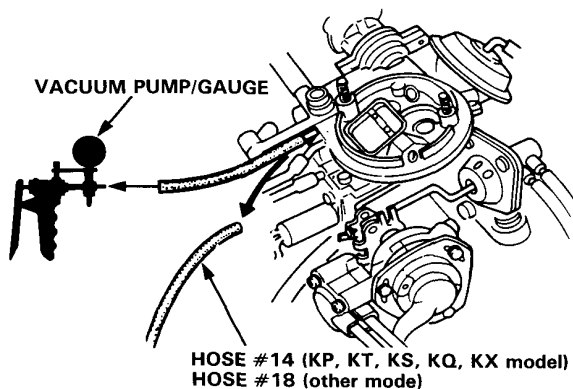


# Power Valve

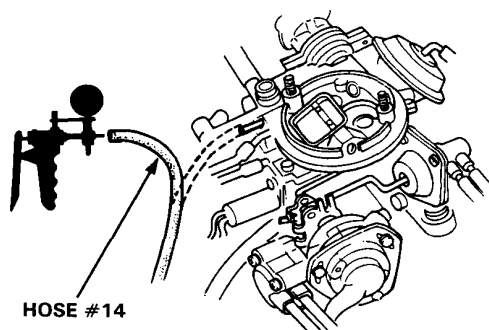


## Inspection

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.



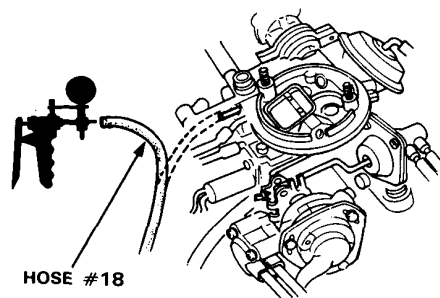
- If no sound is heard, replace the carburetor and re-test.
  - If a clicking sound is heard, go on to step 5 (KS model), step 3 (A20A2 KF, KG, KW, KE, KY model) or step 2 (other model).
2. Connect a vacuum pump/gauge to the hose #14. Start the engine and check that there is vacuum at idling.



- 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 idling.

NOTE: Engine coolant temperature must be below thermostatic valve A set temperature (11°C, 52°F).



- If there is no vacuum, go on to step 4.
  - If there is vacuum, replace the thermostatic valve 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 thermostatic valve vacuum hose #17.
  - If there is vacuum, replace the thermostatic valve A and re-test.
  - If there is no vacuum, check the vacuum hose #18 and the intake manifold-to-thermostatic valve A vacuum hose for blockage, pinch, and disconnection. Replace if necessary.

(cont'd)

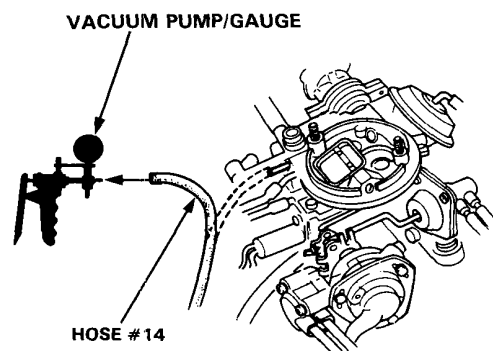


# Power Valve

## 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.

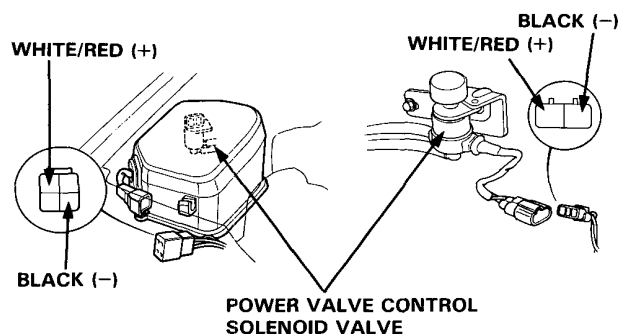
NOTE: Engine coolant temperature must be below 43°C (109°F).



- 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 idling.

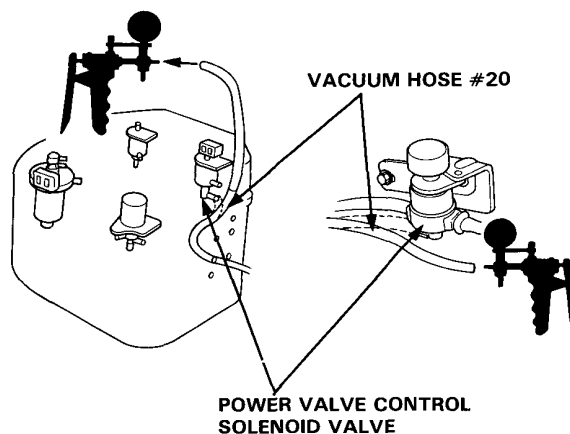
- If there is vacuum, test is complete.
- If there is no vacuum, check for voltage at the power valve control solenoid valve at idling.
- If there is voltage, go on to step 7.
- If no voltage, go on to troubleshooting (page 11-70).

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 intake 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



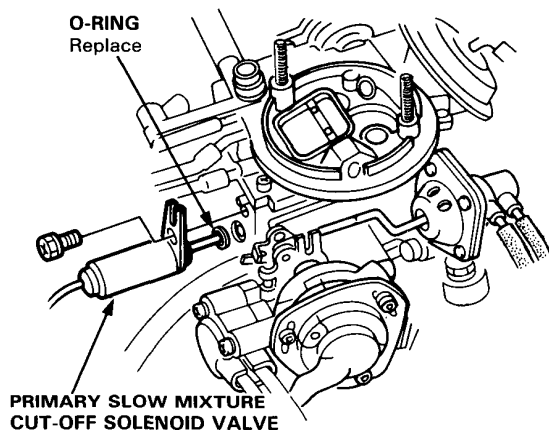
## Testing

### [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.

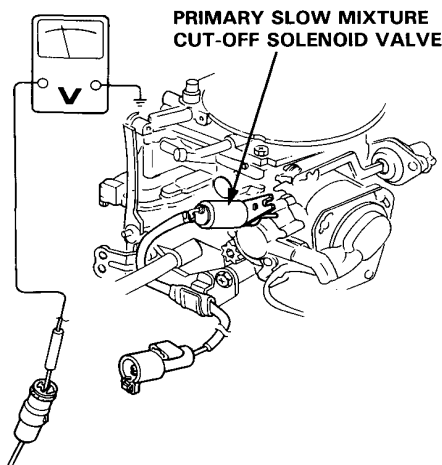
#### WARNING

- 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 set 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).

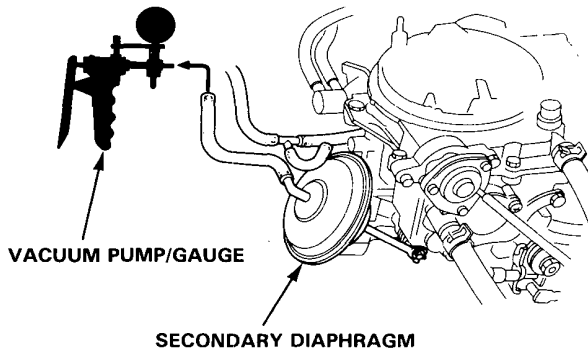


# Vacuum Controlled Secondary

## Inspection

### [A20A2 model]

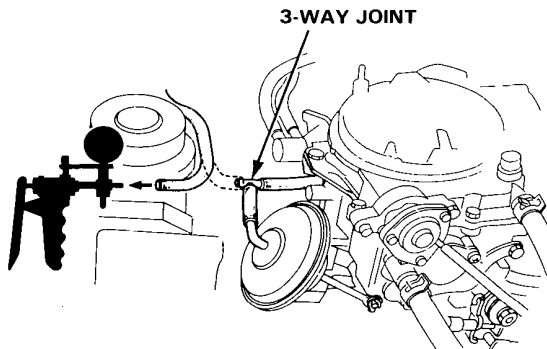
1. Disconnect the secondary diaphragm vacuum hose and attach a spare piece of hose between the diaphragm and a vacuum pump.
2. Open the throttle valve fully and apply a vacuum. Check that the diaphragm rod moves as vacuum is applied and that the vacuum then remains steady.



- 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.



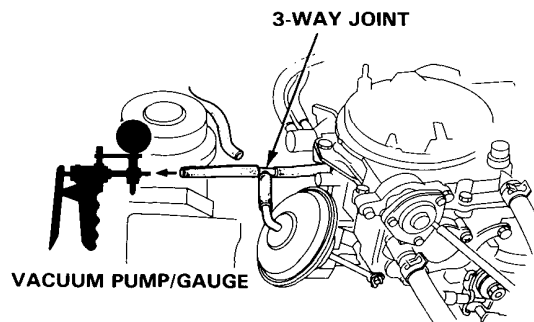
- If vacuum holds, first make sure the hose is not clogged, then replace thermo wax valve A.

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.



# A/C Idle Boost Control System



## System Inspection

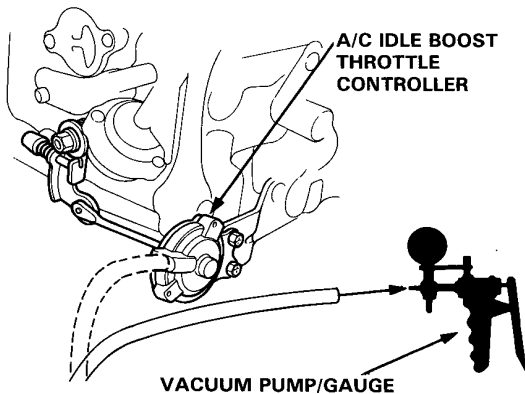
### [A20A2 KQ, KX model]

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.

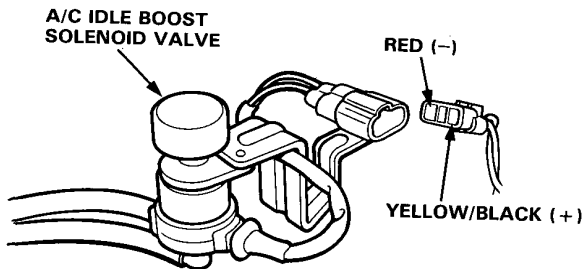
There should be vacuum.



- 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<sup>-1</sup> (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.



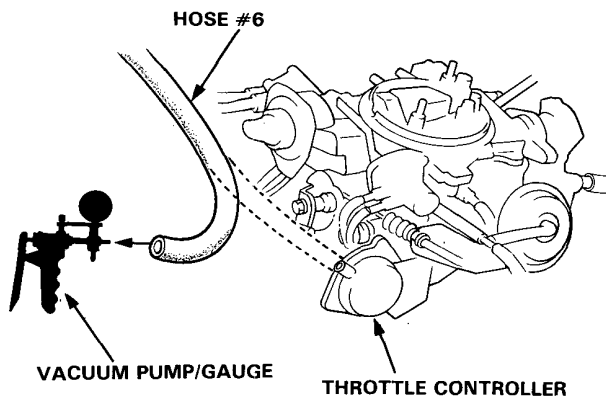
# Dashpot System

## 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 obtained. The idle speed will be excessively high after warming up the engine.

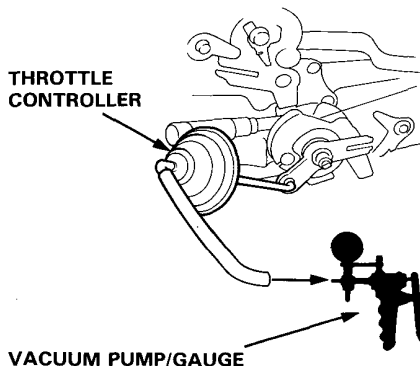
1. Connect a tachometer, start the engine and allow it to reach normal operating temperature (cooling fan comes on).
2. Check that the idle speed is not excessively high.
  - If the idle speed is within specification (pages 11-21, 23), go on to throttle controller adjustment (page 11-47).
  - If the 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<sup>-1</sup> (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).





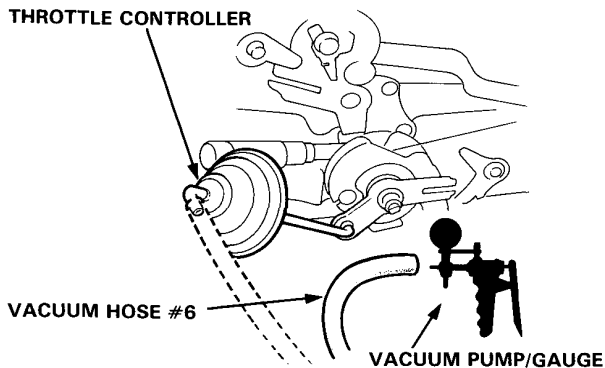
## Throttle Control valve Inspection

### [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  $4,000 \text{ min}^{-1}$  (rpm).

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

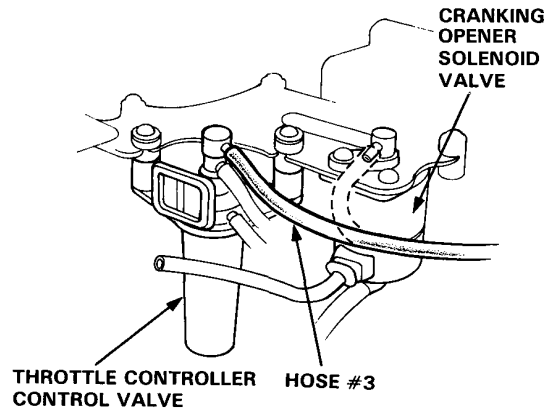


- If vacuum is at least 30 mmHg (1.2 in.Hg) at  $4,000 \text{ min}^{-1}$  (rpm), replace the control valve and re-test.
- If vacuum is below 30 mmHg (1.2 in.Hg), check for vacuum at the carburetor port.
- If there is no vacuum, clean the carburetor port and re-test.
- If vacuum is present, check the 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 inspection step 3.
  - If the throttle returns within the limits, go on to cranking opener solenoid valve inspection (page 11-45).

(cont'd)



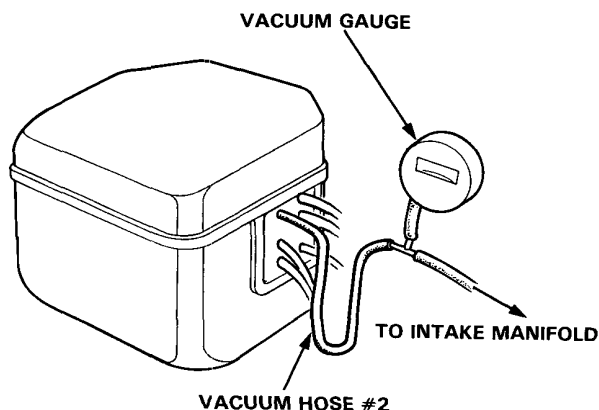
# Dashpot System

## Throttle Control Valve Inspection (cont'd)

### [KS (M/T) model]

Engine speed returns to idle in less than 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.

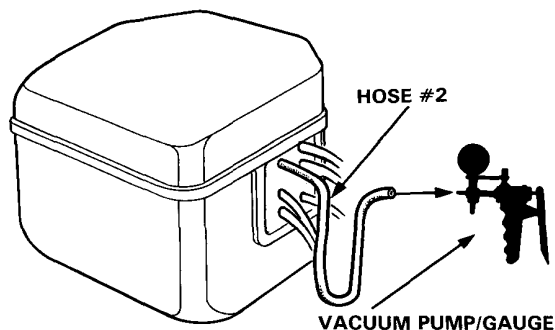


2. Place the shift in second, raise the engine speed to 2,000 min<sup>-1</sup> (rpm) and check for vacuum.

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.

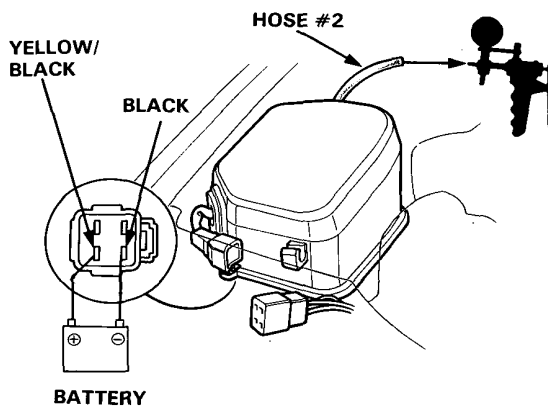


4. Apply vacuum. Vacuum should remain steady.
  - If vacuum remains steady, go on to step 5.
  - If vacuum decreases, replace throttle controller solenoid valve and re-test.
5. Place the shift lever in second and raise the vehicle speed above 24 km/h (15 mph). Apply a vacuum.

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).

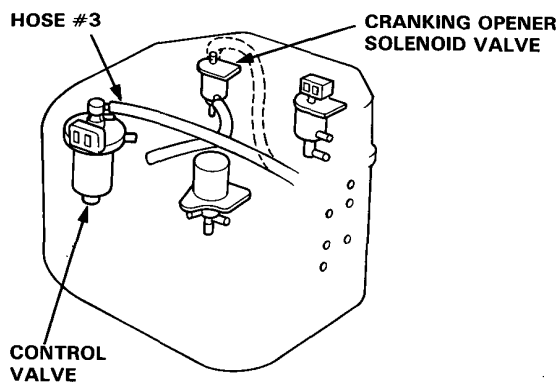




### [KS (M/T) model]

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 column.

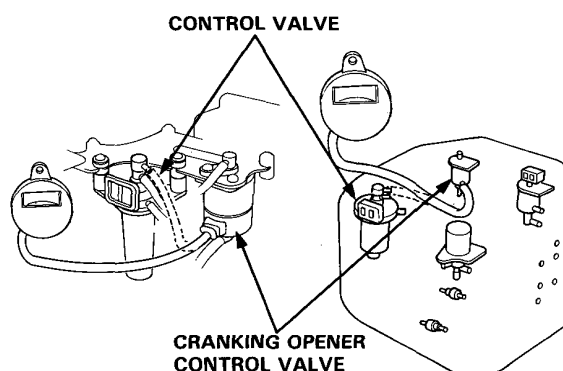
## Cranking Opener Solenoid valve Inspection

### [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 thermostatic valve B (A20A2 model) and re-test.

(cont'd)



# Dashpot System

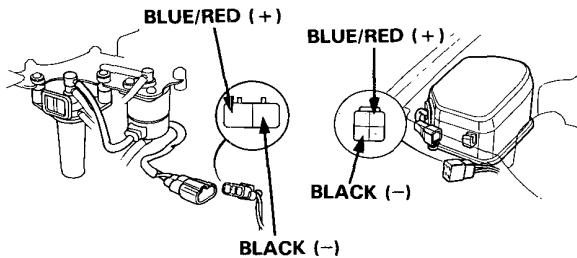
## Cranking Opener Solenoid Valve Inspection (cont'd)

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]



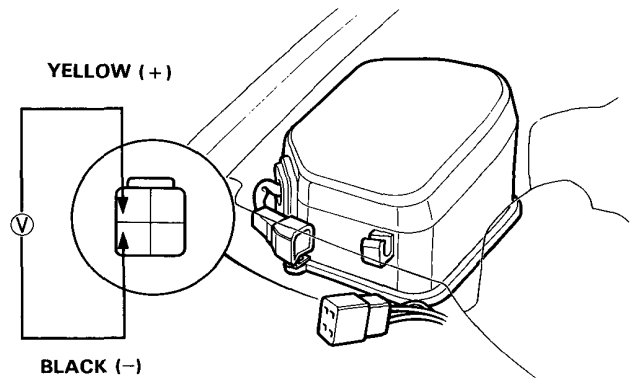
- If there is voltage, replace the cranking opener solenoid valve and re-test.
  - If no voltage, check the wiring and ignition switch and re-test.
5. Check for vacuum at idle.
- There should be no vacuum.
- If there is vacuum, go on to step 6.
  - If no vacuum, test is complete.
6. Check for the voltage at cranking opener solenoid valve with the ignition switch 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 control 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.





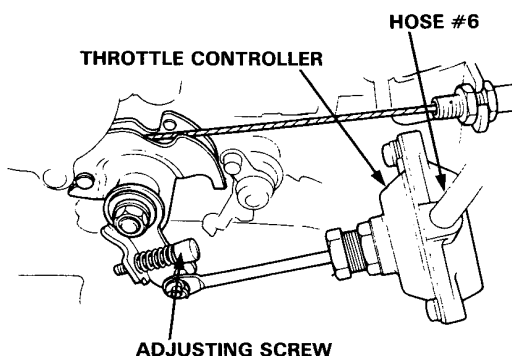
## Throttle Controller Adjusting

### [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  $\text{min}^{-1}$  (rpm).

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

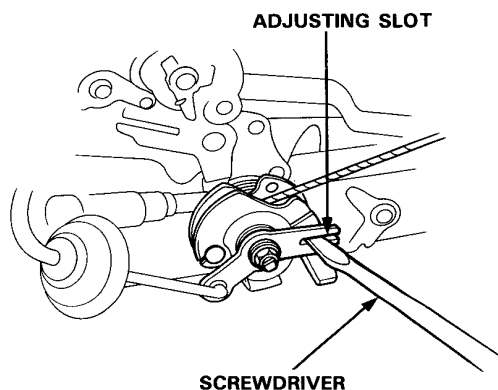


### [KF, KG, KW, KE, KY, KS (M/T) model]

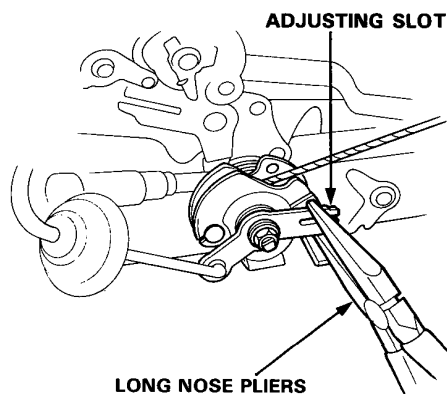
1. Connect a tachometer, start the engine and wait for the engine to warm up (cooling fan comes on).
2. Disconnect vacuum hose #6 from the throttle controller, connect a vacuum pump to the controller and apply 400 mmHg (16 in .Hg) vacuum.

Engine speed should rise to 1,500–2,500  $\text{min}^{-1}$  (rpm) within 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)

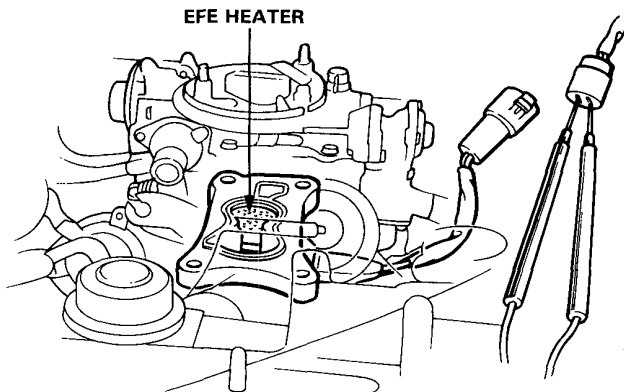
## System Inspection

[KQ, KX model]

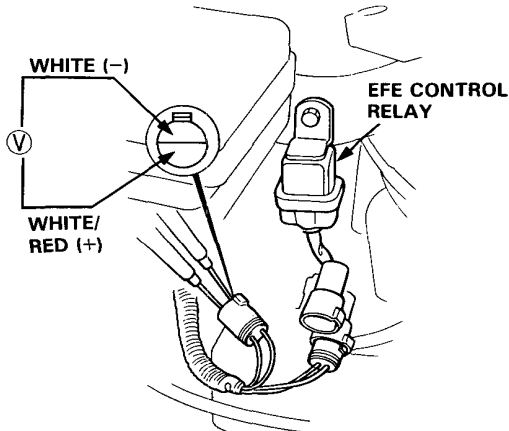
1. Start the engine.

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

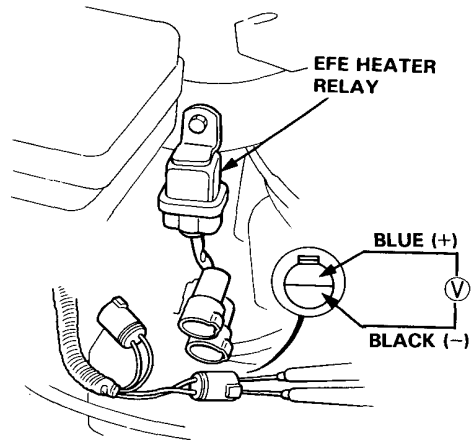
2. Check for voltage at the EFE Heater Connector.



- 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 complete.
    - 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).

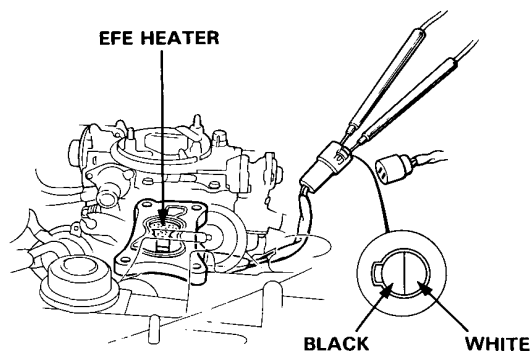




## EFE Heater Inspection

[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 complete.

### CAUTION:

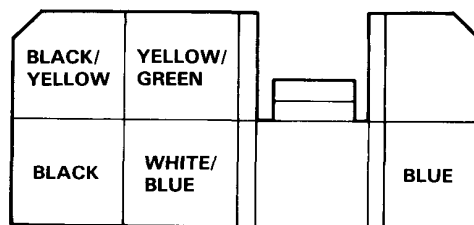
- Be careful not to damage the insulator when servicing the carburetor.
- Make sure that there is no foreign matter on the insulator after installing.
- Make sure that the O-ring and seal are properly installed.
- Do not pull the harness while removing/installing the insulator.
- when removing, make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

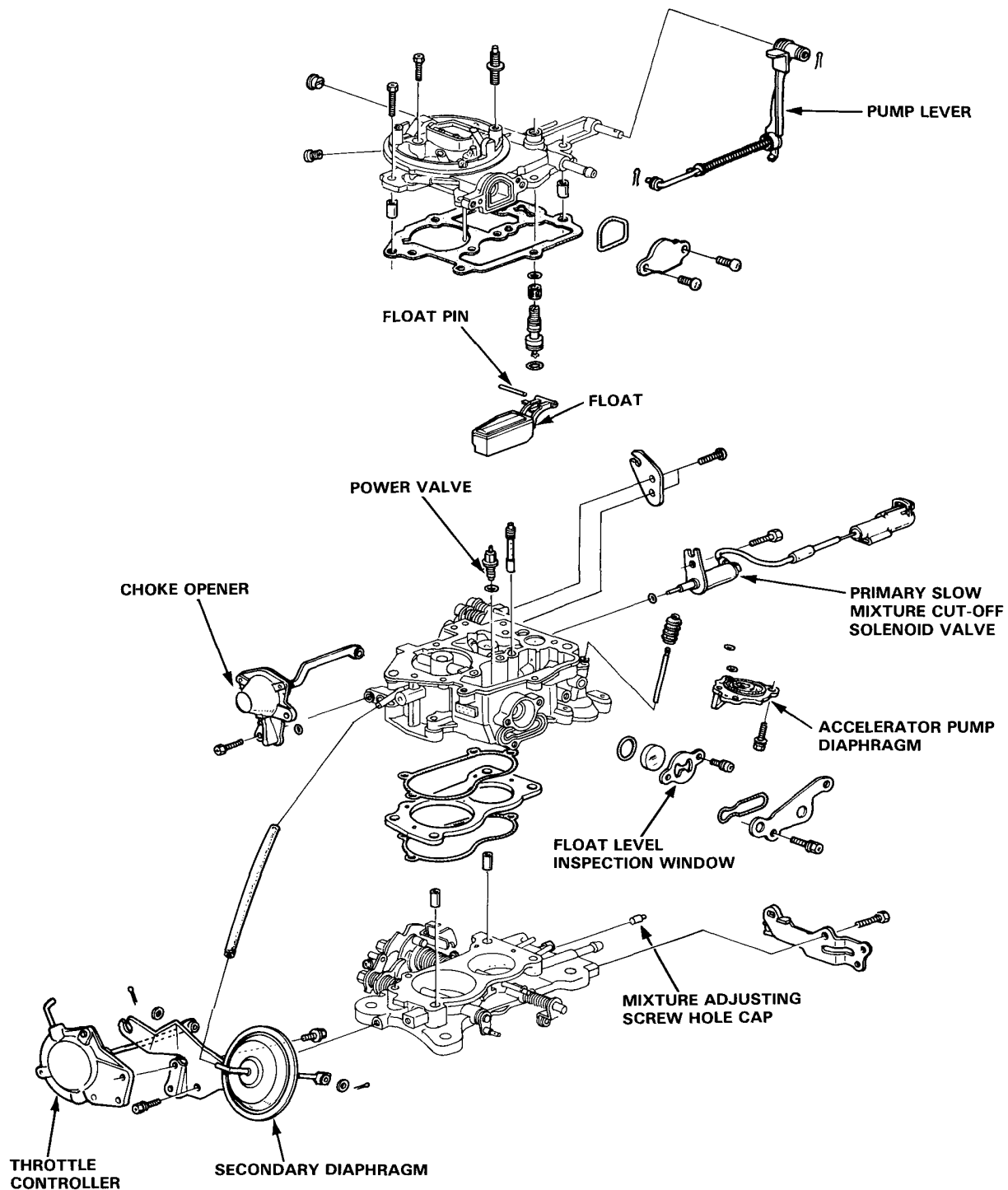
- If there is no continuity, check for an open circuit in the black wire.
2. Check to see if there is voltage between black/yellow and black terminals with the ignition switch on.
    - If there is no voltage, check the black/yellow wiring and fuse.
  3. Check to see if there is voltage between white/blue 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.



# Carburetor

## Replacement of Attached Parts

[A16A1 model]

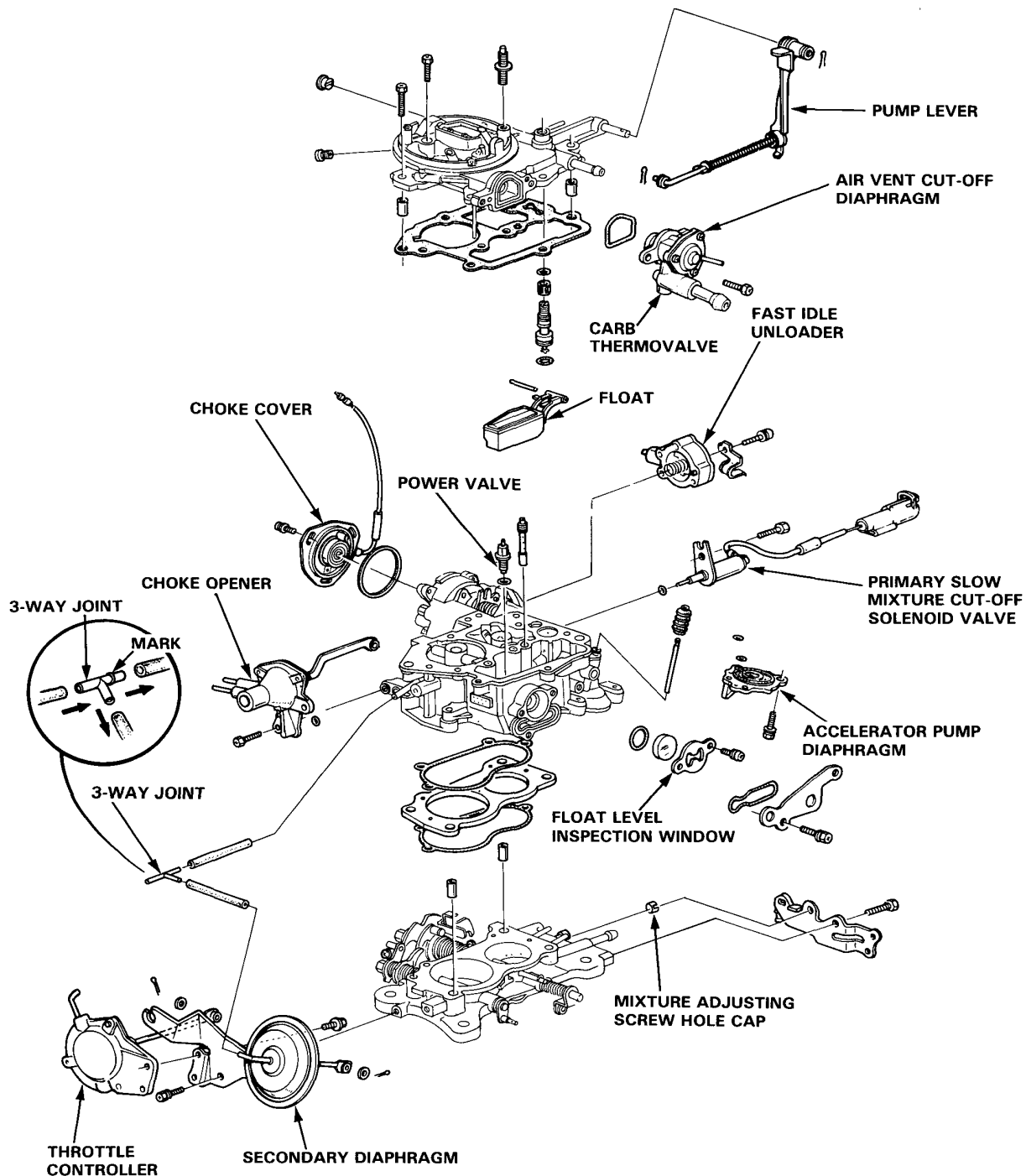






[A20A2 model]

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



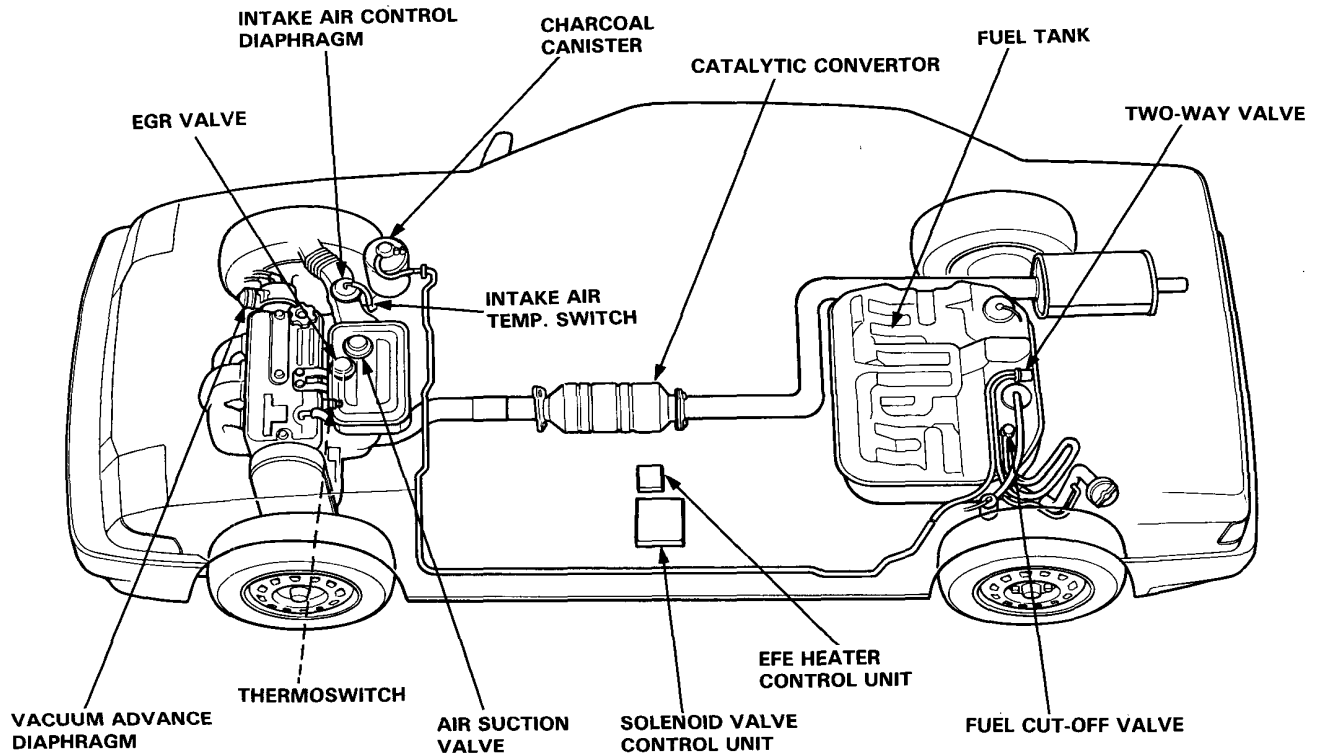


# Emission Controls

## Index

Crankcase Control System .....	11-53
Evaporative Control System .....	11-54
Intake Air Control System .....	11-60
Ignition Timing Control system .....	11-61

EGR System .....	11-63
Air Injection System .....	11-64
Catalytic Converter .....	11-67
Solenoid Valve Control Unit .....	11-68





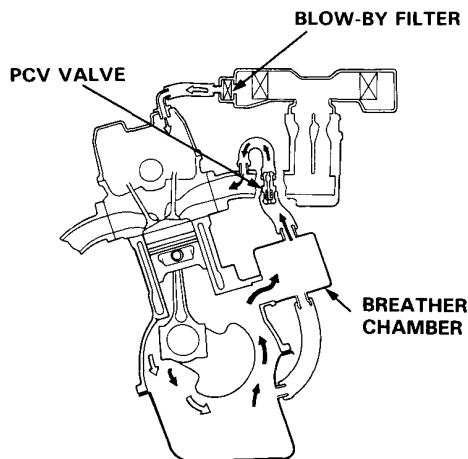
# Crankcase Control System



## Inspection/Replacement

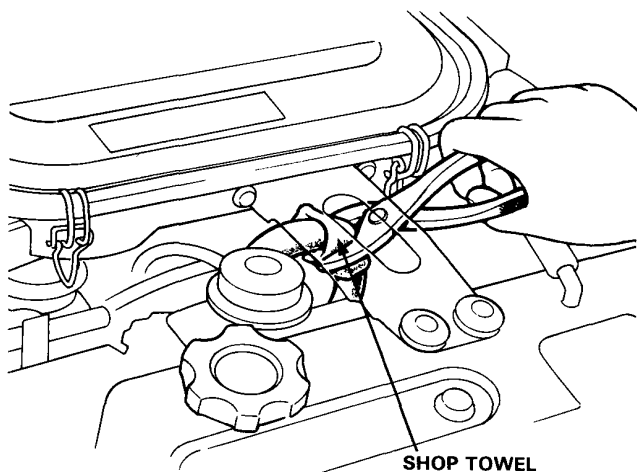
### PCV Valve

1. Check the crankcase ventilation hoses and connections for leaks, clogs 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.

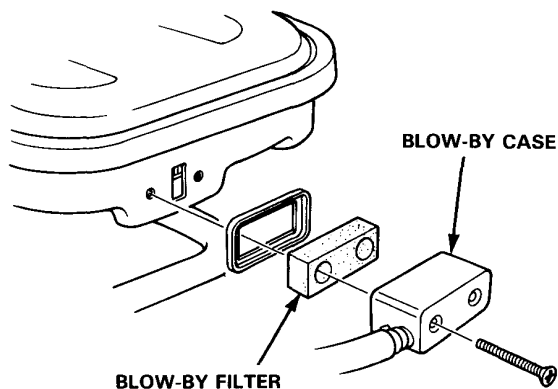


- If no sound is heard, replace the PCV valve and re-test.

### 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.



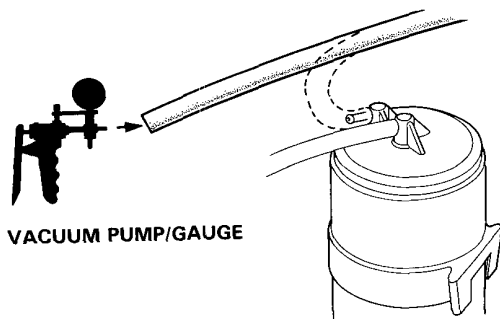


# Evaporative Control System

## Inspection

### [A20A2 KT, KY model]

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



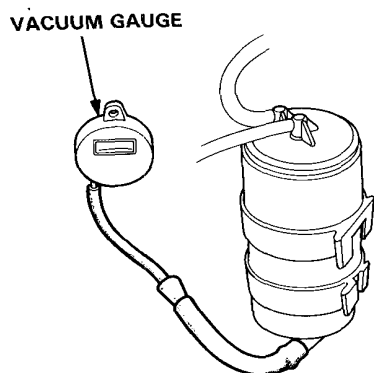
2. Start the engine and raise speed to 3,500 min<sup>-1</sup> (rpm).

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.



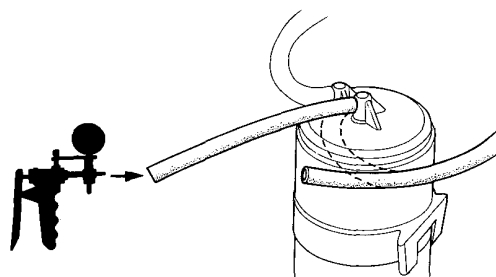
5. Raise engine speed to 3,500 min<sup>-1</sup> (rpm). Vacuum should appear on gauge within 1 minute.

- 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.



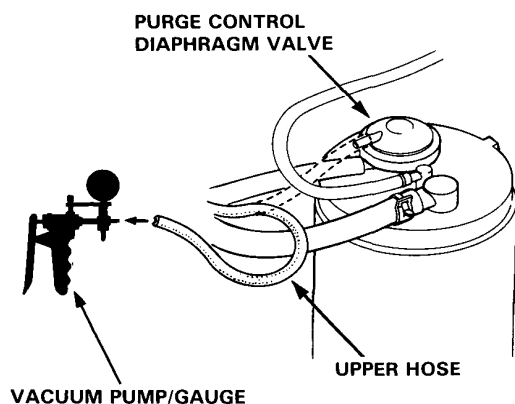


## [A20A2 KQ model]

### Therموالفة B

NOTE: Engine coolant temperature must be below therموالفة 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 therموالفة 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 therموالفة 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 therموالفة B and re-test.

4. Disconnect the vacuum pump/gauge and re-connect hose.

(cont'd)



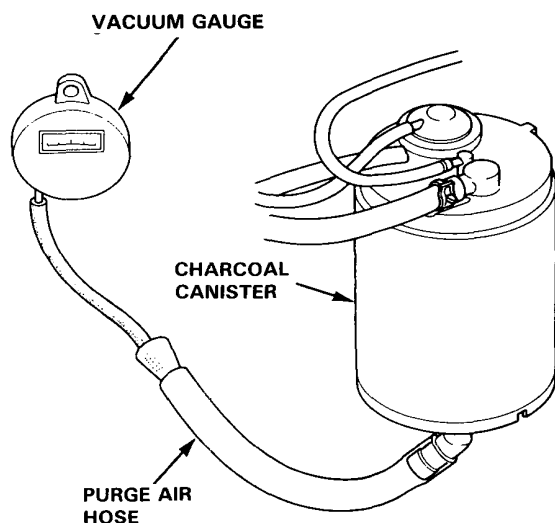
# Evaporative Control System

## Inspection (cont'd)

### [A20A2 KQ model]

#### Charcoal 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.



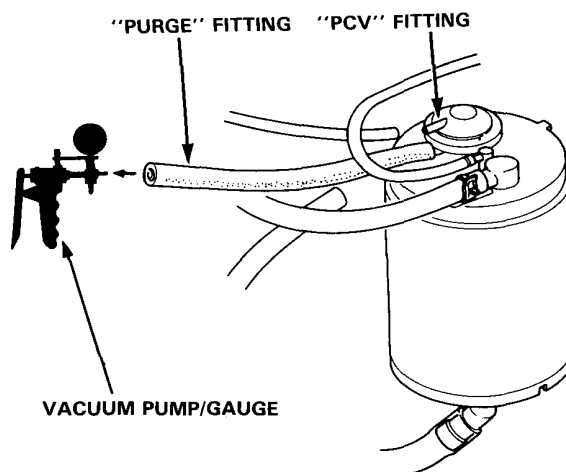
4. Start engine and rise speed to 3,500 min<sup>-1</sup> (rpm).

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.

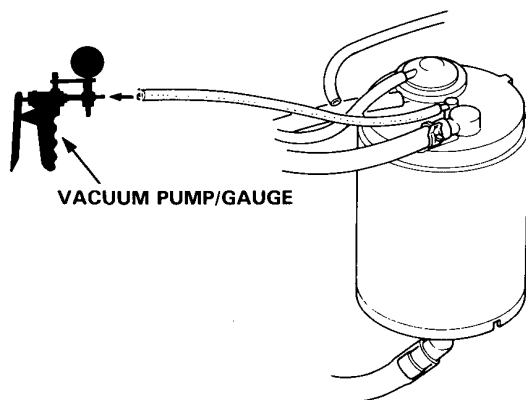
- If vacuum remains steady, disconnect the vacuum pump. Recheck thermostatic valve B operation on previous page.
- If vacuum drops, replace canister and re-test.





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

There should not be any vacuum.

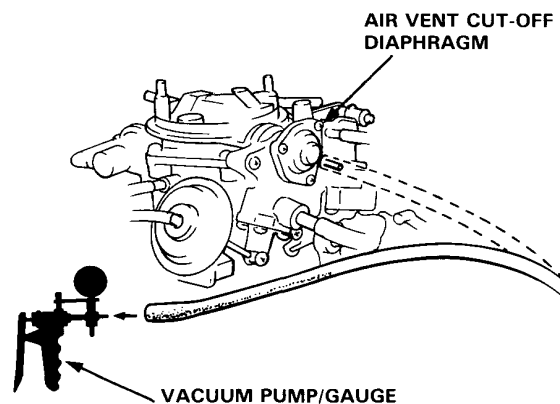


- If no vacuum, reinstall fuel filler cap and canister, test is complete.
- If there is vacuum, replace canister and re-test.

### [A20A2 KQ model]

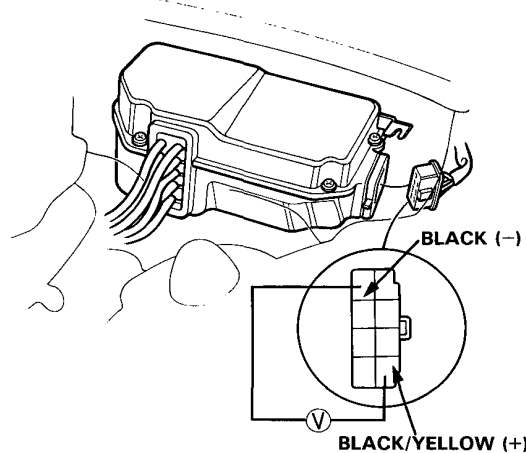
#### Air Vent Cut-Off Diaphragm

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).

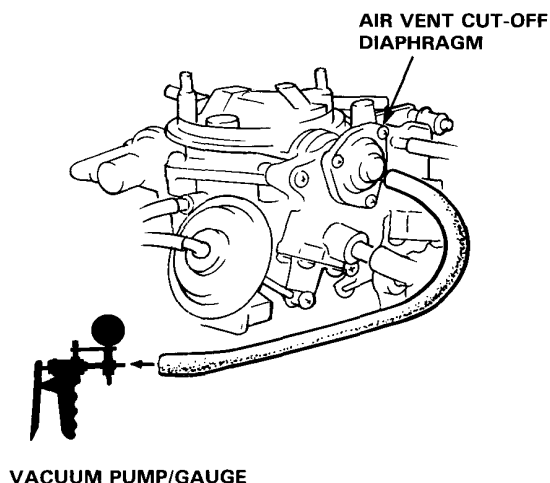
(cont'd)



# Evaporative Control System

## 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 PUMP/GAUGE

Vacuum should remain steady.

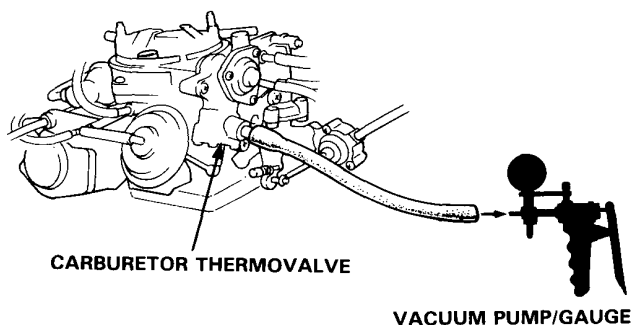
- If vacuum remains stable, diaphragm is OK.
  - If vacuum decreases, replace diaphragm and re-test.
8. Remove the vacuum pump/gauge and re-connect hose between air vent cut-off diaphragm and vacuum holding solenoid valve.

## [A20A2 KQ model]

### Carburetor thermostatic valve

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

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



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

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

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

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

2. Apply vacuum to thermostatic valve.

the valve should not hold vacuum.

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



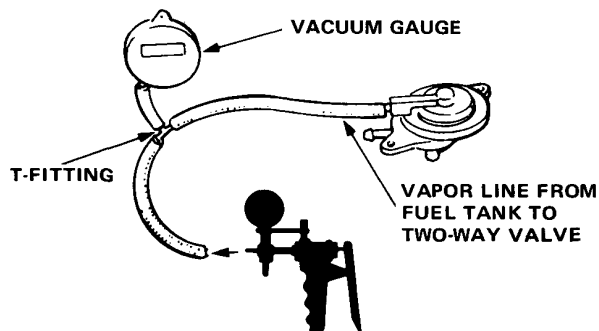


## Two-Way Valve

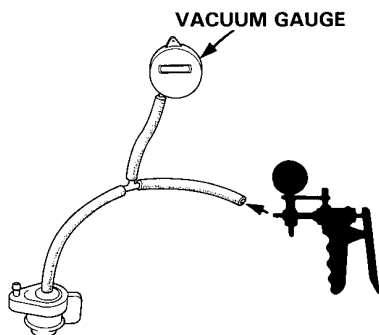
### [KY, KT, KQ model]

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]



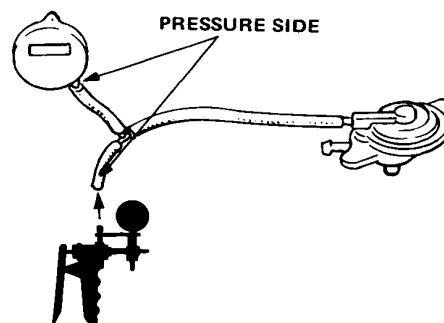
3. Slowly apply a vacuum while watching the gauge.

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

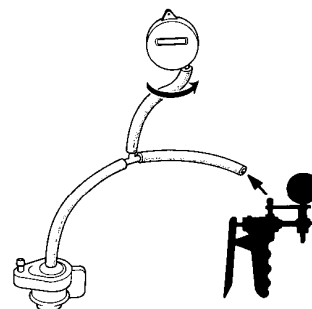
- If vacuum stabilizes momentarily (two-way valve opens) between above range, go on to step 4.
- If vacuum stabilizes (valve opens) out of above range, install new valve and re-test.

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)

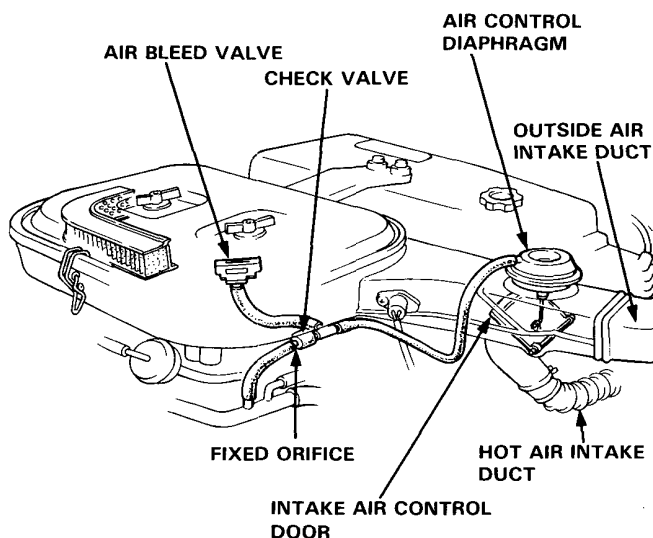
- If vacuum stabilizes momentarily (two-way valve opens) between above range, the valve is OK.
- If vacuum stabilizes (valve opens) out of above range, install new valve and re-test.



# Intake Air Control System

## Inspection

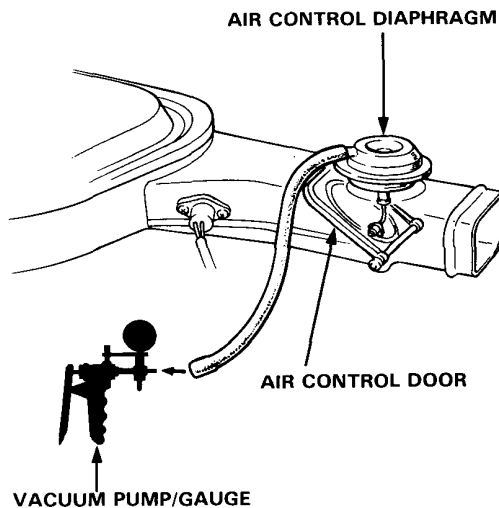
1. Disconnect the air intake duct.
2. With the engine cold, start the engine and let it run for about 5 seconds and stop. The air control door should rise on start-up and remain fully open for at least 3 seconds after stopping the engine.



- 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.



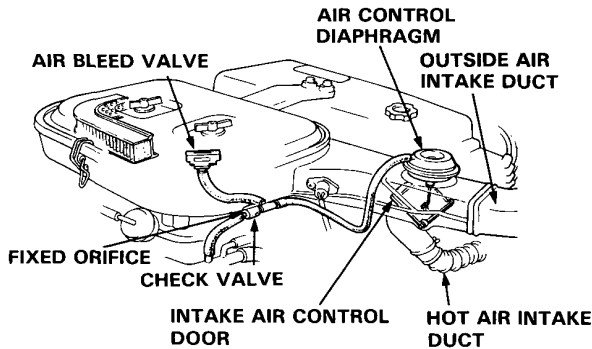
# Ignition Timing Control System



## Inspection

7. Check the control door position.

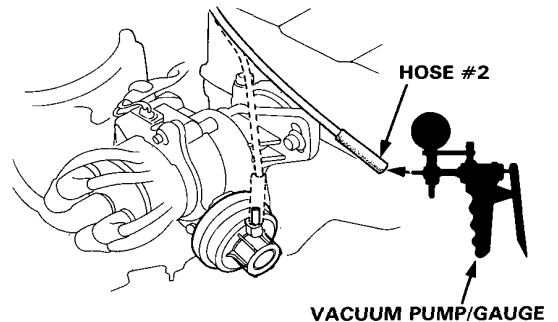
The air control door should be down.



- 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.

### [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 abnormality at test, inspect the vacuum advance diaphragm (page 24-10).

(cont'd)

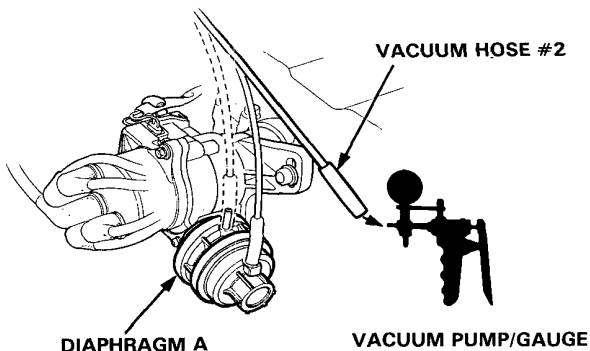


# Ignition Timing Control System

## 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.



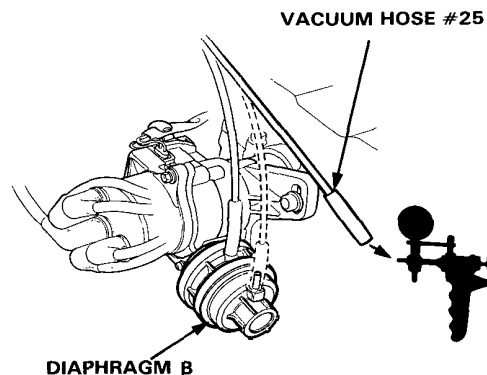
2. Start the engine, allow it to idle and check for vacuum.

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, blockage 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).



# EGR System

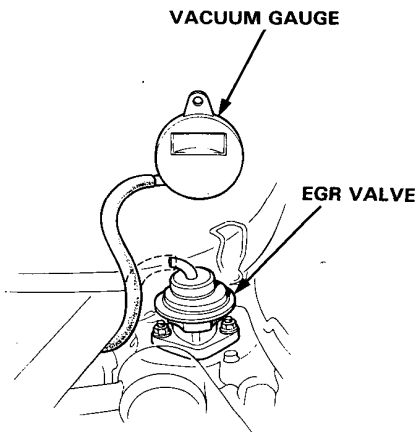


## Inspection

### [A20A2 KQ, KX model]

NOTE: The engine coolant temperature must be below the thermostatic valve 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.

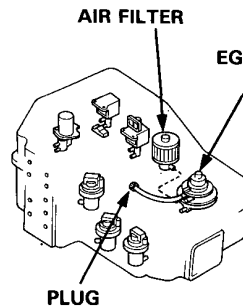
Vacuum should not be available.

- If vacuum is not available, go on to step 3.
  - If vacuum is available, replace thermostatic valve 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.

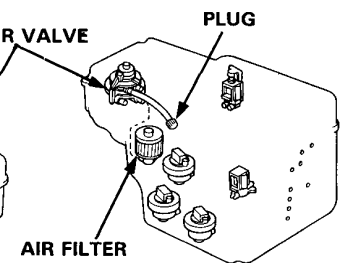
Vacuum should be as shown below:

Condition		Vacuum at EGR hose
1	Idle	No
2	3,000 min <sup>-1</sup> (rpm)	Yes, 1.5—6" Hg
3	3,000 min <sup>-1</sup> (rpm) with blocked vacuum bleed (shown next column)	Less than 1.5" 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 thermostatic valve C. If there is vacuum at the inlet but none at the outlet, replace the thermostatic valve. 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)

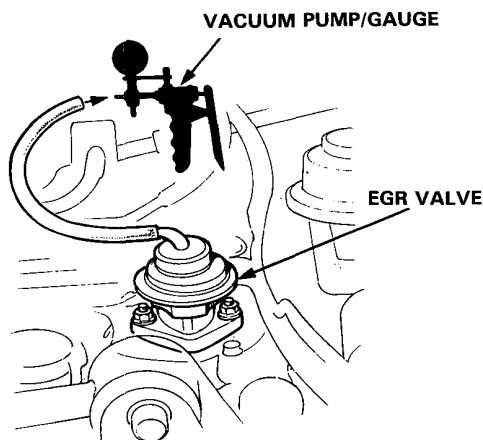


## EGR System

### 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.

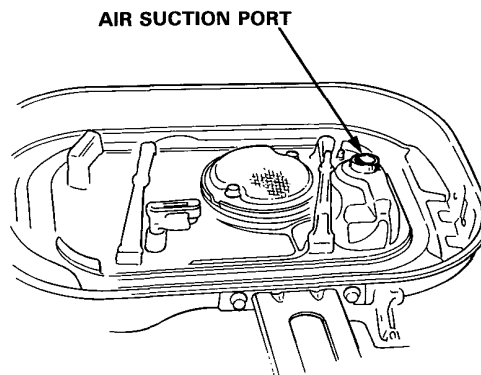
## Air Injection System

### Air Suction Valve Inspection

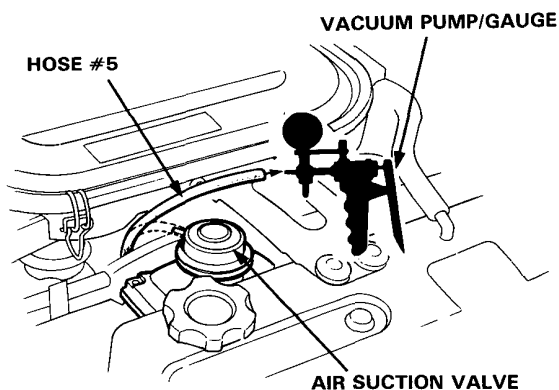
[A20A2 KQ, KX model]

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.



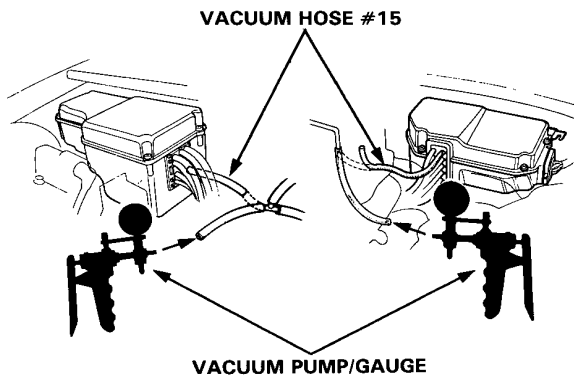


3. Disconnect hose #15 routed from the control box at the vacuum port and check for vacuum at the vacuum port (KQ model) or disconnect hose #15 routed from the control box at the three way joint and check for vacuum at the three way joint (KX model).

There should be vacuum.

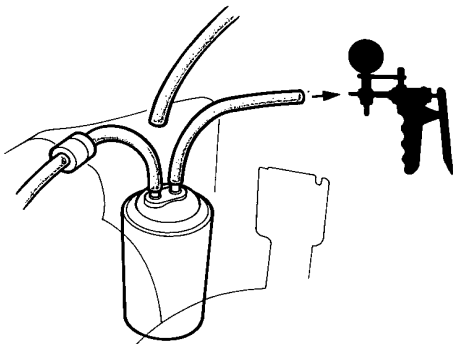
[KX model]

[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.

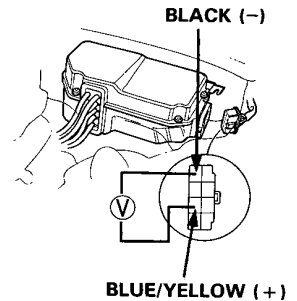
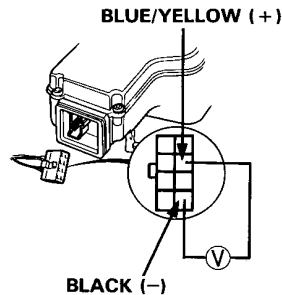


- If there is vacuum, check the vacuum line #15. If there is no problem, replace air bleed valve B and re-test.
- If there is no vacuum, check the vacuum line #24, and re-test.

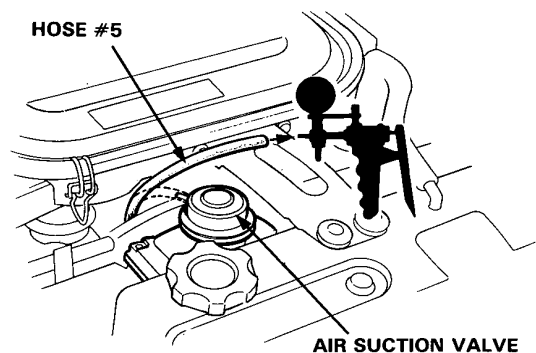
4. Check for voltage at the air suction control solenoid valve.

[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<sup>-1</sup> (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)



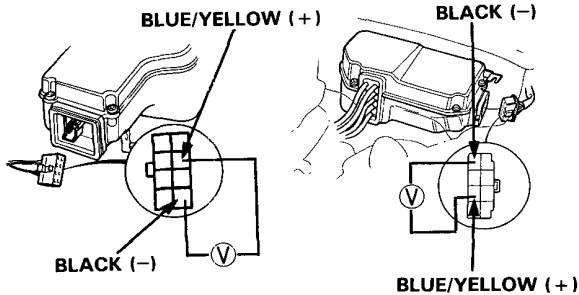
# Air Injection System

## Air Suction Valve Inspection (cont'd)

6. Check for voltage at the air suction control solenoid valve above 3,500 min<sup>-1</sup> (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.

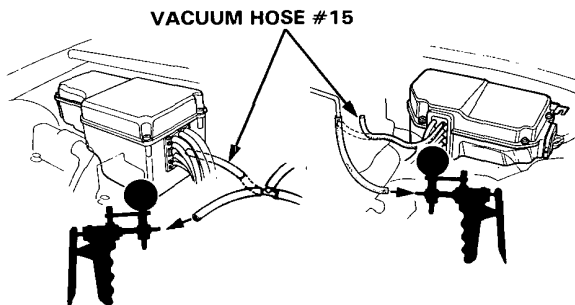
Bubbling noise should be heard.

- 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]

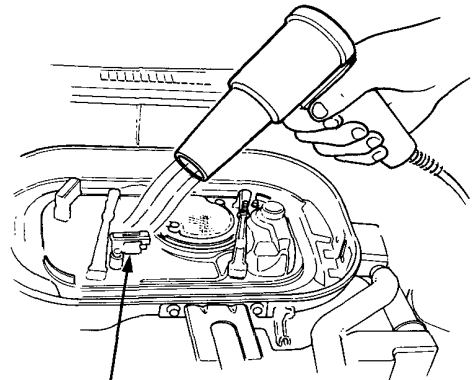
[KQ model]



- 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

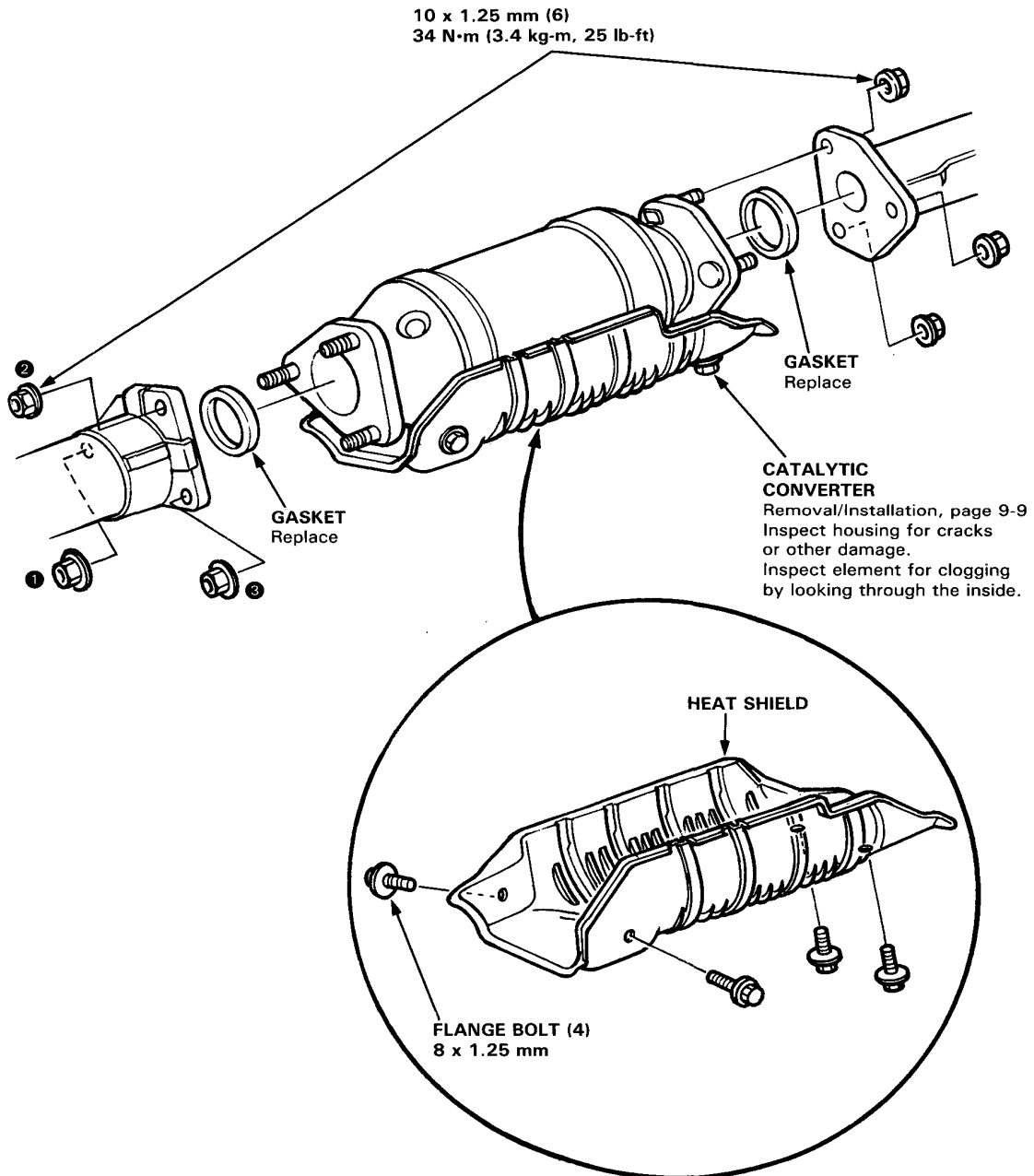


## Inspection

[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 nut in the sequence shown below.

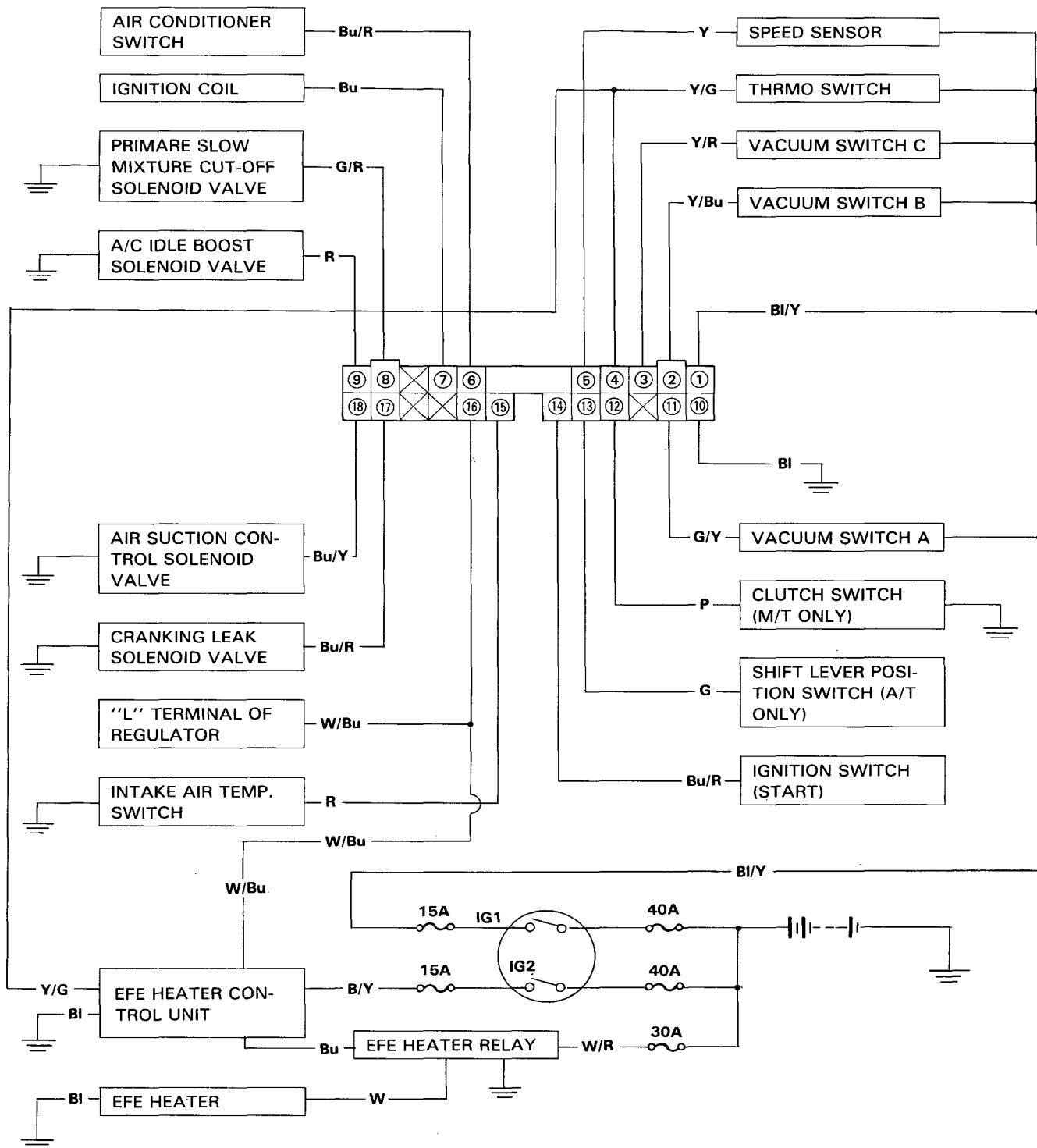




# Solenoid Valve Control Unit

## 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.

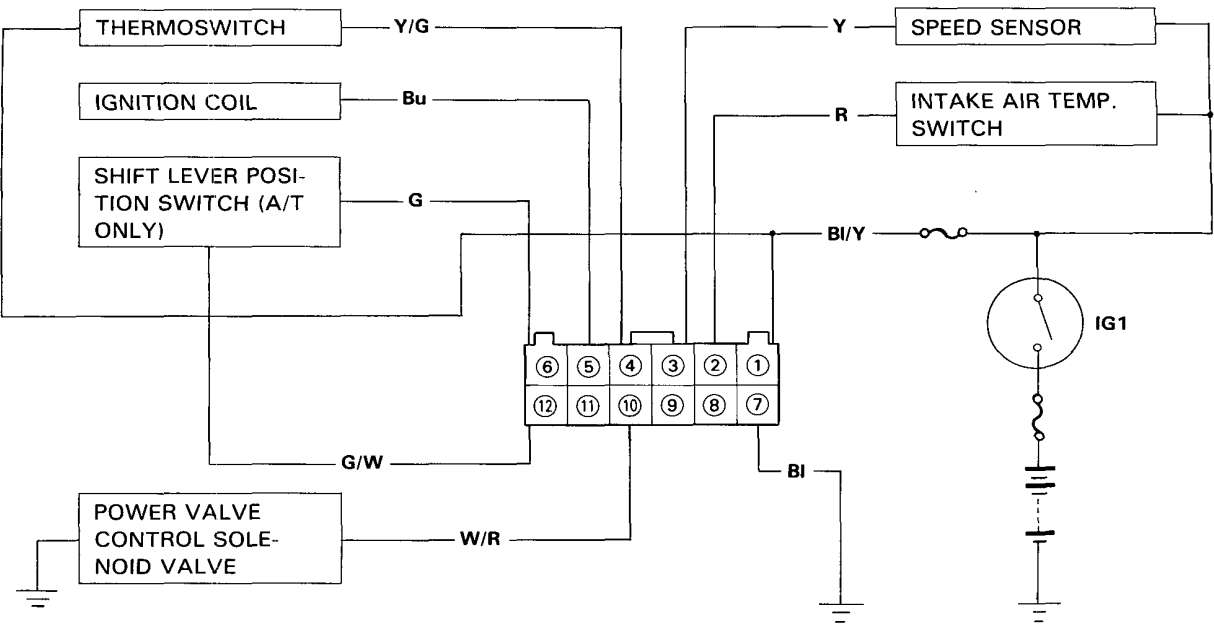
PROBLEMATIC CIRCUIT	REFER TO:		CHECK
To air suction control solenoid valve (18 Blue/Yellow)	1, 2, 4, 8, 10, 12, 13		1. Check for voltage at the control unit connector ① and ⑩ with the ignition switch on. There should be voltage. ● If no voltage, check the wiring and fuse.
To cranking leak solenoid valve (17 Blue/Red)	1, 2, 3, 5, 12, 13		2. Check the ⑩ wire for continuity between the control unit and a suitable ground. There should be continuity.
To primary slow mixture cut-off solenoid valve (8 Green/Red)	M/T	1, 2, 4, 7, 8, 9, 11, 12	3. Check for voltage at the control unit connectors ⑭ and ⑩ with the ignition switch turned to III (start). There should be voltage. ● If no voltage, check the wiring and ignition switch.
	A/T	1, 2, 4, 6, 8, 9, 11, 12	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).
To A/C idle boost solenoid valve (9 Red)	M/T	1, 2, 4, 7, 8, 11, 12, 14	5. After starting the engine, check for the voltage between ⑩ and ⑩. There should be voltage. ● If no voltage, check the wiring and the alternator (24-18).
	A/T	1, 2, 4, 6, 8, 11, 12, 14	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).



# 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 CIRCUIT	REFER TO:		CHECK
To power valve control solenoid valve (⑩ White/Red)	M/T	1, 2, 3, 5, 6, 7	<ol style="list-style-type: none"><li>1. Check for voltage at the control unit connectors or ① and ⑦ with the ignition switch on. There should be voltage.<ul style="list-style-type: none"><li>● If no voltage, check the wiring and fuse.</li></ul></li><li>2. Check the ⑦ wire for continuity between the control unit connector and a suitable ground. There should be continuity.</li><li>3. Check for voltage at the control unit connectors ⑤ and ⑦ with ignition switch ON. There should be voltage.<ul style="list-style-type: none"><li>● If no voltage, check the wiring and ignition coil (24-7).</li></ul></li><li>4. Check there is continuity between ⑥ and ⑦, and between ⑫ and ⑦ with the shift lever set to N or P.<ul style="list-style-type: none"><li>● If not, check the wirings and shift lever position switch (25-70).</li></ul></li><li>5. inspect the speed sensor (11-71).</li><li>6. Inspect the thermoswitch (11-71).</li><li>7. Inspect the intake air temperature switch (11-72).</li></ol>
	A/T	1, 2, 3, 4, 5, 6, 7	





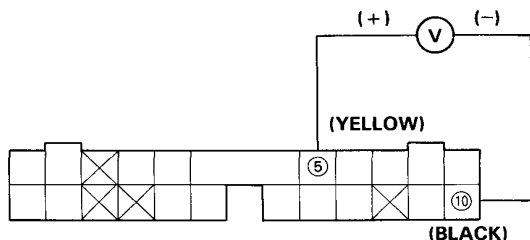
## Speed Sensor

[A20A2 KQ, KX, KS model]

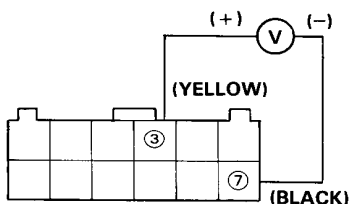
**WARNING** Block rear wheels before jacking up front of car.

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).

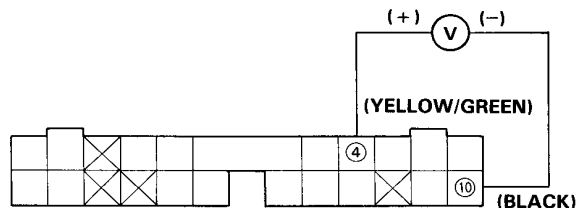
- If there is voltage above approximately 32 km/h (20 mph), and there is no voltage below 16 km/h (10 mph), speed sensor is OK. Go on to step 5.
  - If voltmeter readings do not correspond to above km/h (mph) ranges, install a new speed sensor and re-test.
  - If there is no voltage during speed sensor 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

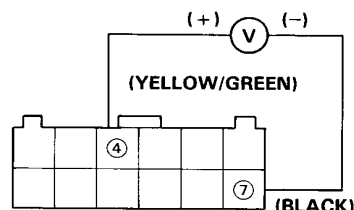
[A20A2 KQ, KX, KS model]

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.



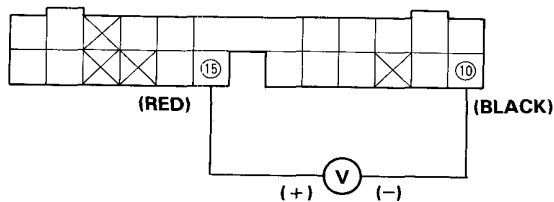
# Solenoid Valve Control Unit

## Intake Air Temperature Switch

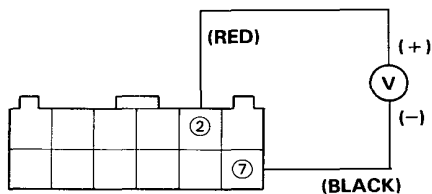
[A20A2, KQ, KX, KS model]

1. Attach the voltmeter probes to the control unit connector as shown.

[KQ, KX model]



[KS model]

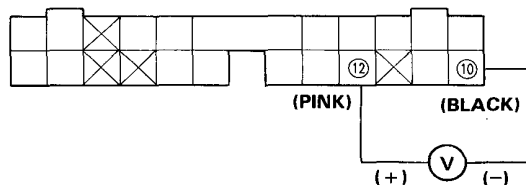


2. Measure the voltage with the ignition switch on. Voltage should be available with the intake air temperature below 15°C (59°F) and should not be available with the intake air temperature above 21°C (70°F).
- If not, check the wiring, replace the intake air temperature switch, and re-test.

## 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 Switches

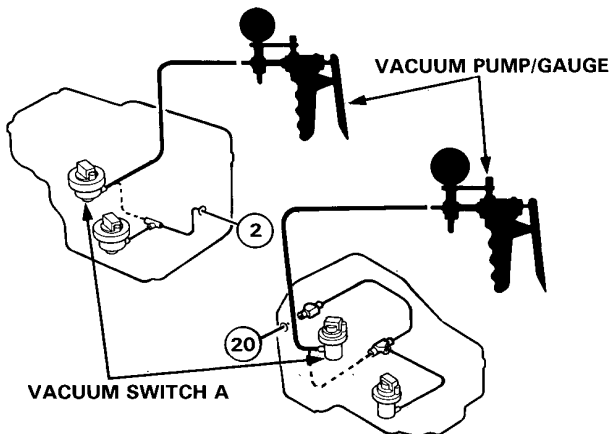
### [A20A2 KQ, KX model]

#### Vacuum Switch A

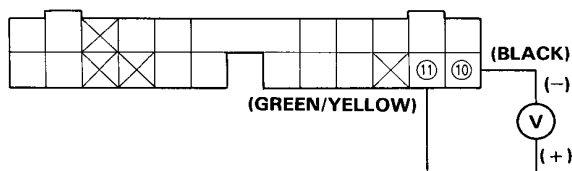
1. Remove the control box from the fire wall by removing the two bolts, then remove the control box cover by removing the four screws.
2. Disconnect the hose to vacuum switch A and connect a vacuum pump to vacuum switch A.

[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.

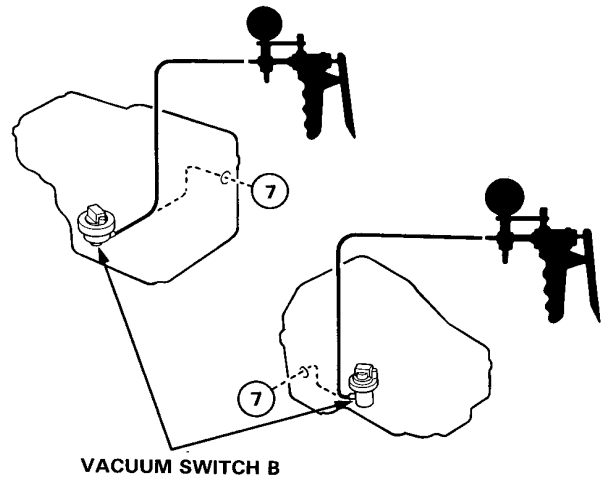
There should be no voltage when vacuum above 100 mmHg (3.9 in.Hg) is applied, and voltage should be available when vacuum is released.

#### Vacuum Switch B

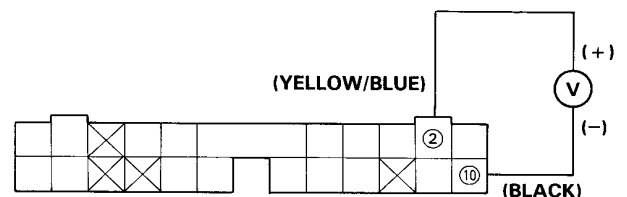
1. Remove the control box from the fire wall by removing the two bolts, then remove the control box cover by removing the four screws.
2. Disconnect the hose to vacuum switch B and connect a vacuum pump to vacuum switch B.

[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

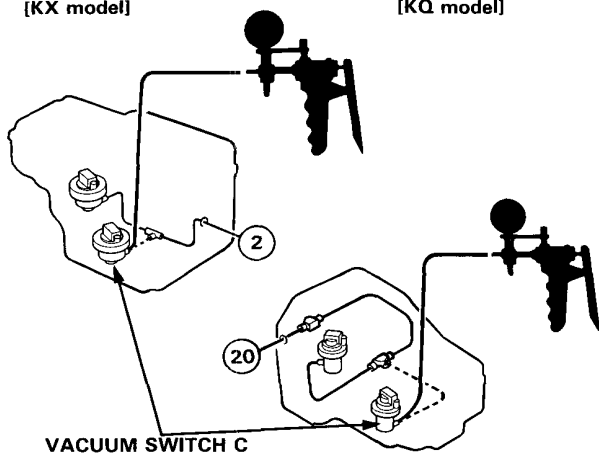
## Vacuum Switchs (cont'd)

### Vacuum Switch C

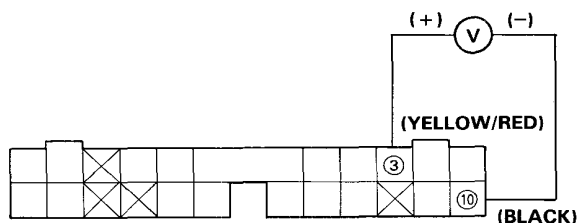
1. Remove the control box from the fire wall by removing the two bolts, then remove the control box cover by removing the four screws.
2. Disconnect the hose to vacuum switch and connect a vacuum pump to vacuum switch.

[KX model]

[KQ model]



3. Attach the positive probe of a voltmeter or test light to ③ terminal (Yellow/Red), and the negative probe to ⑩ terminal (Black) of the control unit connector.

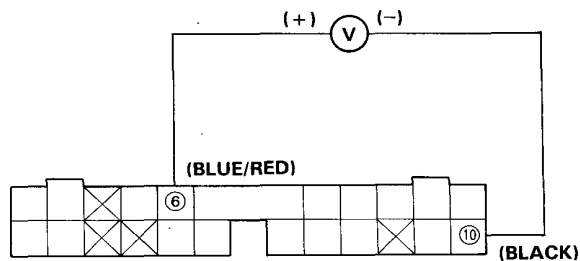


4. Turn the ignition switch on and check for voltage. Voltage should be available when vacuum above 330 mmHg (13 in.Hg) is applied, and there should be no voltage when vacuum is released.

## Air Conditioner Switch Signal

[A20A2 KQ, KX model]

1. Attach the positive probe of a voltmeter or test light to ⑥ terminal (Blue/Red), and negative probe to ⑩ terminal (Black) of control unit connector.

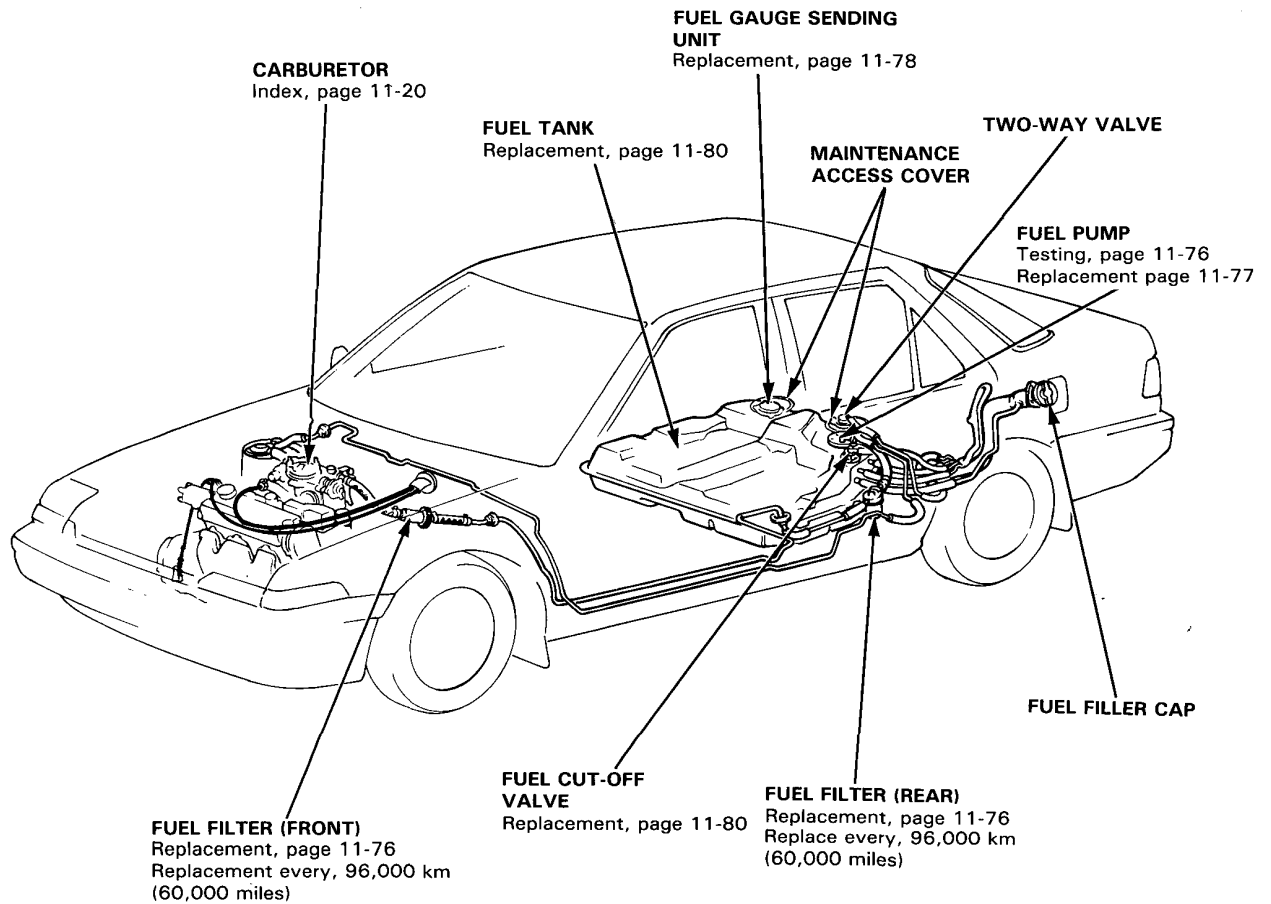


2. Start the engine and make sure that the compressor and cooling fan operate with the blower and A/C switch on. Check the voltage.

There should be no voltage.

- If there is voltage, check the wiring and air conditioner circuit.







# Fuel Filters

## Replacement

Replace both front and rear filters in every 40,000 km (24,000 miles).

### WARNING

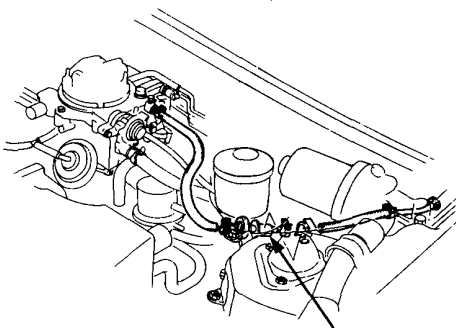
- Do not smoke while working on the fuel system. Keep open flame away from work area.
- Block front wheels before jacking up rear of car.

#### 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.



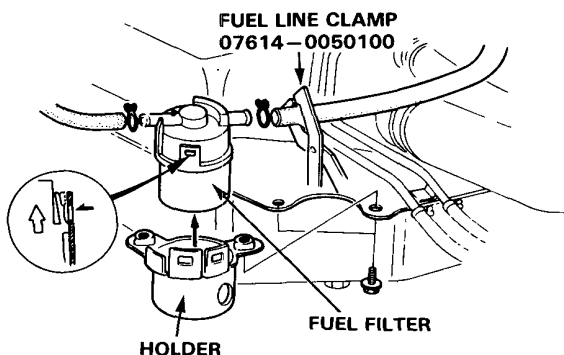
FUEL FILTER

#### 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

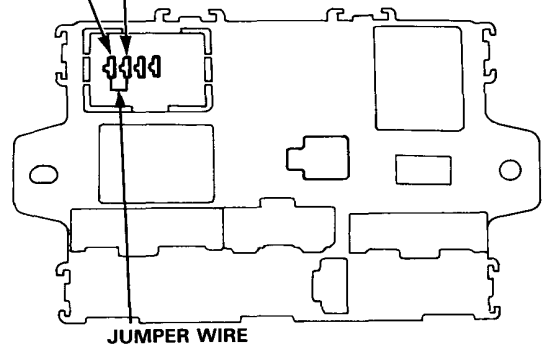
## Testing

**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.

#### 1ST TERMINAL

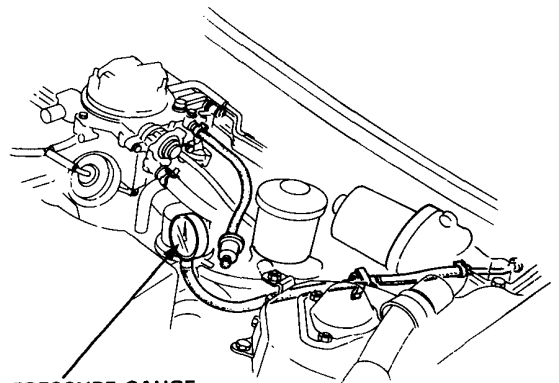
#### 2ND TERMINAL



### 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.



PRESSURE GAUGE  
07406-0040000

4. Turn ignition ON until pressure stabilizes, then turn key off.

Pressure should be 17.7–22.6 kPa (0.18–0.27 kg/cm<sup>2</sup>, 2.6–3.3 psi)

- If gauge shows at least 17.7 kPa (0.18 kg/cm<sup>2</sup>, 2.6 psi), go on to step 4.
- If gauge shows less than 17.7 kPa (0.18 kg/cm<sup>2</sup>, 2.6 psi), replace pump and re-test.



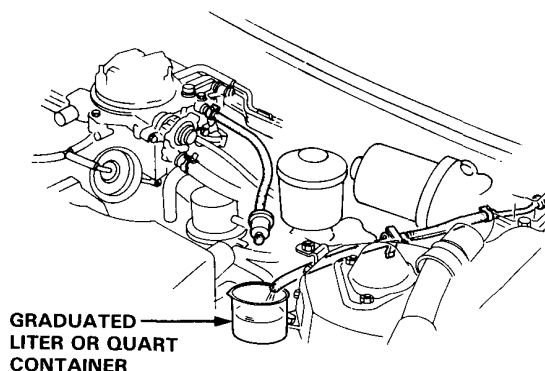


5. Remove pressure gauge and hold a graduated container under the hose.
6. Turn ignition ON for 60 seconds, then turn it OFF and measure amount of fuel flow.

**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

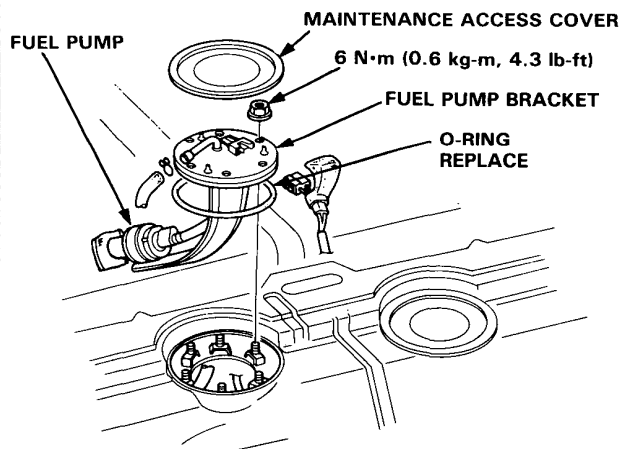
**WARNING** Do not smoke while working on fuel system. Keep open flames away from your work area.

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.

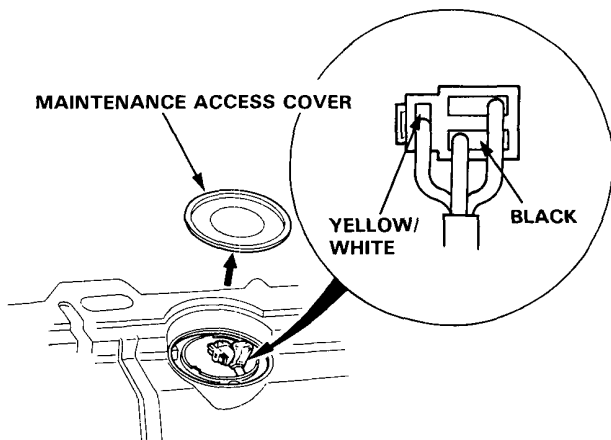




# Fuel Gauge

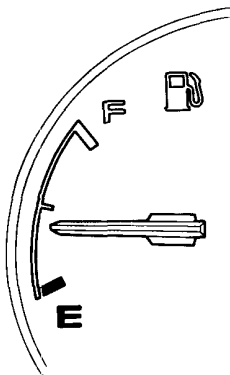
## Testing

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.

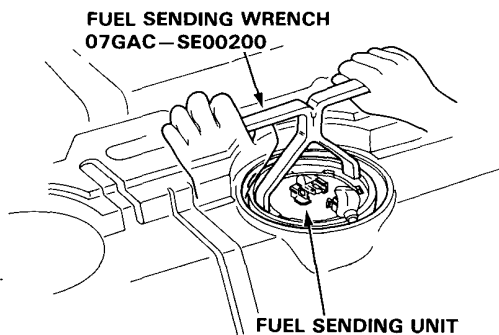


- If the pointer of the fuel gauge does not swing at all, check the fuse, wire harness and coupler. Replace the fuel gauge if they are normal.
- Inspect the fuel gauge sending unit if the fuel gauge is OK.

# Fuel Gauge Sending Unit

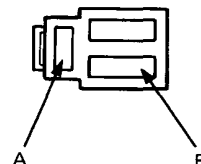
## Testing/Replacement

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.

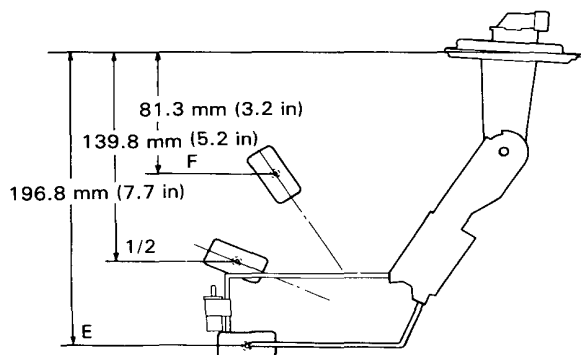


4. Measure the resistance between A and B terminals at E (EMPTY), 1/2 (HALF FULL) and F (FULL) by moving the float.

[Except KY (EXR) model]



Float Position	E	1/2	F
Resistance ( $\Omega$ )	105-110	25.5-39.5	2-5

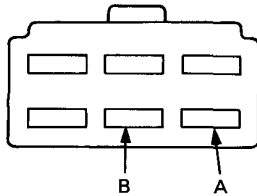




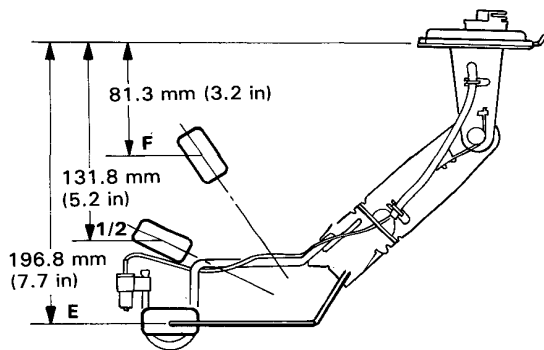
# Low Fuel Warning Light



[KY (EXR) model]



Float Position	E	1/2	F
Resistance ( $\Omega$ )	233—247	121—103	8—18



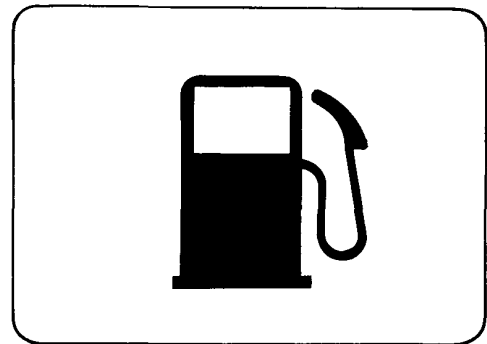
- If unable to obtain the above readings, replace the fuel unit with a new one.

## Testing

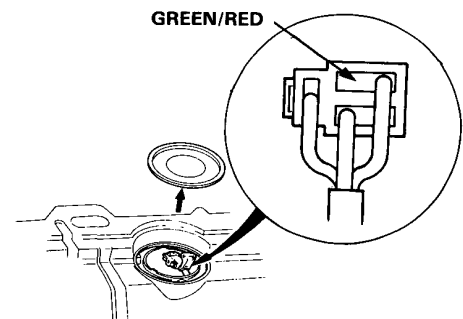
1. Park car on level ground.

**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  $\ell$  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  $\ell$ ). 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 come 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

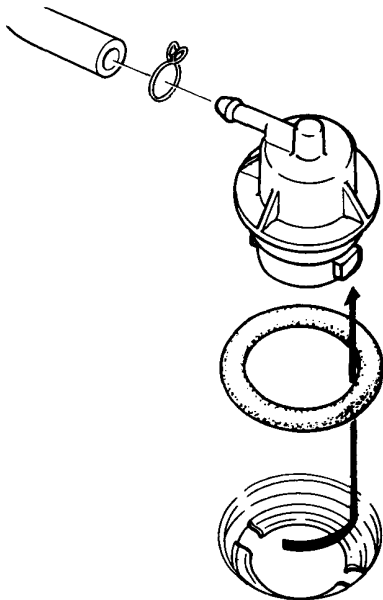
### WARNING

- Do not smoke while working on the fuel system.  
Keep open flame away from work area.
- Block front wheels before jacking 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.

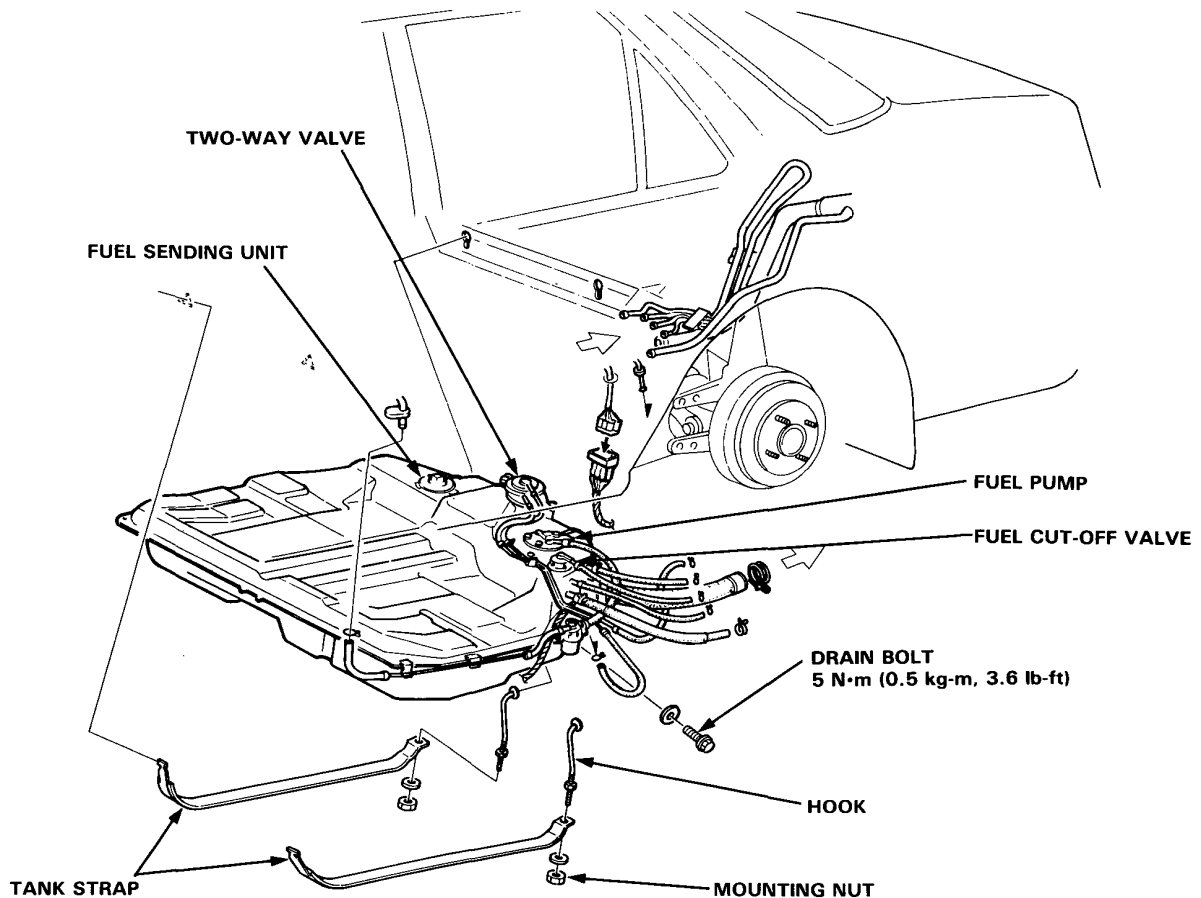
1. Raise the rear of the car and place jackstands in the proper locations.
2. Remove the drain bolt and drain the fuel into an approved container.
3. Disconnect the fuel gauge sending unit connectors.
4. Disconnect the hoses.

**CAUTION:** When disconnecting the hoses, slide back the clamps, then twist hoses as you pull, to avoid 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 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)

Index .....	12-2
Throttle Cable .....	12-6
Vacuum and Electrical Connections ....	12-7
Interconnect Diagram .....	12-8
Troubleshooting	
PGM-FI System .....	12-14
Idle Control System .....	12-28
Sensors/Solenoid Valves .....	12-34
Throttle Body .....	12-41
Idle Speed .....	12-42
Fuel System Testing/Replacement .....	12-45
Emission Controls .....	12-55

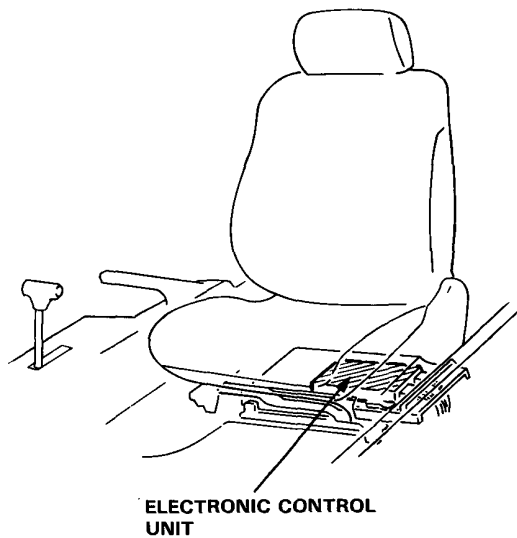
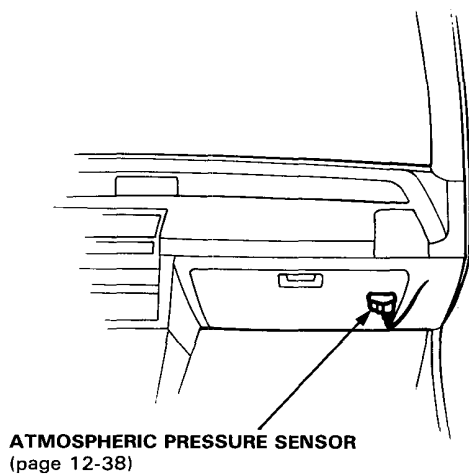
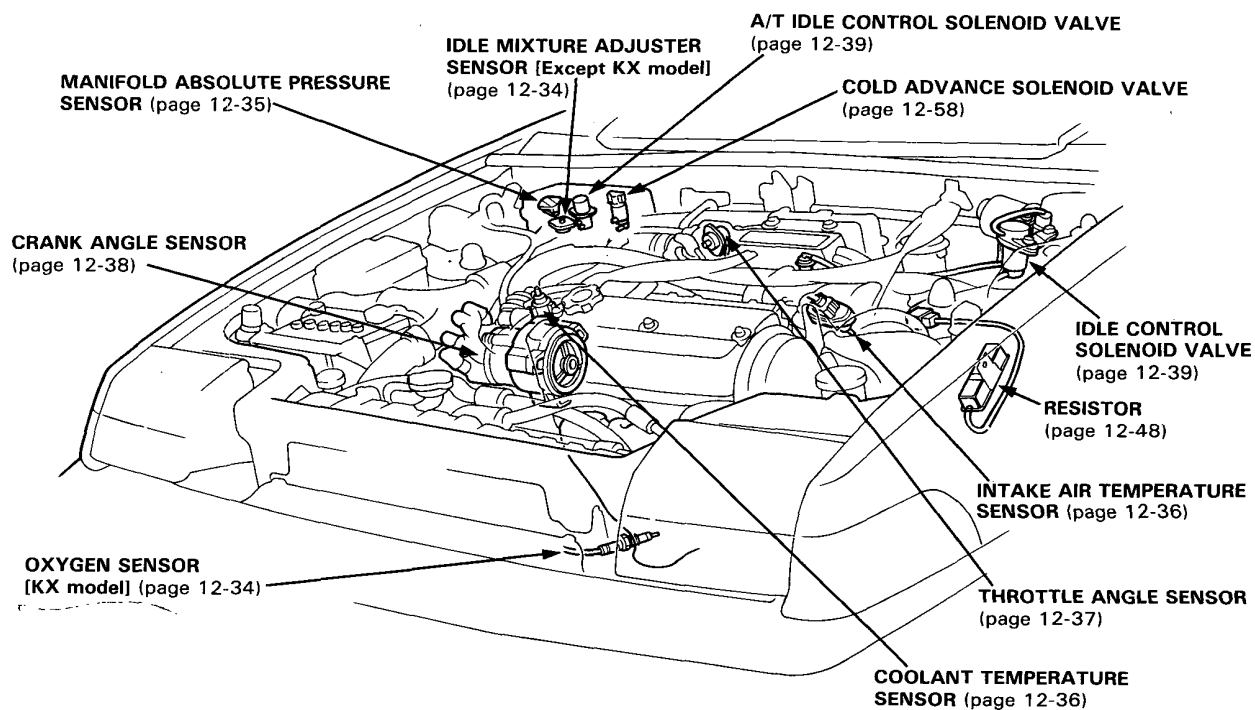


NOTE: Fuel Gauge Sending Unit, Fuel Tank and Catalytic Converter for the Fuel-Injected model are the same as for the carbureted model (page 11-78, 11-81 and 11-67).



# Index

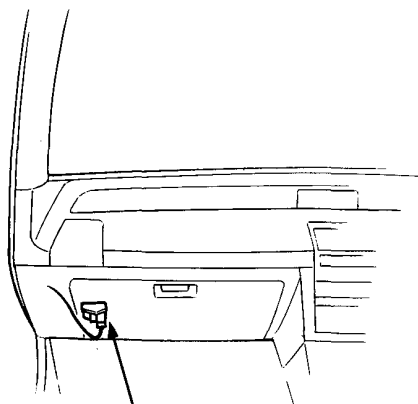
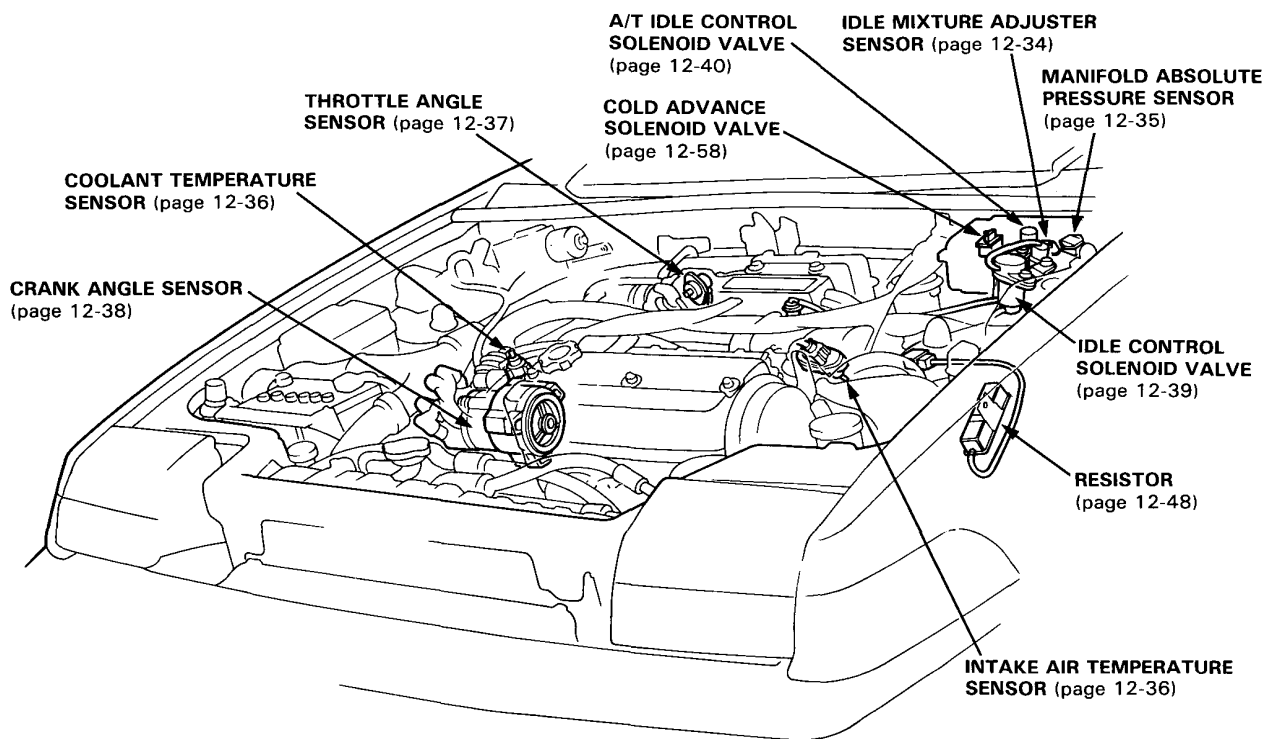
[Except KE model]



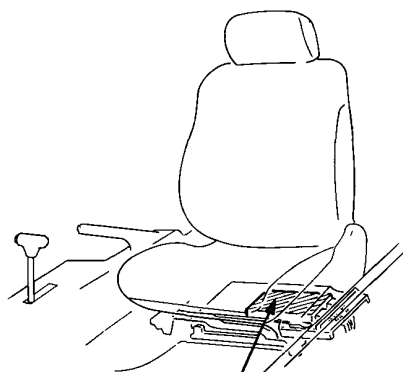




[KE model]

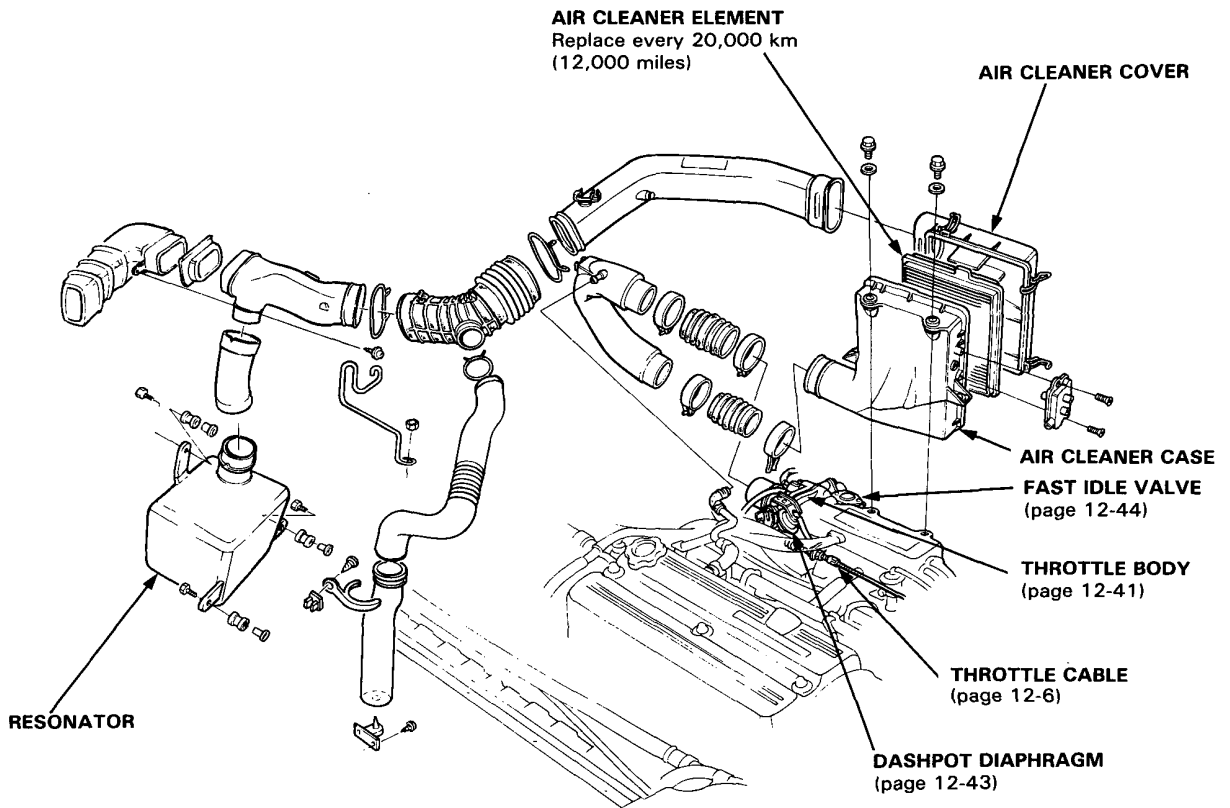


**ATMOSPHERIC PRESSURE SENSOR**  
(page 12-38)



**ELECTRONIC CONTROL UNIT**

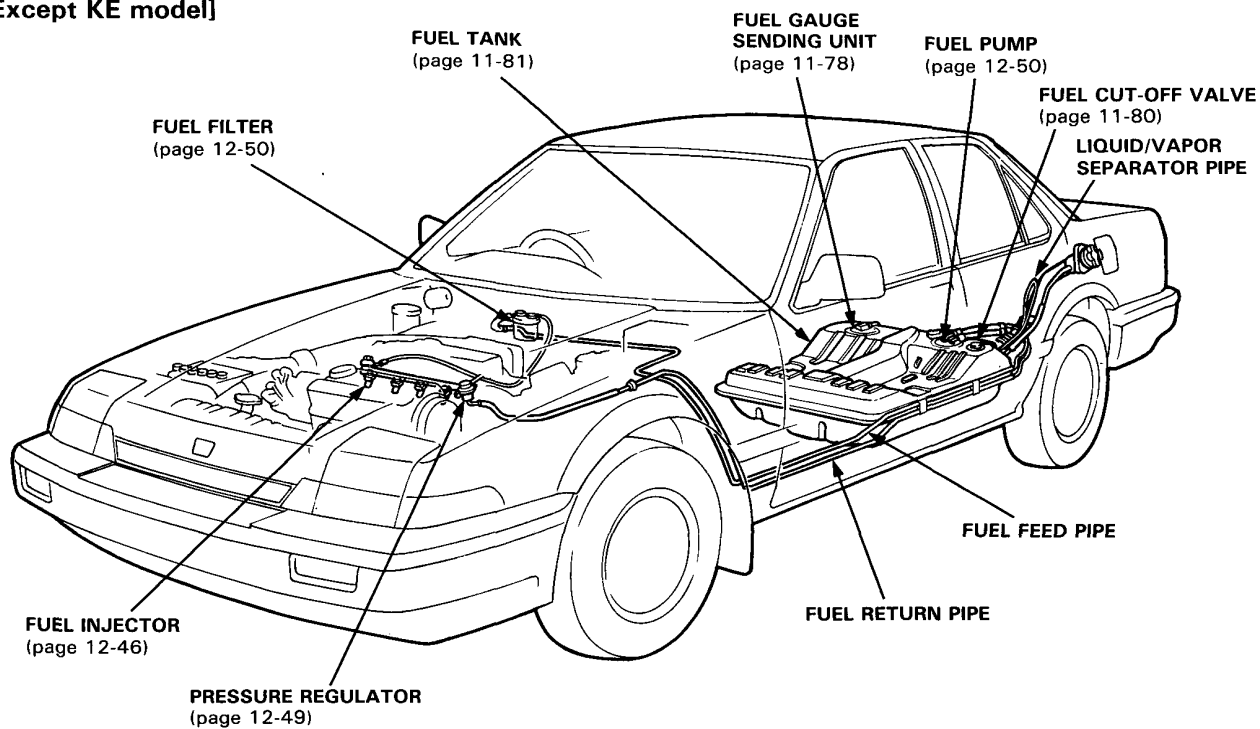




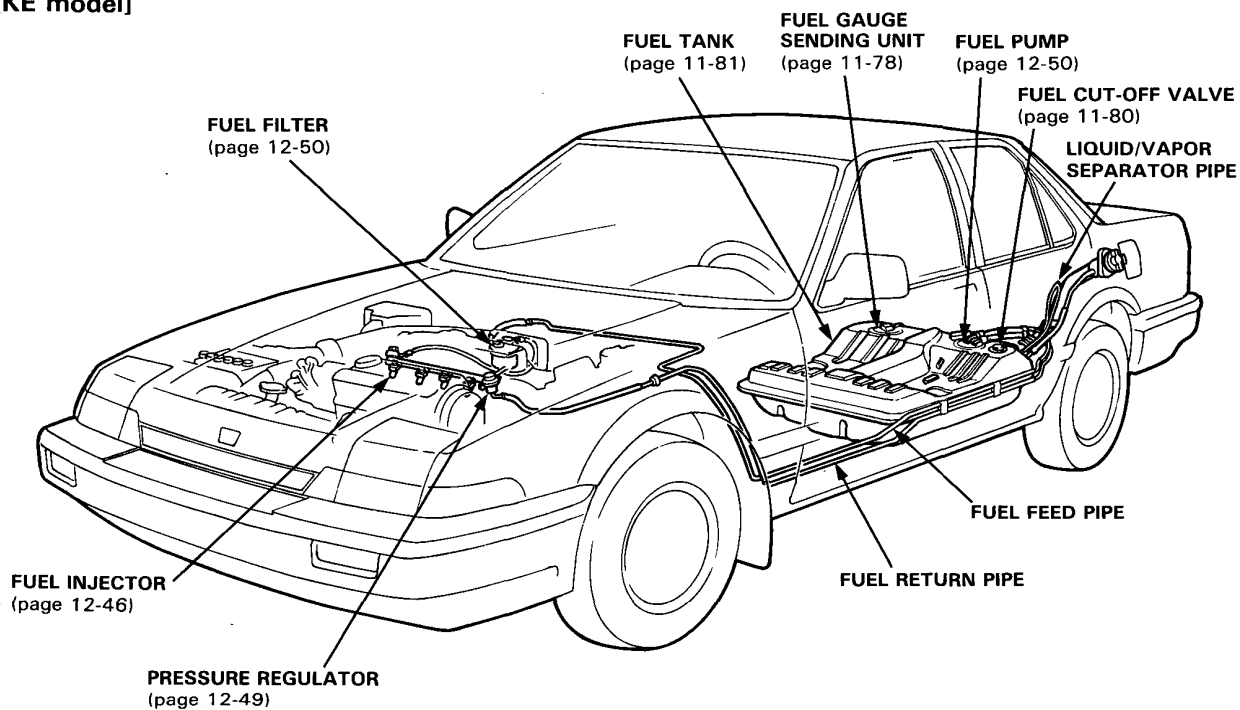




**[Except KE model]**



**[KE model]**

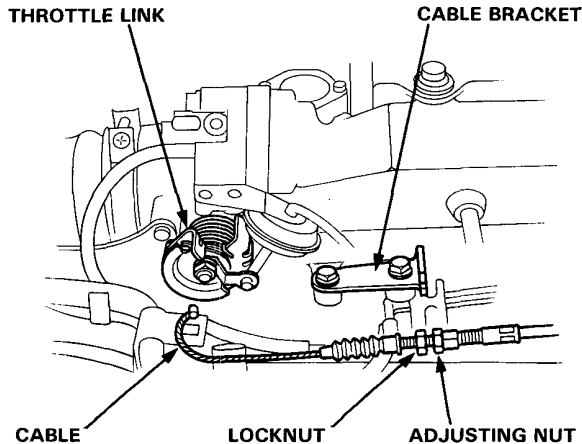




# Throttle Cable

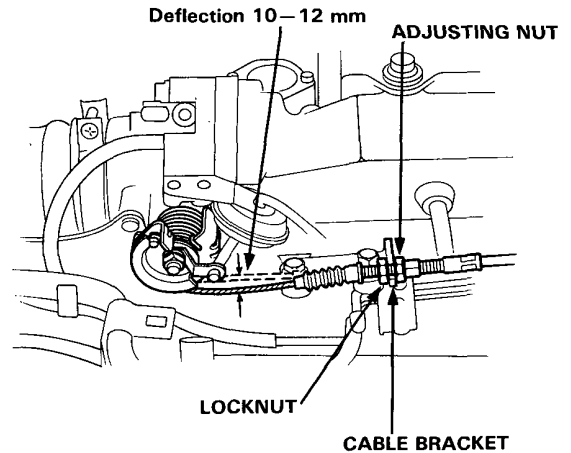
## Replacement

1. Loosen the locknut and remove the throttle cable from the cable bracket.
2. Remove the cable from the throttle linkage.



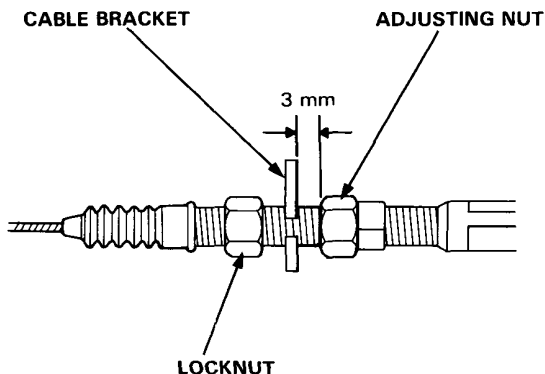
## Inspection/Adjustment

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.)



## Installation

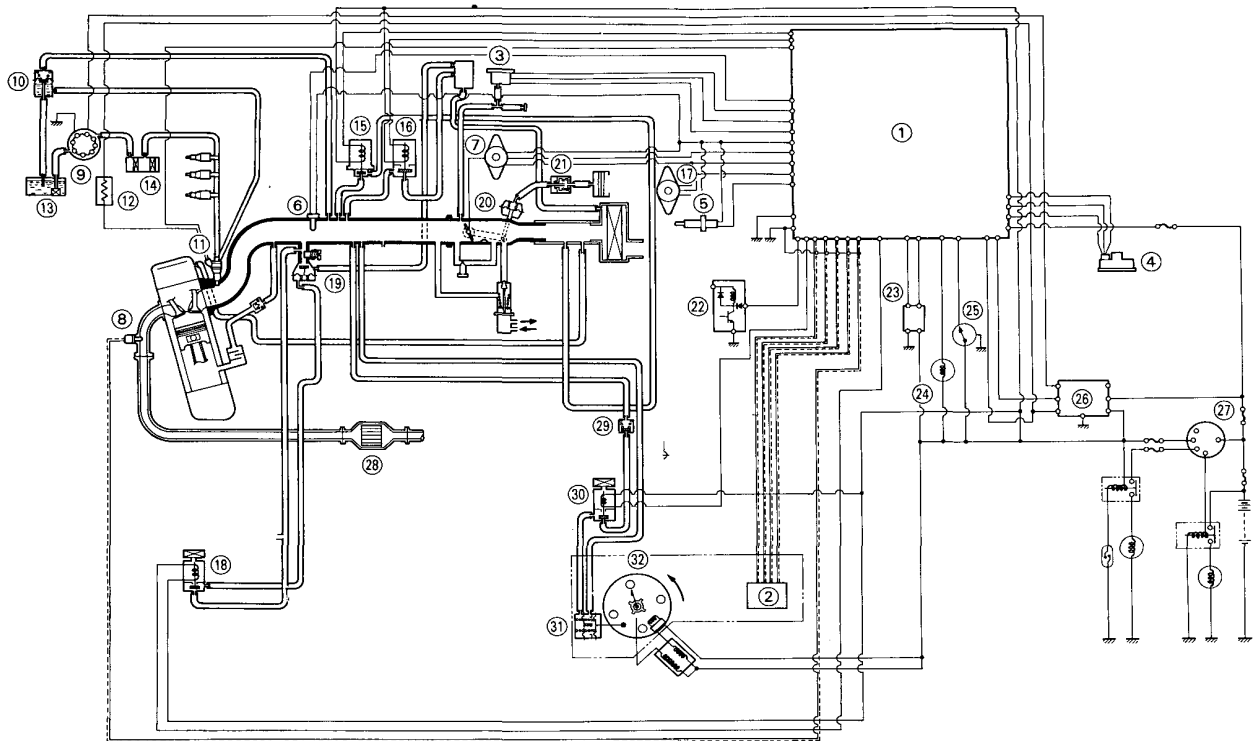
1. Hold the cable sheath, removing all slack from the cable.
2. Turn the adjusting nut until it is 3 mm away from the cable bracket.
3. Tighten the locknut. The cable deflection should now be 10–12 mm (0.39–0.47 in.) If not, see Inspection/ Adjustment.



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.



# Vacuum and Electrical Connections



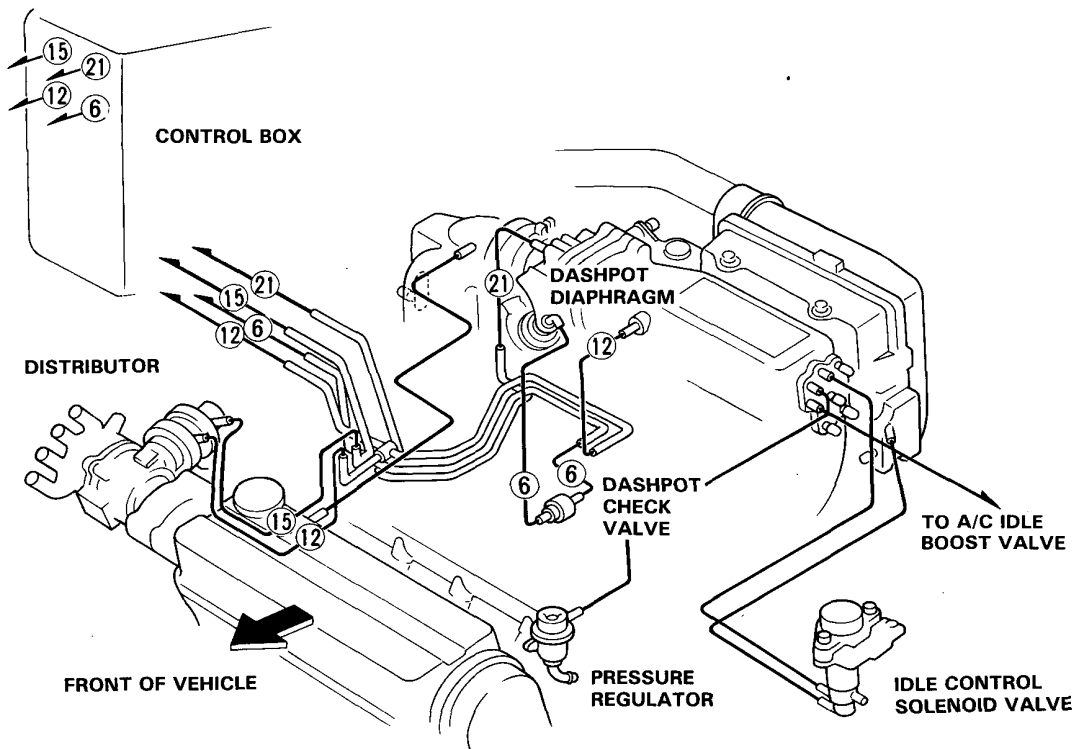
- |                                     |   |
|-------------------------------------|---|
| ① ELECTRONIC CONTROL UNIT (ECU)     | ①⑦ IDLE MIXTURE ADJUSTER SENSOR (Except KX Model) |
| ② CRANK ANGLE SENSOR                | ①⑧ A/C IDLE BOOST SOLENOID VALVE                  |
| ③ MANIFOLD ABSOLUTE PRESSURE SENSOR | ①⑨ A/C IDLE BOOST VALVE                           |
| ④ ATMOSPHERIC PRESSURE SENSOR       | ②⑦ DASHPOT DIAPHRAGM                              |
| ⑤ COOLANT TEMPERATURE SENSOR        | ②① DASHPOT CHECK VALVE                            |
| ⑥ INTAKE AIR TEMPERATURE SENSOR     | ②② ALTERNATOR                                     |
| ⑦ THROTTLE ANGLE SENSOR             | ②③ A/T SHIFT POSITION SWITCH                      |
| ⑧ OXYGEN SENSOR (KX Model)          | ②④ PGM-FI WARNING LIGHT                           |
| ⑨ FUEL PUMP                         | ②⑤ SPEED SENSOR                                   |
| ⑩ PRESSURE REGULATOR                | ②⑥ MAIN RELAY                                     |
| ⑪ INJECTOR                          | ②⑦ IGNITION SWITCH                                |
| ⑫ RESISTOR                          | ②⑧ CATALYTIC CONVERTER (KX model)                 |
| ⑬ FUEL TANK                         | ②⑨ CHECK VALVE (KX model)                         |
| ⑭ FUEL FILTER                       | ③① COLD ADVANCE SOLENOID VALVE                    |
| ⑮ A/T IDLE CONTROL SOLENOID VALVE   | ③② VACUUM ADVANCE DIAPHRAGM                       |
| ⑯ IDLE CONTROL SOLENOID VALVE       | ③③ DISTRIBUTOR                                    |



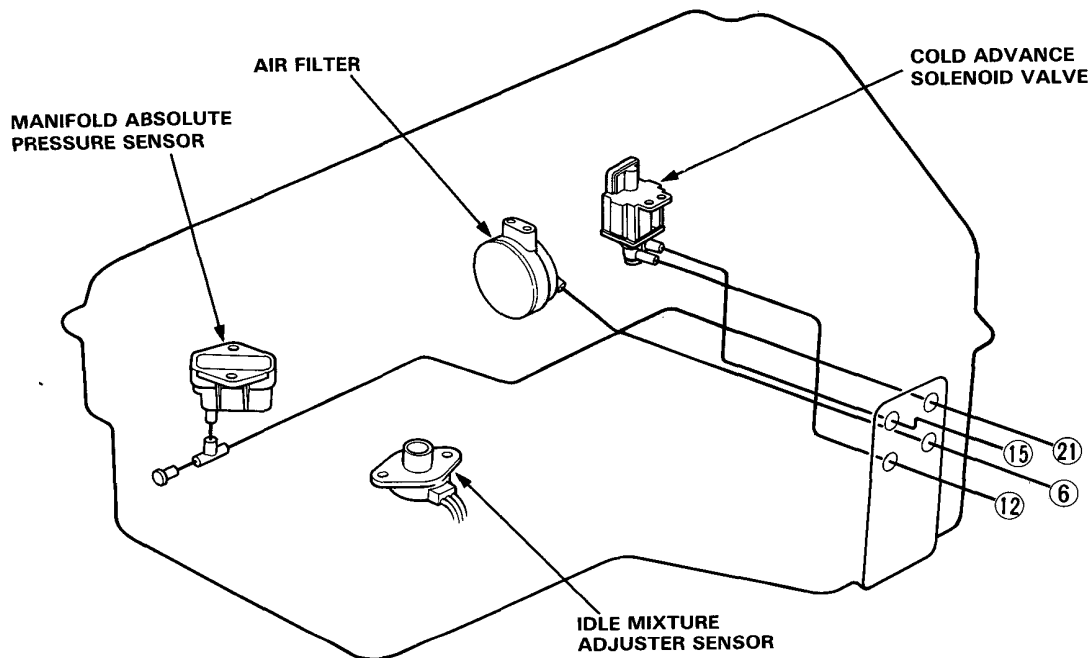
# Interconnect Diagram

[Except KE and KX model]

[M/T]



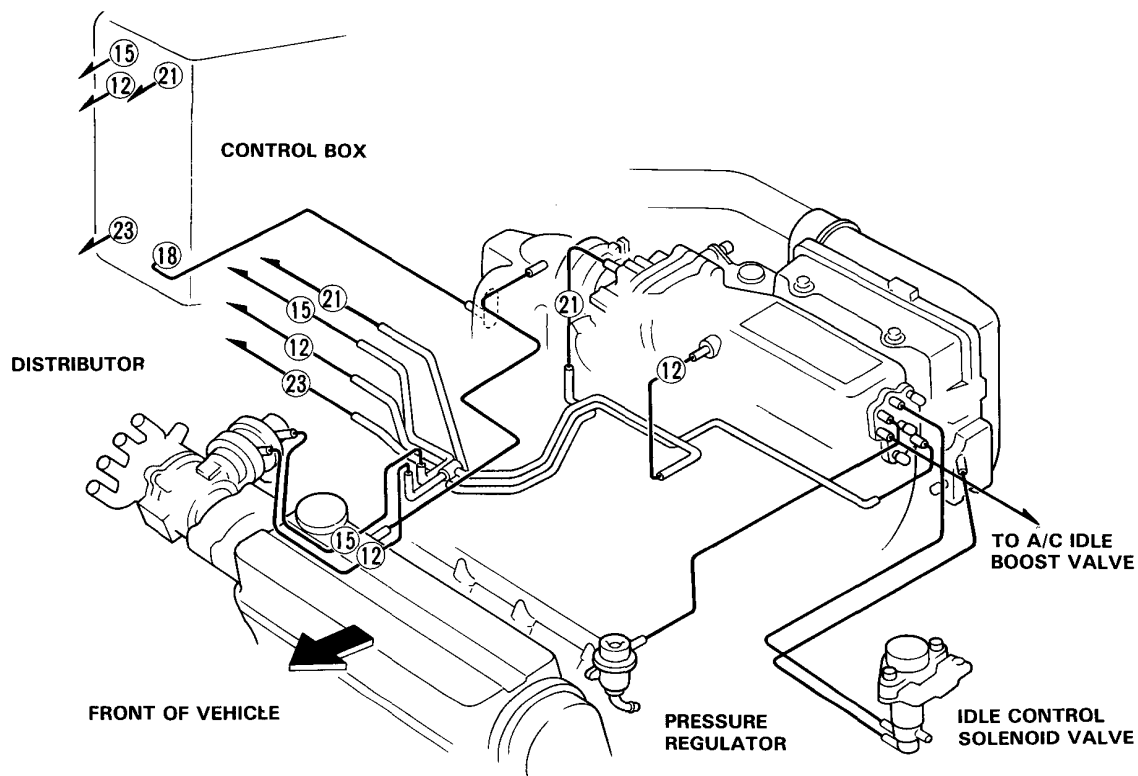
## Control Box



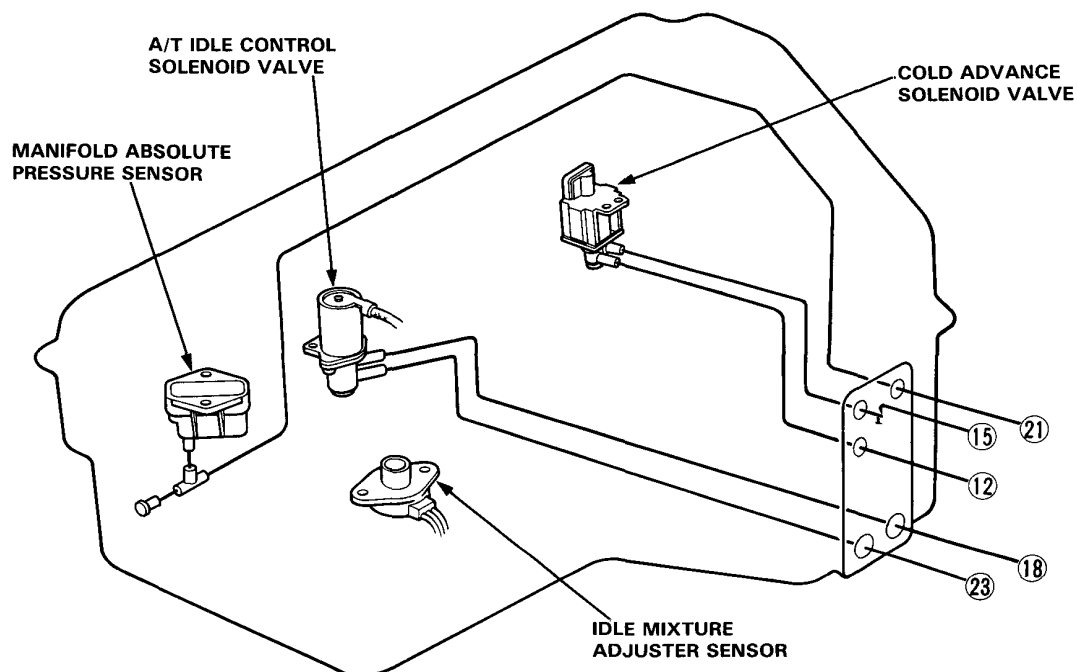




[A/T]



### Control Box

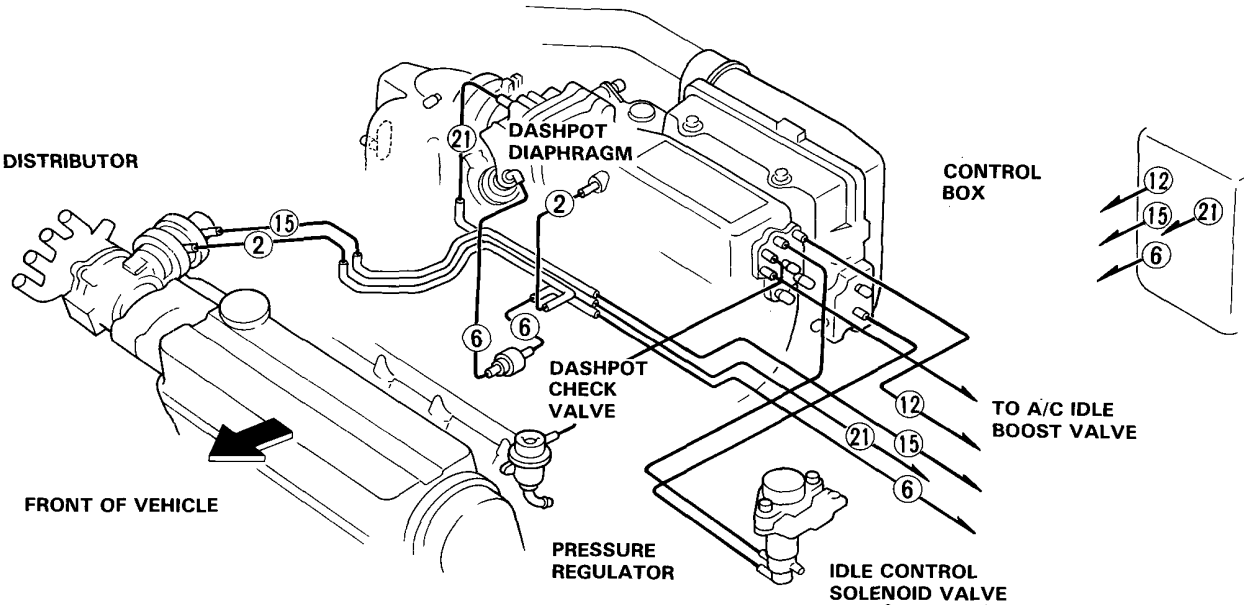




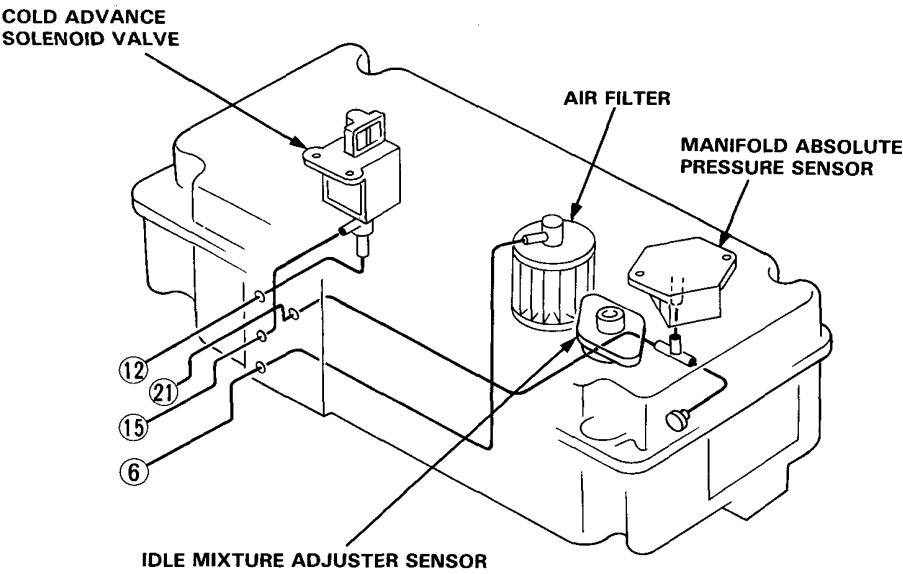
# Interconnect Diagram

[KE model]

[M/T]



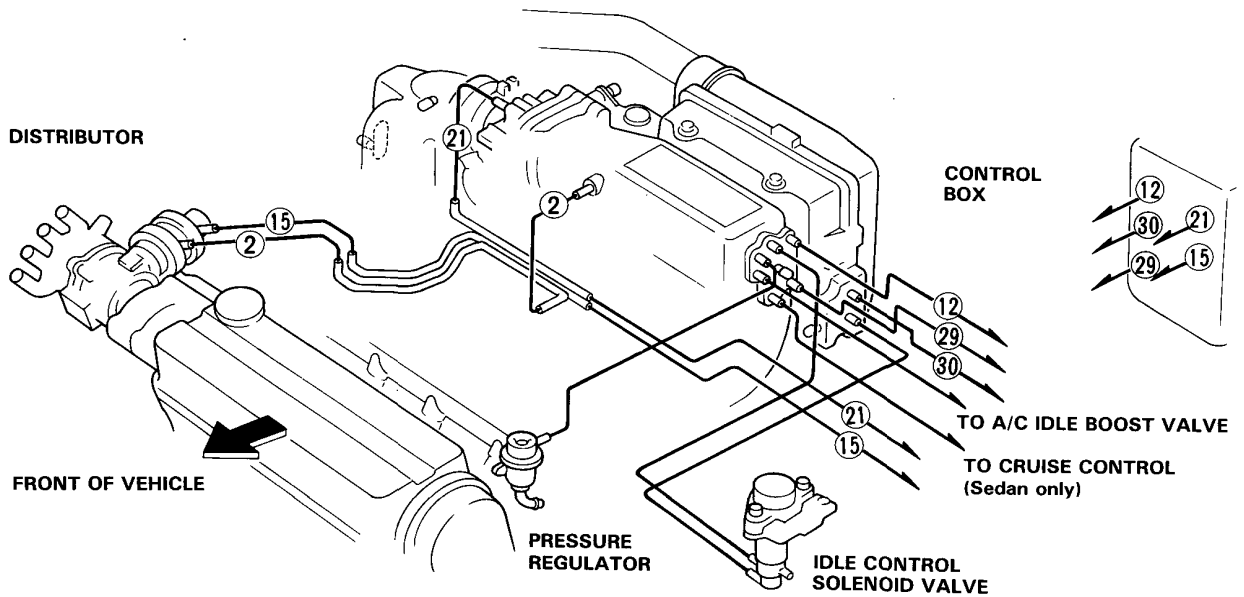
## Control Box



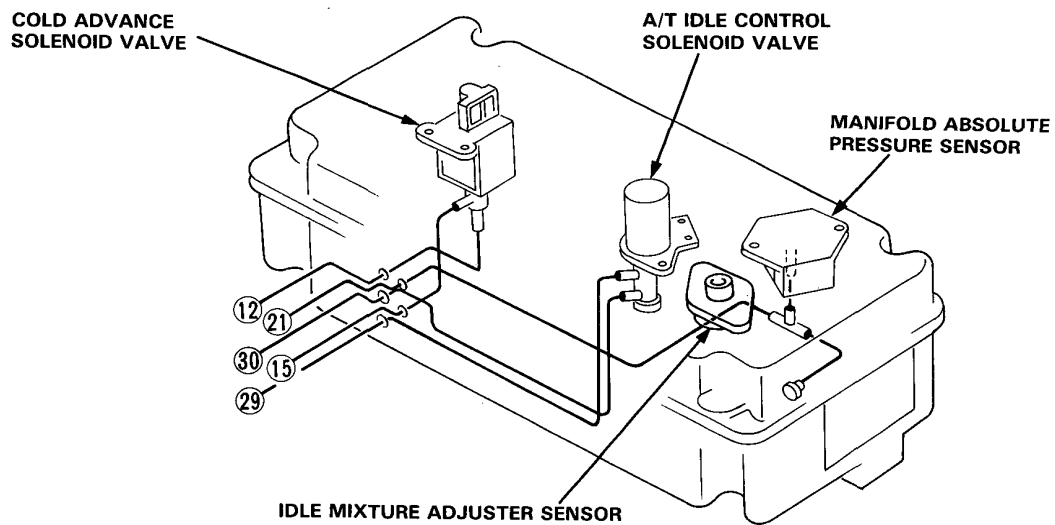




[A/T]



### Control Box

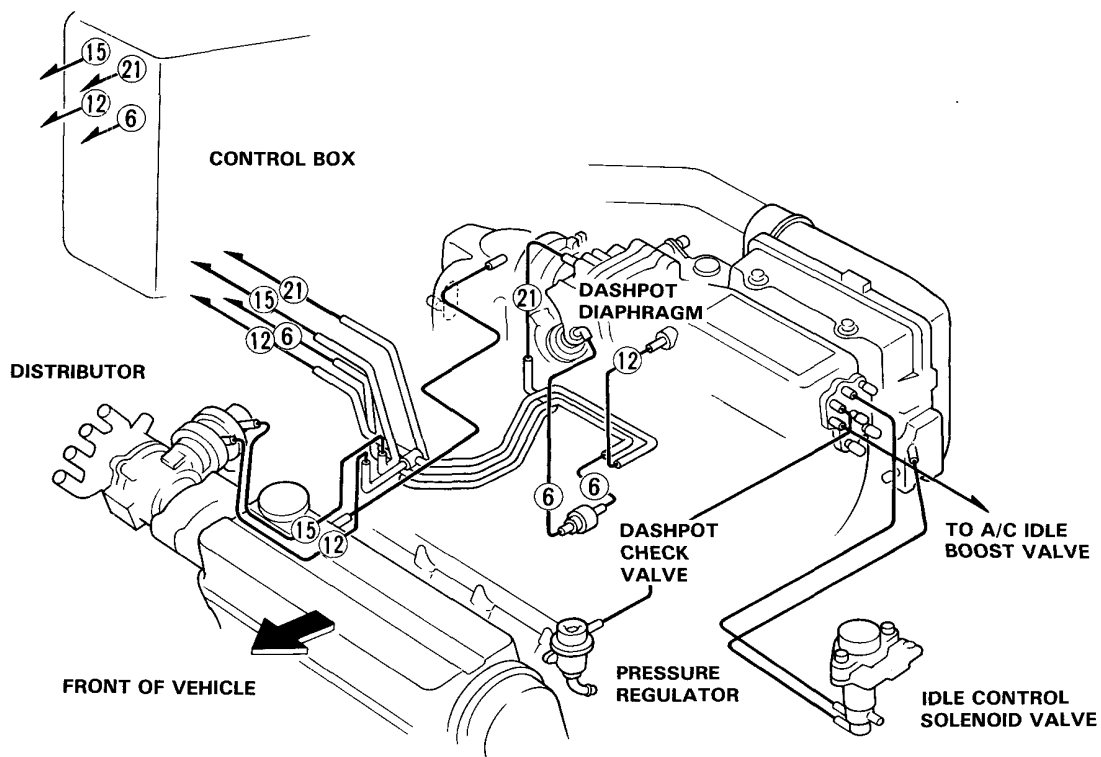




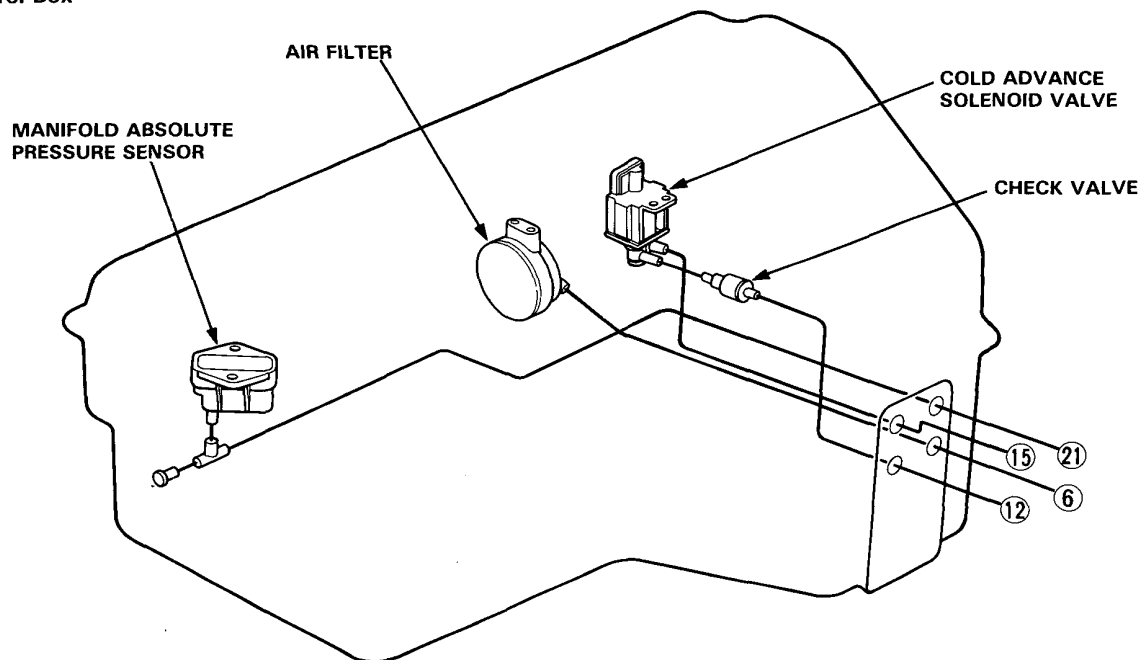
# Interconnect Diagram

[KX model]

[M/T]



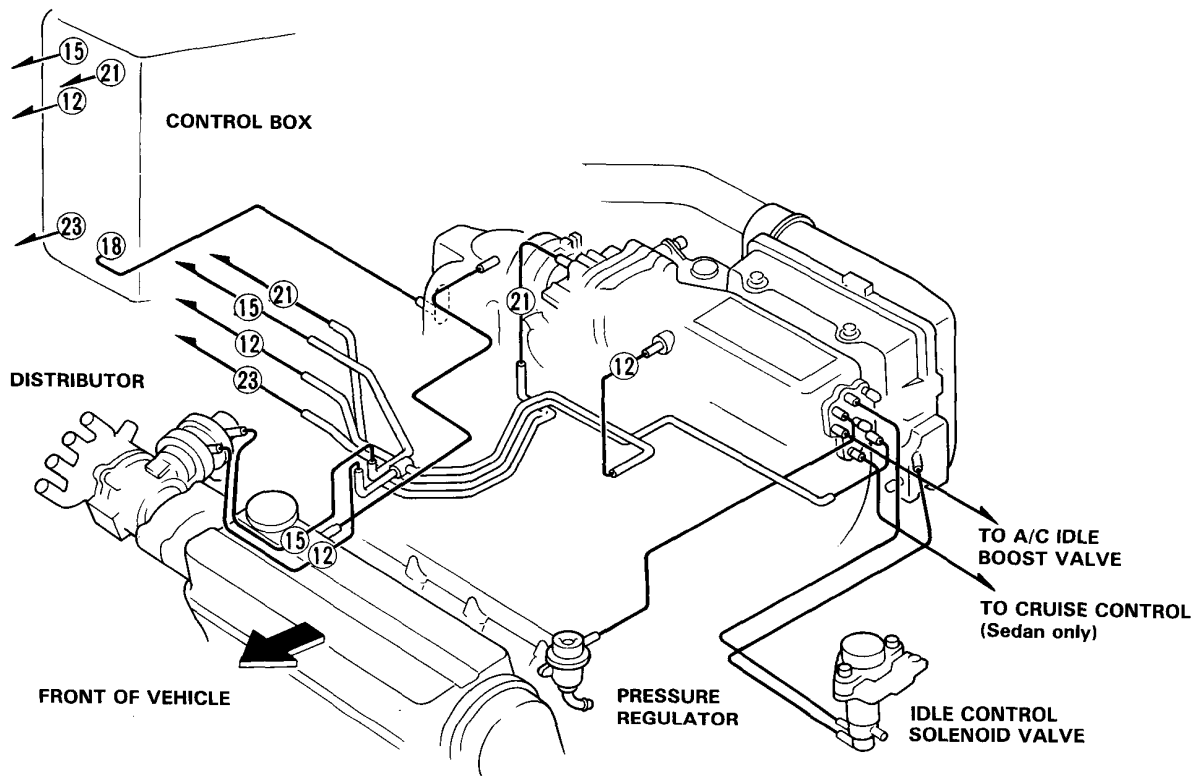
Control Box



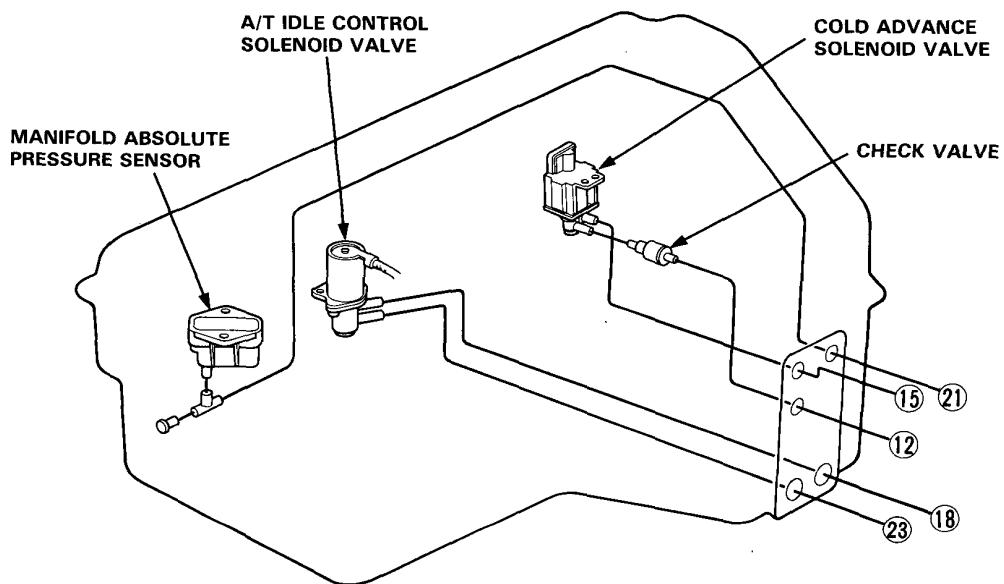




[A/T]



### Control Box





# PGM-FI

## 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		↑						↑	↑





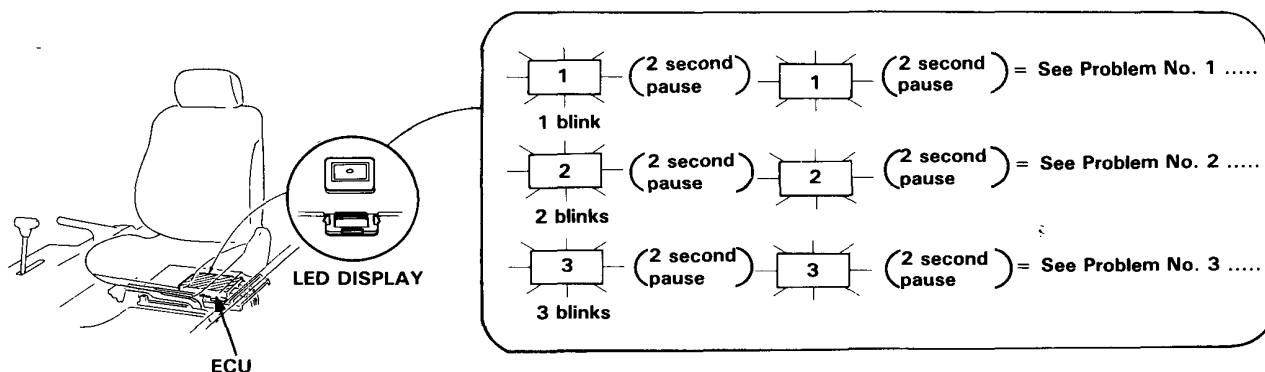
ATMOSPHERIC PRESSURE SENSOR	OXYGEN SENSOR (KX model)	COOLANT TEMPERATURE SENSOR	THROTTLE ANGLE SENSOR	INTAKE AIR TEMPERATURE SENSOR	IDLE CONTROL SYSTEM	IDLE MIXTURE ADJUSTER SENSOR (Except KX model)	IMPORTANT POINTS
							•CHECK FUEL PUMP/INJECTOR
(AT HIGH ALTITUDE) •OPEN/SHORT CIRCUIT •FAULTY SENSOR		•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		<ul style="list-style-type: none"> <li>Engine will not start</li> </ul>	<ul style="list-style-type: none"> <li>Disconnected control unit ground wire</li> <li>Faulty ECU</li> </ul>
		<ul style="list-style-type: none"> <li>Engine will not start</li> <li>No particular symptom shown</li> </ul>	<ul style="list-style-type: none"> <li>Loose or poorly connected power line to ECU</li> <li>Disconnected control unit ground wire</li> <li>Short circuit in combination meter or warning light wire</li> <li>Faulty ECU</li> </ul>
1 [KX Model]		<ul style="list-style-type: none"> <li>No particular symptom shown</li> <li>Erratic idling (Erratic injector, coupler and wiring Insufficient fuel)</li> </ul>	<ul style="list-style-type: none"> <li>Disconnected oxygen sensor coupler</li> <li>Spark plug mis-fire</li> <li>Short or open circuit in oxygen sensor circuit</li> <li>Faulty oxygen sensor</li> <li>Faulty fuel system</li> </ul>
3		<ul style="list-style-type: none"> <li>Fuel fouled plug</li> <li>Frequent engine stalling</li> <li>Hesitation</li> </ul>	<ul style="list-style-type: none"> <li>Disconnected manifold absolute pressure sensor coupler</li> <li>Short or open circuit in manifold absolute pressure sensor wire</li> <li>Faulty manifold absolute pressure sensor</li> </ul>
5		<ul style="list-style-type: none"> <li>Hesitation</li> <li>Fuel fouled plug</li> <li>Frequent engine stalling</li> </ul>	<ul style="list-style-type: none"> <li>Disconnected manifold absolute pressure sensor piping</li> </ul>
6		<ul style="list-style-type: none"> <li>High idle speed during warm-up</li> <li>High idle speed</li> <li>Hard starting at low temp</li> </ul>	<ul style="list-style-type: none"> <li>Disconnected coolant temperature sensor coupler</li> <li>Open or short circuit in coolant temperature sensor wire</li> <li>Faulty coolant temperature sensor (thermostat housing)</li> </ul>
7		<ul style="list-style-type: none"> <li>Poor engine response to opening throttle rapidly</li> <li>High idle speed</li> <li>Engine does not rev up when cold</li> </ul>	<ul style="list-style-type: none"> <li>Disconnected throttle angle sensor coupler</li> <li>Open or short circuit in throttle angle sensor wire</li> <li>Faulty throttle angle sensor</li> </ul>
8		<ul style="list-style-type: none"> <li>Engine does not rev up</li> <li>High idle speed</li> <li>Erratic idling</li> </ul>	<ul style="list-style-type: none"> <li>Short or open circuit in crank angle sensor wire</li> <li>Crank angle sensor wire interfering with spark plug wires</li> <li>Crank angle sensor at fault</li> </ul>
9		<ul style="list-style-type: none"> <li>Same as above</li> </ul>	<ul style="list-style-type: none"> <li>Same as above</li> </ul>
10		<ul style="list-style-type: none"> <li>High idle speed</li> <li>Erratic idling when very cold</li> </ul>	<ul style="list-style-type: none"> <li>Disconnected intake air temperature sensor</li> <li>Open or short circuit in intake air temperature sensor wire</li> <li>Faulty intake air temperature sensor</li> </ul>
11 [Except KX Model]		<ul style="list-style-type: none"> <li>No particular symptom shown</li> <li>High idle speed</li> </ul>	<ul style="list-style-type: none"> <li>Disconnected idle mixture adjuster sensor coupler</li> <li>Shorted or disconnected idle mixture adjuster sensor wire</li> <li>Faulty idle mixture adjuster sensor</li> </ul>
13		<ul style="list-style-type: none"> <li>Poor acceleration at high altitude</li> <li>Hard starting at high altitude when cold</li> </ul>	<ul style="list-style-type: none"> <li>Disconnected atmospheric pressure sensor coupler</li> <li>Shorted or disconnected atmospheric pressure sensor wire</li> <li>Faulty atmospheric pressure sensor</li> </ul>

**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)



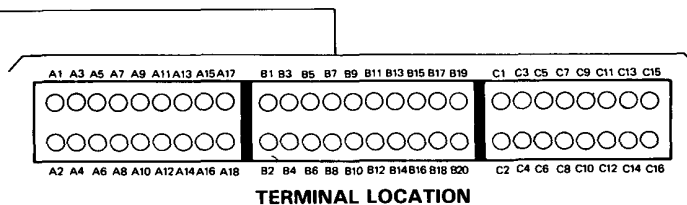
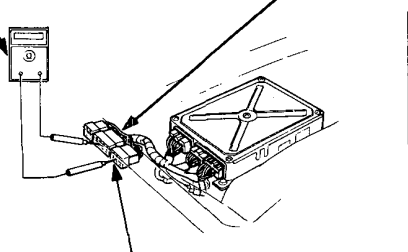
# Self-Diagnosis Indicator

## Troubleshooting (cont'd)

Use the system checker harness and digital circuit tester to check the system.

**DIGITAL  
CIRCUIT  
TESTER**  
07411-0020000

**SYSTEM CHECKER HARNESS**  
07999-PD6000A



**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.



**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?

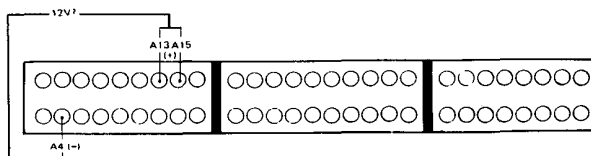
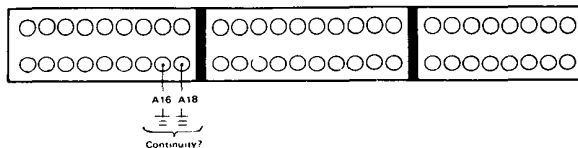
NO

Faulty ground circuit at GND 2.

YES

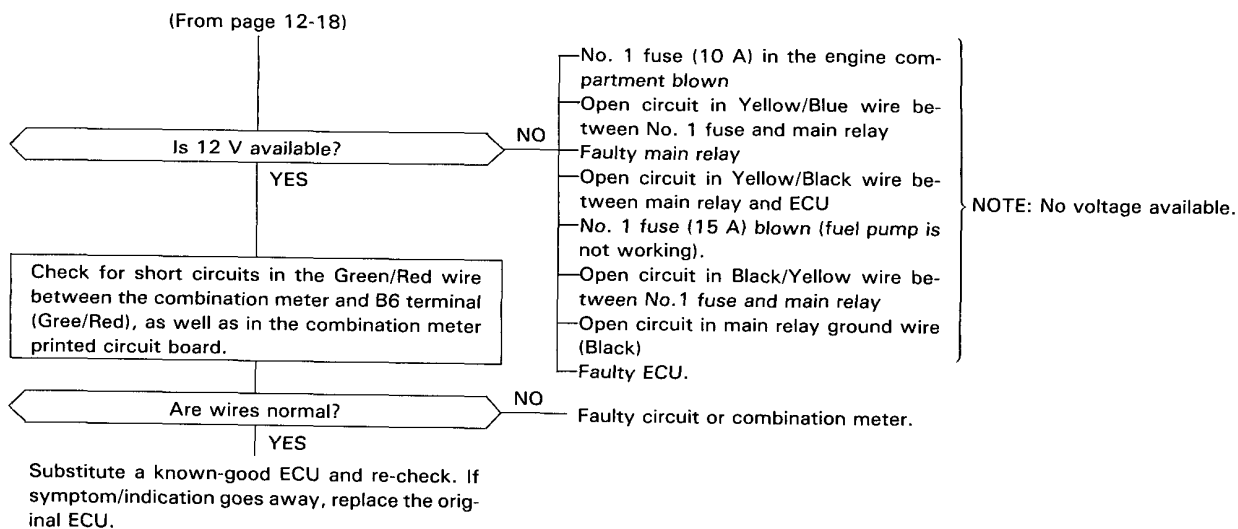
Turn the ignition switch ON.

Measure voltage between A15 (Yellow/Black (+)), the A13 (Black/Yellow (+)) terminals and the A4 terminal (Black (-)).



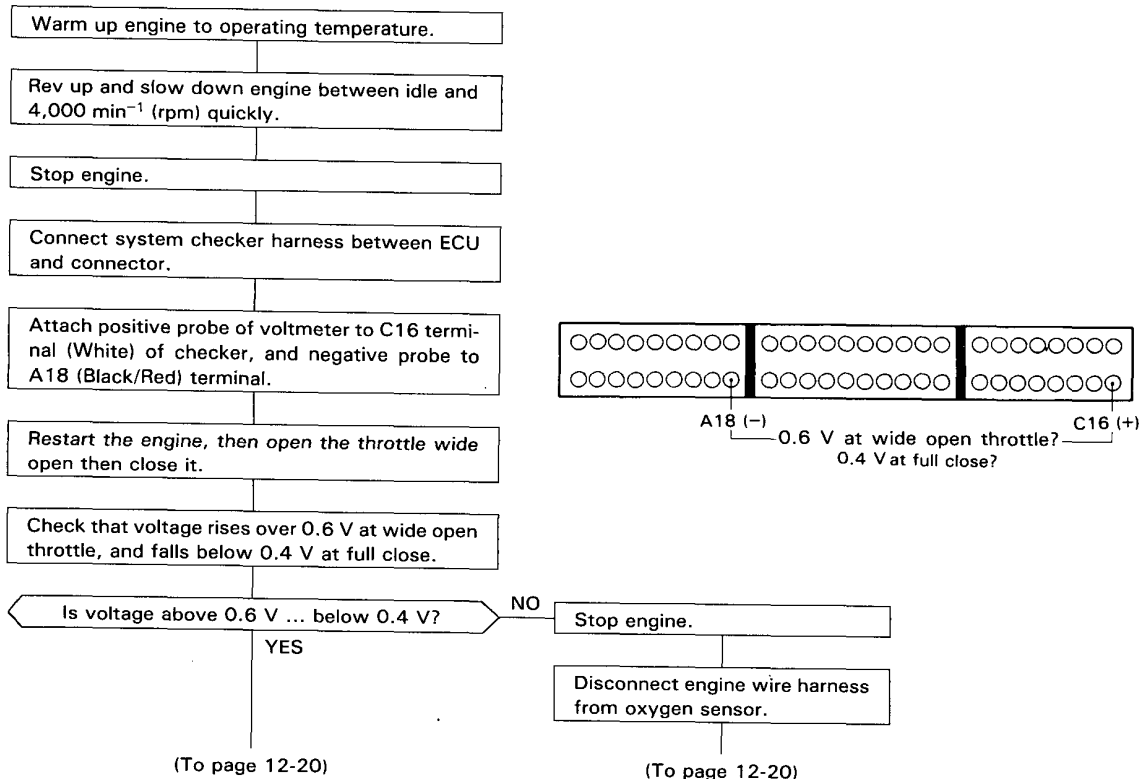
(To page 12-19)





# 1 Self diagnosis indicator blinks once [KX model]

NOTE: First, check the spark plugs.  
Plug mis-fire can be another source of this trouble.



(cont'd)

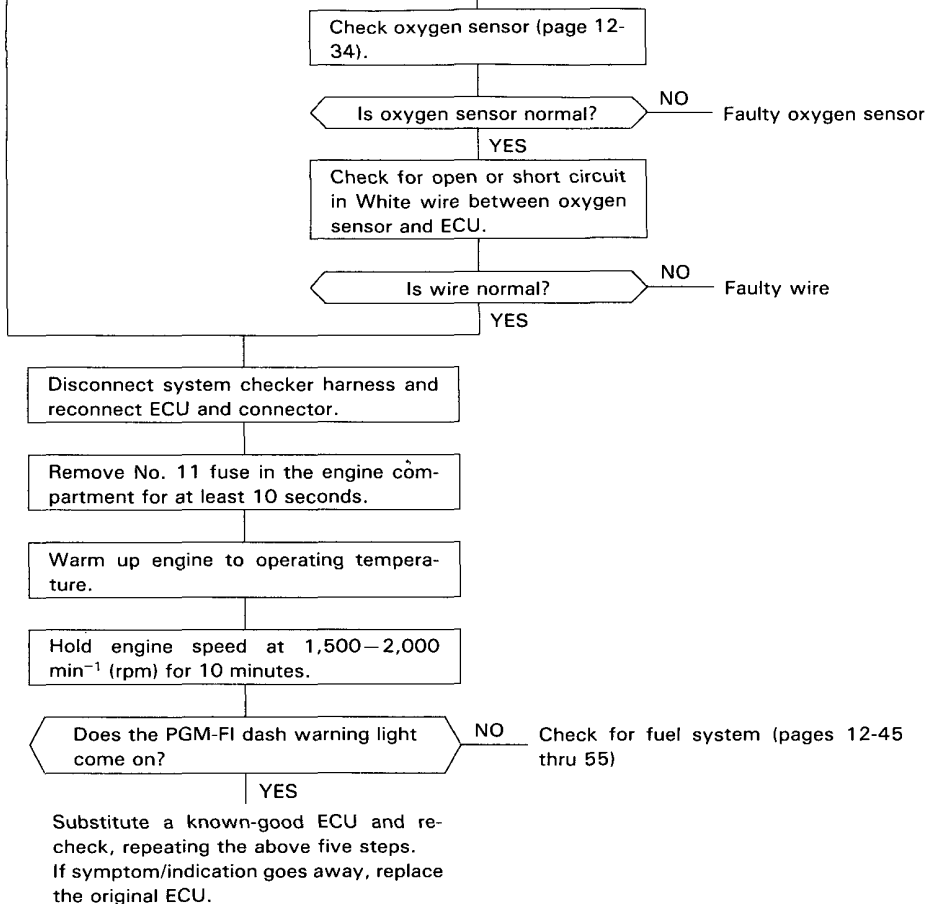


# Self-Diagnosis Indicator

## Troubleshooting (cont'd)

(From page 12-19)

(From page 12-19)







### 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 (-)).

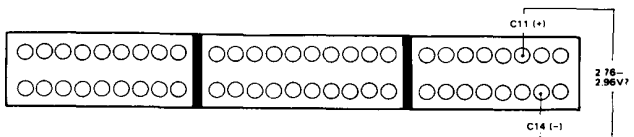
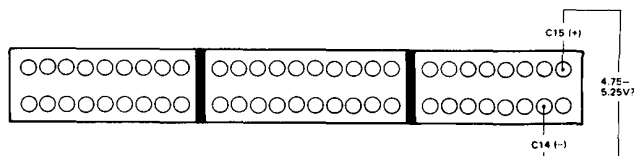
Is voltage between 2.76 and 2.96 V?

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.

YES

Substitute a known-good ECU and re-check.  
If symptom/indication goes away, replace the original ECU.



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.

(cont'd)



# Self-Diagnosis Indicator

## Troubleshooting (cont'd)



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

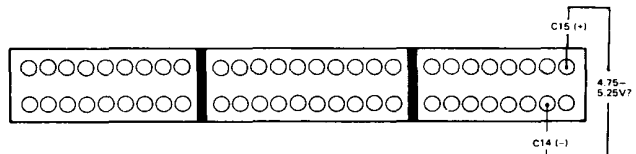
Replace vacuum hose.

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 (-)).



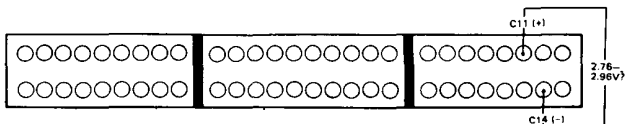
Is voltage between 4.75 and 5.25 V?

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

Connect hand vacuum pump to manifold absolute pressure sensor.

Check that voltage changes as vacuum is applied.

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.

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.





## 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?

YES

Substitute a known-good ECU and re-check.  
If symptom/indication goes away, replace the original ECU.

NO

Stop engine.

Check for open or short circuit in Yellow/Green and Green/White wires between coolant temperature sensor and the ECU.

Are wires normal?

NO

Faulty wires

YES

Check coolant temperature sensor (page 12-36).

Is sensor normal?

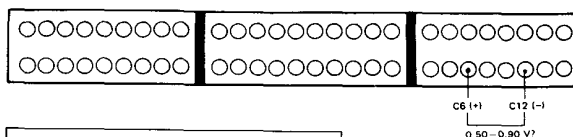
NO

Faulty coolant temperature sensor

YES

Substitute a known-good ECU and re-check.

If symptom/indication goes away, replace the original ECU.



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.

(cont'd)



# Self-Diagnosis Indicator

## 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

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.

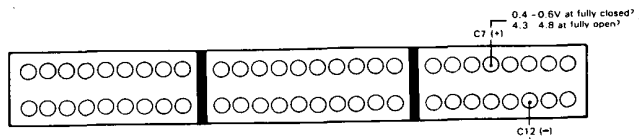
Are voltages within above ranges?

NO

YES

Substitute a known-good ECU and re-check. If symptom/indication goes away, replace the original ECU.

Substitute a known-good ECU and re-check. If prescribed voltage is now available, replace the original ECU.



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).

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.

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.

NOTE: Check that crank angle sensor harness is not interfering with the spark plug wires.





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 ignition switch ON.

Check that voltage is correct for the intake air temperature.

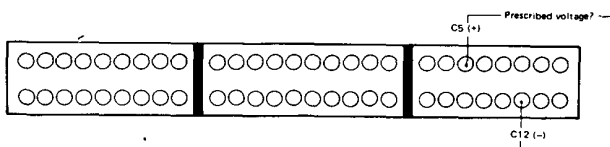
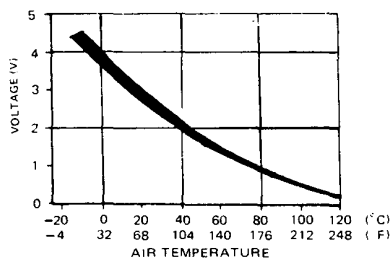
Is voltage correct?

NO

Turn ignition switch OFF.

Substitute a known-good ECU and re-check.  
If symptom/indication goes away, replace the original ECU.

YES



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

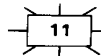
Substitute a known-good ECU and re-check.  
If prescribed voltage is now available, replace the original ECU.

(cont'd)



# Self-Diagnosis Indicator

## Troubleshooting (cont'd)



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.

Are wires normal?

NO

Faulty wires.

YES

Check idle mixture adjuster sensor (page 12-34).

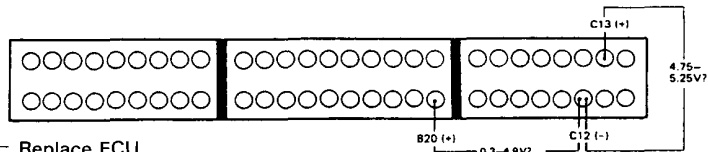
Does sensor operate properly?

NO

Faulty idle mixture adjuster sensor.

YES

Substitute a known-good ECU and re-check. If symptom/indication goes away, replace the original ECU.



NOTE: If there is no voltage, check for short circuit in the wires. If voltage is high, probability is open or bad contact.



**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

YES

Measure voltage between C9 terminal (Red (+)) of system checker harness and C12 terminal (Green/White (-)).

Is 2.76–2.96 V available?

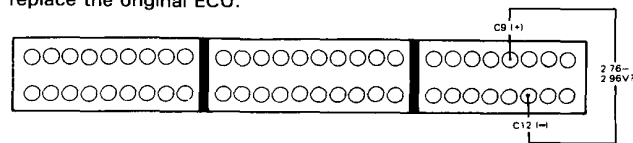
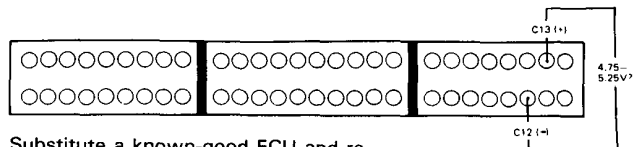
NO

YES

Substitute a known-good ECU and re-check. If symptom/indication goes away, replace the original ECU.

Substitute a known-good ECU and re-check.

If prescribed voltage is now available, replace the original ECU.



Turn Ignition switch OFF.

Check for open or short circuit in Red and Green/White wires between atmospheric pressure sensor and the ECU.

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.

NOTE: If there is no voltage, check for a short circuit. If voltage is high, wires may be open or bad contact.



# Idle Control

## Troubleshooting

Symptom \ Part	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)	<ul style="list-style-type: none"> <li>• Pinch idle control solenoid valve hose and re-adjust.</li> <li>• Any intake or bypass leak.</li> </ul>
					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		↑	<ul style="list-style-type: none"> <li>• Is shift signal available at ECU?</li> <li>• Is A/T idle control solenoid valve working?</li> </ul>
				Open circuit	↑	<ul style="list-style-type: none"> <li>• Is vacuum applied to A/C idle boost valve?</li> <li>• Is A/C idle boost valve opening adjusted properly?</li> </ul>
					↑	Is condition improved when solenoid valve is replaced?

(cont'd)



# Idle Control

## Troubleshooting (cont'd)

### Starter Switch Signal Inspection

Connect system checker harness between ECU and wire harness connector.

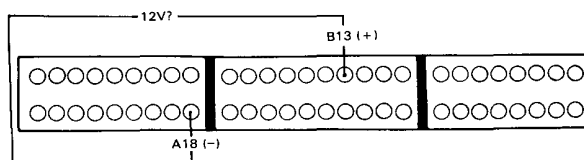
Attach positive probe of voltmeter to B13 terminal (Blue/Red), and negative probe to A18 terminal (Black/Red) of system checker harness.

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.

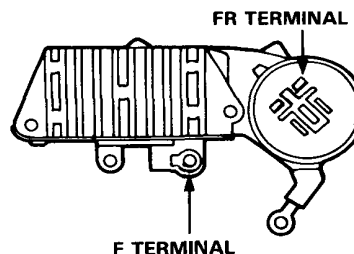
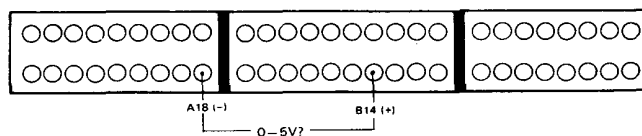
Is there continuity?

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.

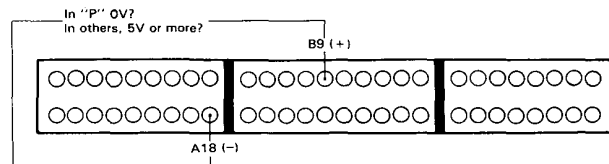
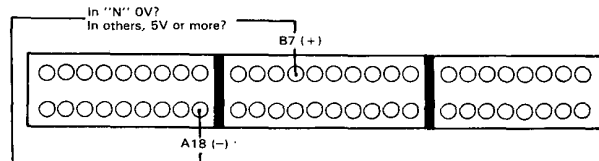
Move shift lever into gear.

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



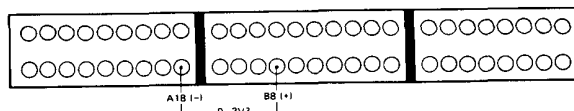
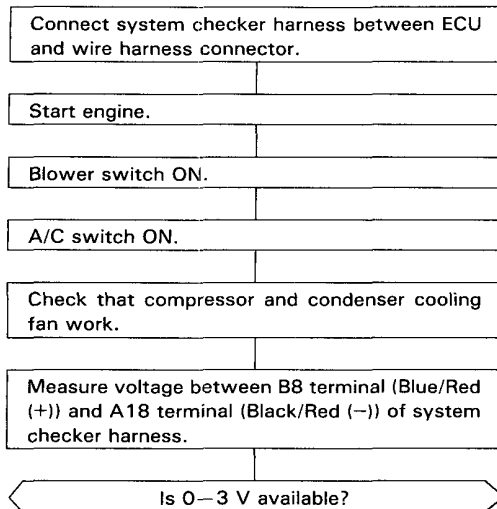
(cont'd)



# Idle Control

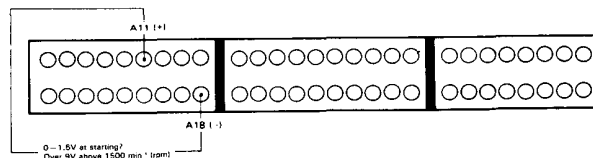
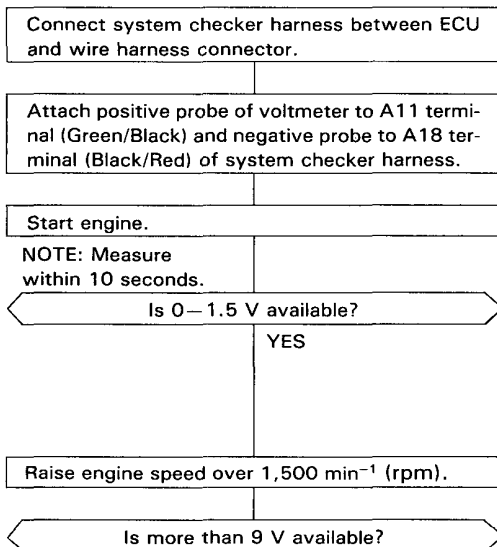
## Troubleshooting (cont'd)

### Air Conditioner Switch Signal Inspection



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



NOTE: No voltage available.





### 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 "D3" or "D4".

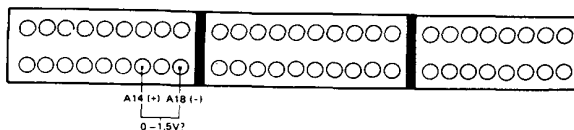
Measure voltage between A14 terminal (Green (+)) and A18 terminal (Black/Red (-)) of system checker harness.

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
- Faulty ECU. NOTE: Voltage should be above 9 V.

NOTE: No voltage available.



### 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.

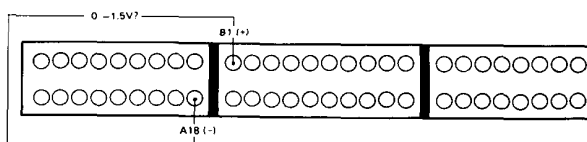
Measure voltage between B1 terminal (Blue/Yellow (+)) and A18 terminal (Black/Red (-)) of system checker harness.

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
- Faulty ECU. NOTE: Voltage should be above 9 V.

NOTE: No voltage available.



(cont'd)



# Sensors

## Oxygen Sensor [KX model]

1. Disconnect the connector of the oxygen sensor.
2. Start the engine and warm up for 2 minutes at  $3,000 \text{ min}^{-1}$  (rpm) under no load. Raise the engine speed to  $4,000 \text{ min}^{-1}$  (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.

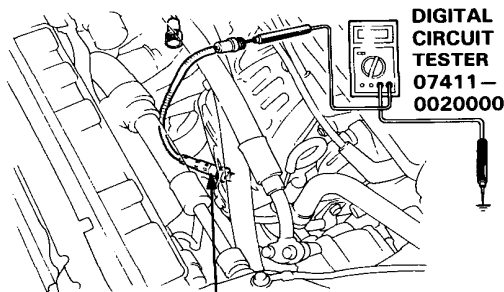
NOTE: If it takes more than one minute to complete the checks, warm up the engine as in step 2 before continuing.

4. Raise the engine speed to  $5,000 \text{ min}^{-1}$  (rpm), then lower to  $2,000 \text{ min}^{-1}$  (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  $4,000 \text{ min}^{-1}$  (rpm).

Voltage should be above 0.6 V.



**OXYGEN SENSOR**  
45 N·m (4.5 kg-m, 33 lb-ft)

- 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.

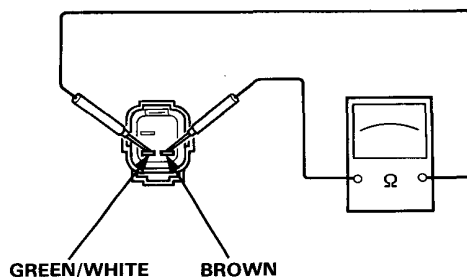
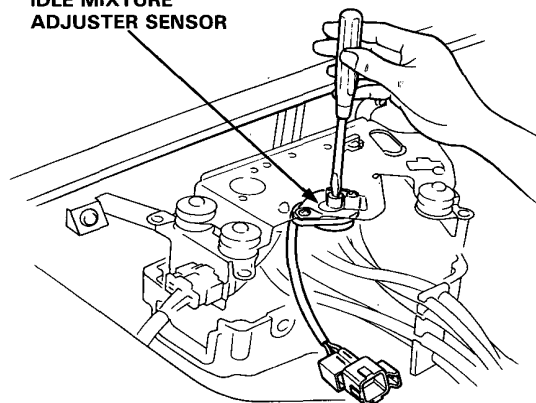
## Idle Mixture Adjustor (IMA) Sensor

### [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 K $\Omega$

**IDLE MIXTURE  
ADJUSTER SENSOR**



- 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

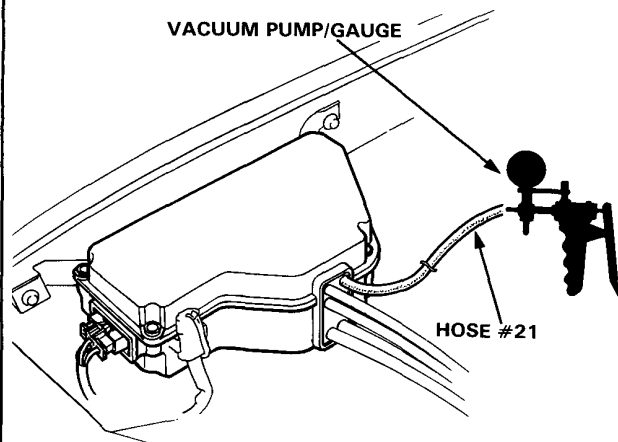




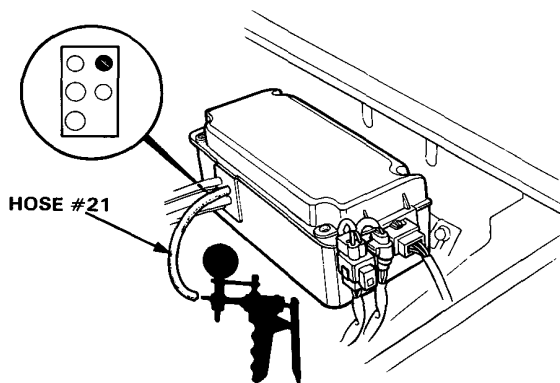
## Manifold Absolute Pressure (MAP) Sensor

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.

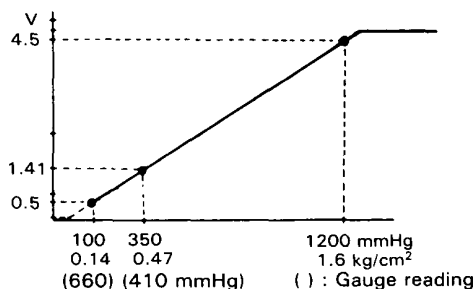
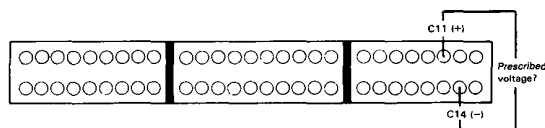
[Except KE model]



[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.

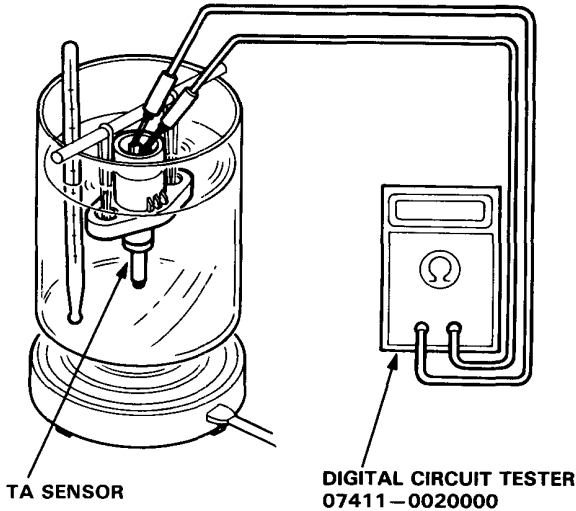


# Sensors

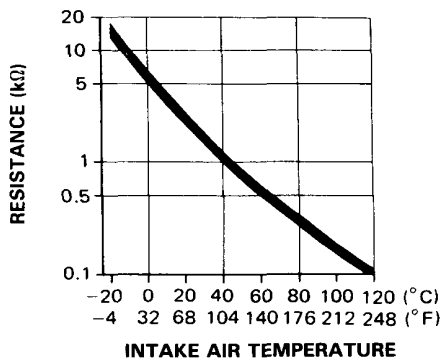
## Intake Air Temperature (TA) Sensor

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 k $\Omega$  at 40°C (104°F)  
0.22–0.35 k $\Omega$  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.

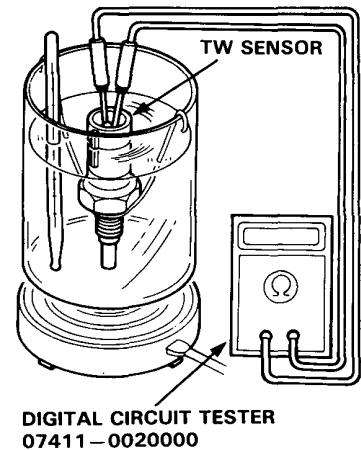
### NOTE:

- Don't let the sensor touch the bottom of the container.
- During the test, stir the water in the container to ensure even temperature.

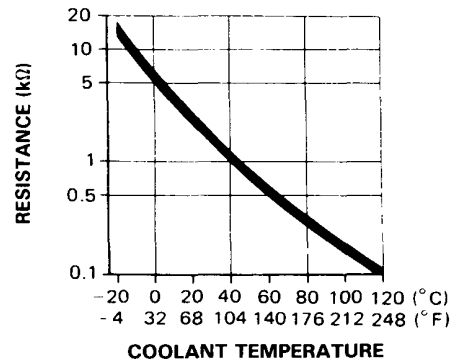
## Coolant Temperature (TW) Sensor

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 k $\Omega$  at 40°C (104°F)  
0.22–0.35 k $\Omega$  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.





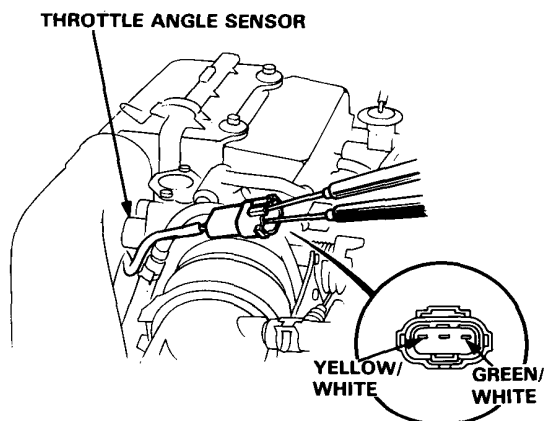
## Throttle Angle Sensor

### 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.

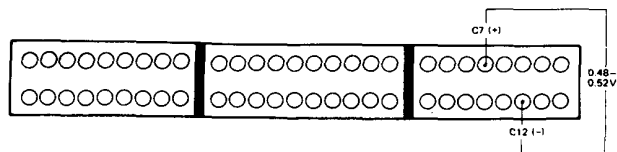
Resistance should be: 4–6 k $\Omega$



- If the resistance is outside the above range, adjust the installation position of the sensor and re-test. Replace if necessary.

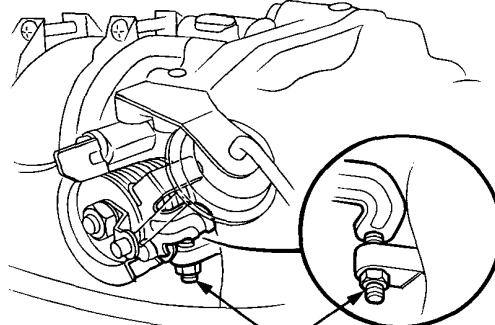
### Installation:

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.



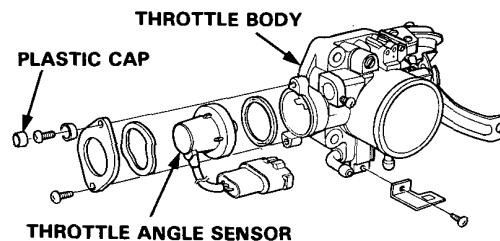
4. With the ignition switch turned ON, adjust the sensor to a position where the throttle stop lever just touches the stop screw. Then measure the voltage between the two terminals.

There should be: 0.48–0.52 V



**THROTTLE STOP SCREW**  
(Factory set; Non-adjustable).

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

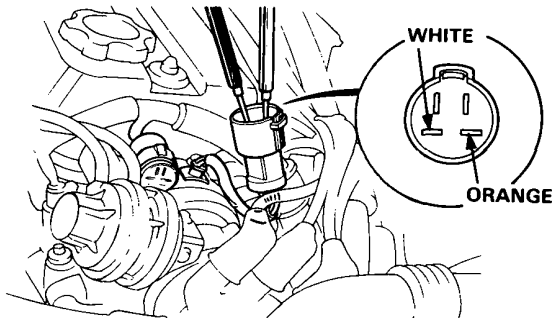
## Crank Angle Sensor

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 k $\Omega$



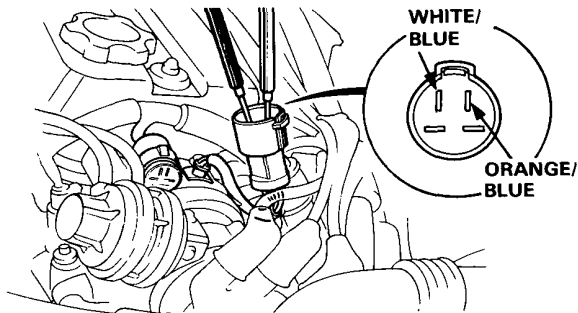
3. Measure the resistance between the White and Orange terminals and the crank angle sensor housing.

Resistance should be: 100 k $\Omega$  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 k $\Omega$



3. Measure the resistance between the Orange/Blue and White/Blue terminals and the crank angle sensor housing.

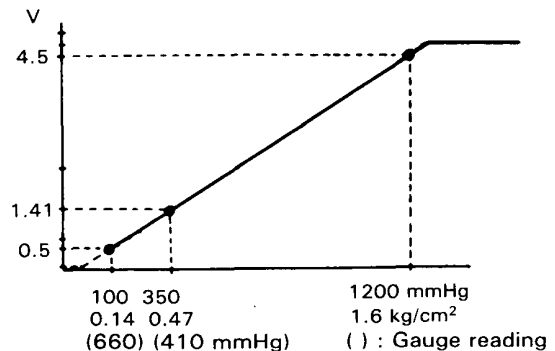
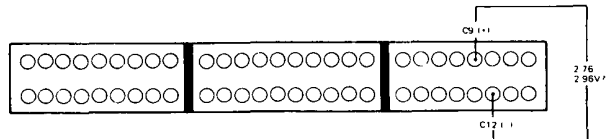
Resistance should be: 100 k $\Omega$  or more

## 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



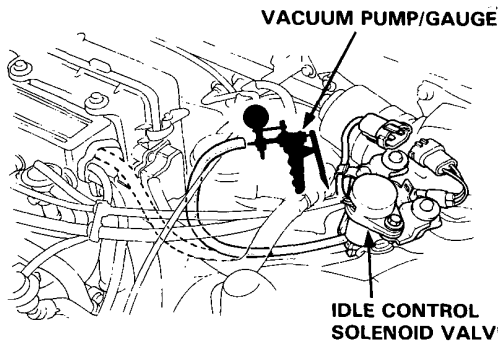
## Idle Control Solenoid Valve

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:

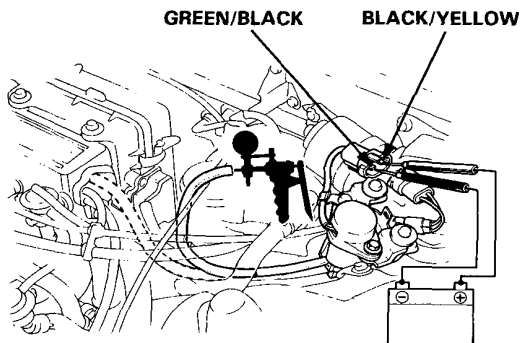
- For a short period after starting the engine.
- Whenever electrical loads are turned ON (vacuum will disappear when engine rpm is raised over 1,500 rpm by operating the throttle).

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.

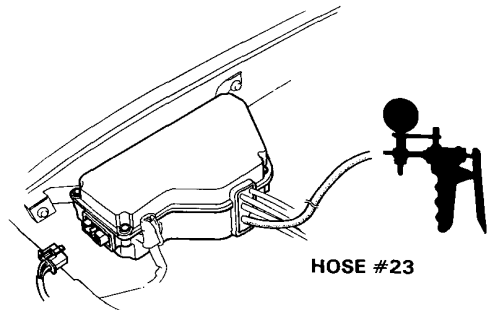


## A/T Idle Control Solenoid Valve

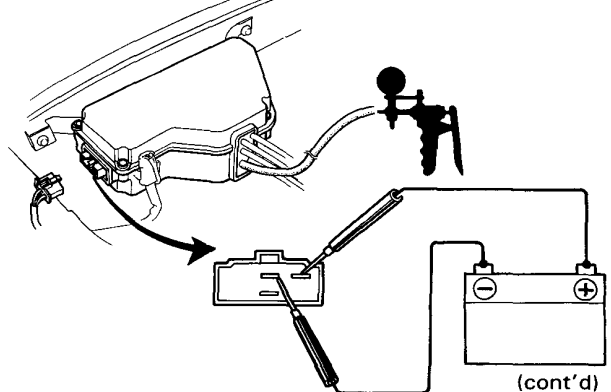
### [Except KE model]

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.





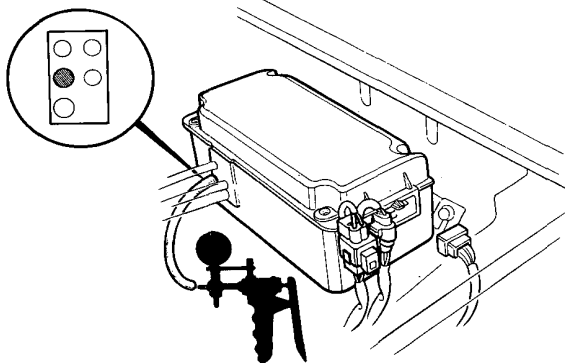
# Solenoid Valves

## A/T Idle Control Solenoid Valve (cont'd)

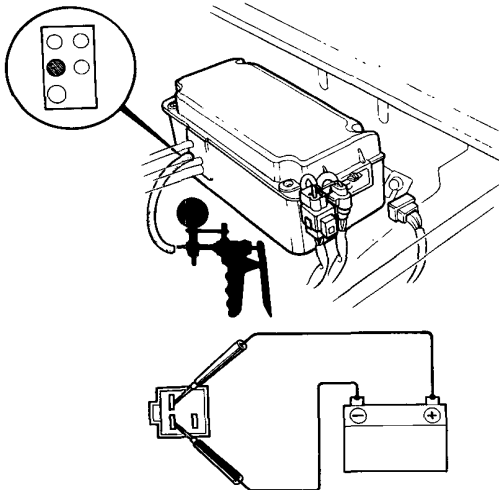
### [KE model]

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. Disconnect 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.



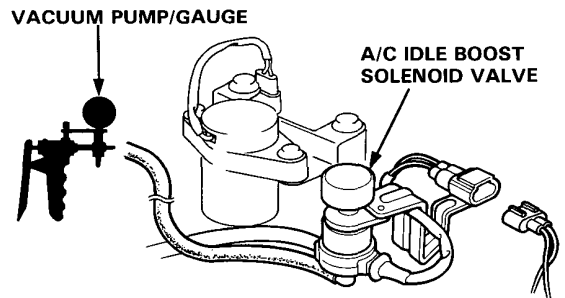
4. Connect the battery positive terminal to the Black/Yellow terminal of the control box coupler and the battery negative terminal to the Yellow/Black terminal.
5. Apply vacuum to the hose.  
It should not hold vacuum.  
If it holds vacuum, replace the valve.



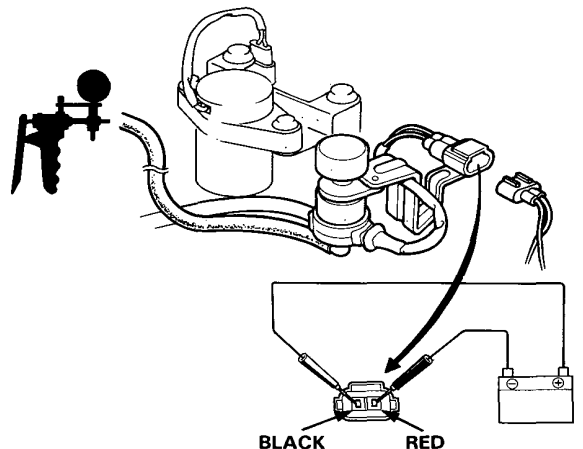
## A/C Idle Boost Solenoid Valve

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 connector 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.

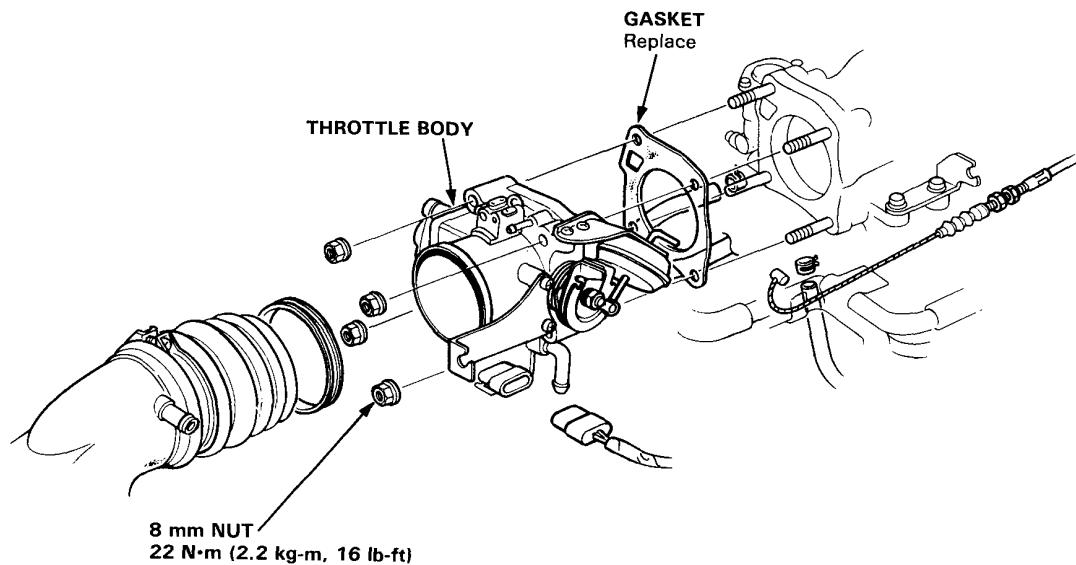




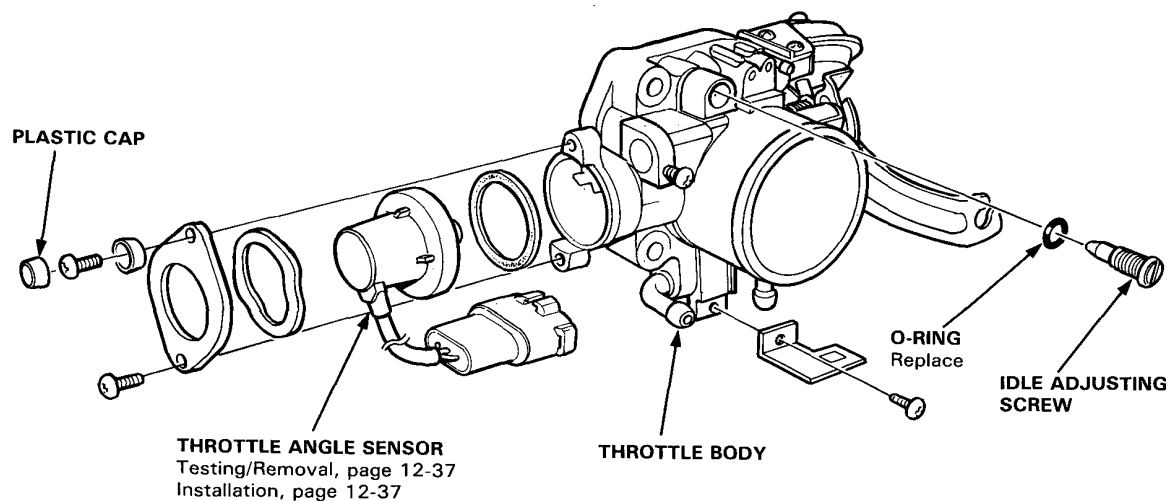
# Air Intake System



## Throttle Body Disassembly



**CAUTION:** The throttle valve stop screw is non-adjustable.

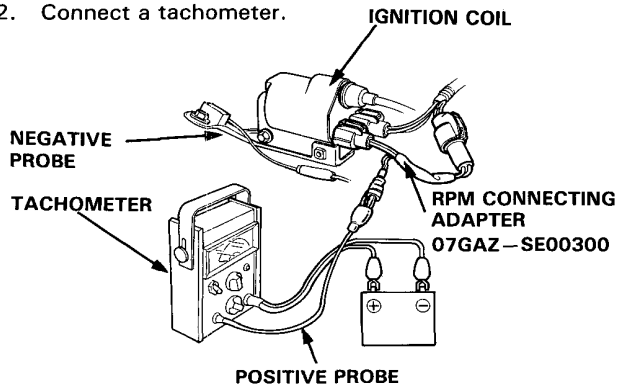




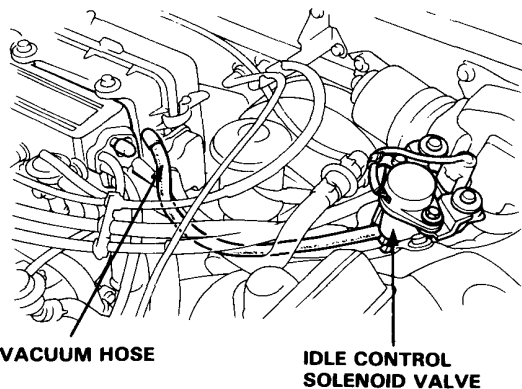
# Air Intake System

## 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:

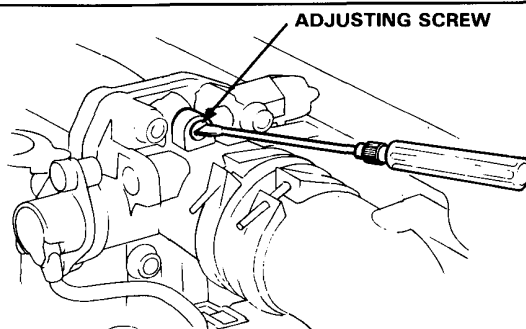
### Except KX model

M/T	$800 \pm 50 \text{ min}^{-1} \text{ (rpm)}$
A/T	$800 \pm 50 \text{ min}^{-1} \text{ (rpm)}$ (in "N" or "P")

### KX model

M/T	$750 \pm 50 \text{ min}^{-1} \text{ (rpm)}$
A/T	$750 \pm 50 \text{ min}^{-1} \text{ (rpm)}$ (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:

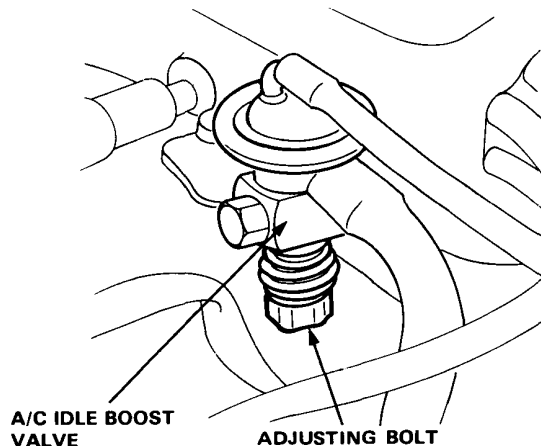
### Except KX model

M/T	$800 \pm 50 \text{ min}^{-1} \text{ (rpm)}$
A/T	$800 \pm 50 \text{ min}^{-1} \text{ (rpm)}$ (in "N" or "P")

### KX model

M/T	$750 \pm 50 \text{ min}^{-1} \text{ (rpm)}$
A/T	$750 \pm 50 \text{ min}^{-1} \text{ (rpm)}$ (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<sub>3</sub>" or "D<sub>4</sub>").  
Idle speed should remain:  
 $750 \pm 50 \text{ min}^{-1} \text{ (rpm)}$  (in "D<sub>3</sub>" or "D<sub>4</sub>").
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<sup>-1</sup> (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.

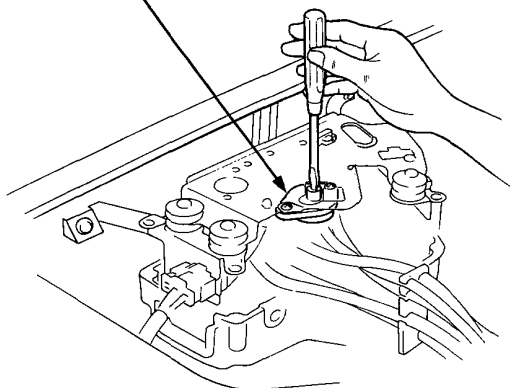
### CO meter should indicate:

**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.

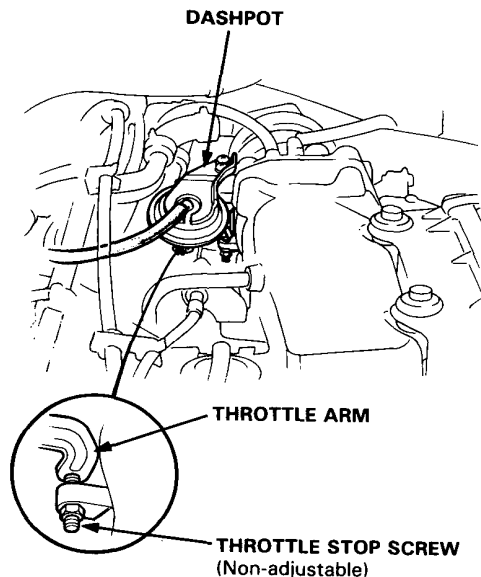
### IMA SENSOR



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



# Air Intake System

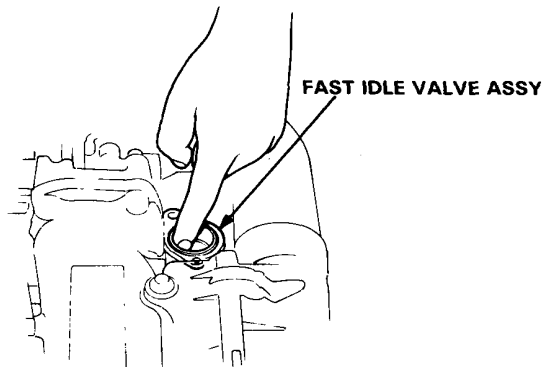
## Fast Idle Valve

### 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:

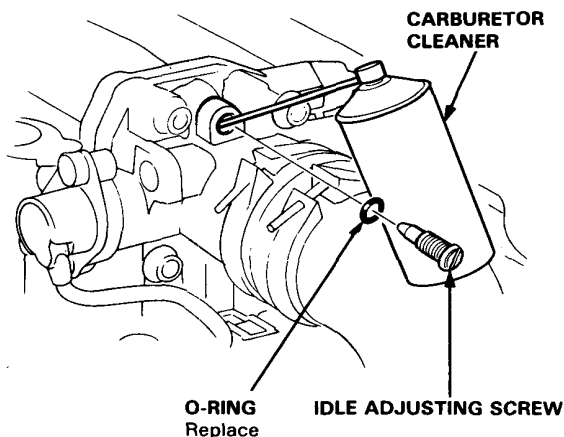
1. Remove the cover of the fast idle valve.
2. Check that the valve is completely closed. If not, an air suction sound can be heard in the valve seat area.



- If any suction is heard, the valve 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.

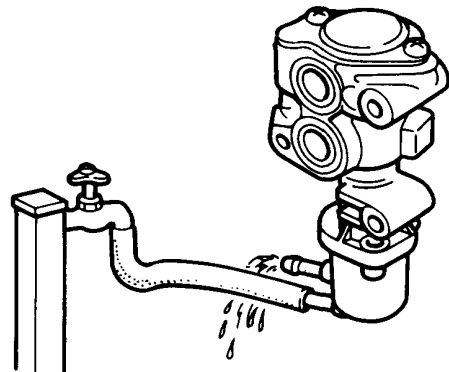
If fast idle speed is low when engine is cold (coolant temperature below 30°C (86°F)). (Fast idle valve may be stuck closed):

Fast idle speed should be:

1,000—1,800 min<sup>-1</sup> (rpm) for M/T

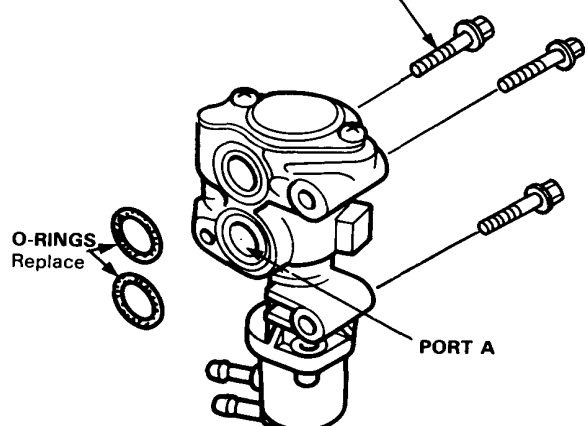
1,000—1,800 min<sup>-1</sup> (rpm) for A/T (in "N" or "P")

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.

12 N·m (1.2 kg-m, 9 lb-ft)



- If air does not flow or the resistance is large, replace the fast idle valve and adjust idle speed. (page 12-42).



# Fuel System



## 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.

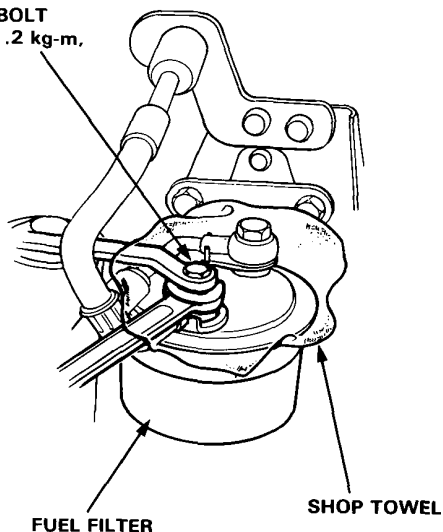
NOTE: Before disconnecting fuel pipes or hoses, release pressure from the system by loosening the 6 mm service bolt at top of the fuel filter.

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.

**SERVICE BOLT**  
12 N·m (1.2 kg-m,  
9 lb-ft)





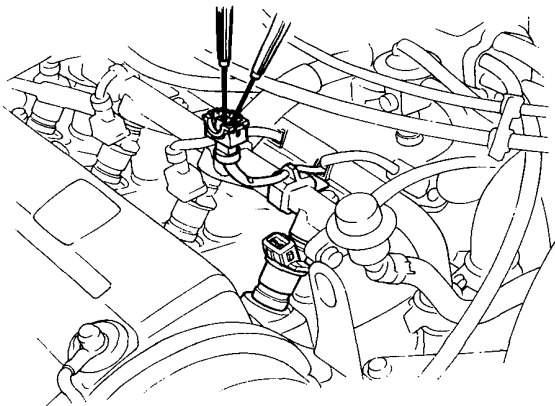
# Fuel System

## Injector Testing

**NOTE:** Check the following items before testing idle speed, ignition timing, valve clearance and idle CO %.

### If the engine will run:

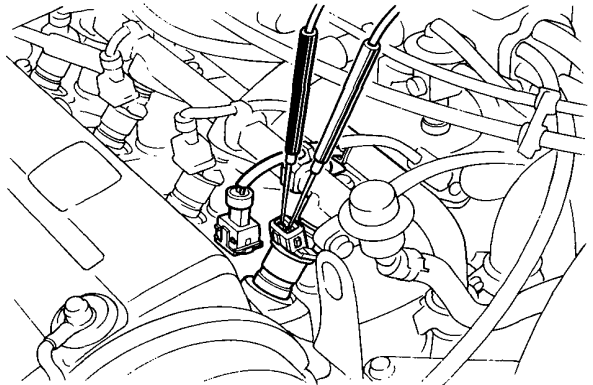
1. With the engine idling, disconnect each injector coupler individually and inspect the change in the idling speed.
  - If the idle speed drop is almost the same for each cylinder, the injectors are normal.
  - If the idle speed or quality remains the same when you disconnect a particular injector, check for voltage at that coupler.
    - If voltage 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  $\Omega$**



- 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.





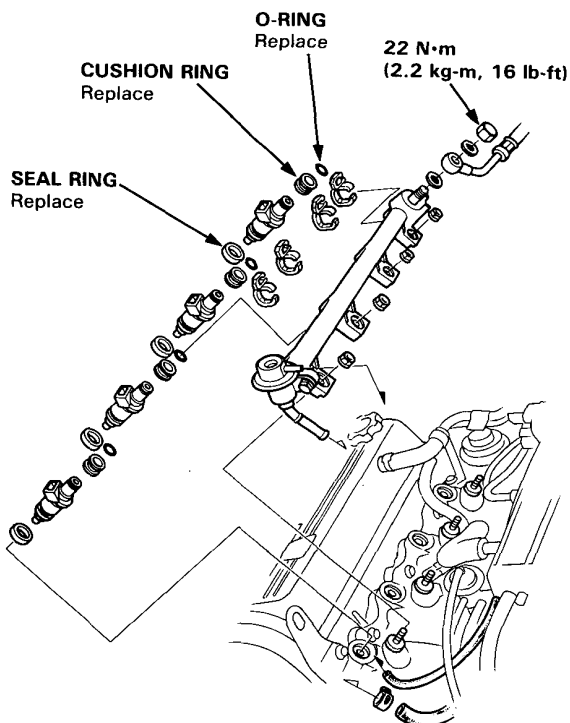
## Injector Replacement

**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.

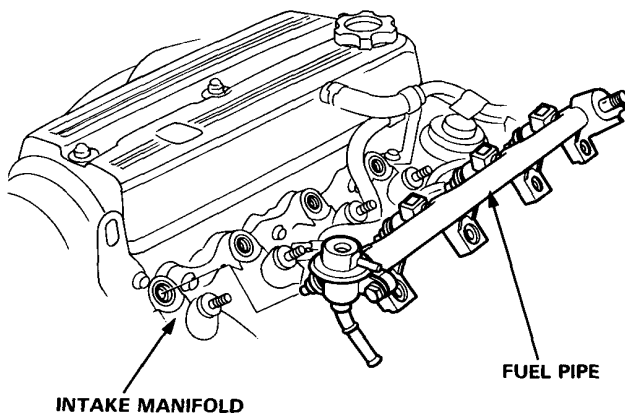
5. Loosen the retainer nuts on the fuel pipe.
6. Disconnect the fuel pipe.
7. Remove the injectors from the intake manifold.



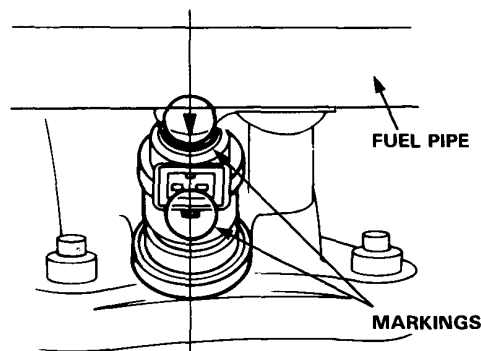
8. Slide new cushion rings onto the injectors.
9. Coat new O-rings with clean engine oil and put them on the injectors.

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.

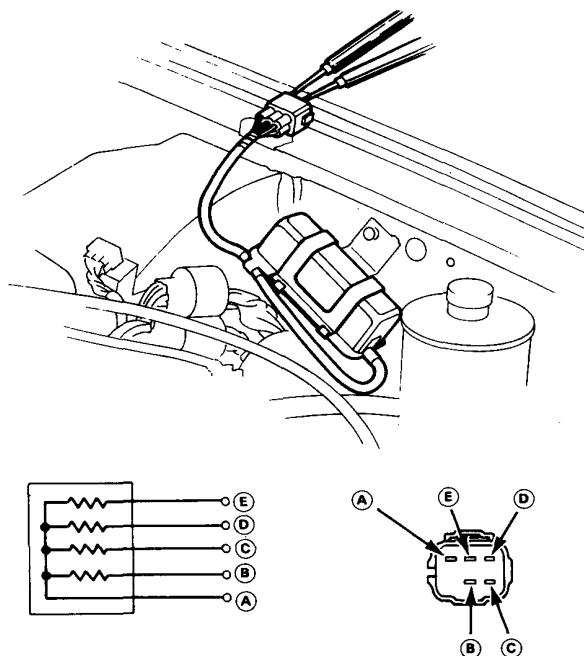


# Fuel System

## 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:  $5-7\ \Omega$



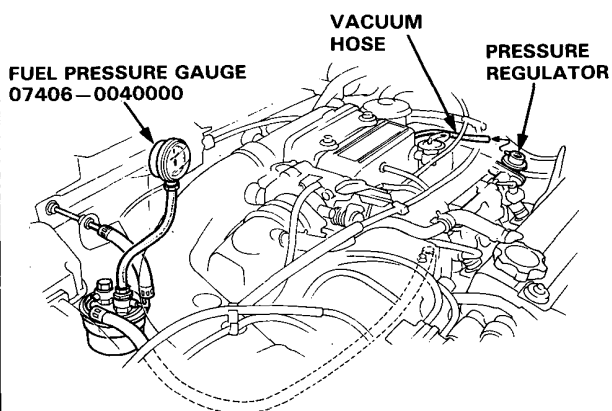
- Replace the resistor with a new one if any of the resistances are outside of the specification.

## 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:

$255 \pm 20\text{ kPa}$  ( $2.55 \pm 0.2\text{ kg/cm}^2$ ,  $36 \pm 3\text{ psi}$ )



- 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





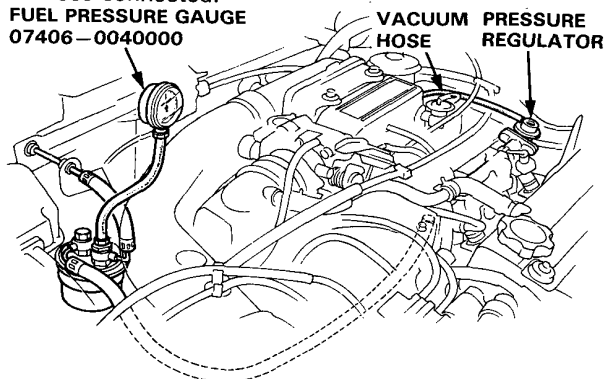
## Pressure Regulator

### Testing:

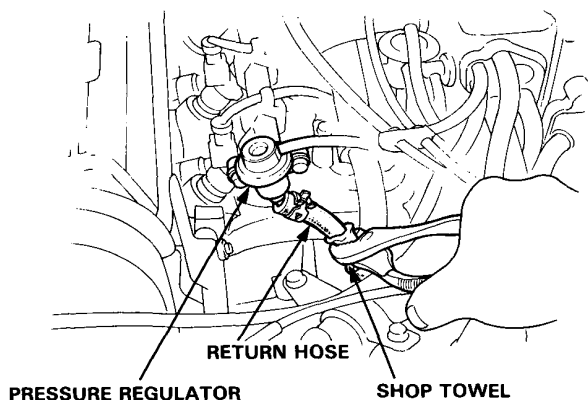
**WARNING** Do not smoke during the test. Keep open flames away from your work area.

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.

FUEL PRESSURE GAUGE  
07406-0040000



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.

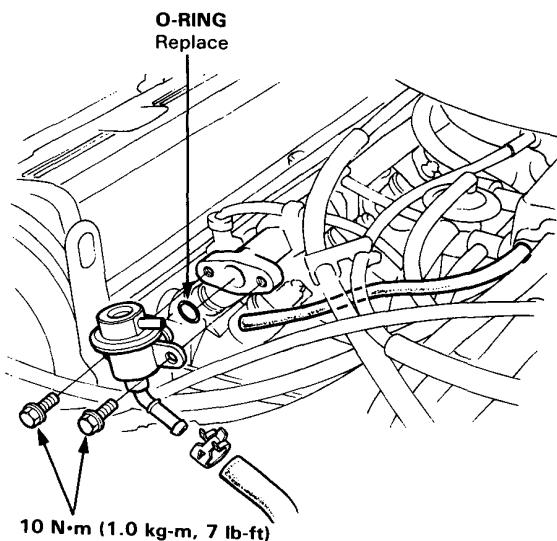
### Replacement:

**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.





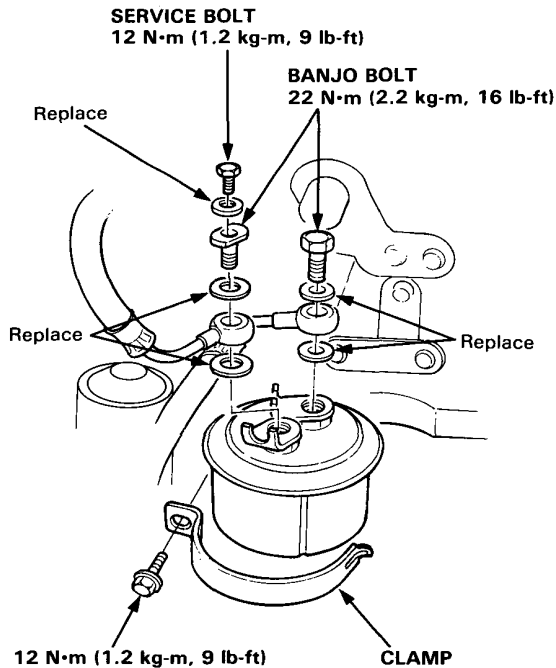
# Fuel System

## 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 ( $255 \pm 20$  kPa,  $2.55 \pm 0.2$  kg/cm<sup>2</sup>,  $36 \pm 3$  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.

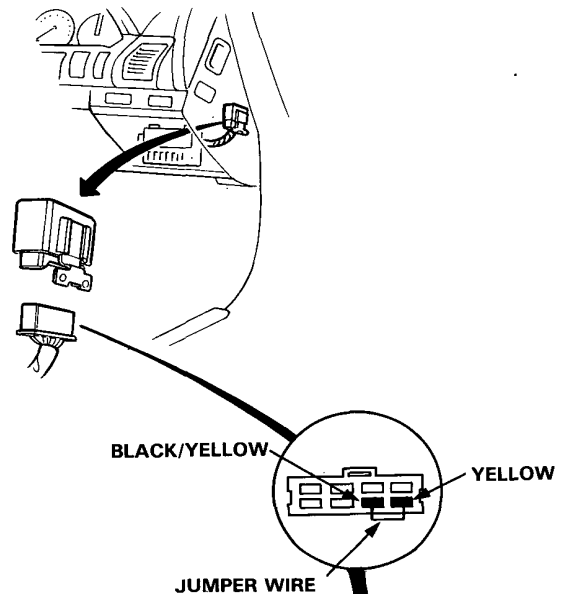


## Fuel Pump Inspection

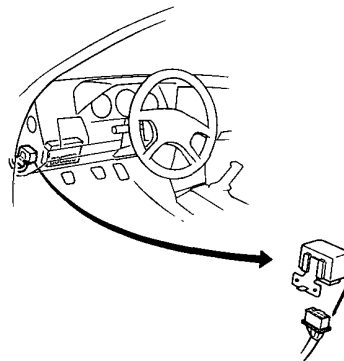
**WARNING** Do not smoke during the test. Keep open flame away from your work area.

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]



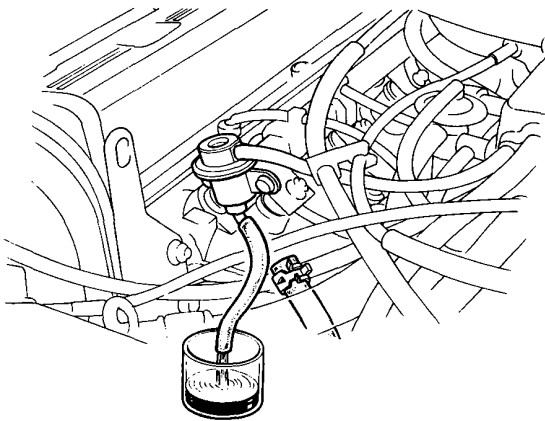




3. Relieve fuel pressure as described on page 12-45, then tighten the service bolt.
4. Disconnect the fuel return hose from the regulator.
5. Turn the ignition switch ON for 10 seconds. Then measure the amount of fuel flow.

**Amount should be:**

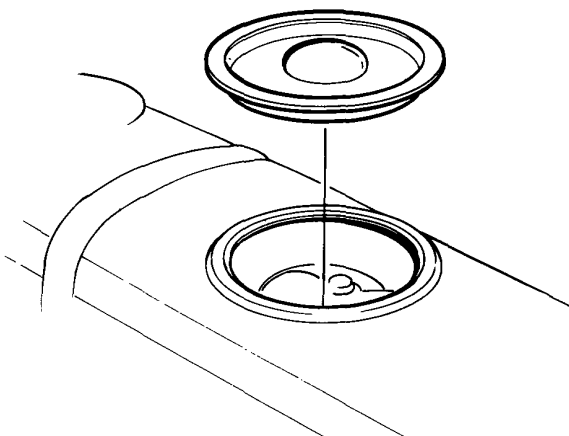
**230 cc (7.8 oz) min. in 10 seconds at 12V**



- If fuel flow is less than 230 cm<sup>3</sup> (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.

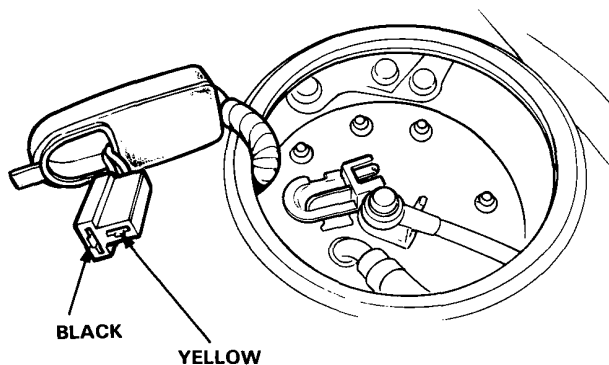
1. Remove the left maintenance access cover in the luggage area.



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.



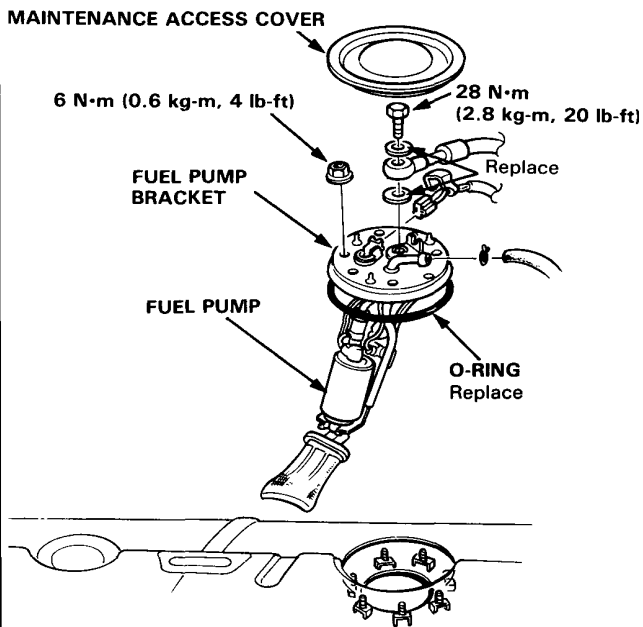
## Fuel System

## 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.

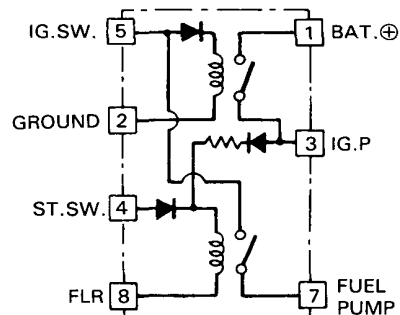
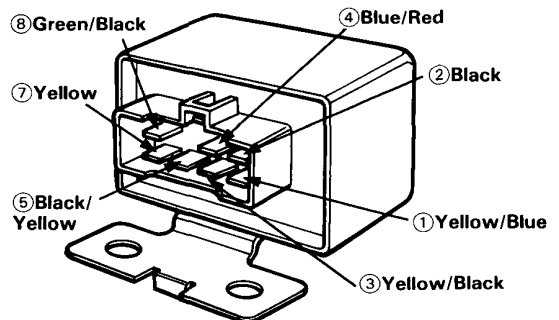


**CAUTION:** Do not disassemble the pump.

## 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 Har-ness Testing in the next column.
  - If there is no continuity, replace the relay.

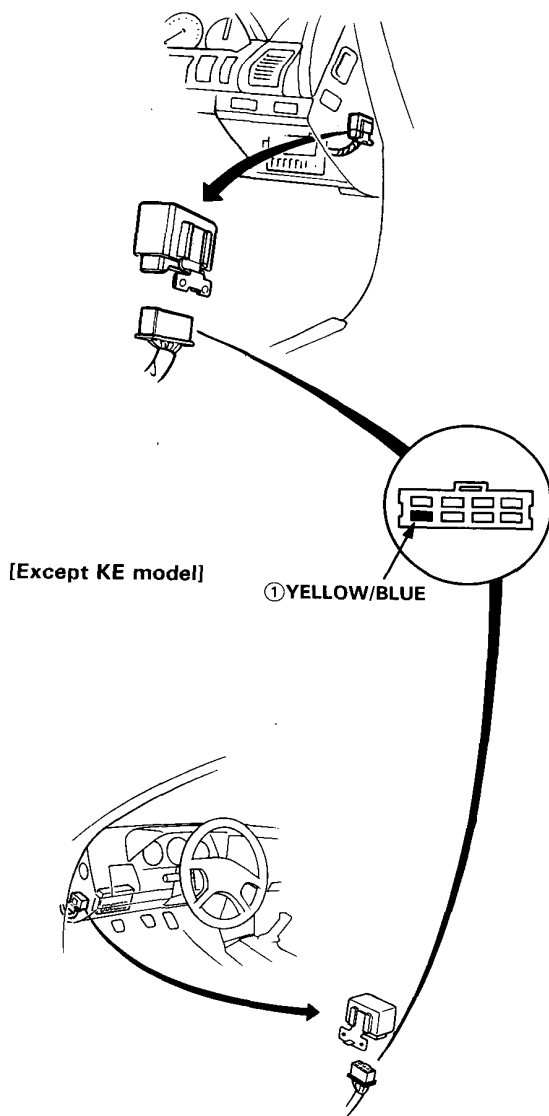




## Harness Testing

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.

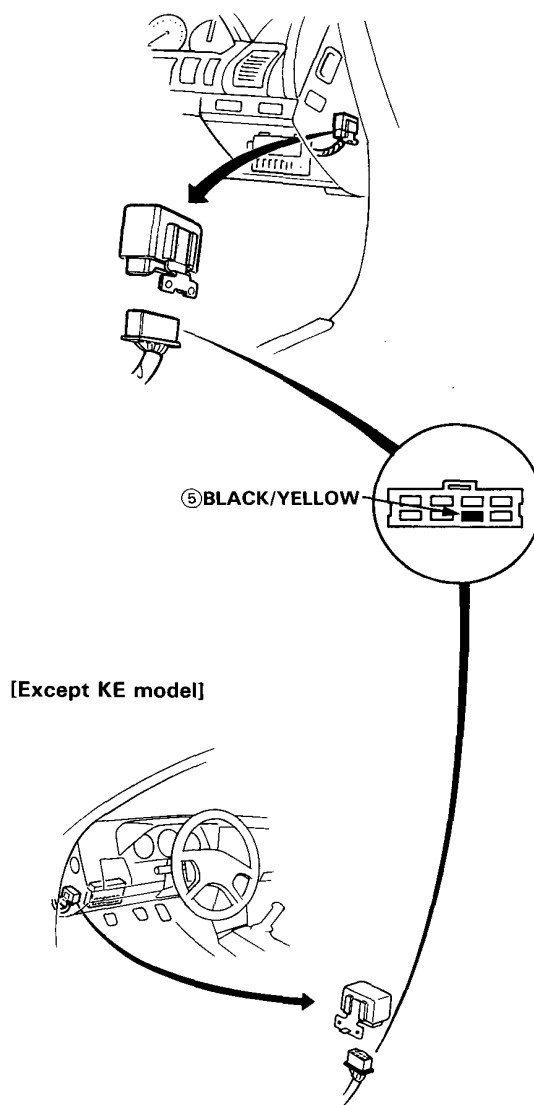
[KE model]



[Except KE model]

4. Connect the positive terminal of the tester to the Black/Yellow wire ⑤ of the coupler and ground the negative terminal 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)

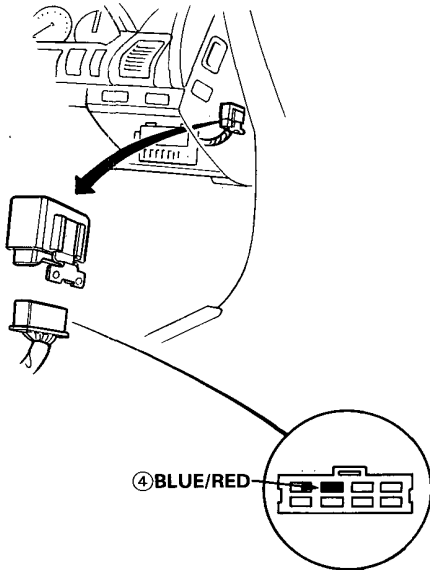


# Fuel System

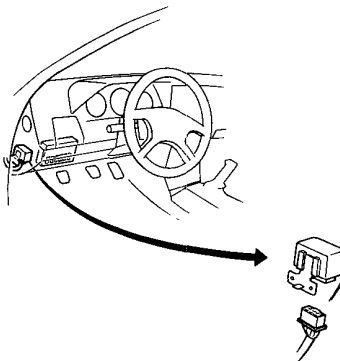
## Harness Testing (cont'd)

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]

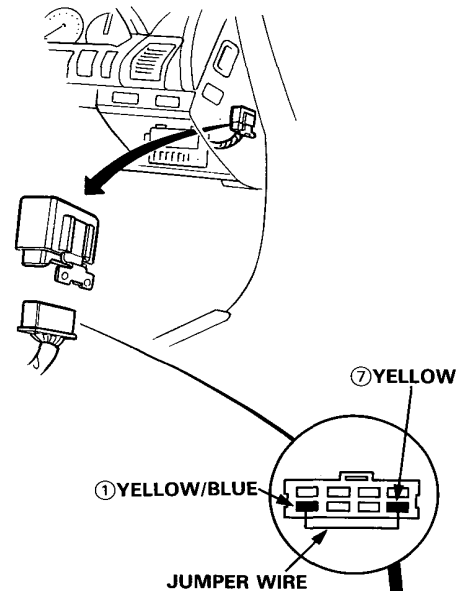


[Except KE model]

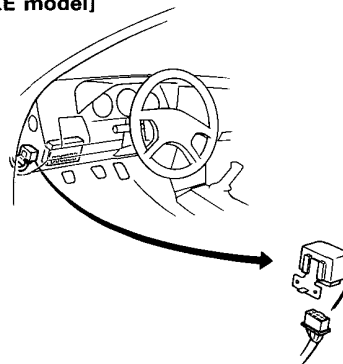


7. Turn the ignition switch to START position.
  - The tester should indicate battery voltage.
  - If there is no voltage, check the wiring between the ignition switch and main relay as well as No. 10 fuse.
8. Connect a jumper wire between the Yellow/Blue wire ① and Yellow wire ⑦ in the coupler.
  - 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]



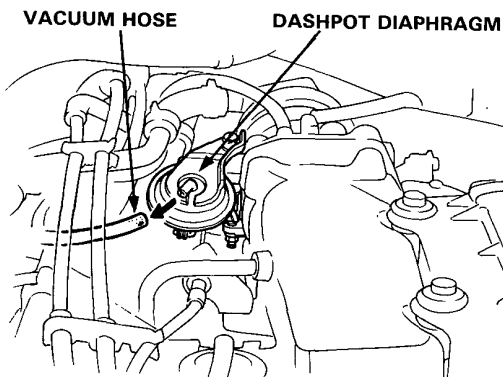




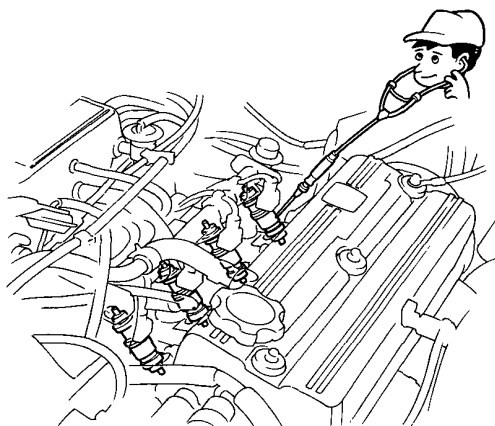
## Emission Controls

### 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.

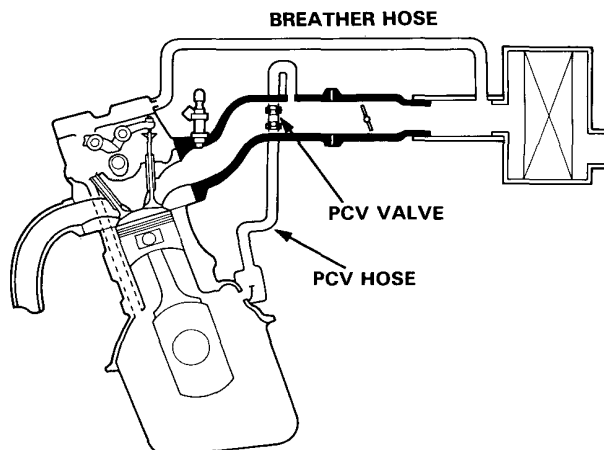


4. While listening to an injector, raise the engine speed to 3,000 min<sup>-1</sup> (rpm) then release the throttle; the clicking of the injector should cease momentarily when releasing the throttle.
- If the clicking does not cease, check the ECU, throttle angle sensor, or wiring between the injector and ECU. Consult the Troubleshooting Chart according to the pattern of the self-diagnosis indicator on the ECU (page 12-17).

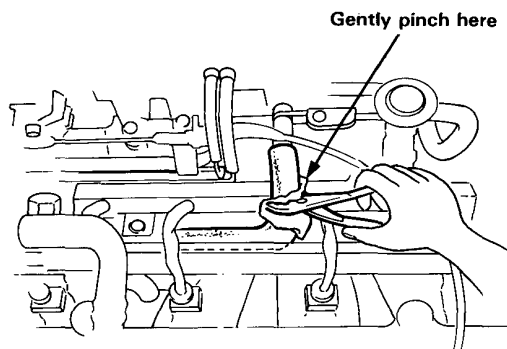
### Crankcase Controls

#### 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.



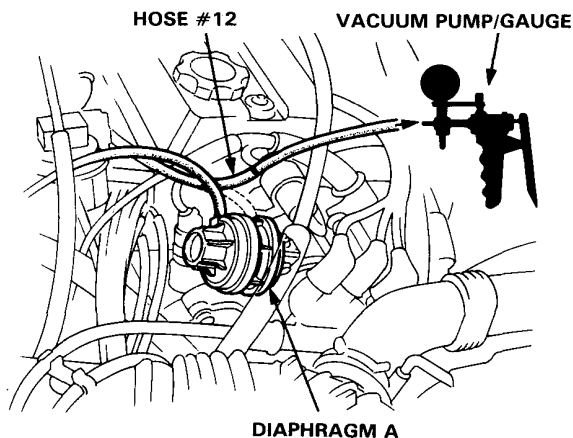
# Emission Controls

## 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.

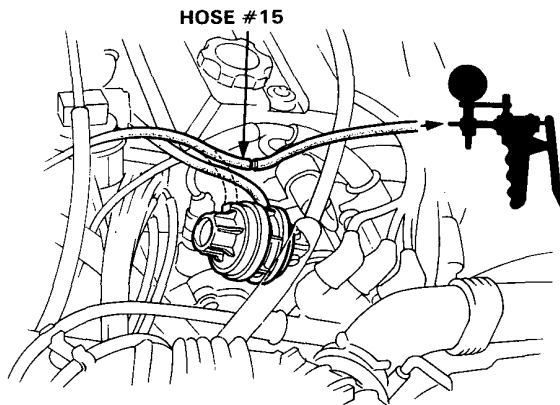


2. Start the engine, allow it to idle and check for vacuum.

There should be vacuum.

- If there is no vacuum, check the vacuum line for leaks, blockage or a disconnected hose and re-test.
- 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<sup>-1</sup> (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).





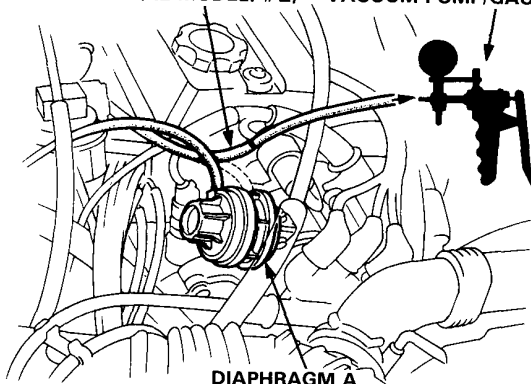
### [Except KX Model]

#### 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.

**HOSE #12 (KE MODEL: #2) VACUUM PUMP/GAUGE**



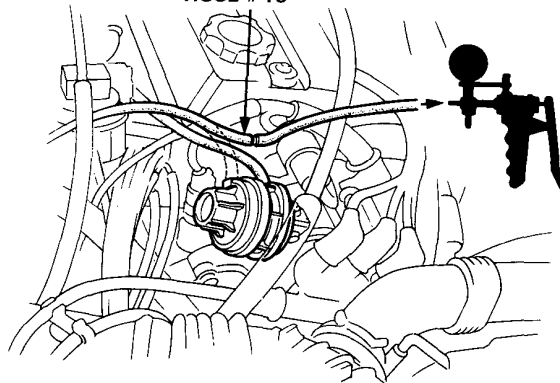
2. Start the engine, allow it to idle and check for vacuum.

There should be vacuum.

- If there is no vacuum, check the vacuum line for leaks, blockage or a disconnected hose and re-test.
- 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.

**HOSE #15**



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)



# Emission Controls

## 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.

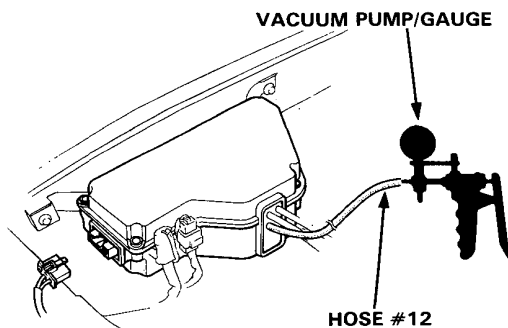
#### [Except KX Model]

- Whenever the coolant temperature is below 60°C (140°F) and the intake air temperature is below 20°C (68°F).

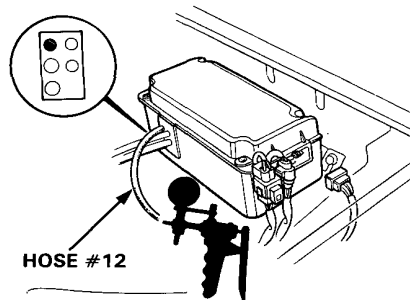
When the valve is open, 9 V or more should be available between the Black/Yellow terminal (+) and White terminal (–) of the main harness at the control box.

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]



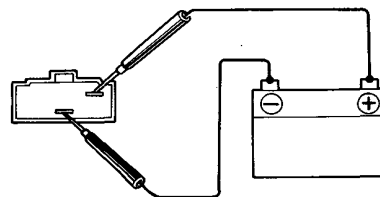
#### [KE Model]



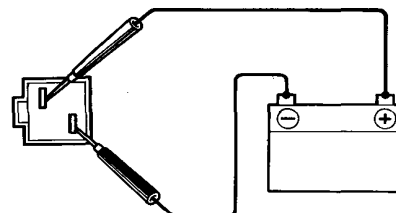
4. Connect the battery positive terminal to the Black/Yellow terminal of the control box coupler, and the battery negative terminal to the Yellow/Green terminal.
5. Apply vacuum to the hose.  
It should not hold vacuum.  
If it holds vacuum, replace the valve.

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, replace the solenoid valve.

#### [Except KE model]



#### [KE model]





## Transaxle

### Clutch

Illustrated Index .....	13-2
Clutch Adjustment .....	13-3
Release Bearing .....	13-4
Pressure Plate .....	13-6
Clutch Disc .....	13-7
Flywheel .....	13-8

### Manual Transmission

Removal .....	14-2
Illustrated Index .....	14-4
Disassembly .....	14-6
Reassembly .....	14-25
Installation .....	14-31

### Automatic Transmission

Description .....	15-2
Troubleshooting .....	15-4
Road Test .....	15-6
Pressure Test .....	15-7
Maintenance .....	15-8
Illustrated Index .....	15-10
Torque Converter .....	15-60
Installation .....	15-61
Neutral/Back-Up Light Switch .....	15-63
Shift Cable Adjustment .....	15-66
Throttle Control Cable Bracket Adjustment/Installation .....	15-67

### Differential

Illustrated Index .....	16-2
Inspection/Disassembly .....	16-5
Reassembly .....	16-6
Installation .....	16-8

### Driveshafts

Removal .....	17-2
Disassembly/Inspection .....	17-3
Reassembly .....	17-4





## Clutch

Illustrated Index .....	13-2
Clutch Adjustment .....	13-3
Release Bearing .....	13-4
Pressure Plate .....	13-6
Clutch Disc .....	13-7
Flywheel .....	13-8
Flywheel and Clutch .....	13-8

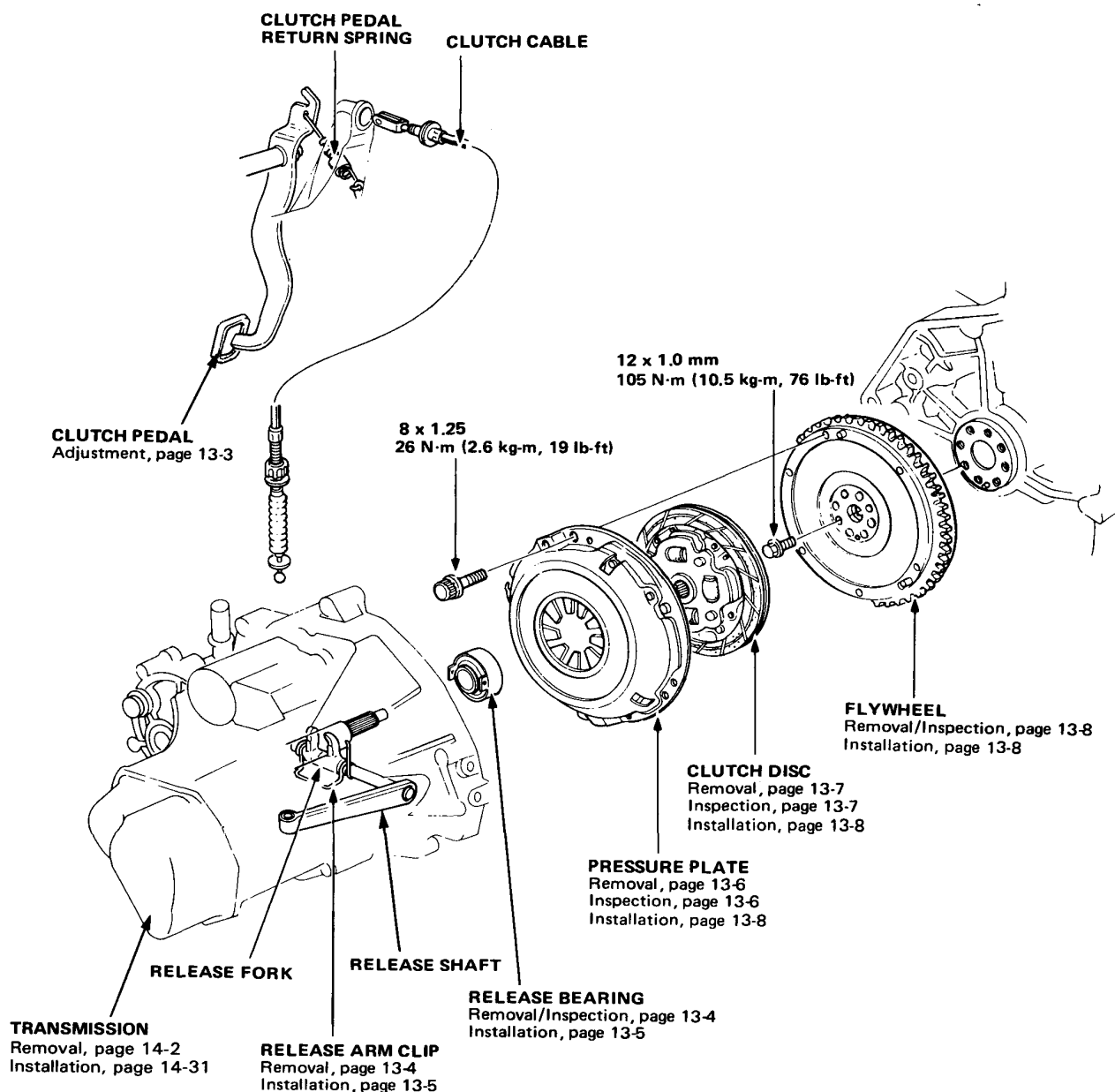




# Clutch

## Illustrated Index

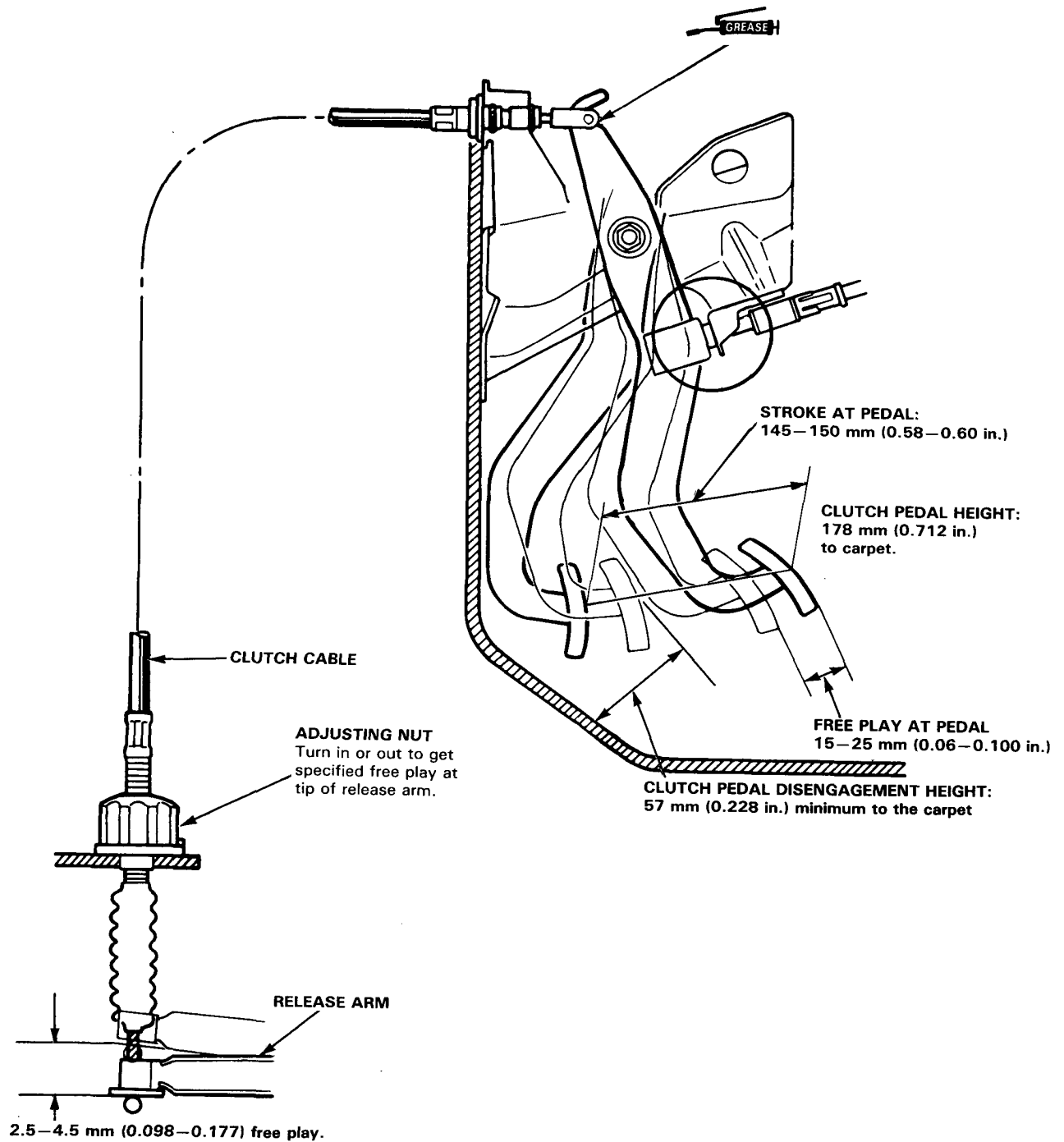
NOTE: Whenever the transmission is removed, the release bearing sliding surface should be cleaned and greased.







## Adjustment

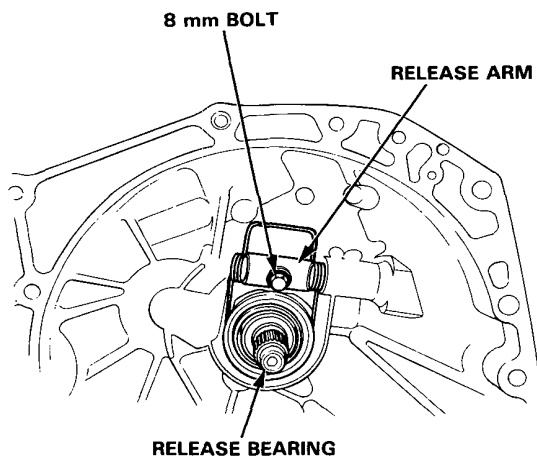




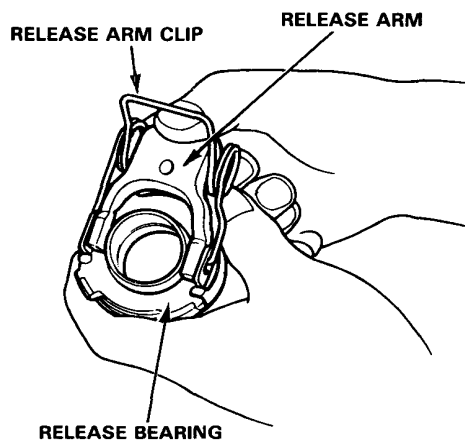
# Release Bearing

## Removal

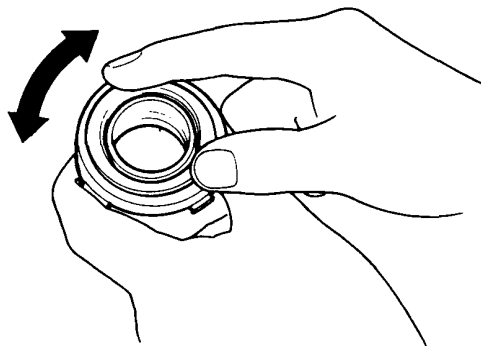
1. Remove the 8 mm special bolt.



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.

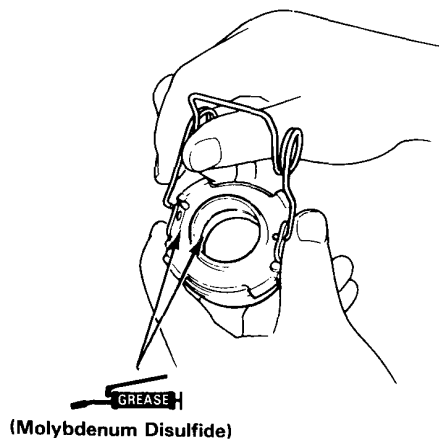
**CAUTION: The bearing is packed with grease. Do not wash it in solvent.**



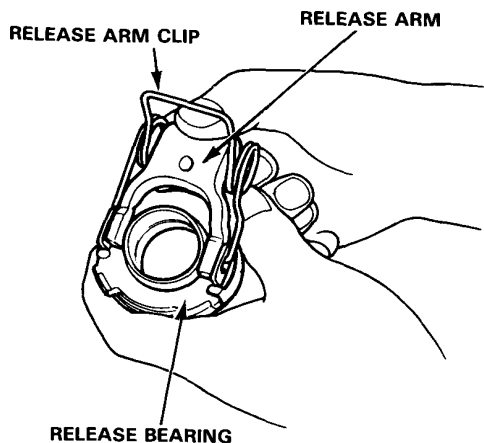


## Installation

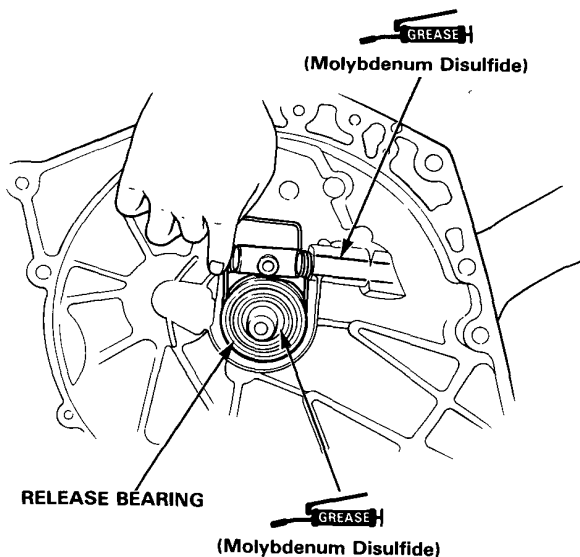
1. Align the release arm with the locating holes of the release bearing.



2. Install the release arm clip in the locating holes as shown.



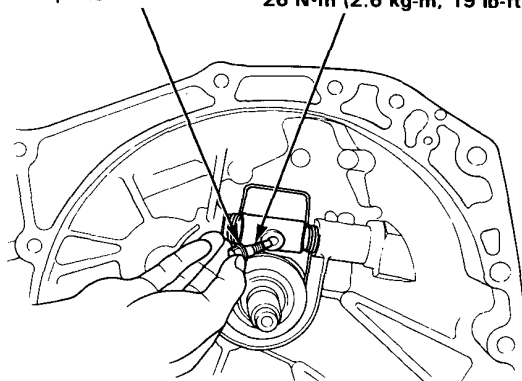
3. Install the release shaft and the release bearing.



4. Align the release shaft and release arm, then install a new spring washer and bolt.

SPRING WASHER  
Replace

8 x 1.25 mm  
26 N·m (2.6 kg-m, 19 lb-ft)



5. Move the release arm up and down to make sure the fork fits properly against the bearing, and that the bearing slides freely.

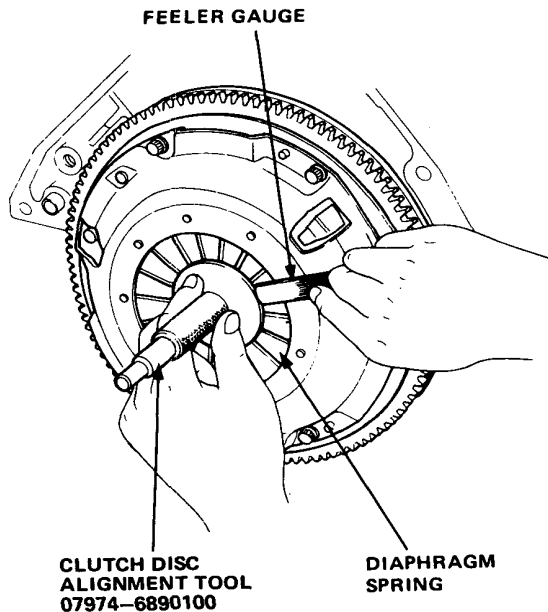


# Pressure Plate

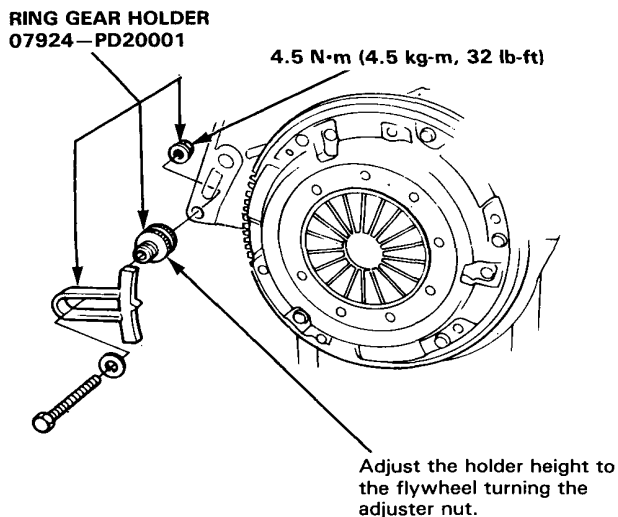
## Removal/Inspection

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.

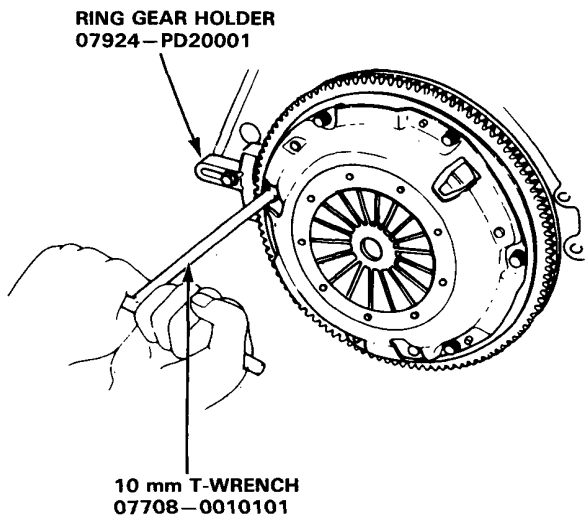
**Service Limit: 1.0 mm (0.04 in.) Max.**



3. Install the Ring Gear Holder.

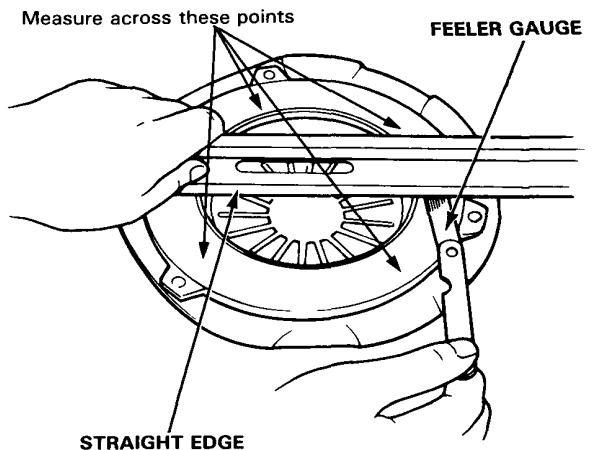


4. To prevent warping, unscrew the pressure plate mounting bolts two turns at a time in a crisscross pattern using a 10 mm T-wrench, then remove the pressure plate and clutch disc.



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.**



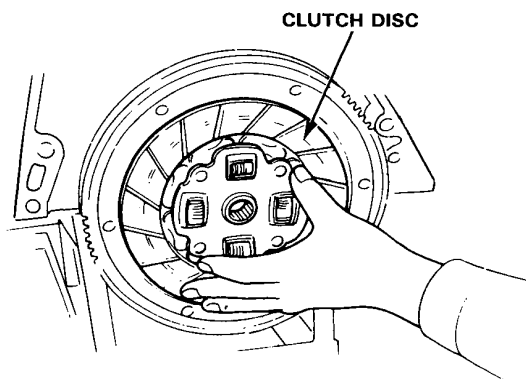


# Clutch Disc



## Inspection

1. Inspect lining of the clutch disc for signs of slipping or oil. Replace it if it is burned black or oil soaked.

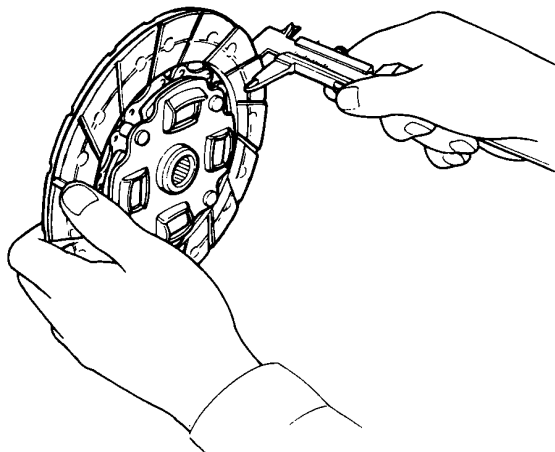


2. Measure the clutch disc thickness.

### Clutch Disc Thickness:

**Standard (New):** 8.1–8.8 mm (0.32–0.35 in.)

**Service Limit:** 5.7 mm (0.22 in.)

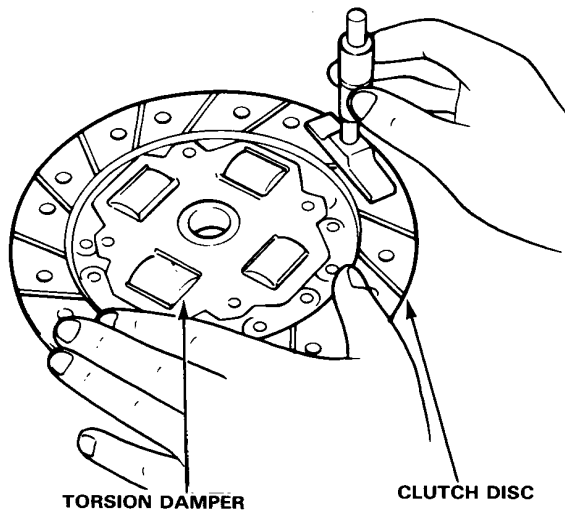


3. Check for loose rubber torsion dampers. Replace the clutch disc if any are loose.
4. Measure the depth from the lining surface to the rivets, on both sides.

### Rivet Depth:

**Standard (New):** 1.3 mm (0.051 in.) min.

**Service Limit:** 0.2 mm (0.008 in.)





# Flywheel

## Inspection/Removal

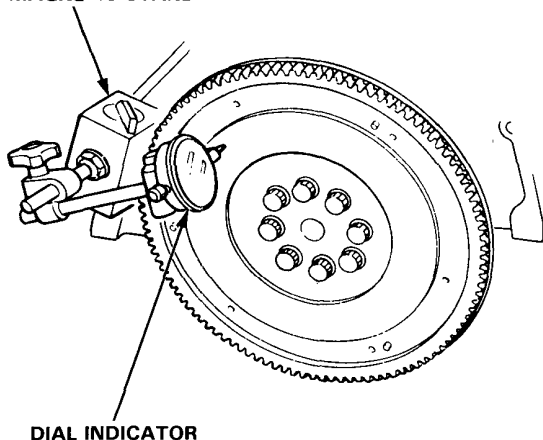
1. Inspect the ring gear teeth for wear or damage.
2. Inspect the clutch disc mating surface on the flywheel for wear, cracks or burning.
3. Measure the flywheel runout using a dial indicator through at least two full turns. Push it against the flywheel each time you turn it to take up the crankshaft 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.)

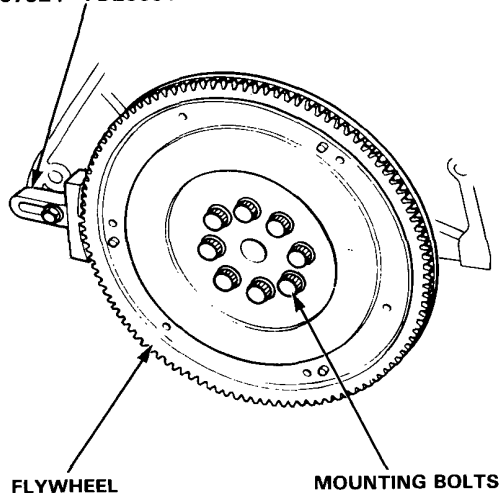
MAGNETIC STAND



DIAL INDICATOR

4. Remove the eight flywheel mounting bolts and flywheel.

RING GEAR HOLDER  
07924-PD20001



FLYWHEEL

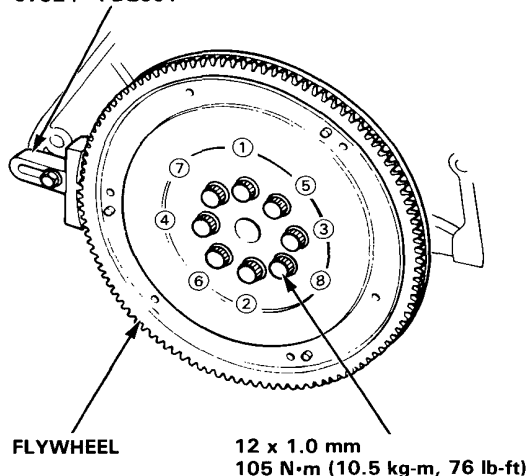
MOUNTING BOLTS

# 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.

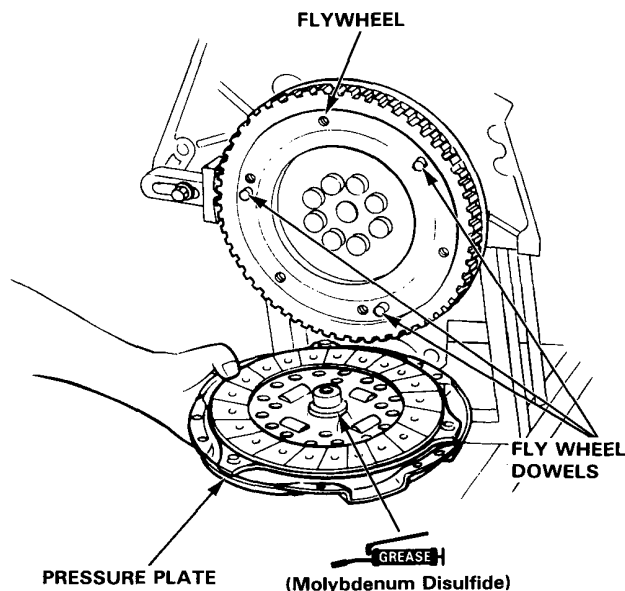
RING GEAR HOLDER  
07924-PD2001



FLYWHEEL

12 x 1.0 mm  
105 N·m (10.5 kg-m, 76 lb-ft)

3. Install the clutch disc and pressure plate by aligning the flywheel dowels with dowel holes in the pressure plate.



FLYWHEEL

PRESSURE PLATE

GREASE  
(Molybdenum Disulfide)

FLY WHEEL  
DOWELS

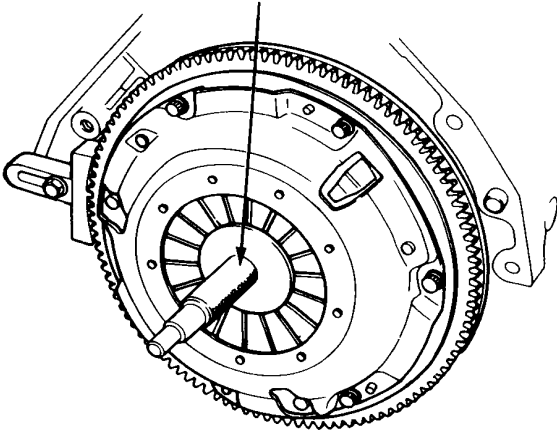
4. Install the attaching bolts finger tight.



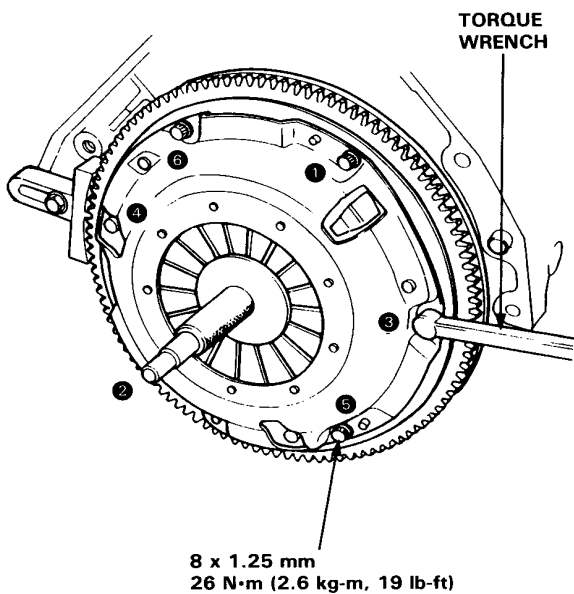


5. Insert the Clutch Disc Alignment Tool in the splined hole in the clutch disc.

**CLUTCH DISC ALIGNMENT TOOL  
07974-6890100**



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 .....	14-2
Transmission Assy	
Removal .....	14-2
Illustrated Index .....	14-4
Transmission Housing	
Disassembly .....	14-6
Reverse Fork	
Shift Shaft Clearance .....	14-8
Differential Oil Seal	
Removal .....	14-10
Bearings and Seals	
Replacement (Clutch Housing) .....	14-10
Bearings	
Replacement (Trans Housing) .....	14-12
Mainshaft Index .....	14-13
Countershaft Index .....	14-14
Synchronizer Sleeve, Shift Shaft .....	14-16
Mainshaft Inspection .....	14-17
Countershaft Inspection .....	14-17
Mainshaft/Countershaft	
Reassembly and Measurement .....	14-18
Shift Arm Holder Index .....	14-22
Shift Arm/Selector Arm .....	14-23
Shift Rod and Shift Arm Holder .....	14-23
Shift Arm/Gear Selector Arm .....	14-24
Shift Rod .....	14-24
Shift Arm Holder Assy .....	14-25
Transmission Assy	
Reassembly .....	14-25
Differential Oil seal	
Installation .....	14-30
Transmission Assy	
Installation .....	14-31
Gearshift Mechanism .....	14-32
Back-up Light Switch .....	14-33





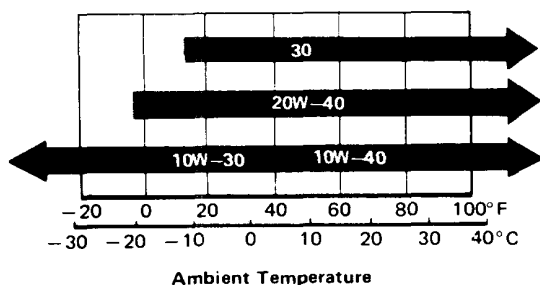
# Maintenance

## 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.

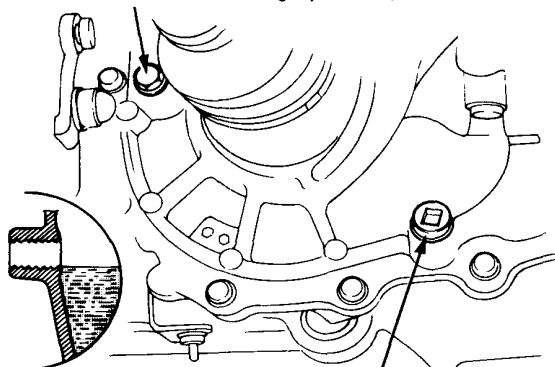
NOTE: Drain plug washer should be replaced at every oil change.

## Oil Capacity

- 2.5ℓ (2.5 U.S. qt.) after drain.
- 2.6ℓ (2.6 U.S. qt.) after overhaul.

### OIL FILLER PLUG

20 x 15 mm 45 N·m (4.5 kg-m, 33 lb-ft)



**DRAIN PLUG 14 x 1.5 mm**  
40 N·m (4.0 kg-m, 29 lb-ft)

# Transmission Assy

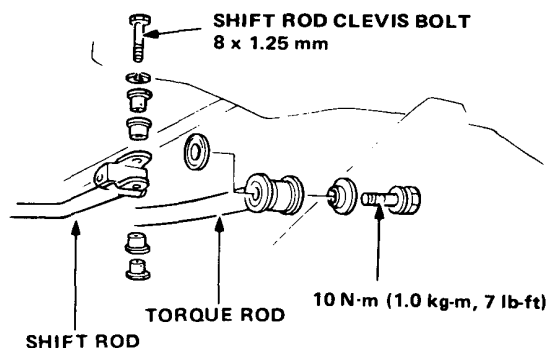
## Removal

### 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.

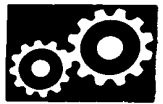
### Car Raised on Hoist

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.



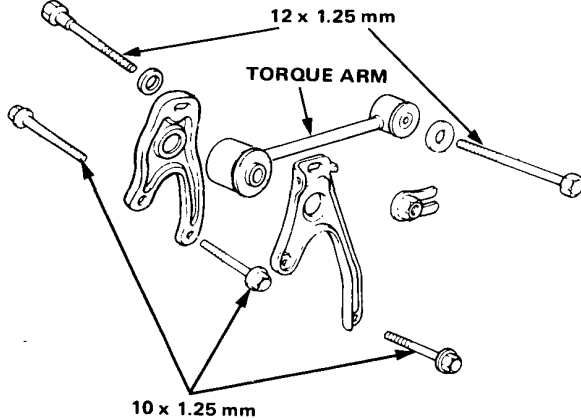
13. Disconnect the tie-rod ball joints and remove using the Ball Joint Remover (page 20-8).
14. Remove the lower arm ball joint bolt from the right-side lower control arm, then use a puller to disconnect the ball joint from the knuckle. Remove the damper fork bolt (page 20-17).



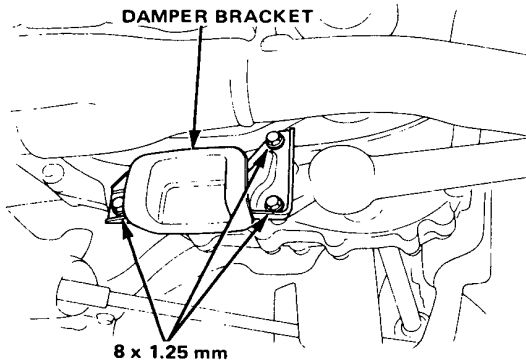


15. Turn each steering knuckle to its most outboard position. With screwdriver, pry right-side CV joint out approximately 1/2", then pull sub-axle out of transmission housing. Repeat on opposite side. Remove the right-side radius rod.

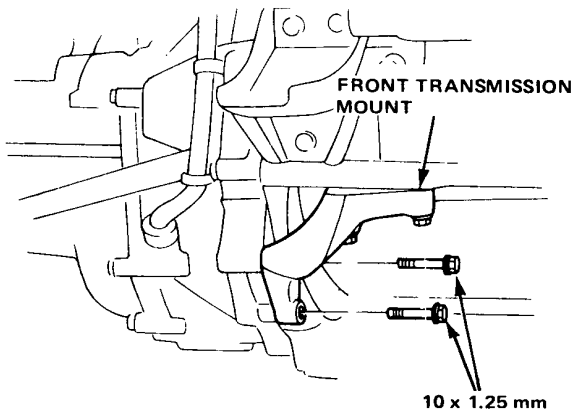
16. Remove the torque arm bracket bolts from the clutch housing.



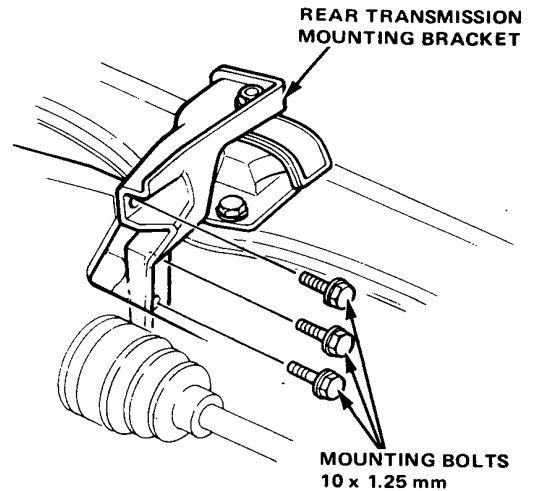
17. Remove the damper bracket from the transmission.



18. Remove the clutch housing bolts from the front transmission mount.



19. Remove the clutch housing bolts from the rear transmission mounting bracket.

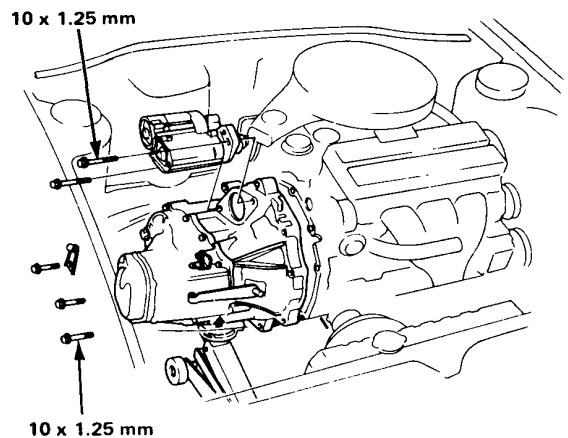


20. Remove the clutch cover.

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.

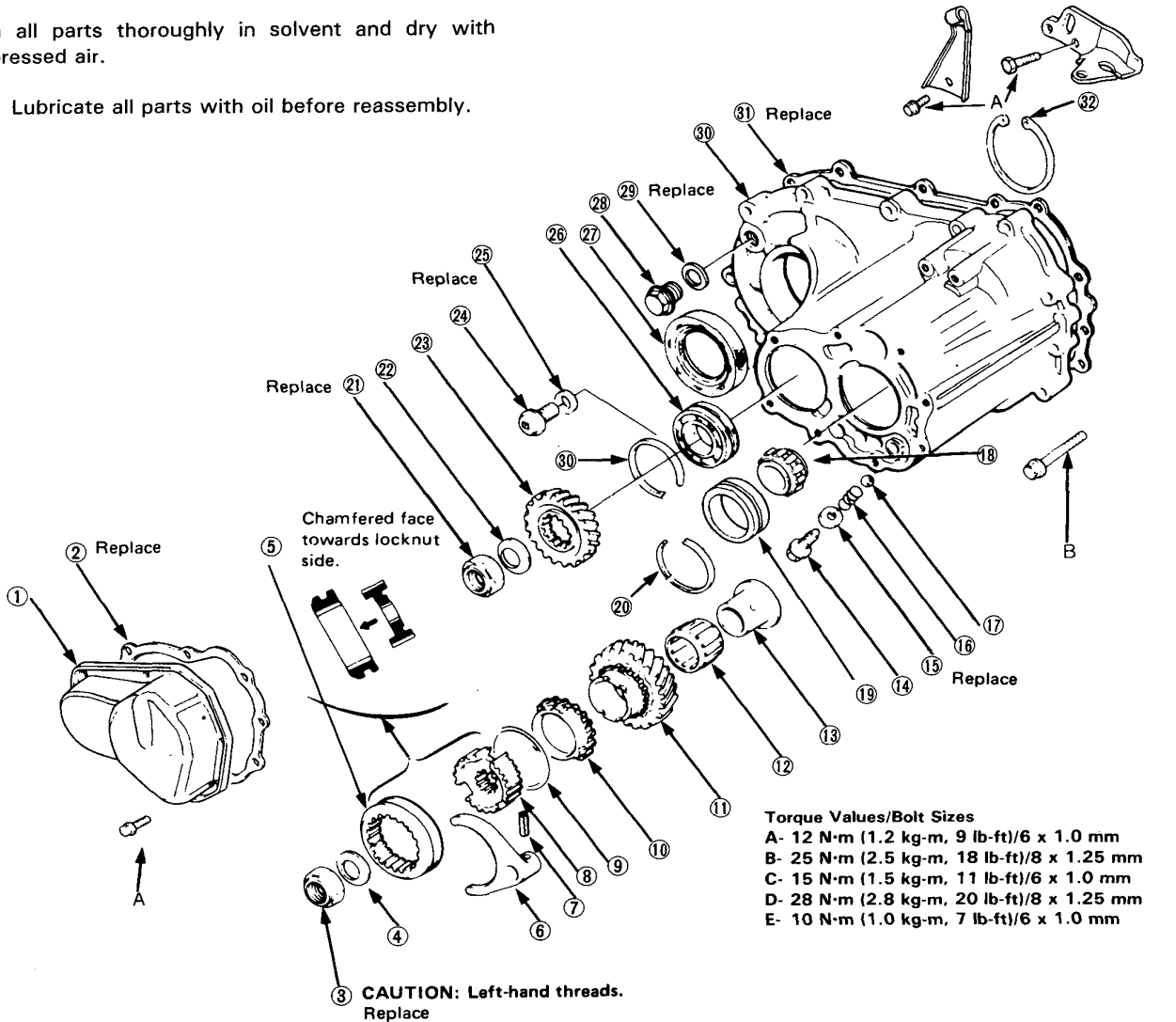




## Illustrated Index

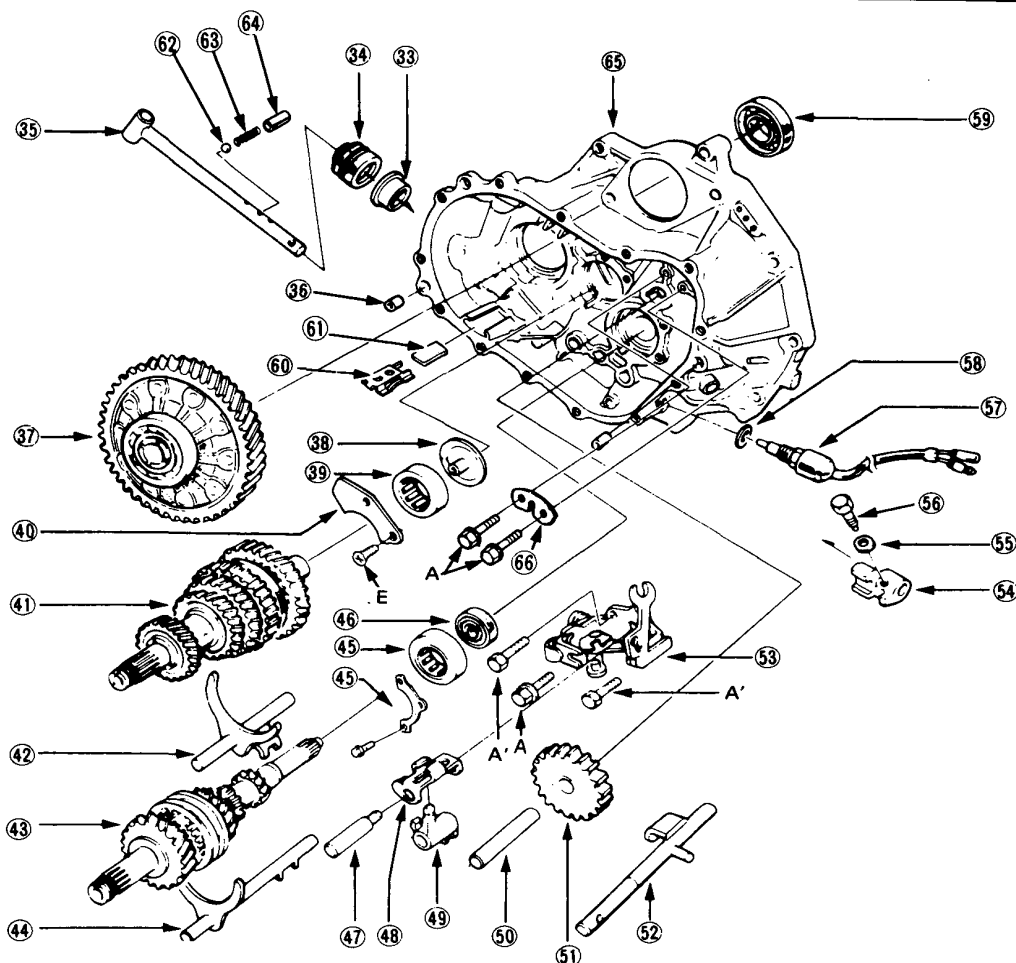
Clean all parts thoroughly in solvent and dry with compressed air.

**Lubricate all parts with oil before reassembly.**



- |  |  |  |
|--|--|--|
| <b>① END COVER</b><br>Removal, Page 14-6<br>Installation, Page 14-29                 | <b>⑩ FIFTH GEAR SYNCHRO RING</b><br>Inspection, Page 14-15         | <b>②③ SPRING WASHER</b>  |
| <b>② GASKET</b>  | <b>⑪ MAINSHAFT FIFTH GEAR</b><br>Removal, Page 14-7                | <b>②④ COUNTERSHAFT FIFTH GEAR</b>  |
| <b>③ LOCKNUT</b><br>Removal, Page 14-6<br>Installation, Page 14-29                   | <b>⑫ NEEDLE BEARING</b>  | <b>②⑤ DRAIN PLUG</b><br>40 N·m (4.0 kg-m, 29 lb-ft)                                  |
| <b>④ SPRING WASHER</b>   | <b>⑬ SPACER COLLAR</b>   | <b>②⑥ WASHER 14 mm</b>   |
| <b>⑤ FIFTH GEAR SYNCHRO SLEEVE</b><br>Removal, Page 14-7<br>Installation, Page 14-29 | <b>⑭ RETAINING SCREW</b><br>22 N·m (2.2 kg-m, 16 lb-ft)            | <b>②⑦ BALL BEARING</b><br>Replacement, Page 14-12                                    |
| <b>⑥ FIFTH GEAR SHIFT FORK</b><br>Removal, Page 14-7<br>Installation, Page 14-29     | <b>⑮ WASHER 12 mm</b>  | <b>②⑧ OIL SEAL</b><br>Removal, Page 14-10<br>Installation, Page 14-30                |
| <b>⑦ SPRING PIN</b>  | <b>⑯ SPRING</b>  | <b>②⑨ OIL FILLER BOLT</b><br>45 N·m (4.5 kg-m, 33 lb-ft)                             |
| <b>⑧ FIFTH GEAR SYNCRO HUB</b><br>Removal, Page 14-7<br>Installation, Page 14-28     | <b>⑰ DETENT BALL</b>   | <b>②⑩ WASHER 20 mm</b>   |
| <b>⑨ SYNCHRO SPRING</b>  | <b>⑱ BEARING OUTER RACE</b><br>Replacement, Page 14-12             | <b>③① TRANSMISSION HOUSING</b><br>Disassembly, Page 14-6<br>Installation, Page 14-27 |
|  | <b>⑲ SNAP RING 60 mm</b>   | <b>③② GASKET</b>   |
|  | <b>⑳ LOCKNUT</b><br>Removal, Page 14-6<br>Installation, Page 14-29 | <b>③③ SNAP RING 80 mm</b>  |





### 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

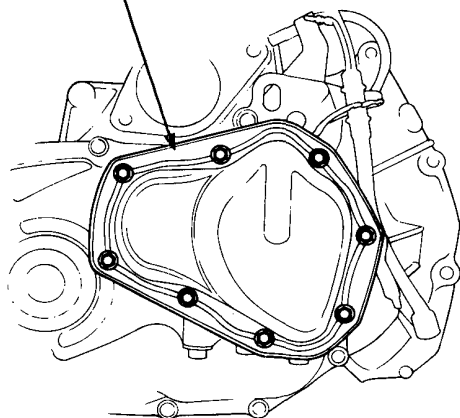


# Transmission Housing

## Disassembly

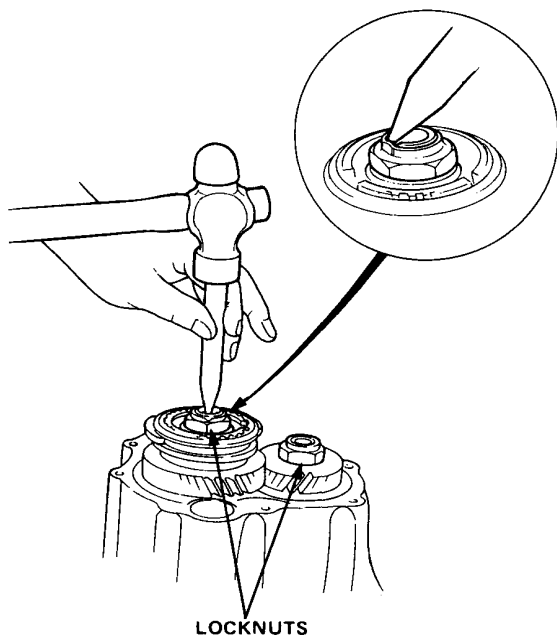
1. Remove transmission end cover.

END COVER  
(8 bolts, 6 x 1.0 mm)



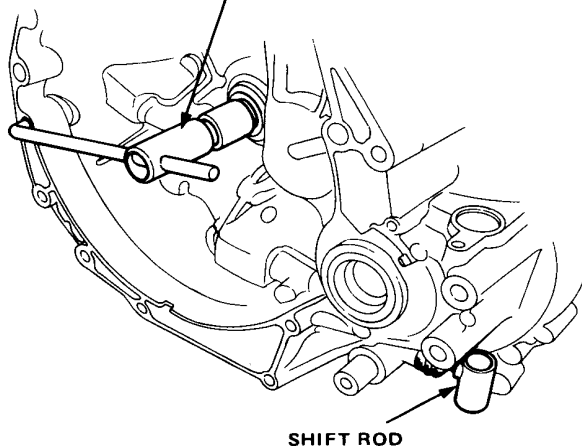
**NOTE:** Before removing mainshaft/countershaft locknuts, measure clearance between spacer collar and shoulder on fifth gear.

2. Bend locking tab on locknuts out of slots in mainshaft and countershaft.



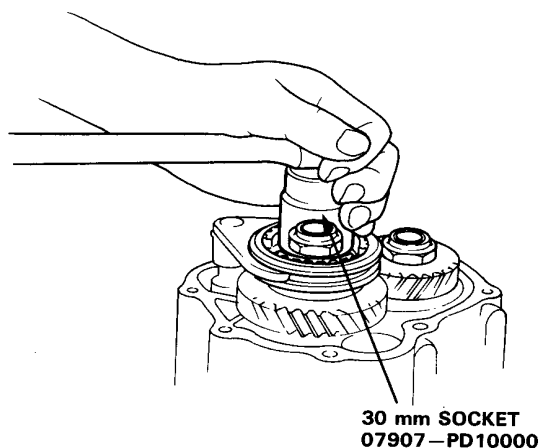
3. Install mainshaft holder.

MAINSHAFT HOLDER  
07923-6890101



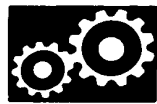
4. Shift transmission into reverse gear.
5. Remove locknuts.

**CAUTION:** The mainshaft locknut has left-hand threads.

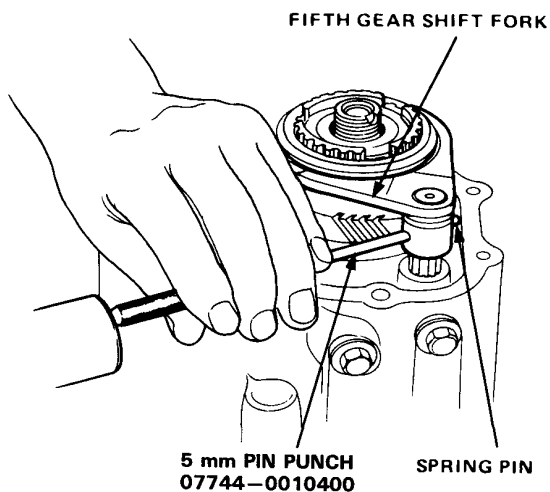


6. Remove mainshaft holder.

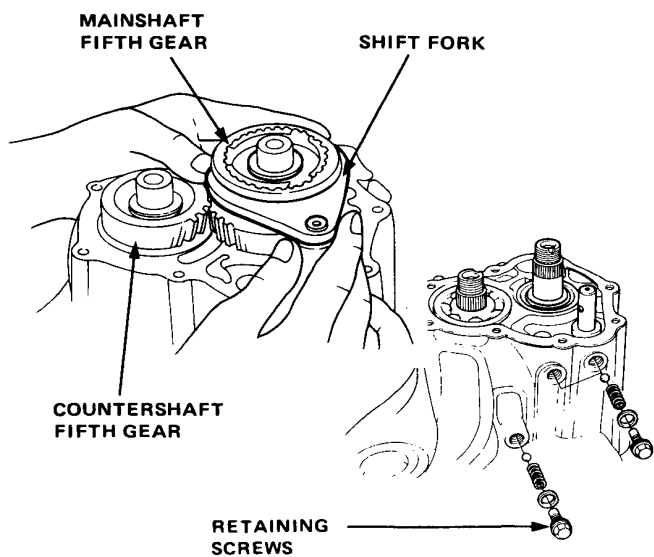




7. Drive out spring pin securing fifth gear shift fork to shaft.

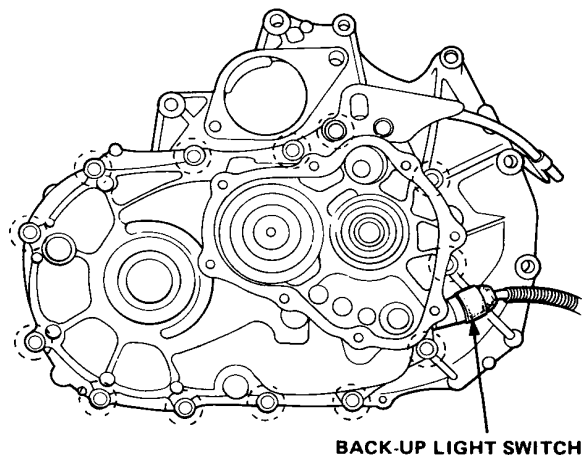


8. Remove mainshaft fifth gear, shift fork, synchronizer sleeve, hub, ring and spring as a unit.
9. Remove countershaft fifth gear.
10. Remove three retaining screws and detent balls.

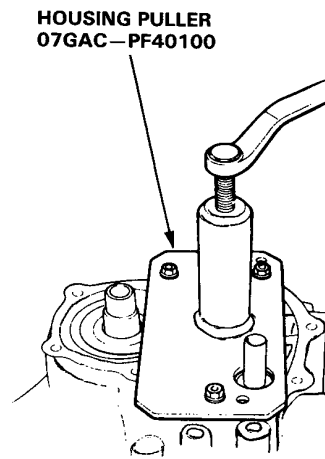


11. Remove back-up light switch.

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.)

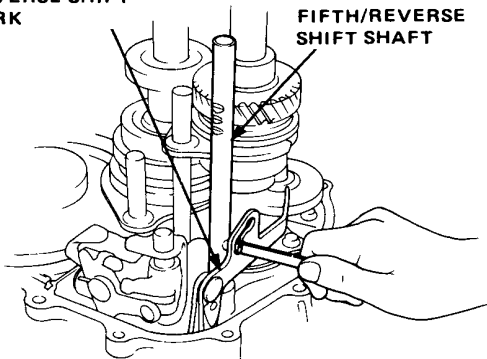
**Service Limit:** 0.5 mm (0.02 in.)

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.)

REVERSE SHIFT  
FORK

FIFTH/REVERSE  
SHIFT SHAFT



### Gear Clearance

1. Check reverse idler gear-to-shift fork clearance.

#### GEAR-TO-FORK CLEARANCE

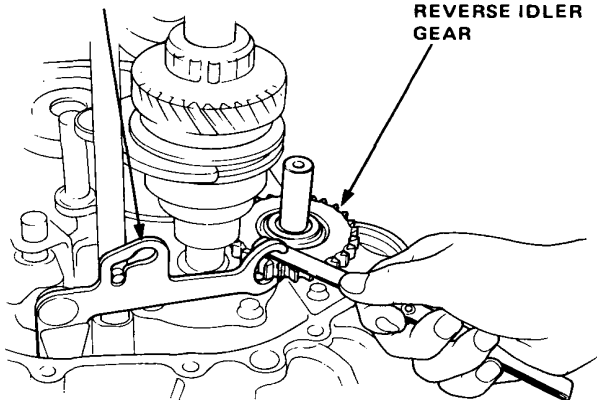
**Standard (New):** 0.2–1.0 mm (0.008–0.04 in.)  
**Service Limit:** 1.7 mm (0.07 in.)

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.)

REVERSE SHIFT FORK

REVERSE IDLER  
GEAR

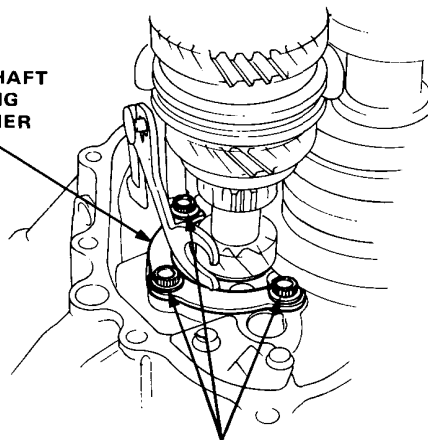


## Countershaft/Mainshaft

### Removal

1. Shift transmission into neutral.
2. Remove the mainshaft bearing retainer plate.

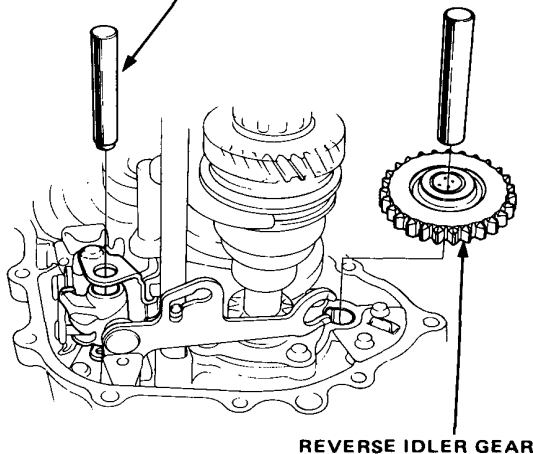
MAINSHAFT  
BEARING  
RETAINER



8 mm SPECIAL BOLTS

3. Pull out the shift guide shaft.
4. Pull out reverse idler shaft and remove gear.

SHIFT GUIDE SHAFT

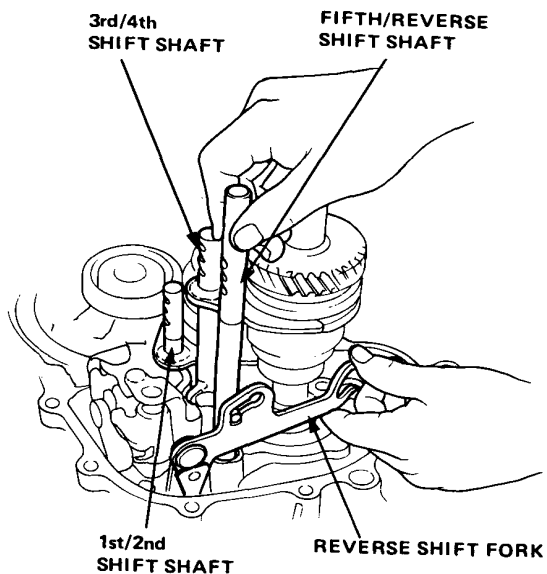


REVERSE IDLER GEAR

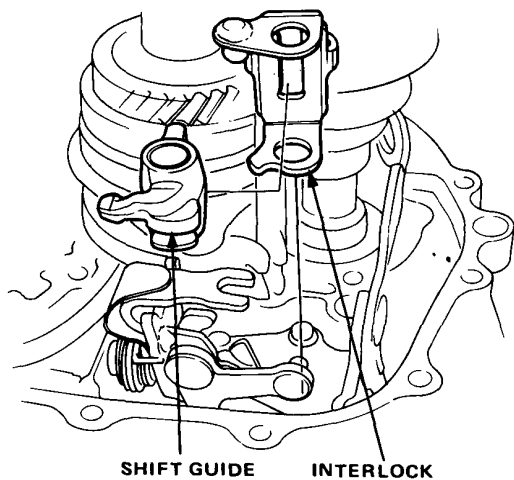




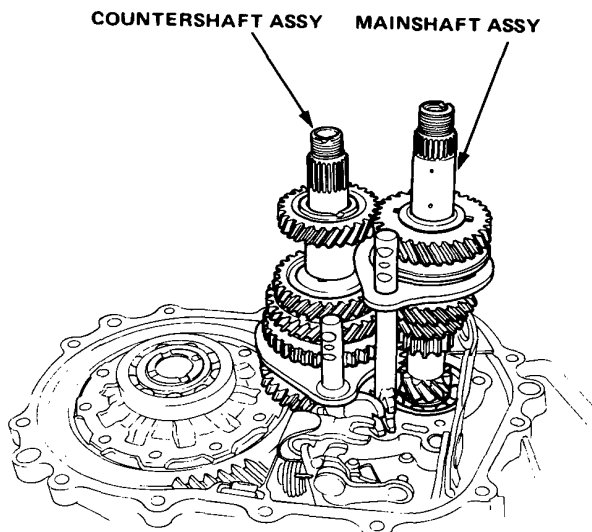
5. Pull the 3rd/4th and 1st/2nd shift shafts up, to shift into fourth and second.
6. Remove the 5th/reverse shift shaft by pulling it up while lifting the reverse shift fork.



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.

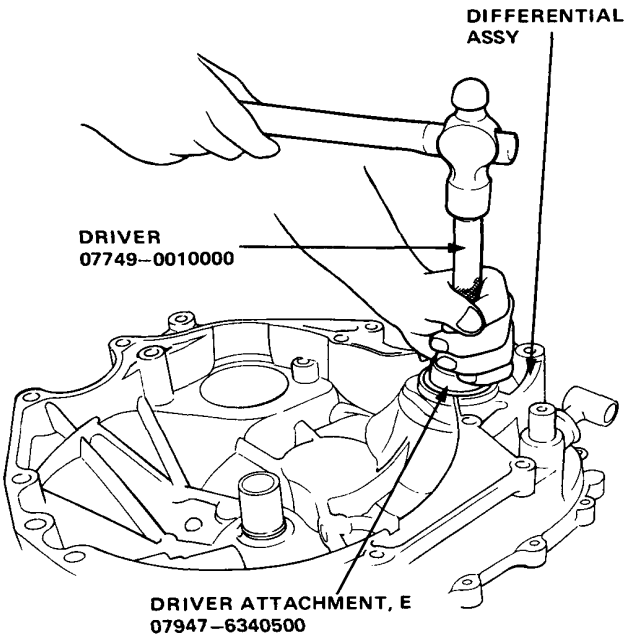




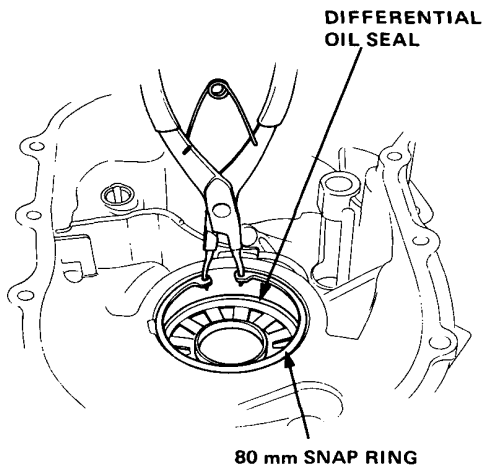
## Differential Oil Seal

### 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.



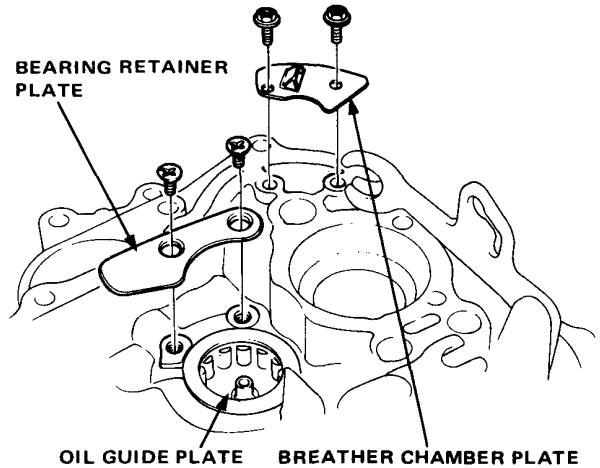
4. Drive the differential oil seal out of the transmission housing.

**NOTE:** Replace the differential oil seal in the transmission housing whenever disassembled.

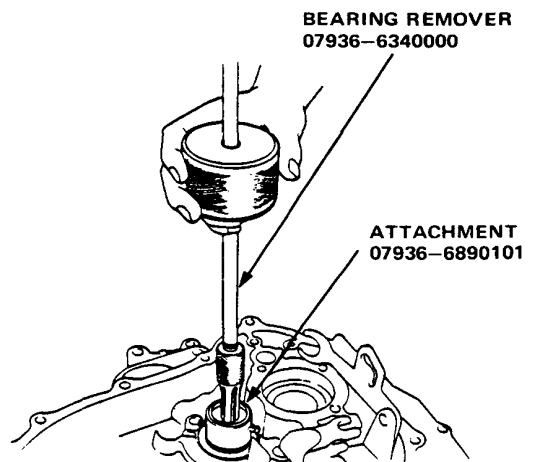
## Bearings and Seals

### 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.

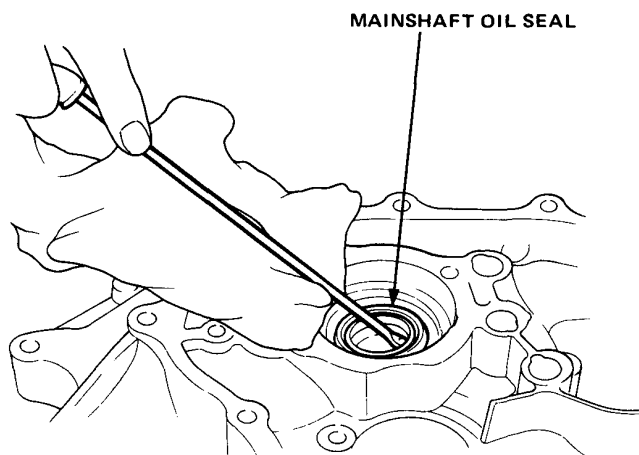






5. Remove mainshaft bearing and oil seal from clutch housing by prying out with a screwdriver.

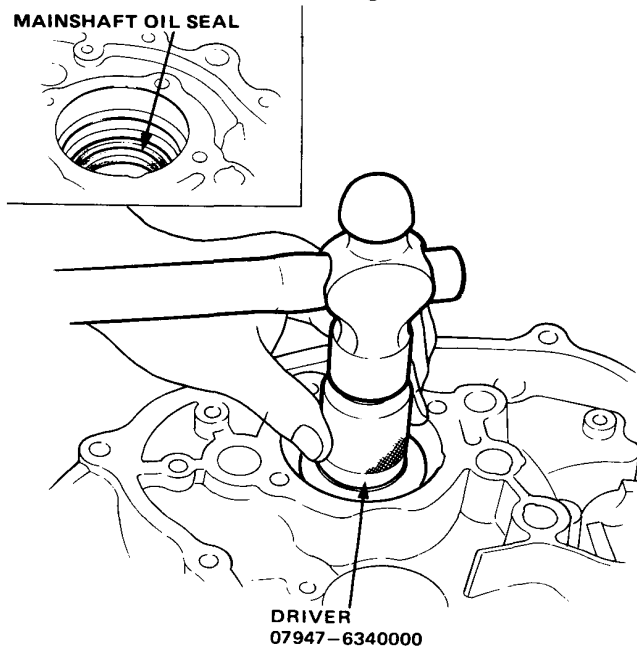
**NOTE:** Always install new oil seal. Do not reinstall old one.



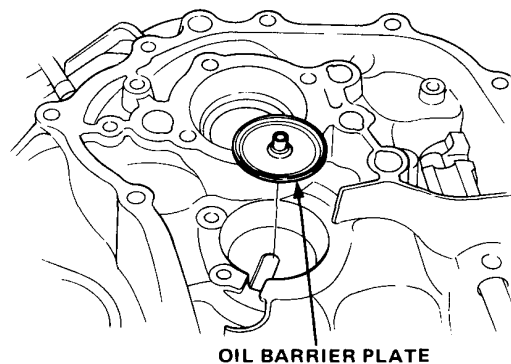
6. Install the mainshaft oil seal.

**NOTE:** Install the oil seal with the sealing lips facing the mainshaft bearing.

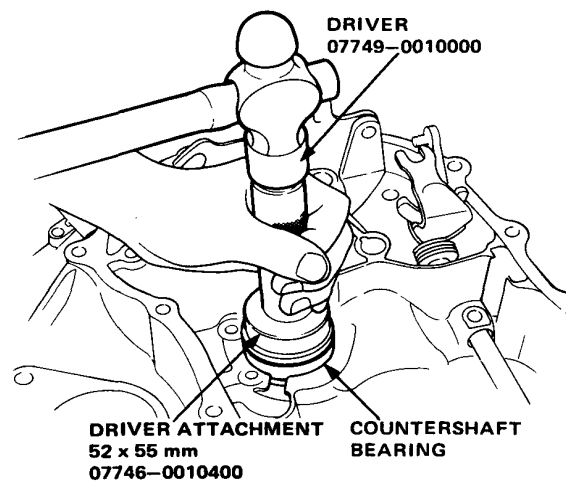
MAINSHAFT OIL SEAL



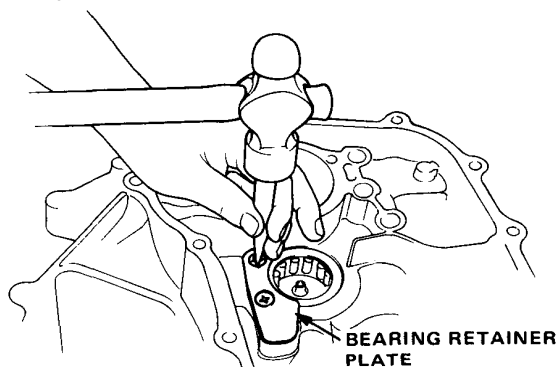
7. Install the countershaft oil barrier plate.



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.



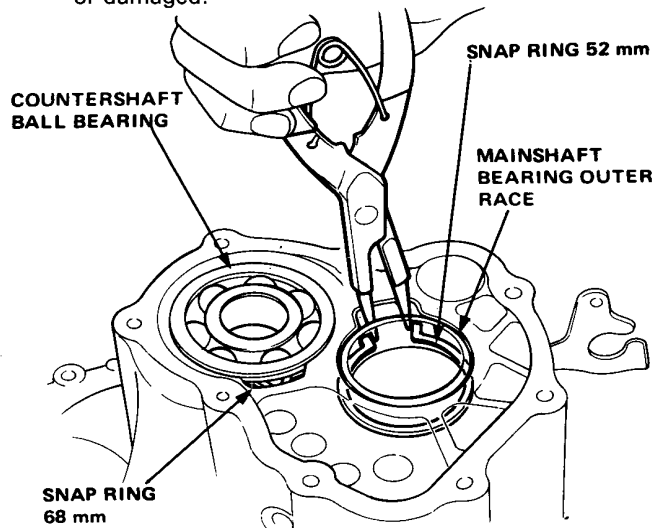
# Bearings

## Replacement (Trans Housing)

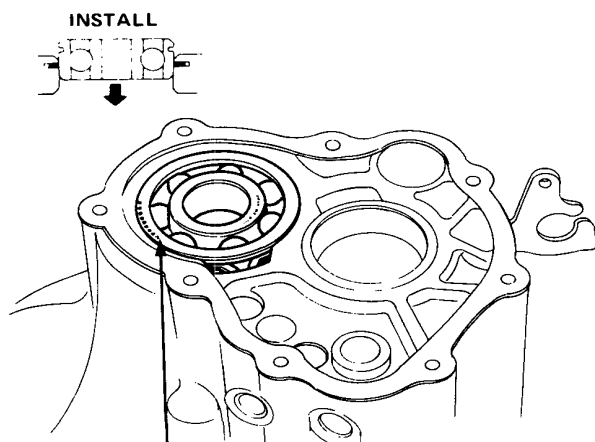
1. Using snap ring pliers, carefully expand the snap ring and press the bearing out into the case.

**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.

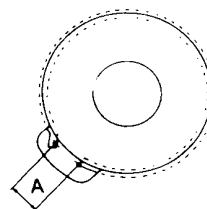
**NOTE:** Inspect the snap rings for wear. Replace any snap rings that are worn excessively or damaged.



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.



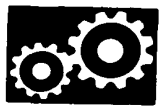
**NOTE:** To confirm proper snap ring seating and condition, measure snap ring gap A as installed:

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.



# Mainshaft

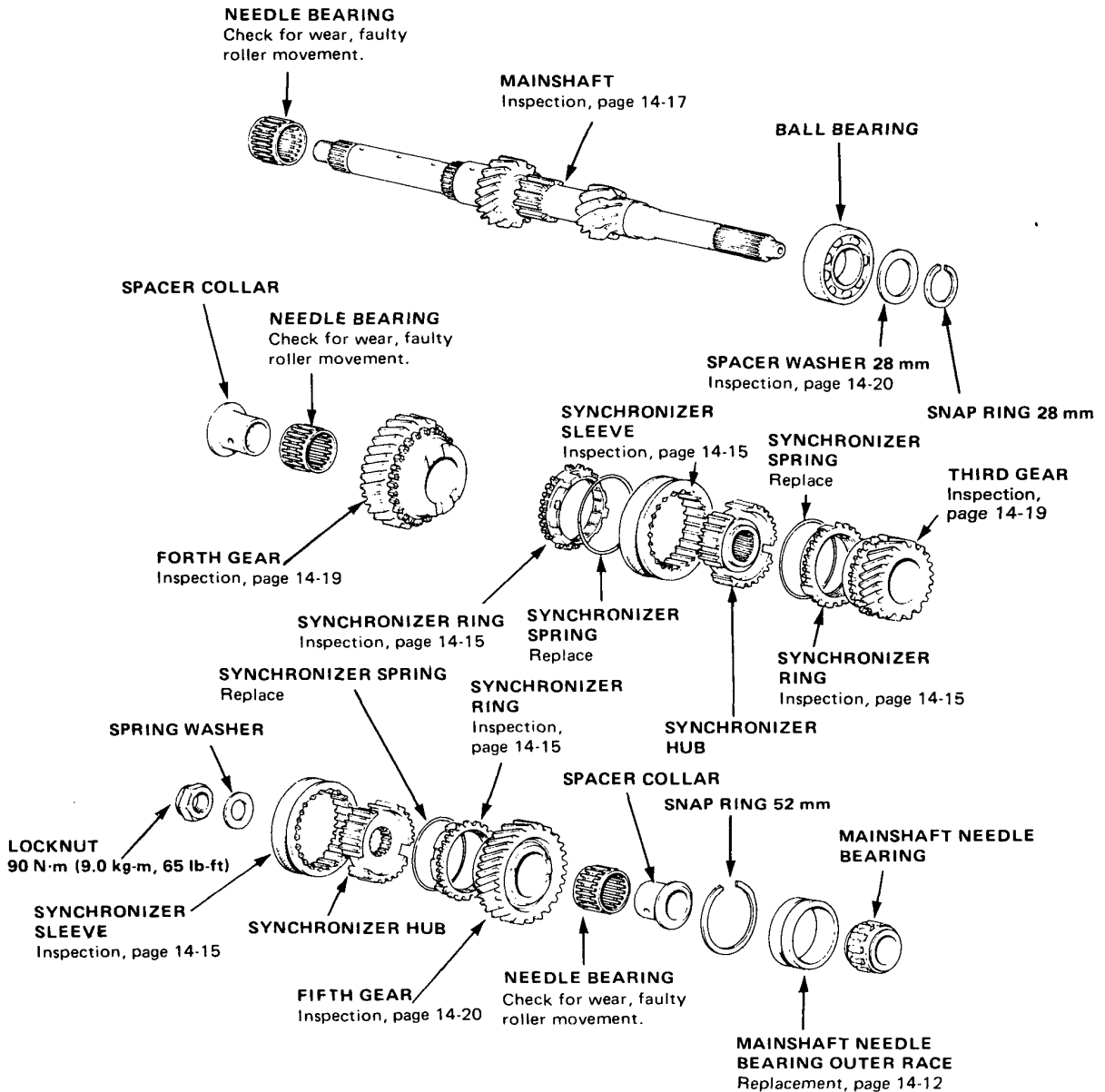


## Index

### 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.





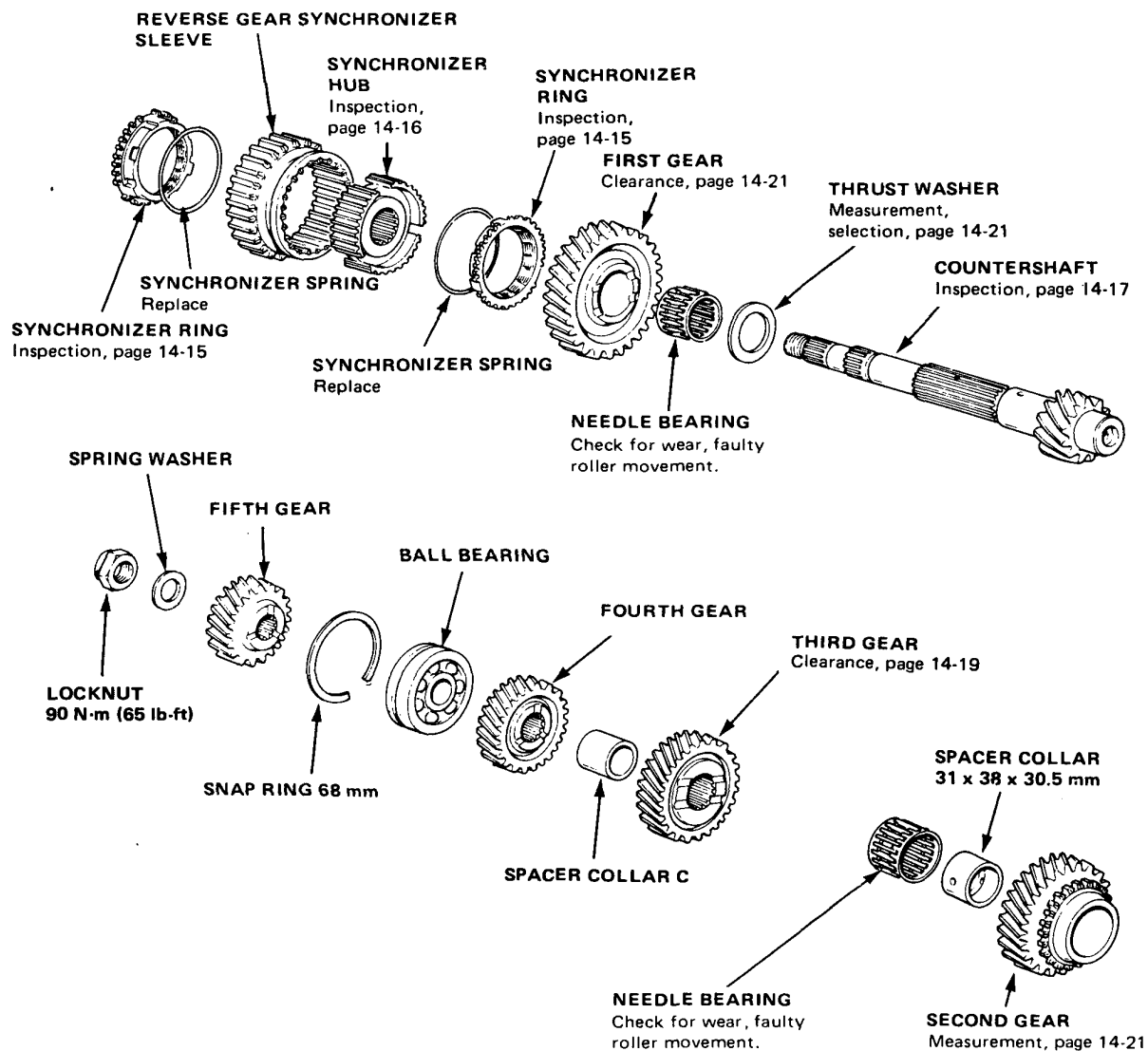
# Countershaft

## 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.





# Gear and Synchro Ring



## Inspections

1. Inspect the inside of synchronizer ring for wear.

SYNCHRONIZER RING

SYNCHRONIZER SPRING  
Replace

2. Inspect the synchronizer ring teeth and matching teeth on gear for wear (rounded off).

Wear

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.

GEAR

SYNCHRONIZER RING



# Synchronizer Sleeve, Shift Shaft

## Shift Fork to Synchronizer Sleeve Clearance

1. Check clearance between each shift fork and its matching synchronizer sleeve.

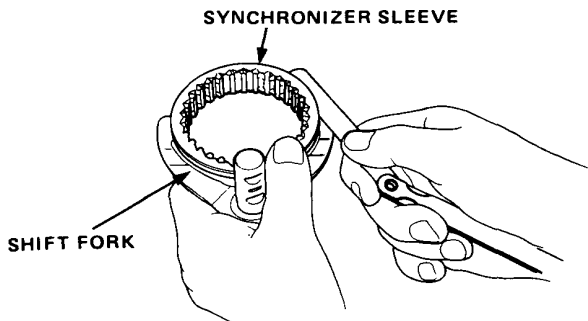
### FORK-TO-SLEEVE CLEARANCE (ALL THREE FORKS & SLEEVES)

Standard (New): 0.35–0.65 mm  
(0.014–0.026 in.)

Service Limit: 1.0 mm (0.039 in.)

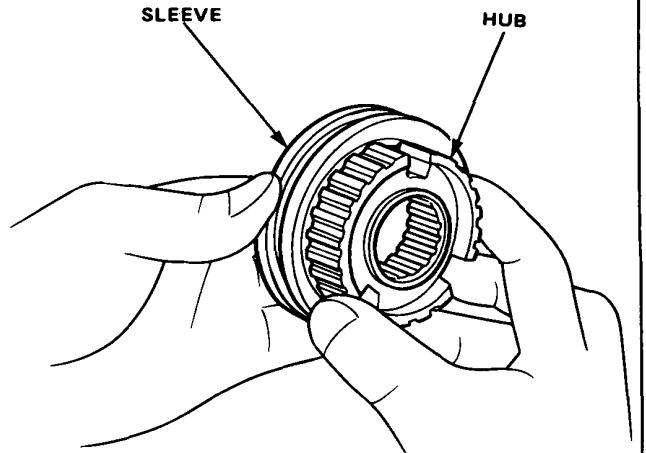
2. If fork-to-sleeve clearance is too great, measure width of groove in synchronizer sleeve.

Standard (New): 6.75–6.85 mm  
(0.266–0.270 in.)



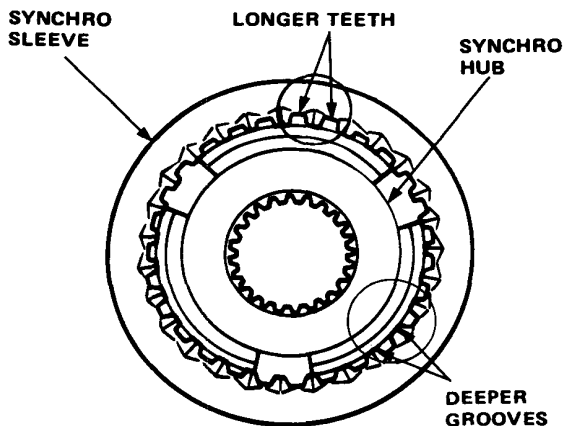
## Synchronizer Sleeve and Hub Inspections

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.

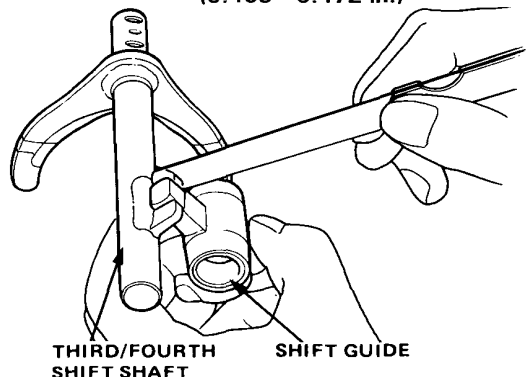
### SHAFT-TO-GUIDE CLEARANCE

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

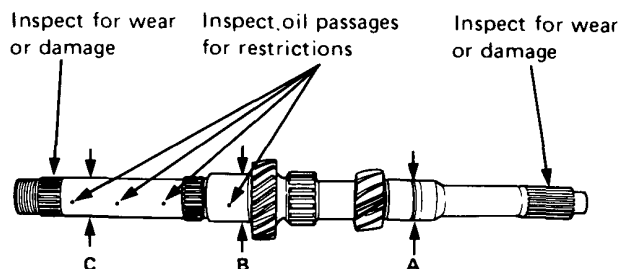
#### Outside Diameter:

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.)



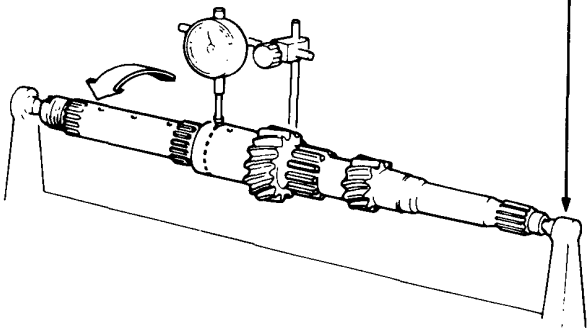
### Runout

Standard (New): 0.04 mm (0.0016 in.)

Service Limit: 0.10 mm (0.004 in.)

Rotate two complete revolutions.

Support with lathe type tool or V-blocks



# Countershaft

## Inspection

### Wear

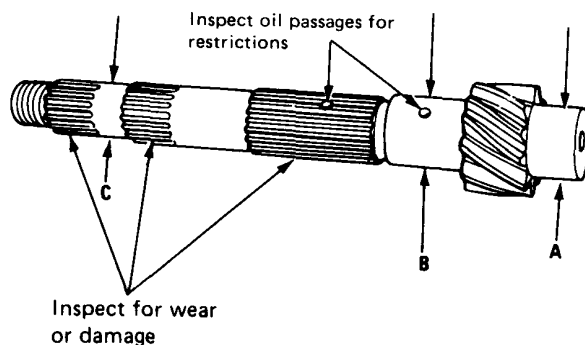
#### Outside Diameter:

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.)



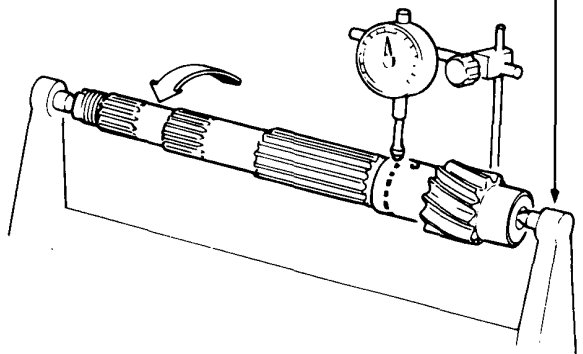
### Runout

Standard (New): 0.04 mm (0.0016 in.)

Service Limit: 0.10 mm (0.004 in.)

Rotate two complete revolutions.

Support with lathe type tool or V-blocks





# Mainshaft/Countershaft

## Reassembly and Measurement

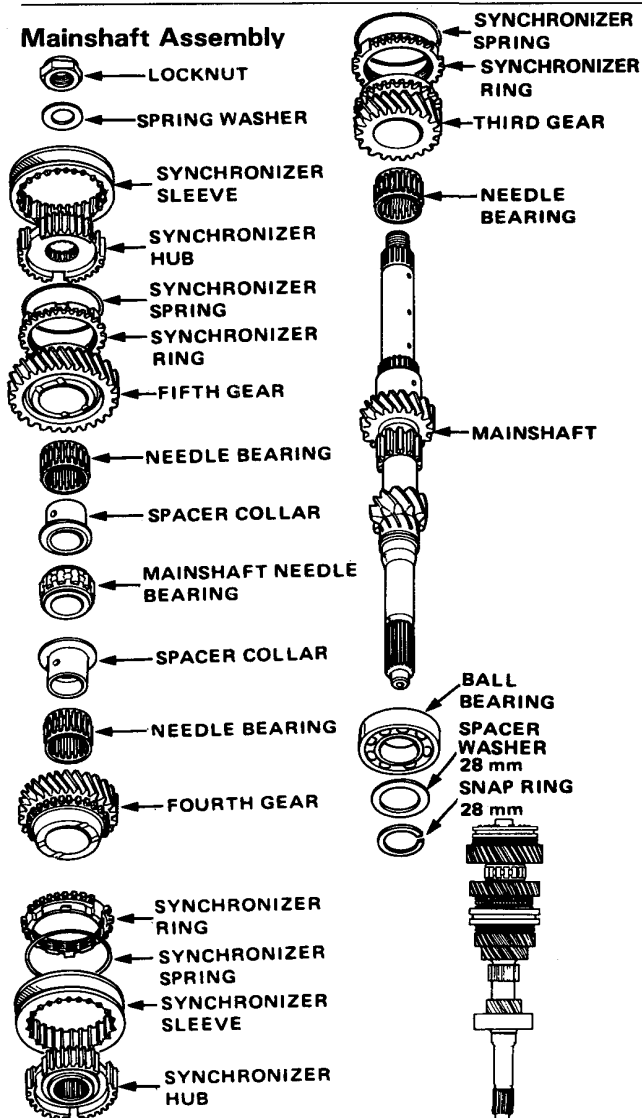
1. Remove both mainshaft and countershaft bearings from transmission housing.
2. Assemble mainshaft and countershaft including bearings and fifth gear components, as shown below. Lubricate all parts with oil before final re-assembly.
3. Install mainshaft/countershaft assembly into clutch housing.
4. 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 overtightening the countershaft or mainshaft locknuts. Whenever locknuts are installed, use an accurately calibrated torque wrench.

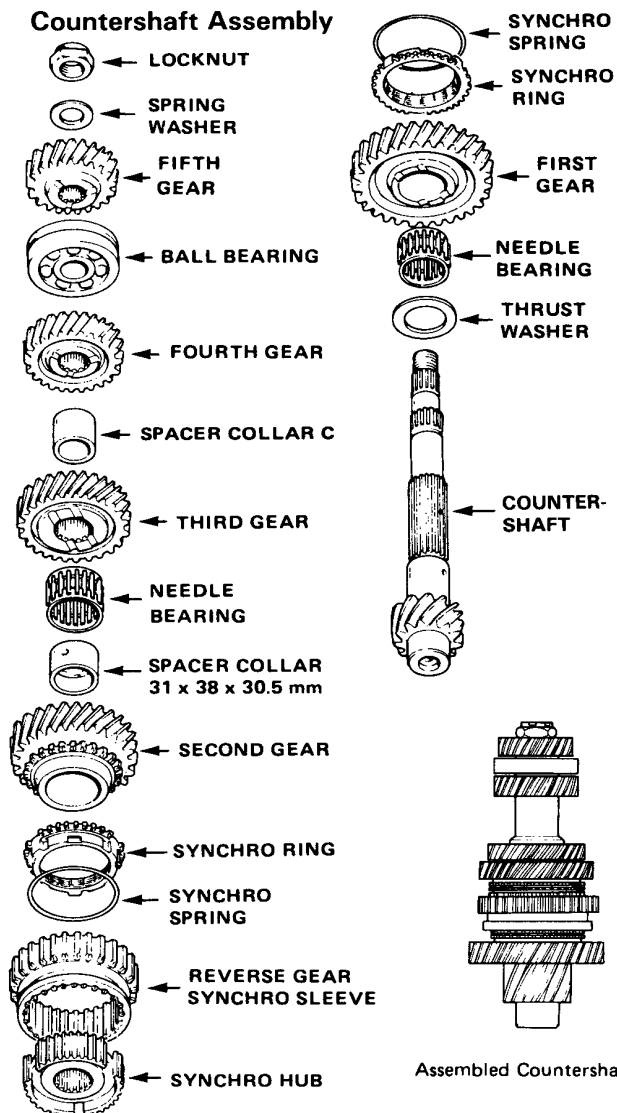
6. Remove transmission shafts from clutch housing and measure clearances as described on next two pages.

### Mainshaft Assembly



Assembled Mainshaft

### Countershaft Assembly



Assembled Countershaft





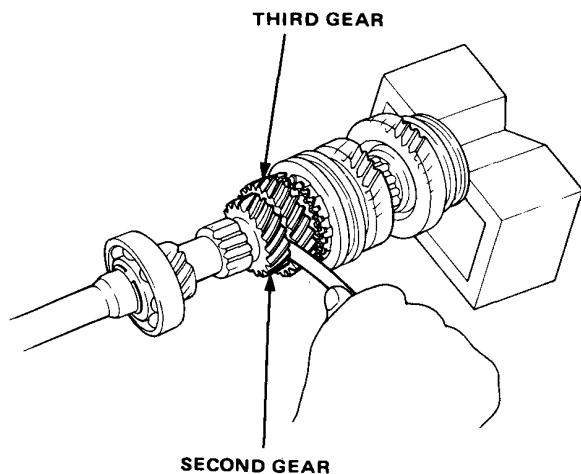
## Mainshaft Measurements

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.)

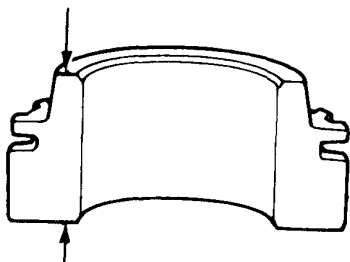


8. If out of tolerance, measure thickness of third gear.

### THIRD GEAR THICKNESS

Standard (New): 29.42–29.47 mm  
(1.158–1.160 in.)

Service Limit: 29.3 mm (1.15 in.)



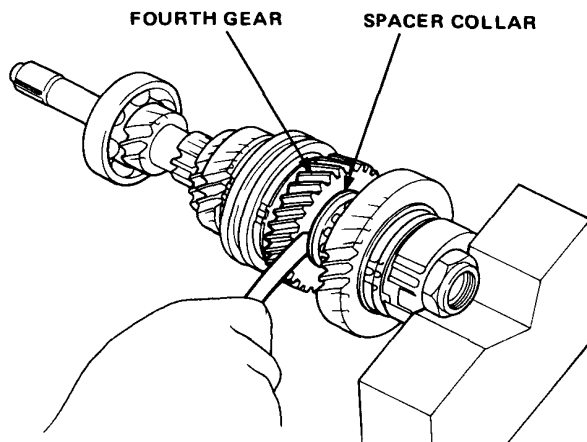
If third gear is OK, replace synchronizer hub if necessary after all other measurements are complete.

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.)

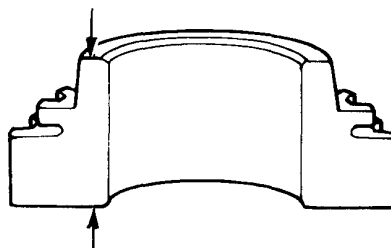


10. If out of tolerance, measure thickness of fourth gear.

### 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)



# Mainshaft/Countershaft

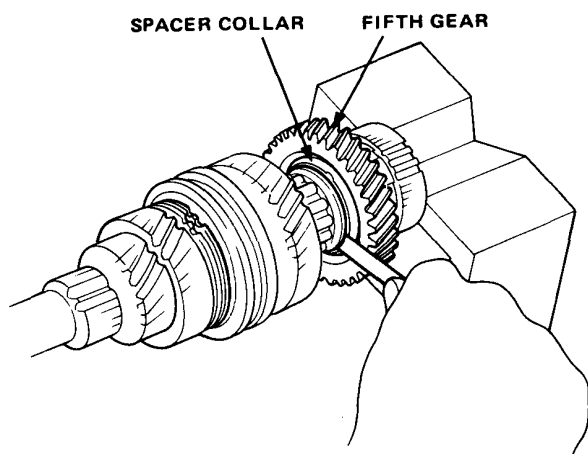
## Reassembly and Measurement

### Mainshaft Measurements

11. Measure clearance between spacer collar and shoulder on fifth gear.

#### FIFTH GEAR CLEARANCE

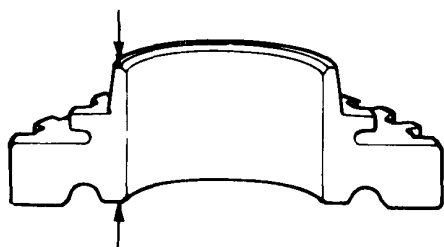
Standard (New): 0.03–0.13 mm  
(0.001–0.005 in.)  
Service Limit: 0.25 mm (0.01 in.)



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.)

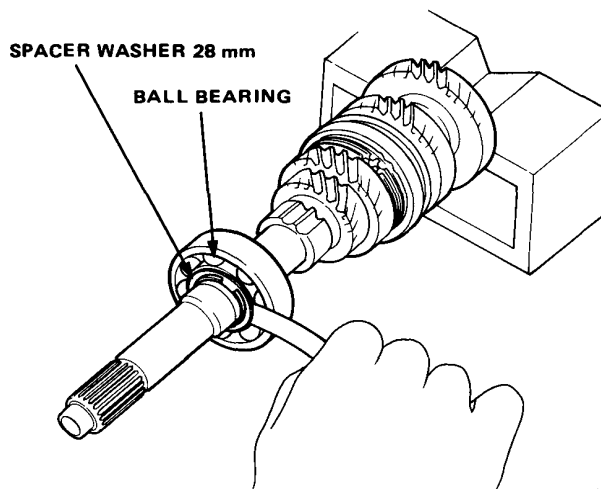


If out of limit, replace fifth gear.

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

IDENTIFI- CATION	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.)



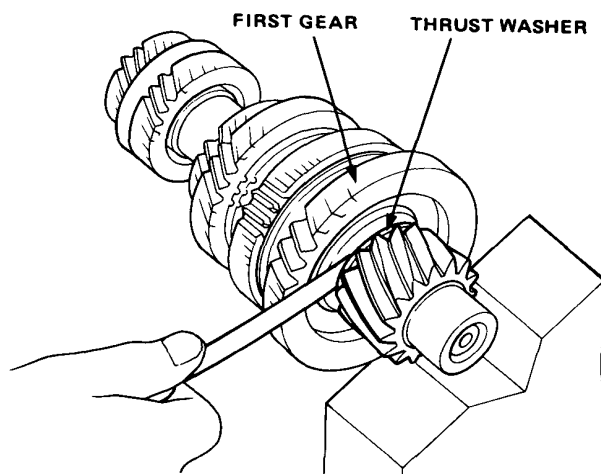


## Countershaft Measurements

14. Measure clearance between first gear thrust washer and shoulder on first gear.

### FIRST GEAR CLEARANCE

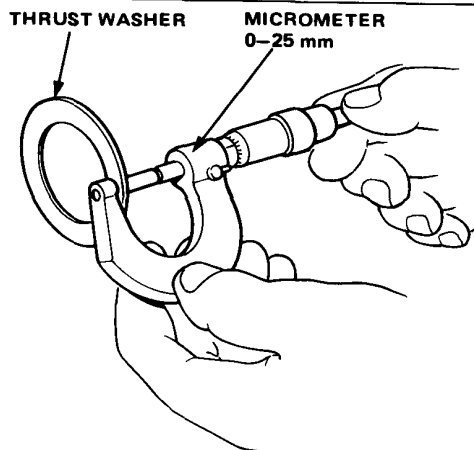
Standard (New): 0.03–0.08 mm  
(0.001–0.003 in.)



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.)

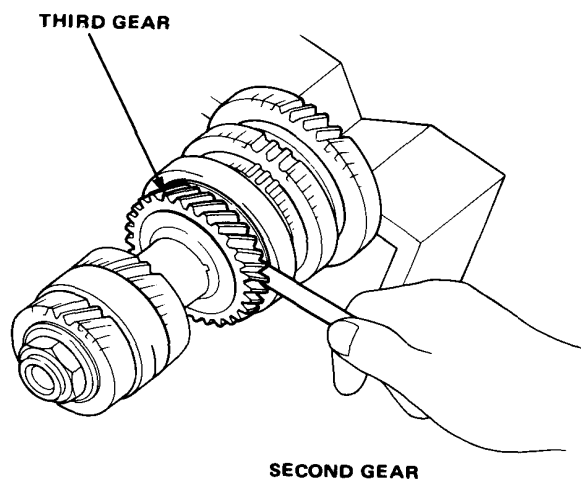


15. Measure clearance between shoulder on third gear and shoulder on second gear.

### SECOND GEAR CLEARANCE

Standard (New): 0.03–0.1 mm  
(0.0012–0.004 in.)

Service Limit: 0.18 mm (0.007 in.)

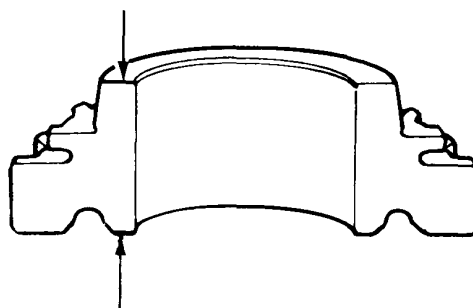


16. If out of tolerance, measure thickness of second gear.

### 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.

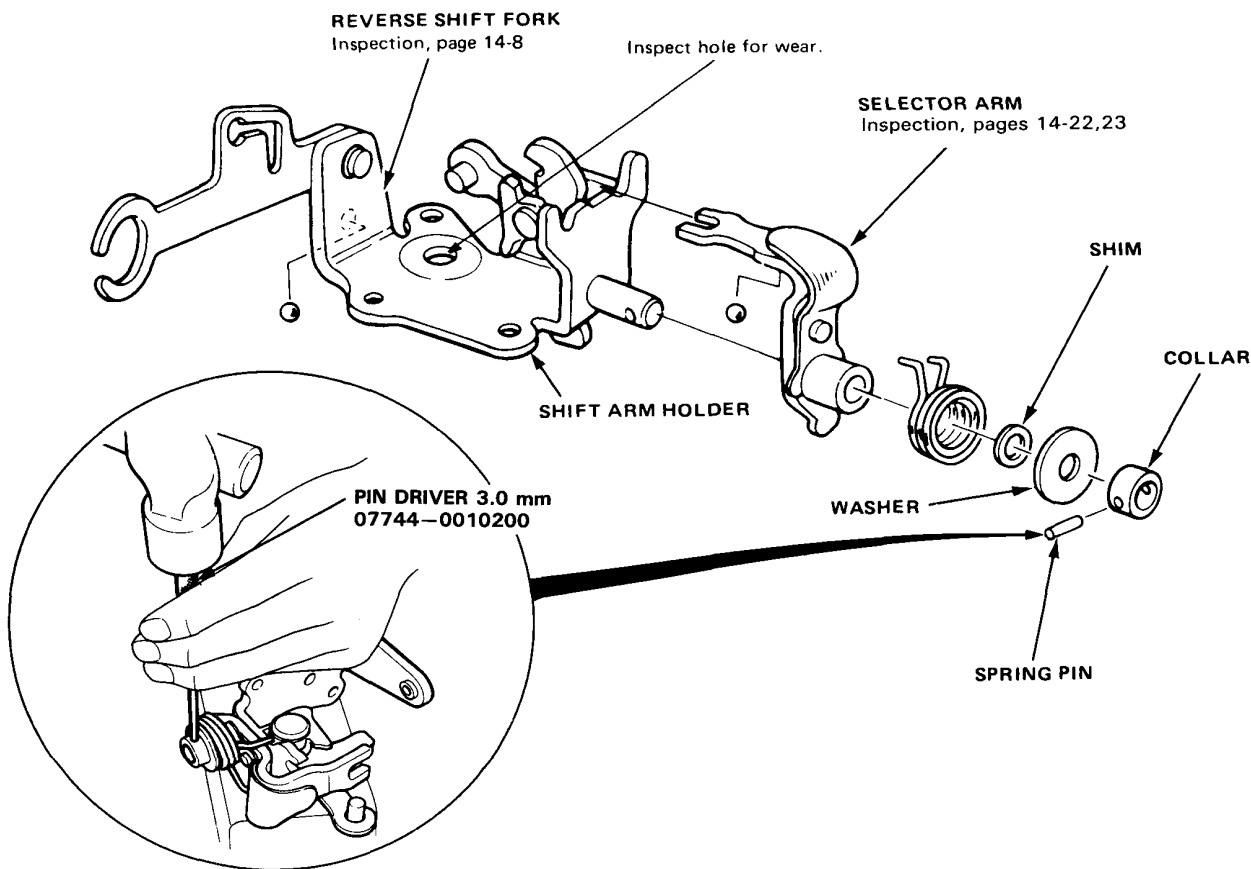
If they are correct, disassemble fifth gear components and reinstall bearings in transmission housing.



# Shift Arm Holder

## Index

To remove selector arm from holder for shimming or replacement, drive out spring pin with driver.



## Clearances

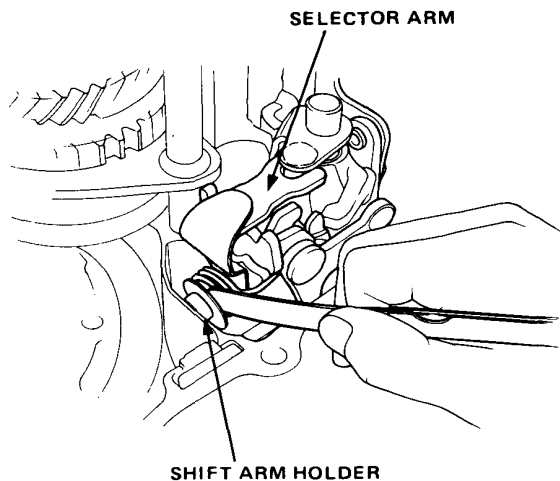
1. Measure clearance between collar and shim on shaft of selector arm as shown.

### 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.)



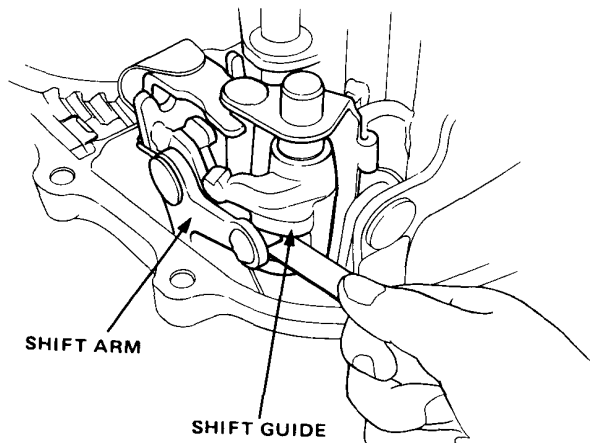


# Shift Arm/Selector Arm



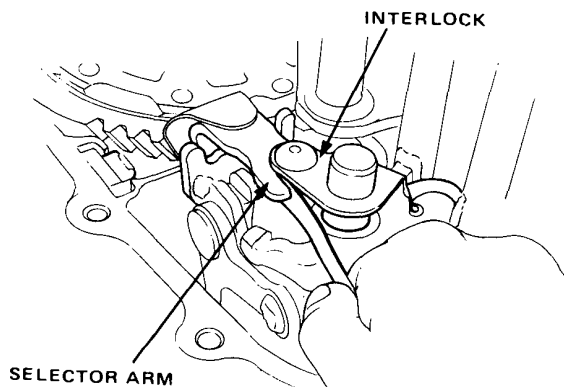
## Shift Guide Clearance

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

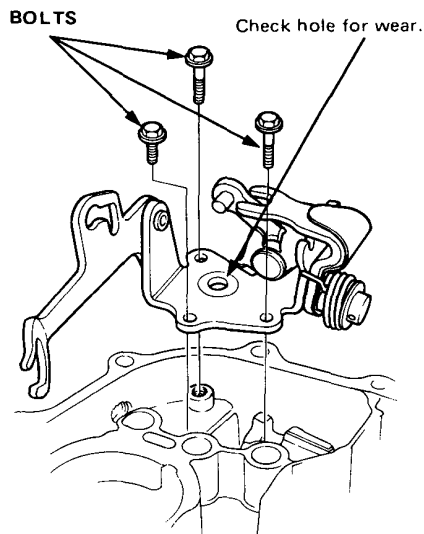
1. Check selector arm-to-interlock clearance.  
**Standard (New):** 0.05–0.25 mm  
(0.002–0.01 in.)  
**Service Limit:** 0.7 mm (0.03 in.)
2. If not within service limit, measure gap between selector arm fingers.  
**Standard (New):** 10.05–10.15 mm  
(0.396–0.4 in.)
3. If gap is wider than standard, replace arm.



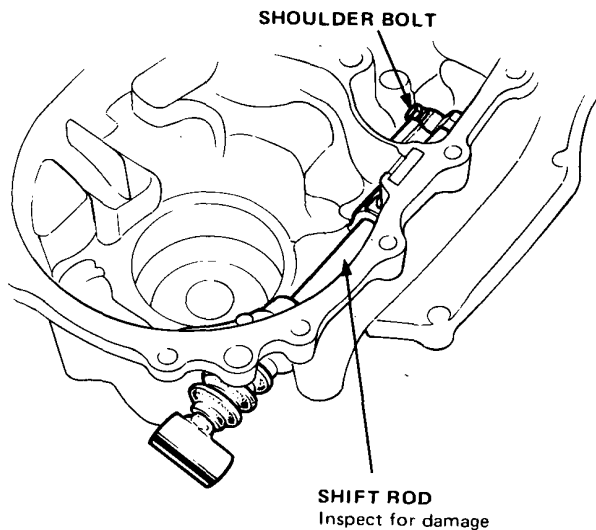
# Shift Rod and Shift Arm Holder

## Removal

1. Remove shift arm holder (3 bolts).



2. Remove shift rod by removing shoulder bolt.

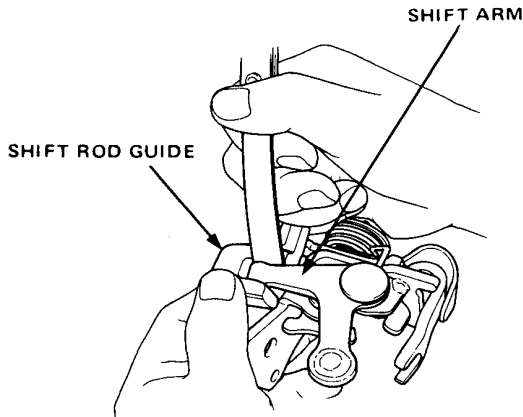




# Shift Arm/ Gear Selector Arm

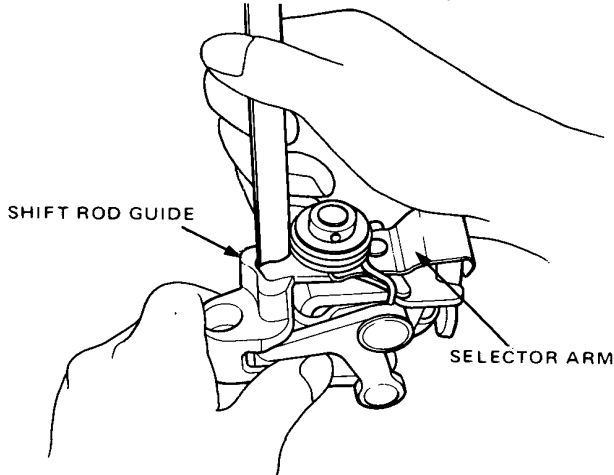
## Shift Rod Guide Clearance

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

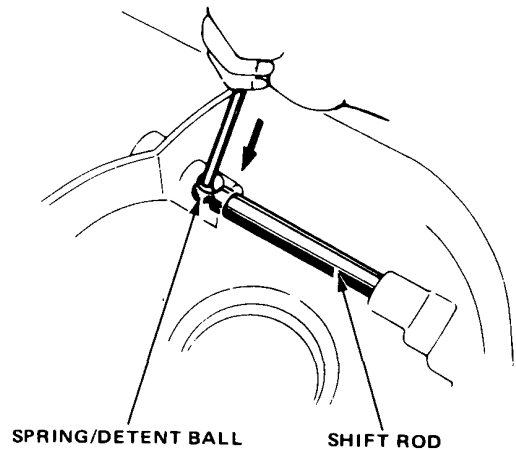
1. Check selector arm-to-shift rod guide clearance.  
**Standard (New):** 0.05–0.25 mm  
(0.002–0.01 in.)  
**Service Limit:** 0.5 mm (0.02 in.)
2. If not within service limit, measure width of tab on selector arm.  
**Standard (New):** 11.9–12.0 mm  
(0.469–0.472 in.)
3. If tab is narrower than standard, replace the arm.



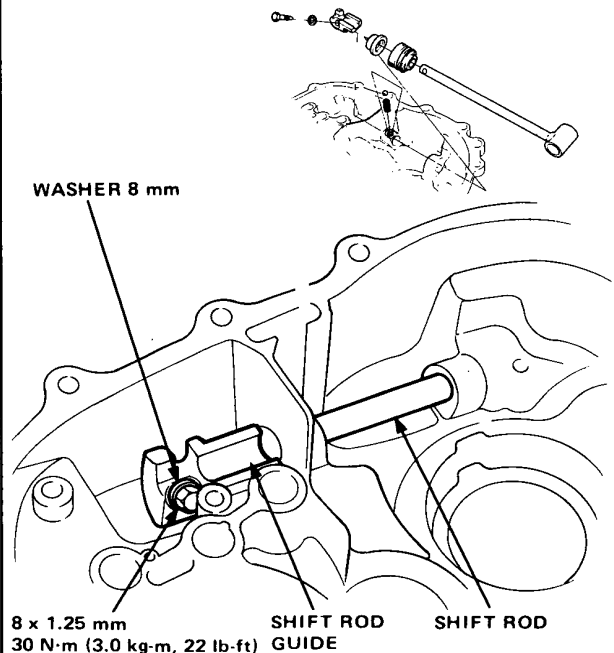
# Shift Rod

## Installation

1. Install shift rod with detent notches facing downward.
2. Install spring and detent ball. Lubricate spring with molybdeum.
3. Install shift rod while pushing detent ball in.



4. Install shift rod guide on shift rod.

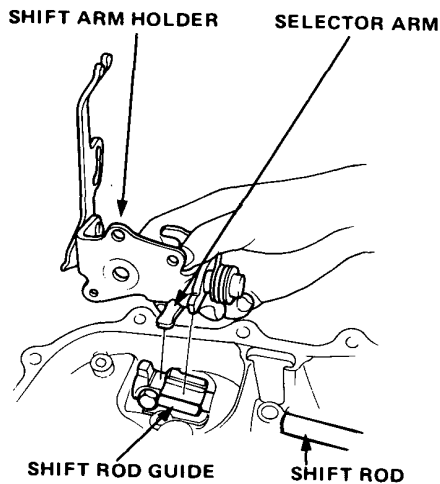




# Shift Arm Holder Assy

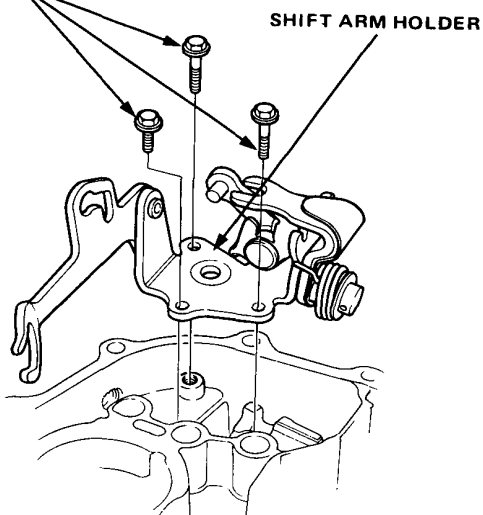
## Installation

1. Hook selector arm and shift arm into shift rod guide.



2. Install bolts in shift arm holder.

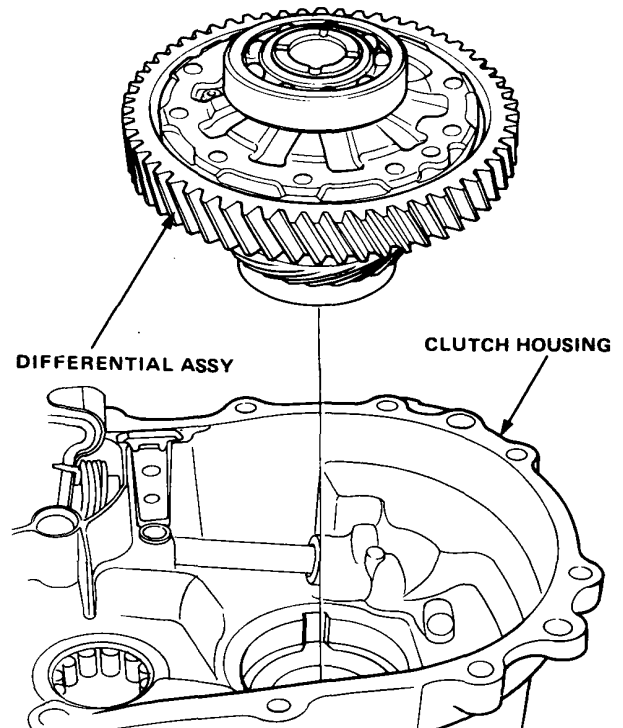
6 x 1.0 mm  
17 N·m (1.7 kg-m, 13 lb-ft)



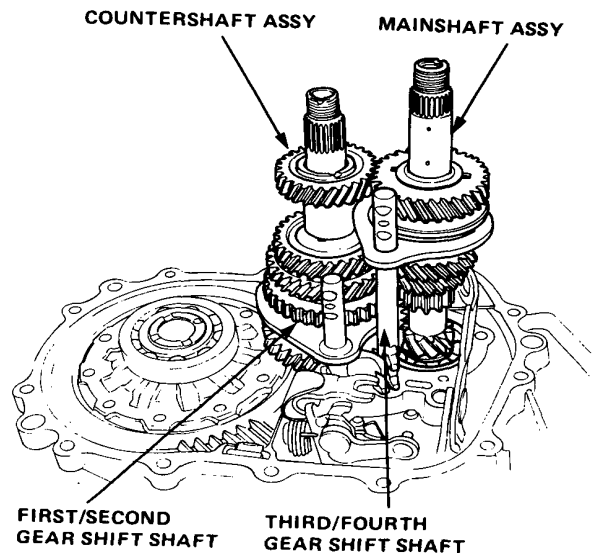
# Transmission Assy

## 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.



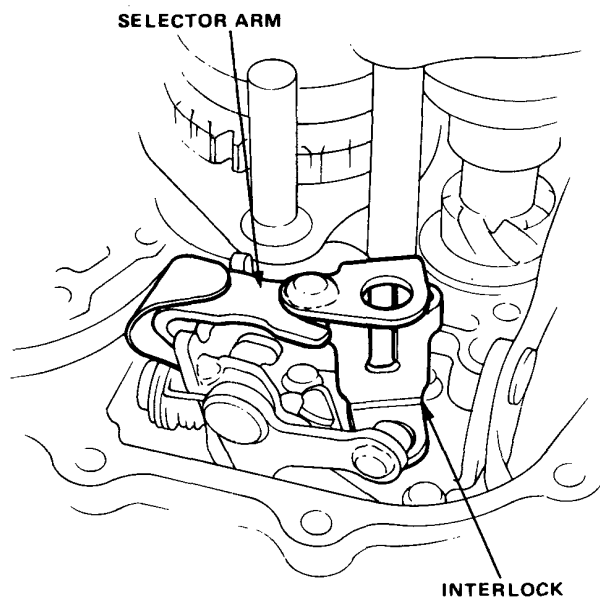
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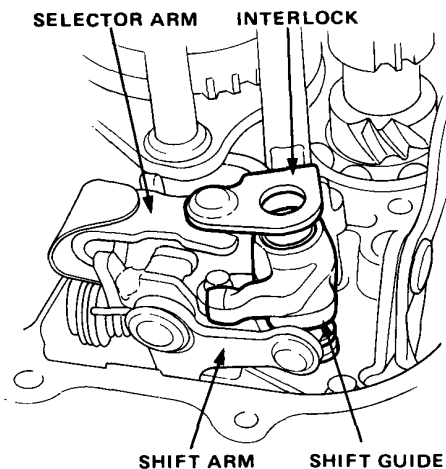
# Transmission Assy

## Reassembly (cont'd)

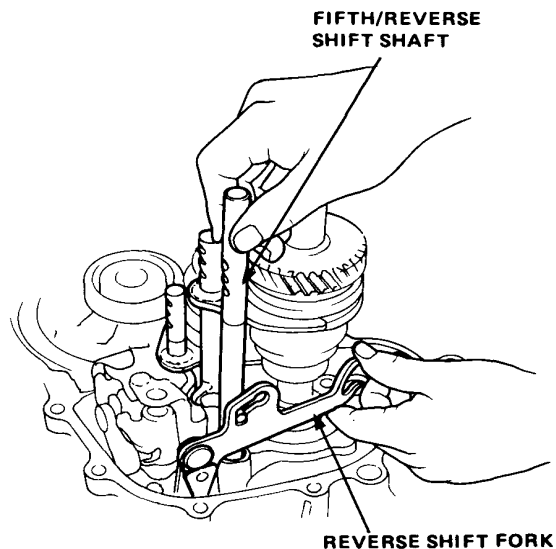
3. Lift mainshaft as shown and install interlock into the selector arm.



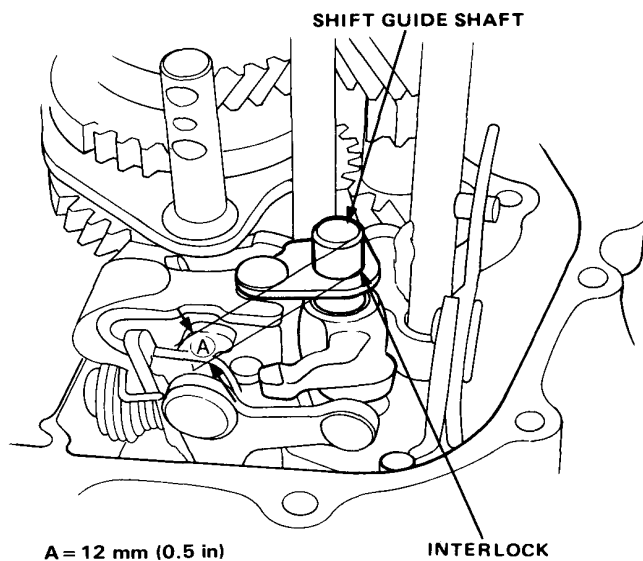
4. Place shift rod in neutral.
5. Hook interlock into selector arm, first/second gear-shift shaft and third/fourth gearshift shaft. Hook shift guide into shift arm.



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.

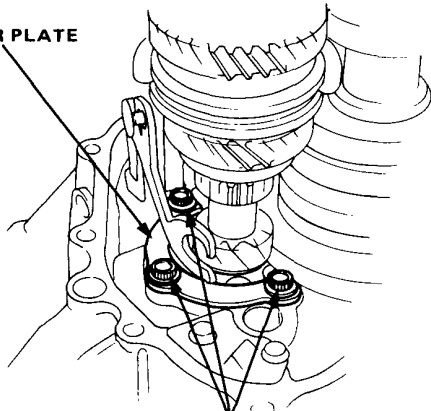






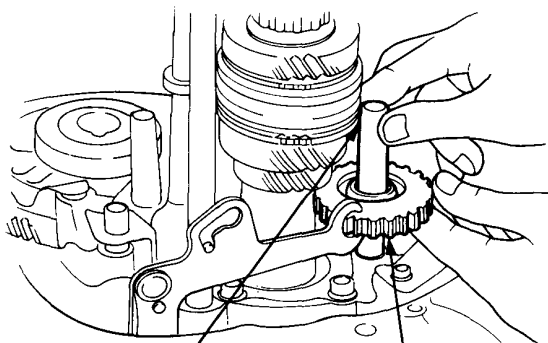
8. Install mainshaft bearing retainer plate.

RETAINER PLATE



**SPECIAL BOLTS**  
28 N·m (2.8 kg-m, 21 lb-ft)

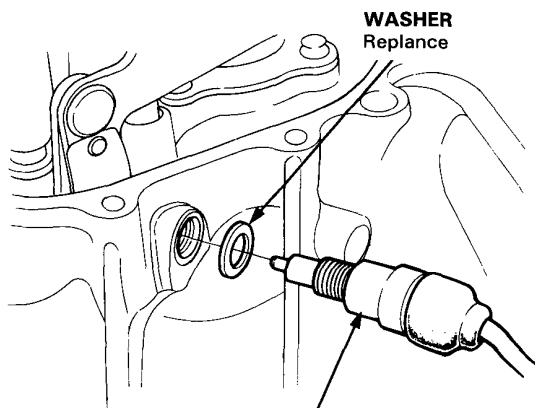
9. Install reverse idler gear and shaft.



REVERSE IDLER  
GEAR SHAFT

REVERSE IDLER  
GEAR

10. Install back-up light switch with new washer.

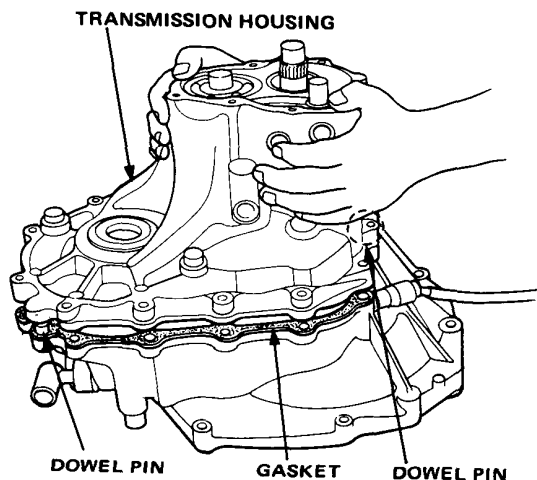


**BACK-UP LIGHT SWITCH**  
14 x 1.5 mm  
25 N·m (2.5 kg-m, 18 lb-ft)

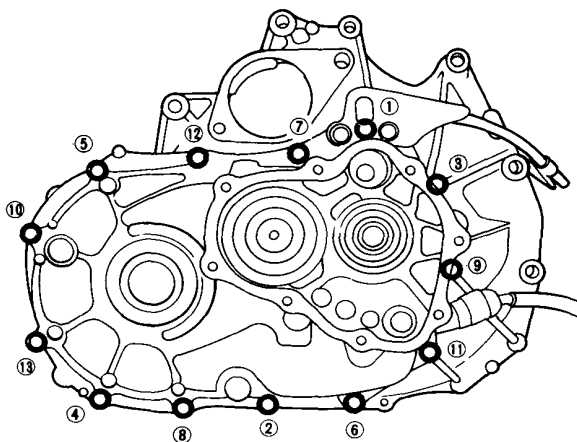
11. Place new gasket on clutch housing.

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).



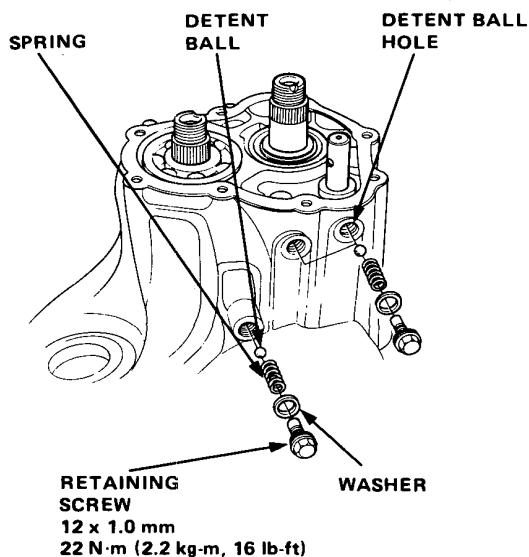
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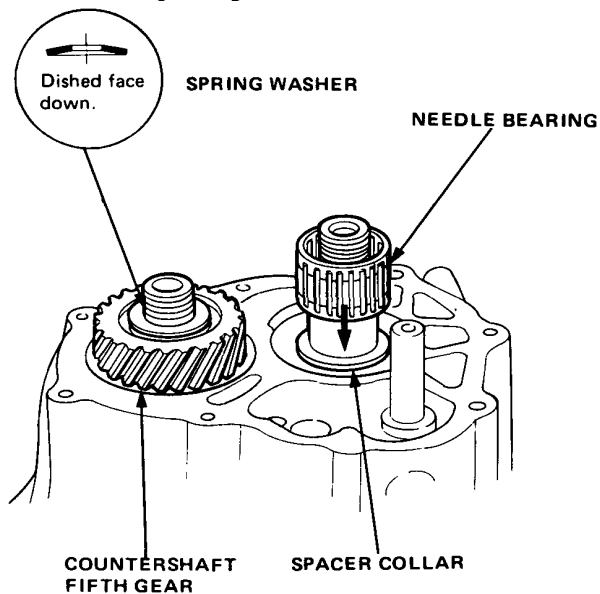
# Transmission Assy

## Reassembly (cont'd)

15. Install three detent balls, washers, and retaining screws.

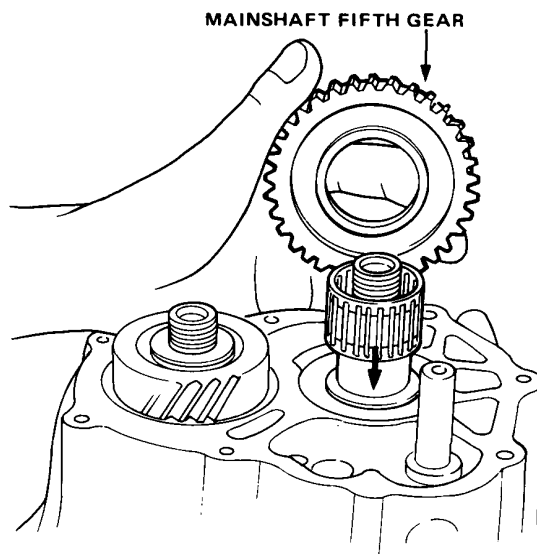


16. Install countershaft fifth gear with high side facing down. Then install spring washer with dished surface facing fifth gear.

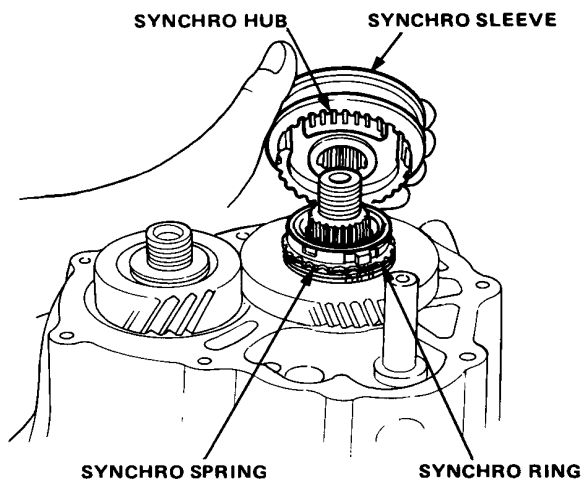


17. Install spacer collar and needle bearing on the mainshaft.

18. Install mainshaft fifth gear.



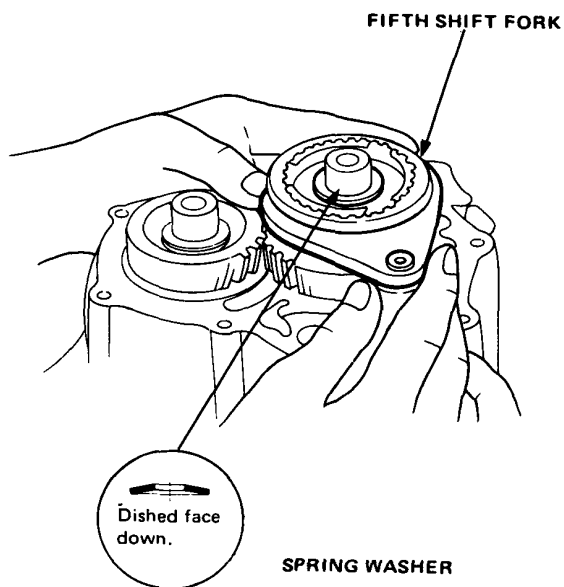
19. Install synchro ring, synchro spring, synchro hub and synchro sleeve on the mainshaft.





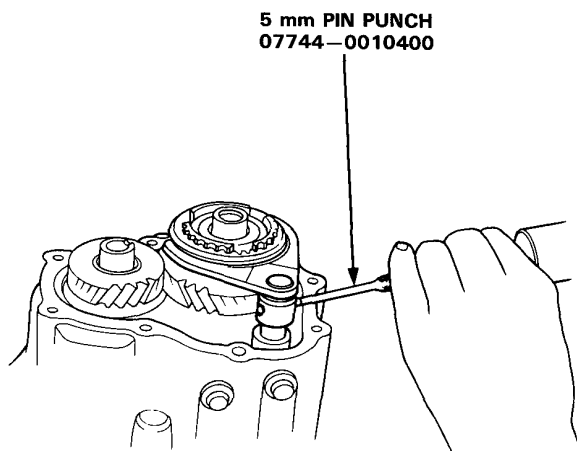


20. Install fifth shift fork into synchro sleeve.



21. Install spring washer with dished (concave) surface facing synchro hub.

22. Drive spring pin into fifth gear shift fork.

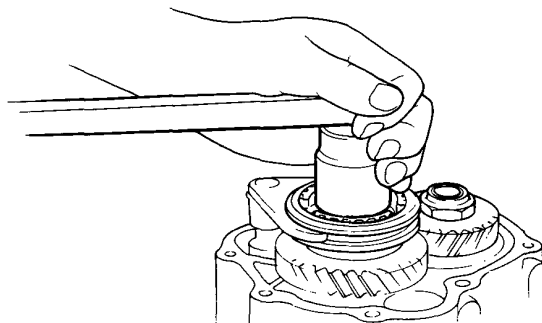


23. Install mainshaft holder 07923-6890101 to prevent shaft from rotating, then shift transmission into reverse gear.

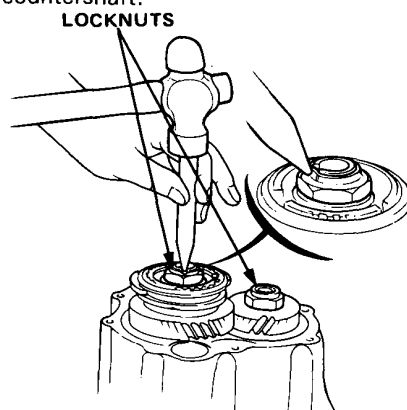
24. Torque mainshaft and countershaft locknuts. Tighten to specified torque, then loosen and re-tighten to same torque.

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.

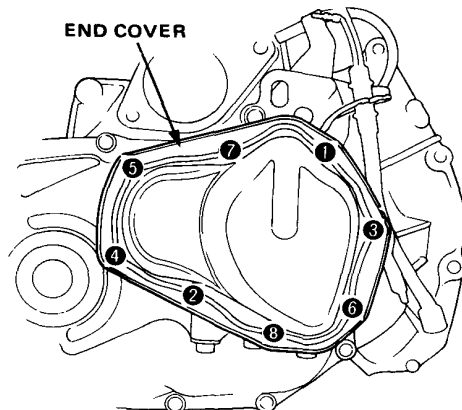


25. Stake shoulders on locknuts into slots in mainshaft and countershaft.



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).

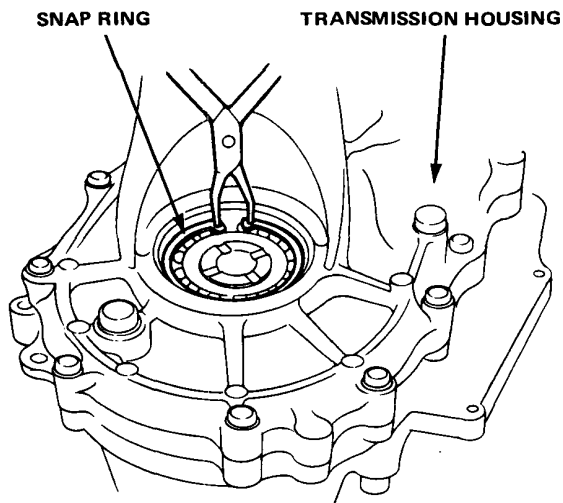




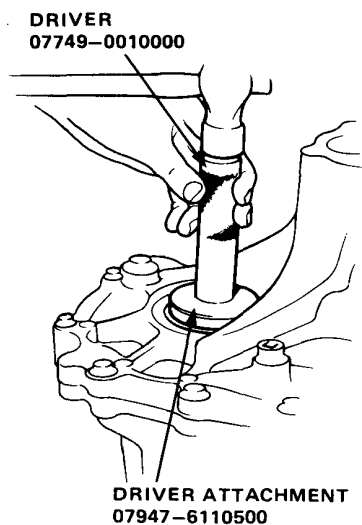
# Differential Oil Seal

## Installation

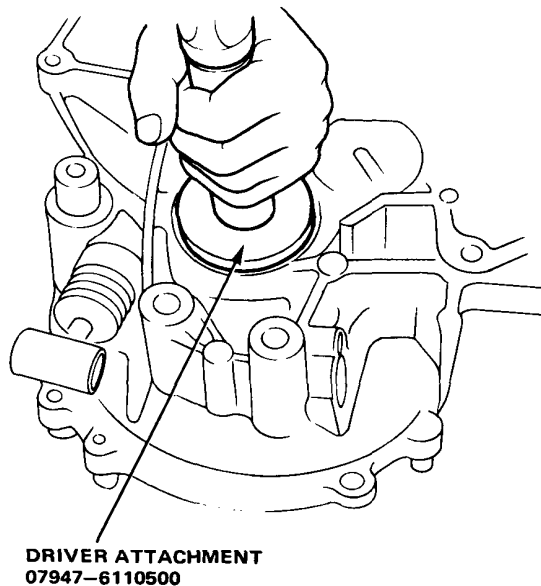
1. Install 80 mm snap ring in transmission housing. If differential bearings or carrier were replaced, select snap ring of correct thickness as shown on page 16-10.



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.





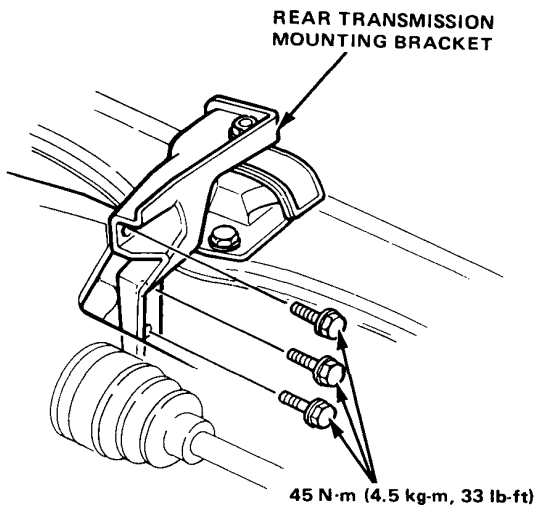
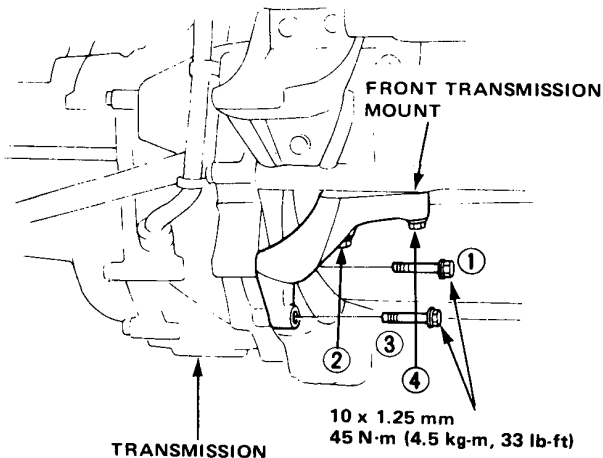
# Transmission Assy



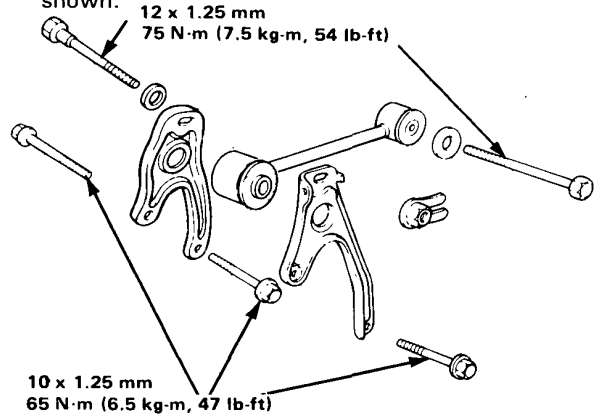
## Installation

### 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).

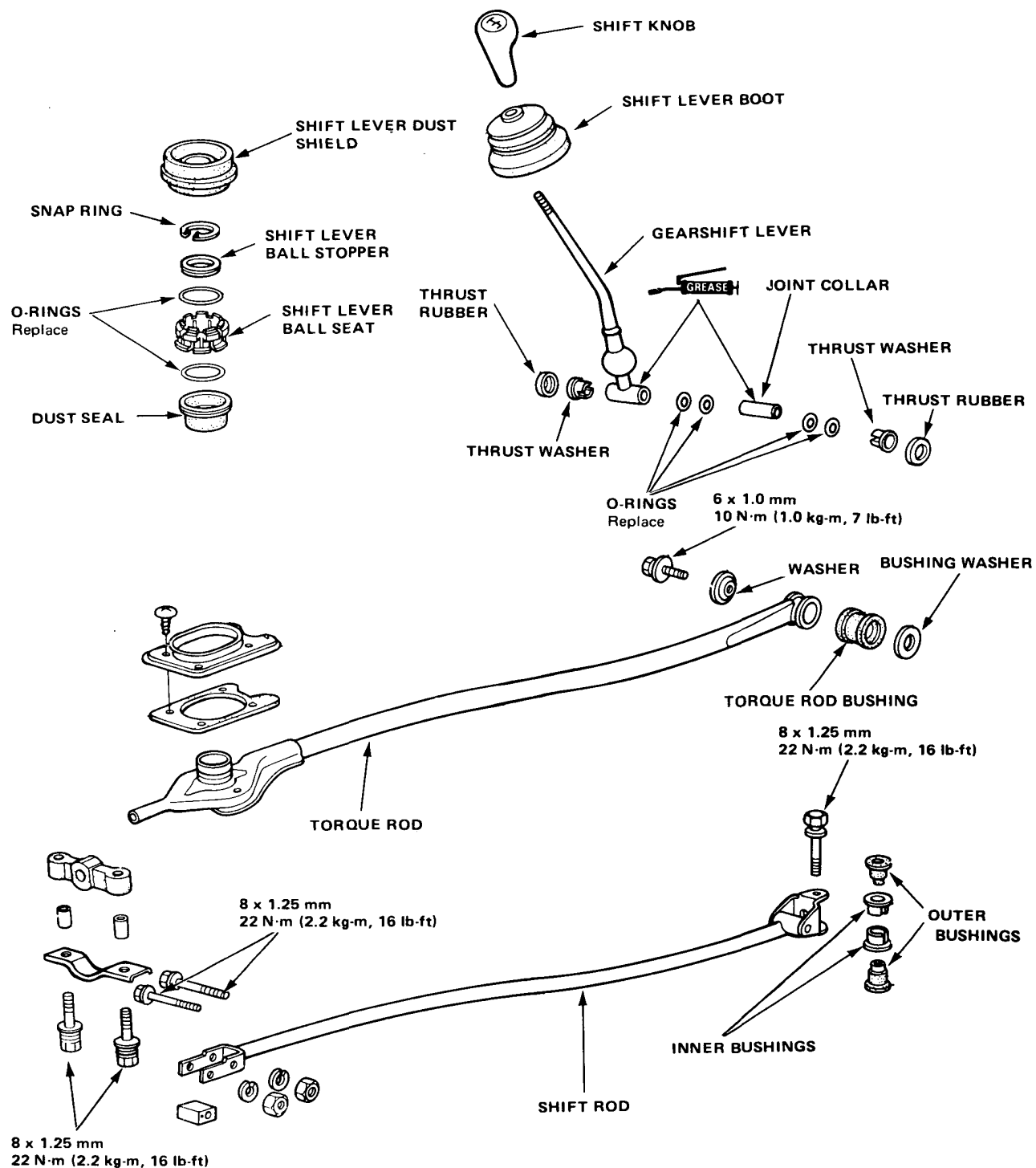
### Car on Ground

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.

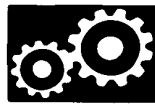


# Gearshift Mechanism

## Overhaul



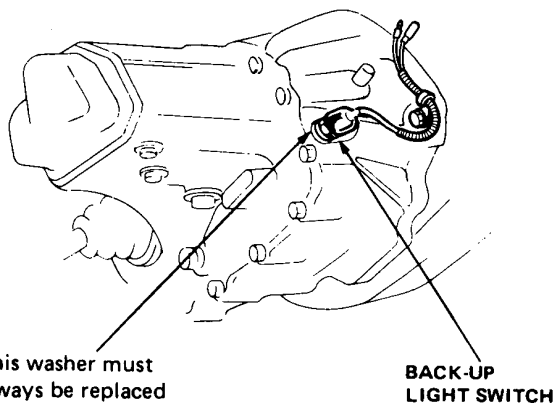




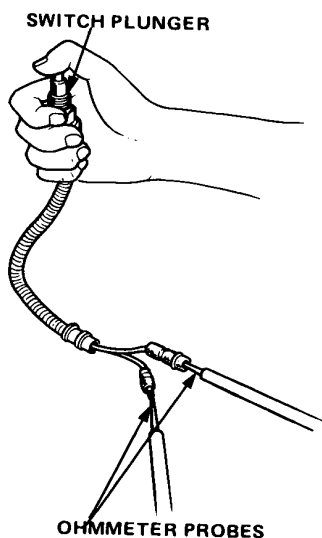
# Back-up Light Switch

## 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 .....	15-2	Servo Valve Body .....	15-30
Troubleshooting .....	15-4	Governor Valve .....	15-31
Road Test .....	15-6	Mainshaft	
Pressure Test .....	15-7	Disassembly .....	15-32
Stall Speed .....	15-8	Reassembly .....	15-32
Maintenance .....	15-8	Countershaft	
Transmission		Disassembly .....	15-33
Removal .....	15-9	Reassembly .....	15-33
Illustrated Index .....	15-10	Countershaft/Mainshaft	
Transmission Housing		Clearance Measurements .....	15-34
Removal .....	15-12	Clutch .....	15-37
Mainshaft/Countershaft		Differential and Seal .....	15-46
Removal .....	15-16	Bearings and Seals .....	15-47
Governor Valve .....	15-16	End Cover .....	15-49
Main Valve Body		Throttle Control Shaft .....	15-50
Removal .....	15-17	Transmission	
Control Shaft .....	15-21	Reassembly .....	15-50
One-Way Clutch/Parking Gear .....	15-22	Torque Converter .....	15-64
Main Valve Body		Transmission	
Disassembly .....	15-23	Installation .....	15-65
Secondary Valve .....	15-24	Console Switch .....	15-67
Valve Body .....	15-25	Shift Indicator Light .....	15-68
Main Valve Body		Shift Indicator Panel .....	15-68
Reassembly .....	15-26	Gearshift Selector .....	15-69
Regulator Valve Body .....	15-28	Shift Cable .....	15-70
Lock-Up Shift Valve Body .....	15-29	Throttle Control Cable .....	15-71





# 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 clutches 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.

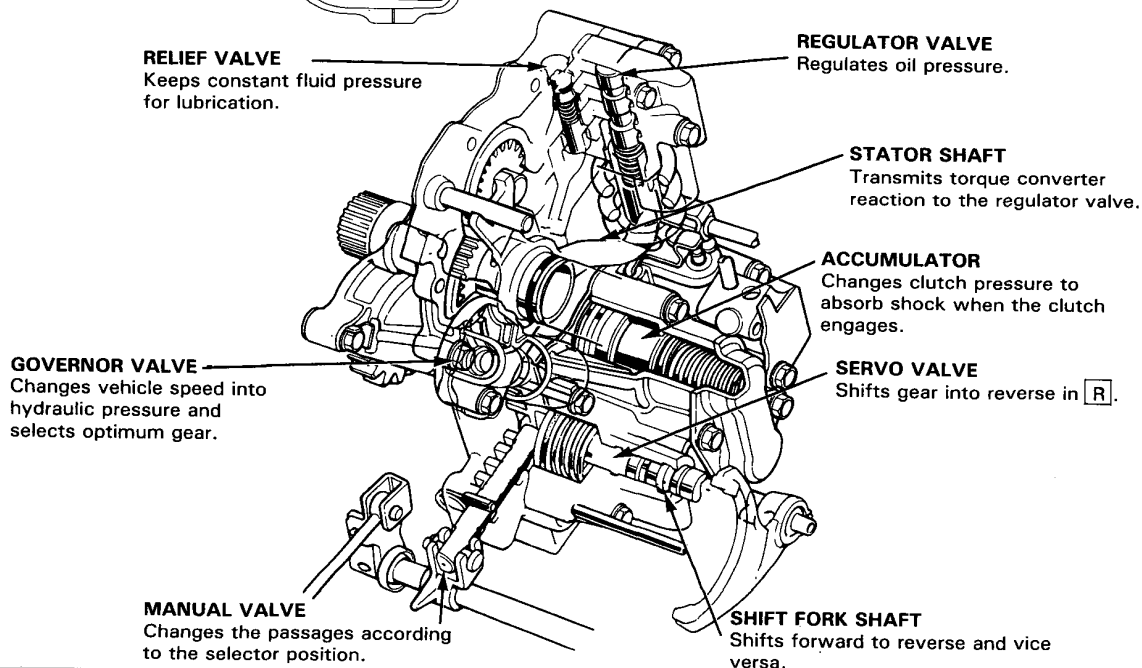
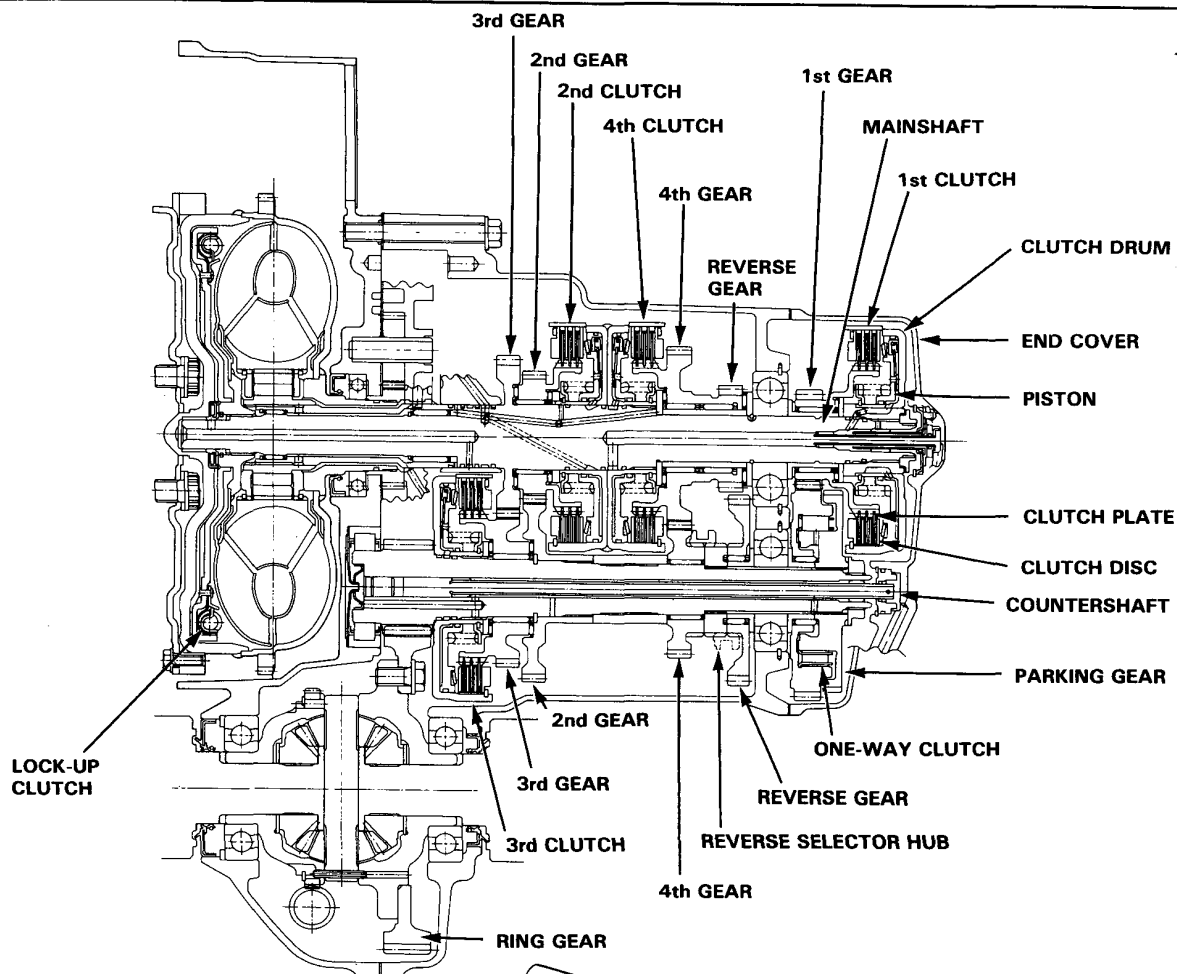
Position	Discription
P PARK	Front wheels locked; parking pawl engaged with parking gear on countershaft. All clutches released.
R REVERSE	Reverse; reverse selector engaged with countershaft reverse gear and 4th gear clutch locked.
N NEUTRAL	All clutches released.
D4 DRIVE (1 through 4)	General driving; 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 through 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.







# Troubleshooting

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 orifice 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.	4th/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.



# Road Test

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
<b>Full-throttle</b> 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
<b>Half-throttle</b> 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
<b>Closed-throttle</b> 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
<b>Full-throttle</b> 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
<b>Closed-throttle</b> 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)

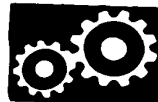
Accelerate from a stop at full throttle, and check for abnormal noise and clutch slippage.

## 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.



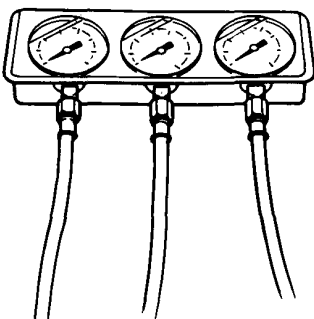
# Pressure Test



## NOTE:

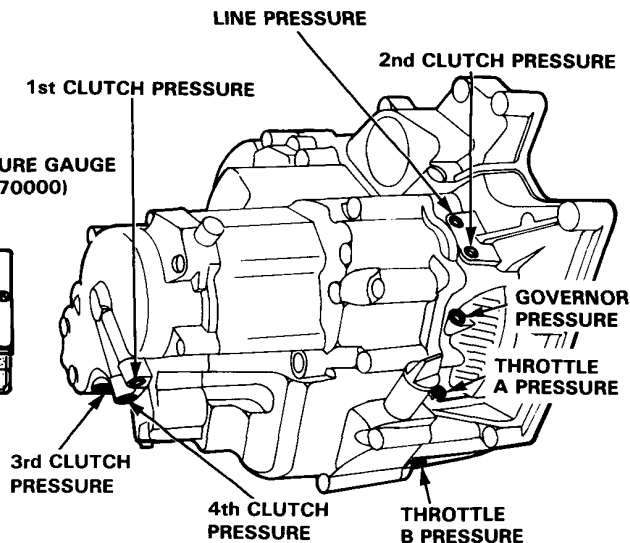
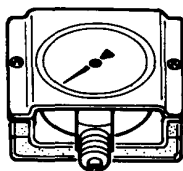
- Stop engine when attaching hoses for pressure tests.  
Torque hose fitting to 18 N·m (1.8 kg-m, 12 lb-ft).
- Do not reuse aluminum washers.
- For throttle and governor test, use Low Pressure Gauge, 07406-0070000.

**GAUGE SET 07406-00200002**  
(Includes pressure hose Assy 07406-0020201)



HOSE FITTING

**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		1800 Engine	
					Standard	Service Limit	Standard	Service Limit
LINE	N or P	<ul style="list-style-type: none"> <li>• With parking brake applied</li> <li>• Run engine at 2,000 min<sup>-1</sup> (rpm).</li> </ul>	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/cm <sup>2</sup> , 121-128 psi)	785 kPa (8.0 kg/cm <sup>2</sup> , 114 psi)	785-834 kPa (8.0-8.5 kg/cm <sup>2</sup> , 114-121 psi)	736 kPa (7.5 kg/cm <sup>2</sup> , 107 psi)
1st	D3 or D4	<b>MEASUREMENTS</b> <ul style="list-style-type: none"> <li>• With parking brake applied raise front wheels off ground and support with safety stands.</li> <li>• Run engine at 2,000 min<sup>-1</sup> (rpm)</li> </ul>	No (or low) FIRST pressure	1st clutch O-rings	785-883 kPa (8.0-9.0 kg/cm <sup>2</sup> , 114-128 psi)	785 kPa (8.0 kg/cm <sup>2</sup> , 114 psi)	736-834 kPa (7.5-8.5 kg/cm <sup>2</sup> , 64-121 psi)	736 kPa (7.5 kg/cm <sup>2</sup> , 107 psi)
2nd	2		No (or low) SECOND pressure	2nd clutch O-rings	441-883 kPa (4.5-9.0 kg/cm <sup>2</sup> , 64-128 psi) varies with throttle opening.	392 kPa (4.0 kg/cm <sup>2</sup> , 57 psi) with lever released. 785 kPa (8.0 kg/cm <sup>2</sup> , 114 psi) with lever in full throttle.	441-834 kPa (4.5-8.5 kg/cm <sup>2</sup> , 64-121 psi) varies with throttle open.	392 kPa (4.0 kg/cm <sup>2</sup> , 57 psi) with lever released. 736 kPa (7.5 kg/cm <sup>2</sup> , 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/cm <sup>2</sup> , 114-128 psi)	785 kPa (8.0 kg/cm <sup>2</sup> , 114 psi)	736-834 kPa (7.5-8.5 kg/cm <sup>2</sup> , 64-121 psi)	736 kPa (7.5 kg/cm <sup>2</sup> , 107 psi)
THROTTLE	D3 or D4	<ul style="list-style-type: none"> <li>• With parking brake applied raise front wheels off ground and support with safety stands.</li> <li>• Run engine at 1,000 min<sup>-1</sup> (rpm)</li> <li>• Disconnect throttle control cable at throttle lever.</li> <li>• Read pressure with lever released.</li> <li>• Manually push lever up simulating full throttle.</li> <li>• Read pressure with lever in full throttle position.</li> </ul>	No (or low) THROTTLE pressure	Throttle valve A Throttle modulator valve	0 kPa (0 kg/cm <sup>2</sup> , 0 psi) lever is released. 505-520 kPa (5.15-5.30 kg/cm <sup>2</sup> , 73-75 psi) 485-515 kPa (4.95-5.25 kg/cm <sup>2</sup> , 70-75 psi) lever in full throttle position.	500 kPa (5.10 kg/cm <sup>2</sup> , 72.5 psi) 481 kPa (4.90 kg/cm <sup>2</sup> , 69.7 psi) with lever in full throttle position.	0 kPa (0 kg/cm <sup>2</sup> , 0 psi) with lever released. 495-525 kPa (5.05-5.35 kg/cm <sup>2</sup> , 72-76 psi) with lever in full throttle position.	490 kPa (5.00 kg/cm <sup>2</sup> , 71 psi) with lever in full throttle position.
				Throttle valve B	0 kPa (0 kg/cm <sup>2</sup> , 0 psi) with lever released. 834-883 kPa (8.5-9.0 kg/cm <sup>2</sup> , 121-128 psi) lever in full throttle position.	785 kPa (8.0 kg/cm <sup>2</sup> , 114 psi)	0 kPa (0 kg/cm <sup>2</sup> , 0 psi) with lever released. 785-834 kPa (8.0-8.5 kg/cm <sup>2</sup> , 114-121 psi) with lever in full throttle position.	736 kPa (7.5 kg/cm <sup>2</sup> , 107 psi)
GOVERNOR	D3 or D4	<ul style="list-style-type: none"> <li>• Place vehicle on chassis dynamometer, or jack up front of car, support with safety stands, block rear wheels, and set hand brake.</li> <li>• Run vehicle at 60 km/h (38 mph)</li> </ul>	No (or low) GOVERNOR pressure	Governor valve	211-221 kPa (2.15-2.25 kg/cm <sup>2</sup> , 31-32 psi) 191-201 kPa (1.96-2.06 kg/cm <sup>2</sup> , 27.7-29.2 psi)	206 kPa (2.10 kg/cm <sup>2</sup> , 30 psi) 186 kPa (1.90 kg/cm <sup>2</sup> , 27.0 psi)	198-208 kPa (2.02-2.12 kg/cm <sup>2</sup> , 28.7-30.1 psi)	193 kPa (1.97 kg/cm <sup>2</sup> , 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 accelerator 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 <b>2</b> , <b>D3</b> , <b>D4</b> & <b>R</b> .	Low fluid level or oil pump output, clogged oil strainer, pressure regulator valve stuck closed. Slipping clutch.
Stall rpm high in <b>D3</b> , <b>D4</b> only.	Slippage of 1st clutch
Stall rpm low in <b>2</b> , <b>D3</b> , <b>D4</b> & <b>R</b> .	<ul style="list-style-type: none"> <li>• Engine output low, throttle cable misadjusted at carburetor.</li> <li>• Oil pump seized.</li> <li>• Torque Converter one-way clutch slipping.</li> </ul>

# 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

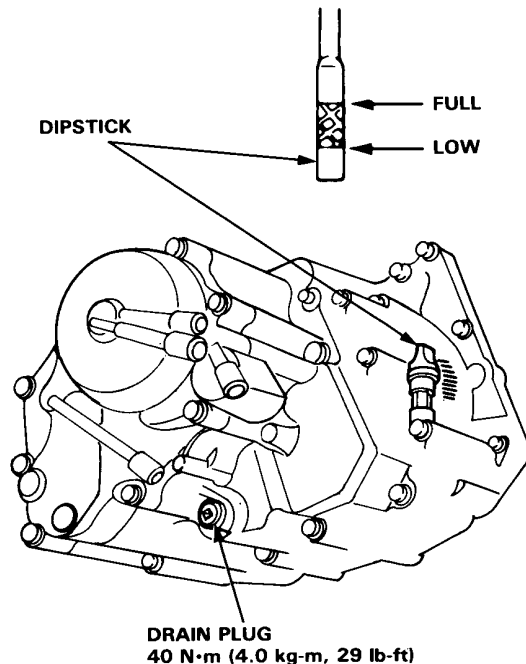
3.0 ℓ (3.2 U.S. qts., 2.6 Imp. qts) at change

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



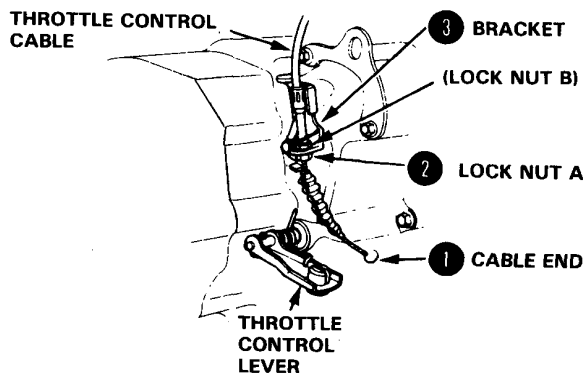


# Transmission



## 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.



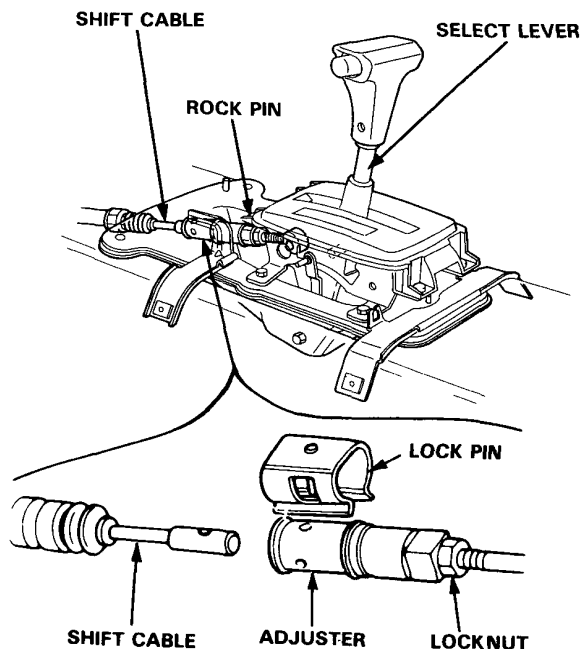
NOTE: For cable adjustment see page 15-71.

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. Remove the damper fork bolt.

15. Turn right side steering knuckle to its most out-board 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.**

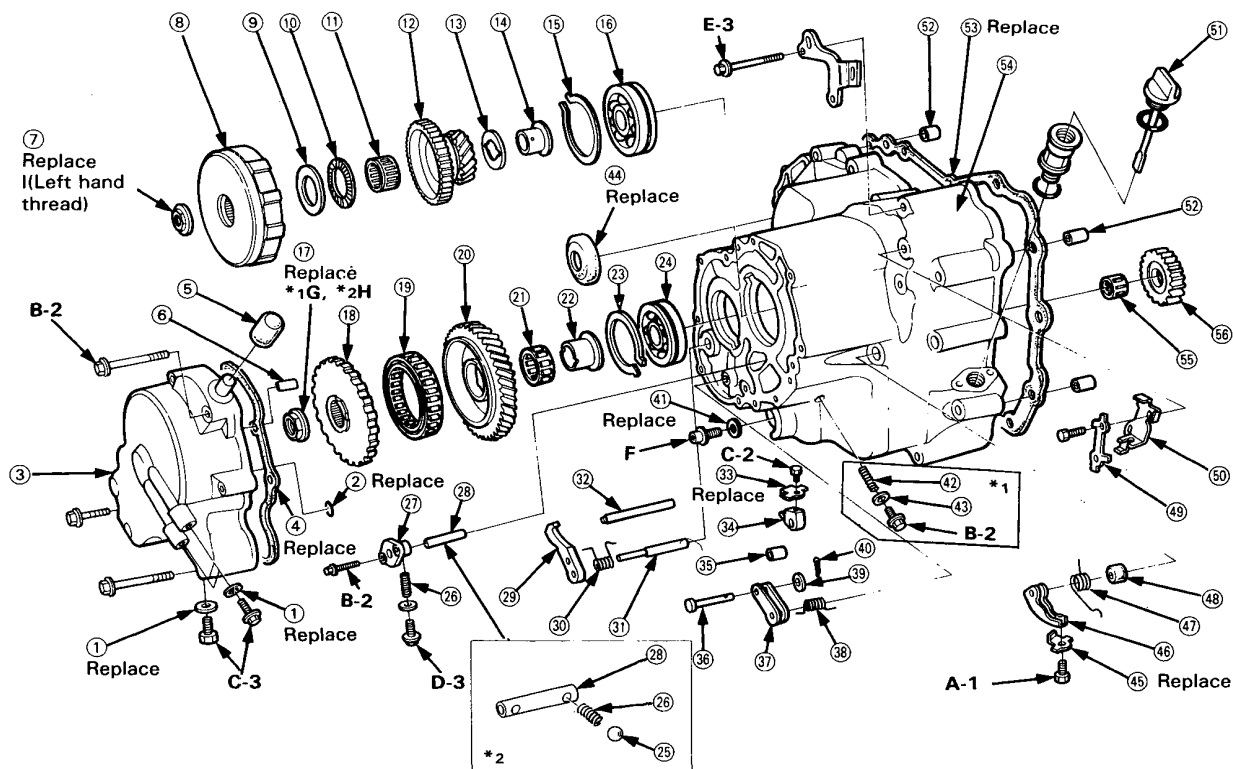
16. Remove transmission damper bracket located in front of torque converter cover plate.
17. Remove torque converter cover plate.
18. Remove center console.



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 transmission jack.
  - Remove torque converter from transmission.



# Illustrated Index



\*1 = A type transmission  
\*2 = B type transmission

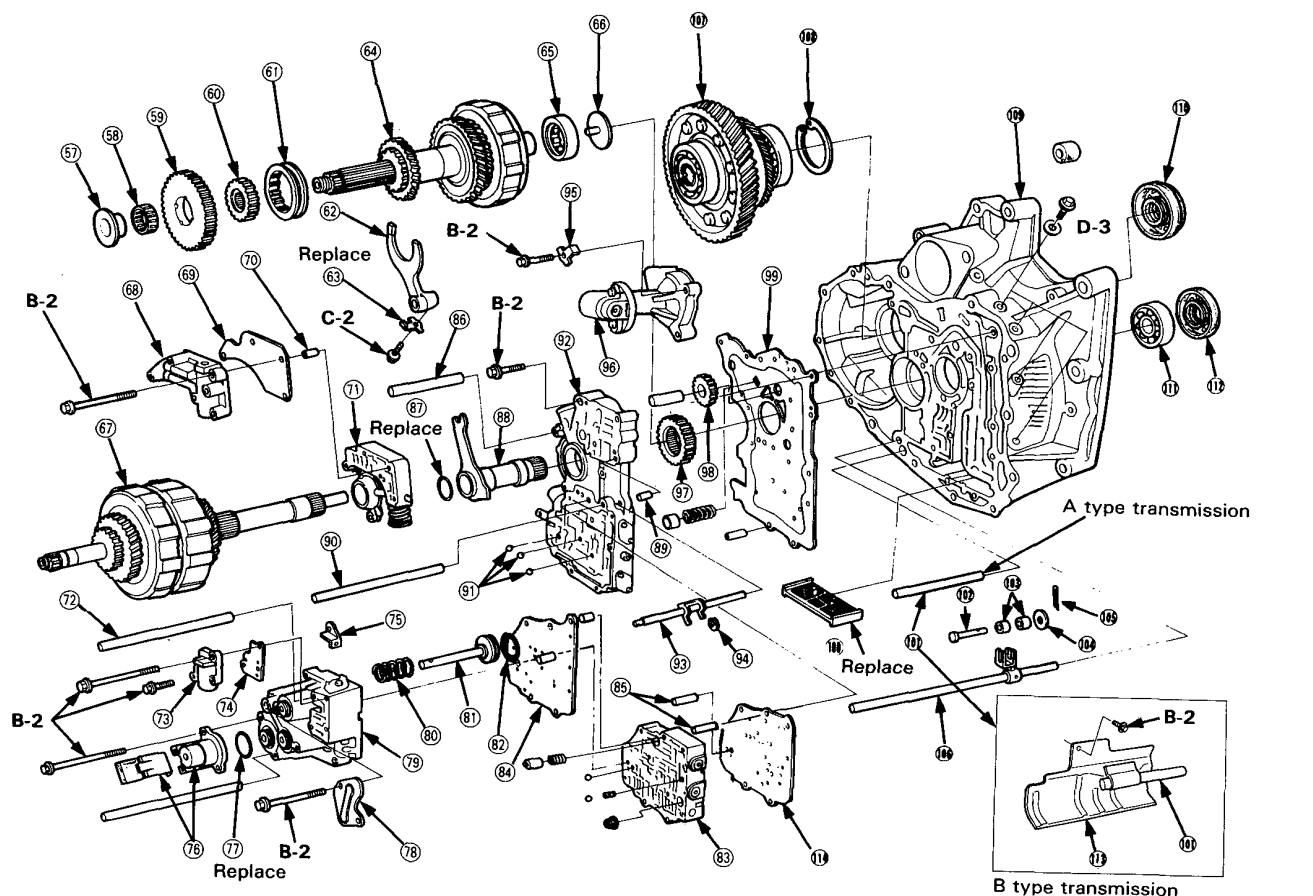
Torque	Bolt size
A-8 N·m (0.8 kg-m, 6 lb-ft)	1-5 x 0.8 mm
B-12 N·m (1.2 kg-m, 9 lb-ft)	2-6 x 1.0 mm
C-14 N·m (1.4 kg-m, 10 lb-ft)	3-8 x 1.25 mm
D-18 N·m (1.8 kg-m, 12 lb-ft)	
E-27 N·m (2.7 kg-m, 20 lb-ft)	
F-40 N·m (4.0 kg-m, 29 lb-ft)	
*1G-110-0-110 N·m (11.0-0-11.0 kg-m, 80-0-80 lb-ft)	
*2H-140-0-140 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  
ONE-WAY CLUTCH
- ⑲ COUNTERSHAFT 1st GEAR  
Disassembly/Inspection,  
page 15-22
- ⑳ NEEDLE BEARING
- ㉑ 1st GEAR COLLAR
- ㉒ SNAP RING 68 mm (2000 Engine)  
SNAP RING 62 mm (1600 Engine)
- ㉓ COUNTERSHAFT BEARING
- ㉔ STEEL BALL
- ㉕ SPRING
- ㉖ REVERSE IDLER  
BEARING HOLDER  
Removal, page 15-14
- ㉗ REVERSE GEAR SHAFT
- ㉘ PARKING PAWL
- ㉙ PARKING PAWL SPRING
- ㉚ PARKING PAWL SHAFT
- ㉛ STOP PIN
- ㉜ LOCK PLATE
- ㉝ PARKING LEVER
- ㉞ PARKING PAWL ROLLER
- ㉟ ROLLER PIN
- ㊱ PARKING SHIFT ARM
- ㊲ RETURN SPRING
- ㊳ WASHER 5 mm
- ㊴ COTTER PIN
- ㊵ WASHER 14 mm
- ㊶ SPRING
- ㊷ WASHER 6 mm
- ㊸ DIFFERENTIAL  
OIL SEAL  
Installation, page 15-46
- ㊹ LOCK PLATE
- ㊺ THROTTLE CONTROL  
LEVER

- ㊻ THROTTLE CONTROL  
SHAFT SPRING  
Removal, page 15-15  
Installation, page 15-59
- ㊼ THROTTLE CONTROL  
SHAFT SEAL
- ㊽ LOCK PLATE
- ㊾ THROTTLE CONTROL  
CABLE BRACKET
- ㊿ DIPSTICK
- 52 DOWEL PIN 14 x 25 mm
- 53 GASKET
- 54 TRANSMISSION HOUSING  
NEEDLE BEARING
- 56 REVERSE IDLER GEAR  
Replacement, page 15-58





- 57 REVERSE GEAR COLLAR
- 58 NEEDLE BEARING
- 59 COUNTERSHAFT
- 60 REVERSE GEAR
- 61 SELECTOR HUB
- 62 REVERSE GEAR SELECTOR
- 63 REVERSE SHIFT FORK
- 64 LOCK PLATE
- 65 COUNTERSHAFT ASSY  
Disassembly/Inspection, page 15-33
- 66 COUNTERSHAFT NEEDLE BEARING
- 67 OIL GUIDE PLATE
- 68 MAINSHAFT ASSY  
Disassembly/Inspection page 15-32
- 69 LOCK UP SHIFT VALVE BODY  
Removal, page 15-18  
Disassembly, page 15-29
- 70 SEPARATOR PLATE

- 71 DOWEL PIN
- 72 REGULATOR VALVE BODY  
Removal, page 15-19  
Repair, page 15-25  
Disassembly, page 15-28
- 73 4th CLUTCH PIPE
- 74 MODULATOR VALVE BODY  
Removal, page 15-17
- 75 SEPARATOR PLATE
- 76 CHECK VALVE STOP PLATE
- 77 4th ACCUMULATOR COVER
- 78 O-RING
- 79 2nd/3rd ACCUMULATOR COVER
- 80 SERVO VALVE BODY ASSY  
Removal, 15-17  
Disassembly, 15-30
- 81 RETURN SPRING
- 82 SERVO VALVE
- 83 O-RING 31 x 2.7 mm
- 84 SECONDARY VALVE BODY ASSY  
Removal, 15-18  
Disassembly/Inspect, 15-24

- 85 SERVO SEPARATOR PLATE
- 86 DOWEL PIN
- 87 STOP PIN
- 88 O-RING
- 89 STATOR SHAFT
- 90 DOWEL PIN
- 91 1st CLUTCH PIPE
- 92 STEEL BALLS
- 93 MAIN VALVE BODY ASSY  
Remove, 15-19  
Disassembly, 15-23
- 94 THROTTLE CONTROL SHAFT
- 95 E-CLIP
- 96 LOCK PLATE
- 97 GOVERNOR VALVE  
Removal, 15-16  
Disassembly/Inspection, 15-31
- 98 PUMP DRIVE GEAR
- 99 PUMP DRIVEN GEAR
- 100 MAIN VALVE SEPARATOR PLATE

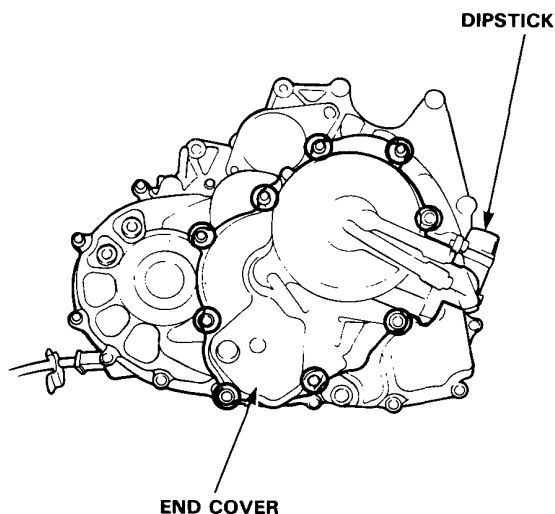
- 101 FILTER SCREEN
- 102 SUCTION PIPE
- 103 MANUAL VALVE PIN
- 104 ROLLERS
- 105 WASHER 5 mm
- 106 COTTER PIN
- 107 CONTROL SHAFT
- 108 DIFFERENTIAL
- 109 SNAP RING 80 mm
- 110 TORQUE CONVERTER HOUSING
- 111 DIFFERENTIAL OIL SEAL
- 112 MAINSHAFT BEARING
- 113 MAINSHAFT OIL SEAL
- 114 BAFFLE PLATE  
B type transmission only
- 115 SECONDARY SEPARATOR PLATE



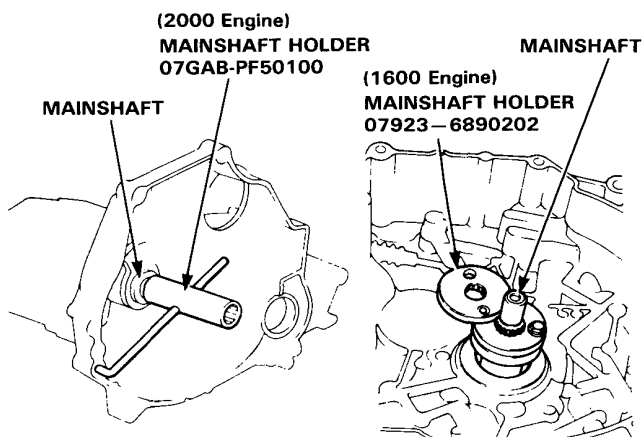
# Transmission Housing

## Removal

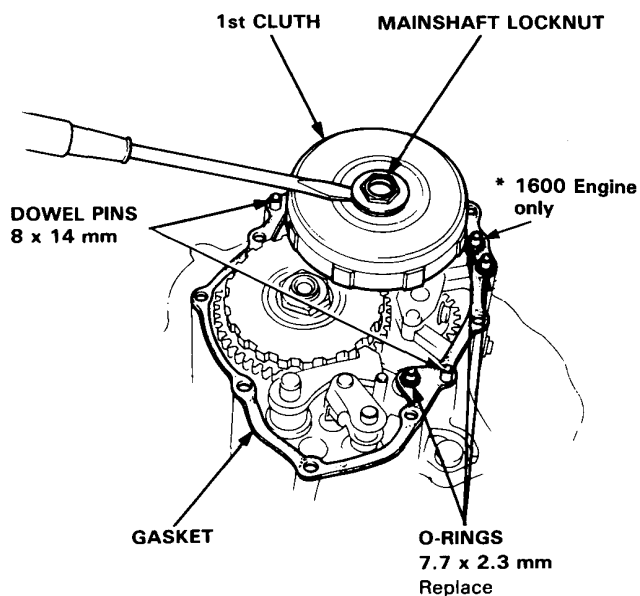
1. Remove the dipstick.
2. Remove the nine bolts from the end cover, then remove the cover.



3. Shift the transmission to PARK.
4. Lock the mainshaft using the mainshaft holder.

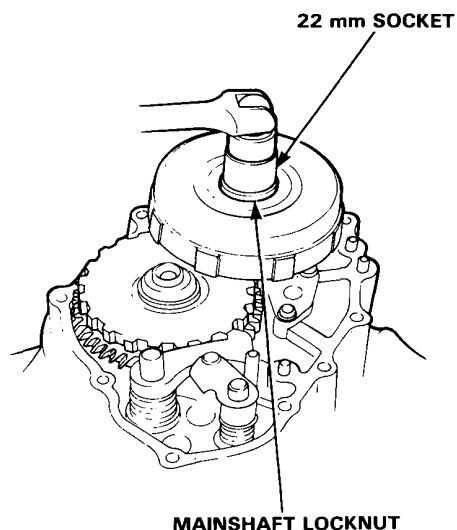


5. Remove the end cover gasket, dowel pins, and O-rings.
6. Pry the staked edge of the locknut flange out of the notch in the 1st clutch.



7. Remove the mainshaft locknut.

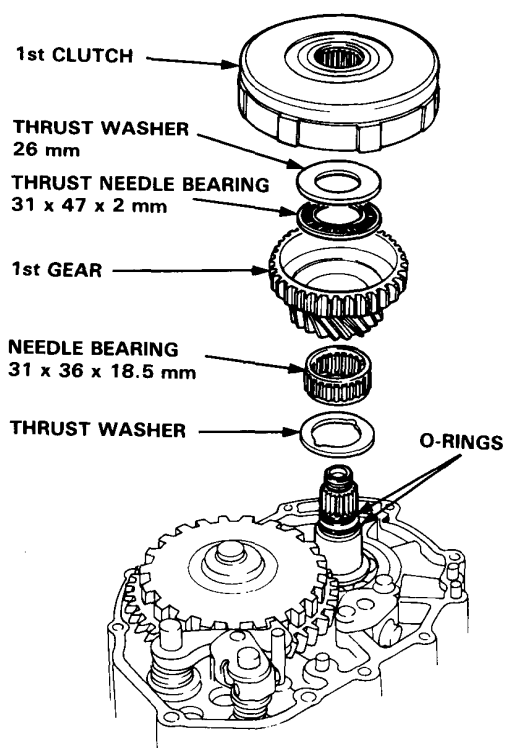
**CAUTION:** The mainshaft locknut has left-hand threads.





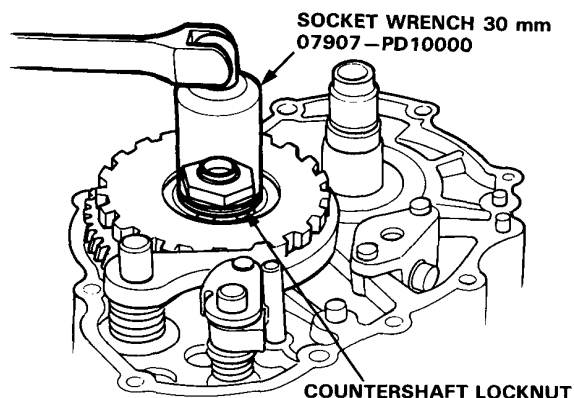


8. Remove the 1st clutch.
9. Remove the needle bearing and thrust washer from the mainshaft.
10. Remove the O-rings and first gear from the mainshaft.

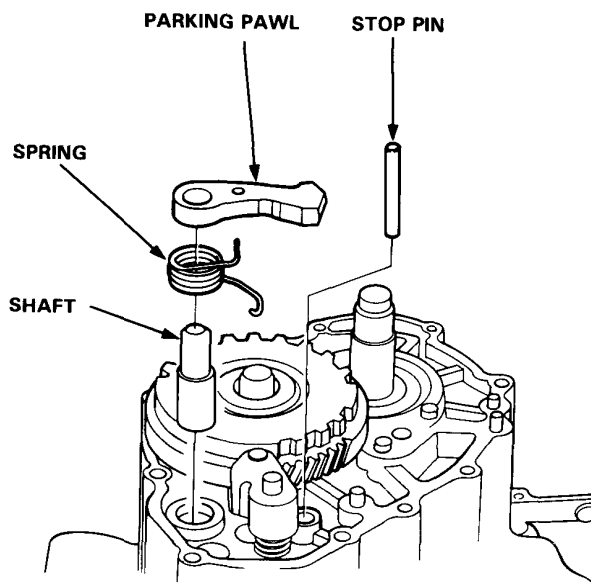


11. Pry the staked edge of the locknut out of the notch in the parking gear.

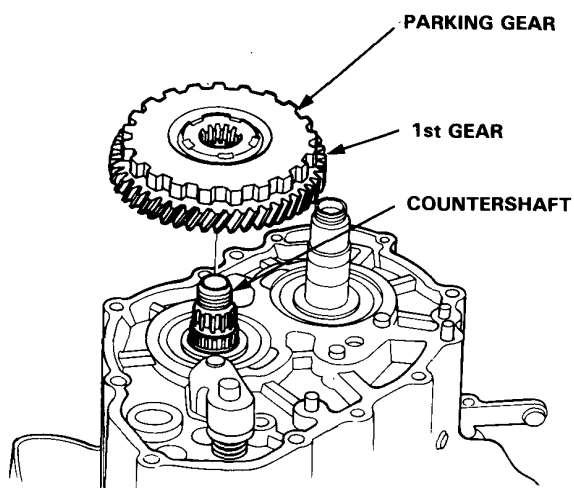
12. Remove the countershaft locknut.



13. Remove the parking pawl, shaft, stop pin and spring.



14. Remove the parking gear and countershaft 1st gear as a unit.



(cont'd)

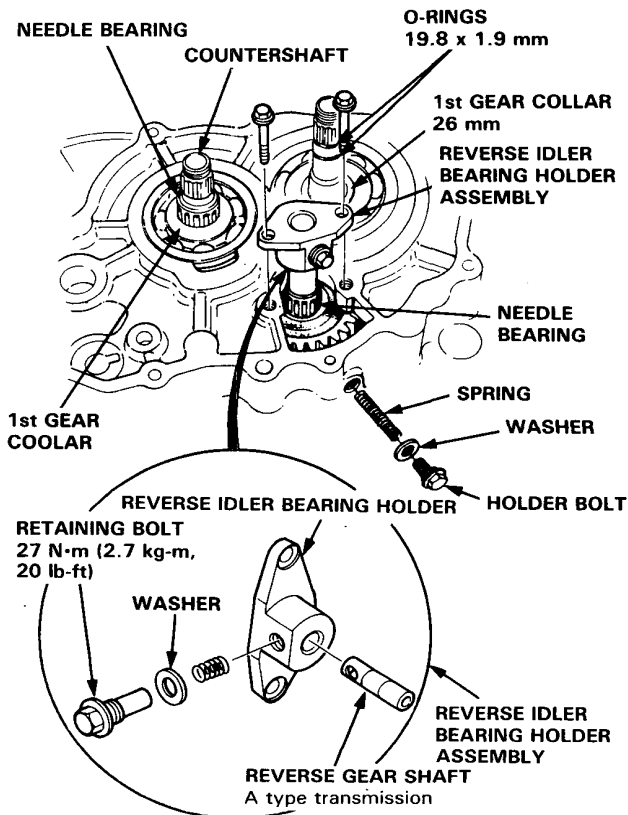


# Transmission Housing

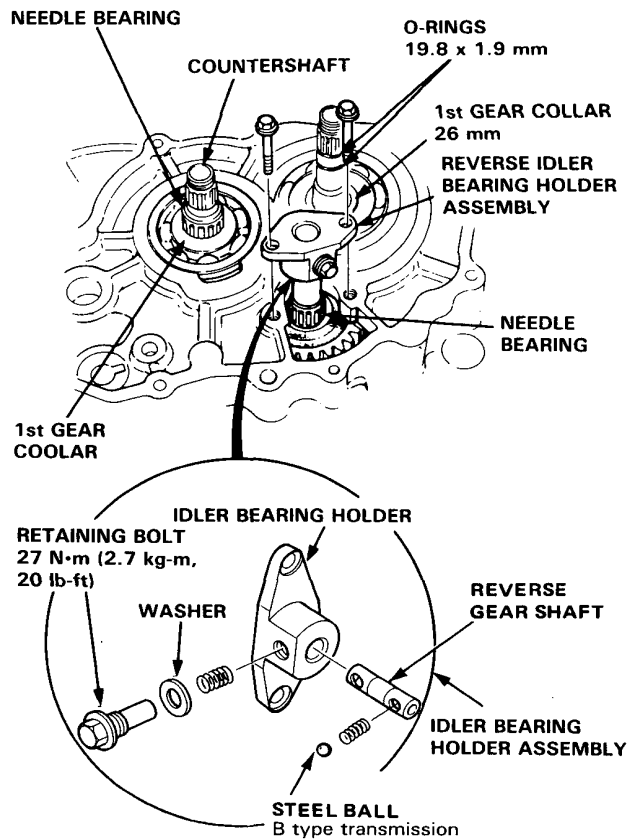
## Removal (cont'd)

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.

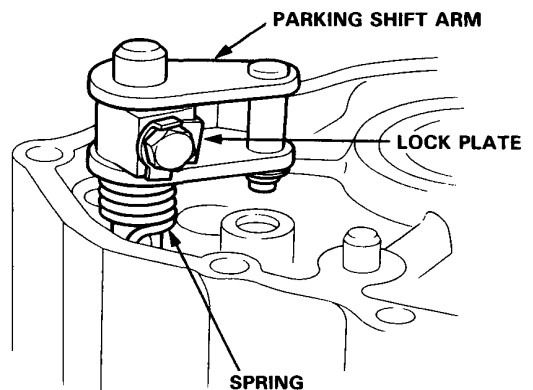
### A type transmission



### B type transmission



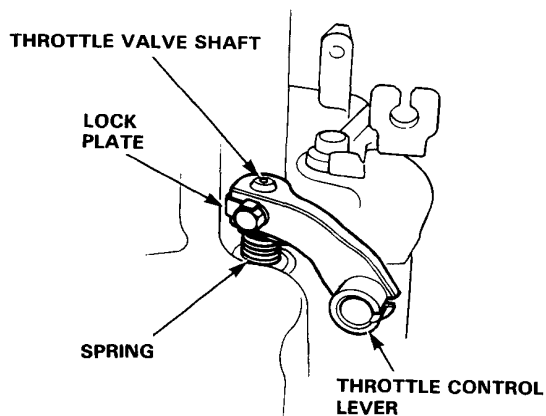
17. Bend down the tab on the lock plate under the parking shift arm bolt.
18. Remove the bolt, then remove the parking shift arm.



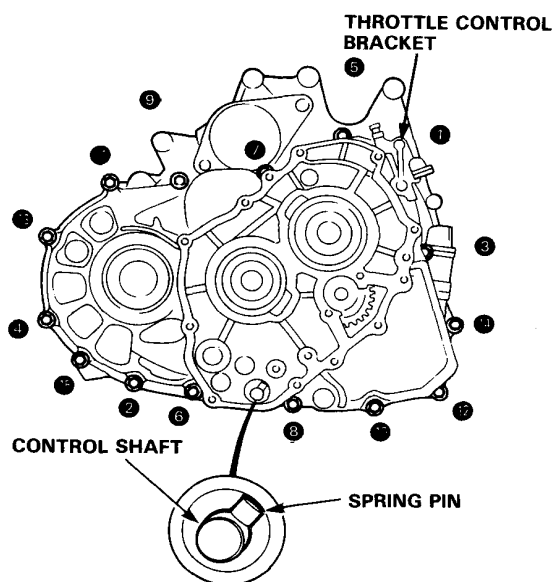




19. Bend down the tab on the throttle control lever bolt lock plate, then remove the bolt. Remove the throttle control lever and spring from the throttle valve shaft.

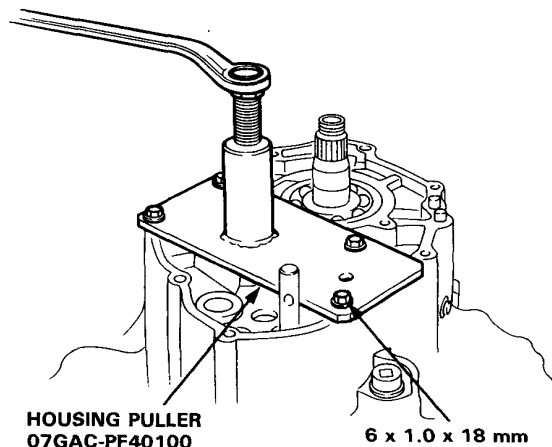


20. Remove the transmission bolts, (1) thru (15), in the sequence shown.



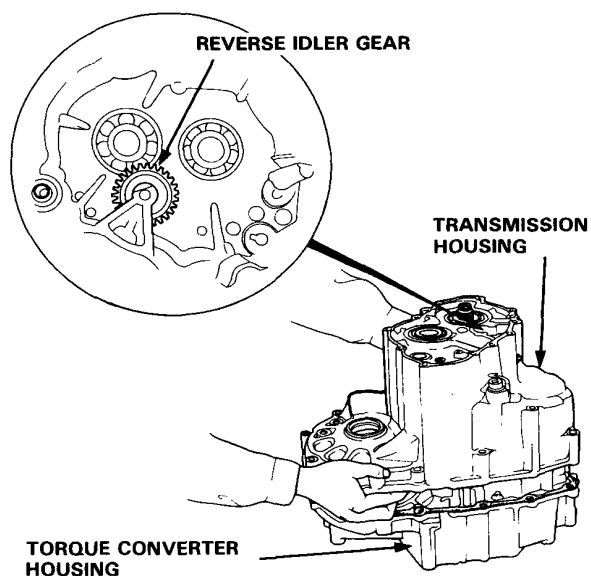
21. Align the control shaft spring pin with the cutout in the transmission housing.

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.

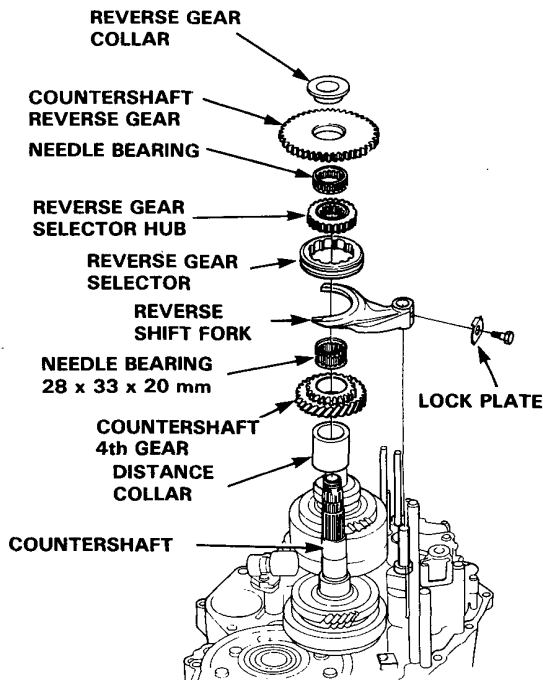




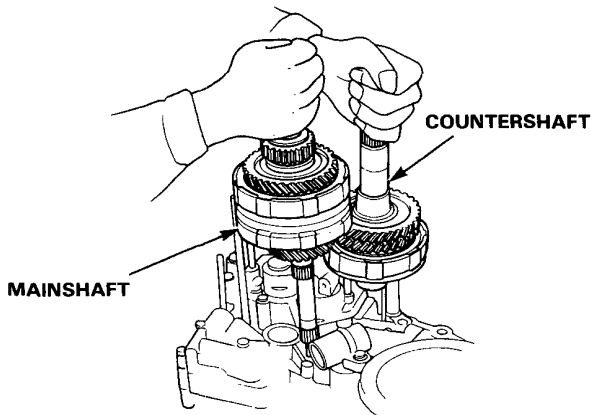
# Mainshaft/ Countershaft

## Removal

1. Remove the reverse gear collar, countershaft reverse gear and needle bearing.



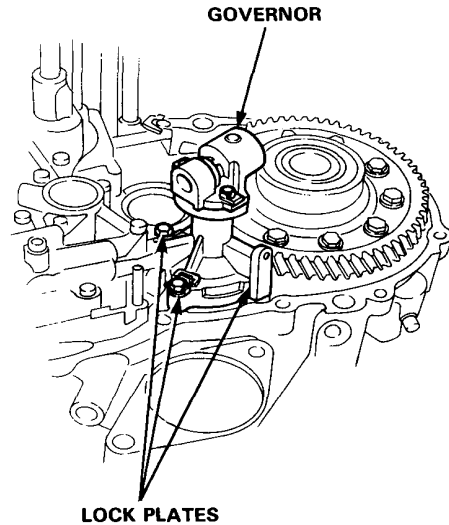
2. Bend down the tab on the lock plate and remove the bolt from the reverse shift fork.
3. Remove the reverse shift fork and reverse gear selector as a unit.
4. Remove the selector hub, countershaft 4th gear, needle bearing and distance collar.
5. Remove the mainshaft and countershaft together.  
NOTE: 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.



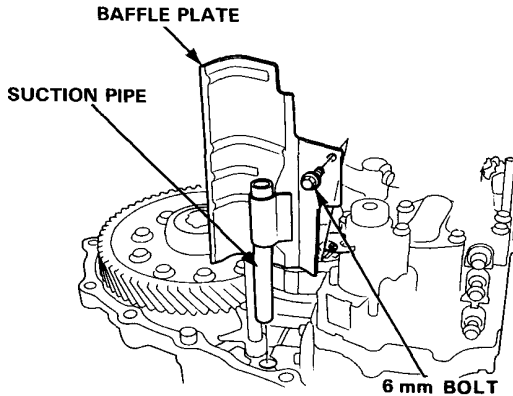


# Main Valve Body



## Removal

1. Remove the baffle plate with the suction pipe (baffle plate is applied from B type transmission).

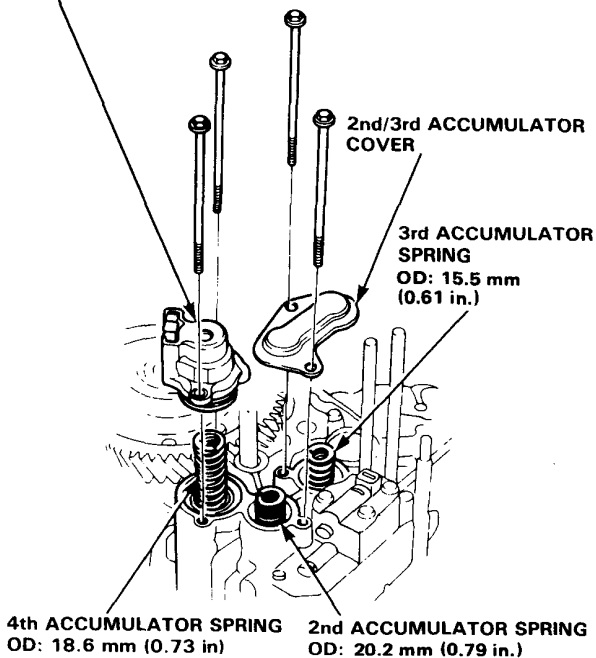


2. Remove the accumulator covers.

**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.

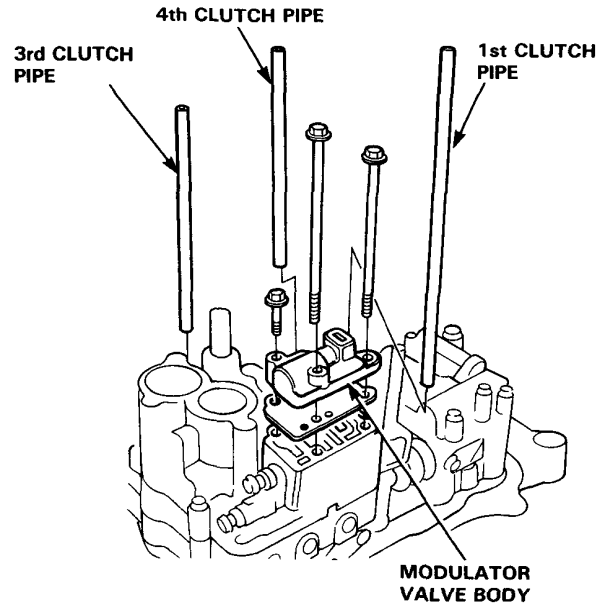
3. Remove the accumulator springs.

4th ACCUMULATOR COVER



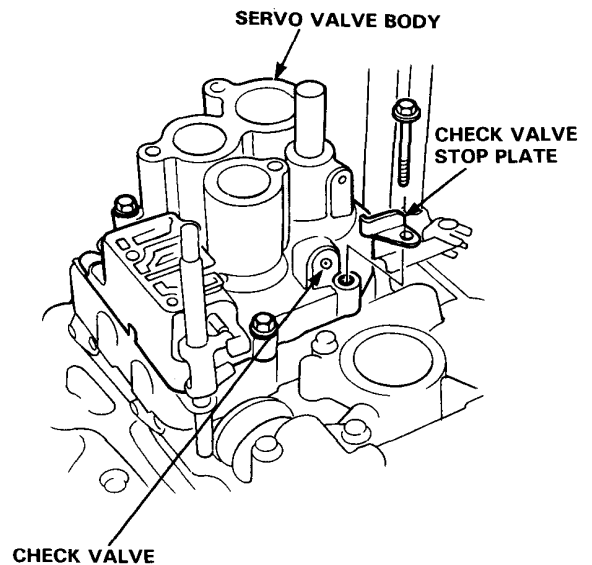
4. Remove the three bolts attaching the modulator valve body.

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)

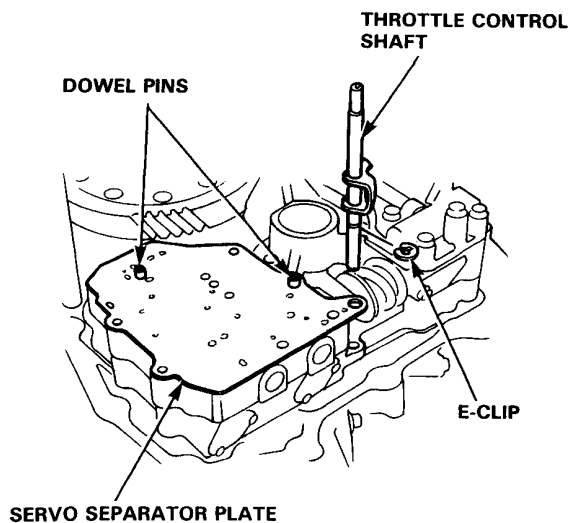


# Main Valve Body

## Removal (cont'd)

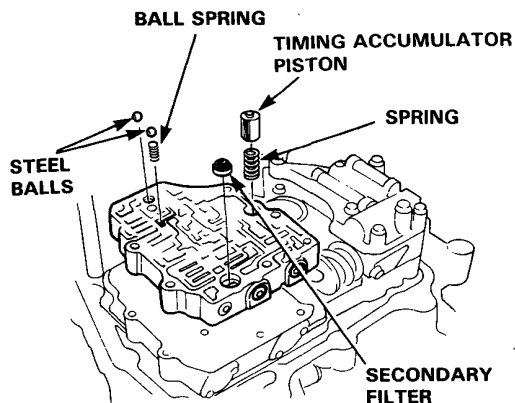
8. Remove the E-clip. Then remove the throttle control shaft from the separator plate.

9. Remove the separator plate and dowel pins.

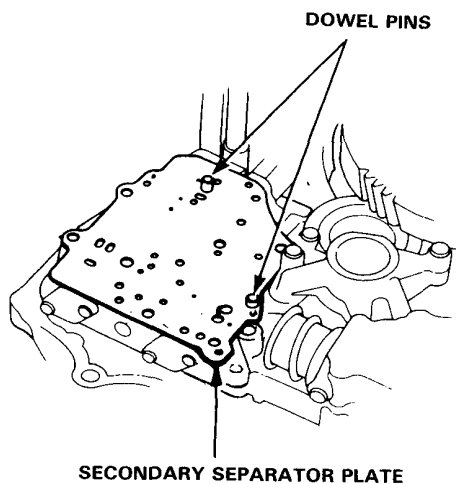


10. Remove the secondary valve body, being careful not to lose the 2 steel balls, ball spring, check valve and spring, secondary filter.

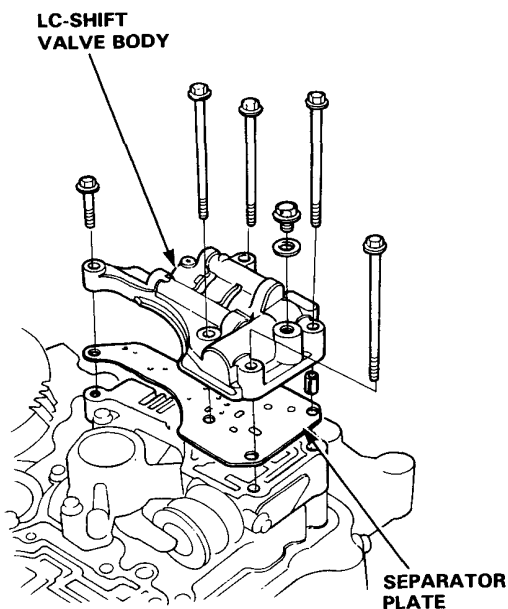
**CAUTION:** Do not use a magnet to remove the steel balls; it may magnetize the balls.



11. Remove the separator plate and dowel pins.



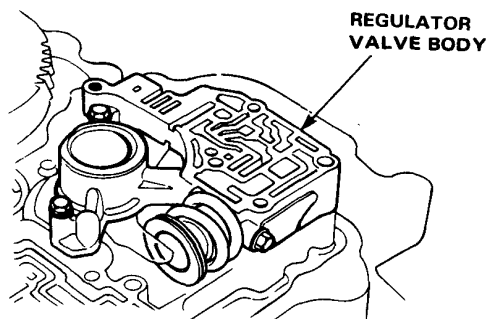
12. Remove the LC-Shift valve body and separator plate (5 bolts).



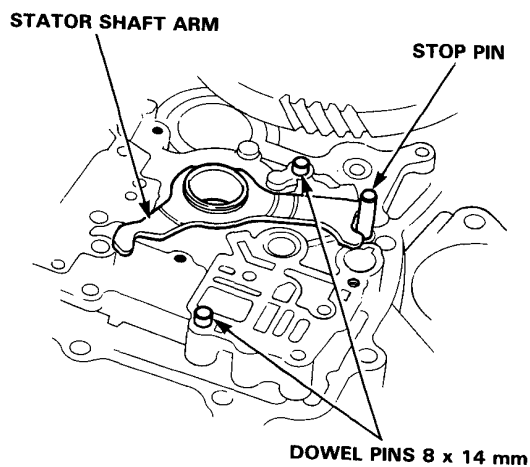




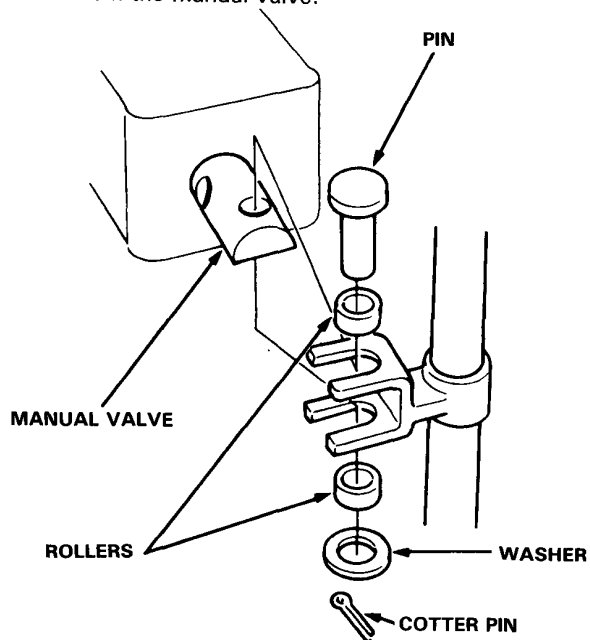
13. Remove the regulator valve body.



14. Remove the stator shaft arm, dowel pins and stop pin.



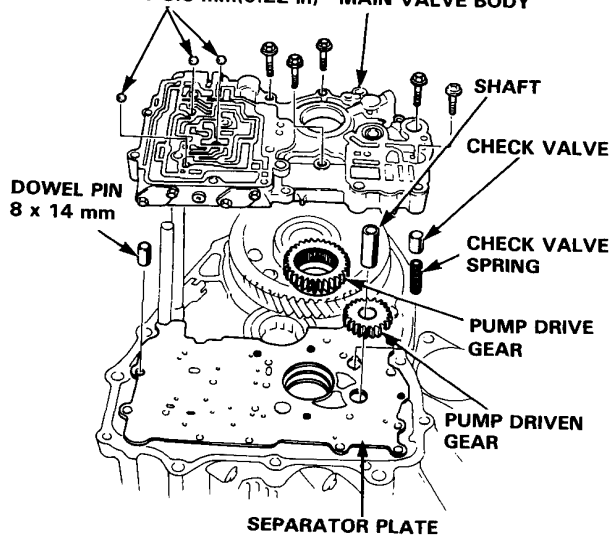
15. Remove the cotter key, washer, rollers, and pin from the manual valve.



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.

**OIL PASSAGE**  
**STEEL BALLS 5.5 mm(0.22 in)** **MAIN VALVE BODY**



(cont'd)



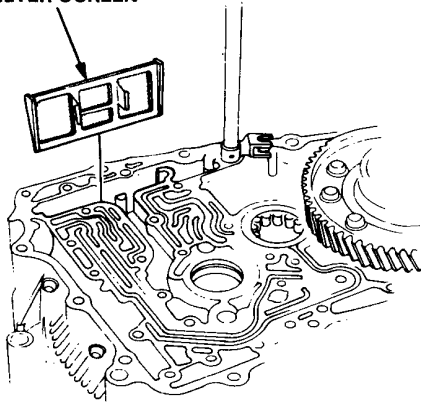
# Main Valve Body

## 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.

FILTER SCREEN



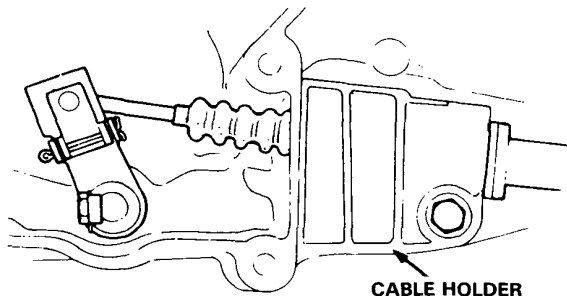


# Control Shaft

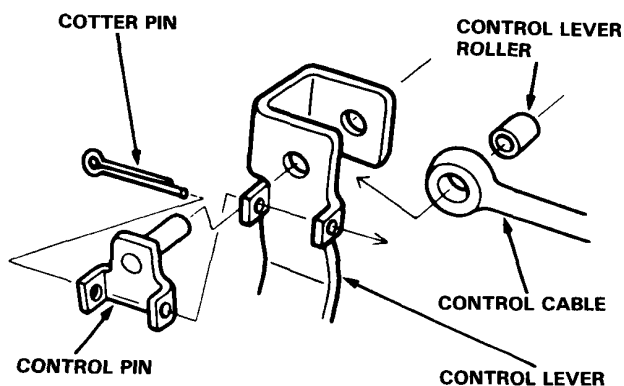


## Removal

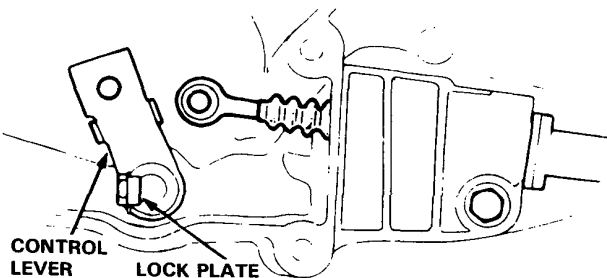
1. Remove the cable holder.



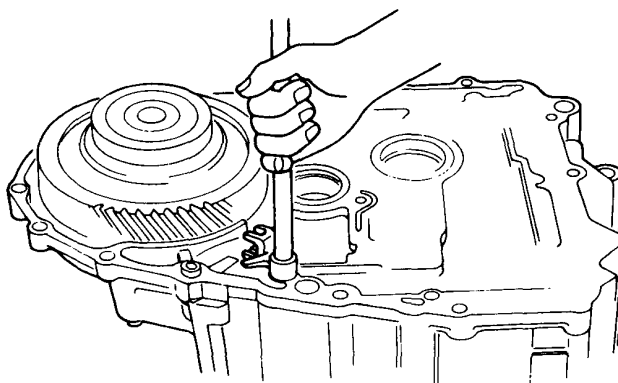
2. Remove the cotter pin, control pin, and control lever roller from the control lever.



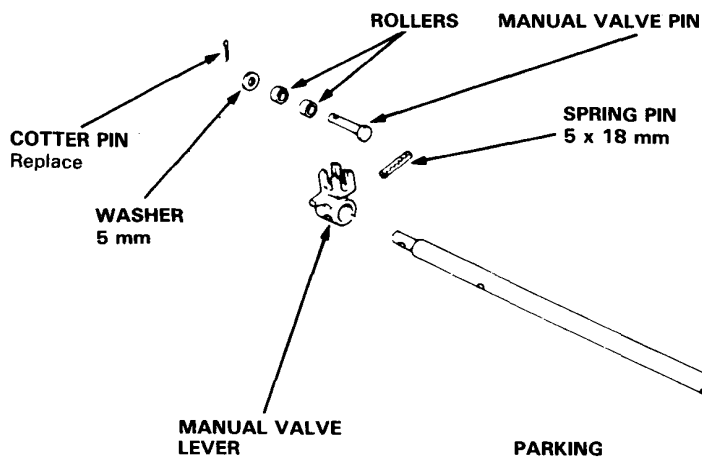
3. Bend down the tab on the lock plate under the bolt in the control lever. Then remove the bolt and lever.



4. Turn the torque converter housing over and remove the control shaft.

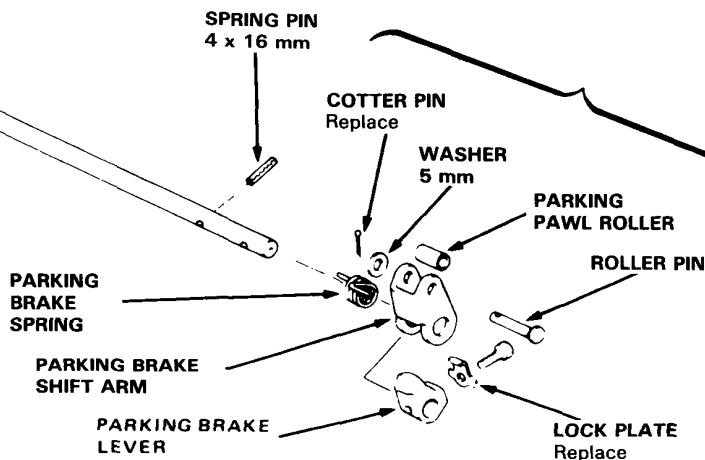


## Disassembly/Reassembly



### NOTE:

These parts are installed on the shaft after the transmission and torque converter housings are assembled.

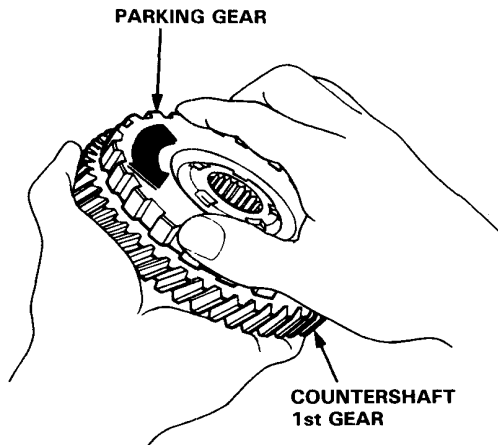




# One-Way Clutch/Parking Gear

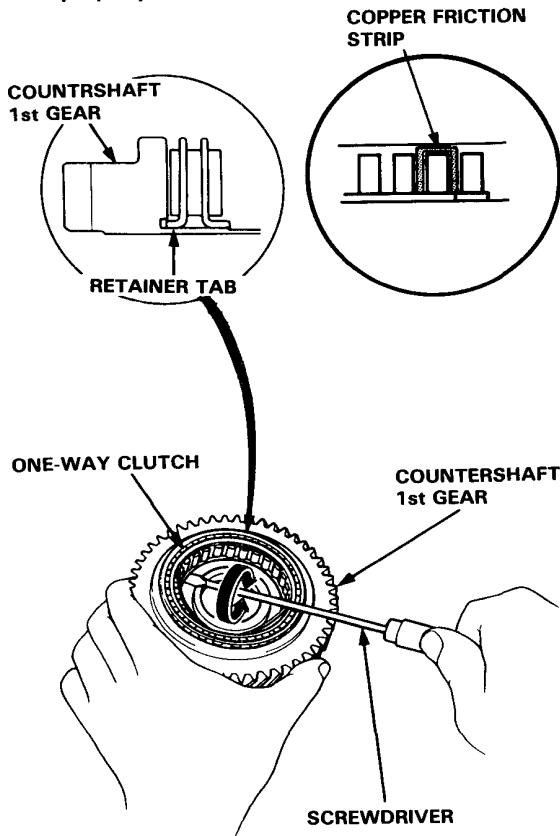
## Disassembly and Inspection

1. Separate the countershaft 1st gear from the parking gear by turning the parking gear in the direction shown.

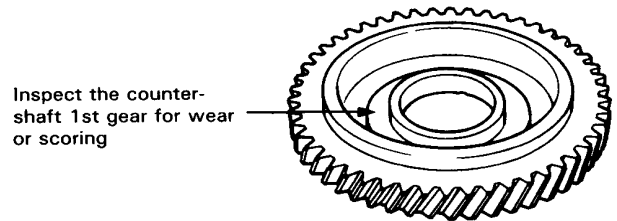
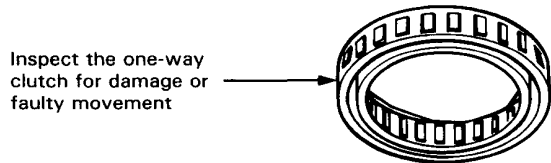
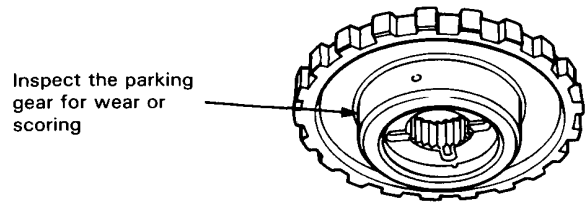


2. Remove the one-way clutch by prying it up with the end of a screwdriver.

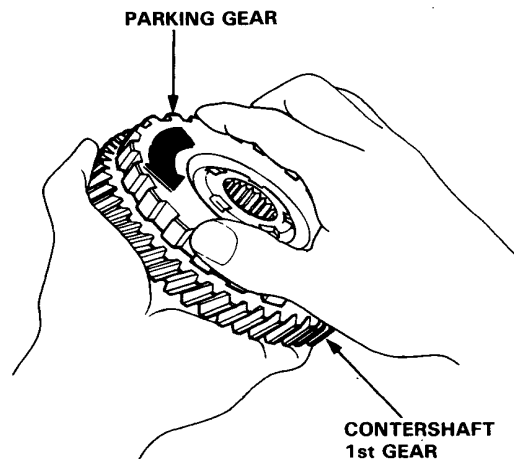
**CAUTION:** Do not pry on the three copper friction strips; if you break a strip, the clutch will not work properly.



Inspect the parts as follows:



After the parts are assembled, hold the countershaft 1st gear and turn the parking gear in direction shown to be sure it turns freely.





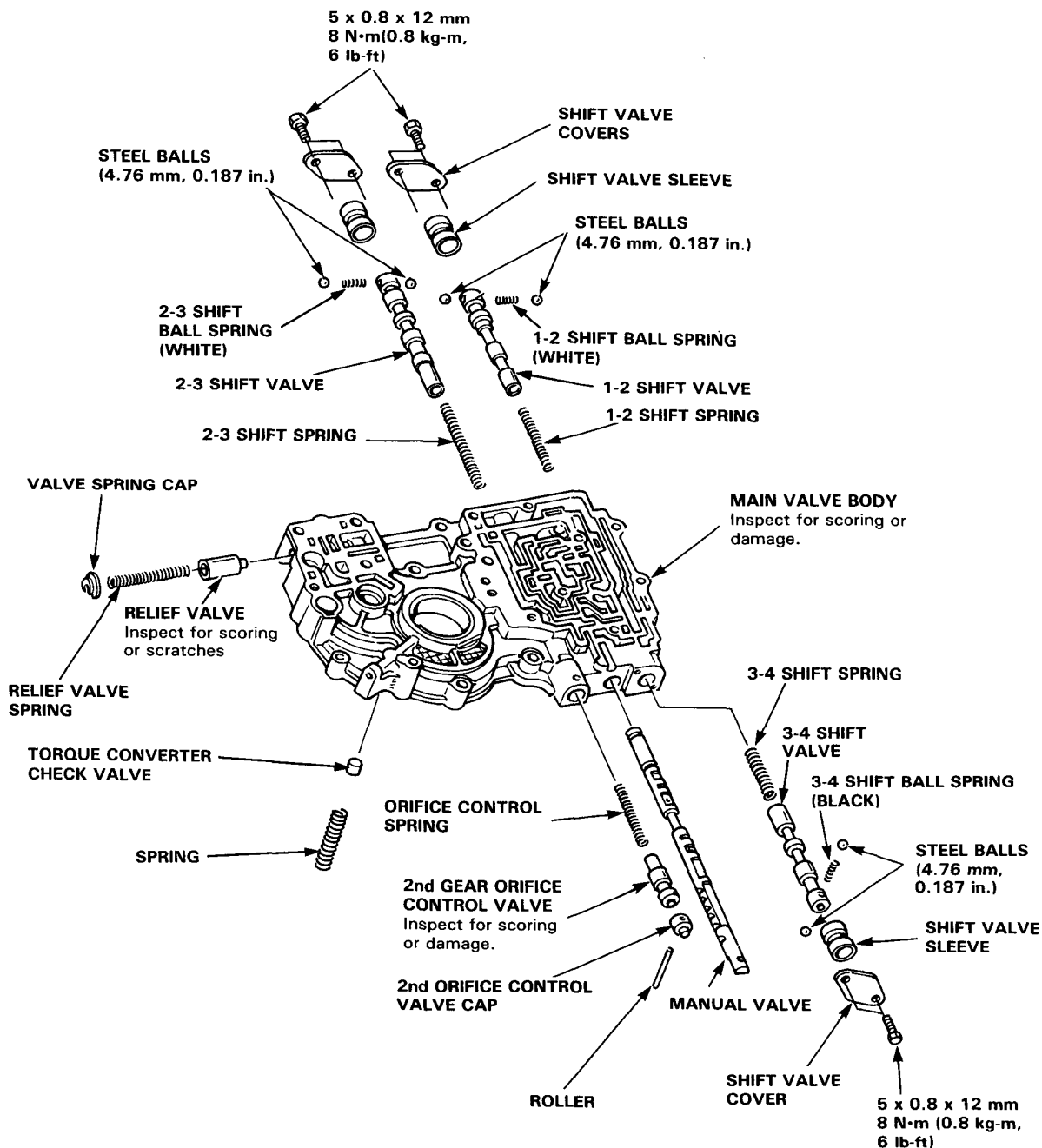
# Main Valve Body



## 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.



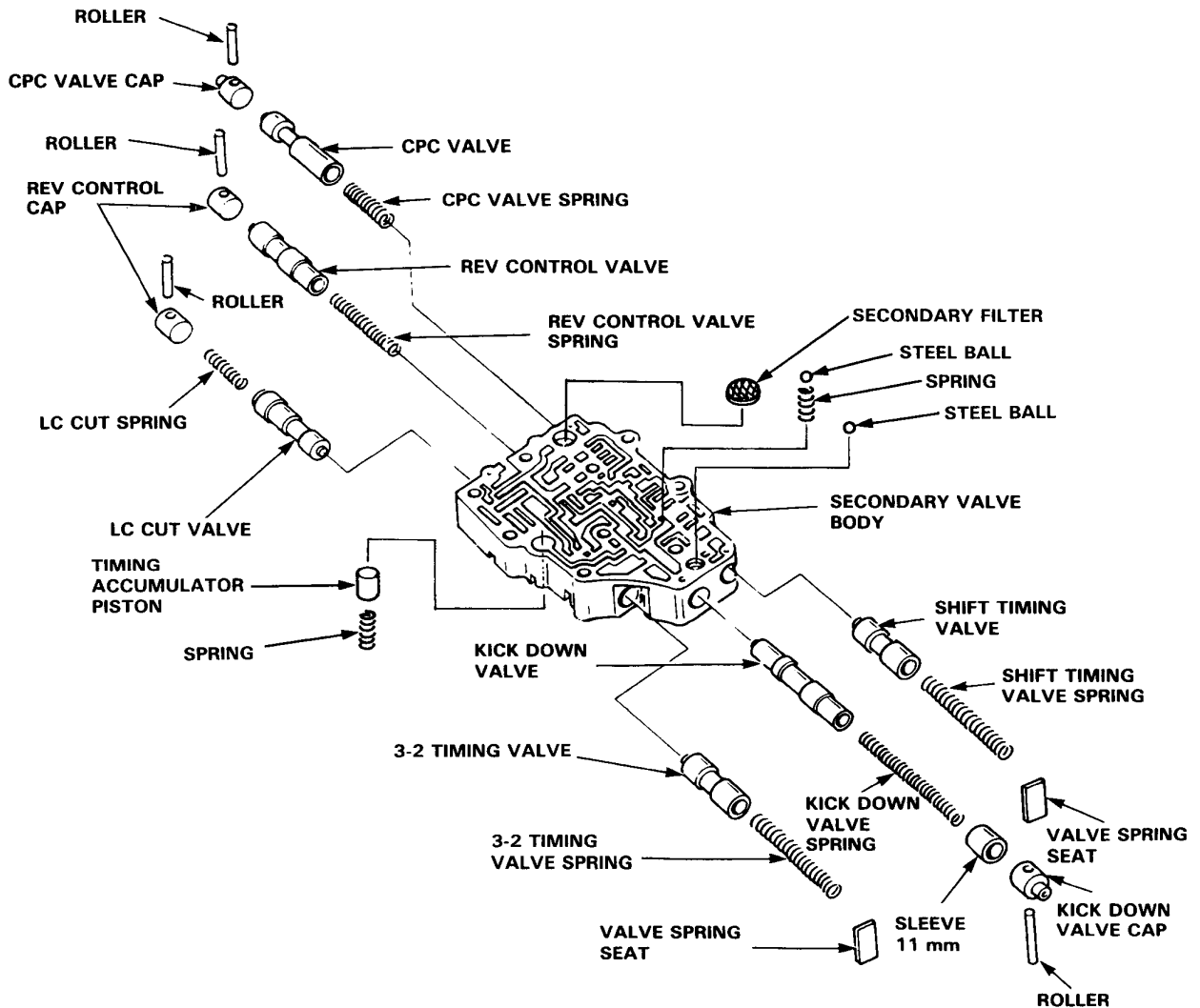


# Secondary Valve

## Disassembly/Inspection/Reassembly

### NOTE:

- Clean all parts thoroughly 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.





# Valve Body



## 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.

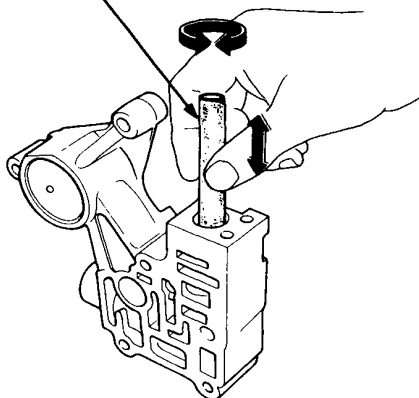
1. Soak a sheet of #600 abrasive paper in ATF for about 30 minutes.
2. Carefully tap the valve body so the sticking valve drops out of its bore.

**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.

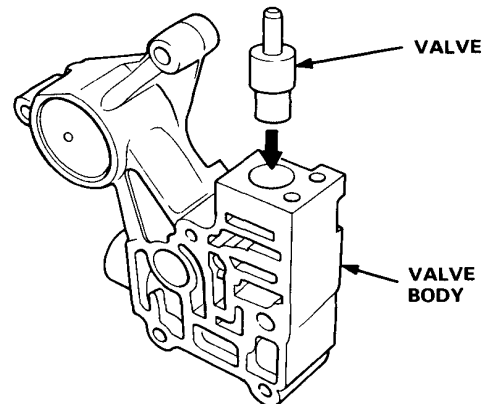
3. Inspect the valve for any scuff marks. Use the ATF-soaked #600 paper to polish off any burrs that are on the valve, then wash the valve in solvent and dry it with compressed air.
4. Roll up half a sheet of ATF-soaked paper and insert it in the valve bore of the sticking valve. Twist the paper slightly, 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.

ATF-soaked  
#600 abrasive  
paper



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.

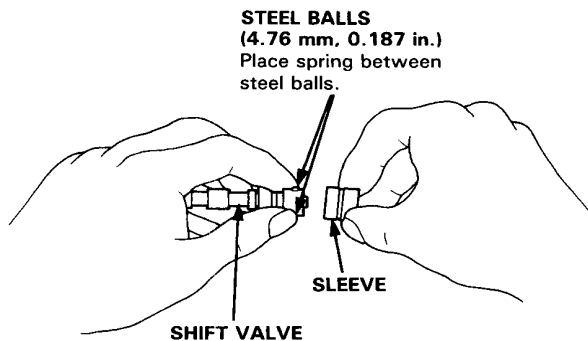


# Main Valve Body

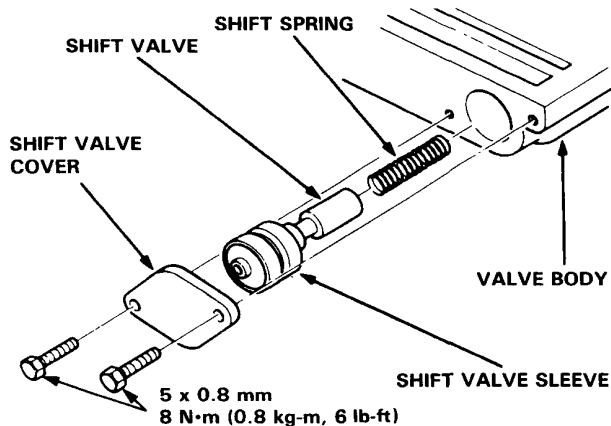
## Reassembly

NOTE: Coat all parts with ATF before assembling.

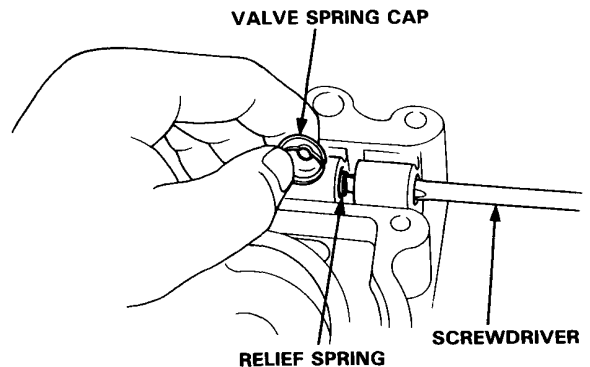
1. Slide the spring into the hole in the big end of the shift valve.  
While holding the steel balls with the tips of your fingers, put the sleeve over valve.



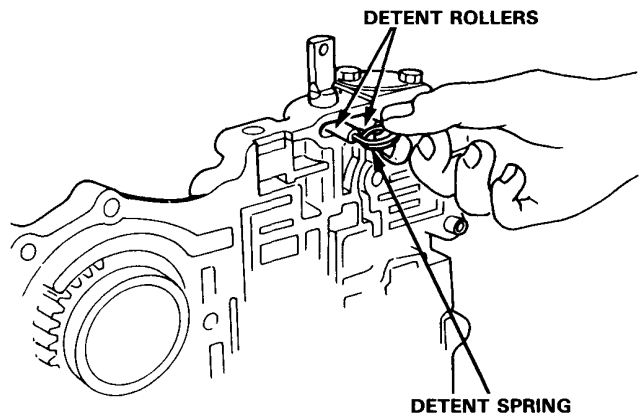
2. Place the shift spring in the valve, then slip it into the valve body and install the valve cover.



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.



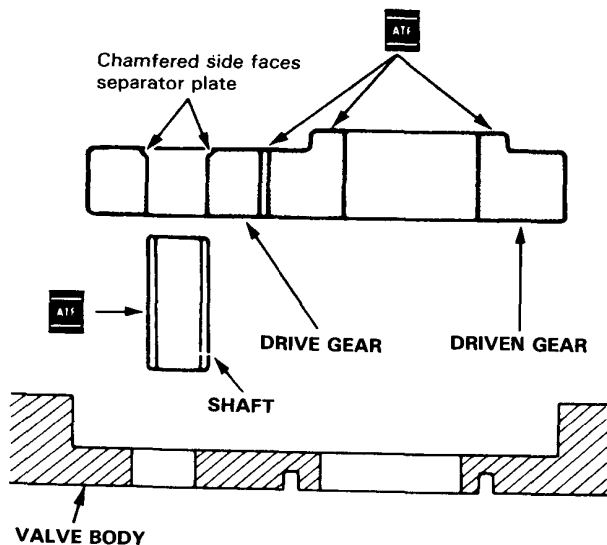
5. Install the manual valve, detent rollers and spring.







6. Install the pump gears and shaft in the main valve body.

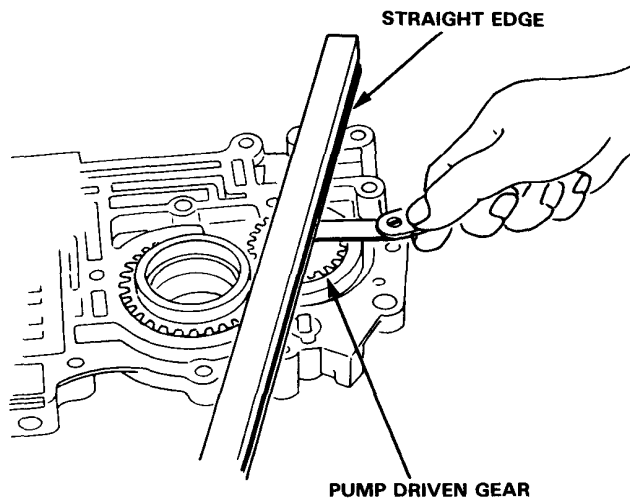


7. Measure the thrust clearance of the driven gear-to-valve body.

**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.)



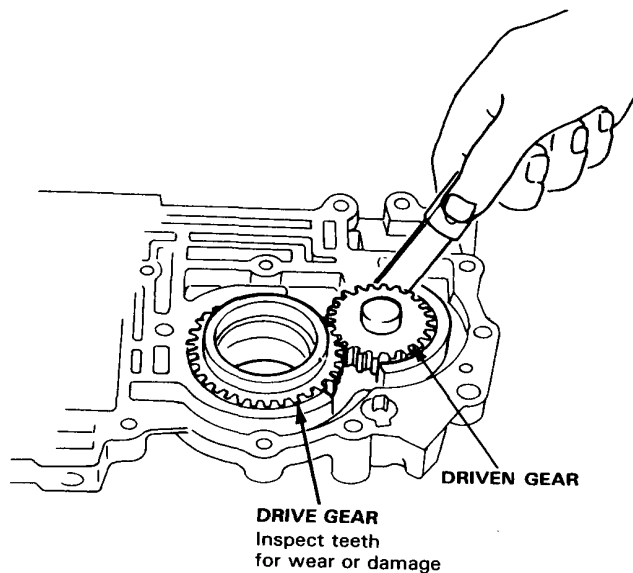
8. Install the oil pump shaft and measure the side clearance of the drive and driven gears.

**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.)





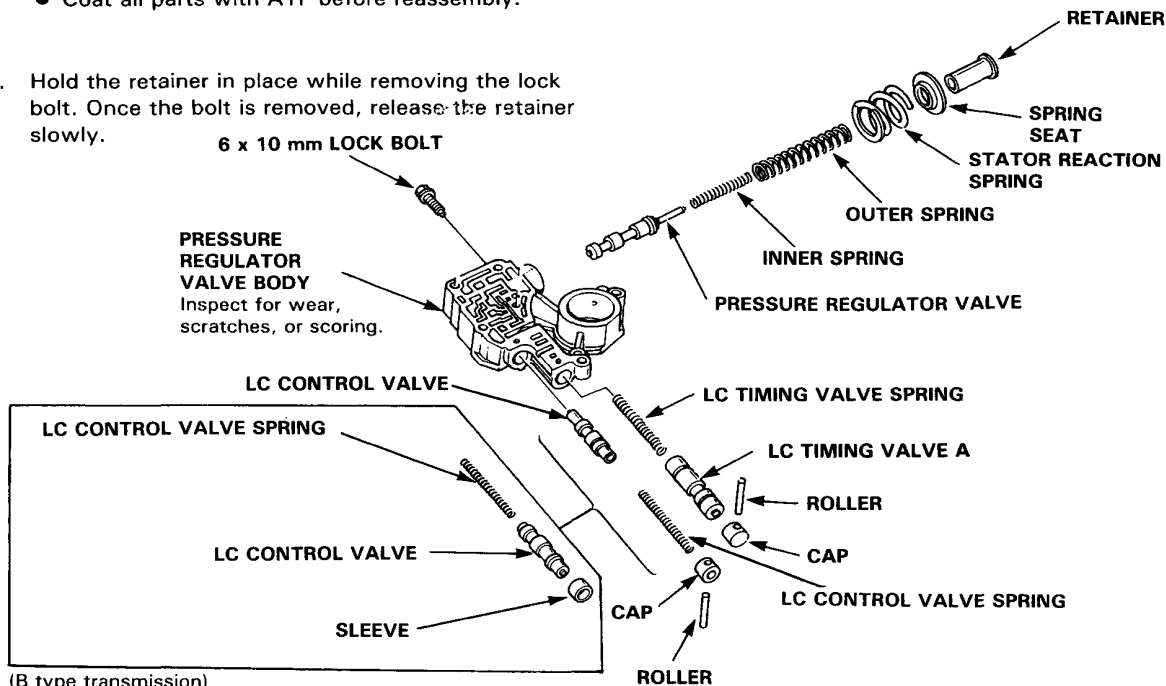
# Regulator Valve Body

## Disassembly/Inspection

### NOTE:

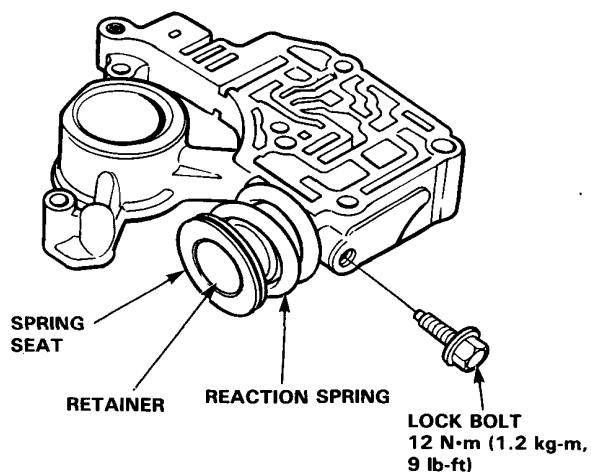
- Clean all parts thoroughly in solvent or carburetor cleaner.
- Replace valve body as assembly if any parts are worn or damaged.
- Check all valves for free movement, if any fail to slide freely, see Valve Body Repair on page 15-25
- Coat all parts with ATF before reassembly.

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.





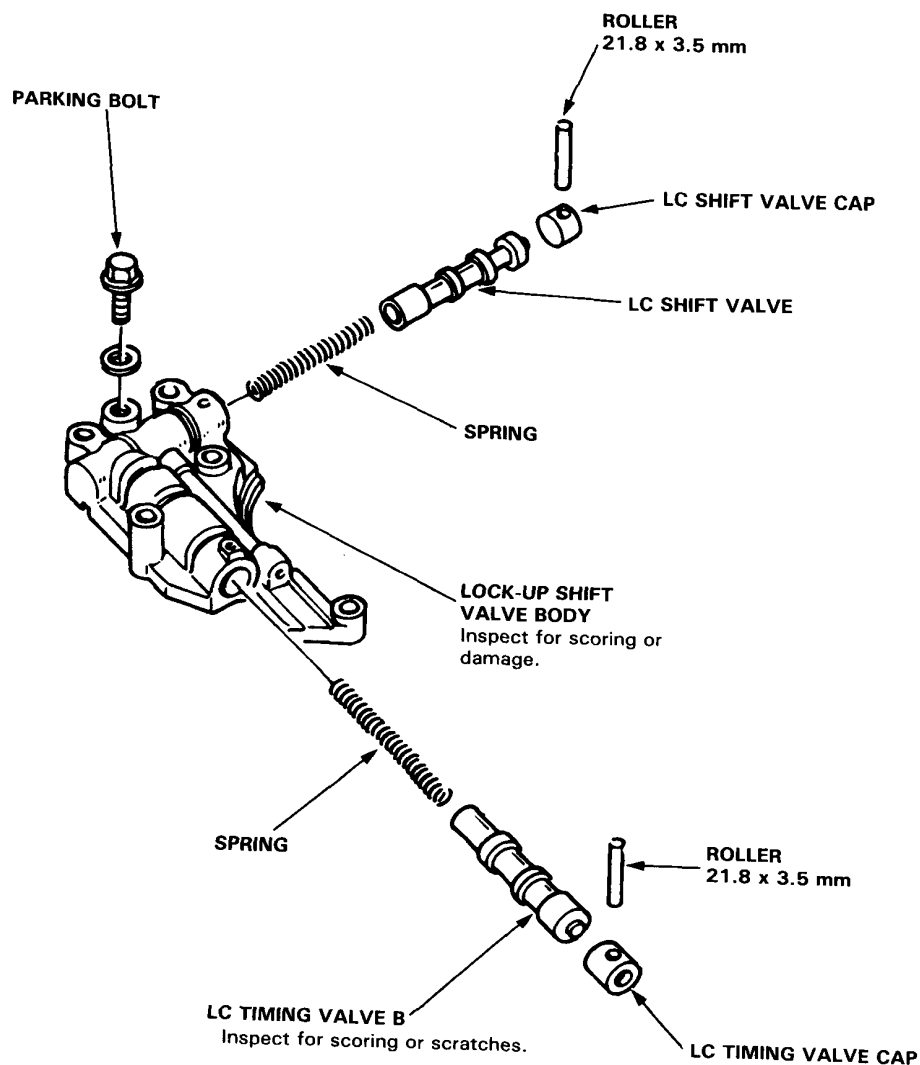
# Lock-Up Shift Valve Body



## Disassembly/Inspection

### NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner.
- Replace valve body as assembly if any parts are 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.



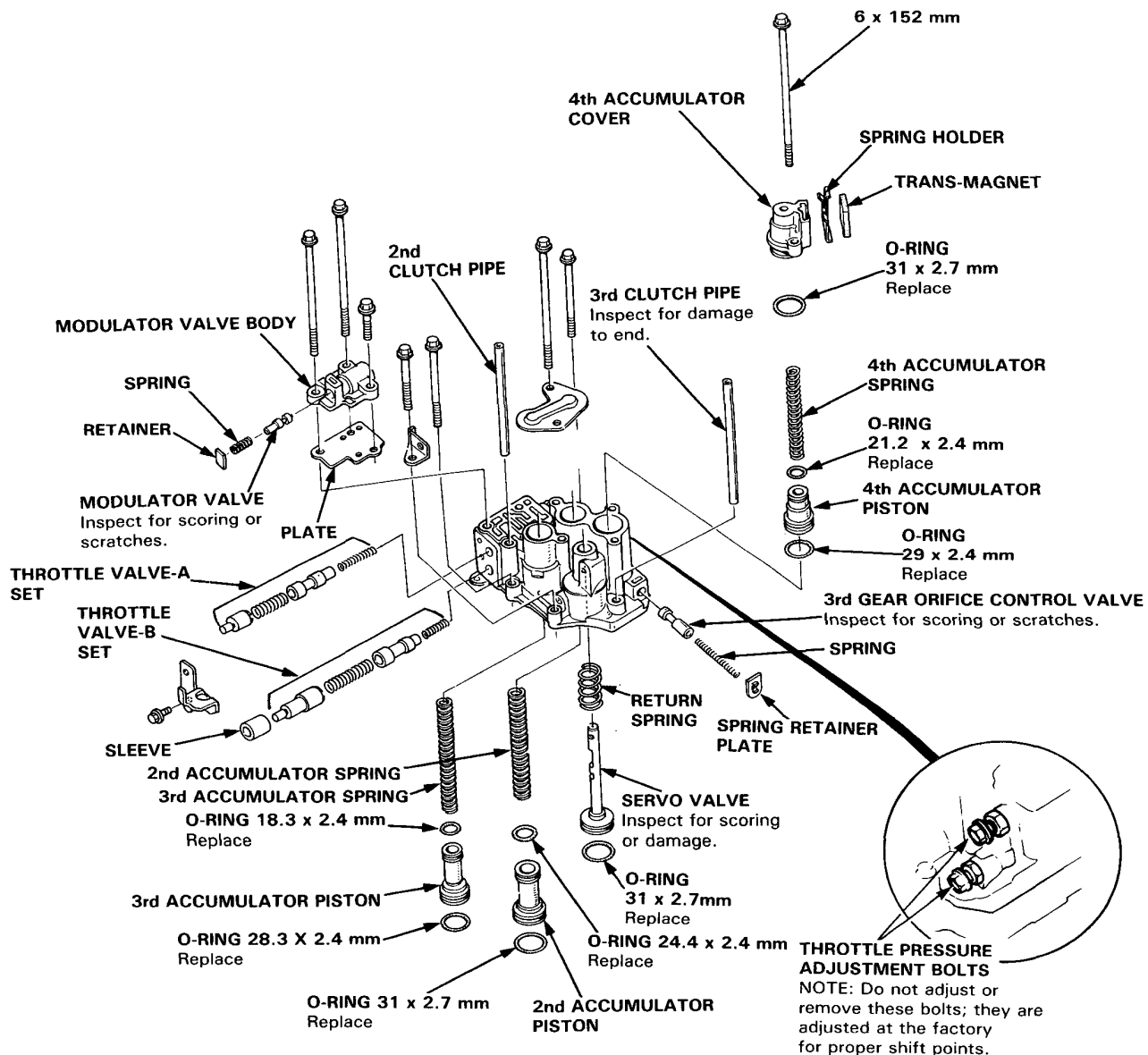


# Servo Valve Body

## 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.





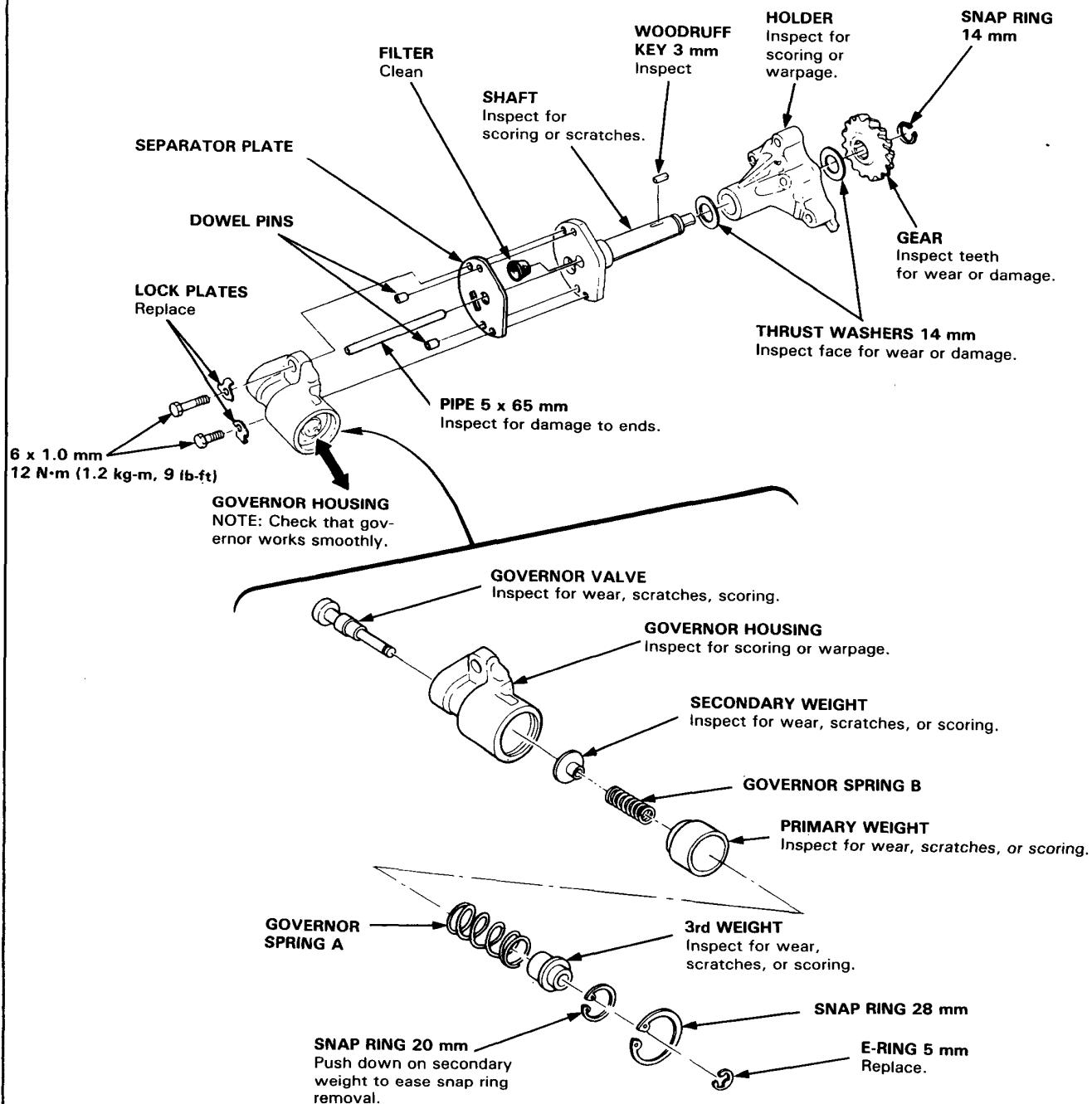
# Governor Valve



## 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.



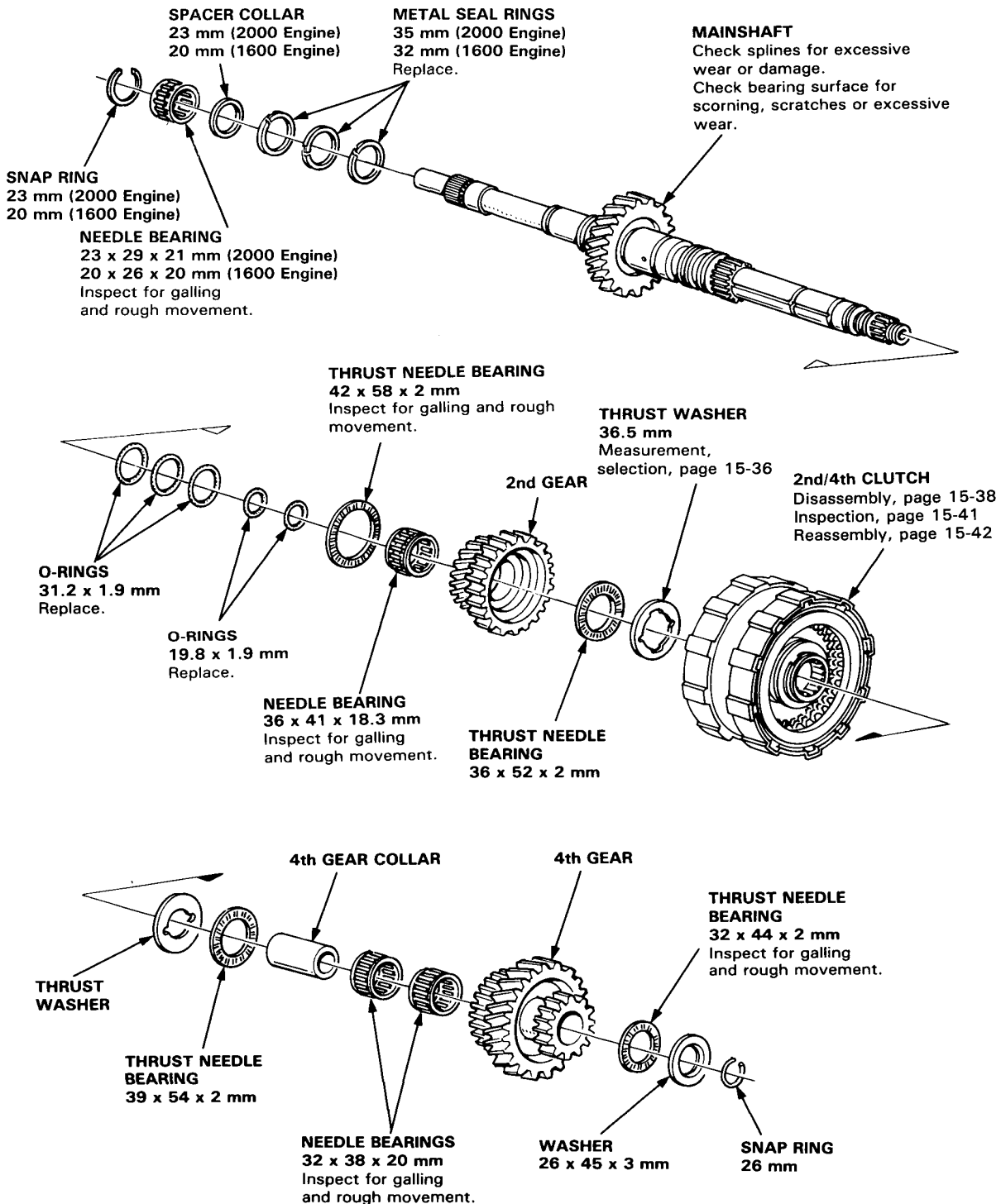


# Mainshaft

## Disassembly/Inspection/Reassembly

### NOTE:

- Lubricate all parts with ATF during reassembly.
- Install thrust needle bearings with unrolled edge of bearing retainer facing washer.





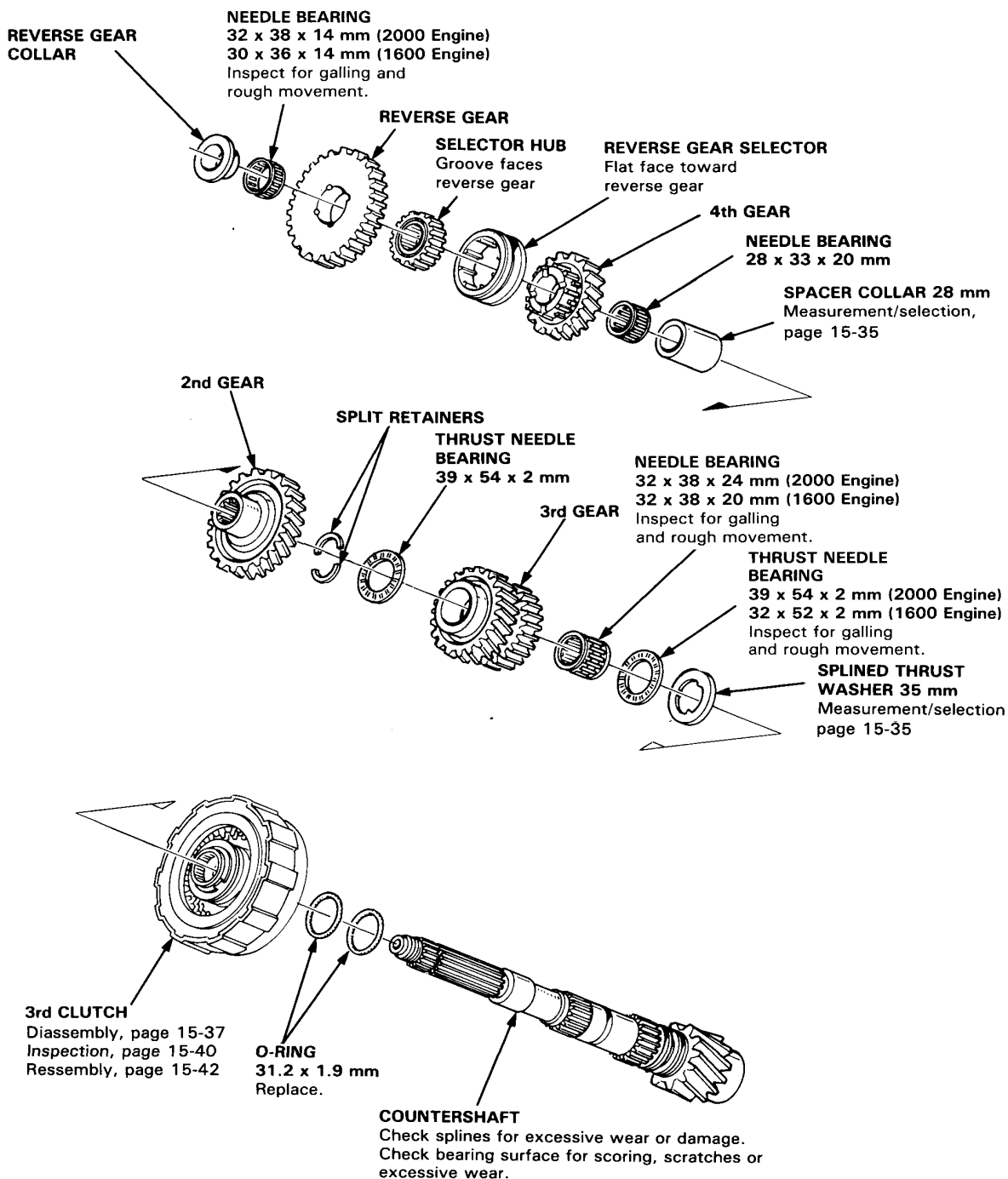
# Countershaft



## 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

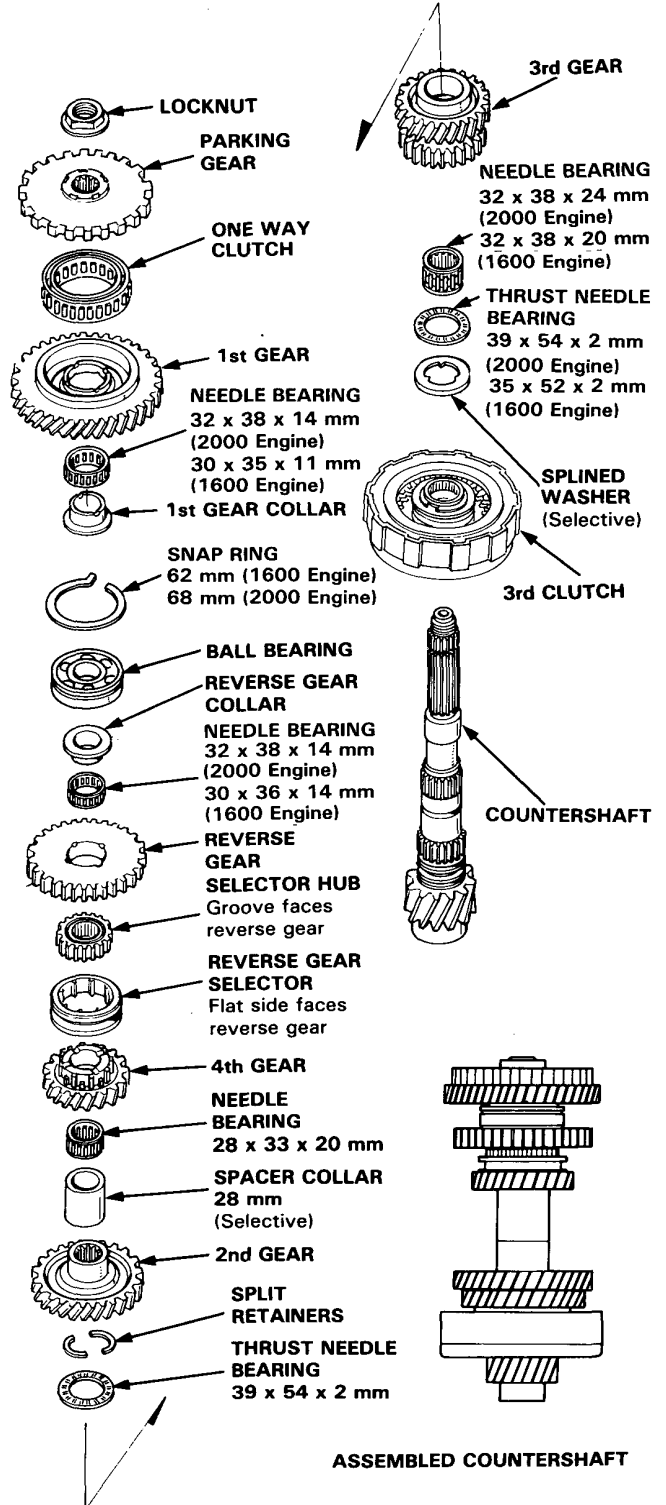
## Clearance Measurements

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.



Lubricate all parts with ATF before final reassembly.

## Countershaft Assembly



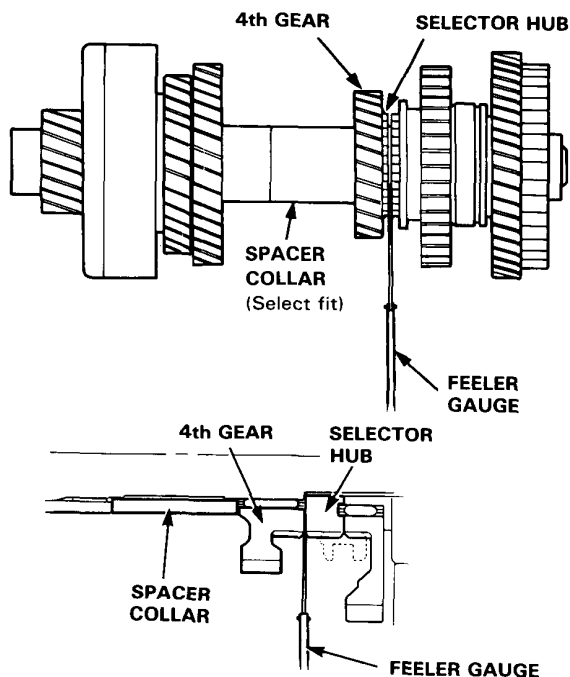




8. On the countershaft, measure the clearance between the shoulder on the selector hub and the shoulder on 4th gear.

**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:**

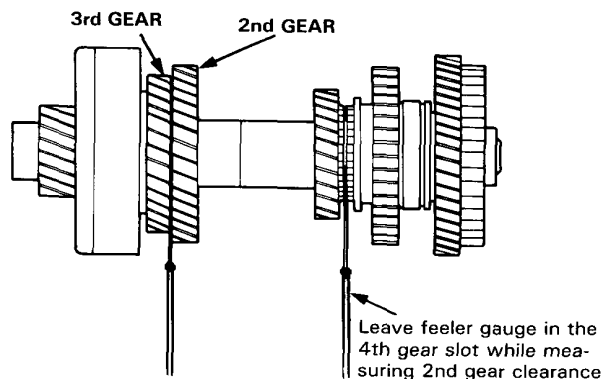
CLASS	P/N	THICKNESS
A	90503-PC9-000	38.97–39.00 mm (1.534–1.535 in.)
B	90504-PC9-000	39.02–39.05 mm (1.536–1.537 in.)
C	90505-PC9-000	39.07–39.10 mm (1.538–1.539 in.)
D	90507-PC9-000	39.12–39.15 mm (1.540–1.541 in.)
E	90508-PC9-000	39.17–39.20 mm (1.542–1.543 in.)
F	90509-PC9-000	39.22–39.25 mm (1.544–1.545 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.

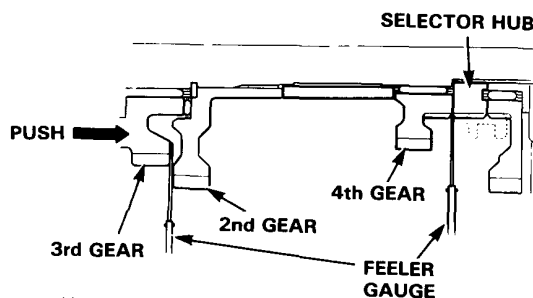
**Countershaft 2nd Gear Clearance:**

**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	2.97–3.00 mm
B	*90411-PA9-010	(0.117–0.118 in.)
B	90412-PF4-010	3.02–3.05 mm
B	*90412-PA9-010	(0.119–0.120 in.)
C	90413-PF4-010	3.07–3.10 mm
C	*90413-PA9-010	(0.121–0.122 in.)
D	90414-PF4-010	3.12–3.15 mm
D	*90414-PA9-010	(0.123–0.124 in.)
E	90415-PF4-010	3.17–3.20 mm
E	*90415-PA9-010	(0.125–0.126 in.)
F	90416-PF4-010	3.22–3.25 mm
F	*90416-PA9-000	(0.127–0.128 in.)
G	90417-PF4-010	3.27–3.30 mm
G	*90417-PA9-000	(0.129–0.130 in.)
H	90418-PF4-010	3.32–3.35 mm
H	*90418-PA9-000	(0.131–0.132 in.)
I	90419-PF4-010	3.37–3.40 mm
I	*90419-PA9-000	(0.133–0.134 in.)

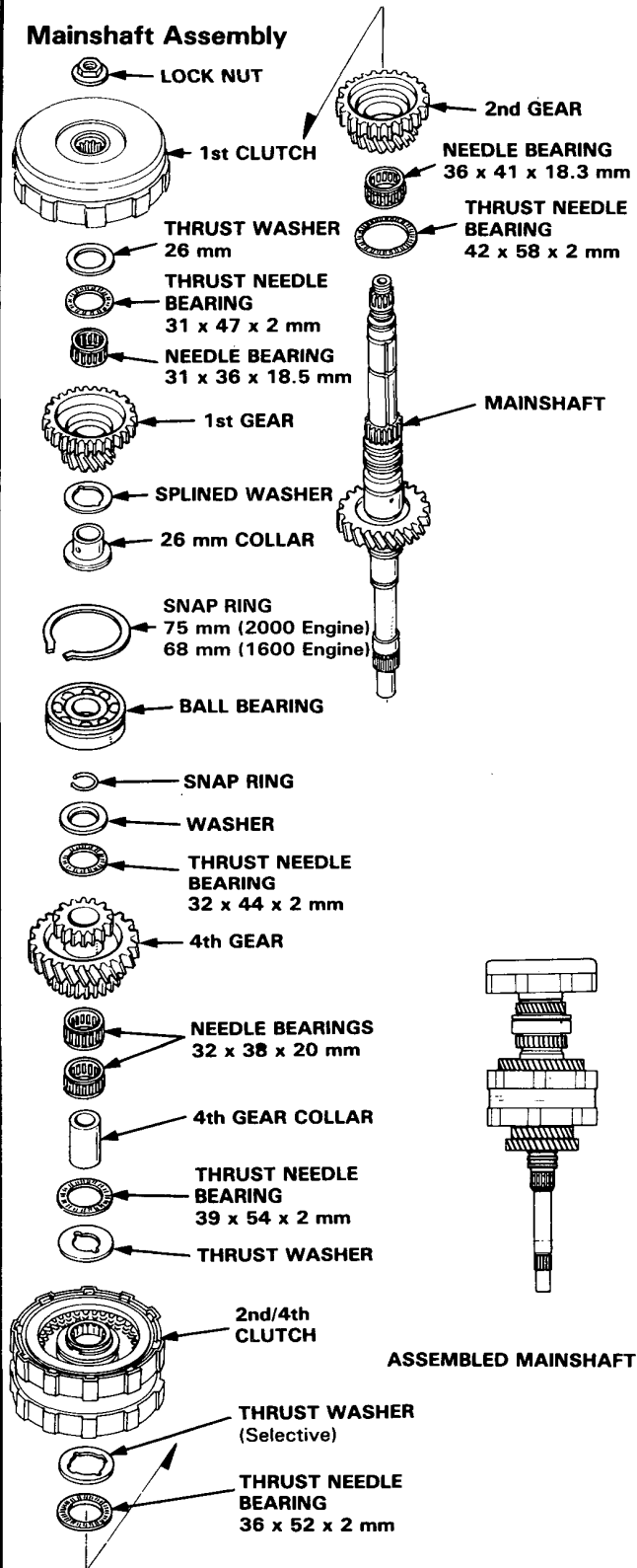
\* 1600 Engine

(cont'd)



# Countershaft/Mainshaft

## Clearance Measurement (cont'd)

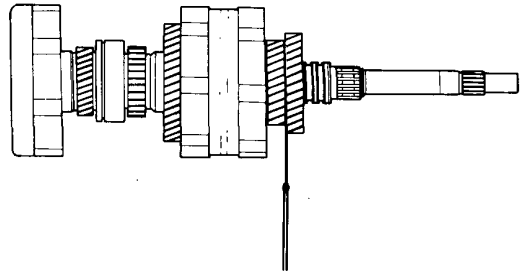


NOTE: Make all measurements before changing the thrust washers. Recheck after making the adjustments.

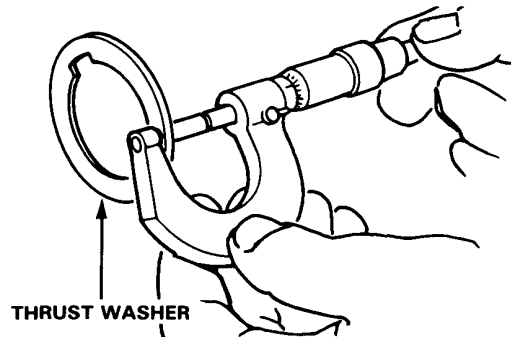
- On the mainshaft measure the clearance between the shoulder of 2nd gear and main 3rd gear, the same way you did on the countershaft in step 9.

**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



# Clutch

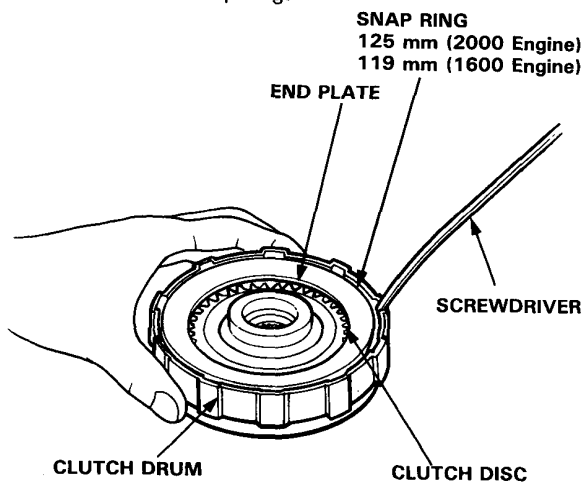


## Disassembly

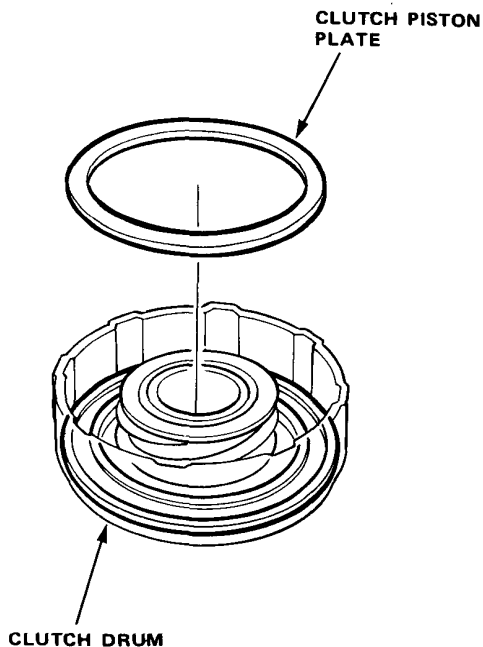
### NOTE:

- 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.

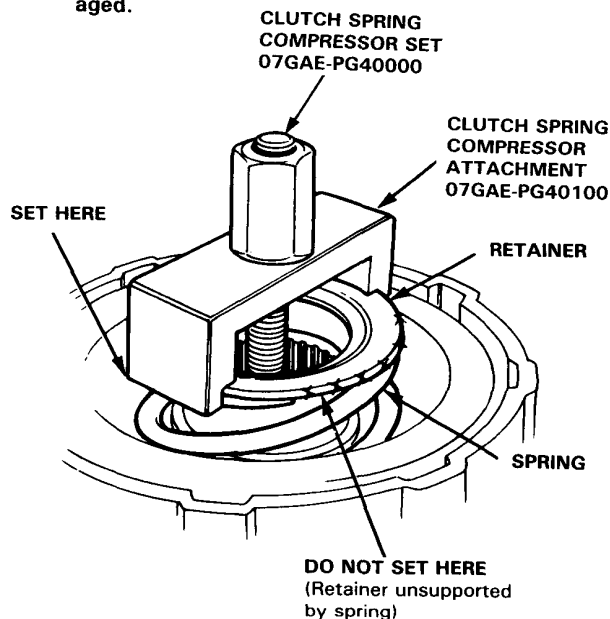


2. Remove the end plate, clutch discs and plates. 1st clutch only: Also remove the clutch piston plate (applied from 2000 Engine B type transmission).

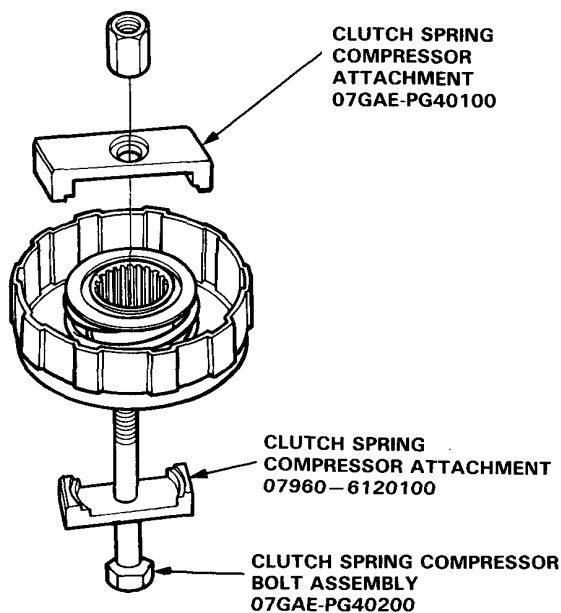


3. Install the clutch spring compressor as shown.

**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



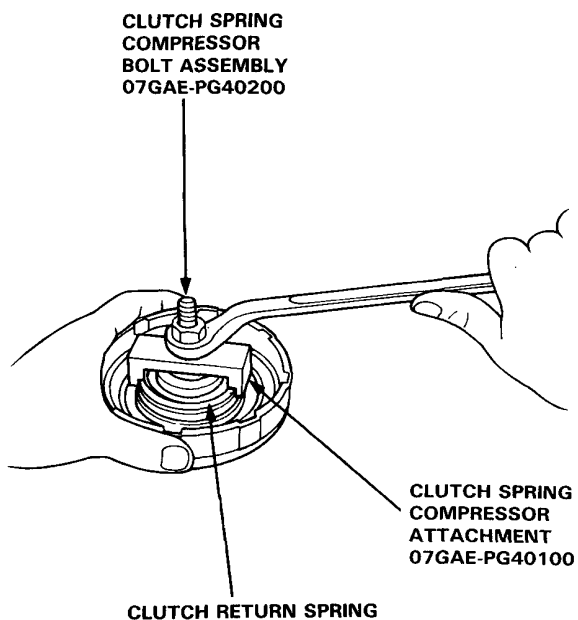
(cont'd)



# Clutch

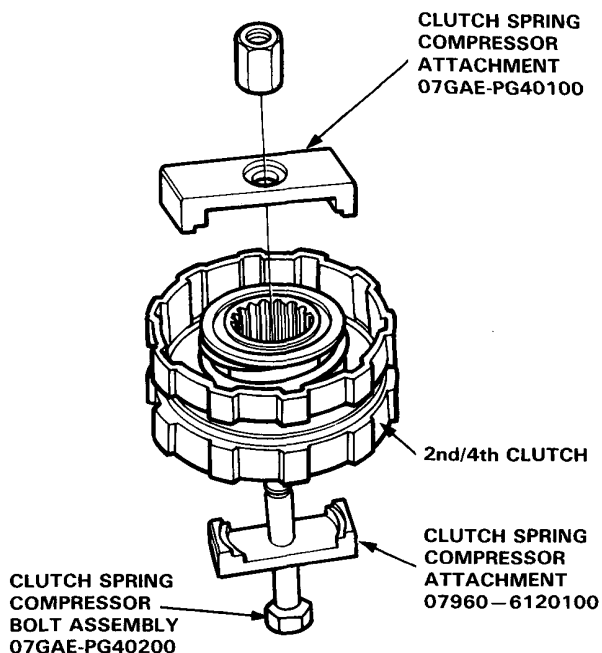
## Disassembly (cont'd)

- Compress the clutch return spring.

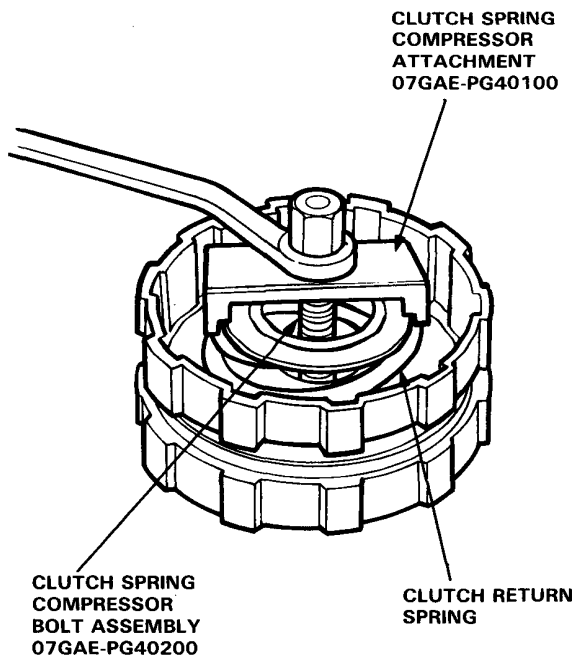


### 2nd/4th Clutch

- Assemble the spring compressor on the clutch drum.



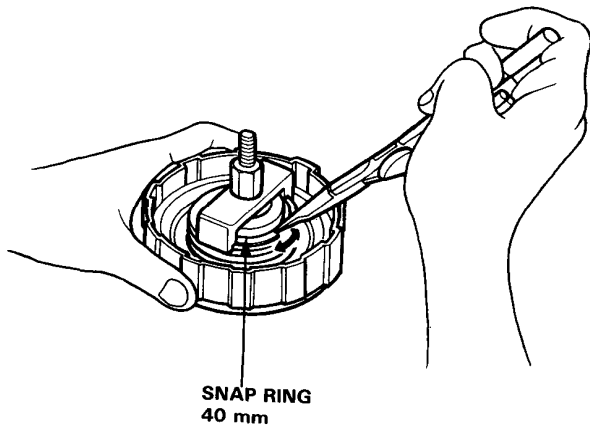
- Compress the clutch return spring.



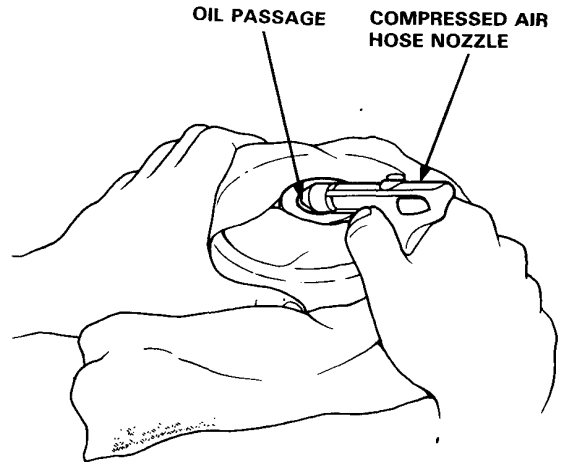




4. Remove the snap ring, then remove the clutch spring compressor, spring retainer and spring.



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.



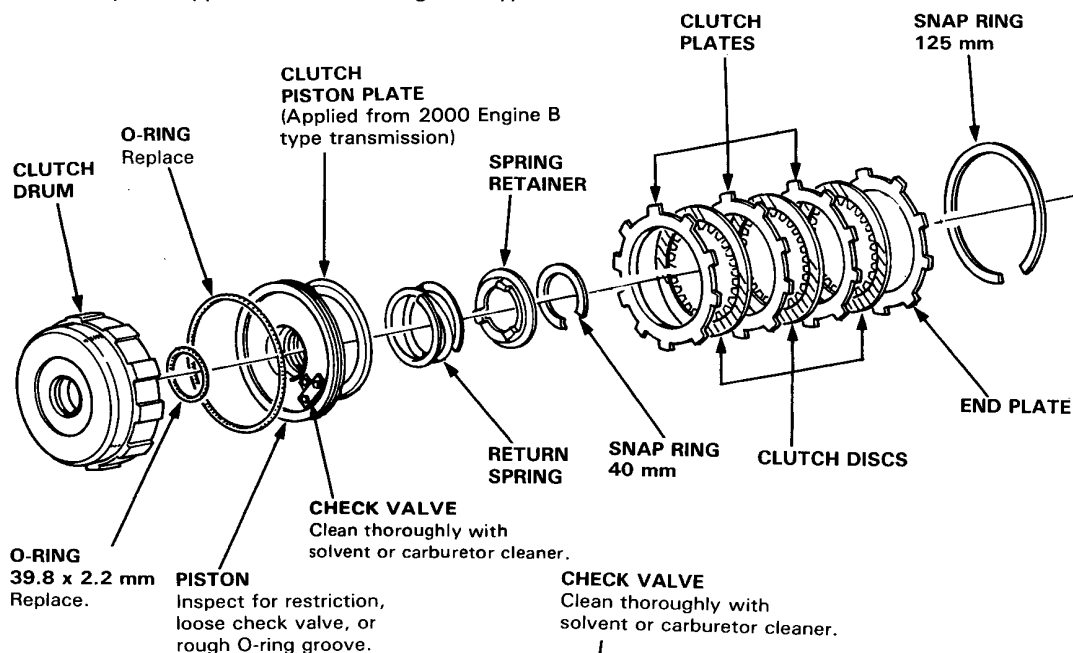


# Clutch

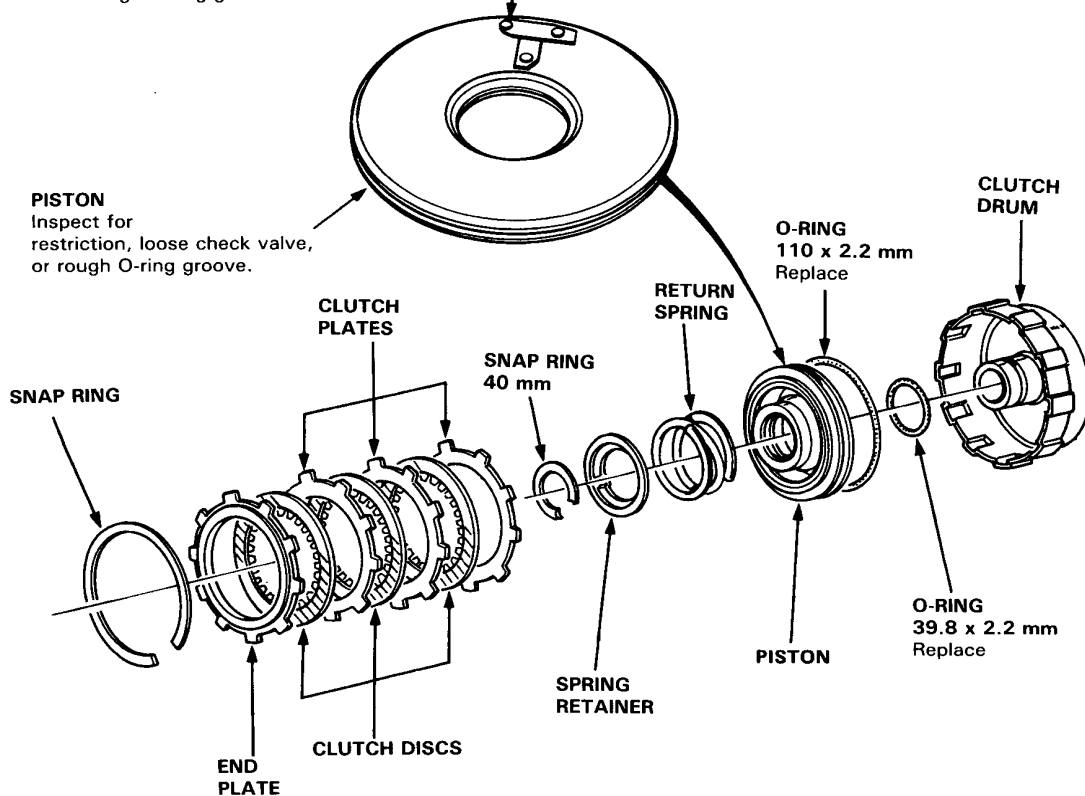
## Disassembly/Inspection

### 1st Clutch

NOTE: Piston plate (applied from 2000 Engine B type transmission) is installed in the 1st clutch.



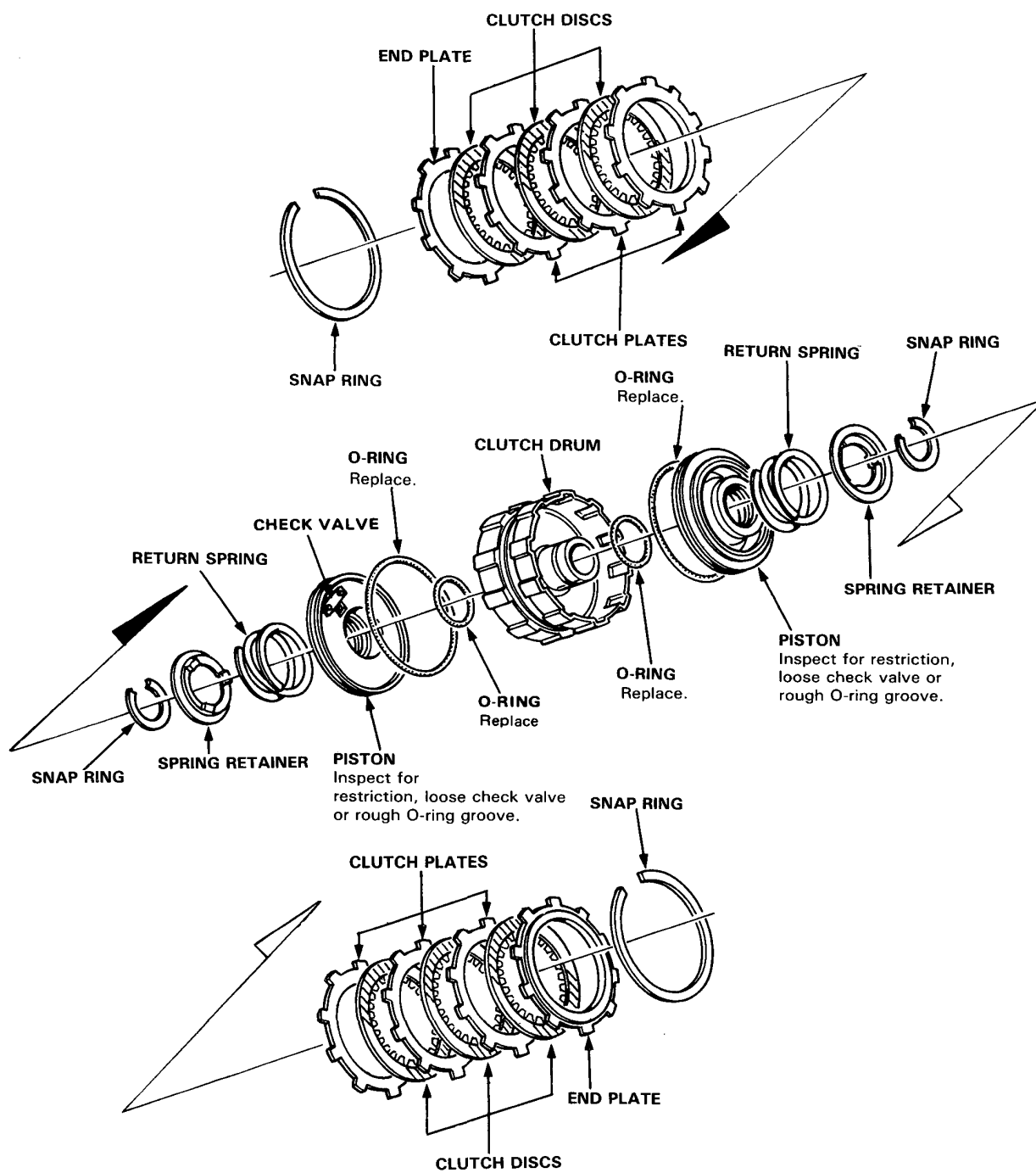
### 3rd Clutch







## 2nd/4th Clutch





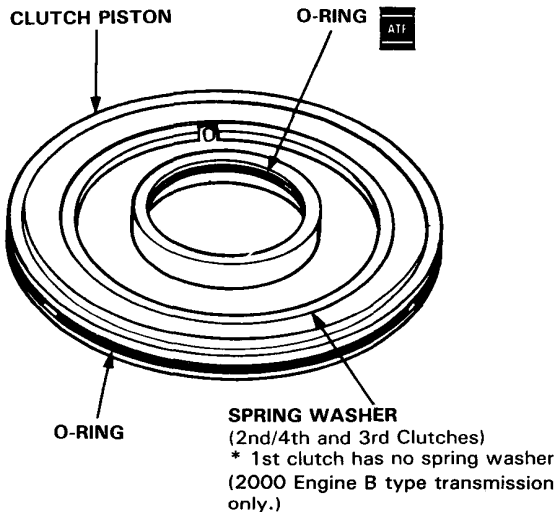
# Clutch

## Reassembly

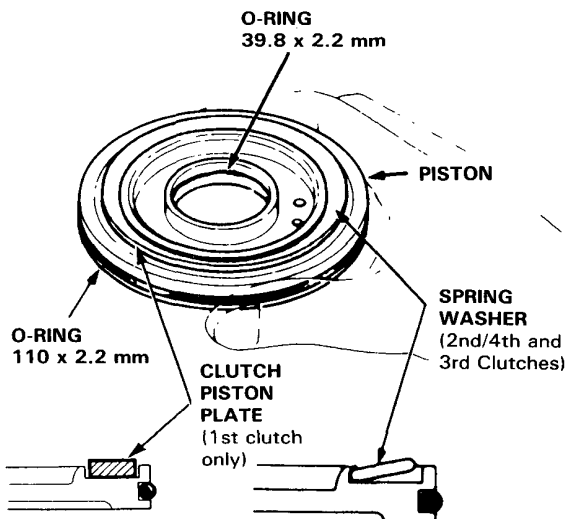
### NOTE:

- 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.

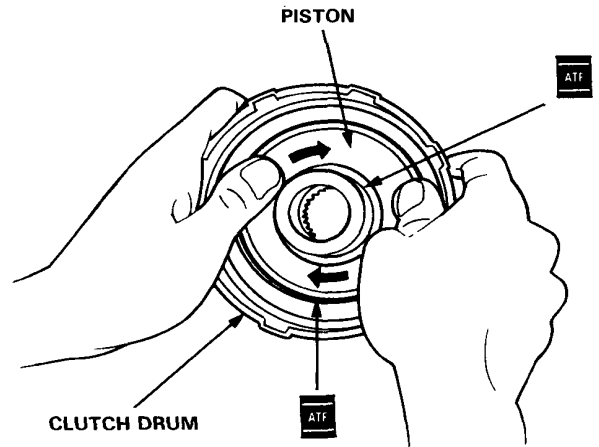


(Applied from 2000 Engine B type transmission)

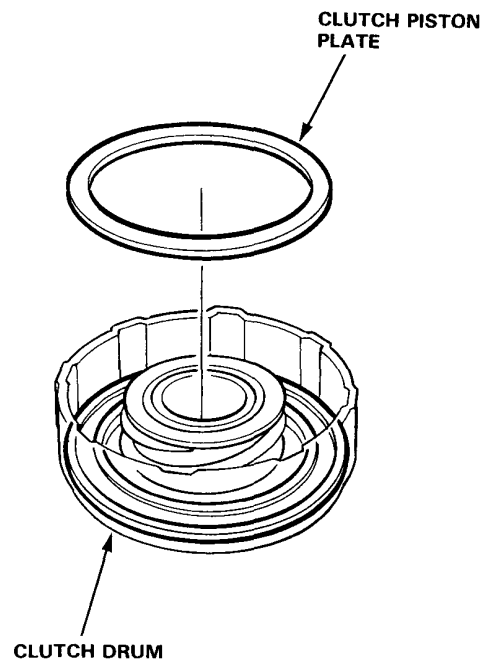
4. Install the piston in the clutch drum. Apply pressure and rotate to ensure proper seating.

NOTE: Lubricate the piston O-ring with ATF before installing.

CAUTION: Do not pinch O-ring by forcing piston installation.



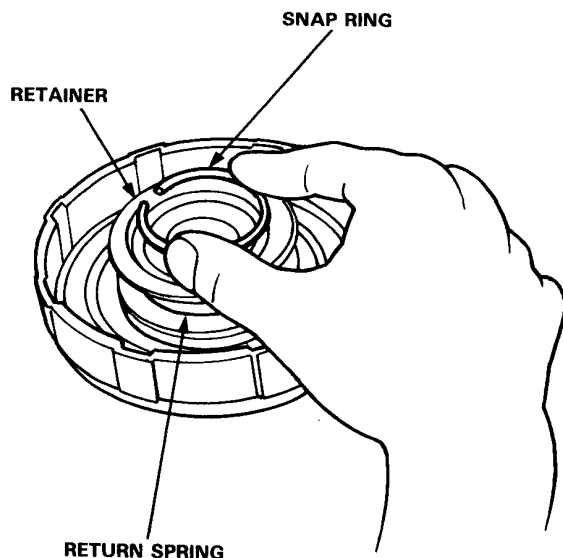
- 1st clutch only:  
Install the clutch piston plate (applied from 2000 Engine B type transmission).





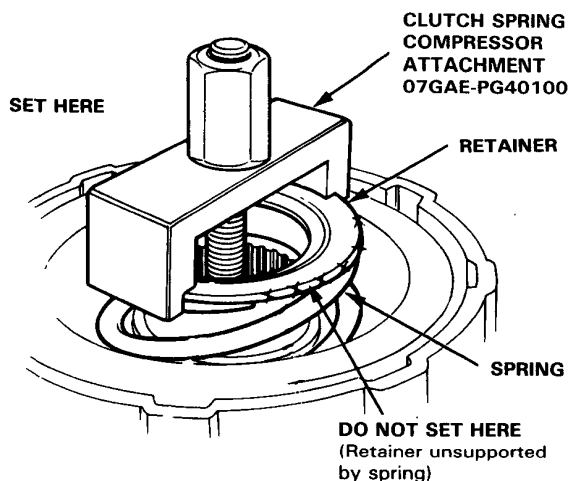


5. Install the return spring and retainer.
6. Position the snap ring on the spring re-tainer.



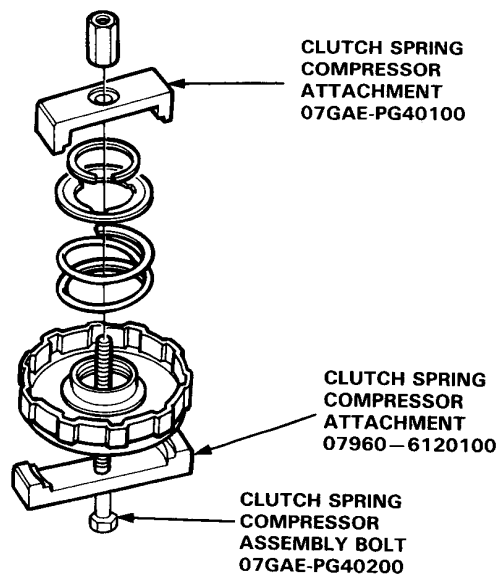
7. Assemble the spring compressor on the clutch drum.

**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.

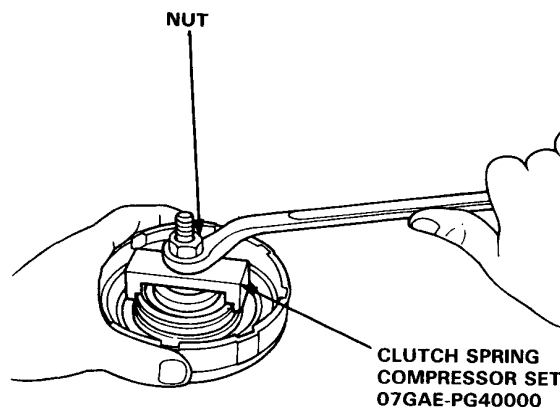


#### 1st and 3rd clutches

- 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)

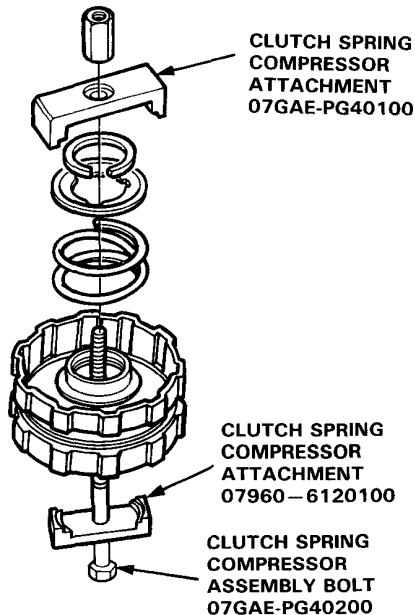


# Clutch

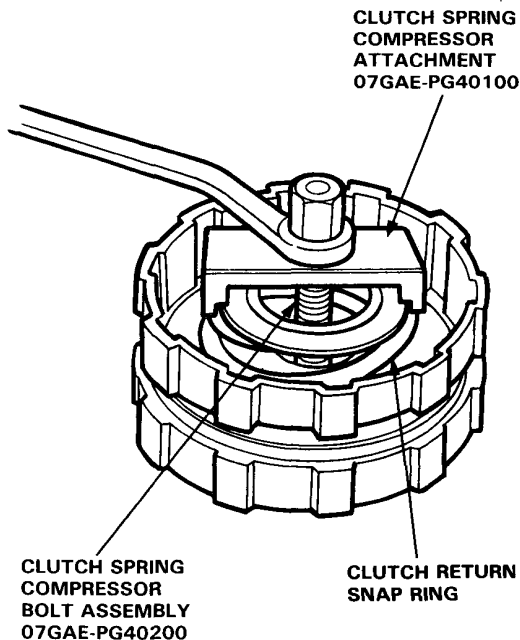
## Reassembly (cont'd)

### 2nd/4th Clutch

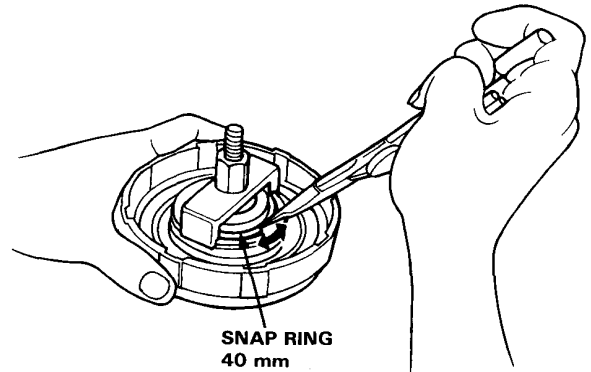
- Assemble the spring compressor on the clutch drum.



- Compress the clutch return spring.

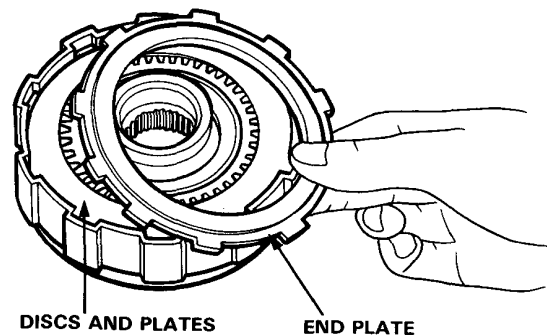


9. Install the snap ring (with its rounded edge facing in ) in the hub groove and remove the spring compressor.



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:

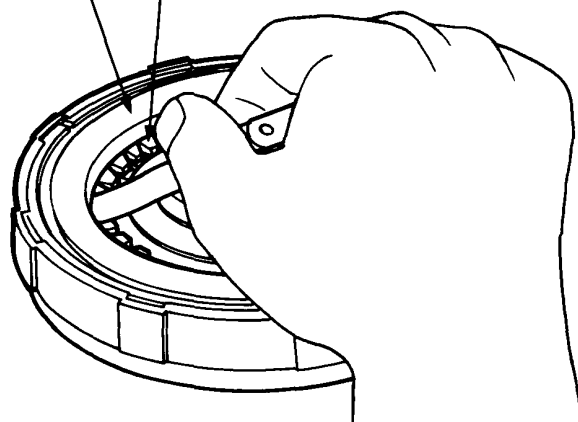
(1600 Engine)

	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)

END PLATE TOP DISC



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.)

NUMBER

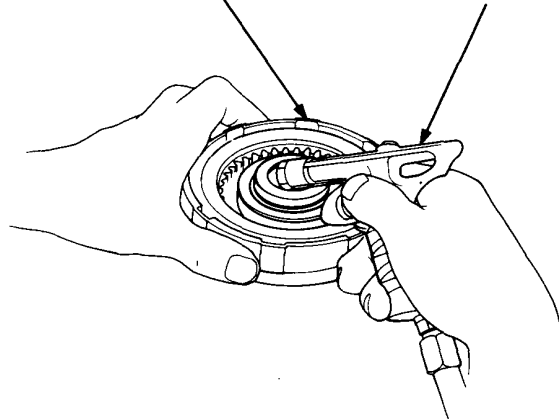


END PLATE

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.

CLUTCH ASSEMBLY

NOZZLE

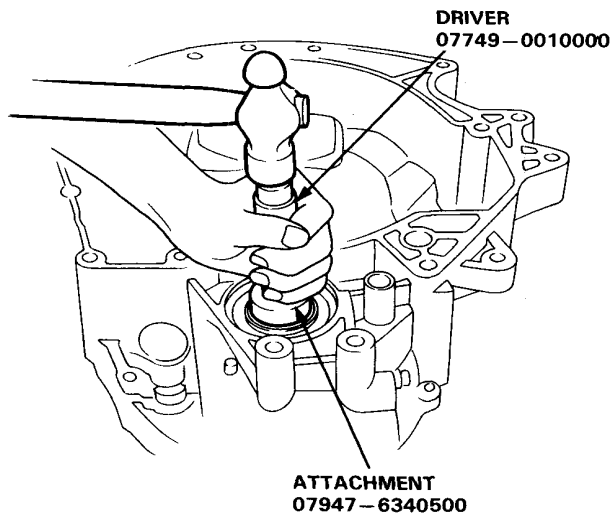




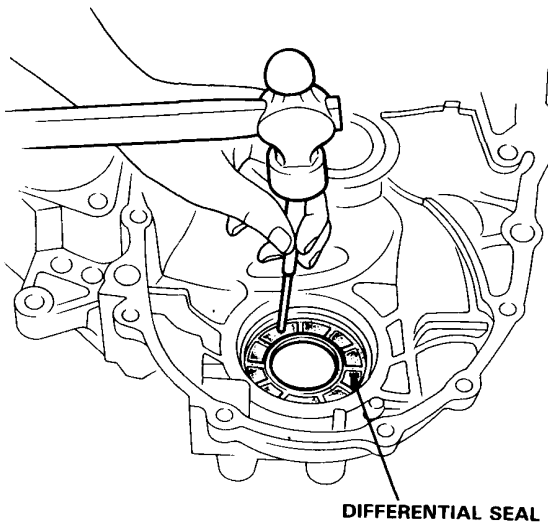
# Differential and Seal

## Replacement

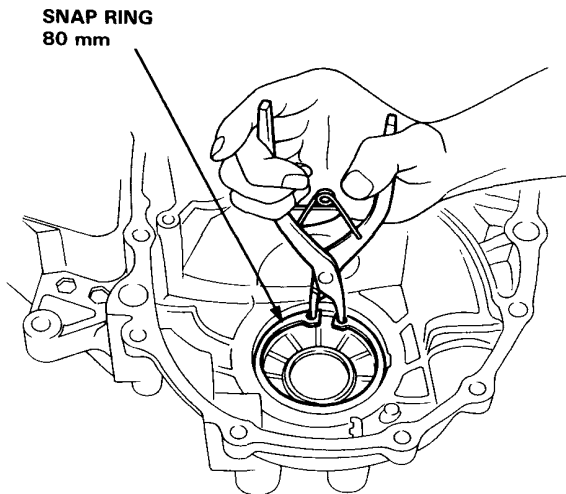
1. If seals are to be replaced, or if differential needs repair, remove the differential.



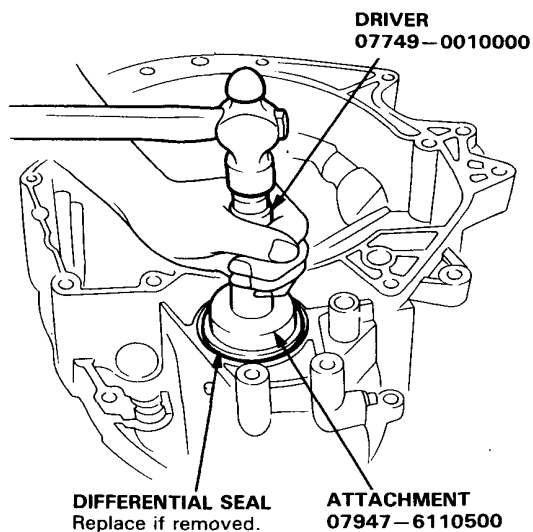
2. On the torque converter housing, remove the 80 mm snap ring, then drive out the seal as shown.
3. Remove the differential seal from the transmission housing in the same way.



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.





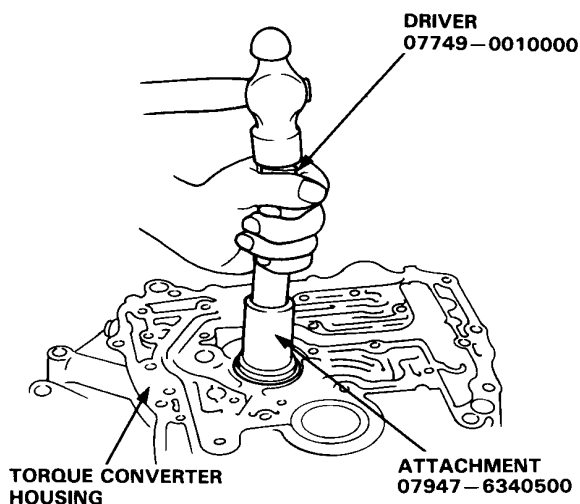
# Bearings and Seals



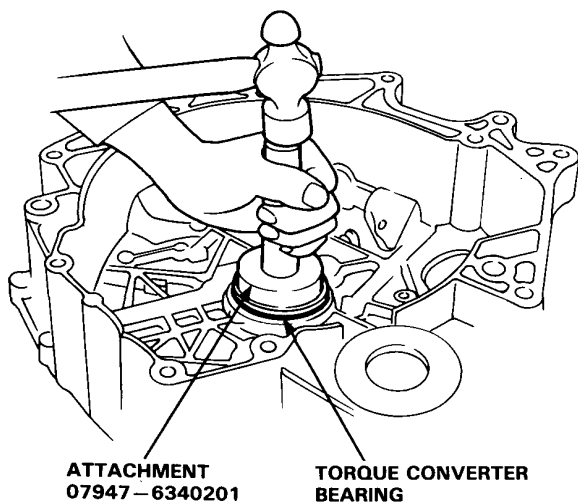
## Replacement

### Torque converter housing

1. Remove the mainshaft bearing and seal from the torque converter housing.

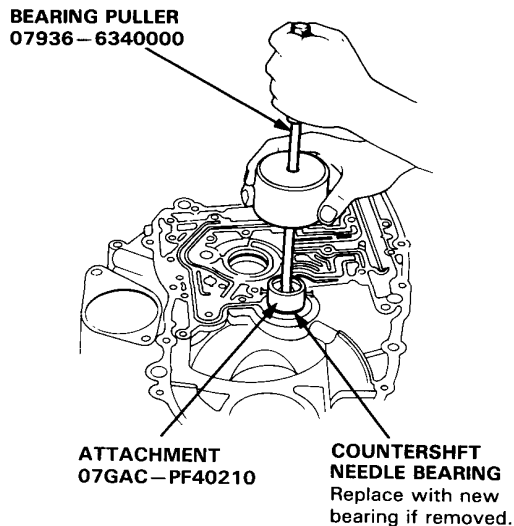


2. Drive in the new mainshaft bearing until it bottoms in housing.



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)

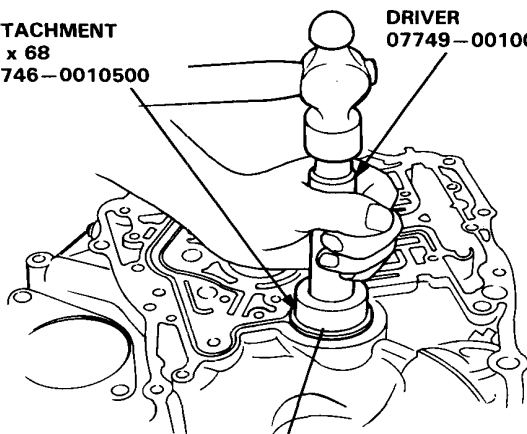


# Bearings and Seals

## Replacement (cont'd)

**ATTACHMENT**  
62 x 68  
07746-0010500

**DRIVER**  
07749-0010000



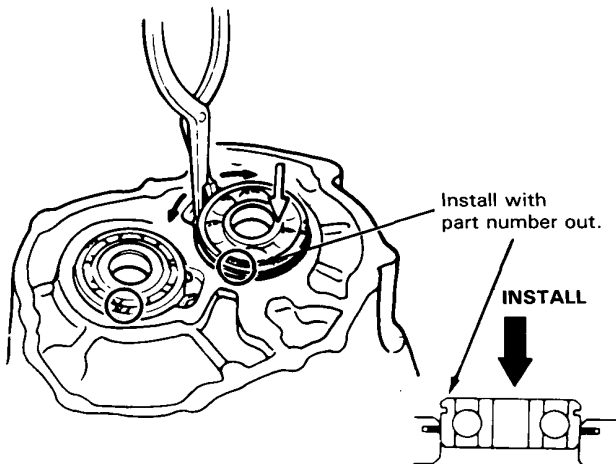
Bearing face should be flush with housing surface.

**HOUSING**

**BEARING**

**OIL GUIDE PLATE**

- 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.



- Make sure the snap rings are seated in the bearing and housing grooves.

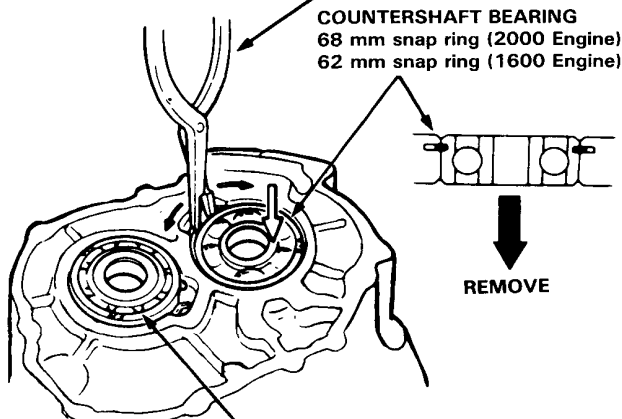
## Transmission housing

- 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.

### SNAP RING PLIERS

**COUNTERSHAFT BEARING**  
68 mm snap ring (2000 Engine)  
62 mm snap ring (1600 Engine)



**MAINSHAFT BEARING**  
75 mm snap ring (2000 Engine)  
68 mm snap ring (1600 Engine)

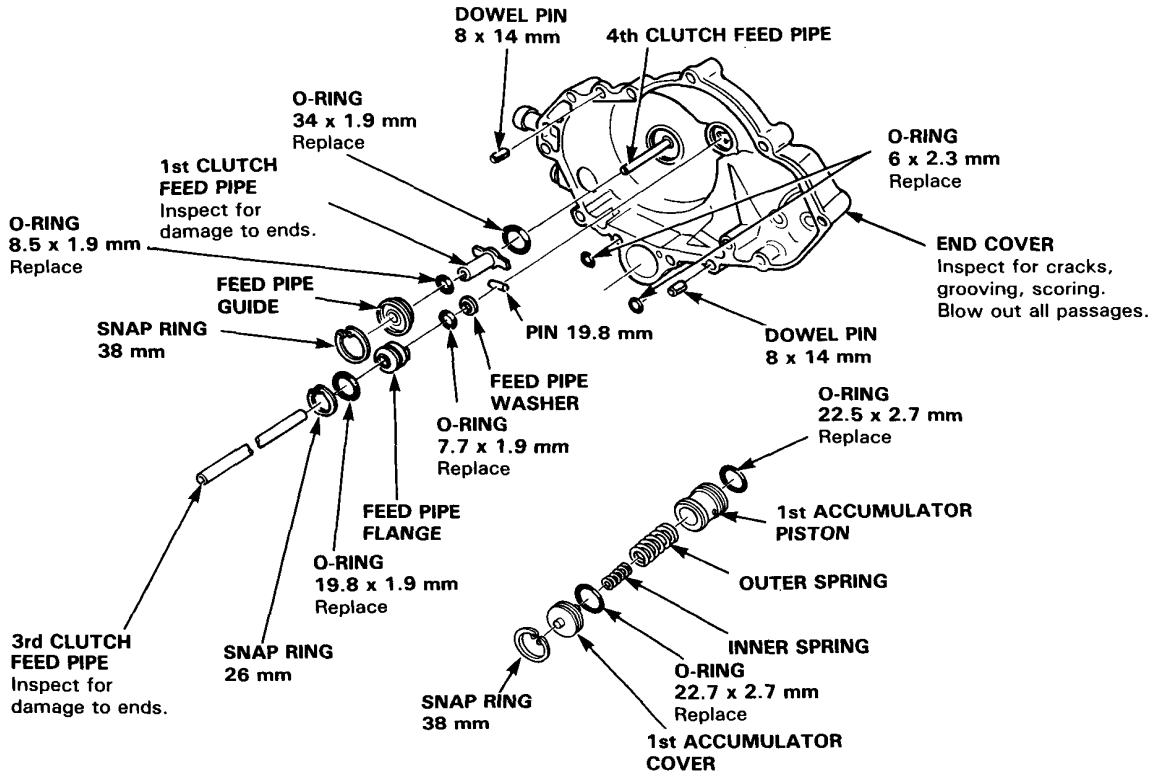


# End Cover



## Disassembly/Inspection

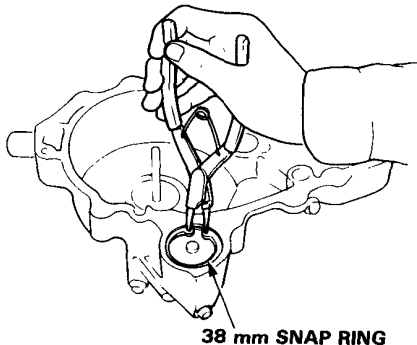
**CAUTION:** Remove and install parts carefully to avoid damaging them.



## Reassembly

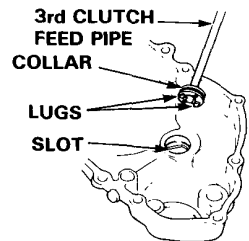
1. Seat the O-ring in the groove of the 1st accumulator piston, and slide the accumulator piston into the right side transmission cover. Install the outer spring, inner spring, another O-ring and accumulator cover, in that order.

2. Install the 38 mm snap ring.



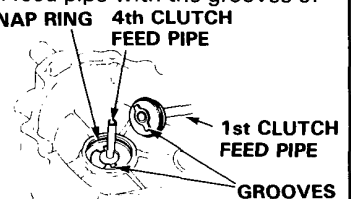
3. With feed pipes assembled, align lugs on the collars with slot in end cover.

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.

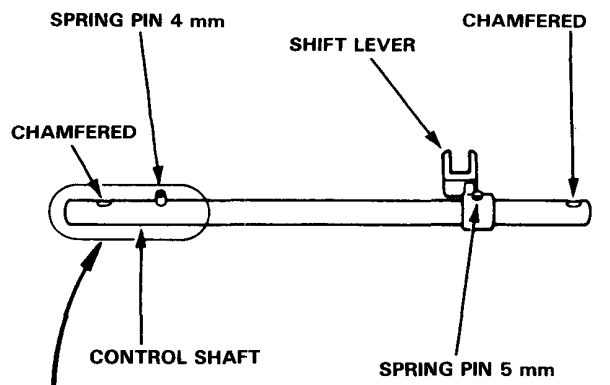
6. Install the snap ring.



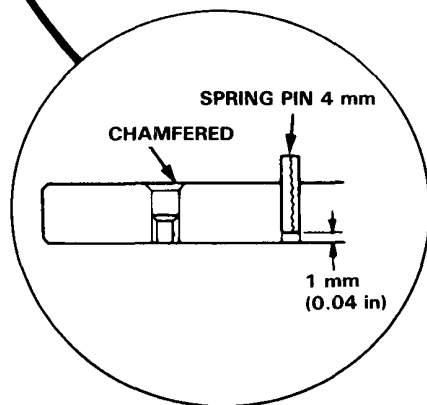


# Throttle Control Shaft

## 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.

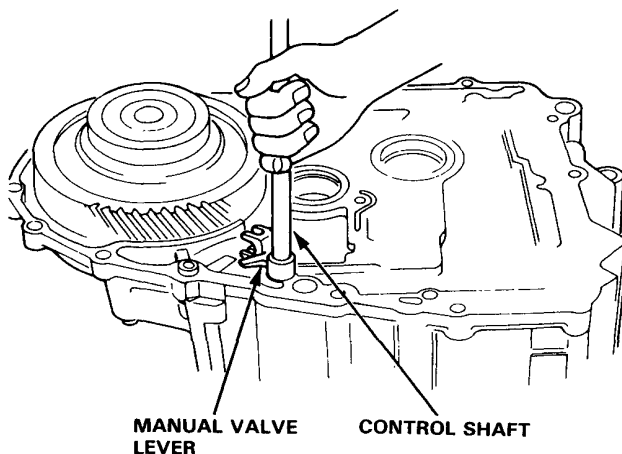


# Transmission

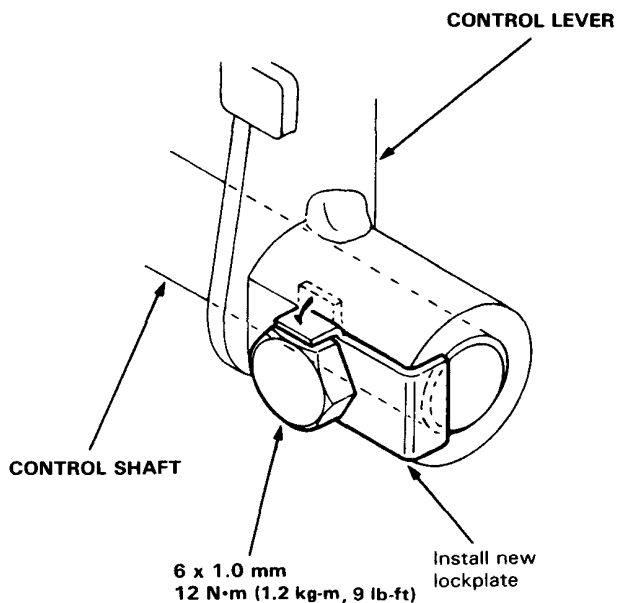
## Reassembly

NOTE: Lubricate all parts with ATF during re-assembly.

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.



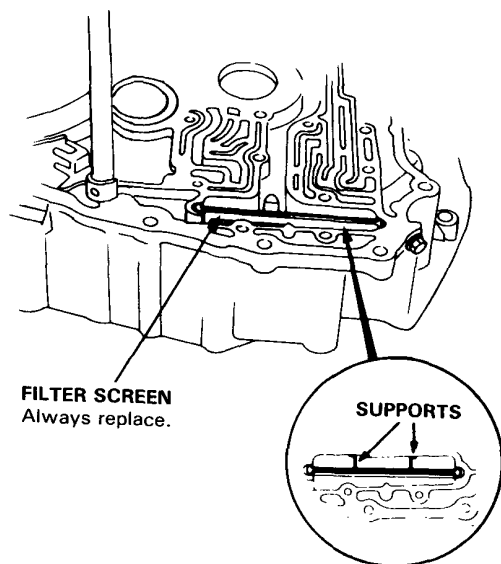
3. Install the control lever and new lock plate on the other end of the shaft. Tighten the bolt to the torque shown, then bend the tab over against the bolt head.



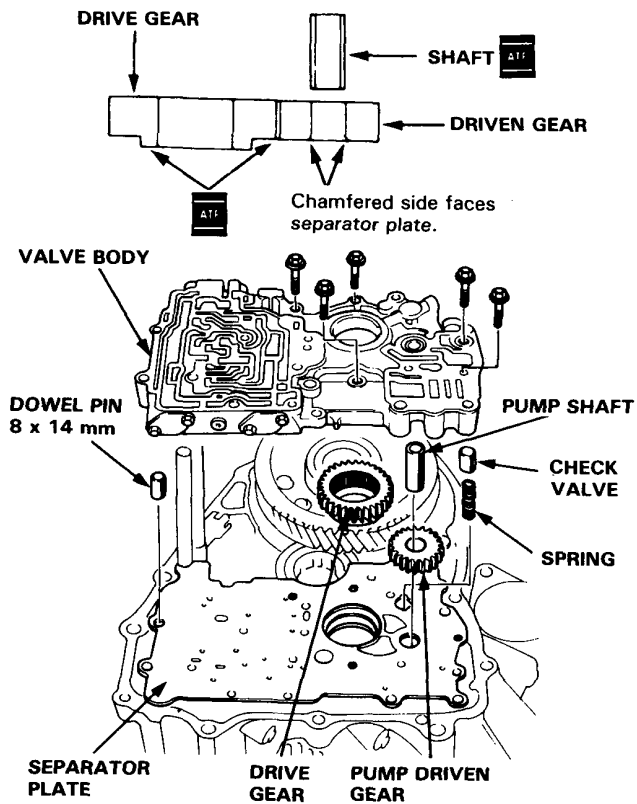




4. Install a new filter screen.



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)

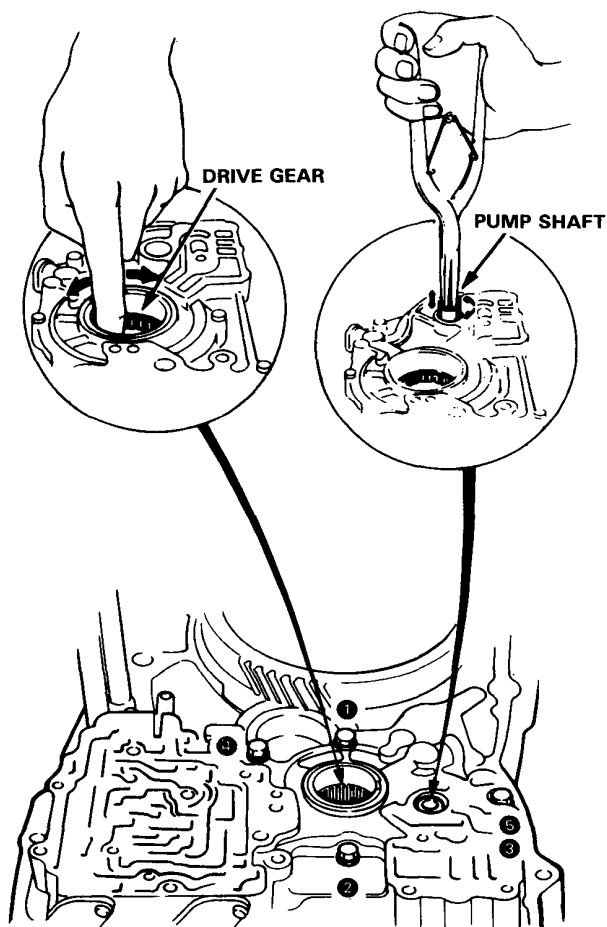


# Transmission

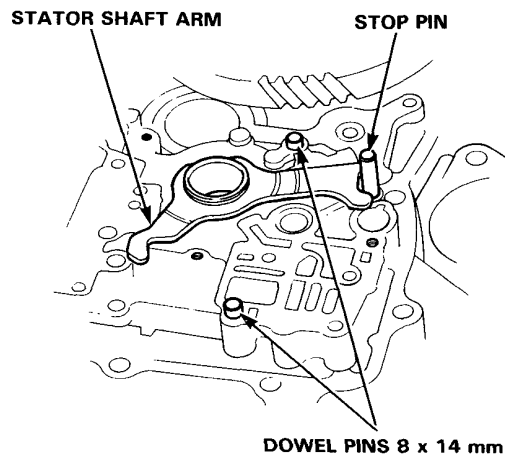
## Reassembly (cont'd)

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.

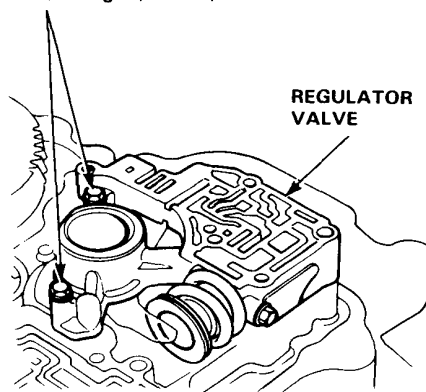


9. Install the stator shaft arm, stop pin and dowel pins.



10. Install the regulator valve and torque its 2 bolts to 12 N·m (1.2 kg-m, 9 lb-ft).

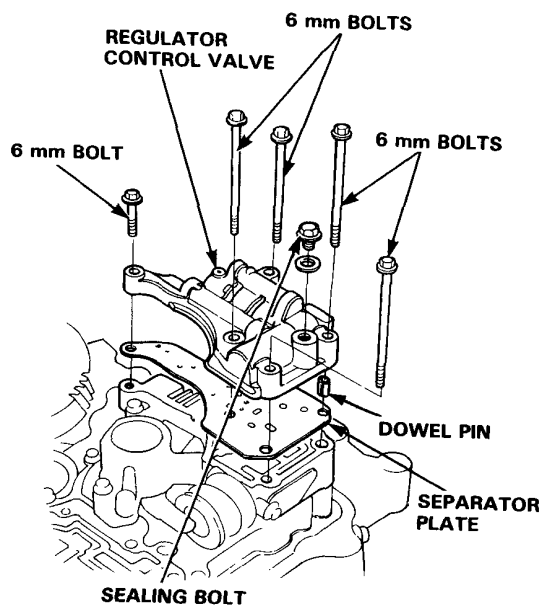
6 mm BOLTS  
12 N·m (1.2 kg-m, 9 lb-ft)



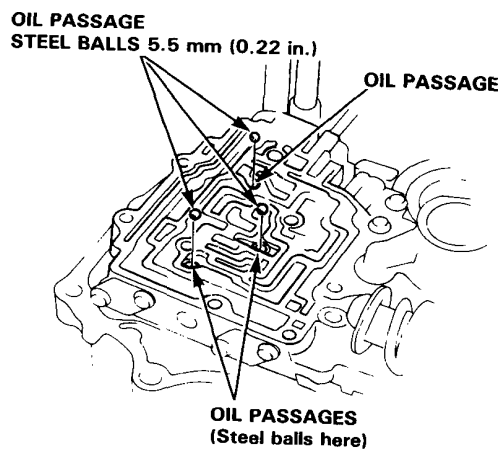




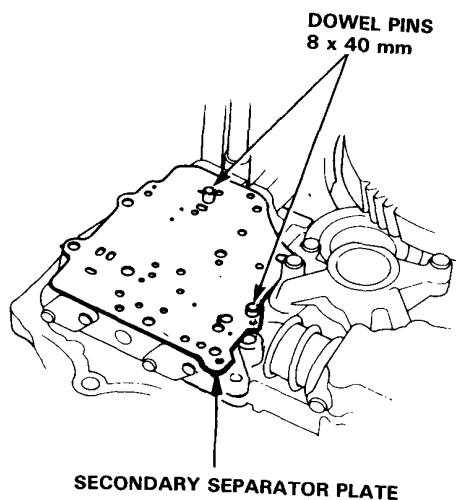
11. Install the dowel pin, and separator plate.
12. Install the regulator control valve body bolts as shown, and torque to 12 N·m (1.2 kg-m, 9 lb-ft).



13. Install the 3 steel balls in main valve body oil passages.



14. Install the separator plate and dowel pins.



(cont'd)

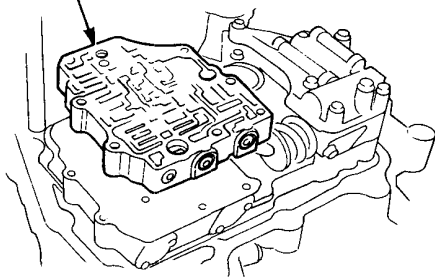


# Transmission

## Reassembly (cont'd)

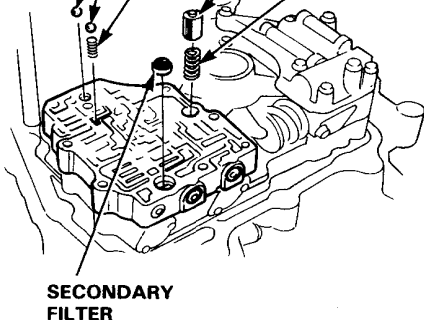
15. Install the secondary valve body.

SECONDARY VALVE BODY



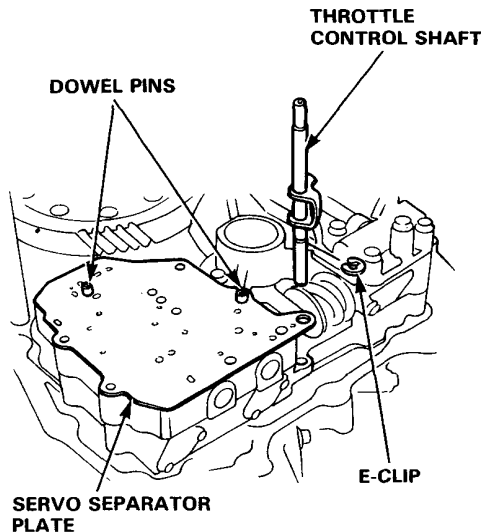
16. Install the steel balls, ball spring, shift timing accumulator piston, valve spring and secondary filter in the secondary valve body.

STEEL BALLS  
SPRING  
ACCUMULATOR PISTON  
VALVE SPRING



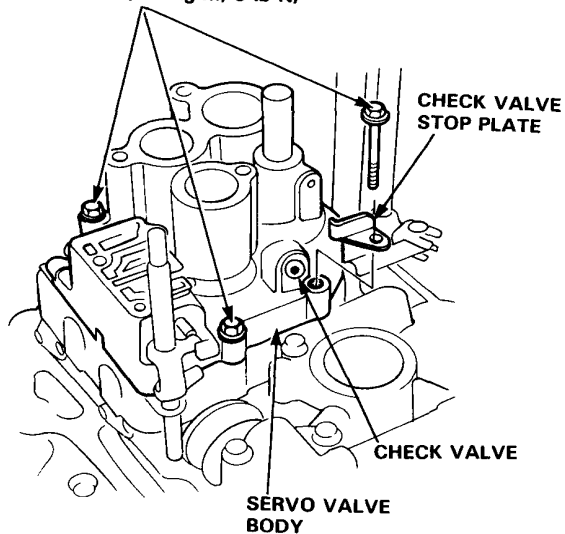
NOTE: The ball for the top oil passage has a spring to press the ball against the separator plate.

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.

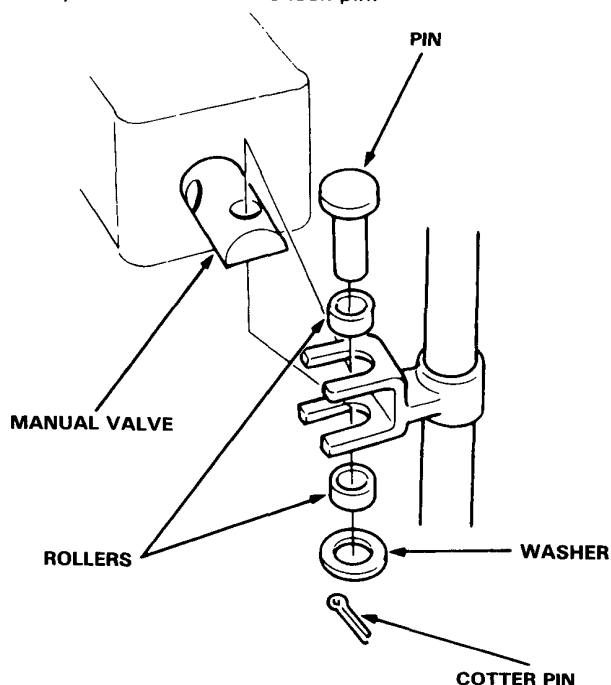
BOLTS  
12 N·m (1.2 kg-m, 9 lb-ft)





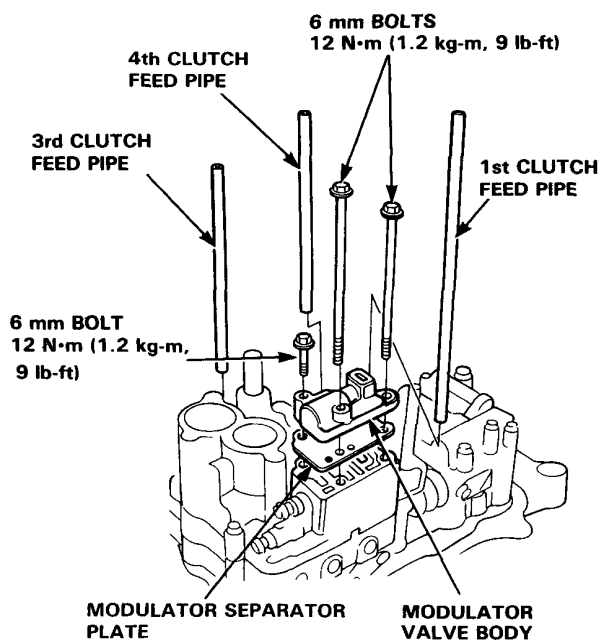


19. Put the rollers on each side of the manual valve stem, then attach the valve to the lever with the pin. Secure with the lock pin.



20. Install the separator plate.

21. Install the 1st, 3rd and 4th clutch feed pipes.

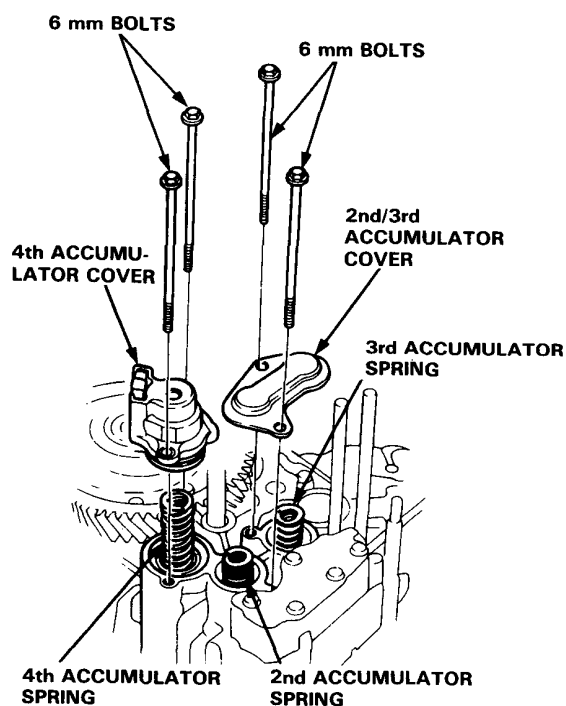


22. Install the accumulator springs.

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.



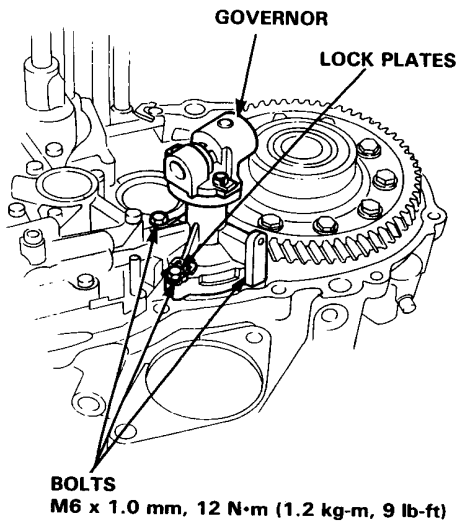
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# Transmission

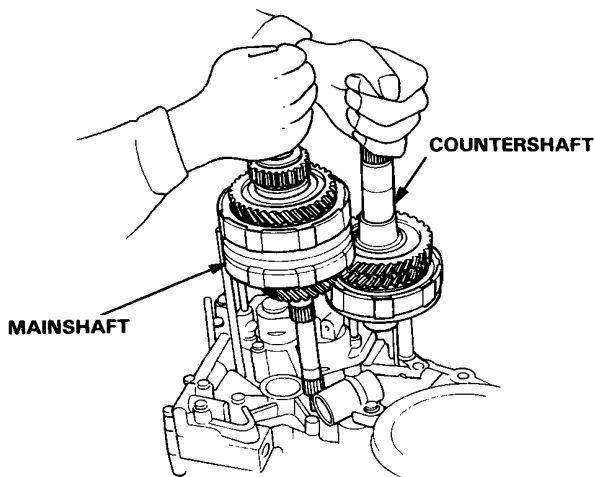
## Reassembly (cont'd)

25. Install the governor valve using new lock plates, and the three 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.

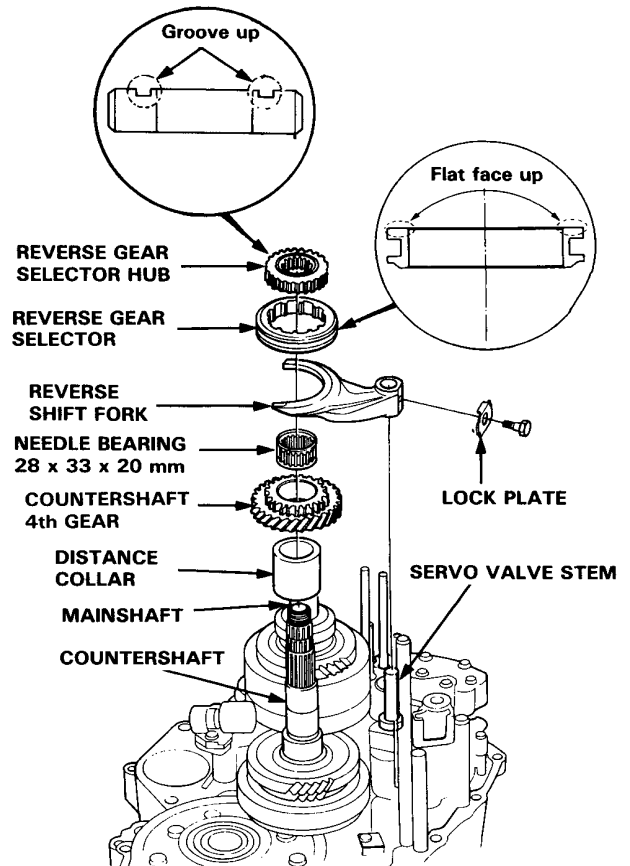


27. Install 4th gear and its needle bearing, and the countershaft 4th gear and its selector hub.

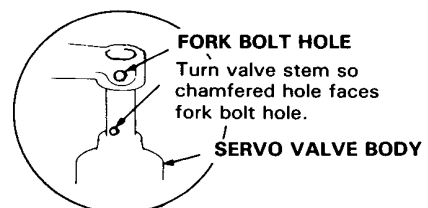
28. Assemble the reverse shift fork and selector sleeve, then install them as an assembly on the countershaft.

### NOTE:

- Install the sleeve with its flat face up.
- Install the reverse gear selector hub with the groove facing up.



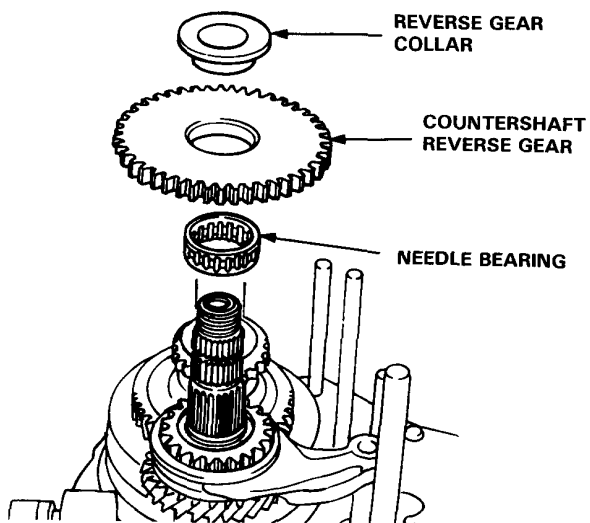
29. Install the reverse shift fork over the servo valve stem. Align the hole in the stem with hole in fork as shown, and install the bolt and new lock plate. Bend the lock tab against the bolt head.



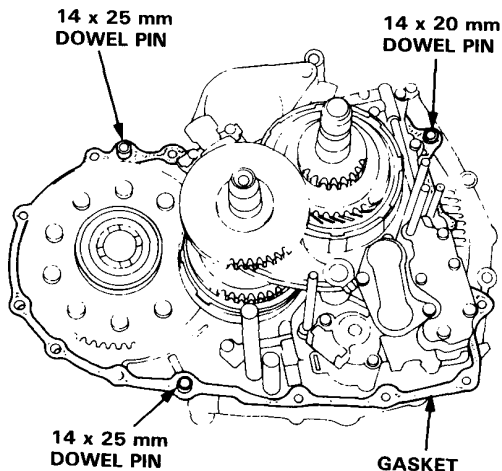




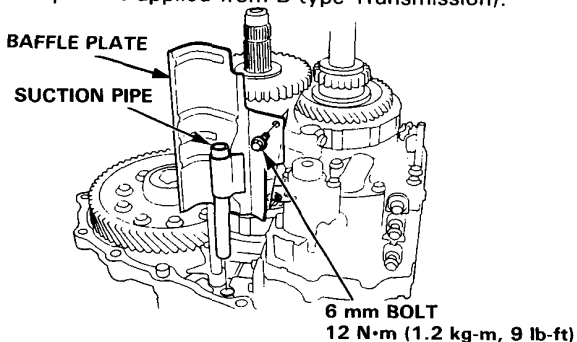
30. Install the countershaft reverse gear, needle bearing, and reverse gear collar.



31. Install the new gasket and three dowel pins in the torque converter housing.



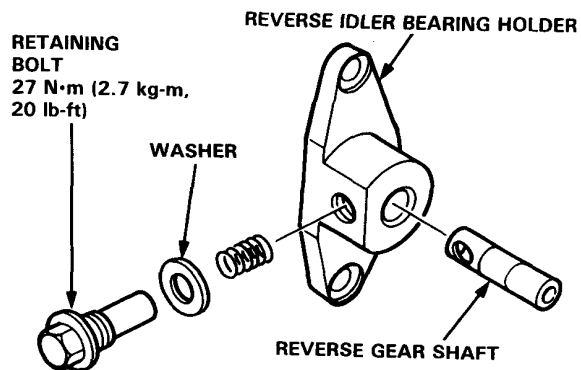
32. Install the baffle plate with the suction pipe (baffle plate is applied from B type Transmission).



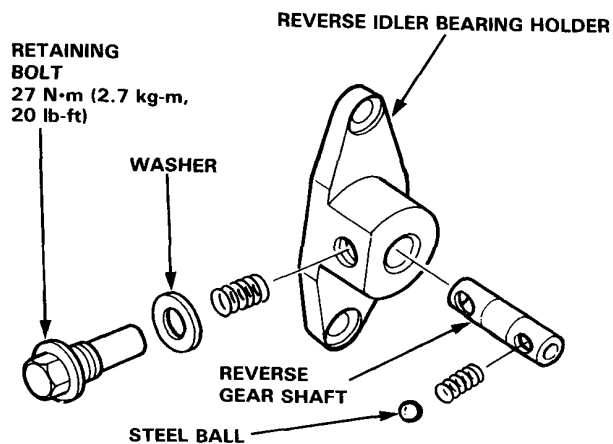
33. Assemble the idler bearing holder.

NOTE: Align the hole in the shaft with the spring.

(A type transmission)



(B type transmission)



(cont'd)

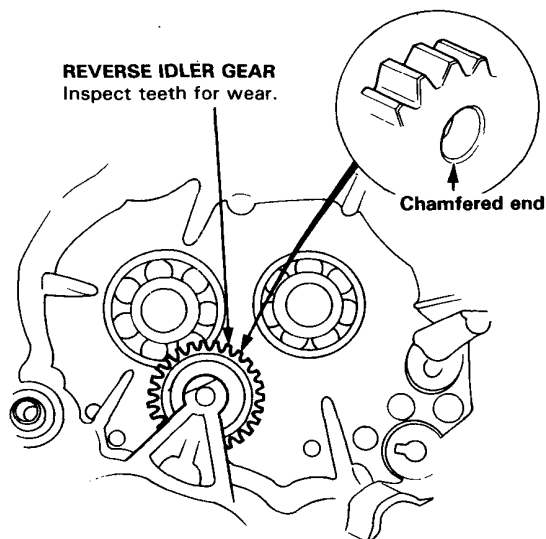


# Transmission

## 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.

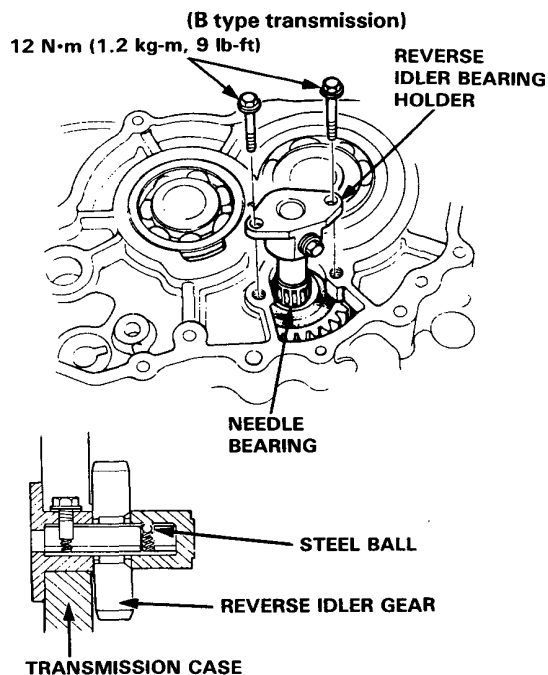
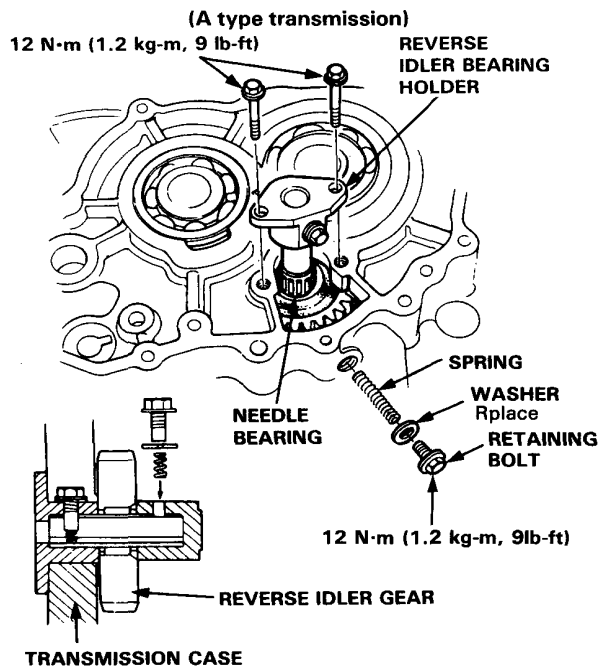


35. Install the needle bearing into the idler gear.

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.

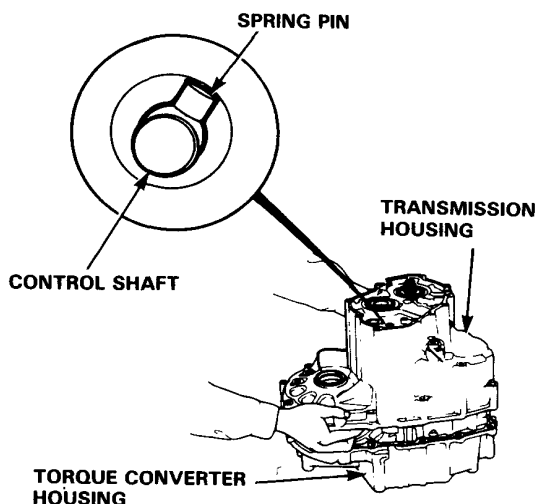






39. Place the transmission housing on the torque converter housing.

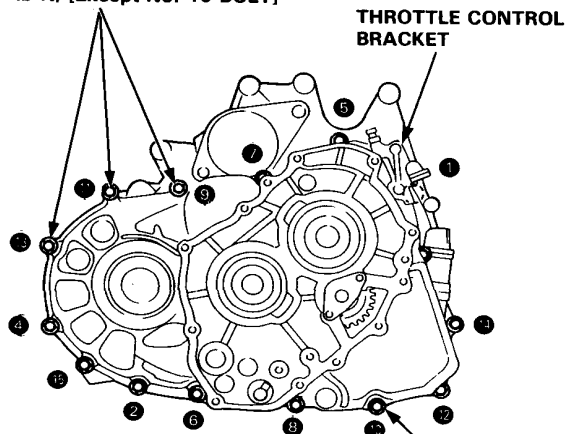
**NOTE:** Be sure the main valve control shaft lines up with the hole in the housing and that the reverse idler gear meshes with the mainshaft and countershaft, or the housing will not go on.



40. Install bolts in order of (1) thru (15) in two or more steps.

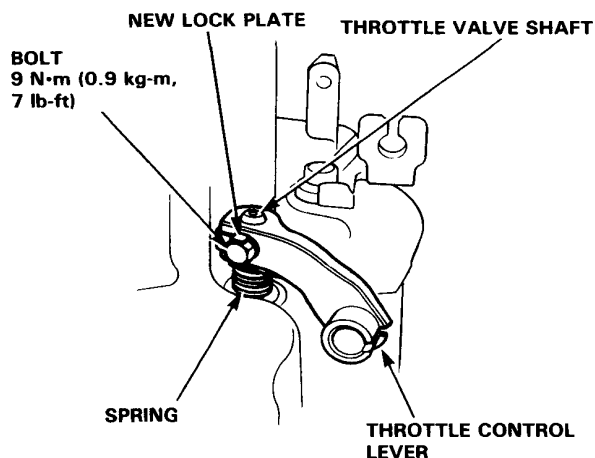
**NOTE:** When tightening the transmission housing bolts, take care that you do not distort or damage the throttle control bracket; distortion or damage to the bracket will change transmission shift points.

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) [Except No. 10 BOLT]



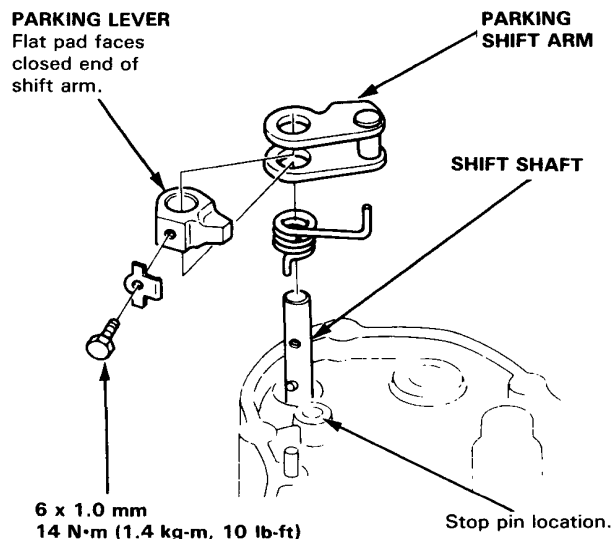
1600 Engine: 10 x 1.25 mm BOLT  
45 N·m (4.5 kg-m, 33 lb-ft)

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.



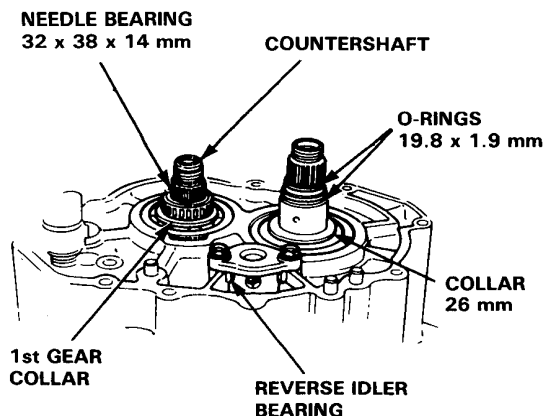
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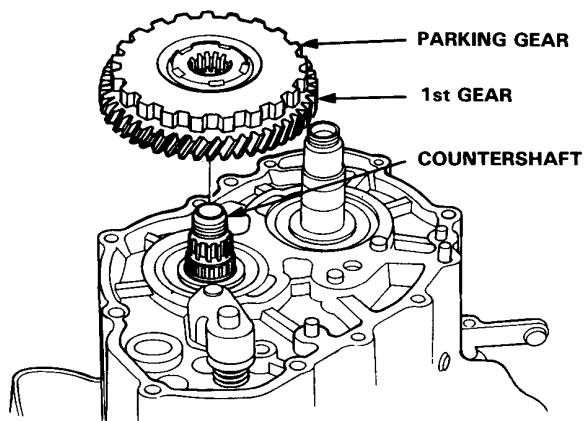
# Transmission

## Reassembly (cont'd)

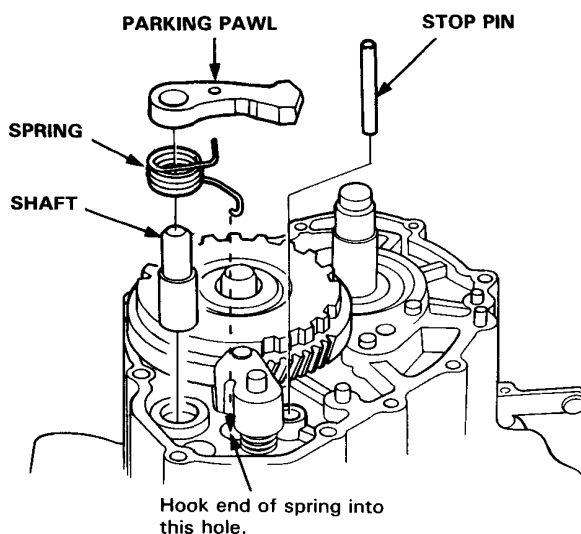
44. Install the 1st gear collar and needle bearing on the countershaft. Install the 26 mm collar on the mainshaft.
45. Install new 19.8 x 1.9 mm O-rings on the mainshaft.



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:

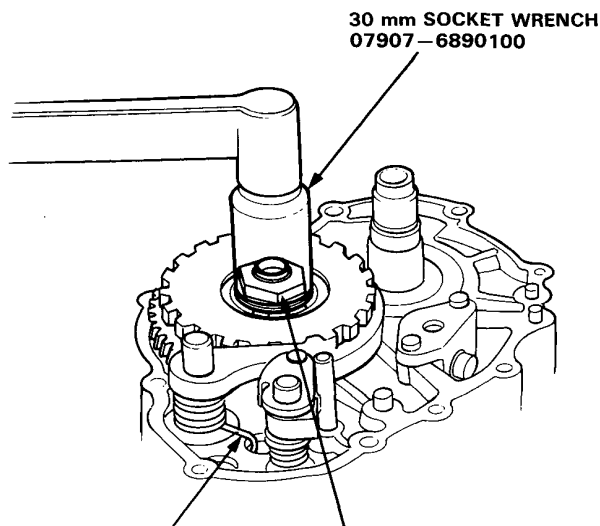
- One end of the parking pawl release spring fits into the hole in the parking pawl, the other end into the hole in the transmission housing as shown.
- The release spring should put clockwise tension on the pawl, forcing it away from the parking gear.





48. Shift to PARK and install the mainshaft holder.

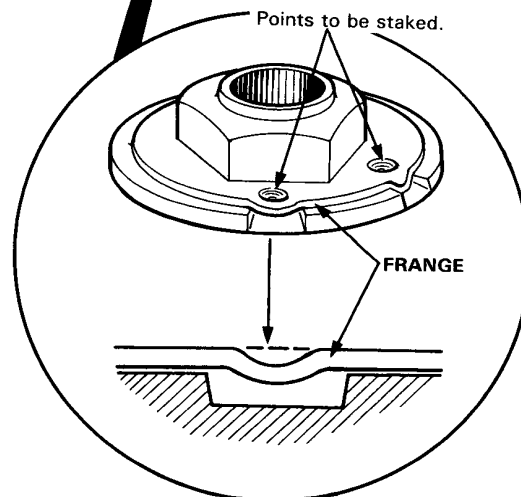
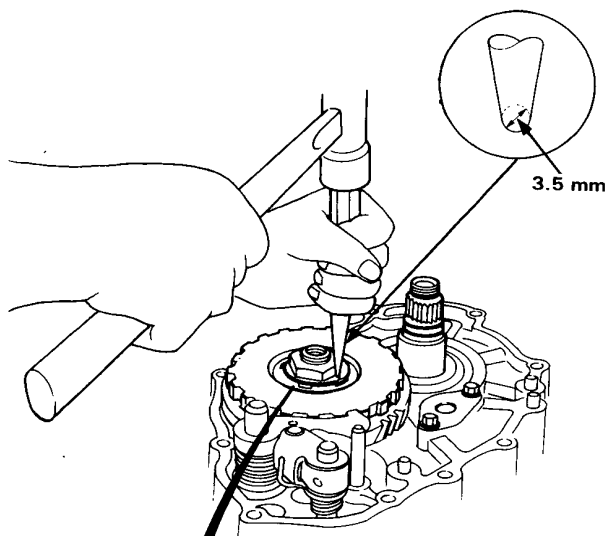
49. Install and torque the new countershaft locknut.



PARKING PAWL  
RELEASE SPRING

**COUNTERSHAFT LOCKNUT**  
2000 Engine: A type transmission  
1600 Engine:  
20 x 1.25 mm  
110 → 0 → 110 N·m  
(11.0 → 0 → 11.0 kg-m,  
80 → 0 → 80 lb-ft)  
Size change from 2000 Engine: B  
type transmission  
23 x 1.25 mm  
140 → 0 → 140 N·m  
(14.0 → 0 → 14.0 kg-m,  
102 → 0 → 102 lb-ft)  
Replace

50. Stake the locknut flange at two places into the gear grooves using a 3.5 mm punch.



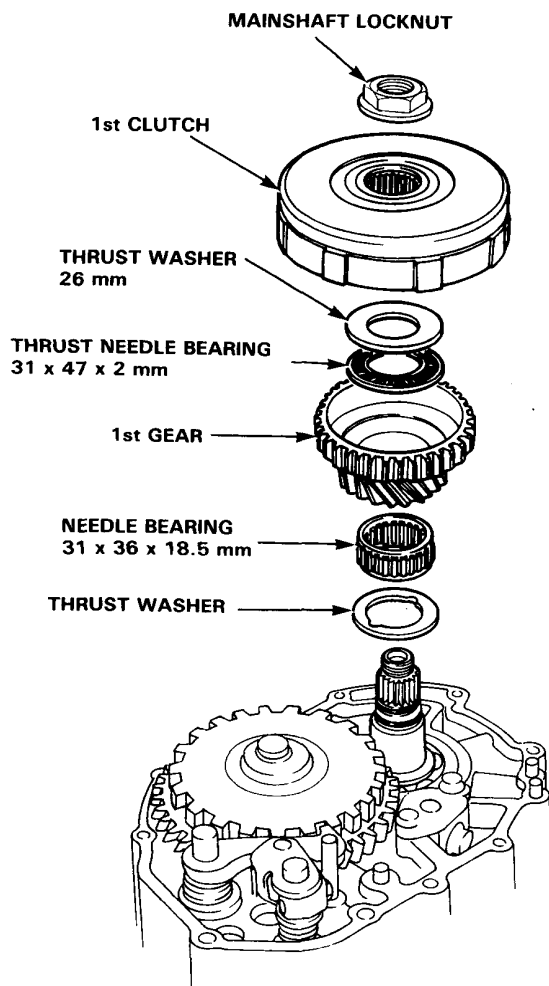
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# Transmission

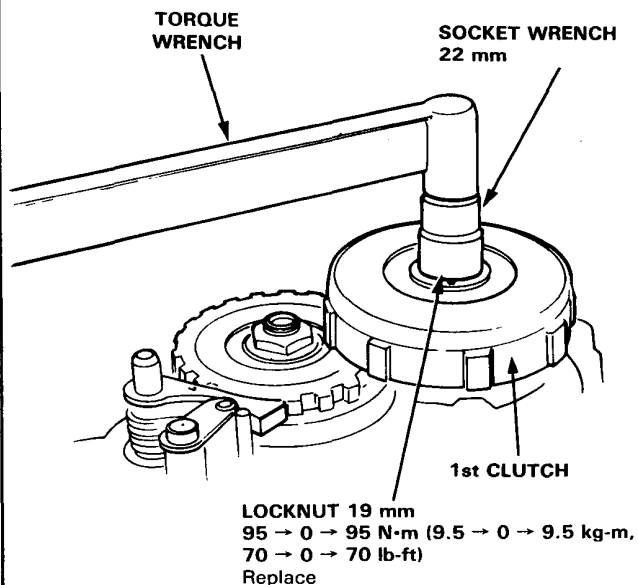
## Reassembly (cont'd)

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.

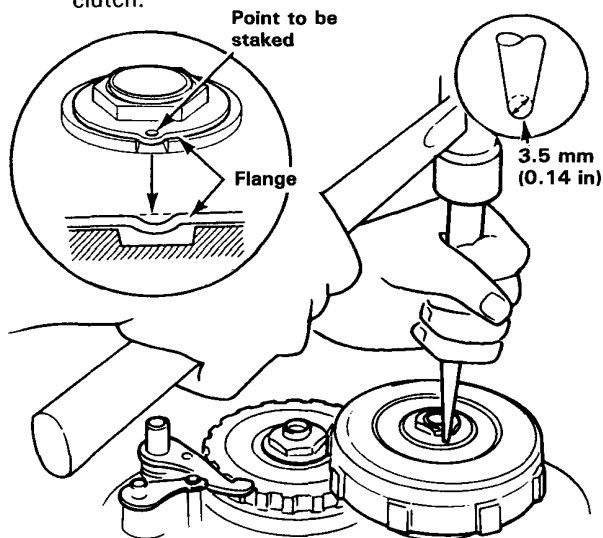


53. Install the 1st clutch on the mainshaft.
54. Attach the mainshaft holder from the underside of the torque converter case.
55. Install and torque the new mainshaft locknut.

**CAUTION:** Locknut has left-hand threads.



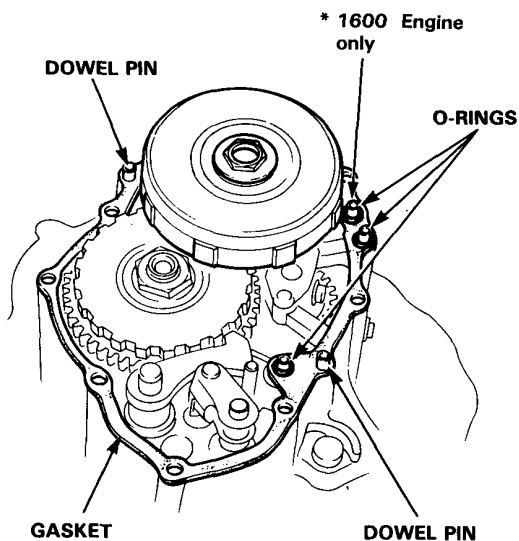
56. Stake the locknut flange into the groove in the 1st clutch.



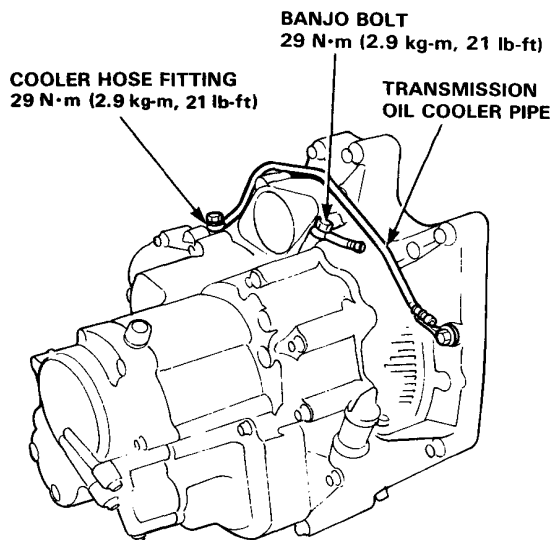




57. Install the gasket, dowel pins, and O-rings on the transmission housing.



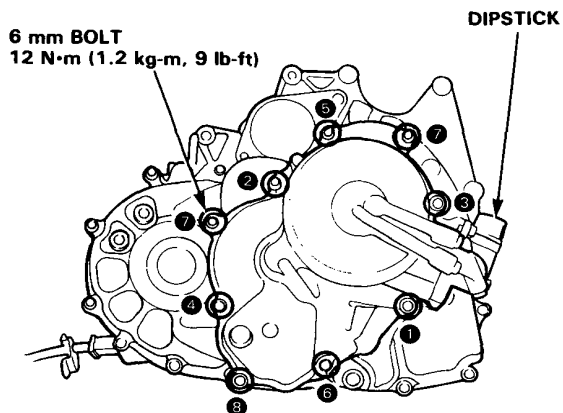
61. Install the transmission cooler hose fitting and torque to 29 N·m (2.9 kg-m, 21 lb-ft).



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.

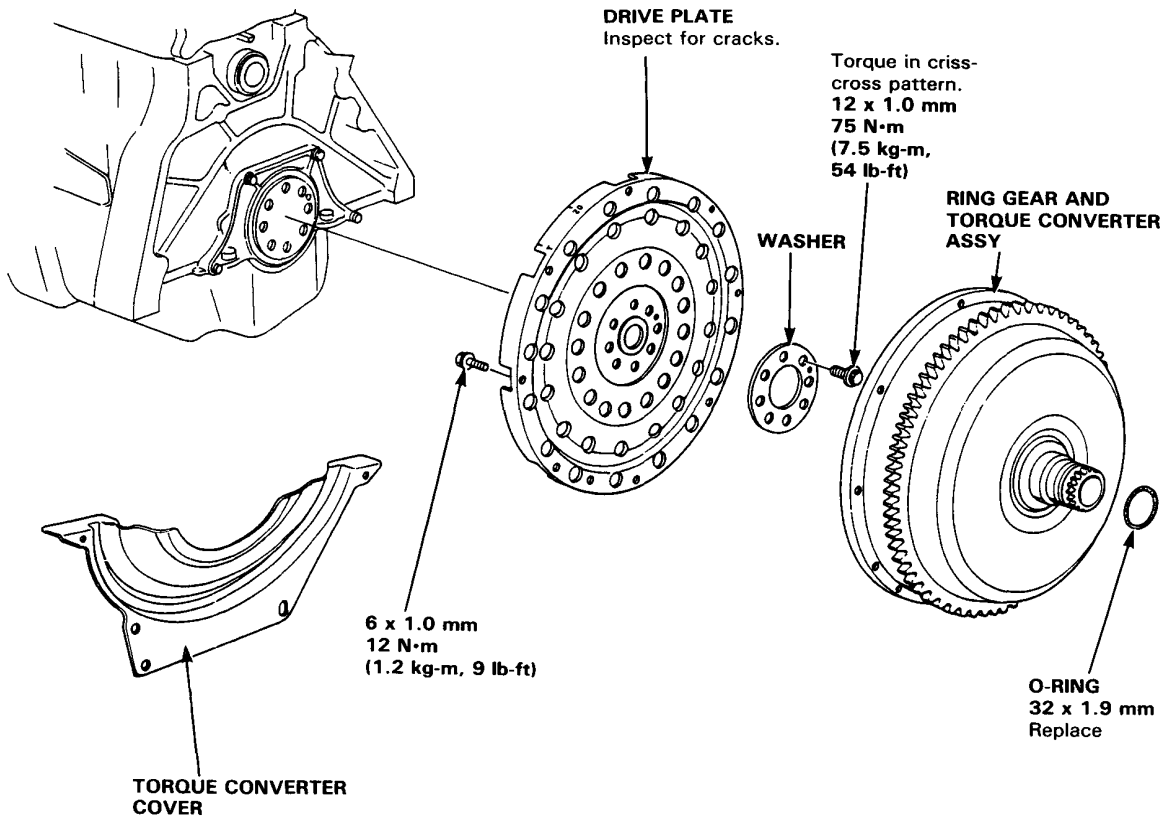
60. Install the transmission cooler banjo fitting, but do not tighten until the transmission is installed in the car and the hose is positioned properly.





# Torque Converter

## Disassembly



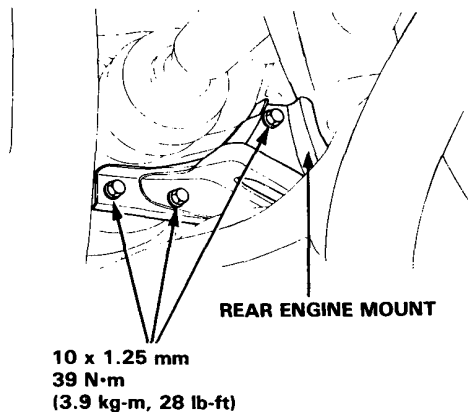


# Transmission

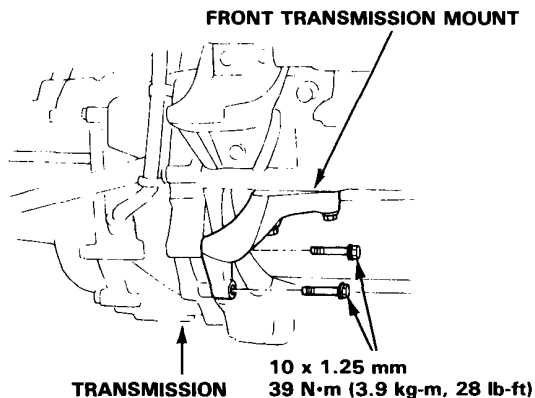


## Installation

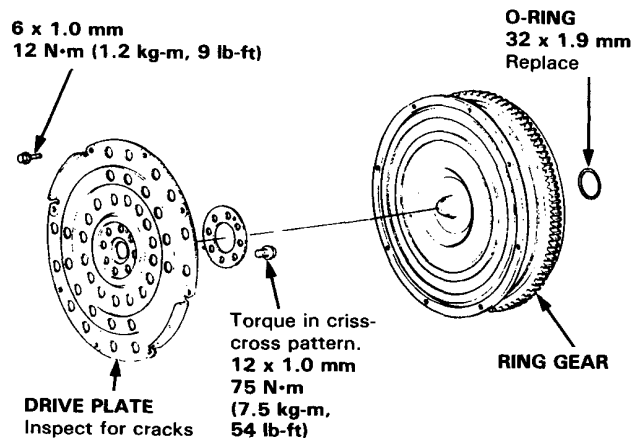
1. Attach shift cable to shift arm with pin, then secure cable to edge of housing with cable holder and bolt, and torque to 12 N·m (1.2 kg-m, 9 lb-ft).
2. Install torque converter on transmission.
3. Place transmission on transmission jack, and raise to engine level.
4. Hook hanger plate with hoist and 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).



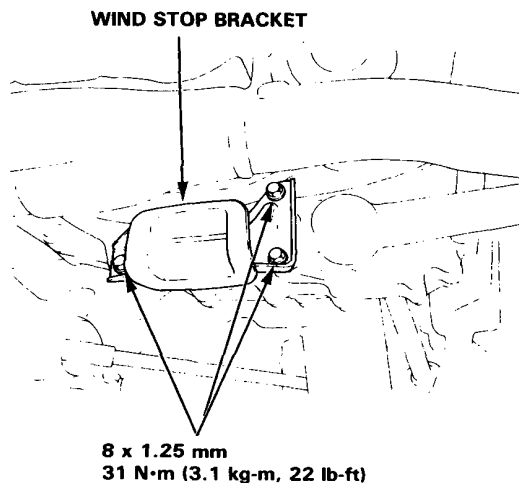
11. Install the front transmission mount bolts and torque to 39 N·m (3.9 kg-m, 28 lb-ft).



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 12 N·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).

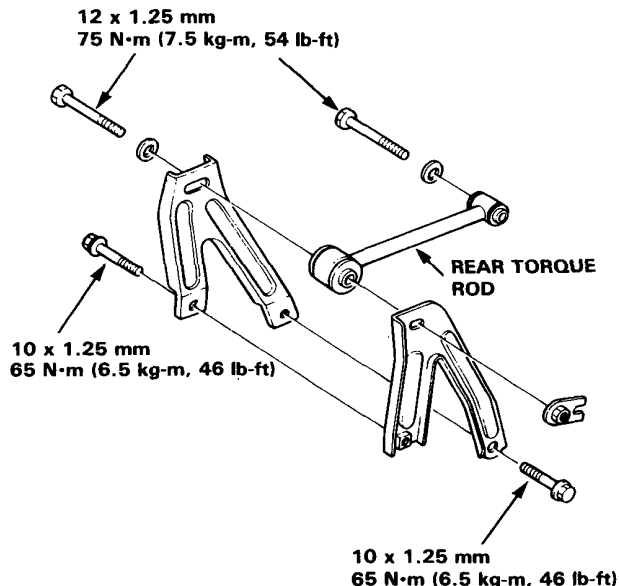
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# Transmission

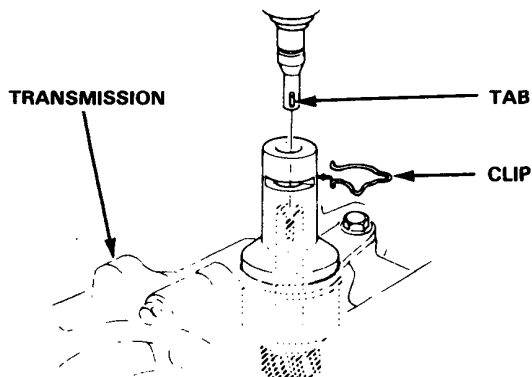
## Installation (cont'd)

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.





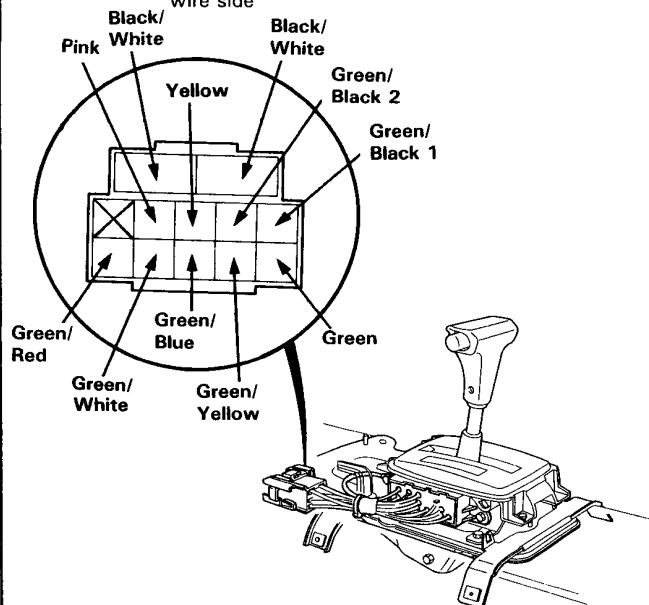
# Console Switch

## 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/BI<sup>1</sup> and G/BI<sup>2</sup> are not the same).

View from  
wire side



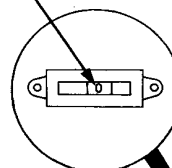
Wire color	2	D3	D4	N	R	P
Pink (cruise control)	○	○	○			
GND	○	○	○	○	○	○
Green/ Yellow	○					
Green/ Blue		○				
Green/ Black 1			○			
Green				○		
Green/ Red					○	
Green/ White						○

## INHIBITER SWITCH

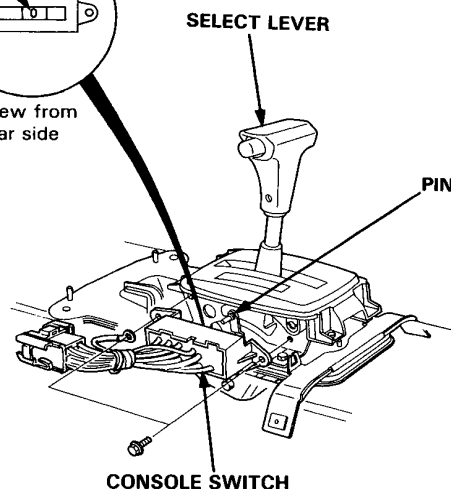
Wire color	N	R	P
Black/ White	○		○
Yellow		○	
Black/ White	○		○
Green/ Black 2		○	

3. Remove the center console and the 2 bolts to replace the console switch.

## SWITCH SLIDER



View from  
rear side



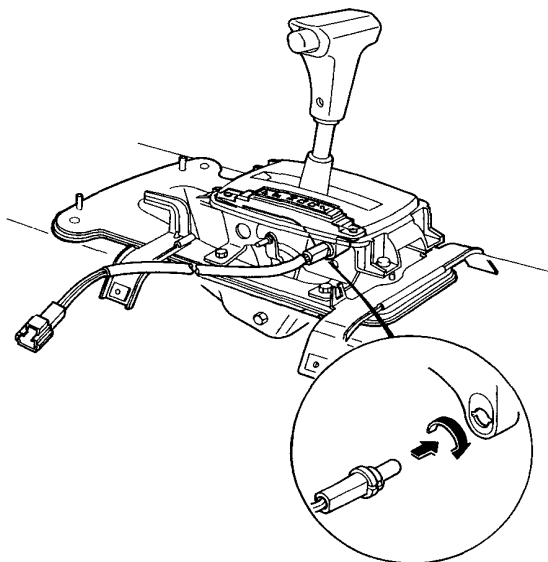
4. Position the switch slider to "Neutral" as shown above.
5. Shift the select lever to "Neutral", then slip the console switch into position.
6. Tighten the switch with the 2 bolts.



## 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.

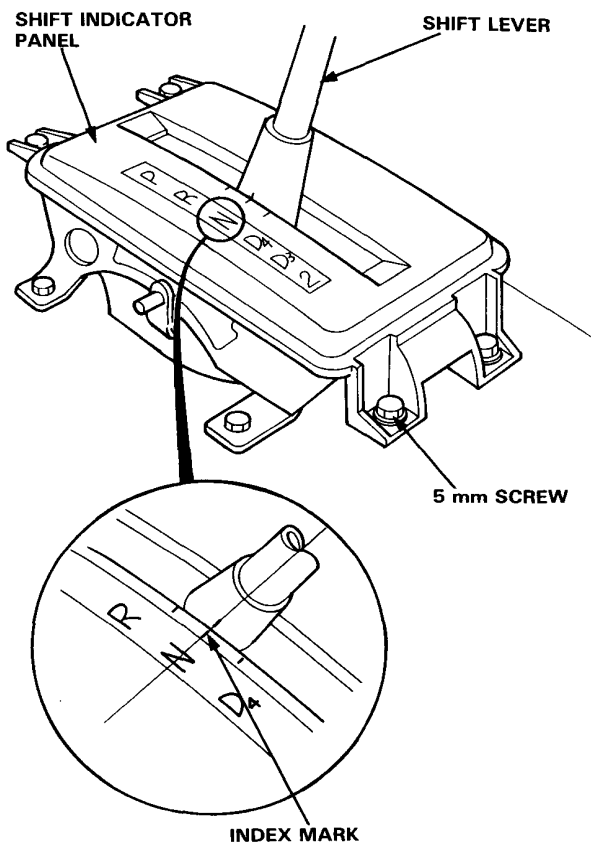


## Shift Indicator Panel

### 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.

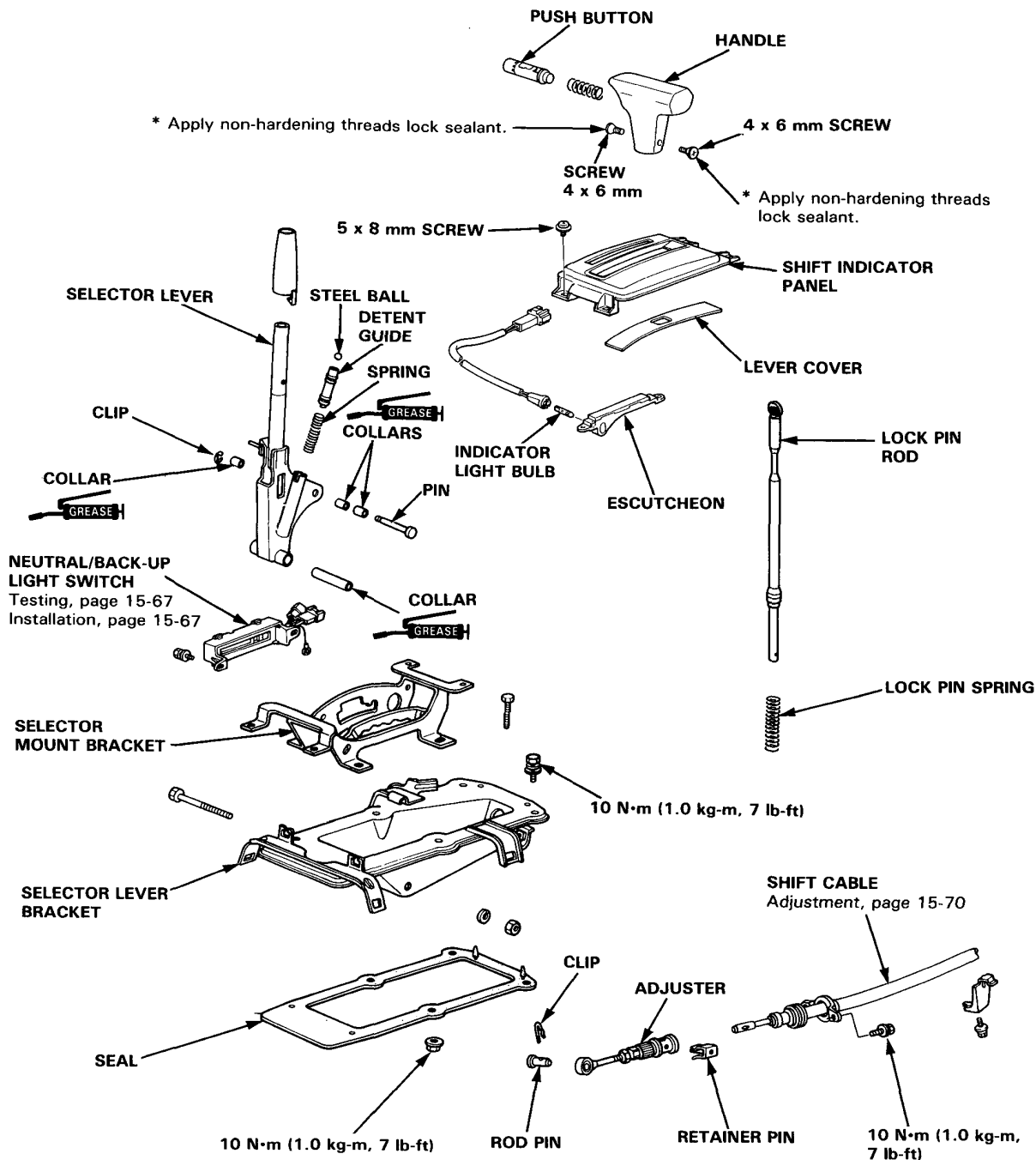




# Gearshift Selector



## Overhaul

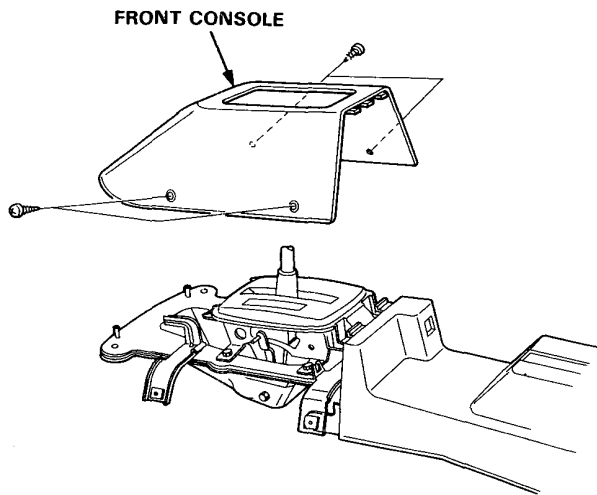




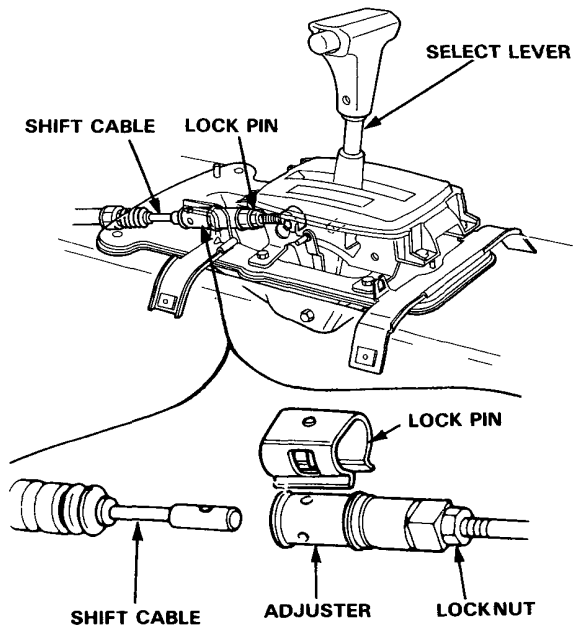
# Shift Cable

## Adjustment

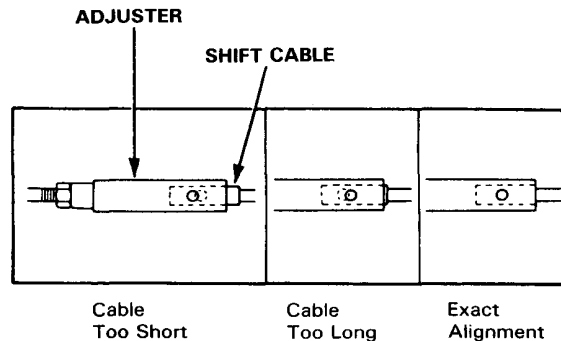
1. Start the engine. Shift to reverse to see if the reverse gear engages. If not, refer to troubleshooting on page 15-4.
2. With the engine off, remove the front console.



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

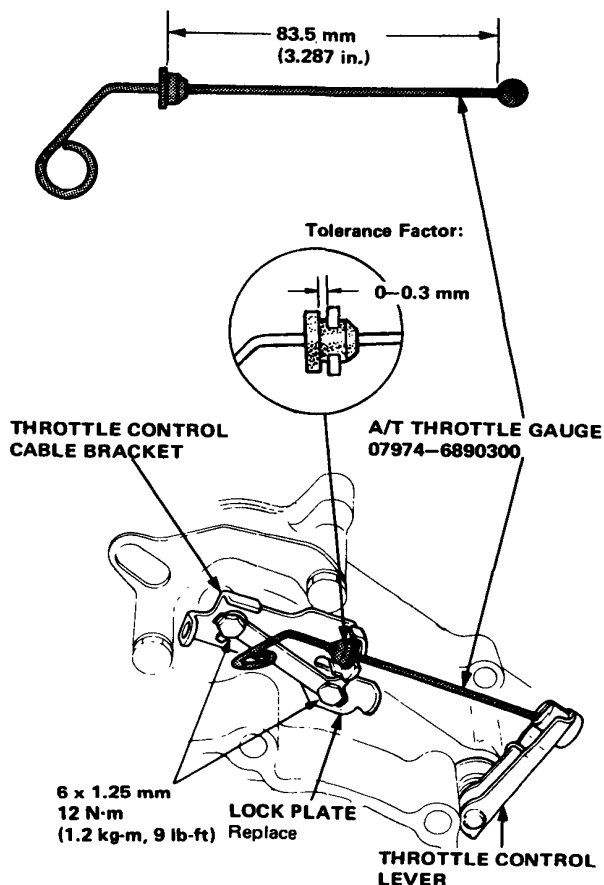
## Adjustment (Carbureted Engine)

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.

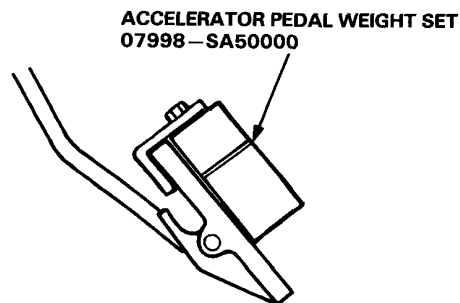
NOTE: The cooling fan should come on twice or more.

- The idle speed is correct.

**700 ± 50 min<sup>-1</sup> (rpm)**

- The automatic choke operation is correct. See "Throttle Control Cable Bracket Adjustment."
- Disconnect the vacuum tube from the dash pot, connect the vacuum 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.



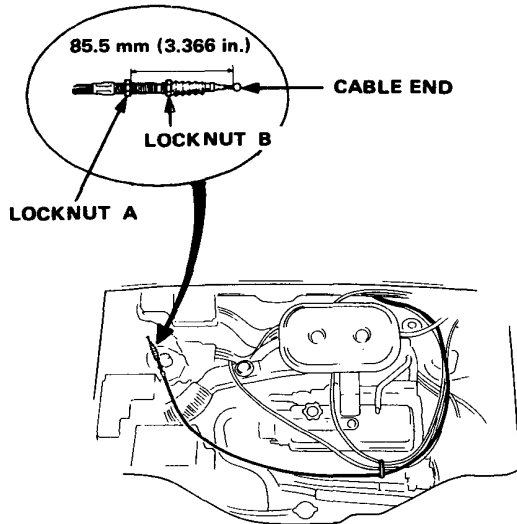
(cont'd)



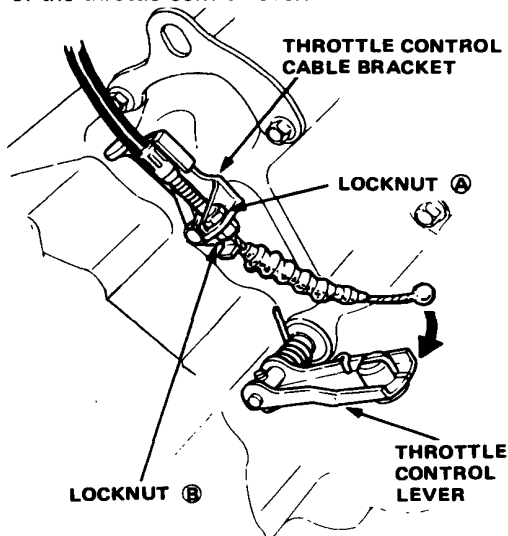
# Throttle Control Cable

## 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.).



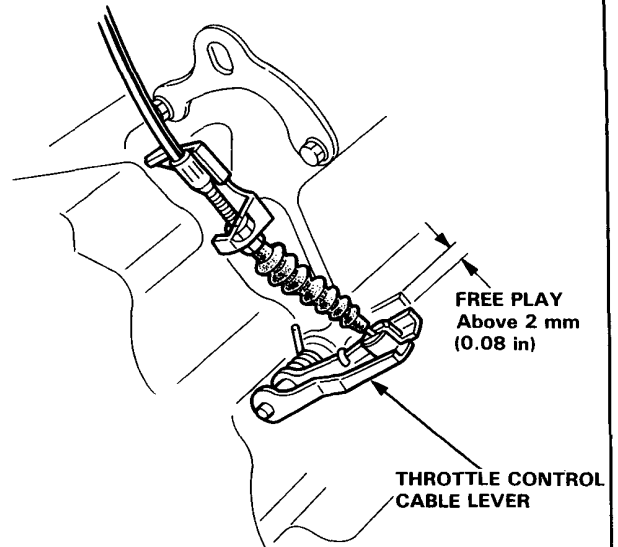
5. Insert the end of throttle control cable in the groove of the throttle control lever.



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.

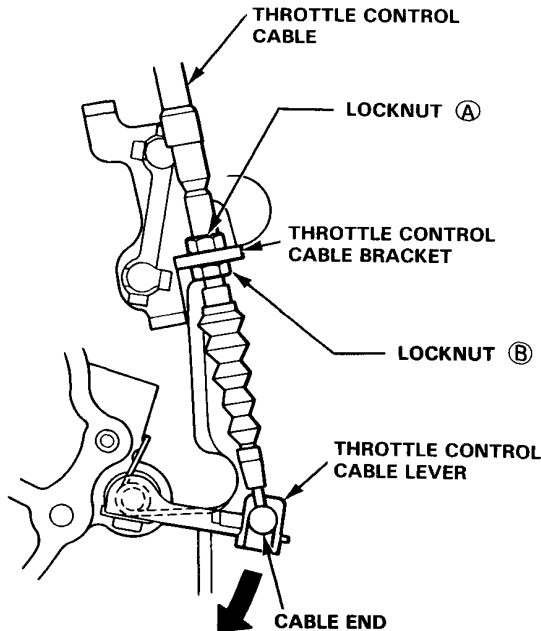
- If the throttle control lever moves before engine speed increases, turn the cable locknut A counter clockwise and tighten locknut B.
- If the throttle control lever moves after engine speed increases, loosen locknut B, turn locknut A clockwise and tighten the locknut B.



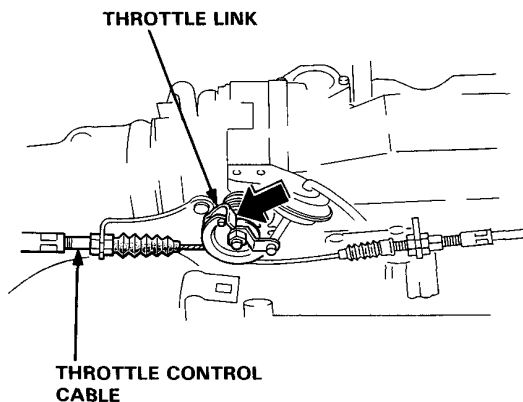


## Adjustment/Inspection (Fuel-Injected Engine)

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".

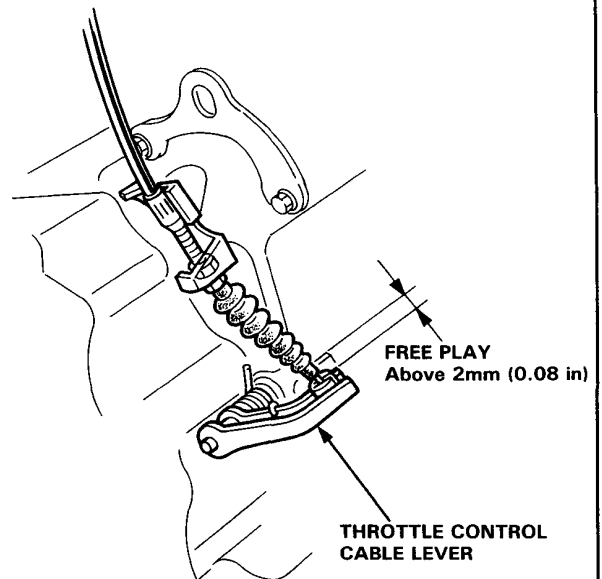
Until no movement can be felt in the throttle link, while continuing to press down on the throttle control lever, pull open the throttle link.

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 converter.

4. Check the following items before starting the engine:

Depress the accelerator to the floor. While its depressed, check that there is play in the throttle control lever.



- Check that the cable moves freely by depressing the accelerator.



## Differential

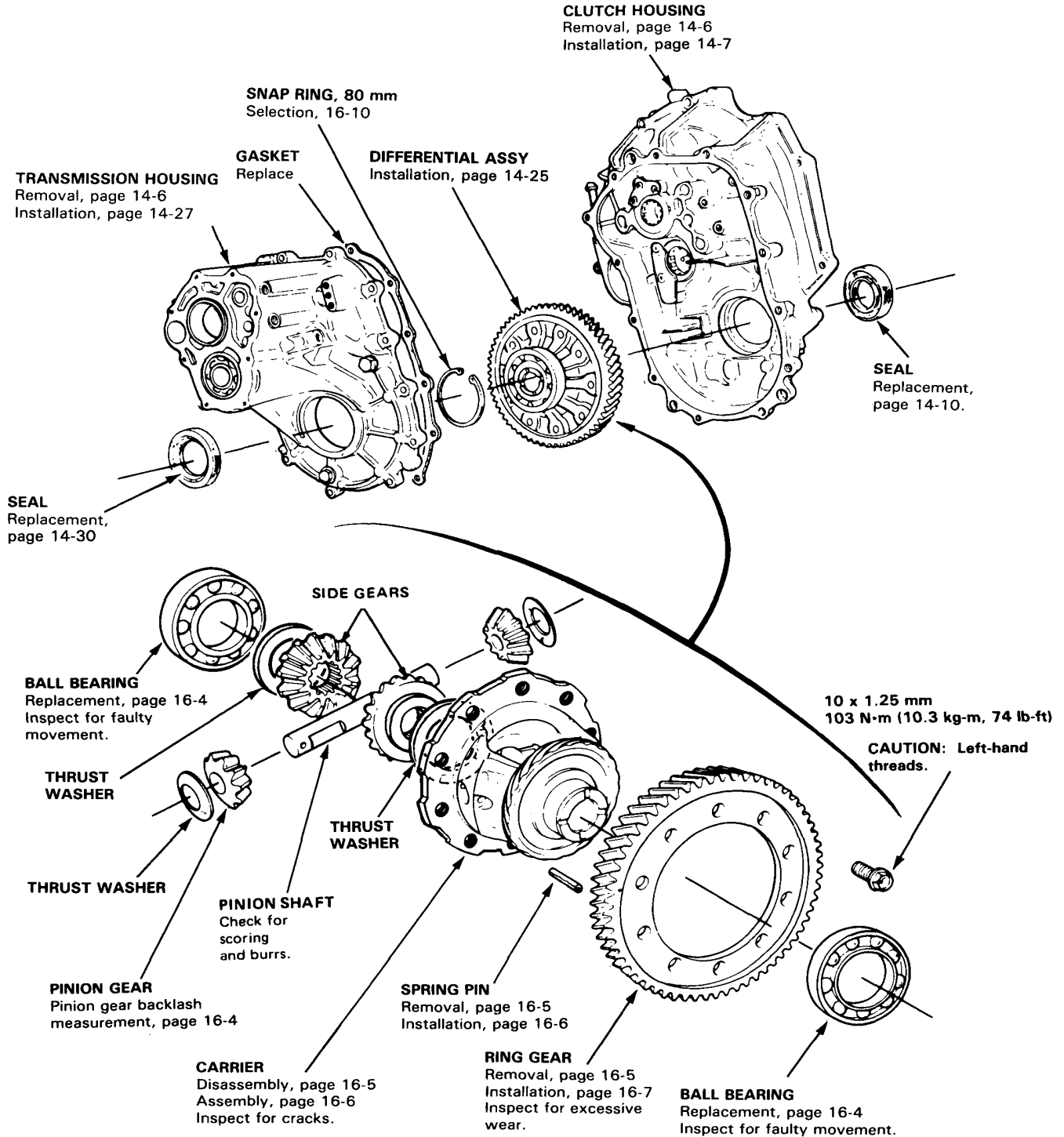
Illustrated Index .....	16-2
Backlash Inspection .....	16-4
Bearing Replacement .....	16-4
Inspection/Disassembly .....	16-5
Reassembly .....	16-6
Installation .....	16-8





# Differential (Manual Transmission)

## Illustrated Index

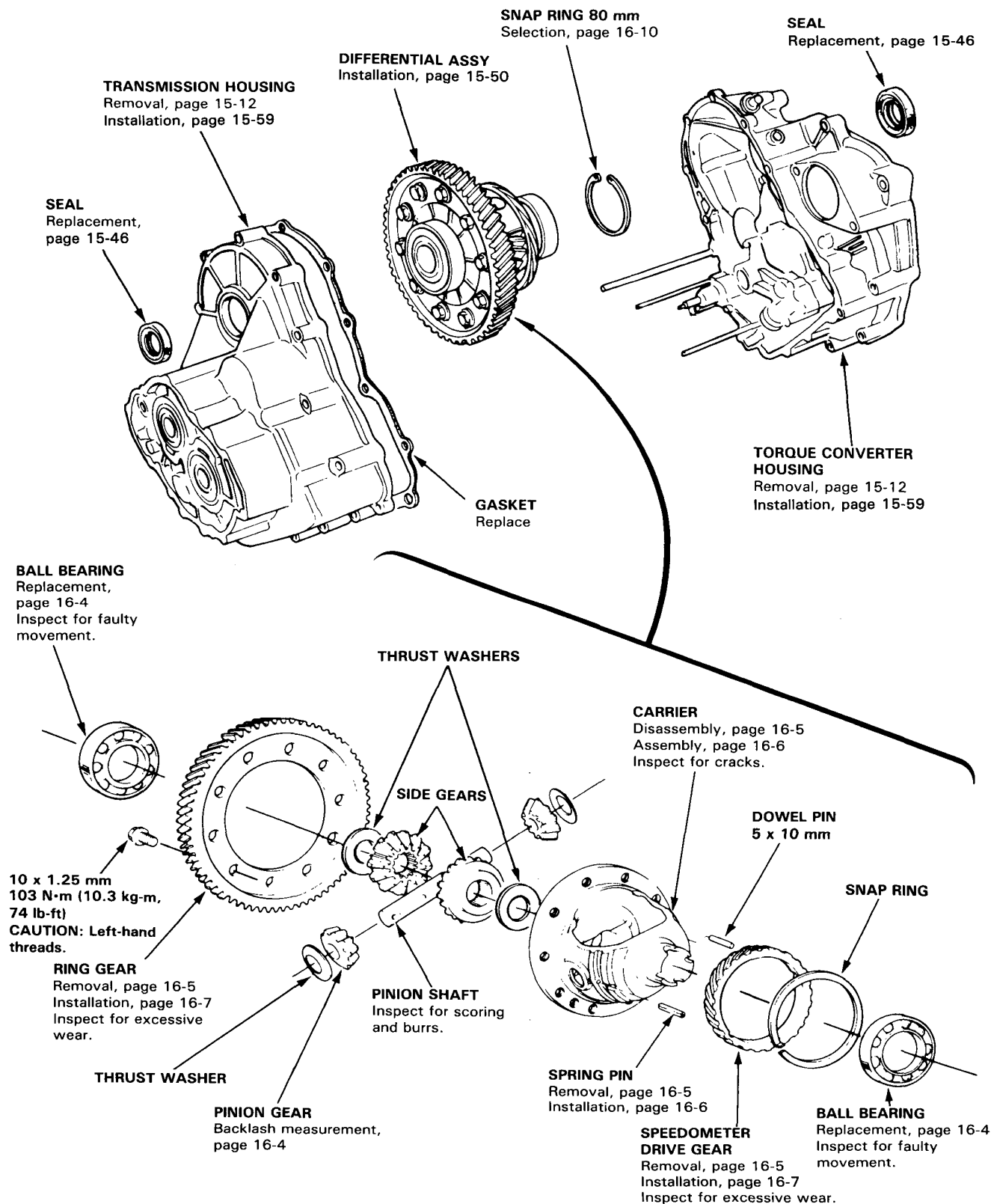






# Differential (Automatic Transmission)

## Illustrated Index



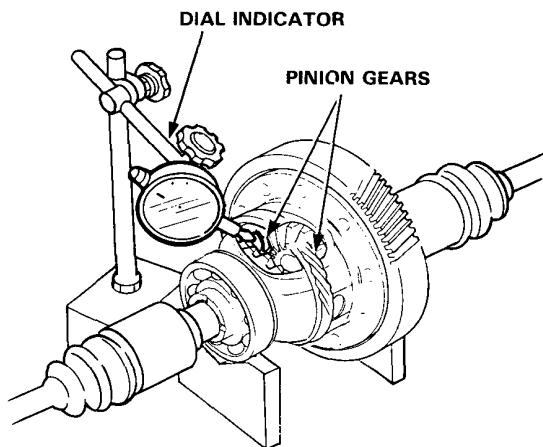


# Differential

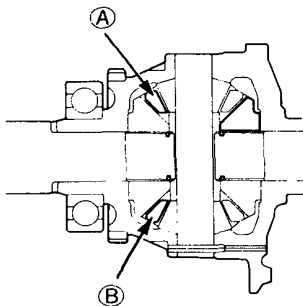
## Backlash Inspection

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.)**



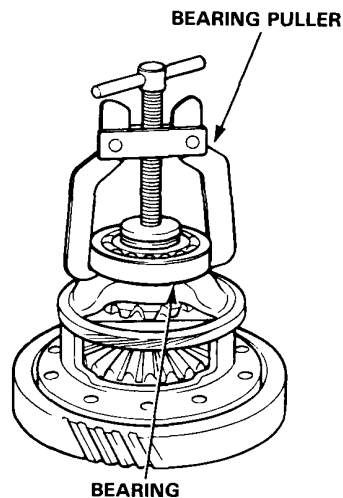
3. If out of tolerance, disassemble differential and select new thrust washers as shown on page 16-6.
4. Measure clearances in the A and B position of the drive pinion.



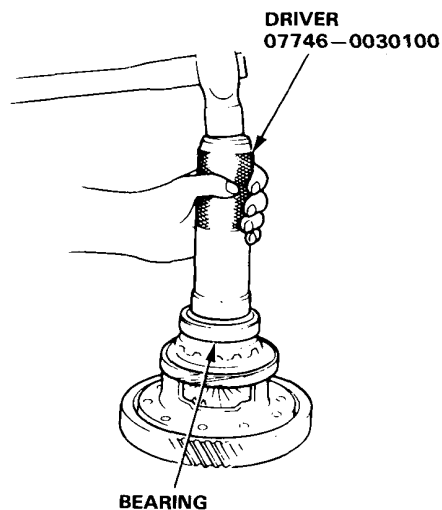
## Bearing Replacement

**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.



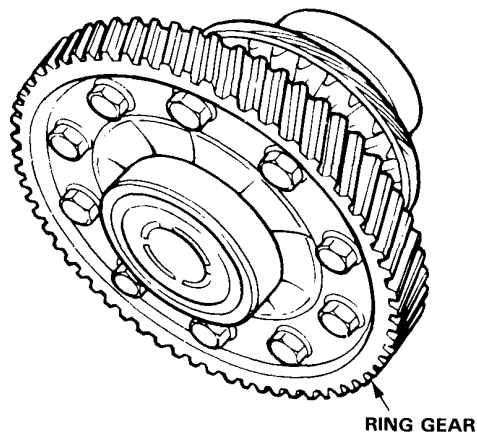




## Inspection/Disassembly

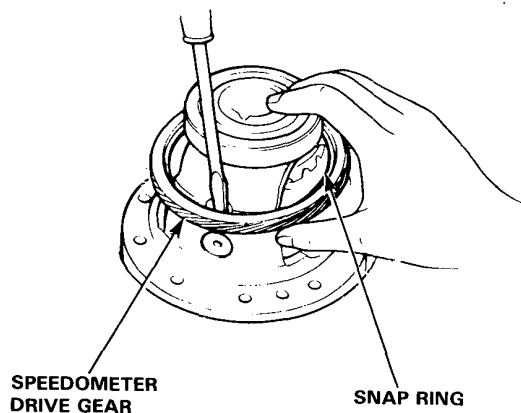
1. Remove ring gear and inspect teeth for wear or damage.

**CAUTION:** The ring gear bolts have left-hand threads.

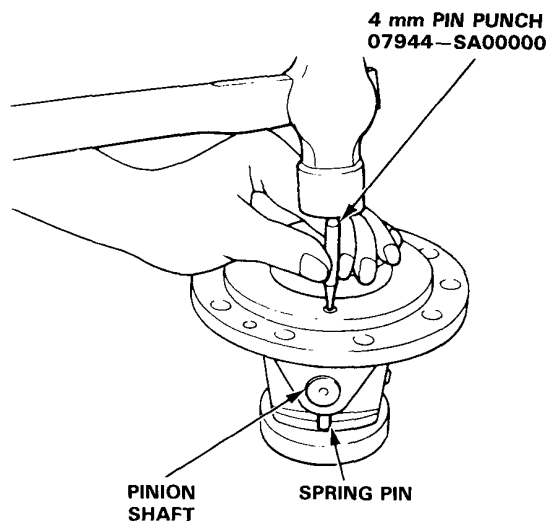


2. Automatic Only:  
Pry snap ring off carrier, then remove speedometer drive gear and dowel pin.

**CAUTION:** The speedometer drive gear has sharp edges; use care when handling it.

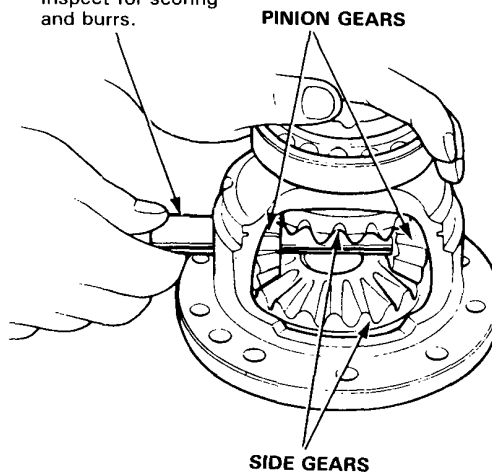


3. Drive out spring pin with pin punch.



4. Remove pinion shaft, pinion gears, and thrust washers.

**PINION SHAFT**  
Inspect for scoring and burrs.



5. Wash parts thoroughly in solvent and dry with compressed air. Inspect all parts for wear or damage and replace any that are defective.

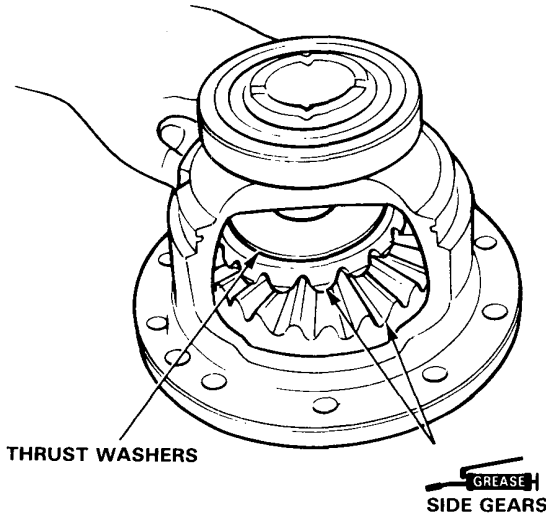


# Differential

## Reassembly

1. Install the side gears in differential carrier.

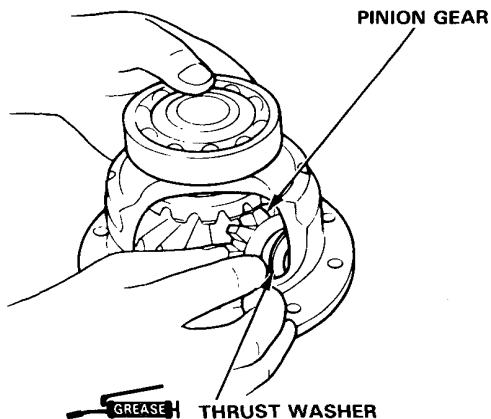
**CAUTION:** Coat all gears with molybdenum disulfide grease on all sides.



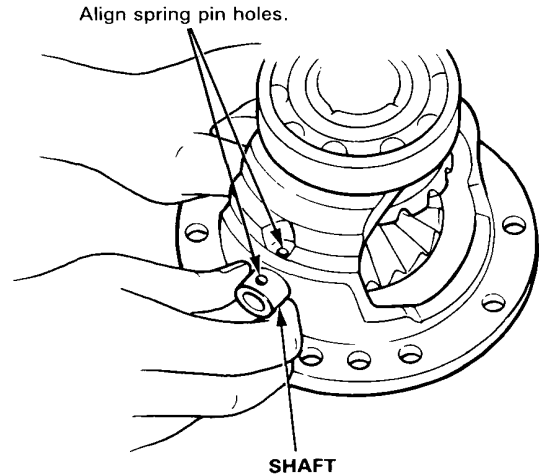
2. Set pinion gears in place exactly opposite each other in mesh with side gears, then install a thrust washer behind each one. Washers must be of equal thickness.

### Thrust Washers

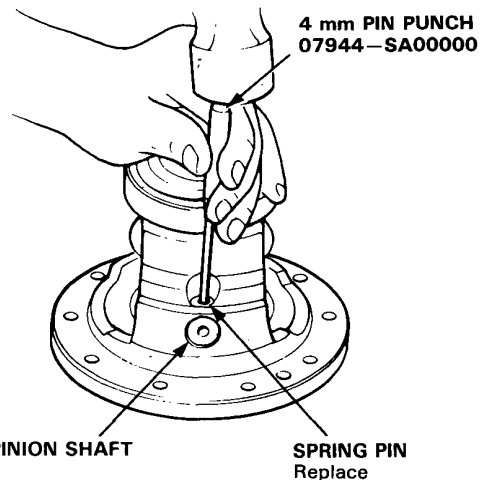
PART NUMBER	THICKNESS
41351-689-000	0.7 (0.028 in)
41355-PC8-000	0.75 (0.029 in)
41352-689-000	0.8 (0.031 in)
41356-PC8-000	0.85 (0.032 in)
41353-689-000	0.9 (0.035 in)
41357-PC8-000	0.95 (0.036 in)
41354-689-000	1.0 (0.039 in)



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.

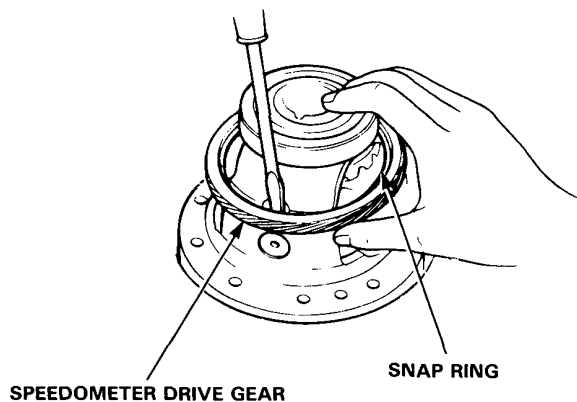




7. Automatic Only:

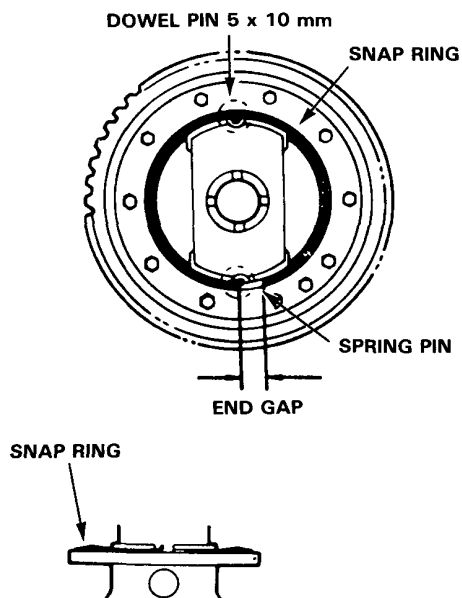
Install speedometer drive gear with its chamfer (on inside diameter) facing carrier and secure with snap ring.

**CAUTION:** The speedometer drive gear has sharp edges; use care when handling it.



8. Automatic Only:

Align snap ring on carrier as shown.

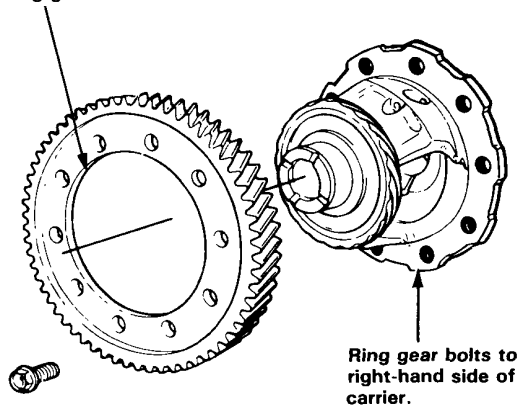


9. Install ring gear. Torque bolts to 103 N·m (10.3 kg-m, 74 lb-ft).

**CAUTION:** Ring gear bolts have left-hand threads.

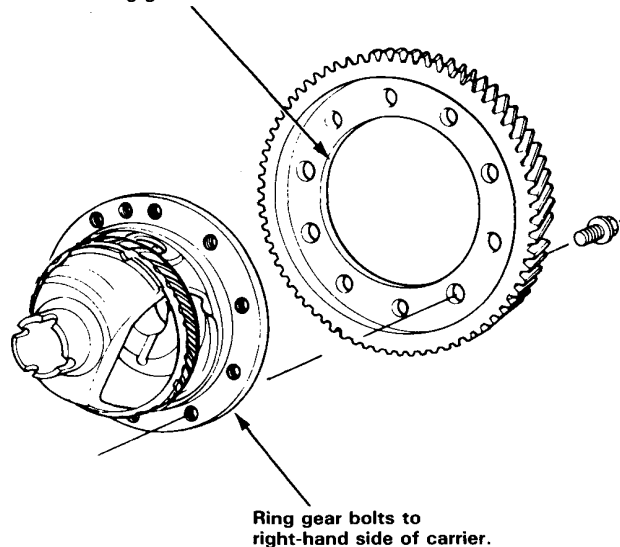
Manual

Chamfer on inside diameter of ring gear faces carrier.



Automatic

Chamfer on inside diameter of ring gear faces carrier.

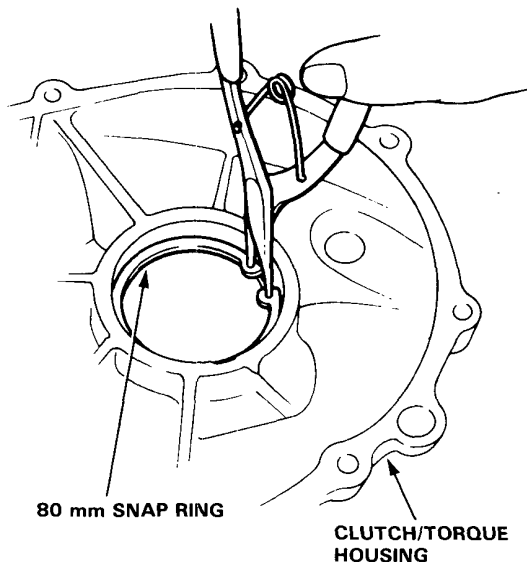




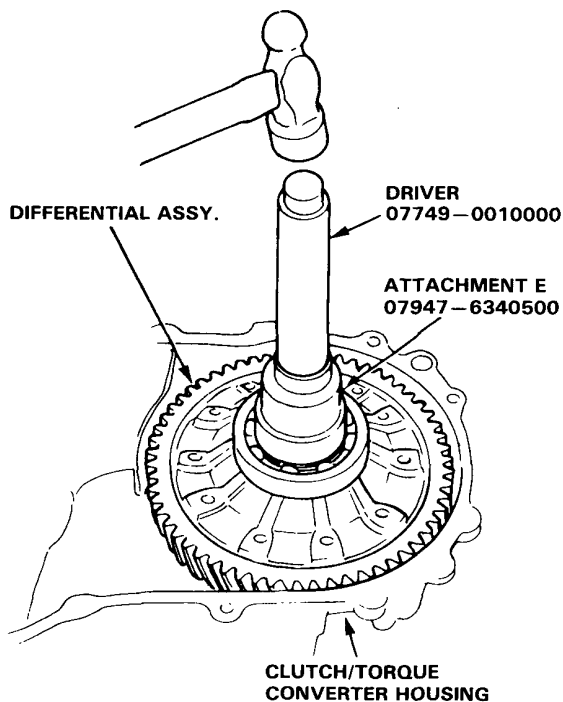
# Differential

## Installation

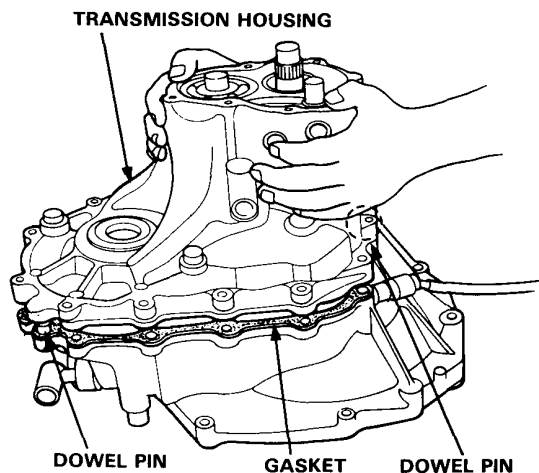
1. Automatic Only:  
Install 80 mm snap ring in clutch/torque converter housing. Do not install oil seal yet.



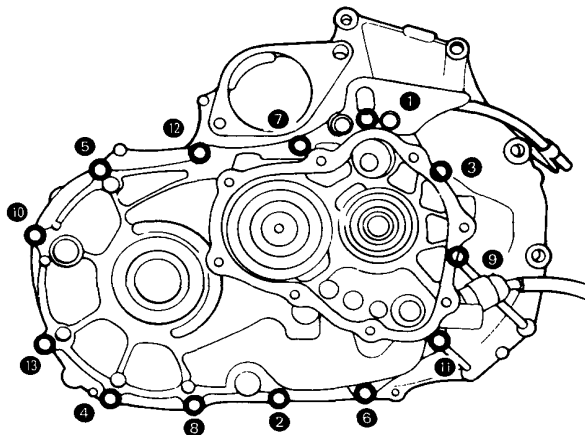
2. Install differential assembly in clutch/torque converter housing using driver. Tap on differential with driver and attachment to seat the snap ring in clutch/ torque converter housing.



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.





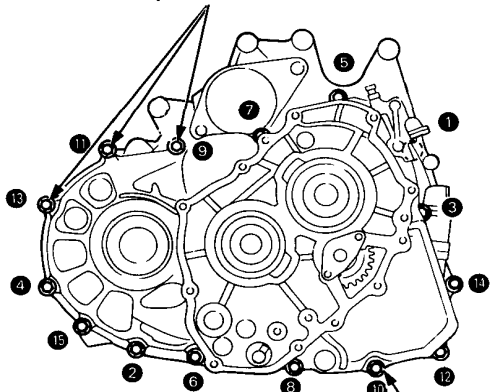


**7. Automatic Only:**

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) [Except No. 10 BOLT]**

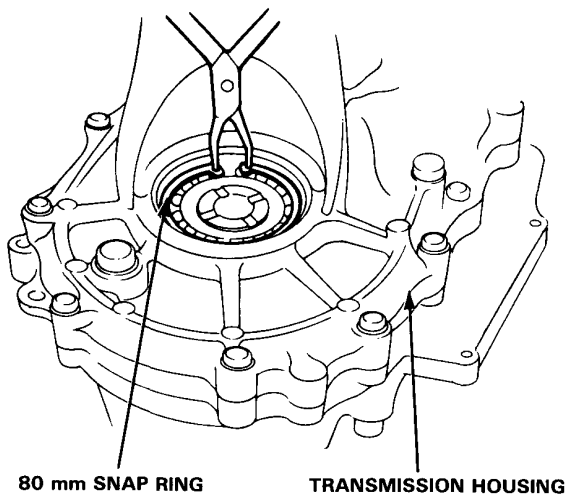


**\* 1600 Engine: 10 x 1.25 mm BOLT  
45 N·m (4.5 kg-m, 33 lb-ft)**

**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:**

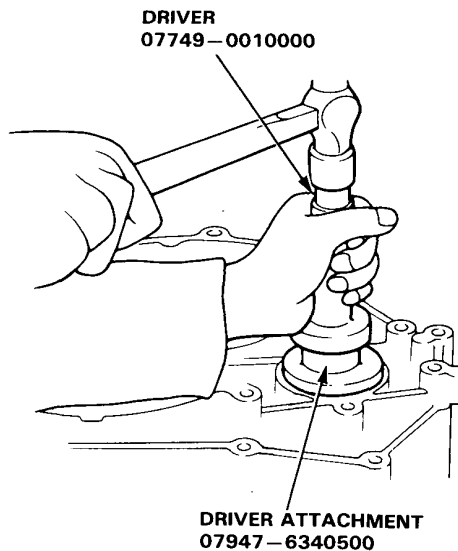
Install 80 mm snap ring in transmission housing.



**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.



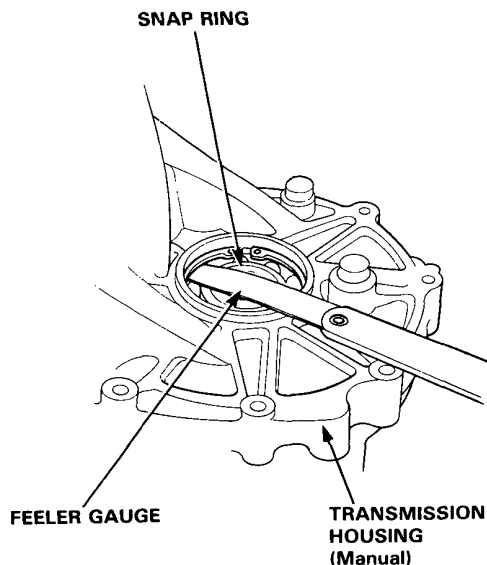
(cont'd)



# Differential

## 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.)

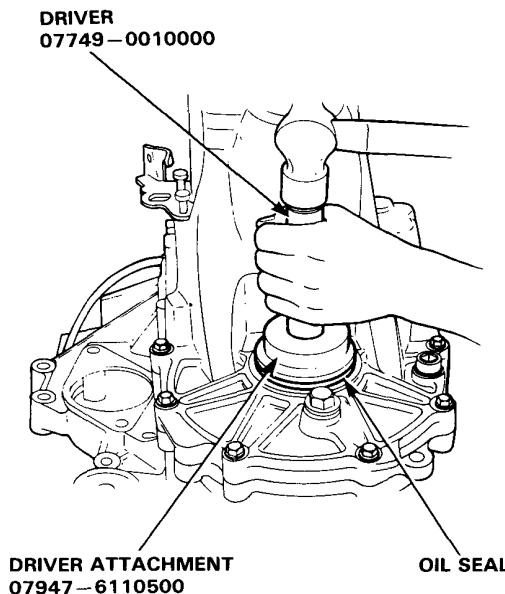
### Automatic only:

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

Removal .....	17-2
Disassembly/Inspection .....	17-3
Reassembly .....	17-4

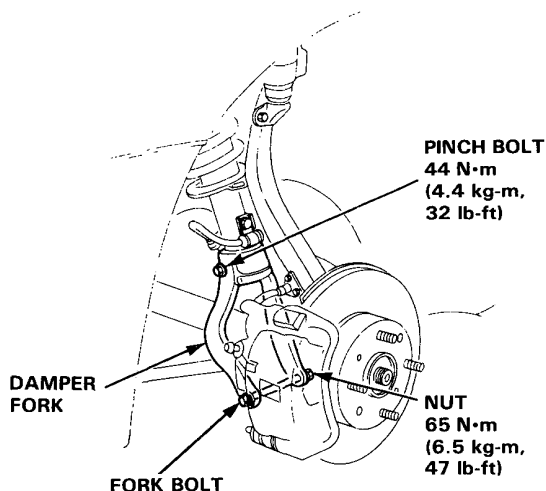




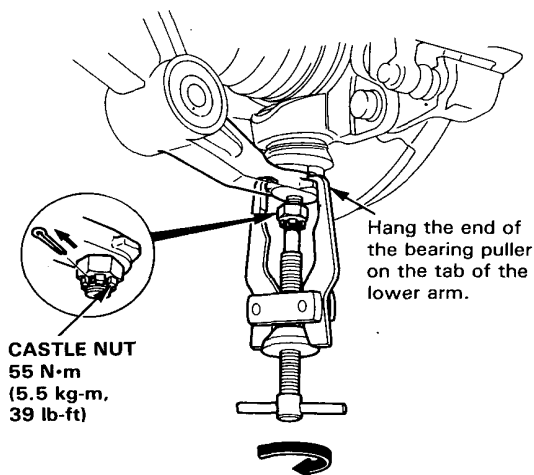
# Driveshafts

## Removal

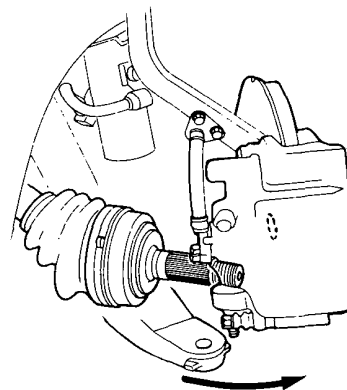
1. Loosen the front wheel lug nuts.
2. Raise the front end of the car and place safety stands in the proper locations. Remove the front wheels.
3. Drain the transmission oil.
4. Raise the locking tab on the spindle nut and remove it with a 32 mm (1.25 in.) socket wrench.
5. Remove the damper fork bolt and damper pinch bolt. Remove the damper fork.



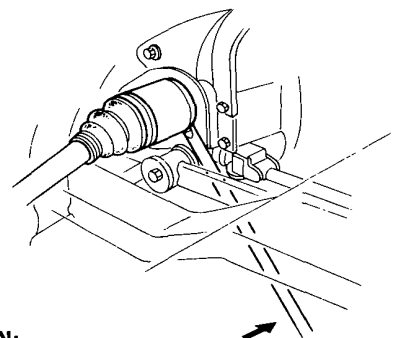
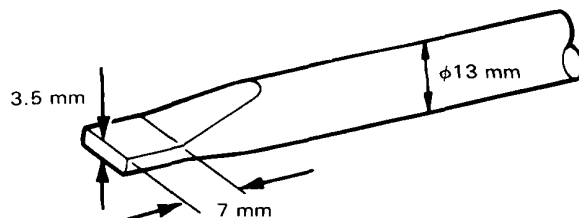
6. Remove the knuckle-to-lower arm castle nut, and separate the lower arm from the knuckle using a commercially available bearing puller.



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.

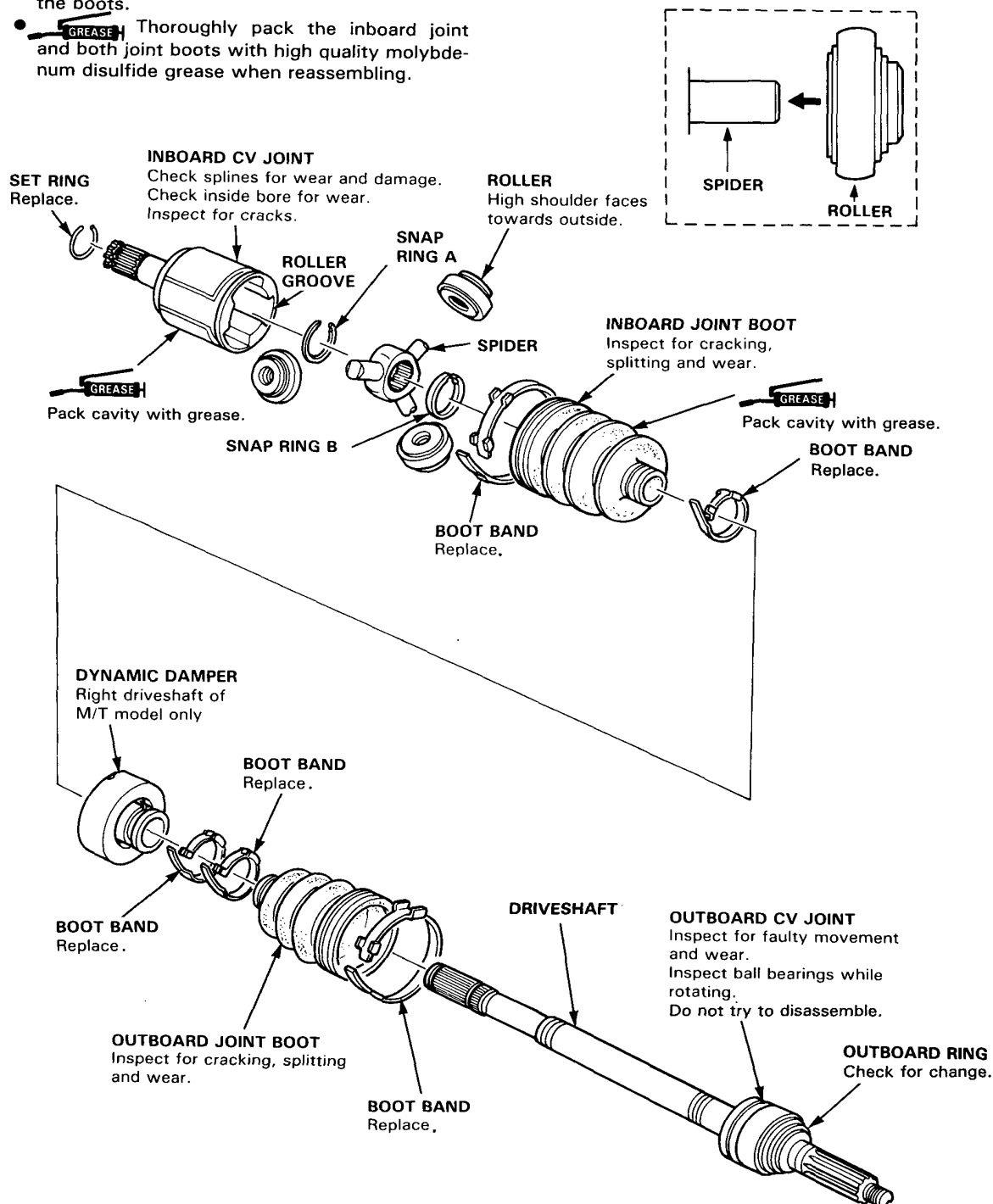




## Disassembly/Inspection

### 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.
-  Thoroughly pack the inboard joint and both joint boots with high quality molybdenum disulfide grease when reassembling.





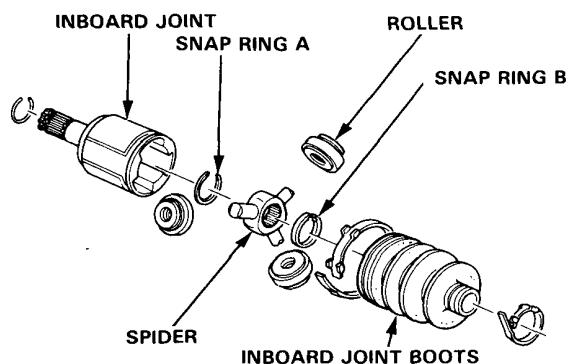
# Driveshafts

## 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.

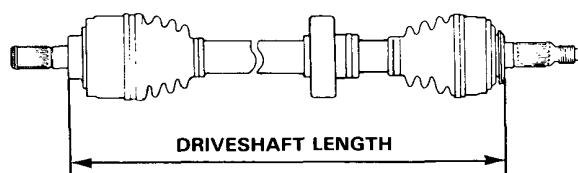
### LEFT DRIVE SHAFT

M/T: 805–809.5 mm (31.7–31.9 in)

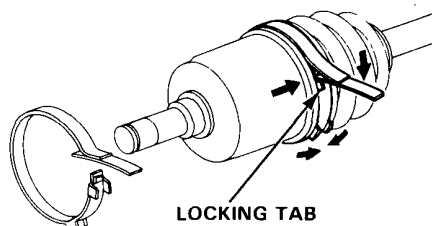
A/T: 812–816.5 mm (32.0–32.1 in)

### RIGHT DRIVESHAFT

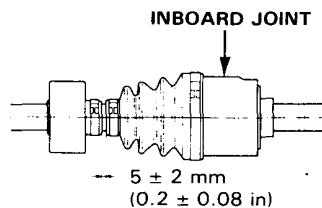
506–510.5 mm (19.9–20.1 in)



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.



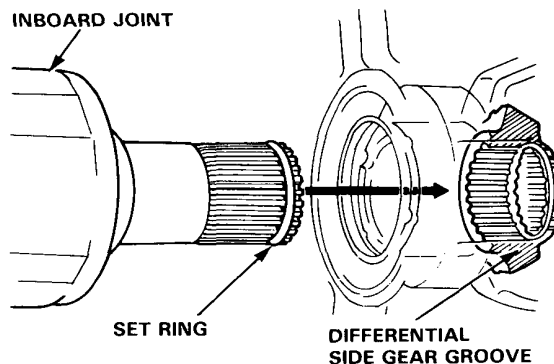
10. Position the dynamic damper as shown below (M/T right driveshaft only).



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

Index .....	18-2
Inspection .....	18-3
Gearbox .....	18-4
Steering Wheel .....	18-9
Column .....	18-10
Steering Lock .....	18-16

### Power Steering

Index .....	18-17
Troubleshooting .....	18-18
Maintenance .....	18-23
On-Car Checks .....	18-24
Pump .....	18-27
Control Unit .....	18-35
Gearbox .....	18-41

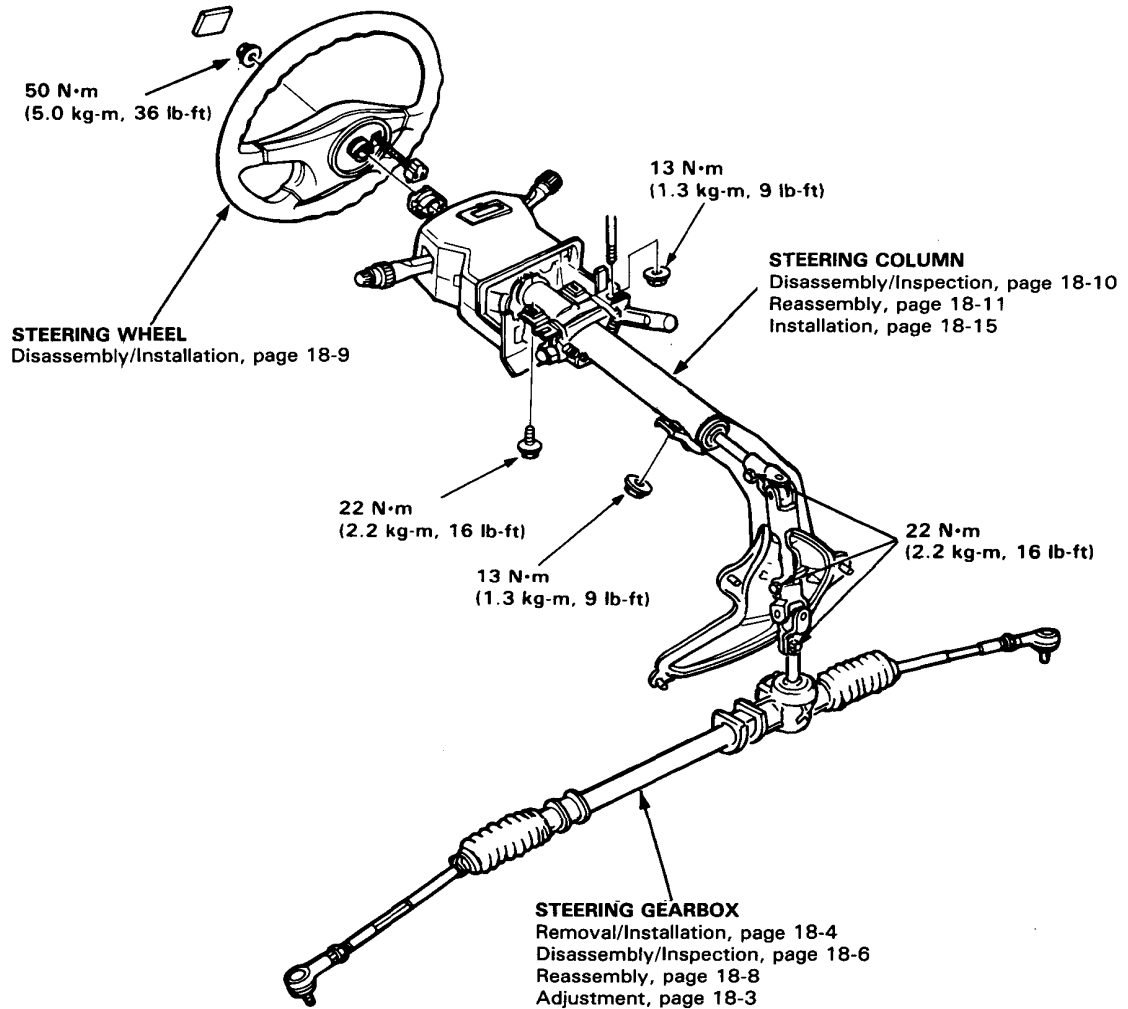




# Manual Steering

## Index

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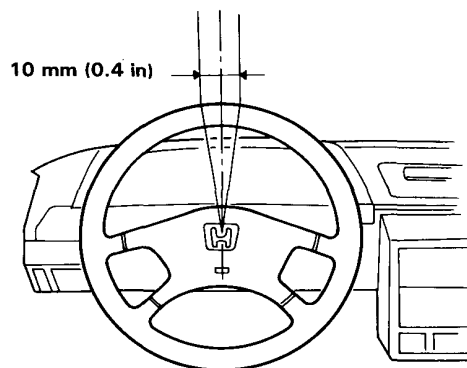


# Inspection

## 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.

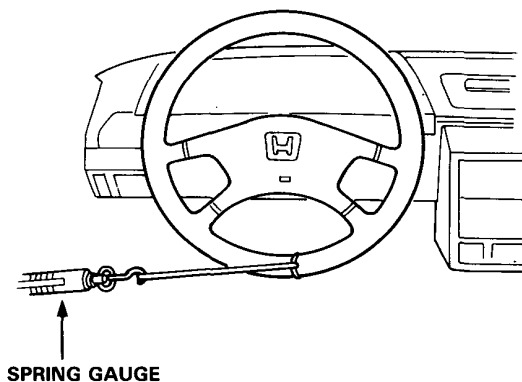
**Service Limit: 10 mm (0.4 in.)**



## Steering Effort Check

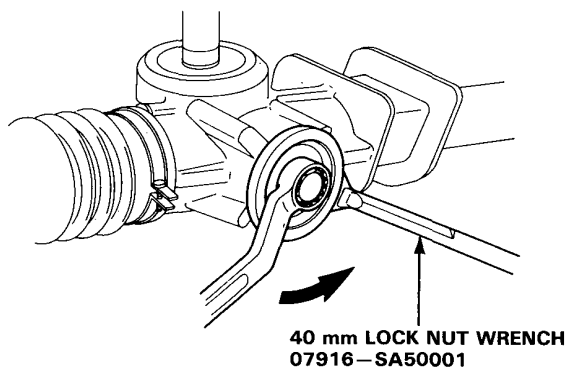
1. Raise the front wheels off the ground.
2. Turn the steering wheel with a spring gauge and check its reading.
3. If the reading exceeds the service limit, adjust the steering gearbox as shown below.

**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.

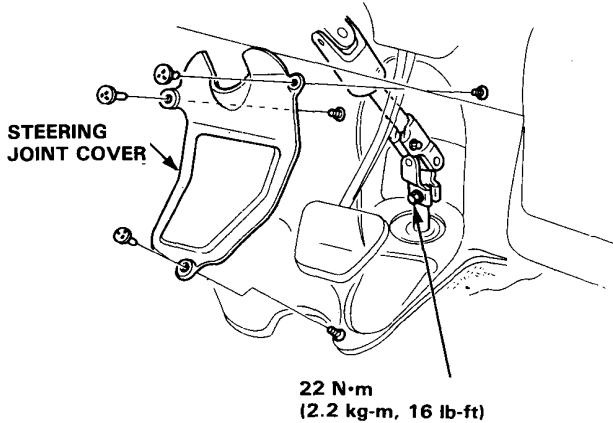




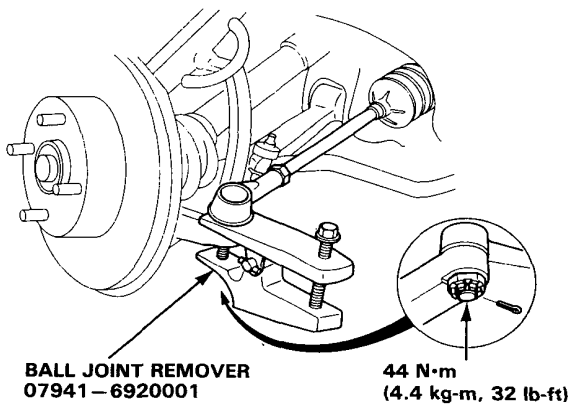
# Gearbox

## Removal/Installation

1. Remove the steering joint cover and disconnect the steering shaft from the gearbox.

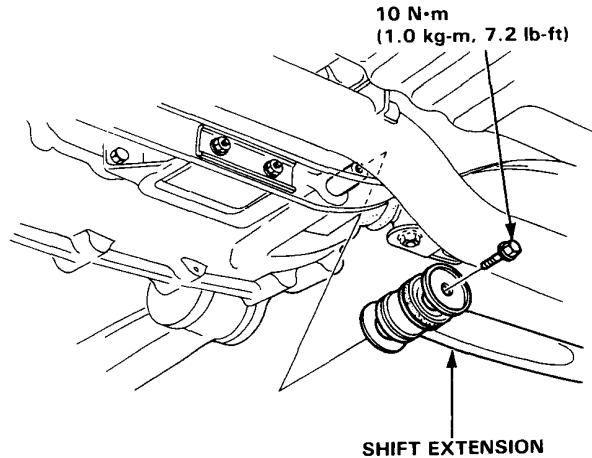


2. Jack up the front of car and support with safety stands in the proper locations.
3. Remove the gearbox shield and wash any dirt or oil off the gearbox using a solvent and brush. Blow dry with compressed air.
4. Remove the front wheels.
5. Disconnect the tie-rods from the steering knuckles using the special tool as shown.

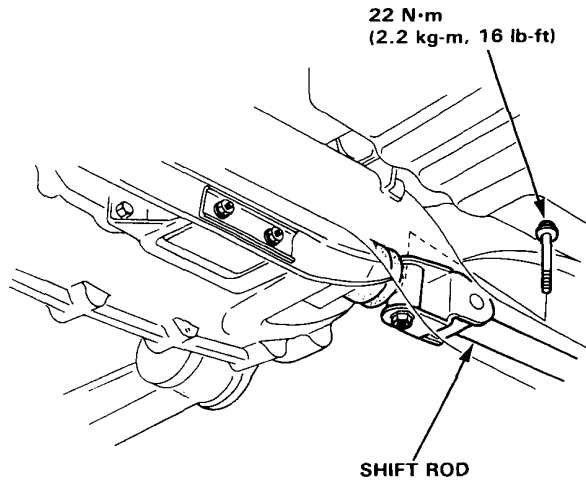


### 6-1 (Manual transmission model only)

- Remove the shift extension from the transmission case.



- Disconnect the gear shift rod from the transmission case by removing the 8 mm bolt.

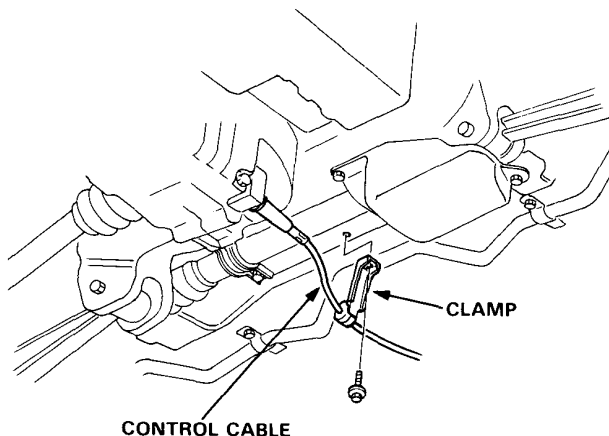




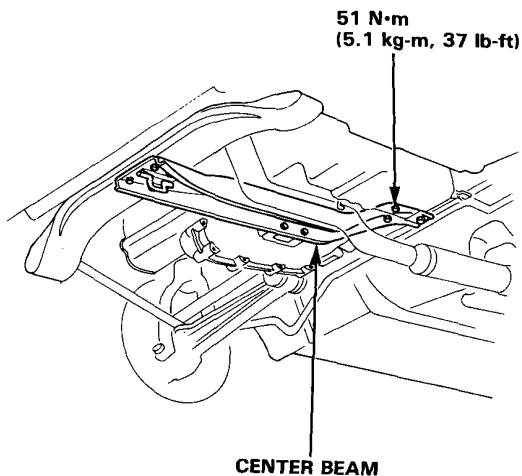


## 6-2 (Automatic Transmission Only)

- Remove the control cable clamp from the transmission housing.



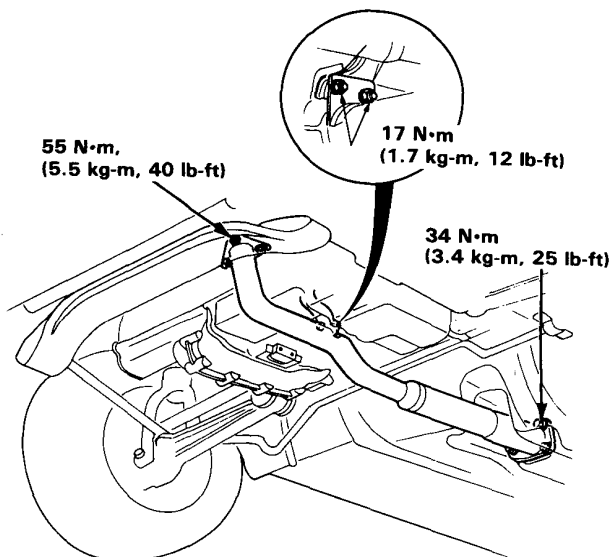
7. Remove the center beam bolts and center beam.



8. Disconnect the exhaust header pipe at the manifold.

**CAUTION:** Replace the exhaust gasket and selflocking nuts when you reinstall the pipe.

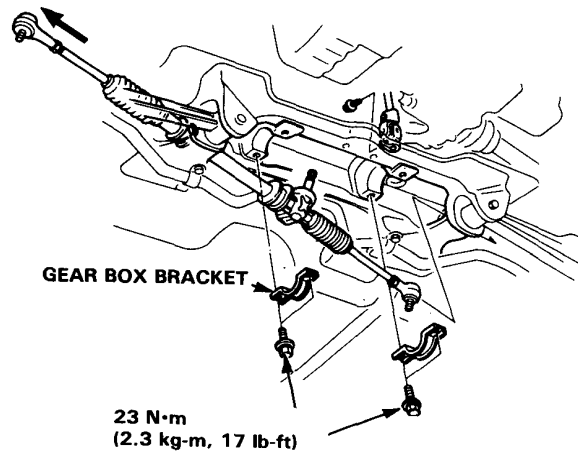
9. Remove the exhaust header pipe joint nuts.



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.

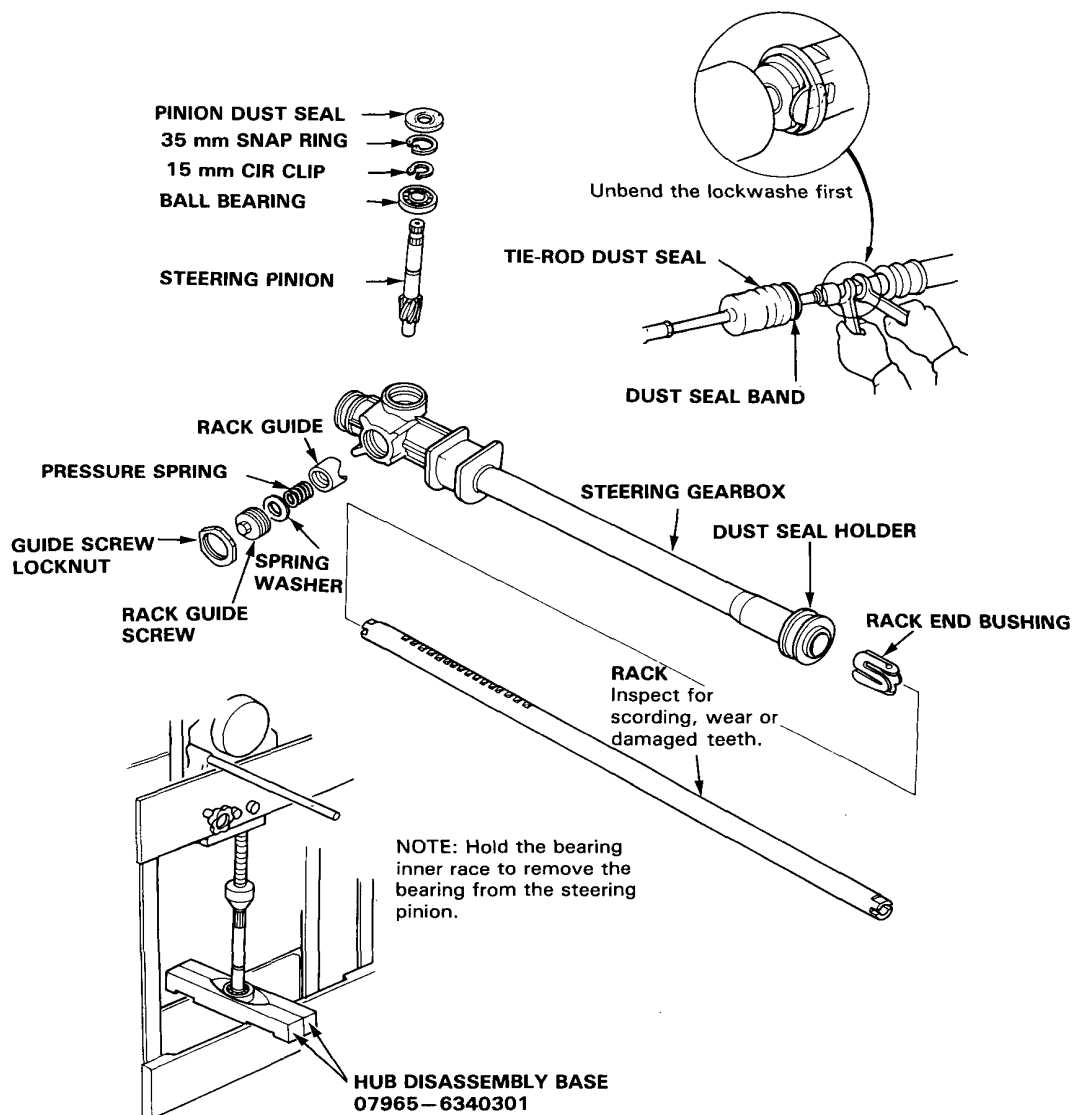




# Gearbox

## 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.





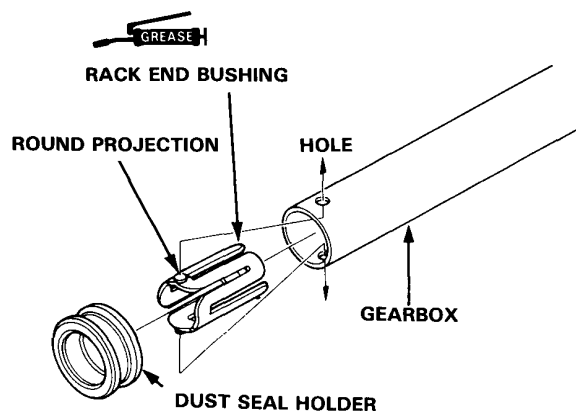


## Rack End Bushing Installation

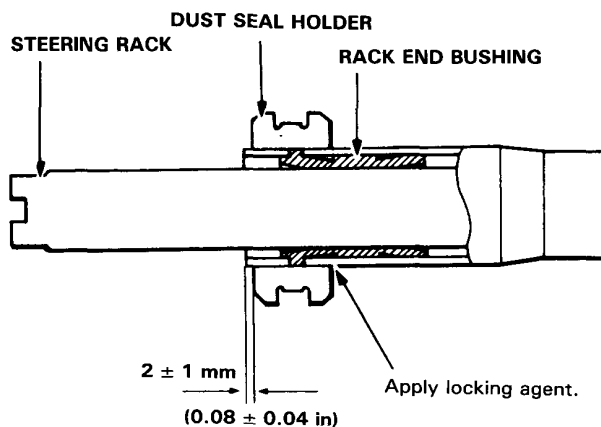
1. Apply 1–3 g of grease to the rack end bushing inner.

**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.

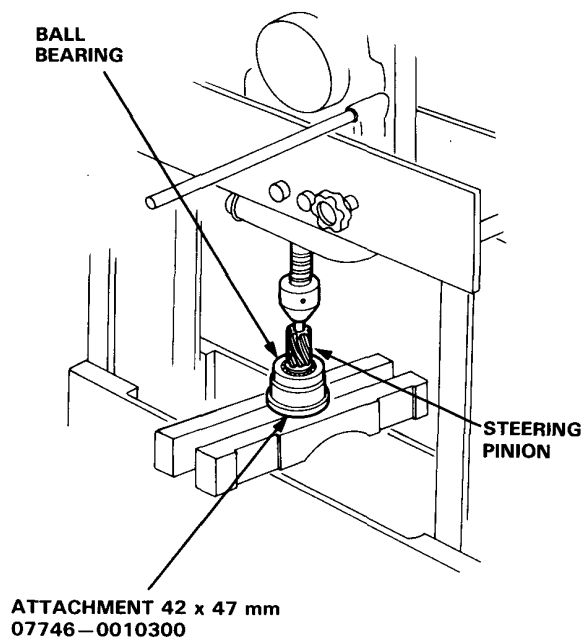


3. Install the dust seal holder on the gearbox as shown.



## Pinion Bearing Installation

1. Press the steering pinion into the bearing using the attachment and hydraulic press.





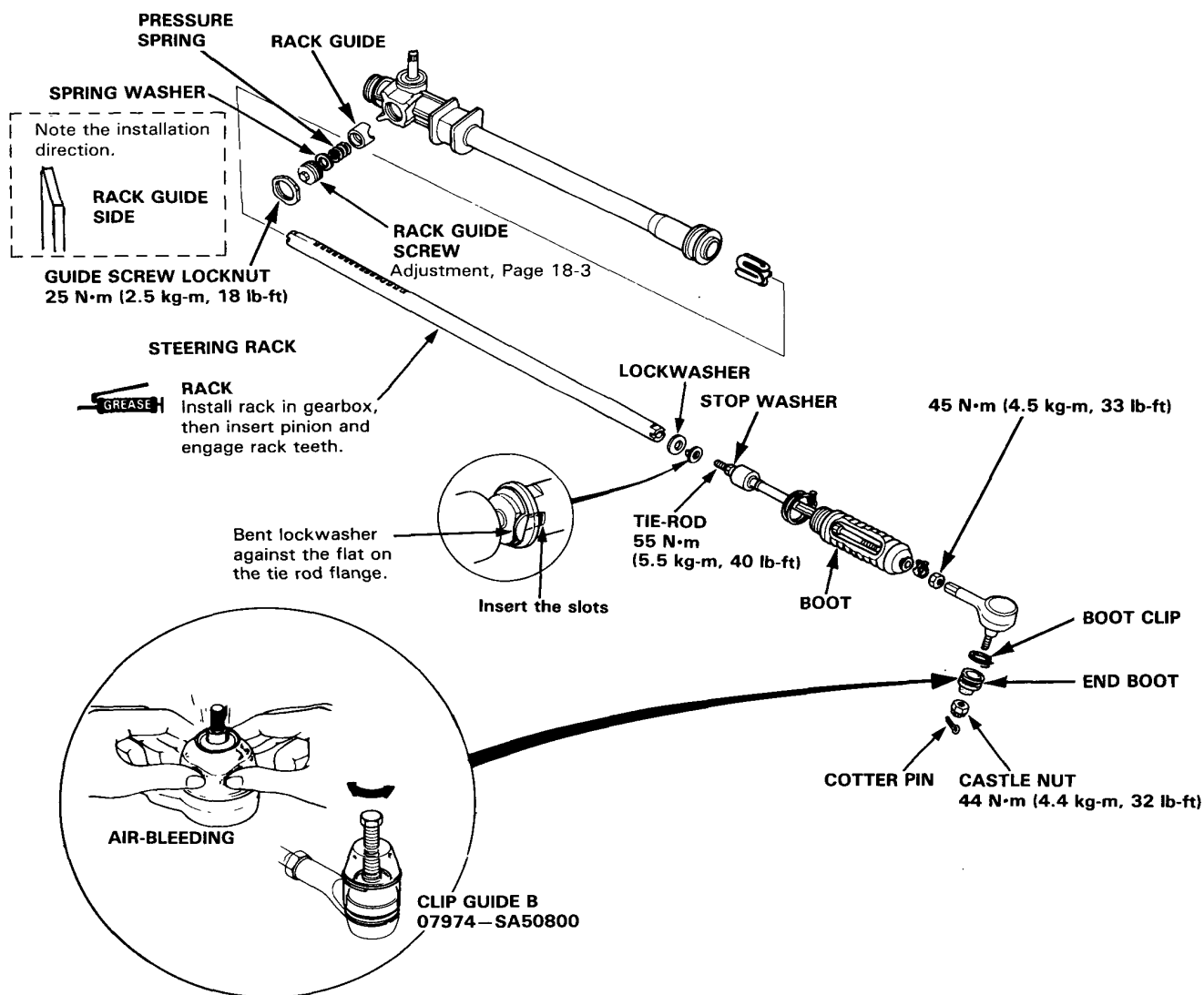
# Gearbox

## 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, then 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.

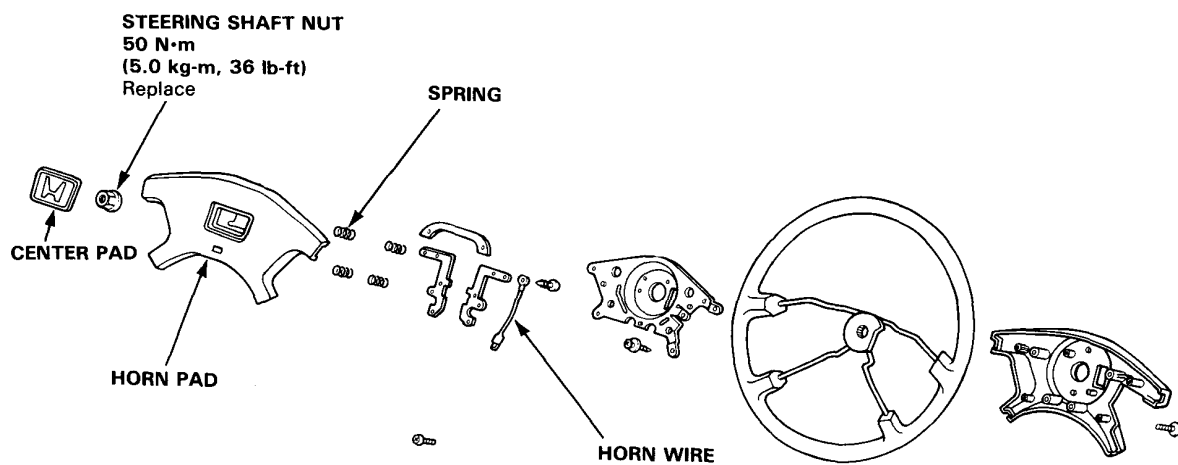
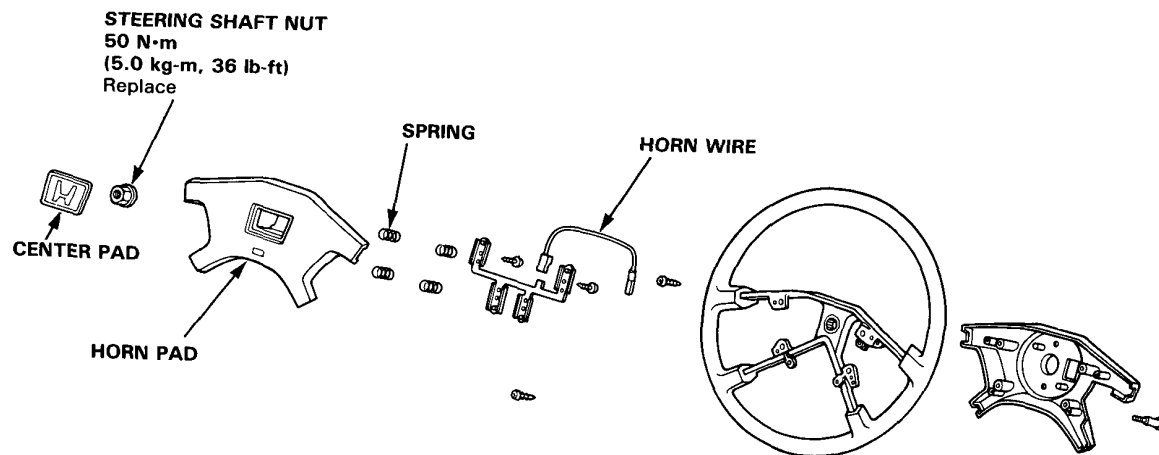




# Steering Wheel



## Disassembly/Reassembly



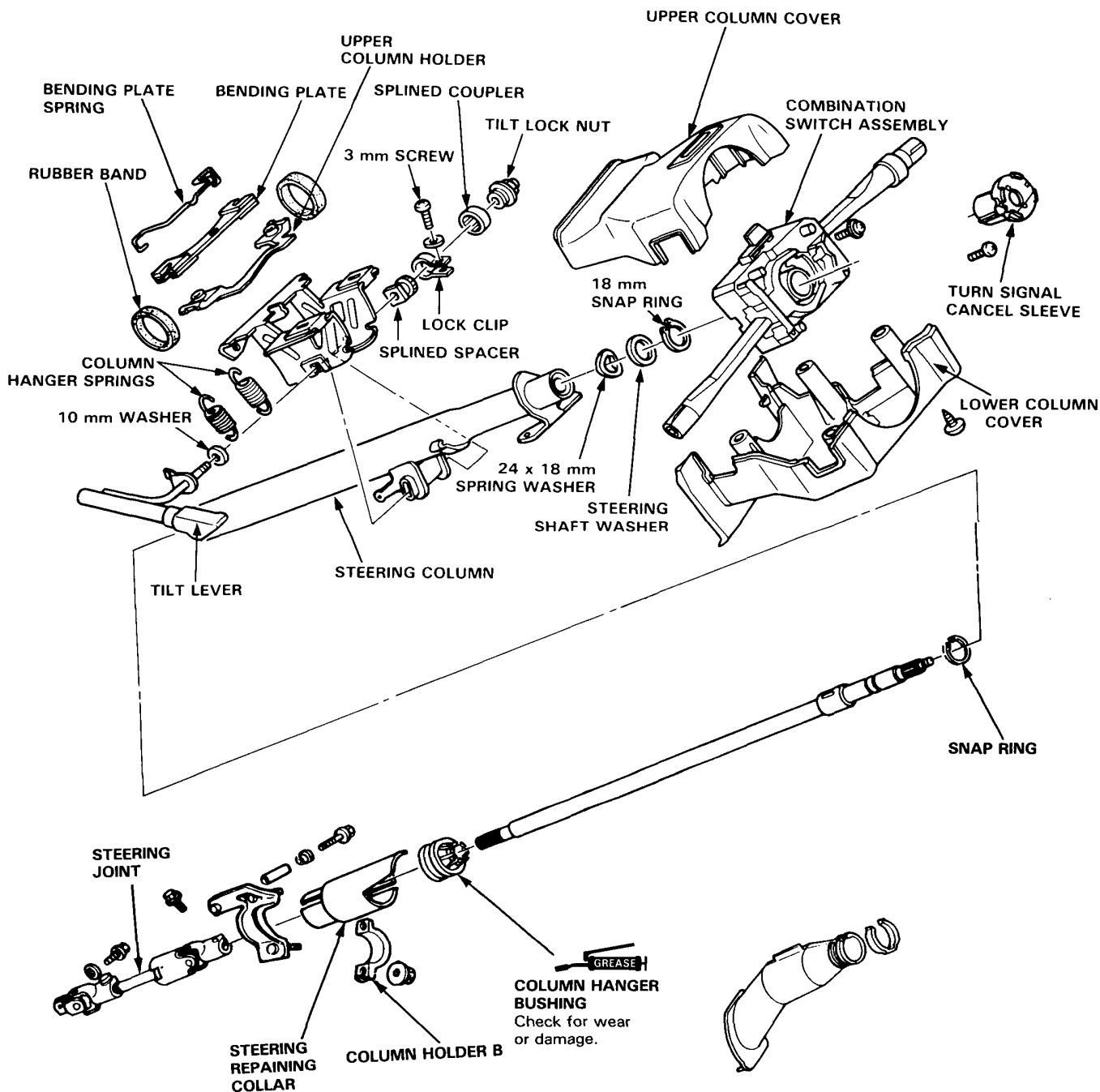


# Column

## 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.

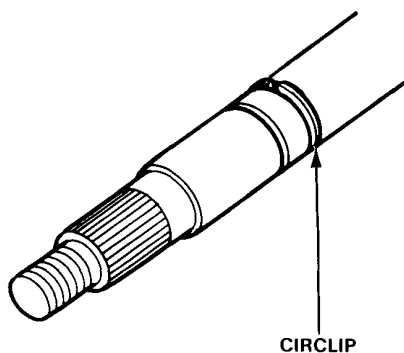






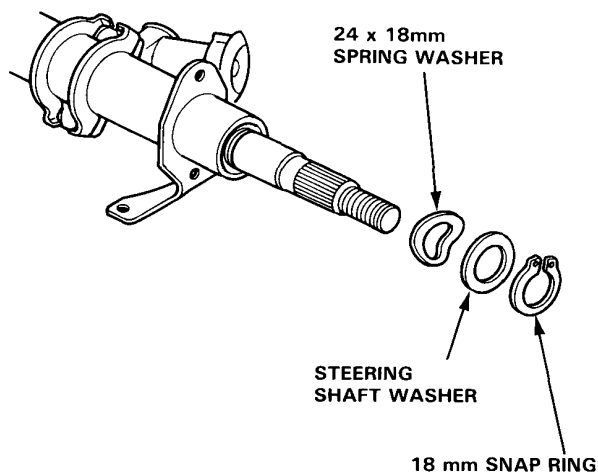
## Reassembly

1. Install the circlip on the steering shaft.

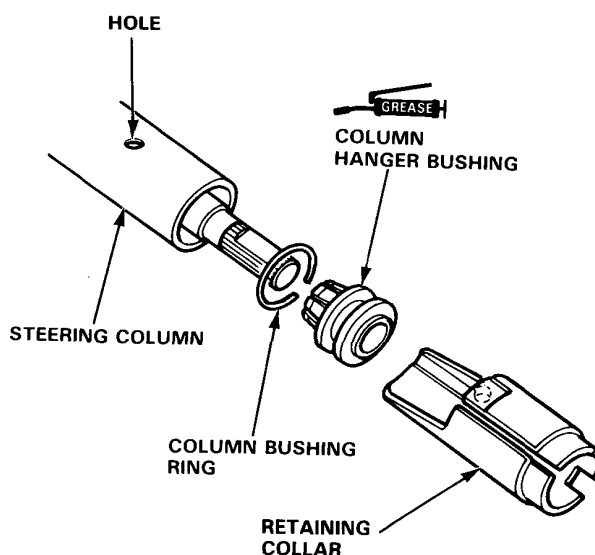


2. Insert the steering shaft into the steering column from the bottom.
3. Install the 24 x 18 mm spring washer and steering washer on the steering shaft and secure with the 18 mm snap ring.

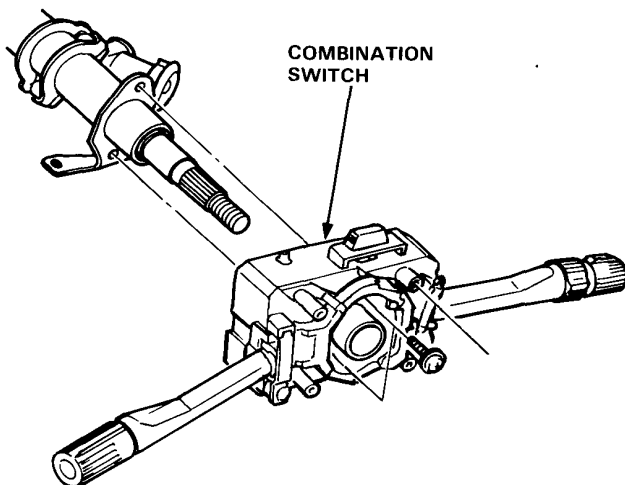
NOTE: Install the spring washer as shown.



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.



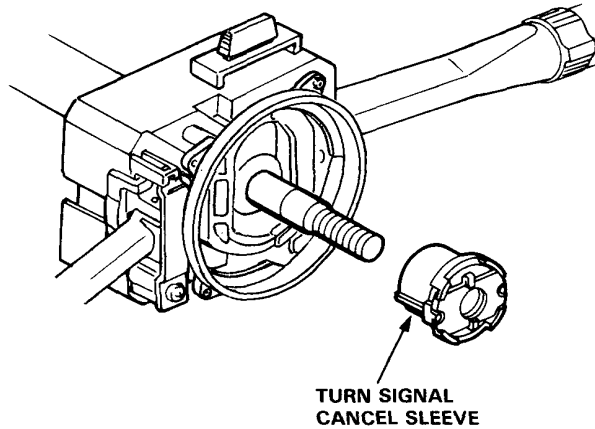
(cont'd)



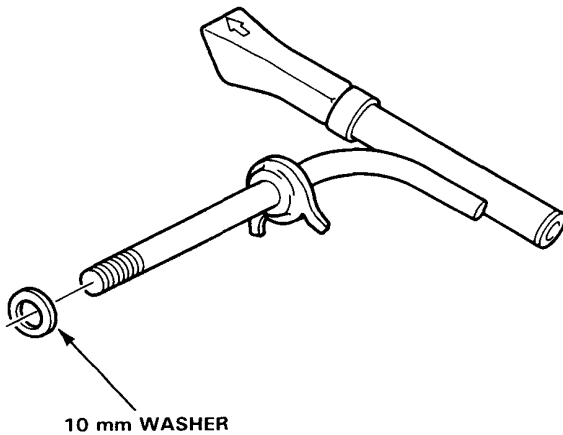
# Column

## Reassembly (cont'd)

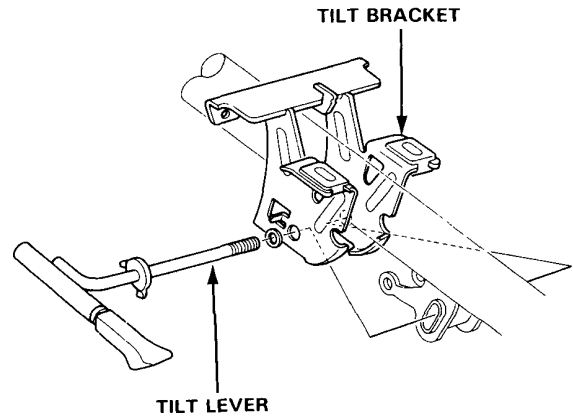
8. Install the turn signal cancel sleeve.



9. Fit the 10 mm washer on the tilt lever.



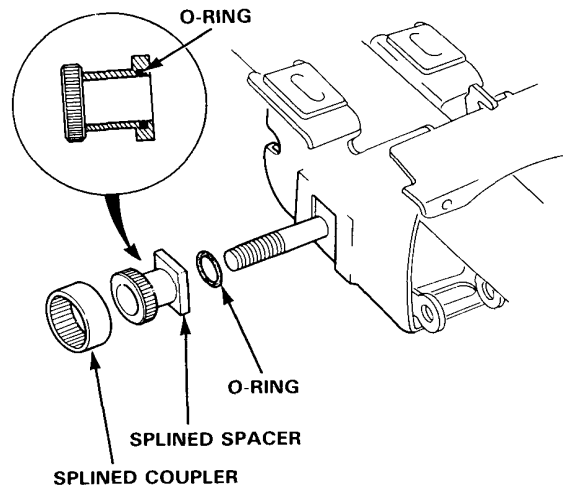
10. Fit the tilt bracket on the steering column and insert the tilt lever shaft.



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.

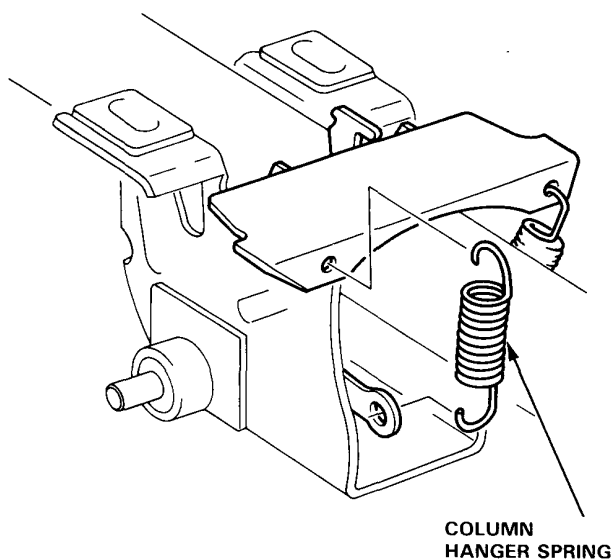
13. Install the splined coupler onto the splined spacer.







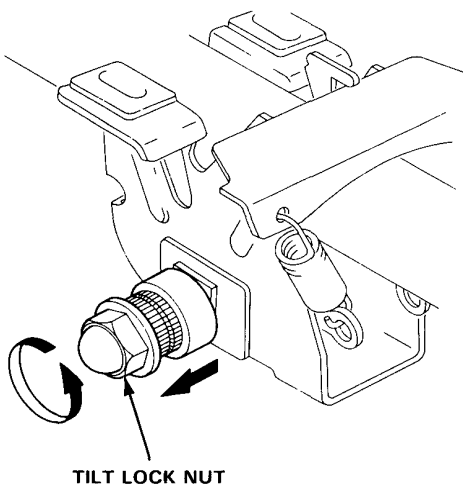
14. Install the column hanger springs between the tilt bracket and the steering column as shown.



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:**

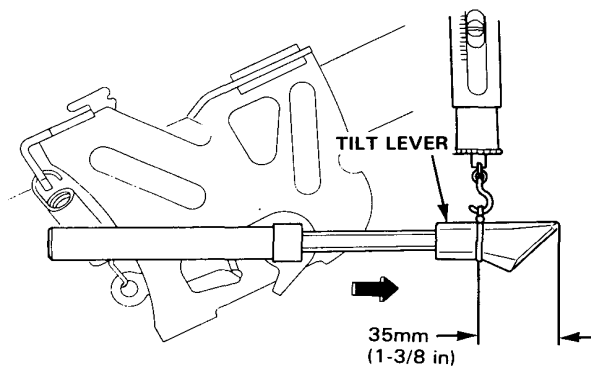
- The tilt lock nut has left hand threads.
- If necessary, align the splines on the lock nut and spacer by turning the tilt shaft slightly.



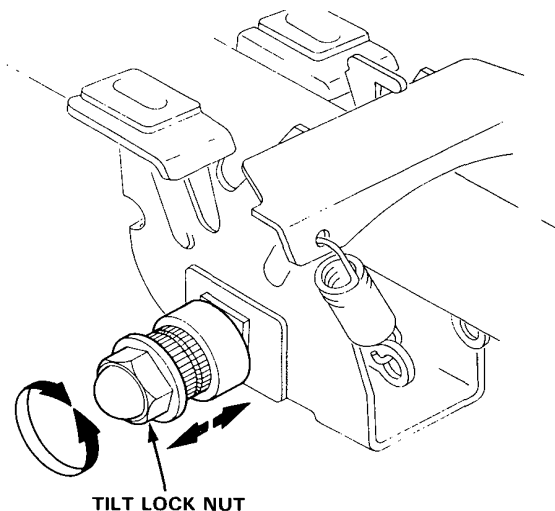
16. Pull the tilt lever out fully and attach a spring scale 35 mm (1-3/8 in) from the end of the knob. Measure the force required to move the lever.

**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.



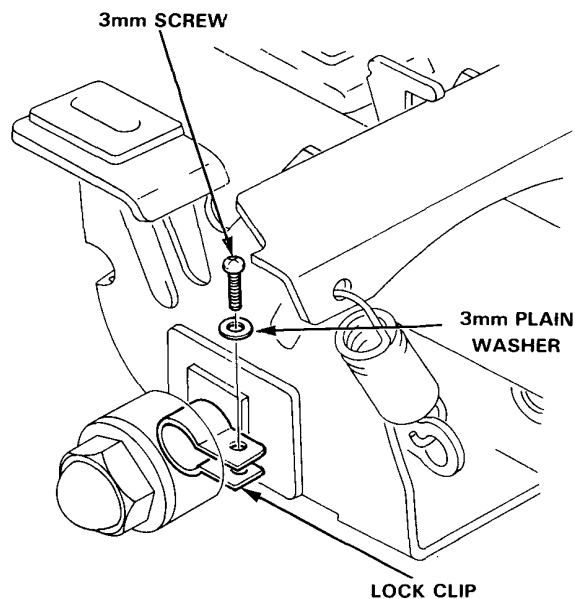
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# Column

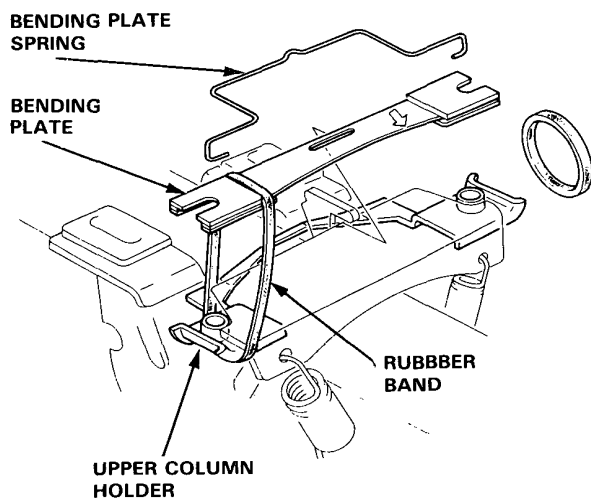
## Reassembly (cont'd)

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.



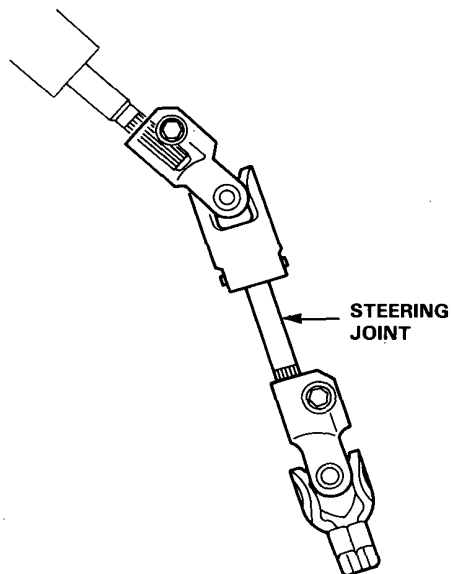
20. Install the upper column holder and bending plate on the steering column with the rubber bands.

**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.





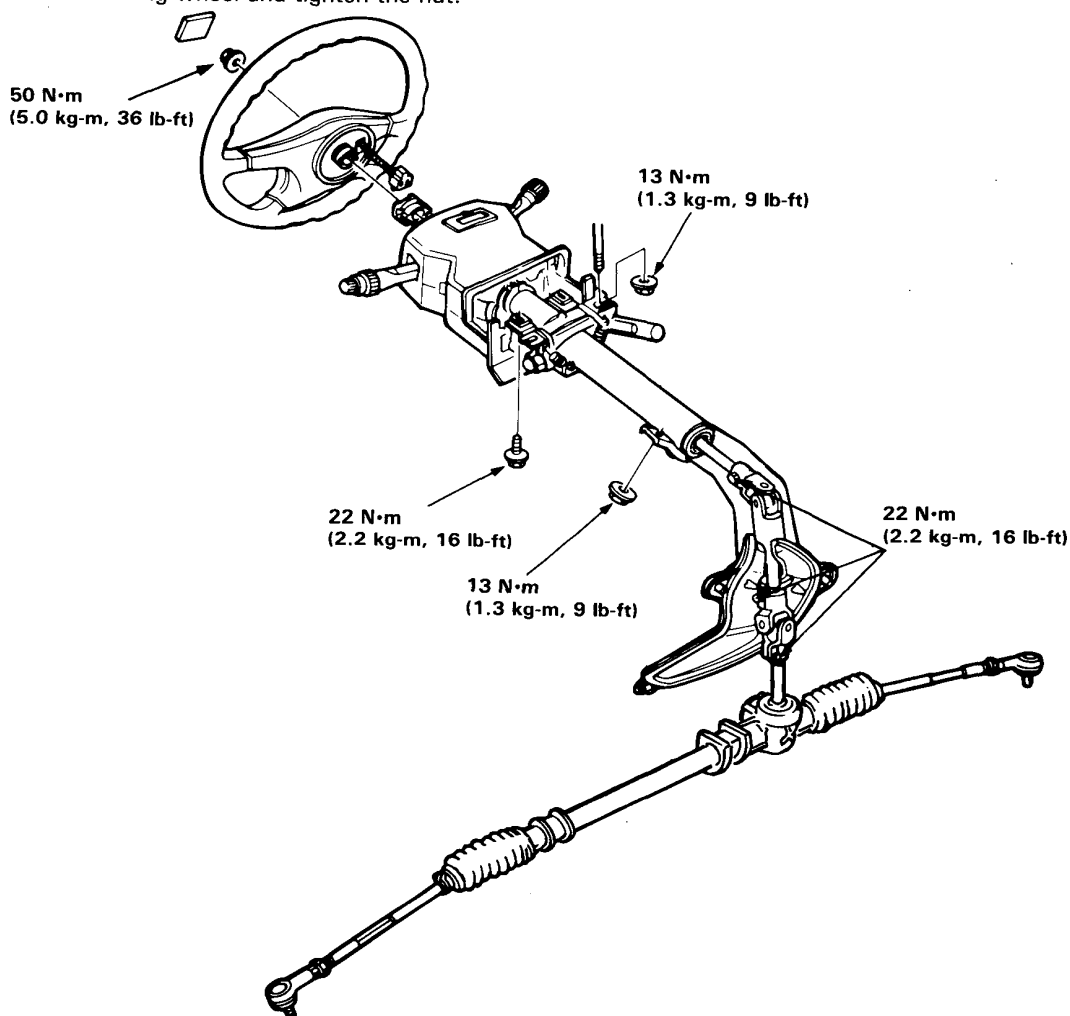


## Installation

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.





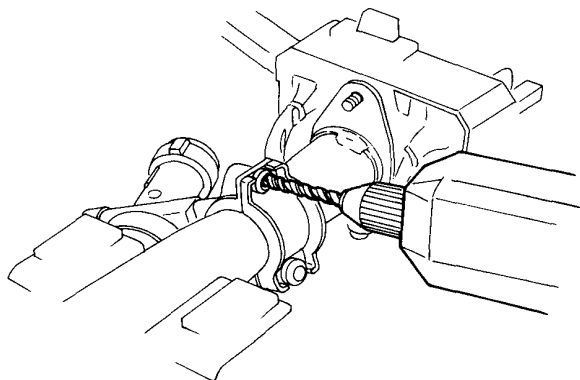
# Steering Lock

## 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.

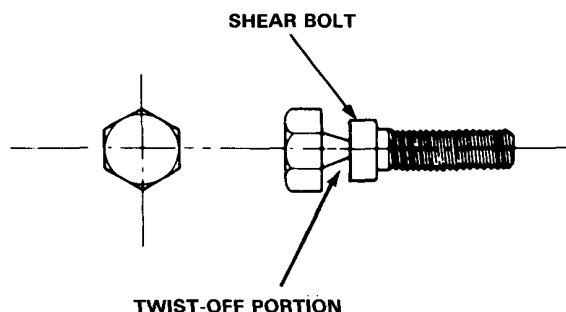
3. Remove the shear bolts from the switch body.



4. Install the new ignition switch without the key inserted.
5. Loosely tighten the new shear bolts.

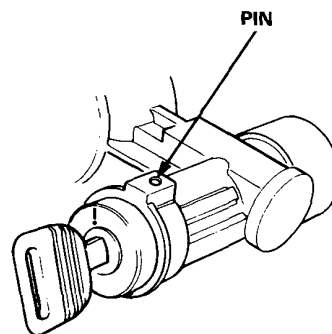
**NOTE:** Make sure the projection on the ignition switch is aligned with the hole in the steering column.

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.

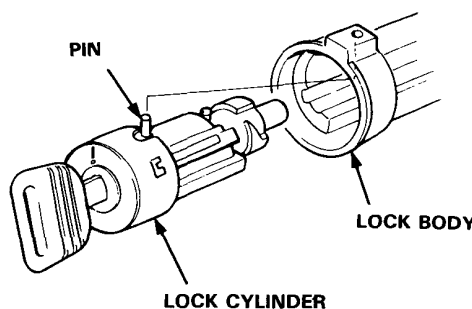


## Lock Cylinder Replacement

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.

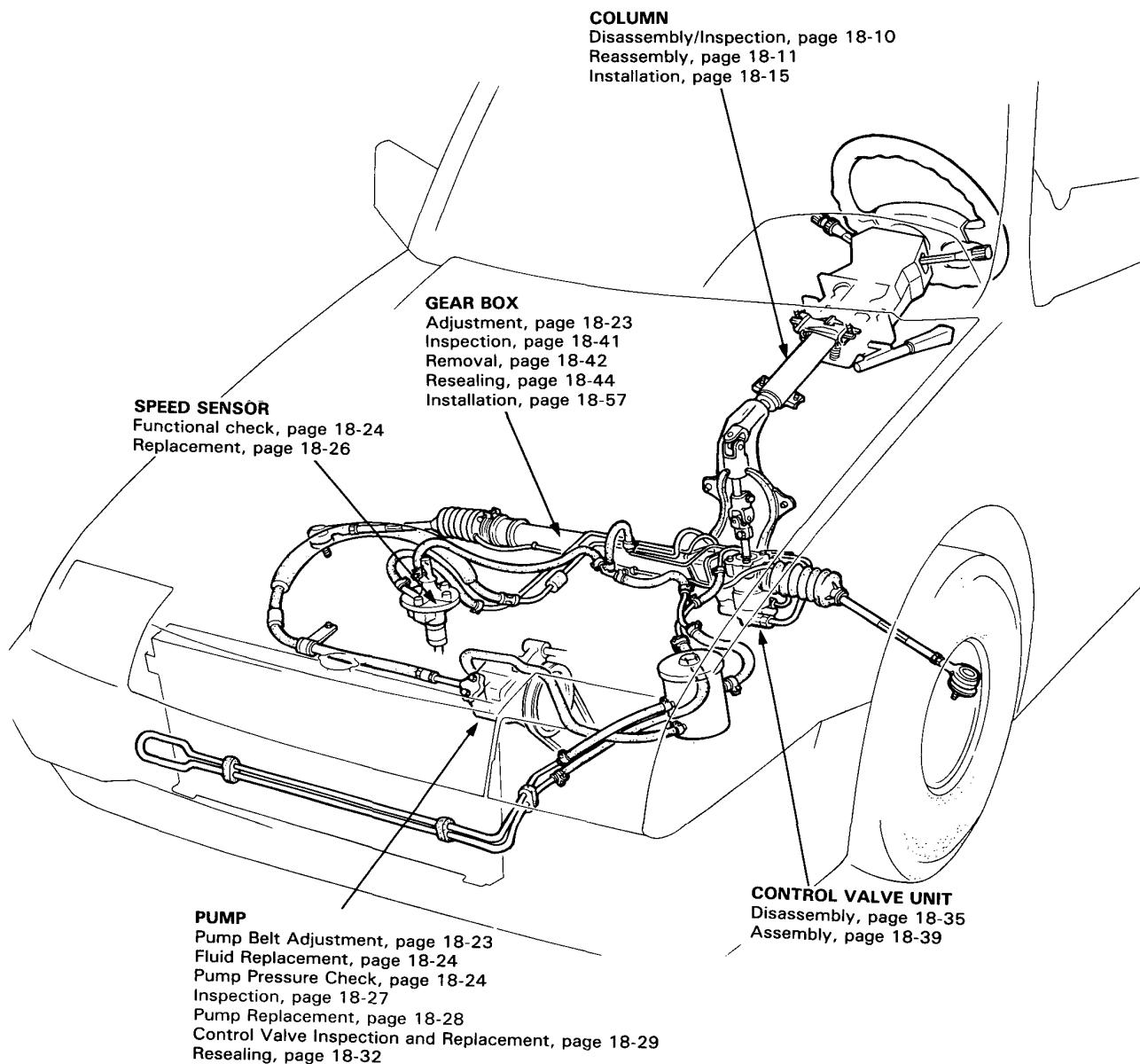


4. Turn the key to "O" and align the lock cylinder with the lock body.
5. Turn slightly the key almost to "I" and insert the lock cylinder until the pin touches the body.
6. Turn the key to the "I", push the pin and insert the lock cylinder into the lock body until the pin clicks into place.



7. Install the ignition switch.





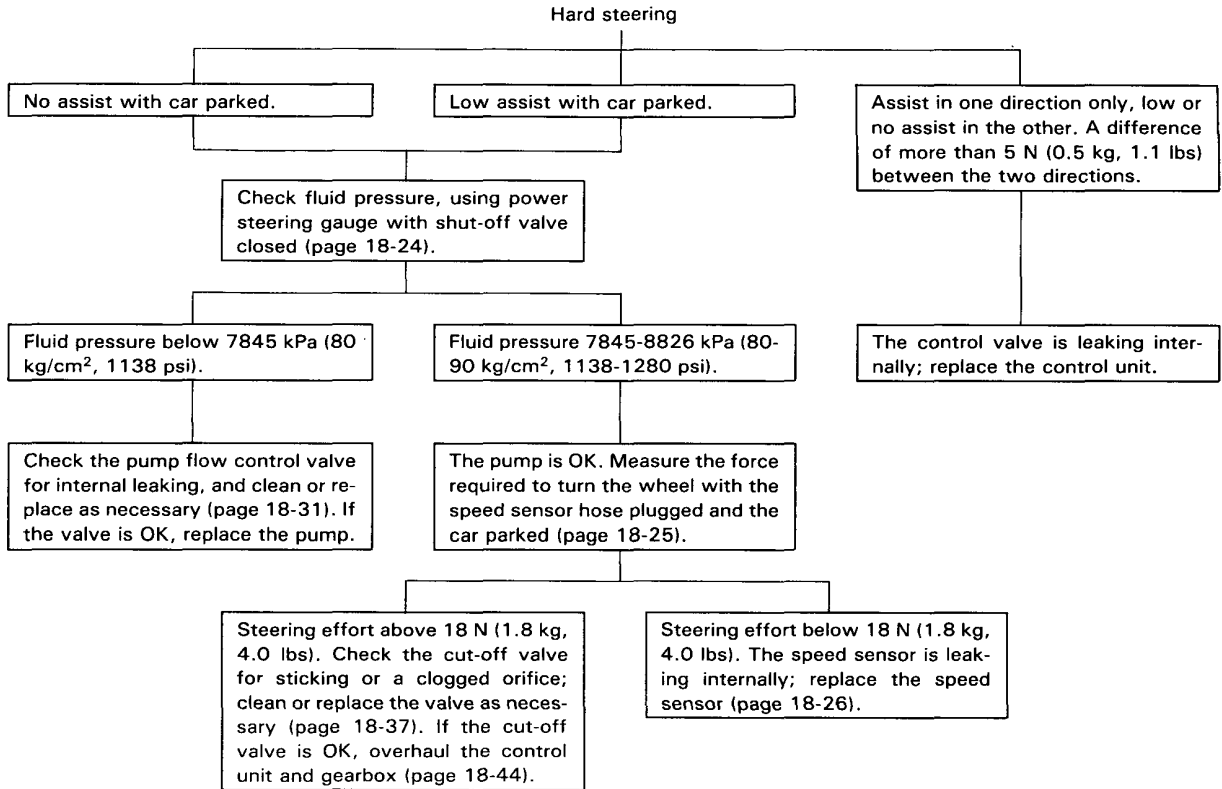


# Troubleshooting

## General

Check the following before you begin:

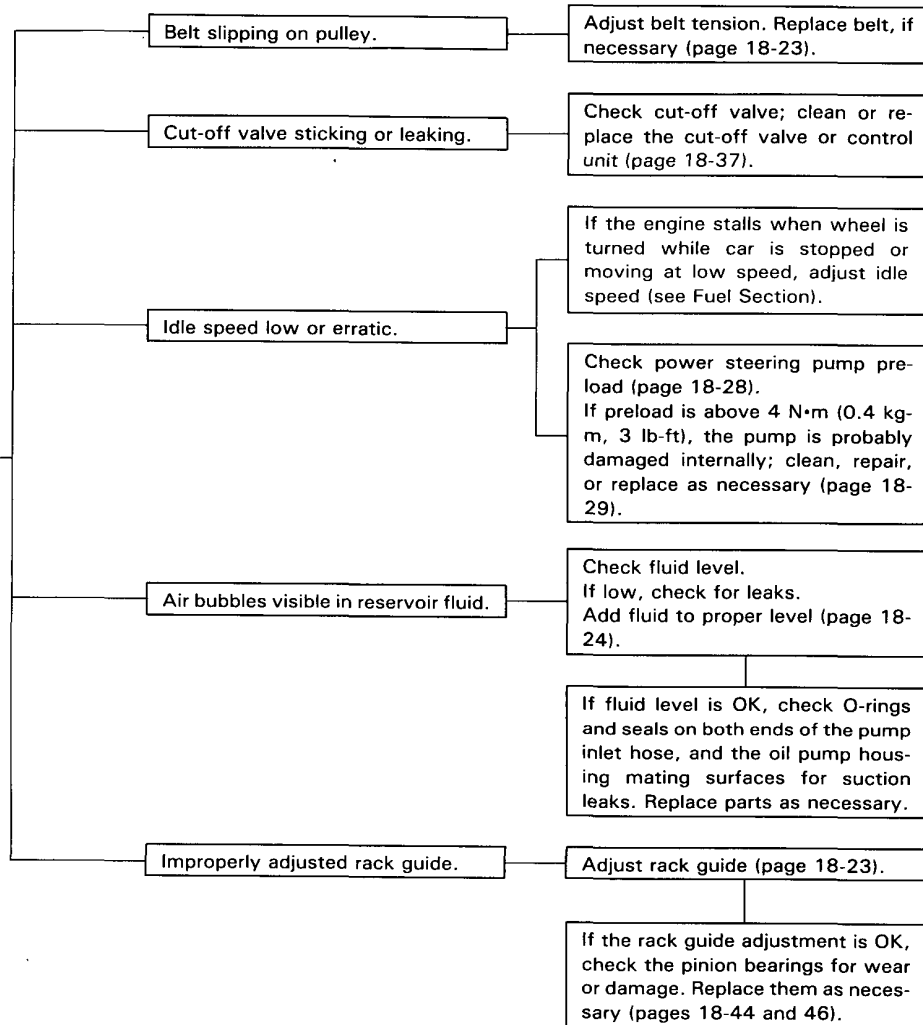
- Has the suspension been modified in a way that would affect steering?
- Are tire sizes and air pressure correct?
- Is the steering wheel original equipment or equivalent?
- Is the power steering pump belt properly adjusted?
- Is steering fluid reservoir filled to proper level?
- Is the engine idle speed correct and steady?







Uneven or rough steering.



(cont'd)



# Troubleshooting

## 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<sup>2</sup>, 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.

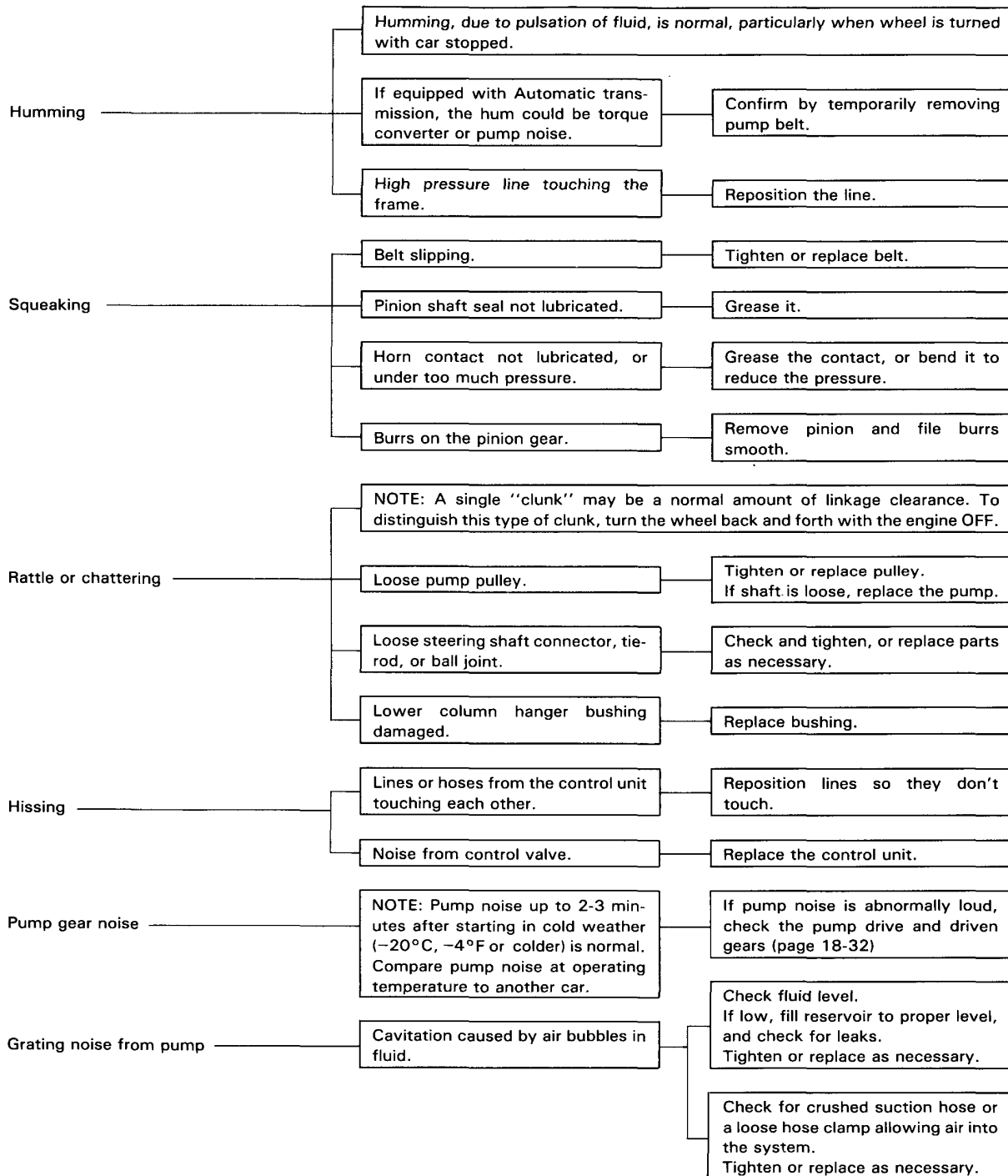
Adjust rack guide (page 18-23).





## Noise and Vibration

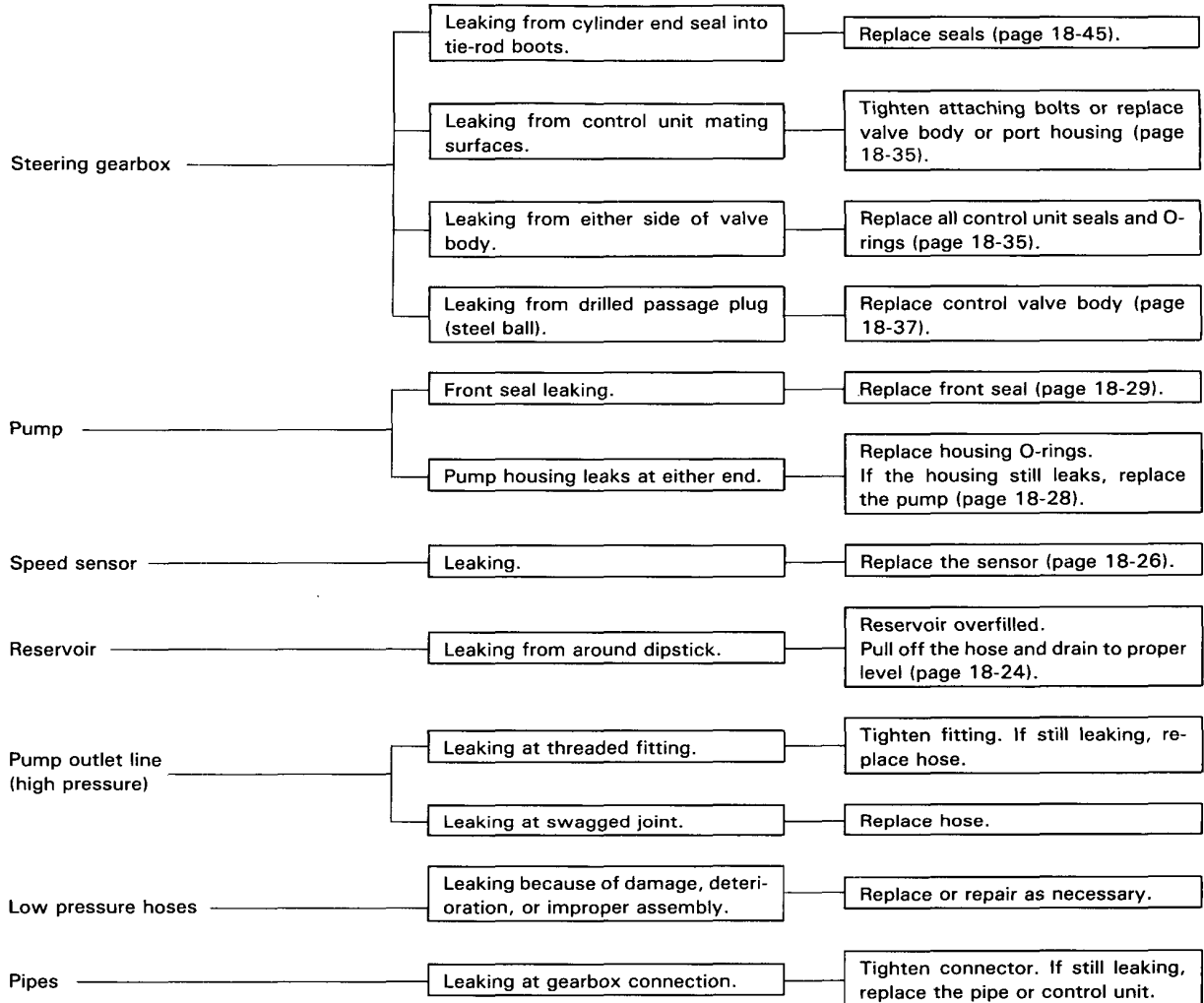
NOTE: Pump noise within 2–3 minutes after starting in cold weather ( $-20^{\circ}\text{C}$ ,  $-4^{\circ}\text{F}$  or colder) is normal.





# Troubleshooting

## Fluid Leaks





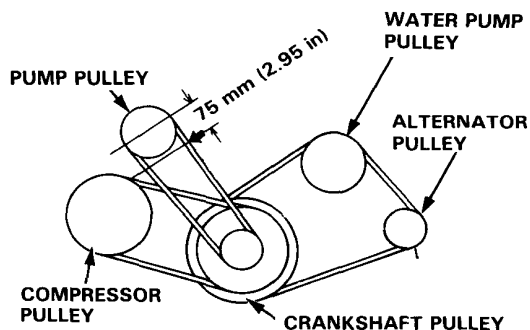
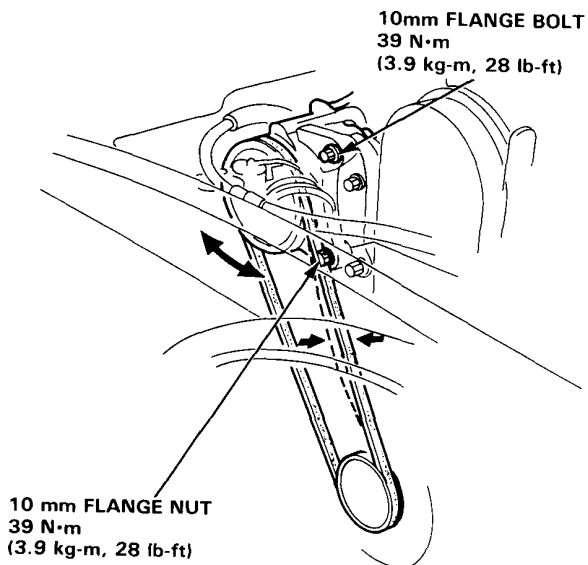
# Maintenance



## Pump Belt Adjustment

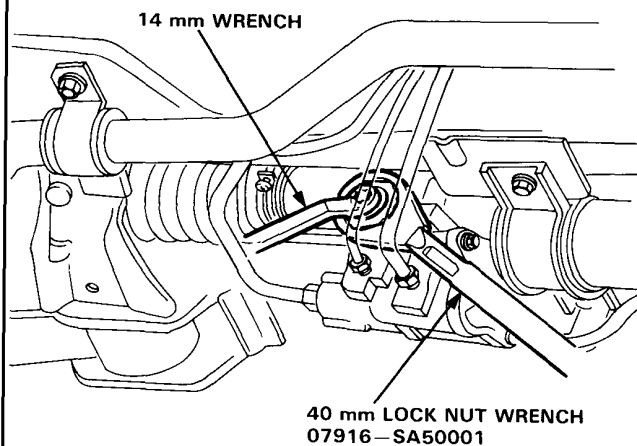
Measure the pump belt tension by pushing on it 75 mm (2.95 in) from the center of the pump pulley with a force of about 100 N (10 kg, 22 lbs). Pump belt should deflect about 14–17 mm (1/2–3/4 in).

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°.
  3. Check the steering effort as described on page 18-25.
- Tighten the lock nut to about 25 N·m (2.5 kg-cm, 18 lb-ft) while preventing the guide screw from turning.



# Maintenance

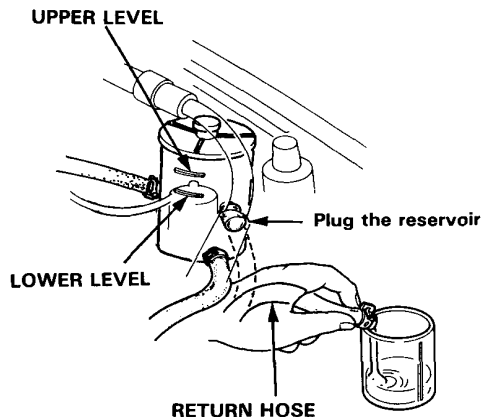
## Fluid Replacement

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

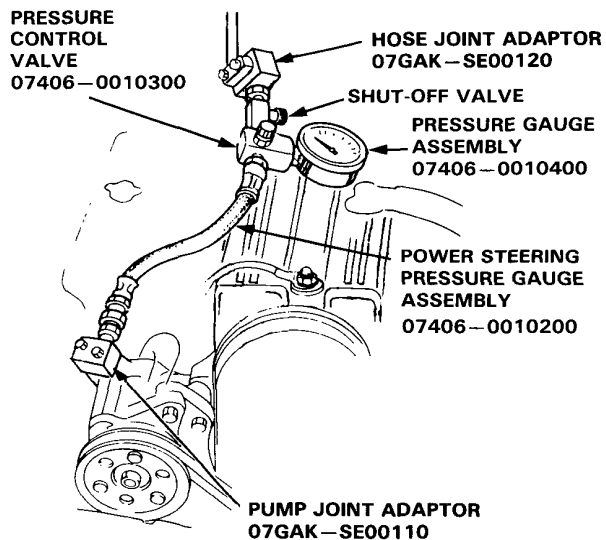
## Pump Pressure Check

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.

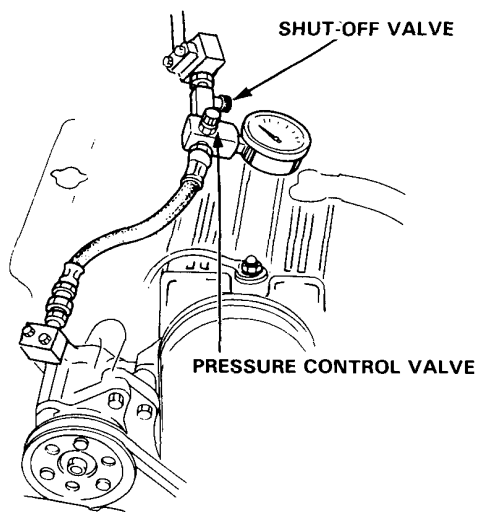




6. Start the engine and let it idle.
7. Turn the steering wheel from lock-to-lock several times to warm the fluid to operating temperature.
8. Close the shut-off valve, then, close the pressure control valve gradually until the pressure gauge needle is stable. Read pressure.
9. Immediately open the shut-off valve fully.

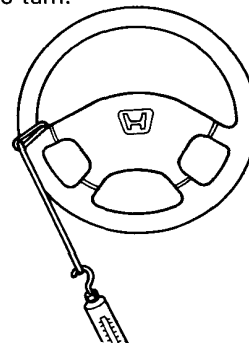
**CAUTION:** Do not keep the shut-off valve closed more than 5 seconds or the pump could be damaged by over-heating.

If the pump is in good condition, the gauge should read at least 7845–8421 kPa (80–90 kg/cm<sup>2</sup>, 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

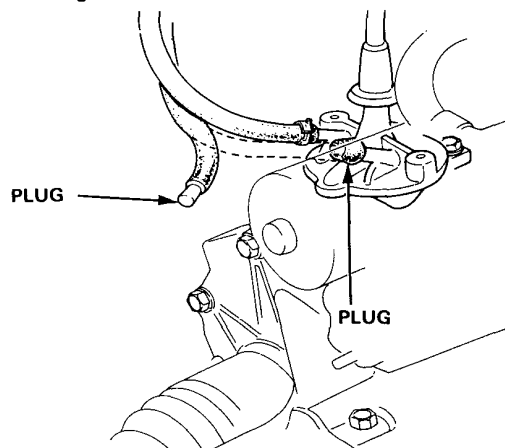
1. Check the power steering fluid level and pump belt tension.
2. Start the engine, allow to idle, and turn the steering wheel from lock-to-lock several times to warm up the fluid.
3. Attach a spring scale to the steering wheel. With the engine idling and the car on a clean, dry floor, pull the scale 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.

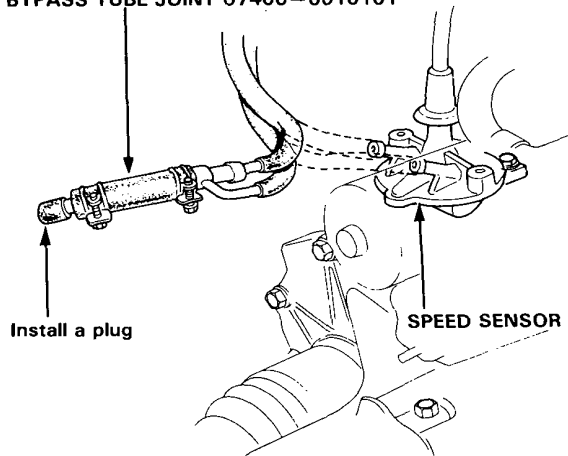


# On-Car Checks

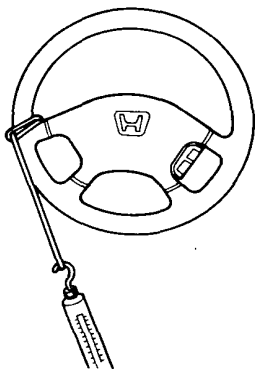
## Assist Check

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.

**BYPASS TUBE JOINT 07406-0010101**



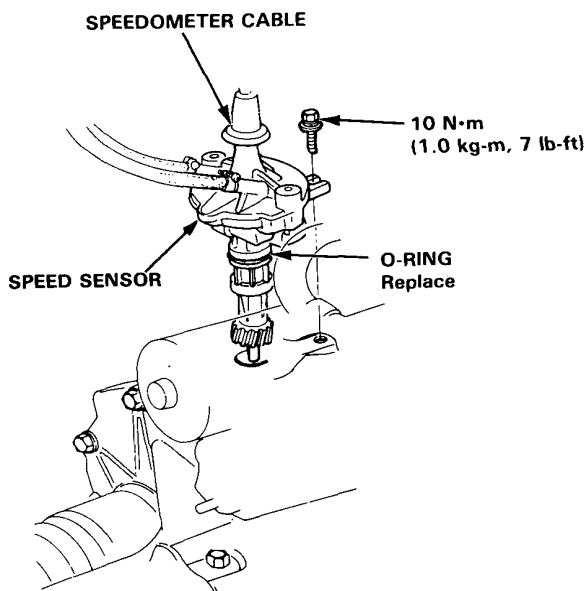
4. Attach the spring scale to the steering wheel. With the engine idling and the car on the clean, dry floor, pull the scale as shown and read it as soon as the tires begin to turn.



- 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.



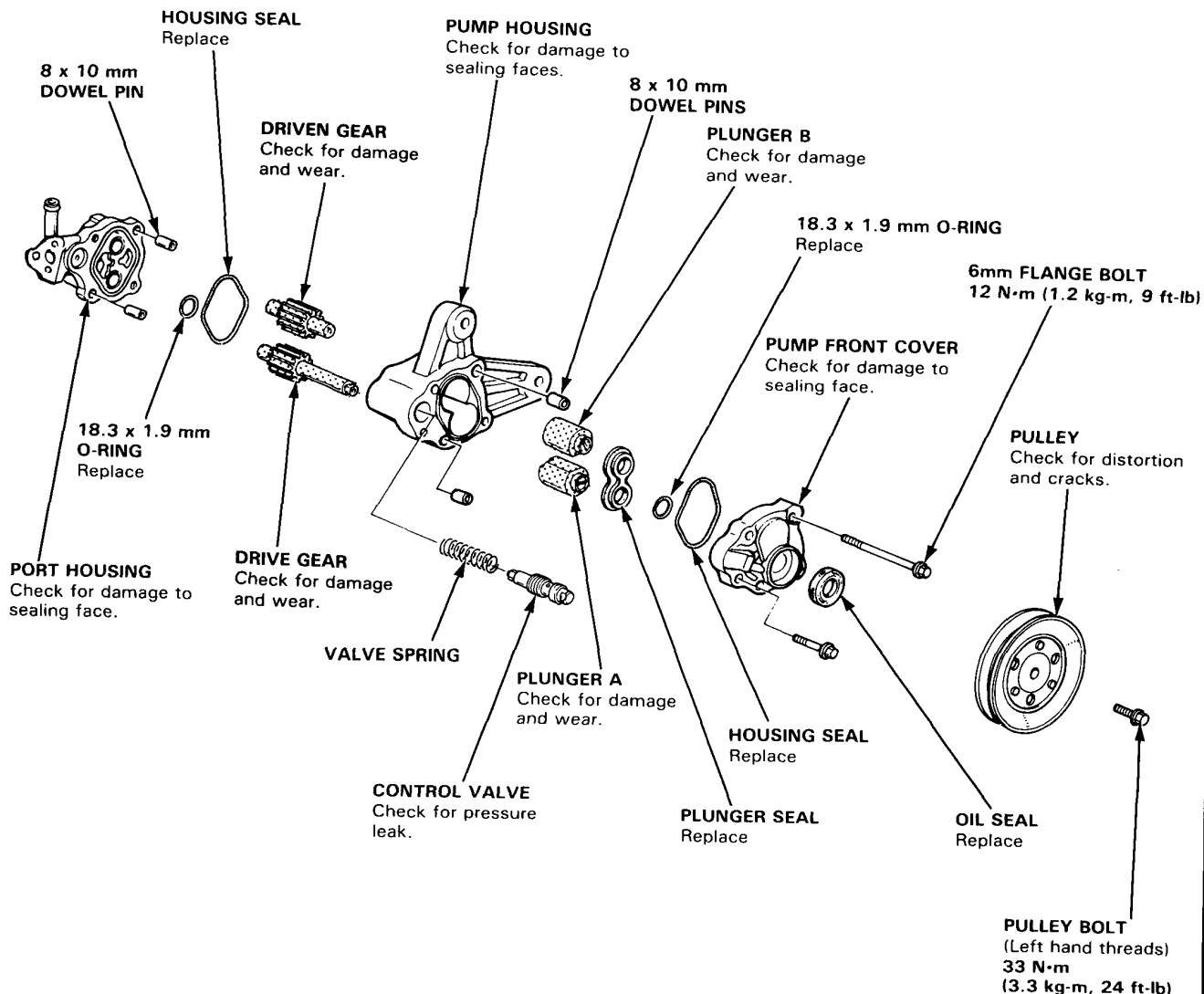
# Pump



## 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.

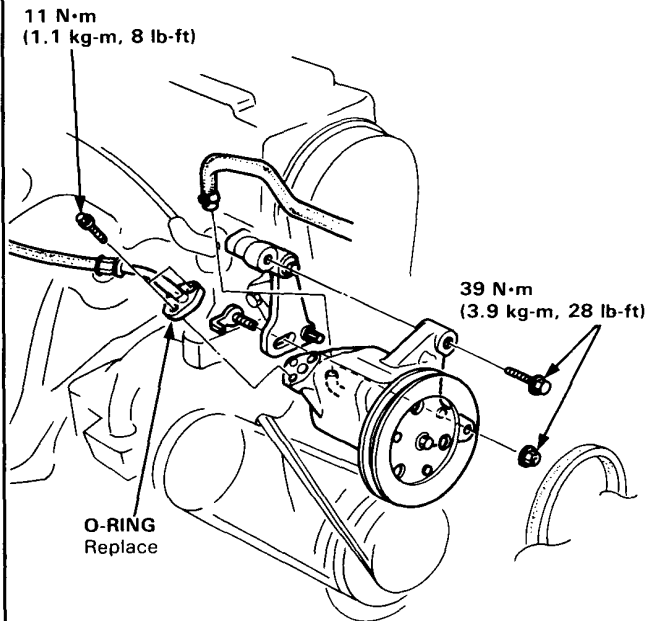




# Pump

## 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.

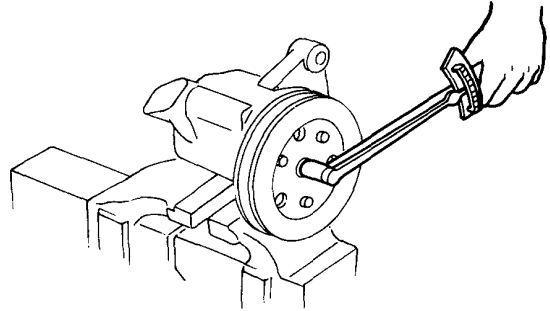


5. Loosely install the new pump on the bracket.
6. Connect the inlet and outlet hoses to the pump.
7. Install and adjust the belt (page 18-23).
8. Fill the reservoir with new fluid to the UPPER level on the reservoir.
9. Start the engine and let it run at fast idle while turning the steering wheel lock-to-lock 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.**



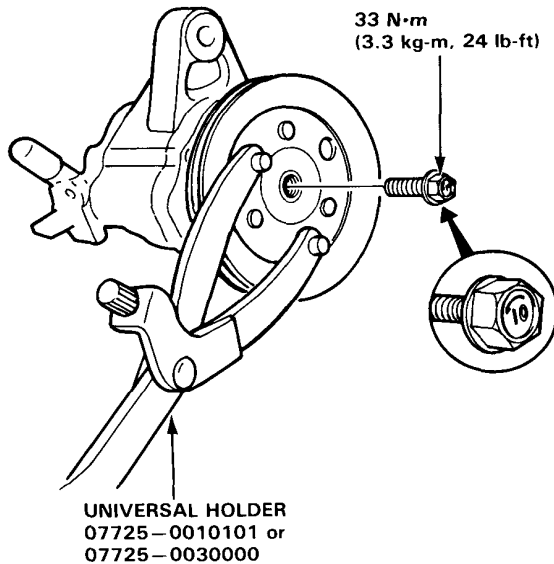




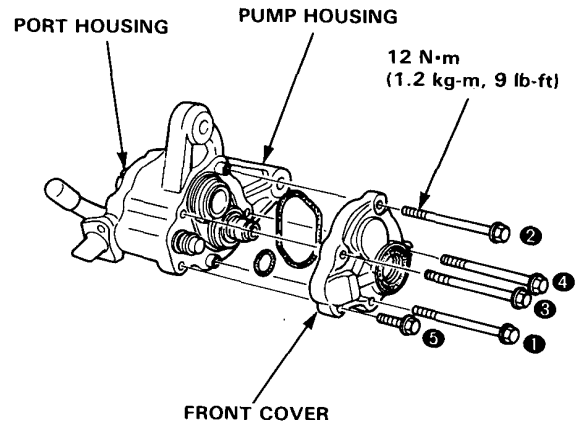
## Control Valve Inspection and Replacement

1. Hold the pulley with Universal holder, remove the pulley bolt, then remove the pulley.

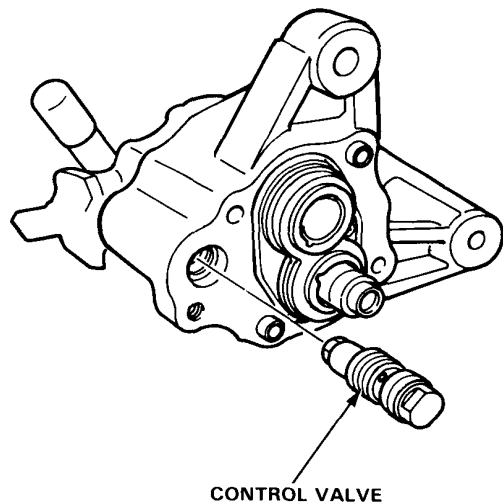
**CAUTION:** The pulley bolt has left hand threads.



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.



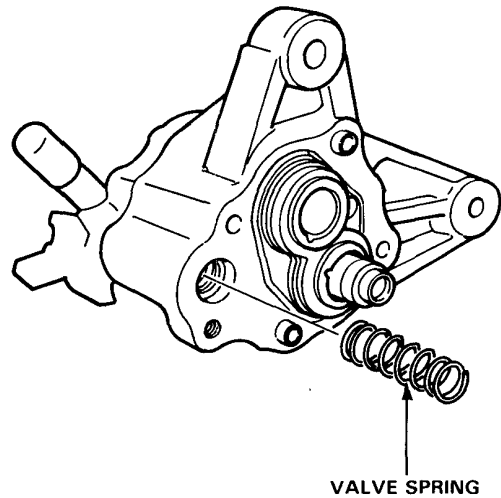
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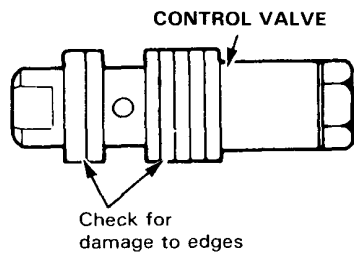
# Pump

## Control Valve Inspection and Replacement (cont'd)

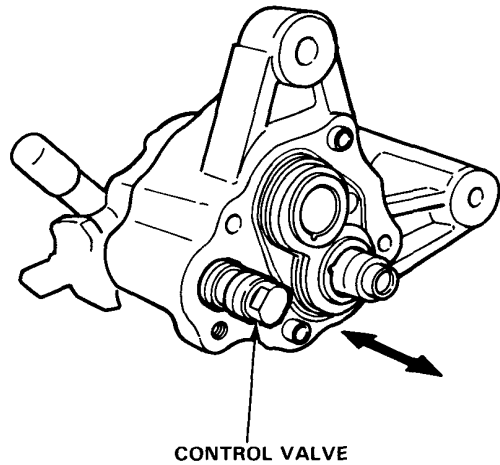
4. Remove the valve spring from the pump housing.



5. Check for wear, burrs, and other damage to the edges of the grooves in the valve.

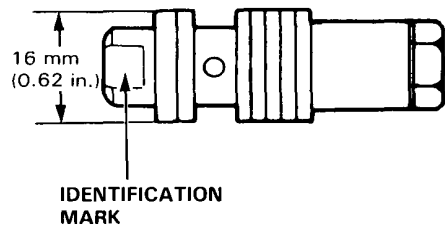


6. Slip the valve back in the pump and check that it moves in and out smoothly.



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.



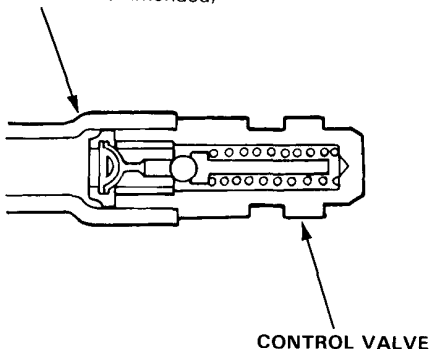
Mark	Part Number	Part Name	Size mm(in)
A	56350-PC1-010	CONTROL VALVE A	15.995-16.000 (0.6297-0.6299)
Without mark	56360-PC1-010	CONTROL VALVE B	16.000-16.006 (0.6299-0.6302)



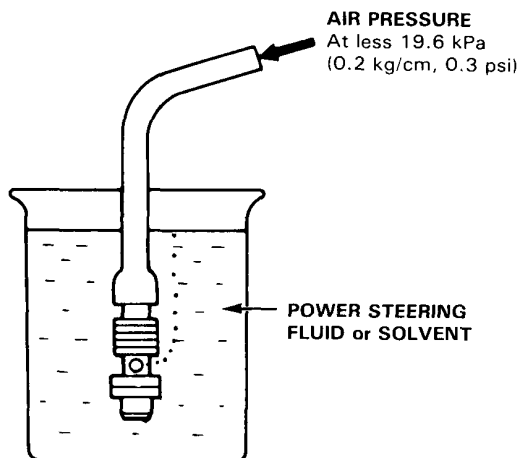


7. Attach a hose to the end of the valve as shown.

**HOSE**  
9.5 mm ID (0.374 in)  
(The power steering  
return hose is recommended)

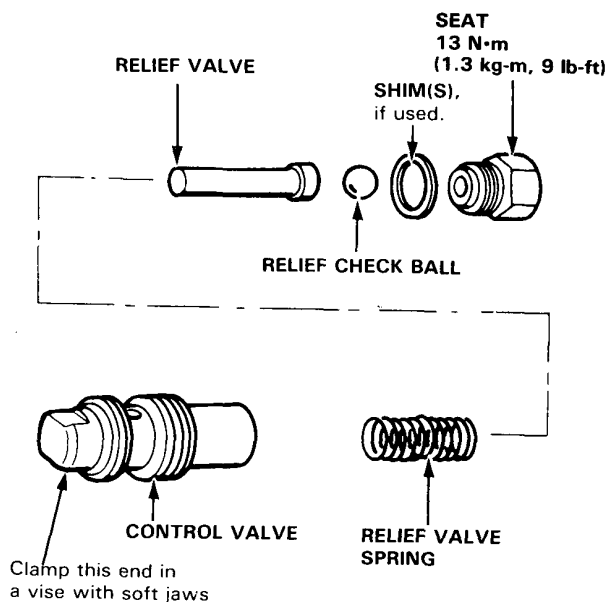


8. Then submerge the valve in a container of power steering fluid or solvent, and blow on the hose. If air bubbles leak through the valve, replace or repair it as follows.



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.



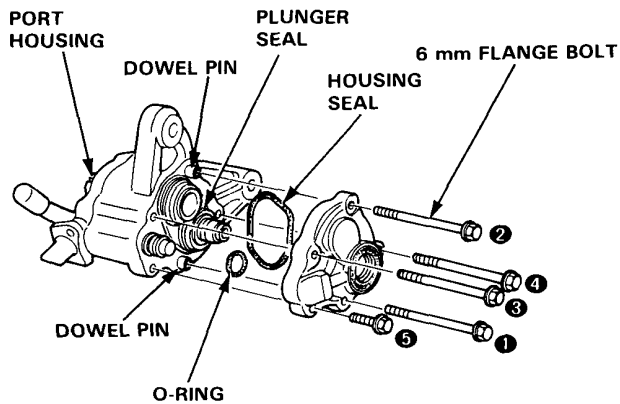
# Pump

## Resealing

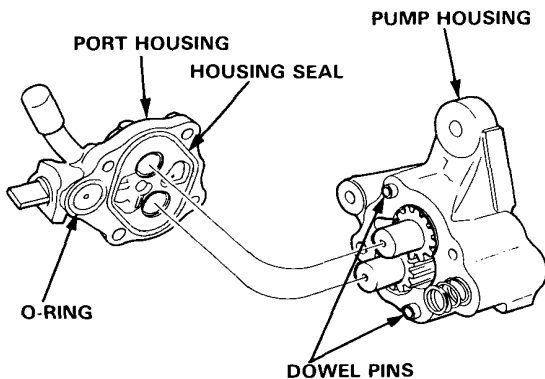
**CAUTION:** The pump components are made of aluminum. Be careful not to damage them when servicing.

1. Remove the pump from car (page 18-28), and remove the pulley and pump front cover (page 18-29).

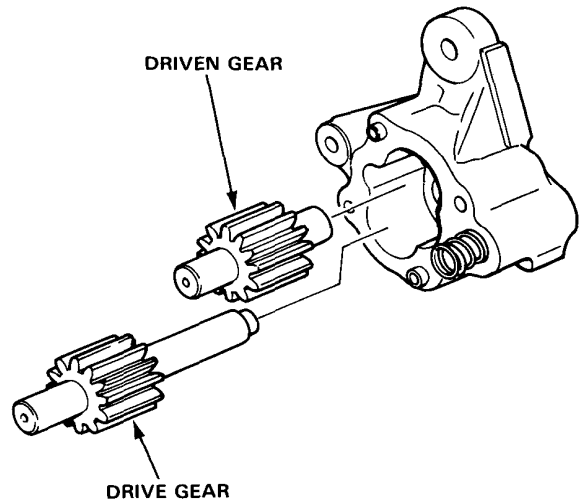
**NOTE:** Remove the front cover bolts in the sequence shown.



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.

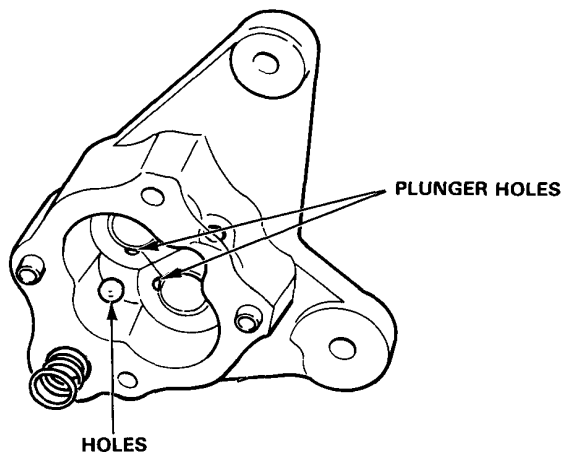


7. Remove the plungers from the pump housing.
8. Pry the seal out of the pump front cover.

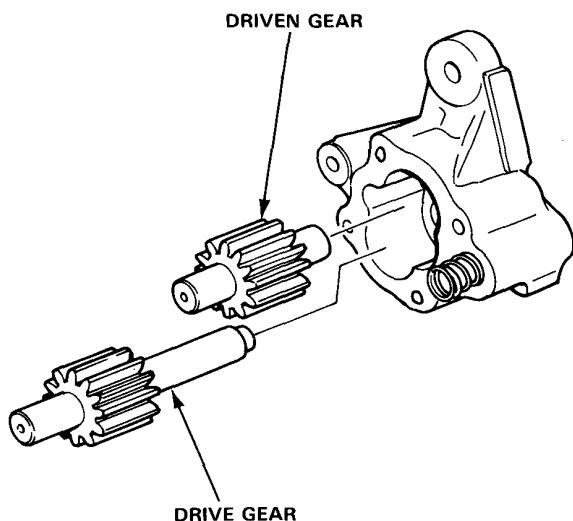




9. Coat the outer surfaces of the plungers with power steering fluid, then install them in the pump housing. Make sure the plunger holes are positioned as shown below.



10. Coat the inside of the plungers with power steering fluid.
11. Install the pump drive and driven gears in the pump housing.

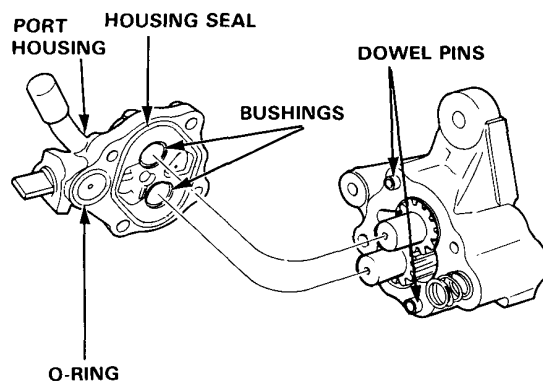


12. Coat the bushings on the port housing with power steering fluid.

13. Install the dowel pins in the pump housing, then install the new housing seal and O-ring in the port housing.

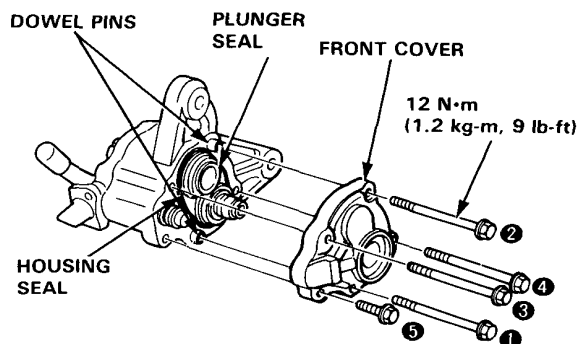
NOTE: Coat the new housing seal and O-ring with grease.

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.



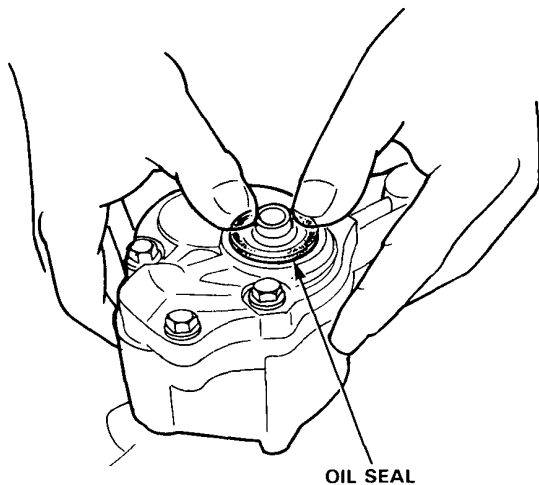
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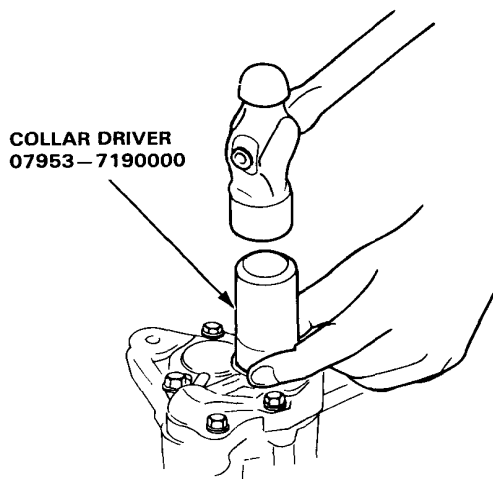
# Pump

## 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.




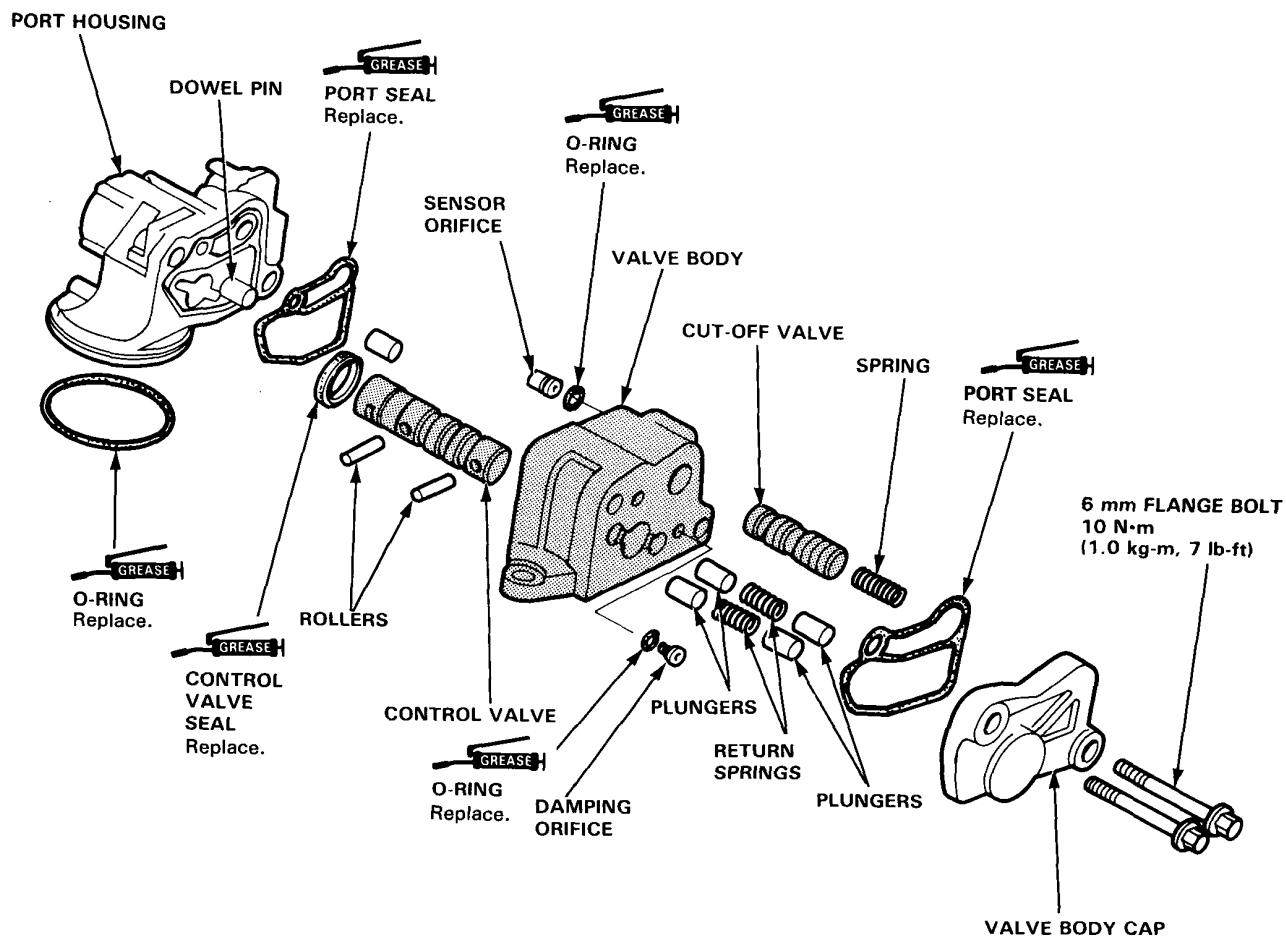


# Control Unit



## 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.
-  STEERING GREASE ..... Honda P/N 08733-B070E



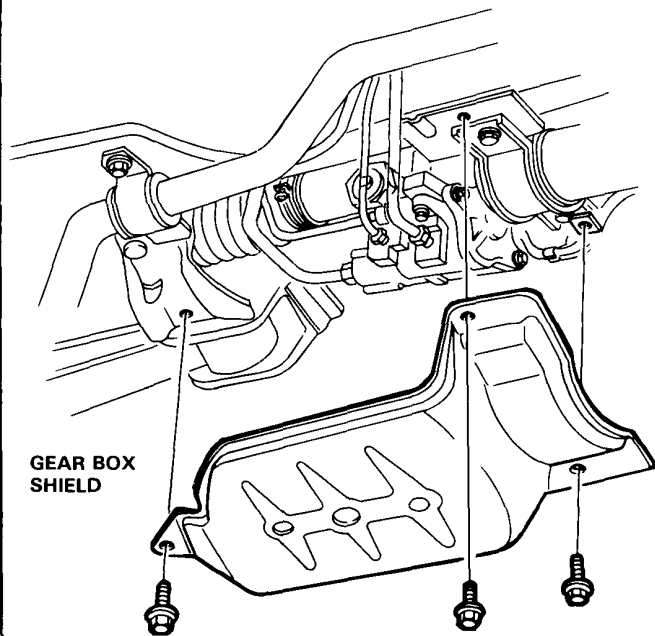
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# Control Unit

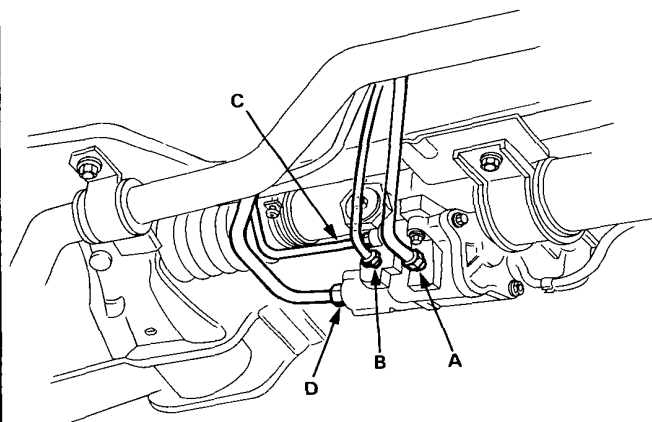
## Disassembly (cont'd)

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 gear-box. Blow dry with compressed air.

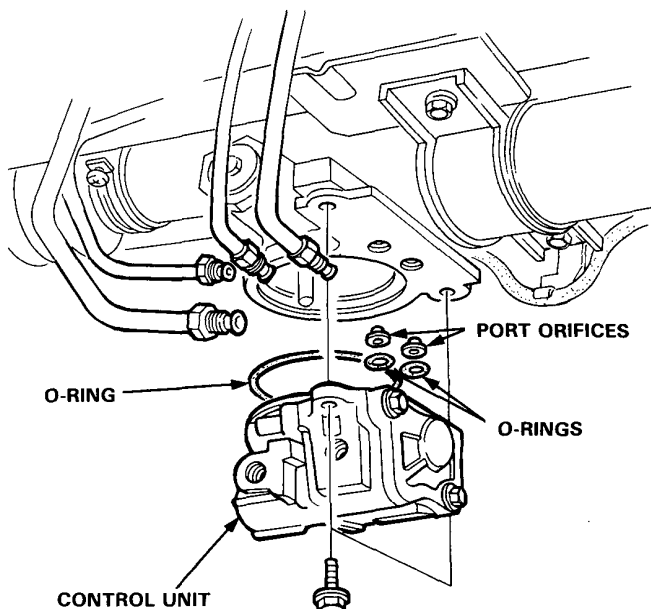


4. Using flare nut wrenches, disconnect the four lines from the control unit.

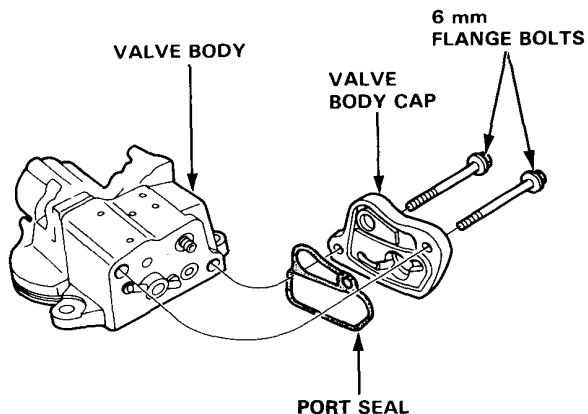
A: From pump	14 mm wrench
B: To speed sensor	12 mm wrench
C: From speed sensor	12 mm wrench
D: To reservoir	17 mm wrench



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.

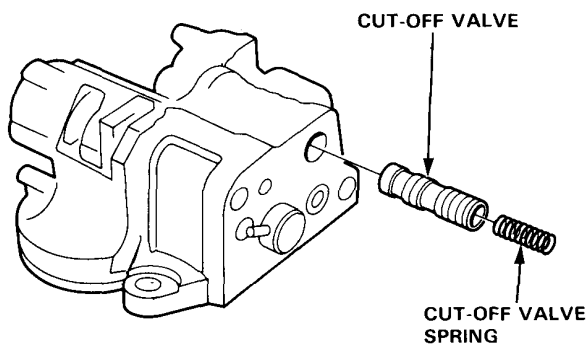


8. Remove the two 6 mm flange bolts, and remove the cap from the valve body.
9. Remove the port seal from the cap.





10. Remove the cut-off valve and spring from the valve body.

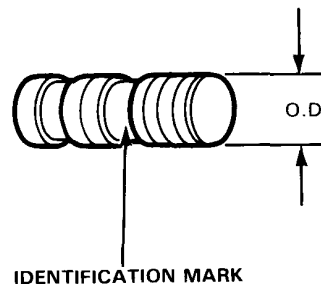
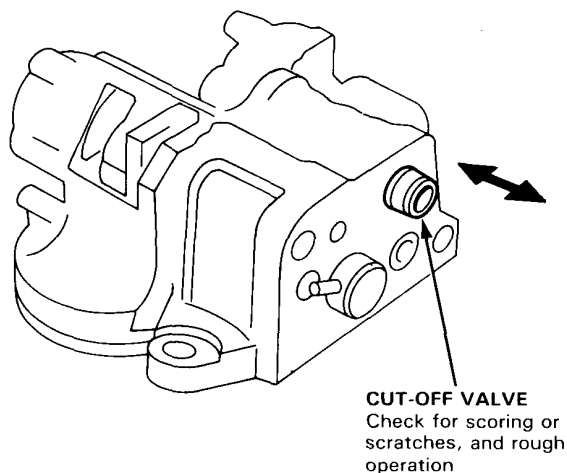


11. Check the cut-off valve:

- 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:**

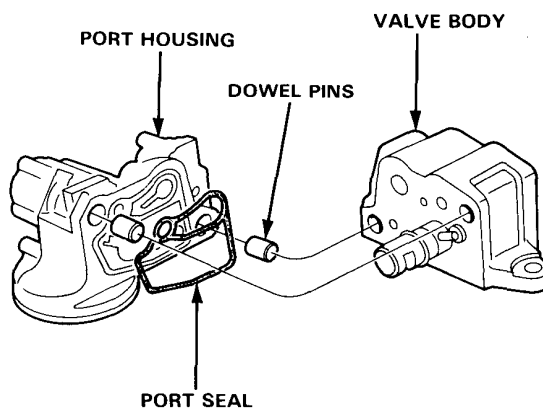
- The cut-off valve is sized to fit the valve body, so, if you replace it, make sure the new valve has the same identification mark on it.
- If the valve body is damaged, replace all three parts (valve body, cut-off valve and control valve) as a set.



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)

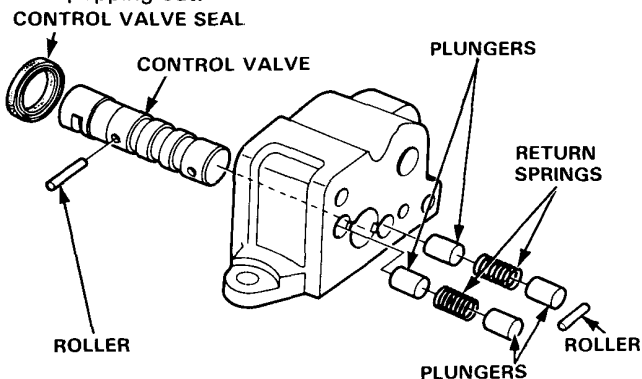


# Control Unit

## 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.



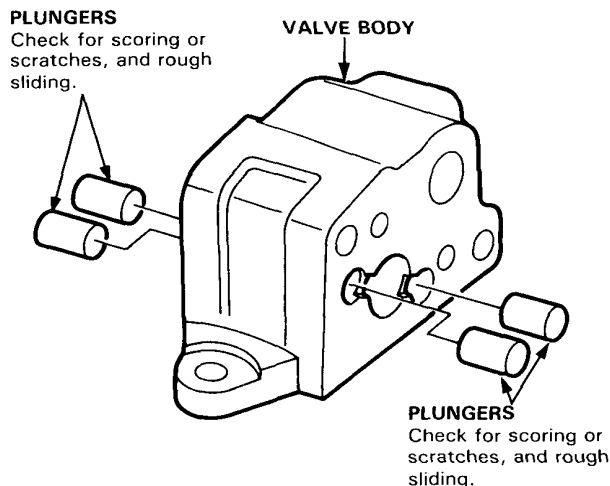
15. Remove the plungers, return springs and control valve from the valve body.

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.

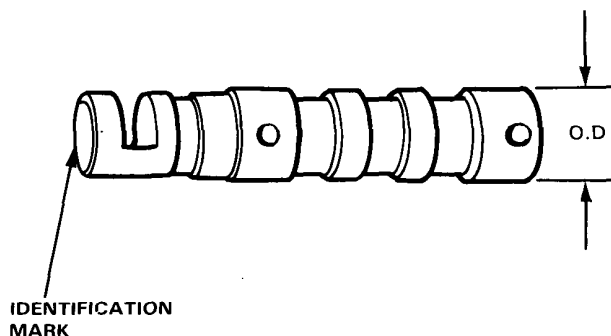
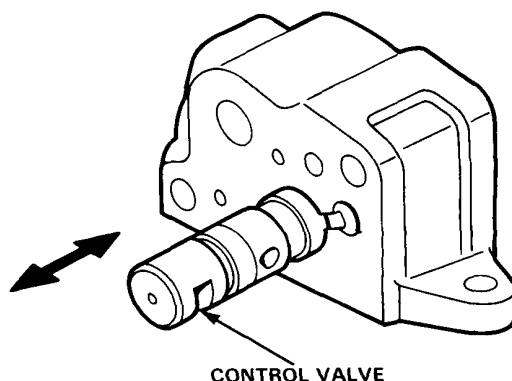


18. Check the control valve.

- 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:

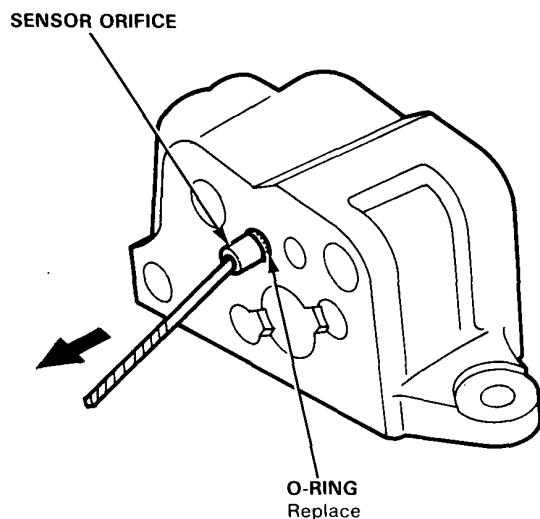
- The control valve is sized to fit the valve body, so, if you replace it, make sure the new valve has the same identification mark on it.
- If the valve body is damaged, replace all three parts (valve body, control valve and cut-off valve) as a set.



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

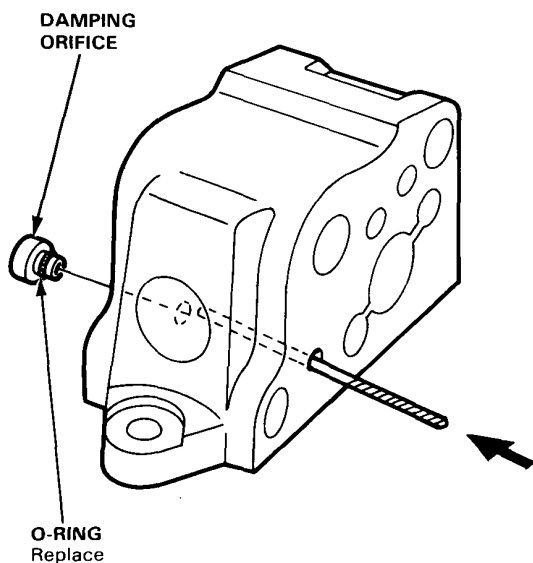


19. Using a 1.5 mm (1/16") drill bit, remove the sensor orifice and 3.4 mm O-ring.



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.

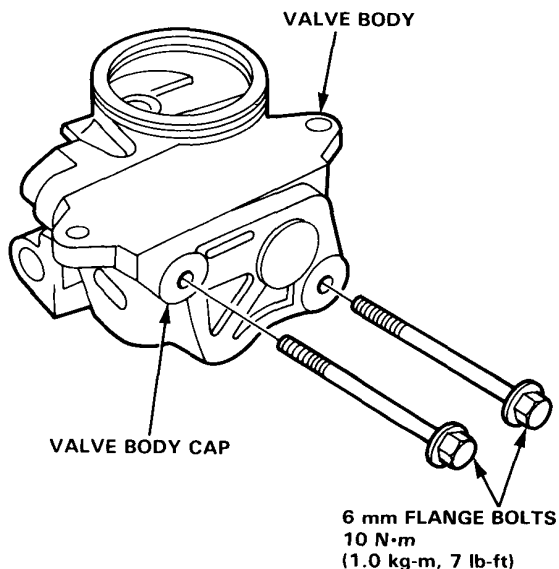
**CAUTION:** Grind the shank end of the drill bit flat before using.



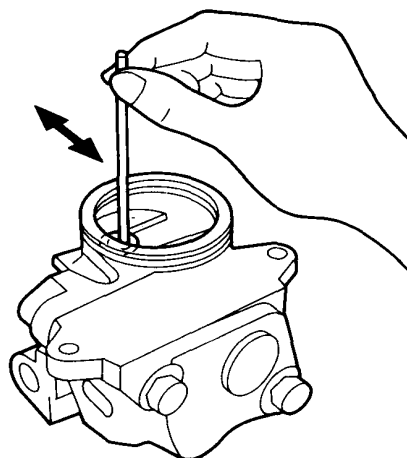
## Assembly

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 referring 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)



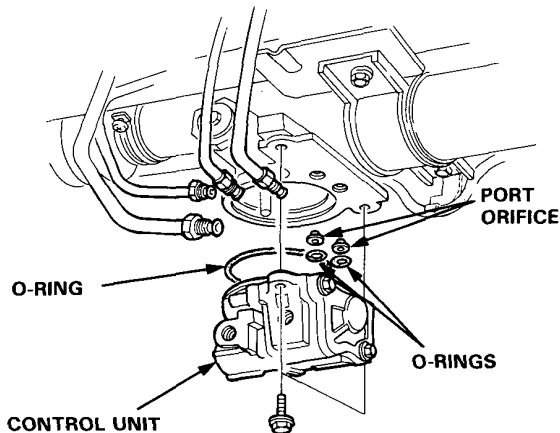
# Control Unit

## 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:

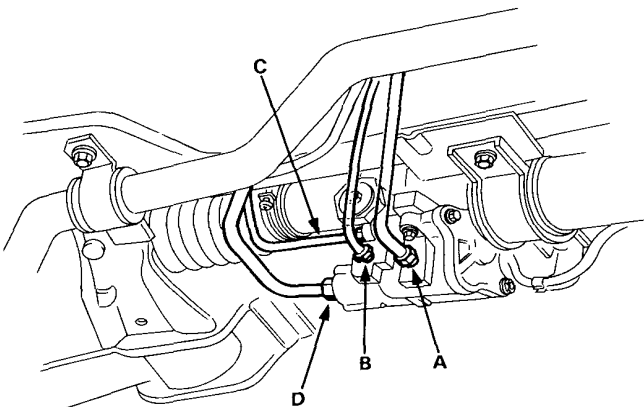
- When installing, be careful not to hit the pinion holder pin.
- Make sure the O-rings are in place and not pinched.



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.



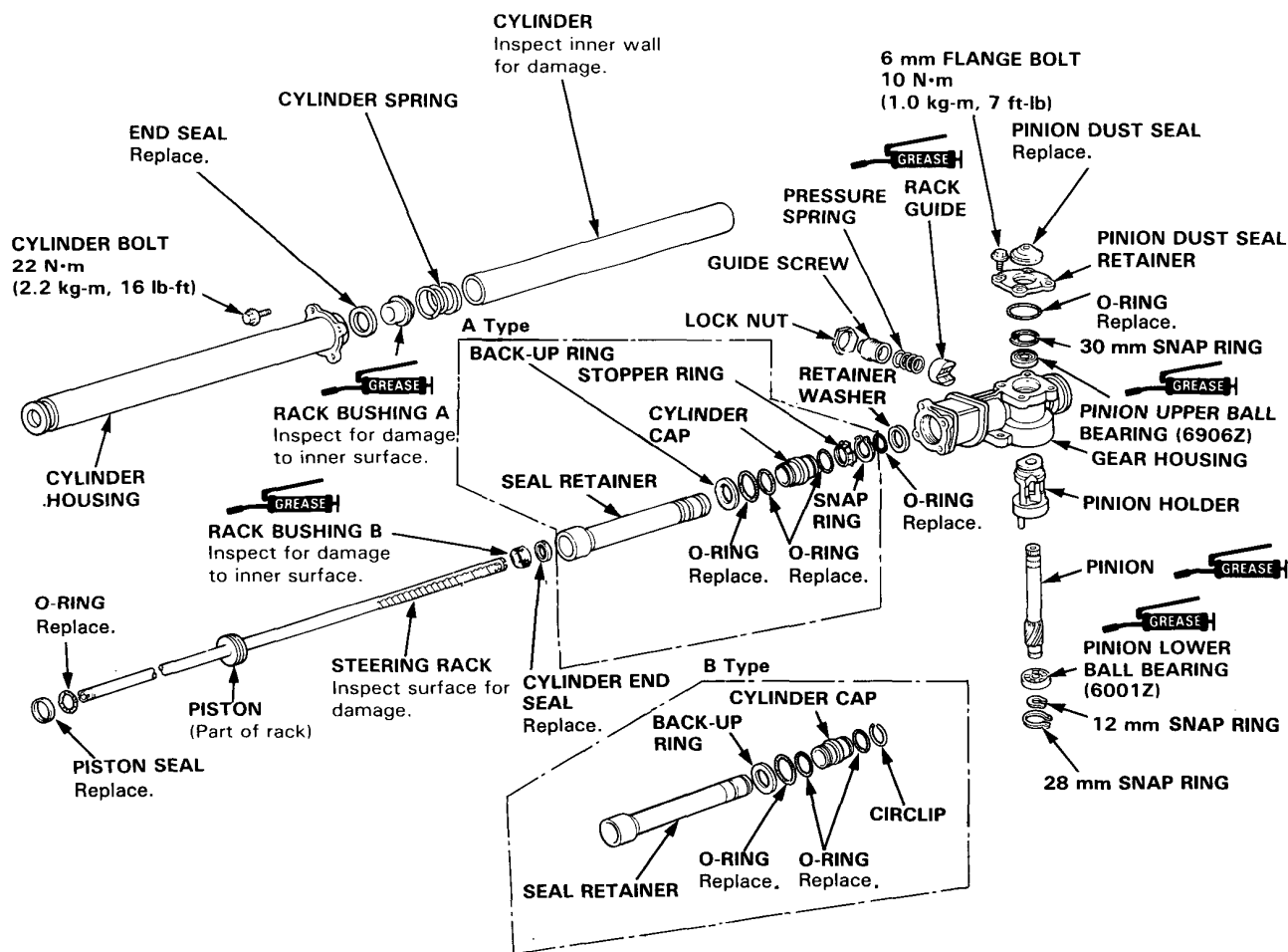


# Gearbox



## 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 re-assembly.
- STEERING GREASE ..... Honda parts number 08733-B070E

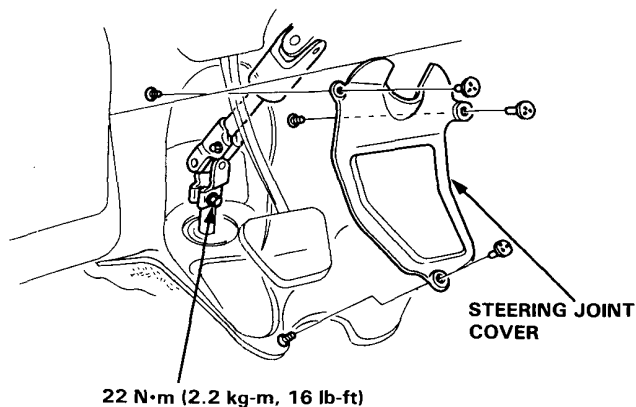




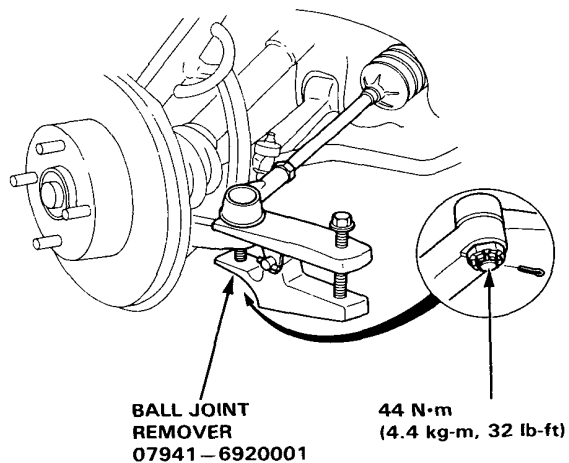
# Gearbox

## Removal

1. Remove the steering joint cover, and disconnect the steering shaft from the gear box.

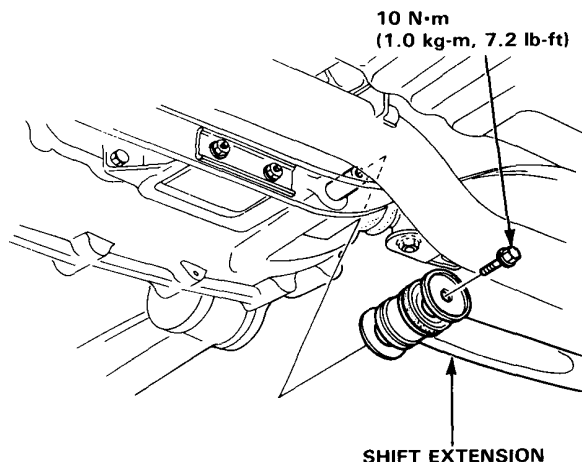


2. Drain the power steering fluid as described on page 18-24.
3. Remove the gearbox shield.
4. Using solvent and a brush, wash any oil and dirt off the control unit, its lines, and that end of the gearbox. Blow dry with compressed air.
5. Raise the front of car and support on safety stands in the proper locations.
6. Remove the front wheels.
7. Disconnect the tie rods from the steering knuckles using the special tool shown.

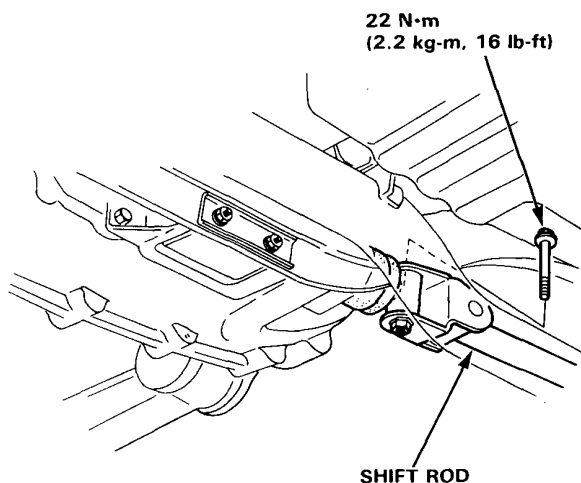


### 8-1. (Manual transmission model only)

- Remove the shift extension from the transmission case.



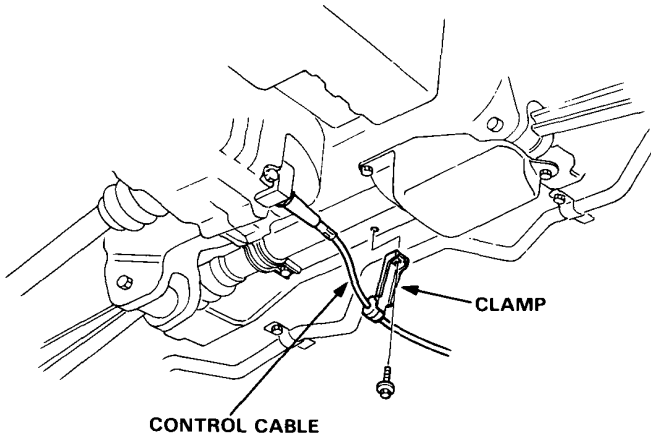
- Disconnect the gear shift rod from the transmission case by removing the 8 mm bolt.



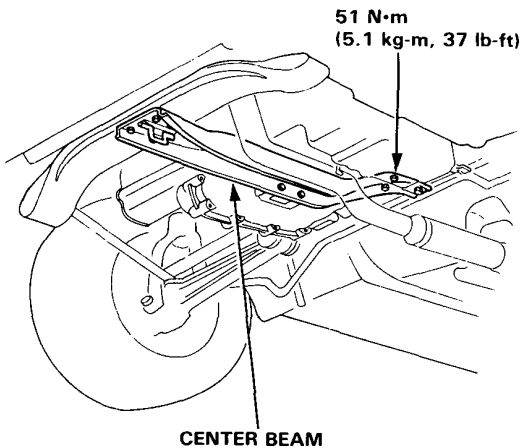


## 8-2. (Automatic transmission only)

- Remove the control cable clamp.



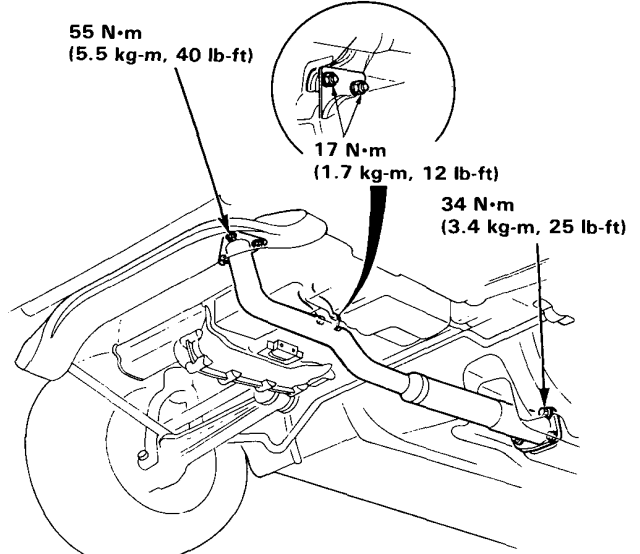
## 9. Remove the center beam bolts and center beam.



## 10. Disconnect the exhaust header pipe at the manifold.

**CAUTION:** Replace the exhaust gasket and selflocking nuts when you reinstall the pipe.

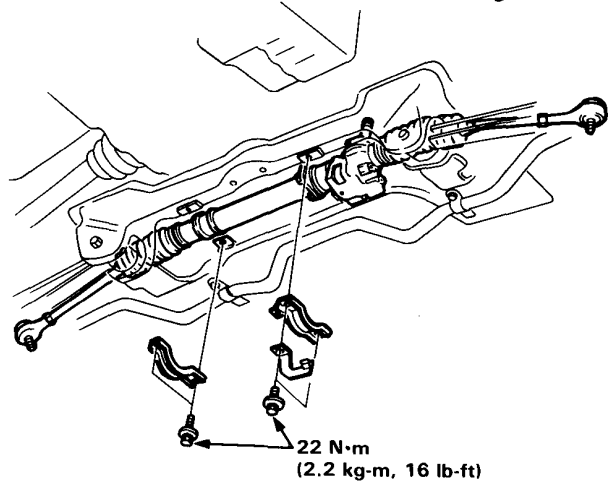
## 11. Remove the exhaust header pipe joint nuts.



## 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.



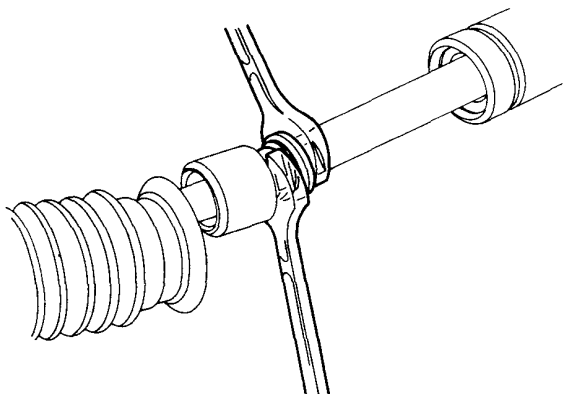
## 15. Slide the gear box right (:LHD, left: RHD) so that the left (:LHD, right: RHD) tie rod clears the bottom of the rear beam, then remove the gear box.



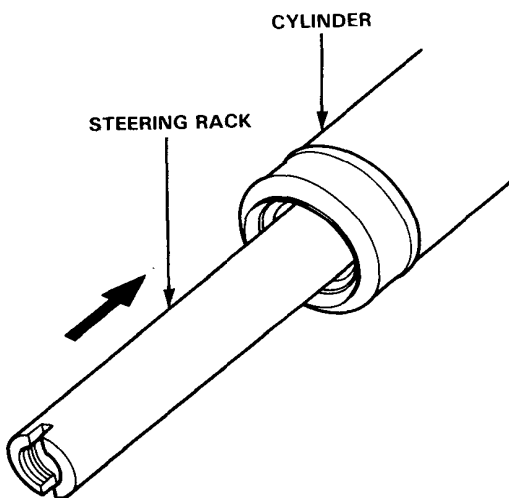
# Gearbox

## Resealing

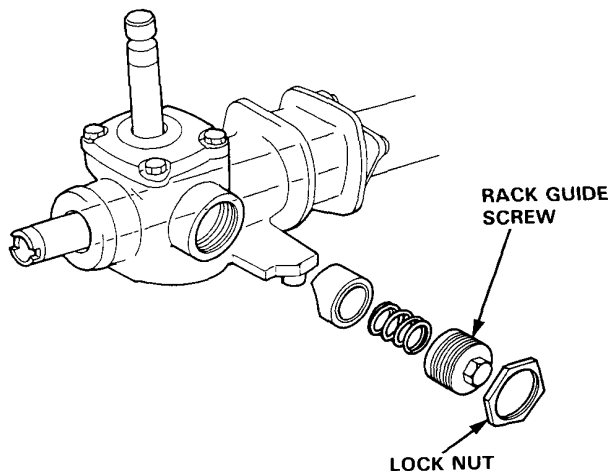
1. Remove the control unit as described on page 18-36.
2. Carefully clamp the gearbox in a vise.
3. Loosen the bands, pull the boots away from the ends of the gearbox, and unbend the tie-rod lock washers. Hold the rack with a 19 mm wrench, and unscrew the tie-rods with a 17 mm wrench.



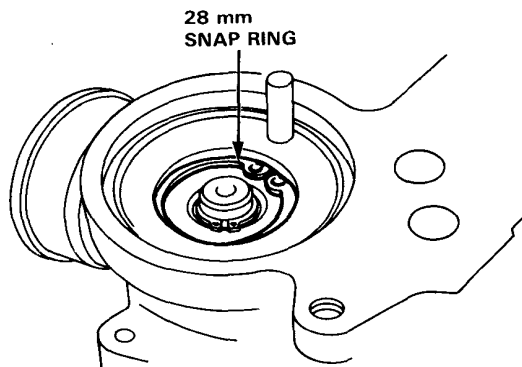
4. Push the right end of the rack back into the cylinder housing so the smooth surface that rides against the seal won't be damaged.



5. Loosen the rack screw lock nut, and remove the rack guide screw.

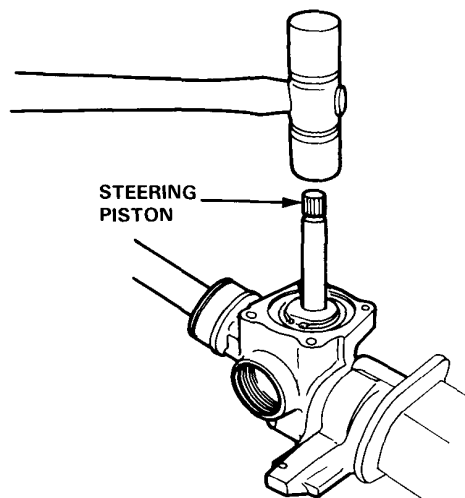


6. Remove the 28 mm snap ring from the bottom of the gear housing.

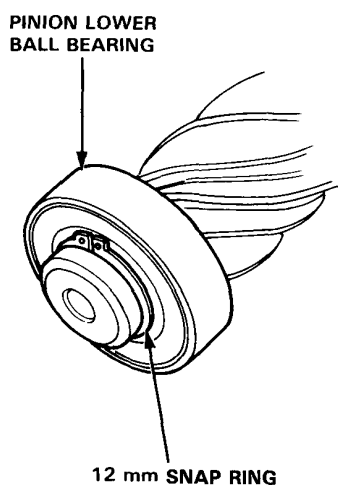




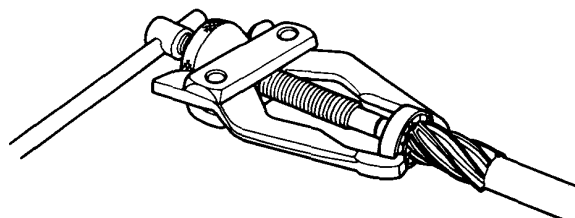
7. Remove the pinion from the gear housing by tapping it lightly.



8. Check the pinion lower ball bearing for play.

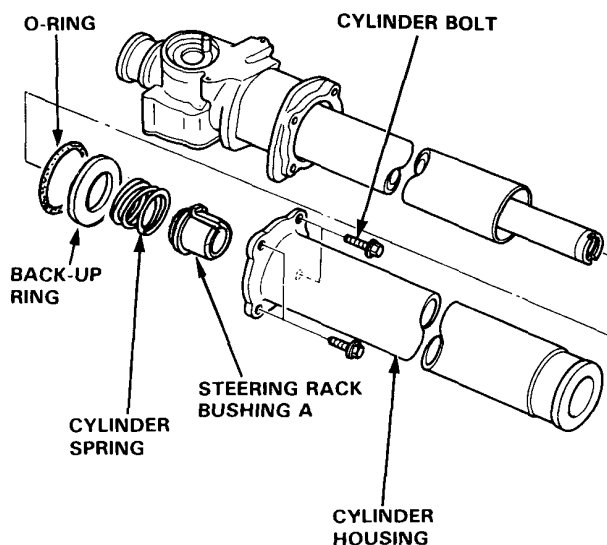


9. If the bearing is noisy or has excessive play, remove the 12 mm external snap ring and remove the bearing using a commercially available bearing puller.



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.

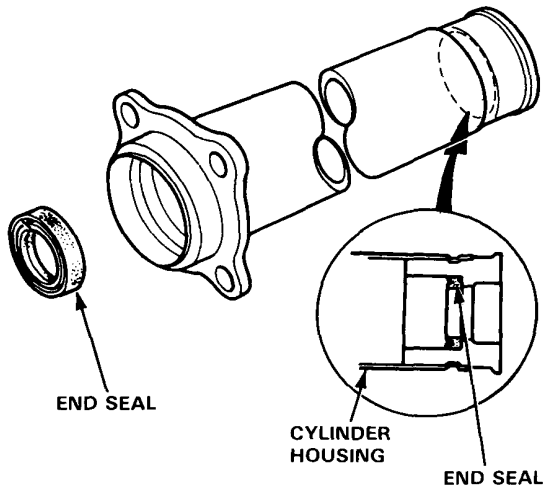
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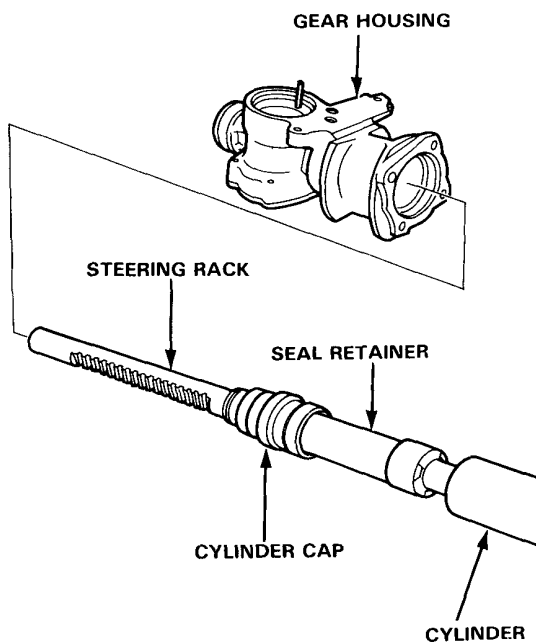
# Gearbox

## Resealing (cont'd)

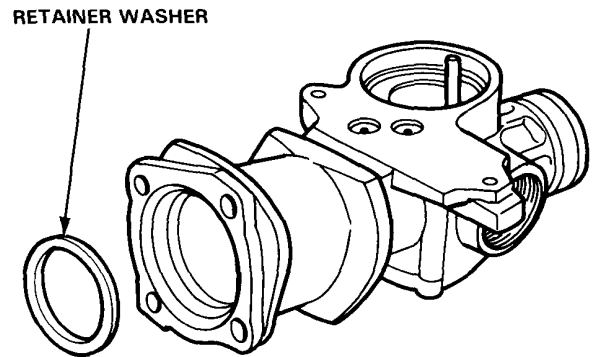
13. Remove the cylinder end seal from the cylinder housing. Use your fingers or a wooden stick to avoid damaging the housing.



14. Remove the cylinder, cylinder seal retainer, cylinder cap and steering rack from the gear housing.

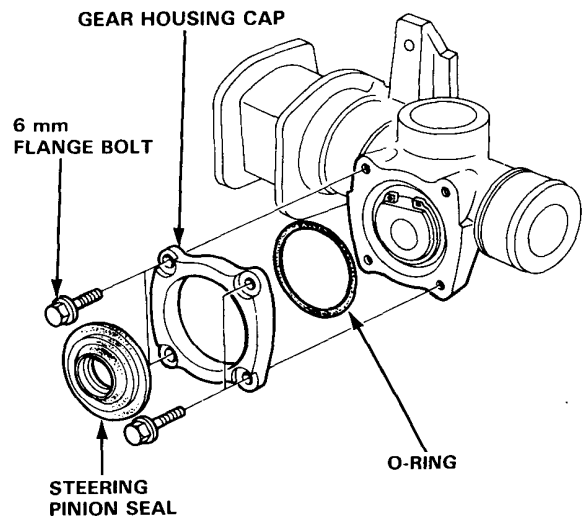


15. Remove the retainer washer from the gear housing.



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.



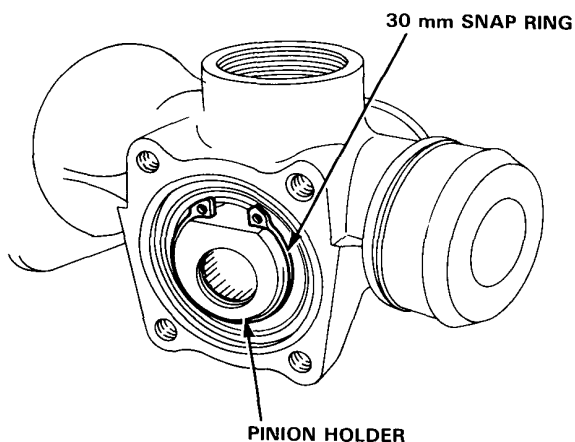
18. Remove the O-ring from the gear housing.



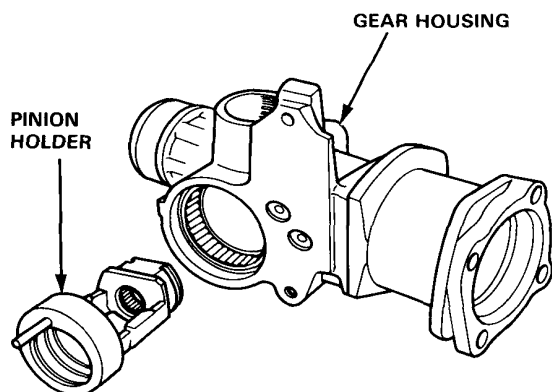
19. Check the upper bearing for free movement and excessive play; if it is good and the grease in it is clean, go on step 20.

If it is damaged, or if dirt has gone past the seal into the grease, replace the bearing.

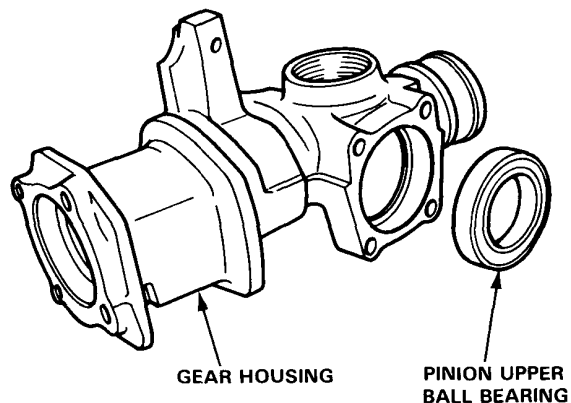
- Remove the 30 mm snap ring from the pinion holder.



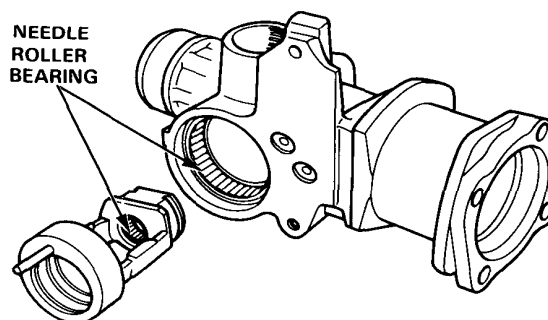
- Remove the pinion holder from the gear housing.



- 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.



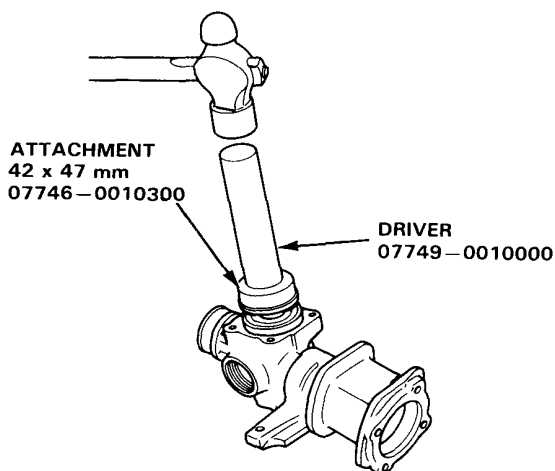
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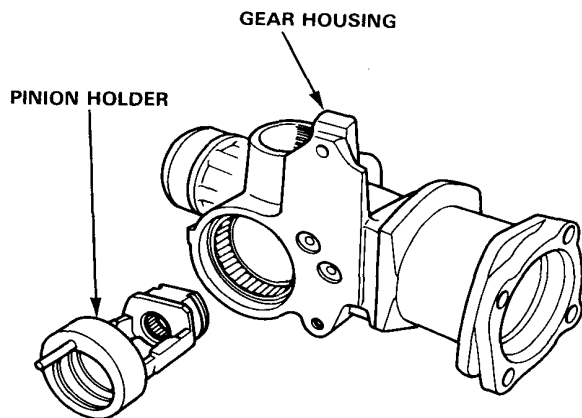
# Gearbox

## Resealing (cont'd)

- Pack a new upper bearing with grease, then drive the bearing into the gear housing with its sealed side facing out.

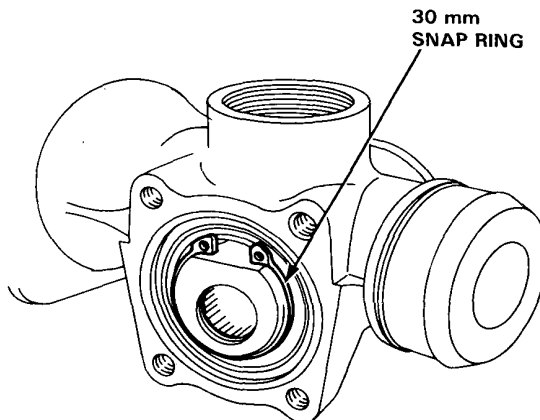


- Install the pinion holder in the gear housing.

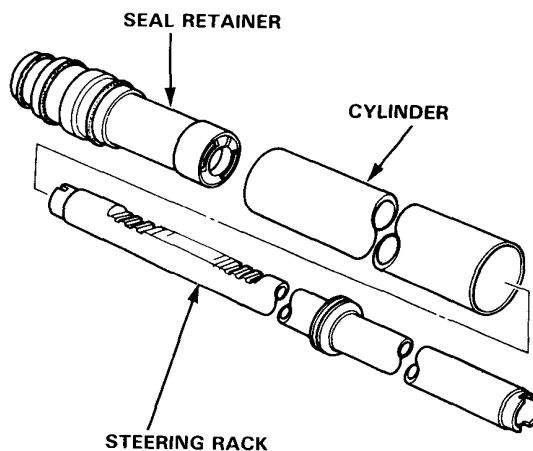


- Reinstall the 30 mm snap ring with its tapered side facing out.

NOTE: The snapping ends must be aligned with the flat area of the pinion holder.



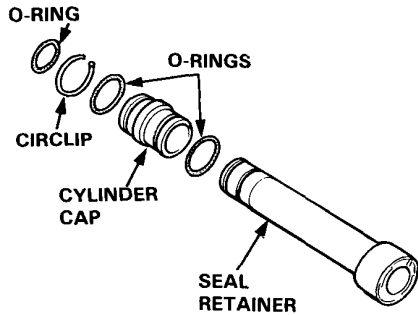
20. Remove the cylinder and seal retainer from the steering rack.





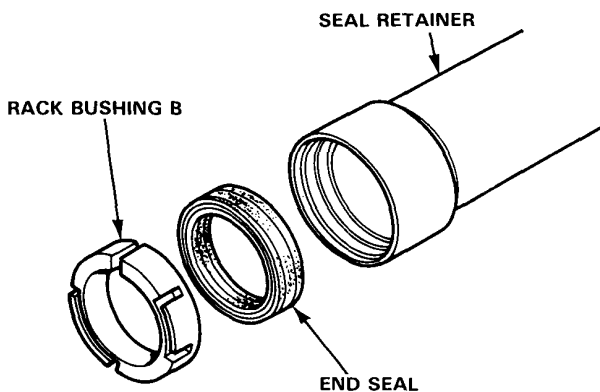
21. Remove the O-ring and circlip from the seal retainer, then remove the cylinder cap from the seal retainer.

22. Remove the O-rings from the cylinder cap.

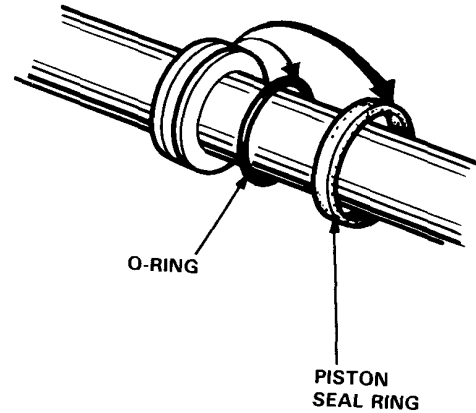


23. Remove the steering rack bushing B from the seal retainer.

24. Remove the cylinder end seal.

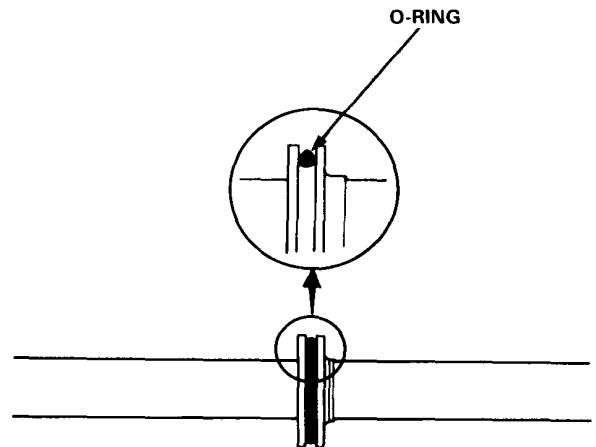


25. Carefully pry the piston seal ring and O-ring off the rack.



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)

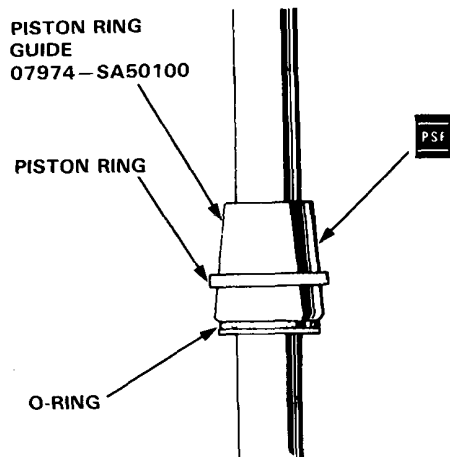


# Gearbox

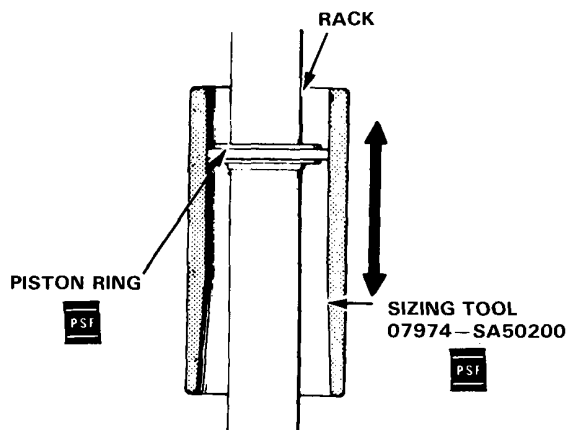
## Resealing (cont'd)

27. Coat the pinion seal ring guide with power steering fluid, and slide it onto the rack, big end first.

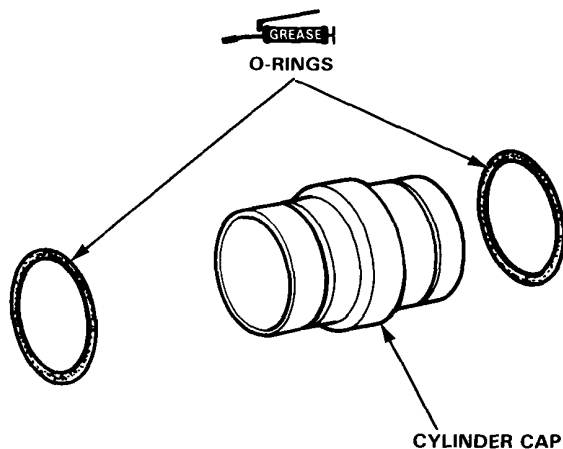
28. Position the new piston seal ring on the guide tool, slide it down to the big end of the tool, and then pull it off into the piston groove on top of the O-ring.



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.

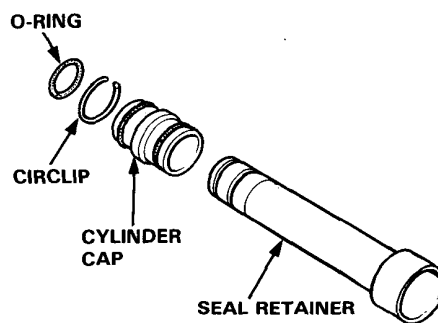


30. Coat new O-rings with grease and install them on the cylinder cap.



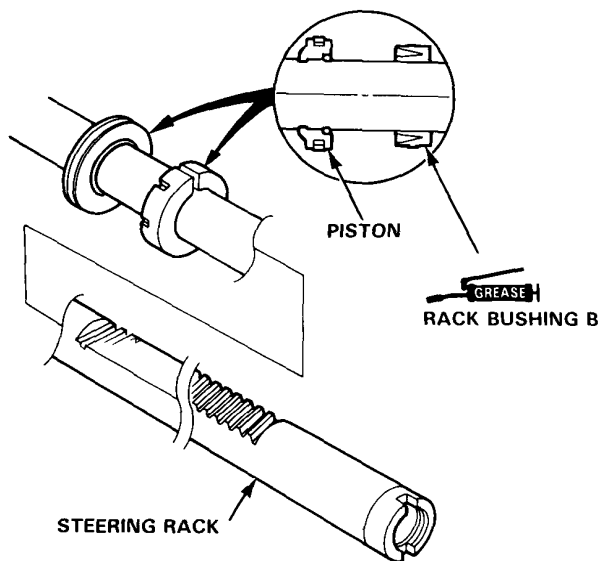
31. Install the back up ring, then slide the cylinder cap onto the seal retainer.

32. Install the circlip and O-ring on the seal retainer.

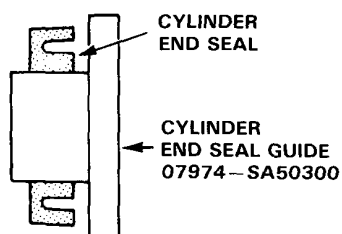




33. Grease the sliding surface of the steering rack bushing B, and install it on the steering rack with its groove side facing the steering rack piston.

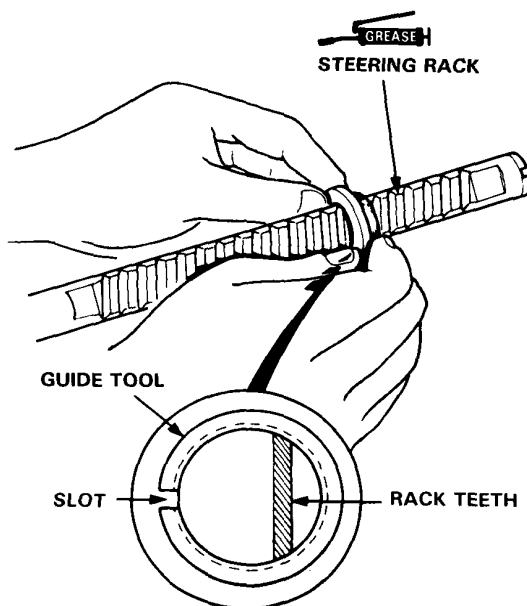


34. Grease the sliding surface of a new cylinder end seal, and the cylinder end seal guide, then set the seal on the seal guide with its grooved side facing the tool.

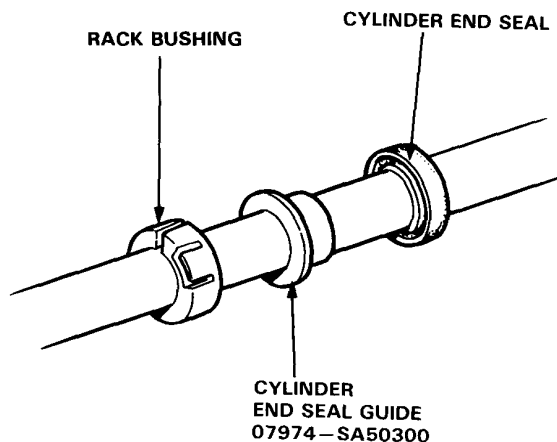


35. Grease the steering rack, and install the cylinder end seal.

**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.



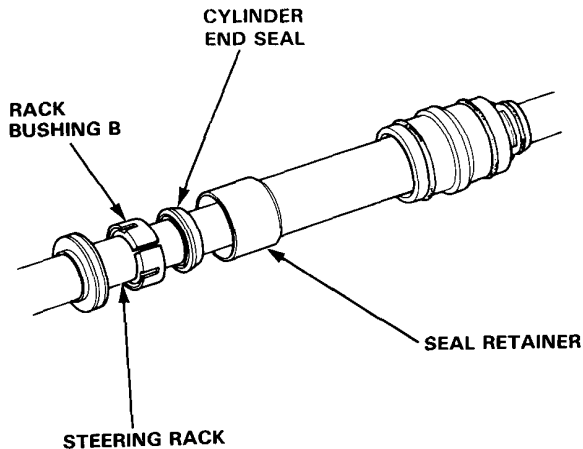
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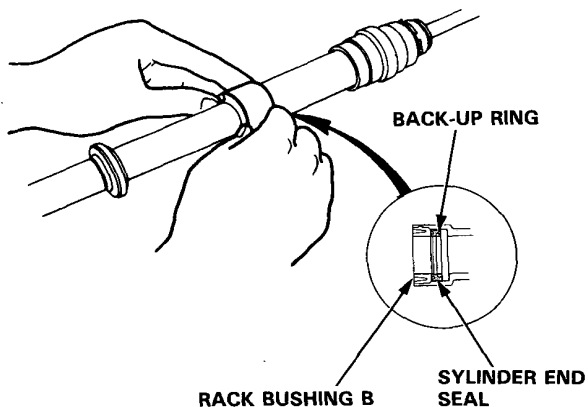
# Gearbox

## Resealing (cont'd)

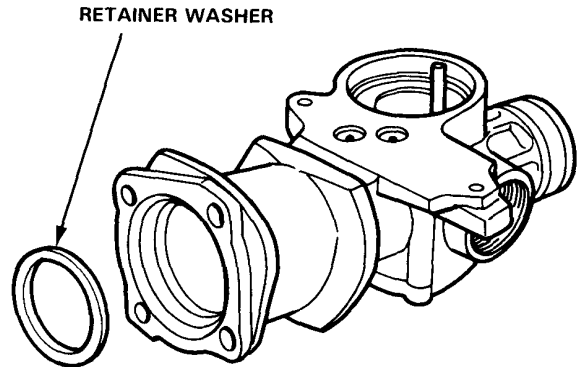
37. Fit the seal retainer on the steering rack.



38. Push the steering bushing B toward the seal retainer by hand until the bushing and end seal are as shown.

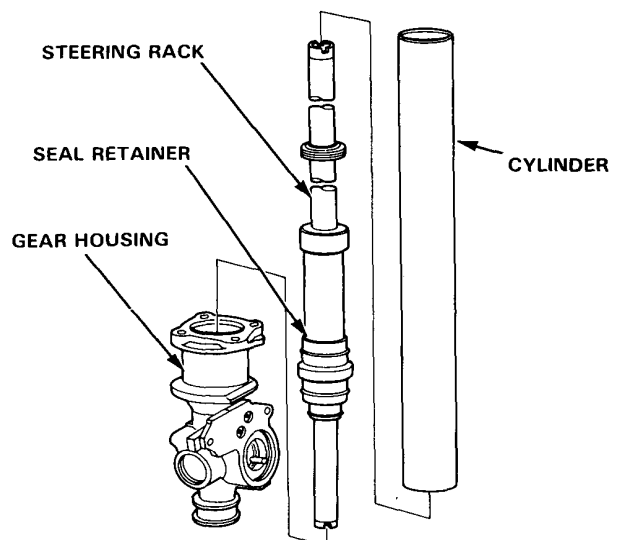


39. Install the retainer washer on the gear housing.



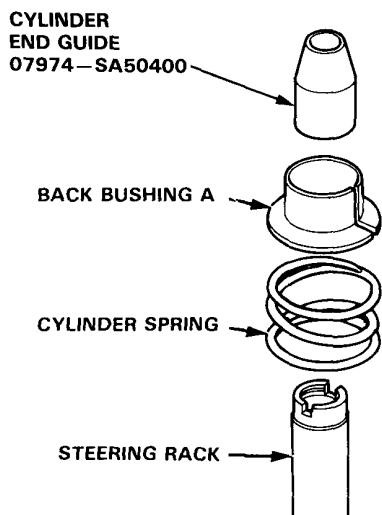
40. Place the gear housing on the work bench and insert the seal retainer and steering rack into the gear housing.

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.

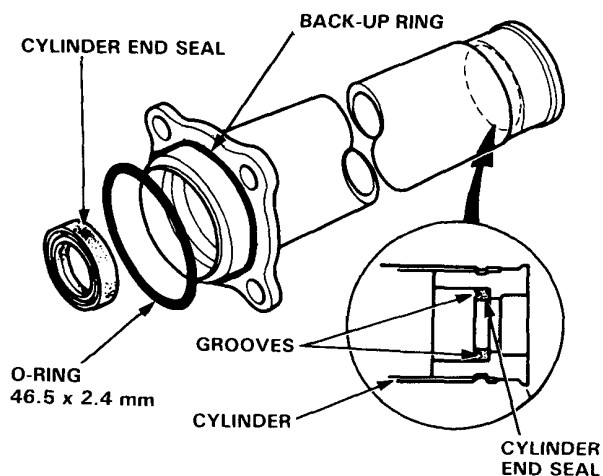




42. Install the cylinder spring over the rack, then coat the rack bushing A with power steering fluid and install it on the spring.
43. Grease the end guide and slip it onto the end of the steering rack.



44. Coat the inside surface of the cylinder with power steering fluid and install the cylinder end seal with its groove side facing out.

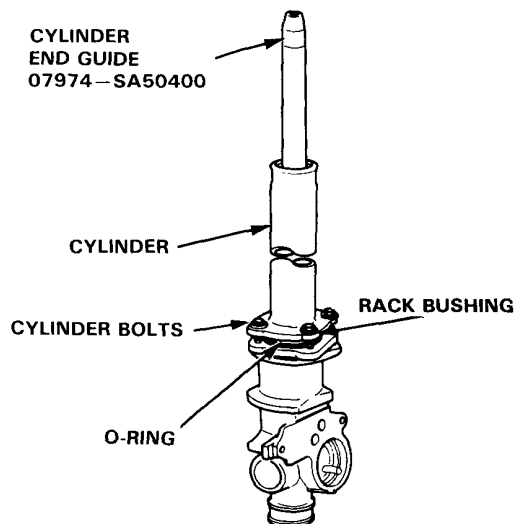


45. Install the back-up ring then install the O-ring on the cylinder.

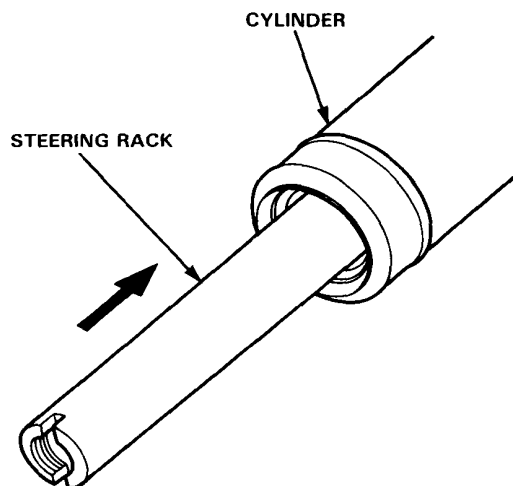
46. Carefully install the cylinder on the gear housing and loosely install with four bolts.

**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)



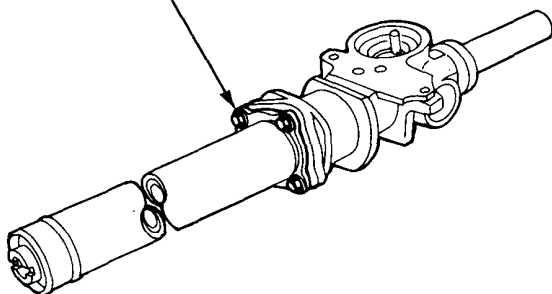
# Gearbox

## Resealing (cont'd)

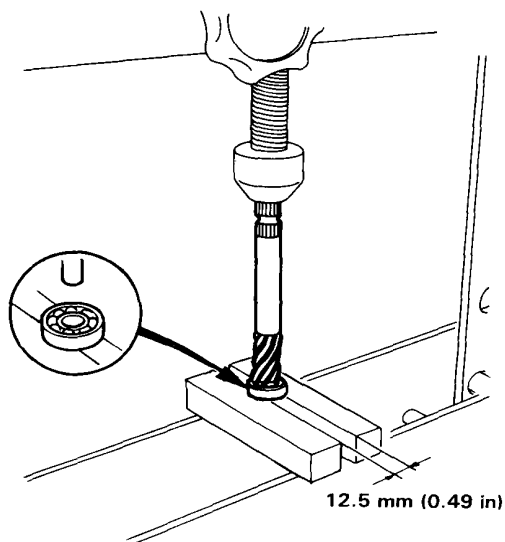
49. Tighten the cylinder housing to the gear housing with four bolts.

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.

CYLINDER BOLT  
22 N·m  
(2.2 kg-m, 16 lb-ft)

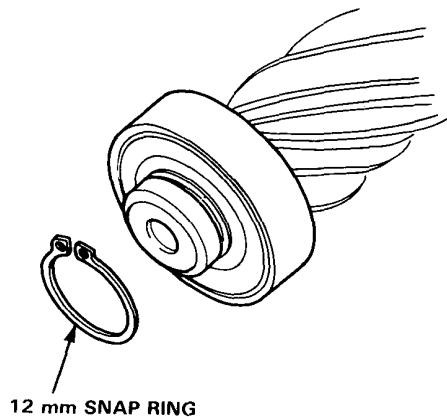


50. Press the lower ball bearing onto the pinion with its shielded side facing down.



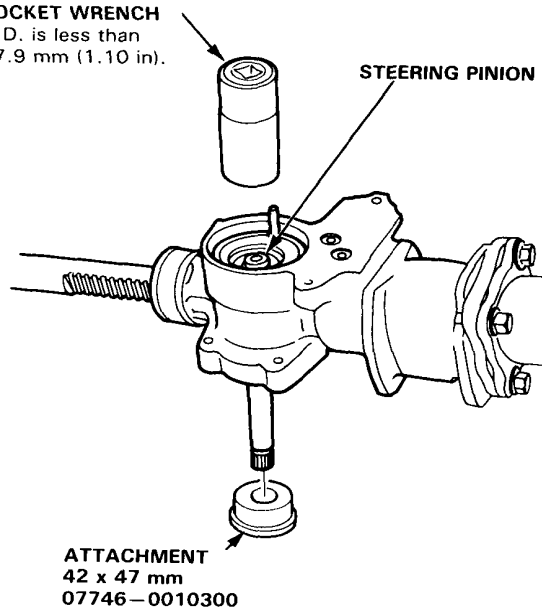
51. Install the 12 mm snap ring on the steering pinion.

52. Apply grease to the lower ball bearing and check for smooth operation.



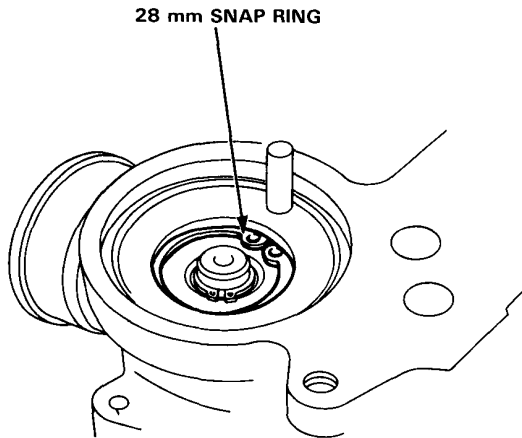
53. Install the steering pinion in the pinion holder.

SOCKET WRENCH  
O.D. is less than  
27.9 mm (1.10 in).

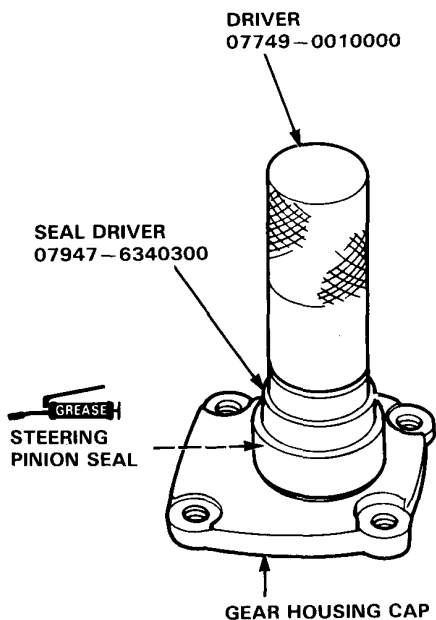




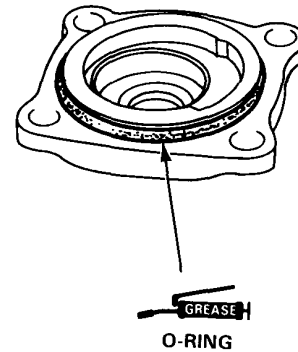
54. Install the 28 mm snap ring securely in the pinion holder groove.



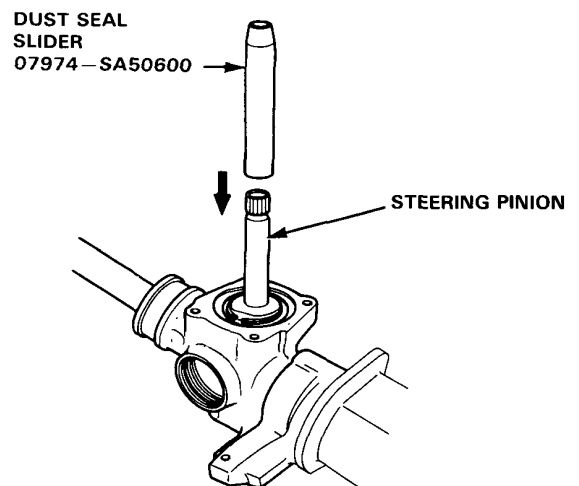
55. Grease the steering pinion seal, and install it on the gear housing using the special tools.



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.



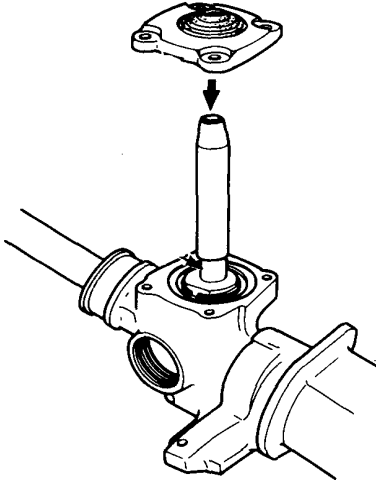
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# Gearbox

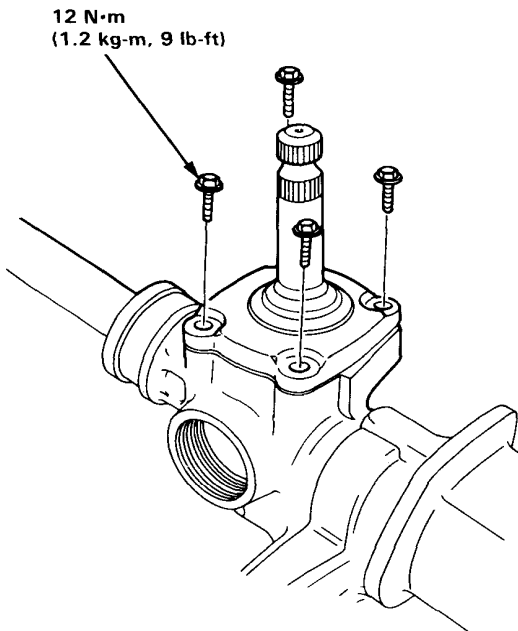
## Resealing (cont'd)

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.

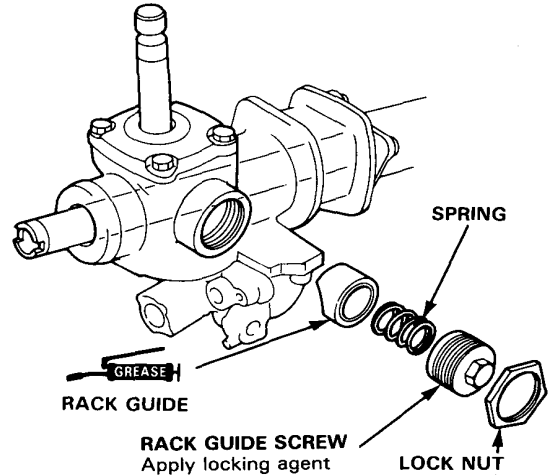


61. Install the control valve unit on the gear housing (page 18-32).

62. Coat the rack guide with grease.

63. Install the rack guide, spring and rack guide screw on the gear housing.

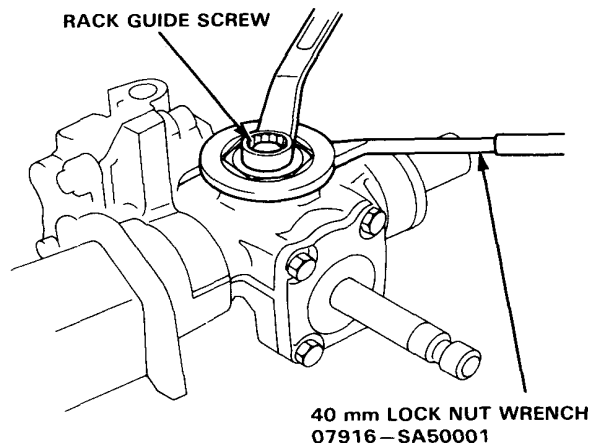
NOTE: Apply locking agent to the rack guide screw threads.



64. Tighten the rack guide screw until it compresses the spring and seats against the rack guide, then loosen it.

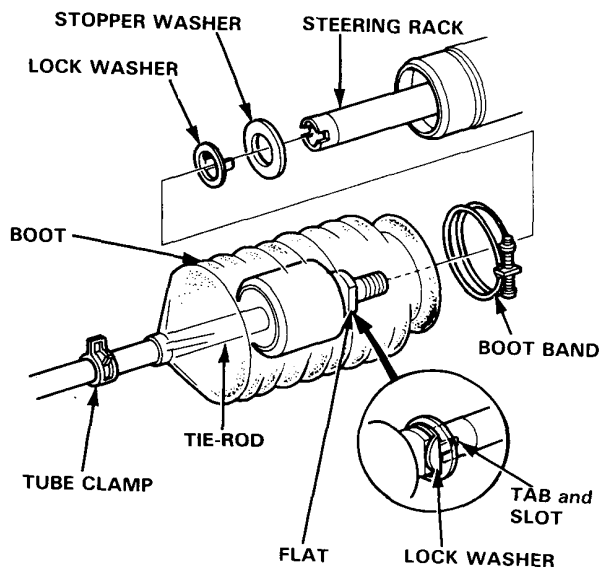
Retighten it to 4 N·m (0.4 kg-m, 2.9 lb-ft), back off about 25° and install the lock nut on the rack guide screw.

65. Tighten the lock nut while holding the rack guide screw with the lock nut wrench.

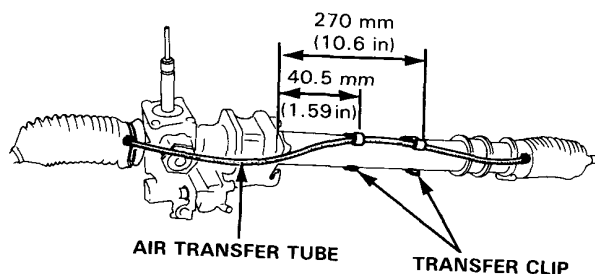




66. Screw each tie rod into the rack while holding the lock washer so its tabs are in the slots in the rack end.
67. Tighten the tie rod securely, then bend the lock washer back against the flat on the flange as shown.
68. Install the boots and secure with boot band and tube clamp.

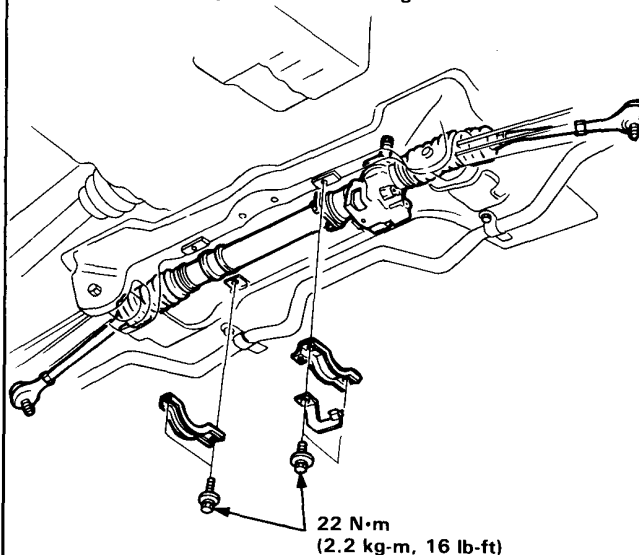


69. Install the air transfer tube and clamp with transfer clips as shown.



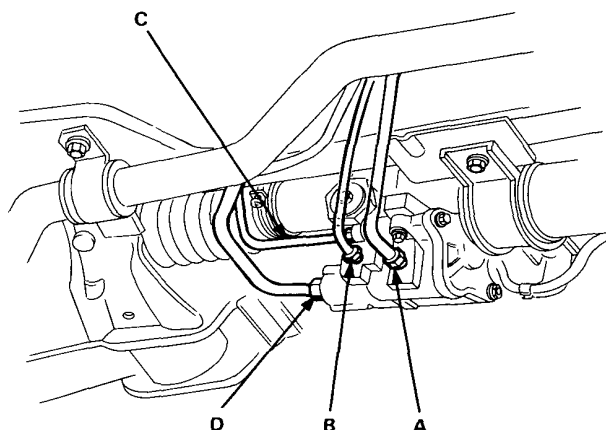
## Installation

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) |



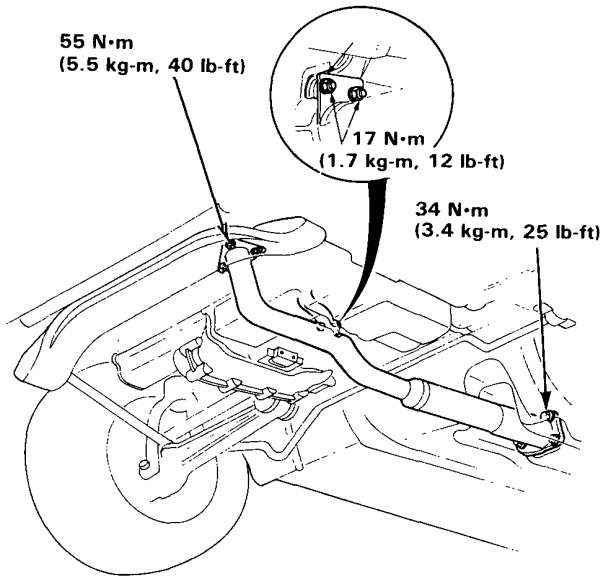
(cont'd)



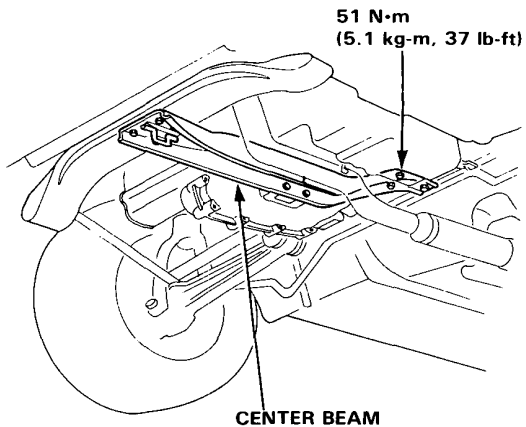
# Gearbox

## Installation (cont'd)

4. Install the header pipe with new gasket, and tighten the bolts and nuts.

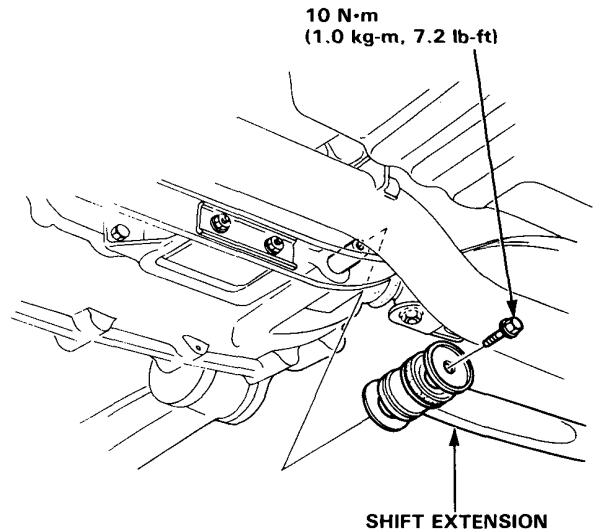


5. Install the center beam and tighten the bolts.

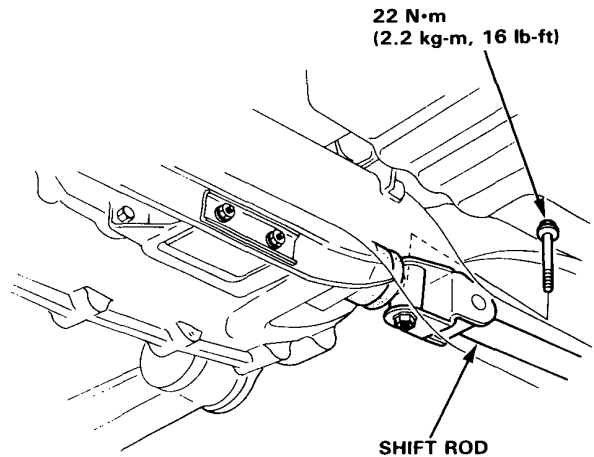


- 6-1. (Manual transmission model only)

- Install the shift extension to the transmission case.



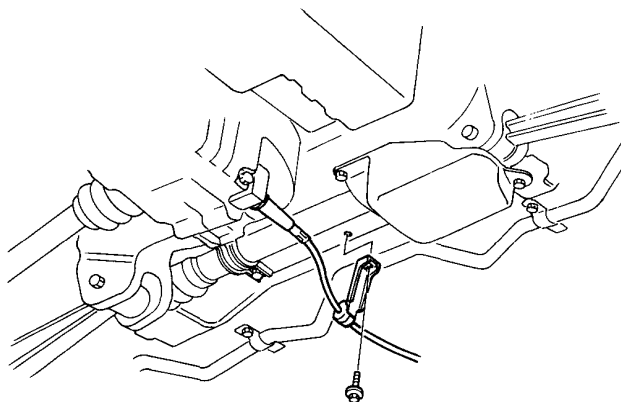
- Connect the shift rod to the transmission case using the 8 mm bolt.



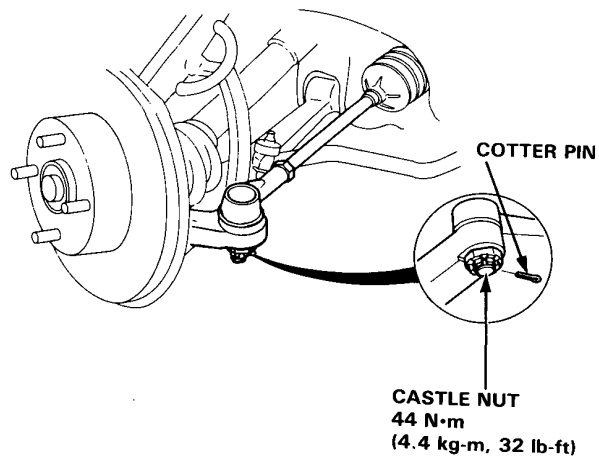


6-2. (Automatic transmission model only)

- Install the cable clamp.

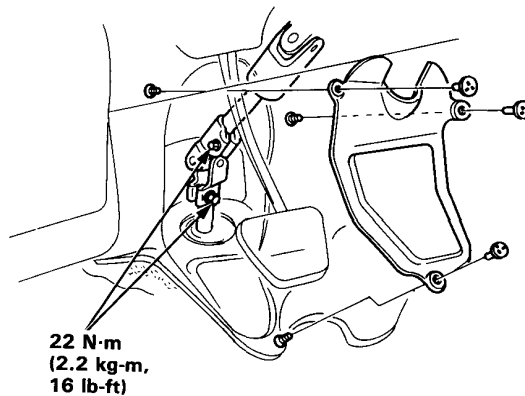


7. Reconnect the tie rods to the steering knuckles, tighten the castle nut to specified torque, and install new cotter pins.



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

Index .....	19-2
Wheel Alignment .....	19-3
Front Suspension .....	19-7
Rear Suspension .....	19-19





# Suspension

## Index

### FRONT DAMPER

- Removal, page 19-16
- Disassembly/Inspection, page 19-17
- Reassembly, page 19-18
- Installation, page 19-18

### KNUCKLE HUB

- Replacement, page 19-11
- Bearing Replacement, page 19-13

### UPPER ARM

- Inspection/  
Disassembly/Reassembly,  
page 19-7

### FRONT STABILIZER BAR

- Removal/Installation,  
page 19-7

### RADIUS ROD

- Disassembly and Inspection, page 19-7

### REAR DAMPER

- Removal, page 19-24
- Disassembly/Inspection, page 19-25
- Reassembly, Installation, page 19-26

### REAR UPPER ARM

- Inspection, pages  
19-19 and 20

### REAR LOWER ARM A

- Inspection, pages 19-19 and 20

### BALL JOINT

- Removal, page  
19-24

### REAR STABILIZER BAR

- Inspection/Removal/  
Installation, pages 19-19 and 20

### REAR LOWER ARM B

- Inspection, pages 19-19 and 20

### TRAILING ARM

- Inspection, pages 19-19 and 20
- Removal, Installation, pages 19-19, 20 and 23



# Wheel Alignment

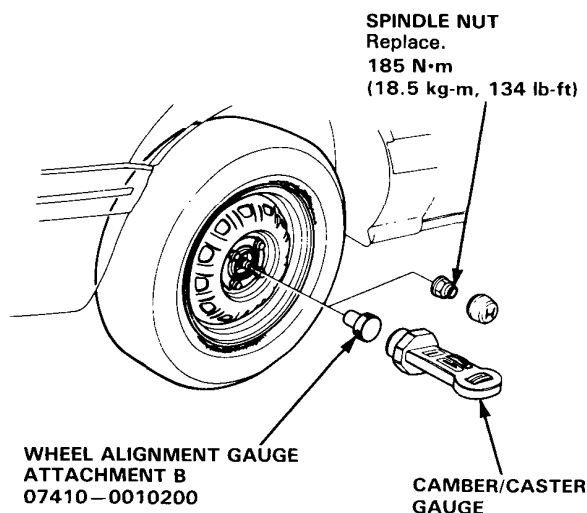


## Camber Inspection

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:  $0^{\circ}00' \pm 1^{\circ}$   
Rear:  $0^{\circ}00' \pm 1^{\circ}$**

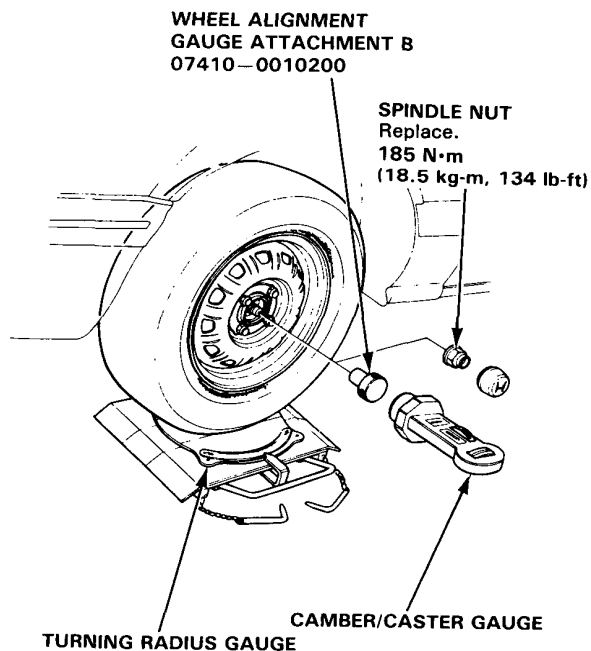


## Caster Inspection/Adjustment

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  $20^{\circ}$  inward.
4. Turn the adjust screw so that the bubble in the caster gauge is at  $0^{\circ}$ .
5. Turn the wheel  $20^{\circ}$  outward and read the caster on the gauge with the bubble at the center of the gauge.

**Caster Angle:  $0^{\circ}30' \pm 1^{\circ}$**



6. If adjustment is required, record the caster reading, then go to step 7. If adjustment is not required, remove alignment equipment.

(cont'd)



# Wheel Alignment

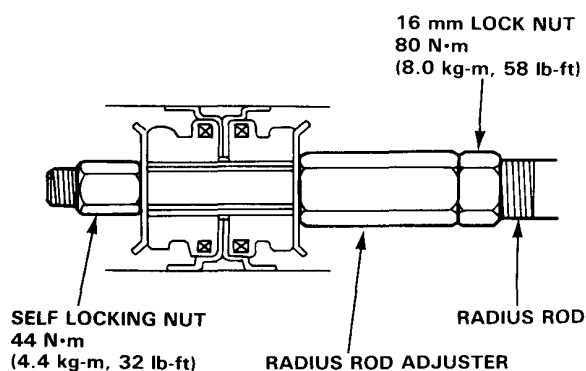
## Caster Inspection/Adjustment (cont'd)

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  $0^{\circ}8'$ .



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.

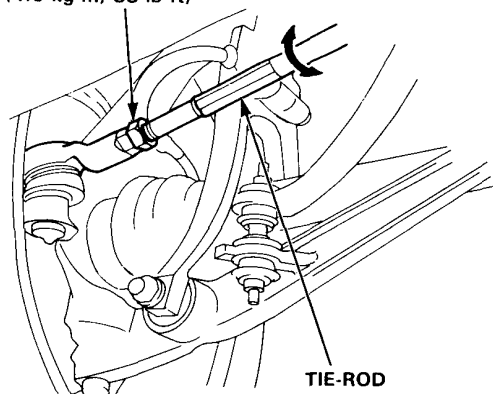
Front toe-in:  $0 \pm 3$  mm ( $0 \pm 0.118$  in)

- 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.

TIE-ROD LOCK NUT  
45 N·m (4.5 kg-m, 33 lb-ft)







## Rear Wheel Toe Adjustment

1. Release parking brake.

NOTE: If the parking brake is engaged, you may get an incorrect reading.

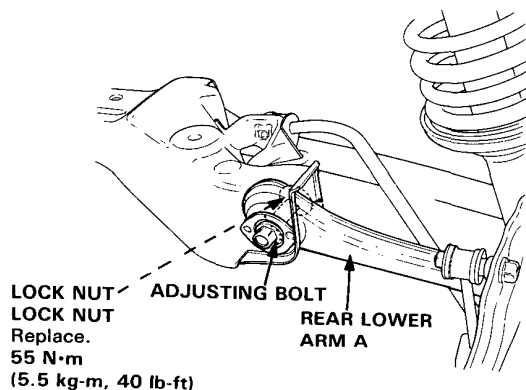
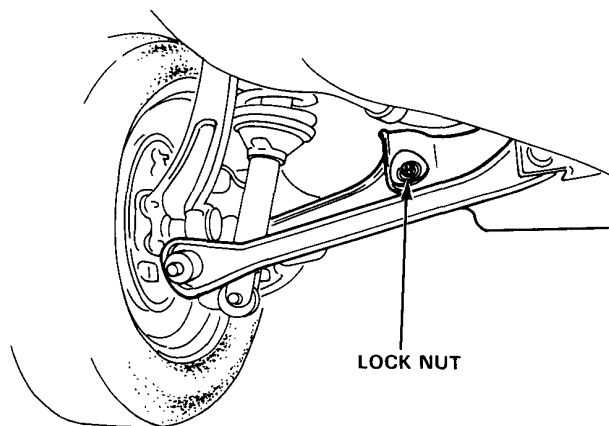
**Rear toe in:  $0 \pm 2$  mm ( $0 \pm 0.08$  in)**

- 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.

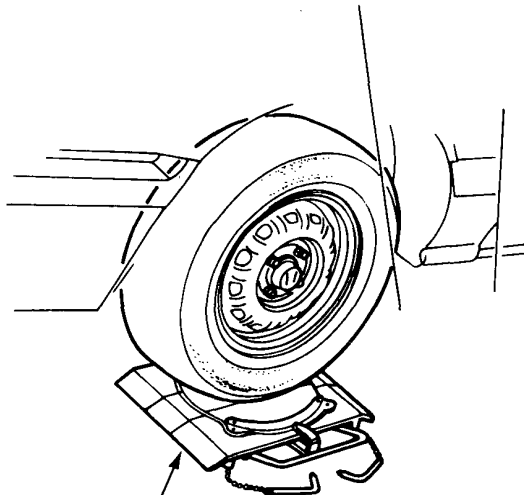
**Turning angle:**

**Inward wheel:  $39^\circ 30' \pm 2$**

**Outward wheel:  $30^\circ 30' \pm 2$**

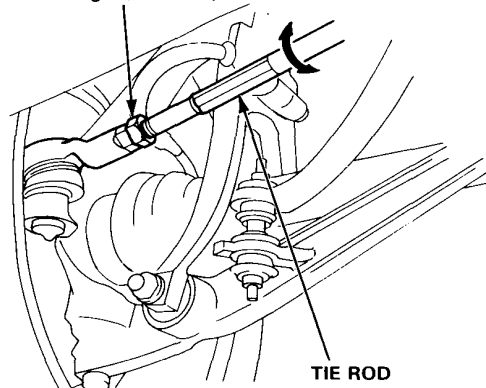
3. If the measurements are not within the specifications, adjust as required by turning the tie rod.

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.



**TURNING RADIUS GAUGE**

**LOCK NUT**  
**45 N·m**  
**(4.5 kg-m, 33 lb-ft)**



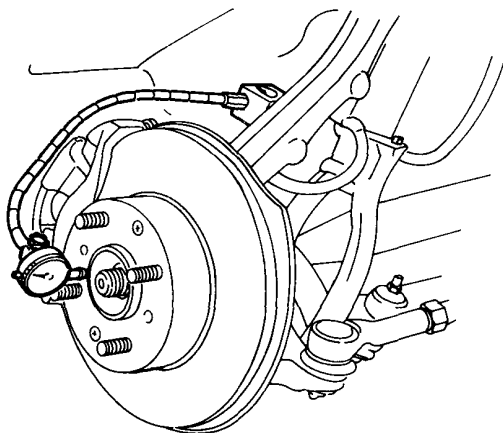


# Wheel Measurement

## Bearing End Play

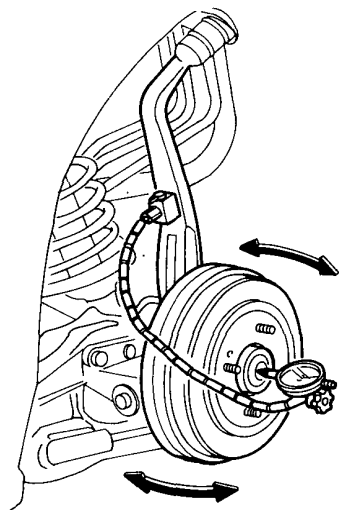
### Front Wheel End Play

Standard: 0—0.05 mm (0—0.002 in)



### Rear Wheel End Play

Standard 0—0.05 mm (0—0.002 in)



## Runout

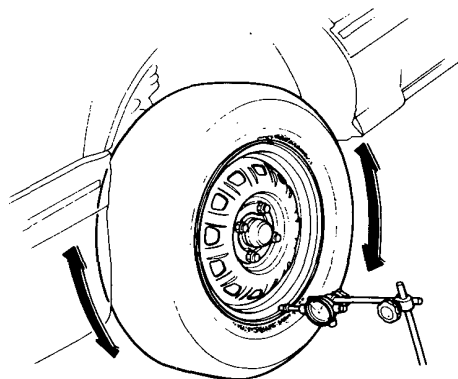
### Front and Rear Wheel

#### Axial Runout

Standard:

Steel Wheel: 0—0.1 mm (0—0.04 in)

Aluminum Wheel: 0—0.7 mm (0—0.03 in)



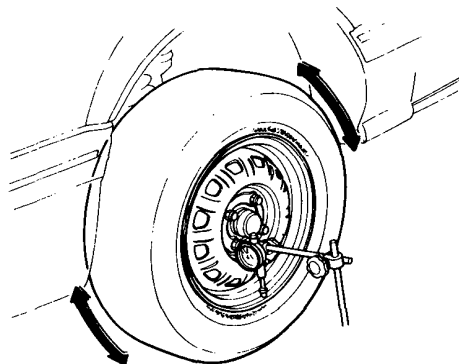
### Front and Rear Wheel

#### Radial Runout

Standard:

Steel Wheel: 0—0.1 mm (0—0.04 in)

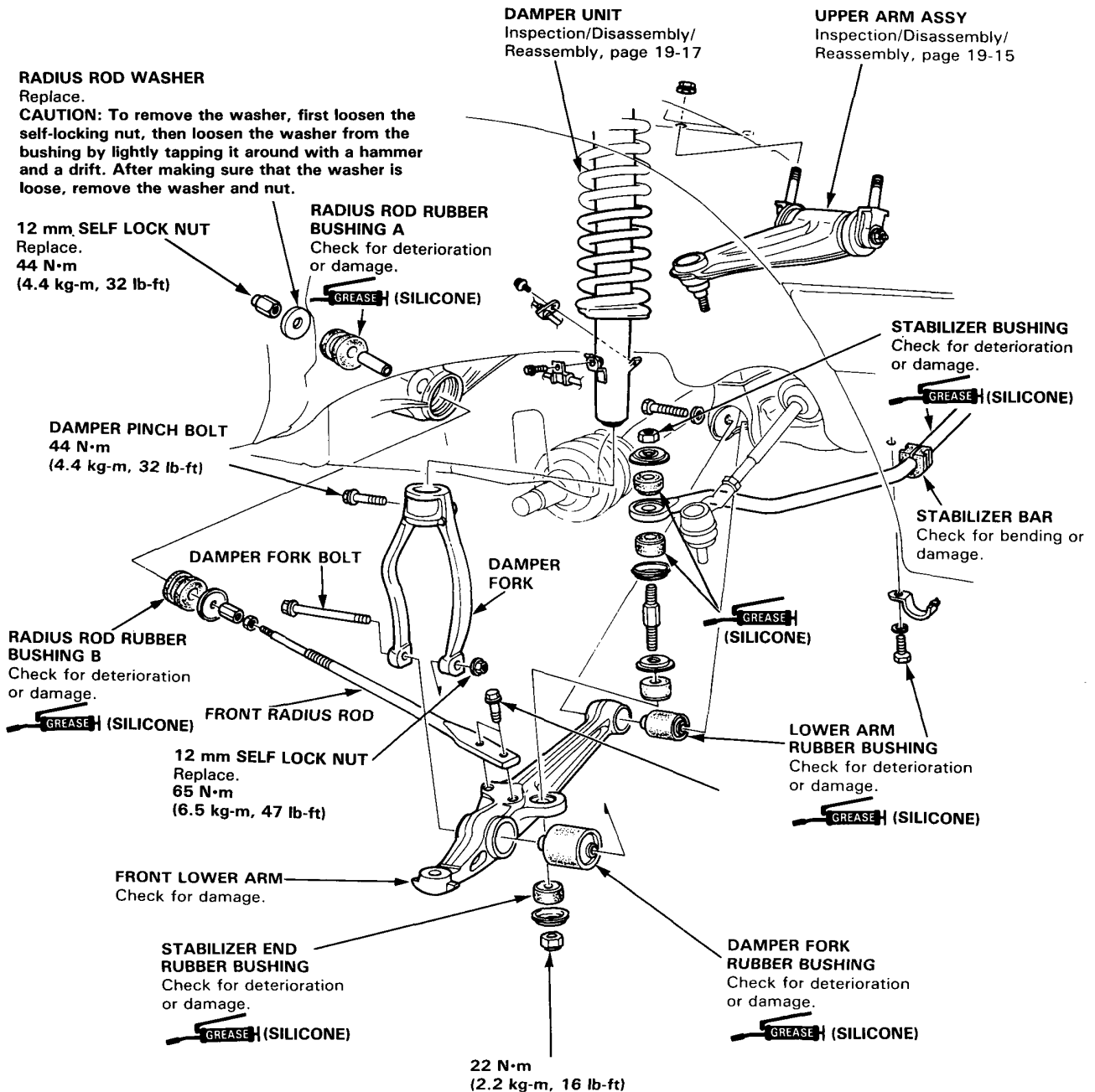
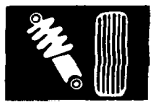
Aluminum Wheel: 0—0.7 mm (0—0.03 in)





# Front Suspension

## Disassembly and Inspection



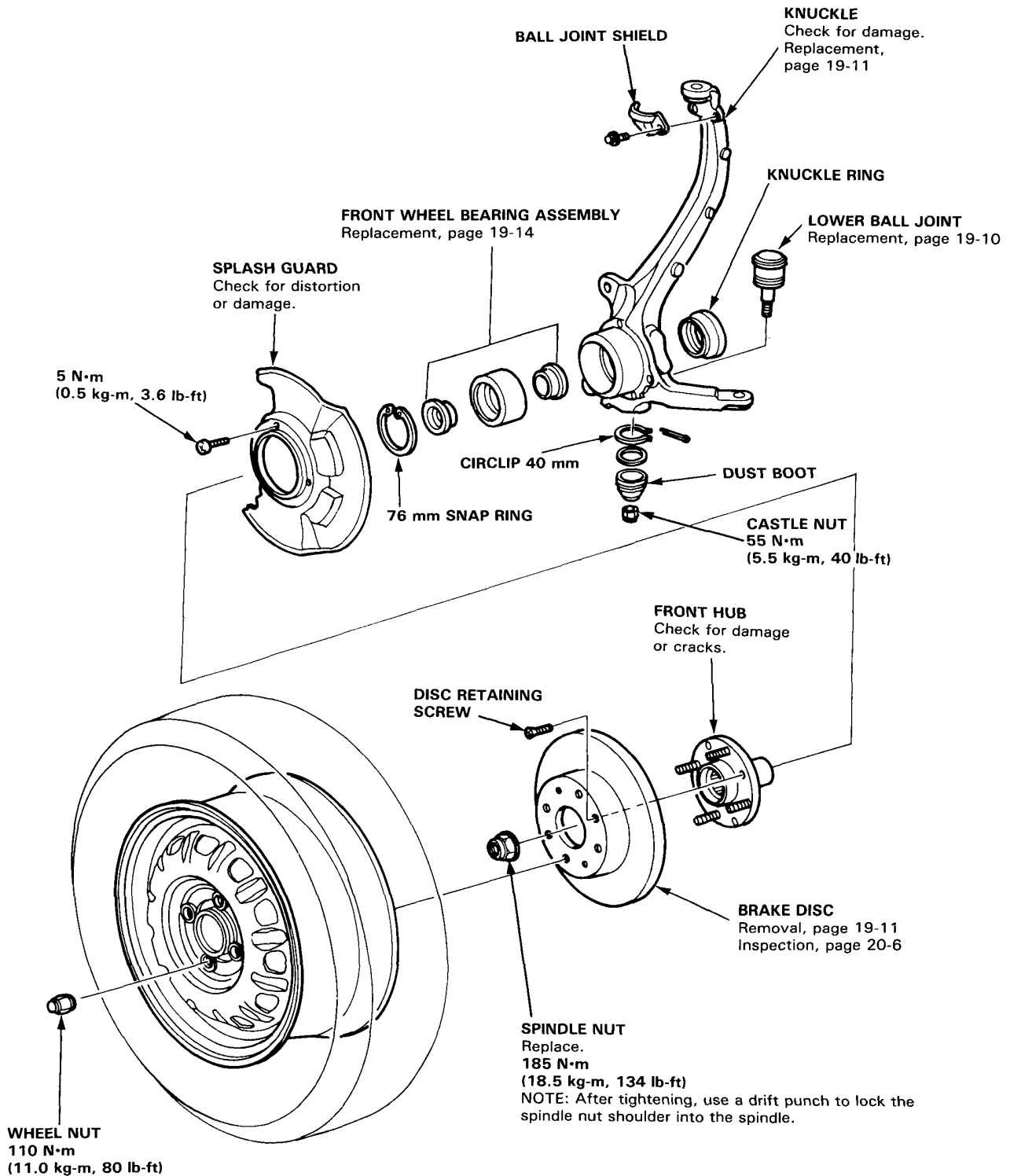
NOTE: The radius rod bushings can be installed for each other. However, the thick bushing should be installed in front position.

(cont'd)



# Front Suspension

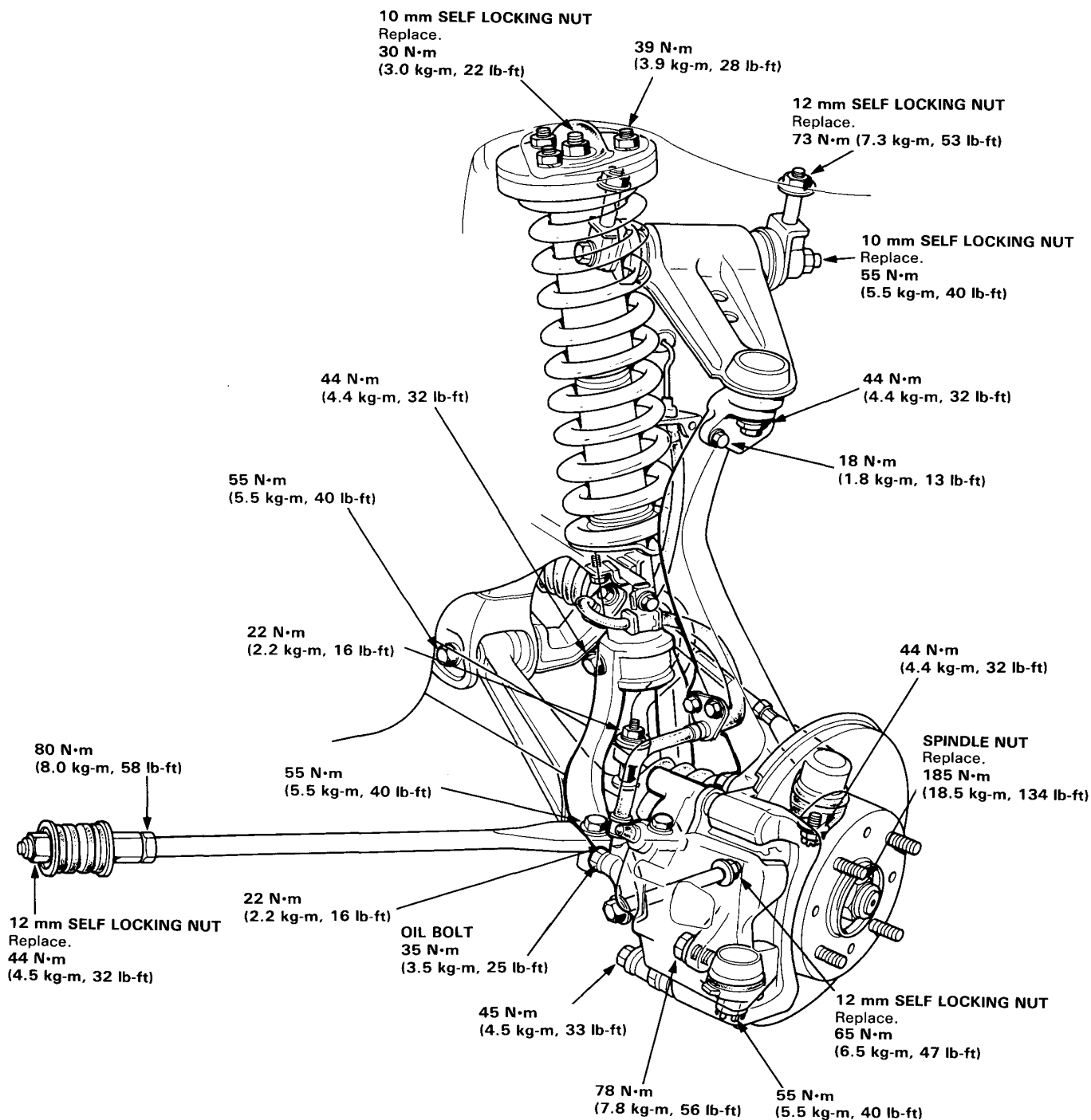
## Disassembly and Inspection (cont'd)







## Torque Specification



NOTE: Before tightening the bolts or nuts connected to the rubber mounts or bushings, the vehicle weight must be loaded.

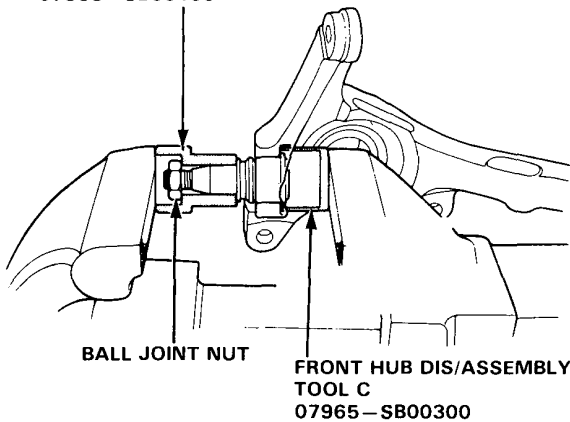


# Front Suspension

## Lower Ball Joint Replacement

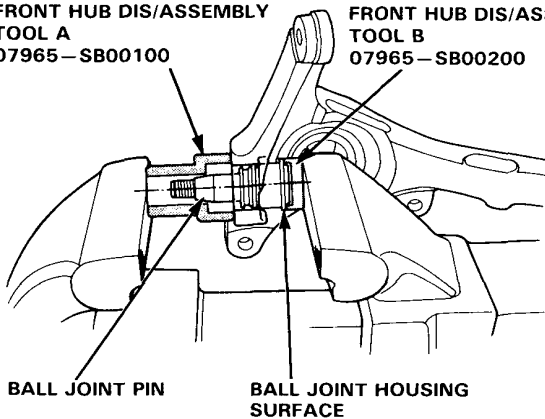
1. Remove the knuckle (page 19-11).
2. Remove the boot by prying the snap ring off.
3. Remove the 40 mm circlip.
4. Install the special tool on the ball joint and tighten the ball joint nut.
5. Position the special tool over the ball joint as shown then set the assembly in a vise. Press the ball joint out of the knuckle.

**FRONT HUB DIS/ASSEMBLY  
TOOL A  
07965-SB00100**

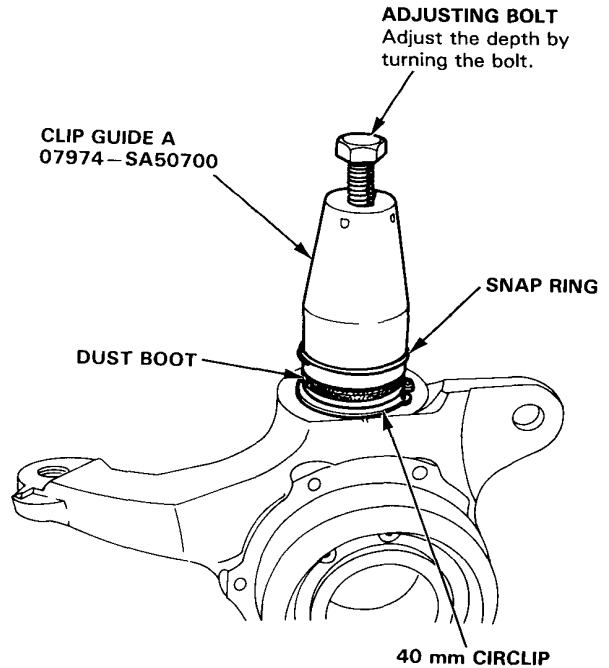


6. Place the ball joint in position by hand.
7. Install the special tool over the ball joint as shown, then press the ball joint in.

**FRONT HUB DIS/ASSEMBLY  
TOOL A  
07965-SB00100**      **FRONT HUB DIS/ASSEMBLY  
TOOL B  
07965-SB00200**



8. Install the 40 mm circlip.
9. Install the boot and snap ring using the special tool.



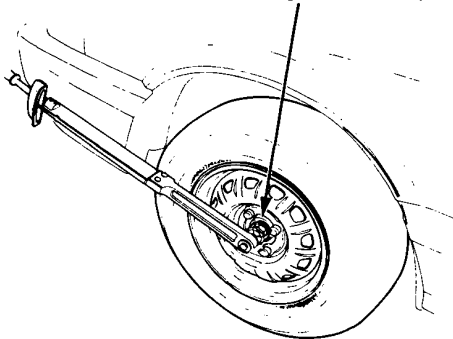




## Knuckle/Hub Replacement

1. Pry the spindle nut lock tab away from the spindle, then loosen the nut using a 32 mm socket.

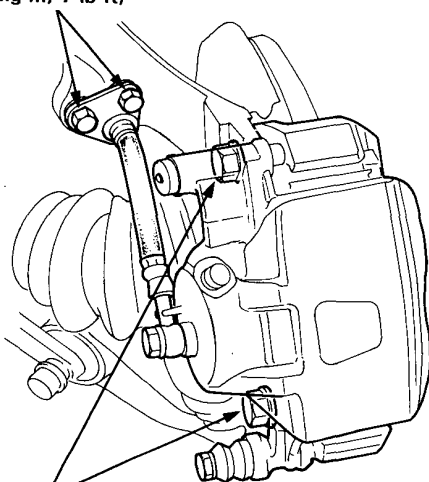
**SPINDLE NUT**  
Replace  
**185 N·m**  
(18.5 kg-m, 134 lb-ft)



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 under-carriage.

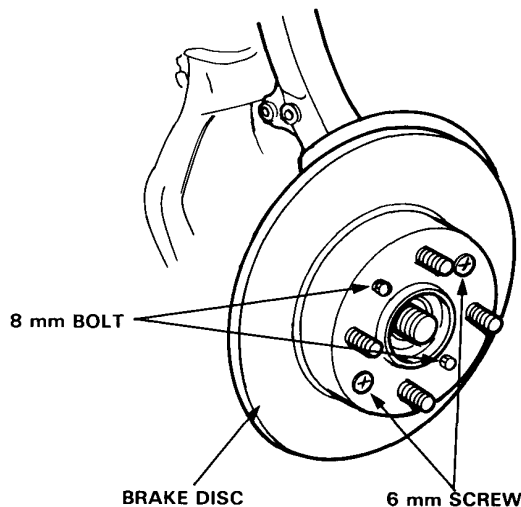
**10 N·m**  
(1.0 kg-m, 7 lb-ft)



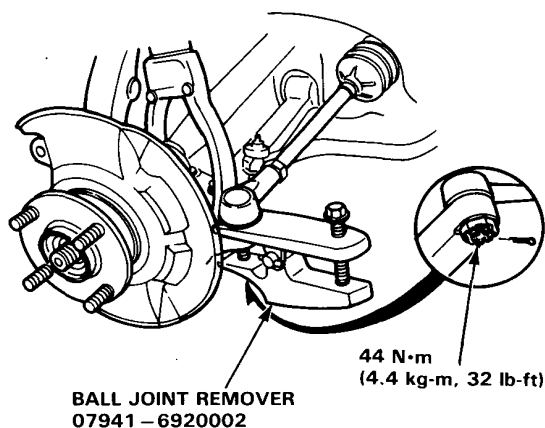
**78 N·m**  
(7.8 kg-m, 56 lb-ft)

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.



**44 N·m**  
(4.4 kg-m, 32 lb-ft)

**BALL JOINT REMOVER**  
07941-6920002

(cont'd)



# Suspension

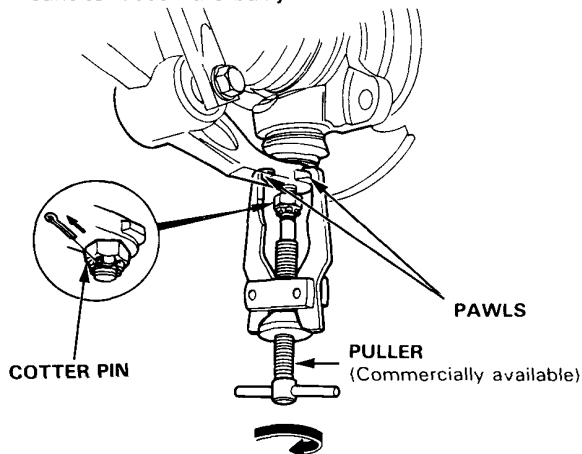
## Knuckle/Hub Replacement (cont'd)

10. Pry the cotter pin off and loosen the lower arm ball joint nut half the length of the joint threads.

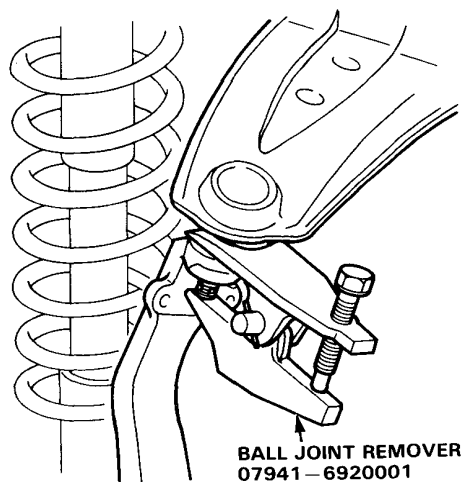
11. Separate the ball joint and lower arm using a puller with the pawls applied to the lower arm.

**CAUTION:** Avoid damaging the ball joint boot.

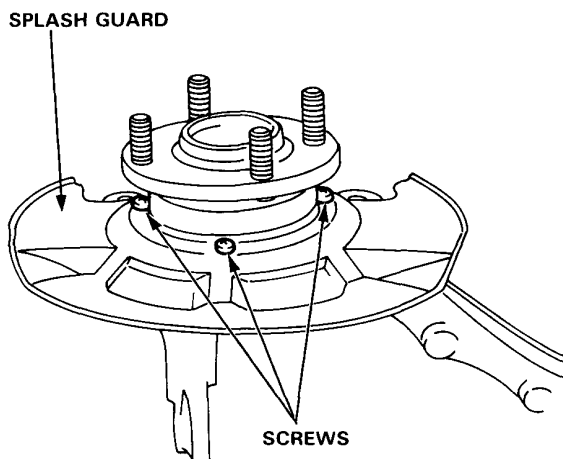
**NOTE:** If necessary, apply penetrating type lubricant to loosen the ball joint.



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.



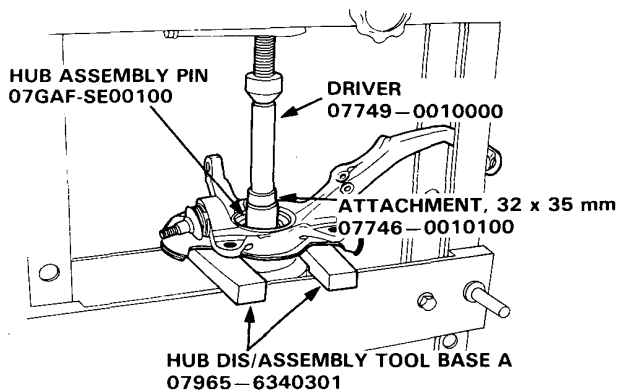
16. Remove the splash guard screws from the knuckle.



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.

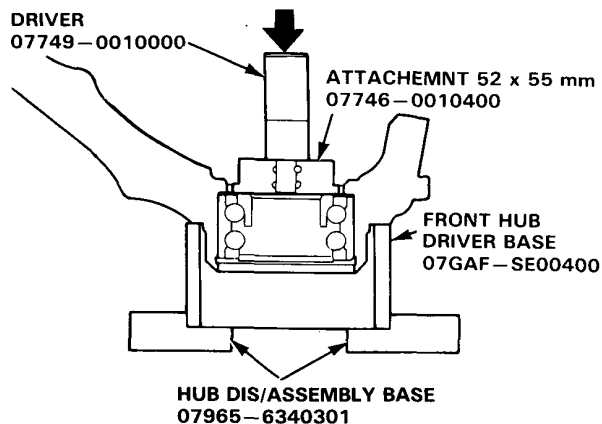




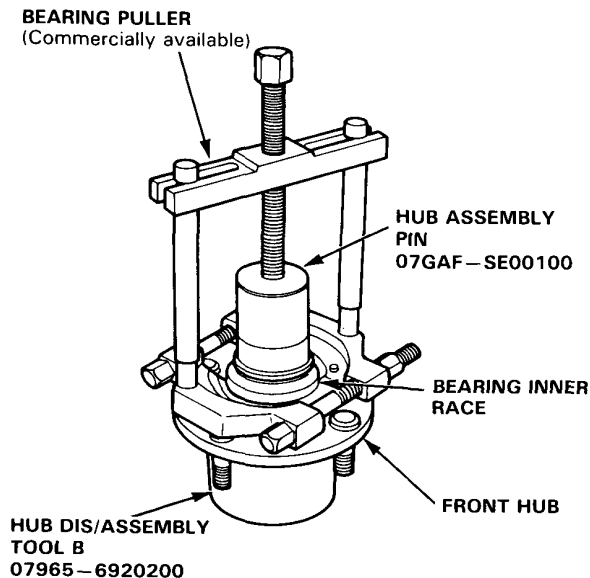


18. Remove the 76 mm snap ring and knuckle ring from the knuckle.

19. Press the wheel bearing out of the knuckle using the special tools shown and a hydraulic press.

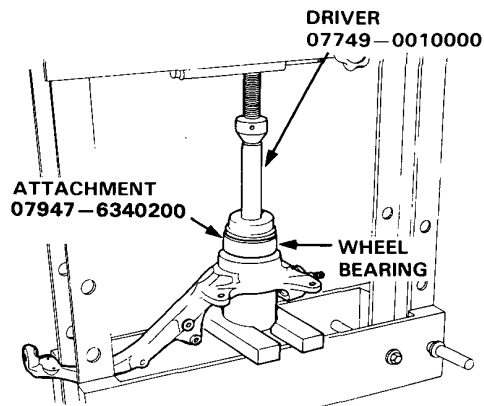


20. Remove the outboard bearing inner race from the hub using the special tools shown and a bearing puller.

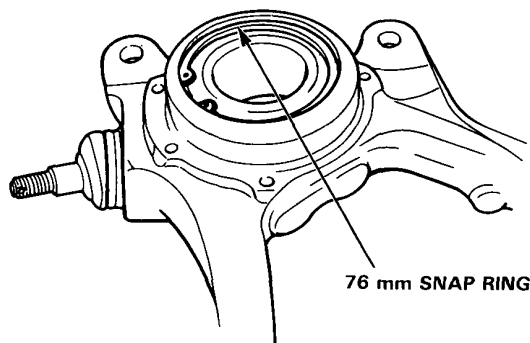


NOTE: Wash the knuckle and hub thoroughly before reassembly.

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)

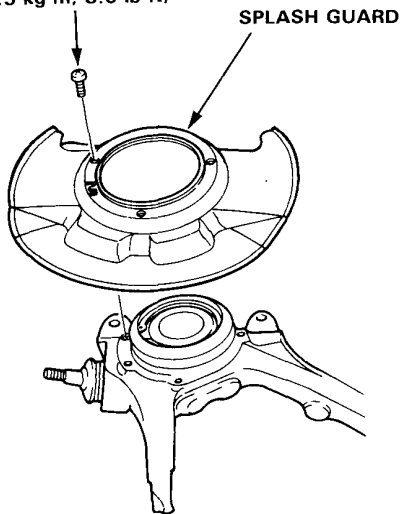


# Suspension

## Knuckle/Hub Replacement (cont'd)

23. Install the splash guard and tighten the screws.

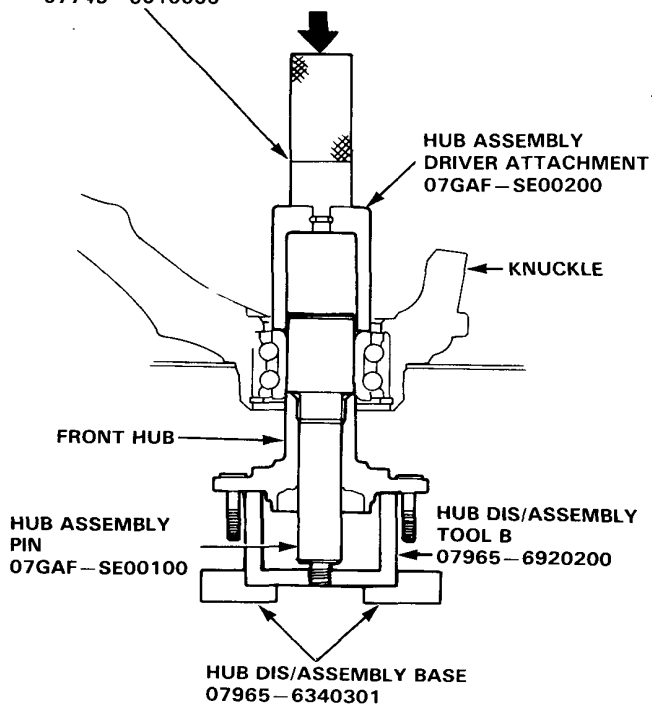
5 N·m  
(0.5 kg-m, 3.6 lb-ft)



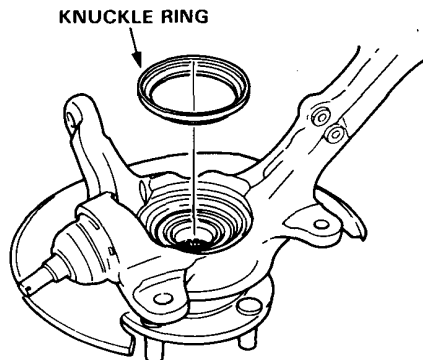
24. Place the front hub in special tool fixture, then set the knuckle in position and apply downward pressure with a hydraulic press.

**CAUTION:** Maximum press load: 2 tons.

DRIVER  
07749-0010000



25. Install the front knuckle ring on the knuckle.

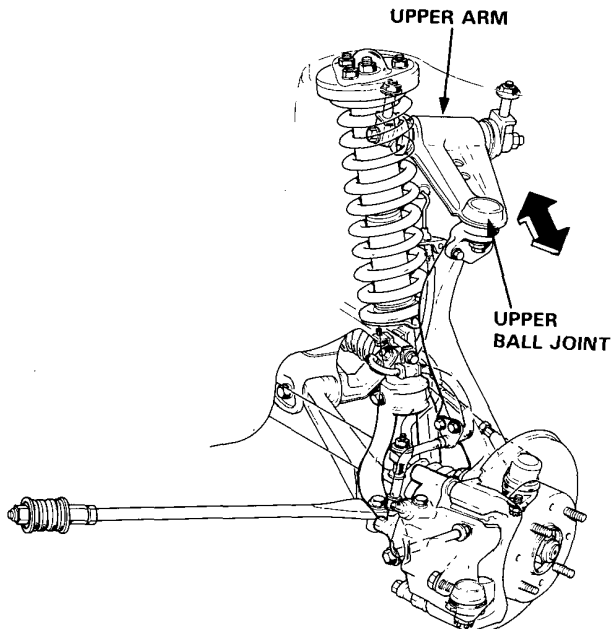




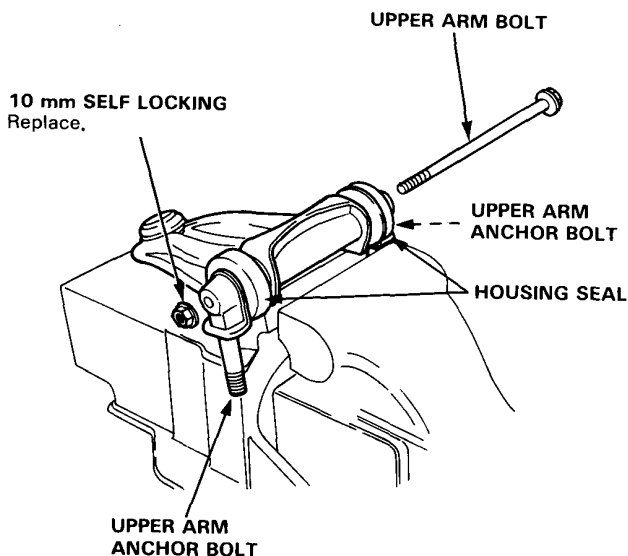


## Upper Arm Bushing Replacement

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.

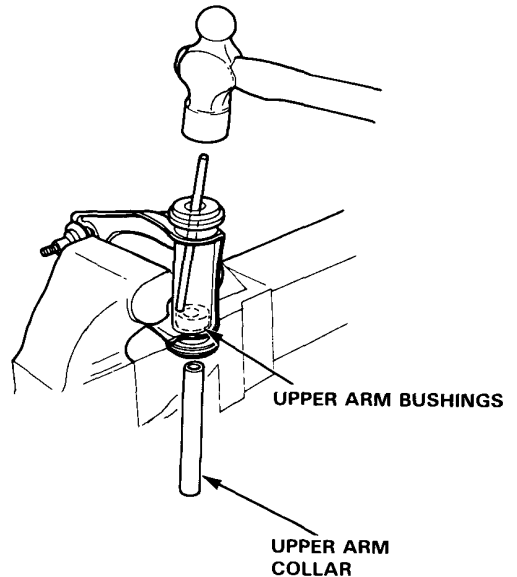


4. Lightly hold the upper arm anchor bolts in the jaws of a vise as shown.

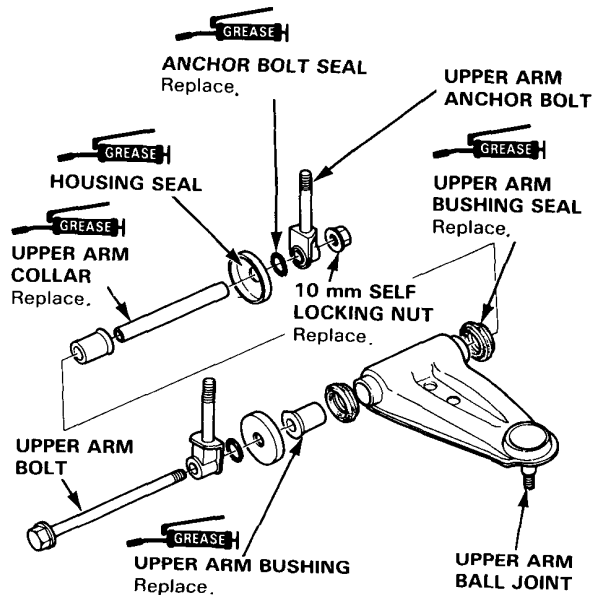


5. Remove the 10 mm self locking nut, upper arm bolt, upper arm anchor bolts and housing seals.

6. Install the upper arm in a vice.



7. Remove the upper arm collar.
8. Drive out the upper arm bushings with a drift.
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)

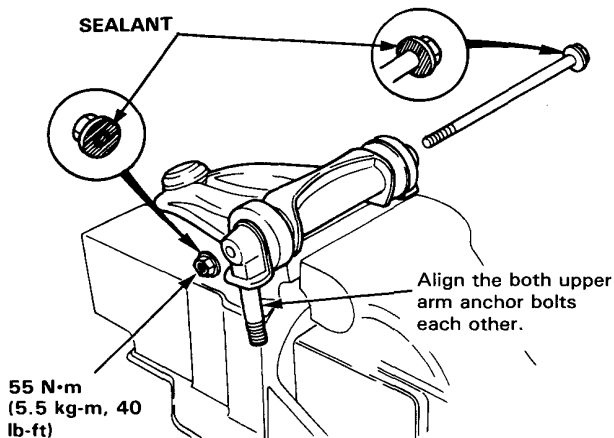


# Front Suspension

## 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.

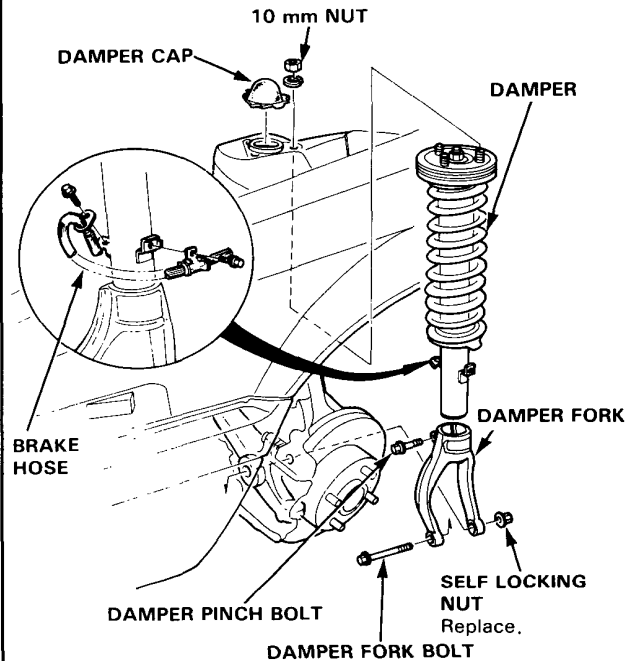
NOTE: Do not apply sealant to the areas other than specified.



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.



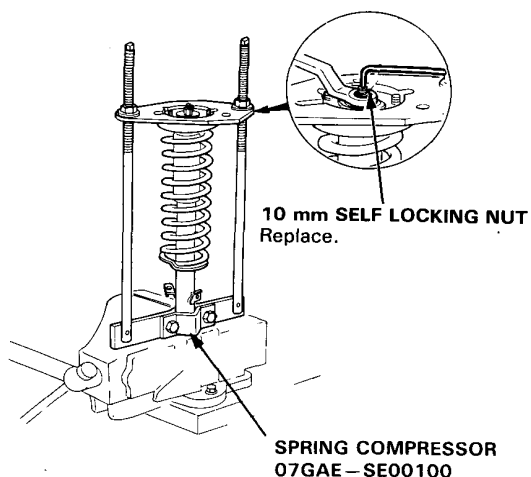




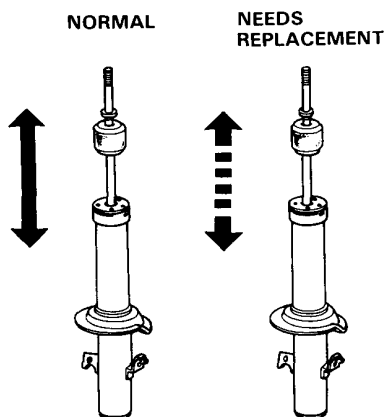
## Damper Disassembly and Inspection

1. Compress the damper spring using the spring compressor, then remove the self locking nut.

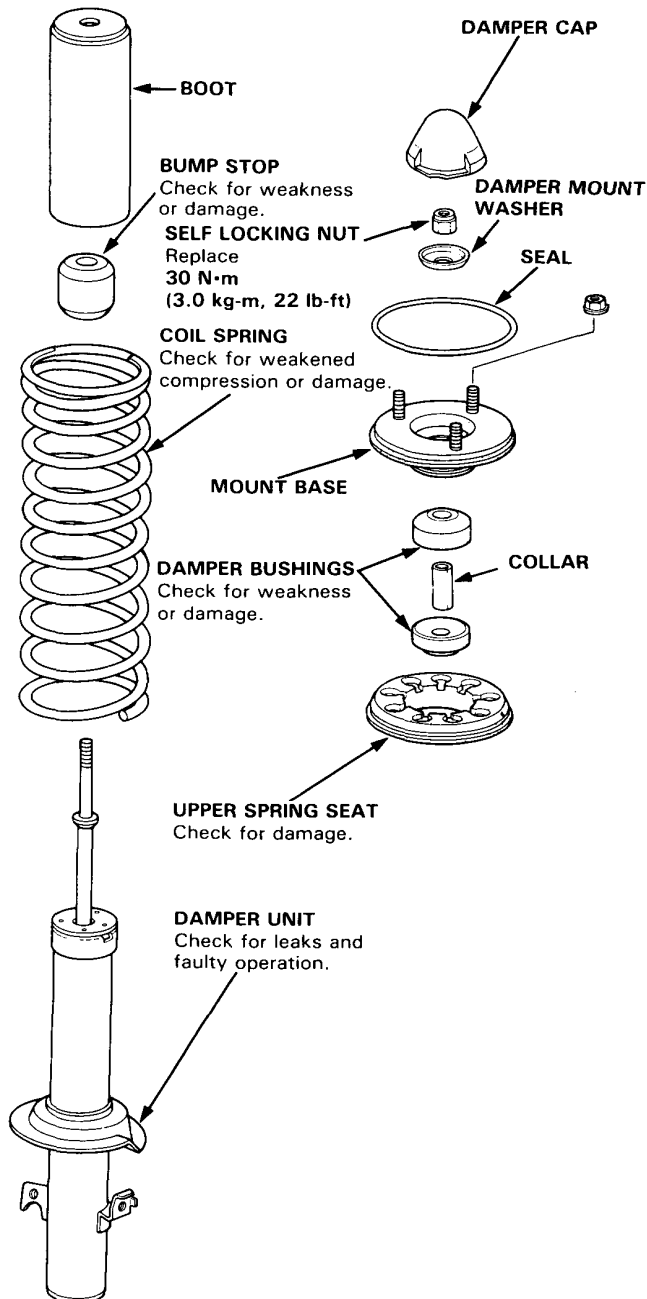
**CAUTION:** Do not compress the spring more than necessary to remove the nut.



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.



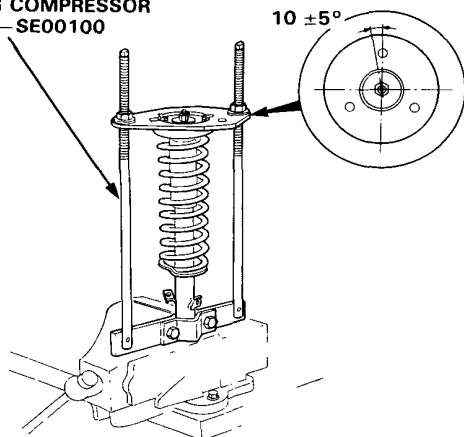


# Front Suspension

## Damper Reassembly

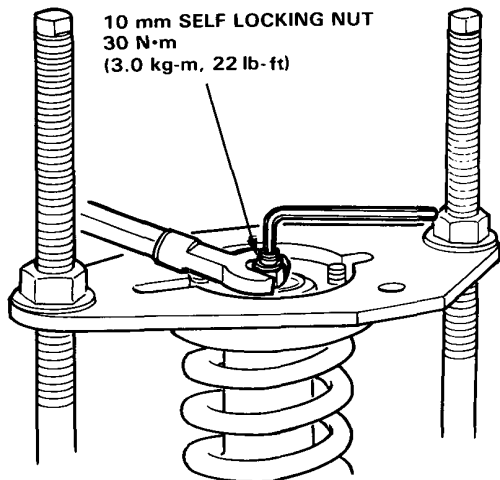
1. Install the damper unit, coil spring, bump stop, boot, upper spring seat, damper bushings, and collar on the spring compressor.
2. Install the mount base on the damper unit as shown.

SPRING COMPRESSOR  
07GAE—SE00100



NOTE: Left side shown, right side antithesis.

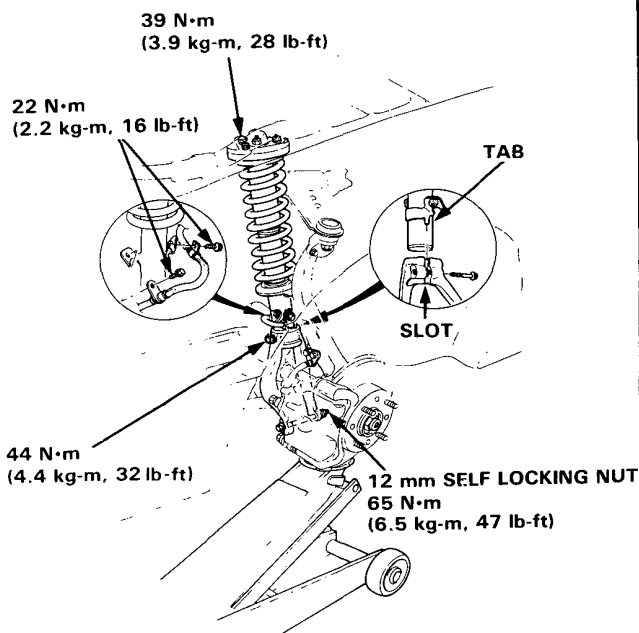
3. Compress the coil spring.
4. Install the damper mount washer and new 10 mm self locking nut.
5. Hold the damper shaft and tighten the 10 mm self locking nut.



## 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.



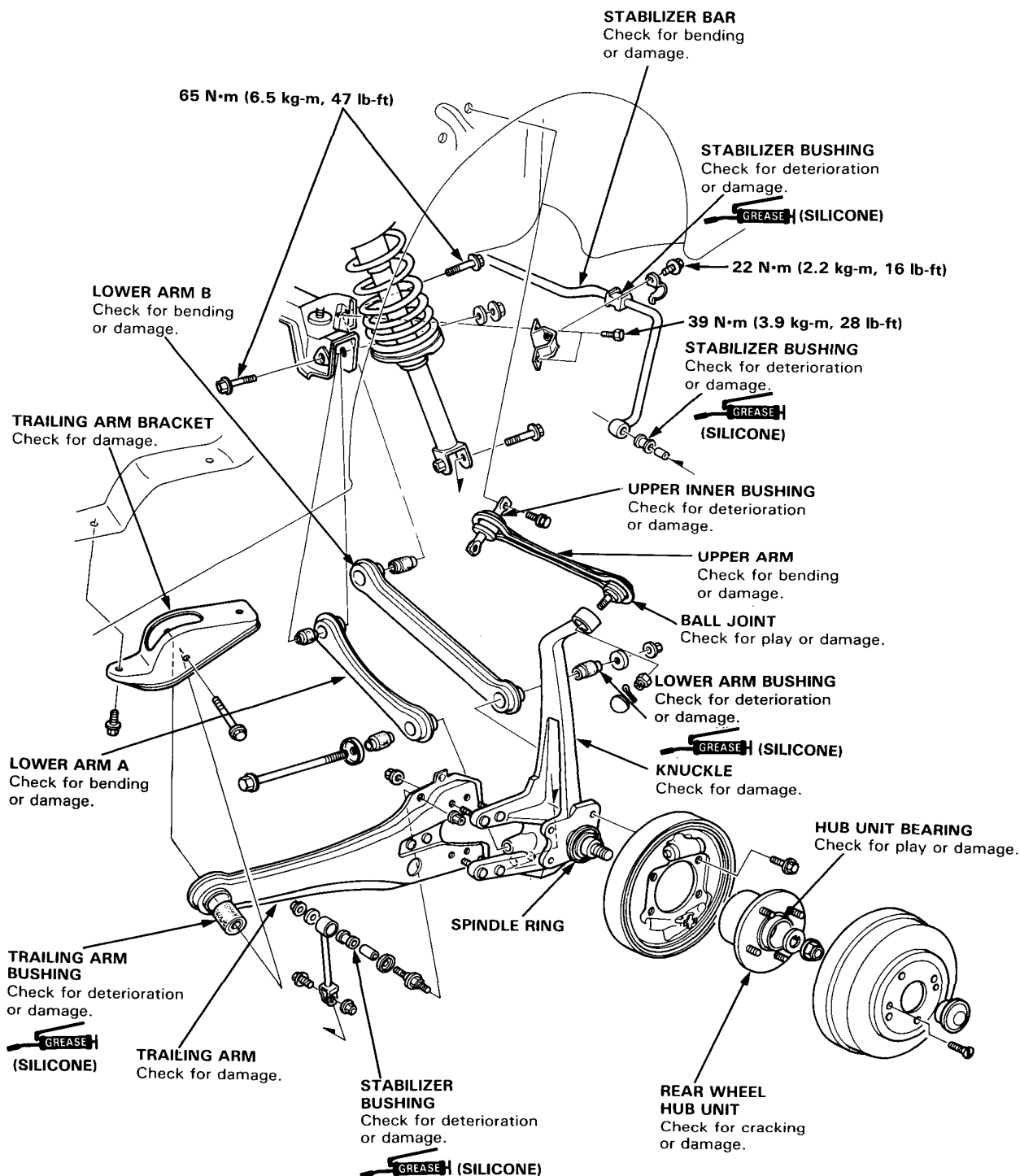
5. Tighten the damper pinch bolt.
6. Secure the damper fork bolt with a new 12 mm self locking nut.
7. Secure the damper assembly to the frame with the 10 mm mount nuts.
8. Install the brake hose clamps with the two bolts.



# Rear Suspension

## Inspection

(Drum Brake Model)

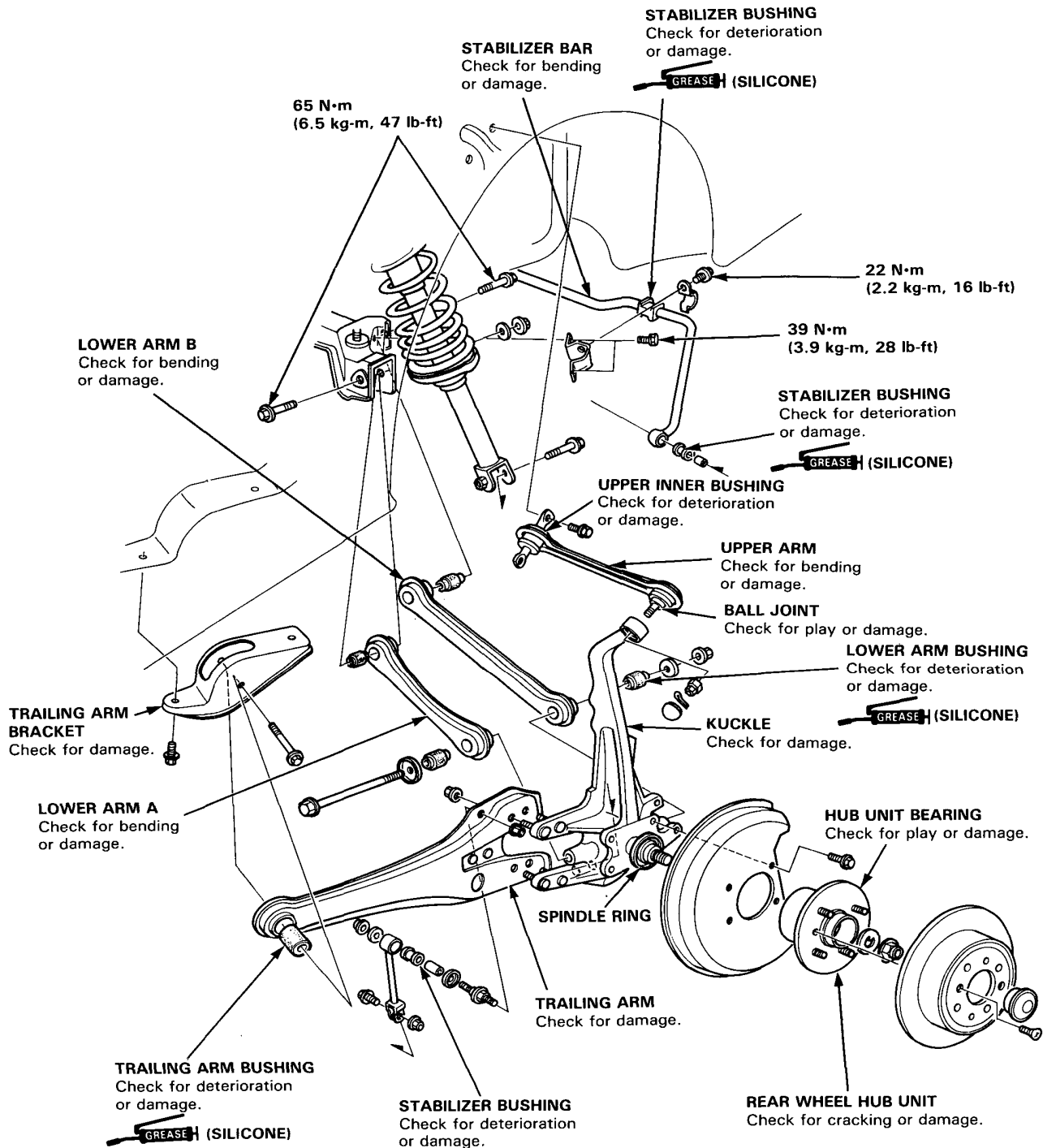




# Rear Suspension

## Inspection

(Disc Brake Model)

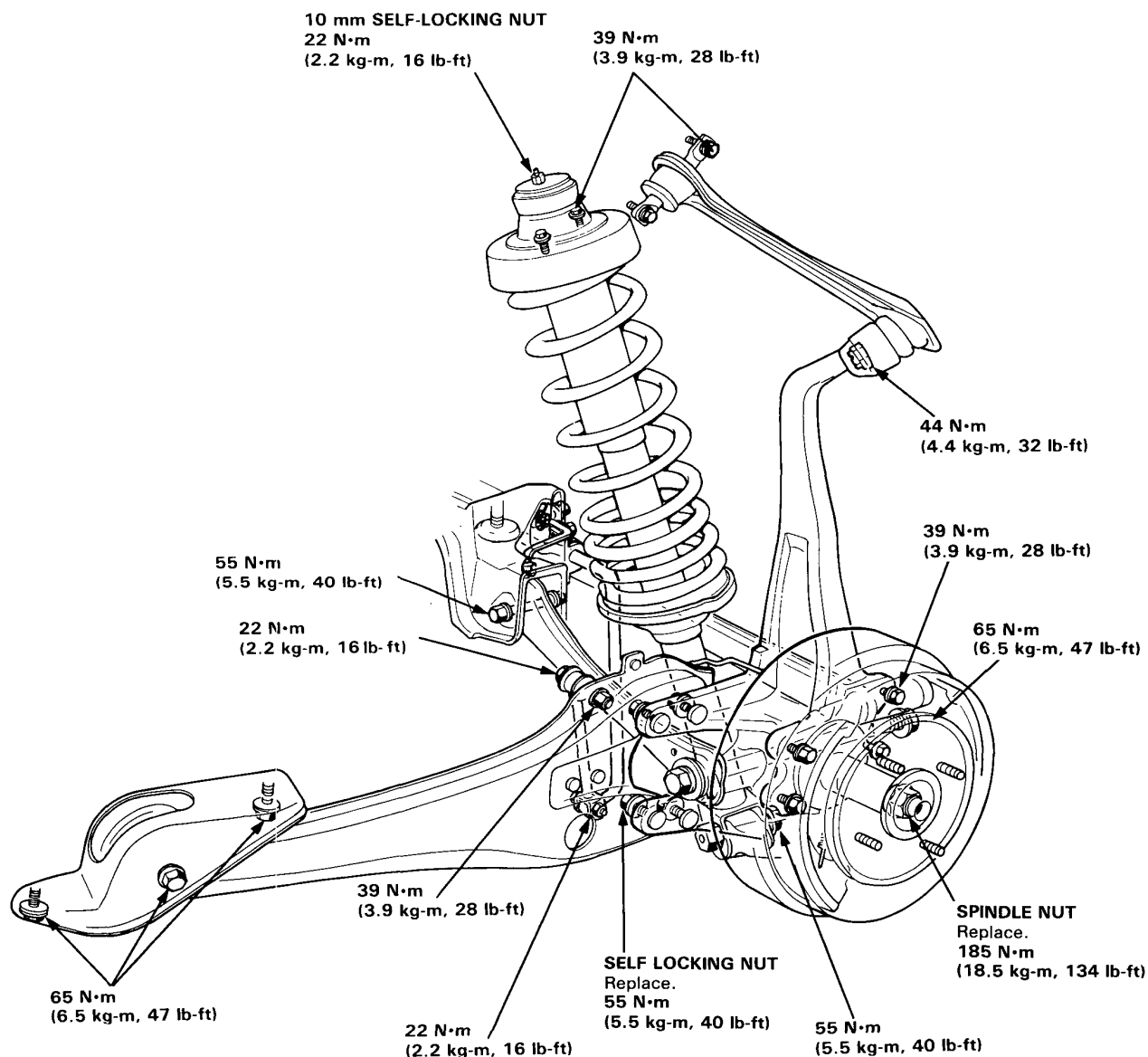






## Torque Spec

(Drum Brake Model)



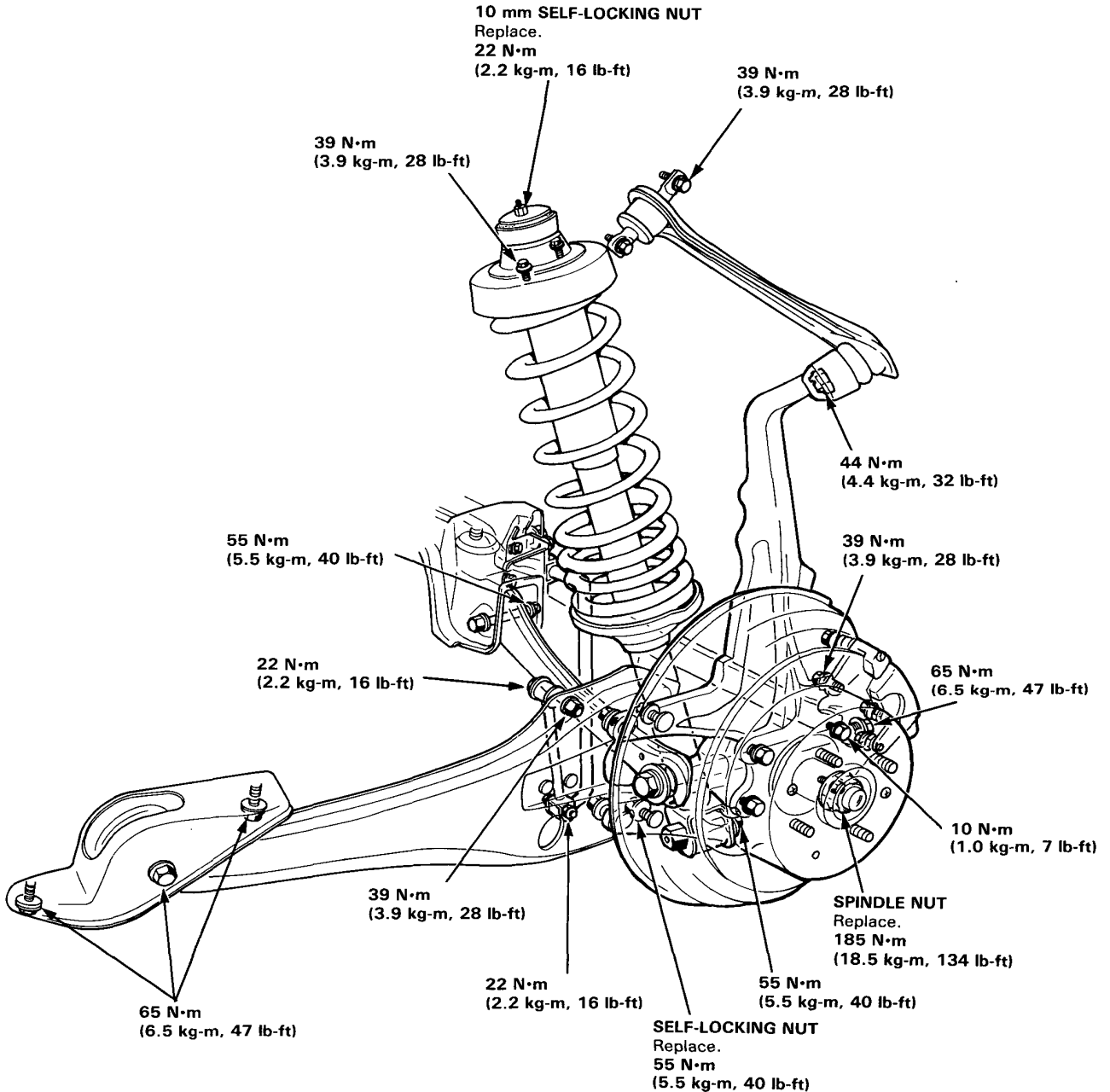
NOTE: Before tightening the bolts or the nuts connected to the rubber mounts or bushings, the vehicle weight must be loaded.



# 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.





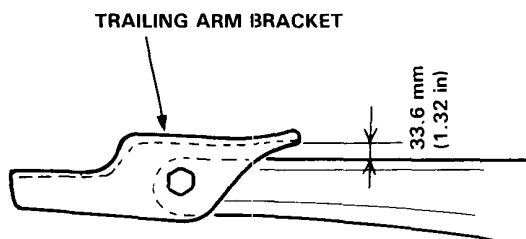
## Dis/Assembly Precautions

**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).

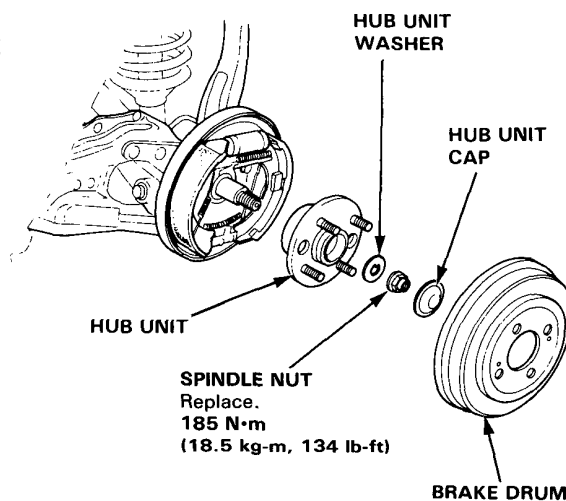


Install the trailing arm bushing with its **FR** mark facing forward.

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.



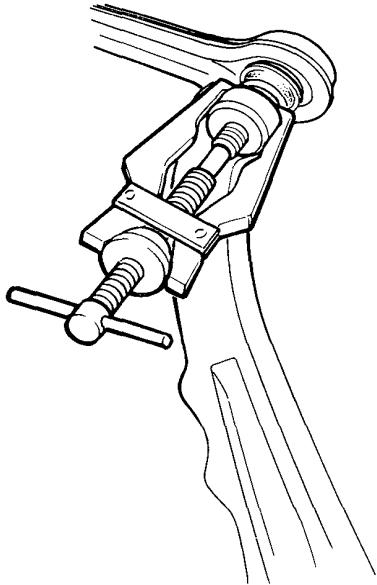
5. Install in the reverse order of removal and tighten a new spindle nut to specified torque, then stake the nut.



# Rear Suspension

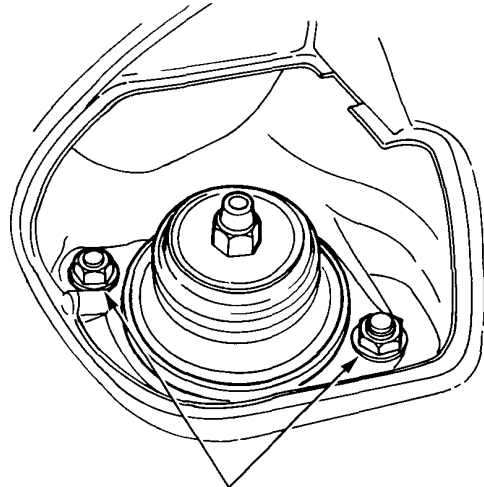
## Ball Joint Removal

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.



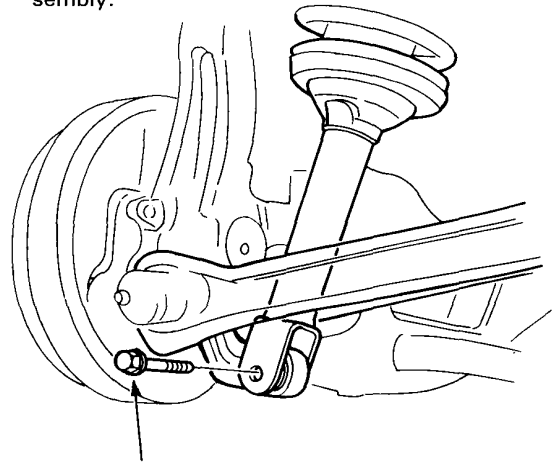
## Damper Removal

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 downward and move the damper in front of lower arm A, then remove the damper.





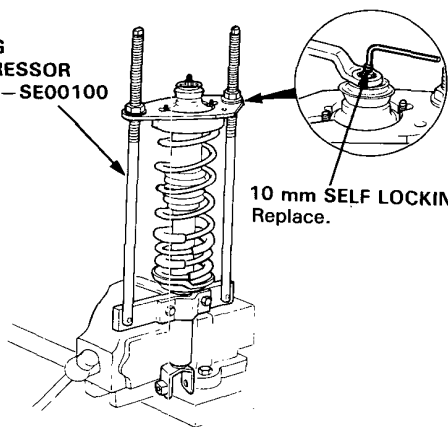
## Damper Disassembly/Inspection

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.

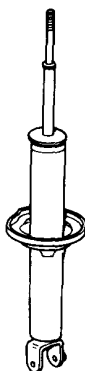
SPRING  
COMPRESSOR  
07GAE-SE00100



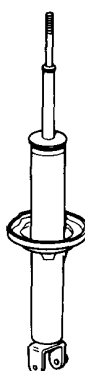
10 mm SELF LOCKING NUT  
Replace.

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.

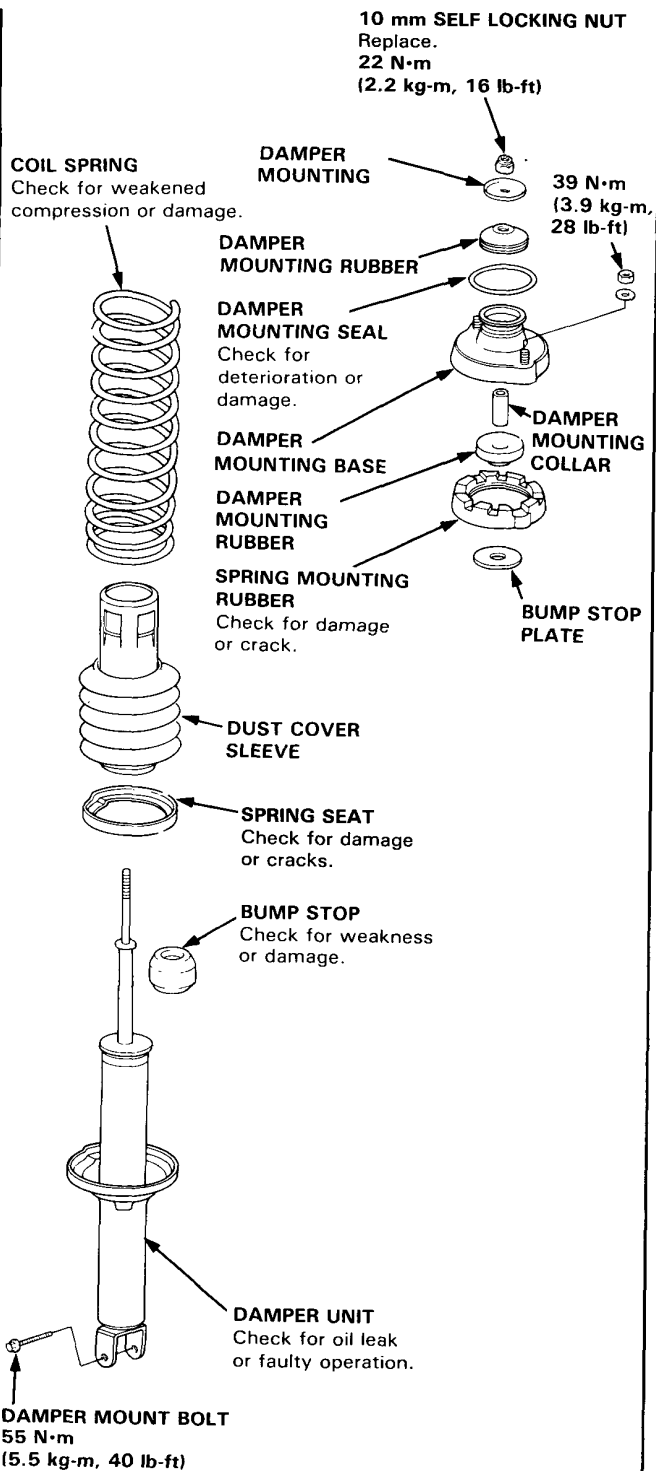
NORMAL



NEEDS  
REPLACEMENT



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.



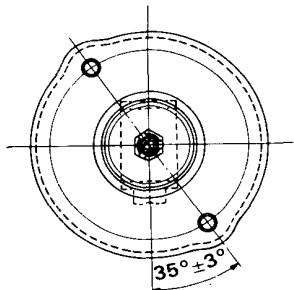


# Rear Suspension

## Damper Reassembly

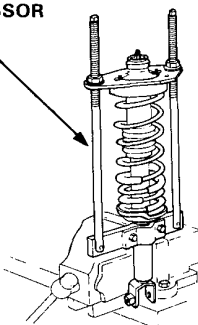
1. Install the spring seat on the damper unit.
2. Install the damper unit, dust cover, coil spring, bump stop plate, damper mounting collar, spring mounting rubber, damper mounting rubber and damper mounting base on the special tool.
3. Install the damper mounting base on the damper unit so that the angle of the bolts is as shown.

NOTE: Left side shown, right side antithesis.

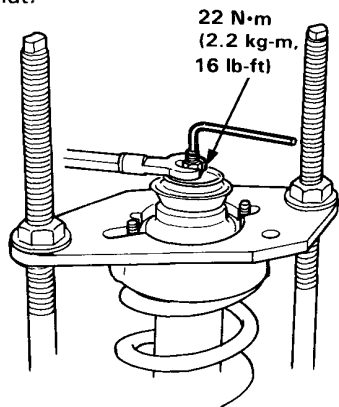


4. Compress the coil spring.

SPRING COMPRESSOR  
07GAE-SE00100

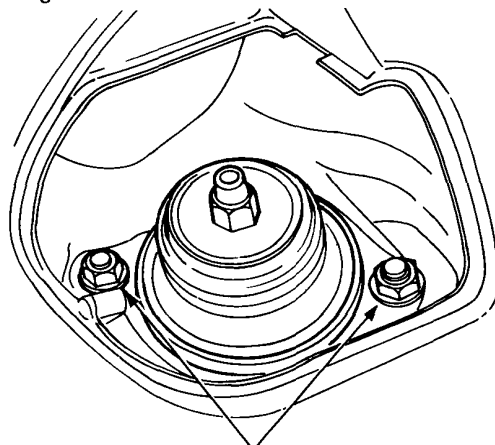


5. Install the damper mounting rubber and damper mounting washer, and loosely install a new 10 mm self locking nut.
6. Hold the damper shaft and tighten the 10 mm self locking nut.



## 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.

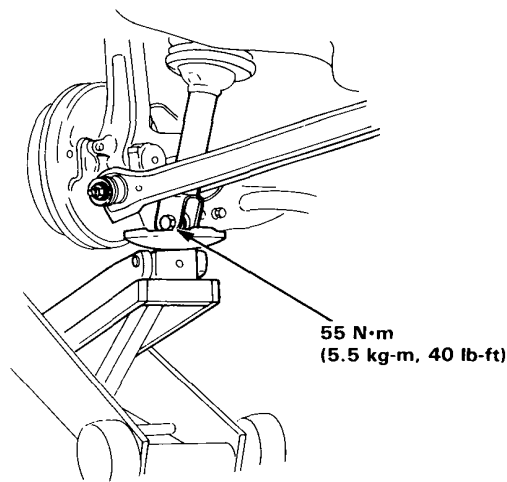


4. Raise the rear suspension with a floor jack until the weight of the car is on the damper.

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

Index .....	20-2
Bleeding .....	20-3
Maintenance and Inspection .....	20-4
Front Brakes .....	20-8
Master Cylinder .....	20-13
Brake Booster .....	20-16
Rear Drum Brake .....	20-36
Rear Disc Brake .....	20-41
Brake Hoses/Pipes .....	20-50
Parking Brake .....	20-51
Switches .....	20-52

### 4W-ALB

Index .....	20-53
Fluid Delivery .....	20-54
Functional Test .....	20-55
Troubleshooting .....	20-56
Master Cylinder .....	20-68
Modulator Assy .....	20-73
Solenoid .....	20-75
Piston/Stroke Switch .....	20-78
Power Unit .....	20-82
Accumulator .....	20-85
Air Bleeding .....	20-87
Pulser/Sensor .....	20-93





# 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.

### PARKING BRAKE

Adjustment, page 20-6.

Disassembly/reassembly,

page 20-51

Switch test, page 20-52.

### DUAL PROPORTIONING VALVE

Removal and installation, page 20-12.

Description, page 20-35.

### 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.

### 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

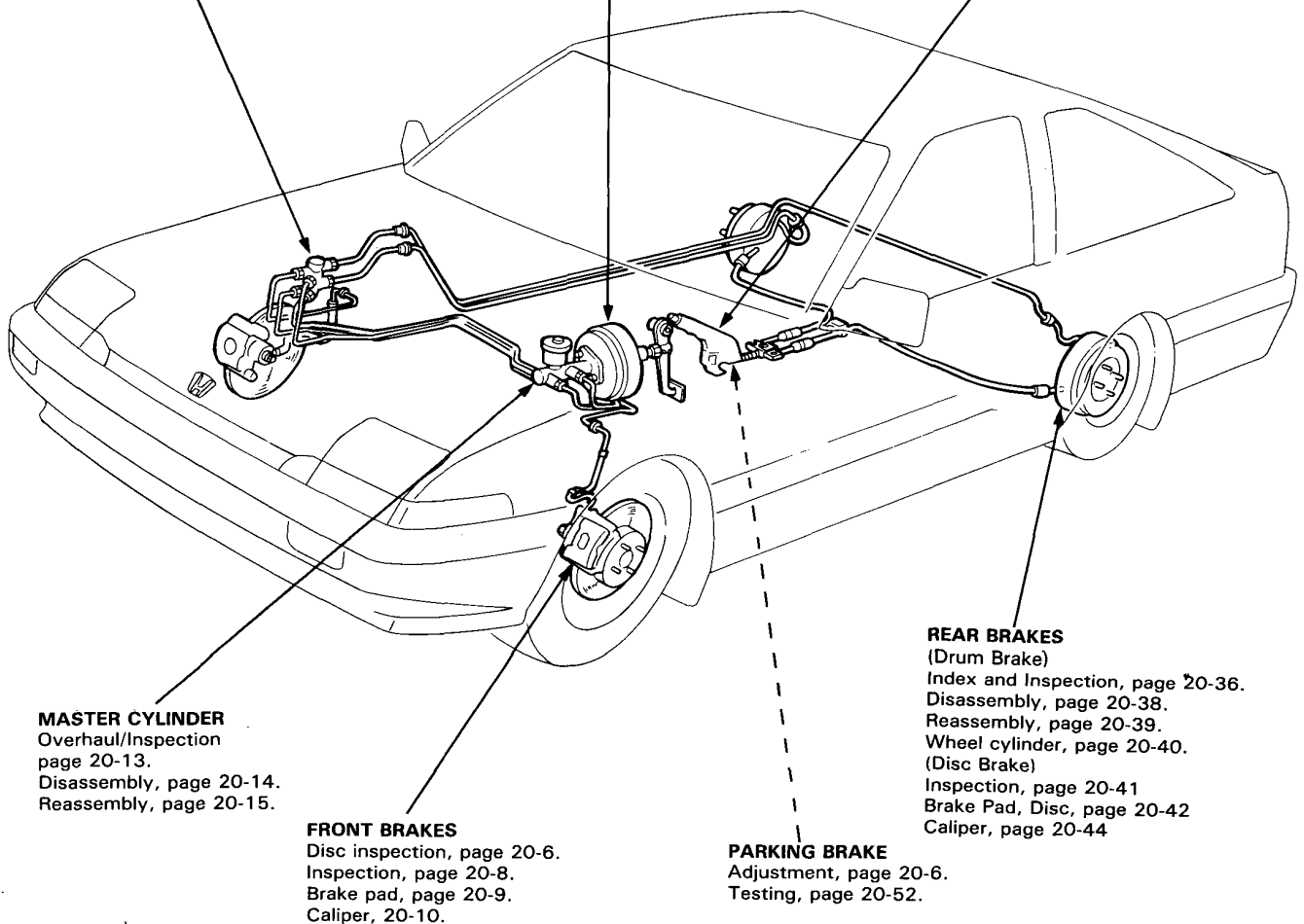
Brake Pad, Disc, page 20-42

Caliper, page 20-44

### PARKING BRAKE

Adjustment, page 20-6.

Testing, page 20-52.





# Bleeding

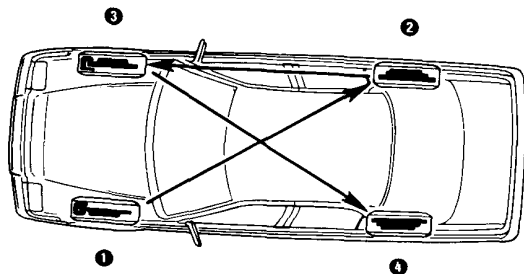


## CAUTION:

- 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.

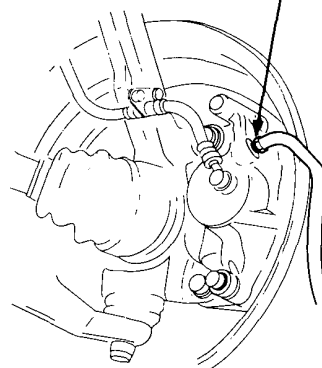
## Bleeding Sequence



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.

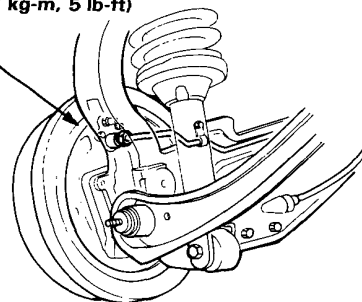
## FRONT

FRONT  
BLEED SCREW  
9 N·m (0.9 kg-m, 7 lb-ft)



## REAR

REAR BLEED SCREW  
7 N·m (0.7 kg-m, 5 lb-ft)



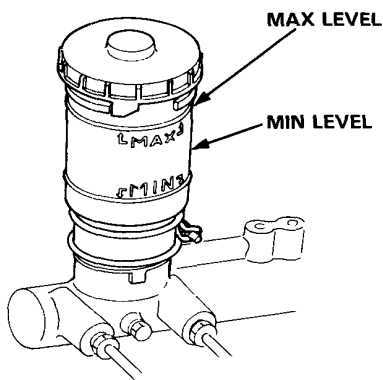
NOTE: Torque of bleed screw of rear disc brake: 9 N·m (0.9 kg-m, 7 lb-ft)



# Maintenance and Inspection

## 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.

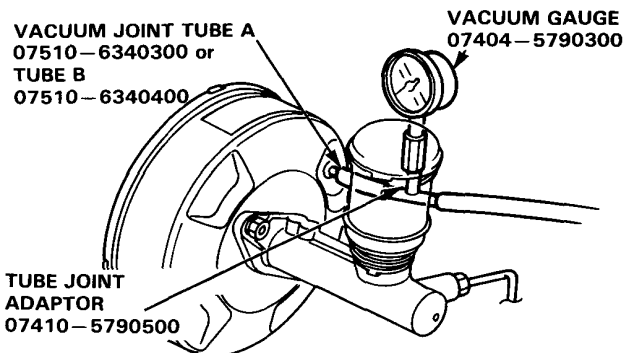
## Booster Test

### 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.

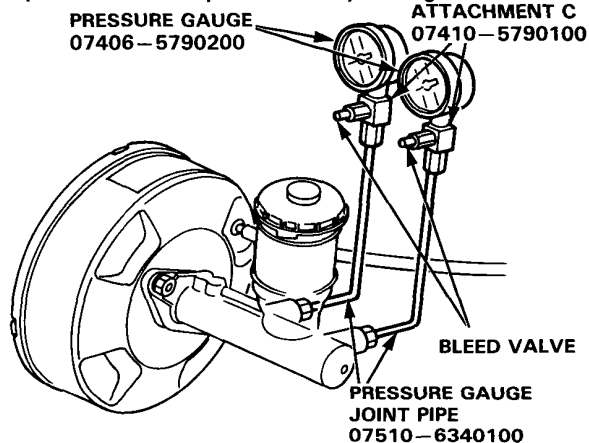
- Check valve
- Vacuum hose
- Seals
- Diaphragm
- Master cylinder rod seal and secondary cup



### 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.

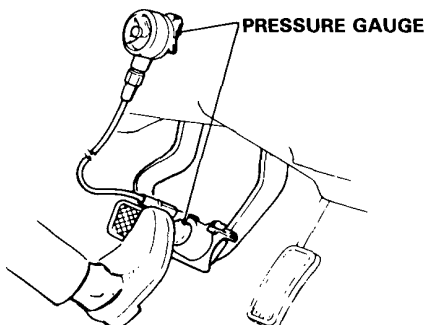
**CAUTION:** Avoid spilling brake fluid on painted, plastic or rubber parts as it may damage the finish.







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.

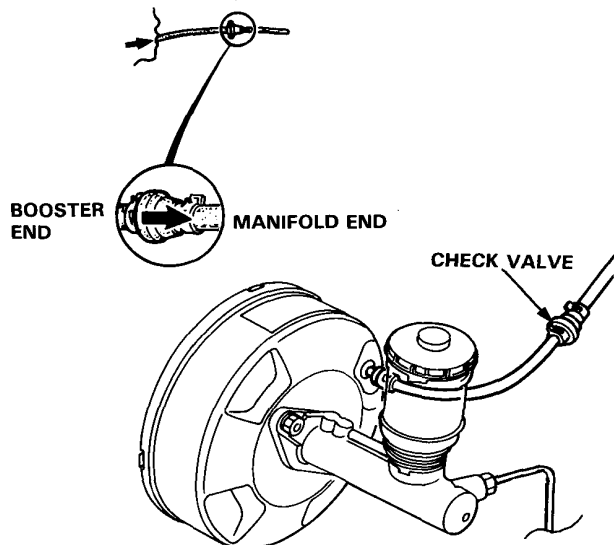


	Vacuum mmHg	Line pressure kpa (kg/cm <sup>2</sup> , psi)
8" Booster	0	1,304 (13.3, 189.1)
	300	4,501 (45.9, 652.7)
	500	6,629 (67.6, 961.3)
9" Booster	0	1,177 (12.0, 170.6)
	300	4,766 (48.6, 691.1)
	500	7,149 (72.9, 1,036.6)

6. Inspect the master cylinder pistons and cups in the readings do not fall within the limits shown above.

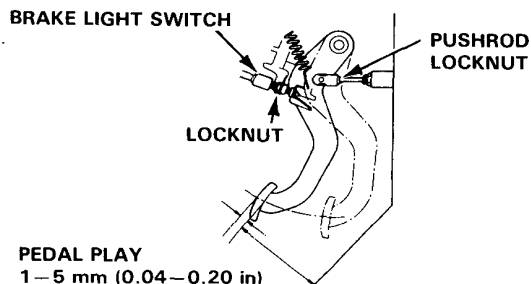
#### Check Valve Test

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

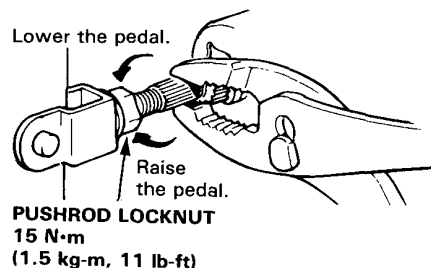
1—5 mm (0.04—0.20 in)

#### PEDAL HEIGHT

205 mm (8.07 in.)

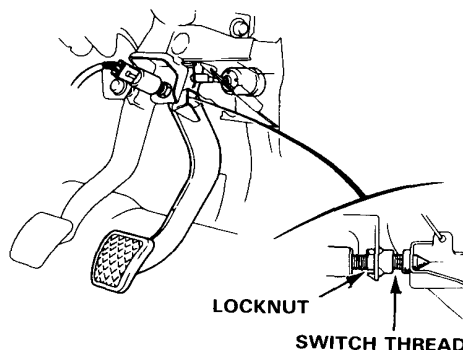
Measure without floor mat.

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.



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.





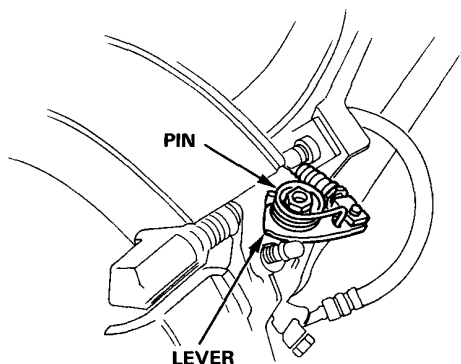
# Maintenance and Inspection

## Parking Brake Adjustment

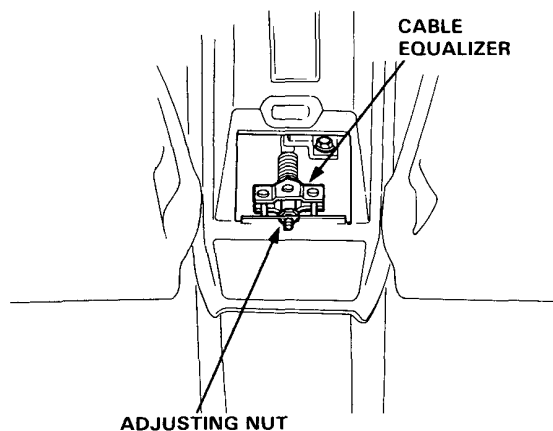
NOTE: When the brake drum or rear brake caliper has been removed, loosen the parking brake adjusting nut, start the engine and depress the brake pedal several times to set self-adjusting brakes before adjusting parking brake cable.

**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.



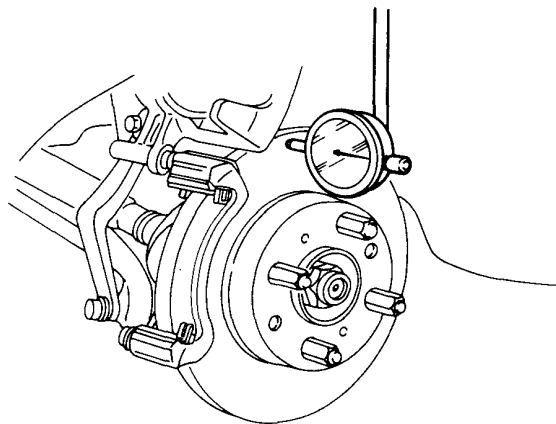
## Run-Out

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.

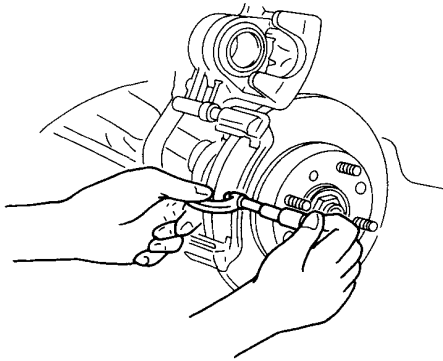






## Thickness and Parallelism

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 ground if its run-out is greater than 0.10 mm (0.004 in.).



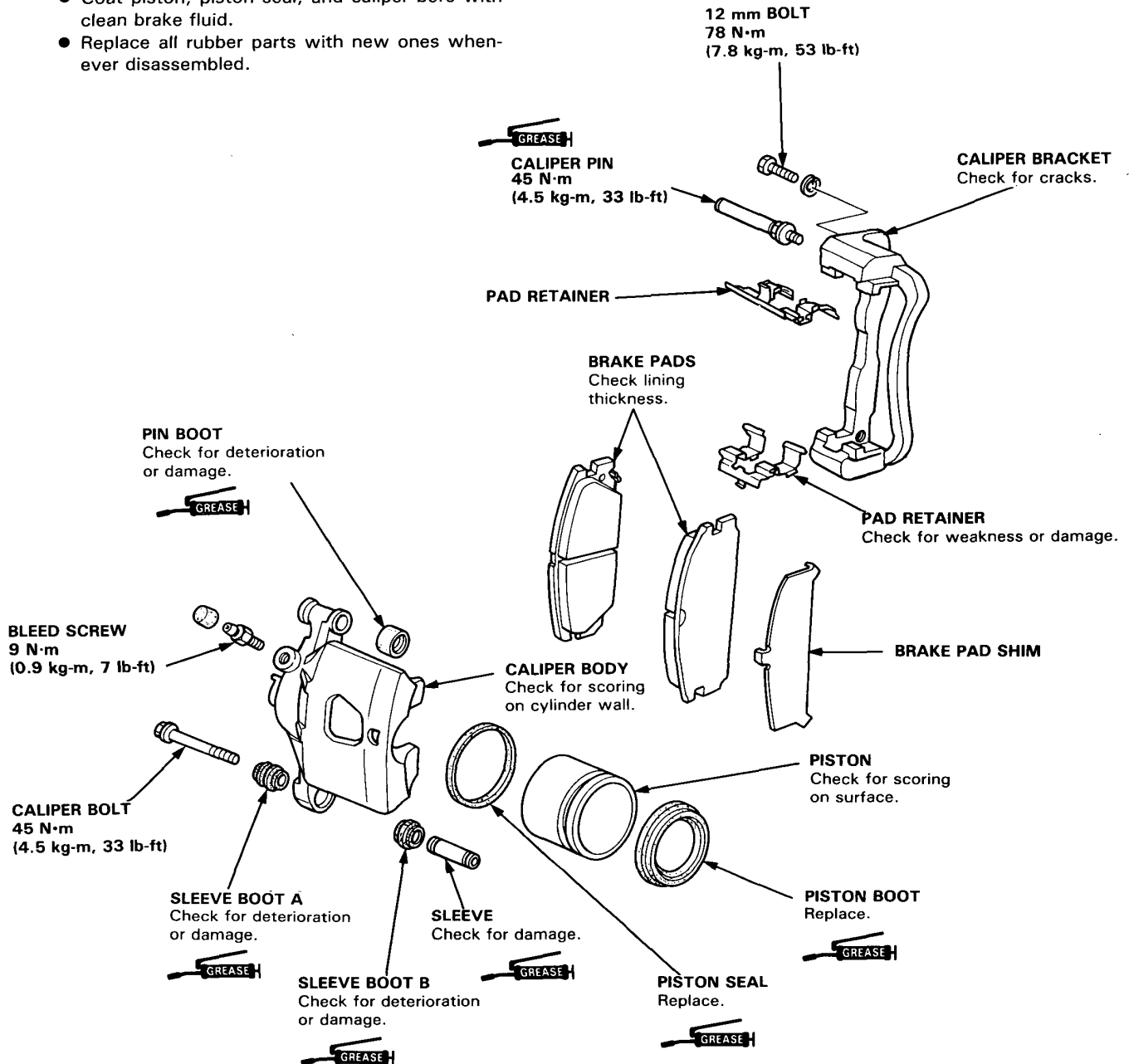
# Front Brakes

## 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.





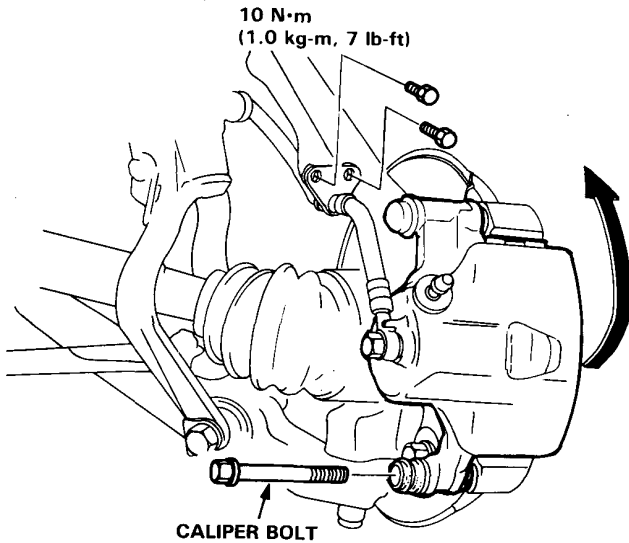
# Brake Pad



## 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.

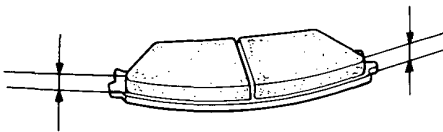


4. Remove the pad shim, pad retainers and pads.
5. Using a vernier caliper, measure the thickness of each brake pad lining.

### Brake Pad Thickness:

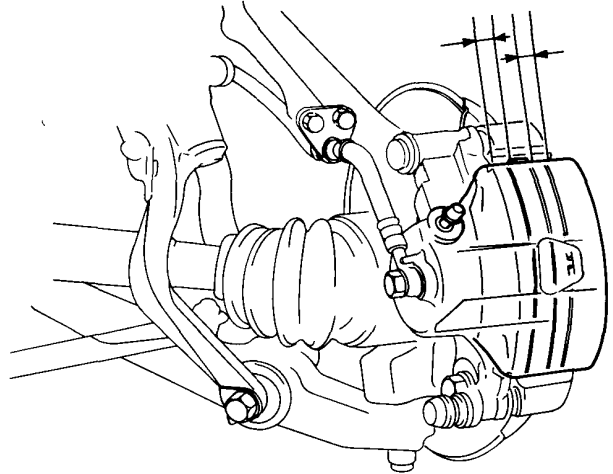
Standard: 11 mm (0.43 in)

Service Limit: 3 mm (0.12 in)

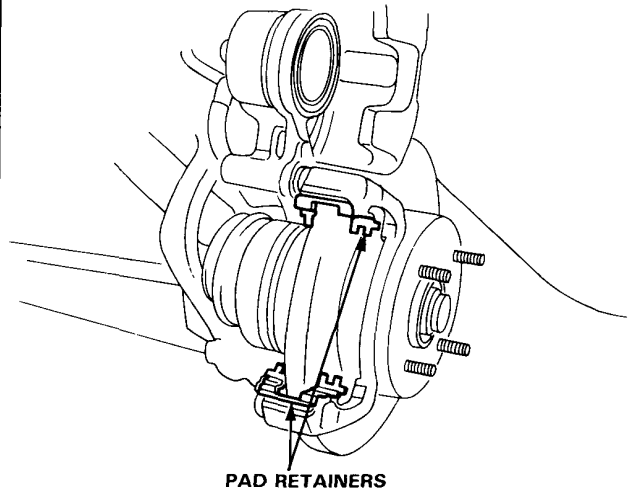


NOTE: Measurement does not include pad backing thickness.

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.



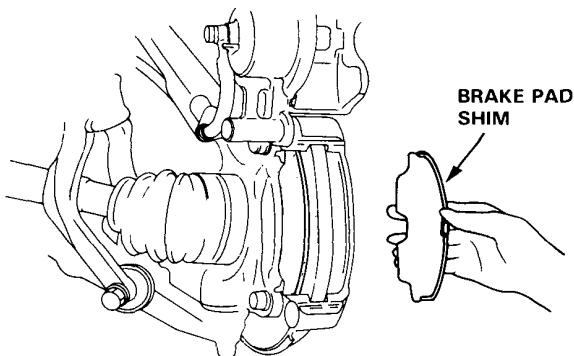
(cont'd)



## Brake Pad

### Inspection/Replacement (cont'd)

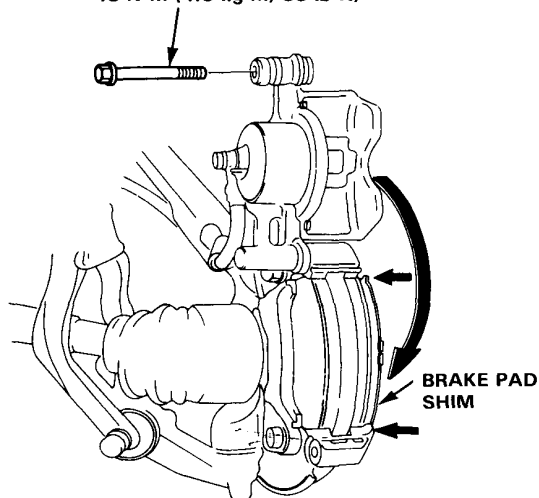
9. Apply anti-seize compound to both surfaces of the shim.
10. Install the brake pad and shim with the shim on the outside.



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.

**CALIPER BOLT**  
45 N·m (4.5 kg-m, 33 lb-ft)



13. Depress the brake pedal several times to make sure the brakes work, then road-test.

## Brake Caliper

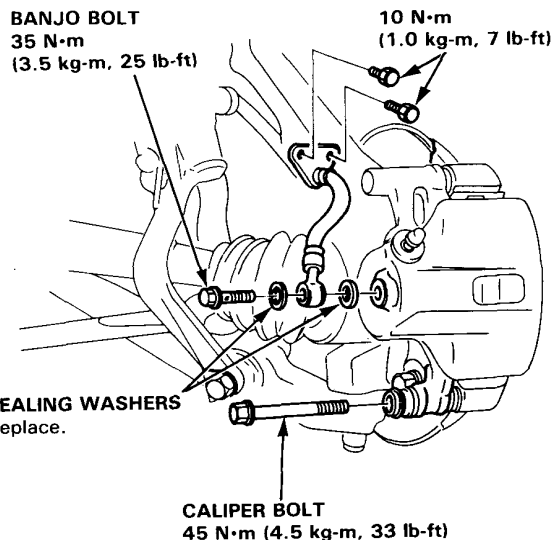
### Disassembly

#### 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.

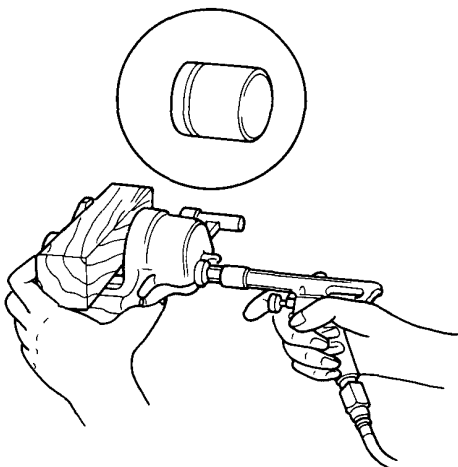






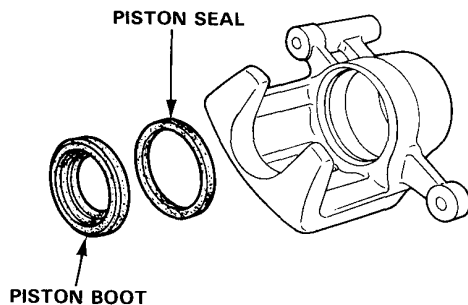
3. Place a wooden block or shop rag in the caliper opposite the piston, then carefully remove the piston from the caliper by applying air pressure through the brake line hole.

**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.

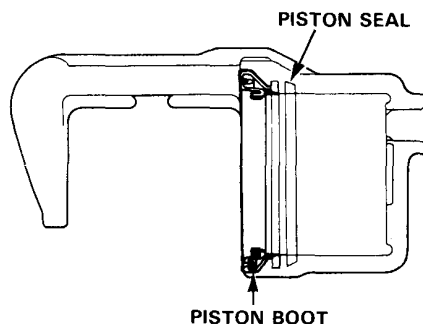


## Reassembly

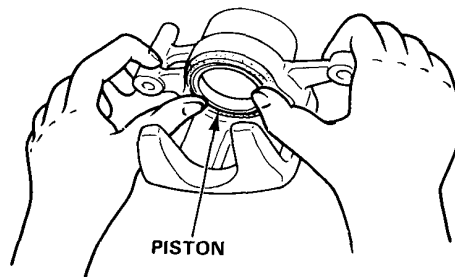
### CAUTION:

- Make sure all parts are clean before reassembly.
- Use only new replacement parts.
- Use only clean 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 damage.
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 .



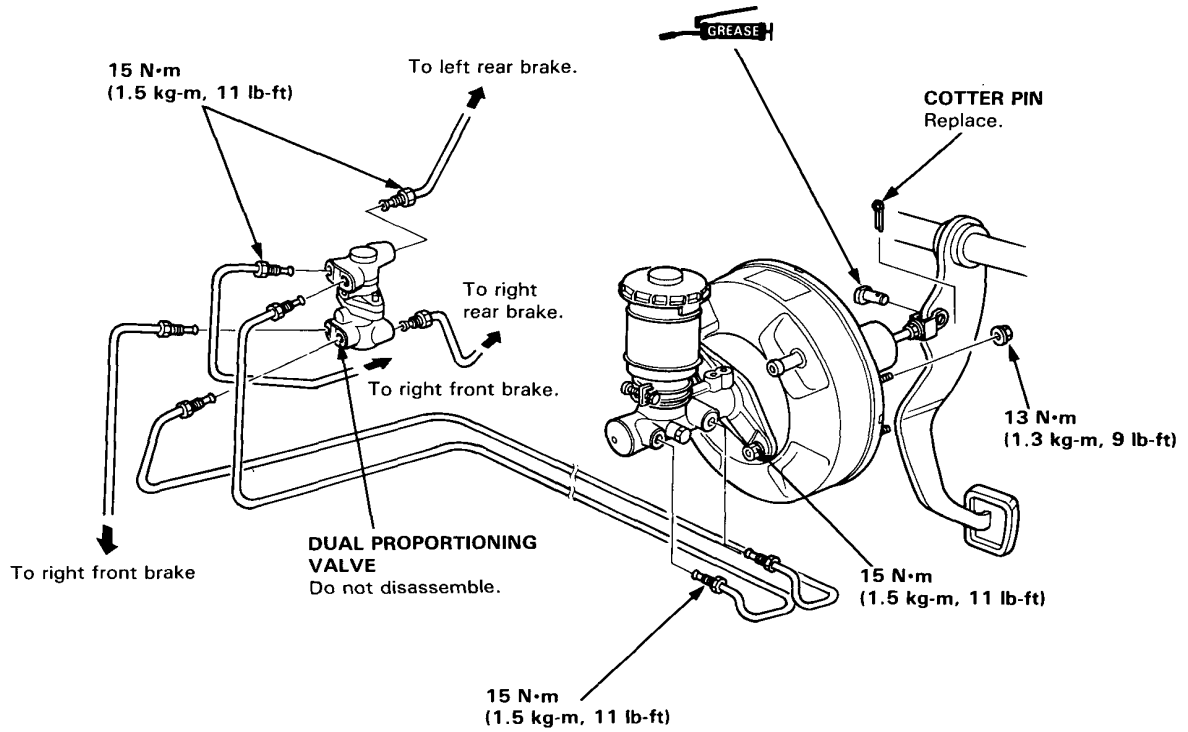
5. Reinstall the caliper in the reverse order of removal.
6. Fill the brake reservoir up and bleed the brake system (page 20-3).



# Master Cylinder, Booster and Proportioning Valve

## Index

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# Master Cylinder

## Overhaul/Inspection



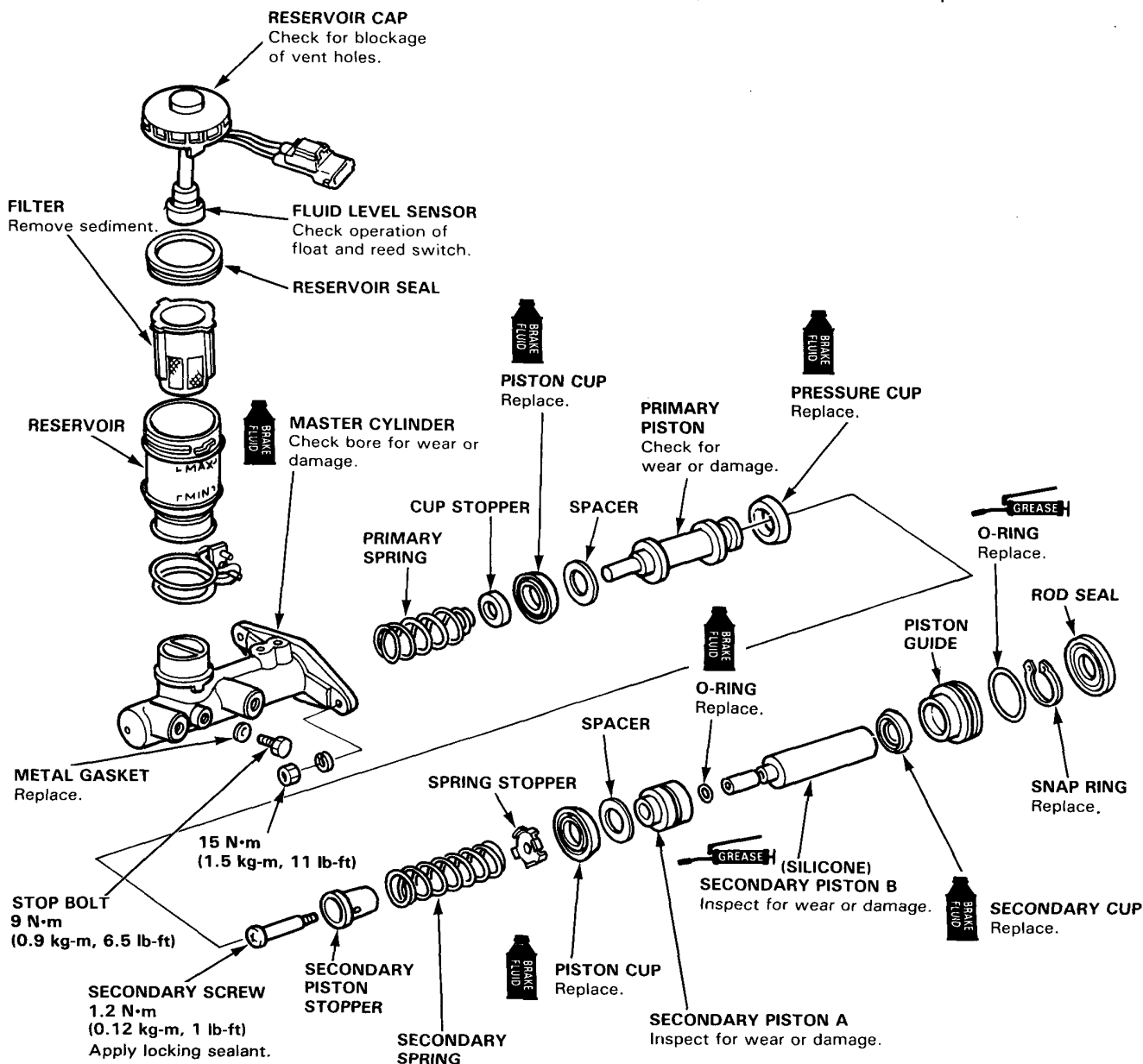
### CAUTION:

- 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 brake fluid.

### 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.





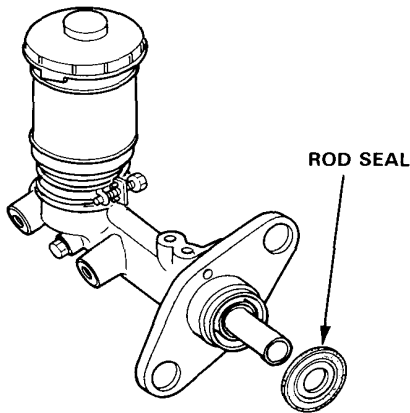
# Master Cylinder

## Disassembly

### CAUTION:

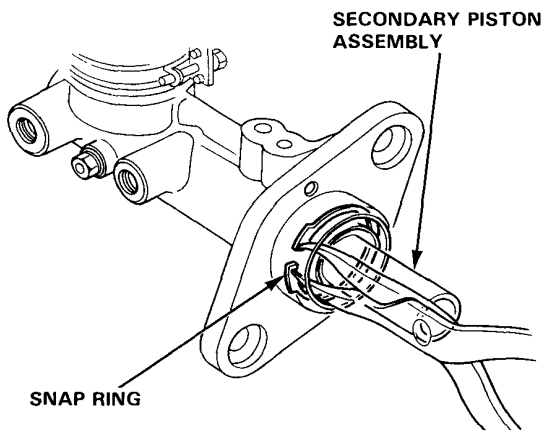
- Avoid spilling fluid on painted, plastic or rubber parts as it may damage the finish.
- Plug the end of the brake hose with a shop rag to prevent brake fluid from flowing out of the brake hose after disconnecting.
- Use only new clean brake fluid.
- Clean all parts thoroughly with brake fluid. Blow 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.

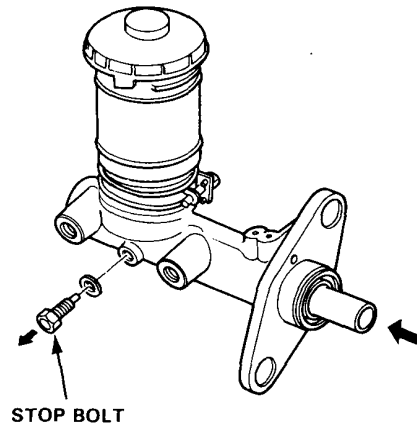


2. Push the secondary piston assembly, then remove the snap ring.

**CAUTION:** Avoid damaging the master cylinder wall.



3. Remove the stop bolt while pushing in the secondary piston assembly.

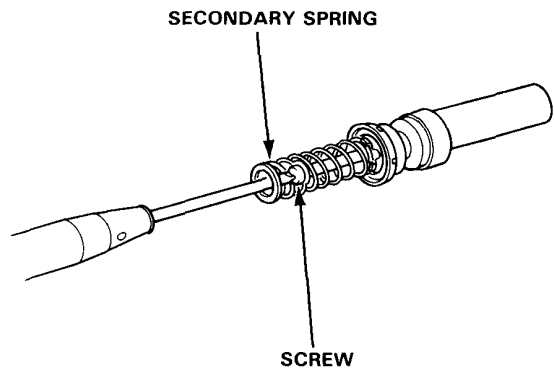


4. Remove the piston guide, secondary piston assembly and primary piston assembly.

**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.





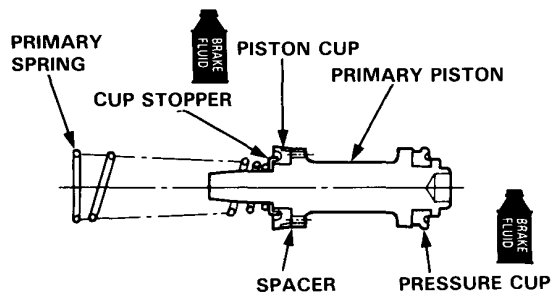
## Reassembly

### CAUTION:

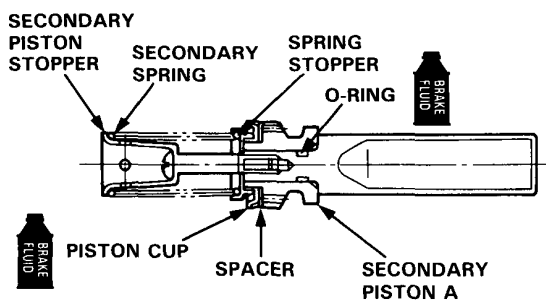
- Make sure all parts are clean before reassembly.
- Use only new replacement parts.
- Use only clean brake fluid.
- Do not allow dirt or other foreign matter to contaminate the brake fluid.
- Do not mix different brands of brake fluid.
- Avoid spilling brake fluid on painted, plastic or rubber surfaces 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.

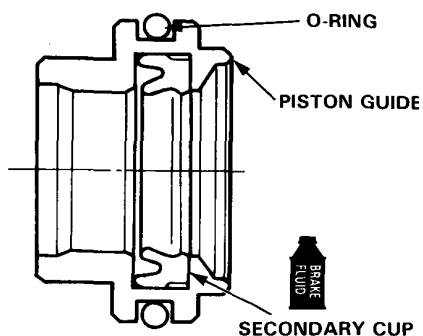
### PRIMARY PISTON ASSEMBLY



### SECONDARY PISTON ASSEMBLY



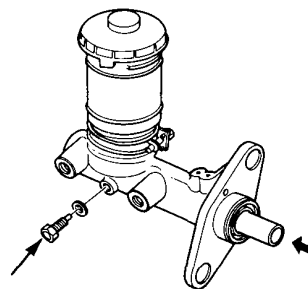
### PISTON GUIDE ASSEMBLY



2. Install the piston assemblies in the master cylinder.

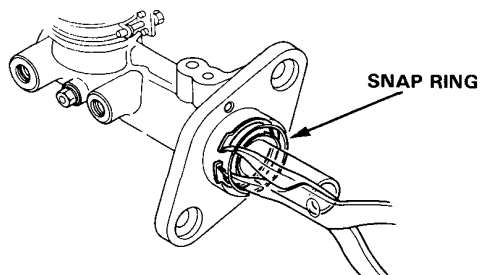
NOTE: To ease assembly, rotate the pistons while inserting.

3. Install the stop bolt and new sealing washer while pushing in the secondary piston assembly, then tighten the stop bolt.

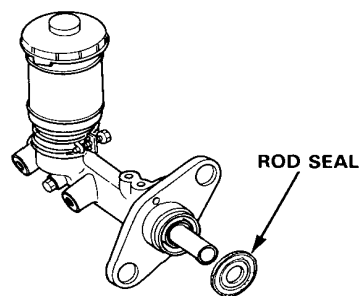


9 N·m  
(0.9 kg-m, 6.5 lb-ft)

4. Install the snap ring after pushing in the secondary piston assembly.



5. Install a new rod seal.





# Brake Booster

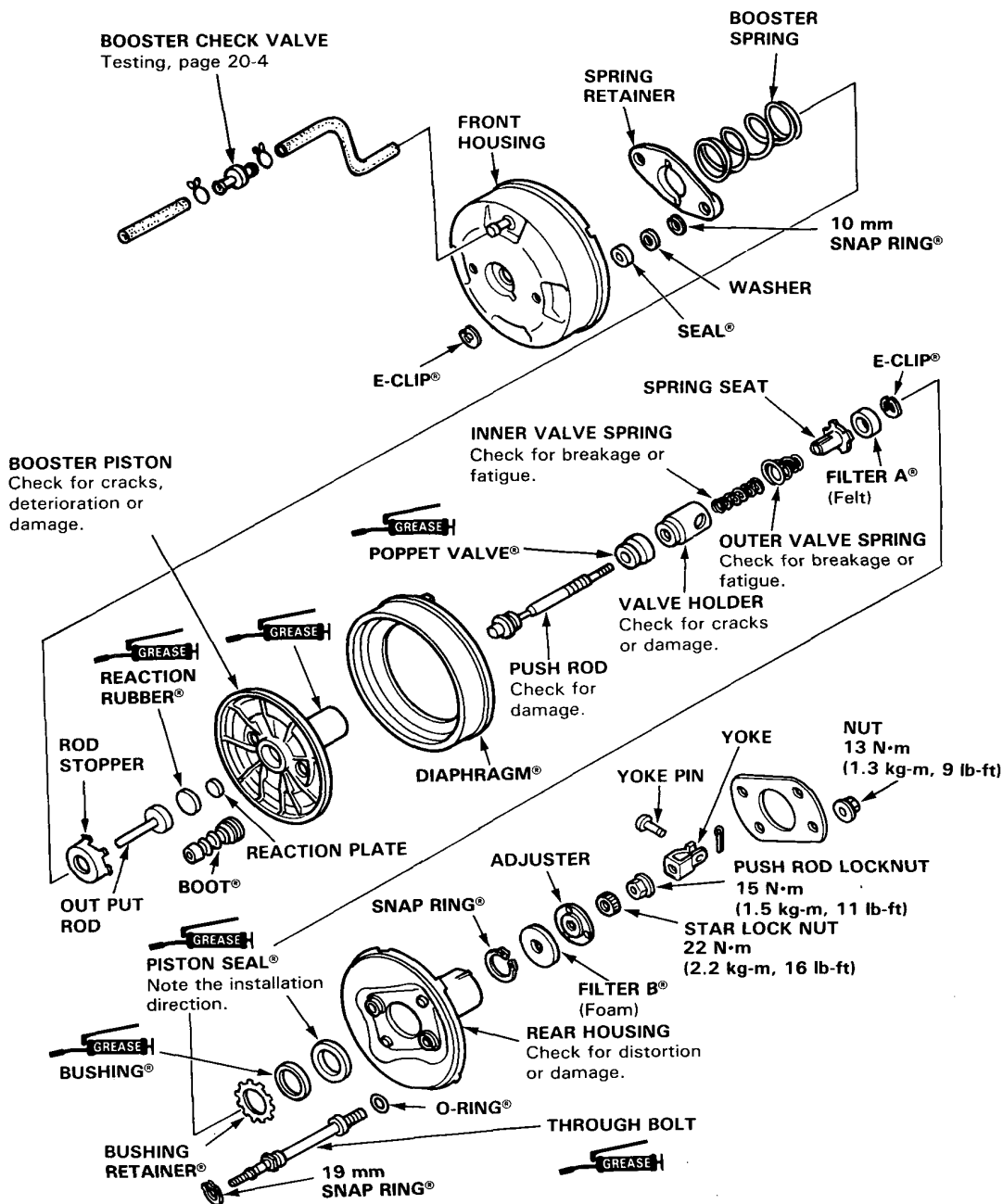
## Index and Inspection

### 8" Booster

Booster testing is on the page 20-4.

#### NOTE:

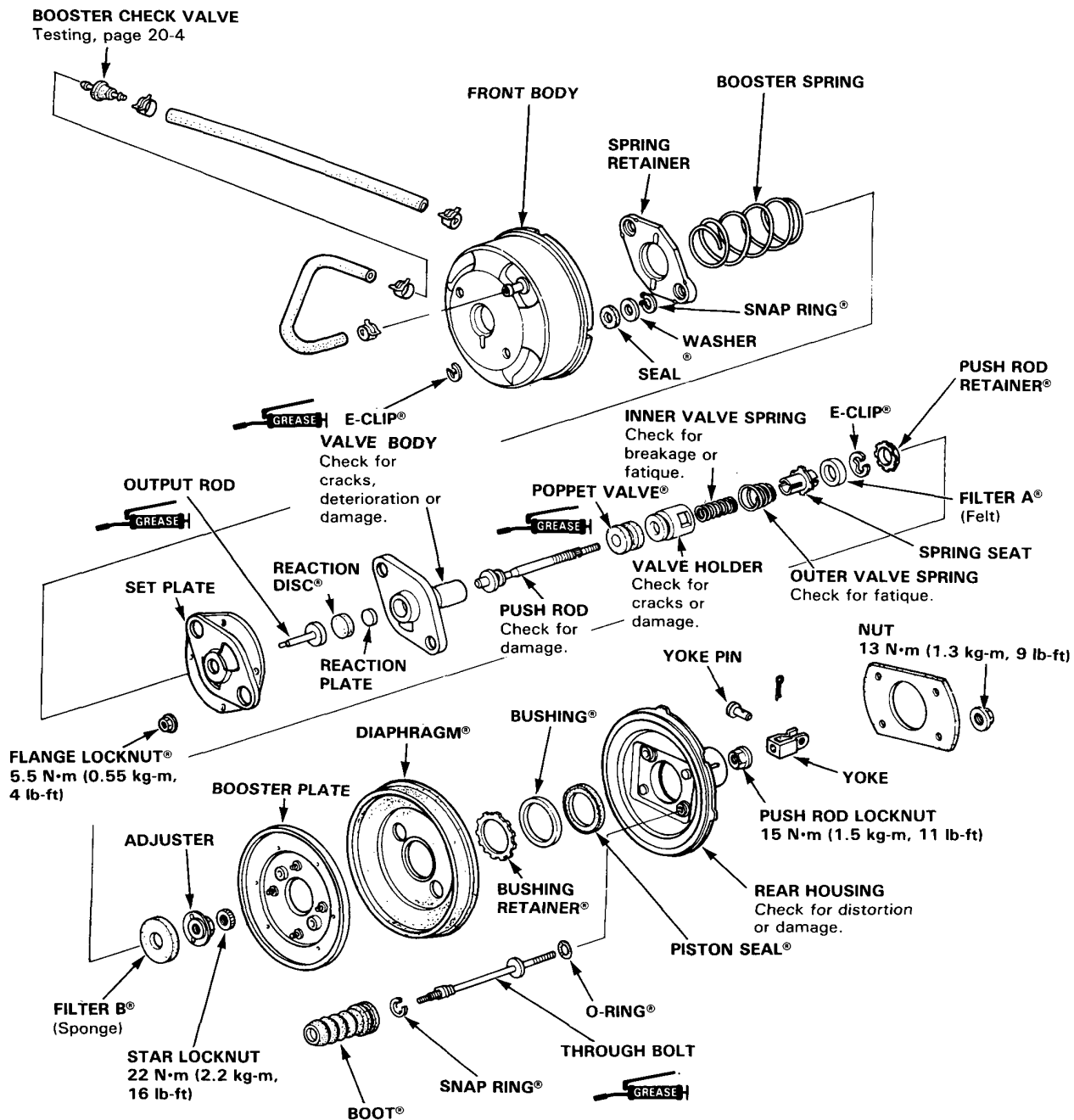
- Parts marked® are available with rebuild kit and must be replaced whenever disassembled.
- **GREASE** on this page refers to silicone grease.
- Scribe an aligning mark across the front and rear housings so you can reassemble in their original positions (page 20-18 and 20-25).







## 9" Booster



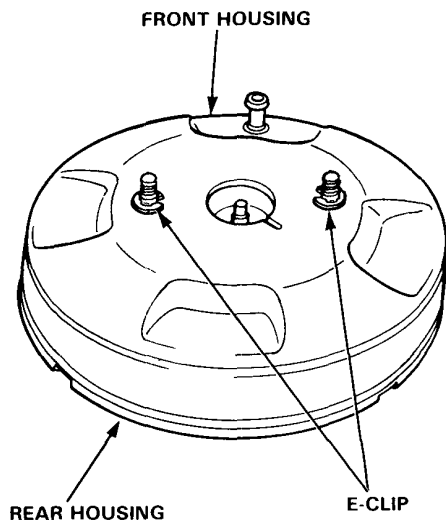


# Brake Booster

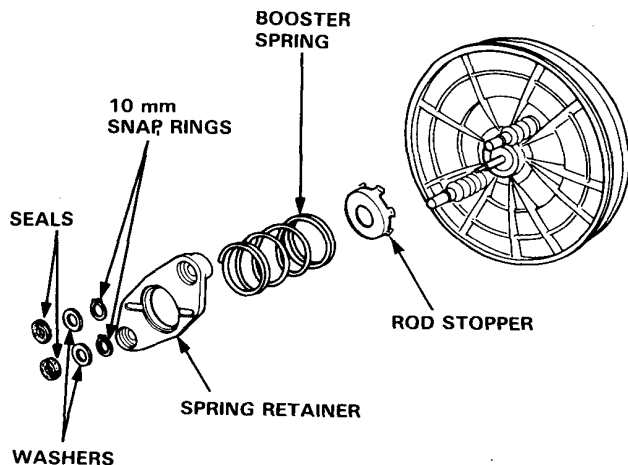
## Disassembly

### 8" Booster

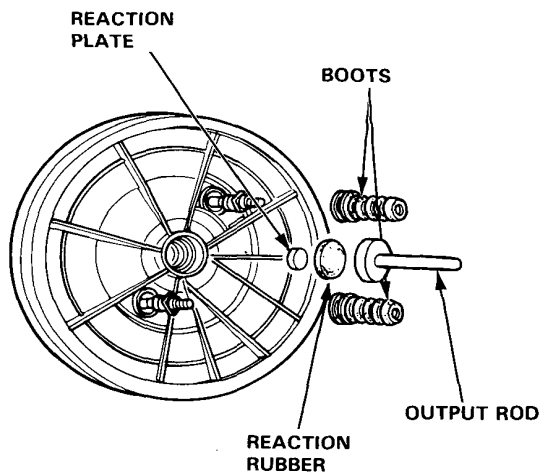
1. Scribe an aligning mark across the front and rear booster housings to ensure proper positioning of parts on reassembly.
2. Remove the E-clips, and separate the front booster housing and the rear booster housing.



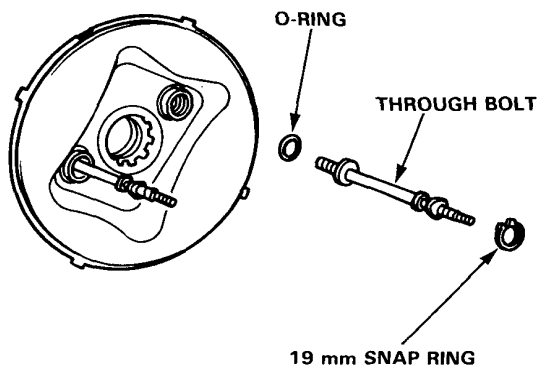
3. Remove the seals and washers from the spring retainer, then remove the spring retainer, booster spring and rod stopper by removing the 10 mm snap rings.



4. Remove the output rod, reaction rubber and reaction plate.
5. Remove the boots.



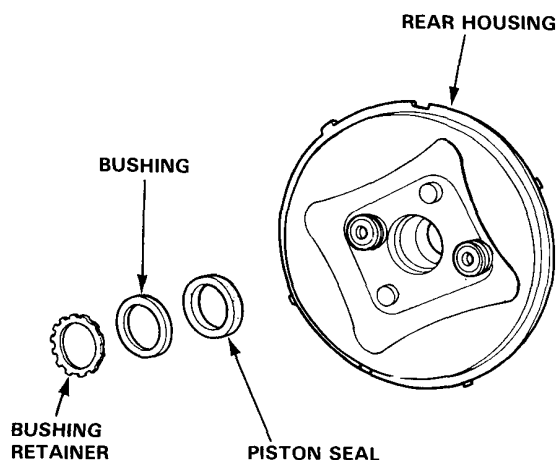
6. Separate the booster piston from the housing.
7. Remove the 19 mm snap ring and remove the through bolt with O-ring from the rear housing.



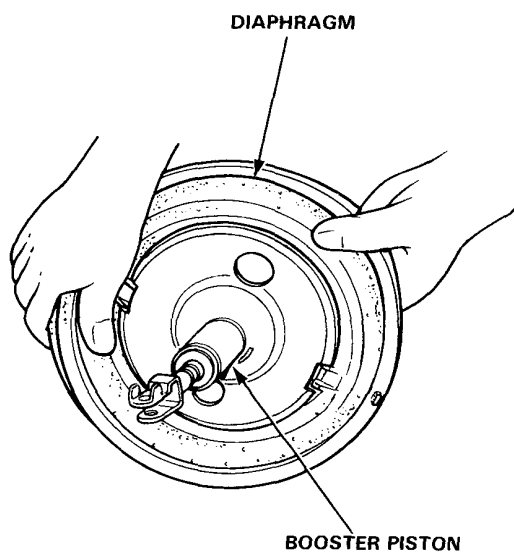




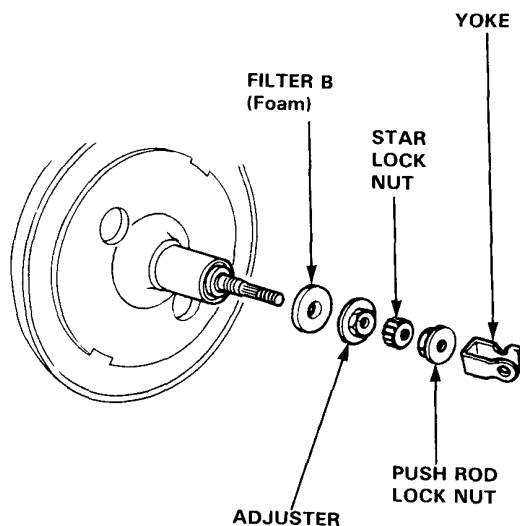
8. Remove the bushing retainer, bushing and piston seal from the rear housing.



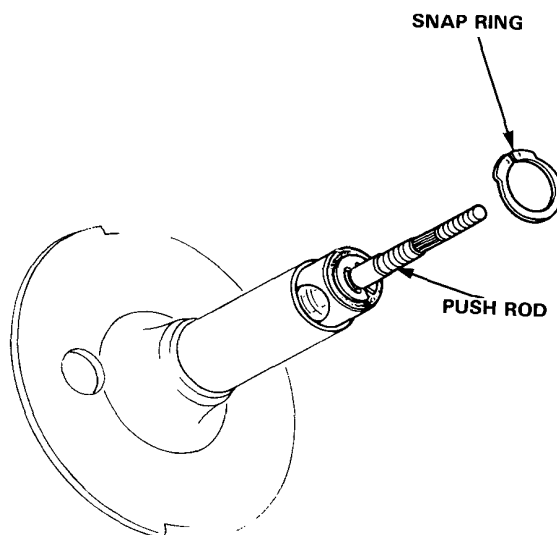
9. Remove the diaphragm from the booster piston.



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.



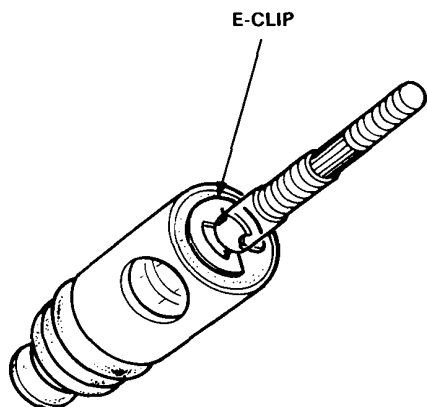
(cont'd)



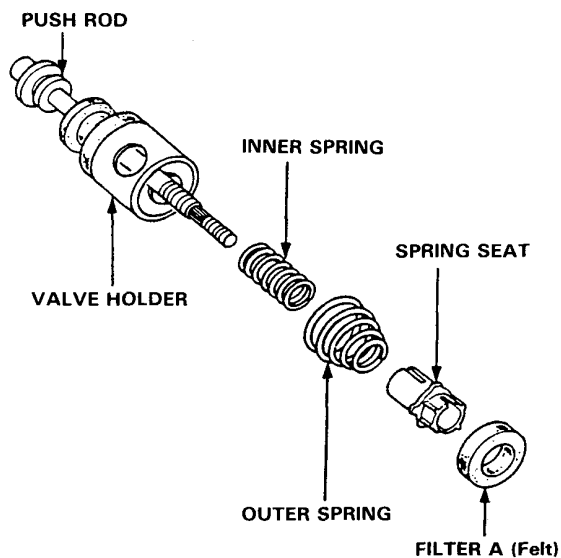
# Brake Booster

## 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



E-CLIP



SEAL



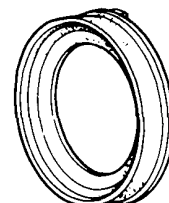
10 mm SNAP RING



REACTION RUBBER



BOOT



DIAPHRAGM



POPPET VALVE



FILTER A (Felt)



E-CLIP



FILTER B (Foam)



SNAP RING



BUSHING RETAINER



BUSHING



PISTON SEAL



19 mm SNAP RING



O-RING



SILICONE GREASE



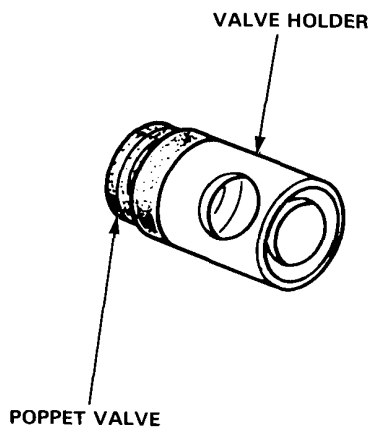


## Reassembly

### 8" Booster

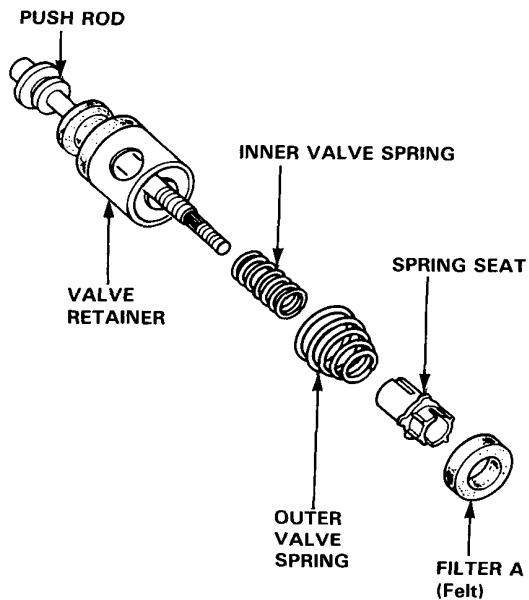
NOTE: Clean all parts before reassembly.

1. Install the poppet valve on the valve holder.

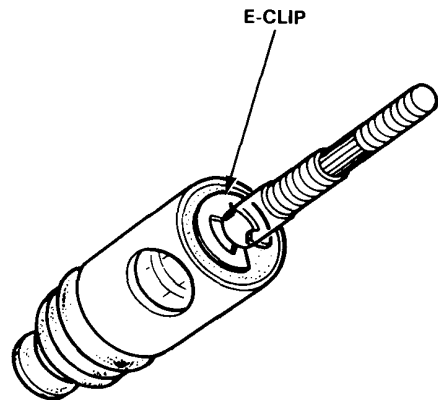


2. Install the valve holder, inner valve spring, outer valve spring and spring seat on the push rod.

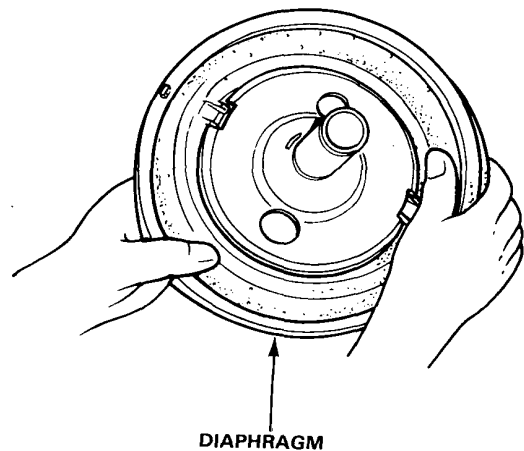
NOTE: Install the spring seat with its short end facing the filter side.



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.



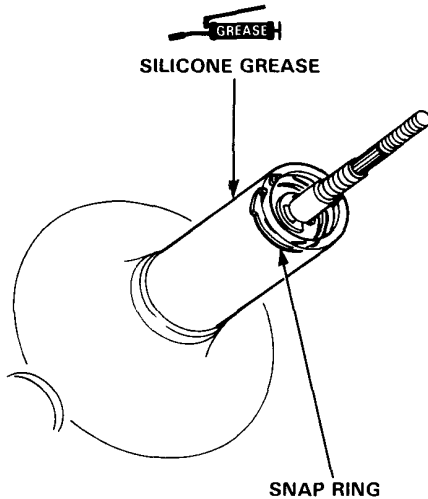
(cont'd)



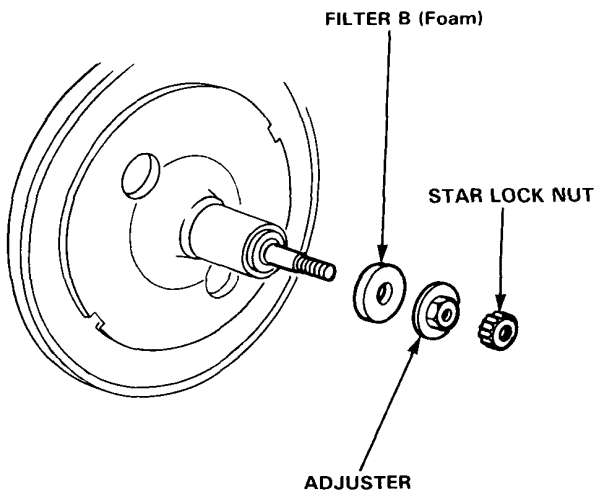
# Brake Booster

## Reassembly (cont'd)

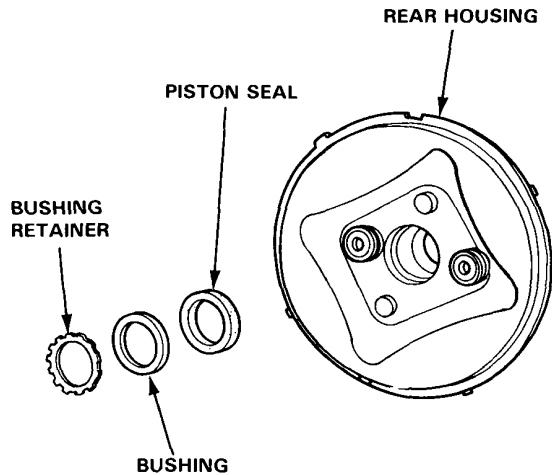
5. Apply silicone grease to the inner and outer surface of the booster piston tube.
6. Install the push rod assembly and secure with the snap ring.



7. Install filter B (foam) on the push rod, then loosely install the adjuster and start lock nut.



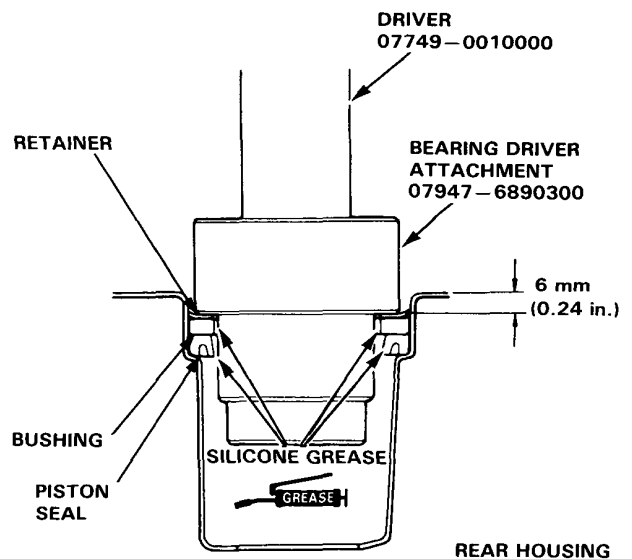
8. Apply silicone grease to the piston seal.
9. Position the piston seal, bushing and bushing retainer on the rear housing.



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.

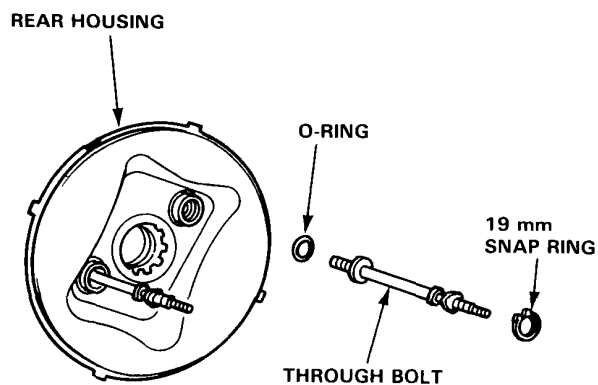
CAUTION: If you drive the retainer more than 6 mm, the piston seal may distort.



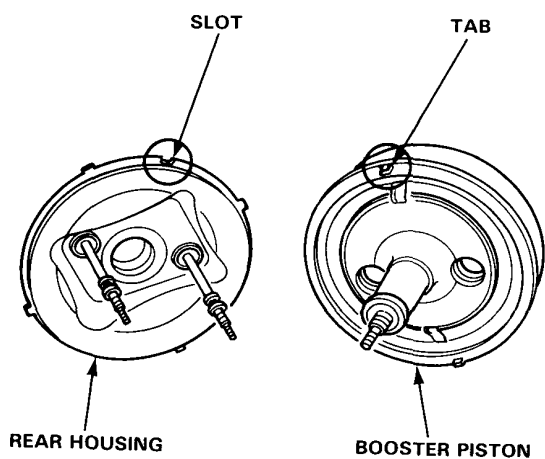




11. Install the O-rings and through bolts on the rear housing and secure with 19 mm snap ring.

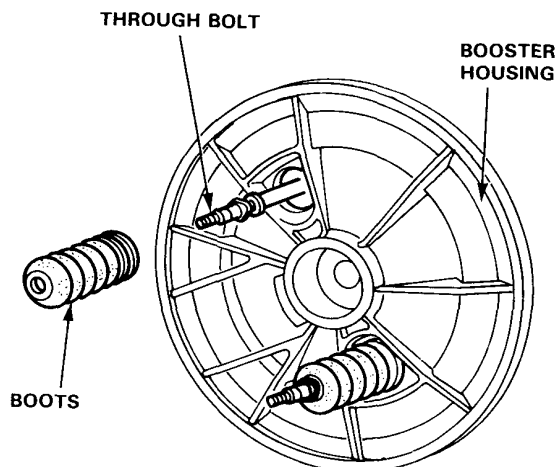


12. Install the booster piston on the rear housing aligning their tabs and slots.



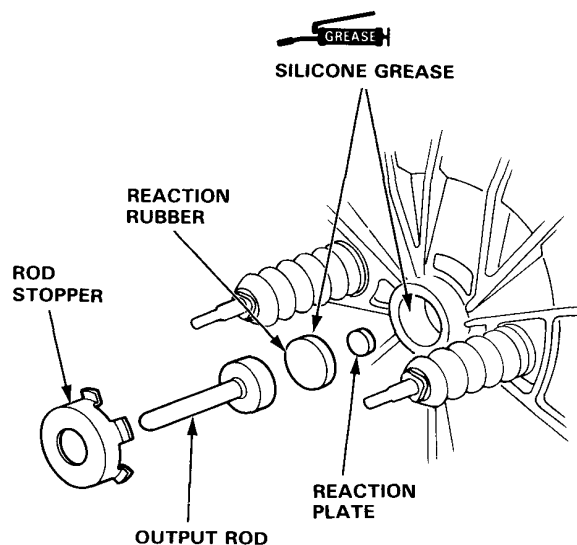
13. Install the boots on the through bolts.

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.



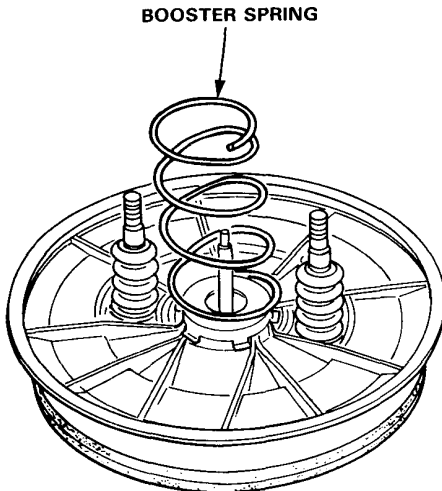
(cont'd)



# Brake Booster

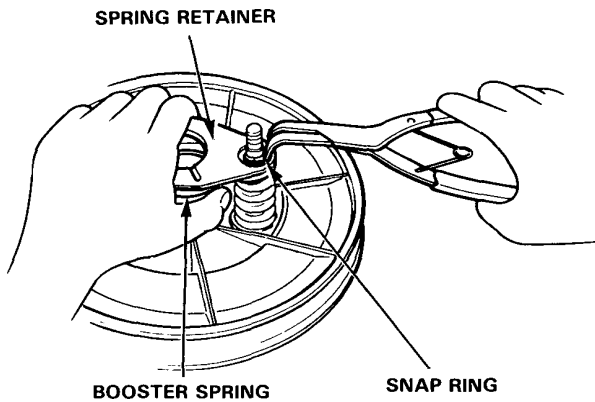
## Reassembly (cont'd)

16. Install the booster spring.



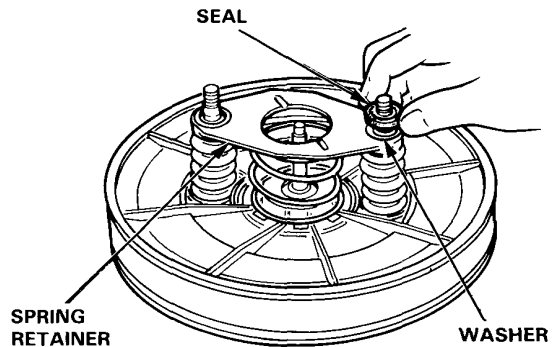
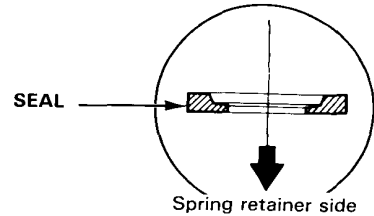
17. Install the spring retainer on the through bolts aligning the square portions of the bolts and retainer.

18. Compress the booster spring, then install the 10 mm snap ring on the through bolts.

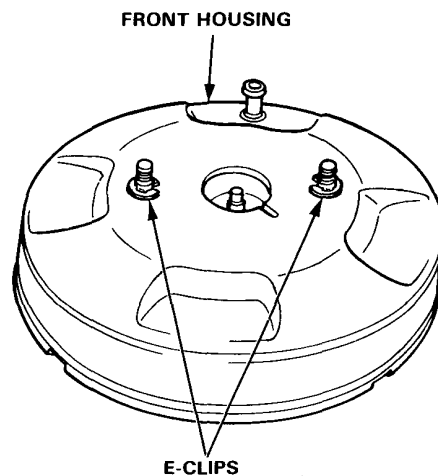


19. Install the washers and seals on the through bolts.

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.



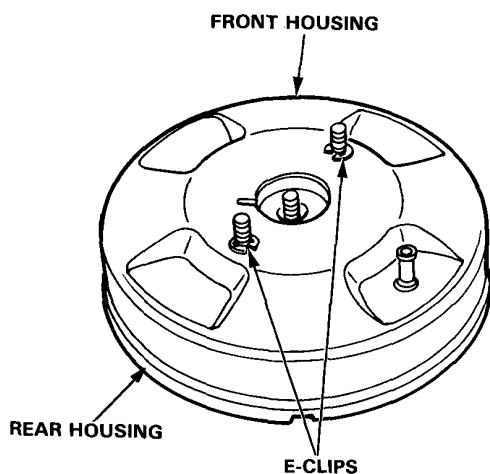




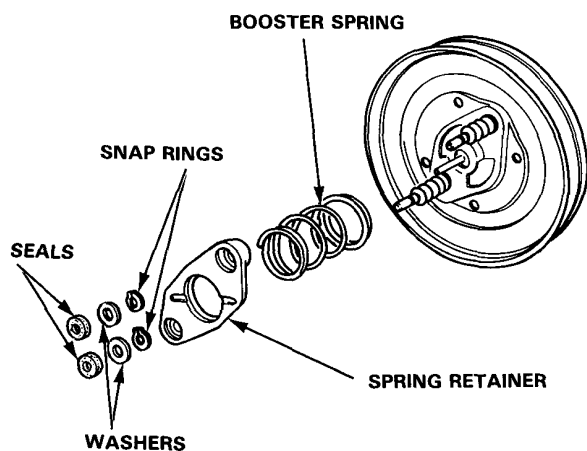
## Disassembly

### 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.

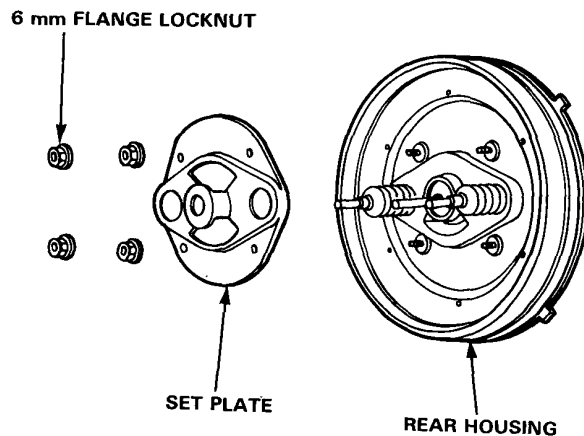


3. Remove the seals and washers from the spring retainer then remove the snap rings.

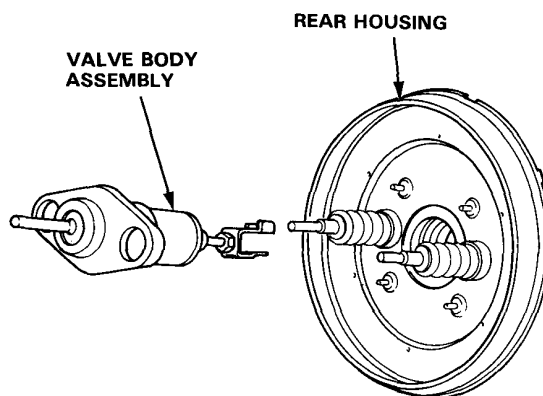


4. Remove the spring retainer and booster spring.

5. Remove the 6 mm flange locknuts and set plate.



6. Remove the valve body assembly from the rear housing.



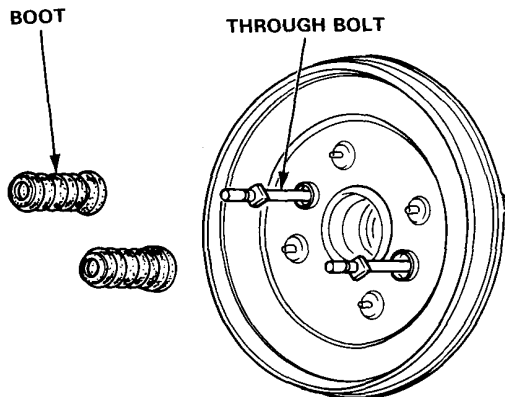
(cont'd)



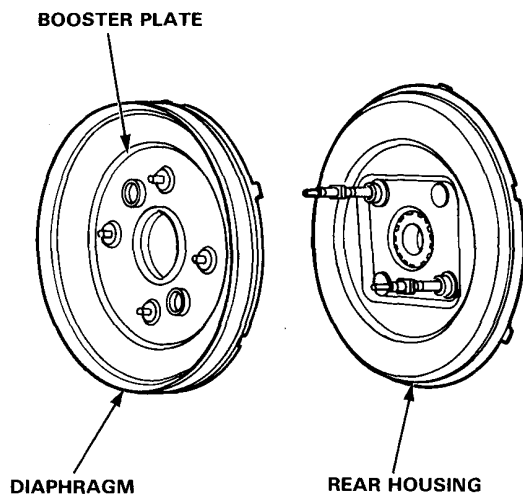
# Brake Booster

## Disassembly (cont'd)

7. Remove the boots from the through bolts.

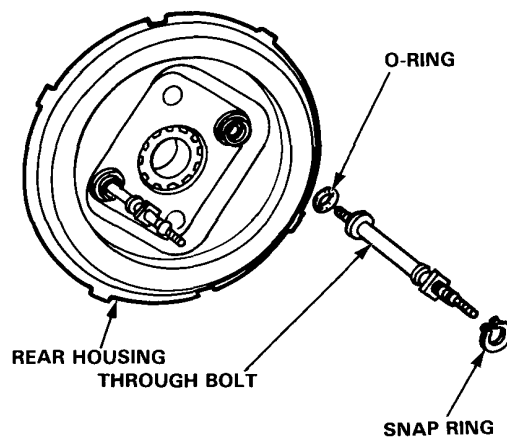


8. Remove the booster plate and diaphragm together from the rear housing.

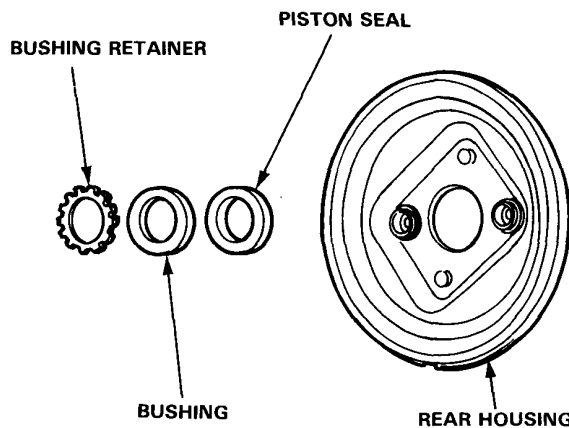


9. Remove the diaphragm from the booster plate.

10. Remove the snap rings, then remove the through bolts and O-rings from the rear housing.



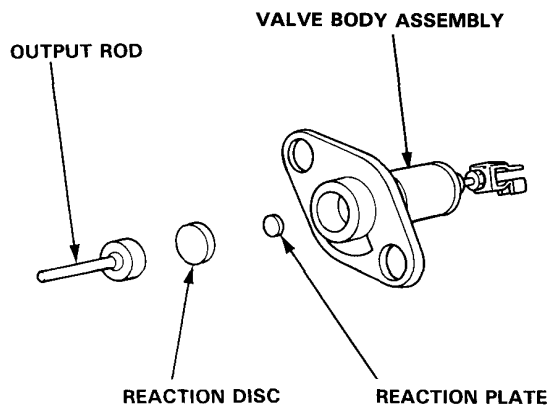
11. Remove the bushing retainer, bushing and piston seal from the rear housing.



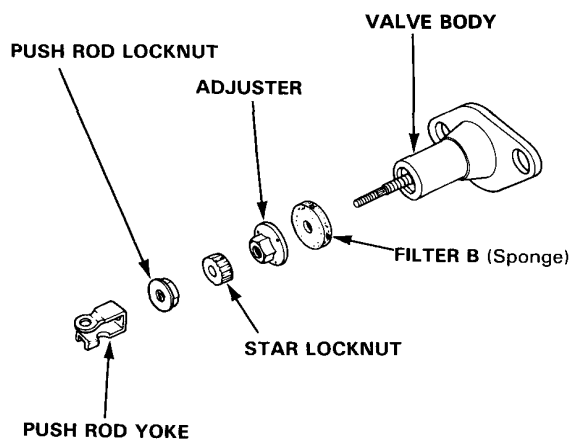




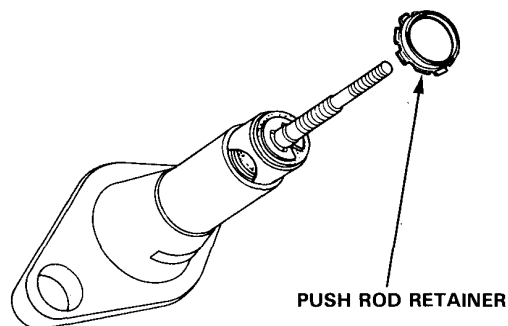
12. Remove the output rod, reaction disc and reaction plate from the valve body assembly.



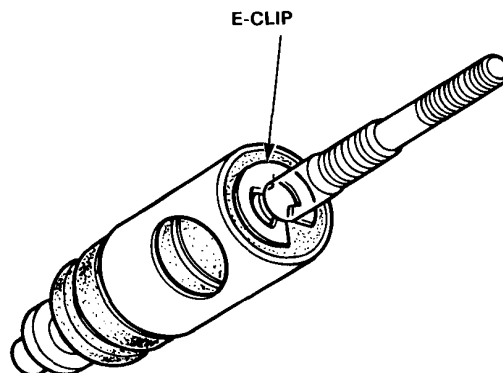
13. Remove the push rod yoke, locknut, star lock nut, adjuster and filter B from the valve body.



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.



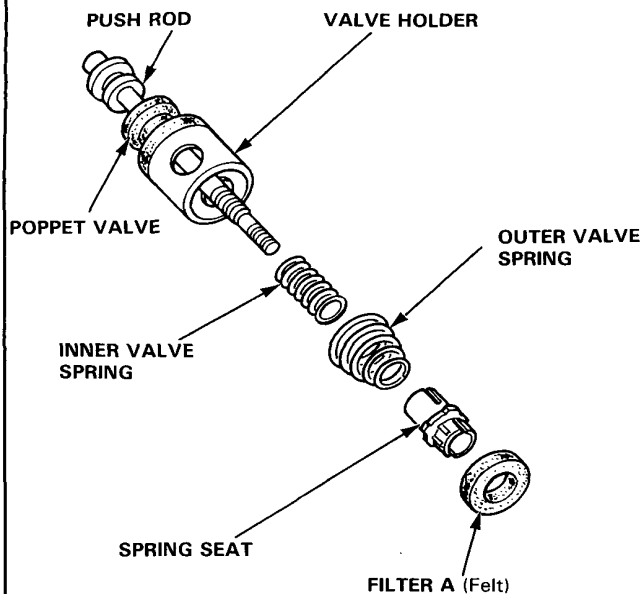
(cont'd)



# 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

E-CLIP

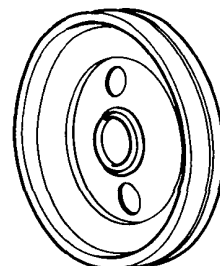
SEAL

SNAP RING

REACTION DISC



BOOT



DIAPHRAGM

POPPET VALVE

FILTER A  
(Felt)

E-CLIP



FILTER B  
(Sponge)



PUSH ROD  
RETAINER



BUSHING  
RETAINER



BUSHING



PISTON SEAL



SNAP RING



O-RING



6 mm FLANGE  
LOCKNUT



SILICONE GREASE

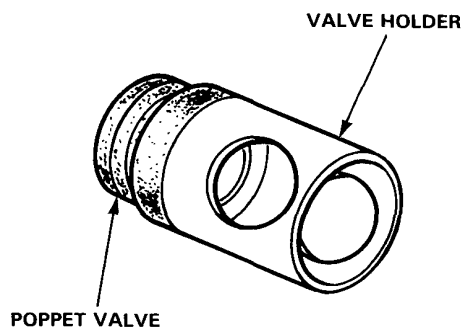




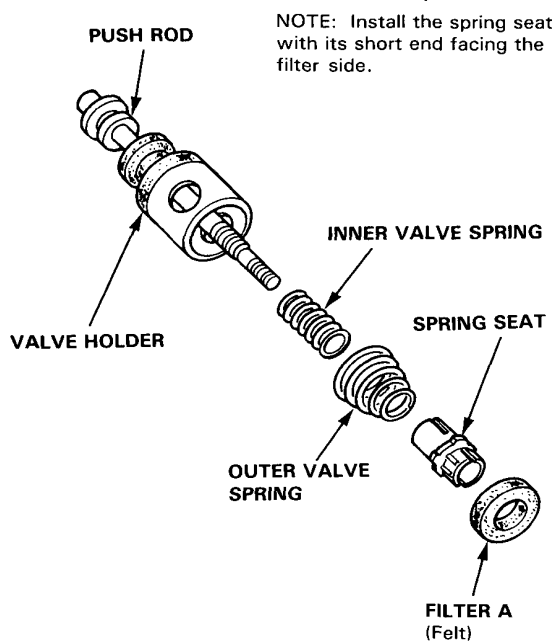
## Reassembly

### 9" Booster

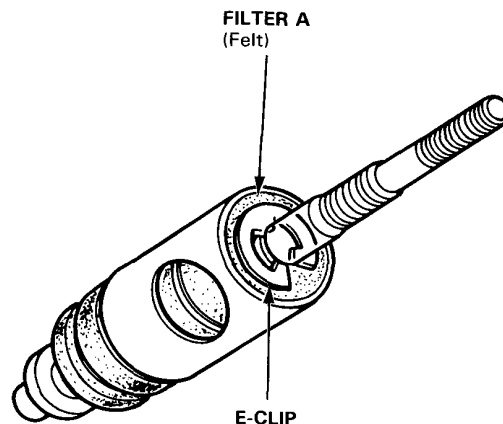
1. Install the poppet valve on the valve holder.



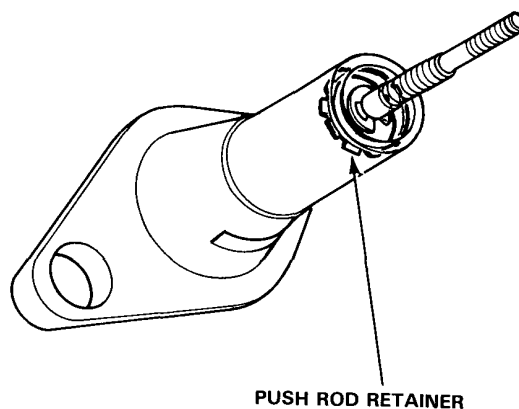
2. Install the valve holder, inner valve spring, outer valve spring and spring seat on the push rod.



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.



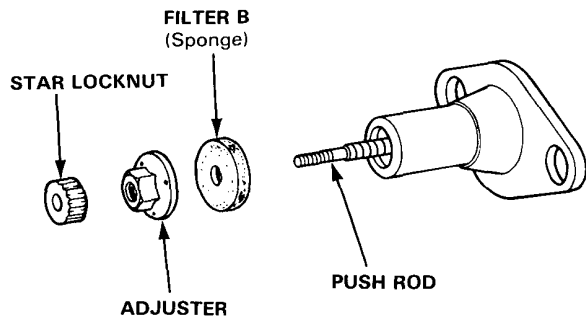
(cont'd)



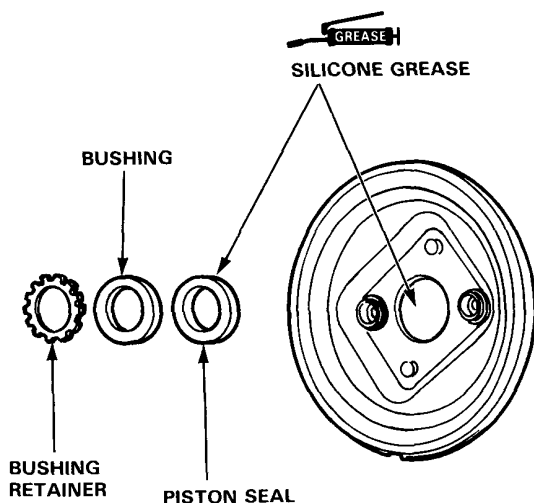
# Brake Booster

## Reassembly (cont'd)

- 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.



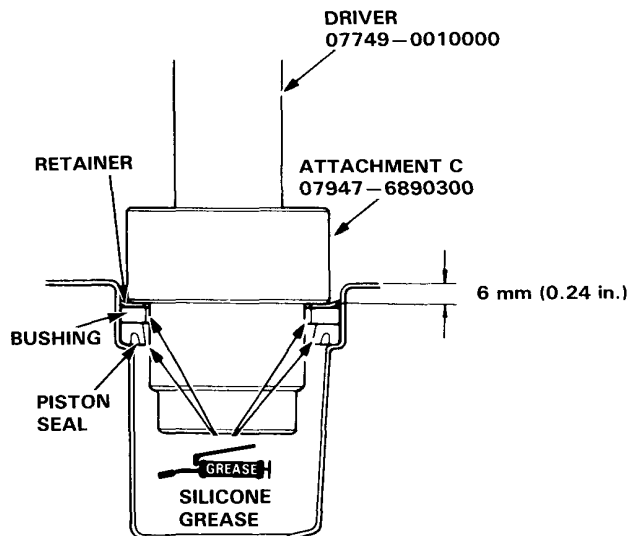
- Apply silicone grease to piston seal, then set the seal in position on the housing.



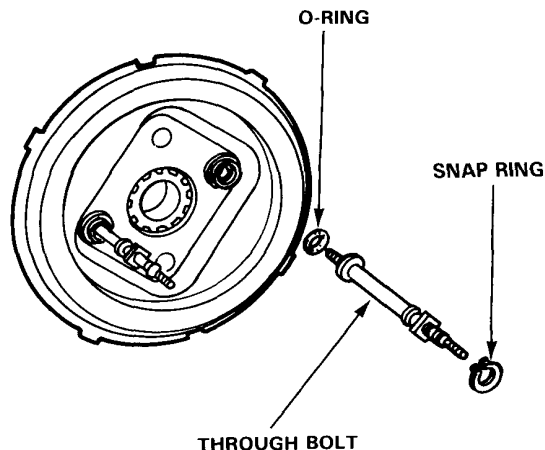
NOTE: Make sure the lip of the seal is facing in, as shown in drawing below.

- 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.



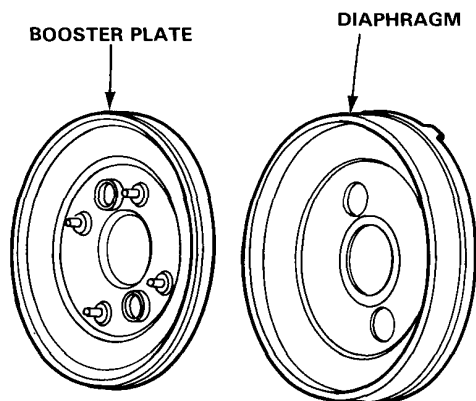
- Install both through bolts, using the O-rings and snap rings.



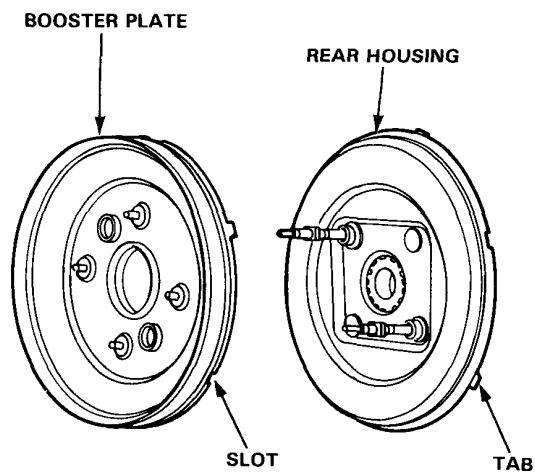




9. Install the diaphragm on the booster plate.

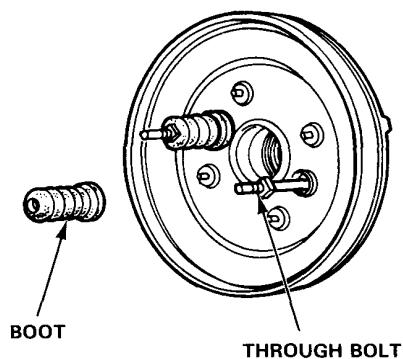


10. Attach the booster plate to the rear housing, aligning their tabs and slots.

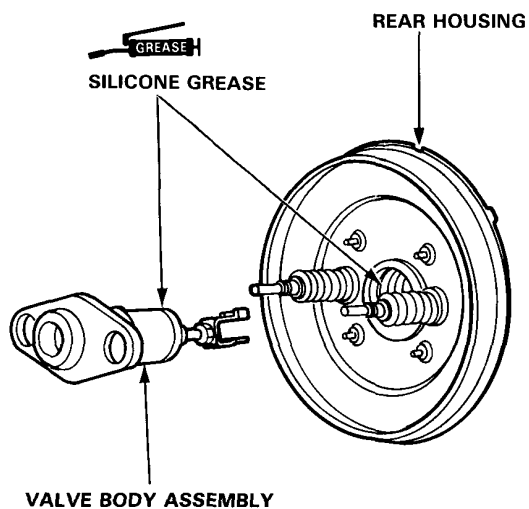


11. Install the boots on the through bolts.

**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.



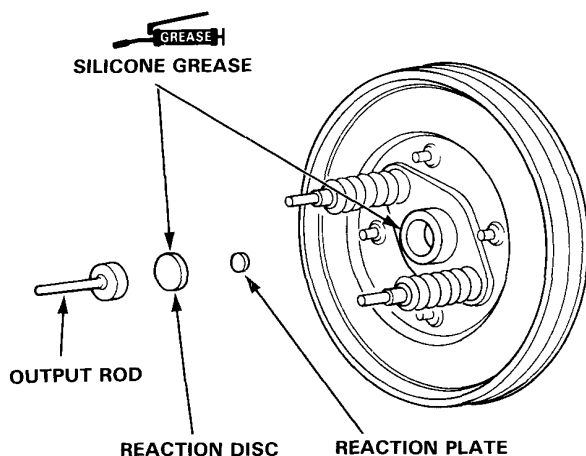
(cont'd)



# Brake Booster

## Reassembly (cont'd)

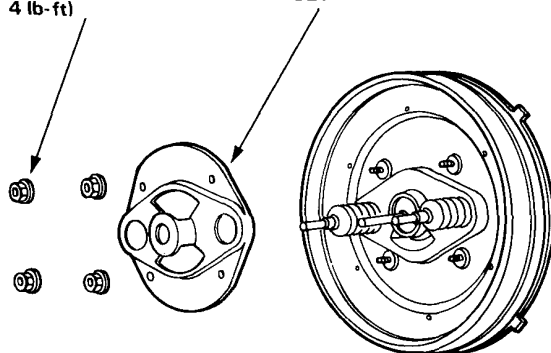
13. Apply silicone grease to the bore of the valve body, then install the reaction plate, reaction disc and output rod.



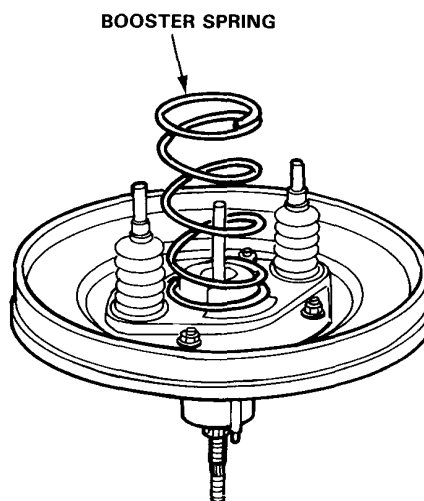
14. Install the set plate, and tighten the four 6 mm flange nuts.

6 mm FLANGE NUT  
5.5 N·m (0.55 kg-m,  
4 lb-ft)

SET PLATE

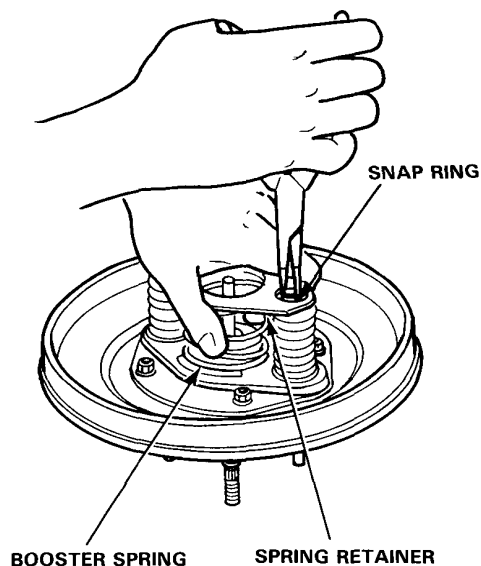


15. Install the booster spring.



16. Install the spring retainer on the through bolts aligning the square portions of the bolts and retainer.

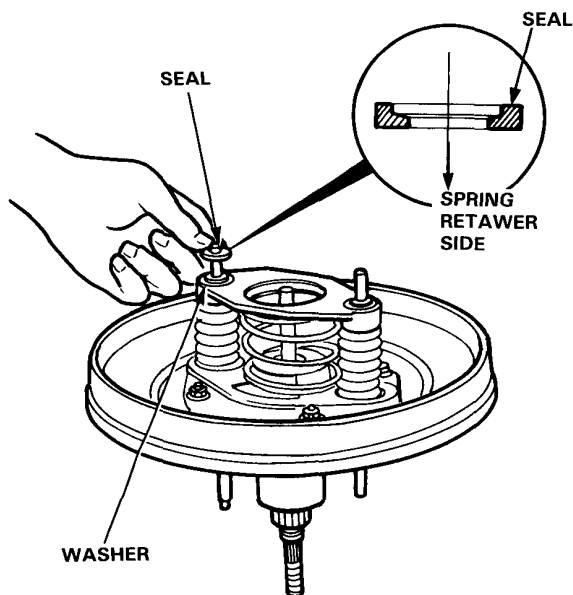
17. Secure the spring retainer by compressing the booster spring, and installing the snap rings on the through bolts.





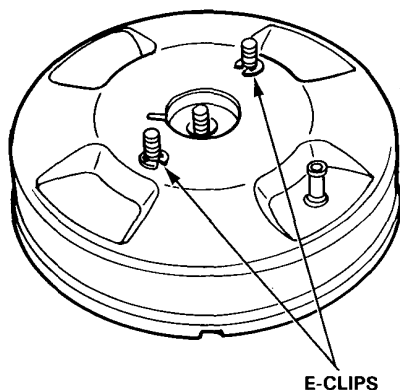


18. Install the washers and seals.



19. Assemble the front and rear housings.

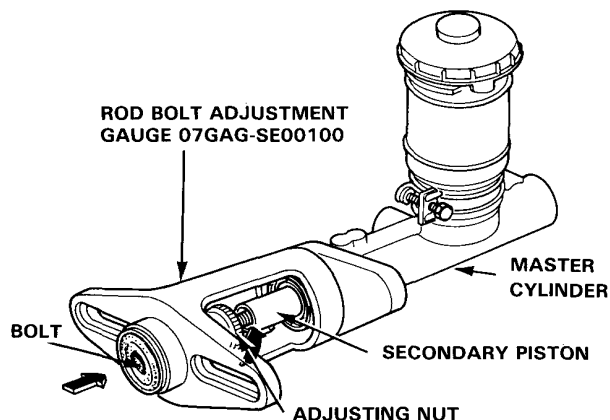
20. Press down on the front housing, then install the E-clips on the through bolts.



## Pushrod Clearance Adjustment

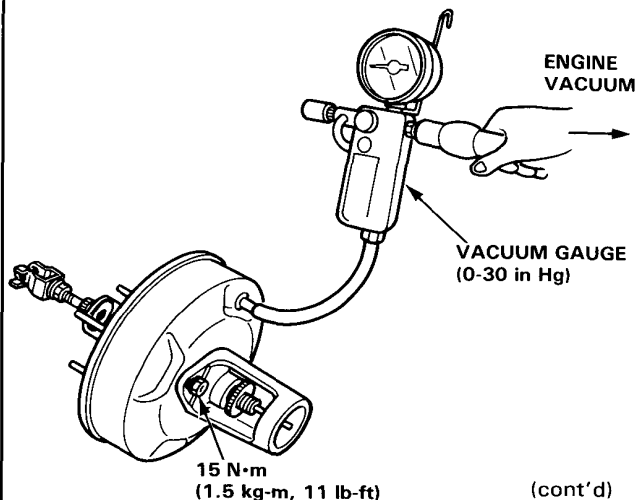
**NOTE:** Master cylinder pushrod-to-piston clearance must be checked and adjustments made, if necessary, before installing master cylinder.

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)

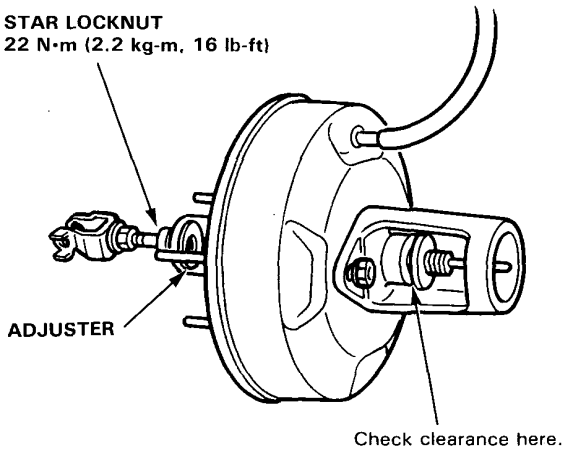


# Brake Booster

## 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.

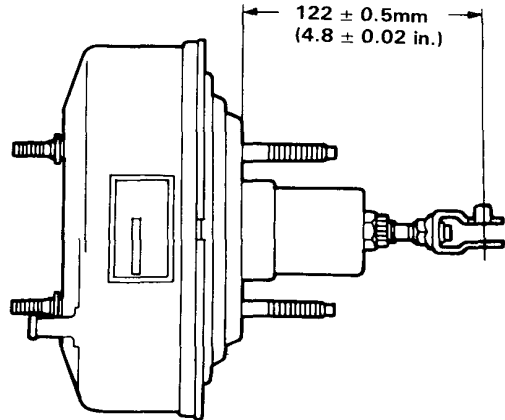
**STAR LOCKNUT**  
22 N·m (2.2 kg-m, 16 lb-ft)



**NOTE:** If the clearance between the gage 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

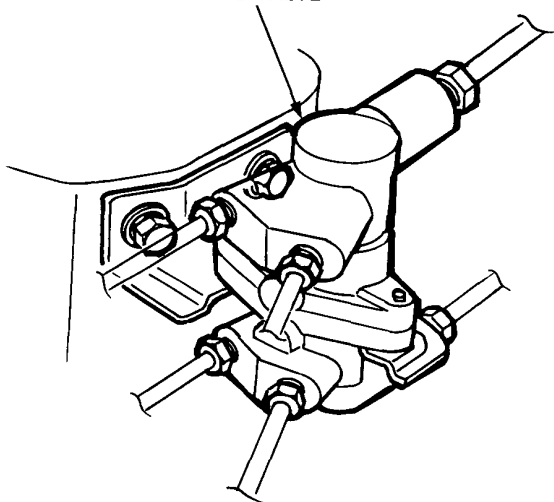
Two proportioning valves are included in the dual diagonal braking system to provide two functions:

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





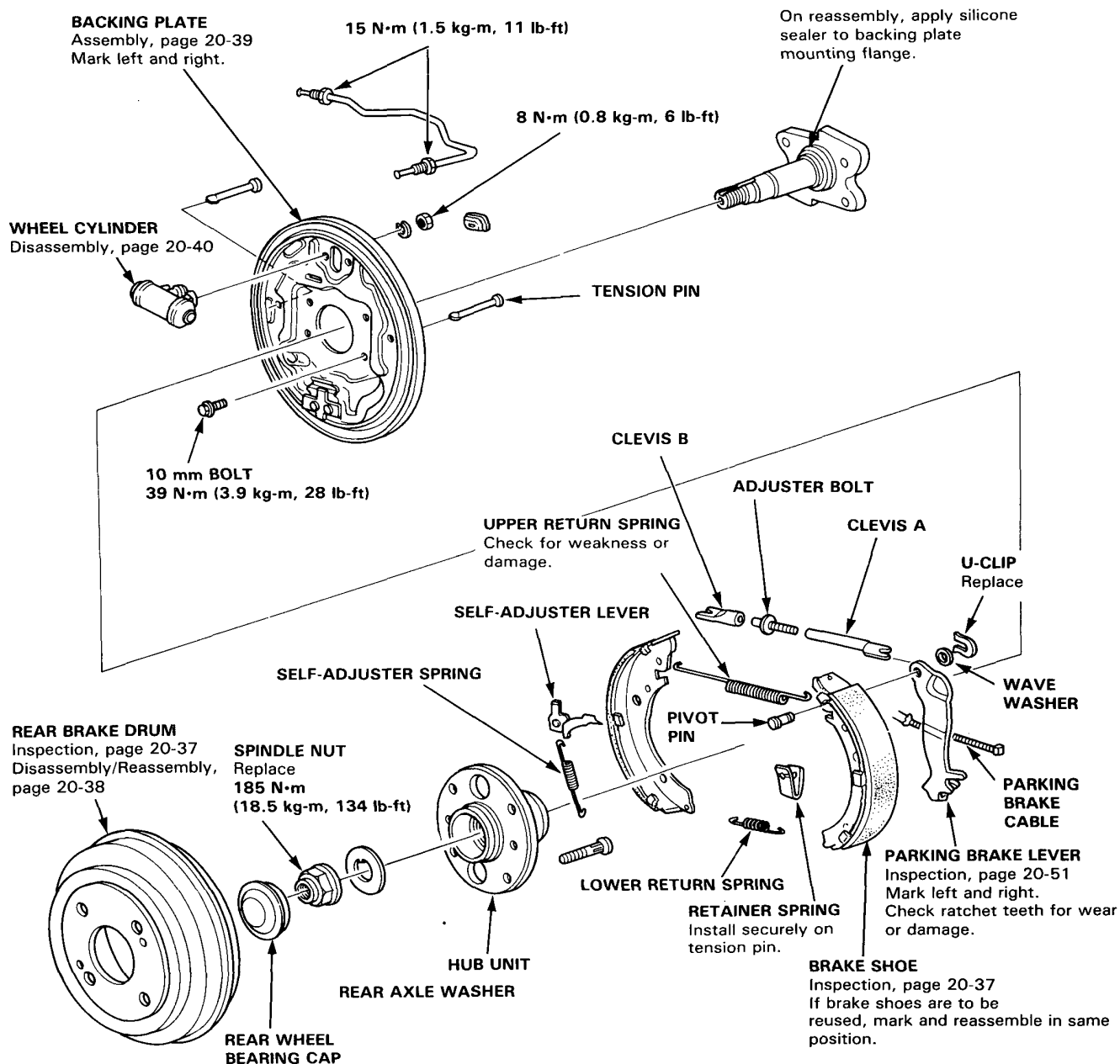
# Rear Drum Brake

## 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

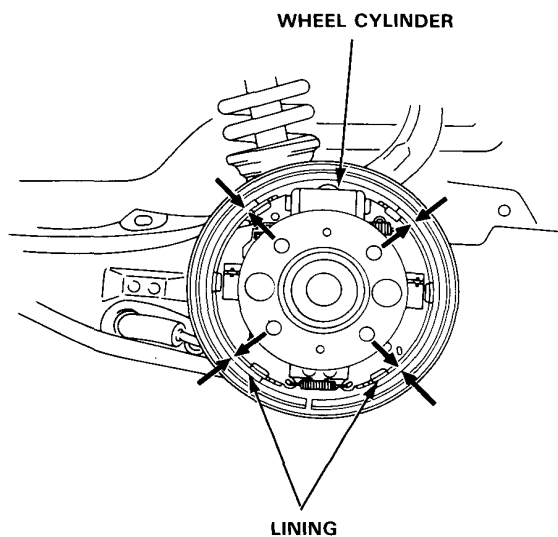
1. Inspect wheel cylinders for leakage.
2. Inspect brake linings for cracking, glazing, wear or contamination.
3. Measure brake lining thickness.

### Lining Thickness

(Does not include brake shoe thickness)

**Standard:** 4.5 mm (0.177 in.)

**Service Limit:** 2.0 mm (0.079 in.)



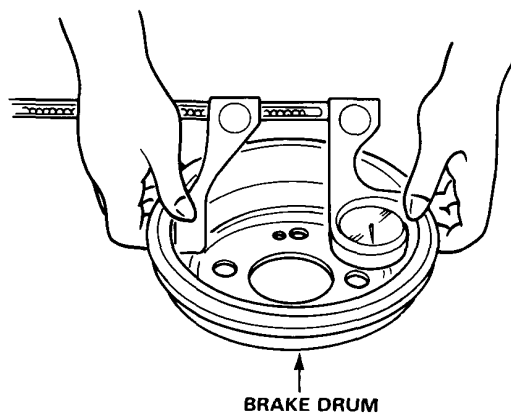
4. Inspect bearings in hub unit for smooth operation. If defective, refer to page 19-23.
5. Measure inside diameter of brake drum.

### 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.



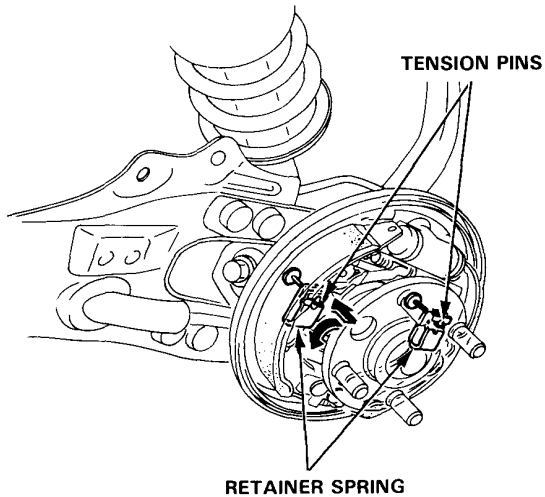
6. Inspect brake drum for scoring, grooving, cracks.



# Rear Drum Brake

## Disassembly

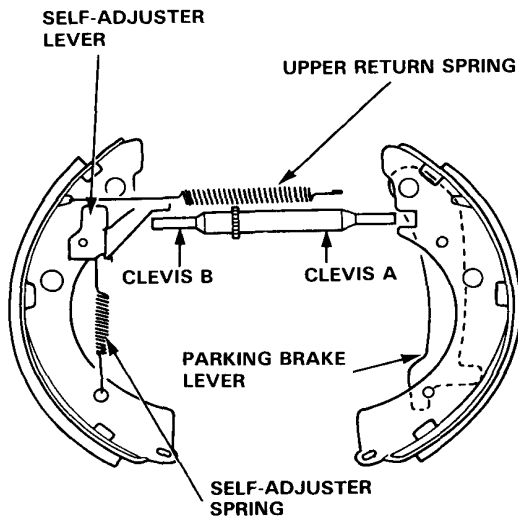
1. Remove the tension pins by pushing the retainer spring and turning them.



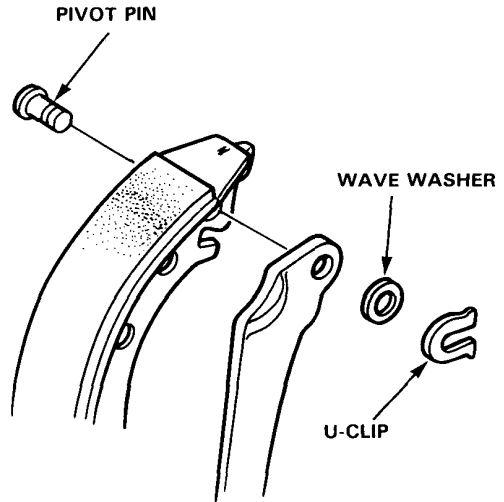
2. Lower the brake shoe assembly and remove the lower return spring.

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 washer, parking brake lever and pivot pin from the brake shoe by removing the U-clip.





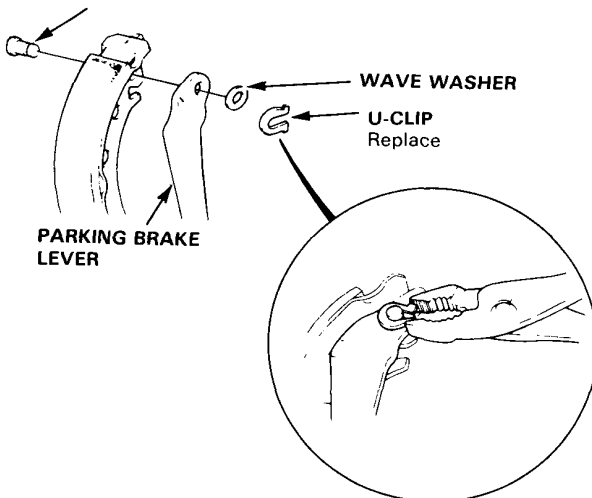


## Reassembly

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.

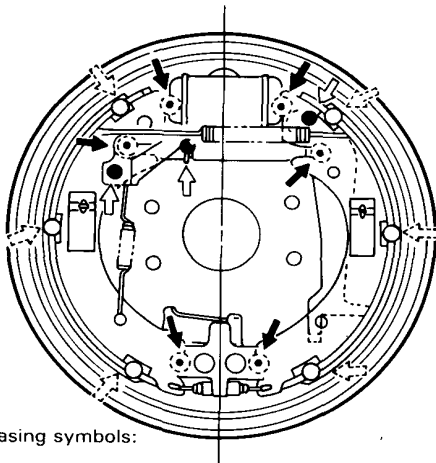
NOTE: Pinch the U-clip securely to prevent the pivot pin from coming out of the brake shoe.

PIVOT PIN



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

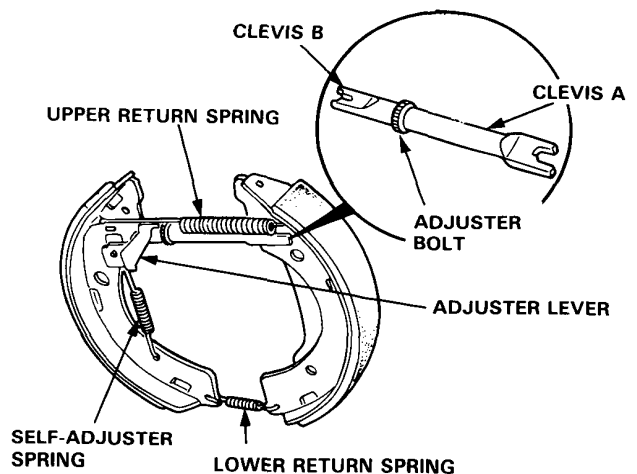
5. Clean and coat the grease to the threaded portions of clevises A and B.  
To shorten the clevises, turn the adjuster bolt.

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 installation 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).

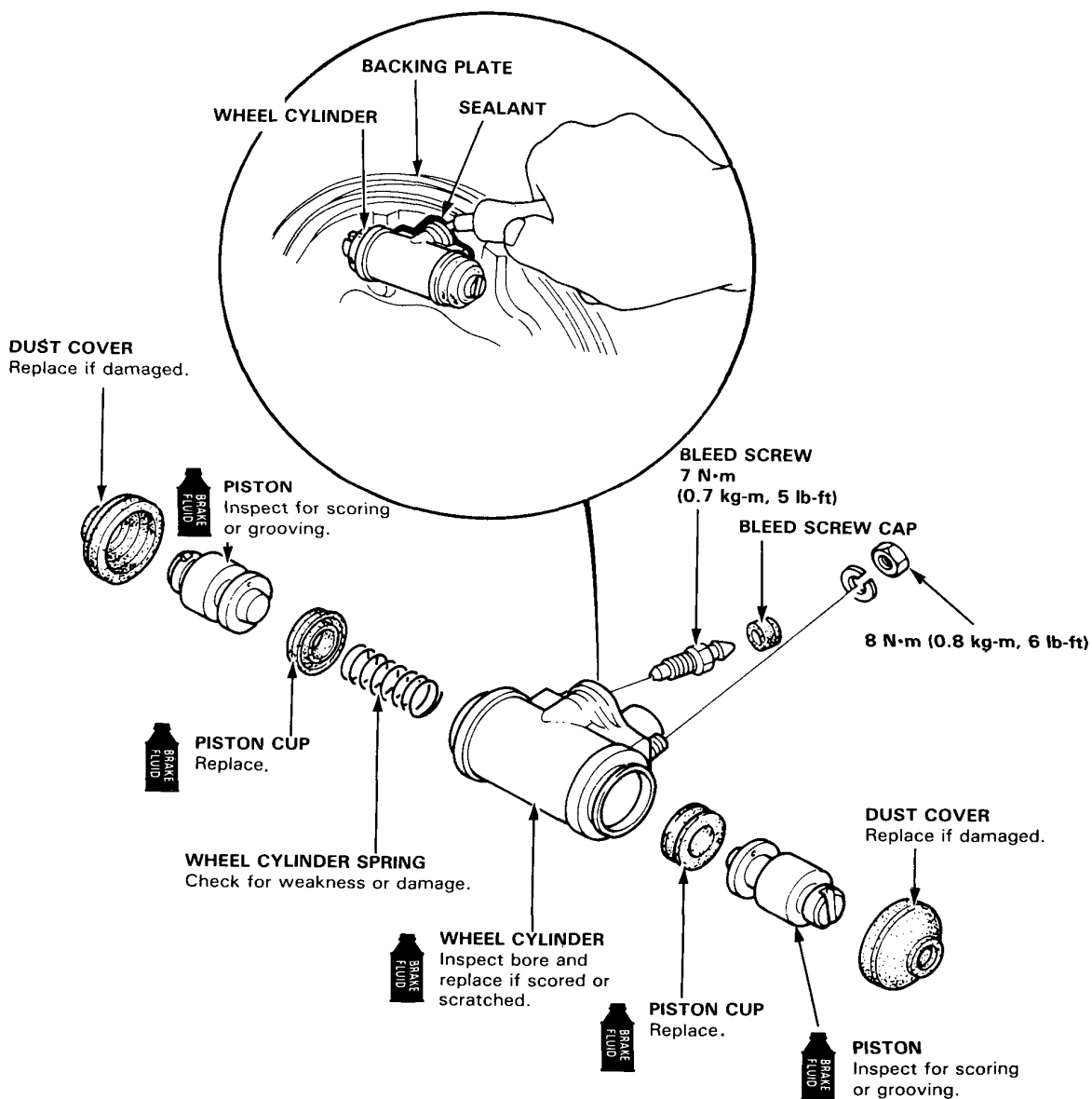


# Wheel Cylinder

## Disassembly and Inspection

### CAUTION:

- Use only clean brake fluid.
- Use only new replacement parts.
- Brake fluid will damage the painted, 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.



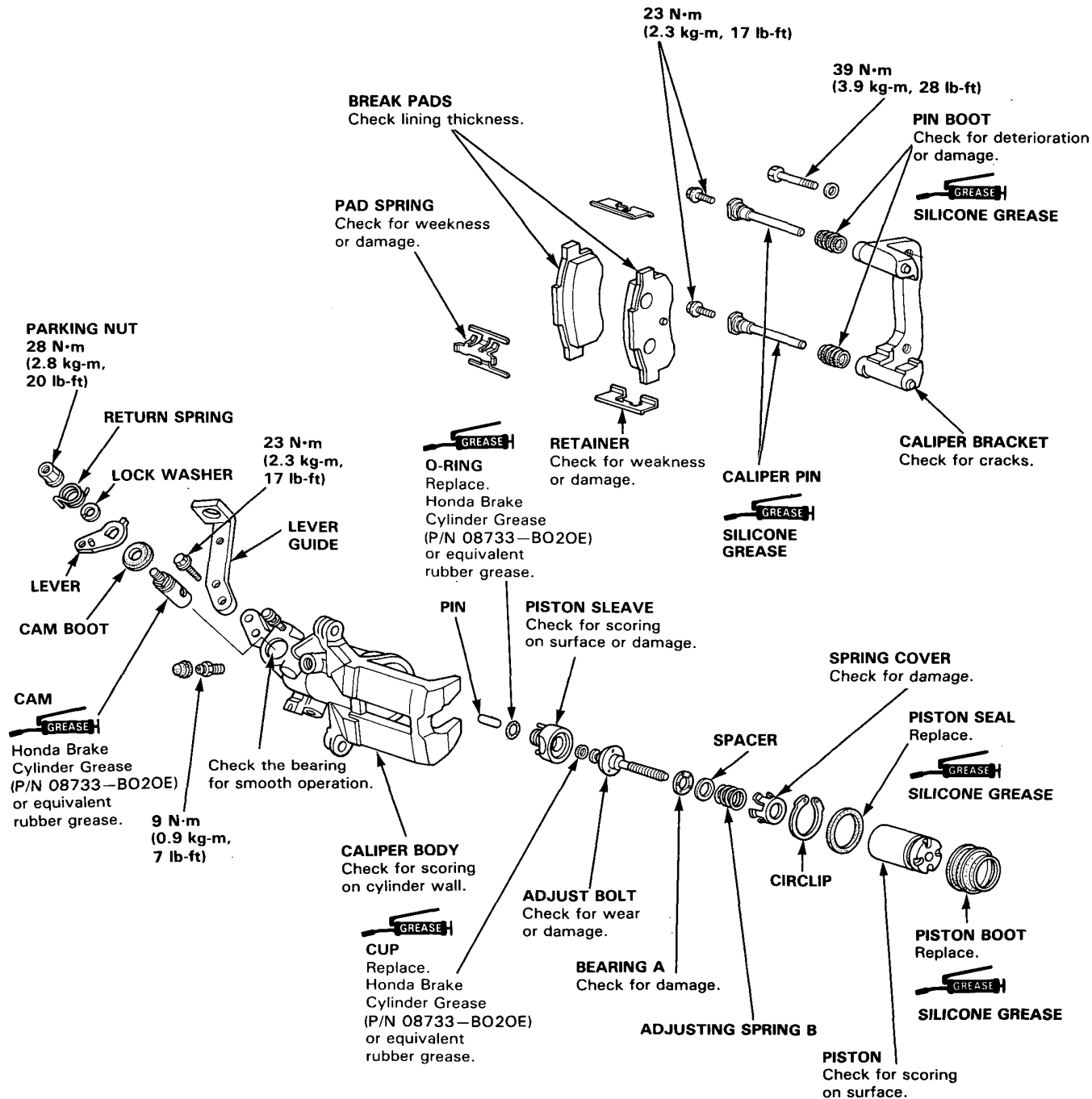


# Rear Disc Brake

## Inspection



**WARNING** Do not use air hose to blow brake assembly clean.

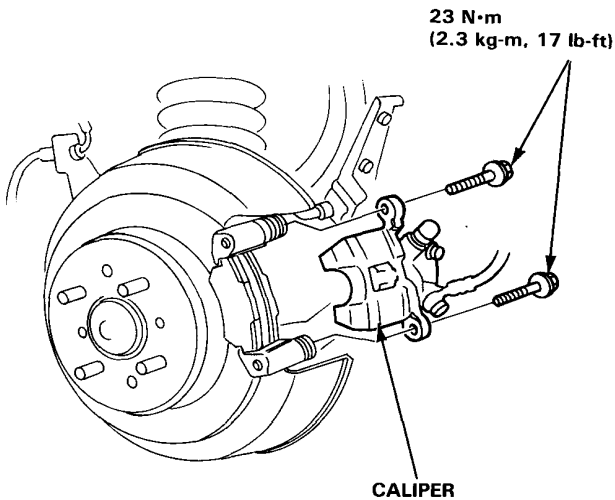




# Rear Brake Pad/Disc

## 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.

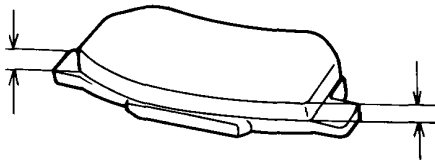


3. Remove the pads and measure the thickness of each brake pad lining using a vernier caliper.

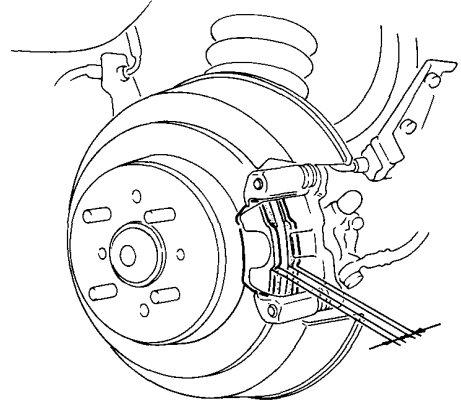
### Brake Pad Thickness:

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.



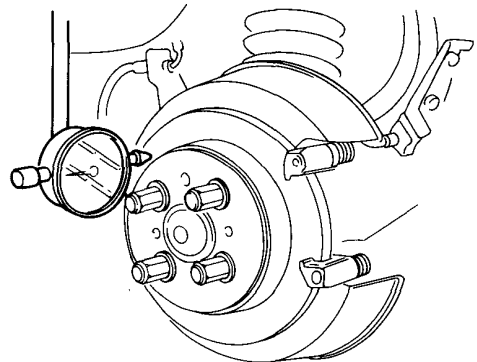
5. Inspect the disc surface for grooves, cracks, and rust. Clean the disc thoroughly and remove all rust.
6. Mount dial indicator as shown and measure the run-out at 10 mm (0.39 in) from the outer edge of the disc.

**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)

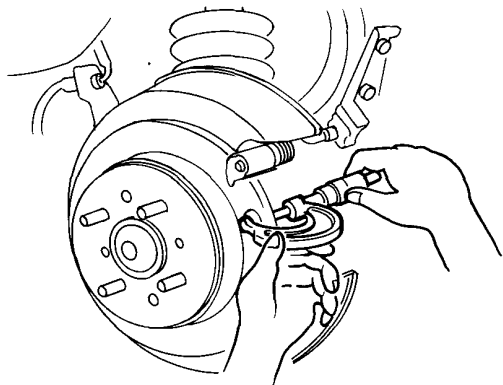
Replace the brake disc if beyond the service limit.







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 it exceeds the following service limits;

**Brake Disc Thickness:**

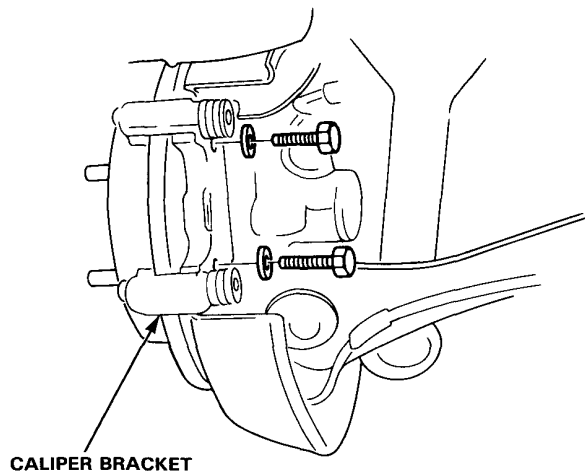
**Standard:** 10.0 mm (0.39 in)

**Service limit:** 8.0 mm (0.31 in)

**Brake Disc Parallelism:**

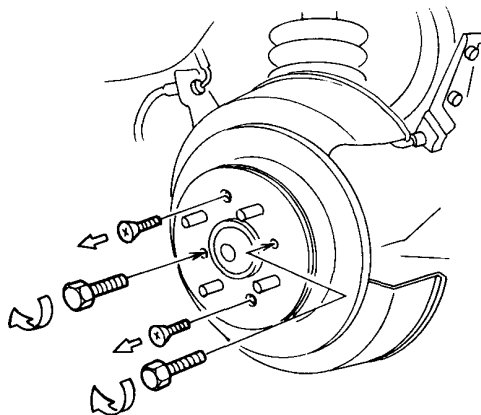
The difference between any thickness measurements should not be more than 0.015 mm (0.0006 in).

9. Replace the brake disc if beyond the limits.
10. Remove the two caliper bracket mounting bolts and caliper bracket.

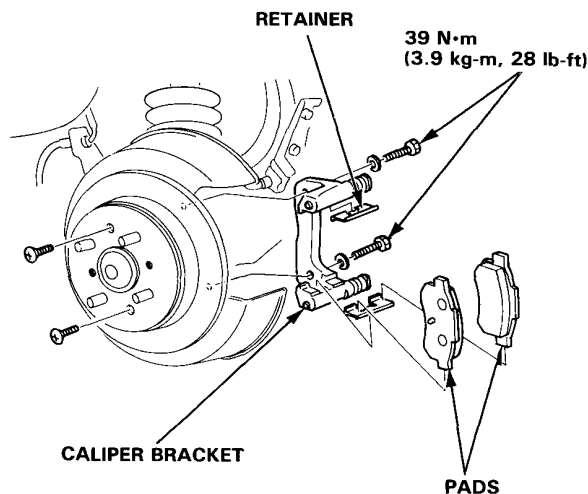


11. Remove the two 6 mm screws and brake disc.

**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)



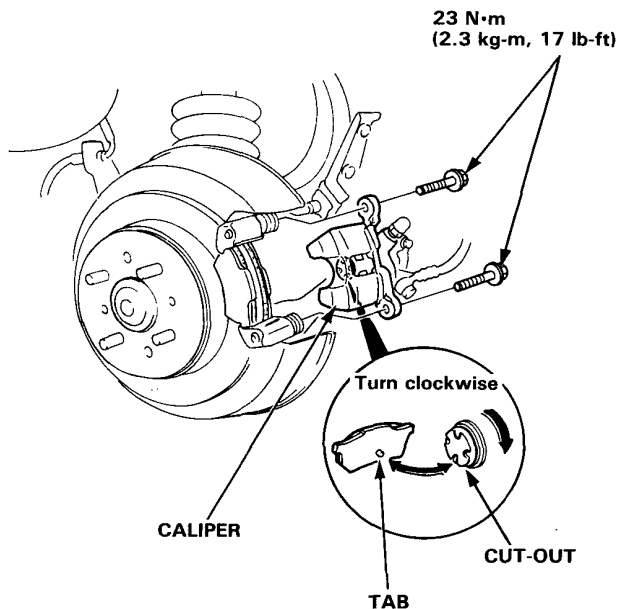
## Rear Brake Pad/Disc

### 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.



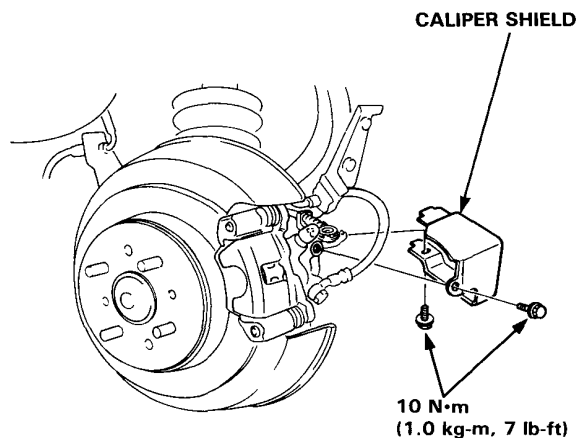
## Rear Caliper

### Disassembly

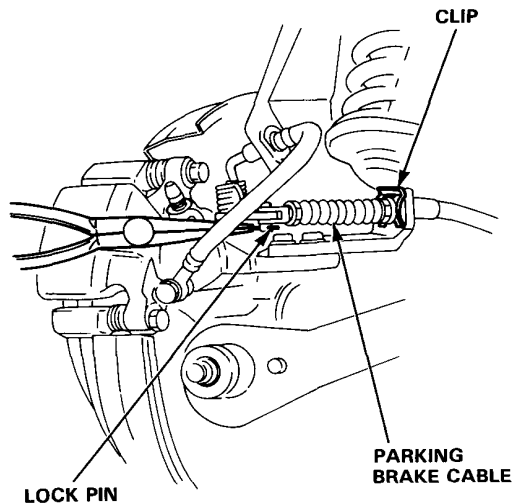
#### CAUTION:

- Make sure all parts are clean before reassembly.
- Use only new 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 it 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.



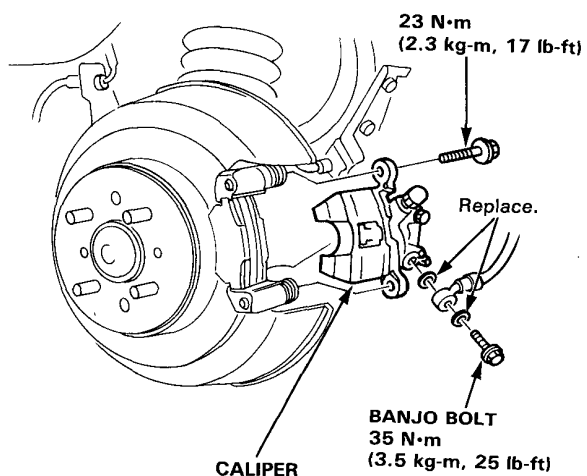




3. Remove the banjo bolt and disconnect the brake hose from the caliper.
4. Remove the two caliper mounting bolts and the caliper from the bracket.

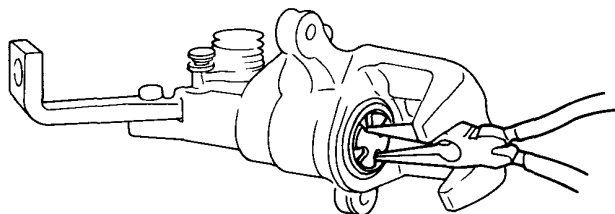
**CAUTION:** Thoroughly clean the outside of the caliper to prevent dust and dirt from entering inside.

Plug the end of the brake hose to prevent brake fluid flowing out.

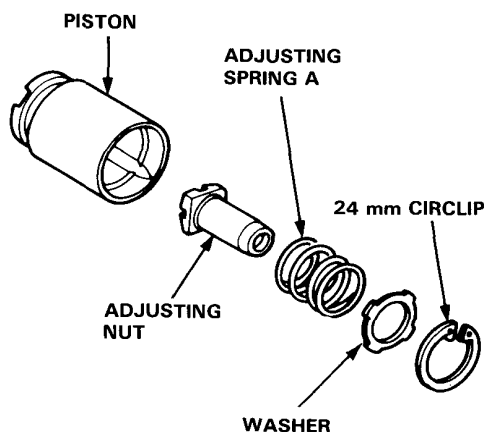


5. Remove the pad spring from the caliper.
6. Remove the piston and piston boot while rotating the piston.

**CAUTION:** Avoid damaging the piston and piston boot.

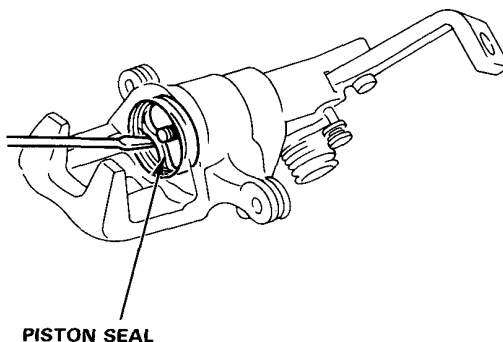


7. Remove the circlip, then washer, adjusting spring A, and the adjusting nut from the piston.



8. Remove the piston seal.

**CAUTION:** Take care not to damage the cylinder bore.



(cont'd)



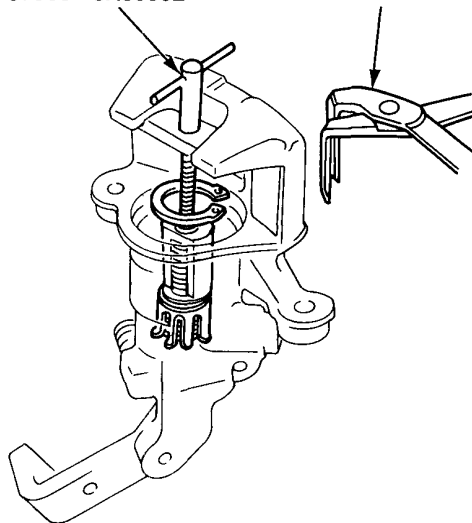
# Rear Caliper

## 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.

**BRAKE SPRING  
COMPRESSOR  
07960-SA50002**

**SNAP RING PLIERS  
07914-SA50001**



11. Remove the spring cover, adjusting spring B, spacer, bearing A and adjusting bolt.

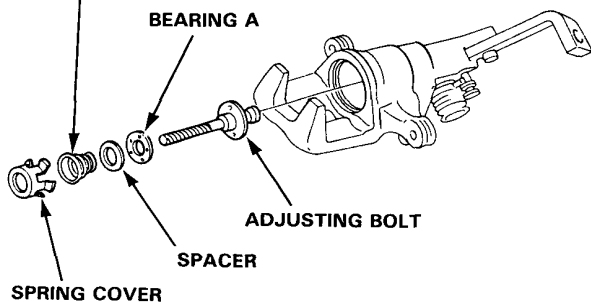
**ADJUSTING SPRING B**

**BEARING A**

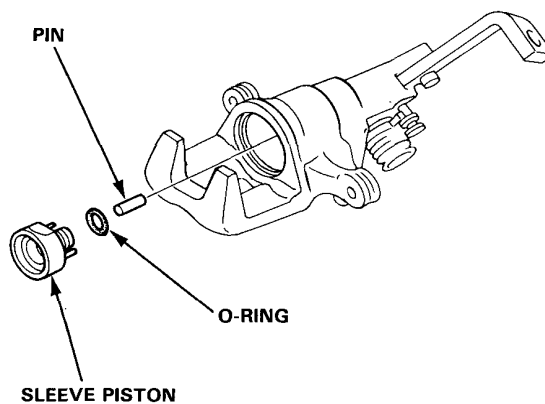
**ADJUSTING BOLT**

**SPACER**

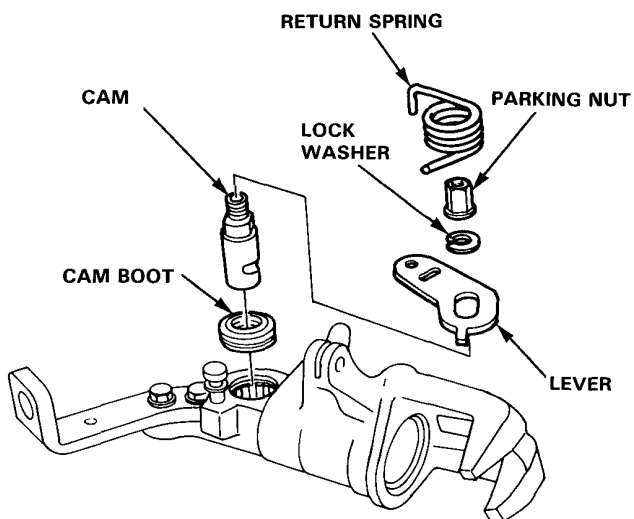
**SPRING COVER**



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.







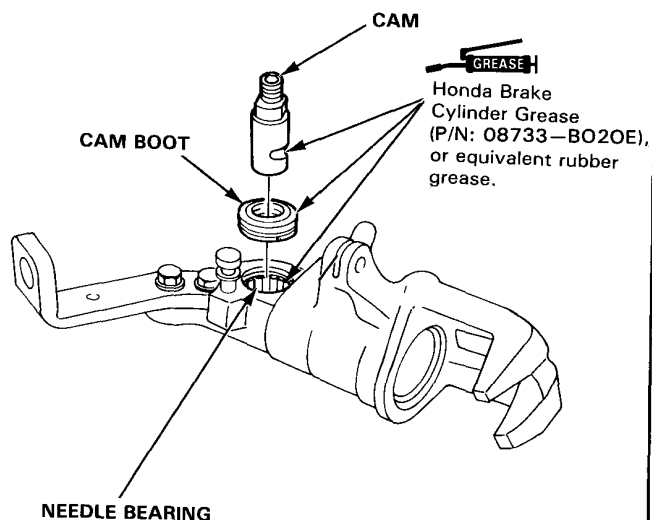
## Reassembly

### CAUTION:

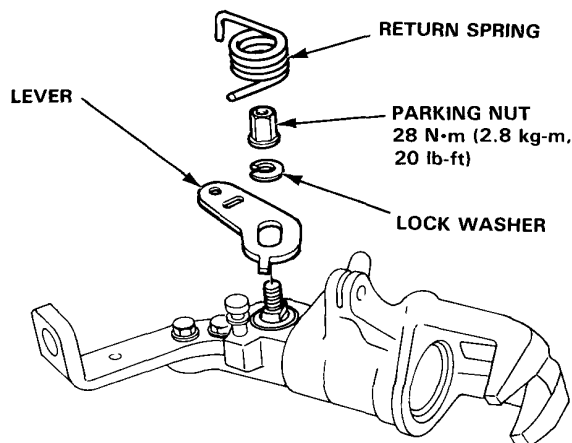
- Make sure all parts are clean before reassembly.
- Use only new replacement parts.
- Use only new clean brake fluid.
- Do not allow dirt or other foreign matter to contaminate the brake fluid.
- Do not mix different brands of brake fluid.
- Avoid spilling brake fluid on painted, plastic or rubber surfaces as it 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-B020E), or equivalent rubber grease.
2. Coat the new cam boot with Honda Brake Cylinder Grease (P/N: 08733-B020E), or equivalent rubber grease and install in the caliper.
3. Install the cam with the hole toward the cylinder.

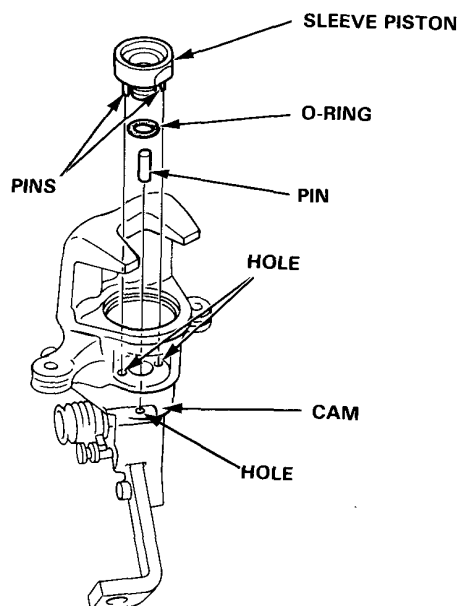
**CAUTION:** Avoid damaging the cam boot since it must be installed before the cam.



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.



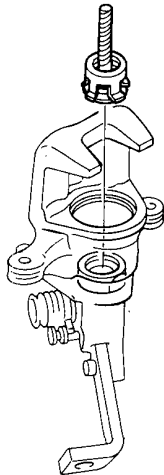
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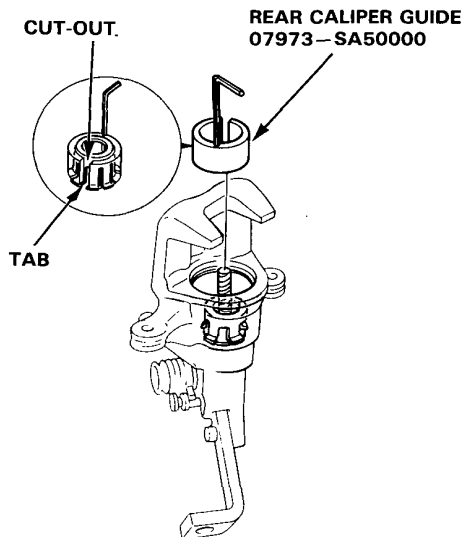
# Rear Caliper

## Reassembly (cont'd)

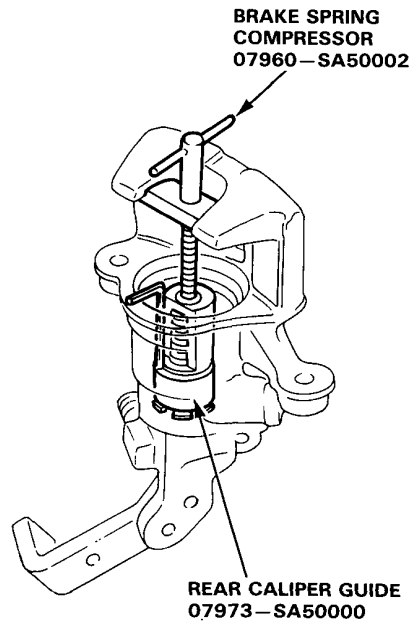
9. Install a new cup with its groove facing the bearing A side on the adjusting bolt.
10. Fit the bearing A, spacer, adjusting spring B and spring cover on the adjusting bolt, and install in the caliper cylinder.



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.



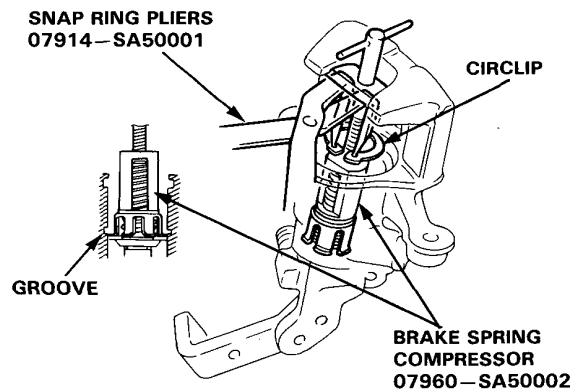
13. Compress the spring until it bottom out.

**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.

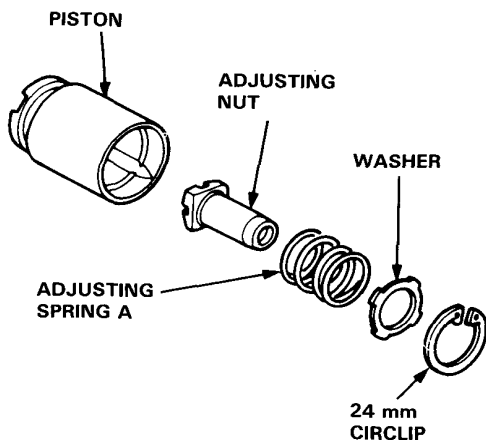
**NOTE:** Check that the circlip is seated in the groove properly.



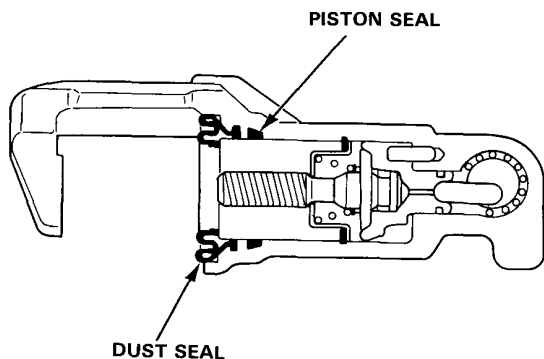




16. Install the adjusting nut, adjusting spring A, and washer, and secure with the circlip.

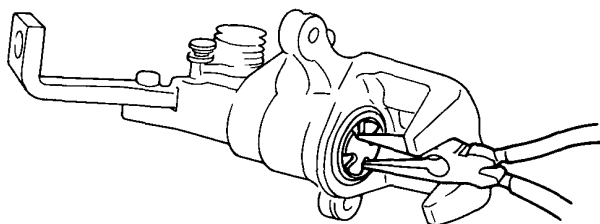


17. Coat the new piston seal and piston boot with silicone grease and install them in the caliper.



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.



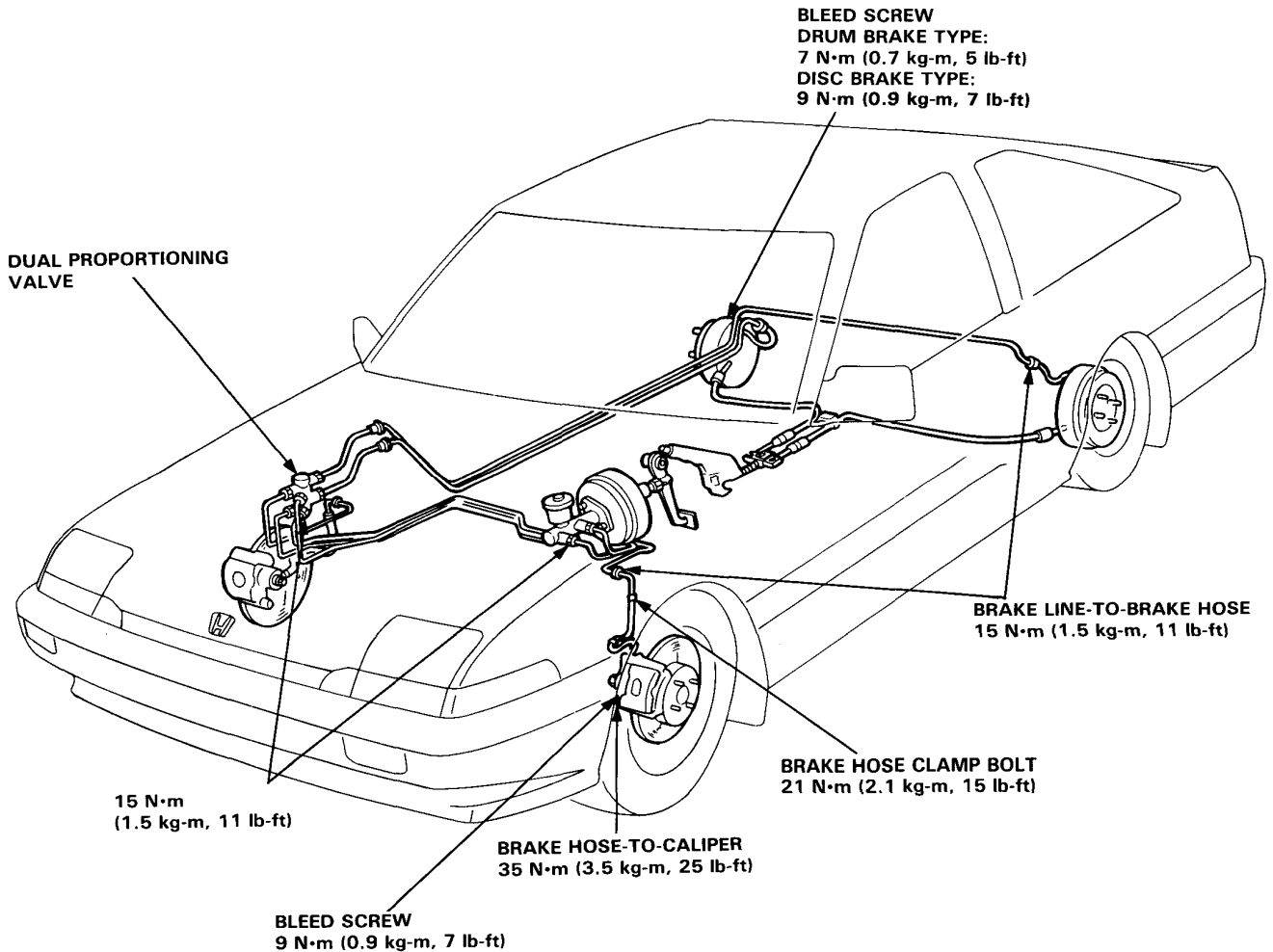
19. Install the brake pad retainers and brake pads.
20. Install the pad springs on the caliper.
21. Install the caliper on the caliper bracket and tighten the caliper mounting bolts.
22. Connect the brake hose to the caliper with new sealing washers and tighten the banjo bolt.
23. Connect the parking 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.

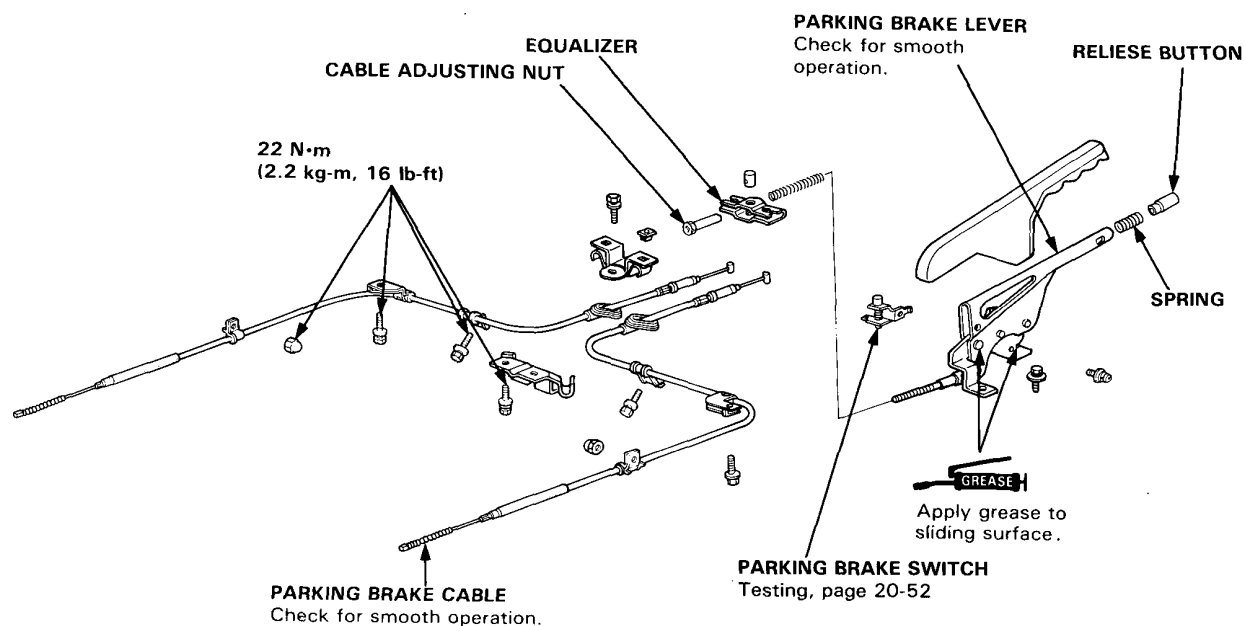




# Parking Brake

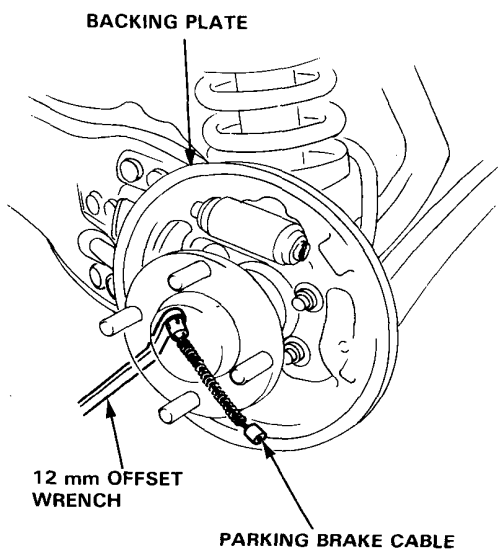


## Disassembly and Reassembly



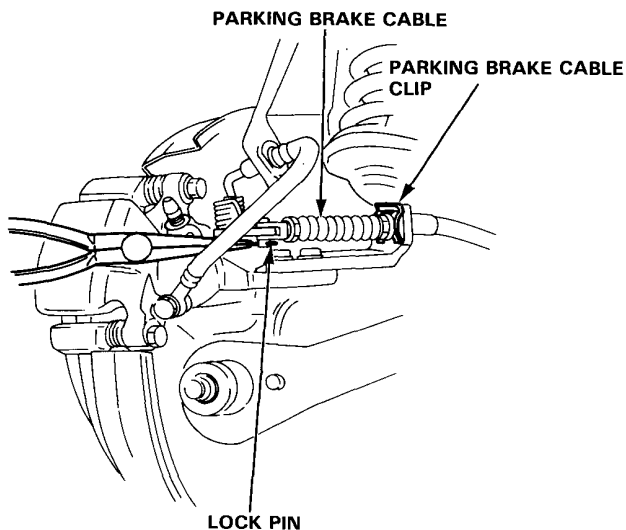
### Drum Brake model

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.



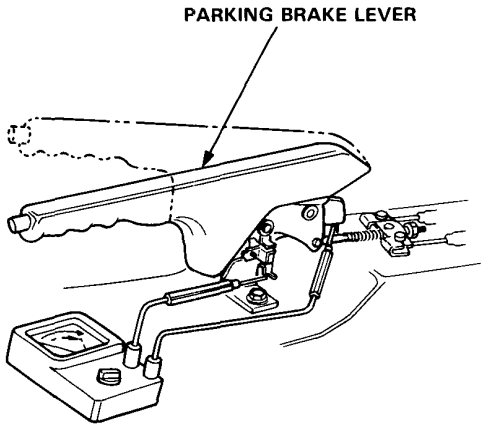


# Switches

## Parking Brake Switch Test

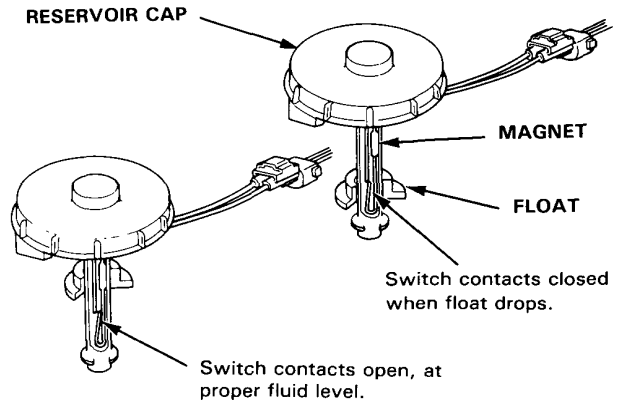
Attach one test probe of an ohmmeter to the switch, and the other to the body.

- With the brake lever up, there should be continuity.
- With the brake lever down, there should be no continuity.



## 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.



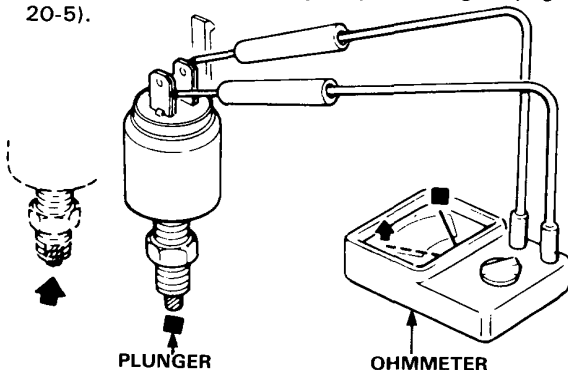
## Brake Light Switch test

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).





# 4W-ALB (4-Wheel Anti-Lock Brake) System



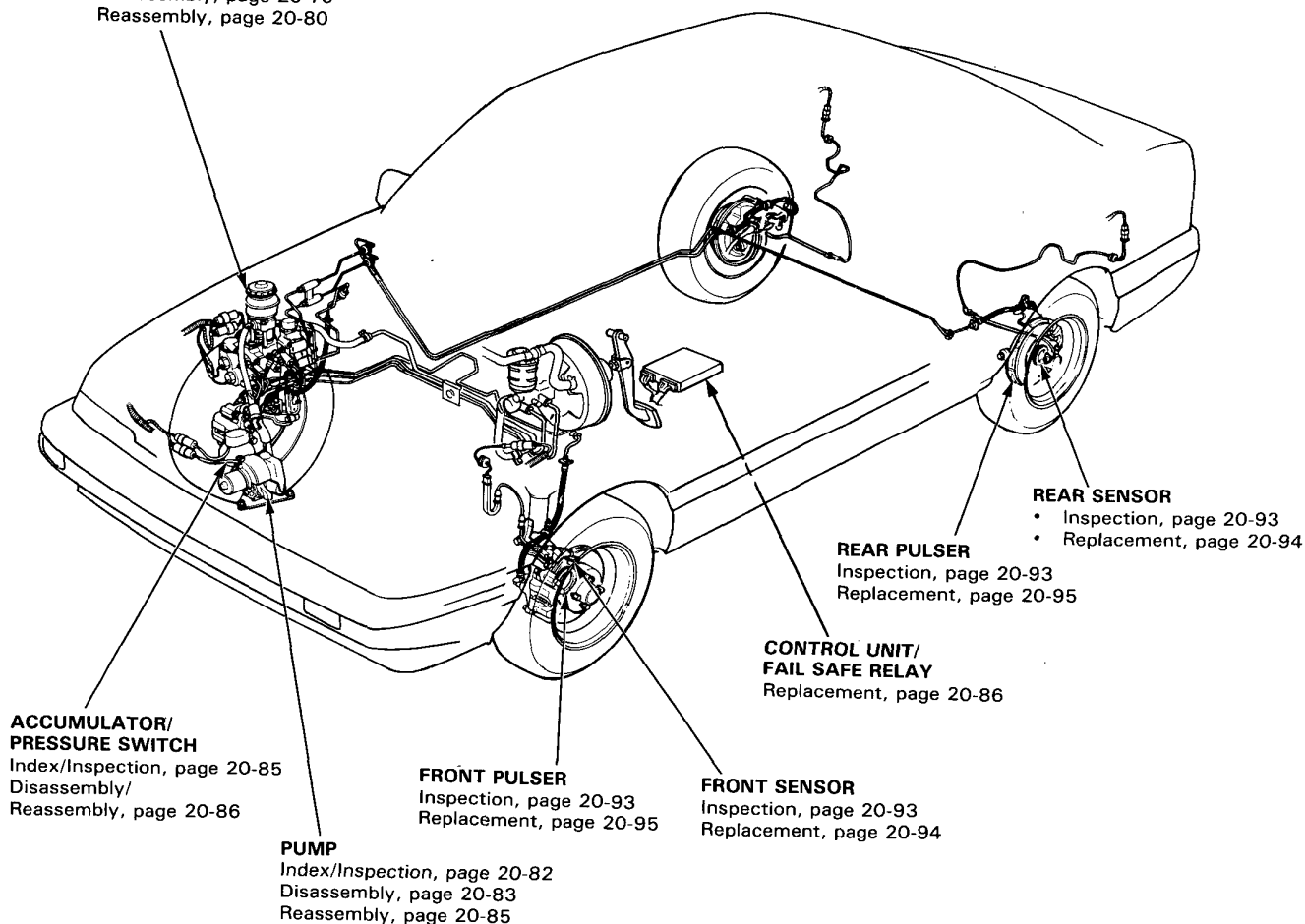
## Index

### 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



### ACCUMULATOR/ PRESSURE SWITCH

- Index/Inspection, page 20-85
- Disassembly/
  - Reassembly, page 20-86

### PUMP

- Index/Inspection, page 20-82
- Disassembly, page 20-83
- Reassembly, page 20-85

### FRONT PULSER

- Inspection, page 20-93
- Replacement, page 20-95

### FRONT SENSOR

- Inspection, page 20-93
- Replacement, page 20-94

### CONTROL UNIT/ FAIL SAFE RELAY

- Replacement, page 20-86

### REAR PULSER

- Inspection, page 20-93
- Replacement, page 20-95

### REAR SENSOR

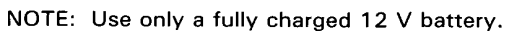
- Inspection, page 20-93
- Replacement, page 20-94



## Fluid Delivery

### Pump delivery

- ALB T-WRENCH**  
**07907—SB00000**



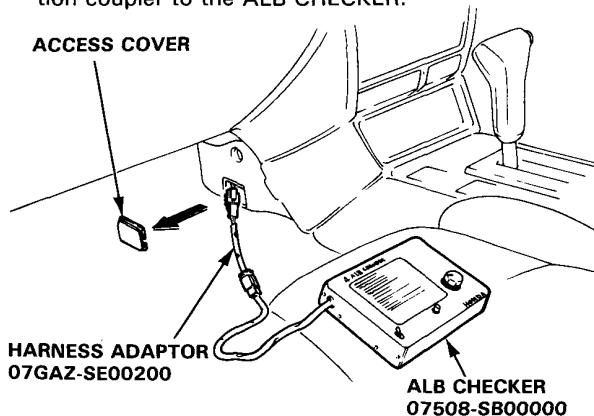




## Functional Test

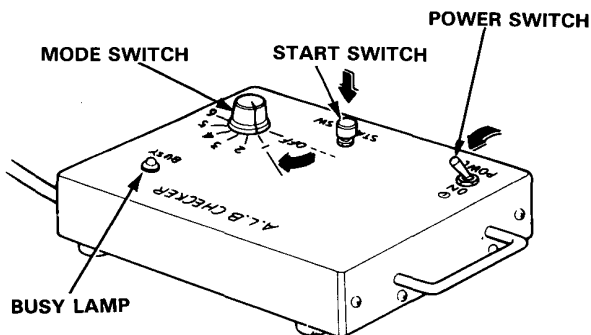
NOTE: Perform the following inspections. The procedures described below are to test each individual function of the system by simulating actual operating conditions.

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 vehicle 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.

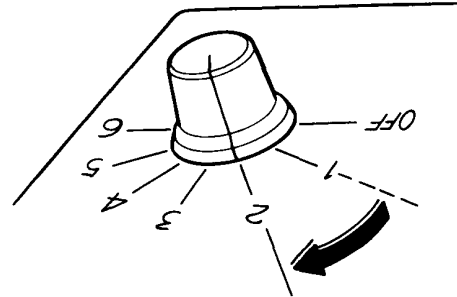


- 2) Turn the mode switch to "1".
- 3) Push the start switch.  
The **ALB**, **(O)** or **BRAKE** lamp should not go on while the BUSY lamp is ON.  
If the **ALB**, **(O)** or **BRAKE** lamp goes on, follow the steps described in troubleshooting.

- 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 misunderstood.

- 5) Turn the mode switch further to "2".

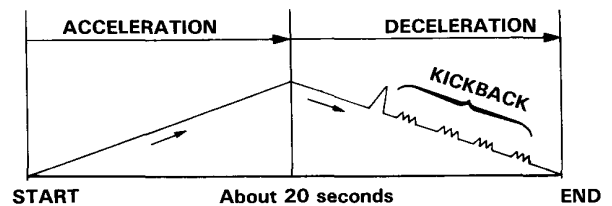


- 6) Depress the brake pedal and push the start switch.

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)

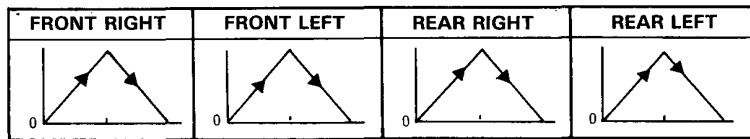


# 4W-ALB

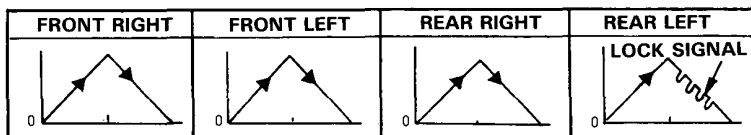
## Function Test (cont'd)

### ALB Checker Operation

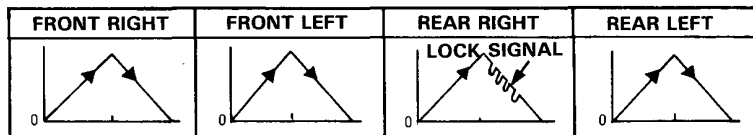
Mode 1: Send the driving signal simulated 0 km/h → approxi. 180 km/h → 0 km/h of each wheels to the control unit to check the control unit self diagnosis circuit. The ALB lamp should not go ON.



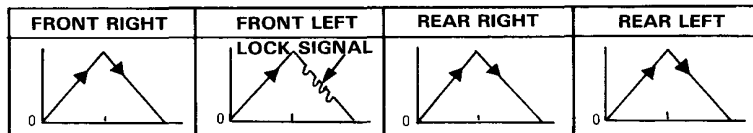
Mode 2: Send the driving signal of each wheels, then send lock signal of the rear left wheel to the control unit. The ALB lamp should not go ON and there should be kickback.



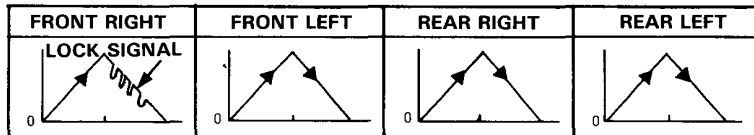
Mode 3: Send the driving signal of each wheels, then send the lock signal of the rear right wheel to the control unit. The ALB lamp should not go ON and there should be kickback.



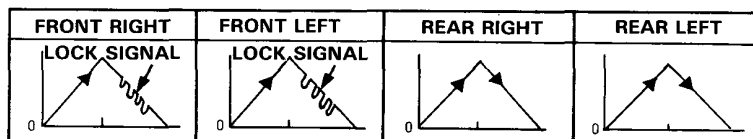
Mode 4: Send the driving signal of each wheels, then send the locking signal of the front left wheel to the control unit. The ALB lamp should not go ON and there should be no kickback.



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:**

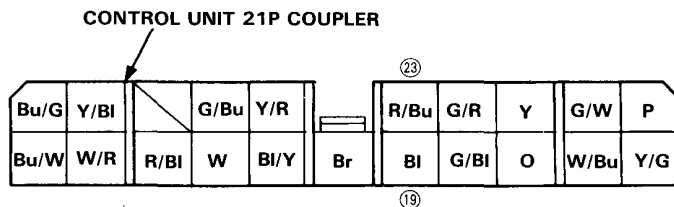
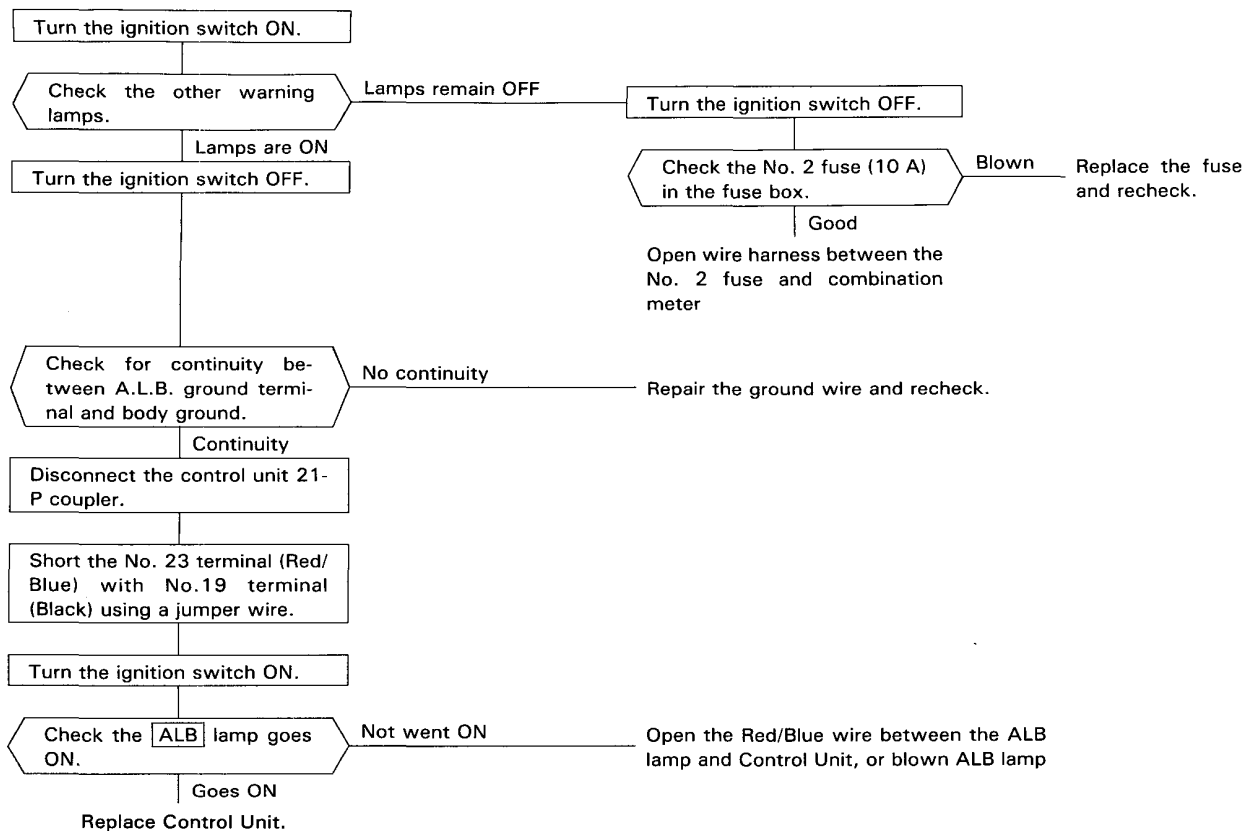
1. The **ALB** lamp go ON in mode 1.  
Check the wiring, if there is good condition, the control unit is faulty.
2. There are no kickback in mode 2, 3 and 6.  
  
Faulty pressure switch (remains ON)  
Shorted wires  
Faulty or disconnected power unit coupler  
Faulty power unit relay
3. Weak kickback 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



# 4W-ALB

## Troubleshooting

1. The **ALB** lamp does not go on when the engine starting (The lamp should go on when the ignition switch turned on).

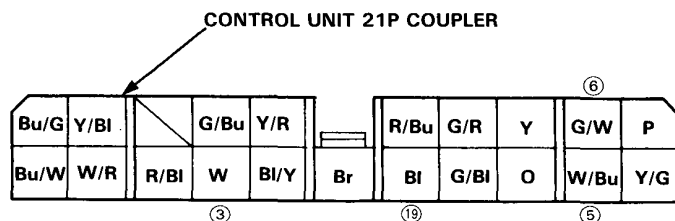
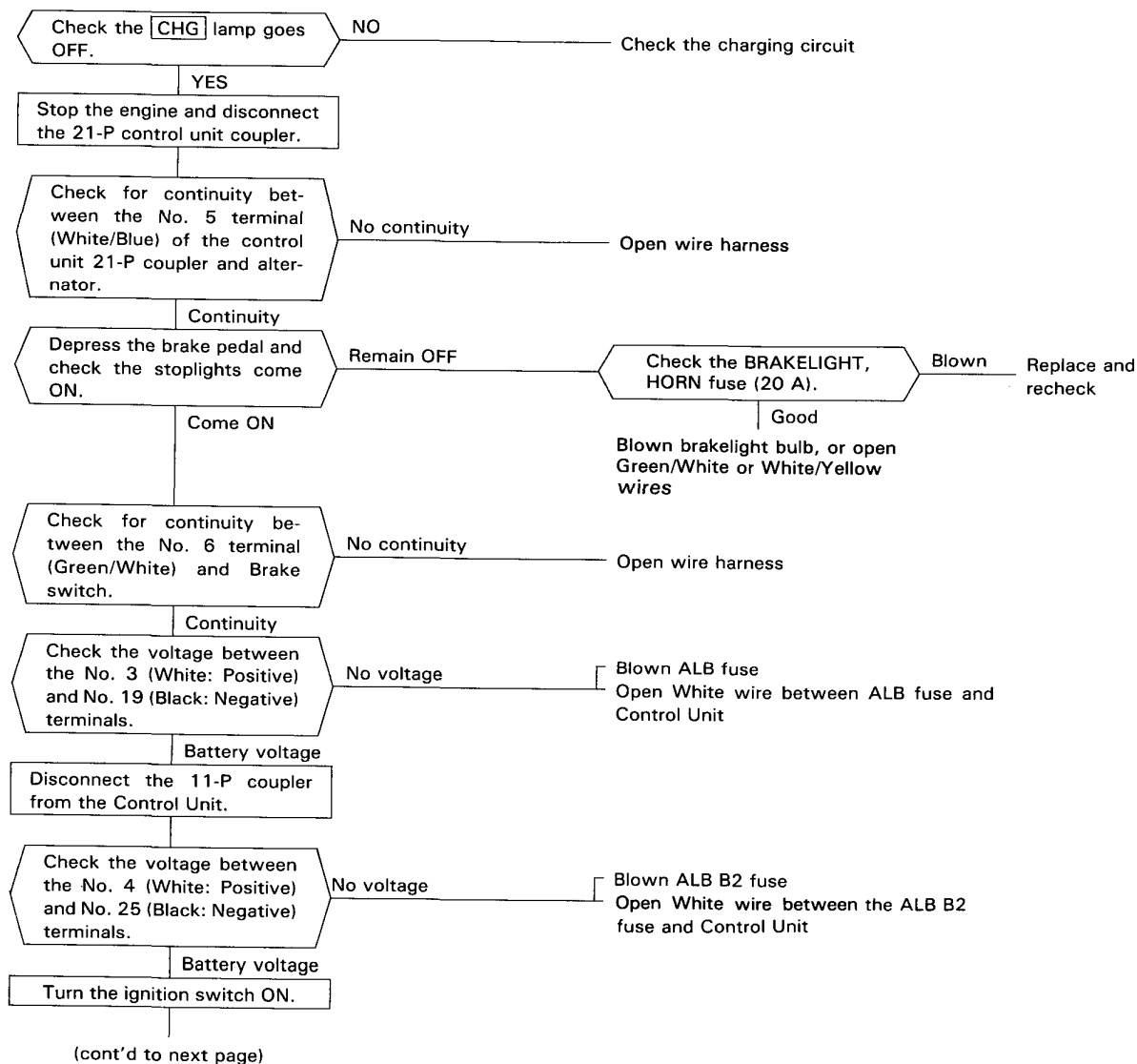


View from wire side.





2. The **ALB** lamp remains ON when the brake pedal is depressed after the engine is started.



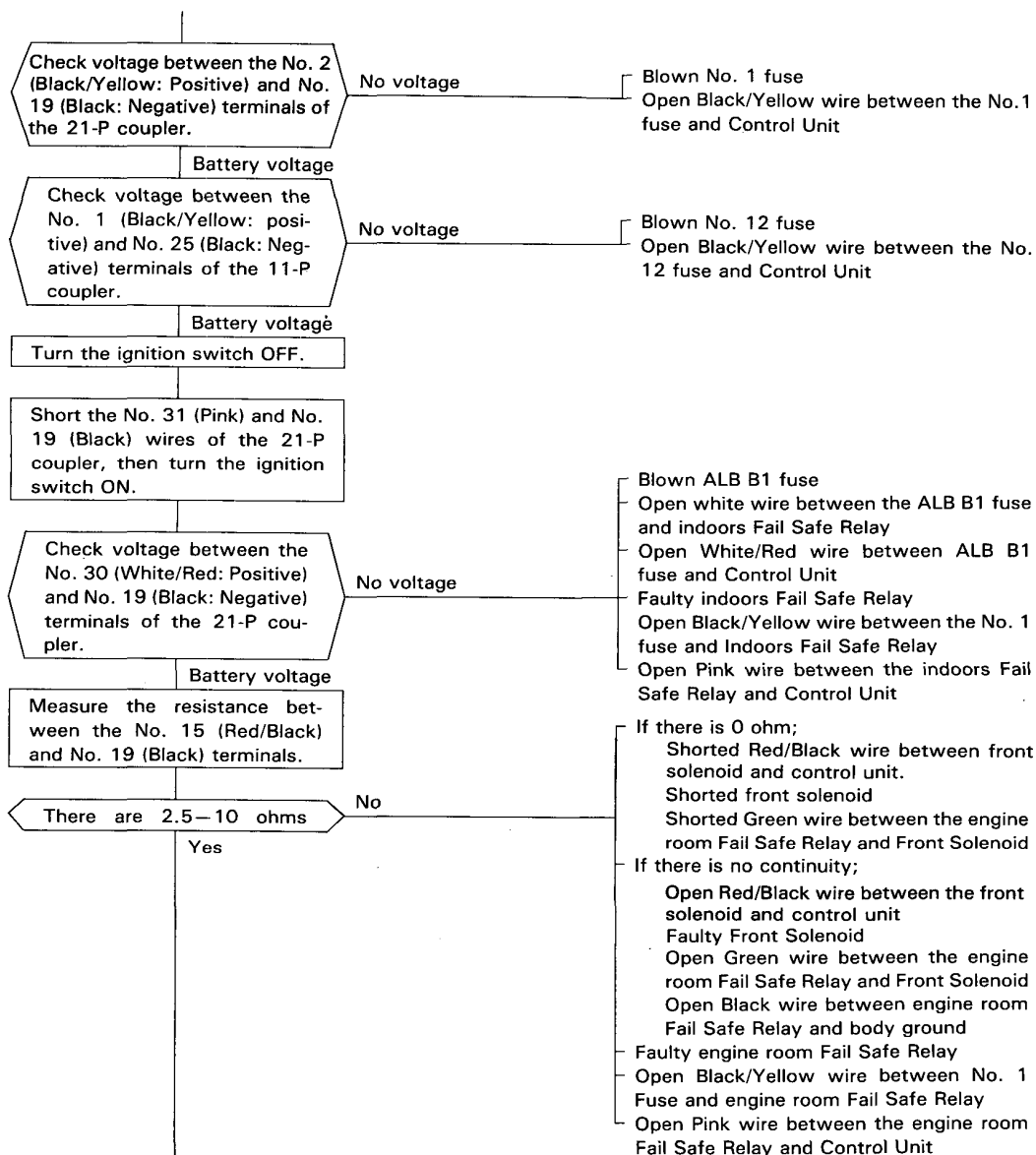
View from wire side.

(cont'd)



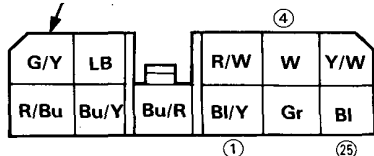
# 4W-ALB

## Troubleshooting (cont'd)



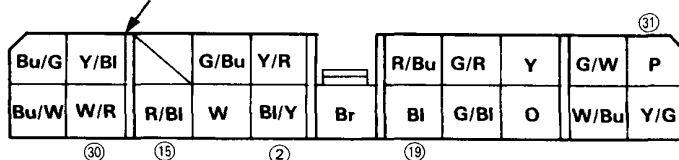
(cont'd to next page)

CONTROL UNIT 11P COUPLER



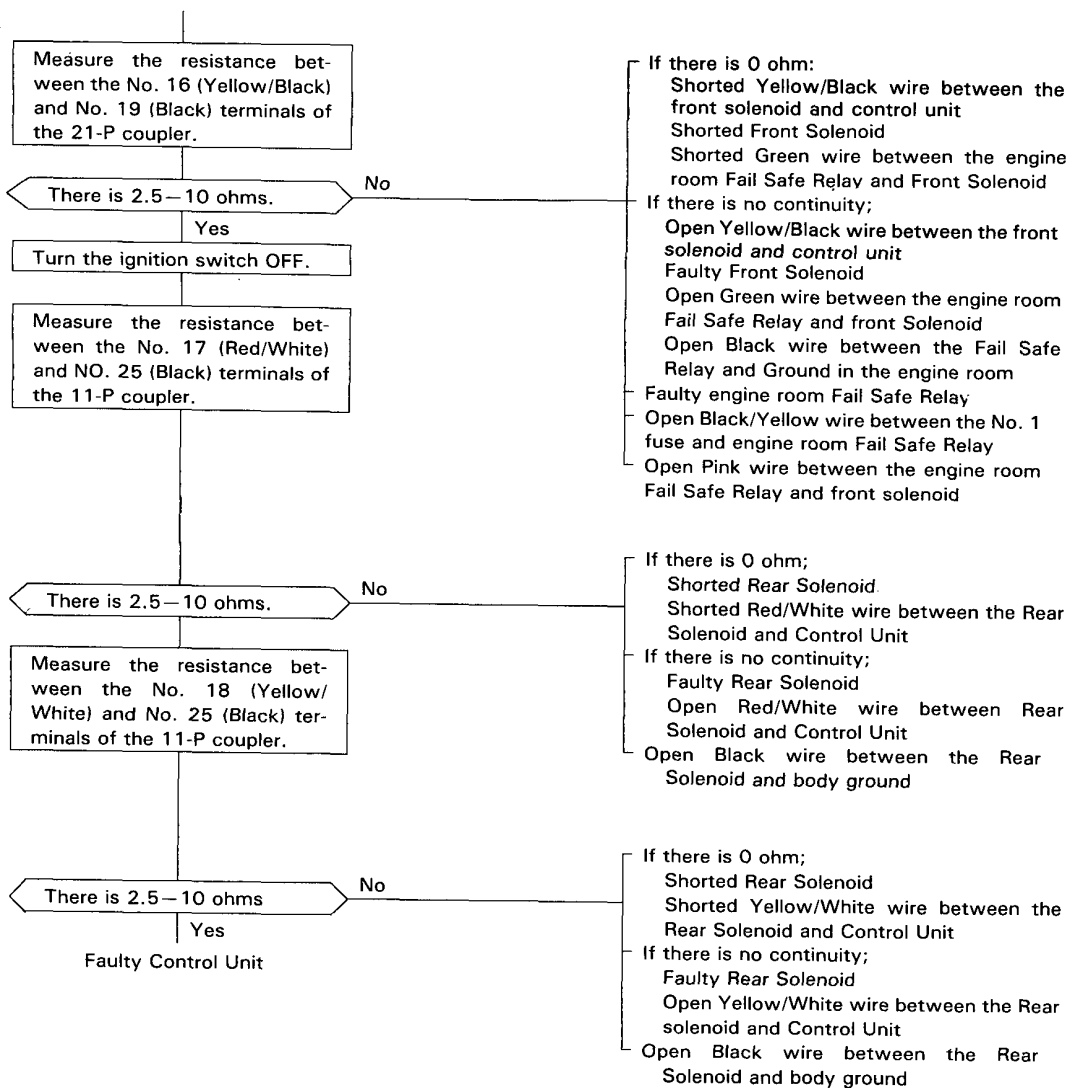
View from wire side.

CONTROL UNIT 21P COUPLER

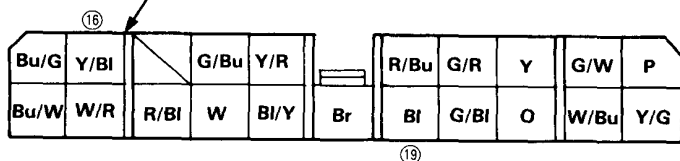


View from wire side.



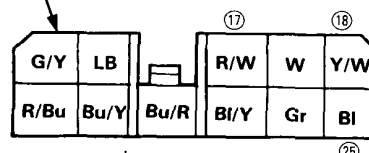


CONTROL UNIT 21P COUPLER



View from wire side.

CONTROL UNIT 11P COUPLER



View from wire side.

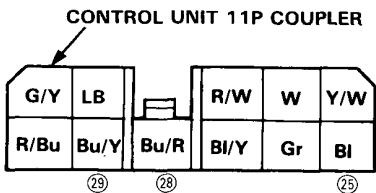
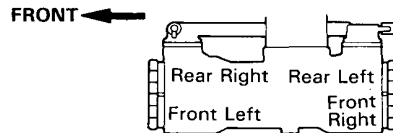
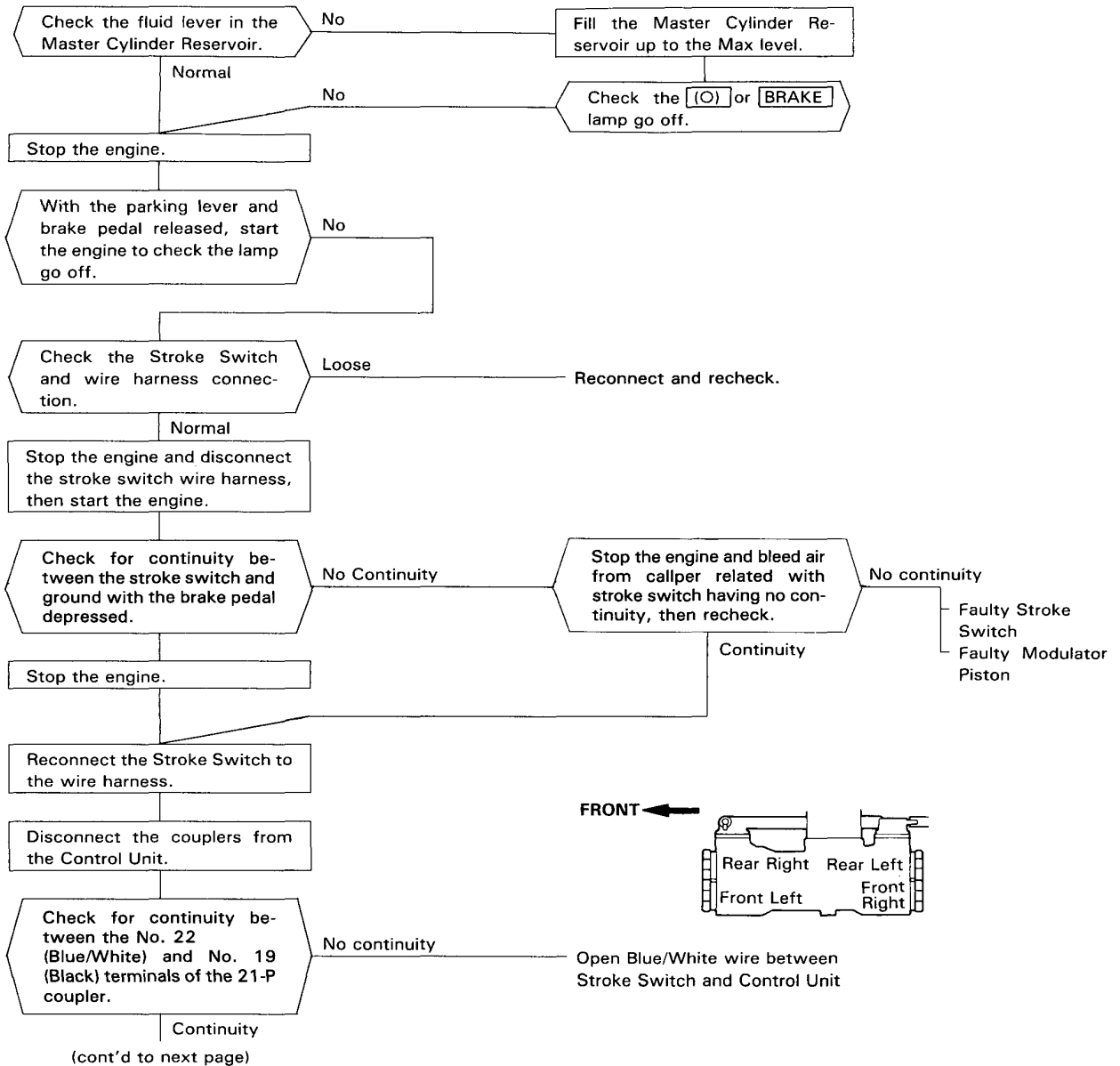
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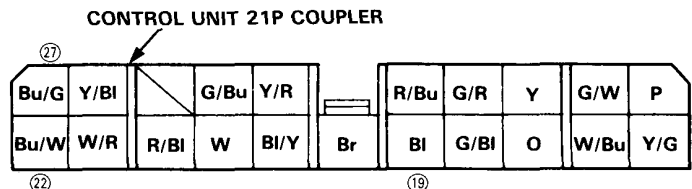
# 4W-ALB

## Troubleshooting (cont'd)

3. (O) or BRAKE lamp won't go OFF, if the parking brake is released.

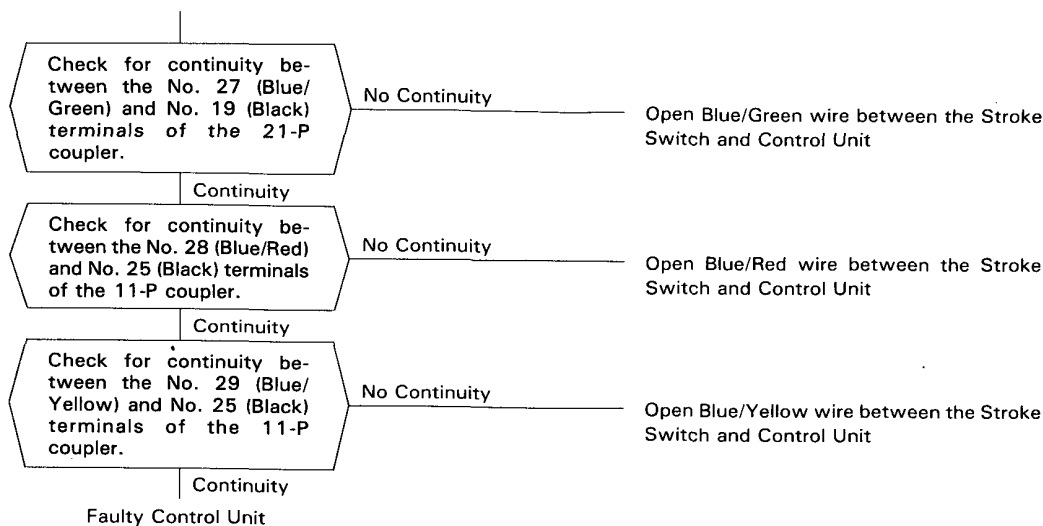


View from wire side.

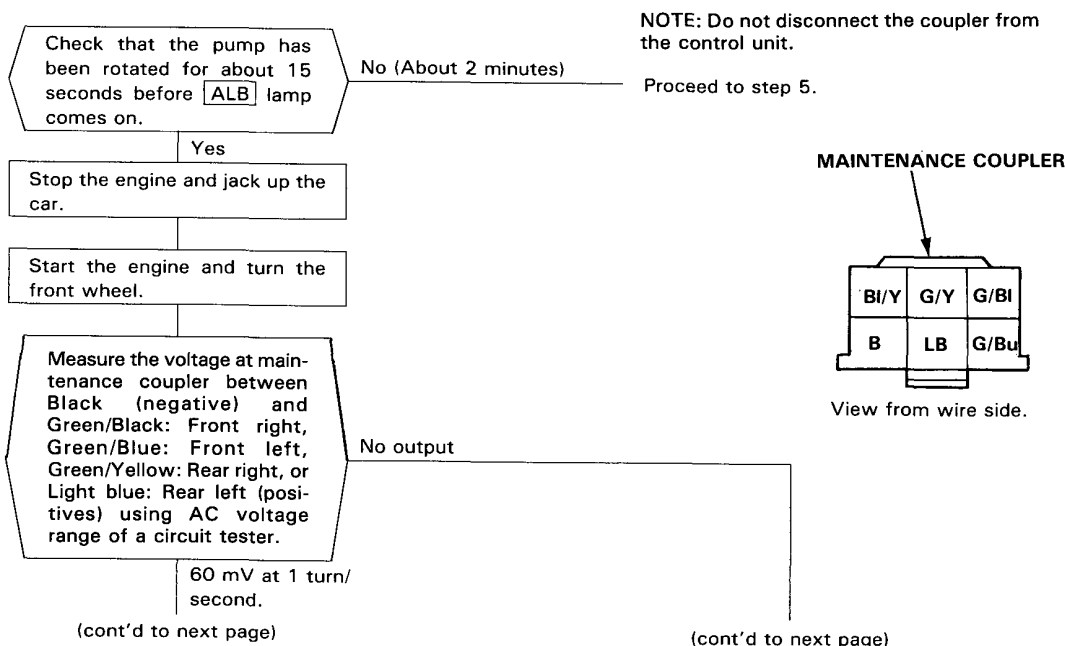


View from wire side.





4. The **ALB** lamp comes on or remains on (Remains on or comes on frequently.....ABNORMAL).

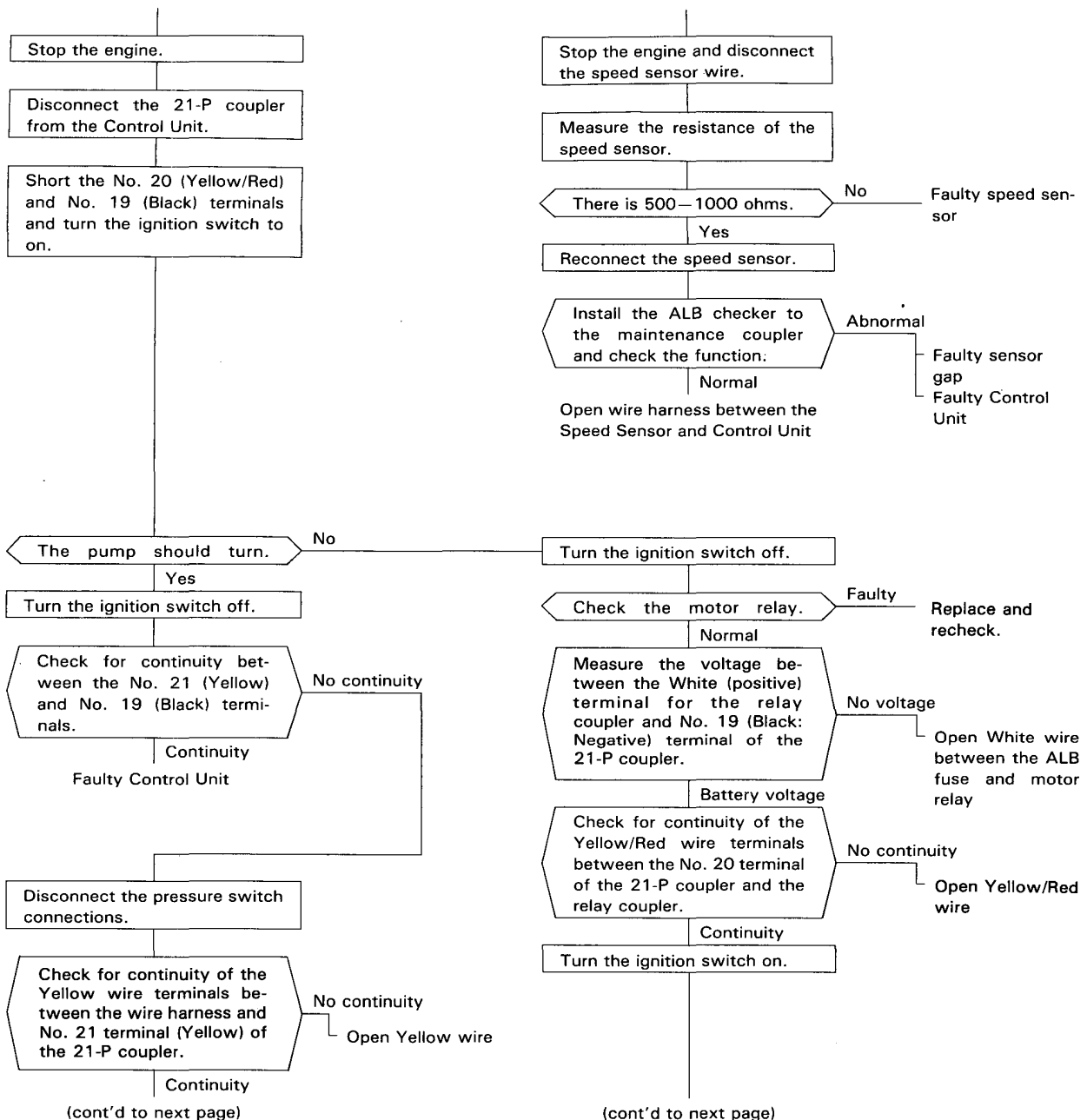


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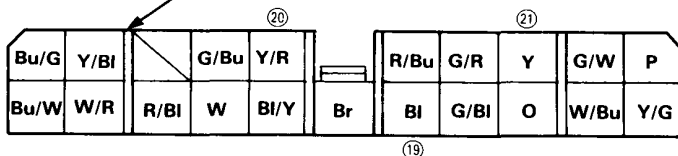


# 4W-ALB

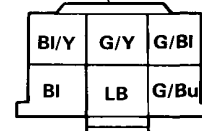
## Troubleshooting (cont'd)



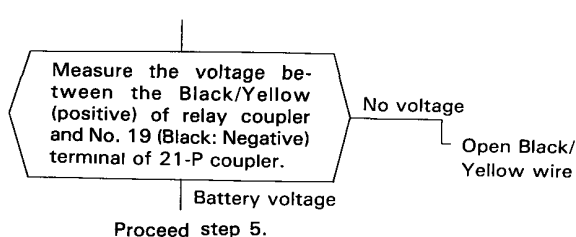
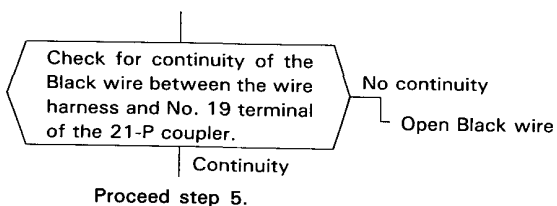
CONTROL UNIT 21P COUPLER



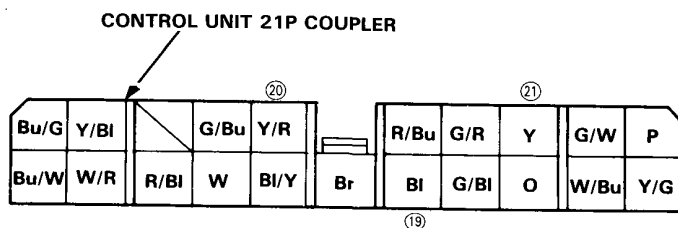
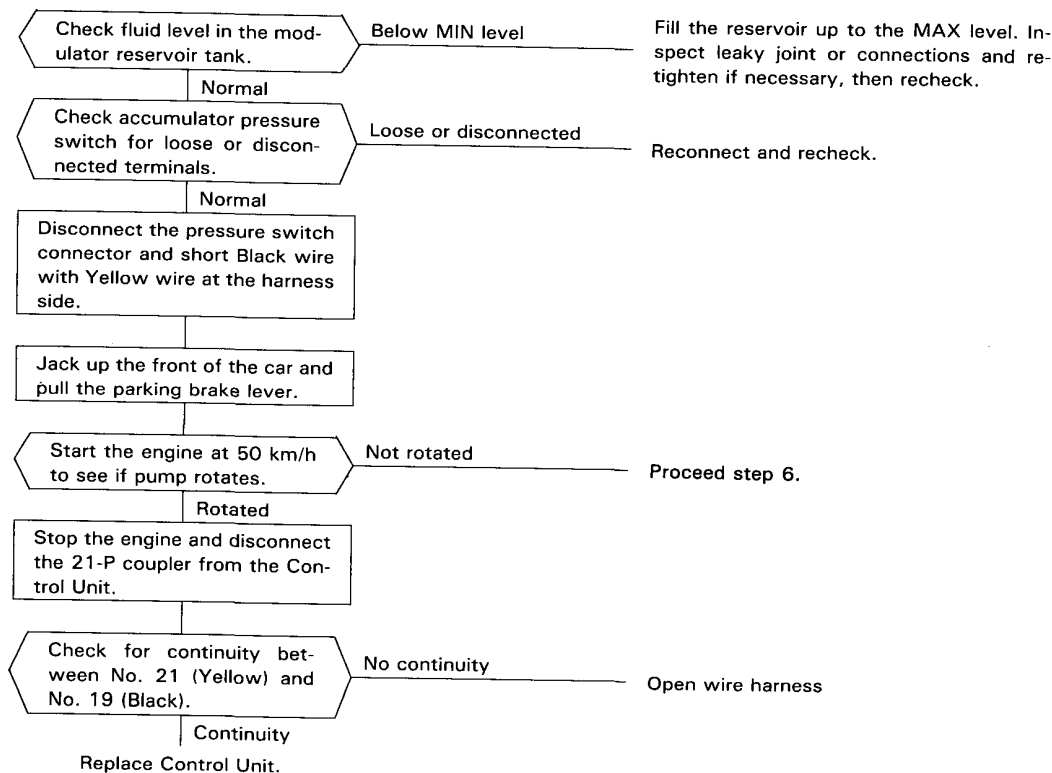
MAINTENANCE COUPLER







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).



View from wire side.

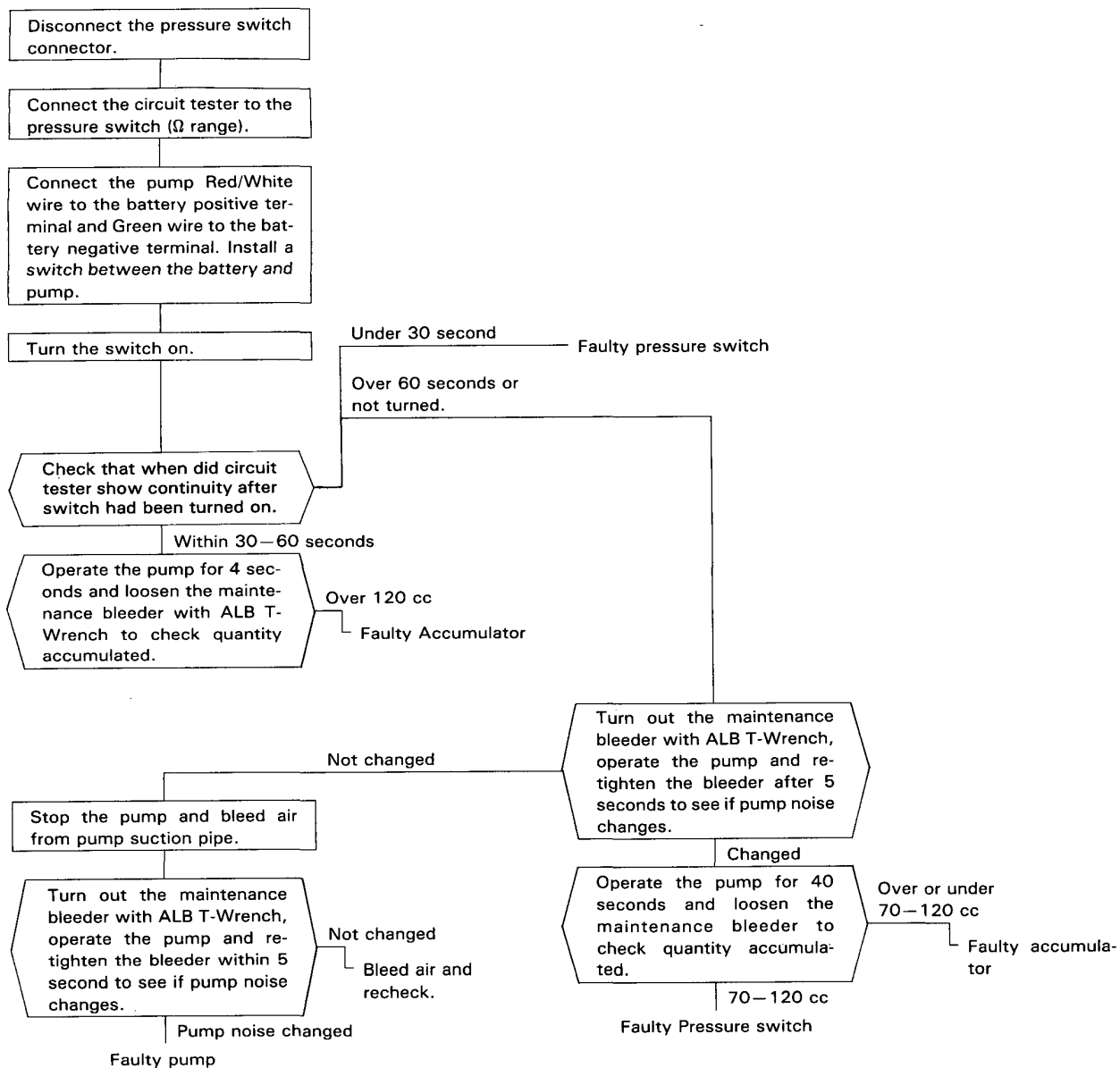
(cont'd)



# 4W-ALB

## Troubleshooting (cont'd)

### 6. Accumulator, 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

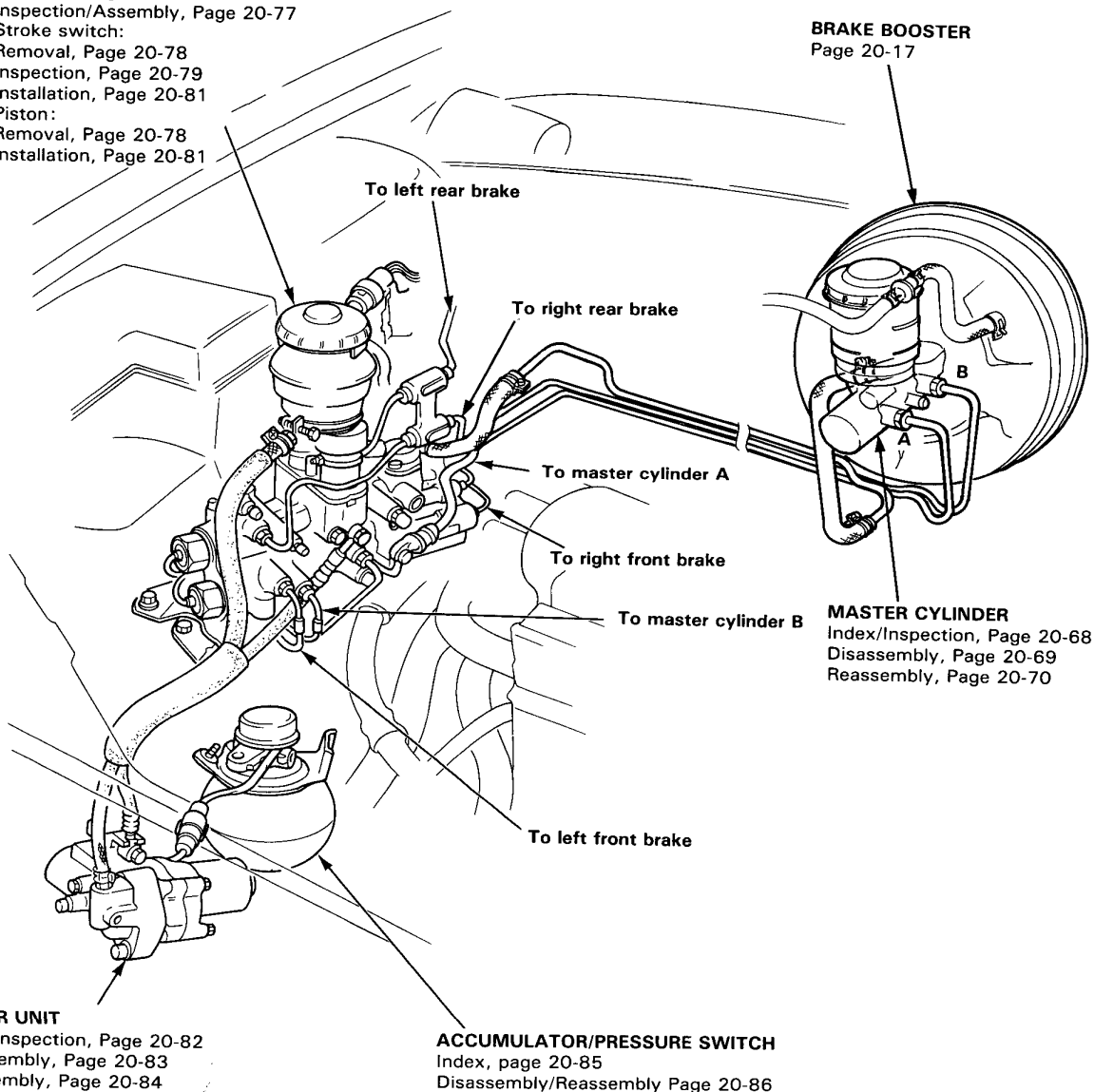
Inspection, Page 20-79

Installation, Page 20-81

Piston:

Removal, Page 20-78

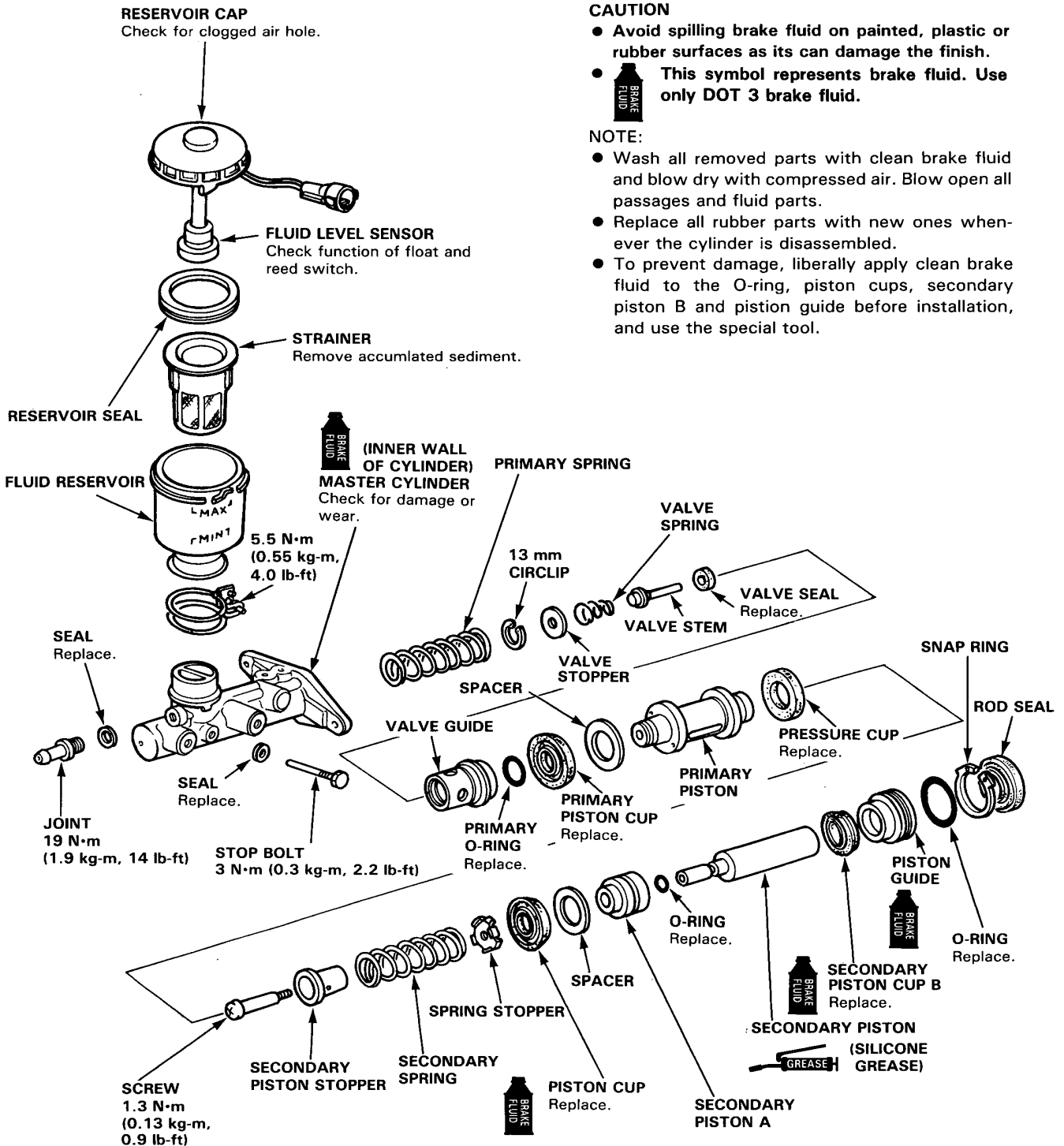
Installation, Page 20-81





# Master Cylinder

## Index/Inspection





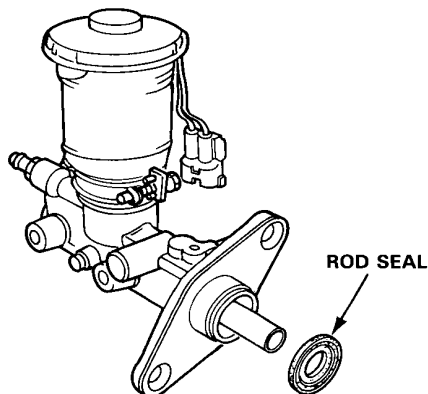


## Disassembly

### CAUTION:

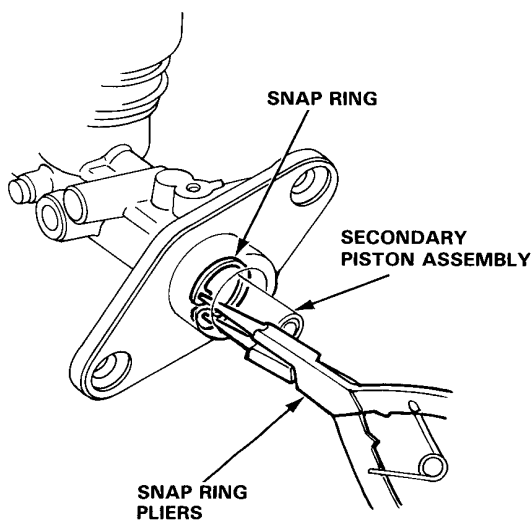
- Avoid spilling brake fluid on painted, plastic or rubber surfaces as its can damage the finish; Wash spilled brake fluid off immediately with clean water.
- Make sure all parts are clean before reassembly and blow dry with compressed air. Blow open all passages and fluid parts.
- Use only new clean brake fluid.
- Use only new replacement parts.
- Do not allow dirt or other foreign matter 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.

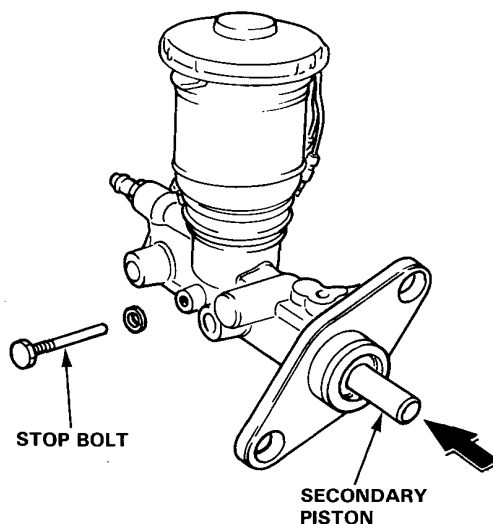


2. Press the secondary piston assembly in, then remove the snap ring.

**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.



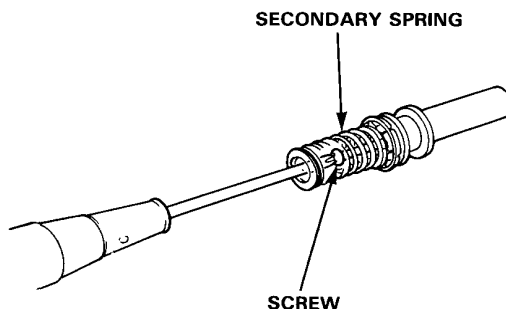
4. Remove the piston guide assembly, secondary piston assembly and primary piston assembly.

**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.



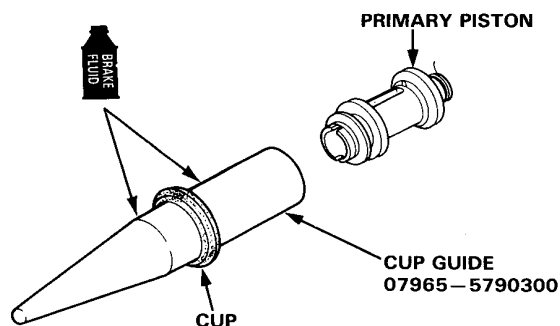
# Master Cylinder

## Reassembly

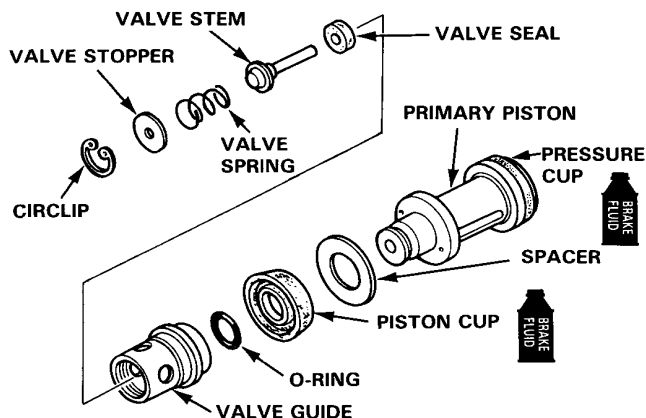
### CAUTION:

- 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 matter to contaminate the brake fluid.
- Do not mix different brand of brake fluid.

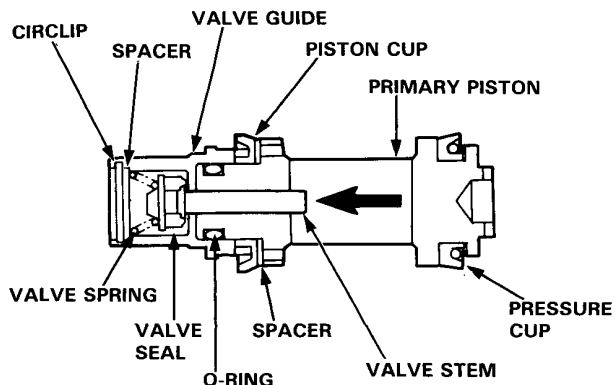
1. Coat the cup guide (special tool) with brake fluid, install the cup over the cup guide, then slide the cup to the primary piston.



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.

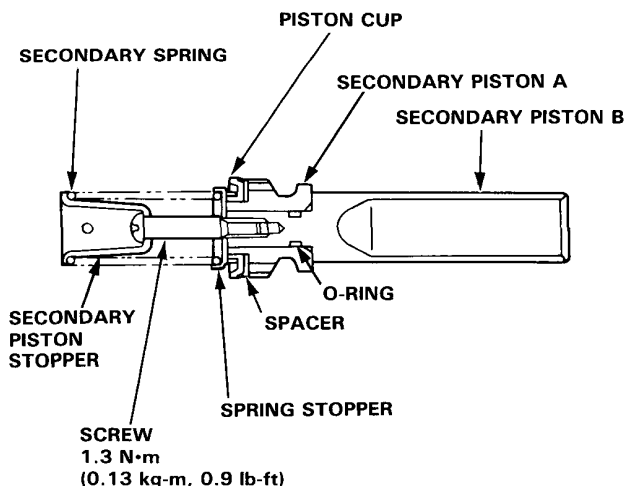


4. Install the valve guide to the primary piston.



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.







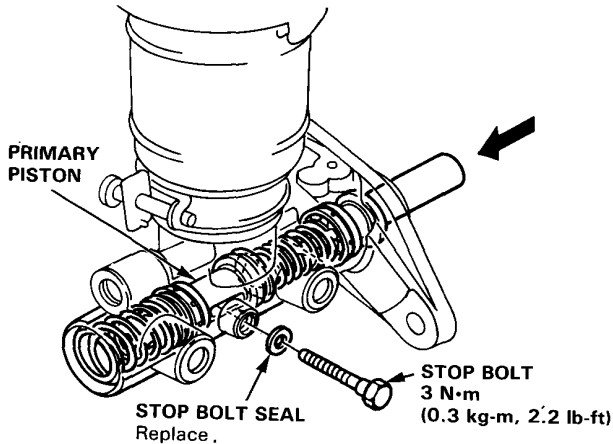
6. Assemble the primary piston assembly, secondary piston assembly and piston guide assembly in the master cylinder body.

NOTE: Install the primary piston with the slot on the cylinder stop bolt hole side.

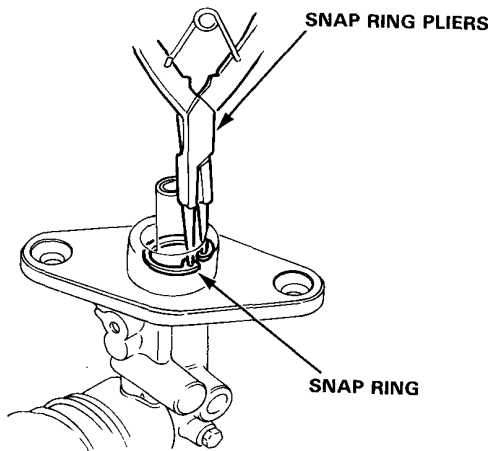
7. Push the secondary piston in until slot aligns with the stop bolt hole, then install and tighten the stop bolt.

**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.

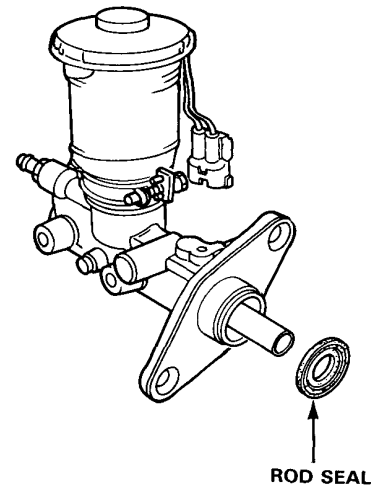


8. Press the secondary piston and install the snap ring.



**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.

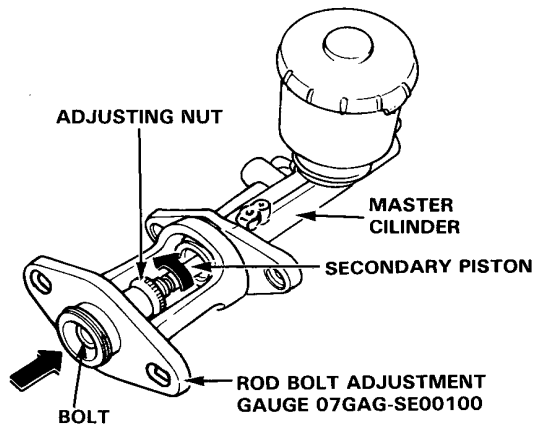


# Master Cylinder/Brake Booster

## Pushrod Clearance Adjustment

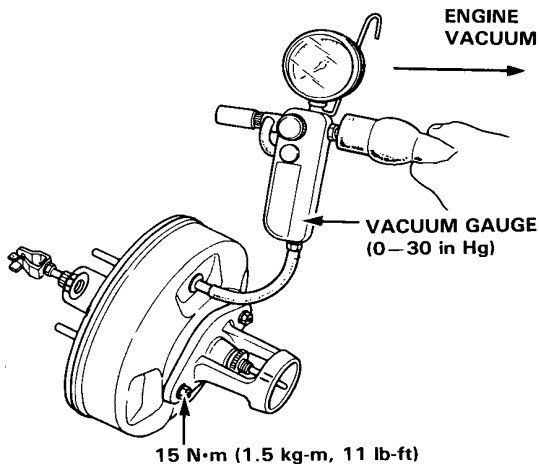
NOTE: Master cylinder pushrod-to-piston clearance must be checked and adjustments made, if necessary, before installing master cylinder.

1. Using the Rod Bolt Adjustment Gauge, adjust bolt so the top of it is flush with end of master cylinder piston.

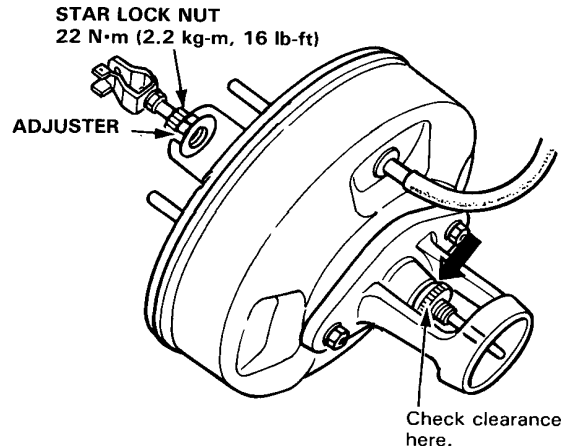


2. Without disturbing the adjusting bolt's position, install the master cylinder rod seal on the adjustment gauge and put the gauge upside down on the booster.
3. Install the master cylinder nuts and tighten to the specified torque.
4. Connect the booster in-line with a vacuum gauge (0–30 in Hg) to the 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)**



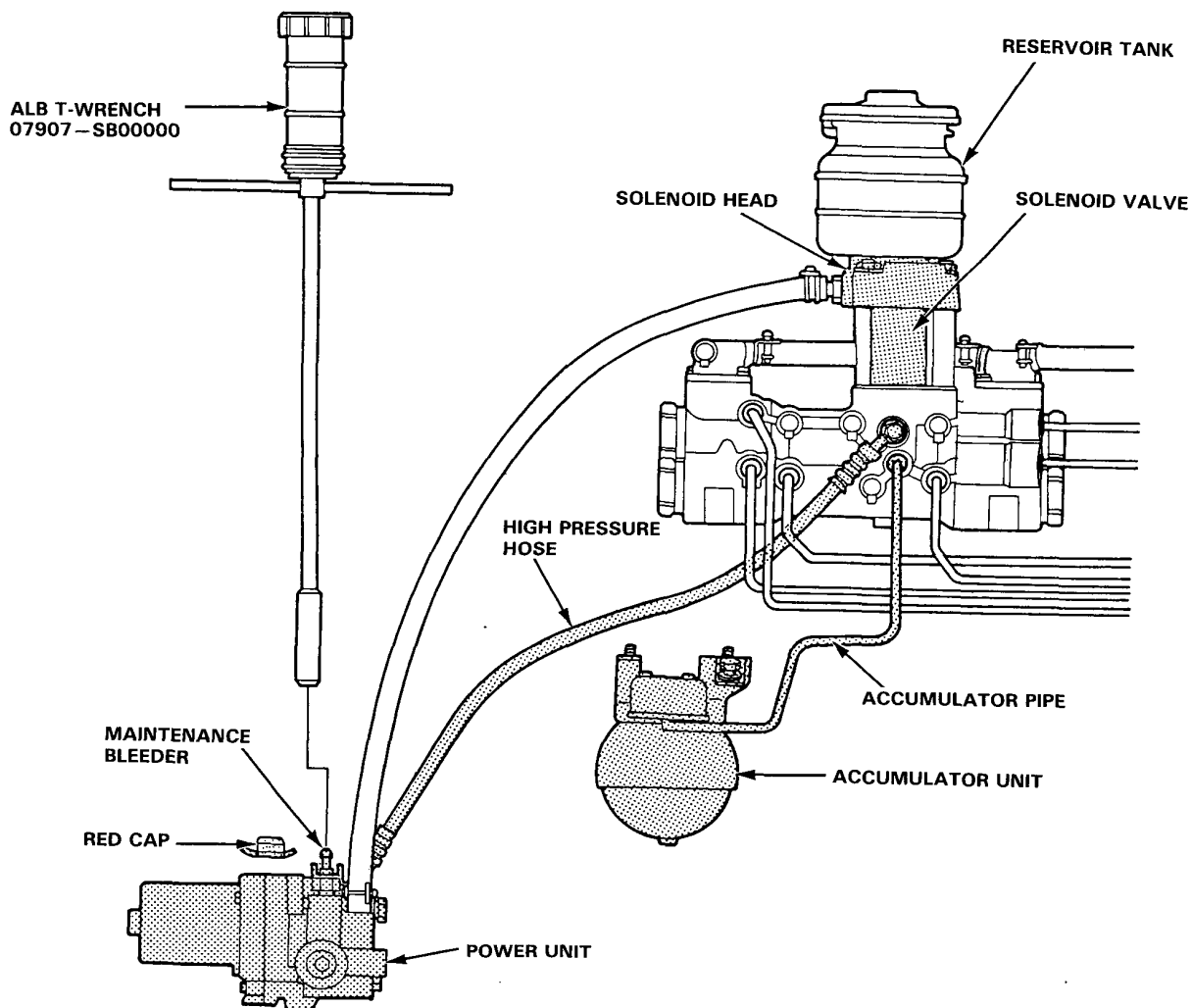
# Modulator



## 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.



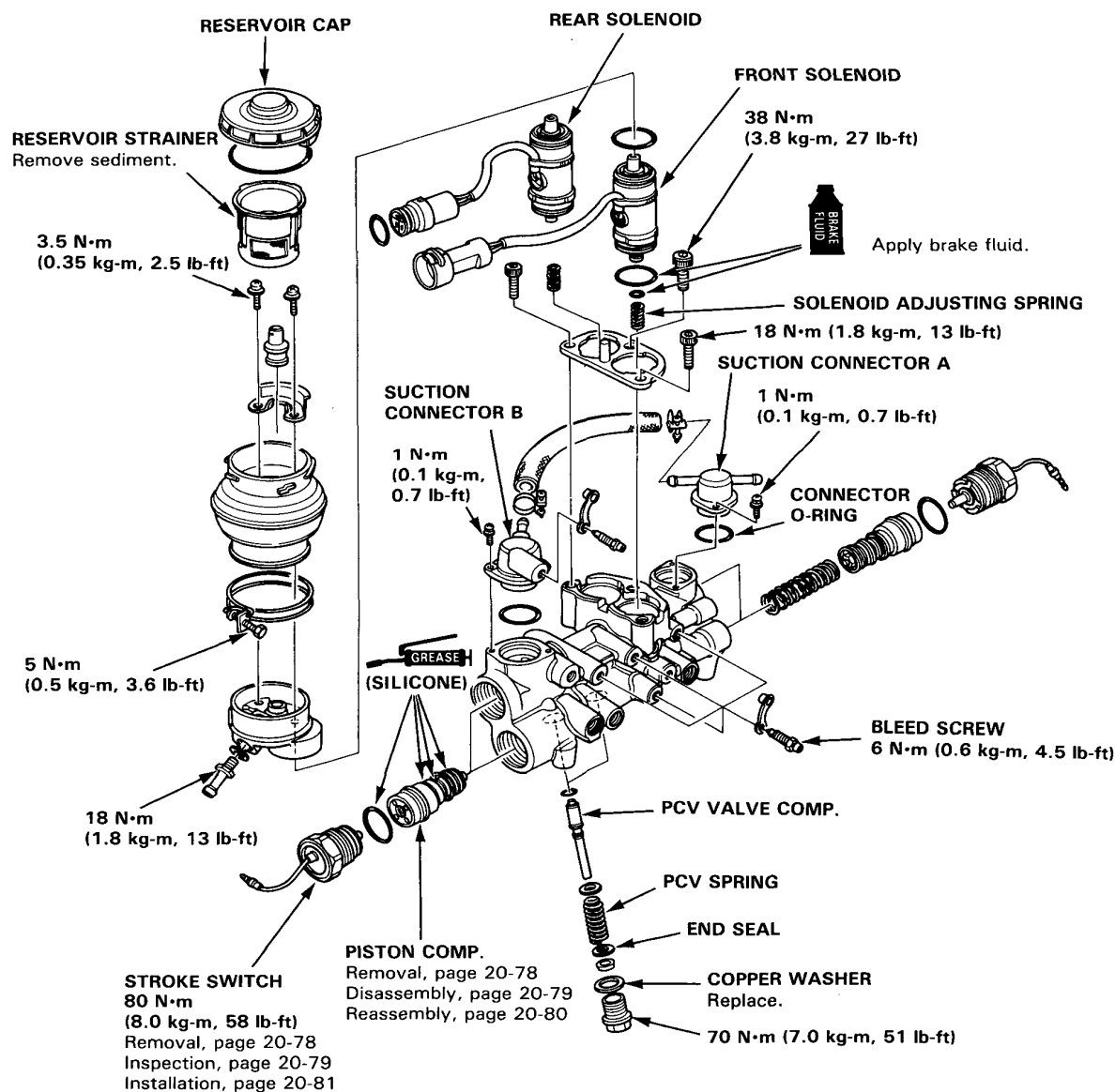


# Modulator Assy

## 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.

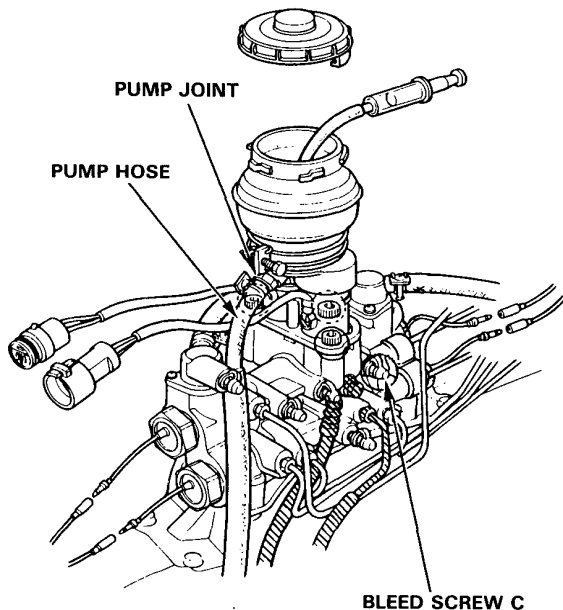




## Reservoir

### 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.

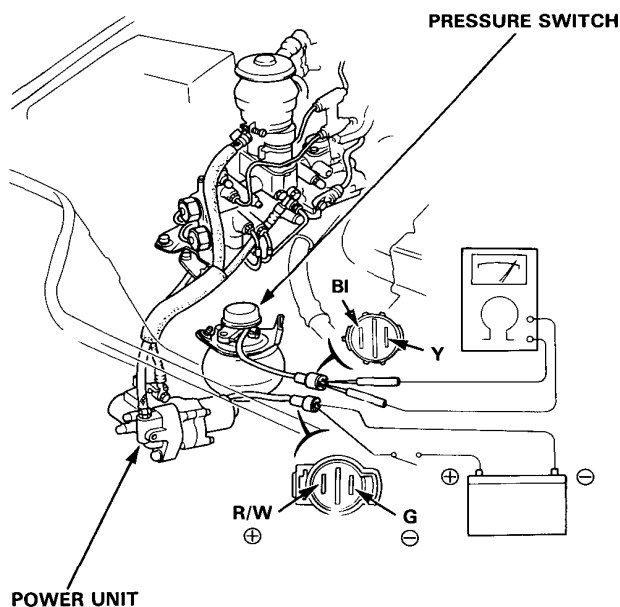
#### **WARNING**

- 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 ( $\Omega$  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

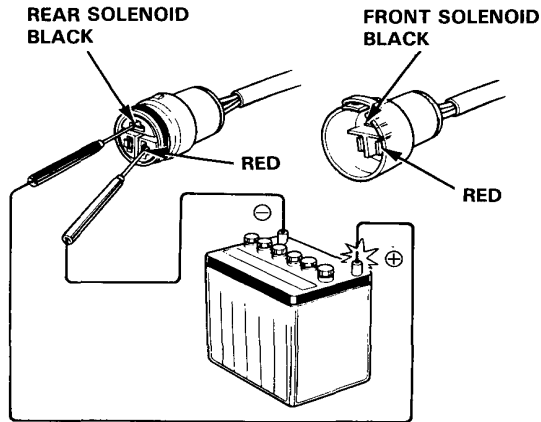
(cont'd)



# Solenoid

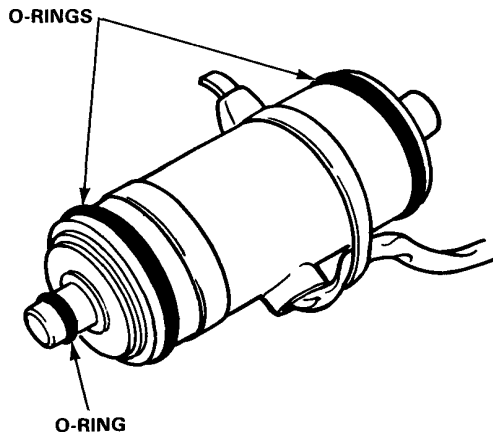
## Leak Test (cont'd)

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.

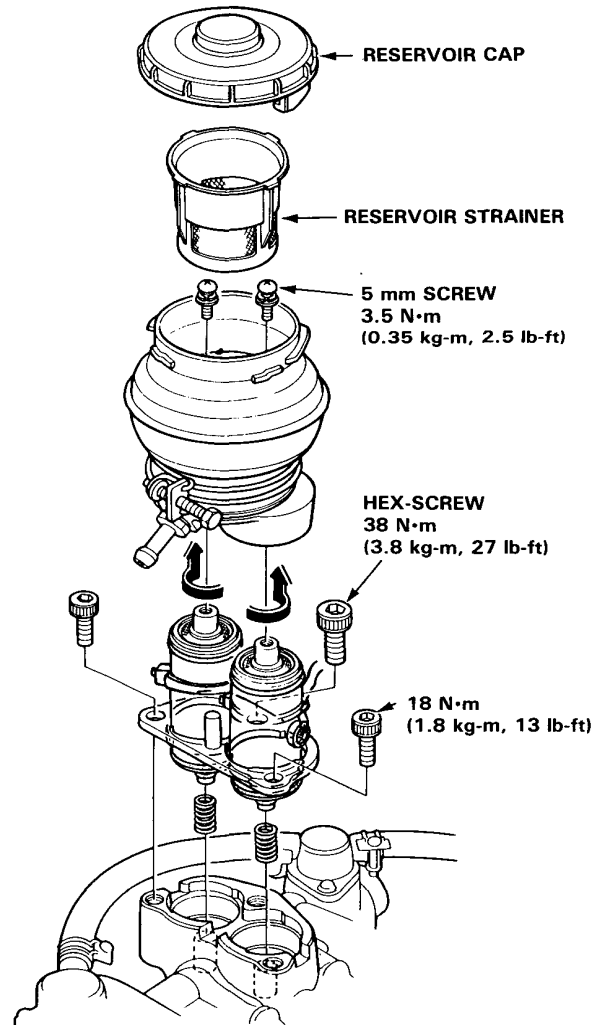
NOTE: The solenoid must be replaced with a new one as a unit except when the O-ring is faulty.



## 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.





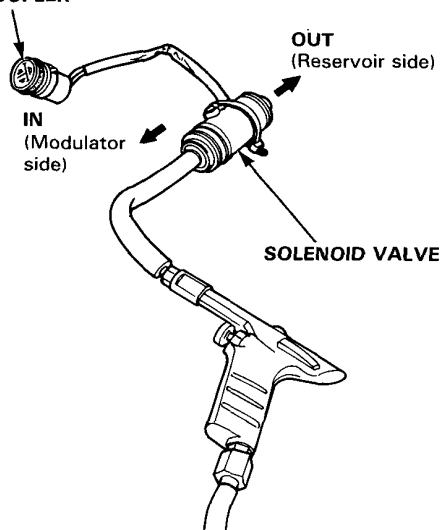


## Inspection

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:

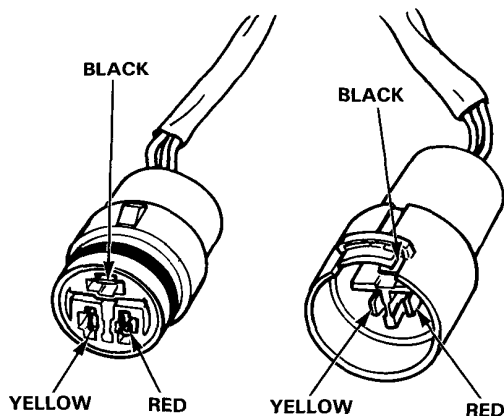
Voltage not applied: •There should be no air flow.  
 Black — Red: •There should be air flow through IN and OUT.  
 Black — Yellow: •There should be air flow through IN.

### 3-P COUPLER



### REAR SOLENOID

### FRONT SOLENOID



NOTE: Handle the solenoid valve with care as it may be damaged if dropped.

## Reassembly

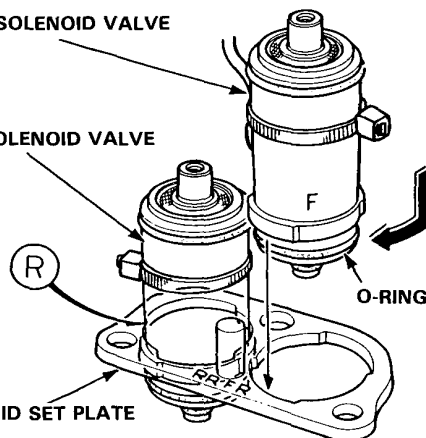
1. Coat the O-ring with the clean brake fluid and install the O-ring onto the solenoid valve.
2. Install the solenoid valves on the set plate as shown.

**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.

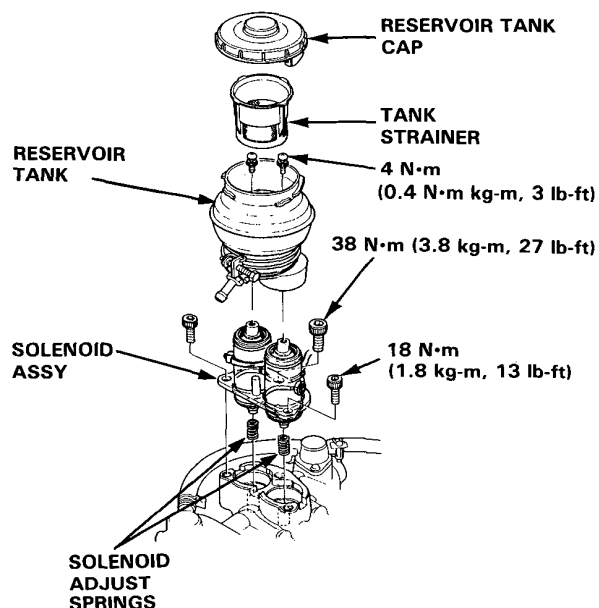
### FRONT SOLENOID VALVE

### REAR SOLENOID VALVE

### SOLENOID SET PLATE



3. Install the solenoid adjust springs on the modulator.
4. Install the solenoid assy, reservoir tank and connect the inlet hose.

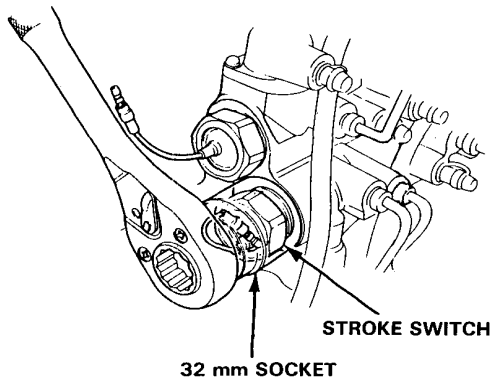




# Piston/Stroke Switch

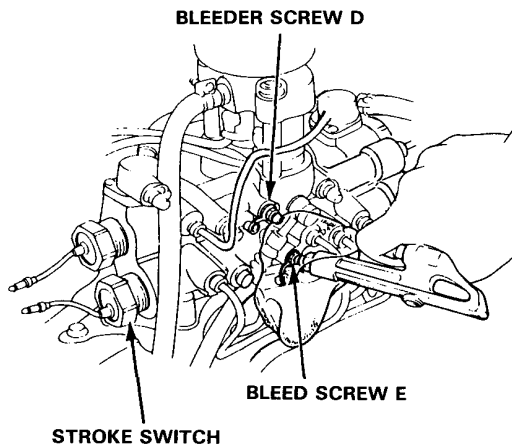
## Removal

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.



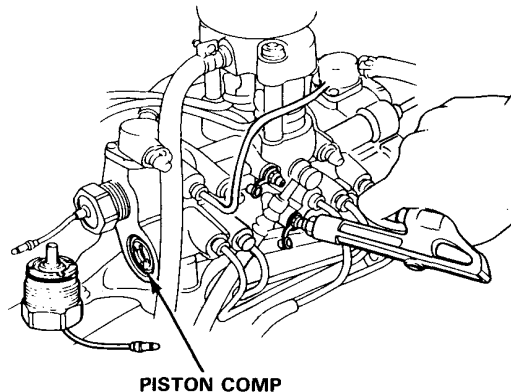
**NOTE:** Place a pan or shop rag under the switch to receive the brake fluid drained.

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.

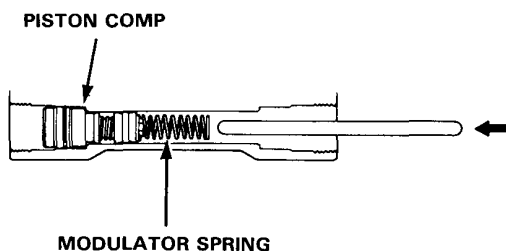
6. Remove the stroke switches and pry the pistons out with the help of the special tool Snap Ring Pliers.



**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.



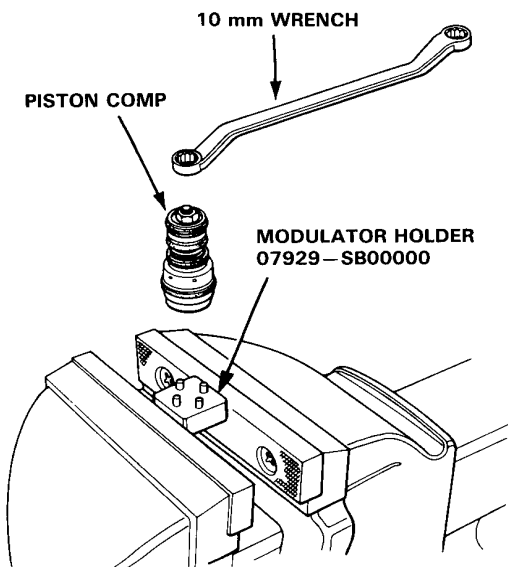
**CAUTION:** Take care not to damage the cylinder wall.





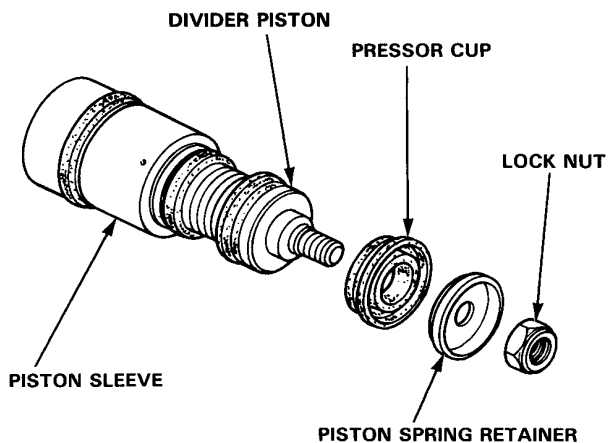
## Piston Disassembly

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. Carefully remove the parts.

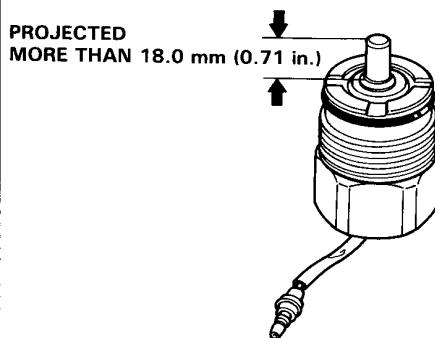
**CAUTION:** The spring can pop out when removing the divider piston.



4. Clean the parts with clean brake fluid. Blow the piston sleeve and divider piston with compressed air.

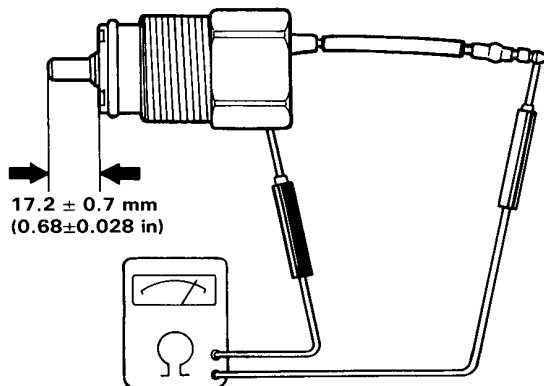
## Stroke Switch Inspection

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.



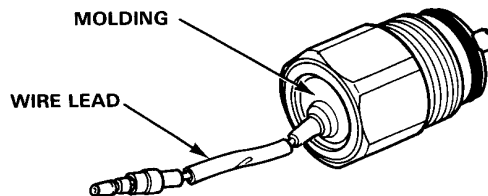
2. Check for continuity between the switch lead and body ground.

There should be no continuity when the projected height of the piston is above  $17.2 \pm 0.7$  mm ( $0.68 \pm 0.028$  in.). There should be continuity when the height is below  $17.2 \pm 0.7$  mm ( $0.68 \pm 0.028$  in.).



3. Check the wire lead, body (threads) and molding for damage, cracks or other faults.

**NOTE:** Do not let the switch fall.

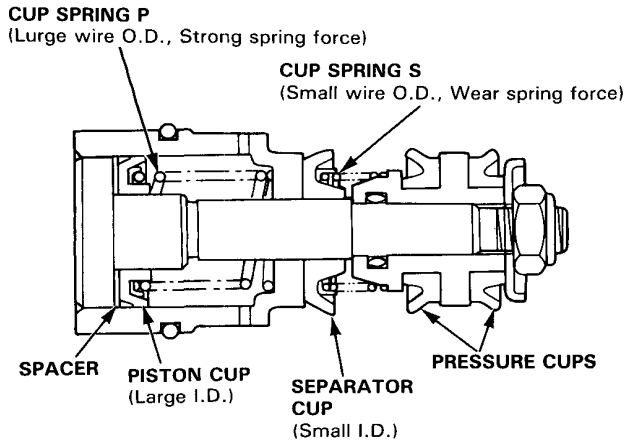




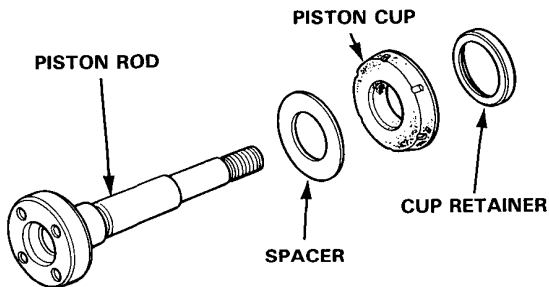
# Piston/Stroke Switch

## Piston Assembly

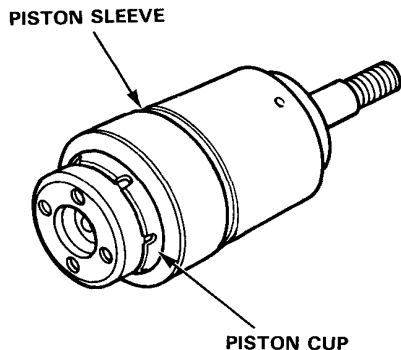
NOTE: Replace the cups and O-rings with new ones. Apply clean brake fluid when installing.



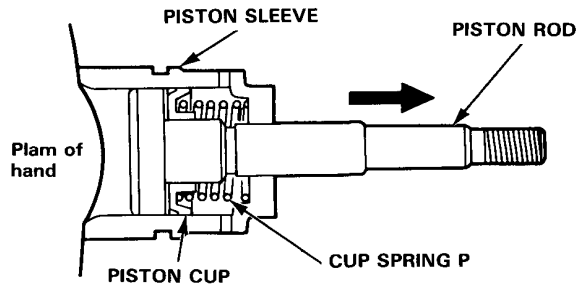
1. Install the spacer, piston cup and cup retainer on the piston rod.



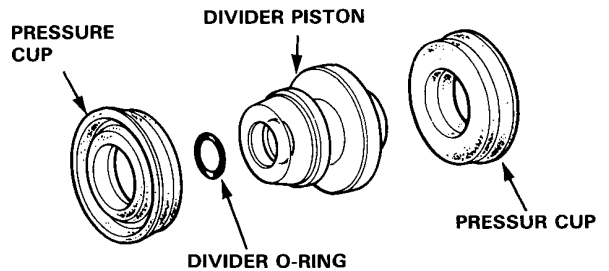
2. Install the cup spring P on the cup retainer, then install the piston sleeve over them.
3. Install the piston cup into the piston sleeve being carefull not to allow the lip of the cup to turn inside out.



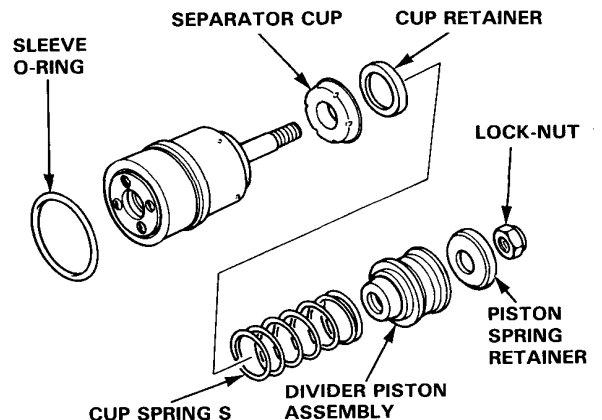
4. Put the piston sleeve on the plam of your hand, pull the piston rod, and check that the plam is sucked.



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 lock-nut.
7. Install the sleeve O-ring on the piston sleeve.

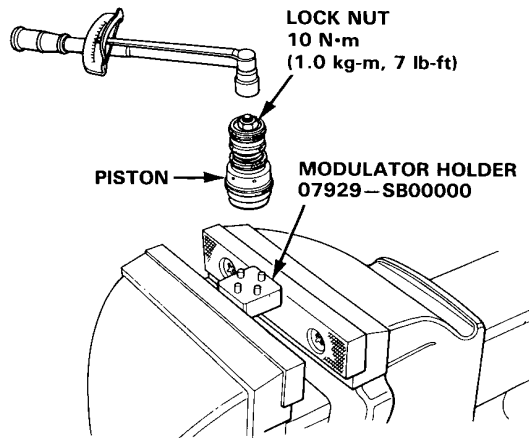




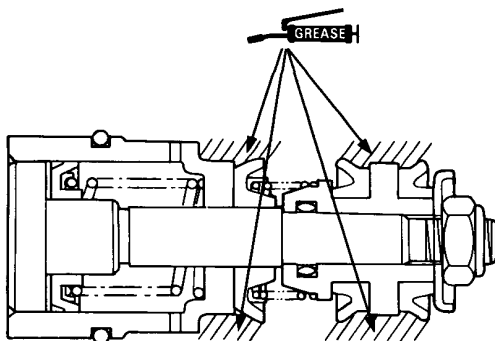


8. Hold the modulator holder (special tool) in a vise and set the piston rod on the holder aligning the four tabs on the holder with the four piston rod holes.

9. Tighten the lock-nut.



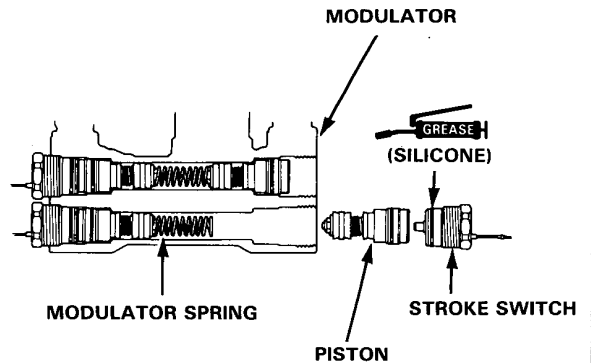
10. Apply Honda Cylinder Grease (P/N 08733-BOZOE) or equivalent rubber grease onto the shaded portion of the piston.



## 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.

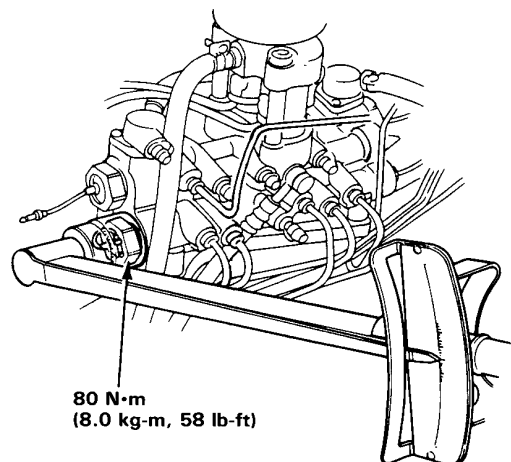
NOTE: Note the piston installation direction.



2. Loosely tighten the stroke switches using a 32 mm socket wrench.

**CAUTION:** Never use a impact wrench.

3. Tighten the stroke switches.

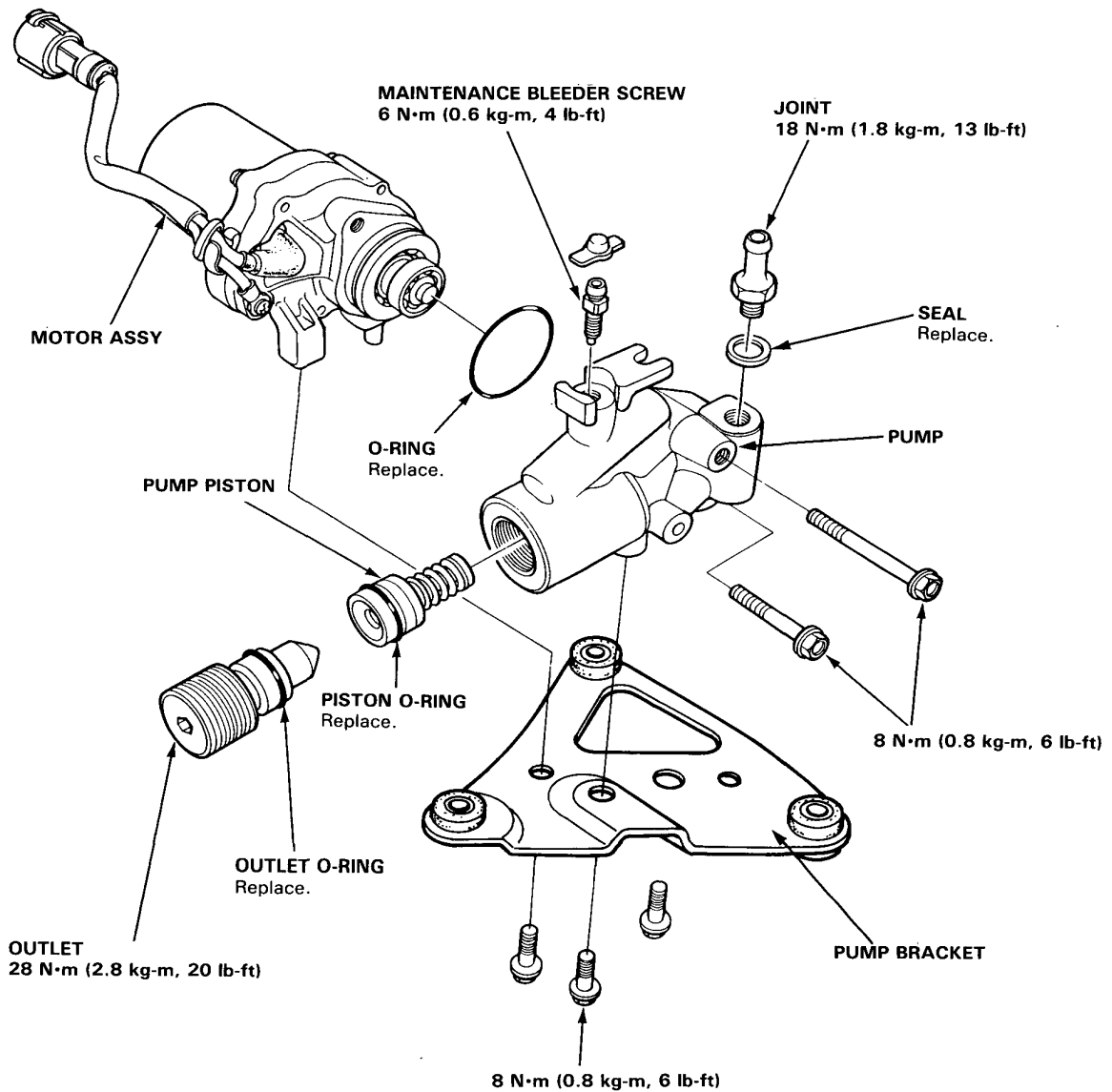




# Power Unit

## Index/Inspection

**CAUTION:** Do not attempt to disassemble the power unit parts except for those shown exploded in this illustration.

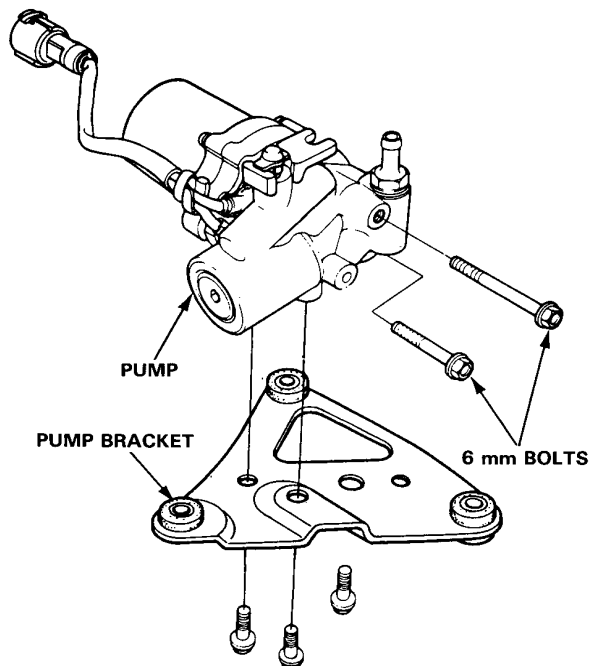




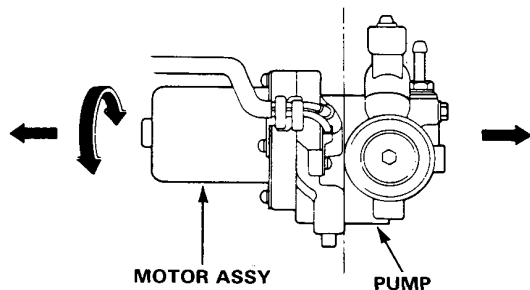


## Disassembly

1. Remove the pump bracket.
2. Remove the 6 mm bolts attaching the pump to the pump motor.

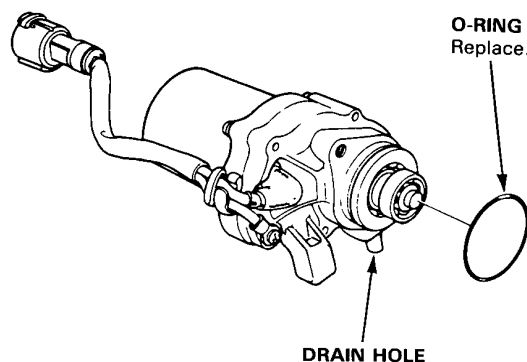


3. Separate the motor from the pump while rotating the pump right and left.



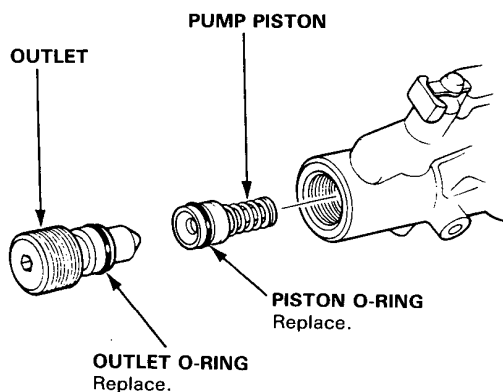
NOTE: An about 10 cc (0.6 cu-in) of brake fluid will flow out when the motor is removed from the pump.

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.

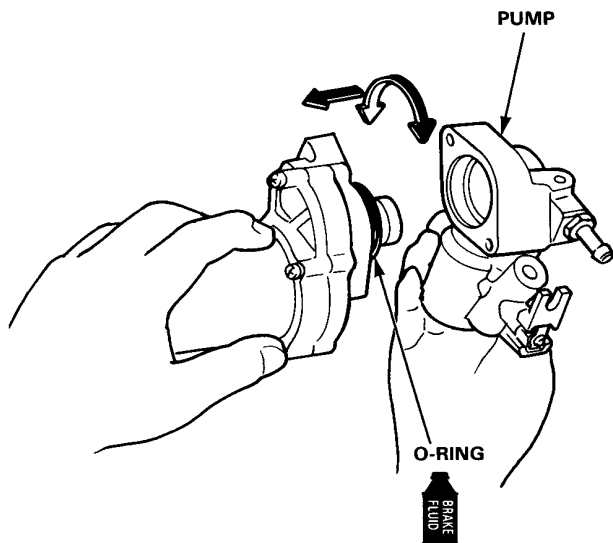




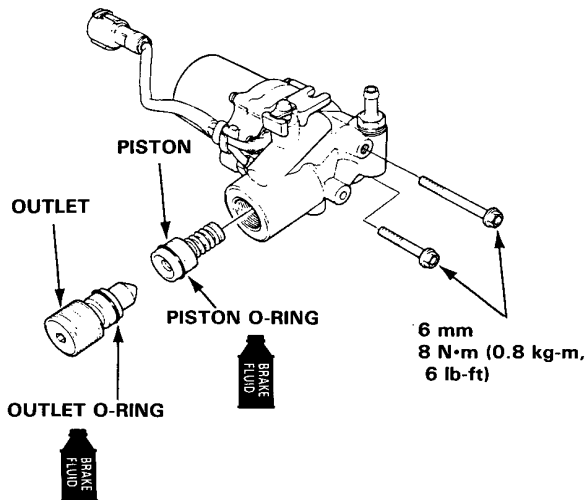
# Pump Assy

## Reassembly

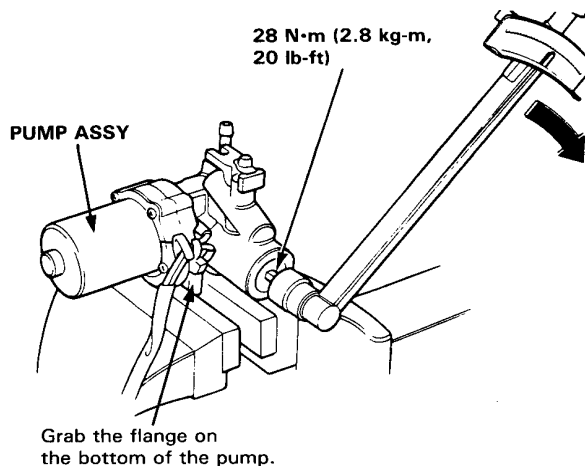
1. Install a new O-ring on the pump motor.
2. Coat the O-ring with clean brake fluid and install the pump on the motor while rotating it right and left by hand.



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.

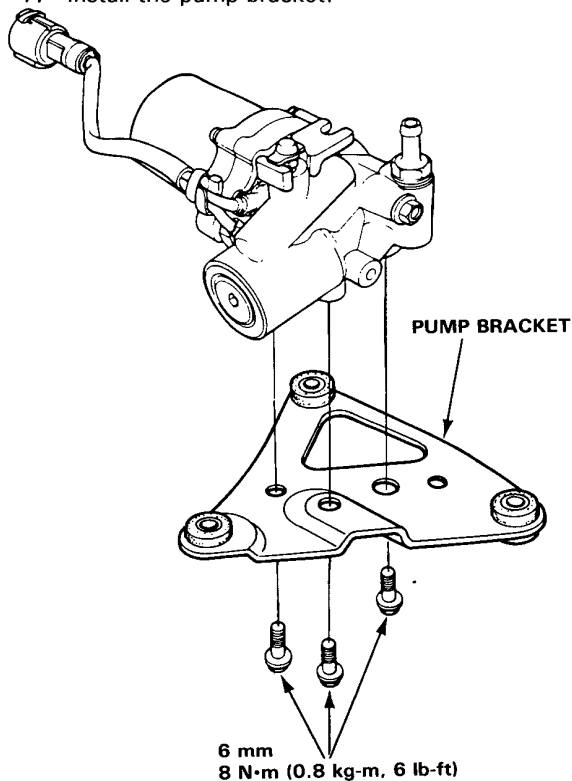


6. Place the motor in a vise as shown and tighten the outlet.



NOTE: Do not place the pump in a vise at locations other than shown above.

7. Install the pump bracket.





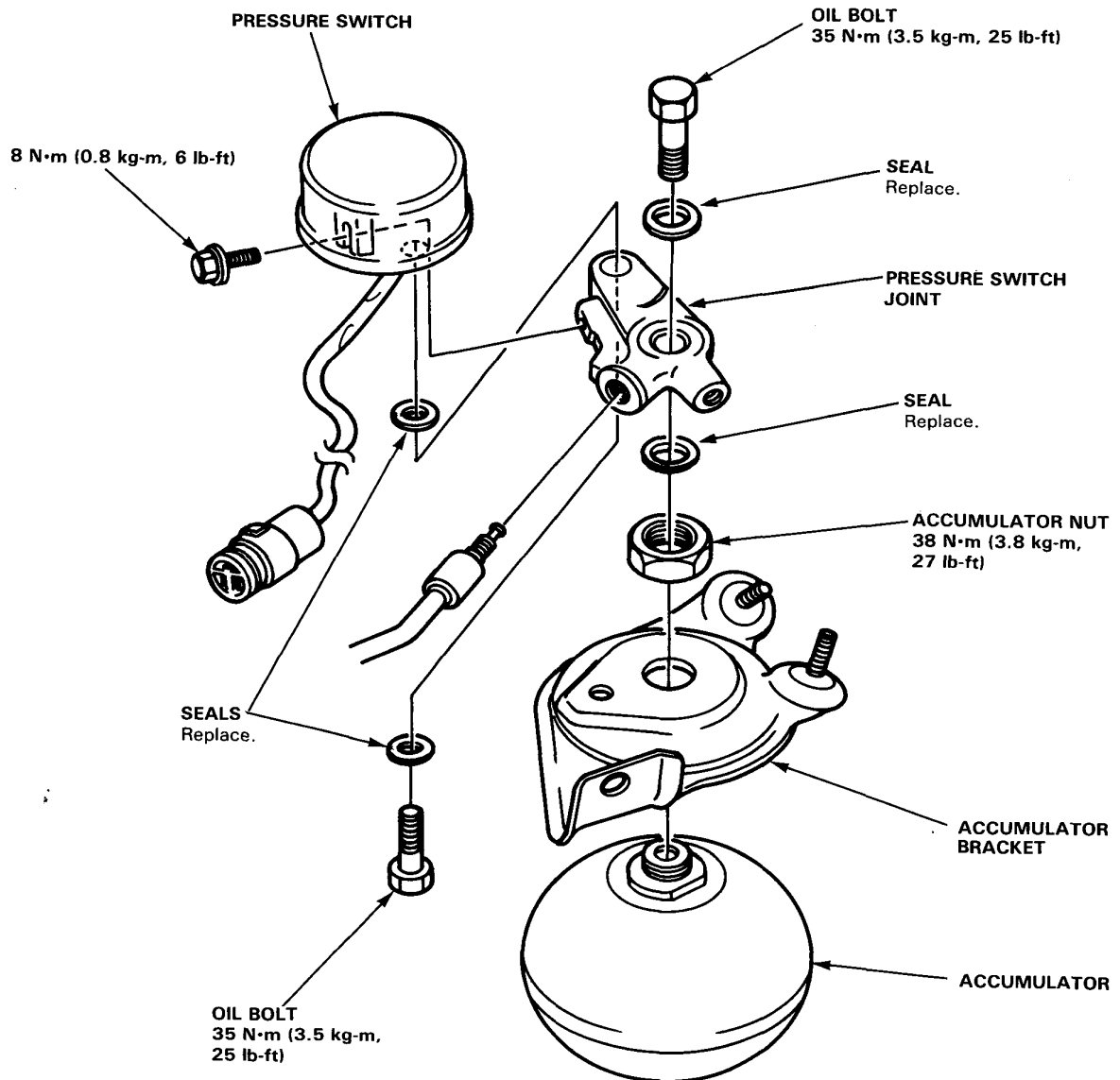
# Accumulator



## 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 matter to contaminate the brake fluid.
- Do not mix different brand of brake fluid.

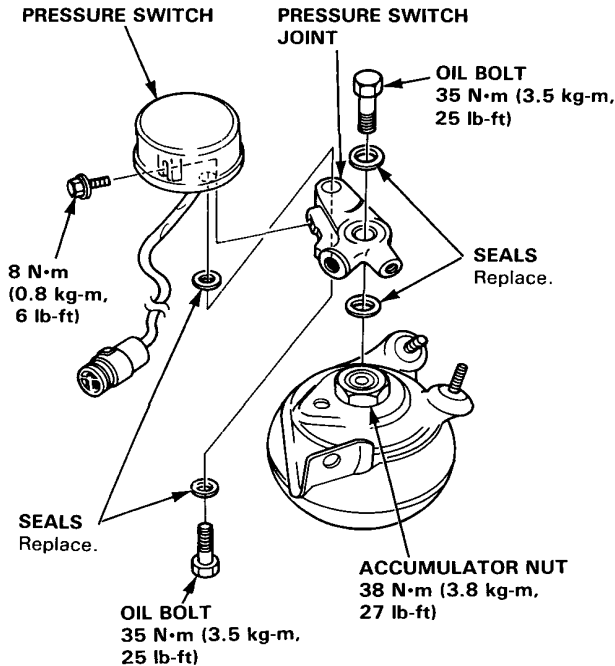




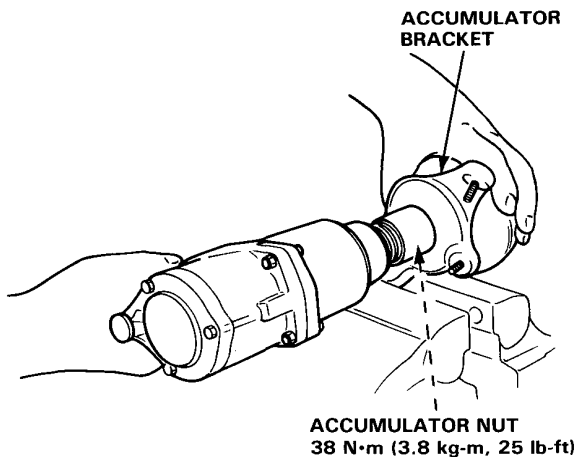
## Accumulator

### 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.

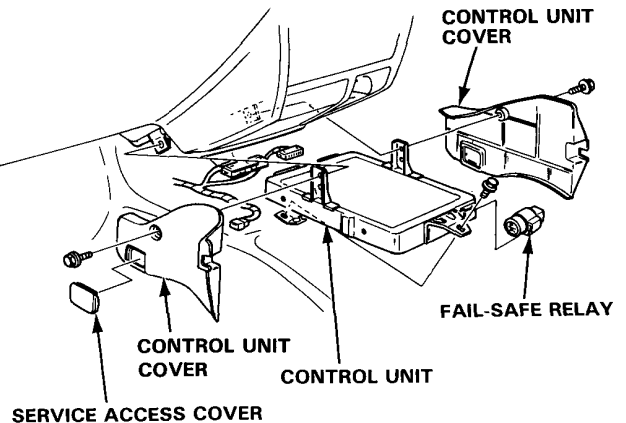
## Control Unit/Fail Safe Relay

### 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.





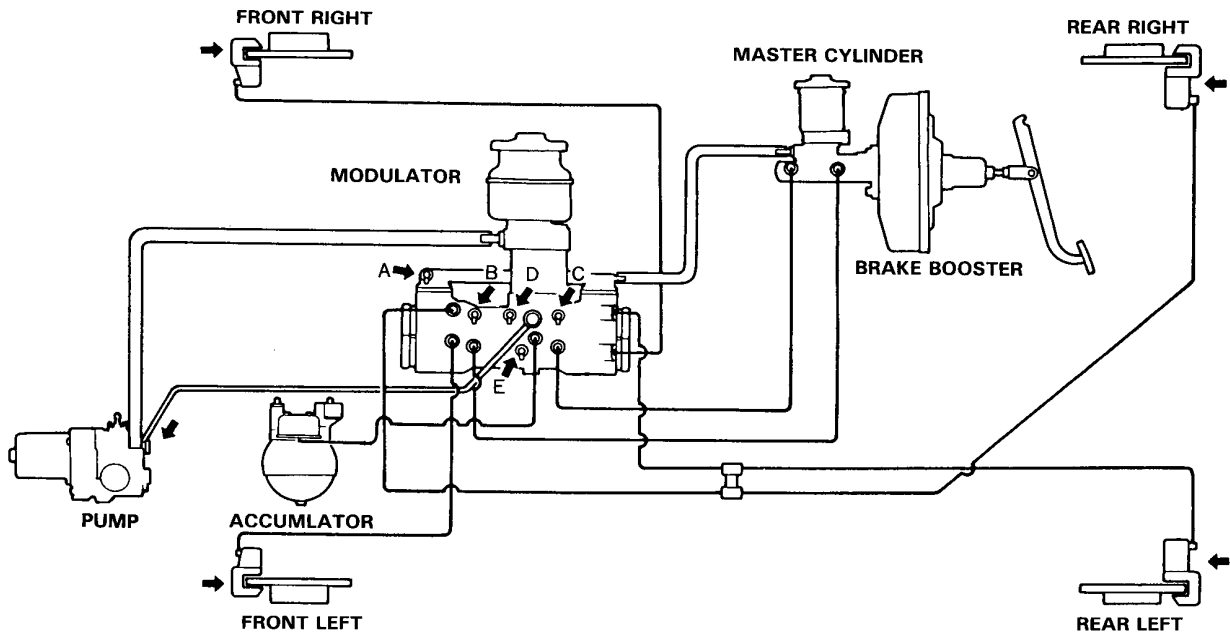
# Air Bleeding

## Air Bleeding (General)

The air must be bled 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.

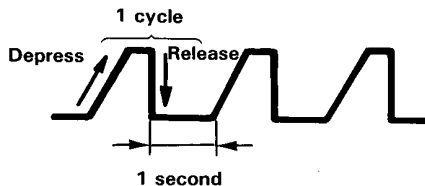


**NOTE:** The ALB equipped models have a modulator inserted in the circuit between the master cylinder and individual brake calipers in place of the proportioning valve. To bleed air from the system, it is essential have a five bleed screws on the modulator be loosened in the specific orders.

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.

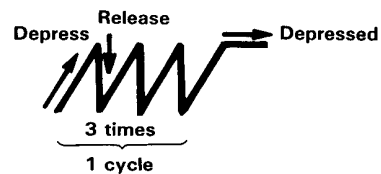
There are two pedal pumping procedures in air bleeding for cars equipped with 4W-ALB. They are indicated by mode 1 and mode 2 in this manual.

Mode 1



Bleed screw: OPEN

Mode 2



Bleed screw: OPEN → CLOSE

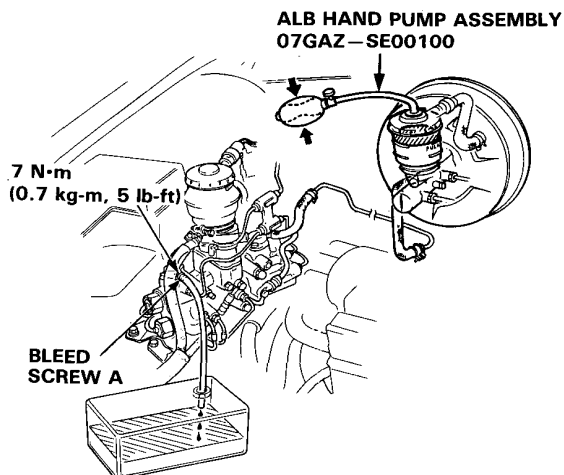


# Air Bleeding

## Manual Bleeding

### Main Hydraulic Brake System:

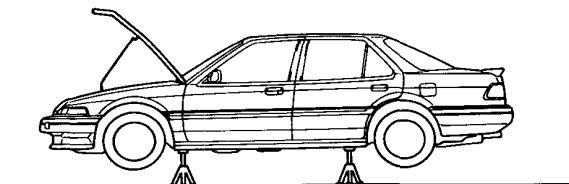
1. Fill the master cylinder reservoir with recommended brake fluid up to the MAX level.
2. Install the ALB hand pump assembly onto the master cylinder as shown.
3. Loosen the bleed screw A on the modulator.



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.

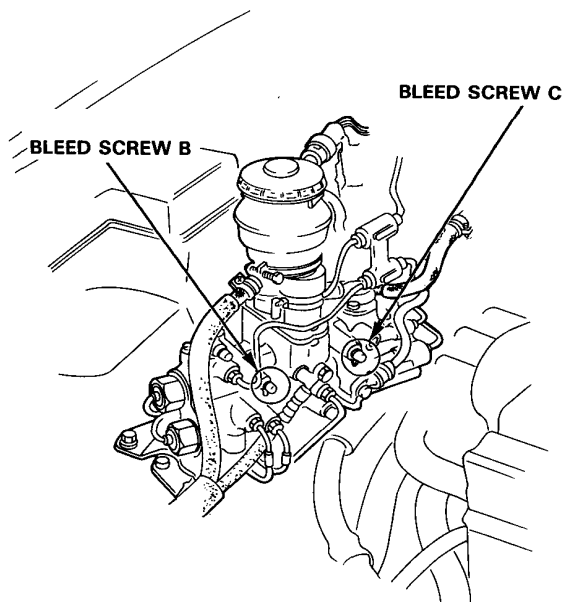
5. Retighten the bleed screw A after being sure that there is no air from the bleed screw A.
6. Raise the car and support with safety stands in proper locations.



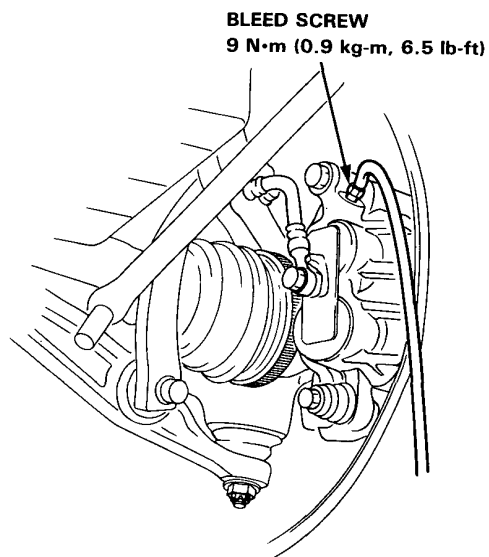
7. Loosen the bleed screw B.

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.





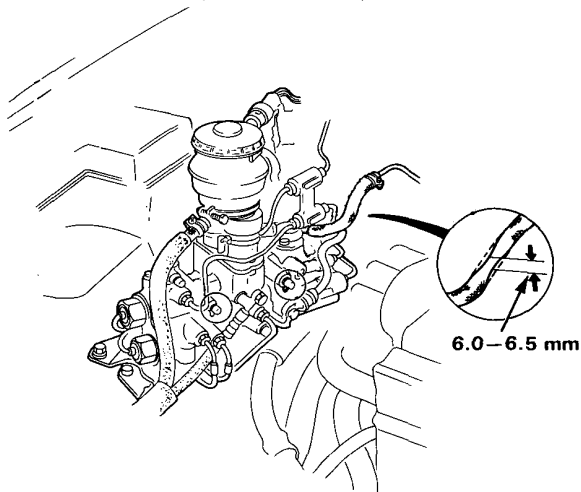


11. Pump the brake pedal in mode 1 about 30 times until air bobbles do not appear from the bleed screws.

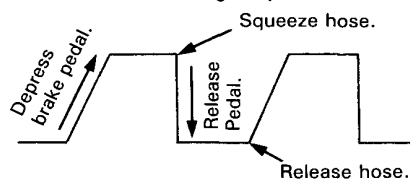
12. Pump the brake pedal in mode 2 for 5–6 times.

**NOTE:**

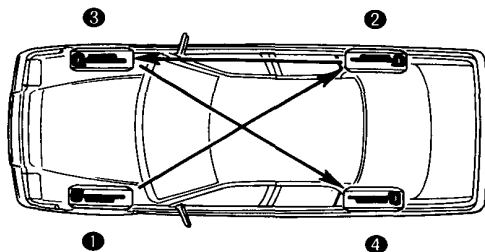
- In the new parts are installed or the brake fluid does not flow in mode 1, narrow the hose between the master cylinder and modulator to 6.0–6.5 mm (0.24–0.25 in) as shown.



- Or, repeat the following steps for 5–6 times.

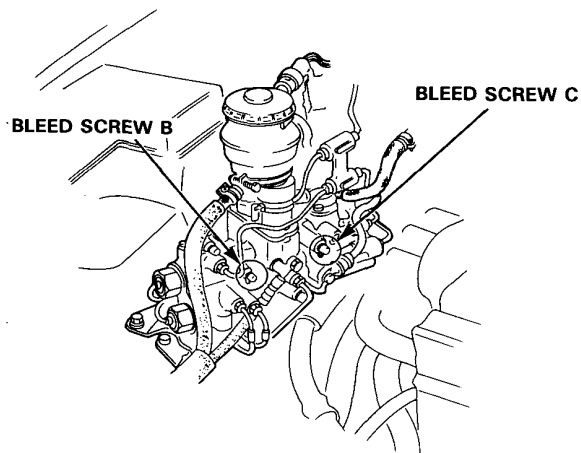


13. Bleed air from each wheel caliper as order shown below until air bubbles do not appear from the bleed screws.



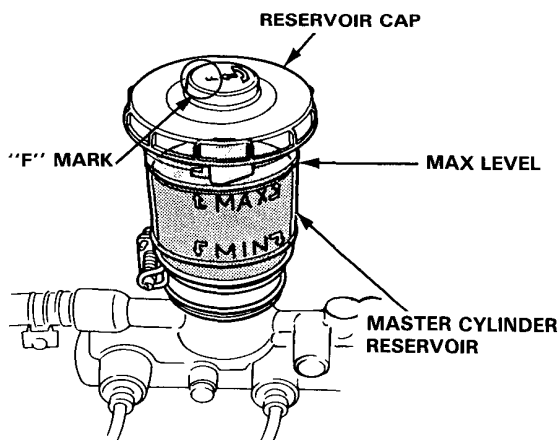
14. Rebleed the bleed screws B and C on the modulator.

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  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  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)

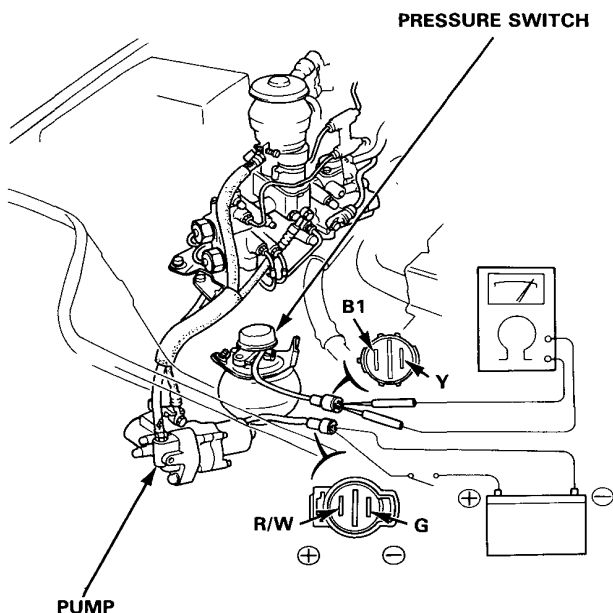


# Air Bleeding

## 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.

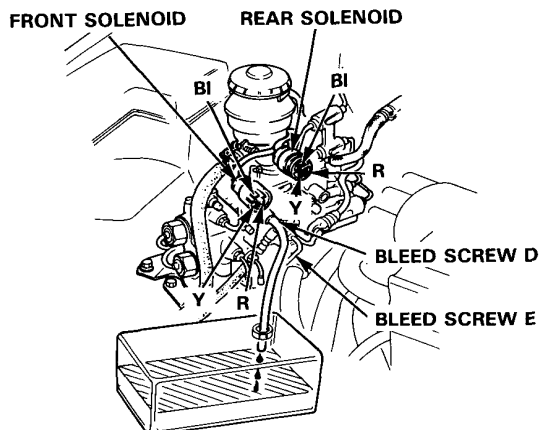


5. Turn on the switch and check for continuity. If the continuity is shown, turn off the switch after 4 seconds.
6. Bleed air from the circuit between the accumulator and the modulator.

NOTE: The air can be bled by operating the solenoids, or by loosening the bleed screw D and E.

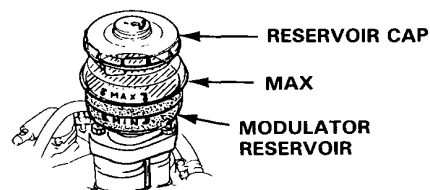
### Bleeding with solenoids:

- 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 ① thru ⑦ 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.

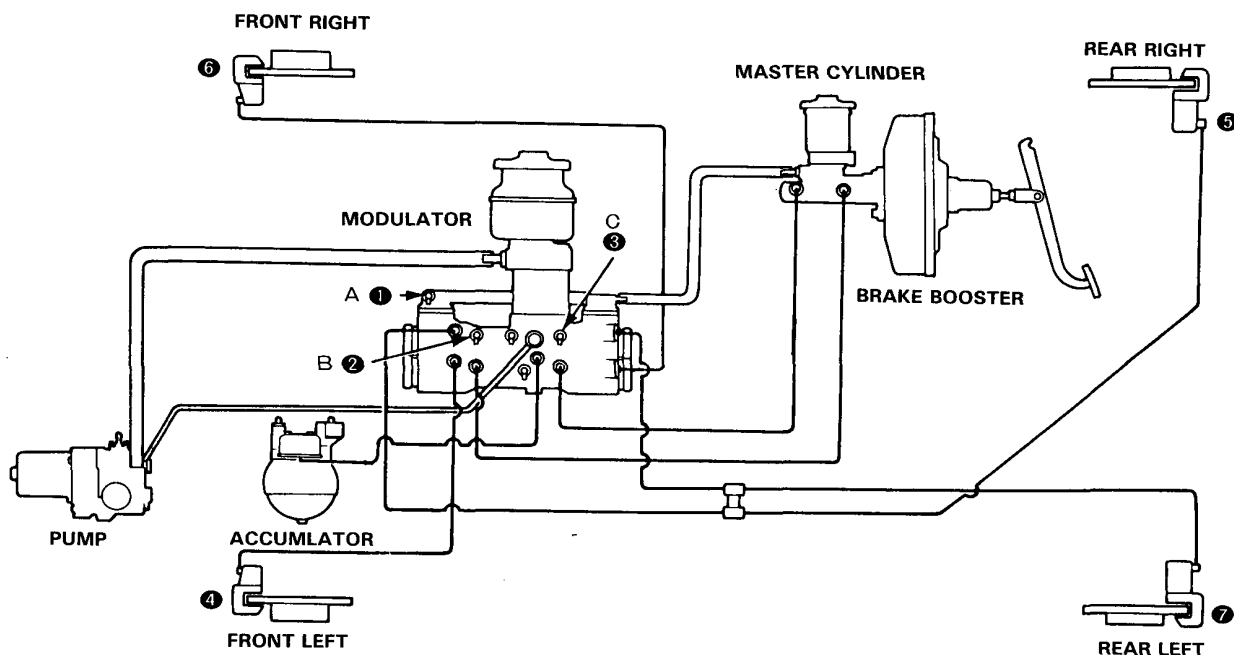
3. Bleed air from bleed screw A ( ① ).
4. Bleed air from bleed screw B and C ( ② and ③ ).
5. Bleed air from bleed screw of each wheels in order ④, ⑤, ⑥, ⑦.
6. Repeat step 4.

#### NOTE:

- Recommended changer pressure:  
294—392 kPa (3—4 kg/cm<sup>2</sup>, 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 ① thru ⑦ indicate the bleeding sequence.

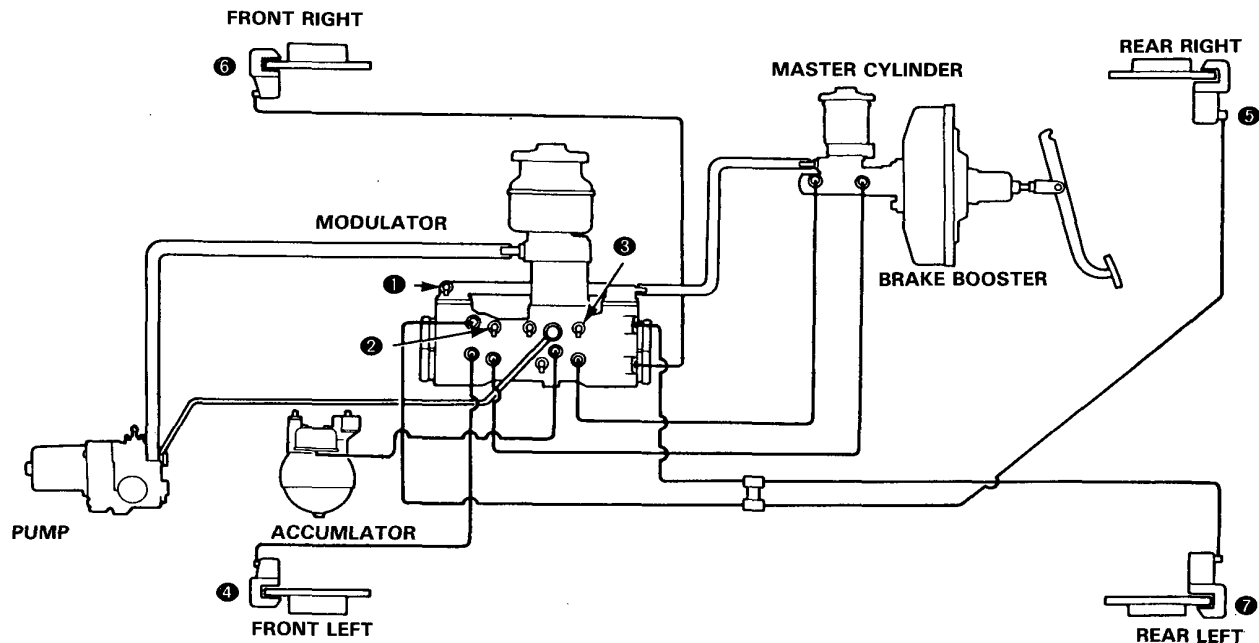
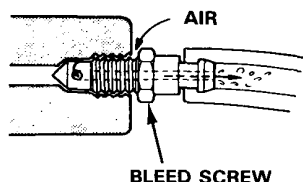
### Main Brake system:

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.





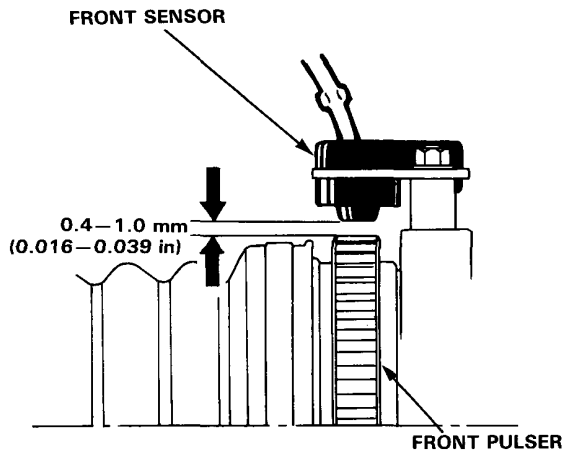
# Pulsers/Sensors



## Inspection

### Front

1. Check the pulser for chipped or damaged teeth and replace if necessary (page 20-95).



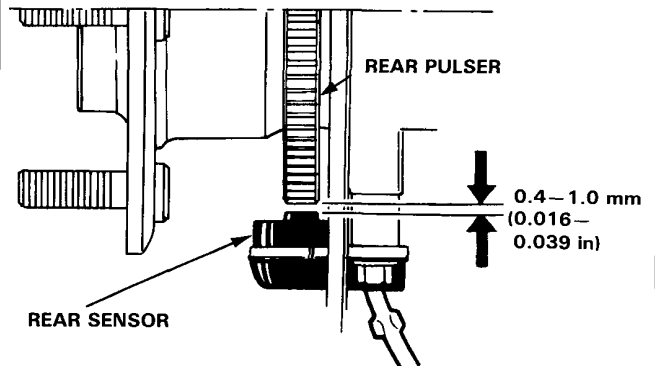
2. Measure air gap between the sensor and pulser all the way around while rotating the driveshaft by hand.

**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.

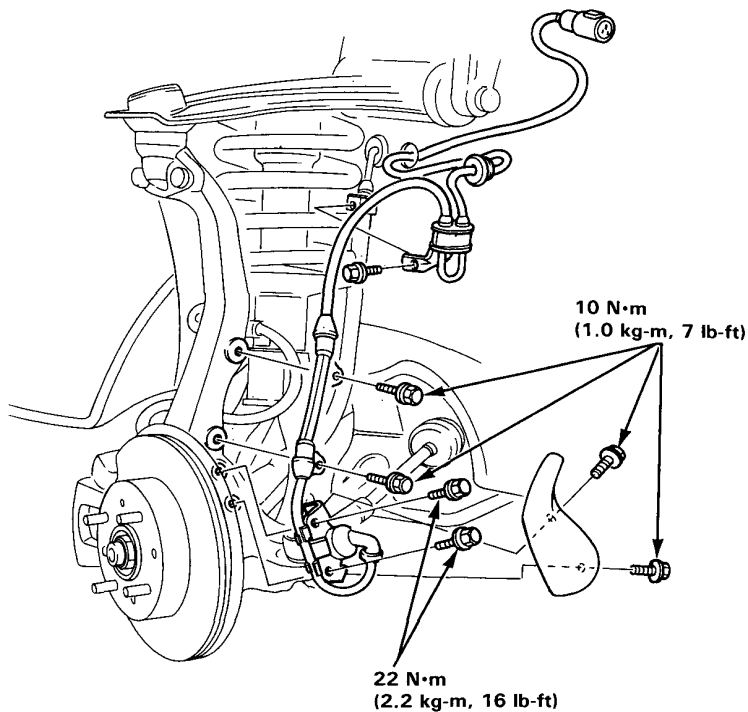


## Sensor

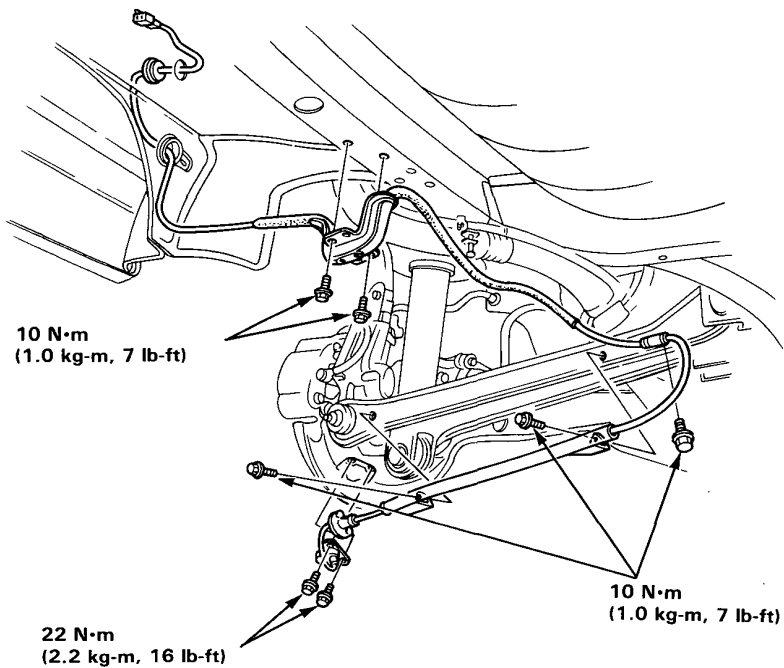
## Replacement

**NOTE:** Be careful when installing the sensors to avoid twisting the wires using the white line on the wires as a guide.

**FRONT**



**REAR**





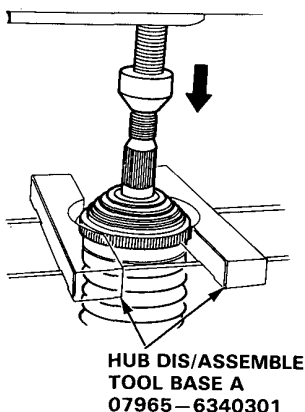


## Replacement

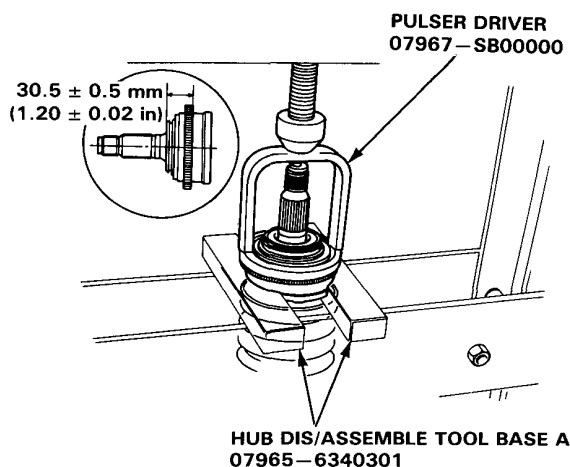
### Front

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/assemble tool base A (special tool) and hydraulic press.

**CAUTION:** The driveshaft will drop when it clears of the pulser.



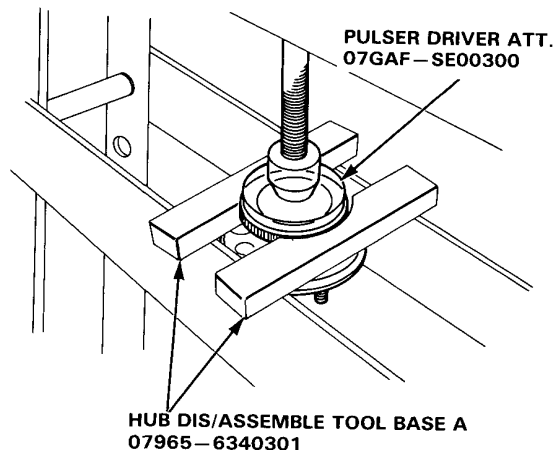
4. Clean the pulser attaching surface thoroughly.
5. Support the outboard joint with the hub dis/assemble tool base A.
6. Press a new pulser onto the outboard joint using the pulser driver (special tool) and a hydraulic press.



### Rear

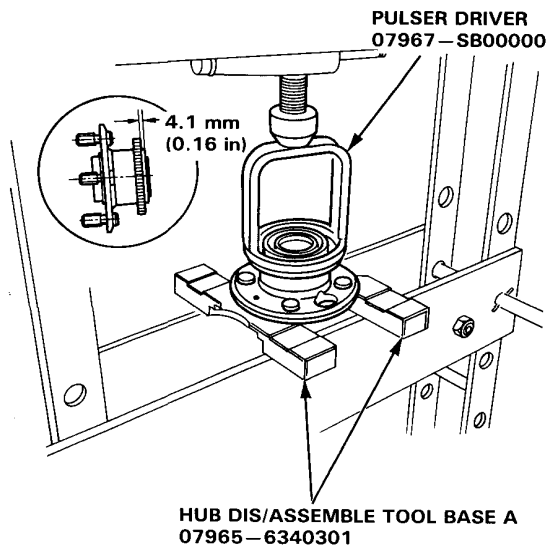
1. Remove the hub unit bearing.
2. Press the pulser off the hub unit using the pulser driver attachment and hub dis/assemble tool base A (special tools).

**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.



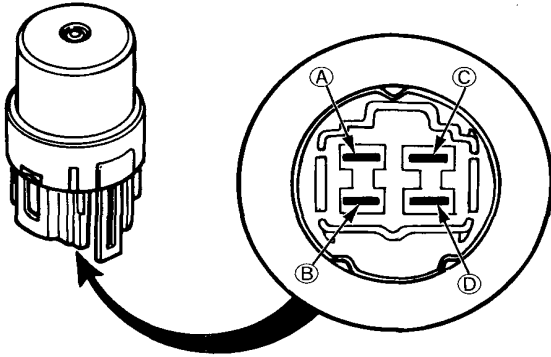


# Relay

## 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 .....	21-2
Windshield, Rear and Quarter Window Glass .....	21-17
Sunroof .....	21-56
Interior .....	21-63
Seats .....	21-67
Seat Belts .....	21-76
Gauges .....	21-82
Dashboard .....	21-85
Bumpers .....	21-89
Hood .....	21-91
Trunk Lid .....	21-92
Tailgate .....	21-93
Opener and Latch .....	21-95
Wipers .....	21-97
Washer System .....	21-99
Retractor Motor .....	21-100
Headlights .....	21-101
Lights .....	21-103
Frame Repair Chart .....	21-106

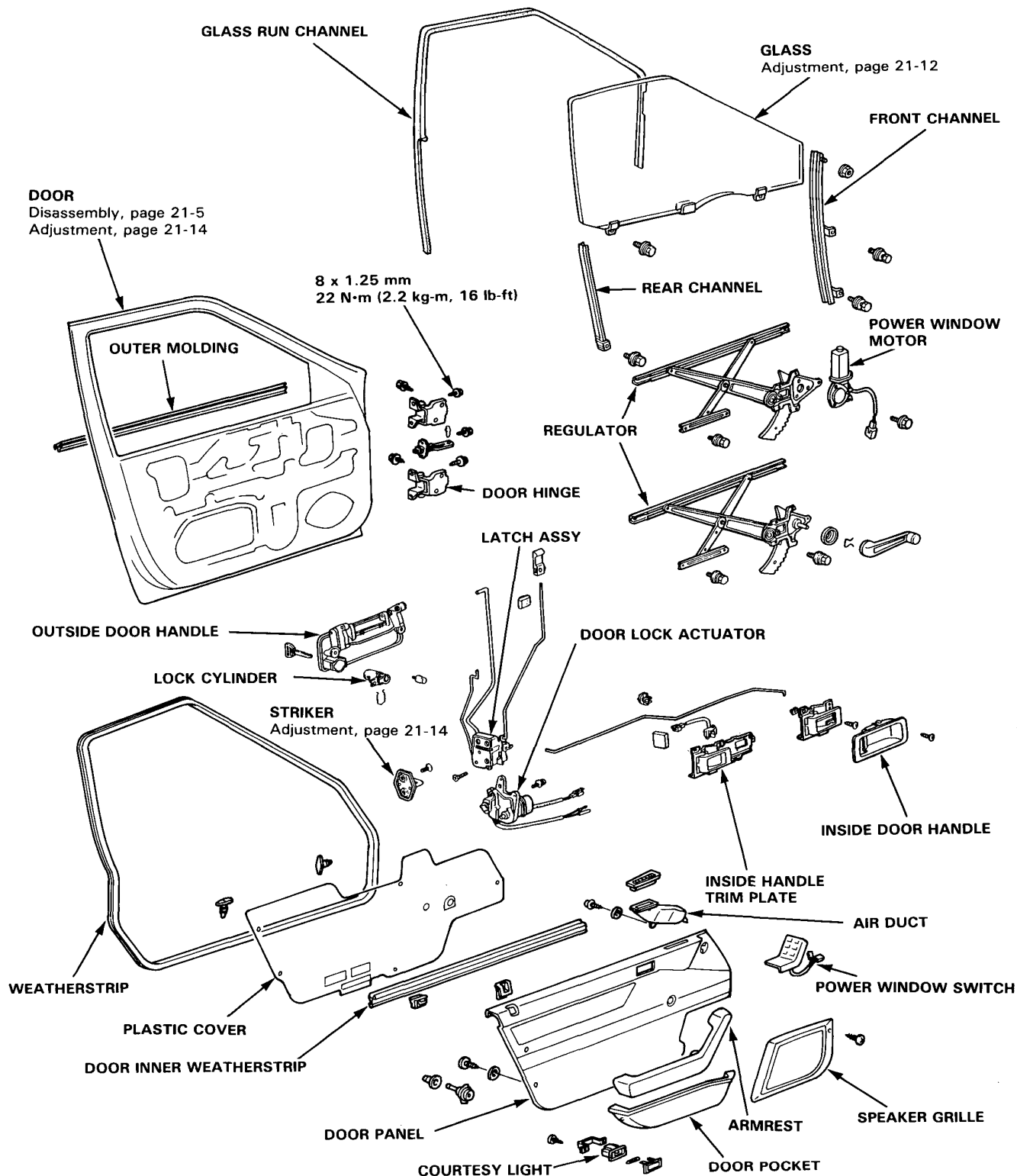




# Doors

## Index

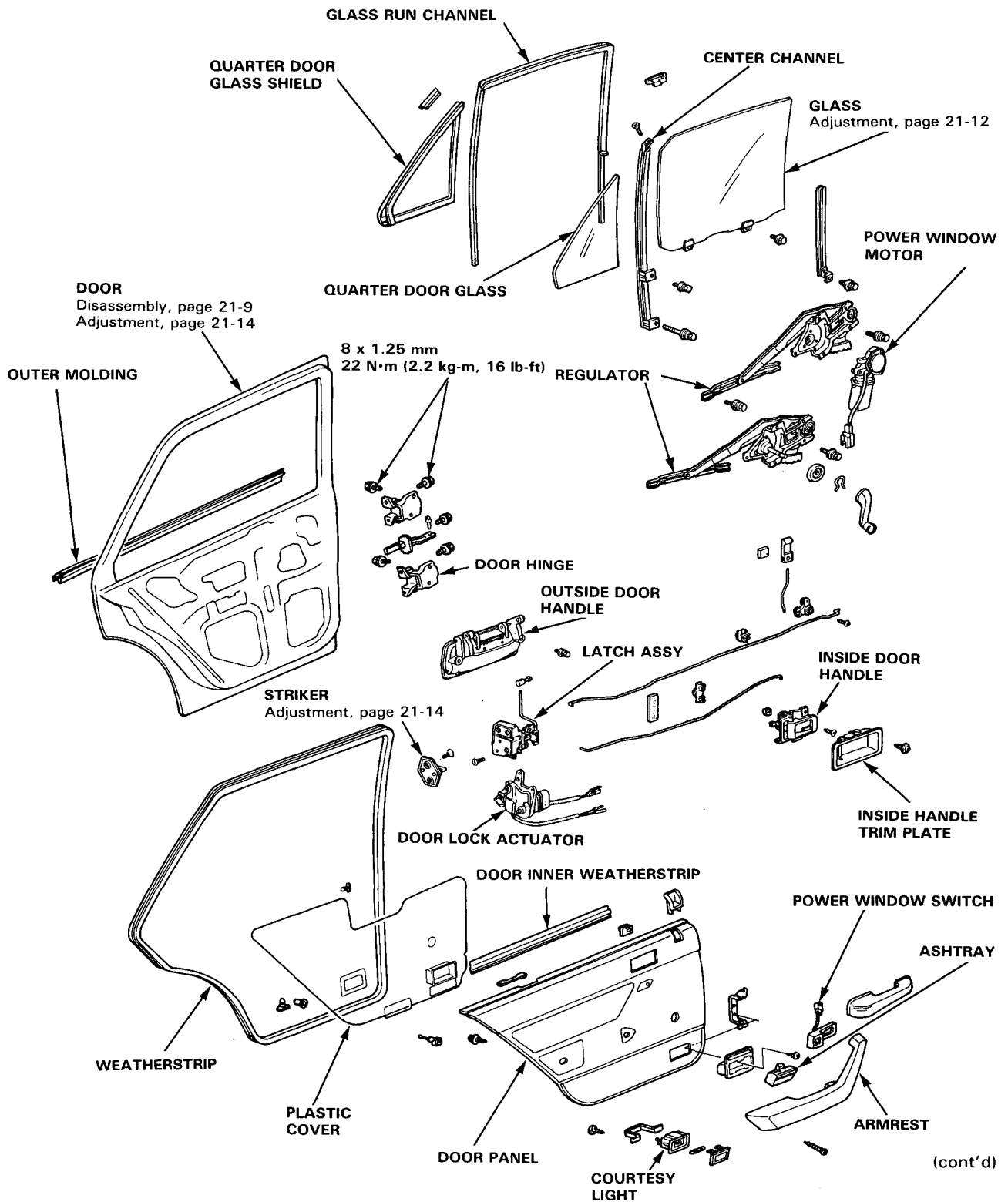
### Sedan Front







## Sedan Rear



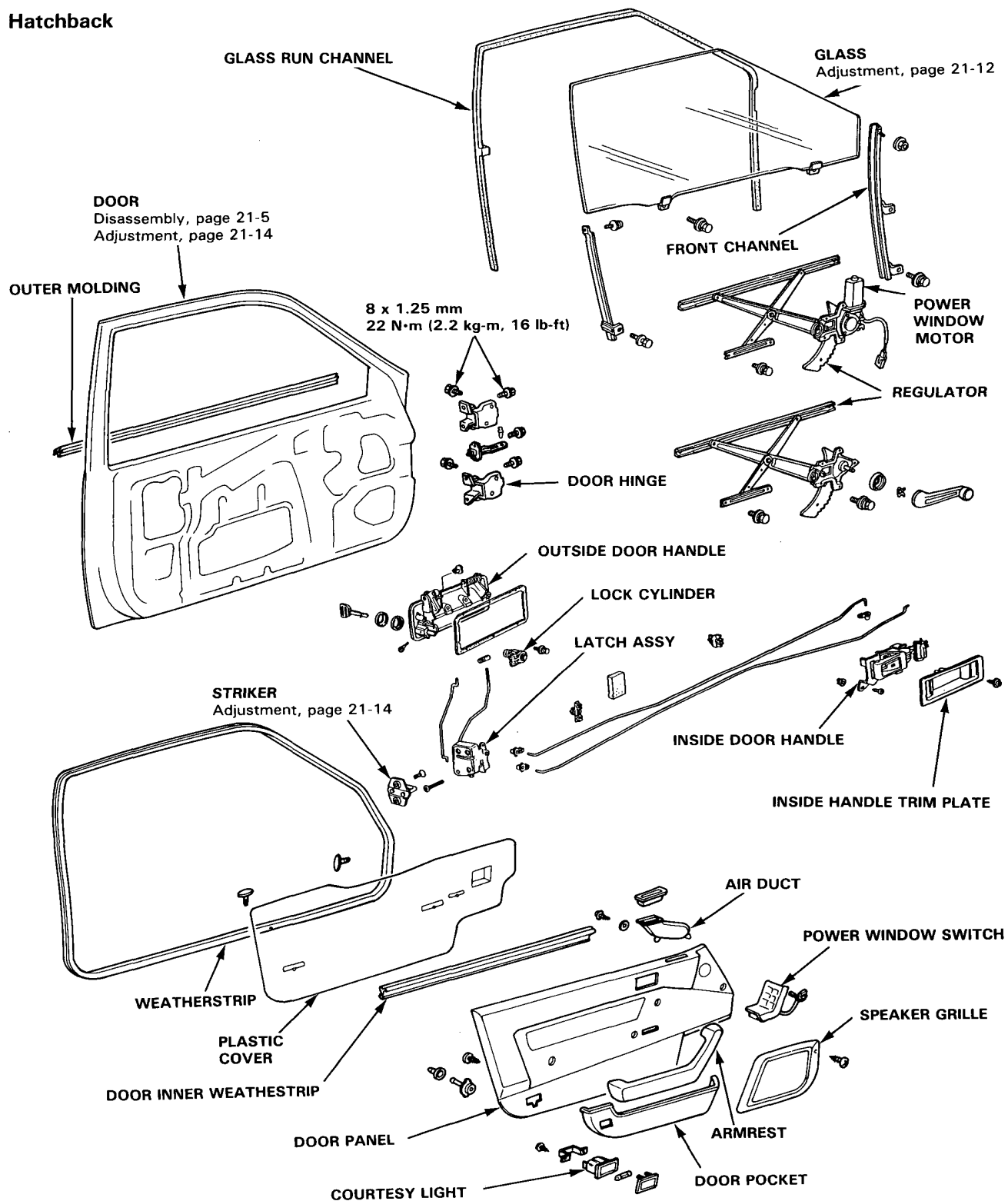
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# Doors

## Index (cont'd)

### Hatchback

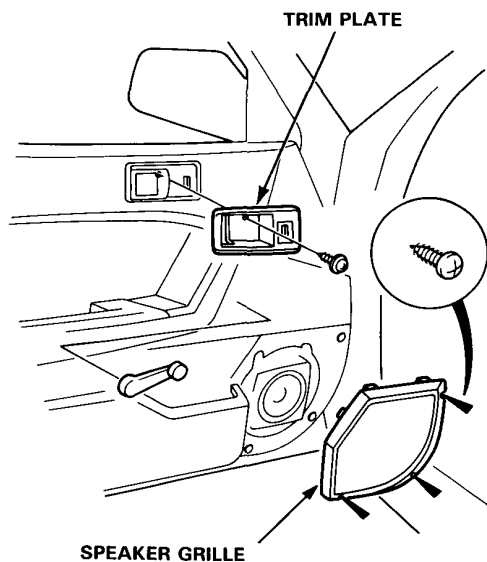




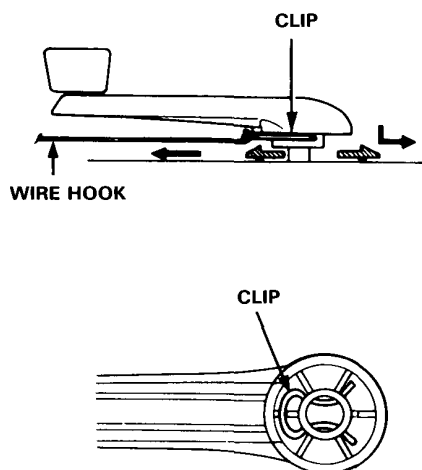


## Front Door Disassembly

1. Remove the trim plate screw, then carefully remove the trim plate.
2. Remove the speaker grille.

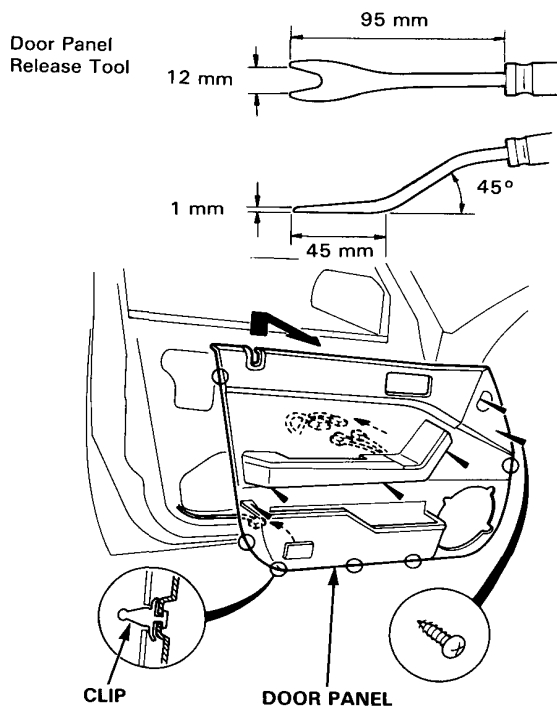


3. If applicable, remove the regulator handle by pulling the clip out with a wire hook.

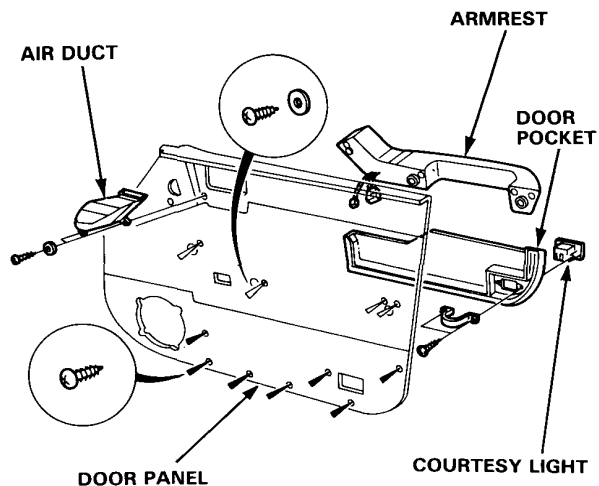


4. Remove the 3 armrest screws and 4 door panel screws, then pry apart the door panel clips. Lift the door panel straight up off the sill, and disconnect the courtesy light and power window wires.

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.



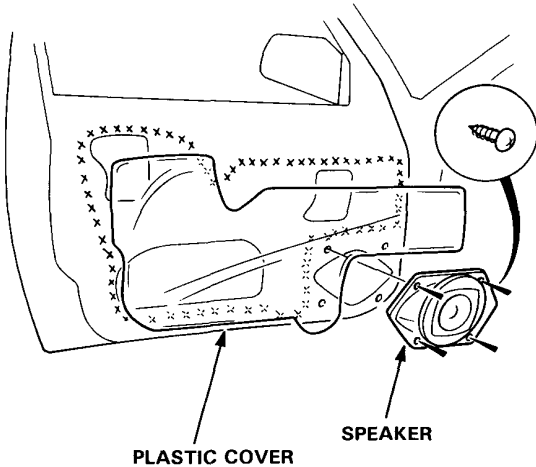
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# Doors

## Front Door Disassembly (cont'd)

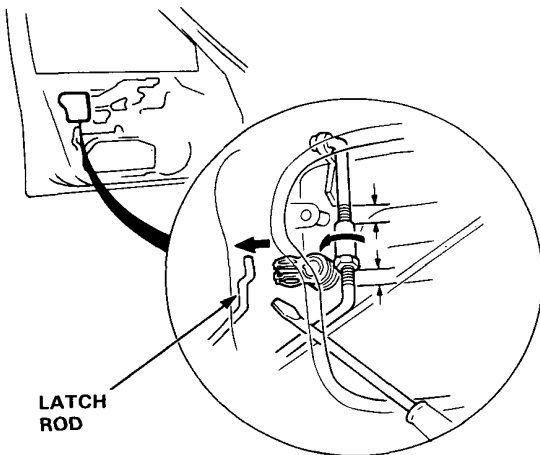
6. Remove the speaker, then carefully remove the plastic cover.



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.

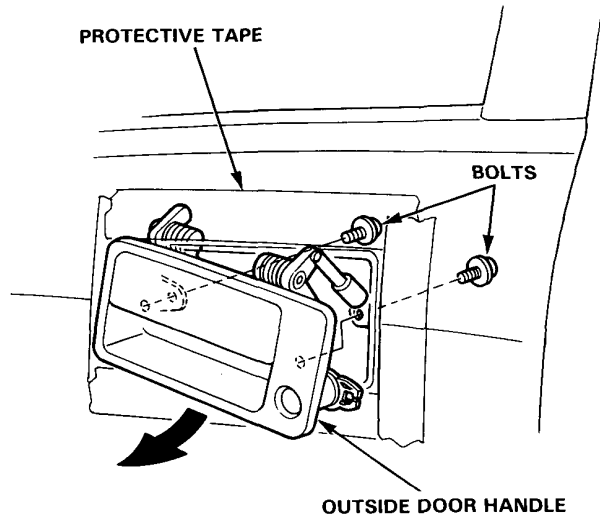
**NOTE:**

- 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.



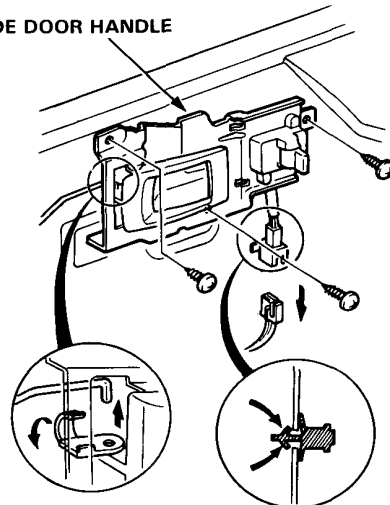
8. Remove the 2 bolts, then remove the door handle.

**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.

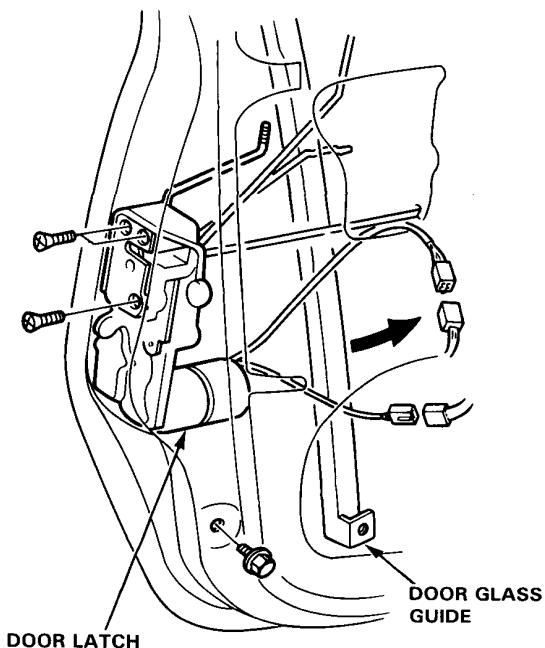
**INSIDE DOOR HANDLE**



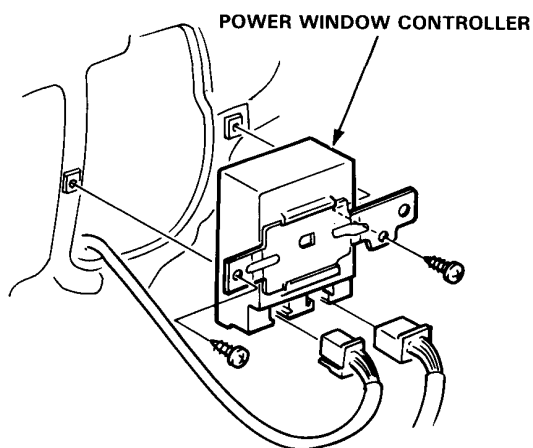




10. Remove the lower bolt of the door glass guide and slide the door glass guide. Remove the screws and take the door latch off the door, then push the door latch and rod inside the door.

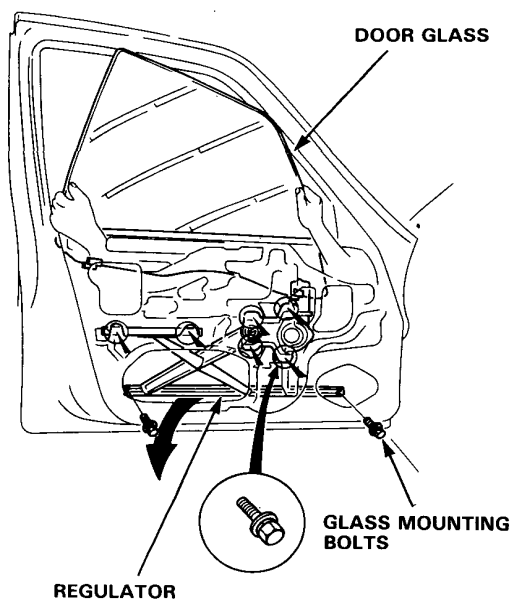


Disconnect the wire harness and remove the 2 screws, then remove the power window controller.

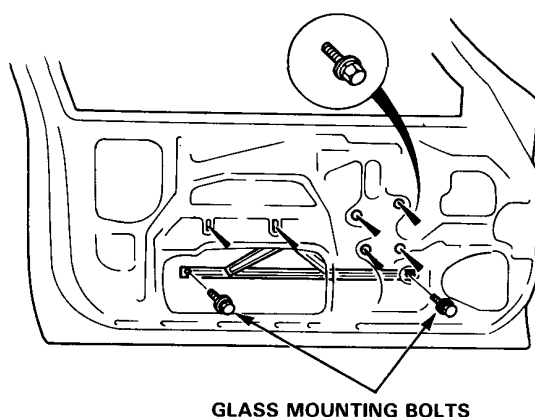


11. Carefully lower the door glass until you can see its mounting bolts. Loosen the bolts and pull the door glass out through the window slot. Remove the regulator mounting bolts, then take out the regulator assembly through the lower hole in the door.

#### Sedan



#### Hatchback



(cont'd)



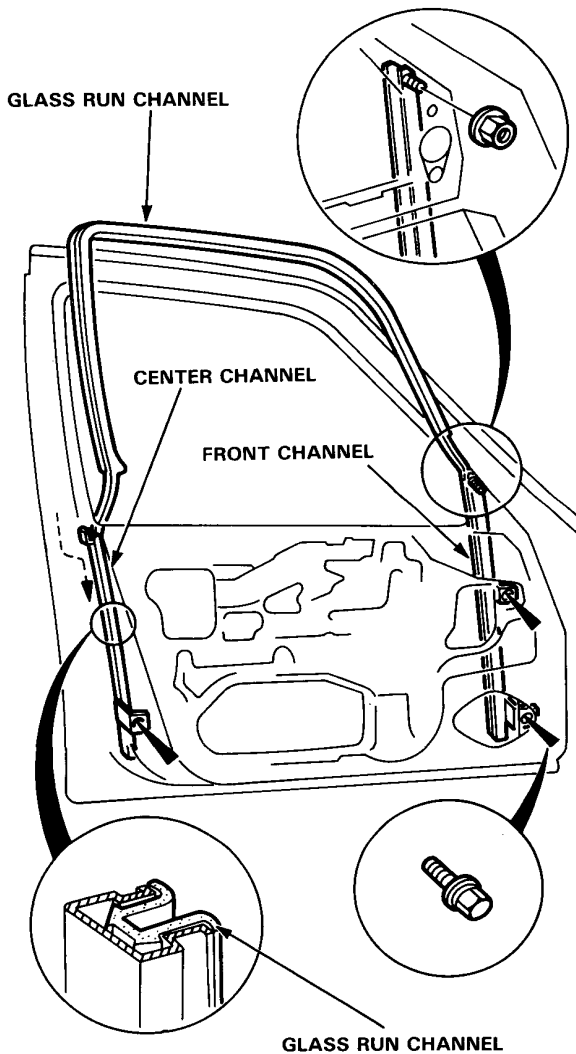
# Doors

## 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.

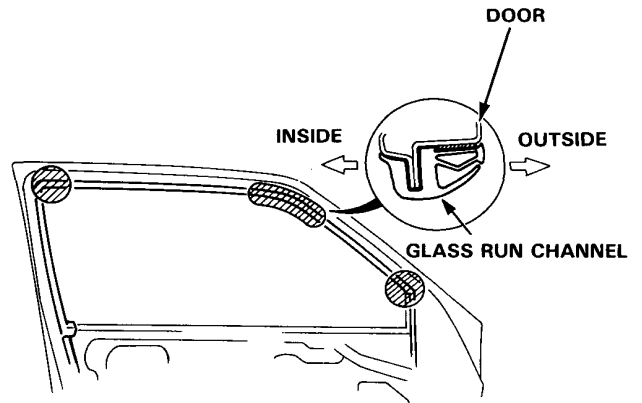
NOTE: Before installation insert the glass run channel into the front and the center channel.

### Sedan



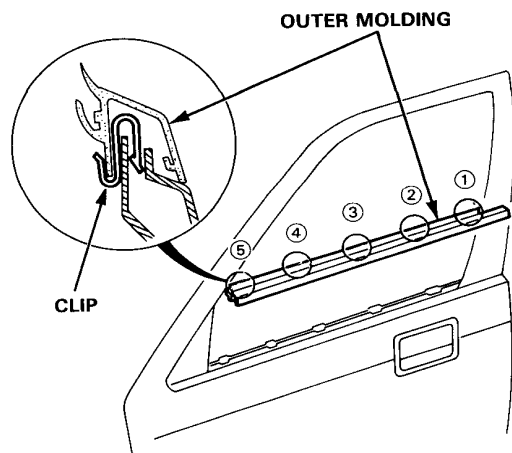
### Hatchback

- 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.

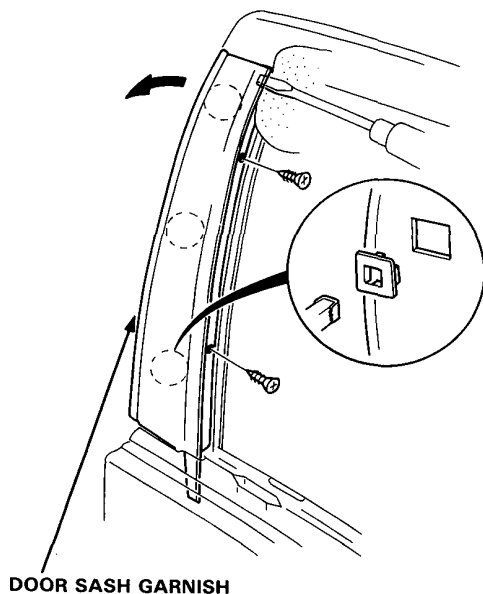




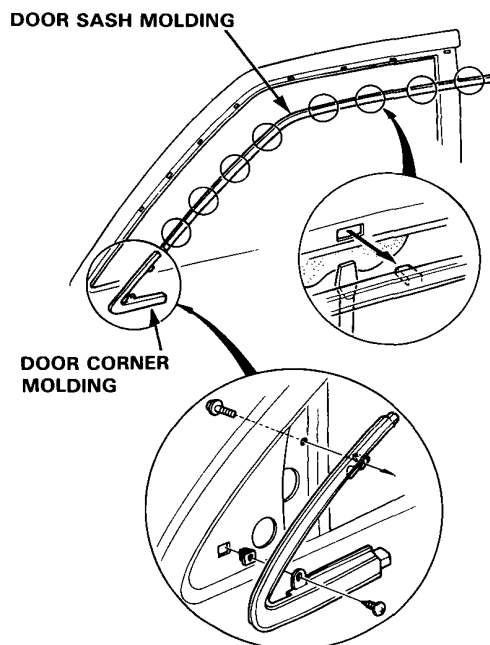


## Rear Door Disassembly

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.

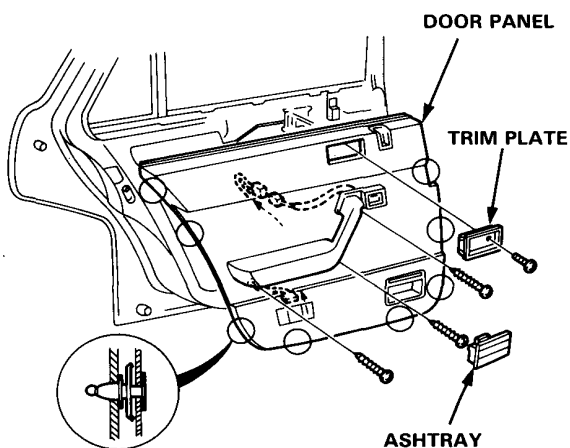


1. Remove the trim plate by removing the screw and remove the screws of armrest.

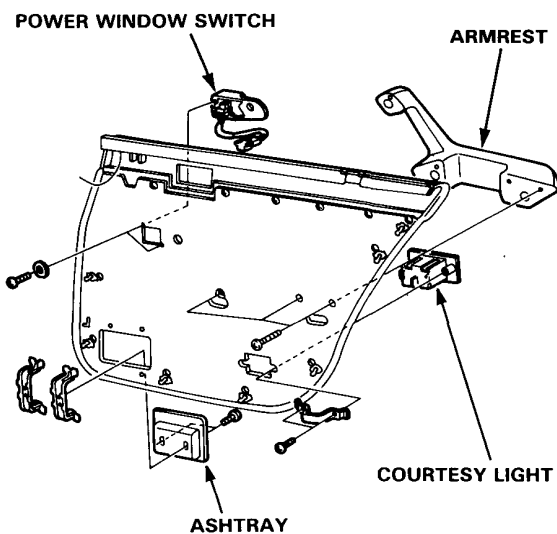
### NOTE:

- 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.

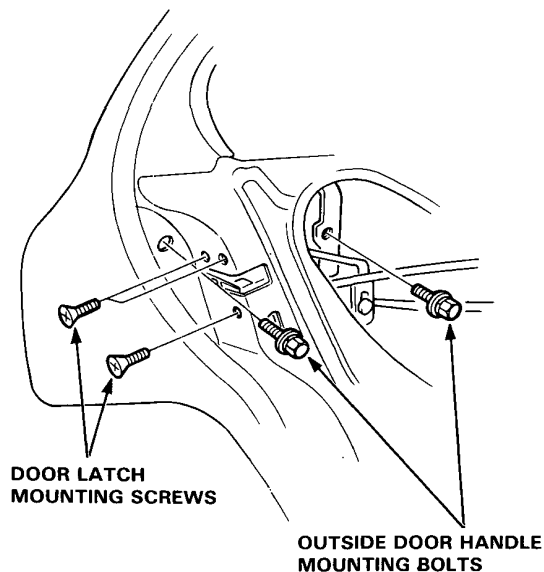
(cont'd)



# Doors

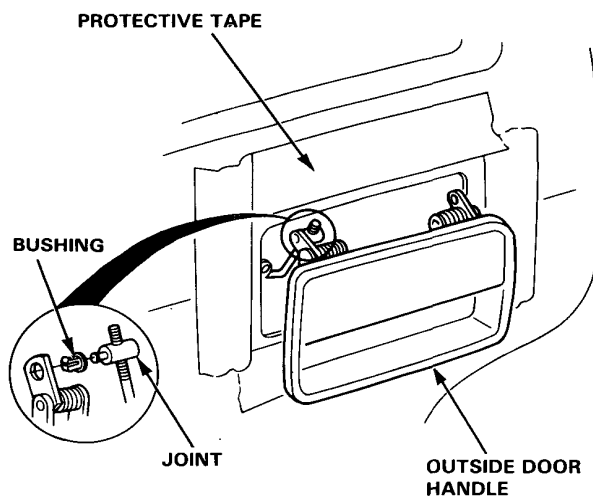
## Rear Door Disassembly (cont'd)

5. Remove the 3 screws of the door latch, and remove the 2 bolts of the outside door handle.

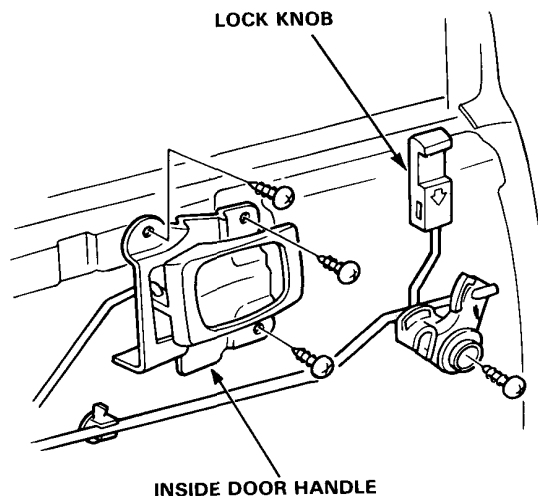


6. Pull the outside door handle out, and pry the joint off the handle with a flat screwdriver. Remove the handle from the rod.

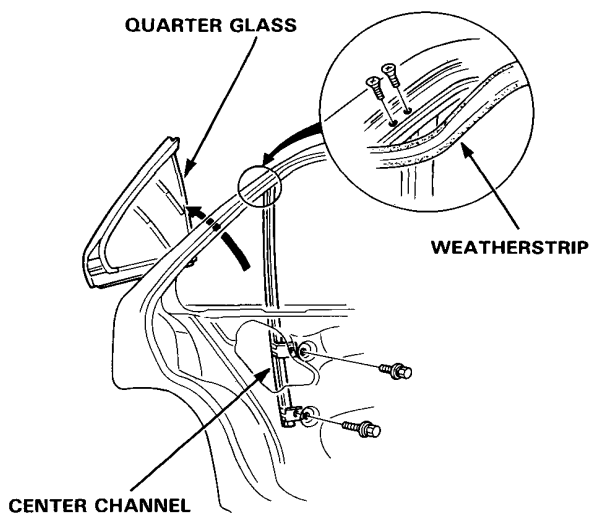
**NOTE:** To prevent damage to the door finish, attach protective tape to the door surface around the door handle.



7. Remove the 2 screws of the inside door handle and the screw of the lock knob, then remove it from the door.



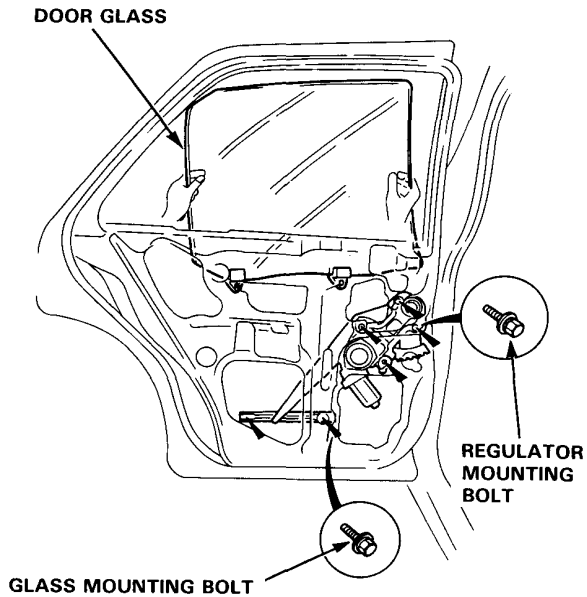
8. Peel the weatherstrip off and remove the 2 screws as shown. Remove the 2 channel bolts, then remove the center channel. Remove the quarter glass.



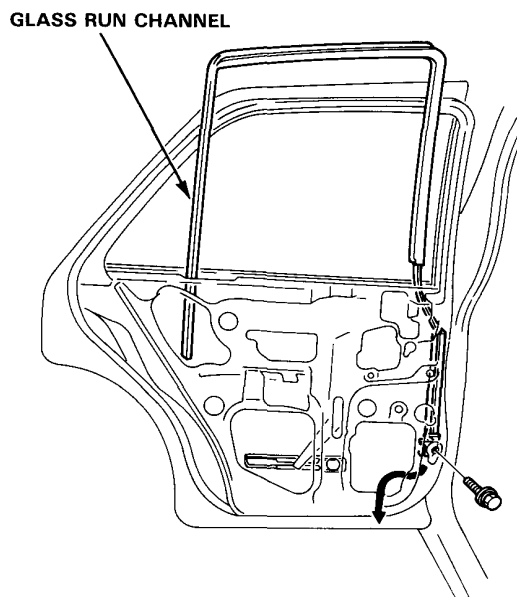




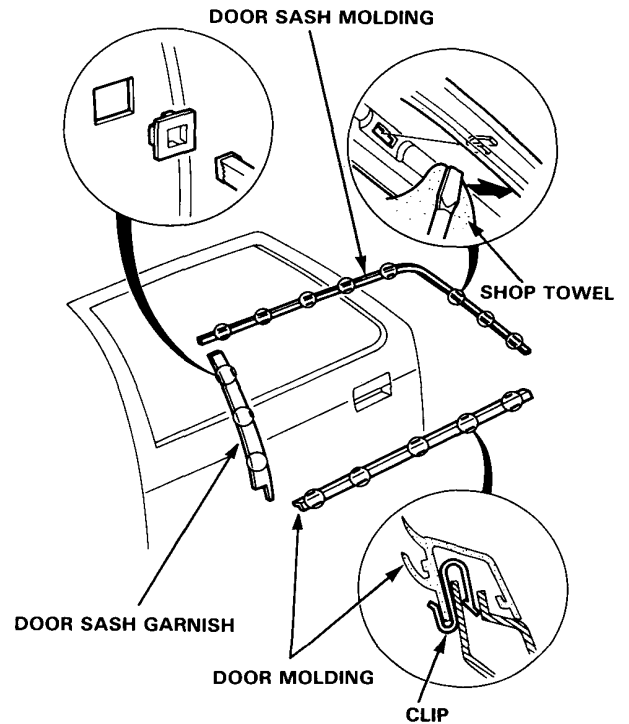
9. Carefully lower the door glass until you can see its mounting bolts, then loosen the bolts. Pull the door glass out through the window slot.



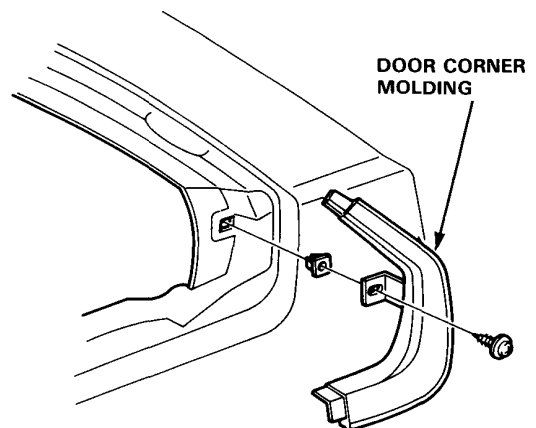
10. Remove the glass run channel and the bolt, then remove the rear channel.



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.





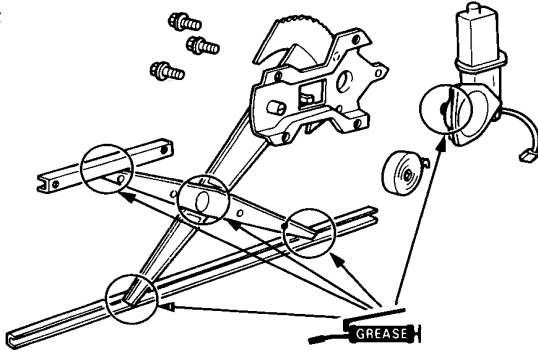
# Doors

## Assembly

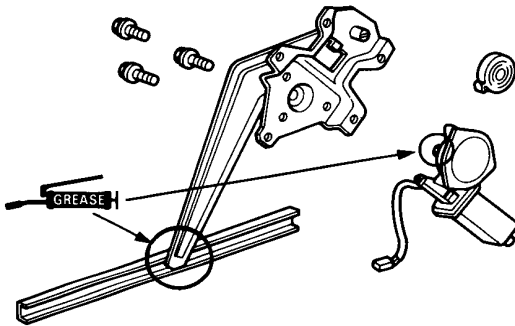
Assemble the door in the reverse order of disassembly, and also:

1. Grease all the sliding surfaces of the window regulator where shown.

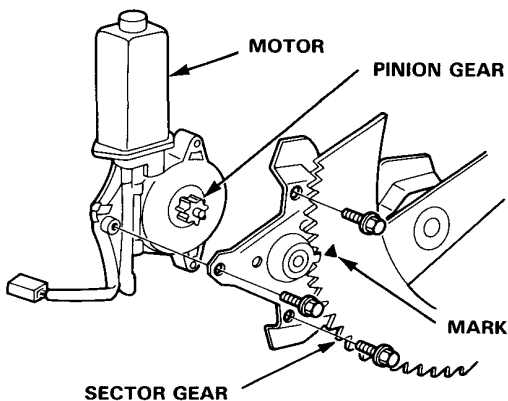
Front



Rear

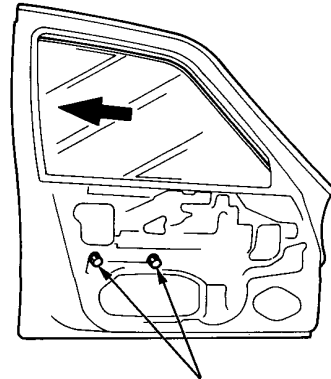


2. Position the motor on its mount by aligning the pinion with the sector, and install using the three mount bolts. Move the window regulator to the original position by connecting a 12V battery to the motor.



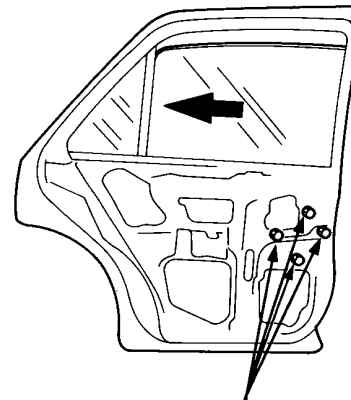
3. To adjust glass fit in the door, raise the glass as far up as possible and hold it against the door sash. Then, tighten the roller guide bolts or motor mount bolts.

Sedan Front



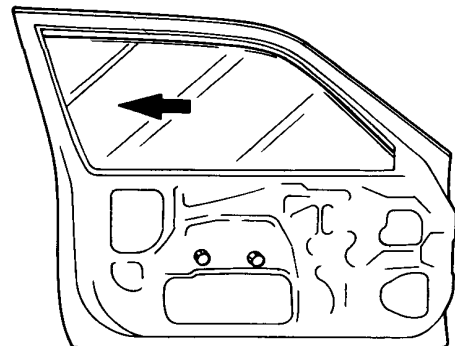
ROLLER GUIDE MOUNT BOLTS

Sedan Rear



MOTOR MOUNT BOLTS

Hatchback

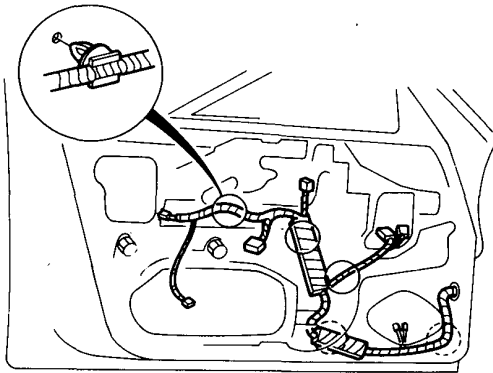




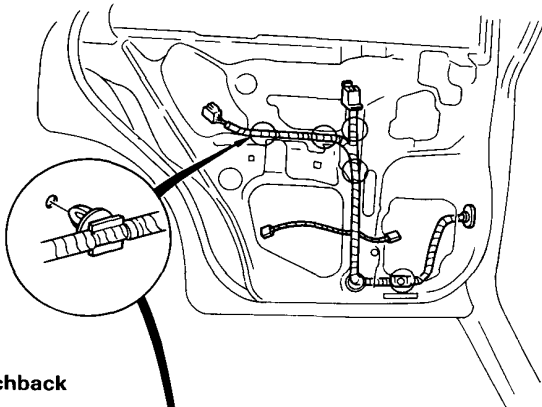


4. Fix the wire harness correctly on the door.

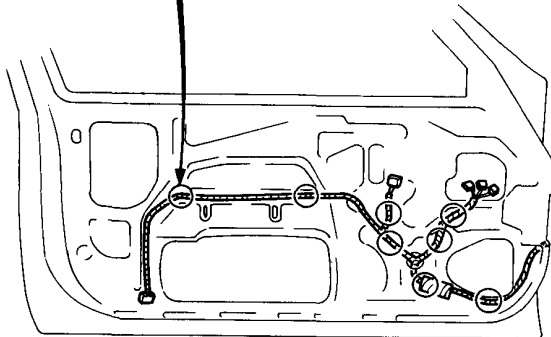
**Sedan Front**



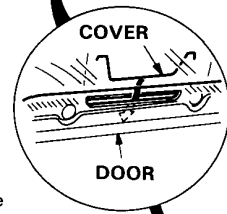
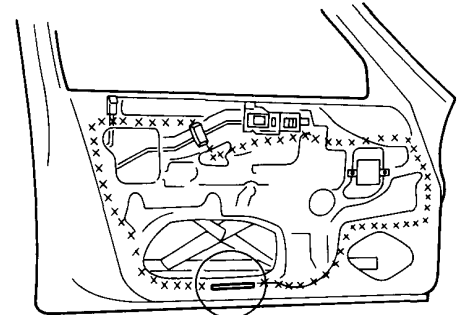
**Sedan Rear**



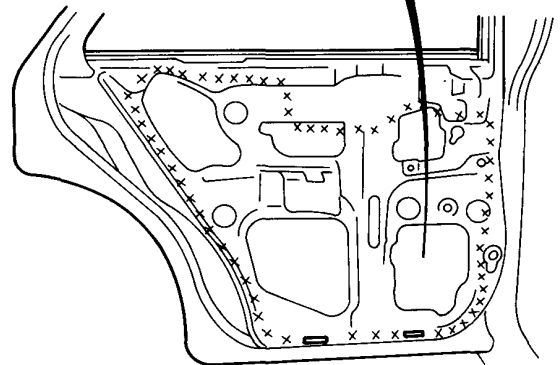
**Hatchback**



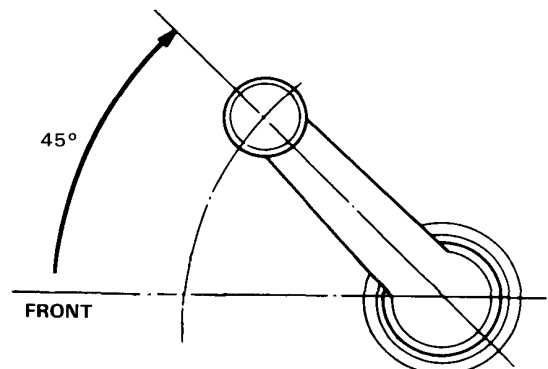
5. When reinstalling the plastic cover, apply adhesive along the edge where necessary to maintain a continuous seal and prevent air/water leaks.



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.





# Doors

## Door Position Adjustment

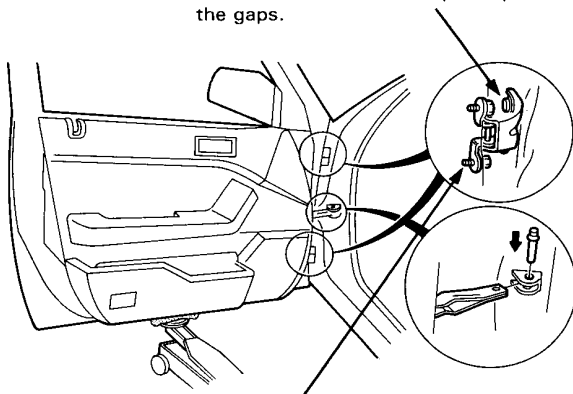
After installing the door, check for a flush fit with the body, then check for equal gap between the front and rear, and top and bottom door edges and the body.

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.

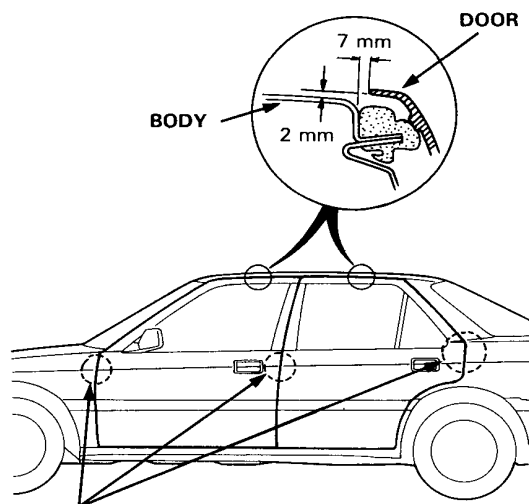
### HINGE MOUNTING BOLTS

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.

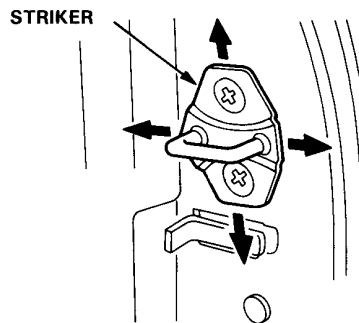


The door and body edges should be parallel.

## 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 recheck.



**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.

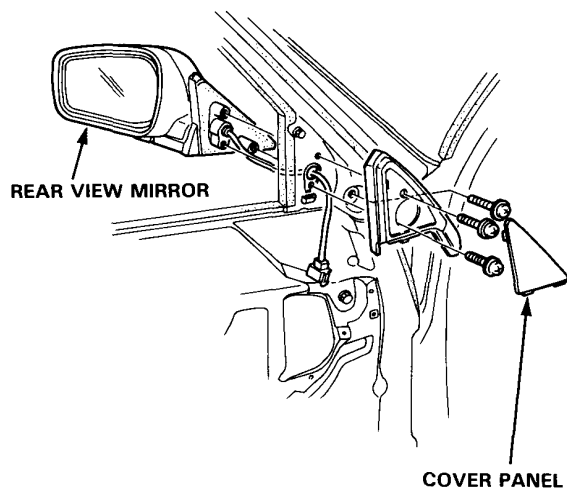


# Power Door Mirror



## Removal

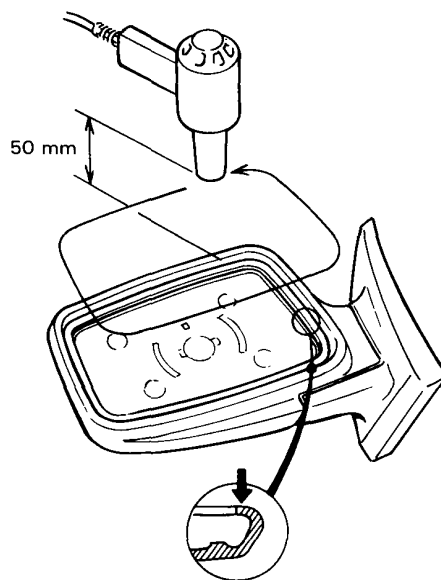
1. Remove the door panel and disconnect the power mirror wires.
2. Pry out the cover panel with a flat screwdriver.



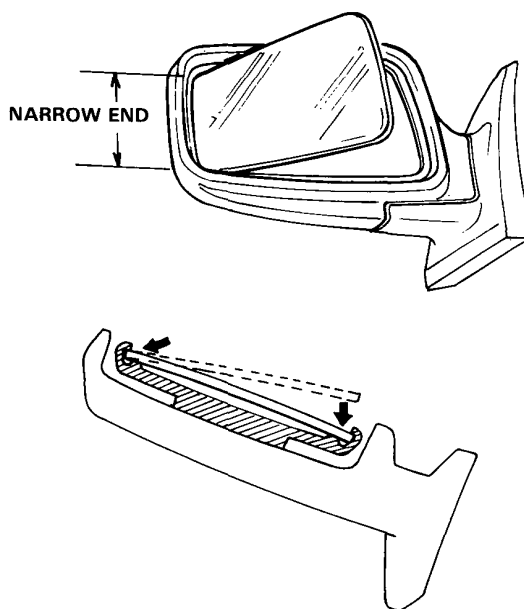
3. Remove the mirror mounting screws while holding the mirror.

## 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.

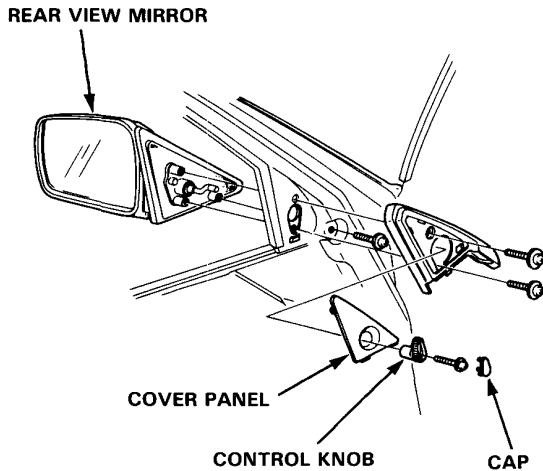




# Door Mirror

## Removal

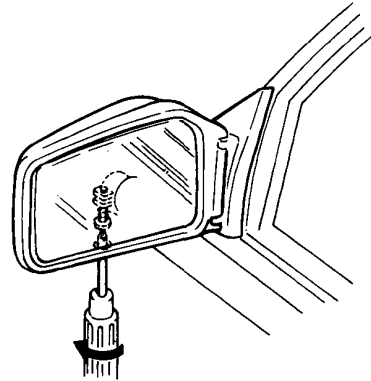
1. Remove the cap and the screw, then remove the control knob.



2. Remove the cover panel.
3. Remove the mirror mounting screws while holding the mirror.

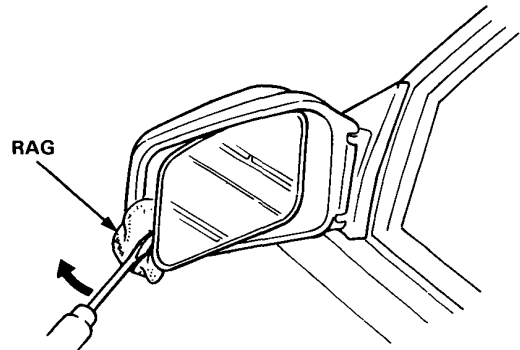
## Mirror Glass Replacement

1. Insert a screwdriver in the mirror through the service hole, and loosen the glass retaining screw.

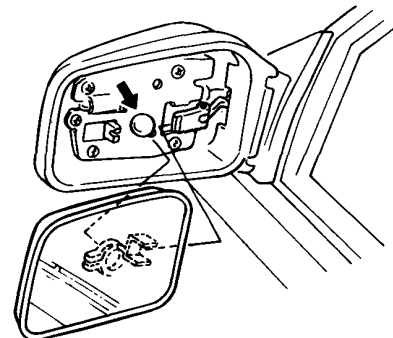


2. Carefully pry out the mirror with a screwdriver as shown.

**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.



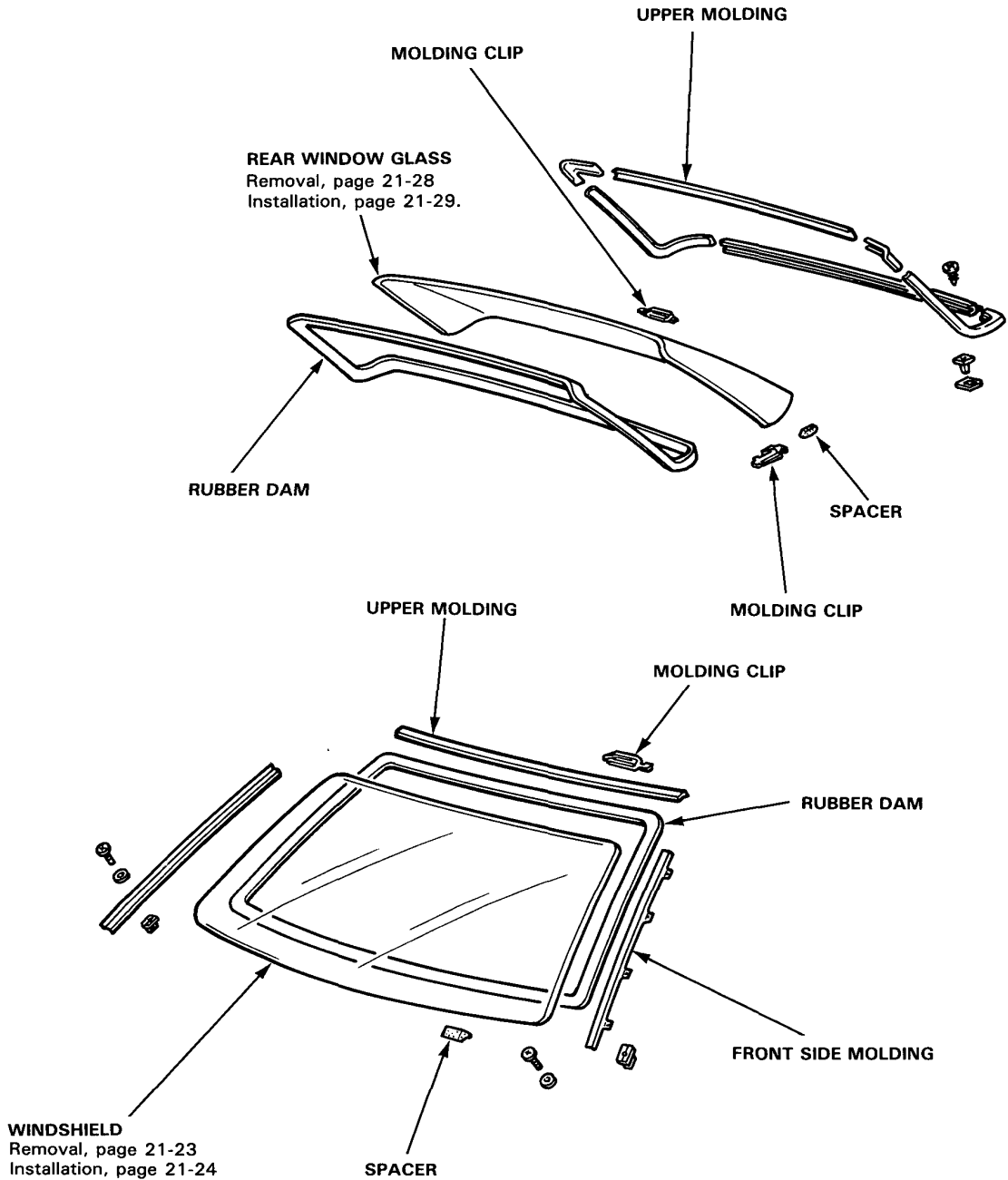


# Windshield, Rear and Quarter Window Glass



## Index

### Sedan



(cont'd)

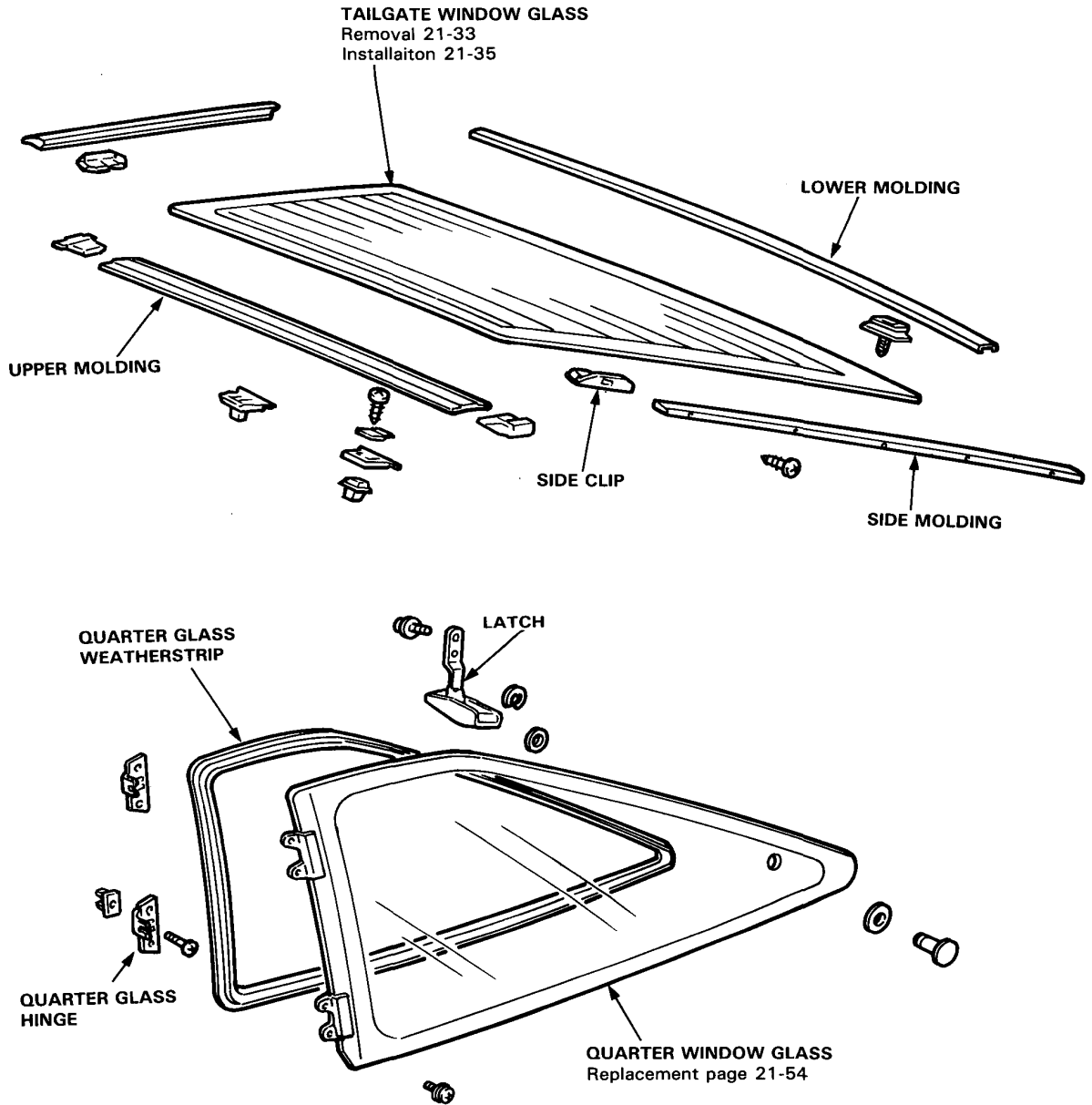


# Windshield, Rear and Quarter Window Glass

## Index (cont'd)

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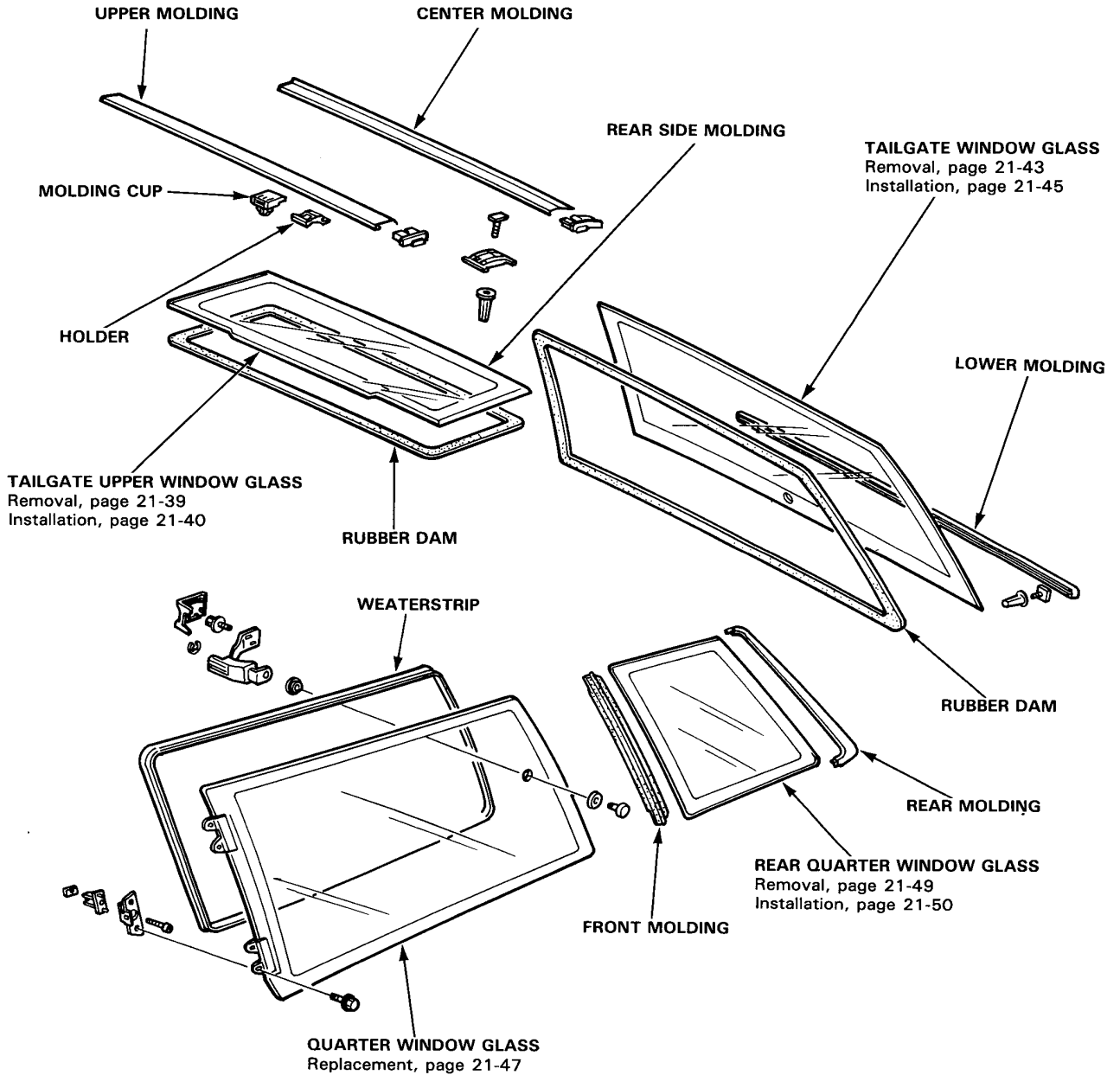
### Glass Back







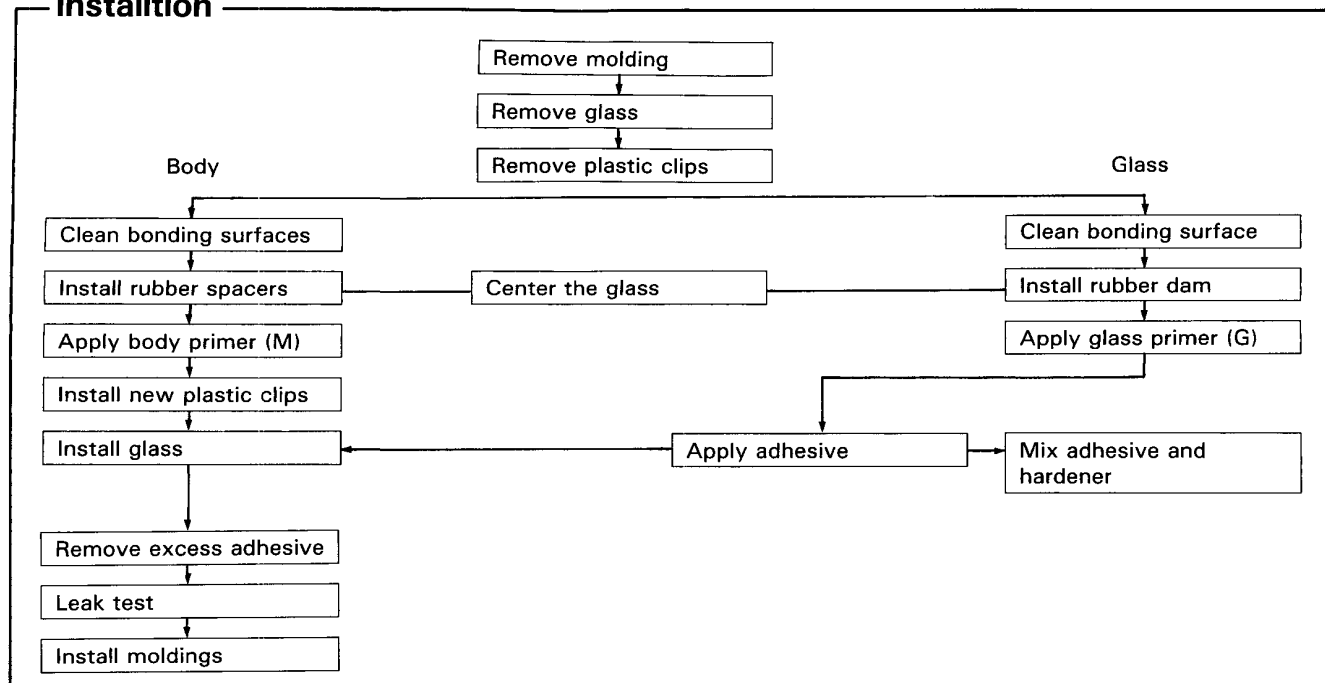
## Aerodeck





# Windshield, Rear and Quarter Window Glass

## Installation



## 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





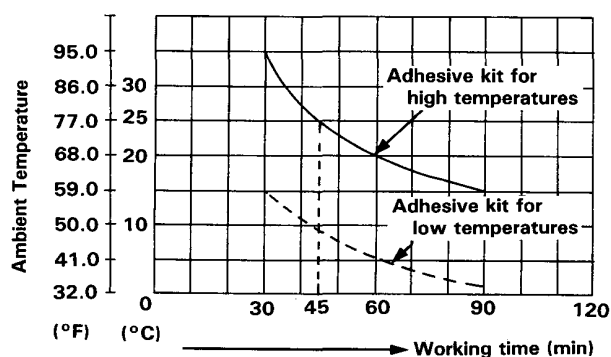
## Workable Time

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.



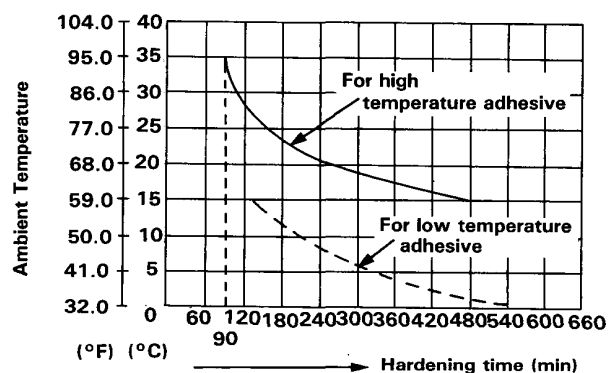
## Notes

- 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:

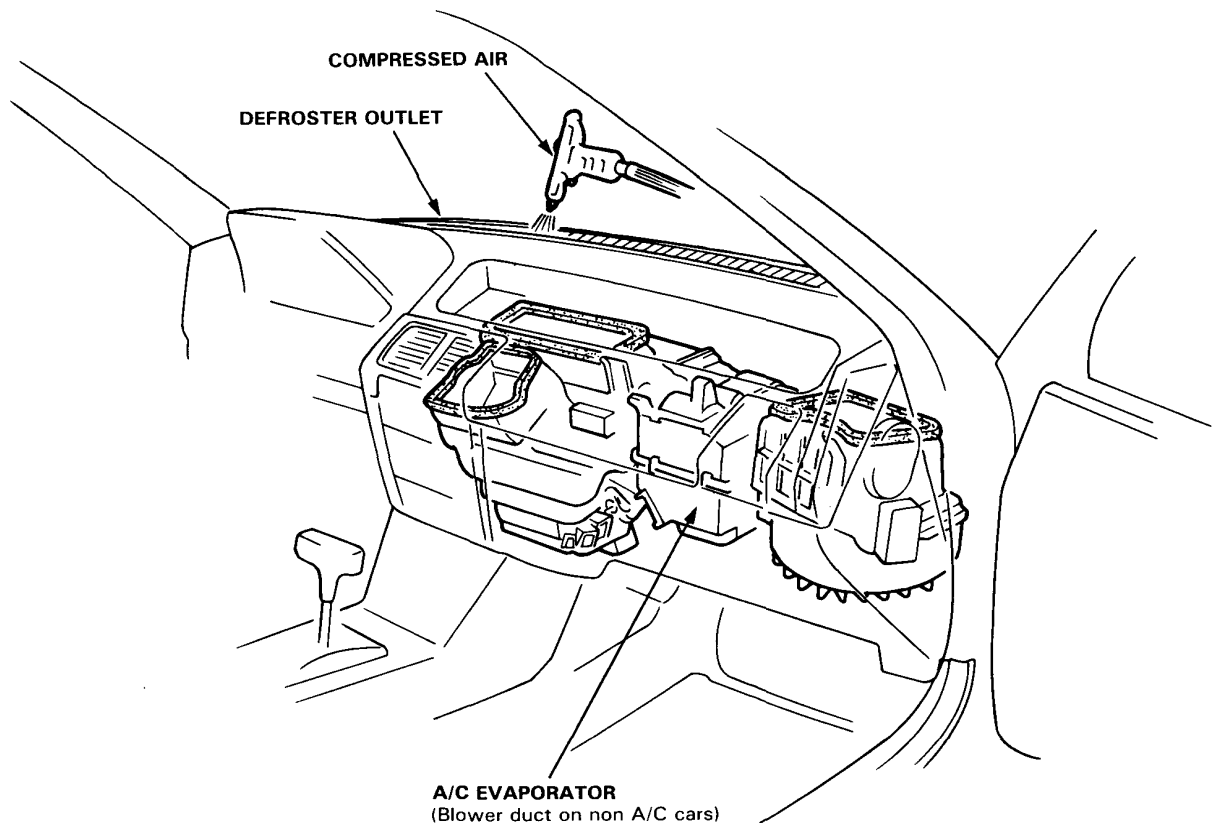
Remove as much broken glass as possible with a vacuum cleaner.

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.



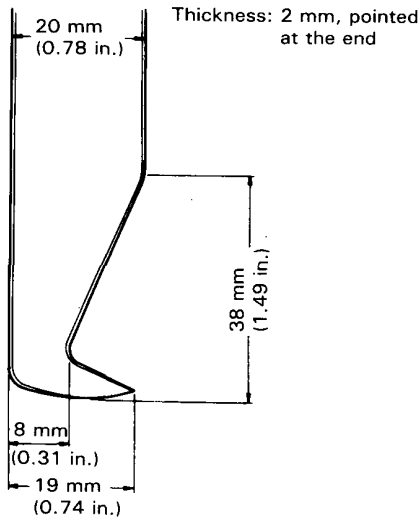




## Removal

**NOTE:** You will need a molding clip release tool to remove some moldings. If necessary, make one that has the dimensions shown.

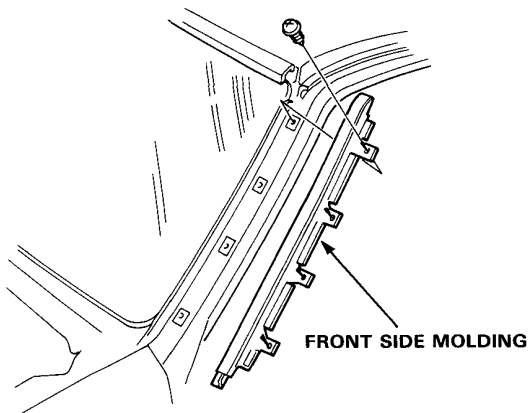
### Molding Clip Release Tool



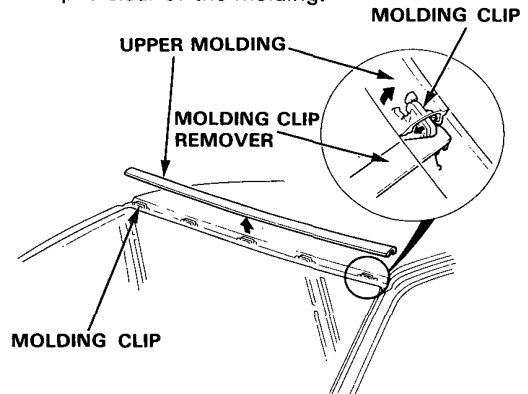
1. To remove the windshield, first remove the:

- Inside rear view mirror (page 21-81).
- Sun visor.
- Front pillar garnish (pages 21-63 to 65).
- Front wiper and air scoop.

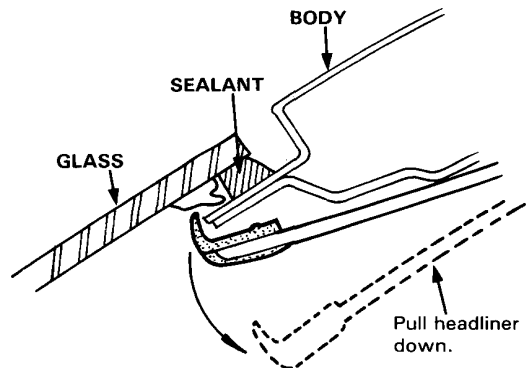
2. Remove the front side molding.



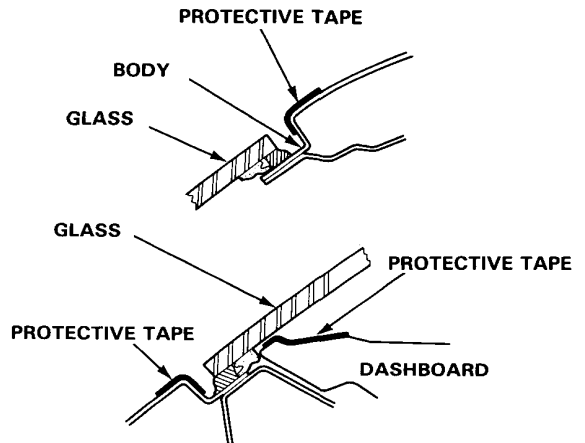
3. Raise the upper molding a little away from the windshield at the locations where the molding clips are used, then apply the end of the molding clip remover to each clip, and pull it toward you until the clip is clear of the molding.



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.



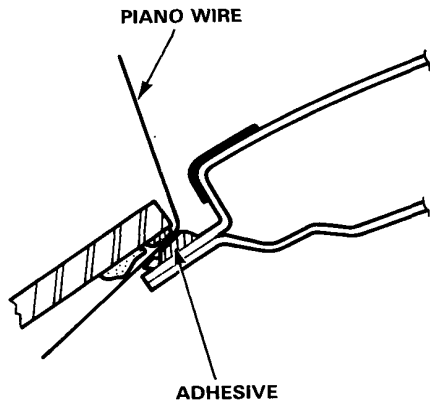
(cont'd)



# Windshield

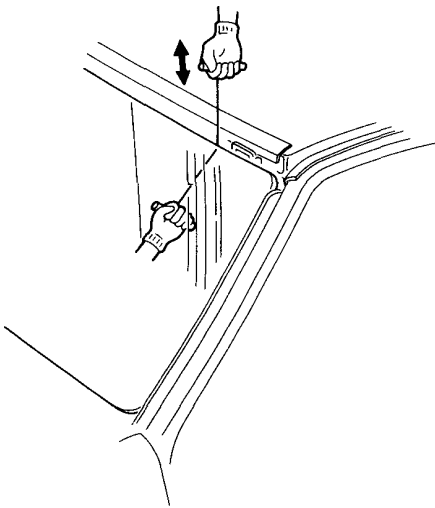
## Removal (cont'd)

- 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.



- 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.



- Remove the molding clips and the rubber dam.

## Installation

- 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.

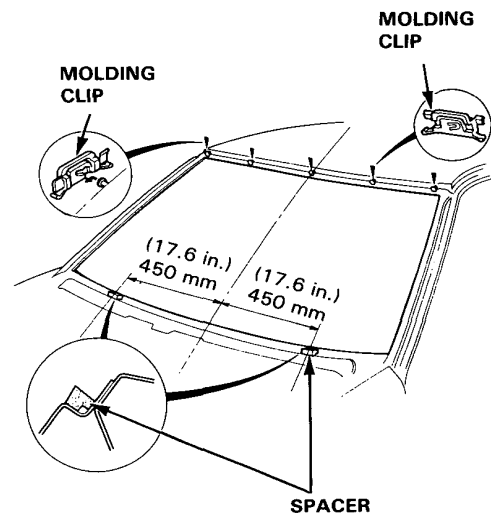
### NOTE:

- 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.

- Clean the body bonding surface with a sponge dampened in alcohol.

**NOTE:** After cleaning, keep oil, grease or water from getting on the surface.

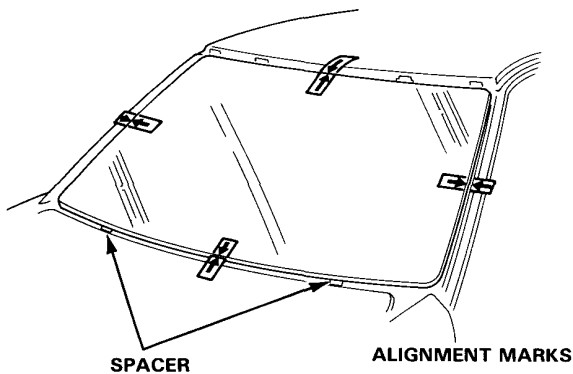
- Peel the backing off each spacer, then install the spacers by pressing them firmly into place at the locations shown.
- Install the molding clips as shown.





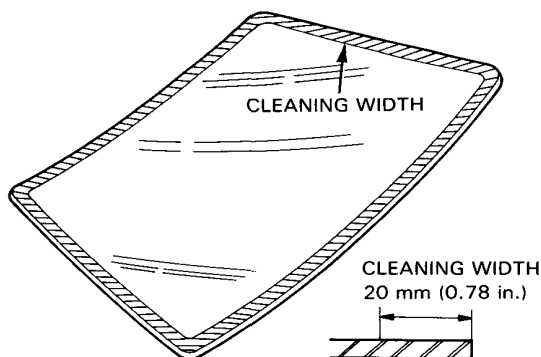


5. Set the glass upright on the spacers, and center it in the opening. Mark the location by marking lines across the glass and body with a grease pencil at the four points shown.



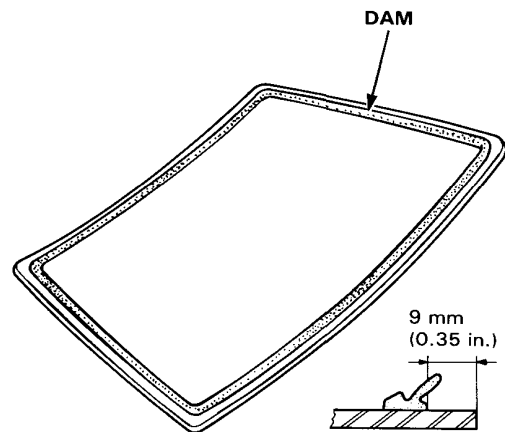
6. If the glass is to be reinstalled, use a putty knife to scrape off all traces of old adhesive, then clean the glass surface with alcohol to a width of about 20 mm.

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.

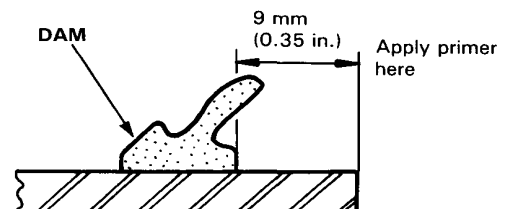
NOTE: Be careful not to touch the glass where adhesive will be applied.



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)



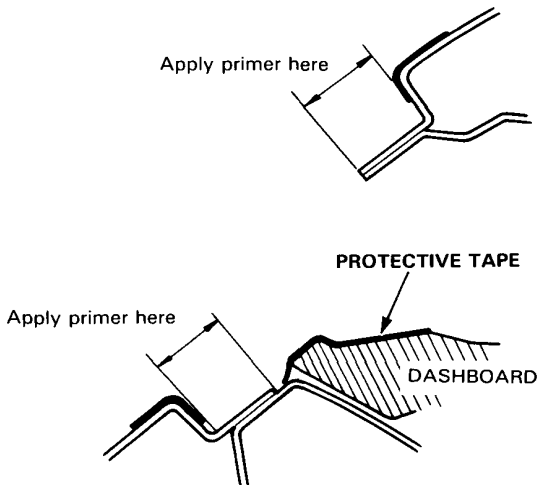
# Windshield

## 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:**

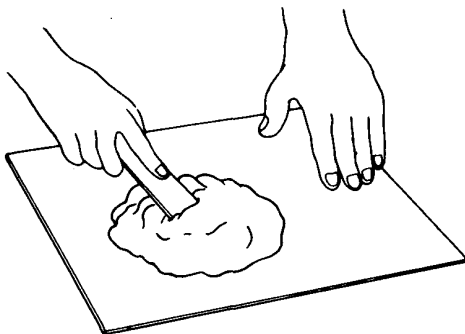
- Do not apply glass primer to the body, and be careful not to mix up glass and body primer sponges.
- Never touch the primed surfaces with your hands.
- Mask off the dashboard before painting the flange.



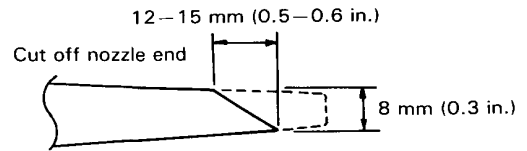
10. Thoroughly mix all the adhesive and hardener together on a glass or metal plate.

**NOTE:**

- Clean the plate with a sponge and alcohol before mixing.
- Follow the instructions that come with the adhesive.

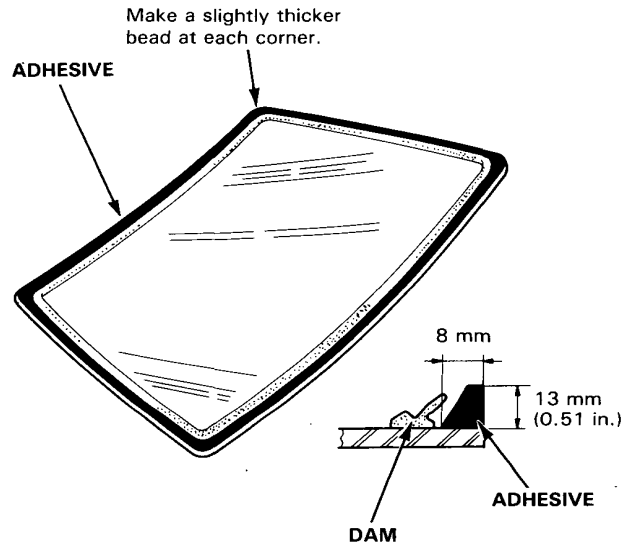


11. Before filling a cartridge, cut off the end of the nozzle at the angle shown.

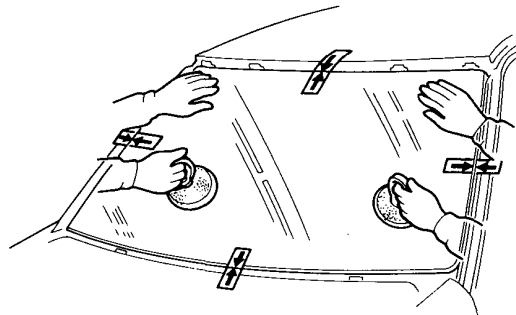


12. Pack adhesive into the cartridge without air pockets, to ensure continuous delivery. Put the cartridge in a caulking gun, and run a bead of adhesive around the edge of the glass as shown.

**NOTE:** Apply the adhesive within 30 minutes after applying the glass primer.



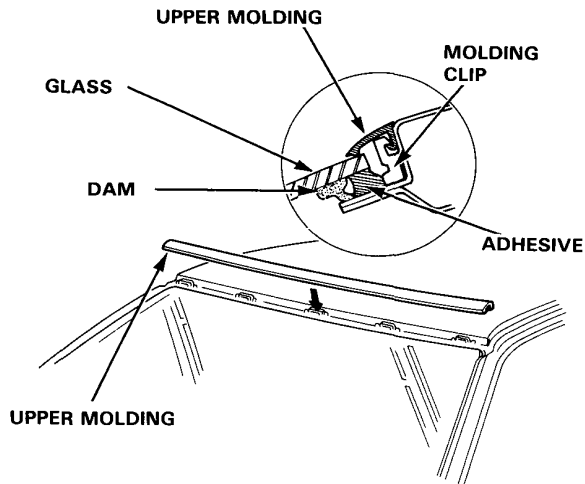
13. Use suction cups to hold the glass over the opening, align it with the marks made in step 5 and set it down on the adhesive. Lightly push on the glass until its edge is fully seated on the adhesive all the way around.







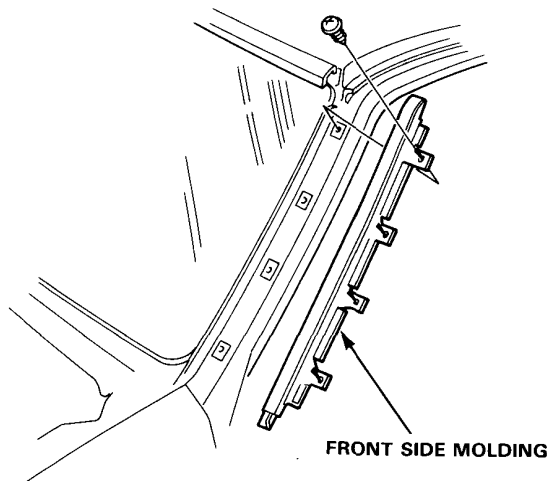
14. Install the upper molding.



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.

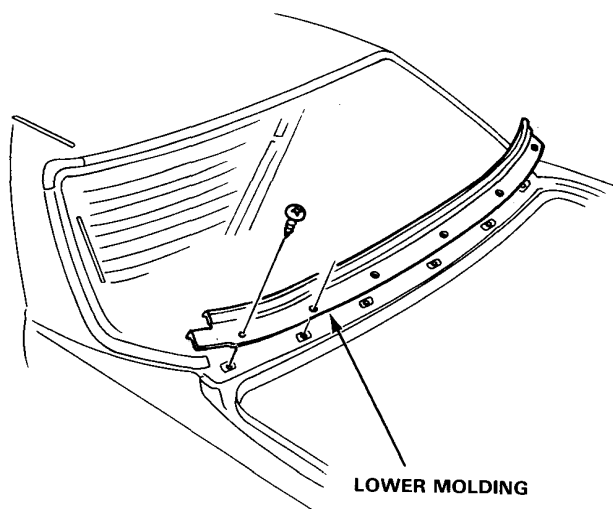
NOTE: You will need a molding clip release tool to remove some moldings. If necessary, make one that has the dimensions shown on page 21-23.

1. To remove the rear glass, first remove:
  - Trunk lid.
  - Rear shelf (page 21-63).
  - Rear pillar trim panel (page 21-63).

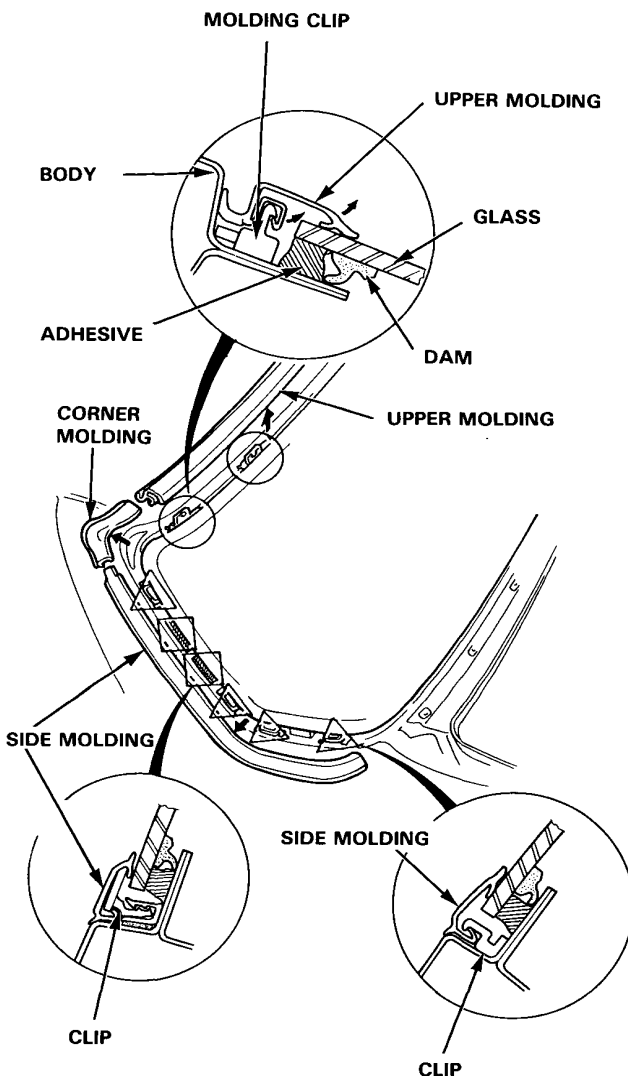
2. Disconnect the defroster leads, and remove their holders.

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.



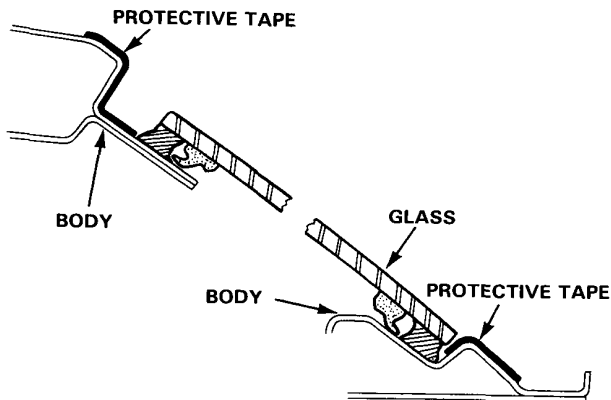




6. Lower the rear of the headliner.

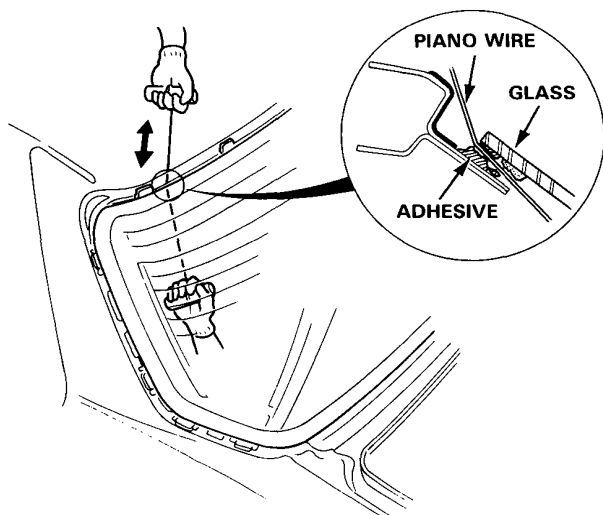
**NOTE:** Take care not to bend the headliner excessively.

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:**

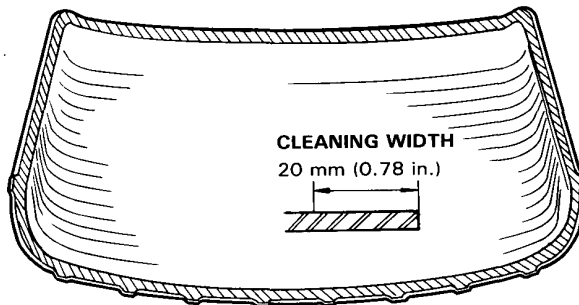
- Do not scrape down to the painted surface of the body; damaged paint will interfere with proper bonding.
- Remove all traces of the rubber spacer material from the body.
- Mask off surrounding surfaces before painting.

2. Clean the body bonding surface with a sponge dampened in alcohol.

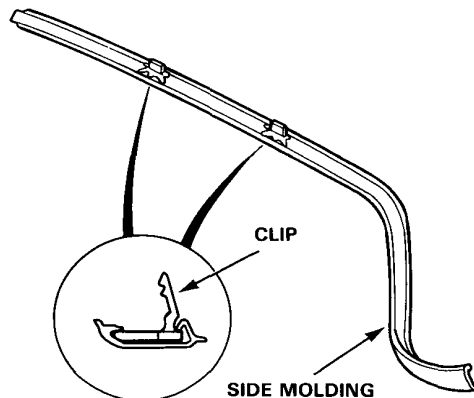
**NOTE:** After cleaning, keep oil, grease or water from getting on the surface.

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.



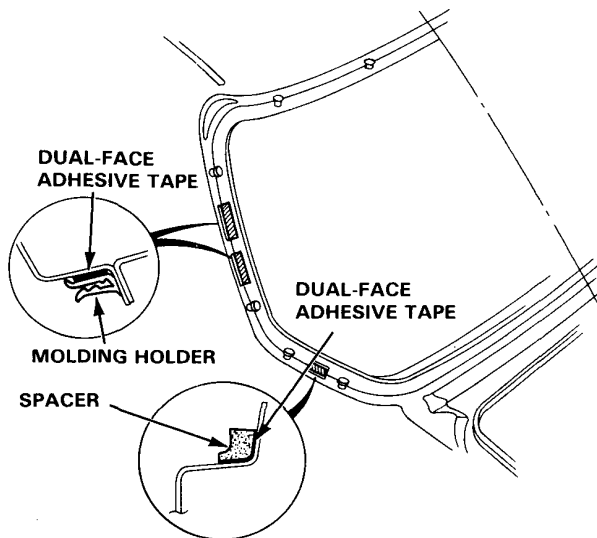
(cont'd)



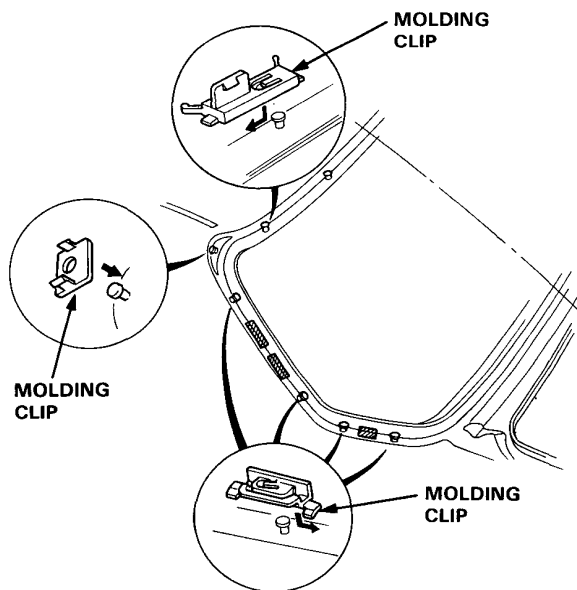
# Sedan Rear Window

## Installation (cont'd)

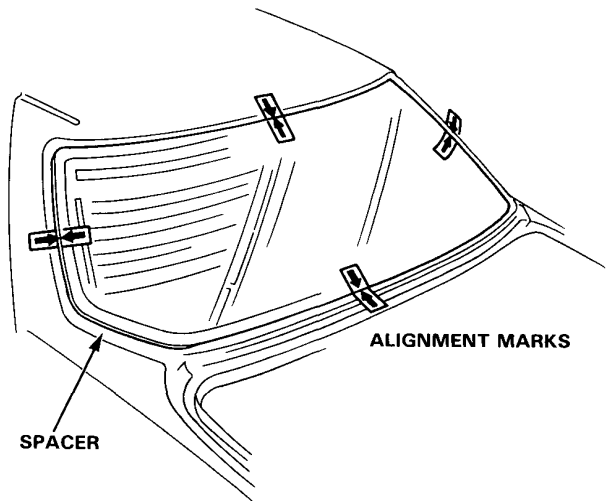
5. Peel the backing of each spacer and molding holder, then install the spacers and holders by pressing them firmly into place at the locations shown.



6. Install the molding clips on the pins on the body.

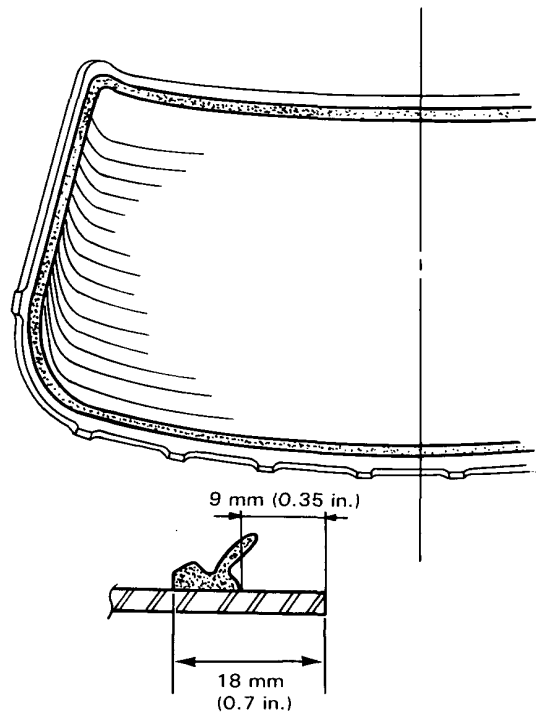


7. Set the glass upright on the spacers, and center it in the opening. Mark the location by marking lines across the glass and body with a grease pencil at the four points shown.



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.



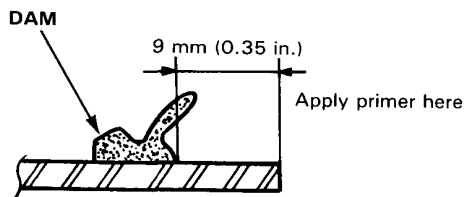




9. With a sponge, apply a light coat of glass primer around the edge of the glass as shown, then lightly wipe it off with gauze or cheesecloth.

**NOTE:**

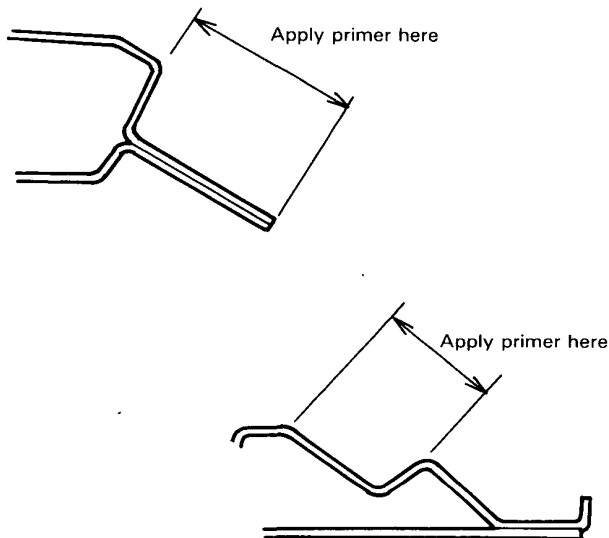
- Do not apply body primer to the glass, and do not get body and glass primer sponges mixed up.
- Never touch the primed surfaces with your hands. If you do, the adhesive may not bond to the glass properly, causing a leak after the glass is installed.
- Keep water, dust, and abrasive materials away from 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:**

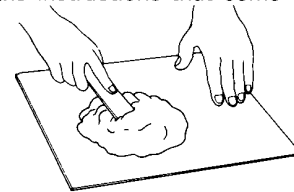
- Do not apply glass primer to the body, and be careful not to mix up glass and body primer sponges.
- Never touch the primed surfaces with your hands.



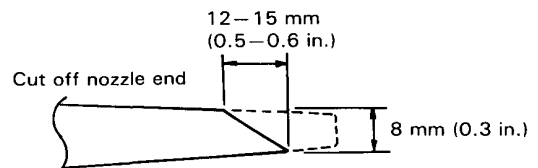
11. Thoroughly mix all the adhesive and hardener together on a glass or metal plate with a putty knife.

**NOTE:** Clean the plate with a sponge and alcohol before mixing.

12. Follow the instructions that come with the adhesive.



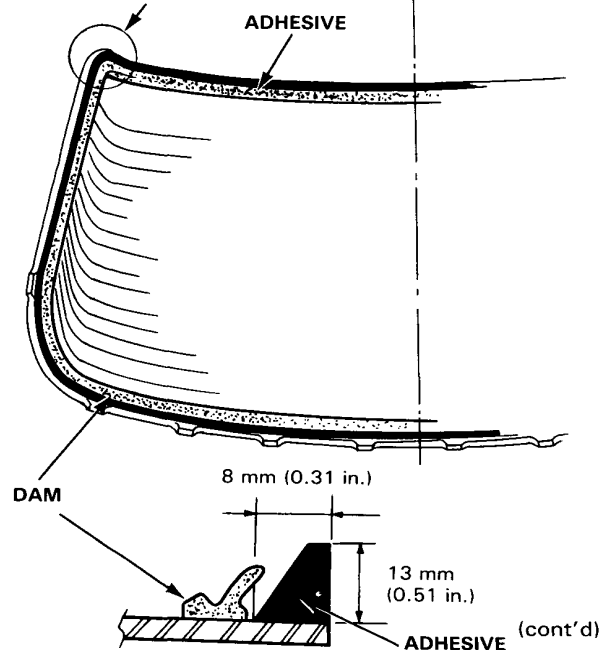
13. Before filling a cartridge, cut off the end of the nozzle at the angle shown.



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.

Make a slightly thicker bead at each corner.





## Installation (cont'd)

**NOTE:** Do not close or open the doors until window adhesive is dry.



**NOTE:** Wipe with a soft rag or towel dampened with unleaded gasoline to remove adhesive from a painted surface or glass.

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).

- 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.

- Rear tray.
- Rear pillar lining.



# Tailgate Window



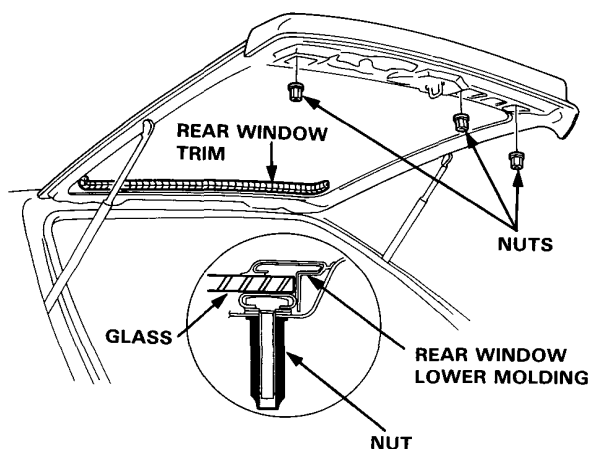
## Removal

### Glass Back

#### CAUTION:

- Wear gloves to remove and install the glass.
- Do not damage the defroster printed circuit.

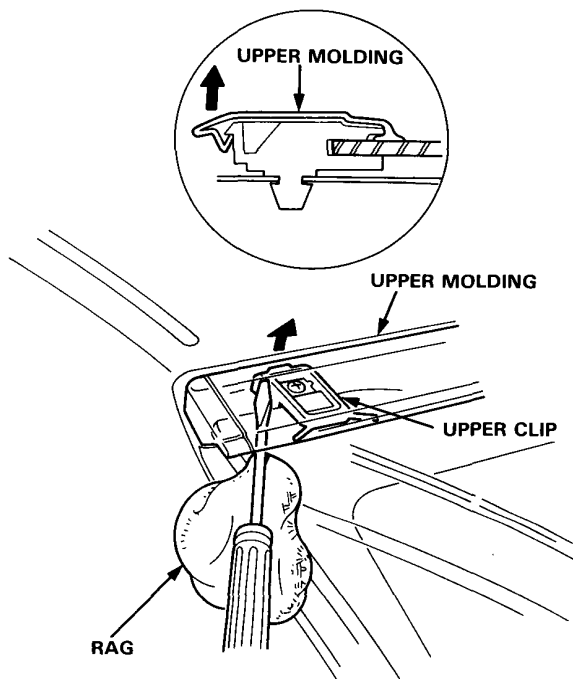
1. Remove the tailgate trim panel and side molding (page 21-93).
2. Remove the rear shelf and the rear wiper.
3. Remove the rear window trim.
4. Remove the rear window lower molding by removing the 3 nuts.



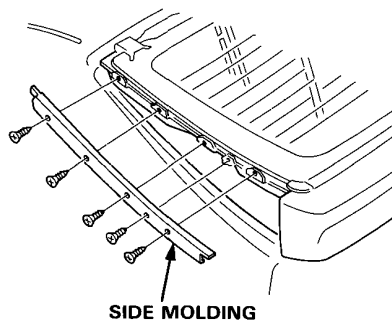
5. Disconnect the defroster leads, and remove their holders.

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.



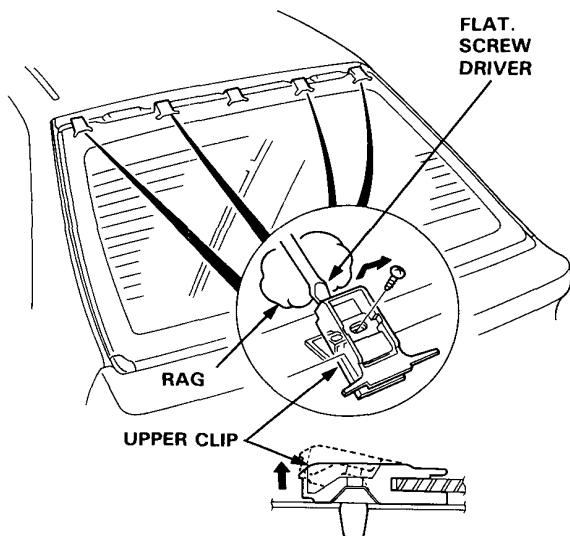
(cont'd)



# Tailgate Window

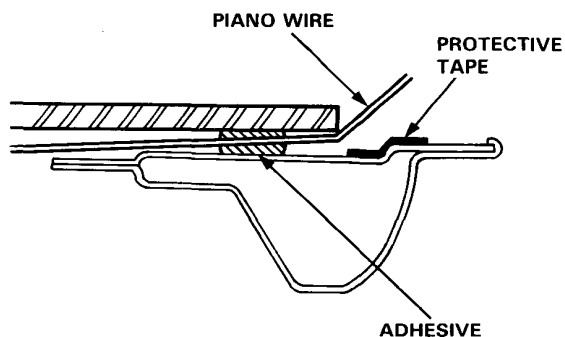
## Removal (cont'd)

8. Remove the screws, then remove all the upper clips as shown.



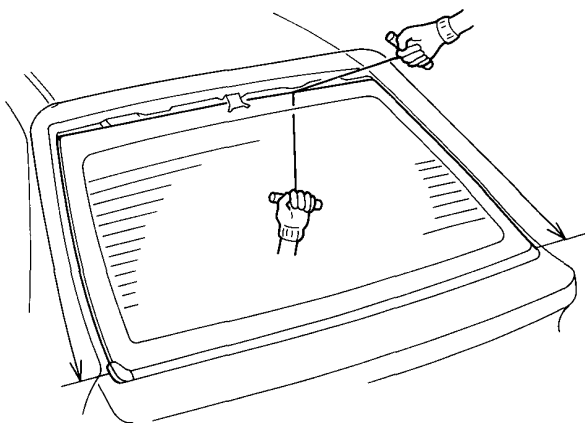
9. Apply protective tape along the edge of the body next to the glass as shown.

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.

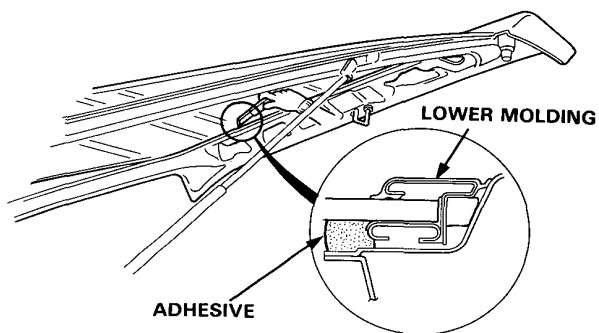


11. With a helper on the outside, pull the wire back and forth in a sawing motion and carefully cut through the adhesive around the entire glass.

**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.

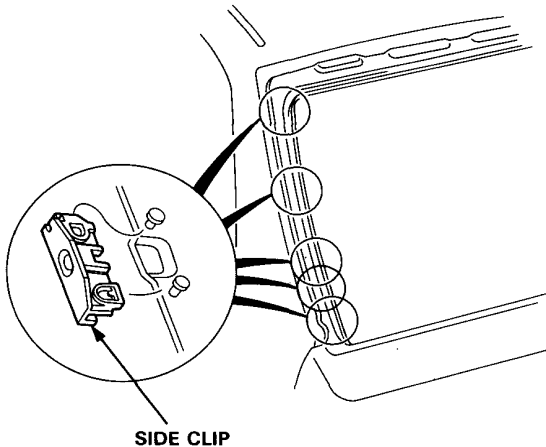


13. When reinstalling the glass, remove the lower molding.





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:

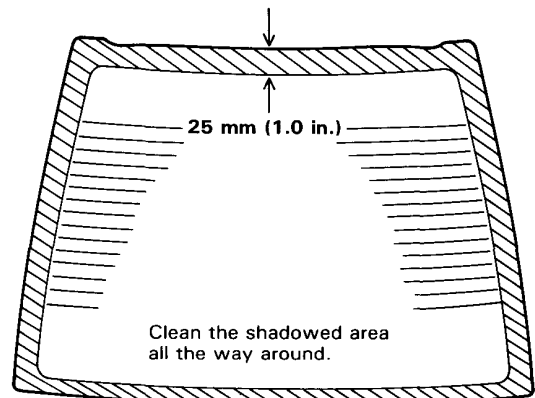
- Do not scrape down to the painted surface of the body; damaged paint will interfere with proper bonding.
- Remove all traces of the rubber spacer material from the body.
- Mask off surrounding surfaces before painting.

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.



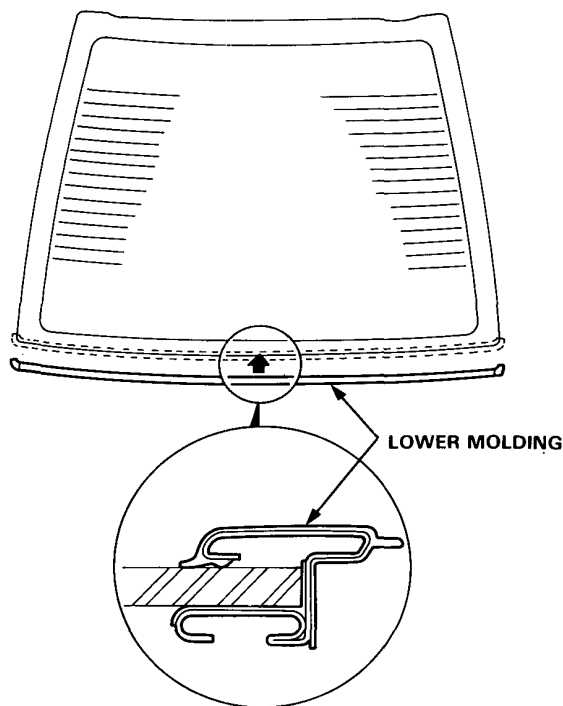
(cont'd)



# Tailgate Window

## Installation (cont'd)

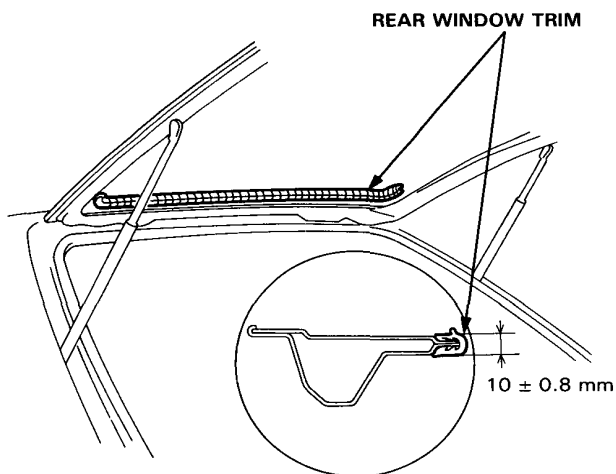
4. Install the lower molding on to the glass.



5. Install the rear window trim in the frame.

**NOTE:**

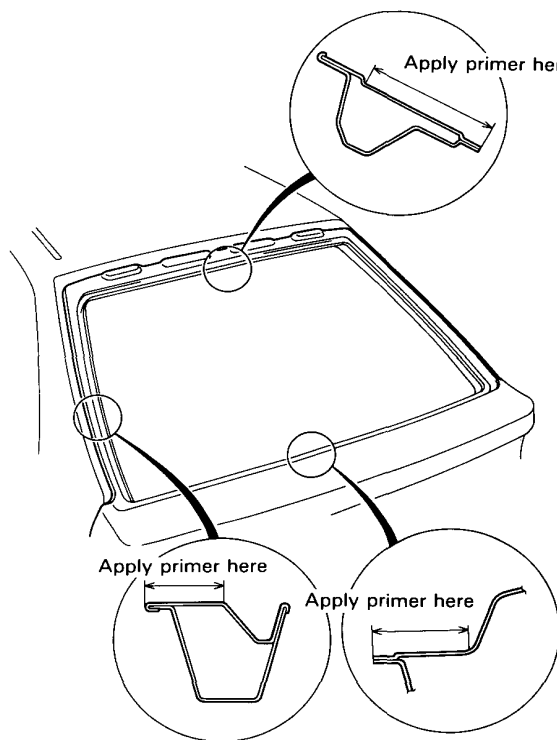
- Install the rear window trim with the wide end on the interior side.
- When attaching the rear window trim, make sure the thickness is even all the way around.



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:**

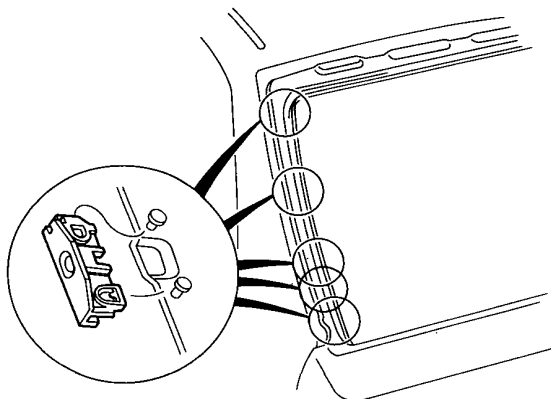
- Do not apply glass primer to the body, and be careful not to mix up glass and body primer sponges.
- Never touch the primed surfaces with your hands.







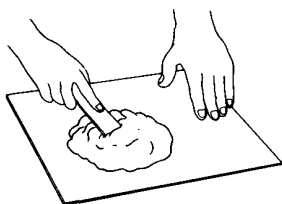
7. Install the side clips to the tailgate.



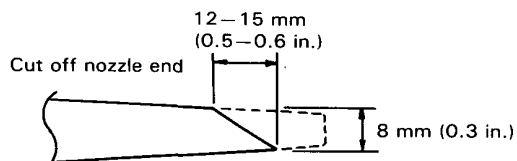
8. Thoroughly mix all the adhesive and hardener together on a glass or metal plate with a putty knife.

NOTE: Clean the plate with a sponge and alcohol before mixing.

9. Follow the instructions that come with the adhesive.

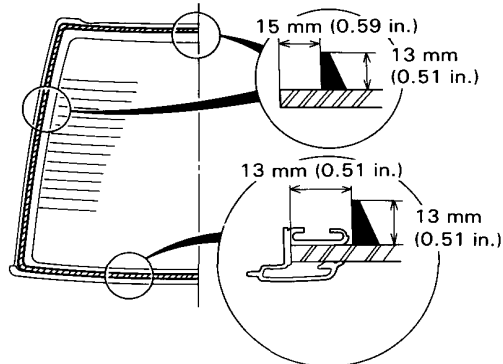


10. Before filling a cartridge, cut off the end of the nozzle at the angle shown.



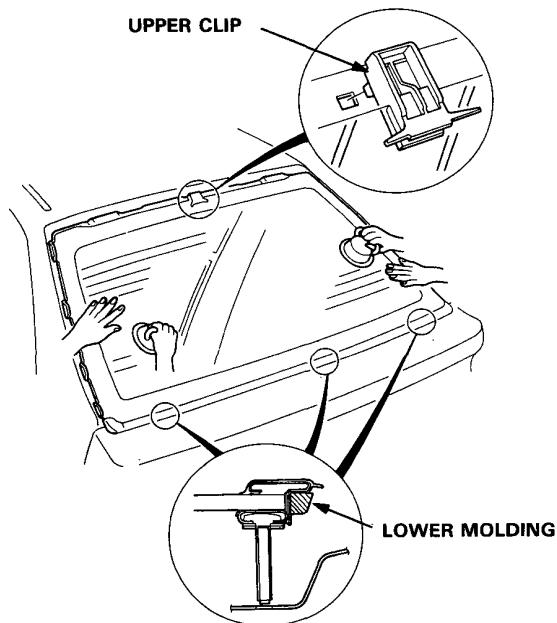
11. Pack adhesive into the cartridge without air pockets, to ensure continuous delivery. Put the cartridge in a caulking gun, and run a bead of adhesive around the edge of the glass as shown.

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.



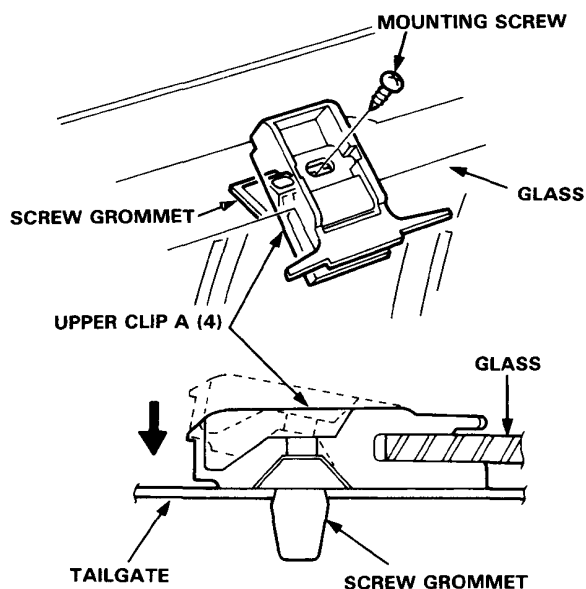
13. Tighten the lower molding mounting nuts.



# Tailgate Window

## Installation (cont'd)

14. Position the screw grommets on the tailgate and the upper clip A on the glass.

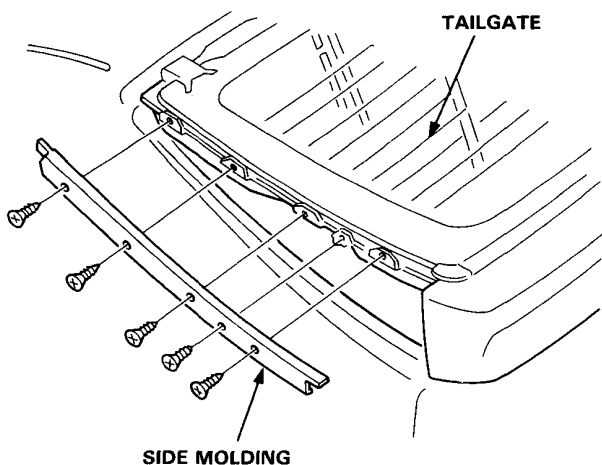


15. Tighten the upper clip A mounting screw.

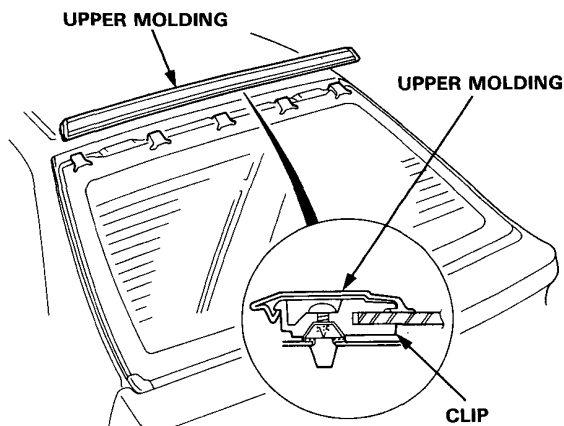
16. Scrape or wipe the excess adhesive off with a putty knife or gauze.

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.





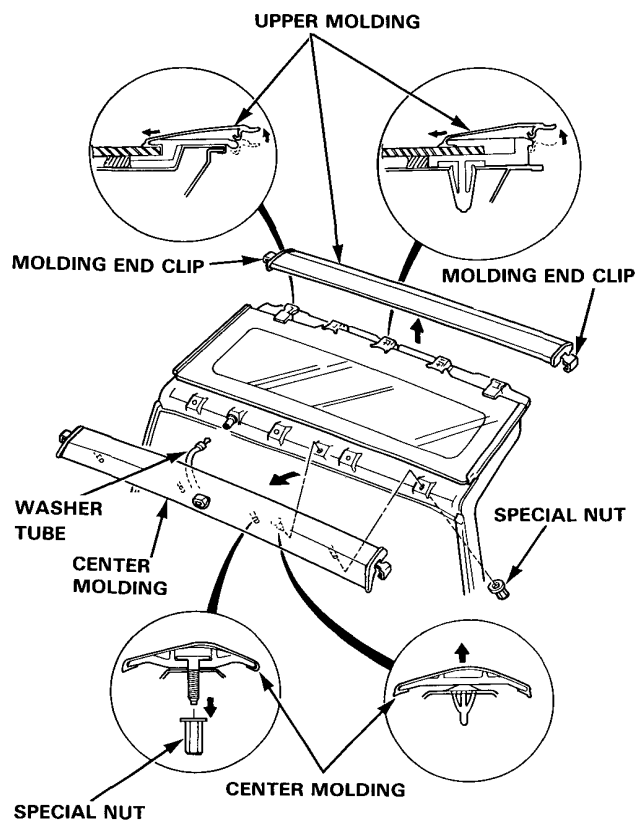
# Tailgate Upper Window

## Removal

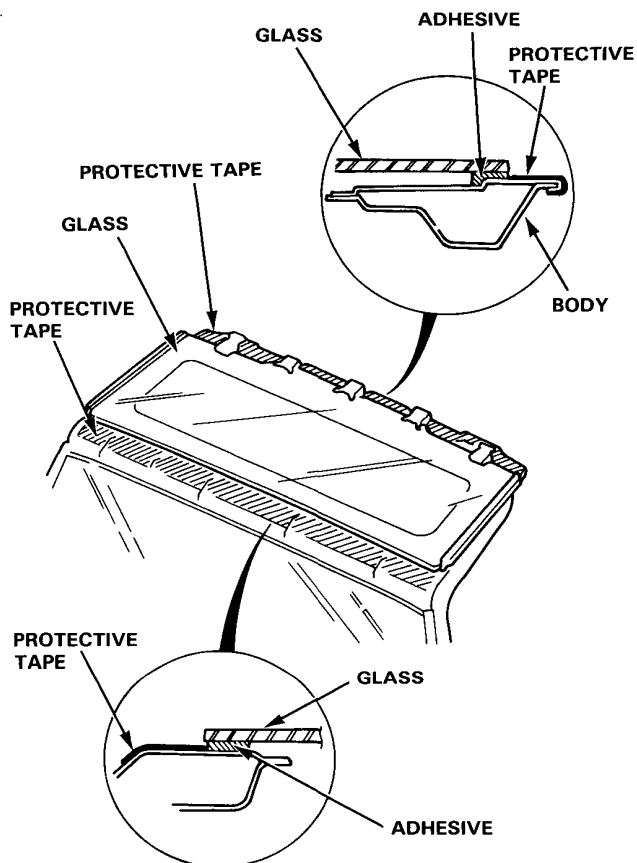
### Aerodeck

**CAUTION:** Wear gloves to remove and install the glass.

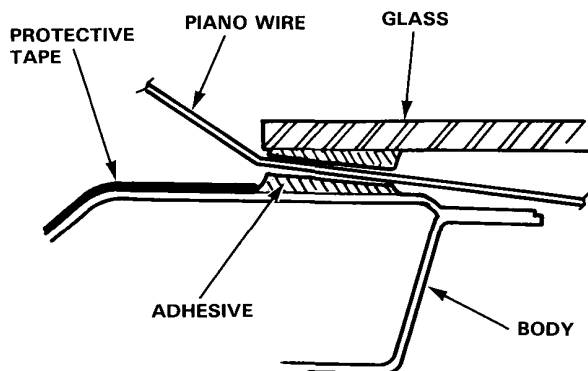
1. Remove the tailgate upper trim panels (page 21-64).
2. Slide the molding end clips, then remove the upper molding and center molding.



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)



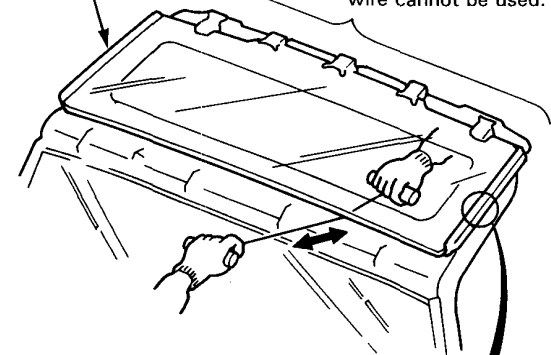
# Tailgate Upper Window

## Removal (cont'd)

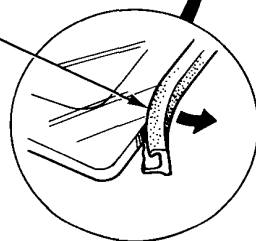
6. With a helper on the outside, pull the wire back and forth in a sawing motion and carefully cut through the adhesive.

WINDOW SIDE MOLDING

Cut the glass adhesive with a knife through this area as the piano wire cannot be used.



WINDOW SIDE MOLDING



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.

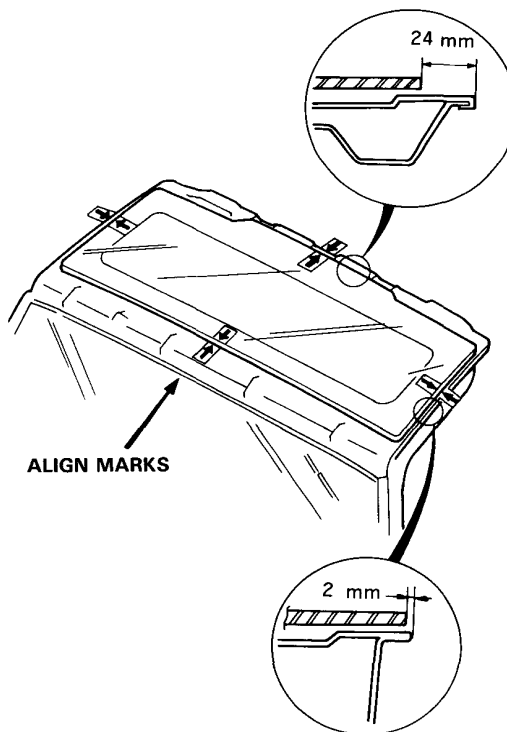
#### NOTE:

- 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.

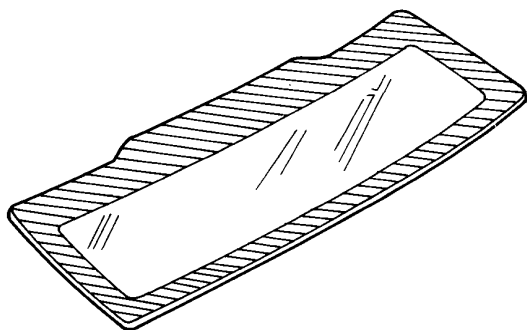




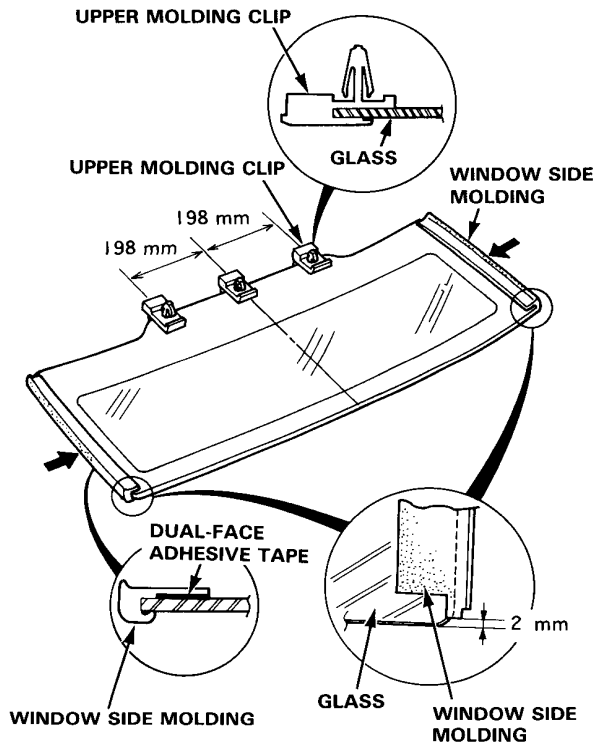


4. If the glass is to be reinstalled, use a putty knife to scrape off all traces of old adhesive, then clean the glass surface with alcohol where new adhesive is to be applied.

NOTE: Make sure the bonding surface is kept free of water, oil and grease.



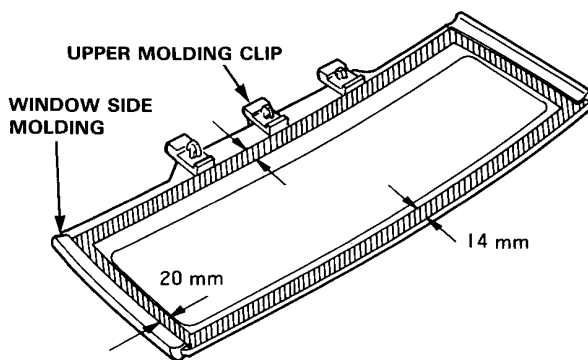
5. After allowing the glass to dry, remove the backing paper and attach the window side molding.



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:

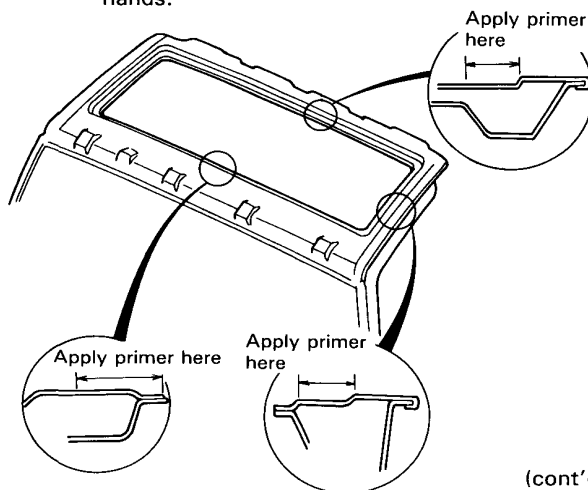
- Do not apply body primer to the glass, and do not get body and glass primer sponges mixed up.
- Never touch the primed surfaces with your hands. If you do, the adhesive may not bond to the glass properly, causing a leak after the glass is installed.
- Keep water, dust, and adhesive materials away from 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)



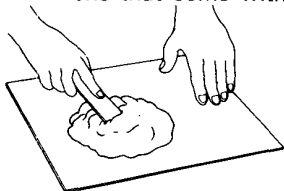
# Tailgate Upper Window

## Installation (cont'd)

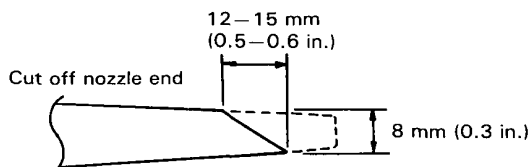
8. Thoroughly mix all the adhesive and hardener together on a glass or metal plate with a putty knife.

**NOTE:** Clean the plate with a sponge and alcohol before mixing.

9. Follow the instructions that come with the adhesive.

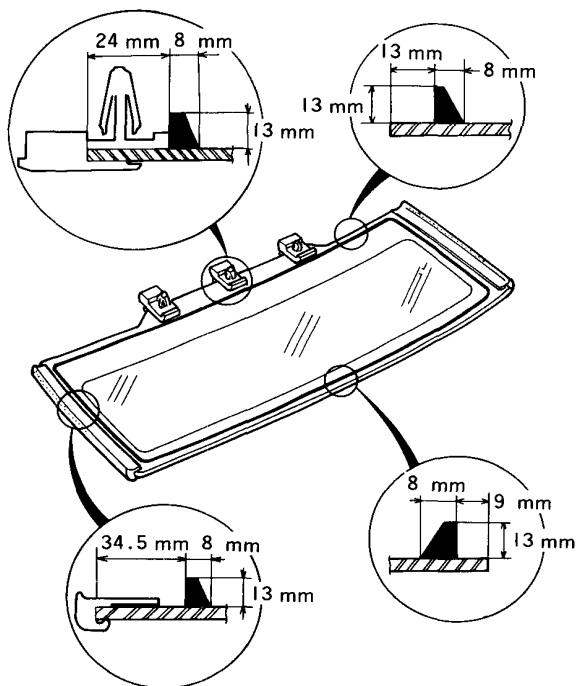


10. Before filling a cartridge, cut off the end of the nozzle at the angle shown.



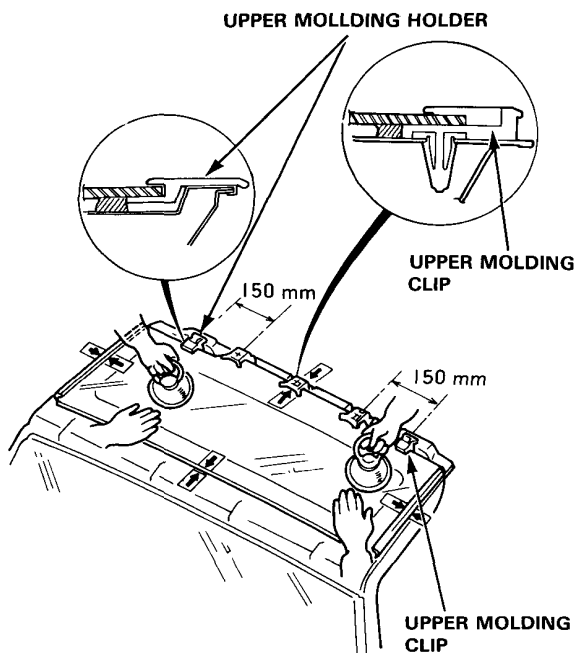
11. Pack adhesive into the cartridge without air pockets, to ensure continuous delivery. Put the cartridge in a caulking gun, and run a bead of adhesive around the edge of the glass as shown.

**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.



# Tailgate Window Glass



## Removal

### CAUTION:

- Wear gloves to remove and install the glass.
- Do not damage the defroster printed circuit.

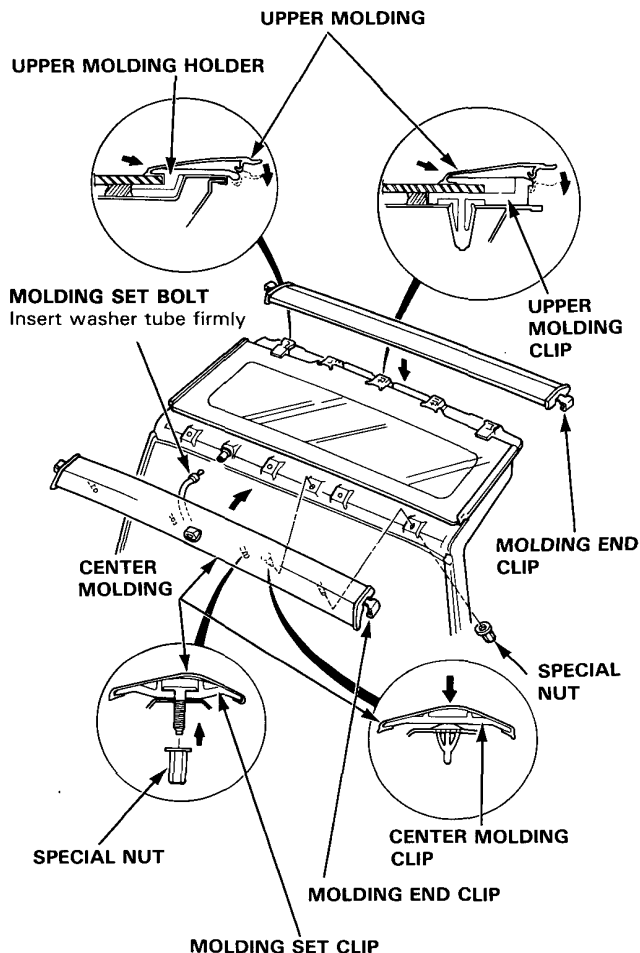
1. To remove the tailgate window glass, first remove the:

- 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.

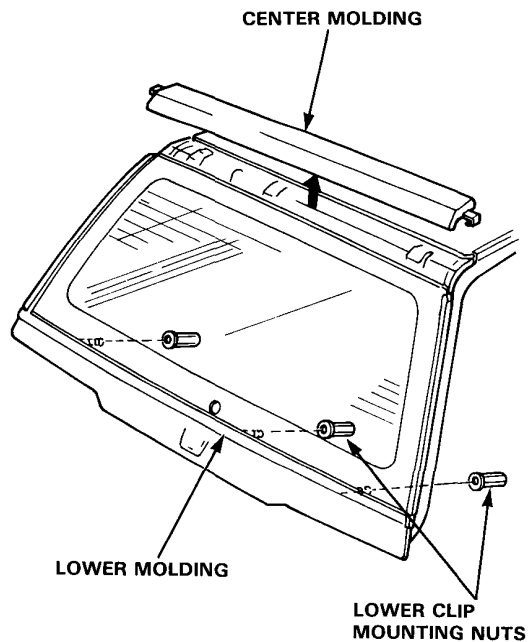
3. Remove the center molding (page 21-39).
4. Remove the 3 lower clip mounting nuts.



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.



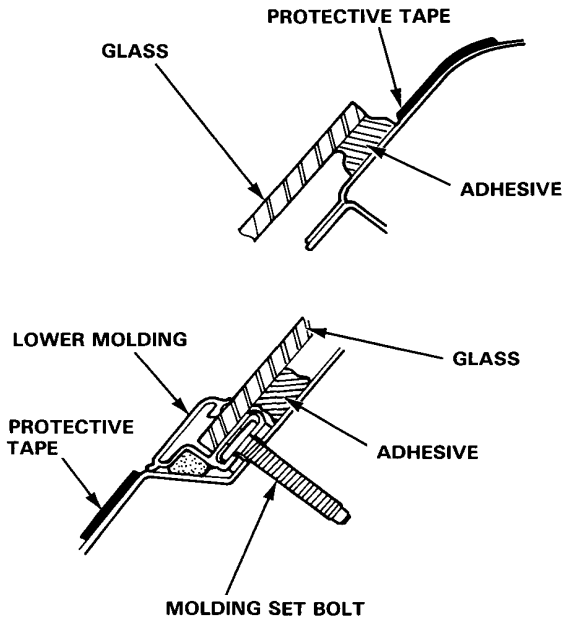
(cont'd)



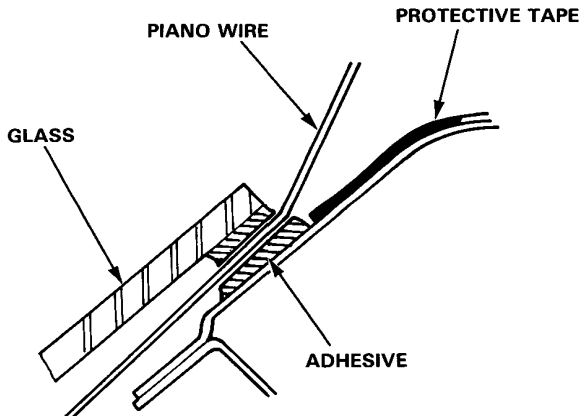
# Tailgate Window Glass

## Removal (cont'd)

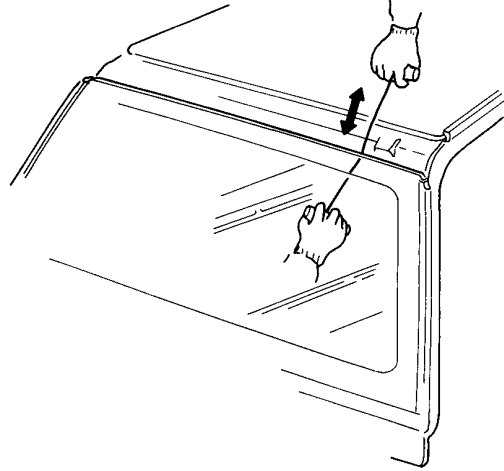
5. Apply protective tape along the edge of the body next to the glass as shown.



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:

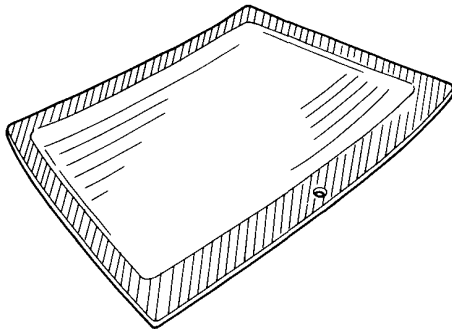
- Do not scrape down to the painted surface of the body; damaged paint will interfere with proper bonding.
- Remove all traces of the rubber spacer material from the body.
- Mask off surrounding surfaces before painting.

2. Clean the body bonding surface with a sponge dampened in alcohol.

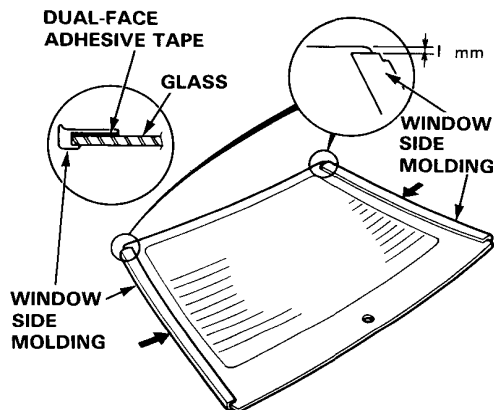
NOTE: After cleaning, keep oil, grease or water from getting on the surface.

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.

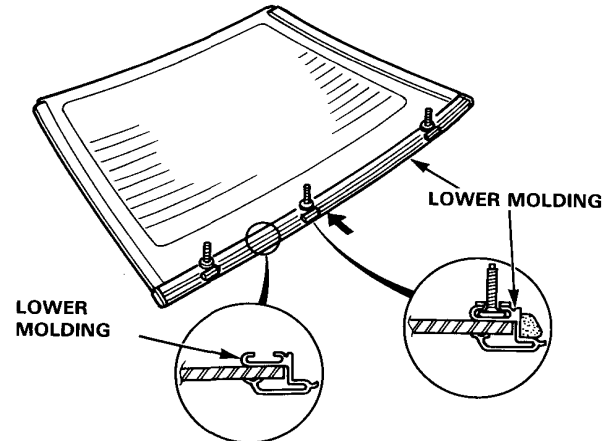


4. After allowing the glass to dry, remove the backing paper and attach the window side molding.



5. If the glass is to be reinstalled, set the lower molding on the glass.

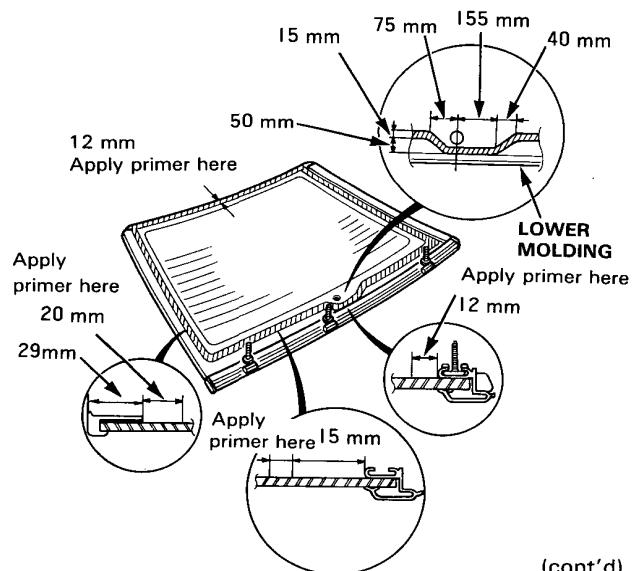
NOTE: Never touch the cleaning surface with your hands.



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)



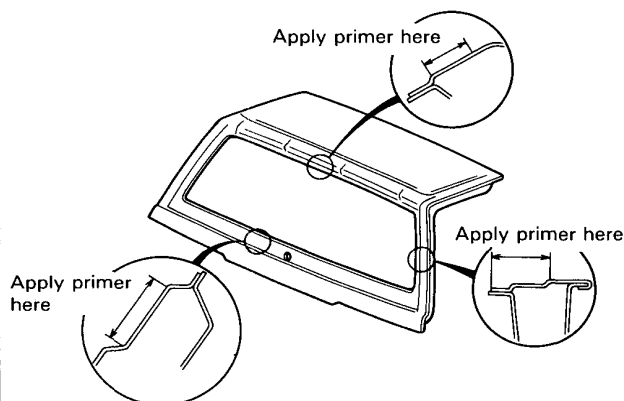
# Tailgate Window Glass

## Installation (cont'd)

- 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:

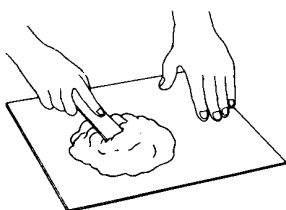
- Do not apply glass primer to the body, and be careful not to mix up glass and body primer sponges.
- Never touch the primed surfaces with your hands.



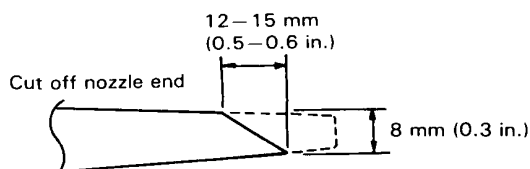
- Thoroughly mix all the adhesive and hardener together on a glass or metal plate with a putty knife.

NOTE: Clean the plate with a sponge and alcohol before mixing.

- Follow the instructions that come with the adhesive.

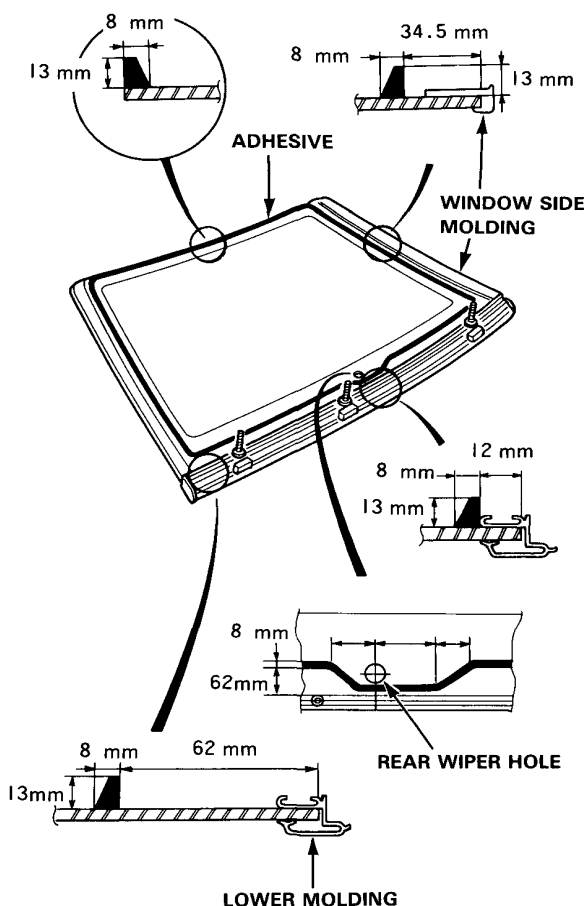


- Before filling a cartridge, cut off the end of the nozzle at the angle shown.



- 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.





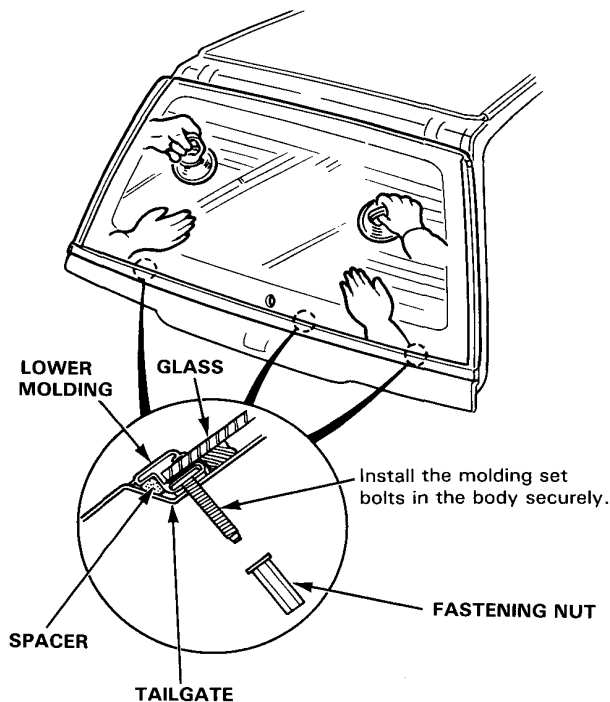


## Quarter Glass

### Replacement

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.



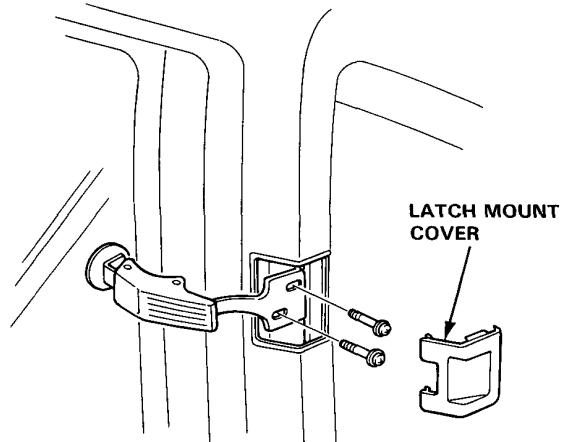
13. Tighten the lower clip mounting nuts.
14. Scrape or wipe the excess adhesive off with a putty knife or gauze.  
  
NOTE: Wipe with a soft rag or towel dampened with unleaded gasoline to remove adhesive from a painted surface or glass.
15. Let the adhesive dry for at least 1 hour, then spray water over the glass and check for leaks. Mark leaking areas and let the glass dry, then seal with sealant (08718-99964).

#### NOTE:

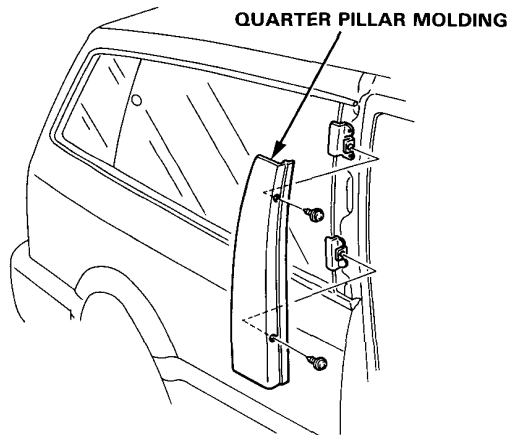
- Let the car stand for at least 4 hours after glass installation. If the car has to be used within the first 4 hours, it must be driven slowly.
- Keep the glass dry within the first hour after installation.

### Aerodeck

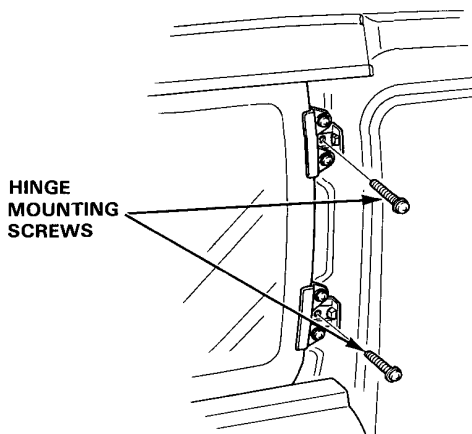
1. Pry the latch mount cover out and then remove the screws.



2. Remove the screws and the quarter pillar molding.



3. Remove the quarter glass hinge mounting screws, and then the glass.



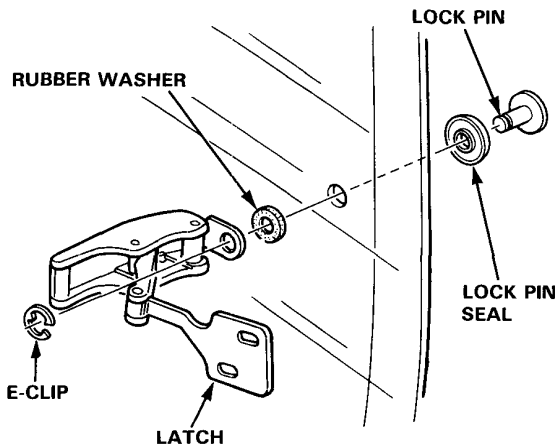
(cont'd)



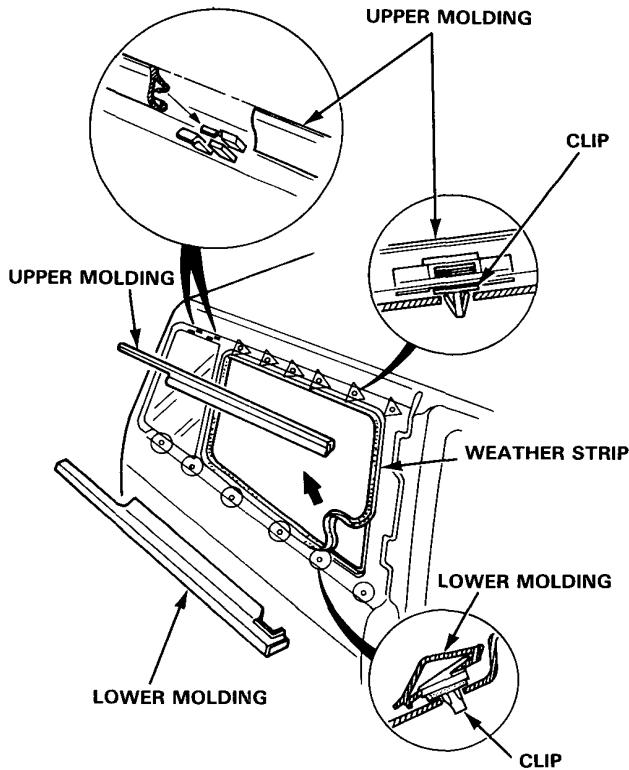
# Quarter Glass

## Replacement (cont'd)

- Remove the E-clip with a screwdriver, then remove the latch.



- If necessary, pull off the weatherstrip and remove the upper molding and the lower molding.



- Install in the reverse order of removal. Check for proper glass fit when closed after installation.

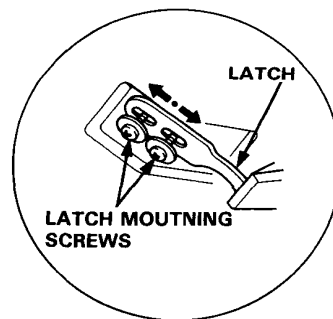
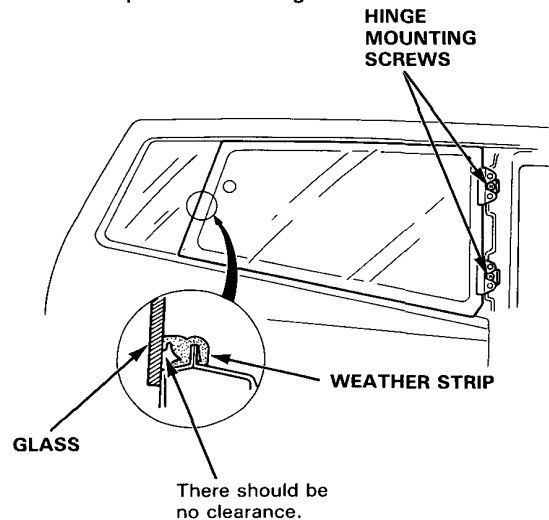
## Adjustment

### 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.







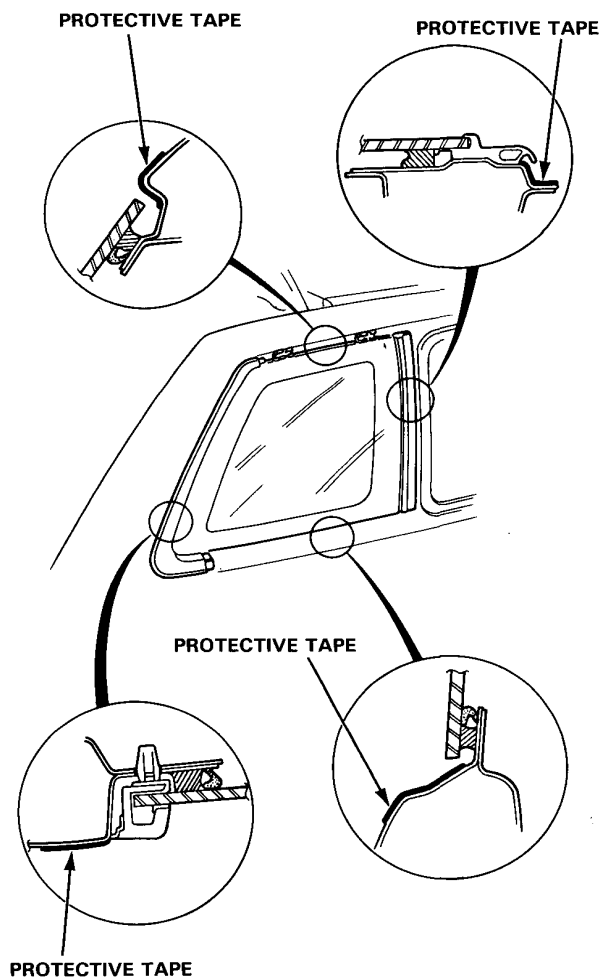
# Rear Quarter Window Glass

## Removal

### Aerodeck

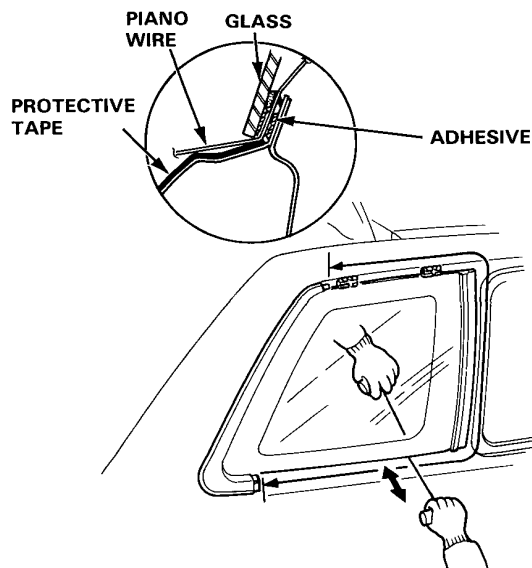
**CAUTION:** Wear gloves to remove and install the glass.

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.

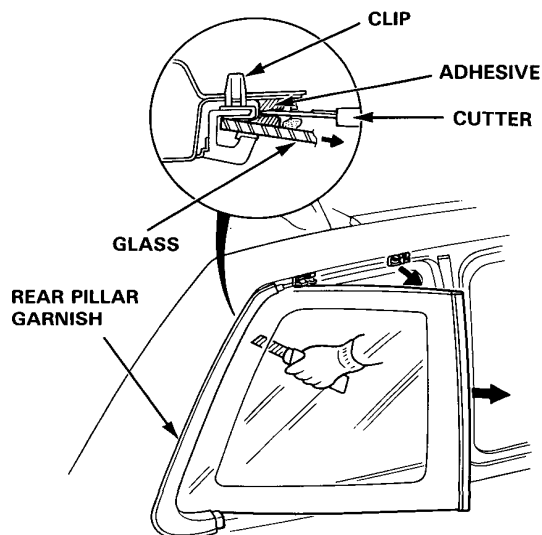


4. Using an awl, make a hole through the glass adhesive from inside the car. Push piano wire through the hole and wrap each end around a piece of wood.
5. With a helper on the outside, pull the wire back and forth in a sawing motion and carefully cut through the adhesive.

**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.



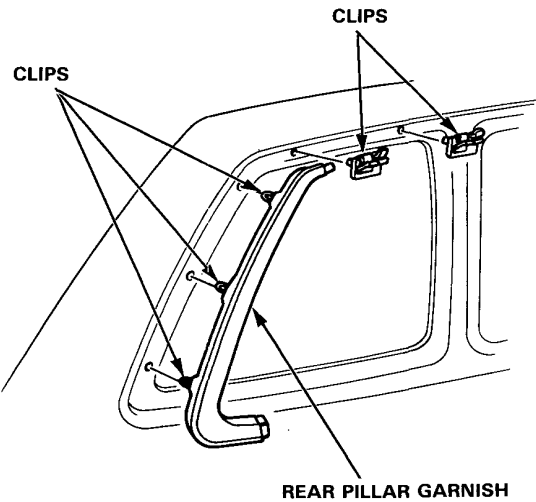
(cont'd)



# 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.

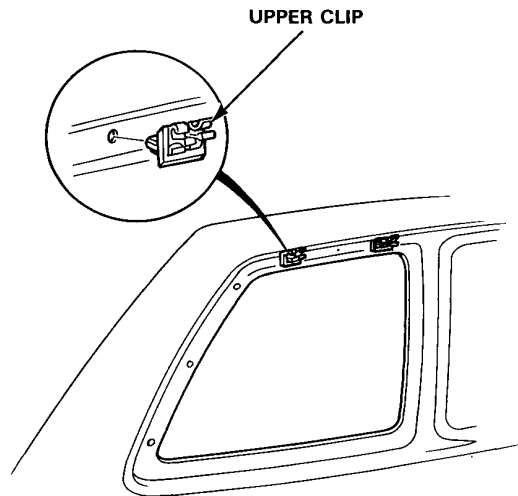
Remove all traces of the rubber spacer material from the body.

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 from getting on the surface.

3. Set the upper clips to the body.

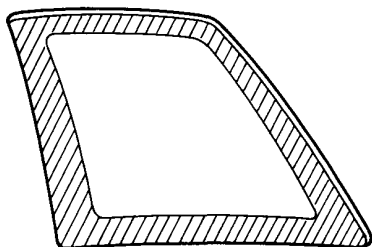




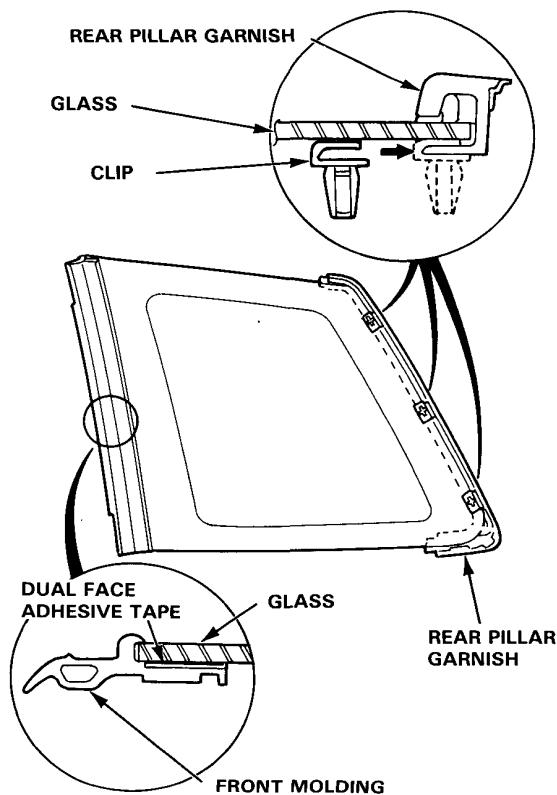


4. If the glass is to be reinstalled, peel the front molding and use a putty knife to scrape off all traces of old adhesive, then clean the glass surface with alcohol where new adhesive is to be applied.

**NOTE:** Make sure the bonding surface is kept free of water, oil and grease.

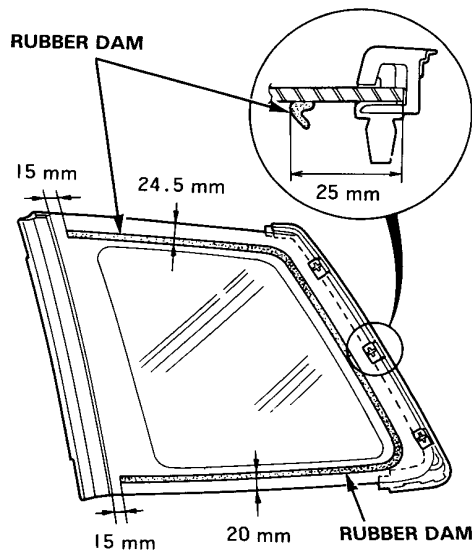


5. Install the front molding and the rear pillar garnish to the glass.
6. Set the clips to the glass at the point shown.



7. Glue the rubber dam to the inside face of the glass as shown, to contain the adhesive during installation.

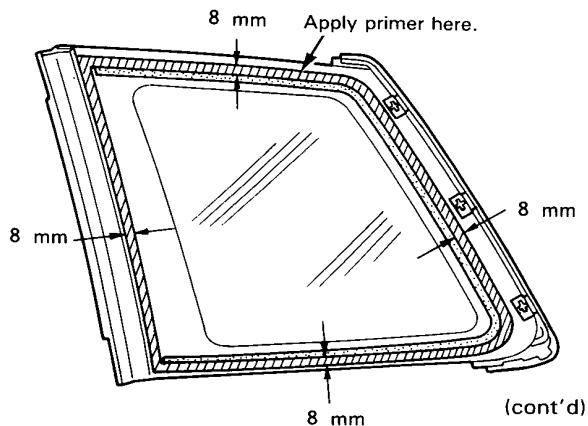
**NOTE:** Be careful not to touch the glass where adhesive will be applied.



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)



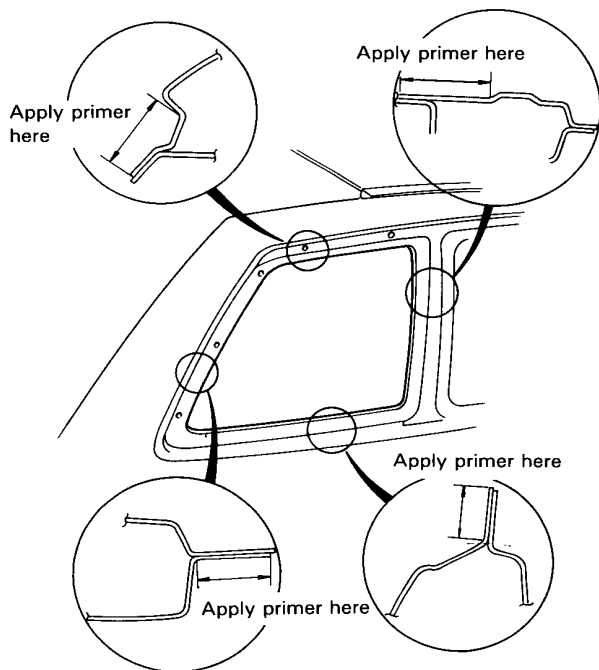
# Rear Quarter Window Glass

## 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:

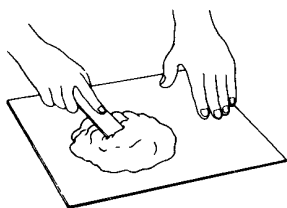
- Do not apply glass primer to the body, and be careful not to mix up glass and body primer sponges.
- Never touch the primed surfaces with your hands.



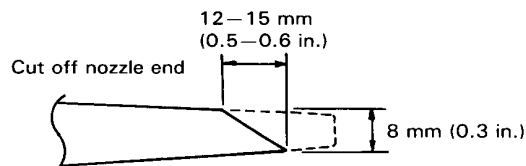
10. Thoroughly mix all the adhesive and hardener together on a glass or metal plate with a putty knife.

NOTE: Clean the plate with a sponge and alcohol before mixing.

11. Follow the instructions that come with the adhesive.



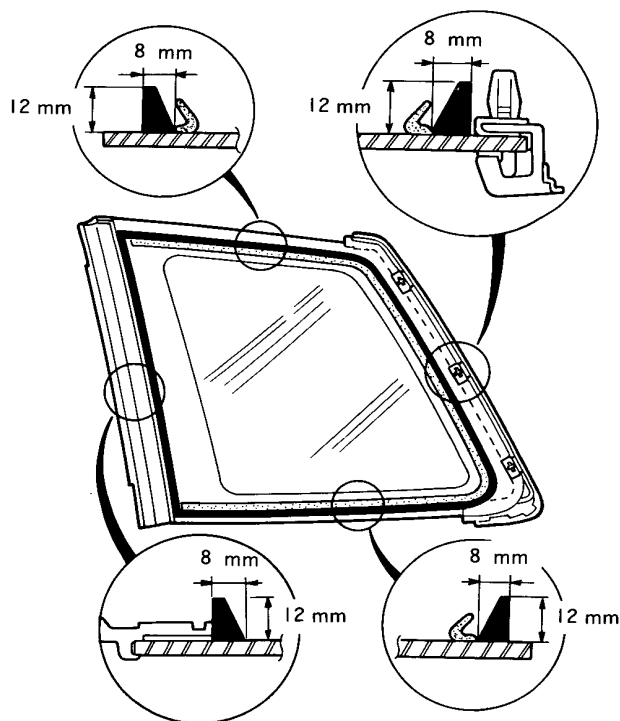
12. Before filling a cartridge, cut off the end of the nozzle at the angle shown.



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.

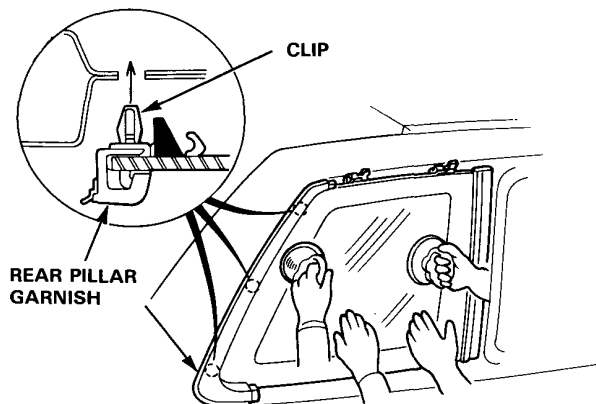






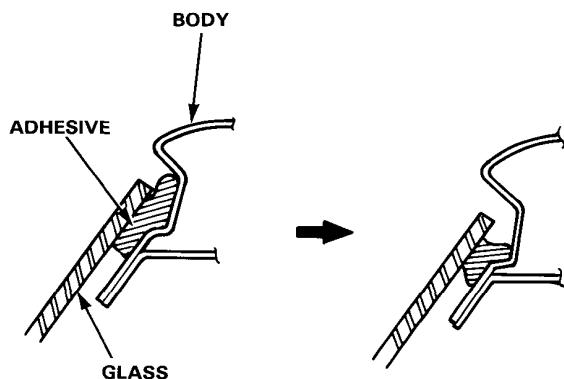
14. Holding the glass using rubber suction cups, align the rear pillar garnish clips with the corresponding positions in the body. Press the circumference of the glass lightly and make sure it adheres firmly.

- 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.

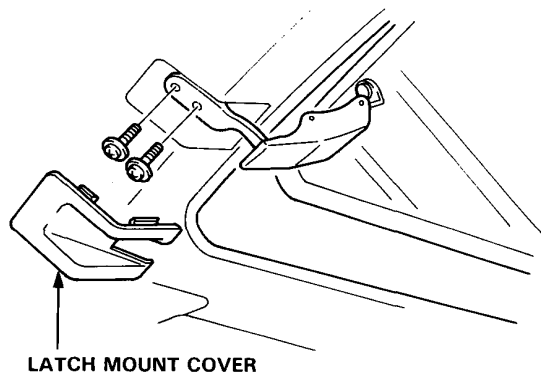


# Quarter Glass

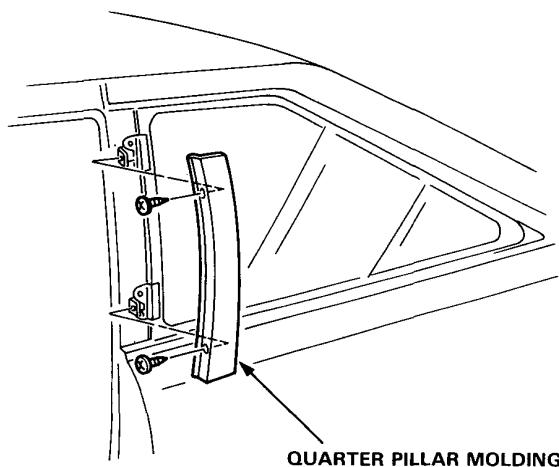
## Replacement

### Glass Back

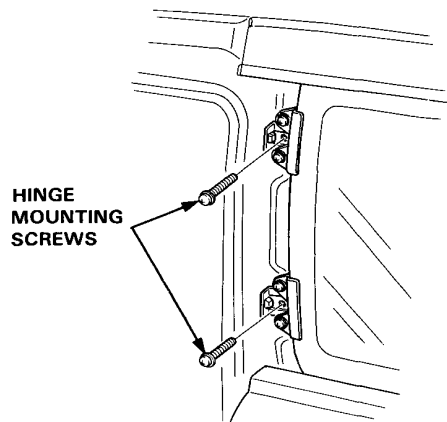
1. Pry the latch mount cover out and then remove the screws.



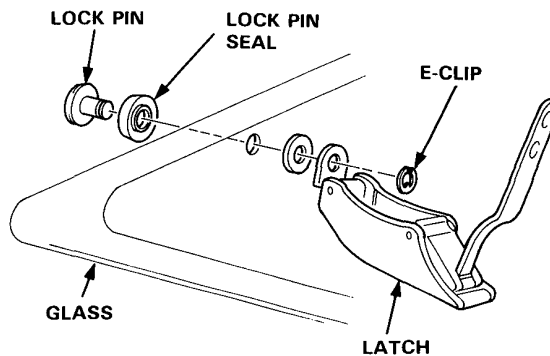
2. Remove the screws and the quarter pillar molding.



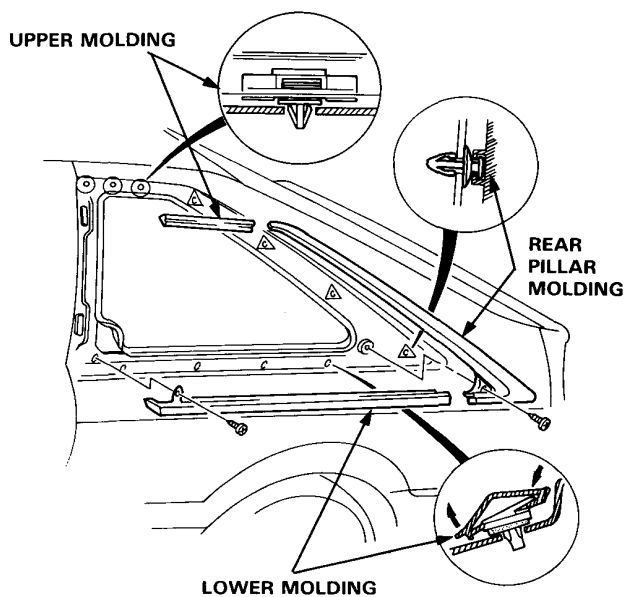
3. Remove the quarter glass hinge mounting screws, and then the glass.



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.





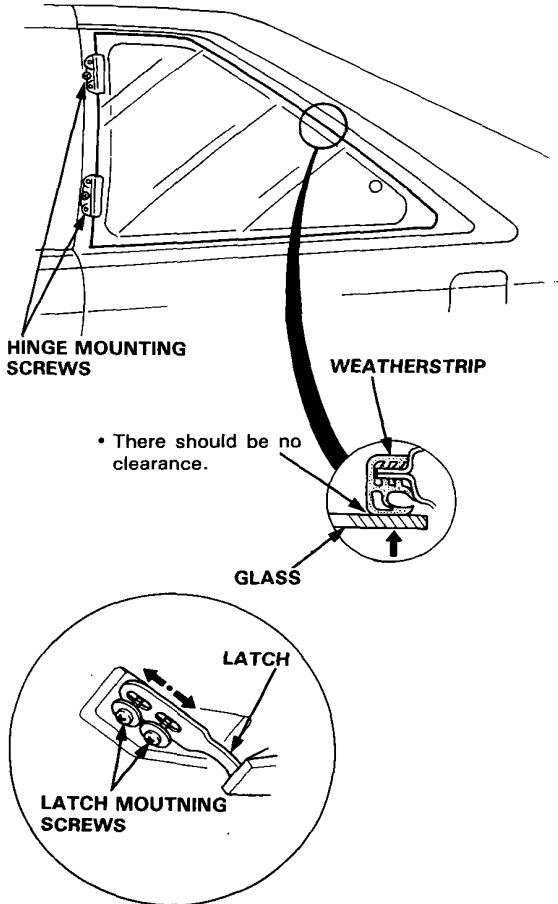
## Adjustment

### 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.

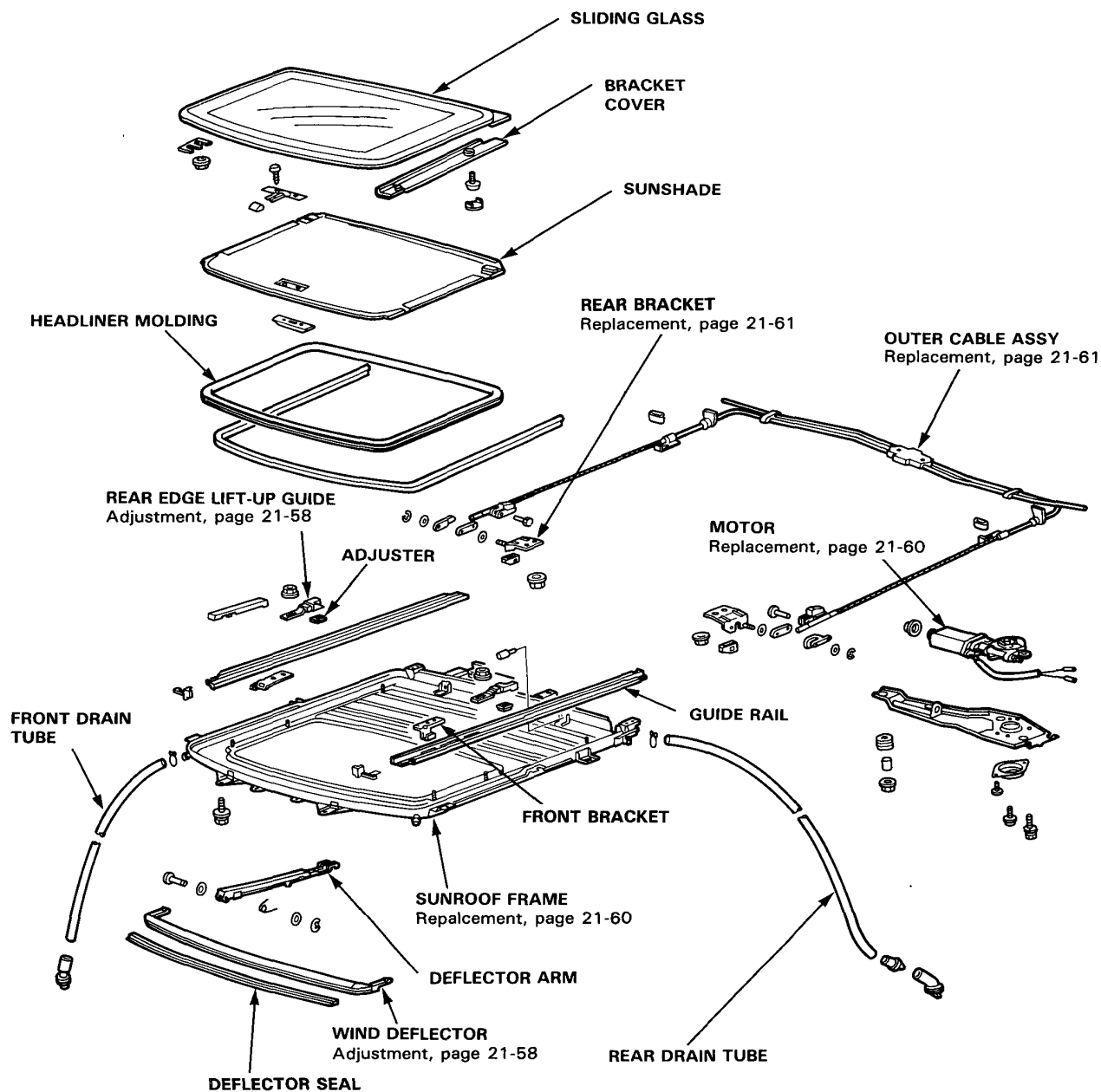
Check for proper contact between the glass and weatherstrip at the rear edge.





# Sunroof

## Index







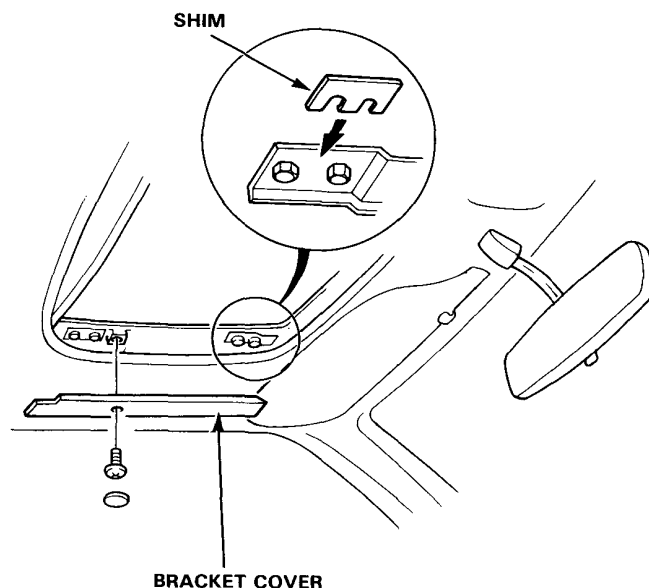
## Troubleshooting

Symptom	Probable Cause
Water leak	<ol style="list-style-type: none"> <li>1. Clogged drain tube.</li> <li>2. Gap between glass weatherstrip and roof panel.</li> <li>3. Defective or improperly installed glass weatherstrip.</li> </ol>
Wind noise	<ol style="list-style-type: none"> <li>1. Excessive clearance between glass weatherstrip and roof panel.</li> </ol>
Deflector noise	<ol style="list-style-type: none"> <li>1. Improper clearance between deflector seal and roof panel.</li> <li>2. Insufficient deflector extension.</li> <li>3. Deformed deflector.</li> </ol>
Motor noise	<ol style="list-style-type: none"> <li>1. Loose motor.</li> <li>2. Worn gear or bearing.</li> <li>3. Outer cable deformed.</li> </ol>
Sliding glass does not move, but motor turns	<ol style="list-style-type: none"> <li>1. Clutch out of adjustment.</li> <li>2. Foreign matter stuck between guide rail and sliding glass.</li> <li>3. Outer cable loose.</li> <li>4. Outer cable not attached properly.</li> </ol>
Sliding glass does not move and motor does not turn (Sliding glass can be moved with sunroof wrench)	<ol style="list-style-type: none"> <li>1. Blown fuse.</li> <li>2. Faulty switch.</li> <li>3. Battery run down.</li> <li>4. Defective motor.</li> </ol>

## Glass Height Adjustment

Roof panel should be even with the glass weatherstrip, to within  $1 \pm 1.5$  mm ( $0.04 \pm 0.06$  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.



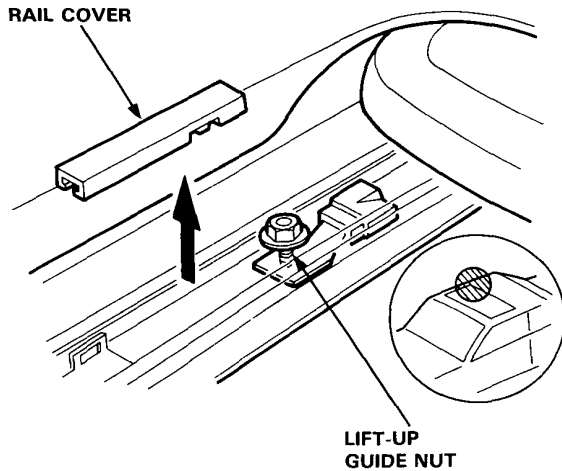


# Sunroof

## Rear Edge Closing Adjustment

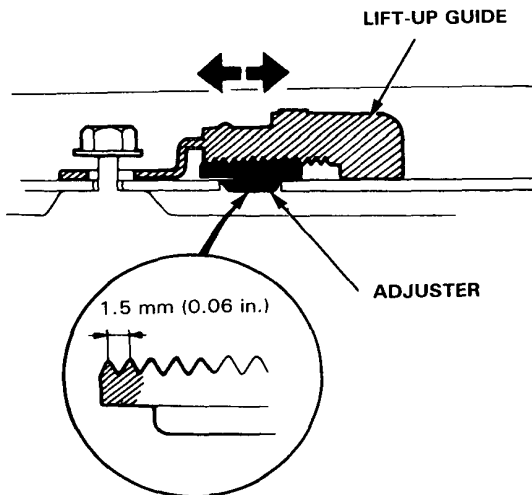
Open the glass about a foot then close it to check where rear edge begins to rise. If it rises too soon and seats too tightly against roof panel or too late and does not seat tightly enough, adjust it.

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.

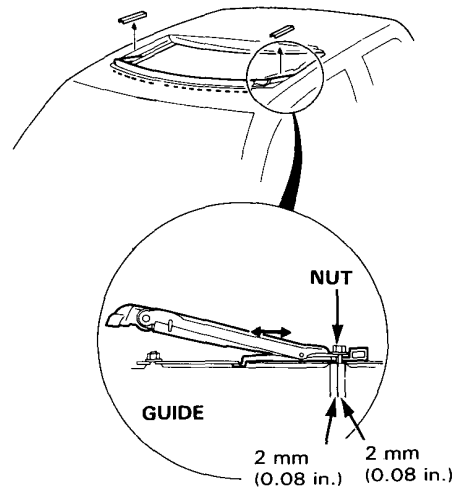


## Wind Deflector Adjustment

NOTE: A gap between deflector seal and roof panel will cause wind noise when driving at high speed with the sunroof open.

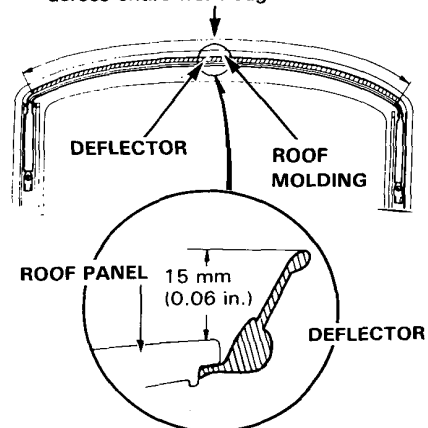
1. Open the sunroof and pry the rail covers off both sides.
2. Loosen deflector mounting nuts.

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.



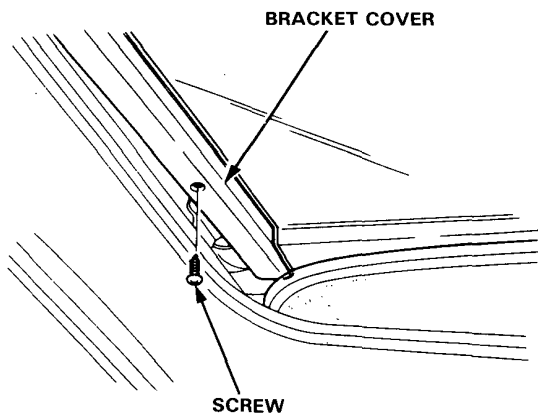
NOTE: The height of the deflector when open can not be adjusted. If damaged or deformed, replace it.



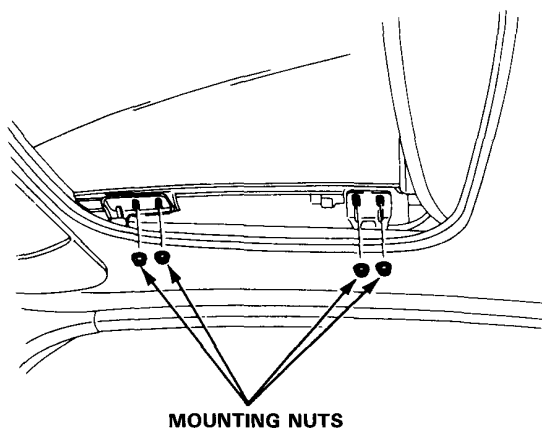


## Glass and Sunshade Replacement

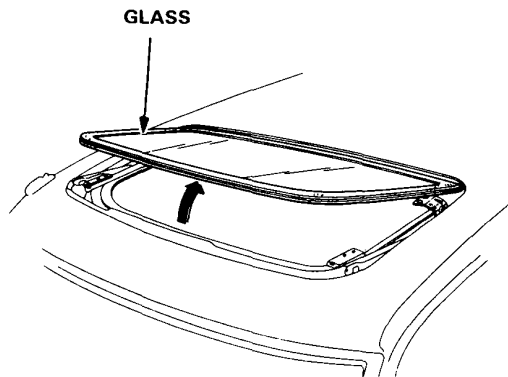
1. Slide sunshade all the way back.
2. Pry plug out of each bracket cover, remove screw, and slide cover off to the rear.



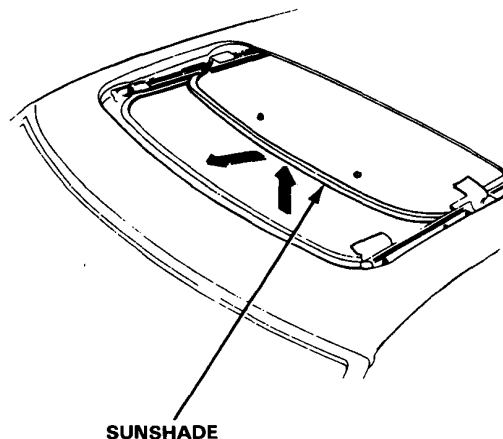
3. Close the glass fully.
4. Remove the mounting nuts from front and rear brackets both sides.



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.



# Sunroof

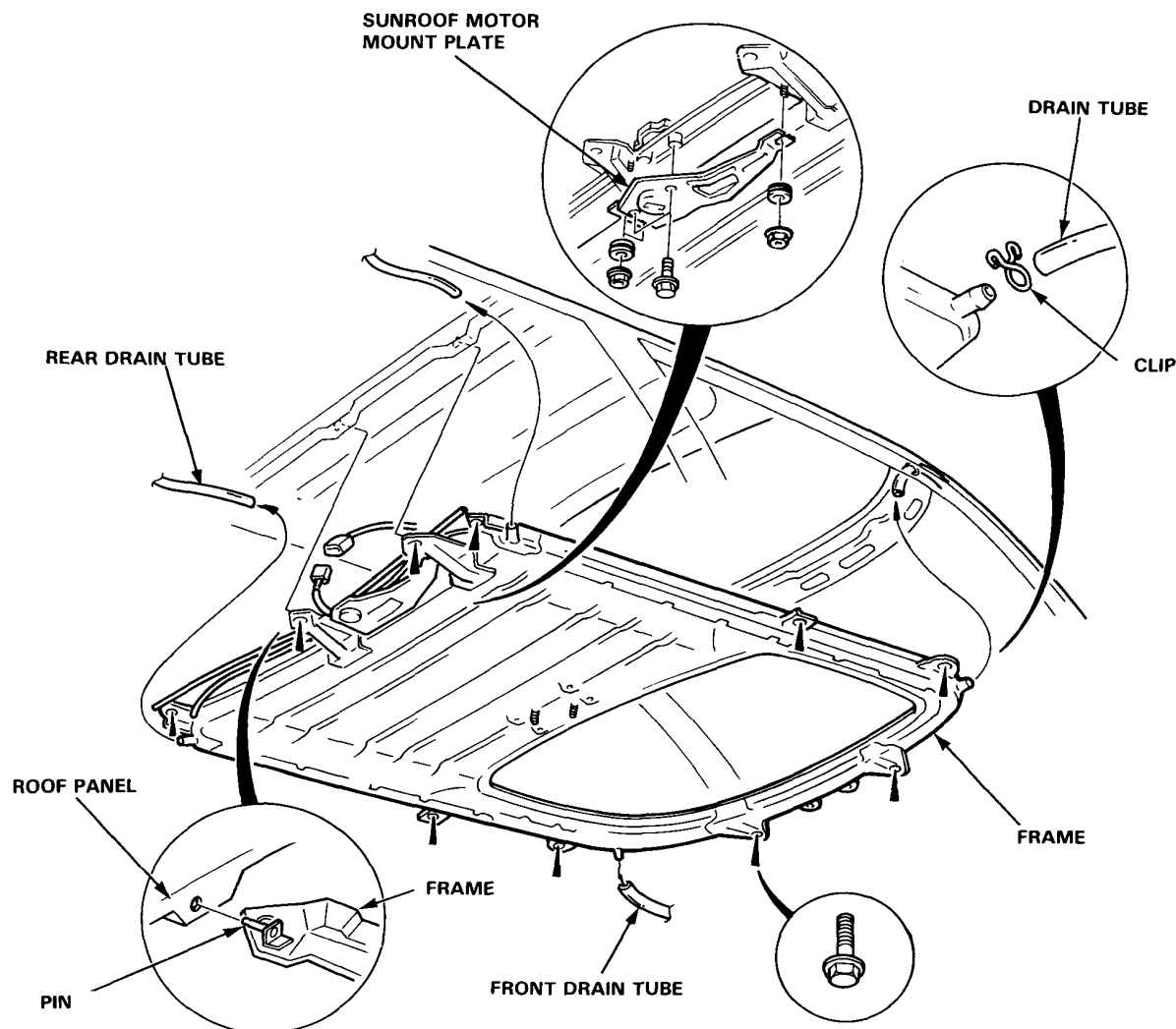
## Motor, Drain Tube and Frame Replacement

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.

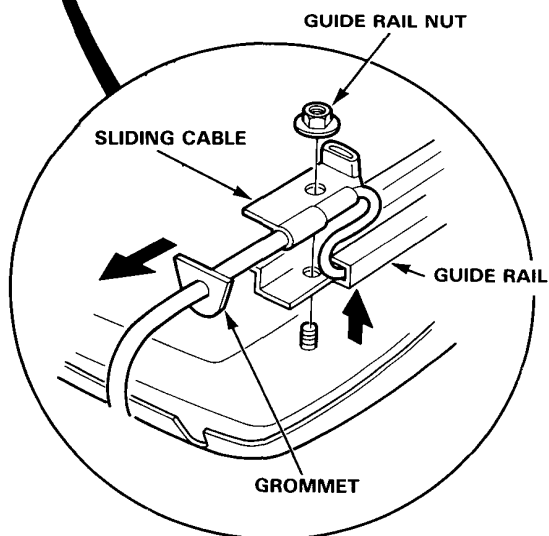
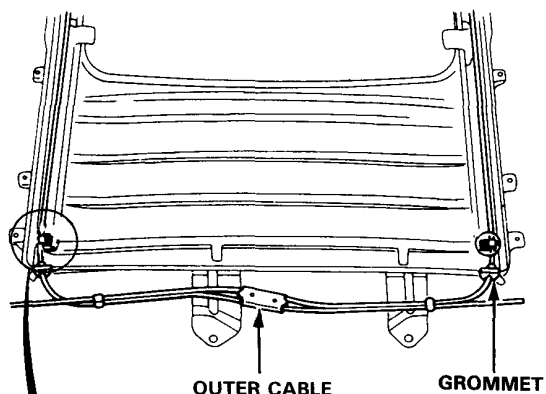




## Cable Replacement

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.

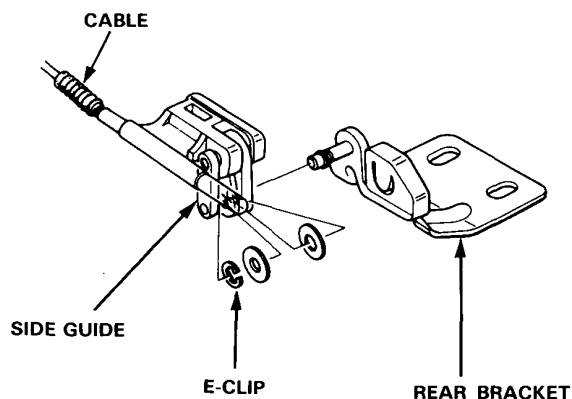


## Rear Bracket Disassembly

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.

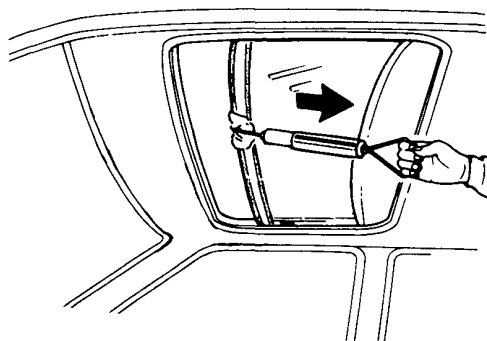


## Closing Drag Check (Motor Removed)

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).

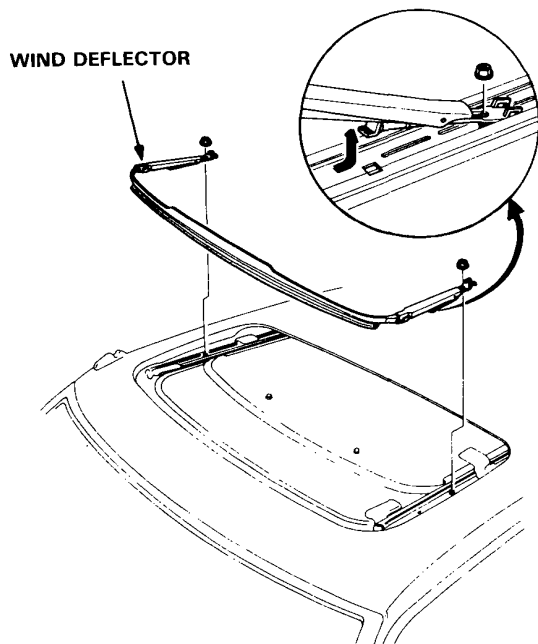




# Sunroof

## 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.

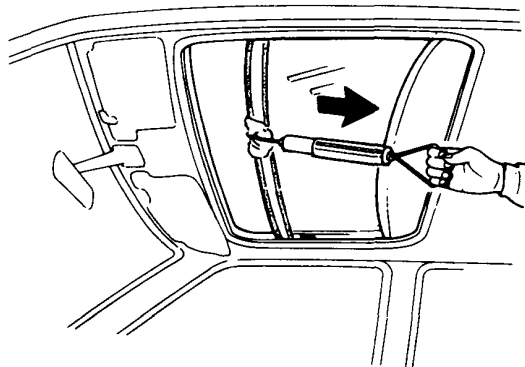


## Closing Force Check (Motor Installed)

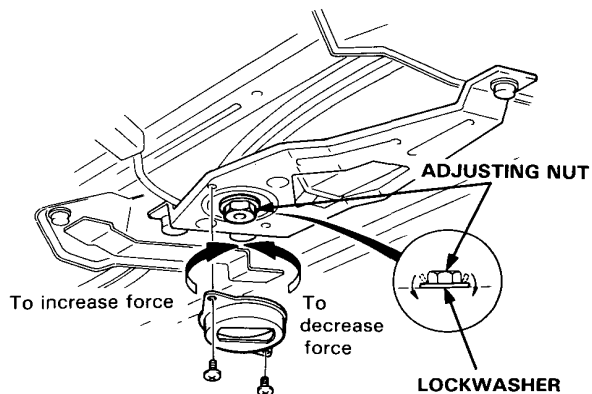
1. After installing all removed parts, have a helper hold the switch to close the sunroof while you measure force required to stop it. Attach spring scale as shown. Read force as soon as glass stops moving, then immediately release the switch and spring scale.

**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.





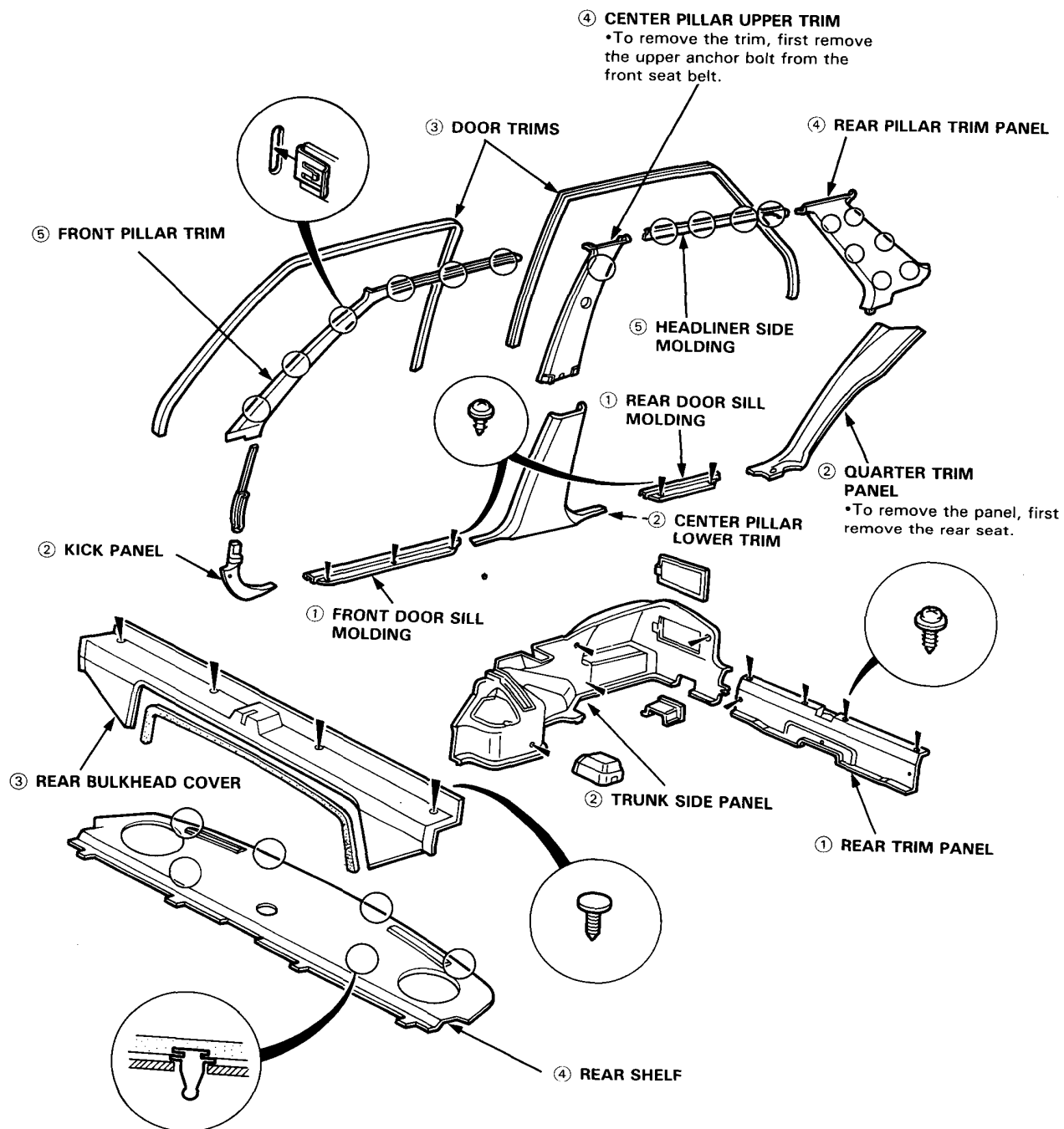


# Interior Trim

## Replacement

Sedan

Disassemble in numbered sequence.



(cont'd)

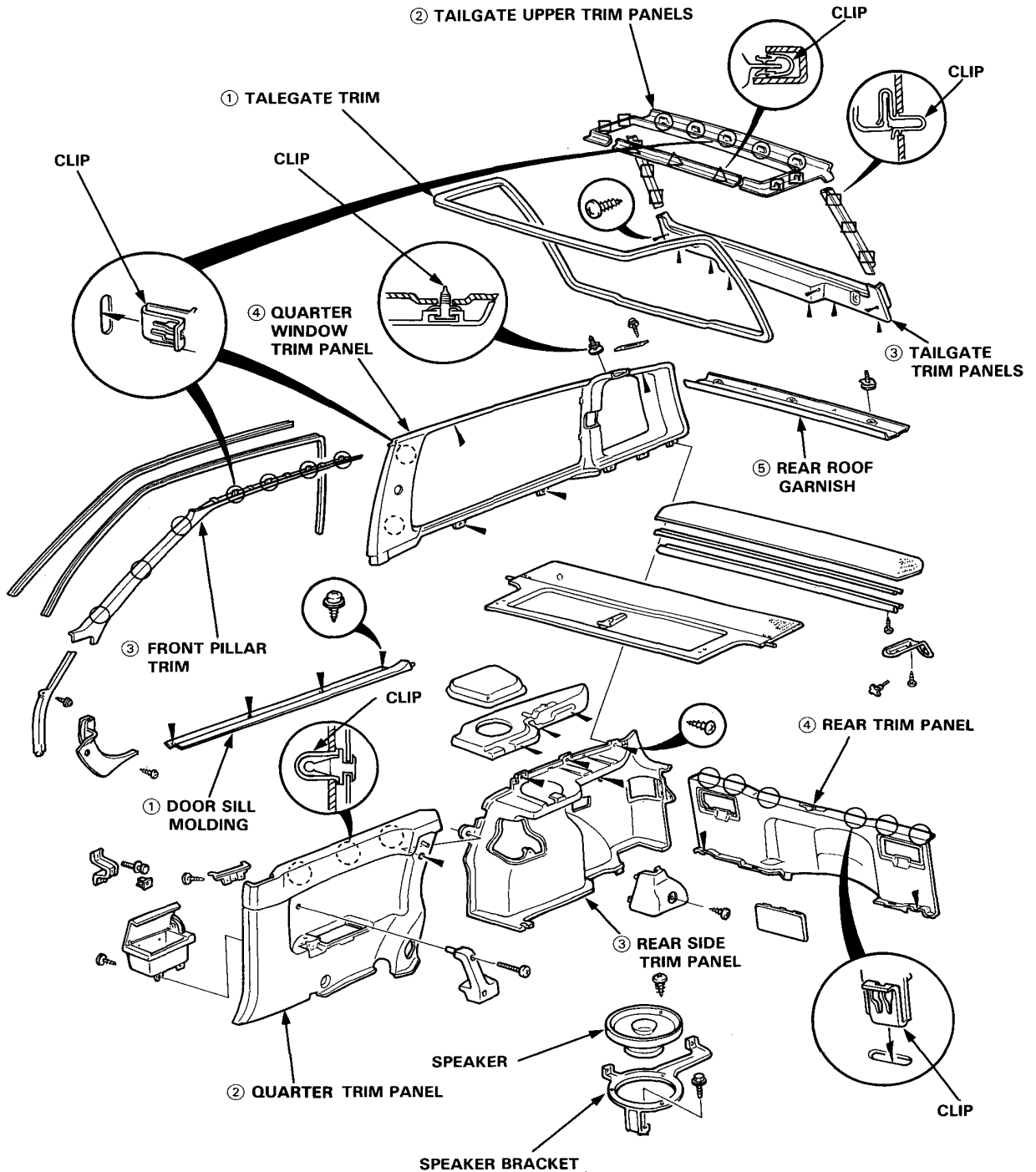


# Interior Trim

## Replacement (cont'd)

Aerodeck

Disassemble in numbered sequence.

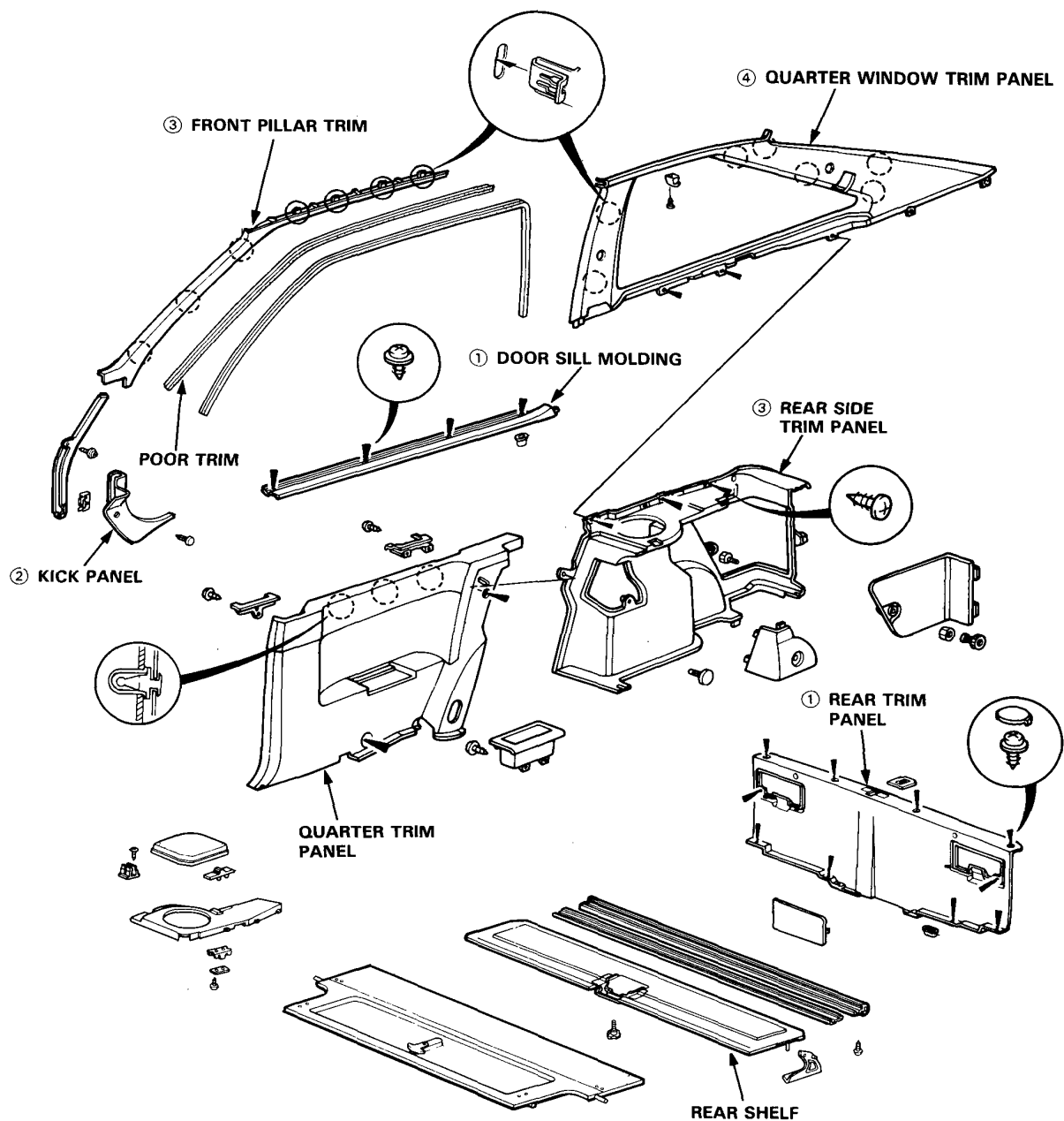






## Glass Back

Disassemble in numbered sequence.

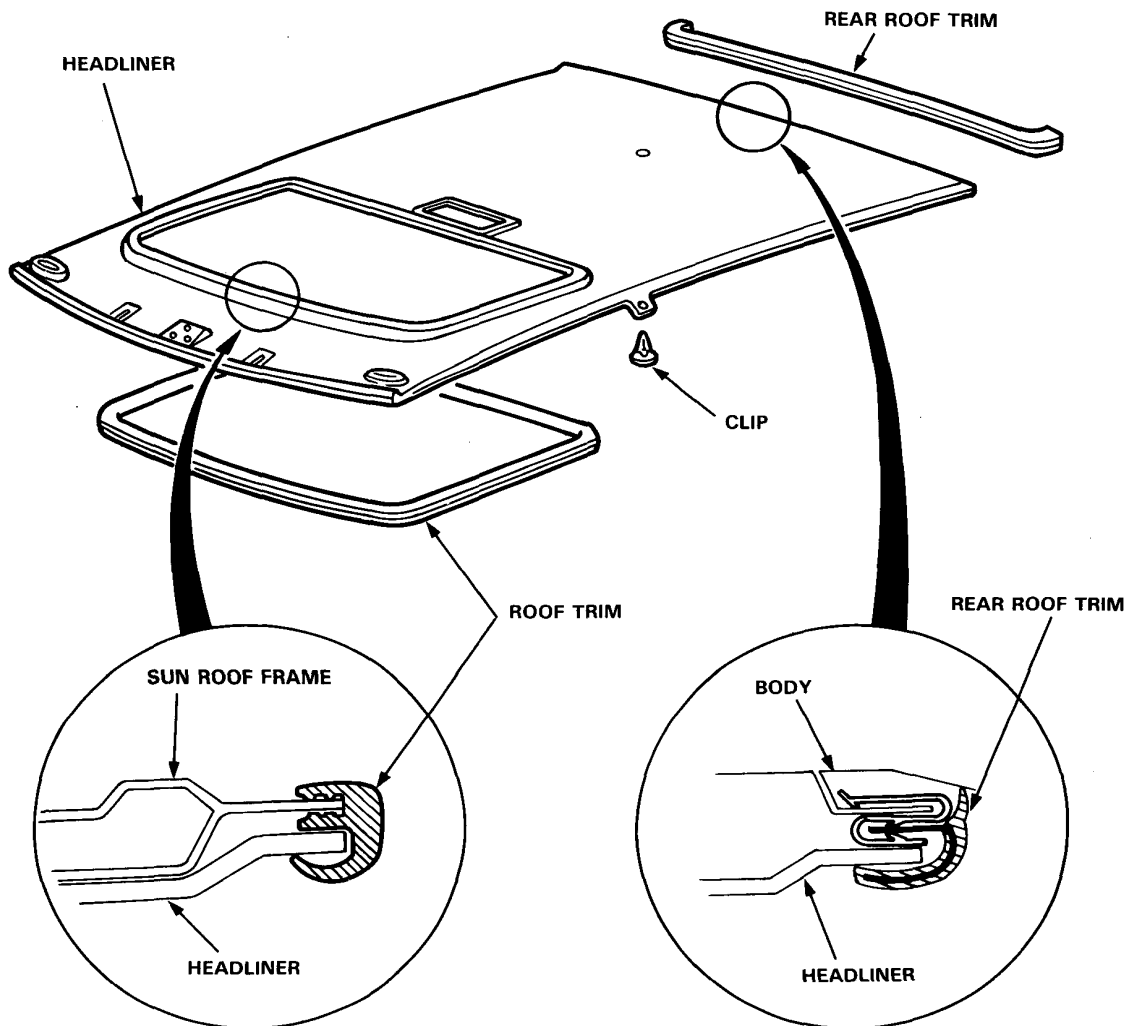




# Headliner

## 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.



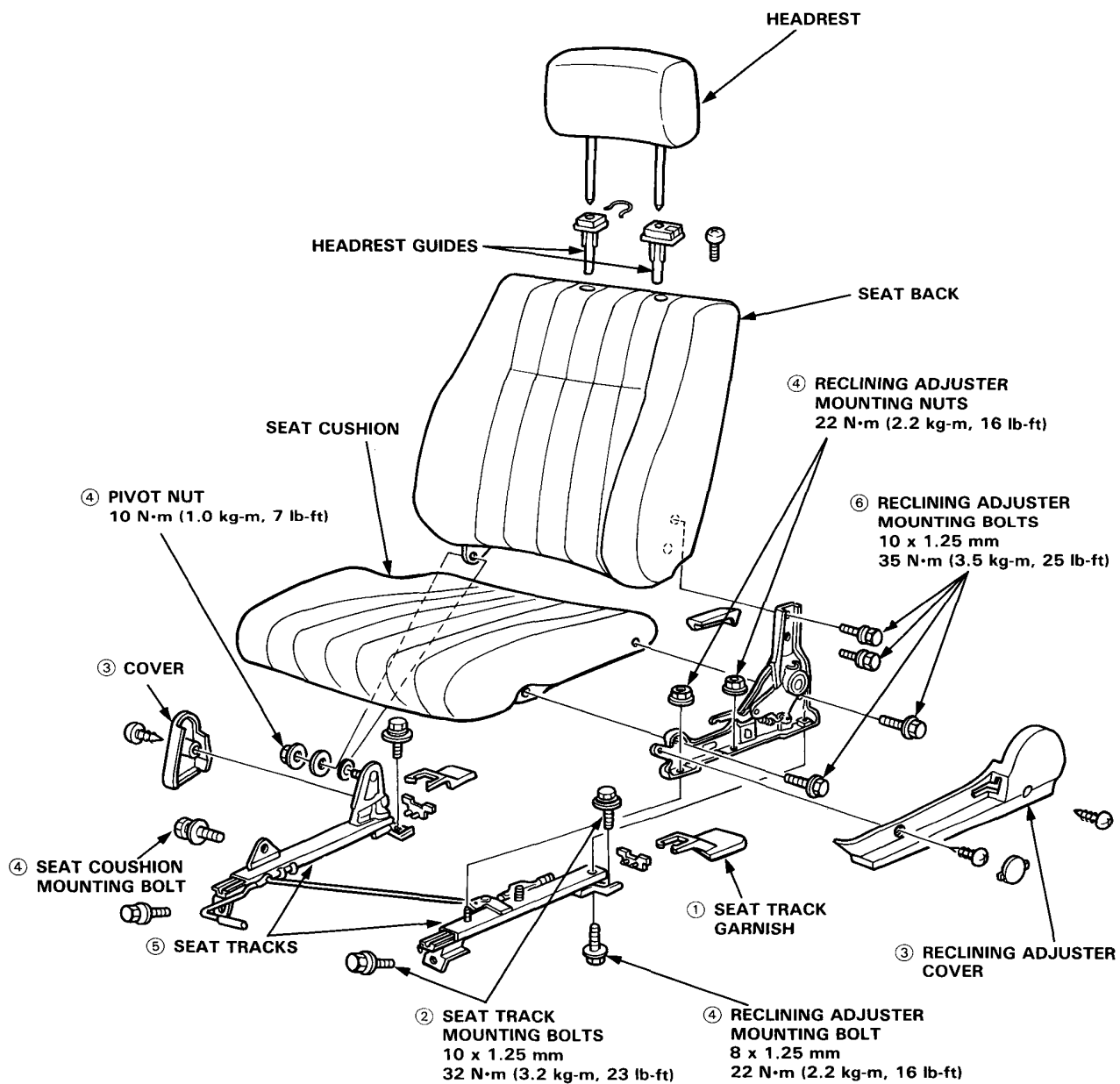




# Front Seat

## Exploded View

Disassemble in numbered sequence.



(cont'd)

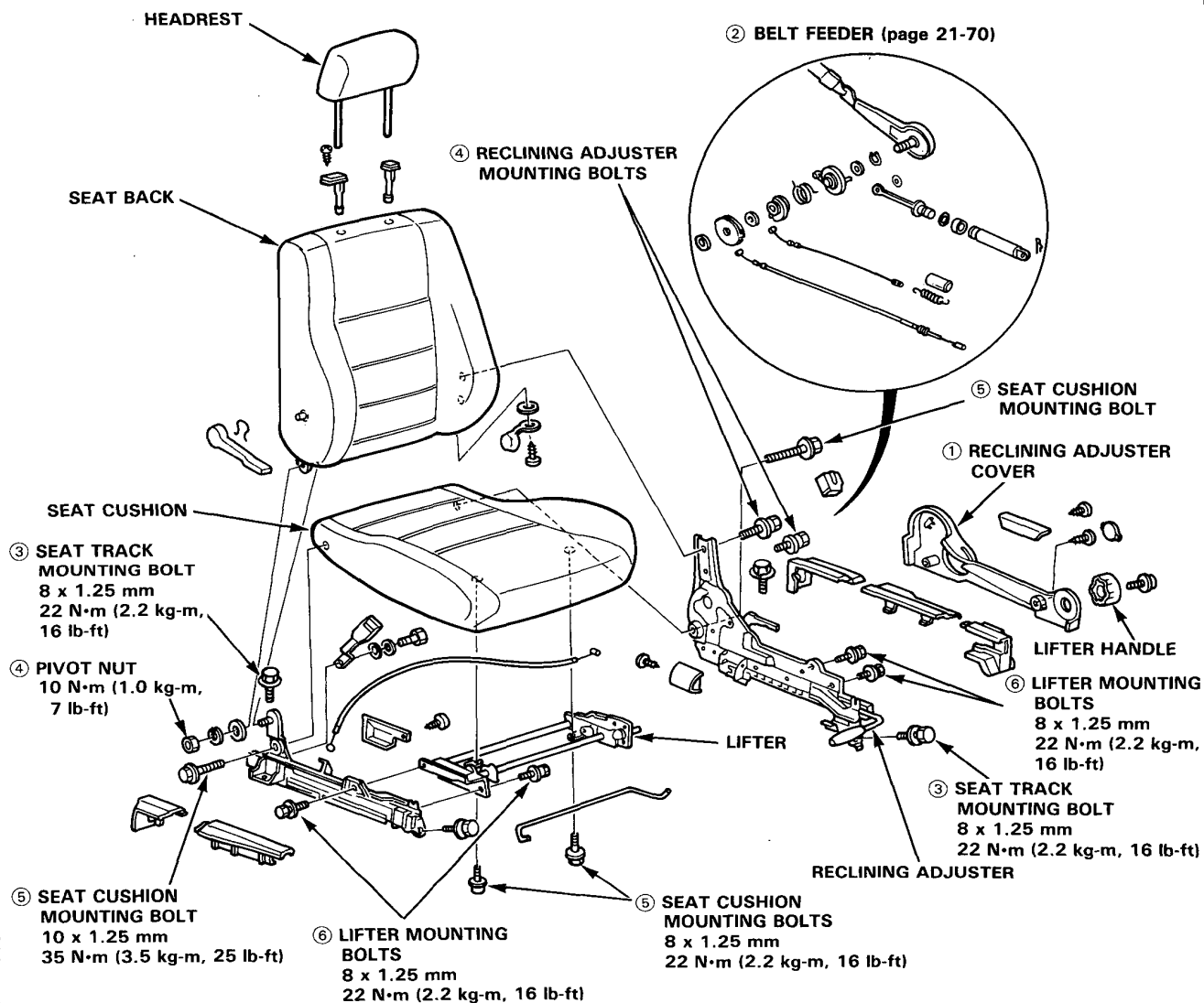


# Front Seat

## Exploded View (cont'd)

With Belt Feeder:

Disassemble in numbered sequence.





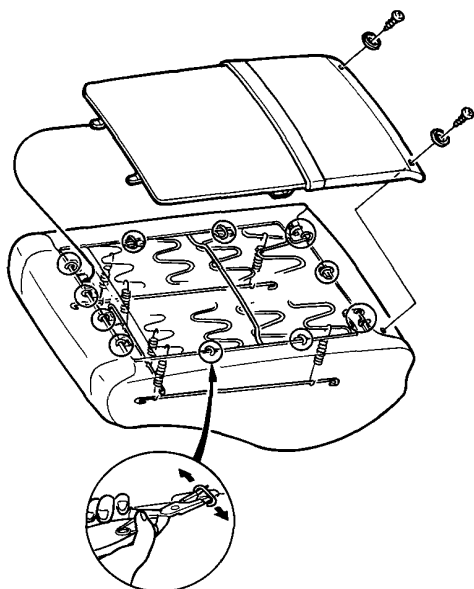
# Seat Cover



## Replacement

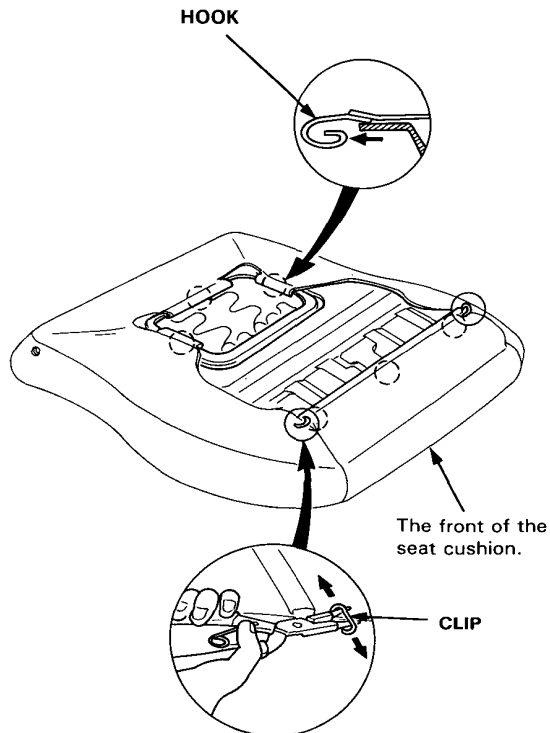
### Front Seat Back:

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.

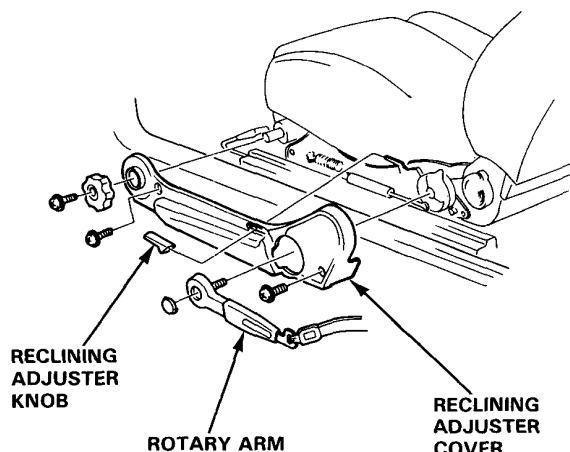
**NOTE:** To prevent wrinkles when installing a seat cover, make sure the material is stretched evenly over the frame before securing all the clips.



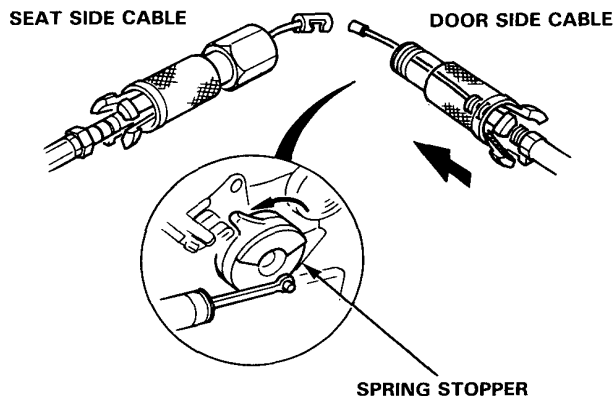
# Belt Feeder

## Removal

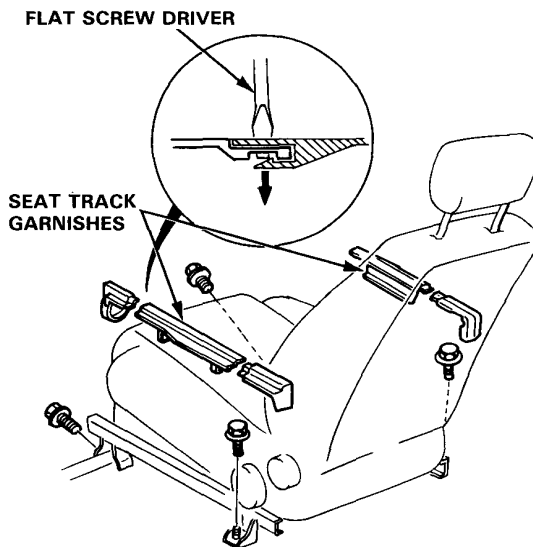
1. Remove the reclining adjuster knob and 2 screws, then remove the reclining adjuster cover.



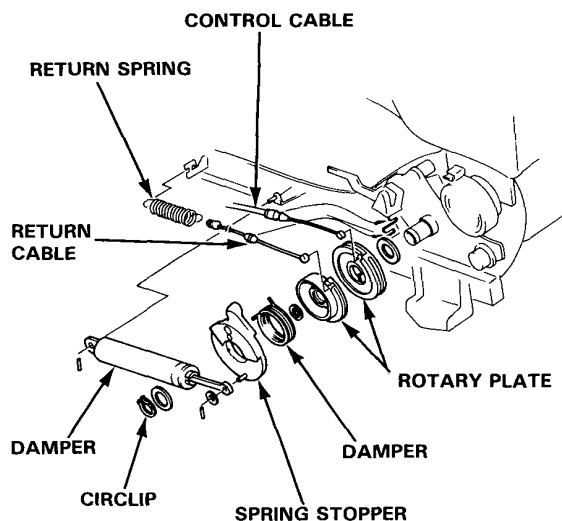
2. Pull the control cable intermediate joint out from under the seat. Dismantle the intermediate joint, push the door side cable into the joint, turn the spring stopper in the rotary unit in the direction of the arrow, pull out the cable connector and disconnect.



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.



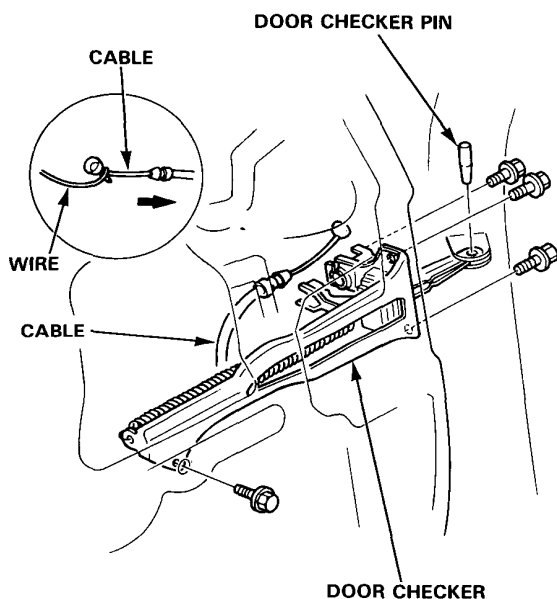




5. Shut the window glass fully, then remove the :

- Door panel.
- Speaker.
- Plastic shield.
- Power window controller.
- Lower bolts of the front sash.

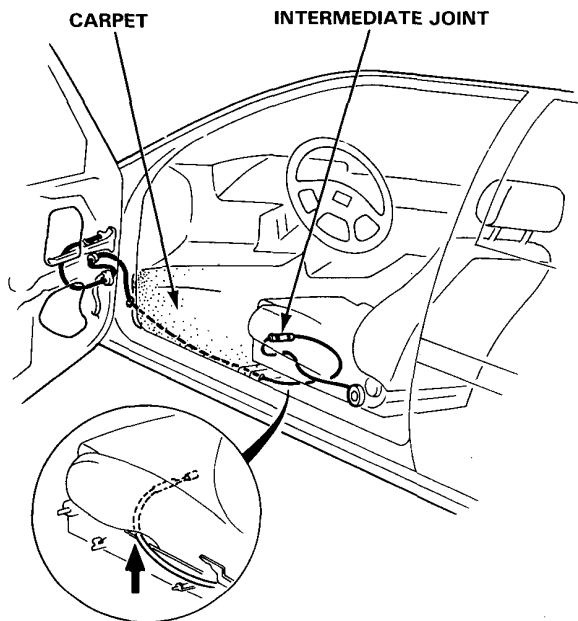
6. Remove the four bolts holding the door checker, then remove the door checker pin and disconnect the cable. Attaching a fairly long piece of wire to the cable before extracting it helps when refitting.



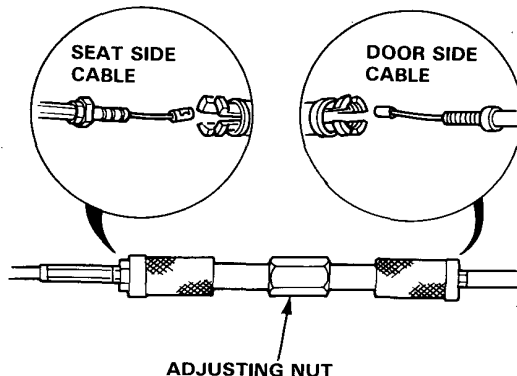
## Installation

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.



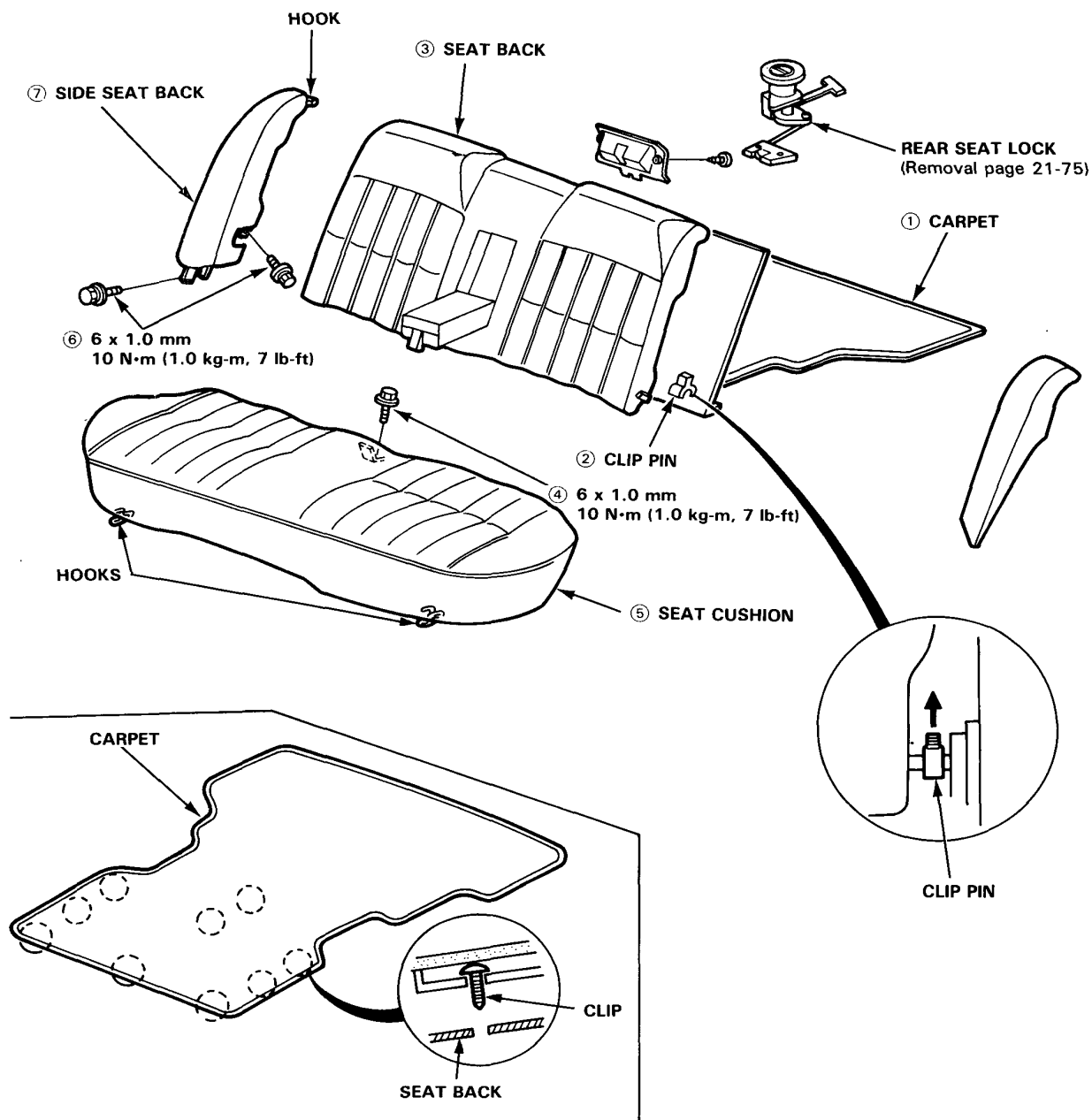


# Rear Seat

## Replacement

Sedan (TYPE I)

Disassemble in numbered sequence.

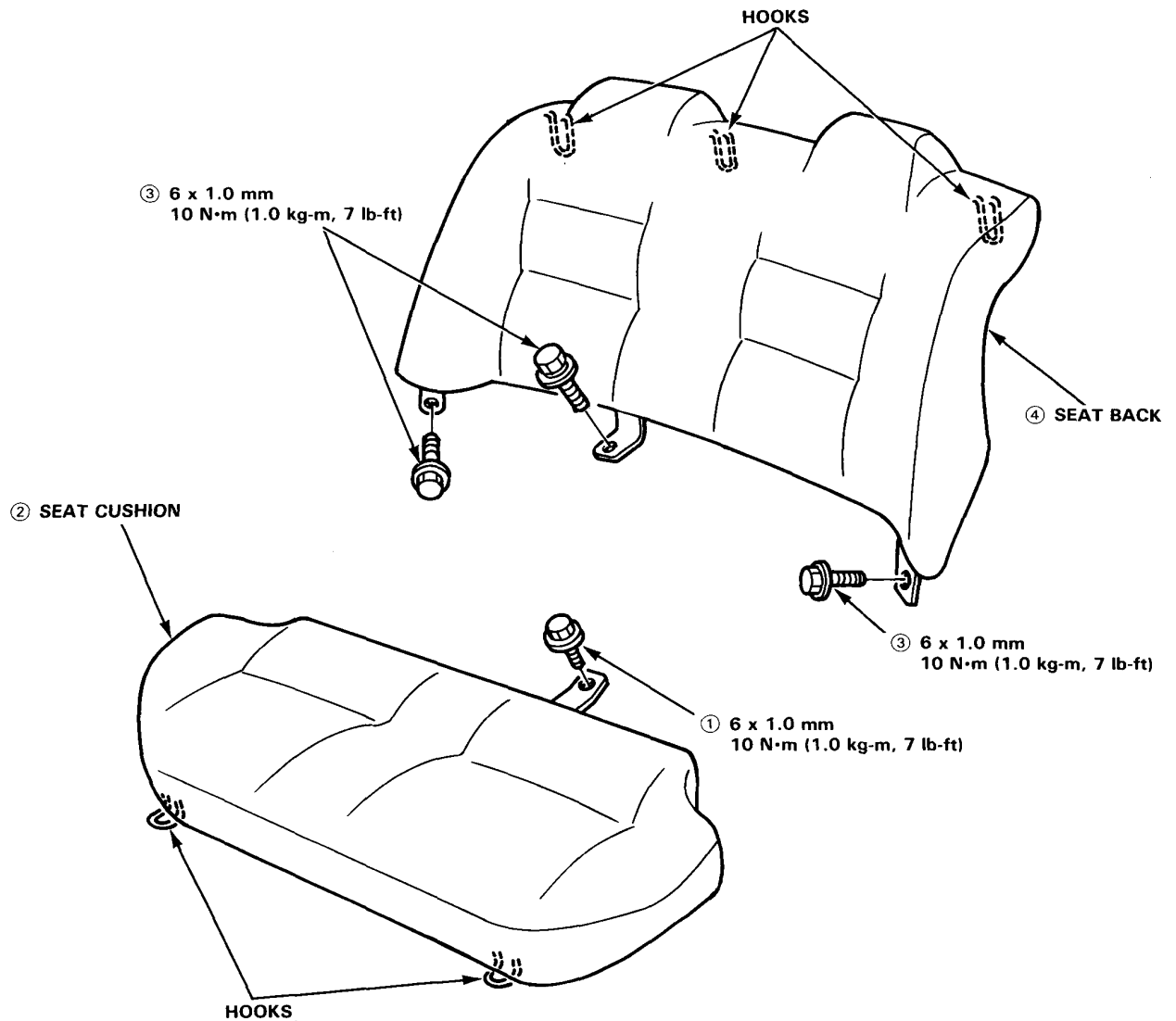






## Sedan (TYPE II)

Disassemble in numbered sequence.



(cont'd)

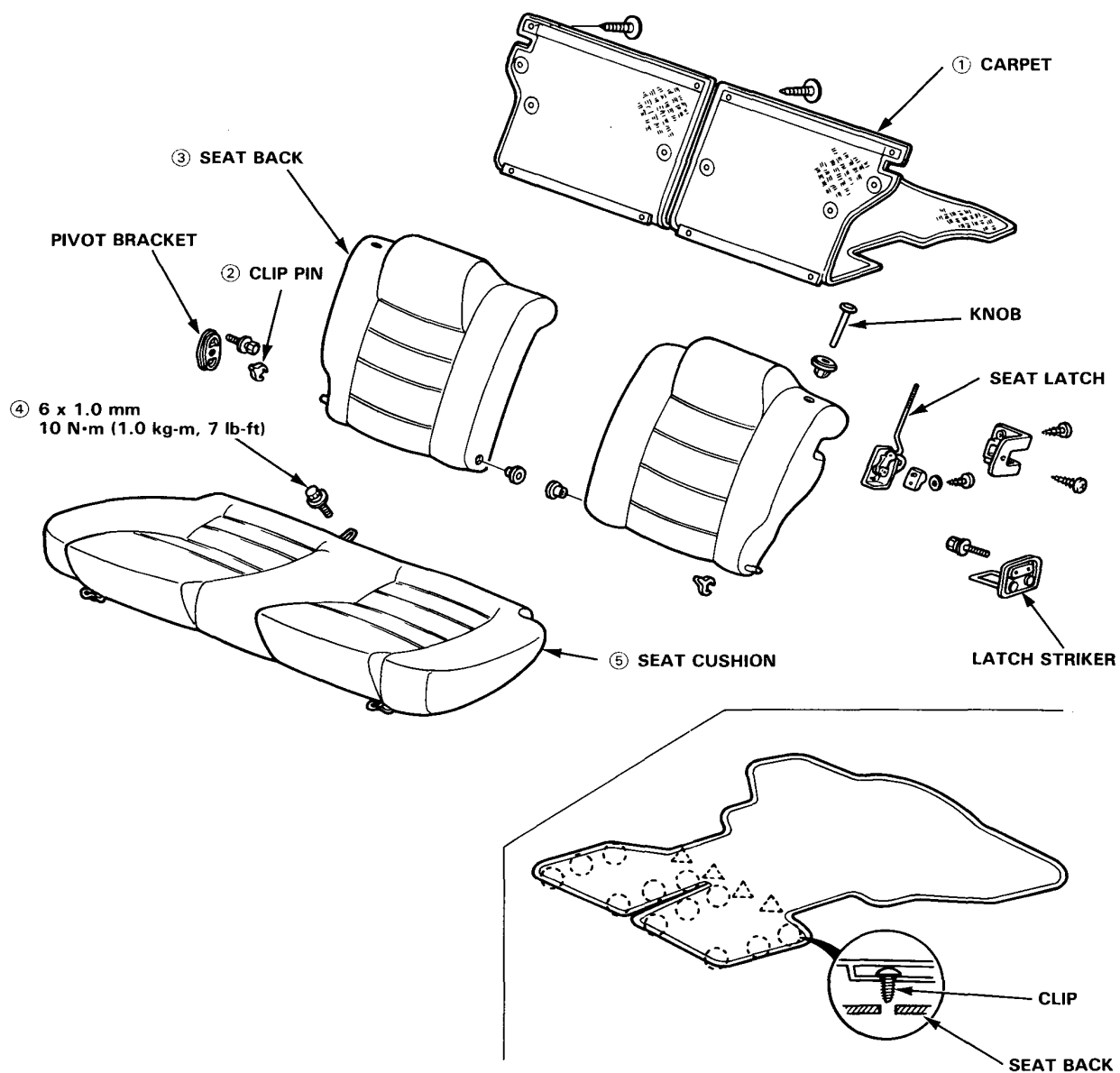


# Rear Seat

## Replacement (cont'd)

### Hatchback

Disassemble in numbered sequence.





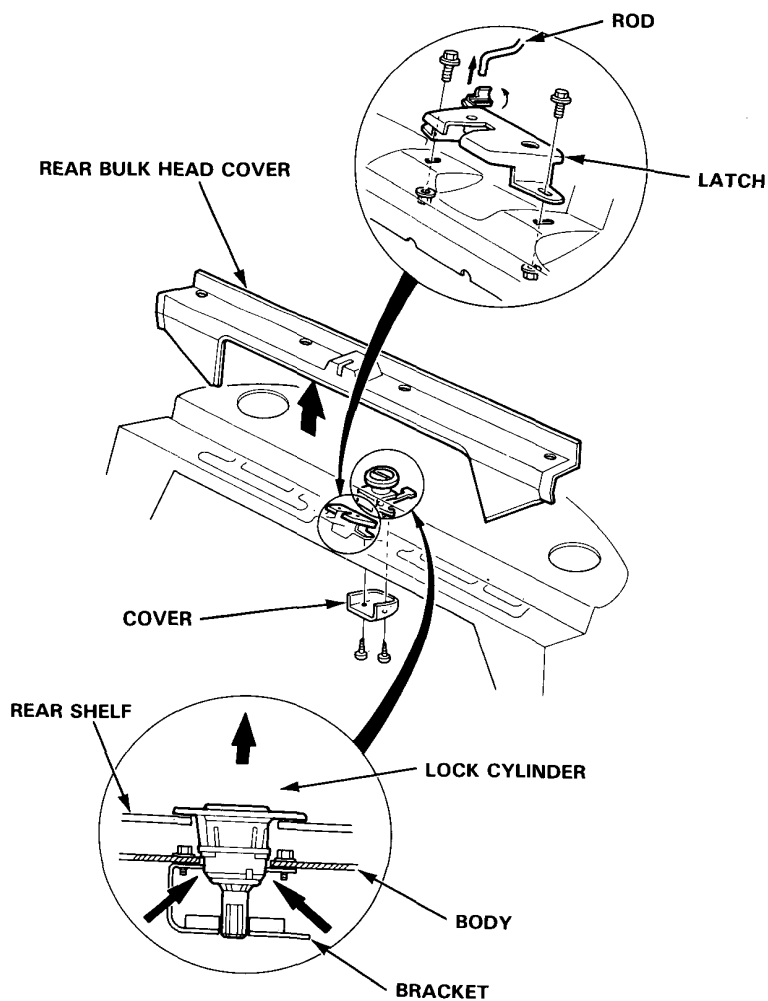


# Rear Seat Lock

## 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.



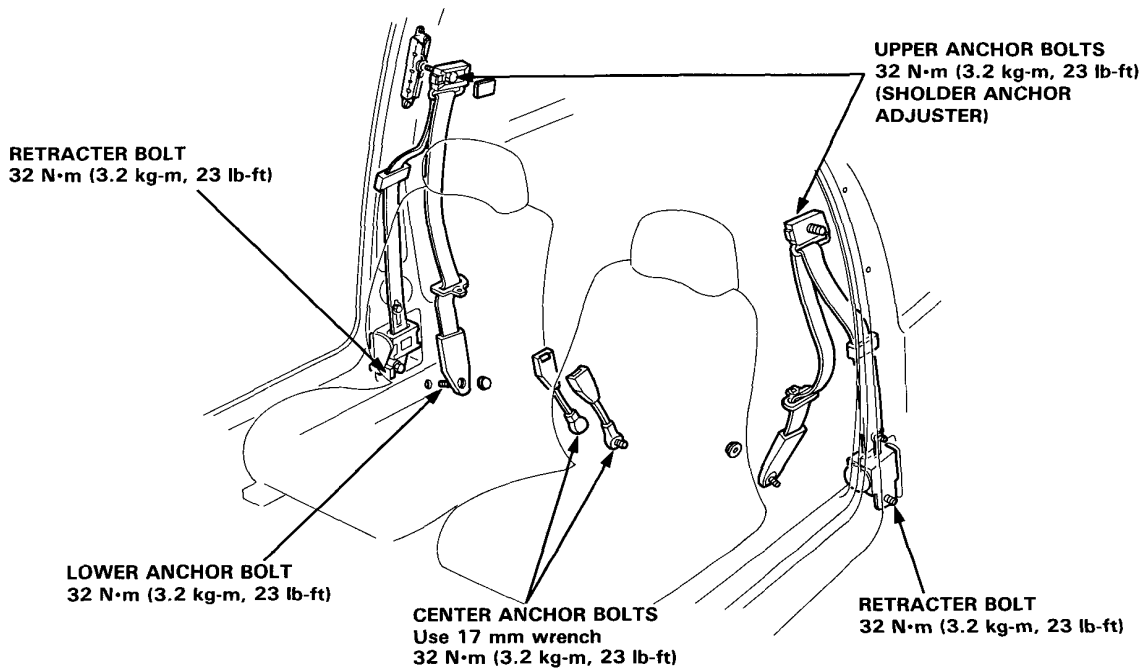


# Front Seat Belts

## Replacement

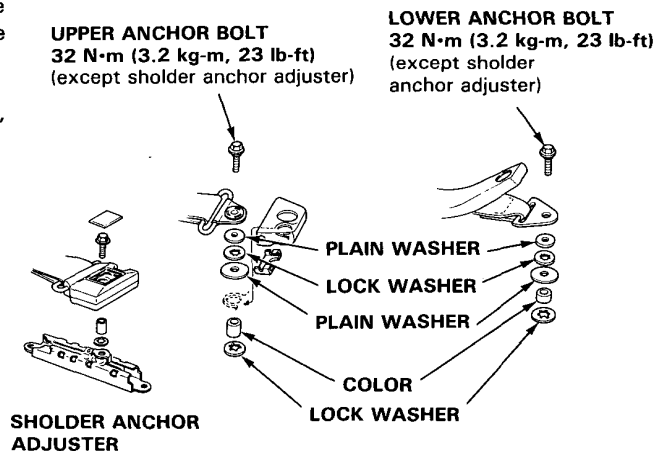
**CAUTION:** Check the seat belts for damage and replace them if necessary. Be careful not to damage them during removal and installation.

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 forward 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.





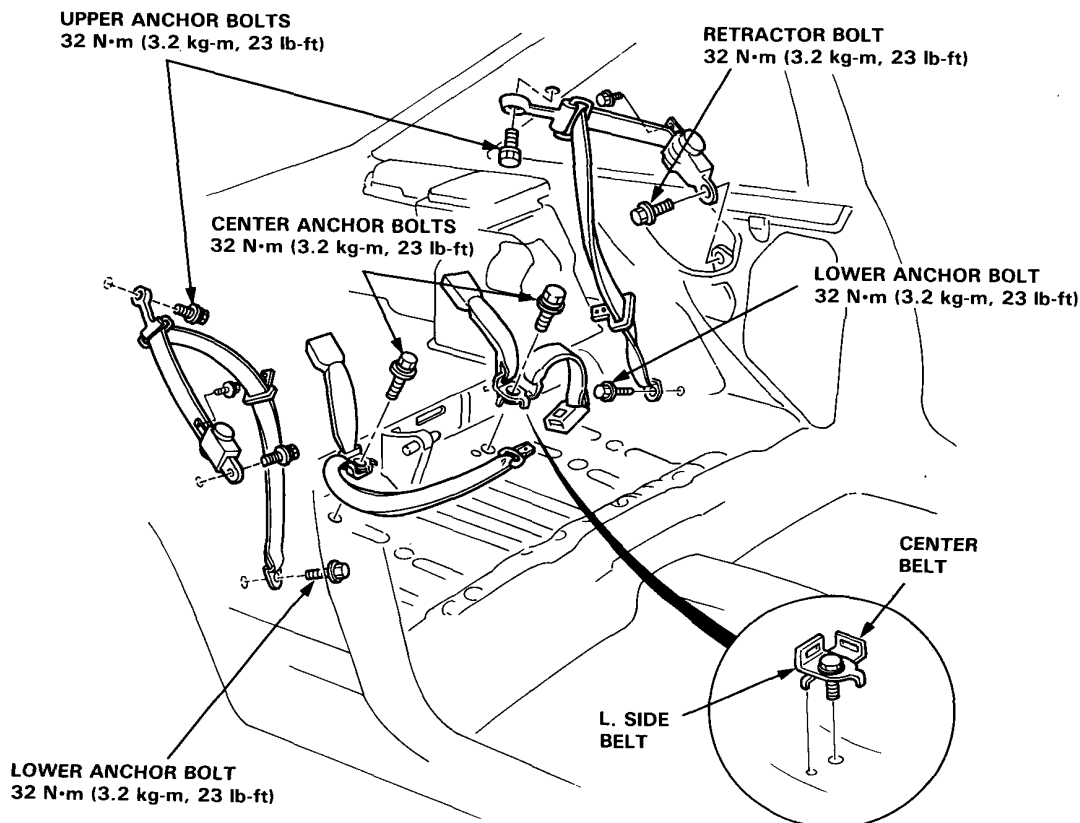
# Rear Seat Belts



## Replacement

**CAUTION:** Check the seat belts for damage and replace them if necessary. Be careful not to damage them during removal and installation.

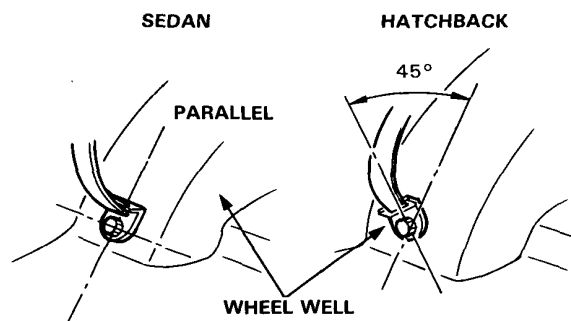
1. Remove the rear seat.
2. Remove the rear side trim panels.
3. Remove the upper anchor bolt, the lower anchor bolt and retractor bolt with a 17 mm socket or box-end wrench.



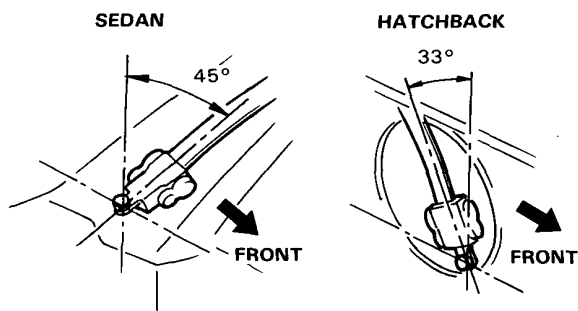
4. Check that the retractor locking mechanism function as described on page 21-78.
5. Install the seat belt in the reverse order of removal.

**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





# Seat Belt

## Inspection

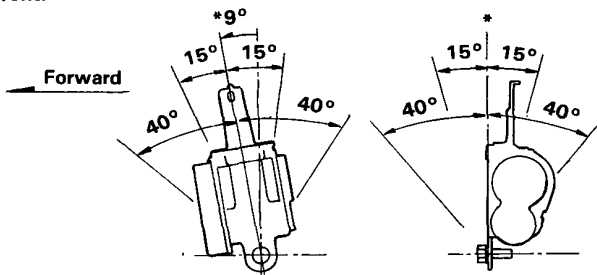
### Retractor Inspection

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°.

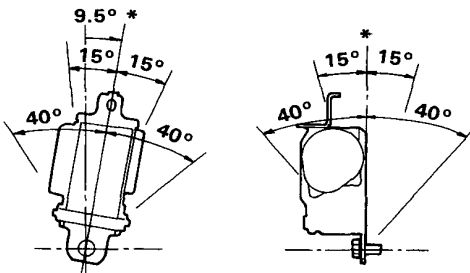
**CAUTION:** Do not attempt to disassemble the retractor.

Glass Back, Aerodeck  
Front:

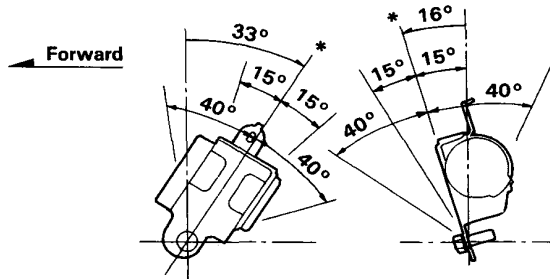
\*: Mounted Position.



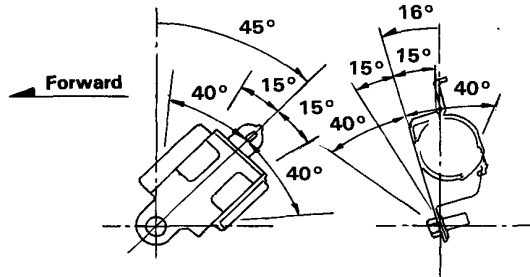
Sedan Front:



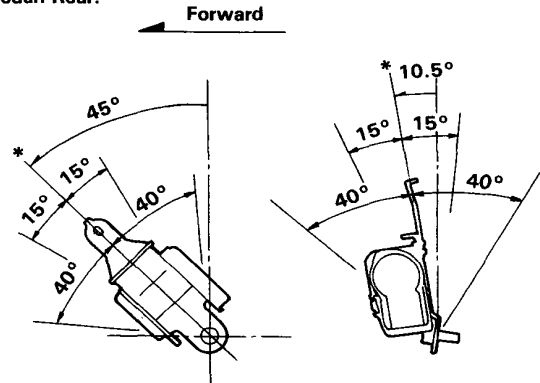
Glass Back Rear:



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.

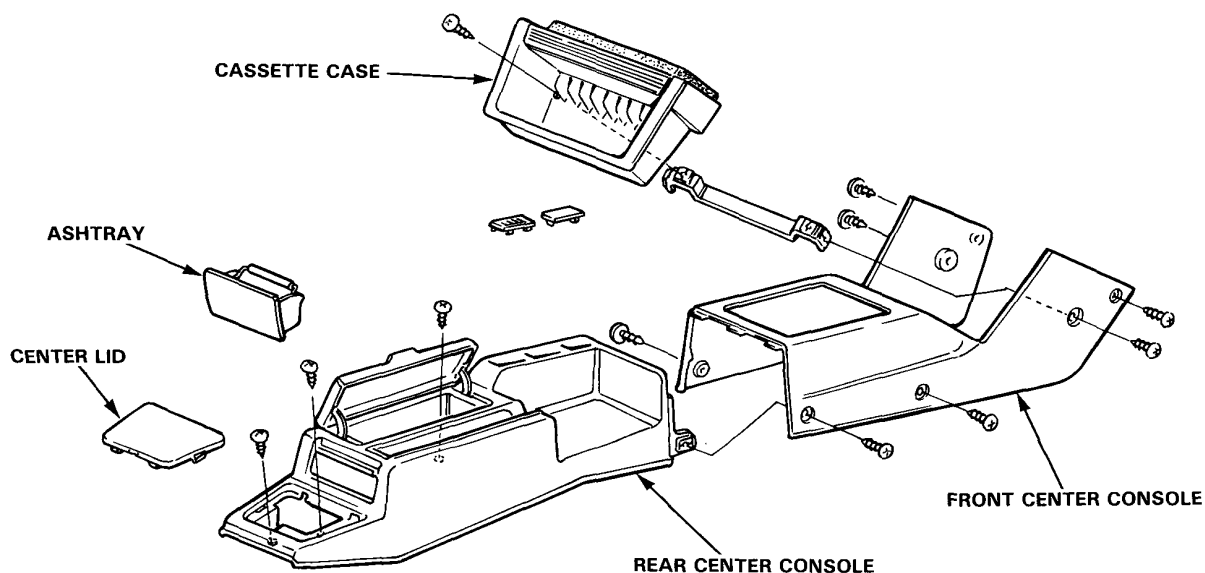




# Center Console

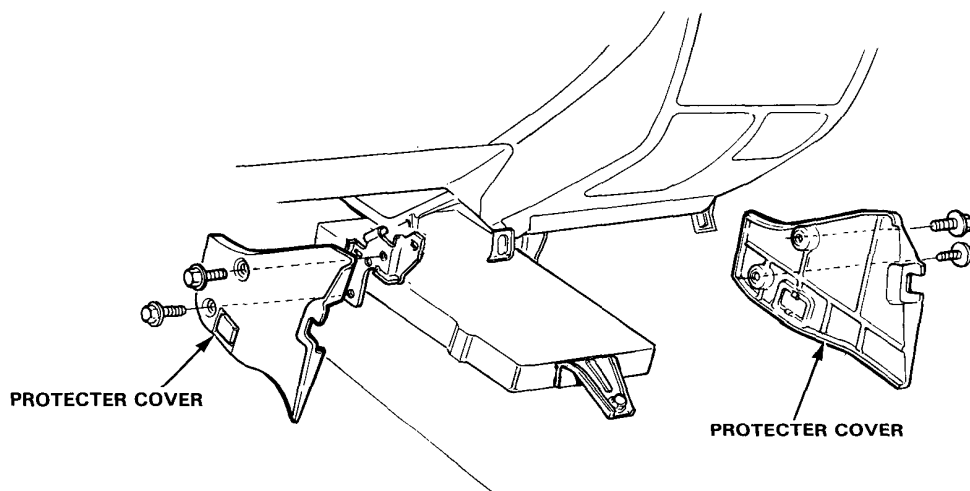
## Replacement

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.



## Protector Cover Replacement

Remove the protector cover by removing the bolts.





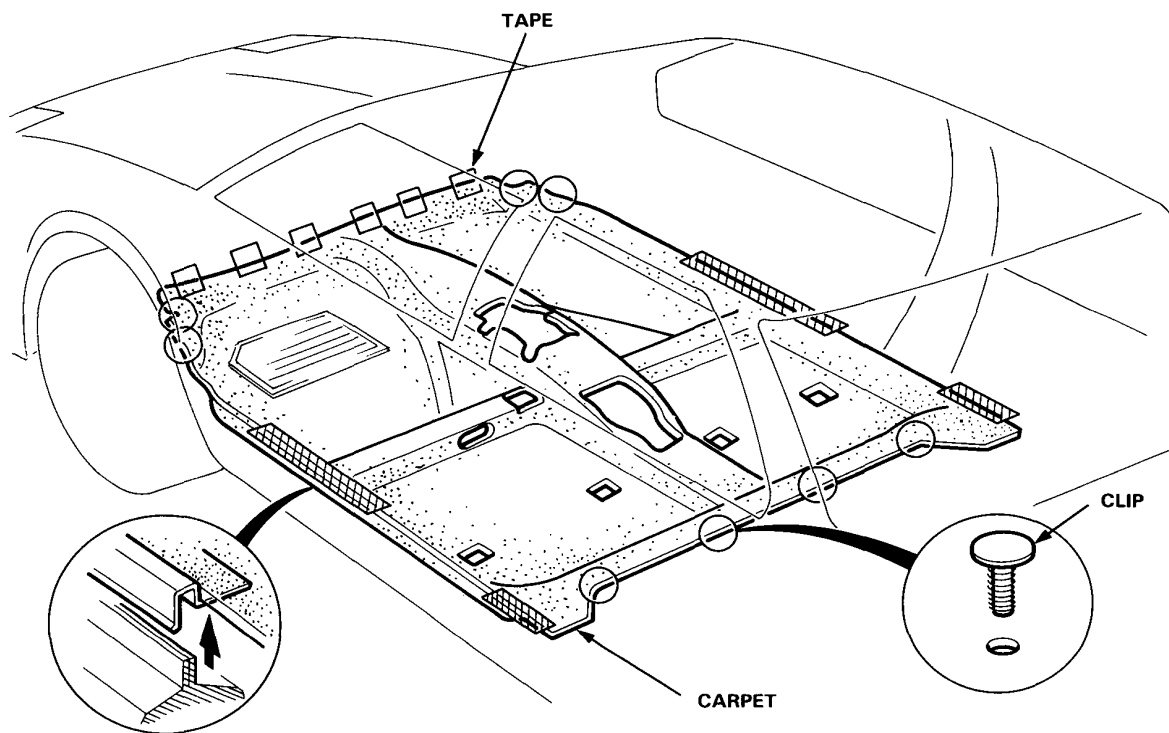
# Carpet

## 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.



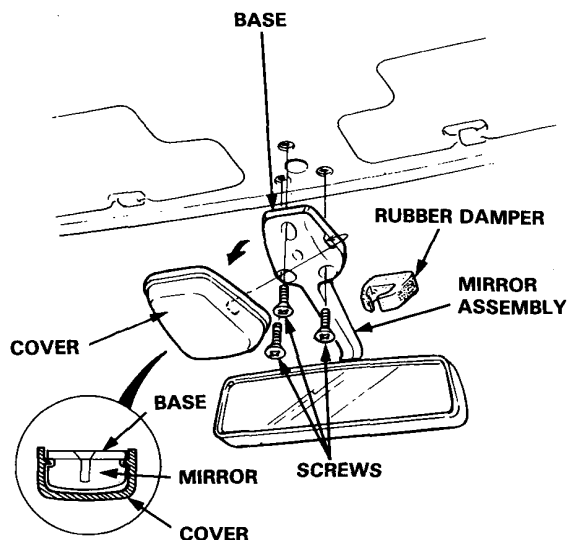




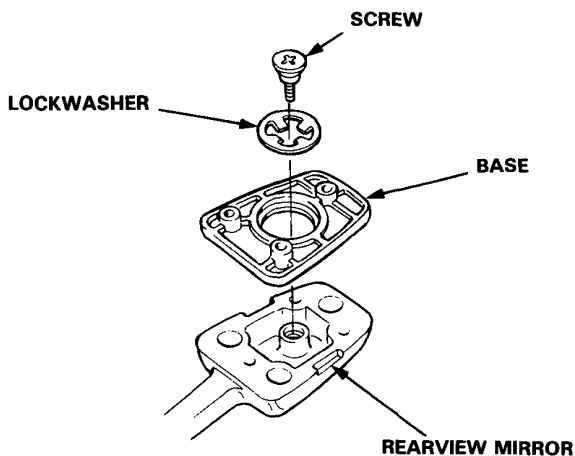
## Rearview Mirror

### Replacement

1. Remove the rubber damper.
2. Pry the cover off using the end of a flat-tip screwdriver.



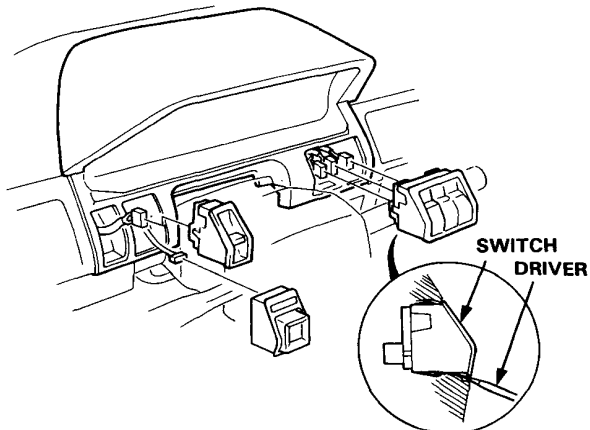
3. Remove the 3 mounting screws from the mirror base, then remove the mirror assembly.
4. Remove the base from the bracket by removing the screw.



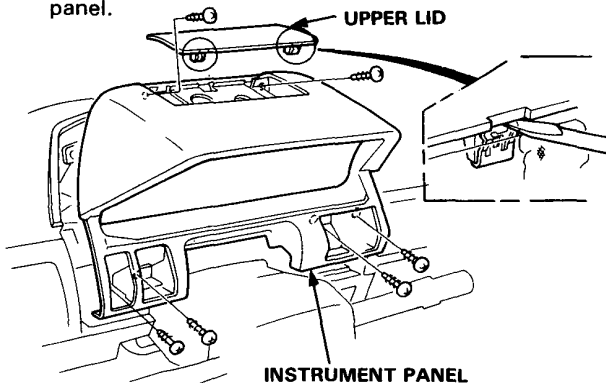
## Instrument Panel

### Replacement

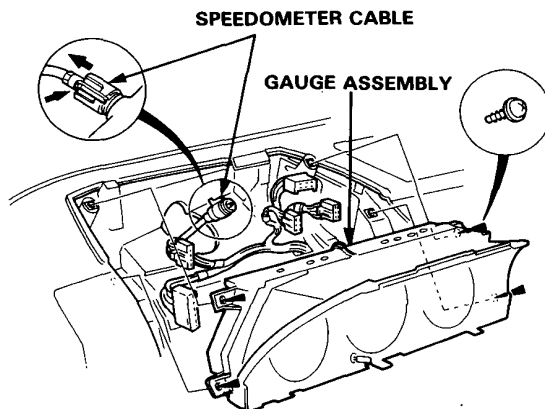
1. Remove each switch from the instrument panel by inserting a thin flat-tip screwdriver under the bottom center of the switch and prying it loose. Then pull the switches straight back and disconnect the wire connectors.



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.



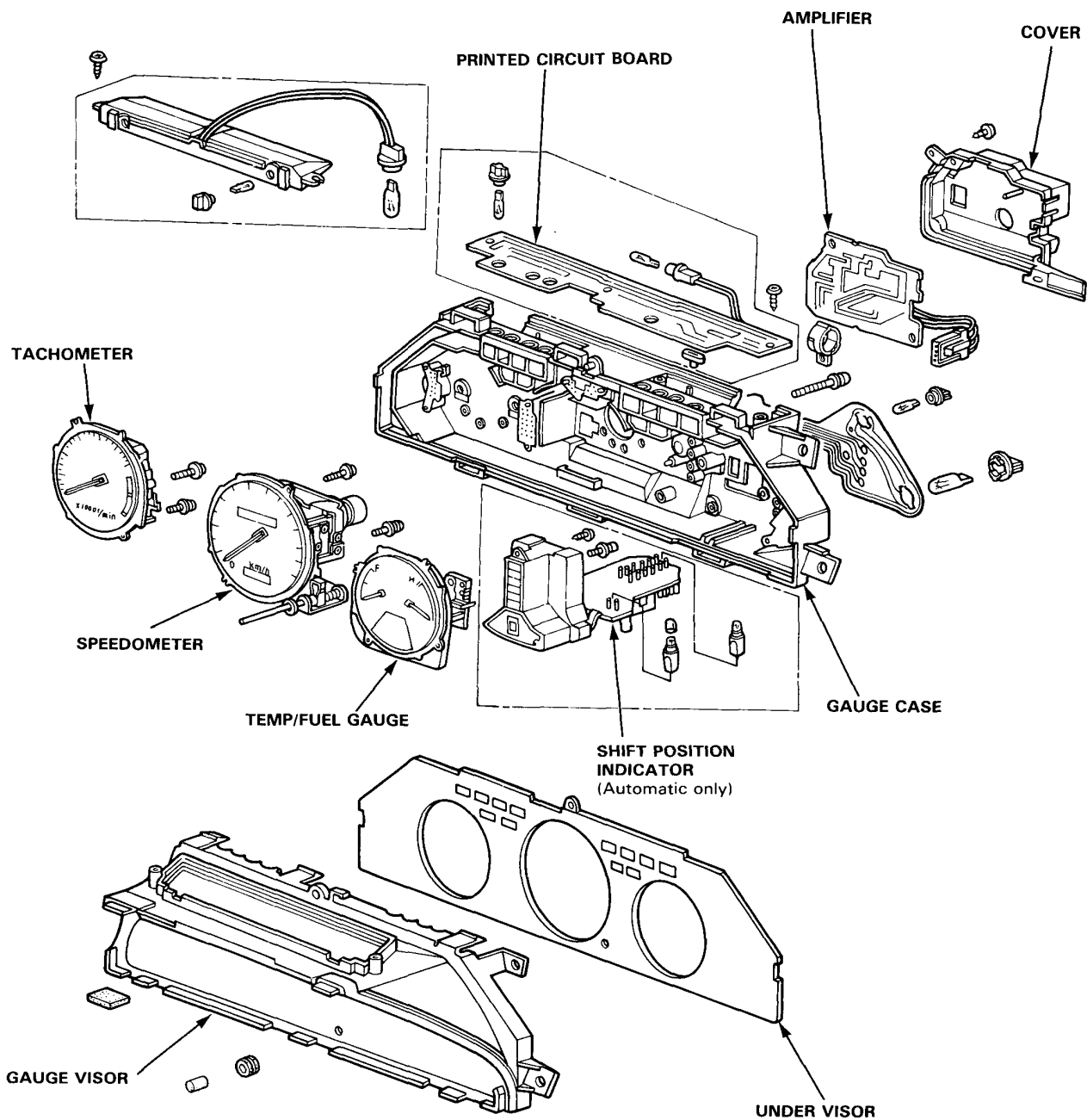


# Gauges

## Replacement

(NIPPON SEIKI)

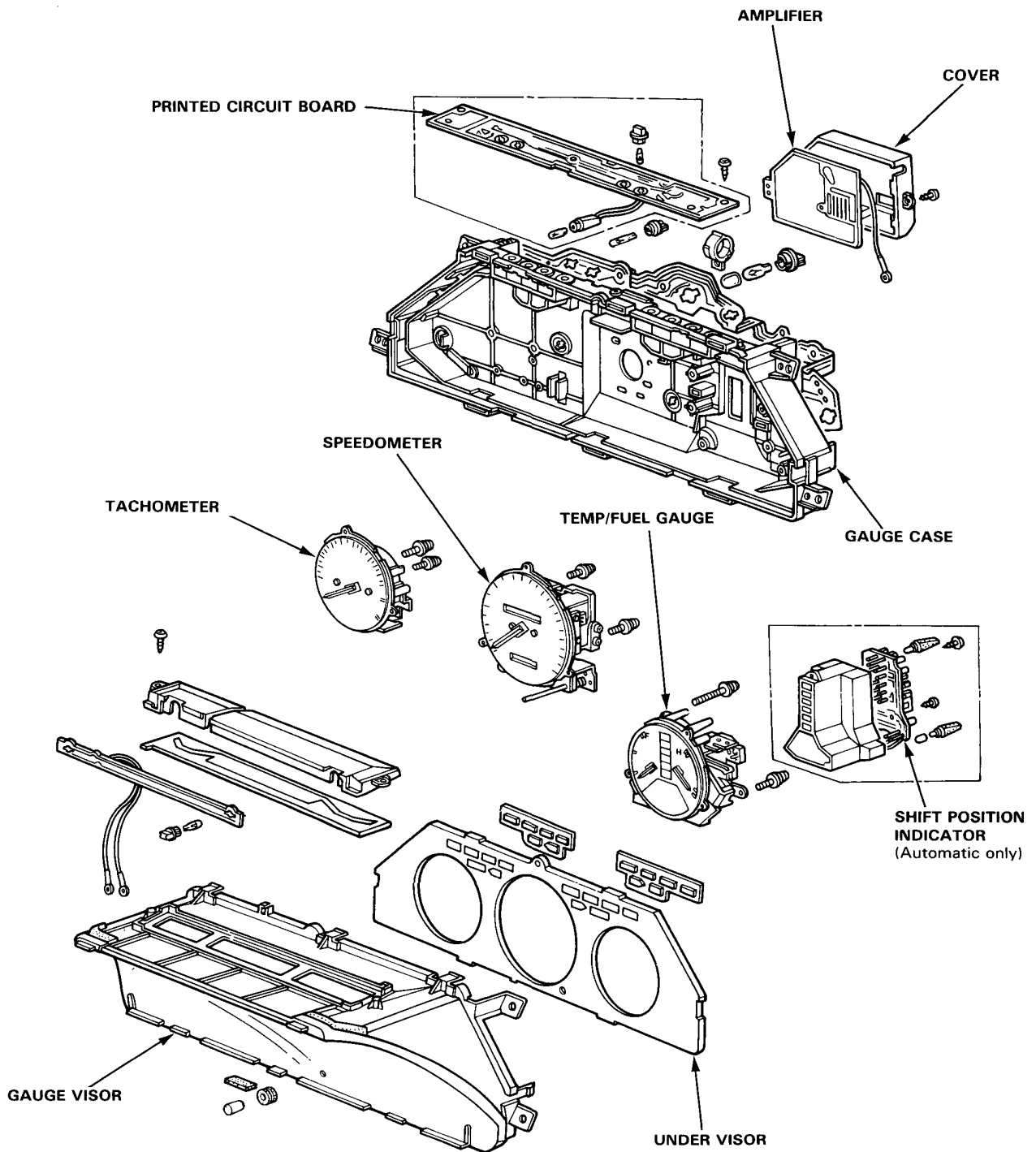
NOTE: Avoid damaging terminals and printed circuit.







(ND)



(cont'd)

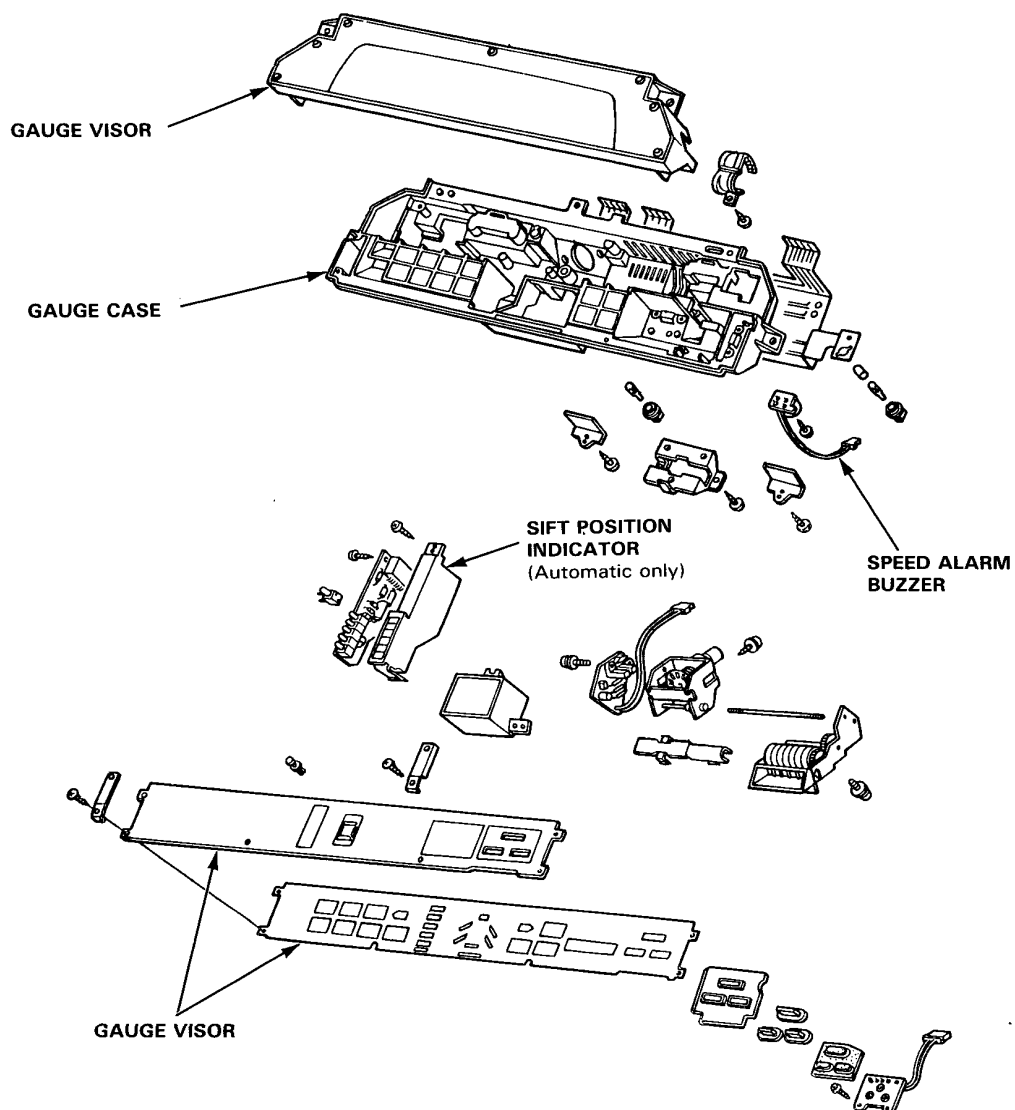


# Gauges

## Replacement (cont'd)

### (DIGITAL GAUGE)

NOTE: Avoid damaging terminals and printed circuit.

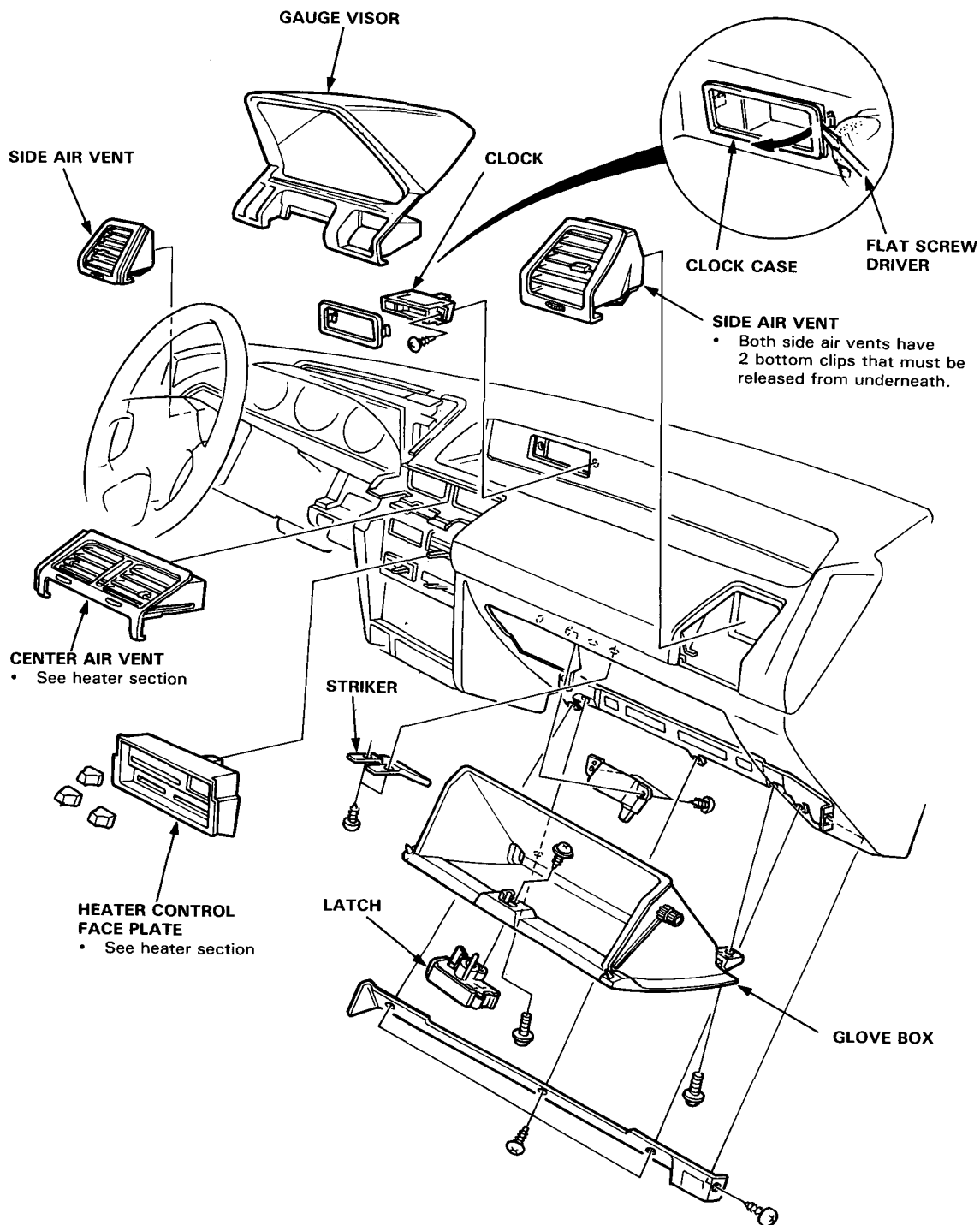




# Dashboard Components



## Removal/Installation

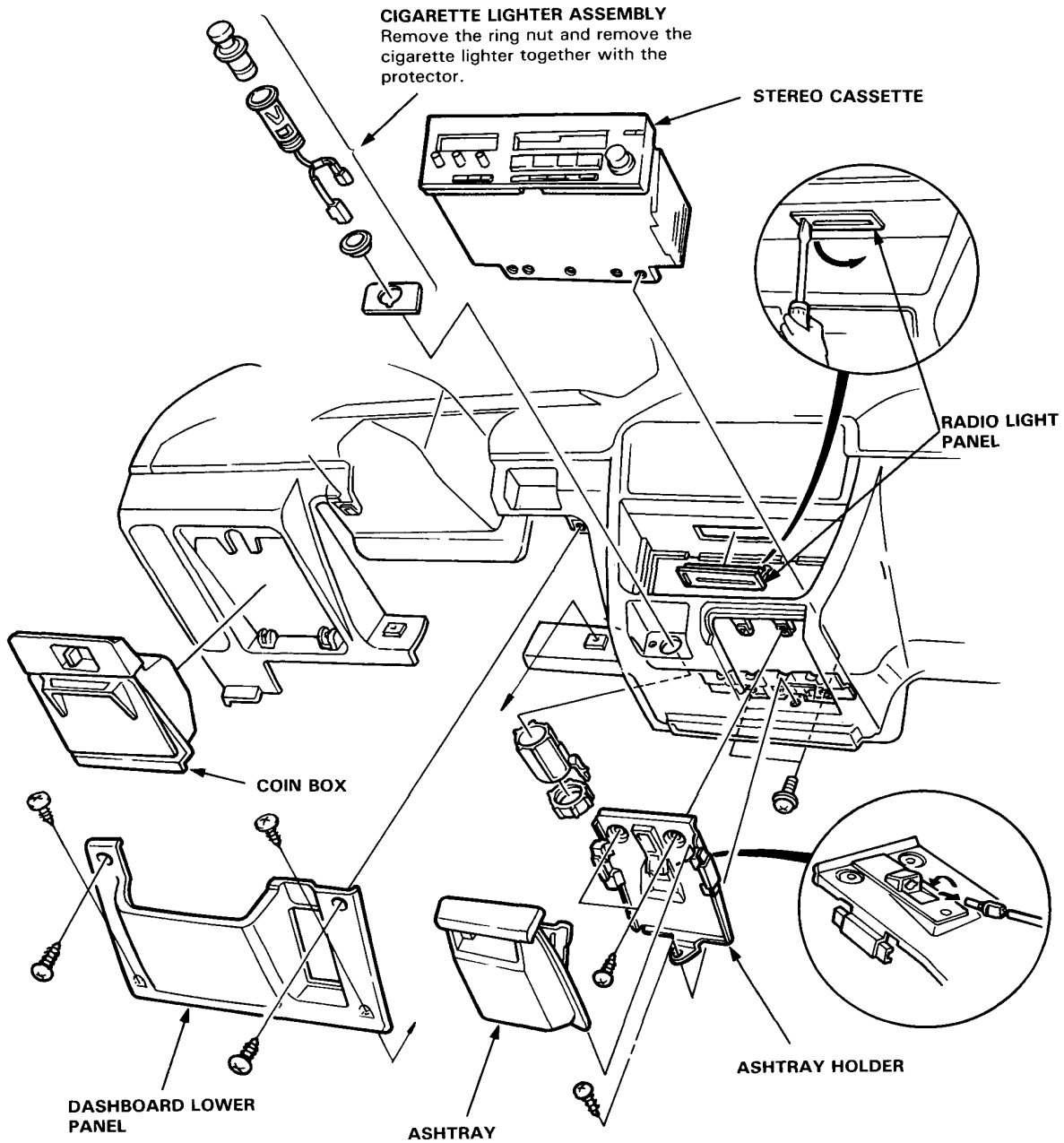


(cont'd)



# Dashboard Components

## Removal/Installation (cont'd)





# Dashboard

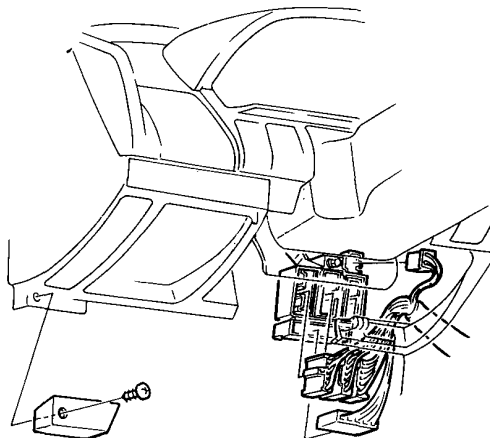


## Replacement

1. To remove the dashboard, first remove the:

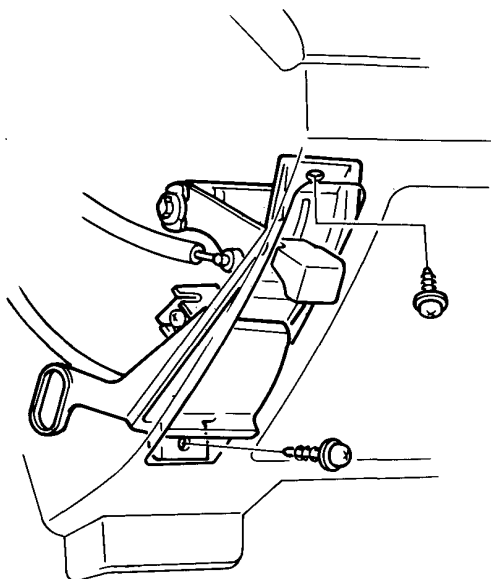
- Steering wheel.
- Dashboard lower panel.
- Steering column cover.
- Turn signal cancel sleeve.
- Combination switches.
- Ashtray holder.

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)



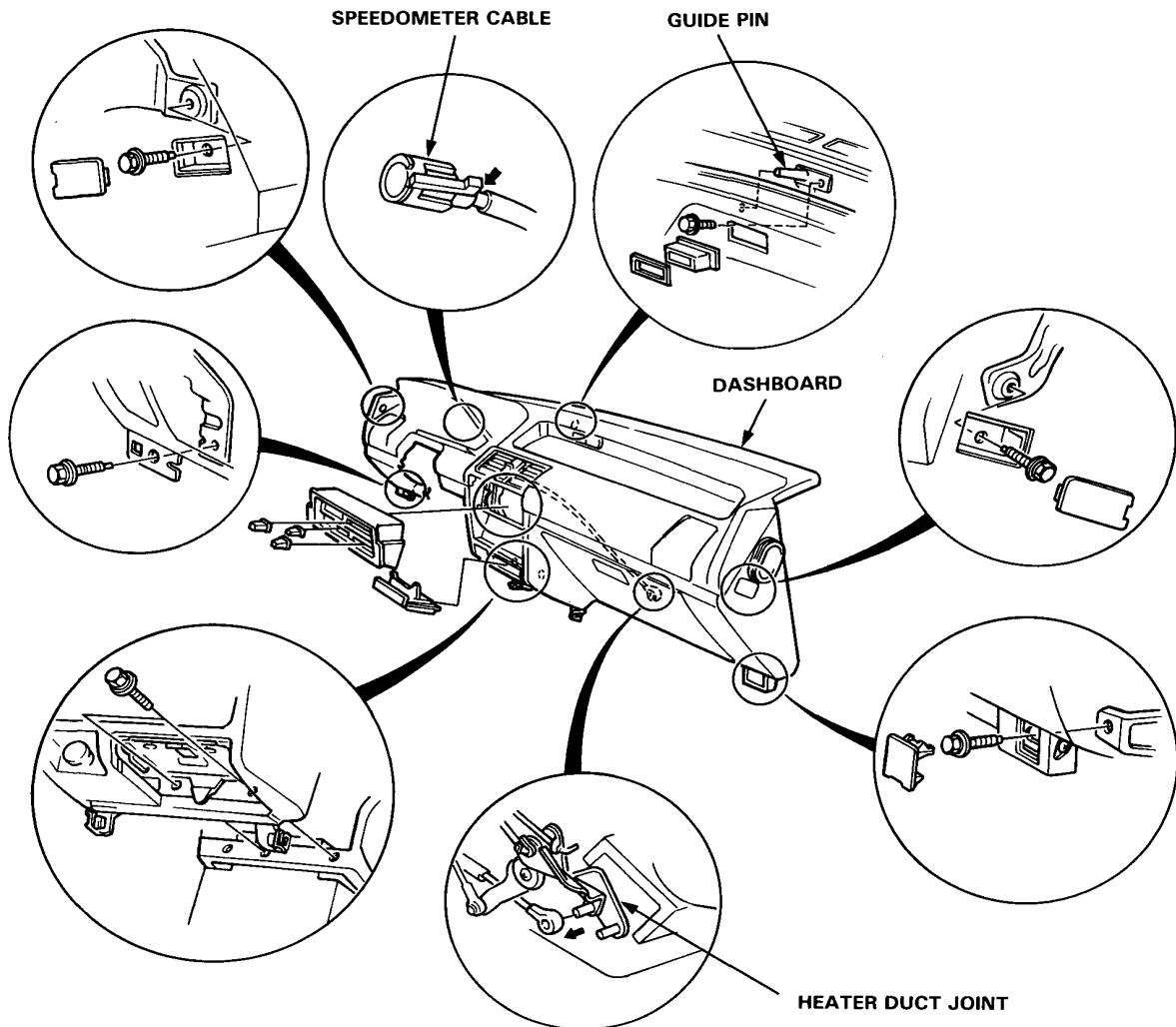
# Dashboard

## 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 interfering with the heater control lever or cable.



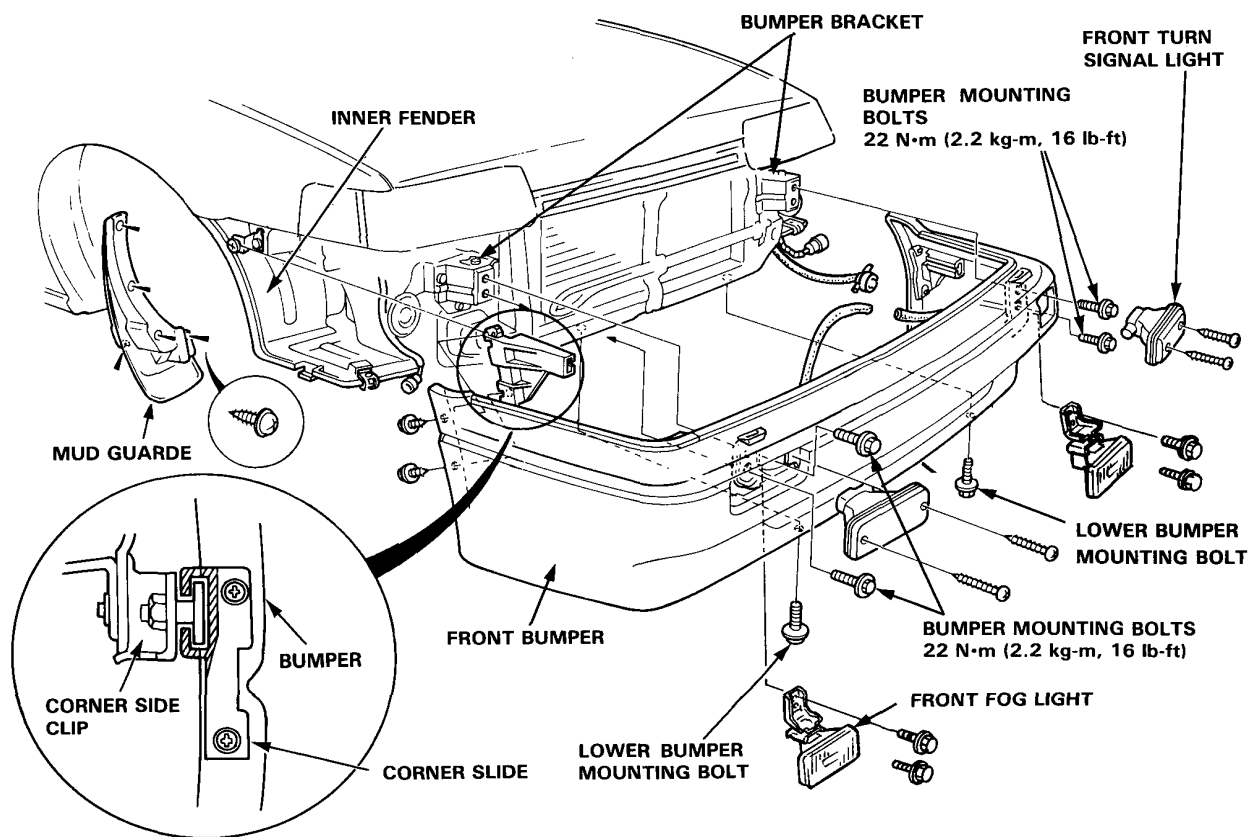




# Front Bumper

## 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 guards by removing the screws.

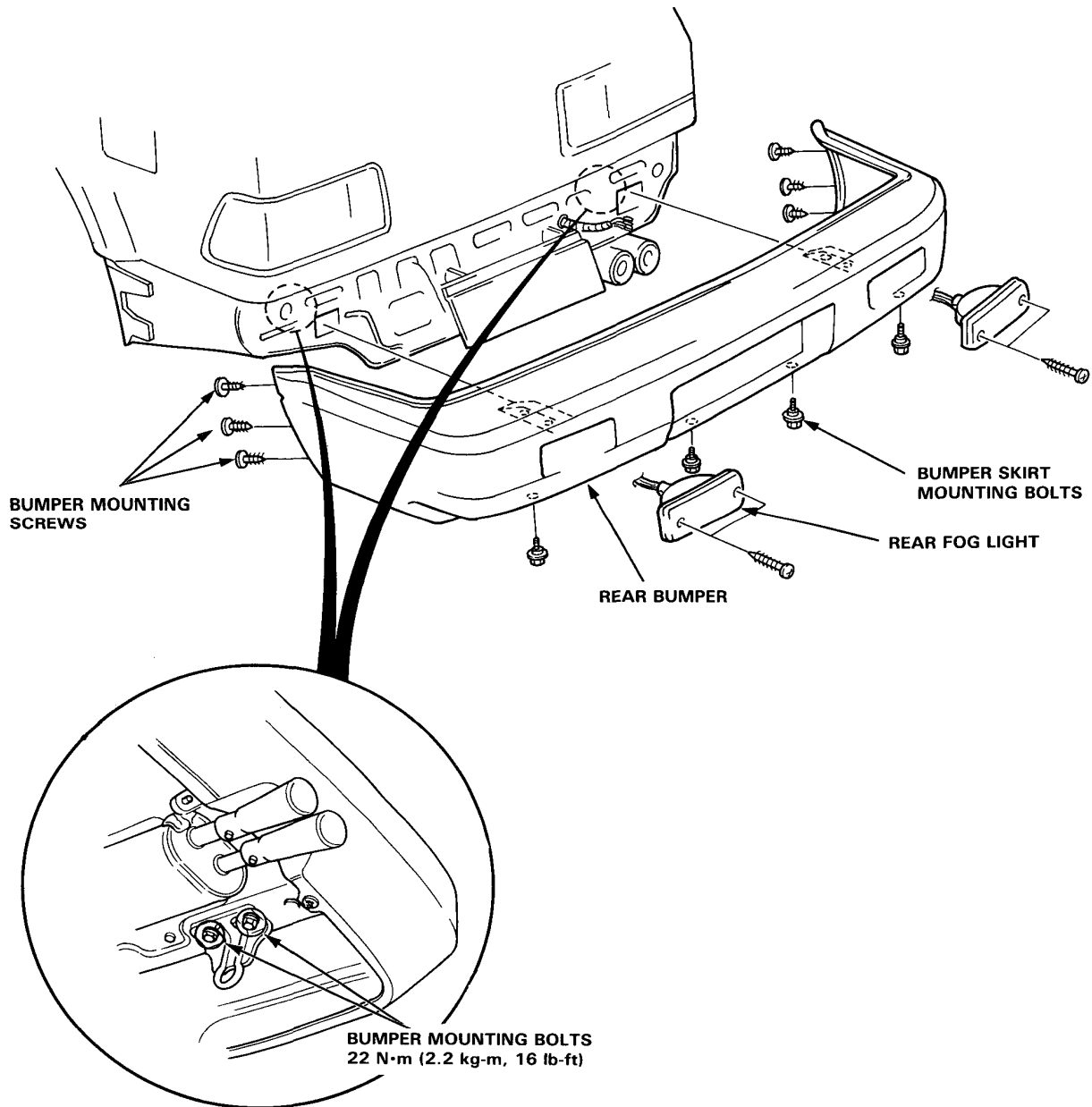




# Rear Bumper

## 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.



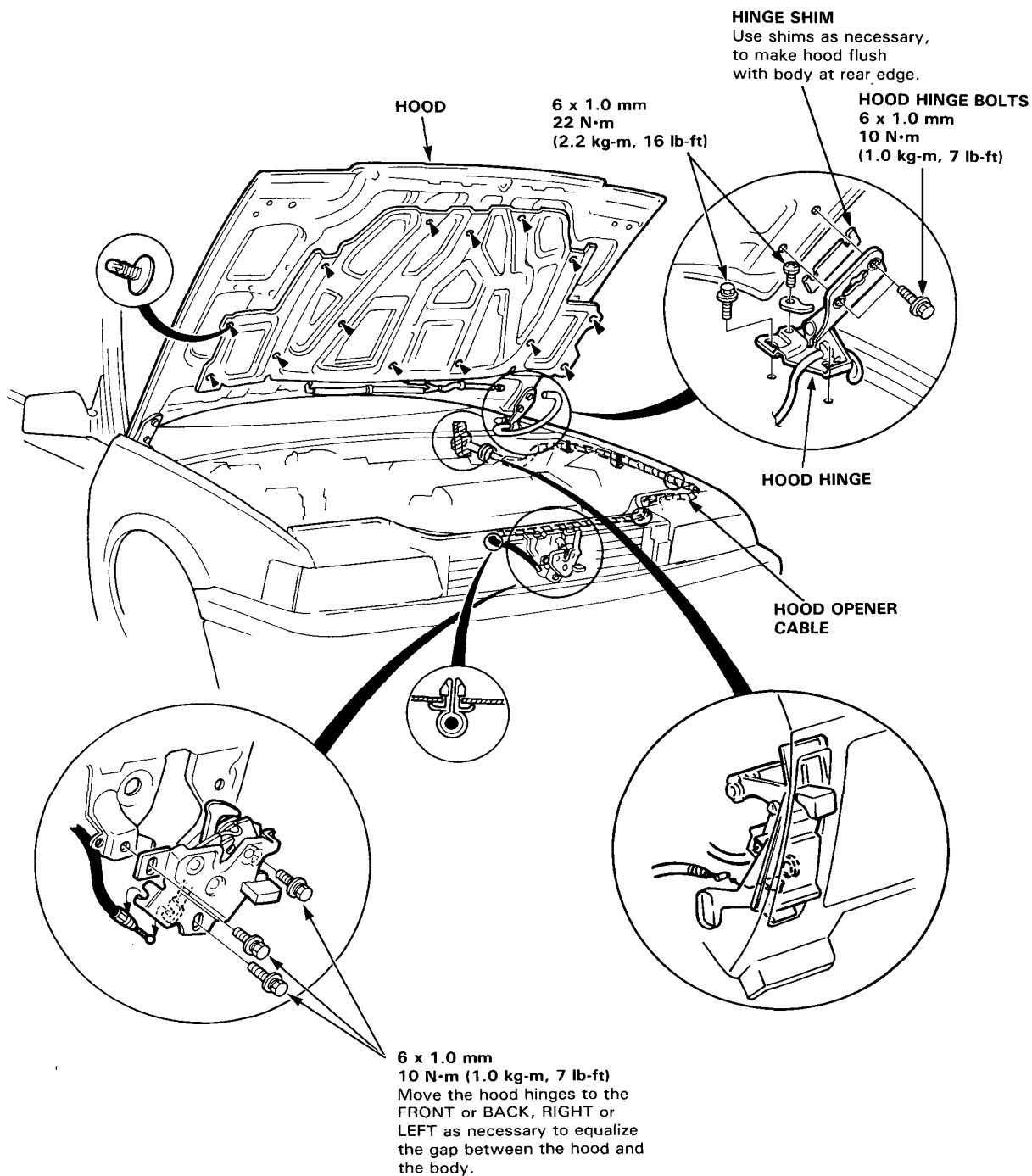




# Hood

## 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

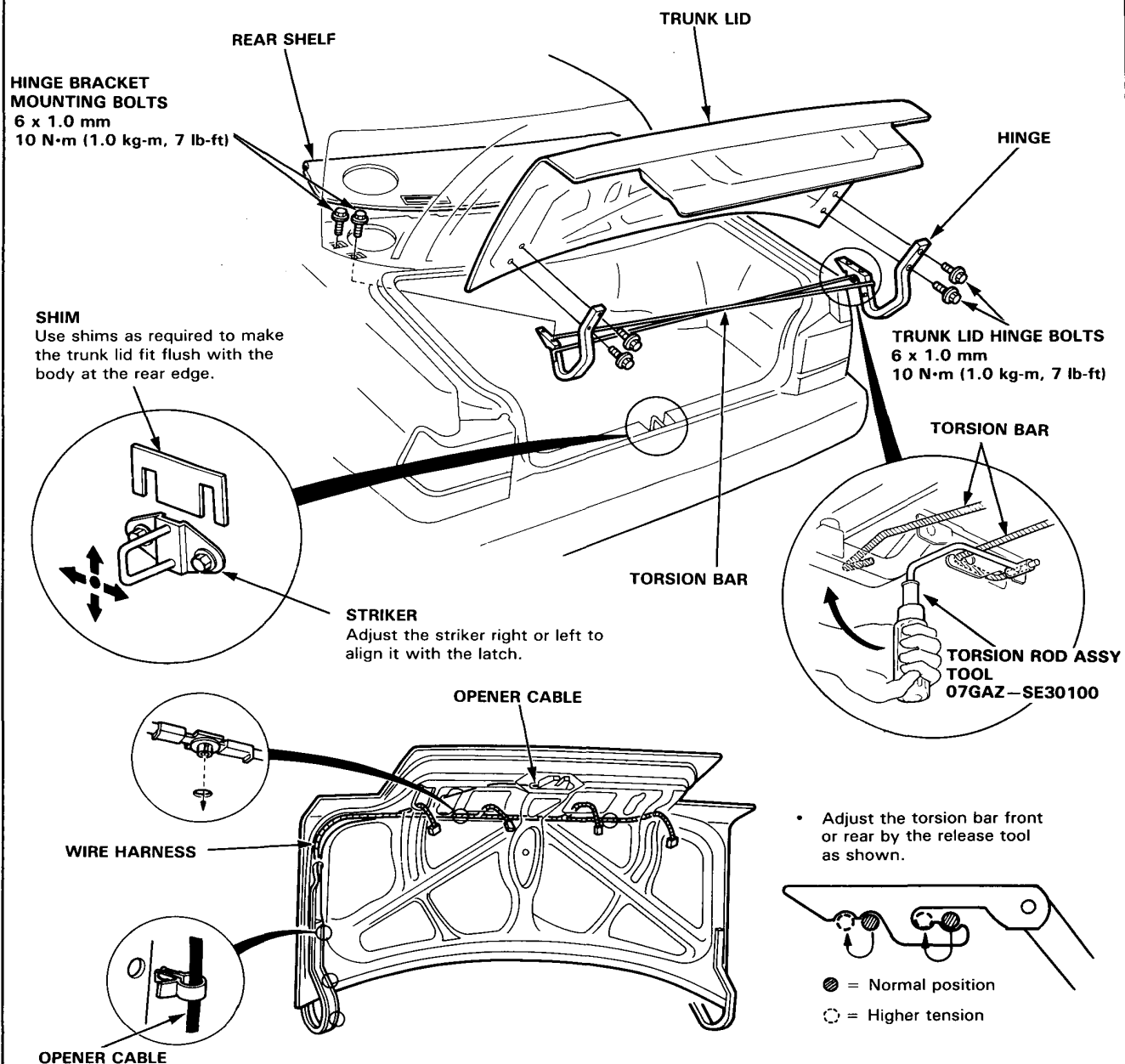
## Replacement/Adjustment

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

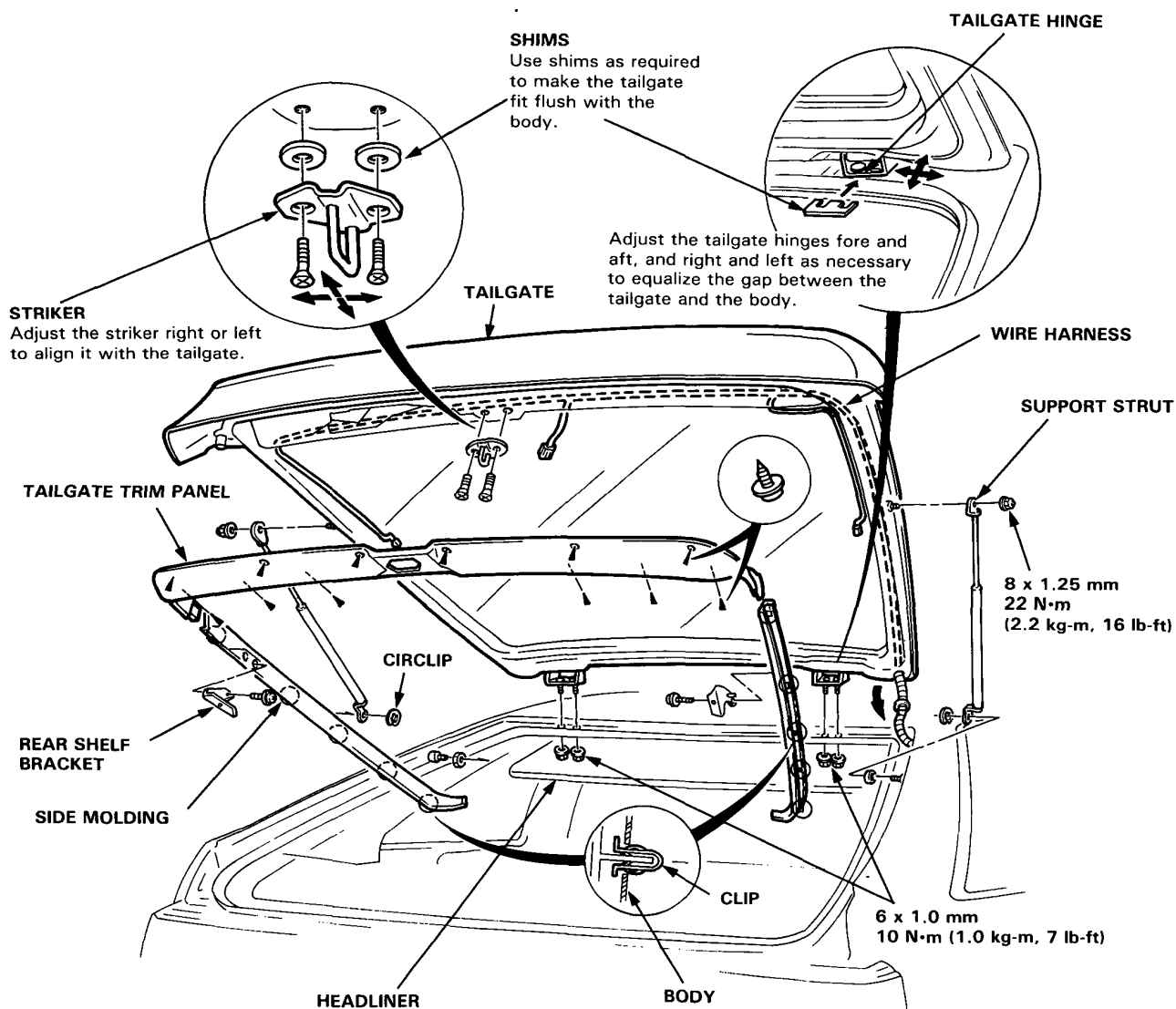
### Glass Back

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.

#### SUPPORT STRUT MOUNTING BOLTS

6 x 1.0 mm  
10 N·m (1.0 kg-m, 7 lb-ft)

#### SUPPORT STRUT CIRCLIP

#### WASHER TUBE

#### HINGE MOUNTING NUTS

6 x 1.0 mm  
10 N·m (1.0 kg-m, 7 lb-ft)

#### WIRE HARNESS

#### TAILGATE

#### STRIKER

#### TAILGATE HINGE

#### STRIKER

Adjust the striker right or left to align it with the tailgate.

#### SHIMS

Use shims as required to make the tailgate fit flush with the body.

6 x 1.0 mm  
10 N·m (1.0 kg-m, 7 lb-ft)



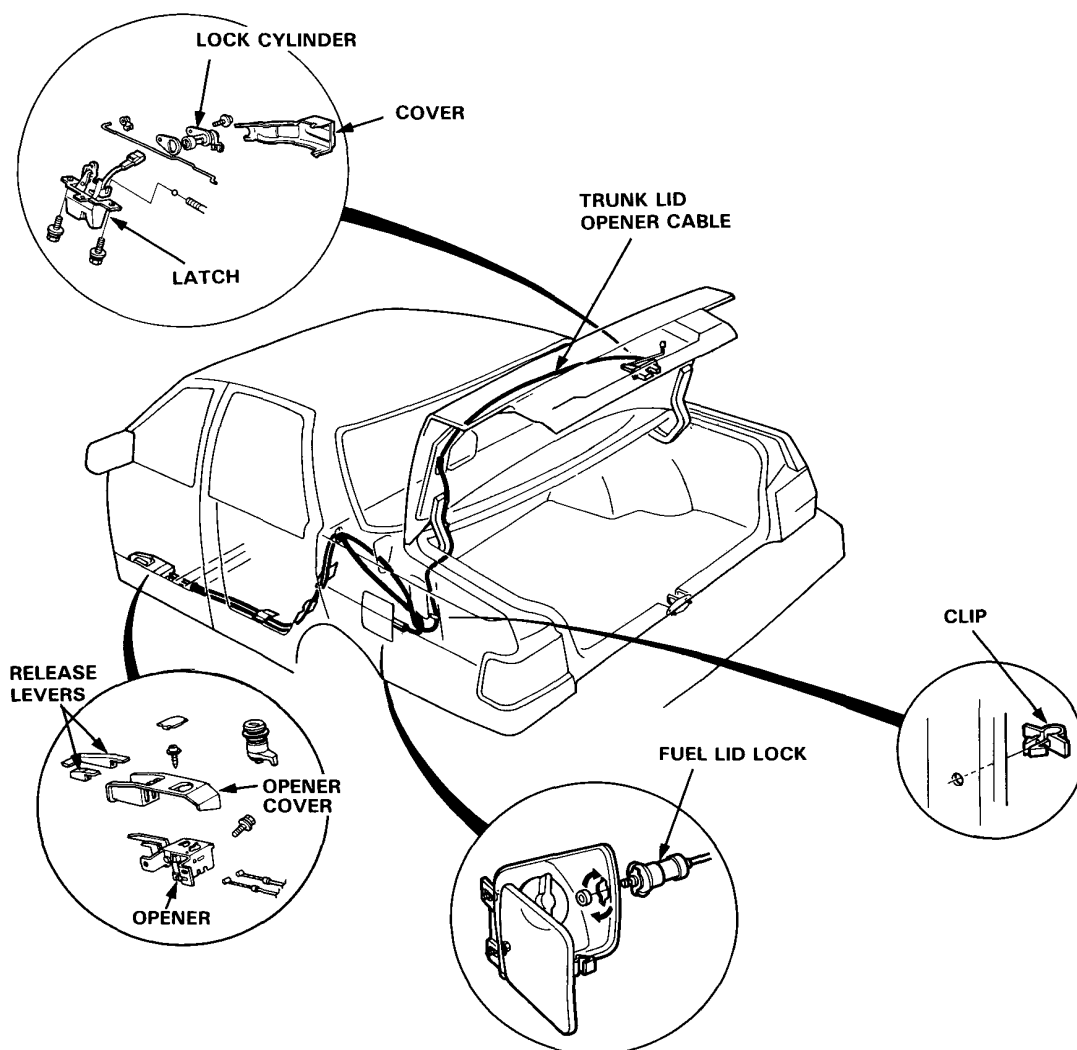


# Opener and Latch

## 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)

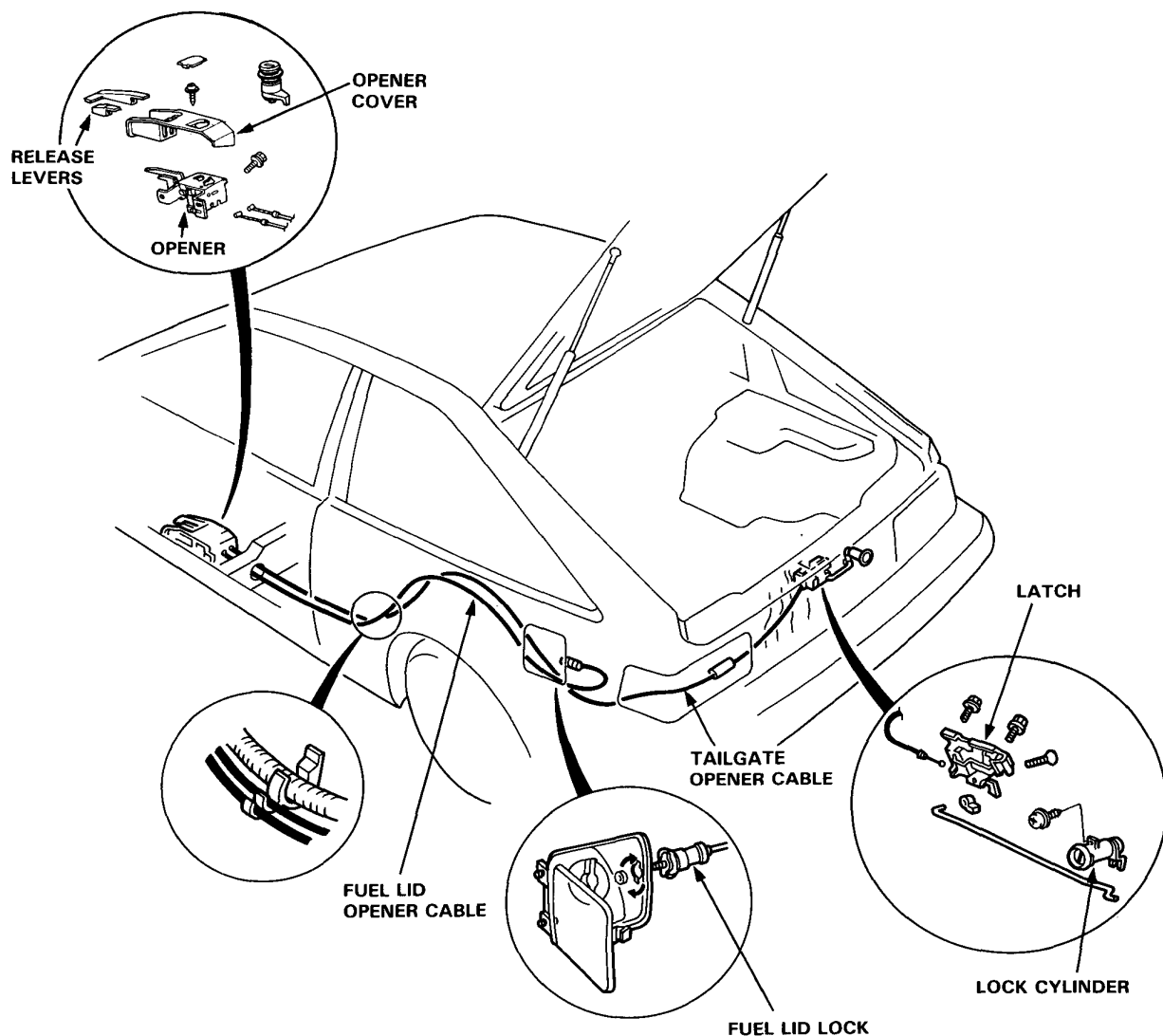


# Opener and Latch

## 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 following 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.



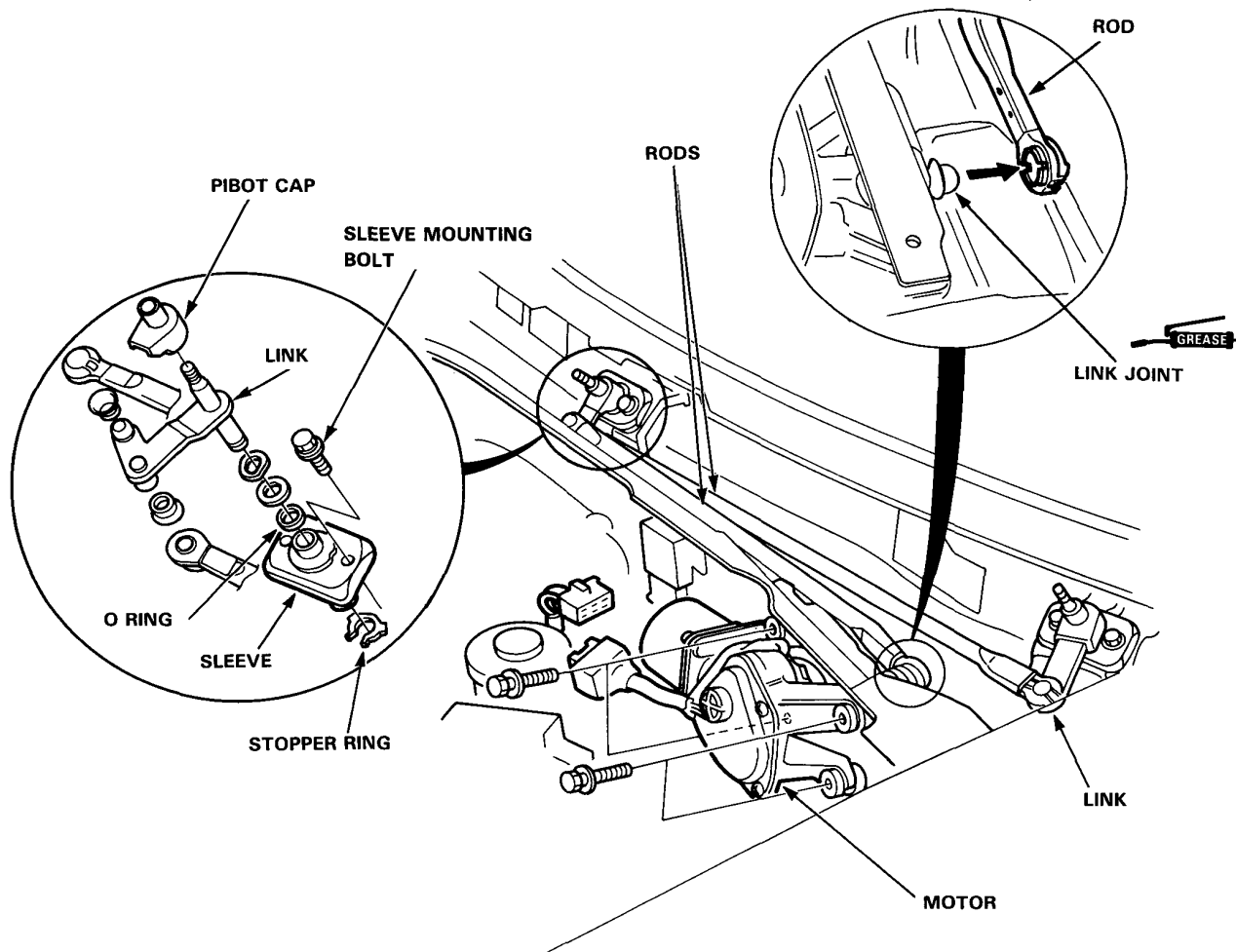
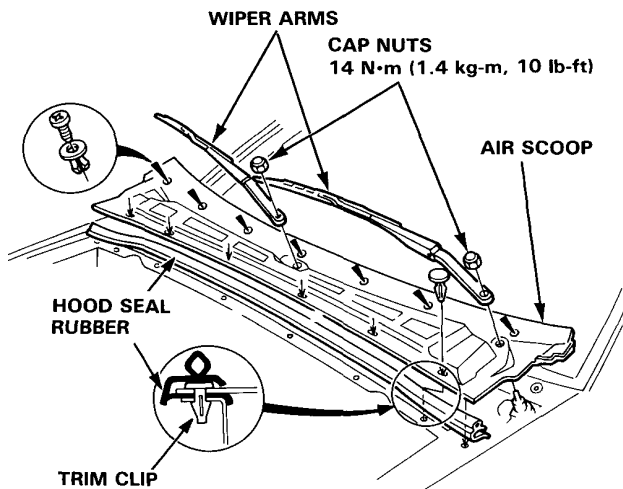


# Wiper



## Front Wiper and Motor Replacement

1. Remove the cap nuts and remove the wiper arms.
2. Remove the trim clips, then remove the air scoop.
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.

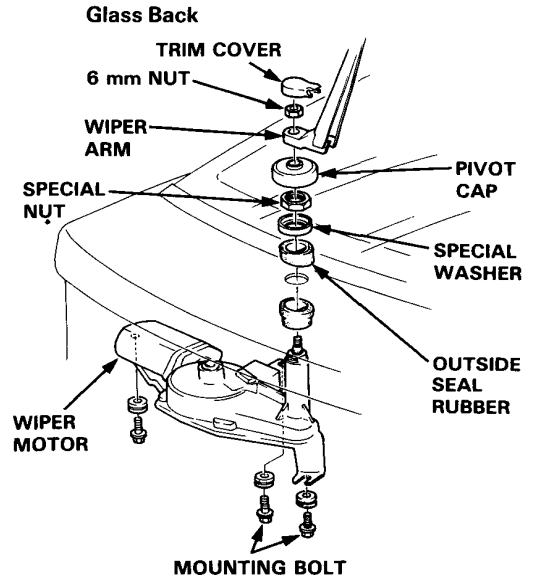
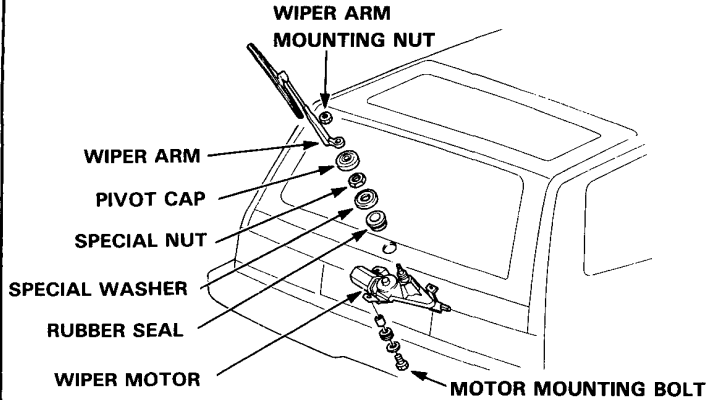


# Wiper

## 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



## Wiper Arm Installation and Travel

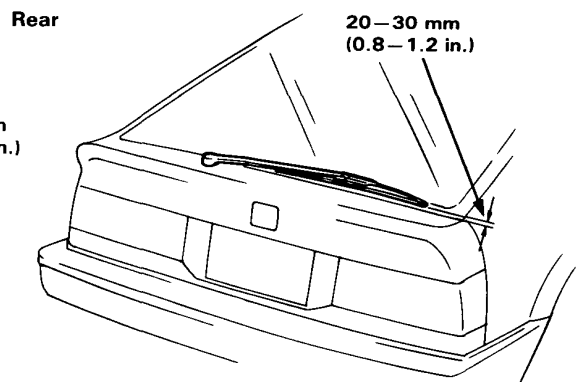
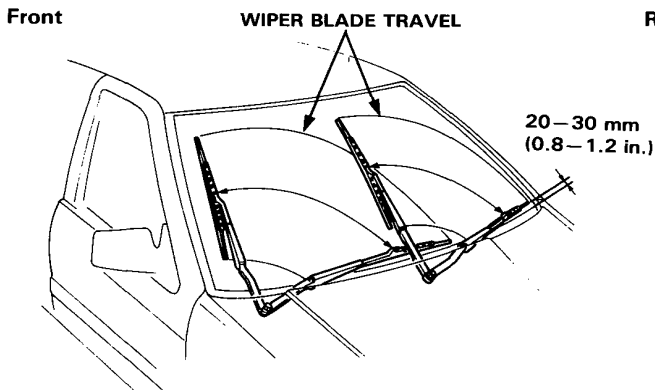
Adjust the wipers so the tips are 20–30 mm (0.8–1.2 in.) from the air scoop at rest.

### Wiper Blade Travel

Front:  $80^{\circ} \pm 2^{\circ}$  on driver side  
 $92^{\circ} \pm 2^{\circ}$  on passenger side

Rear:  $170^{\circ} 30' \pm 3^{\circ}$  Glass Back  
 $108^{\circ} \pm 5^{\circ}$  Aerodeck

Headlight:  $160^{\circ} \pm 3^{\circ}$



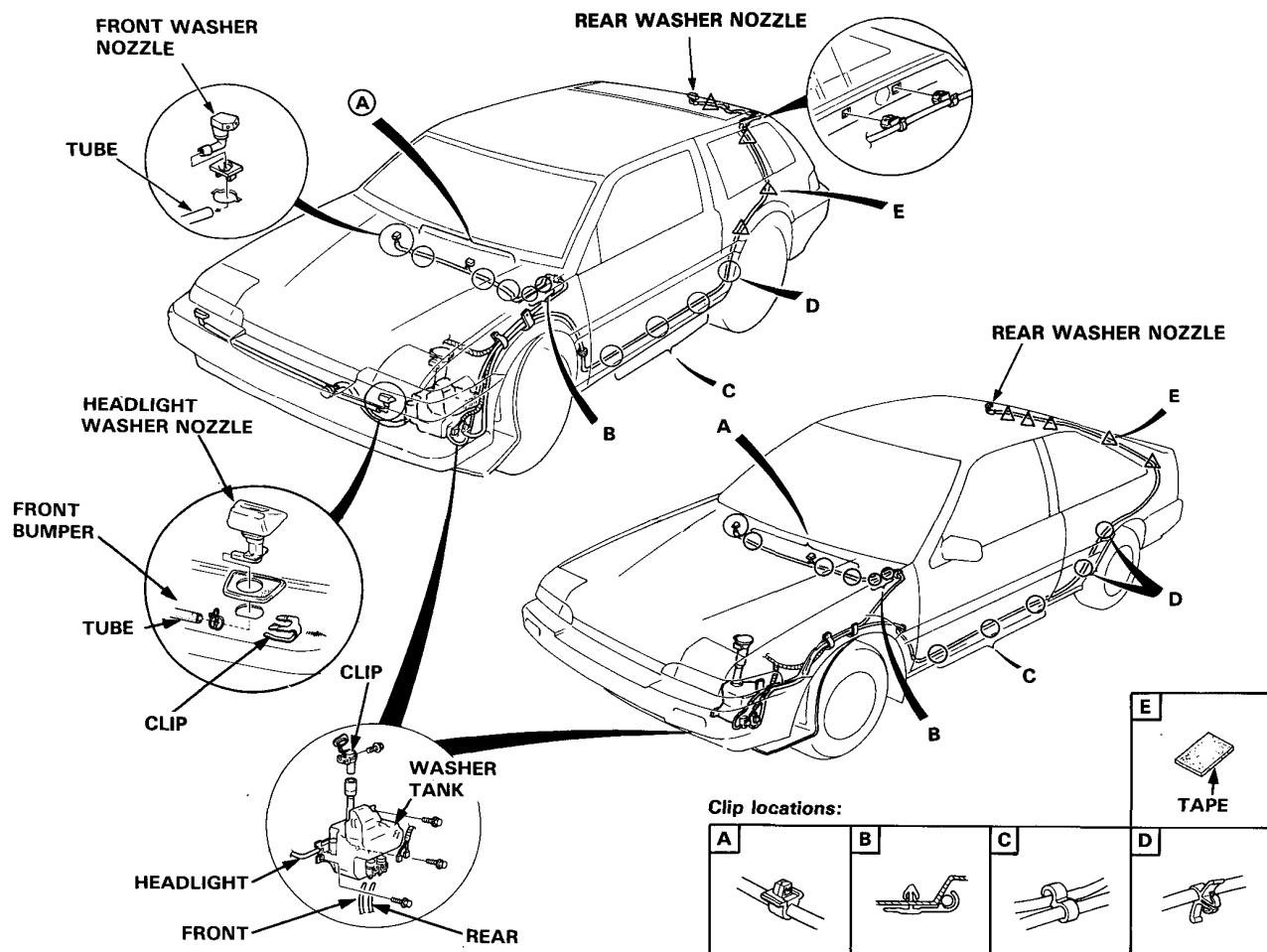




# Washer System

## Replacement

1. Remove the front bumper (page 21-89), then remove the washer 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:

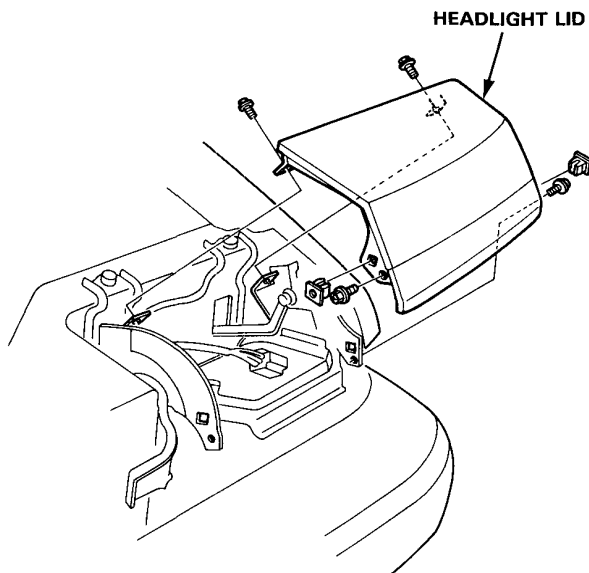
- Install the tubes with the washer motor wire harness and cabin harness.
- When reinstalling the inner parts, take care not to pinch the tubes.
- Install the gromets firmly.
- Attach the tube inside the engine room firmly.
- After installation, check the position of washer nozzle.



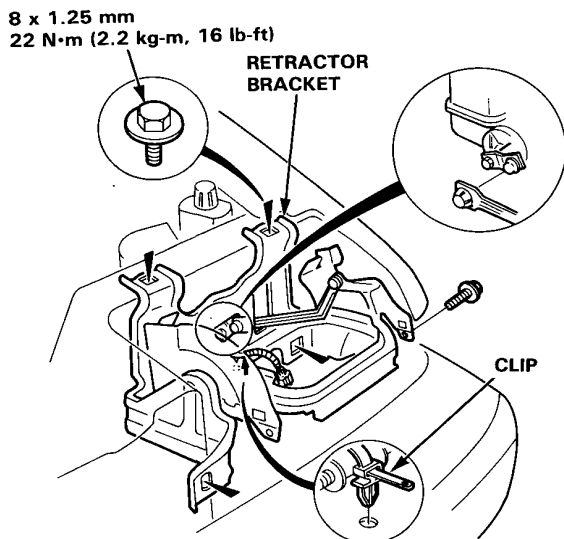
# Retractor Motor

## Replacement

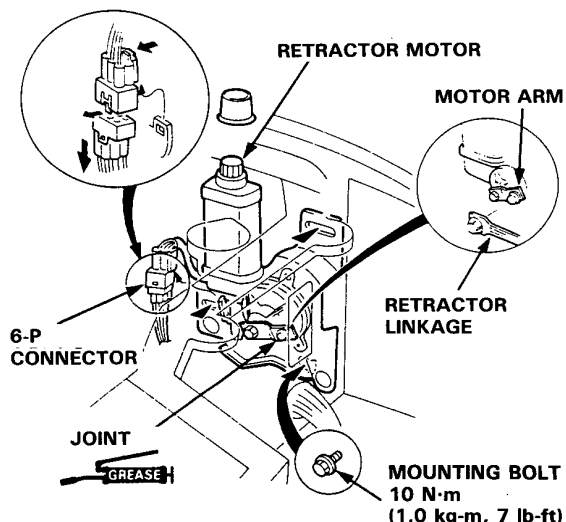
1. Remove the headlights (page 21-101).
2. Remove the position lights (page 21-104).
3. Shut the retractable light, then remove the 4 bolts and 2 clips, then remove the Headlight lid.



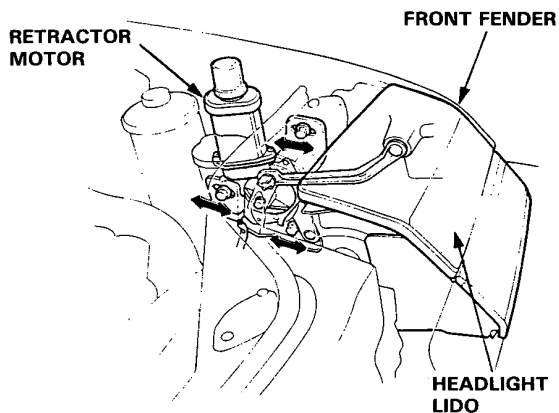
4. Remove the 2 clips, then disconnect the joint of the motor and link and remove the 5 bolts, then remove the retractable bracket.



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

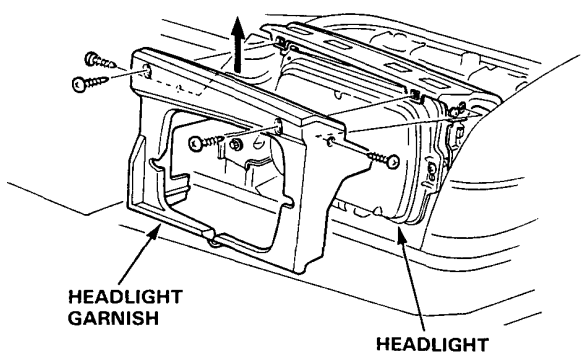


## Replacement (Retractable Headlight)

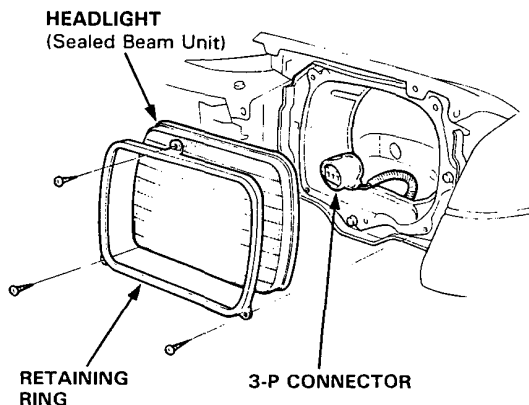
### CAUTION:

- Halogen headlights can become very hot in use; do not touch them or the attaching hardware immediately 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.

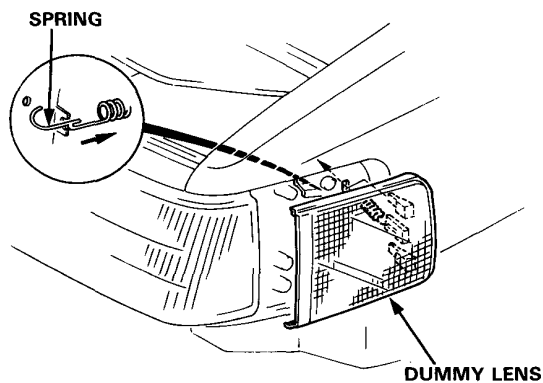


## Replacement (Other Headlight)

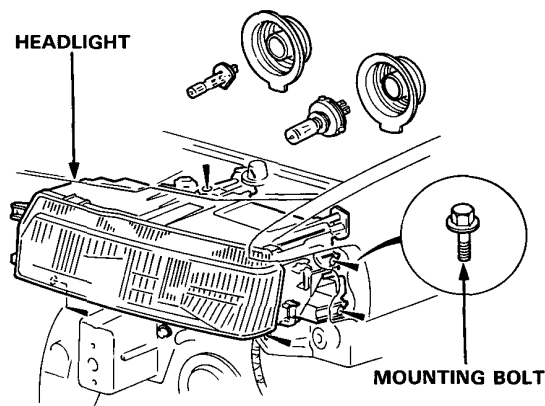
### CAUTION:

- Halogen headlights can become very hot in use; do not touch them or the attaching hardware immediately 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.



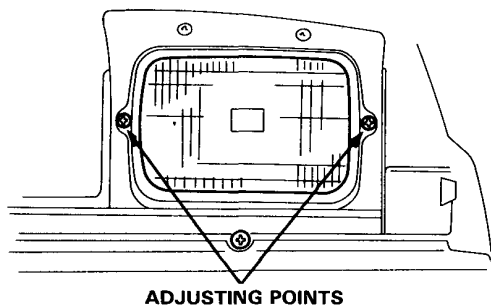


# Headlights

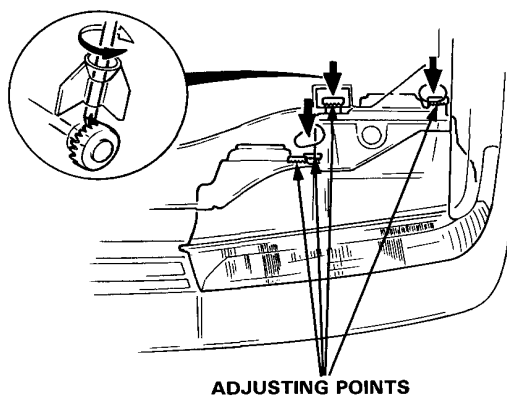
## Adjustment

NOTE: Adjust headlight to local requirements.

Retractable model:

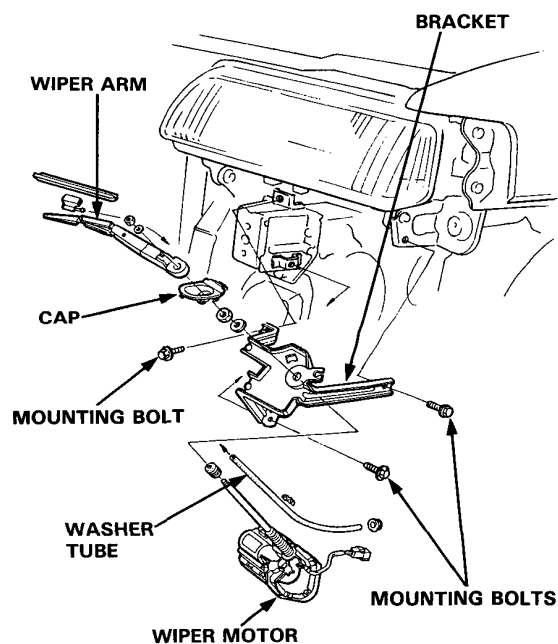


Other models:



## 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.



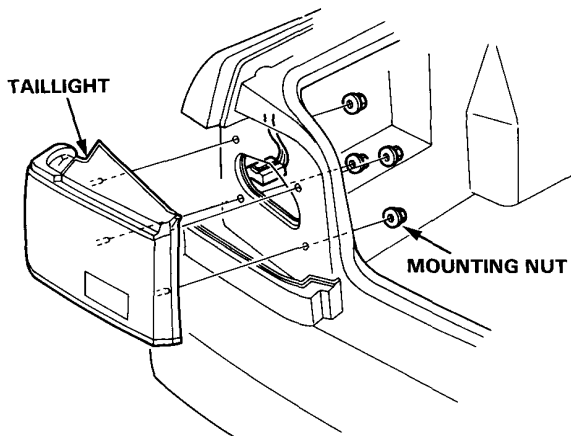


# Lights

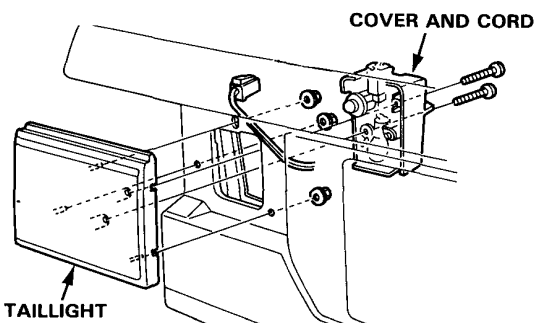


## Taillights Replacement

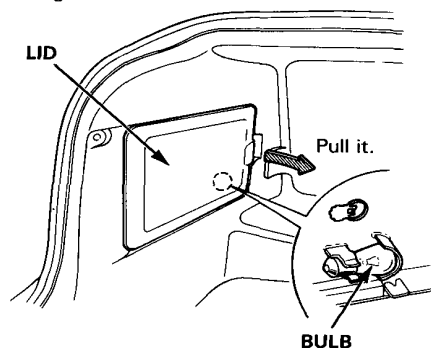
1. Remove the rear trim panel (pages 21-63, 64 and 65).
2. Remove the trunk side panel or rear side trim panel (pages 21-63, 64 and 65).
3. Disconnect the wire harness and remove the 4 nuts, then remove the taillight.



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.

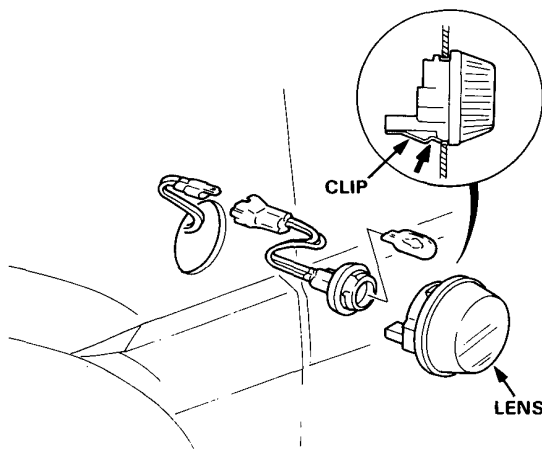


6. If necessary, replace the bulb by removing the tail-light lid.



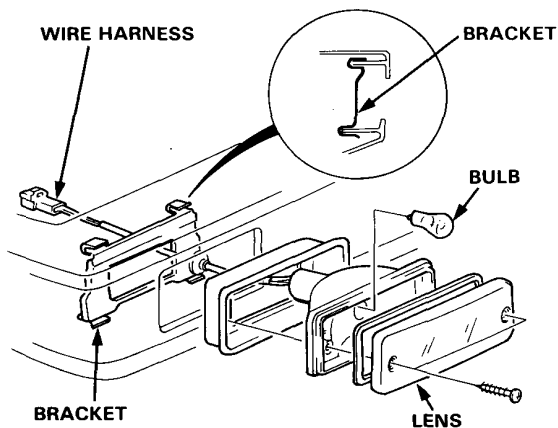
## Side Turn Light Replacement

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.

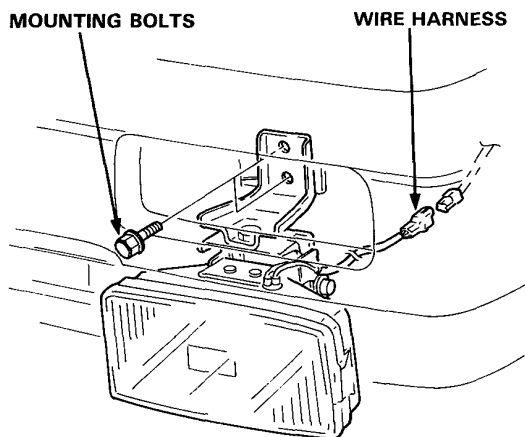




# Lights

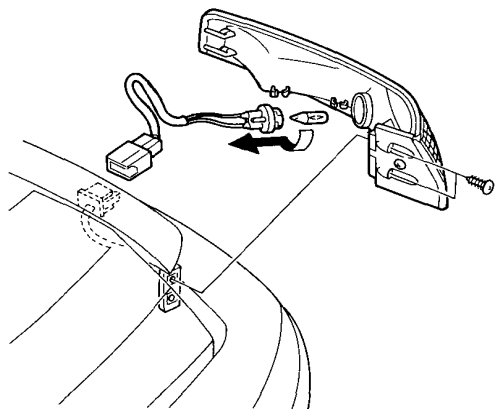
## Day Light System Replacement

1. Disconnect the wire harness.
2. Remove the 2 bolts, then remove the day light system.



## Position Light Replacement

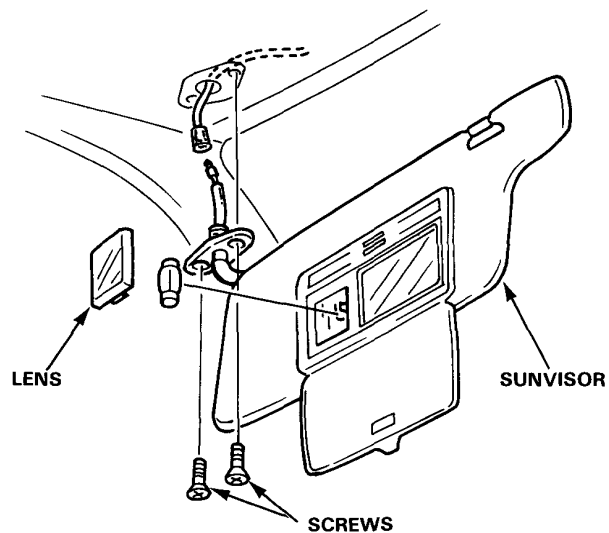
1. Remove the 2 screws and slide the position light to the front, then remove it.
2. Disconnect the wire harness.



## Interior Light Replacement

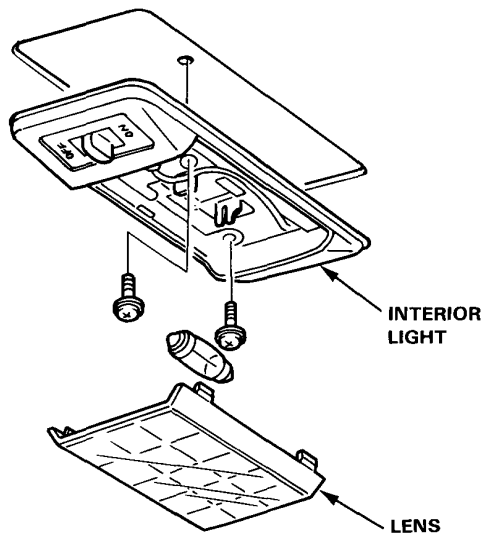
### VANITY MIRROR LIGHT

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.

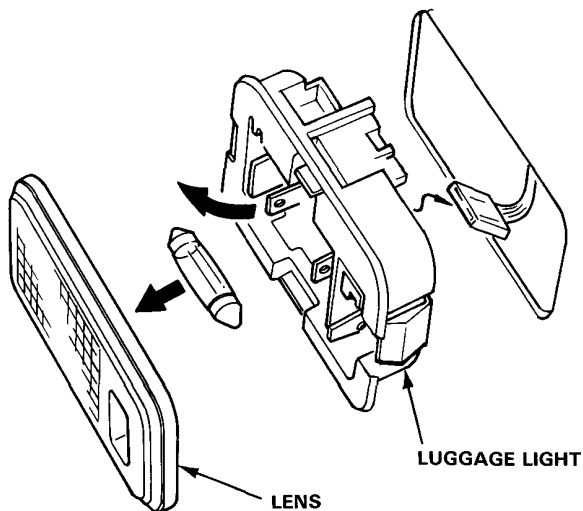






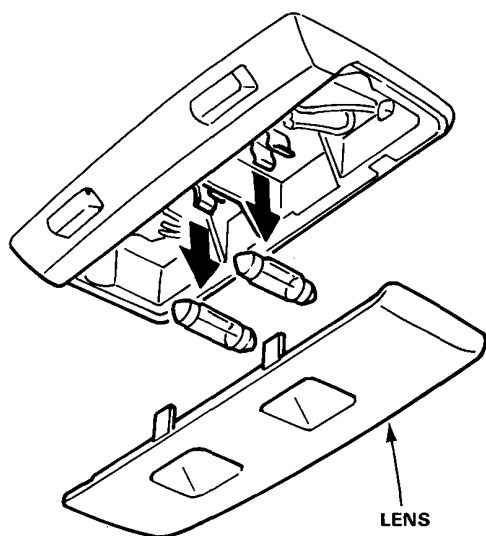
### LUGGAGE LIGHT

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.



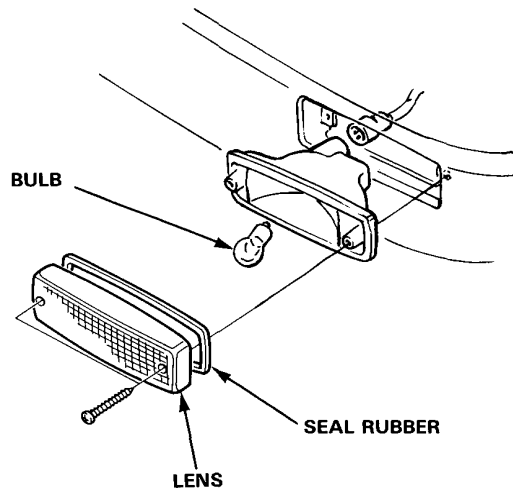
### SPOT LIGHT

1. Pry off the spot light lens.
2. Remove the screws and the housing.
3. Disconnect the 2-P connector from the housing.



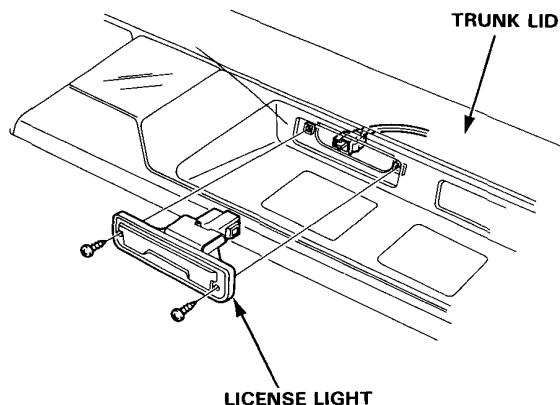
### Front Turn/Position Light Replacement

Remove the 2 screws and disconnect the wire harness, then remove the front turn/position light.



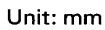
### License Light Replacement

Remove the 2 screws and disconnect the wire harness, then remove the license light.





**21-106**





## Heater and Air Conditioner

Heater .....	22-2
Air Conditioner .....	23-2





## Heater

Illustrated Index .....	22-2
Heater Door positions .....	22-4
Circuit Diagram .....	22-5
Connector information .....	22-6
Blower Replacement/Disassembly .....	22-7
Heater Assembly Replacement (Button Type) .....	22-8
Heater Assembly Replacement (Lever Type) .....	22-9
Heater Core Replacement/Overhaul ....	22-10
Heater Cable Adjustment and Installation .....	22-11
Heater Control Removal .....	22-12
Heater Control Disassembly .....	22-13
FAN Switch Test .....	22-14
REC Switch Test .....	22-14
Control Panel Test .....	22-15
Heater Control Troubleshooting .....	22-16
Recirculation Control Motor Testing ....	22-17
Function Control Motor Testing .....	22-17





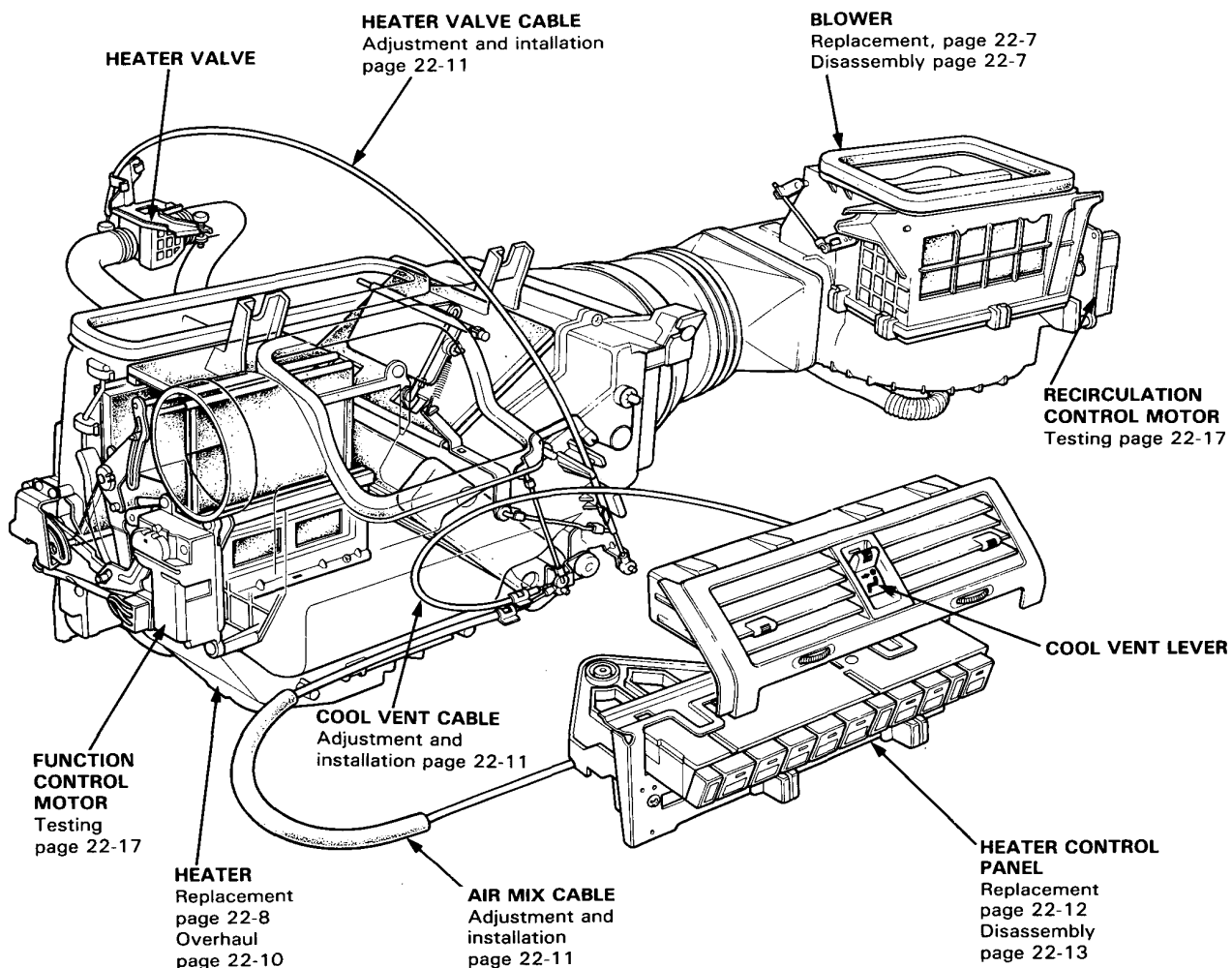
# Heater

## Illustrated Index

### Button Type:

#### NOTE:

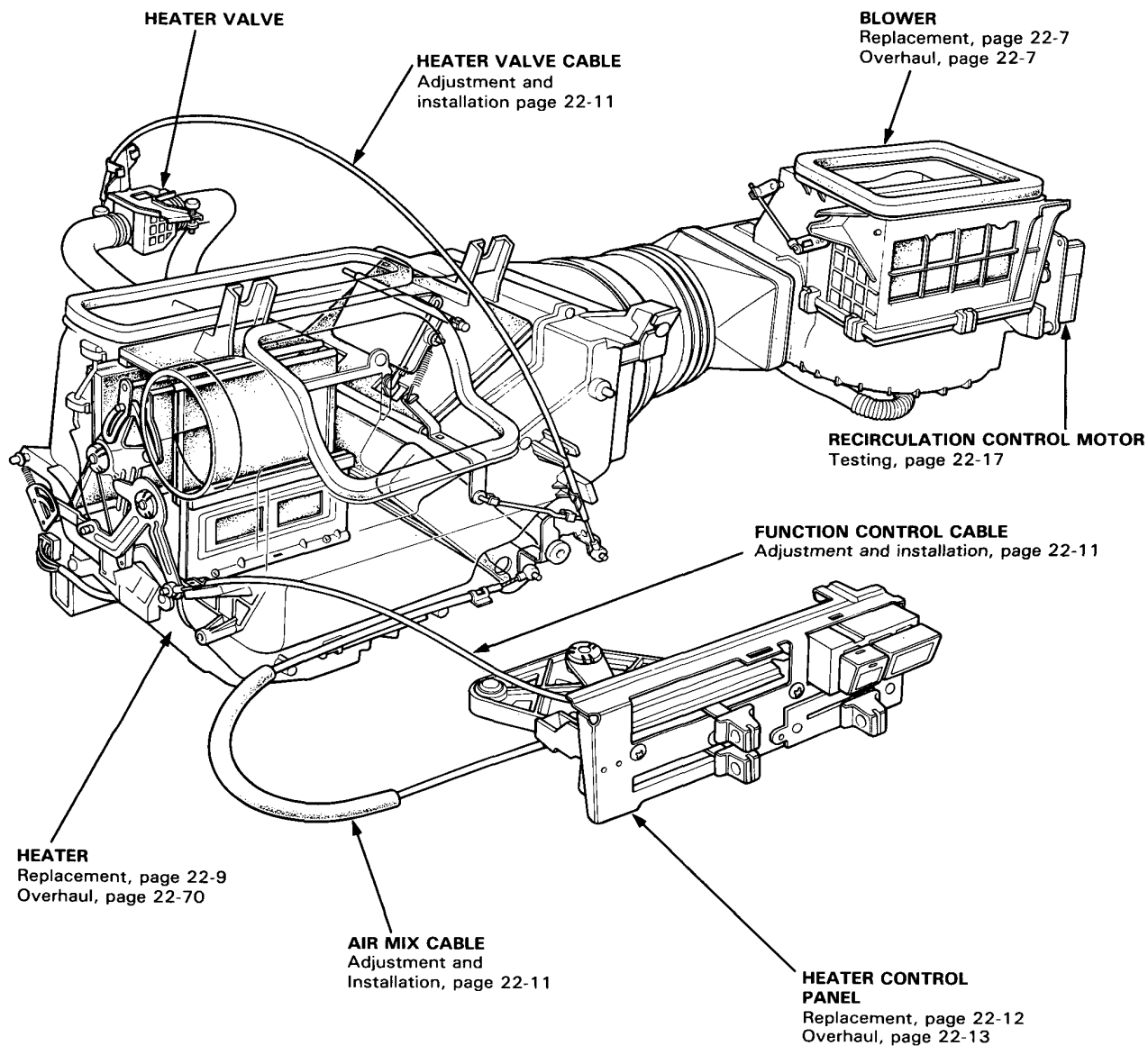
- These illustrations show the L.H. Drive car. The R.H. Drive car is, with a partial exception, contrast to this illustration.







## Lever Type:



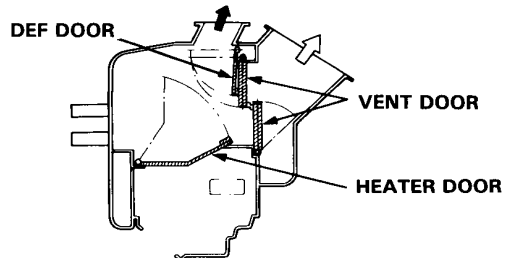
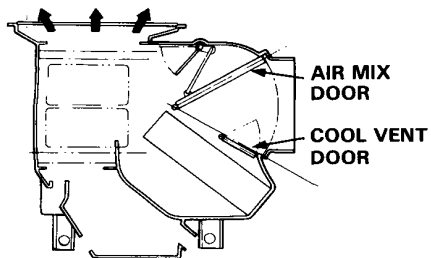


# Heater

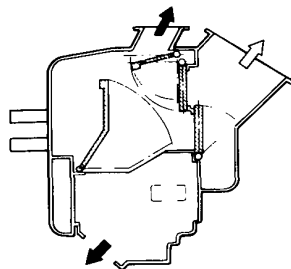
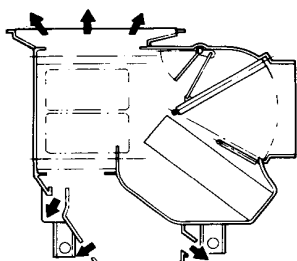
## Heater Door Positions

Front View

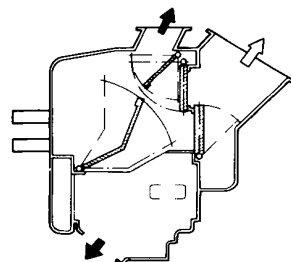
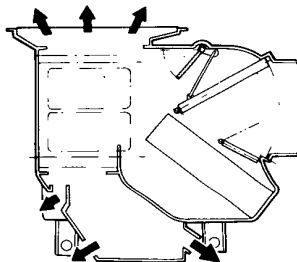
Side View



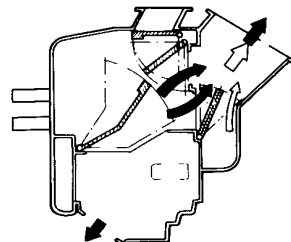
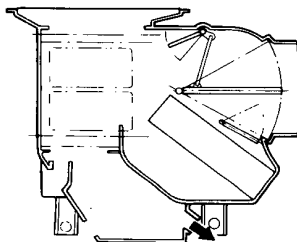
H/DEF



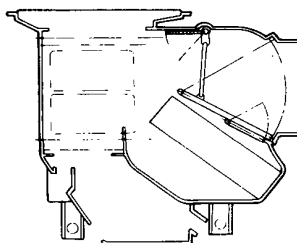
HEAT



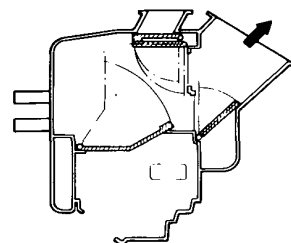
HI-LO



VENT



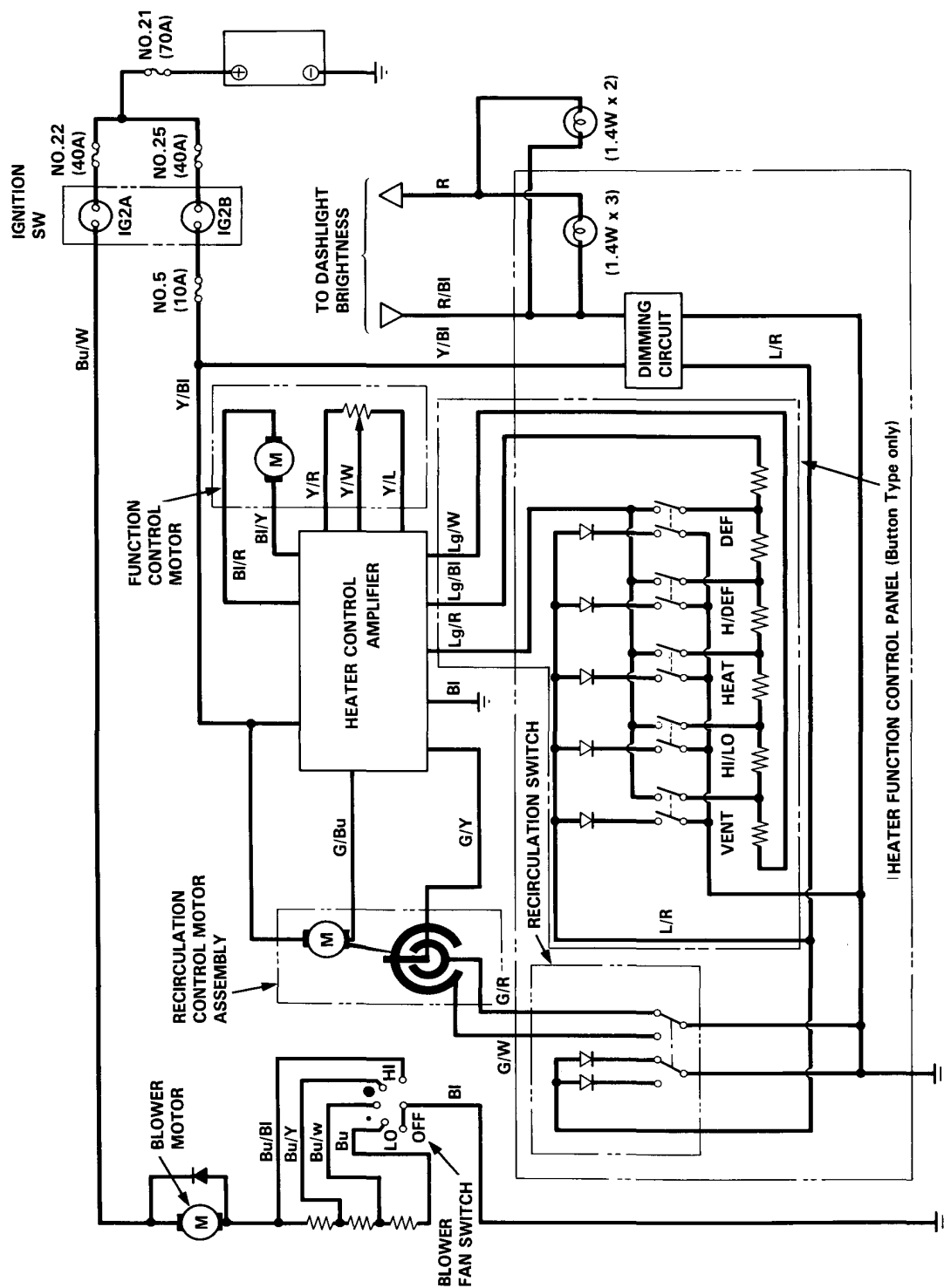
Cool VENT  
open only







## Circuit Diagram





# Heater

## Troubleshooting/Connector Information

If air flows abnormally, test follows:

### 1. Motor Test:

- Function control motor page 22-17.
- Recirculation control motor page 22-17.

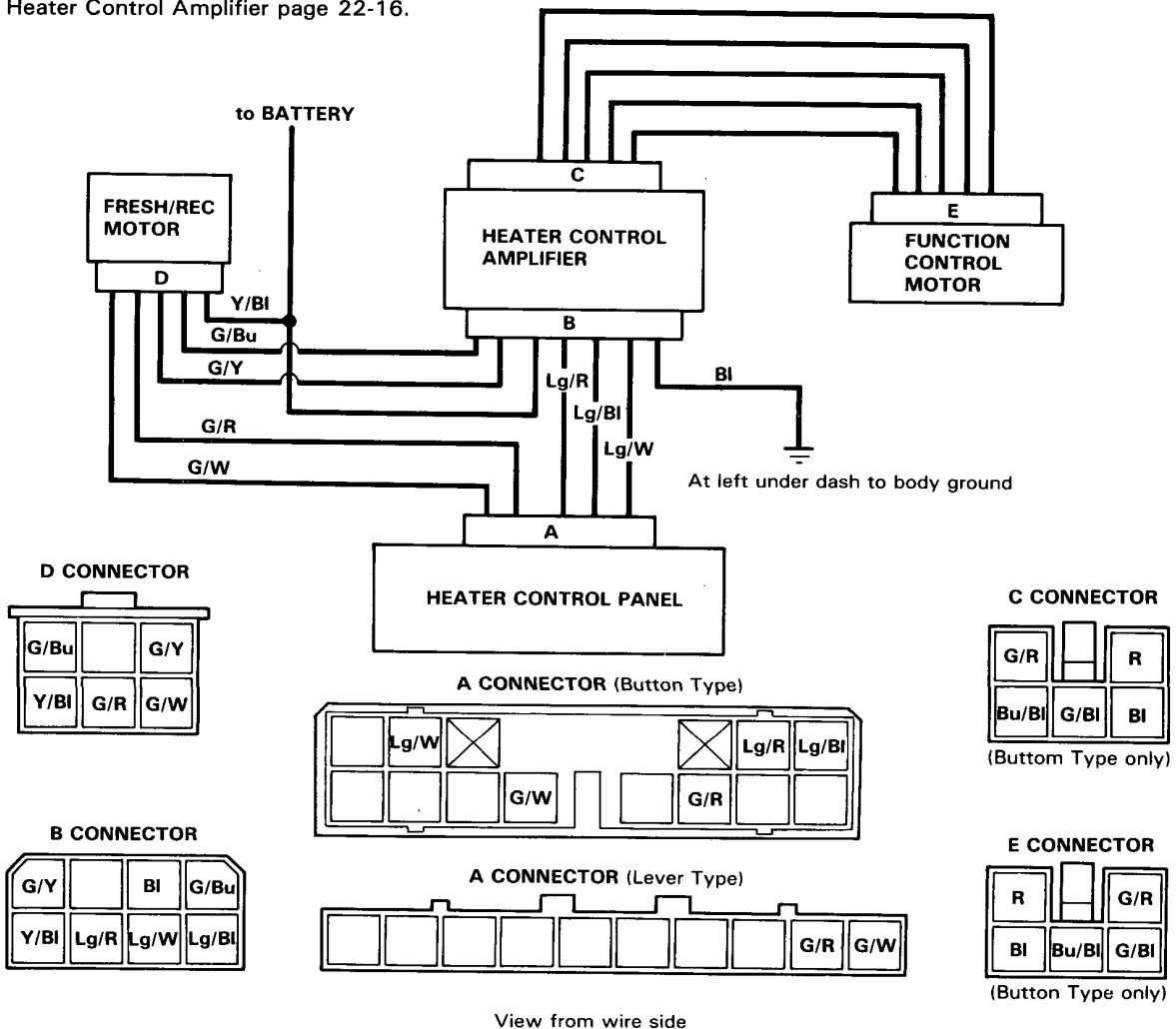
### 2. Control Panel Switch Test:

- 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.

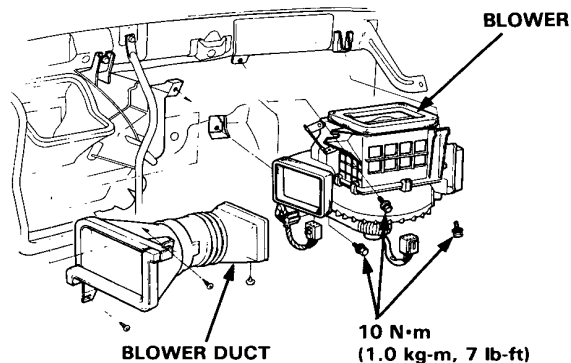






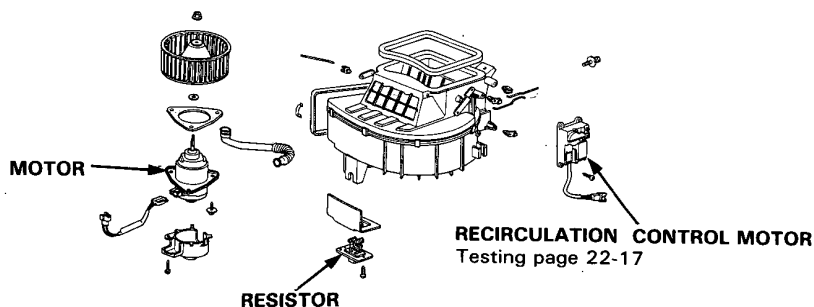
## Blower Replacement

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.

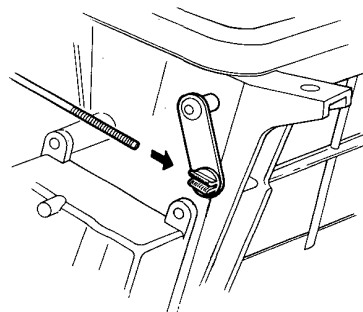
## Blower Overhaul



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

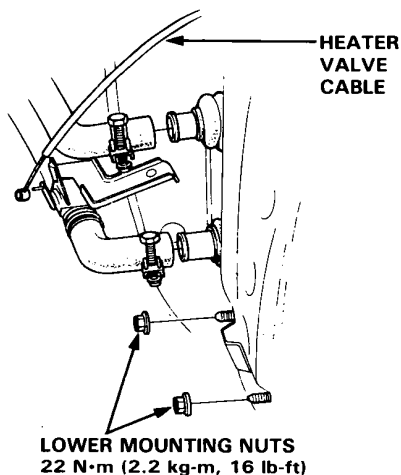
## Heater Assembly Replacement

### 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.

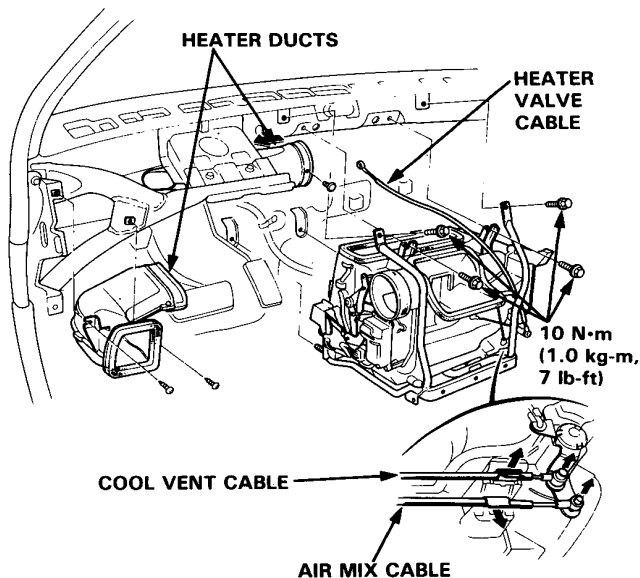
3. Disconnect the heater valve cable from the heater valve.



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 connector.

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).



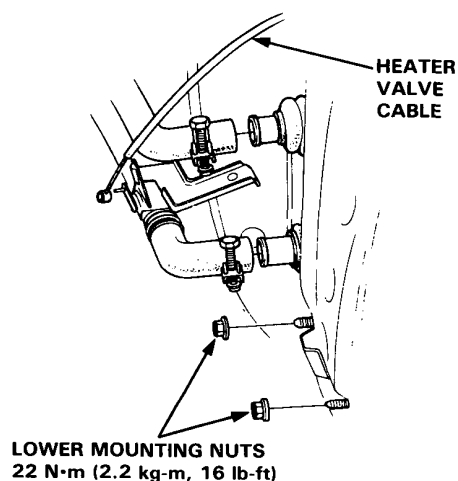


### Lever Type:

1. Drain coolant at the radiator.
2. Disconnect the heater hoses at the firewall.

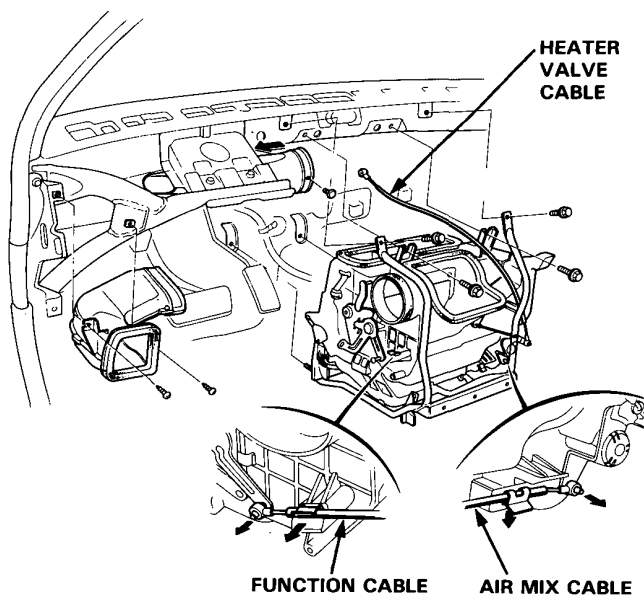
NOTE: Coolant will run out when the hoses are disconnected, drain it into a clean drip pan.

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).



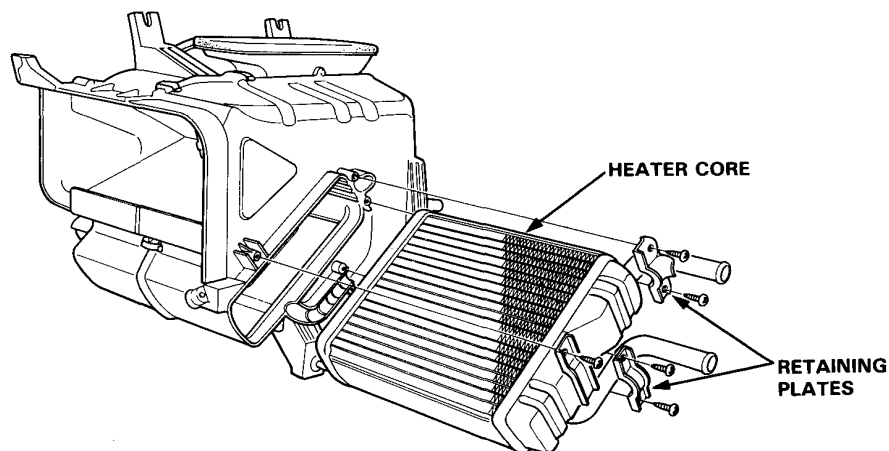
# Heater

## Heater Core Replacement/Overhaul

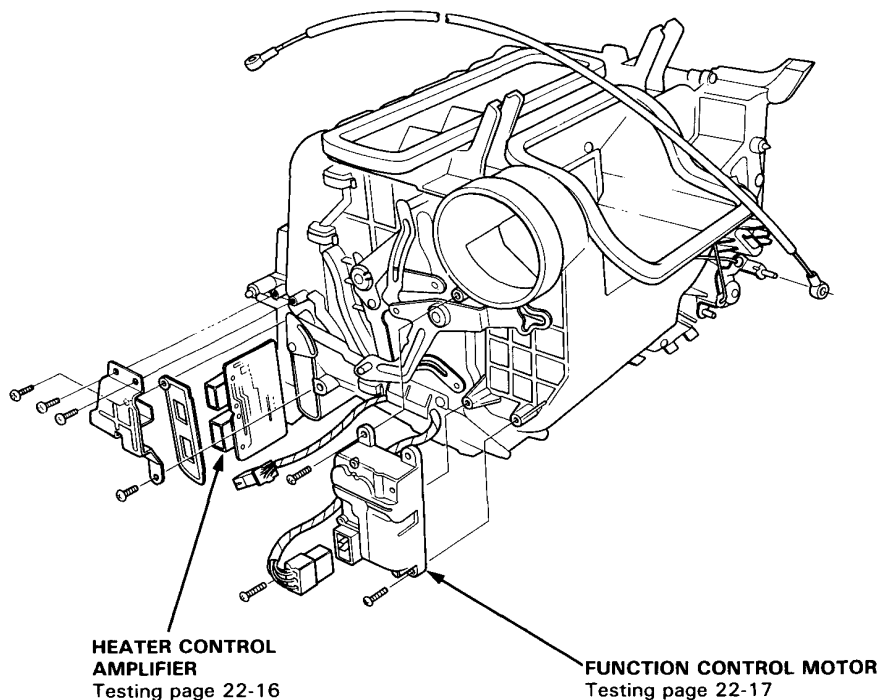
1. Remove the heater assembly (page 22-8 or 9).
2. Remove the set tapping screws and retaining plates.
3. Pull out the heater core from the heater housing.

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





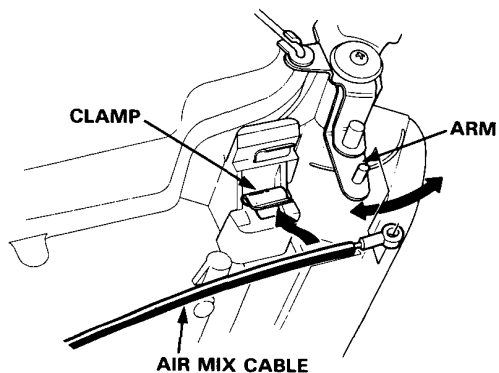


## Control Cable Adjustment and Installation

NOTE: L.H. Drive car shown, R.H. Drive car is similar.

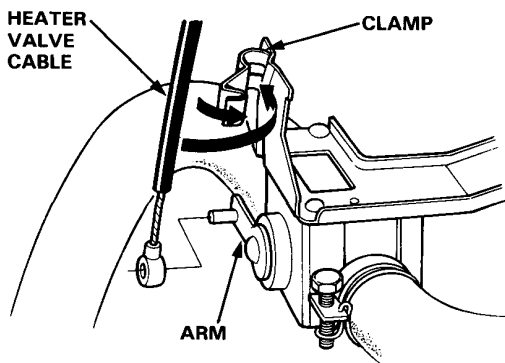
### Air Mix Cable

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.



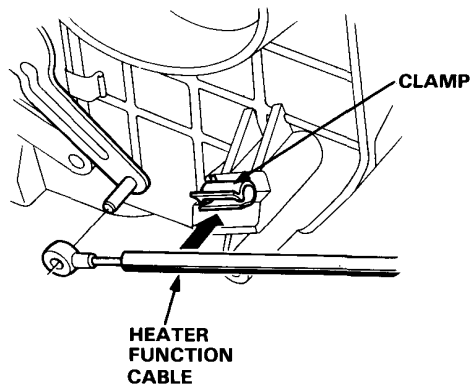
### Heater Valve Cable

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.



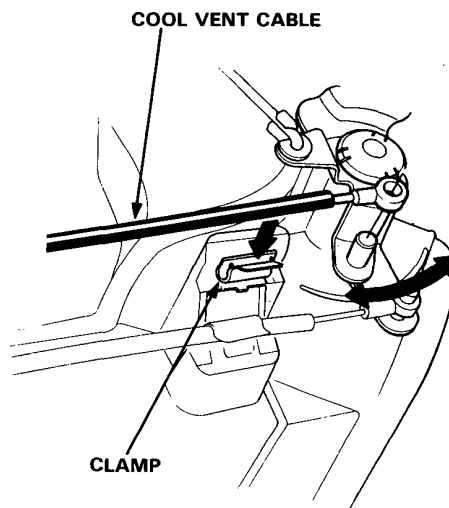
### Heater Function Cable (Lever Type only)

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.



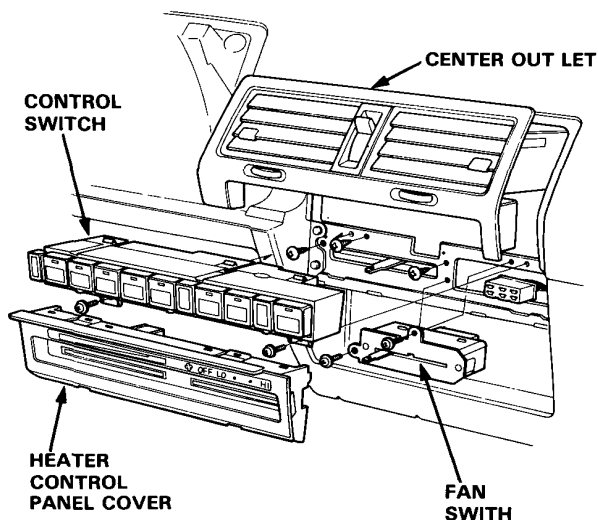


# Heater

## Heater Control Removal

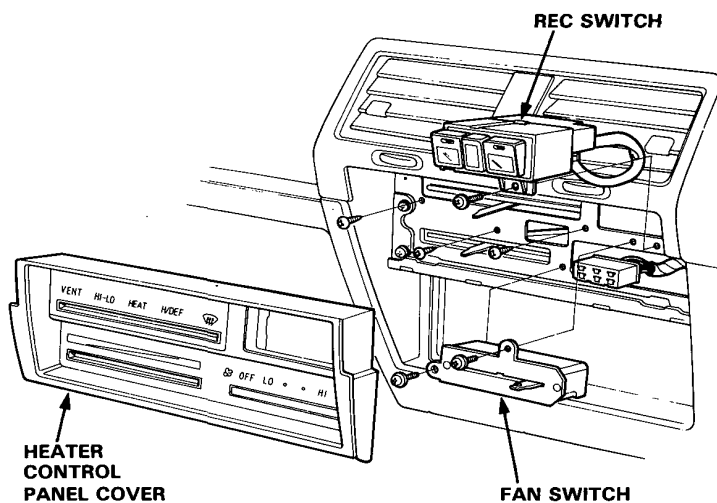
### Button Type:

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.

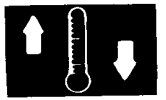


### Lever Type:

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.

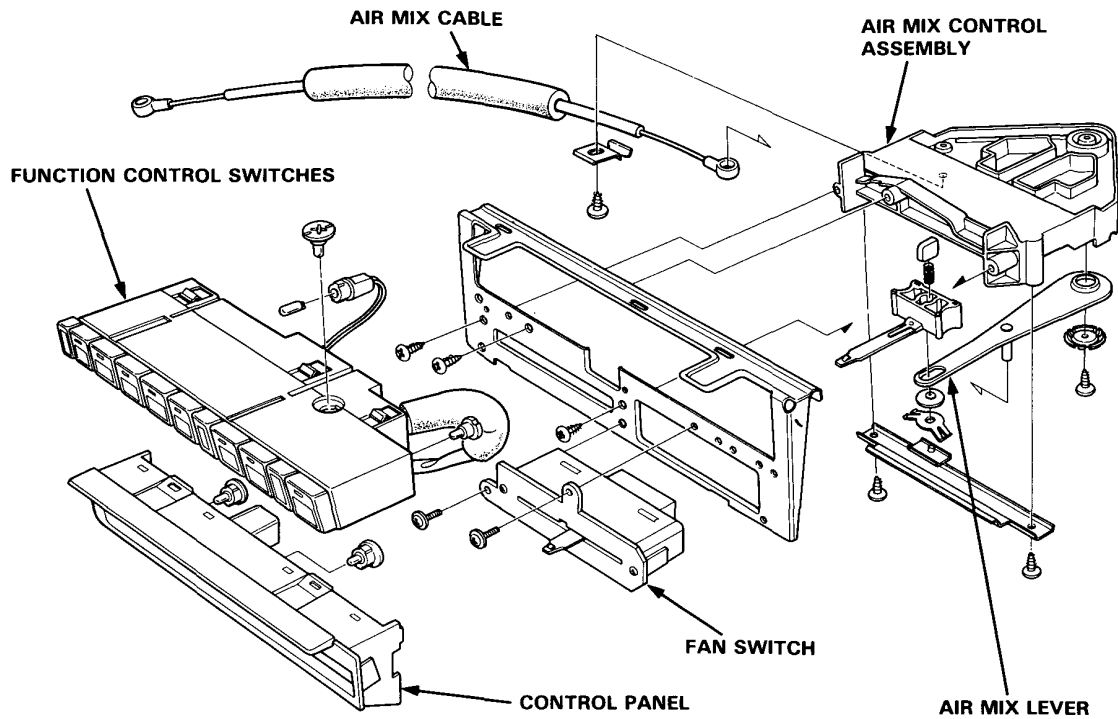




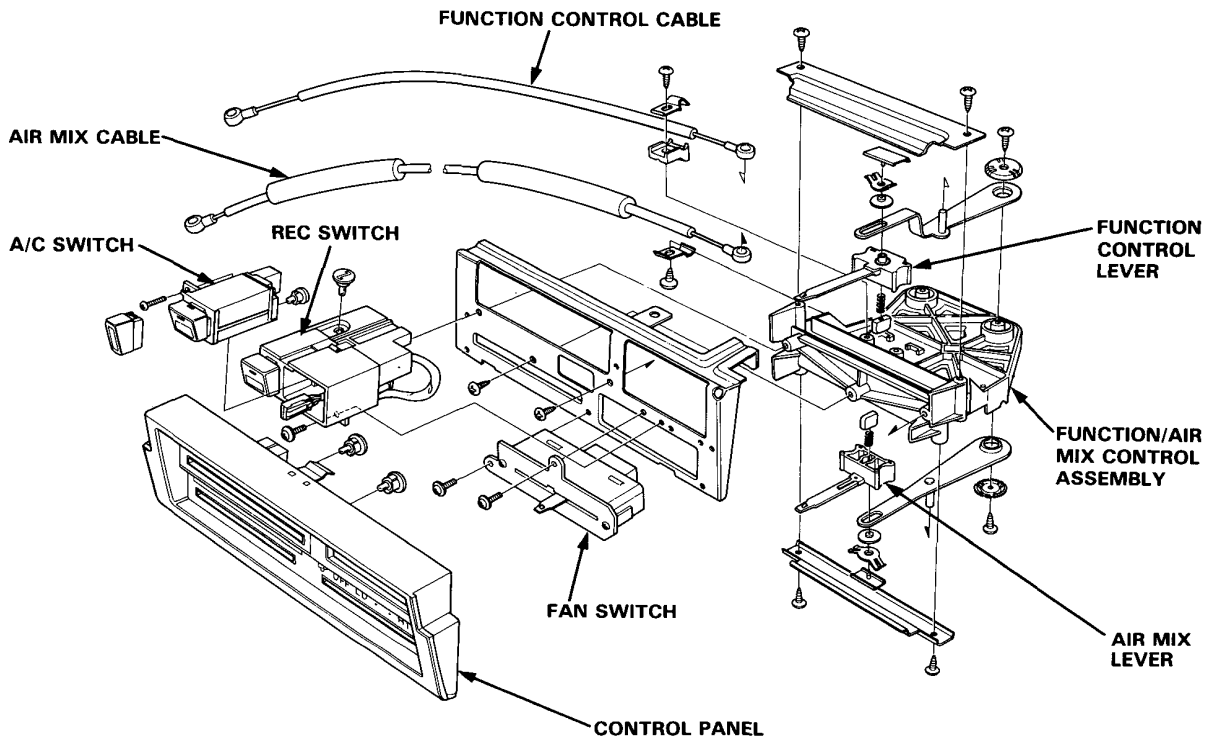


## Heater Control Disassembly

### Button Type:



### Lever Type:



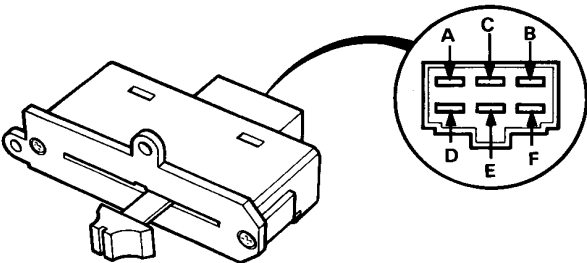


# Heater

## Fan Switch Test

Check for continuity between the terminals as shown in the chart:

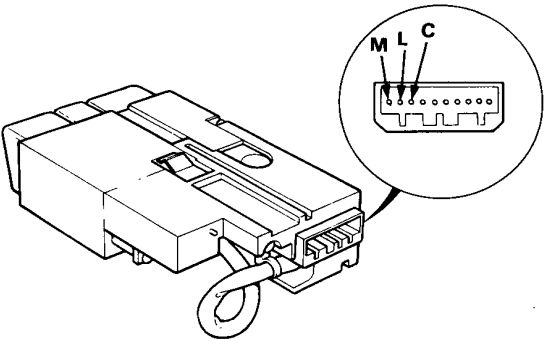
Terminal Position	A	B	C	D	E	F
OFF						
LO	○	○	○			
•	○	○		○		
●	○	○			○	
HI	○	○				○



## REC Switch Test (Lever Type)

Check for continuity between the terminals, as shown in the chart:

		L	C	M
REC	inside air	○	○	
	outside air		○	○





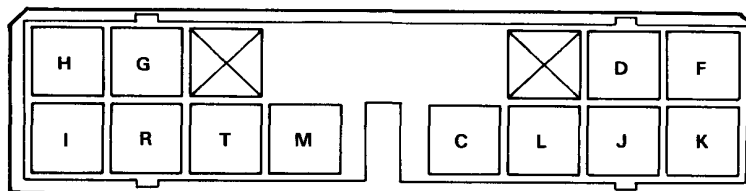


## Control Panel Test (Butlon Type)

### FRESH/REC Switch

Check for continuity between the terminals, as shown in the chart:

Position \ Terminal	L	C	M
REC			
FRESH			



### Function Switch

Check resistance between the terminals, as shown in the chart:

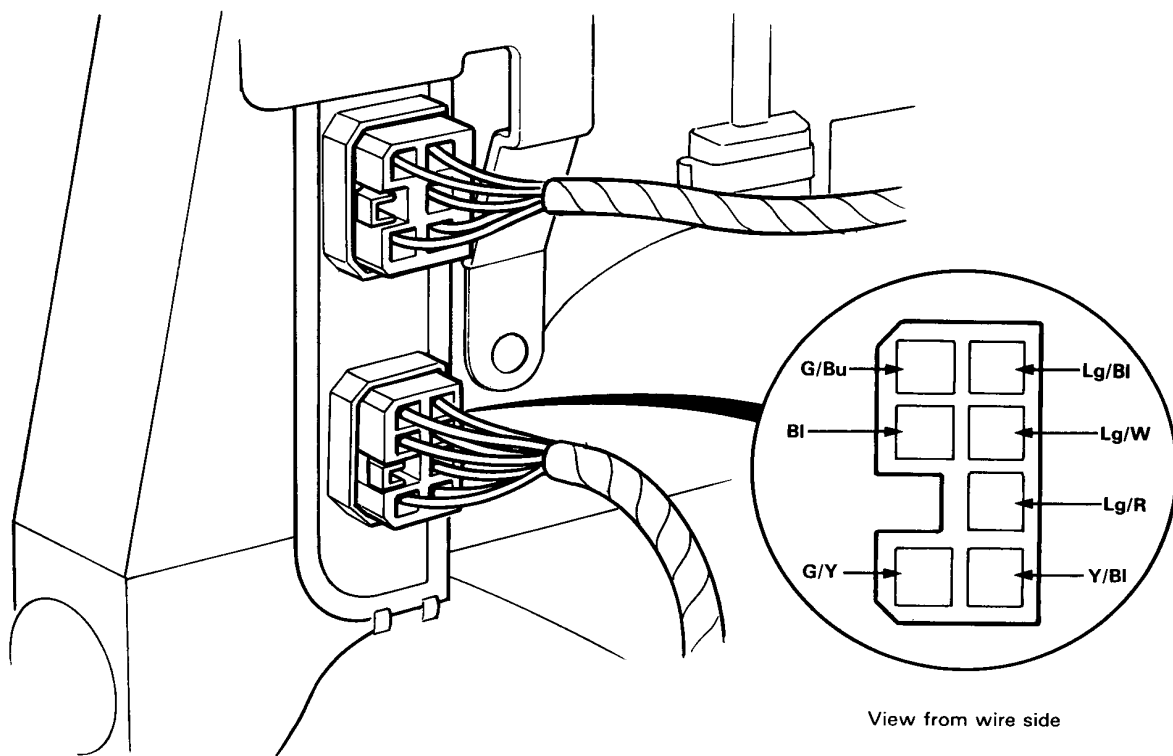
Position \ Terminal	Terminal G to D	Terminal G to F
VENT	Approx: 2.0K $\Omega$	Approx: 5.9K $\Omega$
HI-LO	Approx: 3.2K $\Omega$	Approx: 5.9K $\Omega$
HEAT	Approx: 4.2K $\Omega$	Approx: 5.9K $\Omega$
H/DEF	Approx: 4.8K $\Omega$	Approx: 5.9K $\Omega$
	Approx: 5.9K $\Omega$	Approx: 5.9K $\Omega$



# Heater

## Heater Control Troubleshooting

No.	Wire: test condition	Test: desired result	Actual result: possible cause
1	Yellow/Black (Y/BI): Ignition switch ON.	Check voltage: should have 12 volts.	<ul style="list-style-type: none"> <li>• If not, there is an open in Y/BI.</li> <li>• If there are 12 volts: proceed to No.2</li> </ul>
2	Green/Blue (G/Bu): • Ignition switch ON. • Ground to the G/Bu wire.	Check REC motor: it should run.	<ul style="list-style-type: none"> <li>• If not there is an open in G/Bu or motor.</li> <li>• If it runs: proceed to No. 3.</li> </ul>
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	<ul style="list-style-type: none"> <li>• If there is 0 volt: there is an open in Lg/R or Lg/W.</li> <li>• If voltage is other than specified: there is an open in the function switch.</li> </ul>

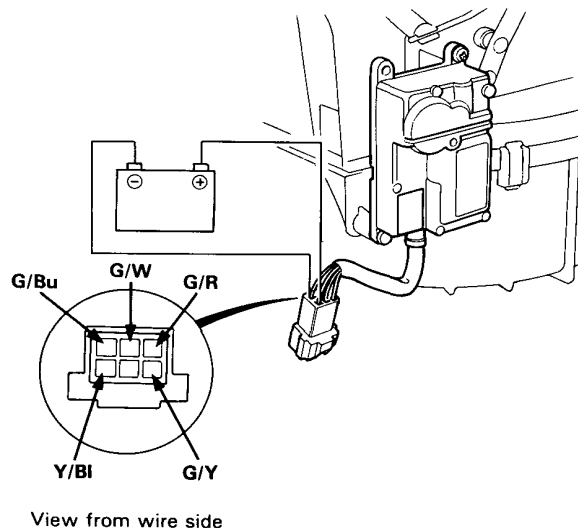






## Recirculation Control Motor Testing

1. Connect a battery positive lead to Y/BI 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.



## Function Control Motor Testing

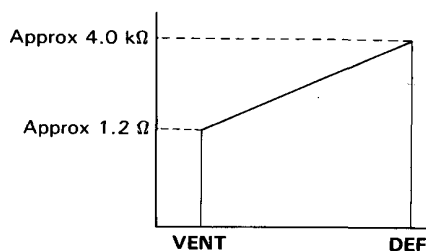
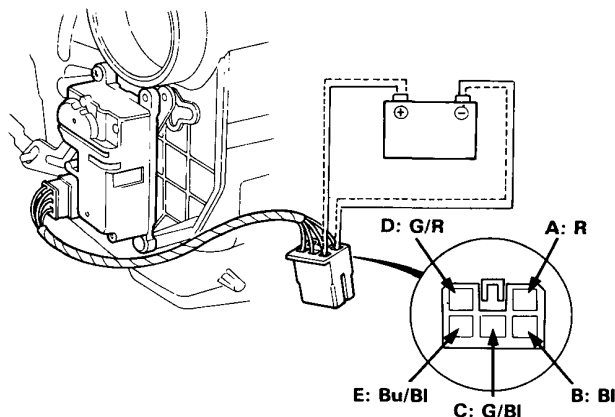
1. Measure the resistance between the D (G/R) and E (Bu/BI) terminals.

**Resistance : 4K $\Omega$**

2. Check motor operation by connecting a wire from the battery positive terminal to the A (R) terminal, and a negative to the B (BI) terminal.
3. Reverse the wires to be sure the motor will run in both directions.

**CAUTION:** Be sure 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/BI) 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

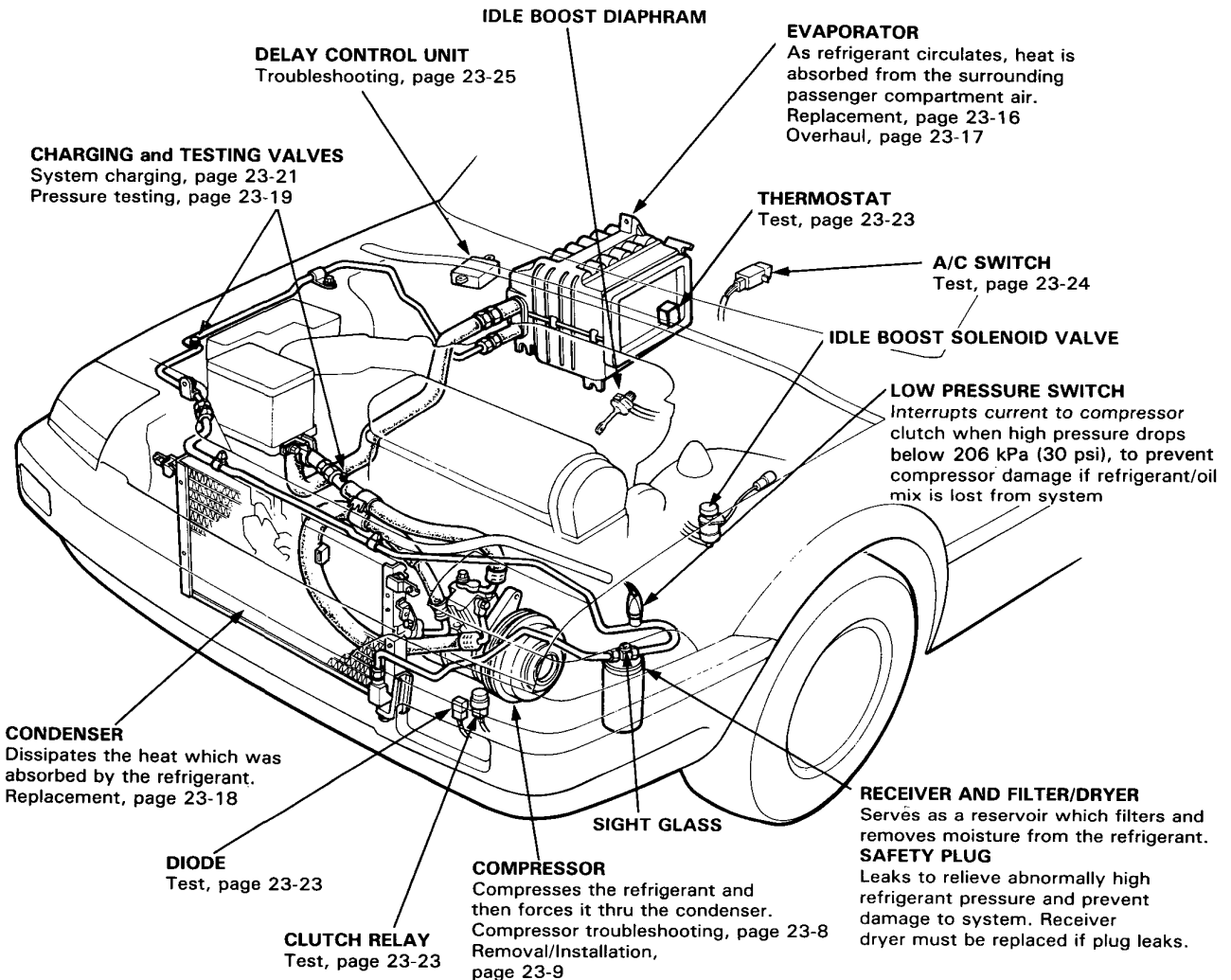
Illustrated Index .....	23-2
System Wiring Diagram .....	23-3
Electrical Troubleshooting .....	23-4
Performance Test .....	23-6
Compressor Troubleshooting .....	23-8
Compressor Replacement .....	23-9
Compressor Clutch	
Inspection .....	23-10
Overhaul .....	23-11
Shaft Seal Replacement .....	23-12
Evaporator	
Replacement .....	23-16
Overhaul .....	23-17
Condenser Replacement .....	23-18
Pressure Test .....	23-19
Discharge Procedure .....	23-19
System Evacuation .....	23-20
Leak Test .....	23-20
System Charging .....	23-21
Idle Adjustment .....	23-22
Thermostat Test .....	23-23
Clutch Relay Test .....	23-23
Diode Test .....	23-23
A/C Switch Test .....	23-24
Delay Control Unit Troubleshooting .....	23-25





# Air Conditioner

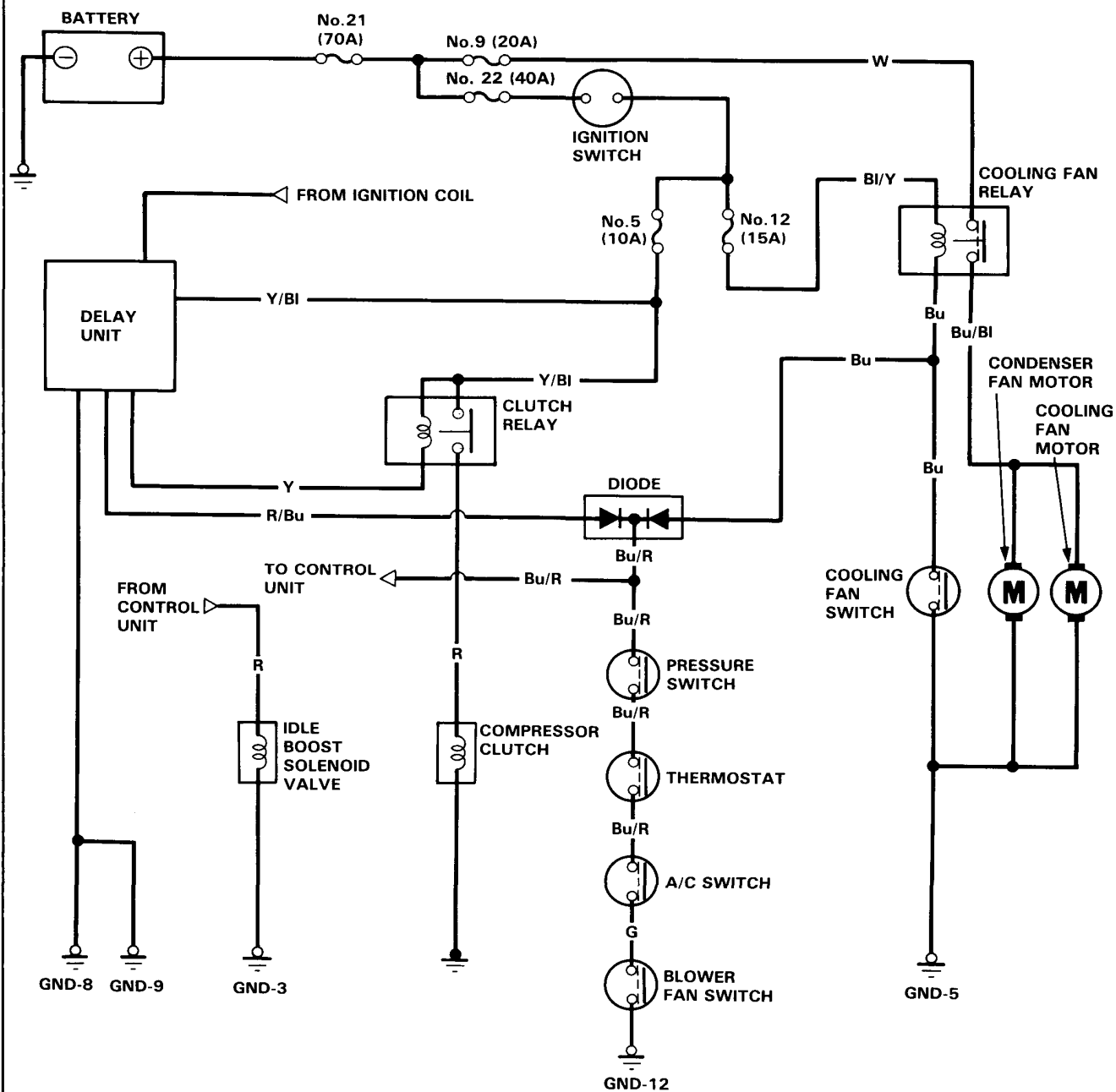
## Illustrated Index







## Wiring Diagram

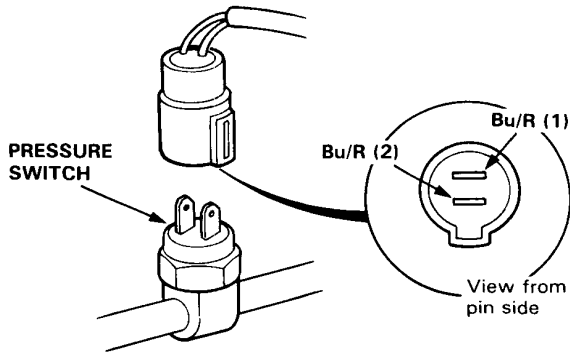




# Air Conditioner

## Electrical Troubleshooting

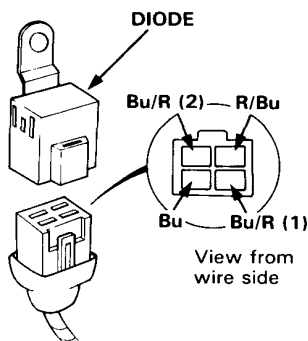
1. Check the fuses No. 21, 22, 9, 5, and 12 first.
2. Disconnect the pressure switch connector, then connect the Bu/R (1) terminal to ground.



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.

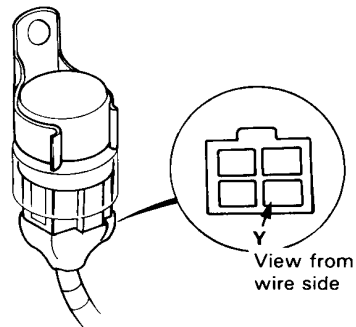
- If the motors do not start, replace the cooling fan relay with new one and retest.
- If the motors turn, there is an open in the Bu wire.

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.

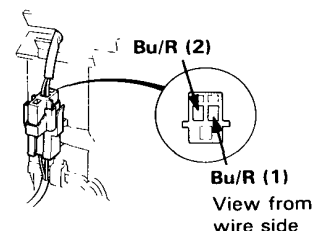
5. Connect the Y terminal at the clutch relay connector to ground with the connector connected.



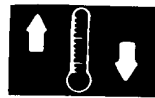
Turn the ignition switch ON, the clutch should work.

- 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.







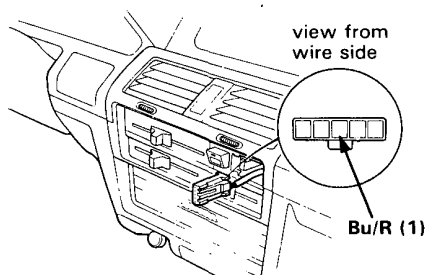
Turn the ignition switch ON, the compressor clutch should come on.

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.

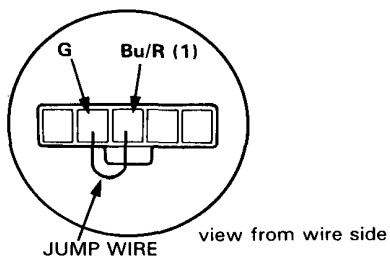


Turn the ignition switch ON, the clutch should come on.

- 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 BI 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  $\pm 10\%$  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 temperature

(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/in<sup>2</sup>)

Intake pressure: 170 kPa (25 lbs/in<sup>2</sup>)

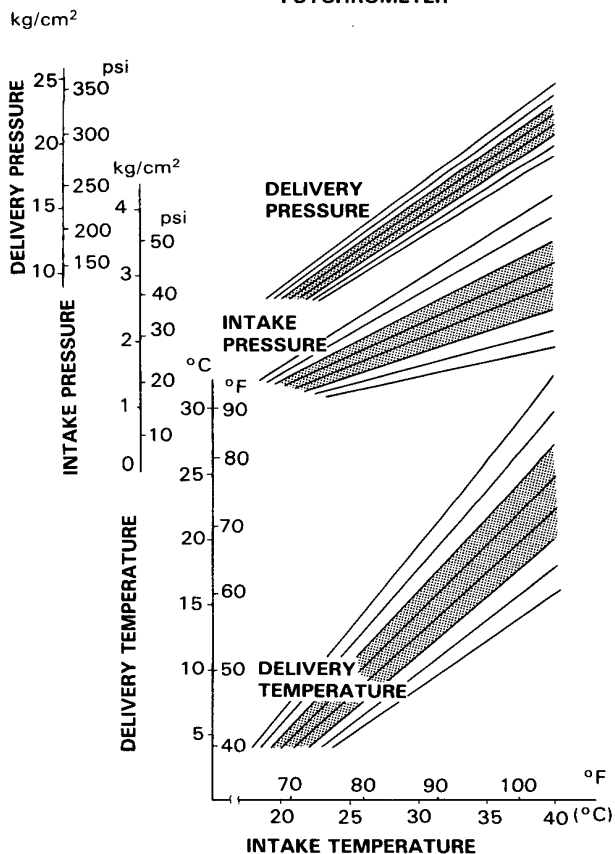
Proper intake/delivery pressure, and temperature ranges are shown on the chart at right.

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.

LOW PRESSURE VALVE (Close) HIGH PRESSURE VALVE (Close)

DRY BULB THERMOMETER

PSYCHROMETER







## 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.



# Air Conditioner

## 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	<ul style="list-style-type: none"> <li>• Clogged condenser or radiator fins</li> <li>• Condenser fan not working properly.</li> </ul>	<ul style="list-style-type: none"> <li>• Clean</li> <li>• Check voltage and fan rpm</li> </ul>
	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	<ul style="list-style-type: none"> <li>• Faulty compressor discharge or inlet valve.</li> <li>• Faulty compressor seal</li> </ul>	Replace compressor Repair
	Outlet of expansion valve is not frosted, low pressure gauge indicates vacuum.	<ul style="list-style-type: none"> <li>• Leaking thermostat</li> <li>• Frozen expansion valve</li> <li>• Faulty expansion valve</li> </ul>	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	<ul style="list-style-type: none"> <li>• Expansion valve open too long</li> <li>• Loose thermostat (poor contact)</li> </ul>	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	<ul style="list-style-type: none"> <li>• Faulty gasket</li> <li>• Faulty high pressure valve</li> <li>• Foreign particle stuck in high pressure valve</li> </ul>	Replace compressor
Suction and discharge pressures abnormally high (Test on page 23-19)	Reduced air flow through condenser	<ul style="list-style-type: none"> <li>• Clogged condenser fins</li> <li>• Condenser fan not working properly</li> </ul>	<ul style="list-style-type: none"> <li>• Clean condenser.</li> <li>• Check voltage and fan rpm.</li> </ul>
	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

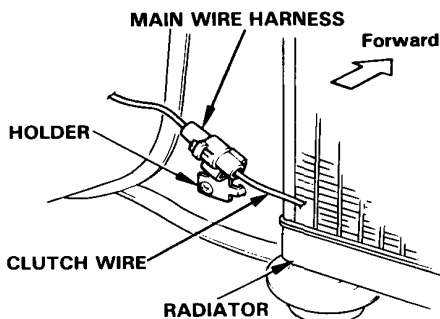




## Compressor Replacement

### Removal

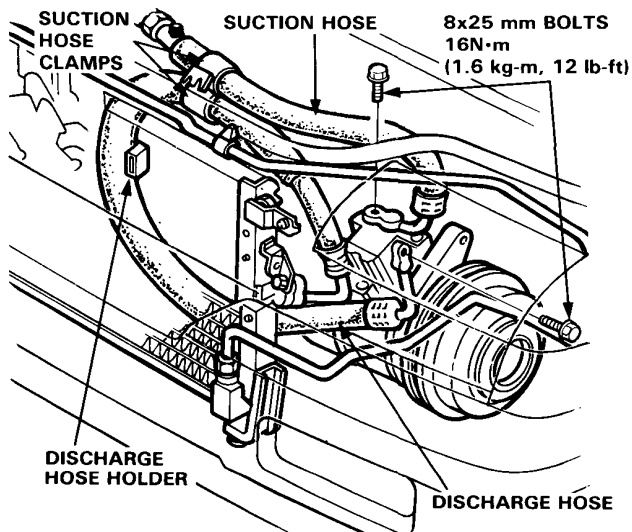
1. Run the engine at idle speed and turn on the air conditioner for a few minutes.
2. Shut the engine off and disconnect the battery negative terminal.
3. Disconnect the compressor clutch wire and remove the connector from the holder.



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.

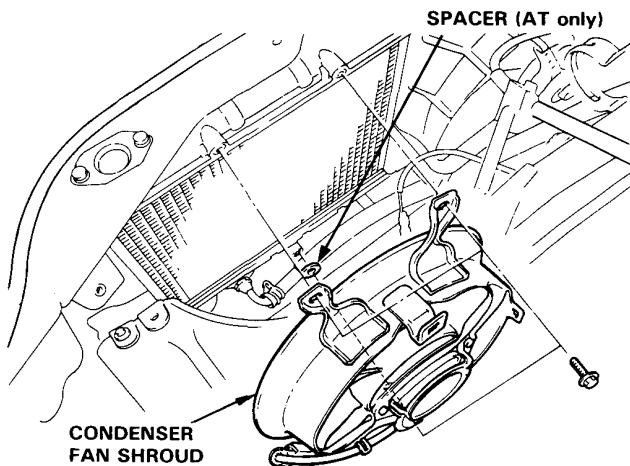
**CAUTION:** Cap the open fittings immediately to keep moisture and dirt out of the system.

9. Remove the suction hose clamps (2).
10. Remove the discharge hose holder.



11. Disconnect the condenser fan motor connector.

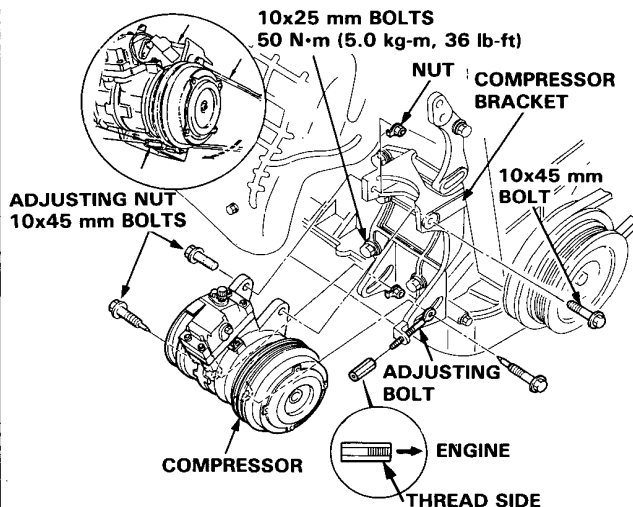
12. Remove the condenser fan shroud.



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)



# Air Conditioner

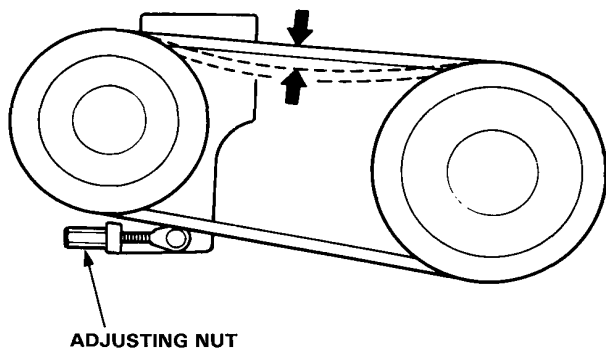
## Compressor Replacement (cont'd)

### Installation

Install the compressor in reverse order of removal and;

- If a new compressor is installed, drain 30 cm<sup>3</sup> (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) deflection when 98 N (10 kg, 22 lb) force is applied between the pulleys.

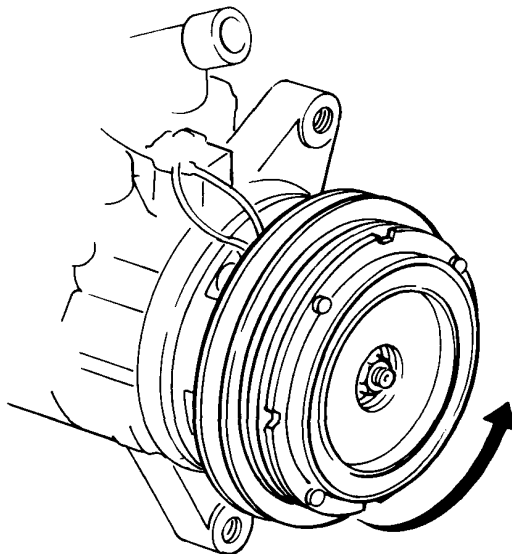


- Charge the system.
- Test the performance.

**CAUTION:** Do not loosen the cylinder cover bolts on the compressor.

## Clutch Inspection

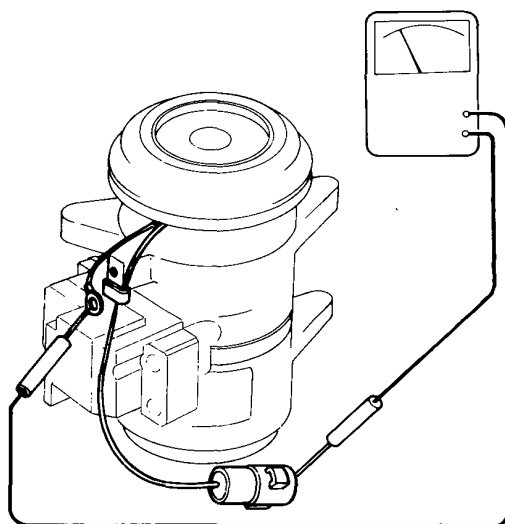
- Check pulley bearing play and drag by rotating the pulley by hand. Replace the pulley with a new one if it is noisy or has excessive play and drag.



- Check resistance of the stator coil:

**Stator Coil Resistance:** 3.75 ± 0.2 ohm at 20°C (68°F)

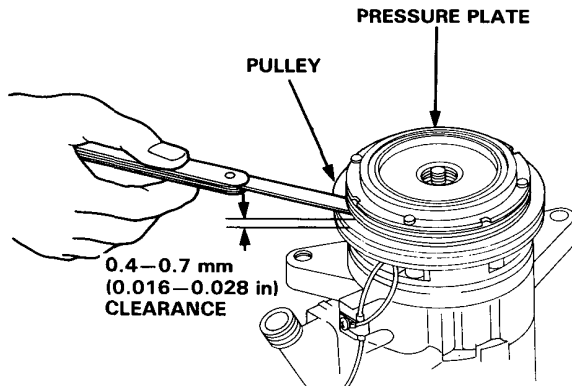
If resistance is not within specifications replace the coil.



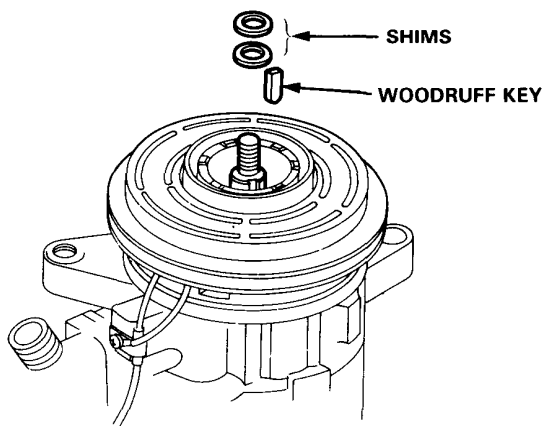




- Tighten the hub nut to 15–17.5 N·m (1.5–1.75 kg-m, 11–12.7 lb-ft) and measure the clearance between the pulley and pressure plate all the way around, if the clearance is not within specified limits, the pressure plate must be removed and shims added or removed as required.

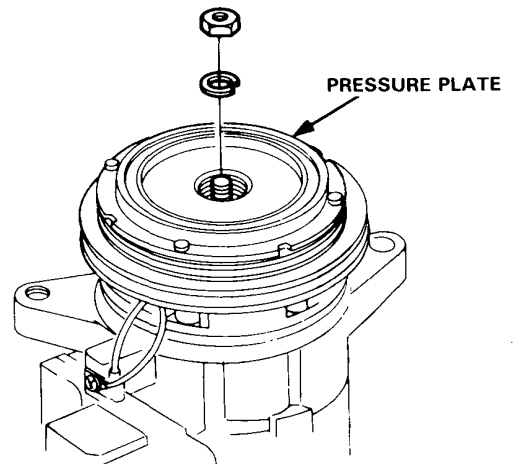


NOTE: The shims are available in six sizes: 0.1 mm and 0.2 mm of thickness. 0.1 mm shim is used for minor adjustment.

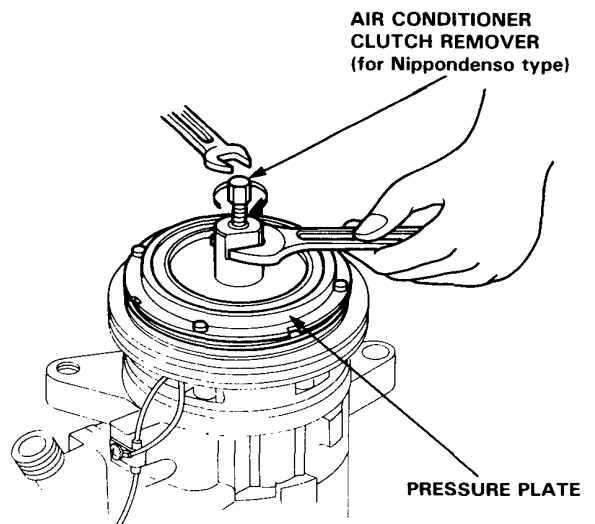


## Compressor Clutch Overhaul

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.



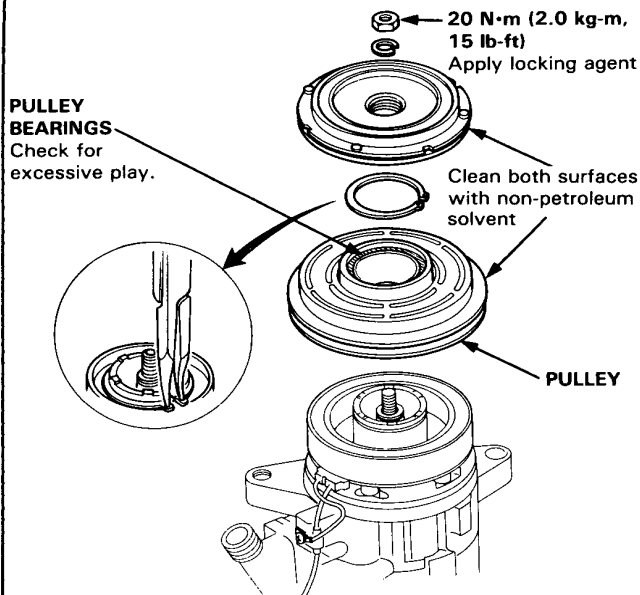
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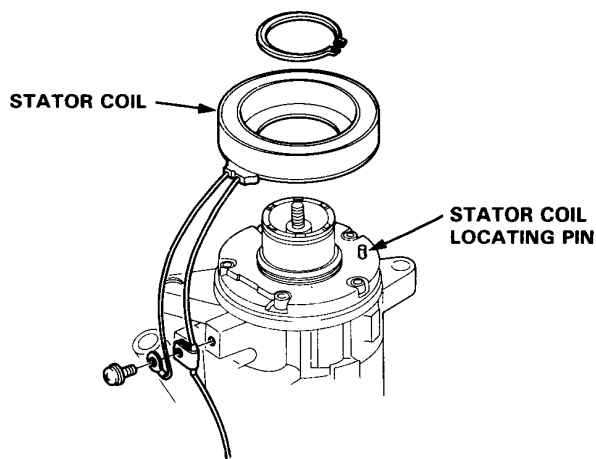
# Air Conditioner

## 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.



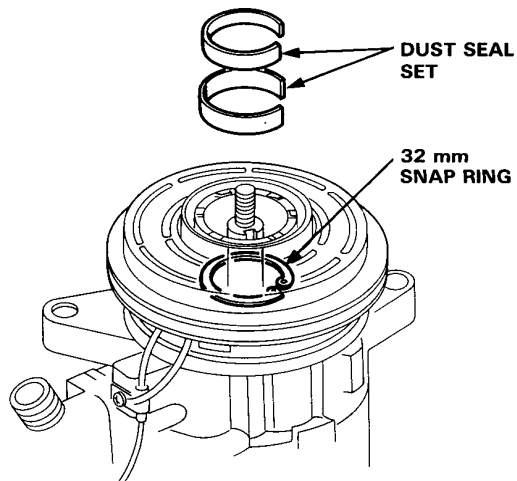
## Shaft Seal Removal

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.

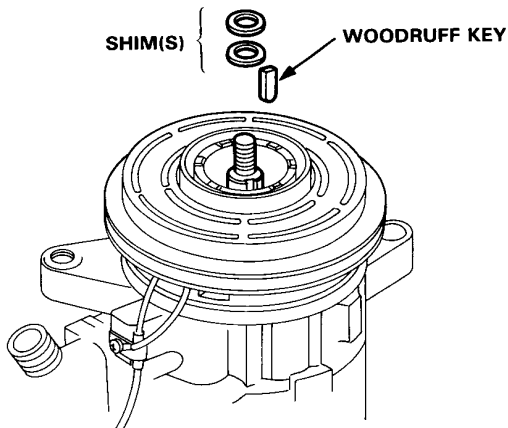


3. Remove the woodruff key from the key way.

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.

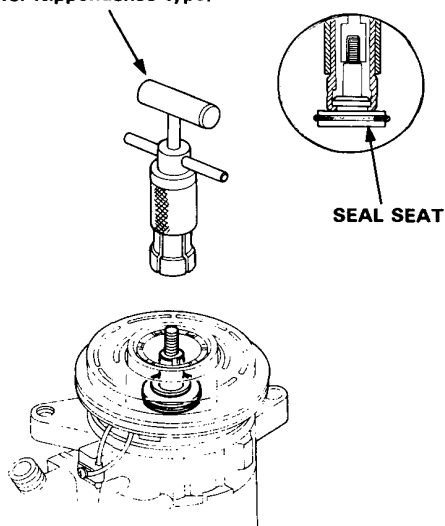




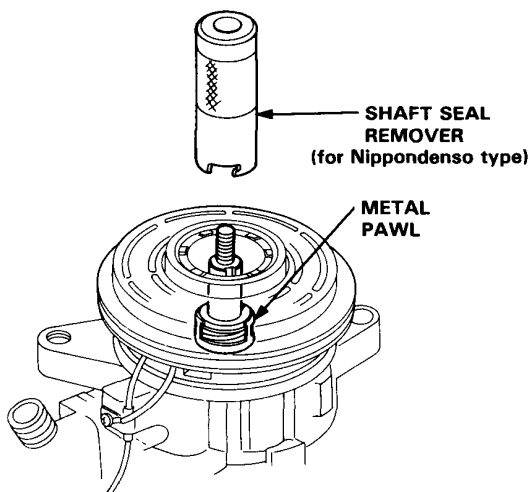


5. Seat the seal plate into the groove of the shaft seal remover.
6. Pull out the seal seat.

**SHAFT SEAL REMOVER  
(for Nippondenso type)**



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.

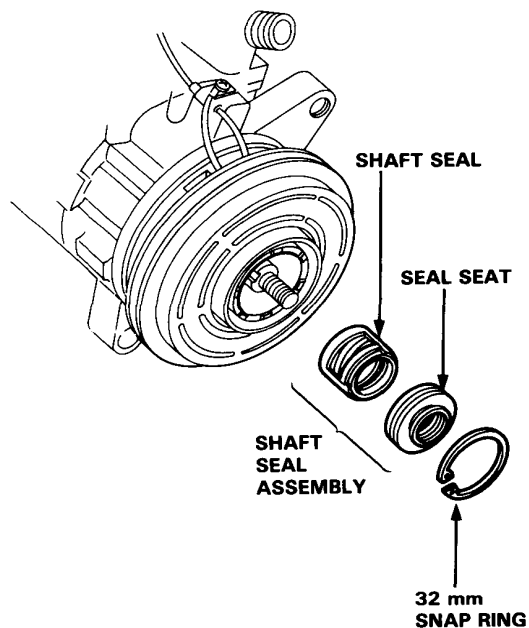


9. Press the remover until bottoms, then turn it counterclockwise as far as it will go.
10. Withdraw the remover.
11. Lay down the compressor and clean the shaft seal contacting face of the compressor with cleaning solvent.

**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.





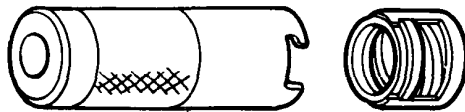
# Air Conditioner

## 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.

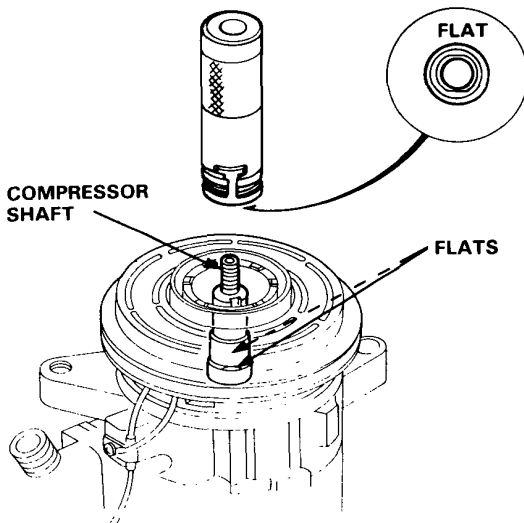
**NOTE:**

- Use only clean refrigerant oil.
- Do not touch the sealing surfaces of the shaft seal after lubricating.



SHAFT SEAL REMOVER

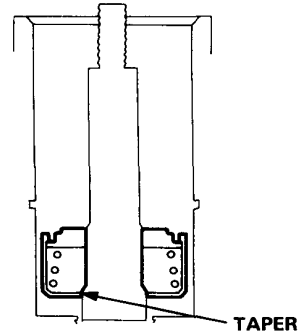
3. Liberally lubricate the compressor shaft with refrigerant oil.
4. Install the shaft seal onto the compressor shaft aligning the seal case flats with the shaft flats.



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.



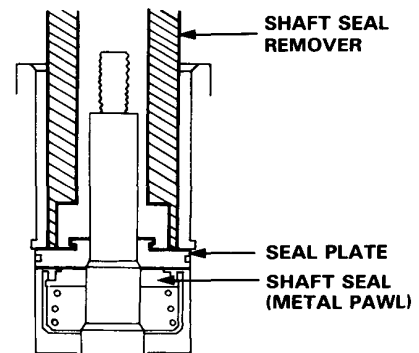
8. Check the inside diameter of the compressor for score marks or foreign particles.
9. Clean the seal seat with cleaning solvent, then lubricate the seal seat with refrigerant oil (SUNISO 5GS or equivalent).

**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.

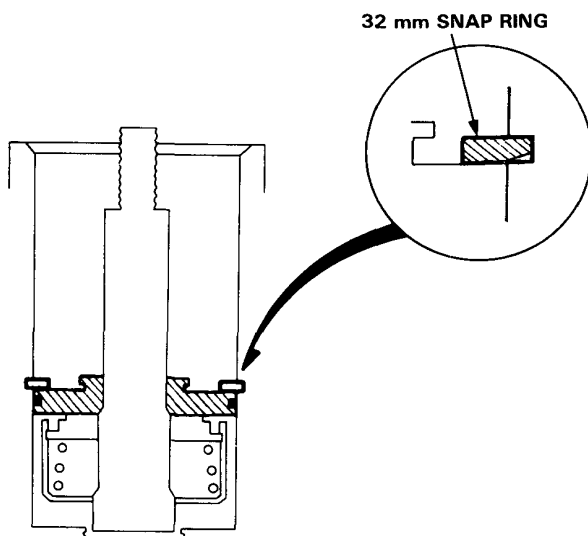
**CAUTION:** Be careful not to damage the compressor.



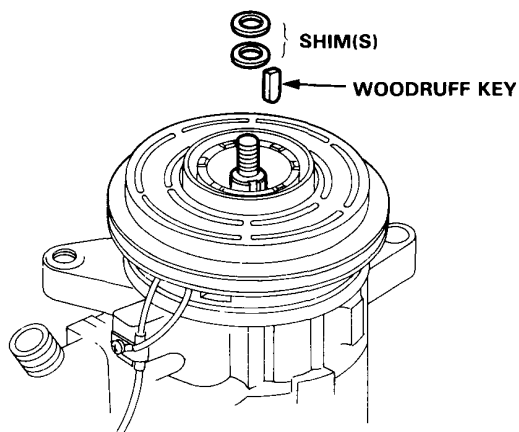




12. Install the 32 mm snap ring with its chamfered edge inside.
13. Press the snap ring with the grip side of the remover.



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.



# Air Conditioner

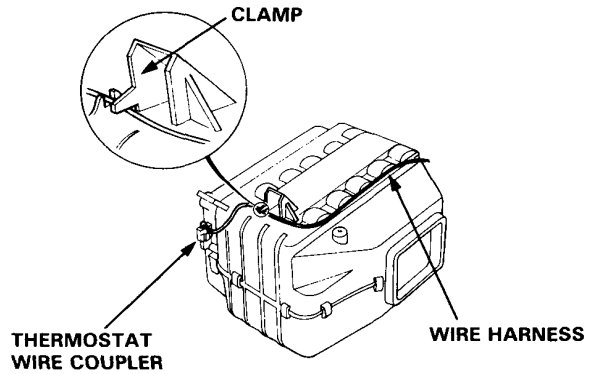
## Evaporator Replacement

1. Disconnect the battery negative terminal.
2. Discharge the refrigerant (page 23-19).
3. Disconnect the receiver line and suction hose from the evaporator.

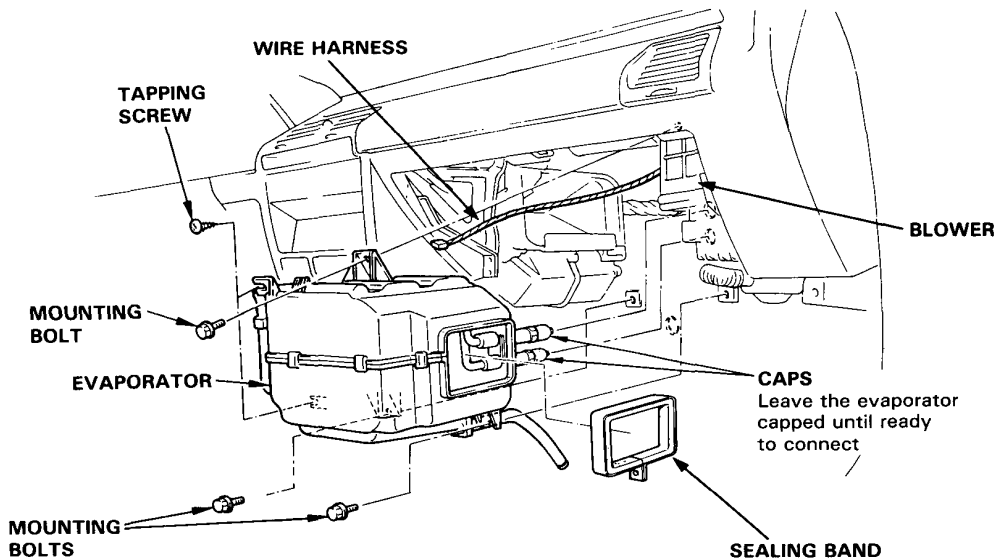
**CAUTION:** Cap the open fittings immediately to keep moisture and dirt out of the system.

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.

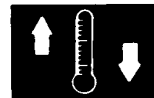
10. Remove the evaporator by removing the three bolts and two tapping screws.



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

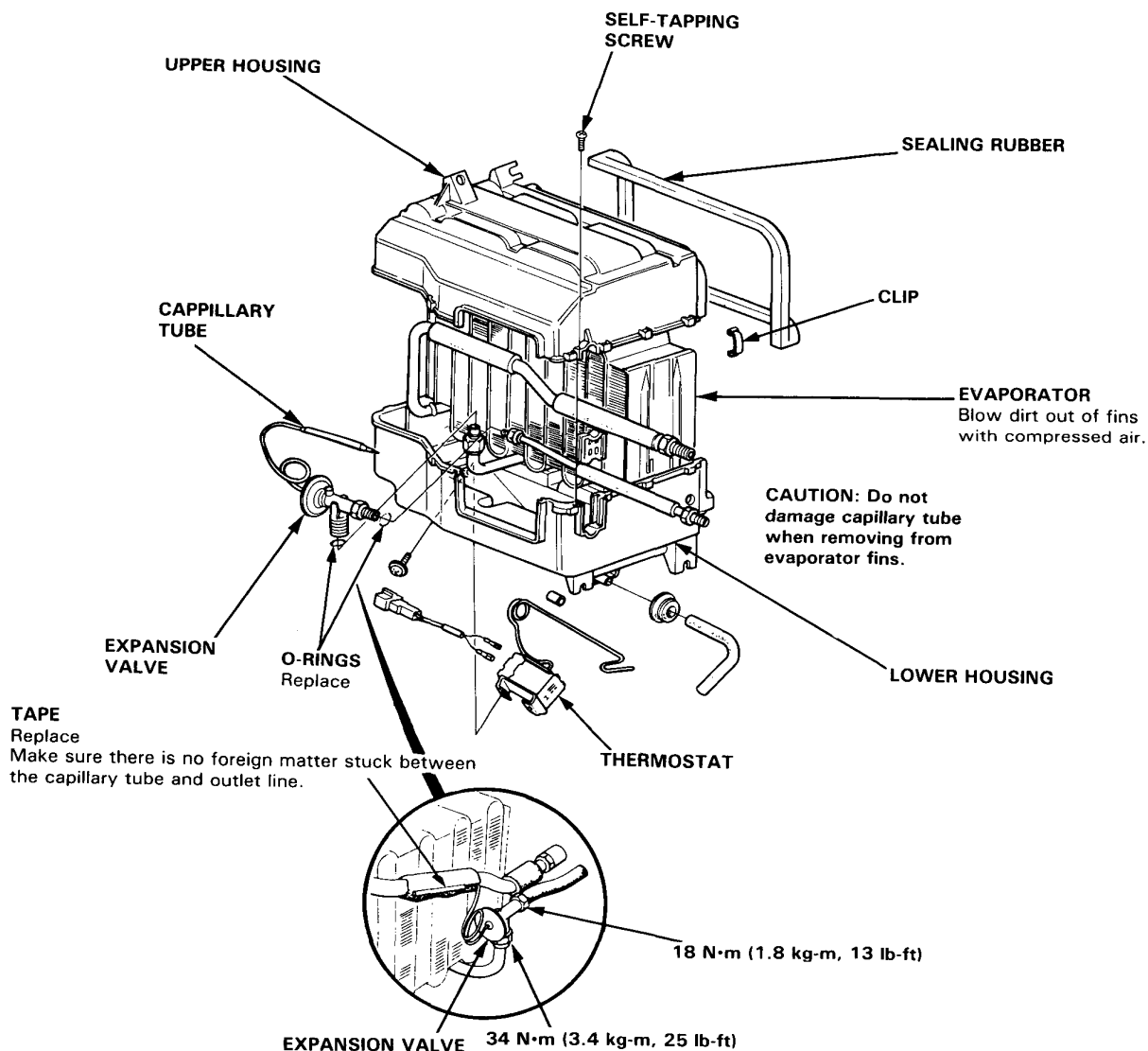
1. Remove the self-tapping screw and clip from the housing.
2. Carefully separate the housings as required to obtain access to the capillary tube in the housing.
3. Pull out the capillary tube of the thermostat from the evaporator fins.
4. Separate the housings and remove the evaporator cover.
5. Remove 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.





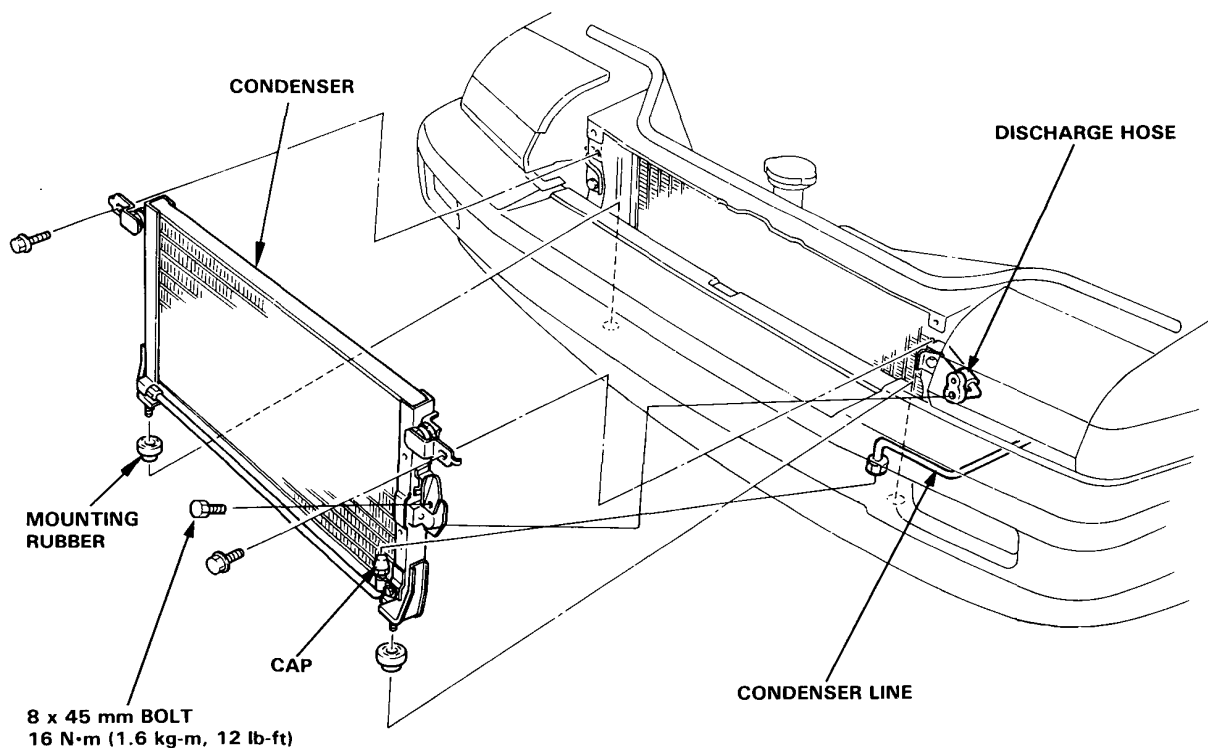
# Air Conditioner

## Condenser Replacement

1. Disconnect the battery negative terminal.
2. Remove the front bumper and one of the left or right headlight.  
  
NOTE: It is not required to remove the front bumper 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

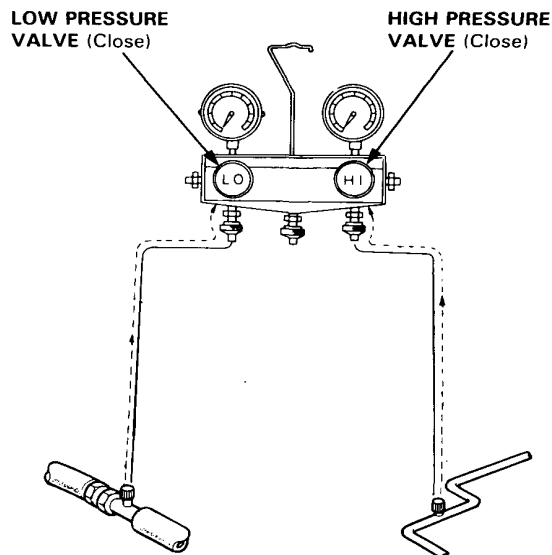
1. Connect the gauges as shown.
2. Close both high and low pressure valves.
3. Test with the hood up, doors and windows open, temperature lever on COLD, function button on VENT and fan at high speed.
4. Leave the air conditioner on about 10 min. The sight glass should be free of bubbles.

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

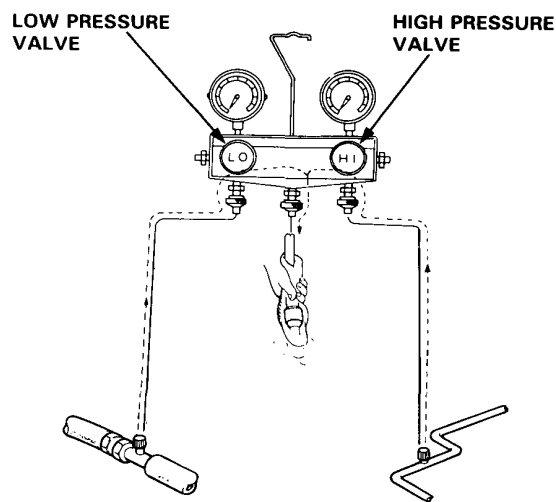
### WARNING

- 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).

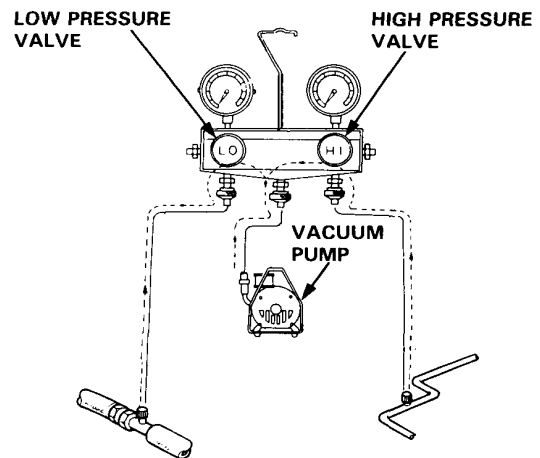




# Air Conditioner

## System Evacuation

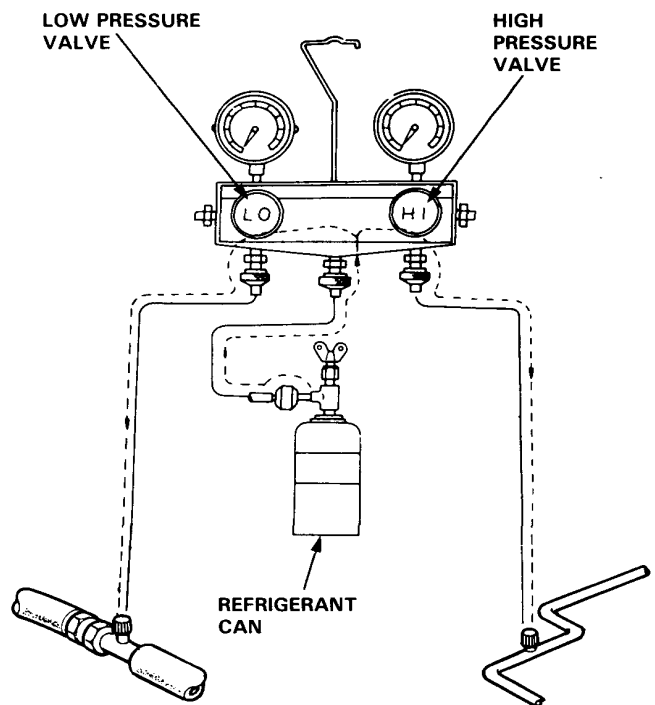
1. When an A/C System has been opened to the atmosphere, such as during installation or repair, it must be evacuated using a vacuum pump. (If the system has been open for several days, the receiver/dryer should be replaced).
2. Attach a gauge set and pump as shown, connecting the center charging hose 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 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).
  - 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.

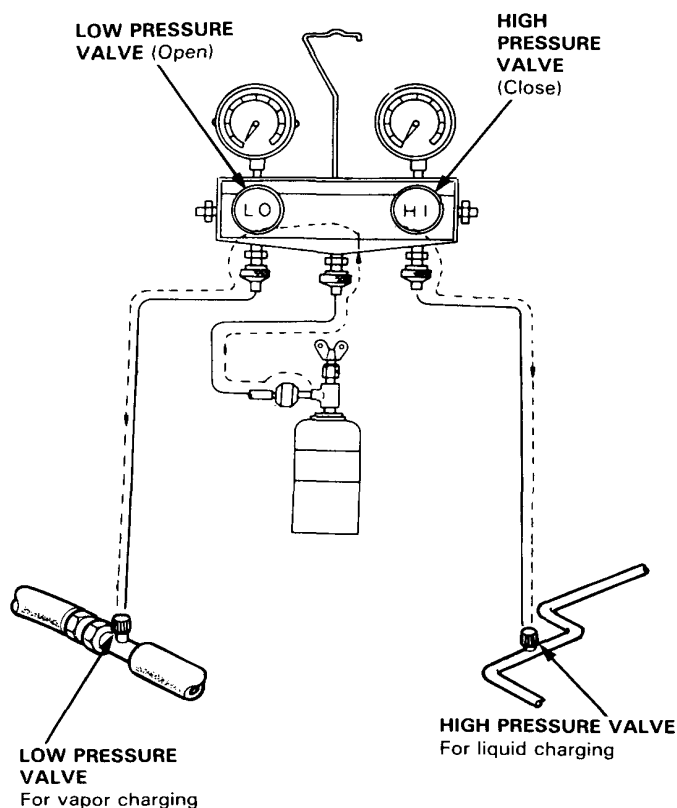
LIQUID CHARGE through the high pressure side:

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





# Air Conditioner

## 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 $750 \pm 50$ rpm (in neutral) A/T $750 \pm 50$ rpm (N or P range)
	Except KS	M/T $750 \pm 50$ rpm (in neutral) A/T $700 \pm 50$ rpm (N or P range)
Fuel-Injected Engine	KX only	M/T $750 \pm 50$ rpm (in neutral) A/T $750 \pm 50$ rpm (N or p range)
	Except KX	M/T $800 \pm 50$ rpm (in neutral) A/T $800 \pm 50$ rpm (N or P range)

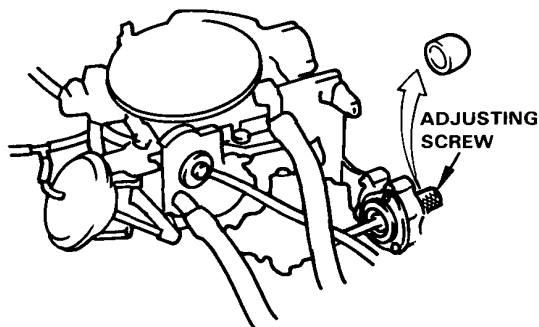
- ② After charging, adjust the idle speed with the air conditioner ON.
  - Apply the parking brake and block the wheels.
  - Headlights ..... OFF
  - A/C temperature lever ..... COLD
  - Vent and recirc buttons ..... ON
  - Fan switch ..... HI

- ③ Adjust the idle speed by turning the idle adjusting screw in or out as required.

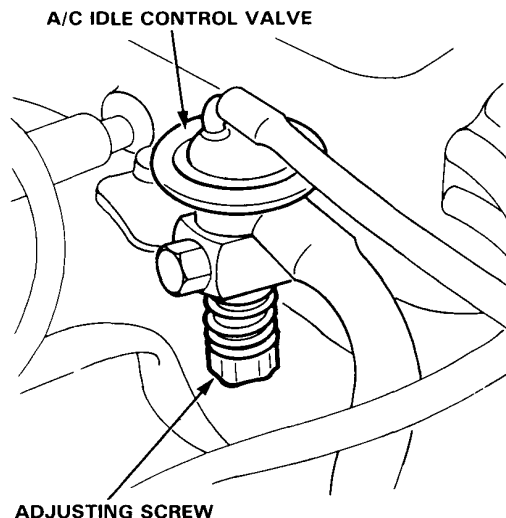
IDLE SPEED, A/C ON:

MODEL		A/C ON
Carbureted Engine	KS only	M/T $800 \pm 50$ rpm (in neutral) A/T $750 \pm 50$ rpm (N or P range)
	Except KS	M/T $750 \pm 50$ rpm (in neutral) A/T $750 \pm 50$ rpm (N or P range)
Fuel-Injected Engine	KX only	M/T $750 \pm 50$ rpm (in neutral) A/T $750 \pm 50$ rpm (N or p range)
	Except KX	M/T $800 \pm 50$ rpm (in neutral) A/T $800 \pm 50$ rpm (N or P range)

### Carbureted Engine



### Fuel-injected Engine







## Thermostat Test

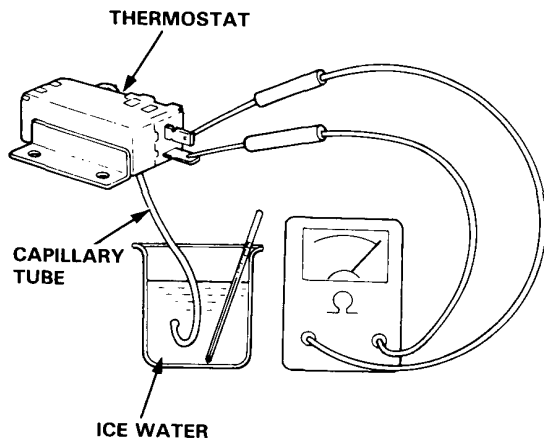
Dip the thermostat capillary tube into a pan filled with ice water, and check for continuity.

**Cut-off** ..... 1.5–0.5°C (35–33°F)

**Cut-in** ..... 2.5–5.0°C (37–41°F)

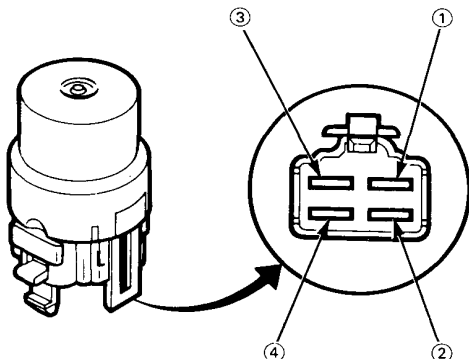
If cut-off or cut-in temperature is too low or too high, replace the thermostat.

The cut-off and cut-in of the thermostat must not be gradual, but sudden.



## Clutch Relay Testing

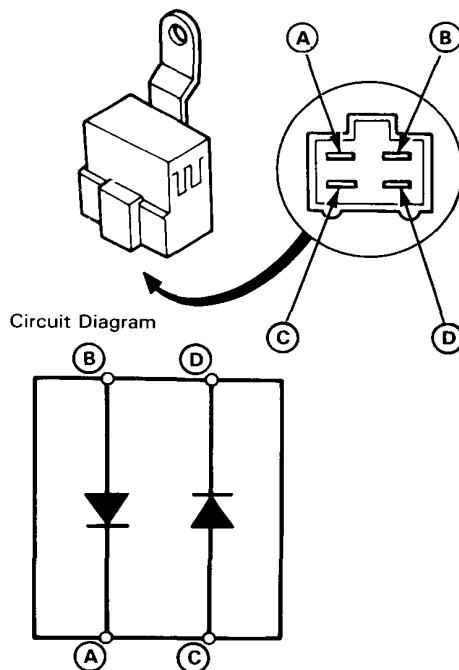
1. Check for continuity between terminals ③ and ④. There should be no continuity.
2. Connect a 12V battery across terminals ① and ②. There should be continuity between terminals ③ and ④.



## 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.

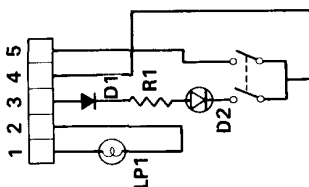
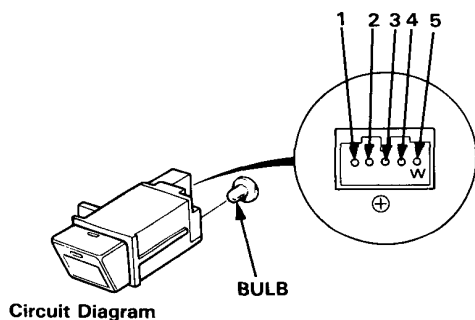




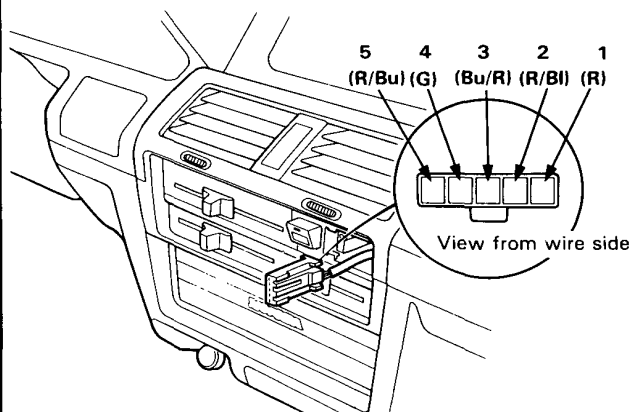
## A/C Switch Test

- 
- TAPPING SCREW**
- SCREW HOLE LID**
- A/C SWITCH**
- COUPLER**

- | Terminal<br>Position | 1   | 2   | 3   | 4   | 5   |
|----------------------|---|---|---|---|---|
| OFF                  |  |  |   |   |   |
| ON                   |  |  |  |  |  |



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.

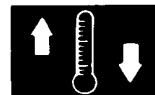


<b>Terminal: test condition</b>	<b>Test: desired result</b>	<b>Actual result: possible cause</b>
4(G): blower switch on	Check for continuity to ground: there should be continuity with blower switch ON.	• If not: there is an open in Gwire or blower switch.
5(Bu): ignition switch ON	Connect to body ground: the A/C system should 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.

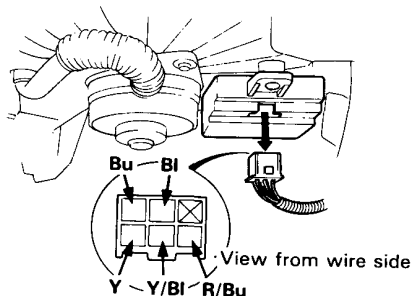
2. Reinstall the switch in the reverse order of removal.





## 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	<ul style="list-style-type: none"> <li>• If there is continuity with A/C switch OFF: there is short circuit in R/Bu</li> <li>• If there is no continuity with A/C switch ON: there is an open in R/Bu</li> </ul>
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 .....	24-2
Body Electrical .....	25-2





## Engine Electrical

Illustrated index .....	24-2
Wiring Diagram .....	24-3
Ignition	
Timing Inspection and Setting .....	24-4
Spark Plug Inspection .....	24-6
Coil Test .....	24-7
Wire Inspection and Test .....	24-7
Radio Condenser Capacity Test .....	24-8
Distributor Removal/Installation .....	24-10
Distributor Overhaul .....	24-12
Charging	
Battery Test .....	24-15
Warning Light Test .....	24-17
Alternator Belt Adjustment .....	24-17
Alternator Replacement .....	24-18
Alternator and Regulator Test .....	24-18
Alternator Overhaul .....	24-20
Starter	
Test .....	24-22
Replacement .....	24-24
Solenoid Test .....	24-25
Overhaul .....	24-26
Reassembly .....	24-34





# 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.

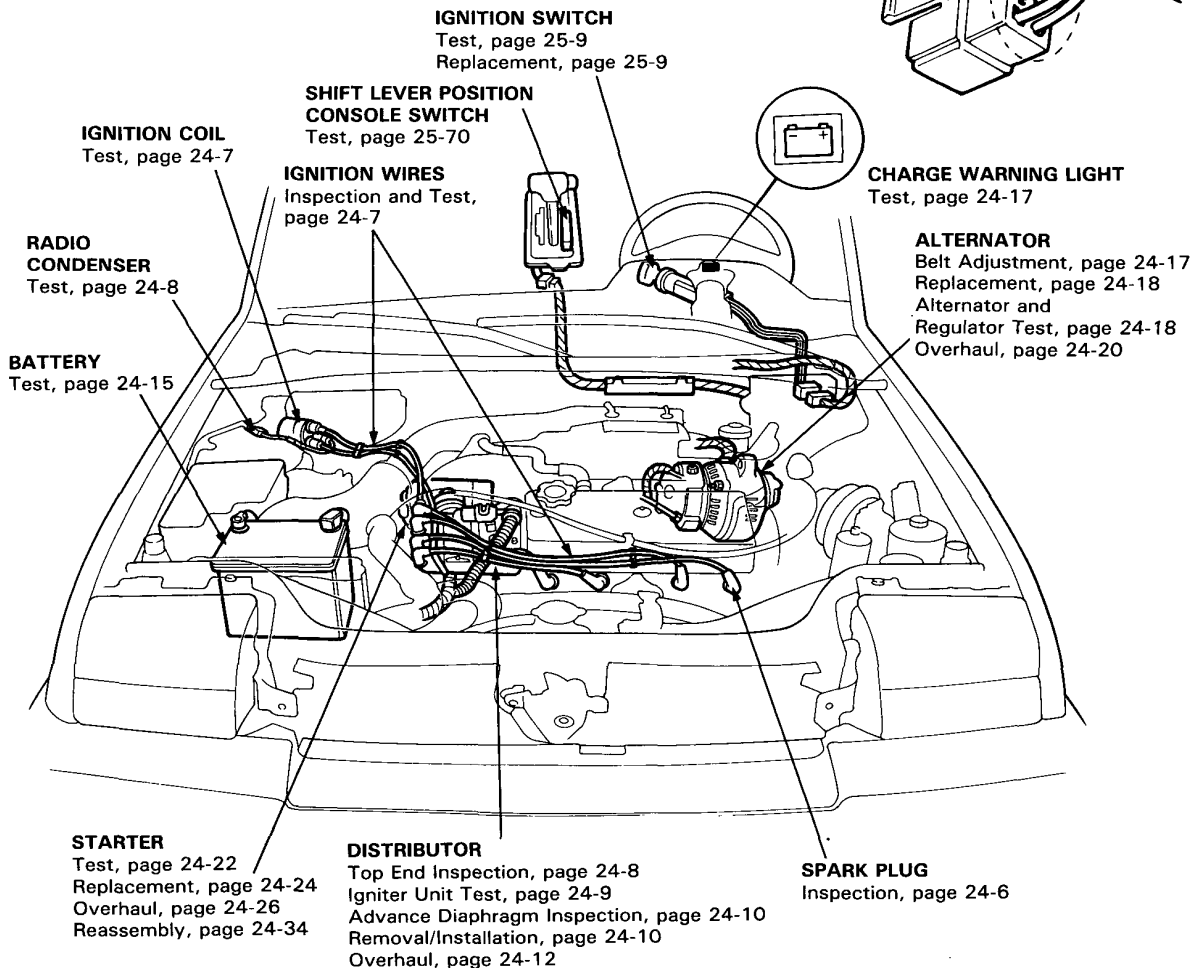
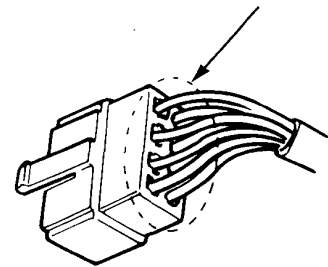
### While you're working:

- 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.

Pack with silicone grease

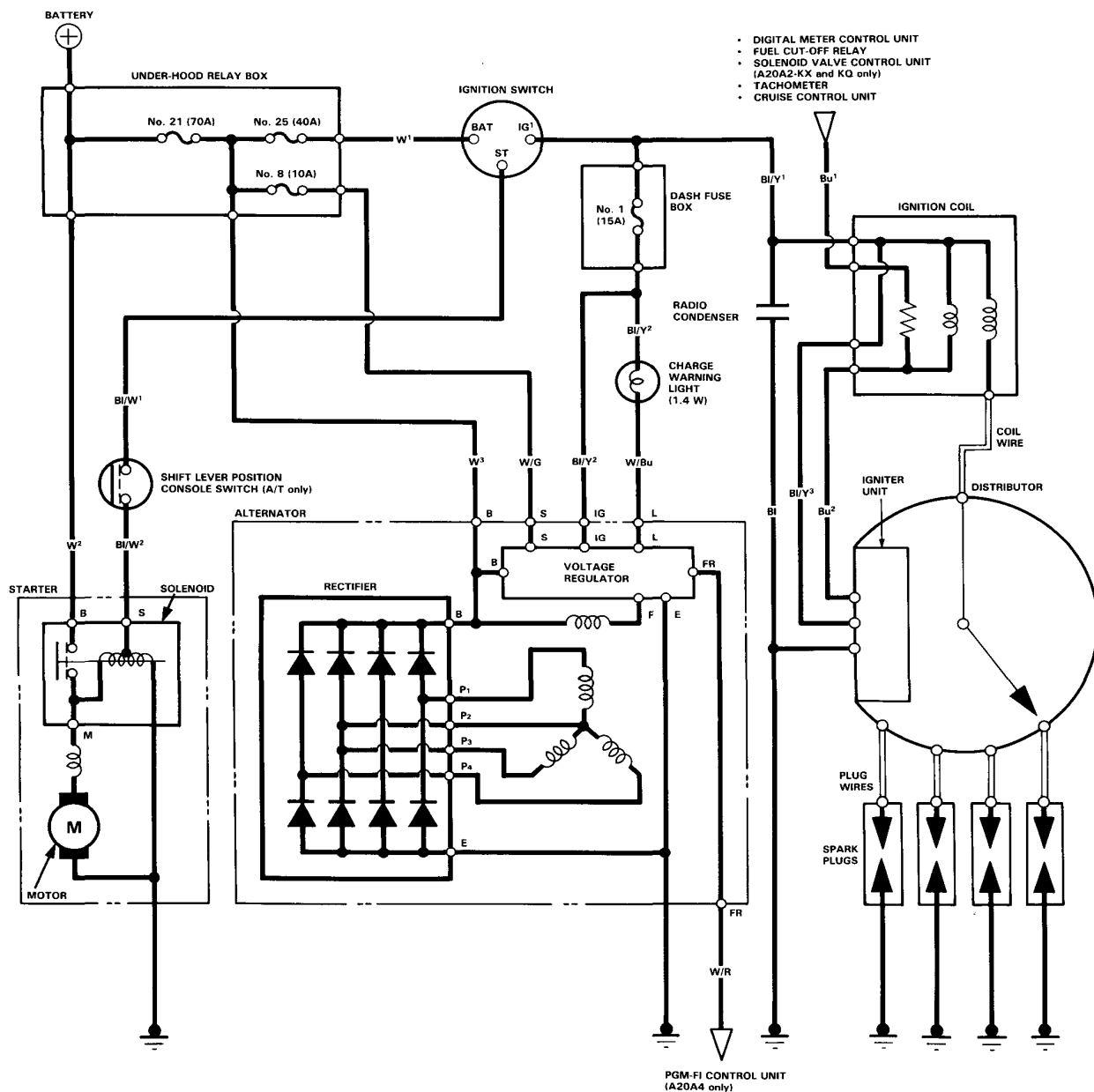






## Wiring Diagram

NOTE: Several different wires have the same color; They have been given a number suffix to distinguish them (for example Bu<sup>1</sup> and Bu<sup>2</sup> are not the same).





# Ignition

## 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).

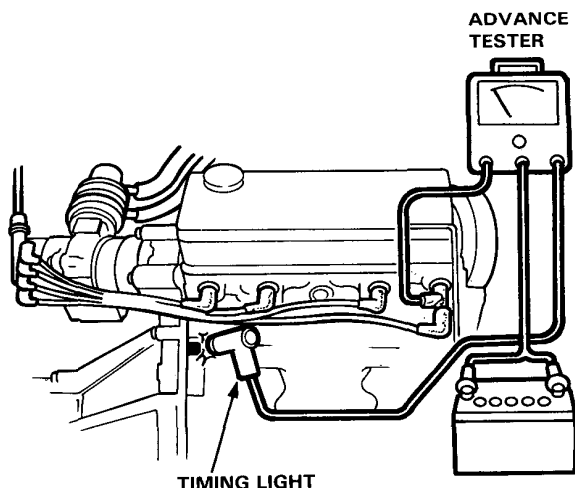
- The inside hose should have vacuum.
- The outside hose should not have vacuum.

### 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 toward the fly-wheel (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)

Engine Model	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)

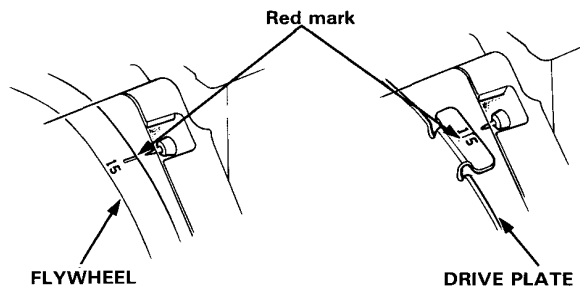
Engine Model	A16A1	A20A2	A20A4
KS	—	10 ± 2	10 ± 2
KX	—	10 ± 2	15 ± 2
KQ	—	15 ± 2	—
KT	24 ± 2	20 ± 2	—
Others	20 ± 2	20 ± 2	15 ± 2

### Idle Speed [min<sup>-1</sup> (rpm)]

Engine Model		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

#### Manual Transmission

#### Automatic Transmission

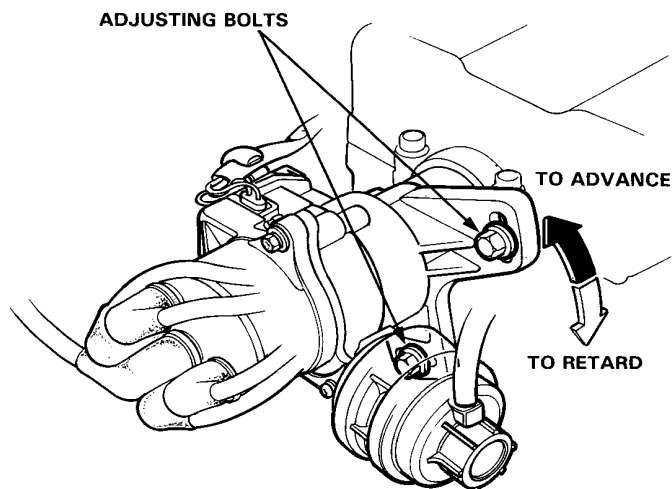




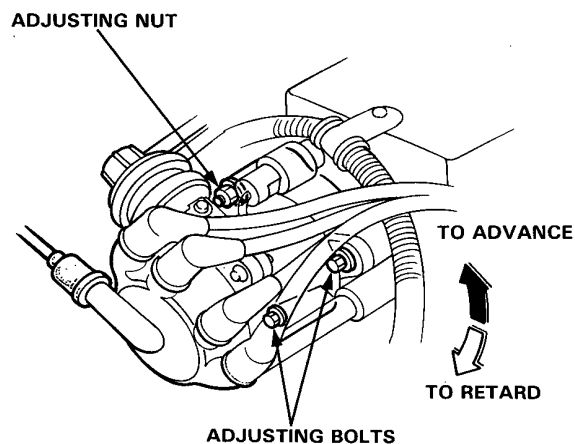


6. Loosen the distributor adjusting bolts (and nut for A20A4 engine), and turn the distributor housing counterclockwise to advance the timing, or clockwise to retard the timing.

#### A16A1 and A20A2 engines:



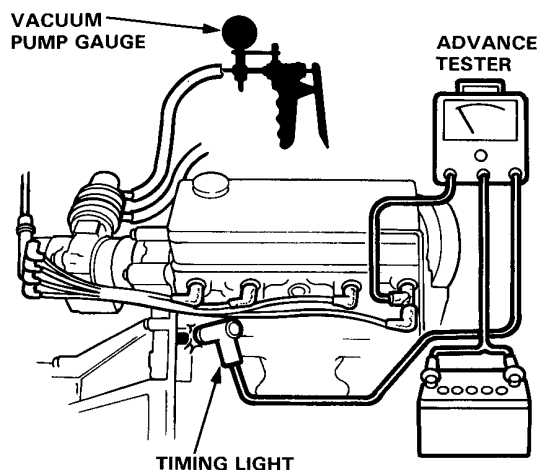
#### A20A4 engine:



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;

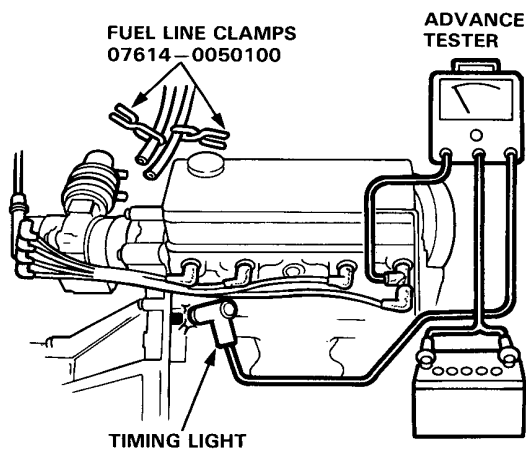
- A20A2-KX, KQ and KS (M/T) models: 6°
  - KS (A/T) model : 10°
  - Others : 10°
- A20A4-KX model : 6°
  - Others : 9°



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



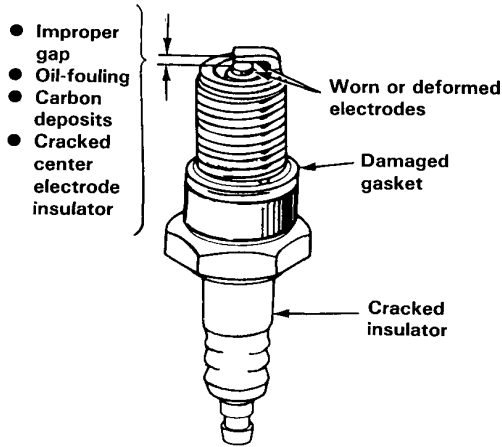
10. If advance is not as specified, check the advance diaphragm and distributor advance mechanism.



# Ignition

## Spark Plug Inspection

1. Inspect the electrodes and ceramic insulator for:



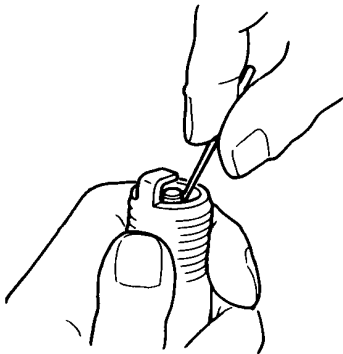
**Burned or worn electrodes may be caused by:**

- 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

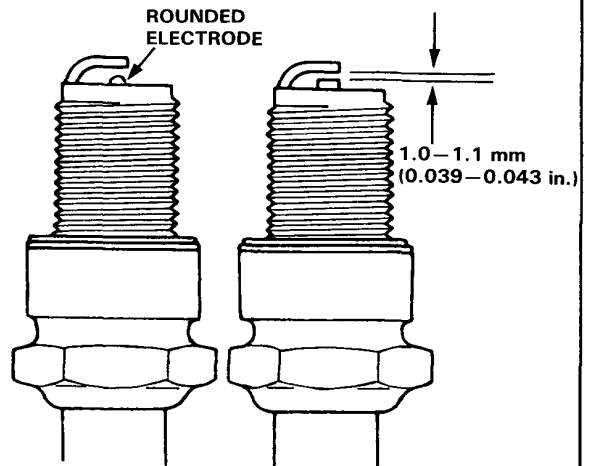
2. Clean the electrodes with a spark plug cleaning machine, or with a wire brush. Clean between the outer shell and center insulator with a stiff wire as shown. Clean plug threads with a wire brush.



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 (A) and (D) terminals):**

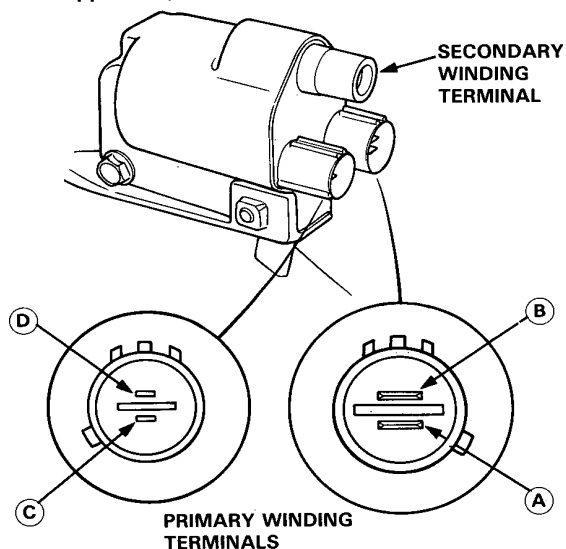
1,215–1,485 ohms

**Secondary Winding Resistance (between (A) and secondary winding terminal):**

11,074–11,526 ohms

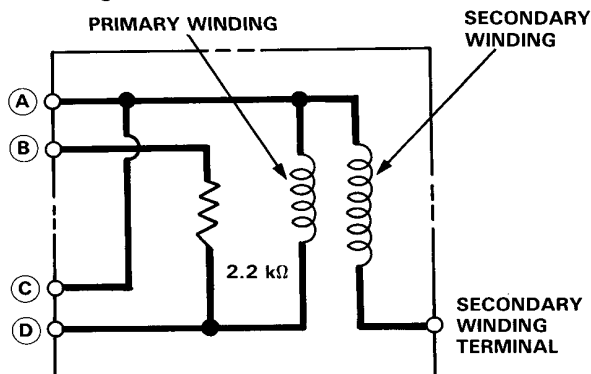
**Resistance between (B) and (D) terminals:**

Approx. 2,200 ohms



3. Check for continuity between (A) and (C) terminals. Replace the coil if there is no continuity.

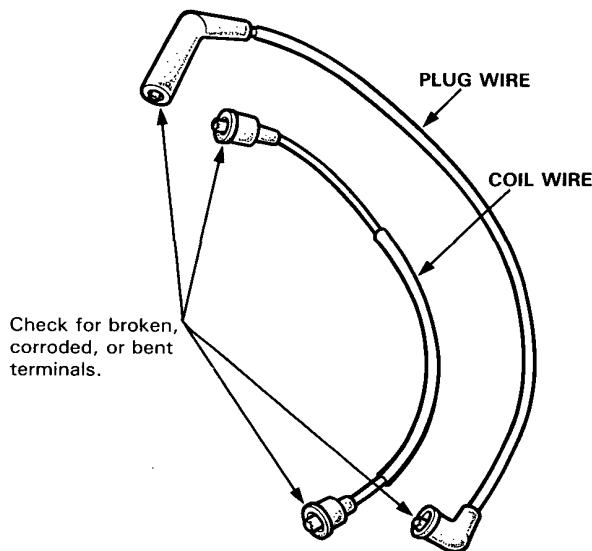
### Circuit Diagram



## 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.

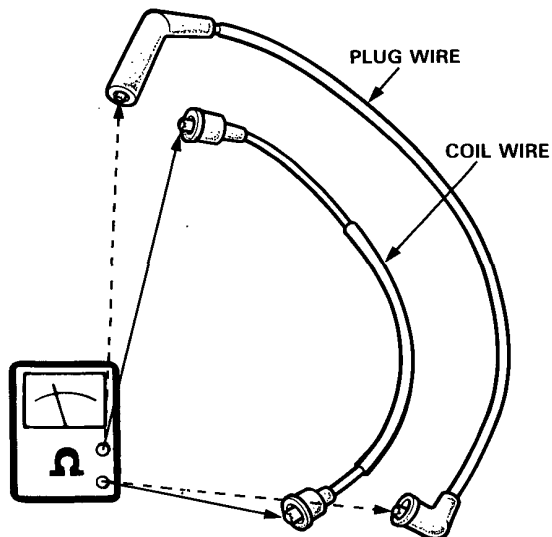
1. Check condition of the wire terminals. If any terminal is corroded, clean it, and if it is broken or distorted, replace the wire.



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.

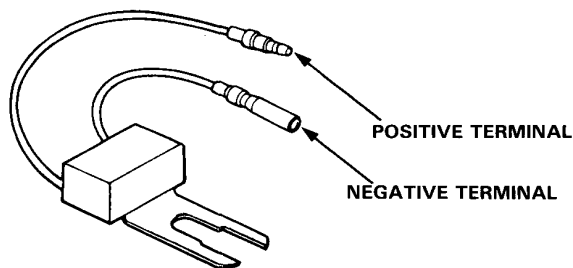


# Ignition

## Radio Condenser Capacity Test

1. Use a commercially available condenser tester. Connect the tester probes and measure condenser capacity.

**Condenser Capacity:  $0.47 \pm 0.09$  microfarads ( $\mu\text{F}$ )**

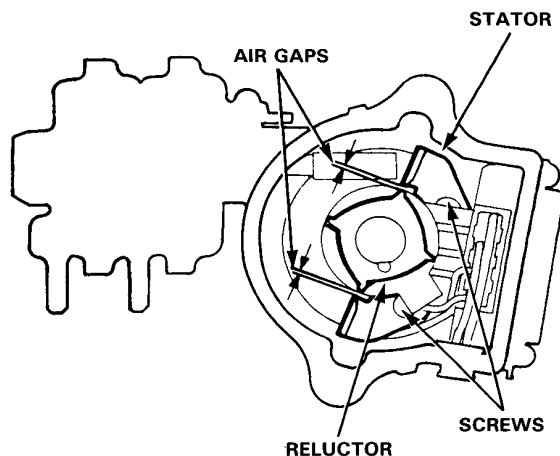


**NOTE:** The radio condenser is intended to reduce ignition noise; however, condenser failure may cause the engine to stop running.

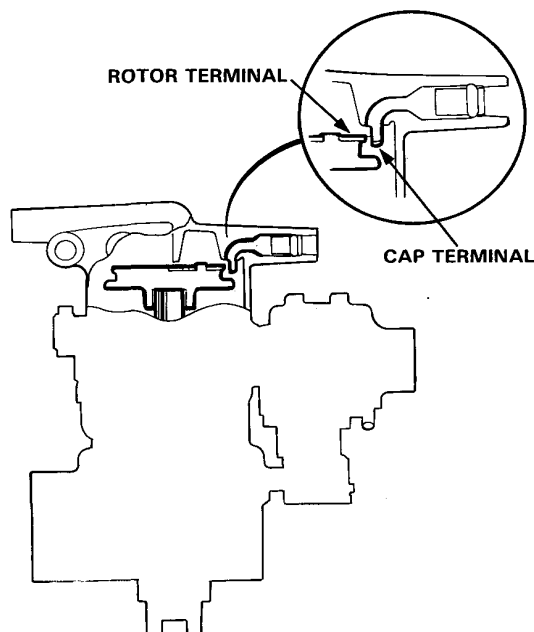
2. If not within the specifications, replace the radio condenser.

## 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.

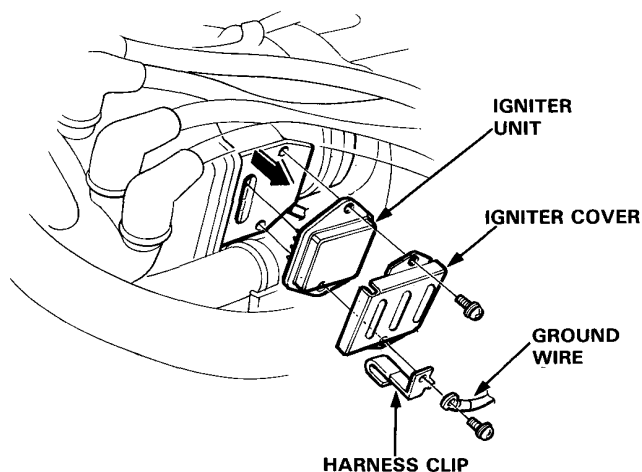




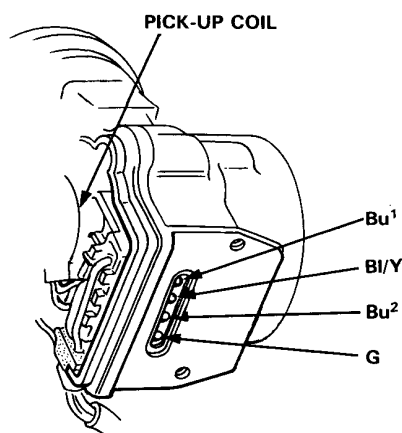


## Igniter Unit Test

1. Remove the igniter cover and pull out the igniter unit.



2. Check voltage between the Bu terminal and body ground, then the BI/Y terminal and body ground, with the ignition switch ON. There should be battery voltage.

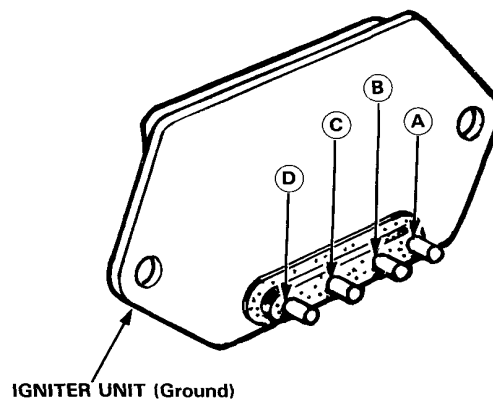


3. Measure resistance between the G and Bu<sup>2</sup> terminals on the pick-up coil. Replace the pick-up coil if the resistance is not within specifications.

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)

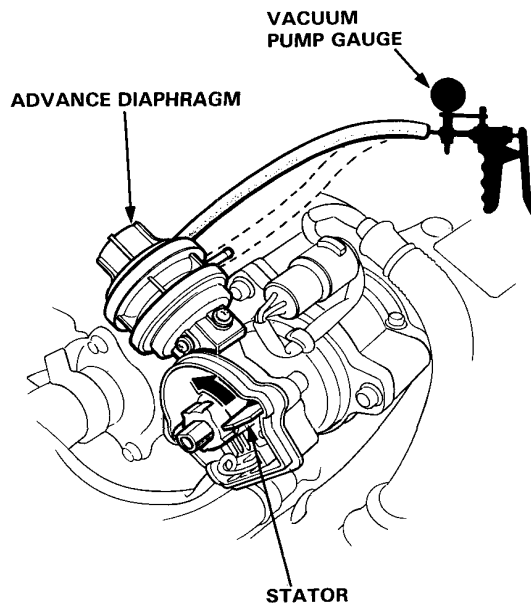
NOTE: When installing the igniter, pack silicone grease in the connector housing.



# Ignition

## Advance Diaphragm Inspection

1. Connect a vacuum pump to the advance diaphragm as shown.



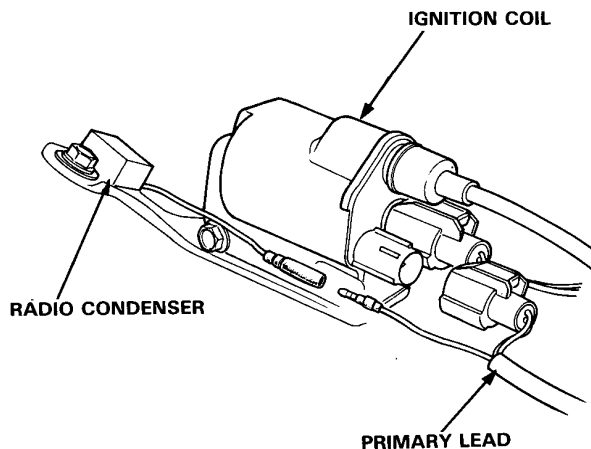
2. When vacuum (more than 500 mmHg, 20 in.Hg) is applied to the diaphragm, the stator should turn counterclockwise and stay. If the stator does not turn or stay, replace the diaphragm.

When vacuum is released, the stator should return. If the stator does not return, replace the diaphragm.

## Distributor Removal/Installation

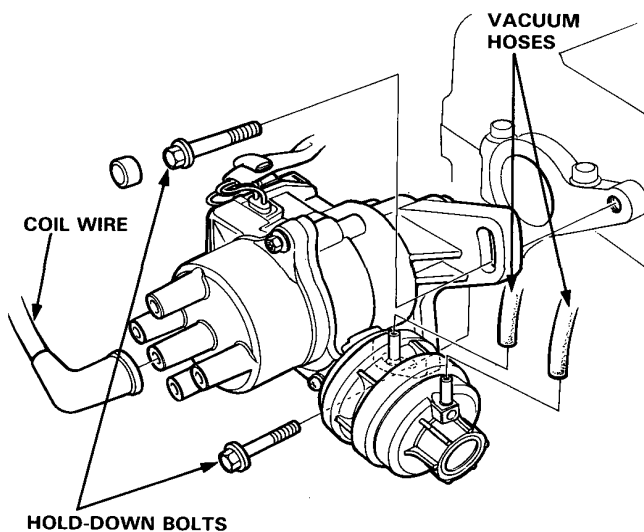
### Removal

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.

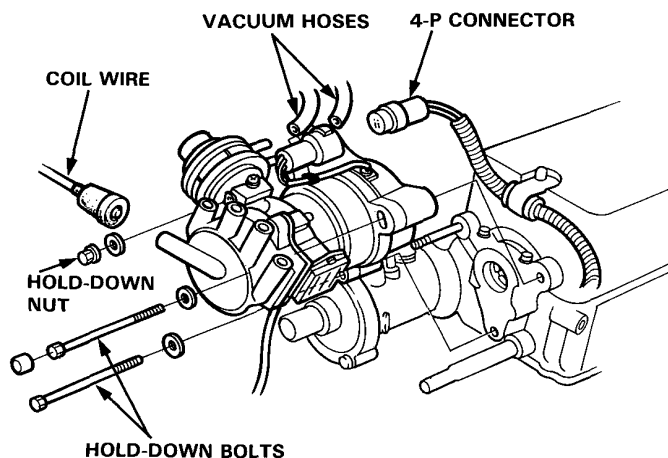
**A16A1 and A20A2 engines:**







### A20A4 engine:

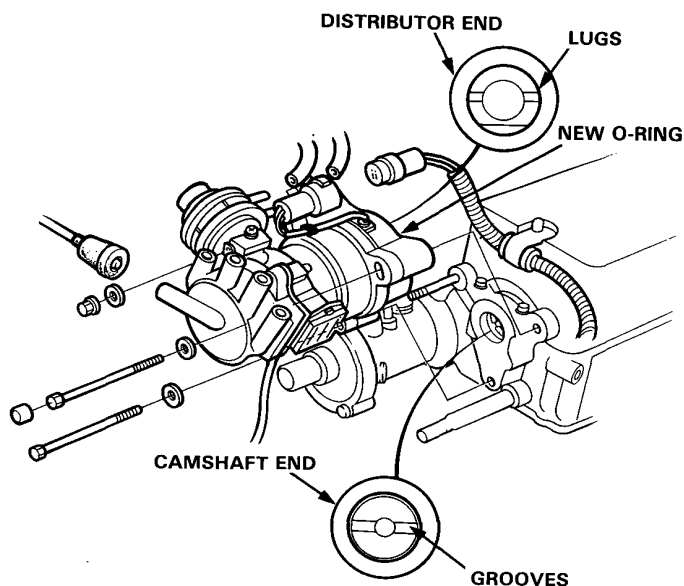


5. Remove the distributor hold-down bolts (and nut for A20A4 engine), then remove the distributor from the cylinder head.

### Installation

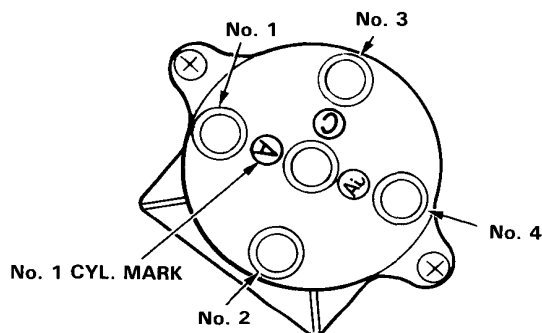
1. Coat a new O-ring with engine oil then install it.
2. Slip the distributor into position.

**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.

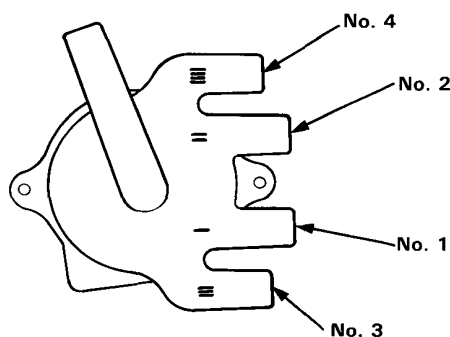


3. Install the hold-down bolts (and nut for A20A4 engine), and tighten temporarily.
4. Connect the coil wire to the distributor cap and the vacuum hose(s) to the advance diaphragm.
5. Connect the primary lead to the ignition coil and radio condenser.
6. For A20A4 engine, connect the 4-P connector to 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.

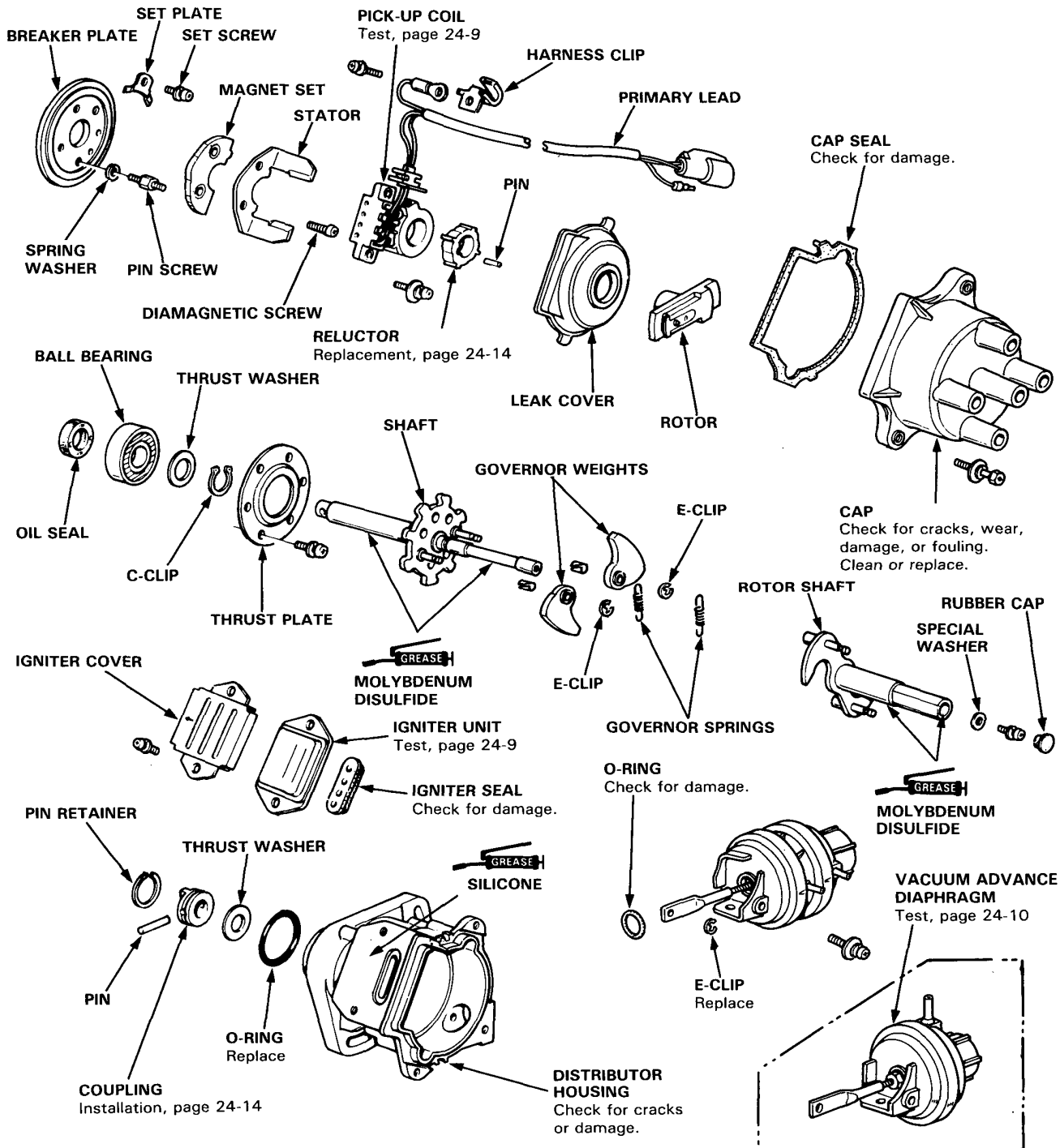


# Ignition

## Distributor Overhaul

A16A1 and A20A2 engine:

NOTE: After installing the reluctor, adjust the air gaps between the stator and reluctor (see page 24-8).

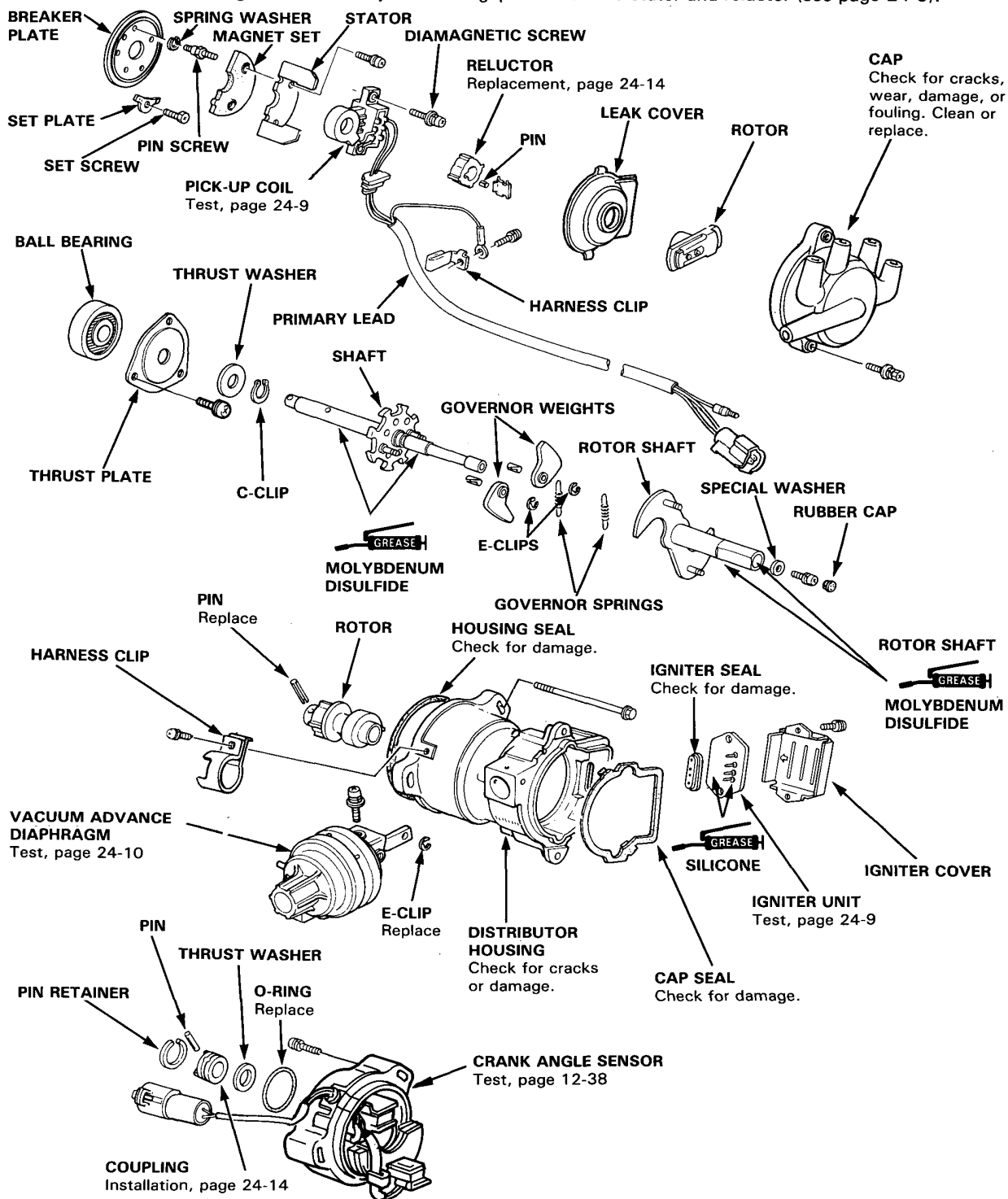






## A20A4 engine:

NOTE: After installing the reluctor adjust the air gap between the stator and reluctor (see page 24-8).

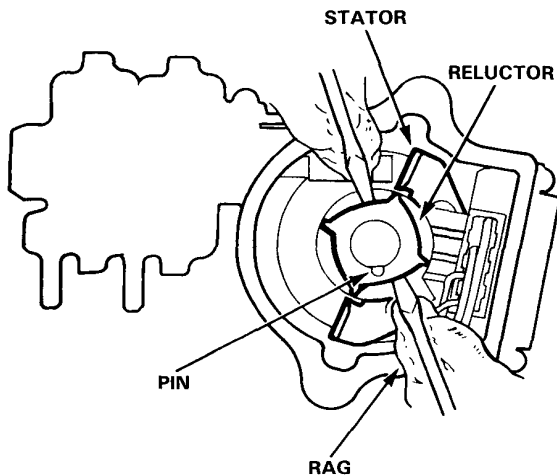




# Ignition

## Reluctor Replacement

1. Carefully pry up the reluctor by using two screwdrivers as shown. Do not damage the reluctor and stator.



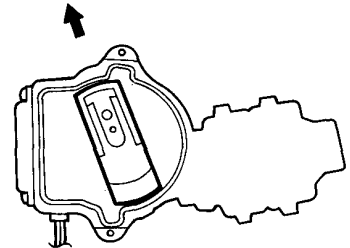
2. When installing the reluctor, be sure to drive in the pin with its gap away from the shaft.

**NOTE:** The number or letter manufacturing code on the reluctor must always face up.

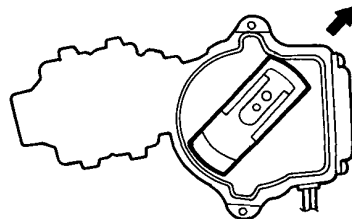
## Distributor Coupling Installation

1. Install the rotor, then turn it so that it faces in the direction shown (toward the No. 1 cylinder).

**A16A1 and A20A2 engines:**

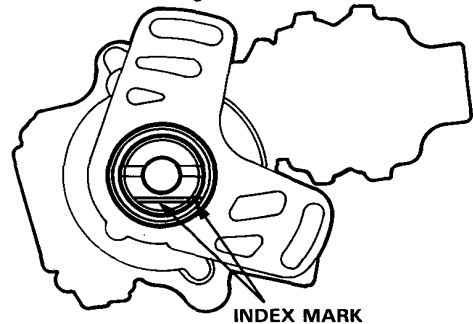


**A20A4 engine:**

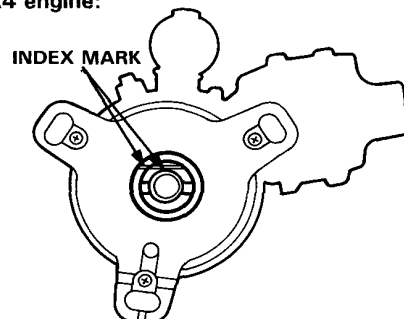


2. Set the thrust washer and coupling on the shaft.
3. Check that the rotor is still pointing toward the No. 1 cylinder, then align the index mark on the housing with the index mark on the coupling.

**A16A1 and A20A2 engines:**



**A20A4 engine:**



4. Drive in the pin and secure it with the pin retainer.



# Charging

## 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.

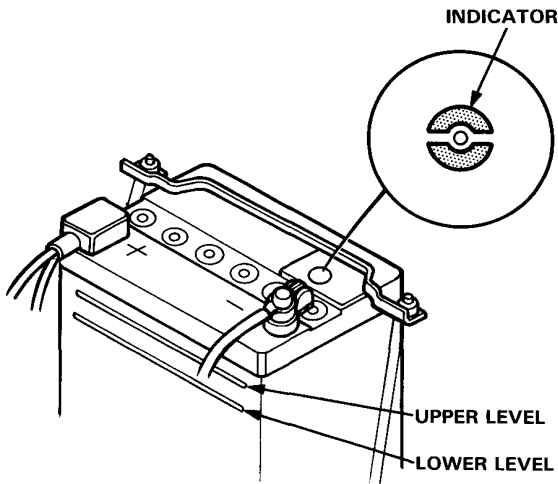
- If it spills on painted surfaces, clothing, or skin, rinse it off with water immediately to minimize the damage.
  - Always wear safety goggles or a face shield when servicing a battery.
1. Check for damage: If the case is cracked or the posts are loose, replace the battery.
  2. Check the battery 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.

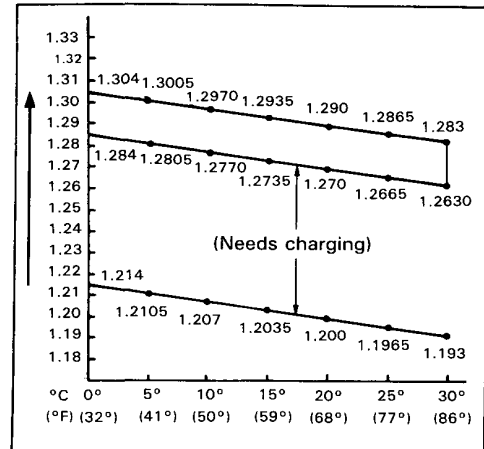


3. Check the electrolyte specific gravity:

### 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)



# Charging

## 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.

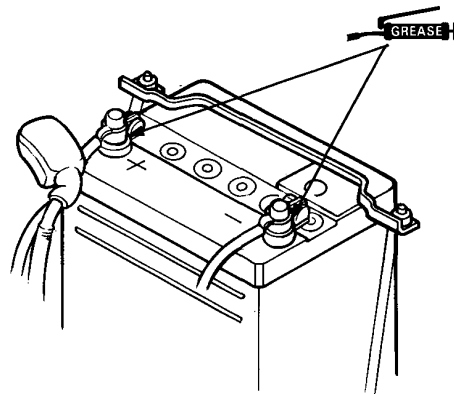
Watch the battery voltage during the entire 3 minutes; the highest reading should stay below 15.5 V.

- 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 charger, 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.

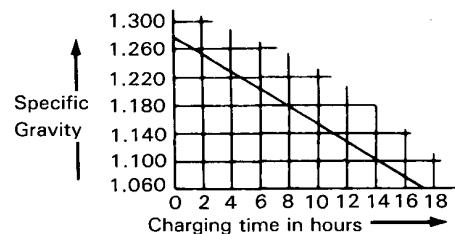
**NOTE:** Coat terminals lightly with petroleum jelly to retard corrosion. Baking soda may be mixed with the jelly for additional protection against acid build-up.



## 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.

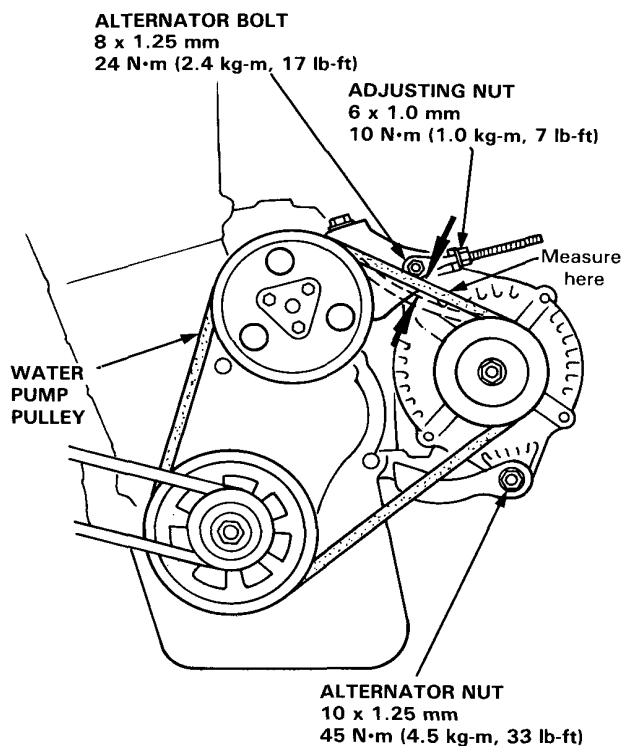
1. Turn the ignition switch on. The charge warning light should come on.  
If it does not come on, unplug the alternator connector and short the pin of the W/Bu wire to ground.
  - If the warning light still does not come on, check for:
    - Blown No. 1 (10 A) fuse in the dash fuse box.
    - Bad bulb.
    - An open in the BI/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.



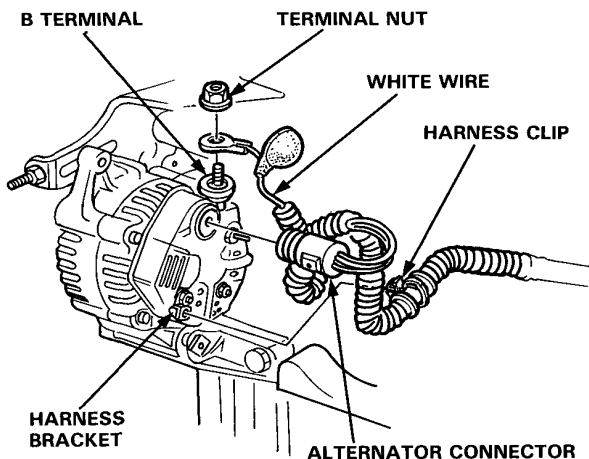
2. Loosen the alternator bolt and nut.
3. Move the alternator by turning the adjusting nut to obtain the proper belt tension, then retighten the bolt and nut.
4. Recheck the deflection of the belt.



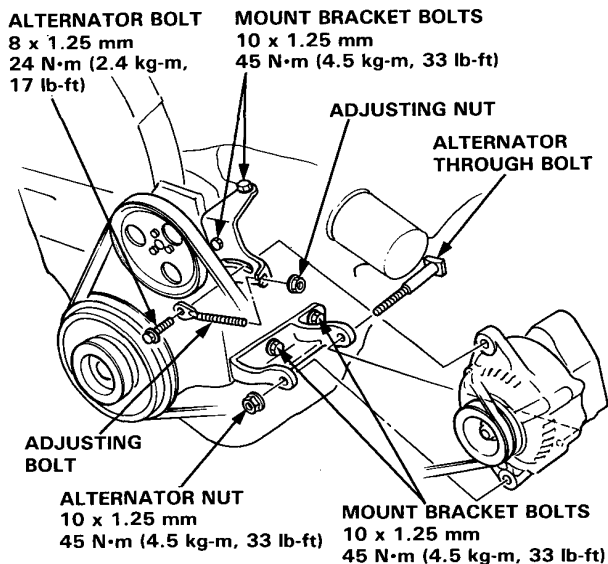
# Charging

## 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.



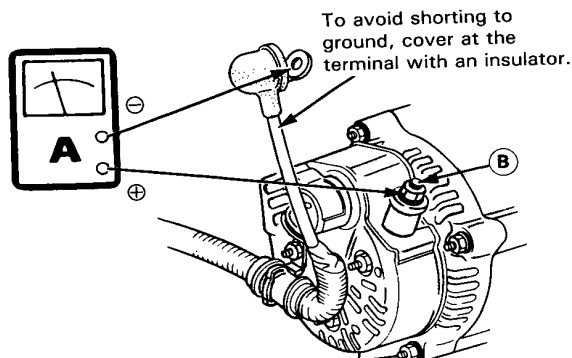
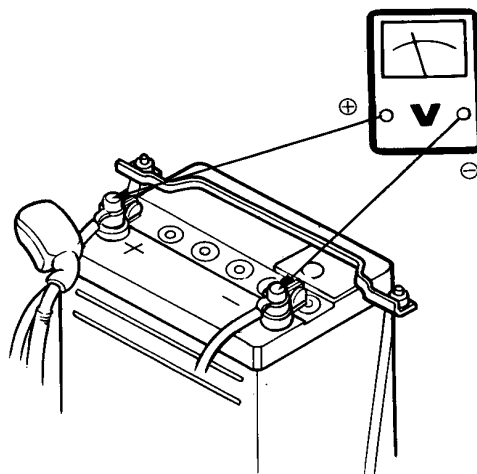
4. Remove the terminal nut and the white wire from the B terminal.
5. Remove the alternator bolt and nut, then remove the alternator belt from the alternator pulley.



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.)



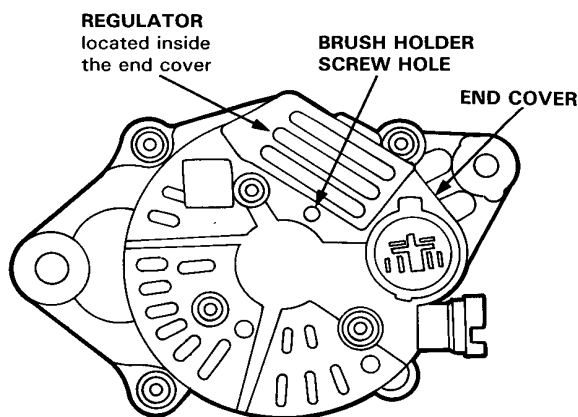




3. Start the engine, and turn on the headlights, blower motor, rear defogger and etc.
4. Compare the readings to the chart in step 8. If no output or below specification, go to step 6. If output is within specification and voltage is between 13.9 and 15.1 V, the voltage regulator and alternator are OK. 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.

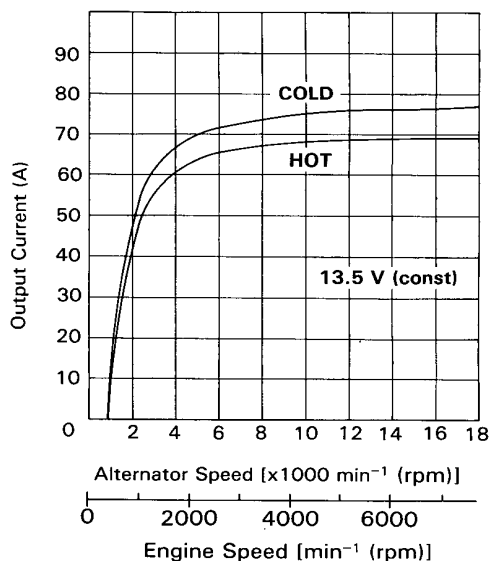
6. Perform a full-field test: Insert a short screwdriver into the brush holder screw hole in the alternator and cover.



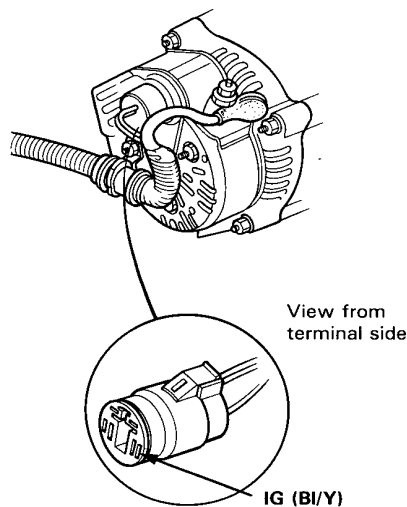
7. While it's touching the brush screw, ground the screwdriver against the cover (you may have to scrape some point off the cover for a good ground). Note the amperage while grounding the screwdriver.

**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.

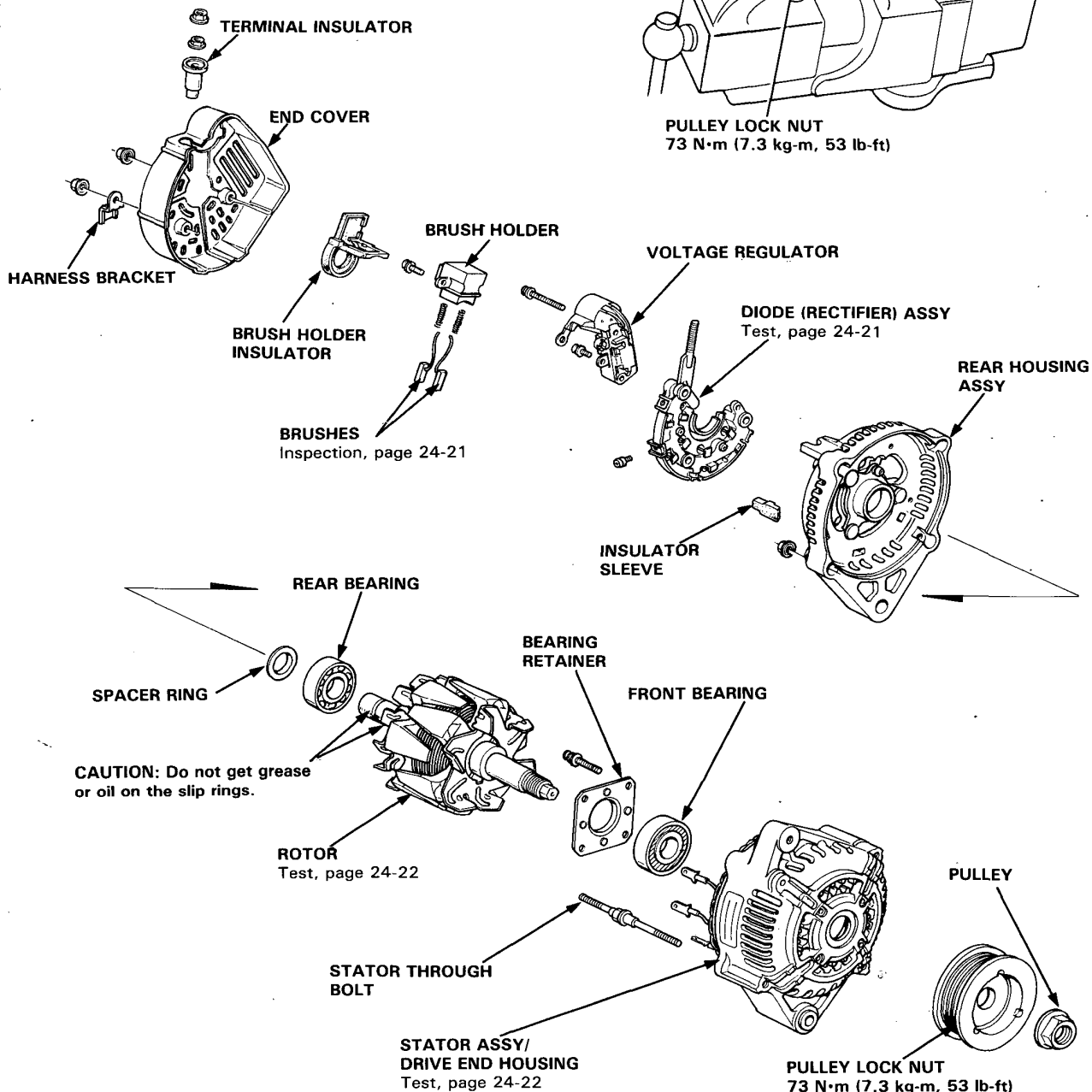
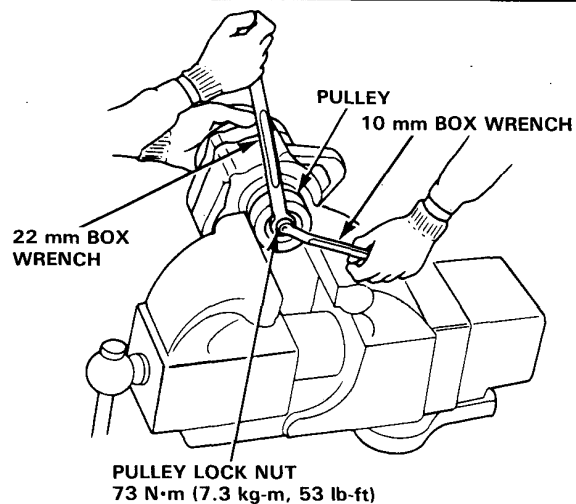


# Charging

## 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.



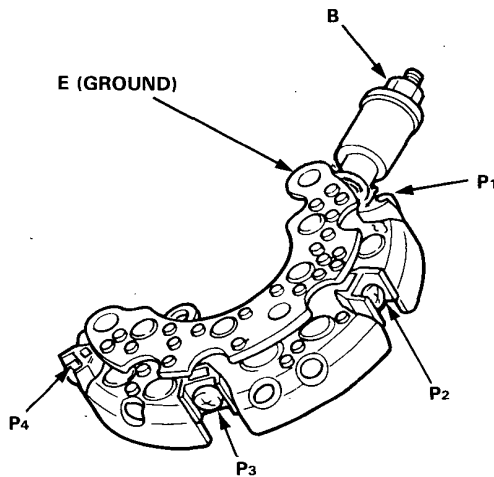




## Rectifier Test

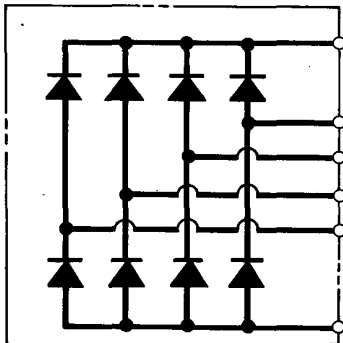
NOTE: The diodes are designed to pass current in one direction and block current in the opposite direction. Since the alternator rectifier is made up of eight diodes (4 pairs), each diode must be tested for continuity in both directions; a total of 16 checks.

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



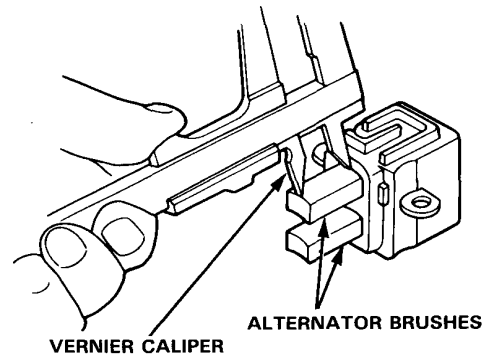
## Alternator Brush Inspection

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.

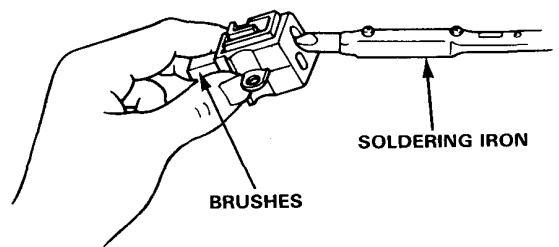
### Alternator Brush Length:

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.



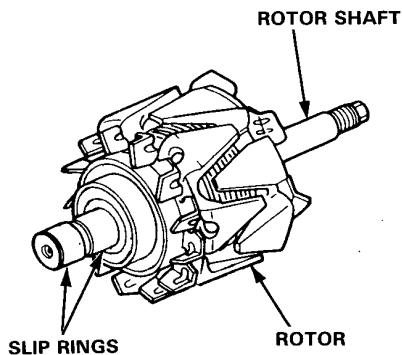
**CAUTION:** When replacing the brushes, use only a rosin core type solder or solder joints will corrode.



## Charging

### Rotor Slip Ring Test

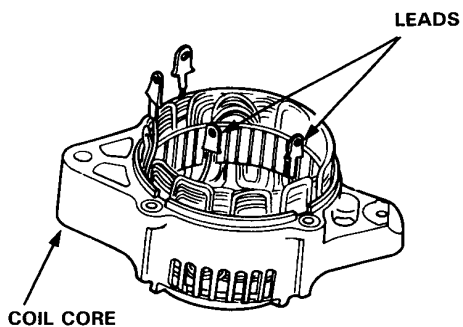
1. Check that there is continuity between the slip rings.
2. Check that there is no continuity between the rings and the rotor or rotor shaft.



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:

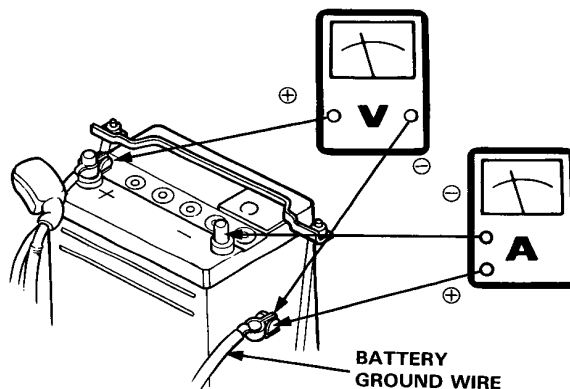
Use a starter system tester.  
Connect and operate the equipment in accordance with manufacturer's instructions.  
Test and troubleshoot as described starting with step 2.

#### Alternate Procedure:

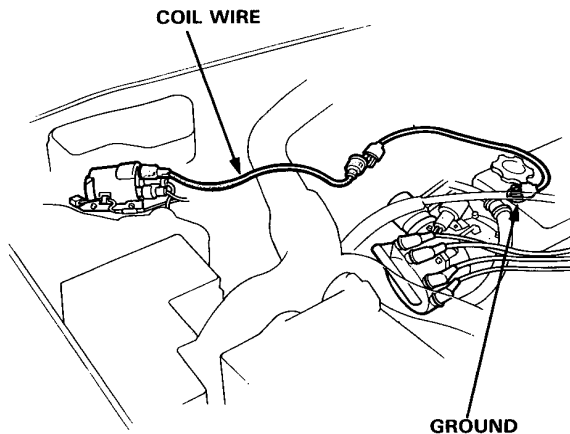
Use the following equipment:

- Ammeter, 0–400 A
- Voltmeter, 0–20 V (accurate within 0.1 volt)
- Tachometer 0–1200 min<sup>-1</sup> (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 (BI/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 BI/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<sup>-1</sup> (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

## 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 BI/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

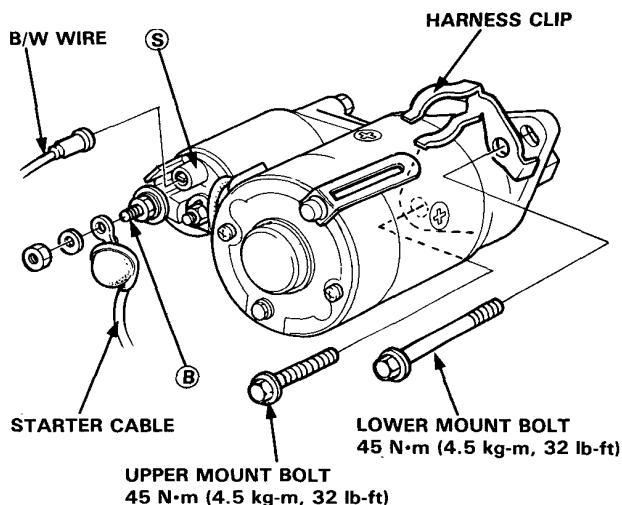
##### Direct drive type:

All models: 10 x 1.25 x 125

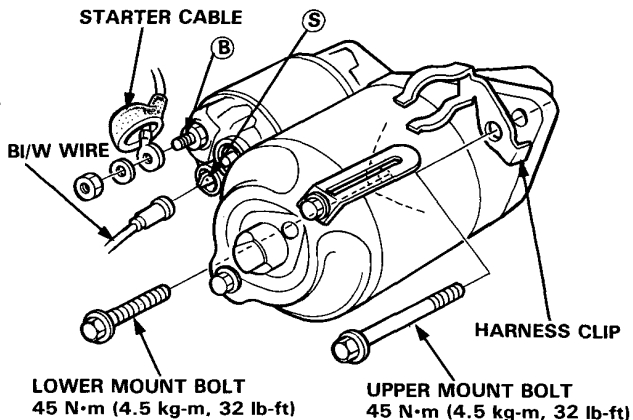
### Lower Mount Bolt

All models: 10 x 1.25 x 43

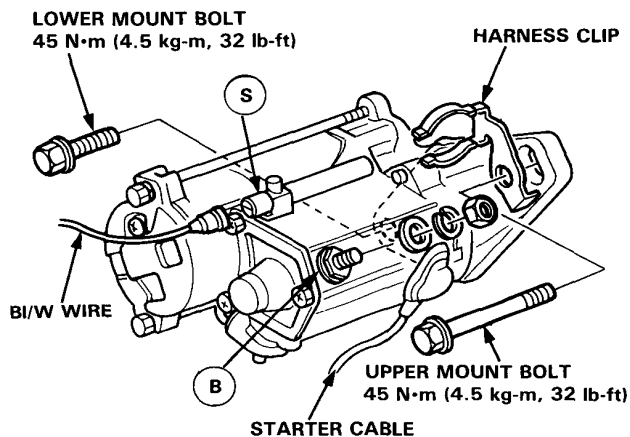
### Hitachi 0.8 kw:



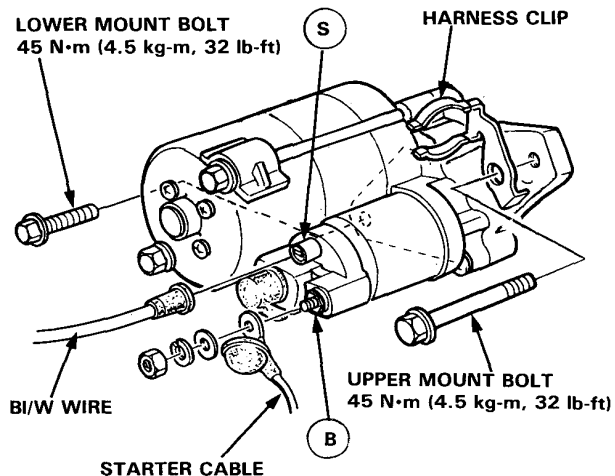
### ND 0.8 kw:



### ND 1.0 kw and 1.4 kw:



### Mitsuba 1.0 kw and 1.4 kw:



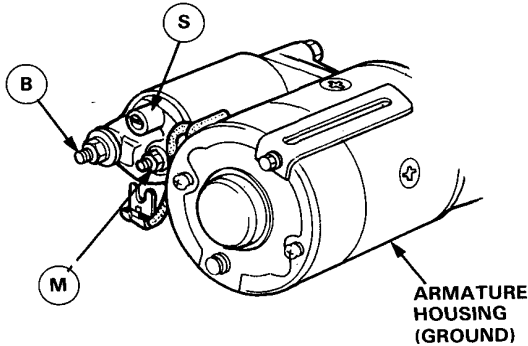




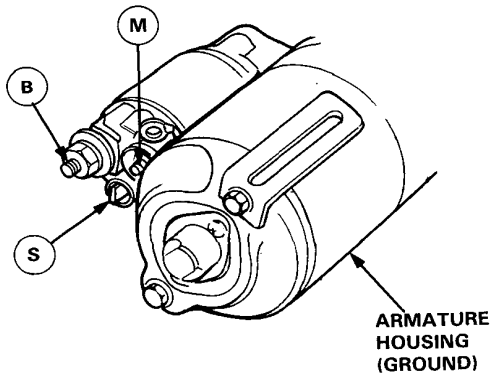
## Starter Solenoid Test

1. Check the pull-in coil for continuity between (S) terminal and the armature housing (ground).  
Coil is OK if there is continuity.
2. Check the hold-in coil for continuity between (S) and (M) terminals.  
Coil is OK if there is continuity.

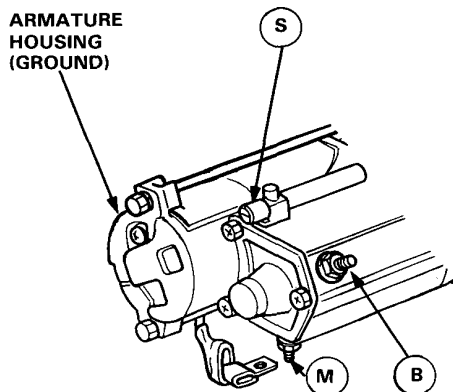
Hitachi 0.8 kw:



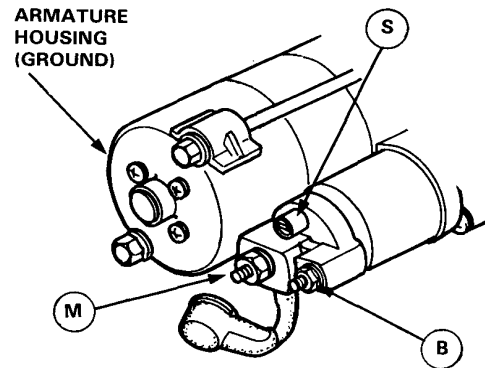
ND 0.8 kw:



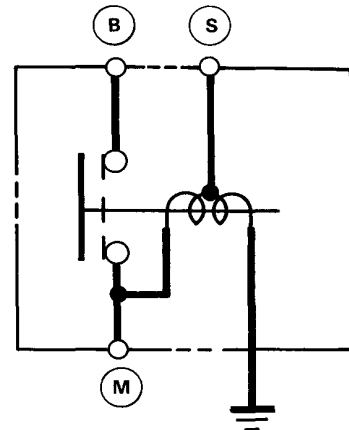
Nippon Denso 1.0 kw and 1.4 kw:



ND 1.0 kw and 1.4 kw:



Circuit Diagram

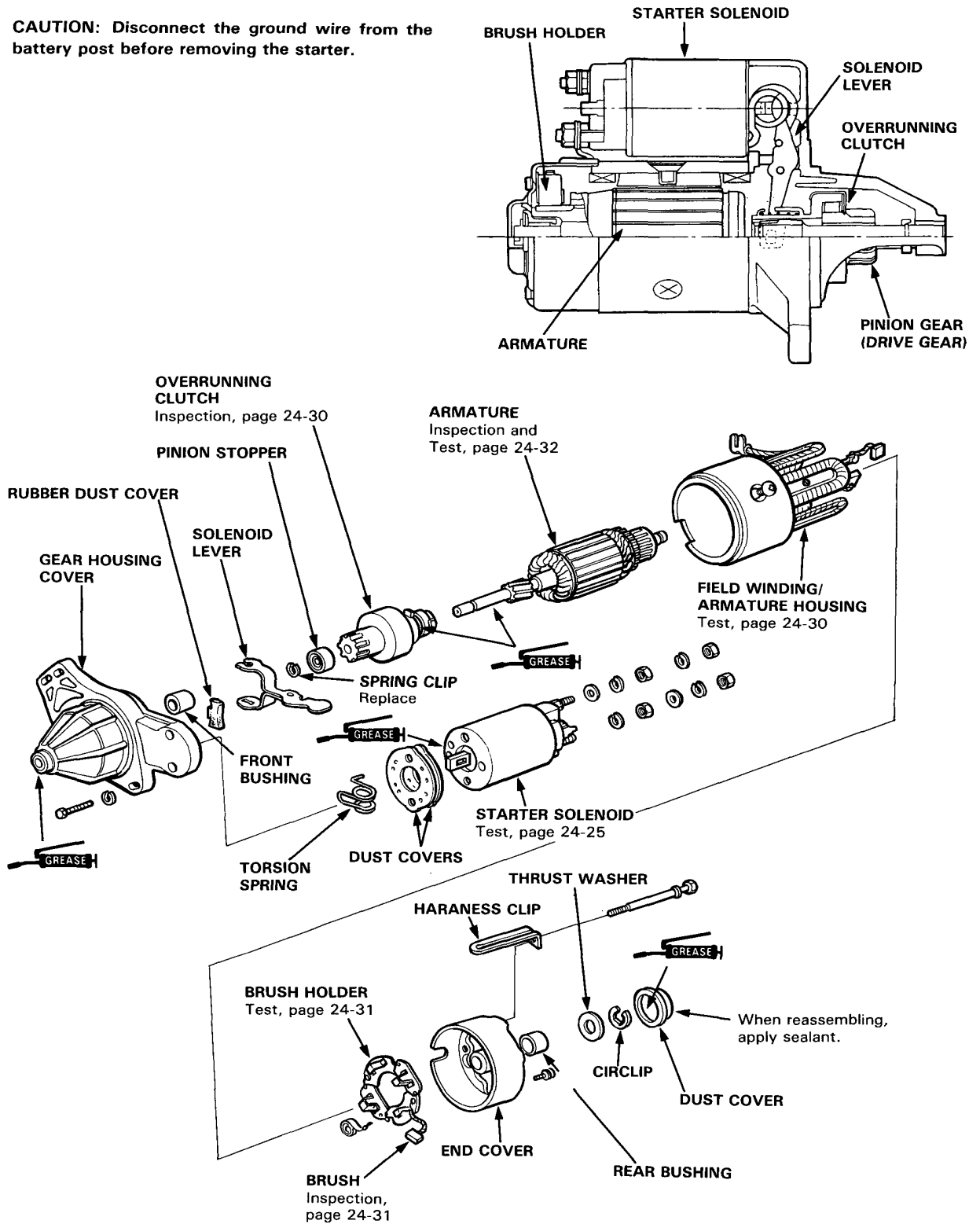




# Starter

## Starter Overhaul (Direct drive 0.8 kw Hitachi)

**CAUTION:** Disconnect the ground wire from the battery post before removing the starter.

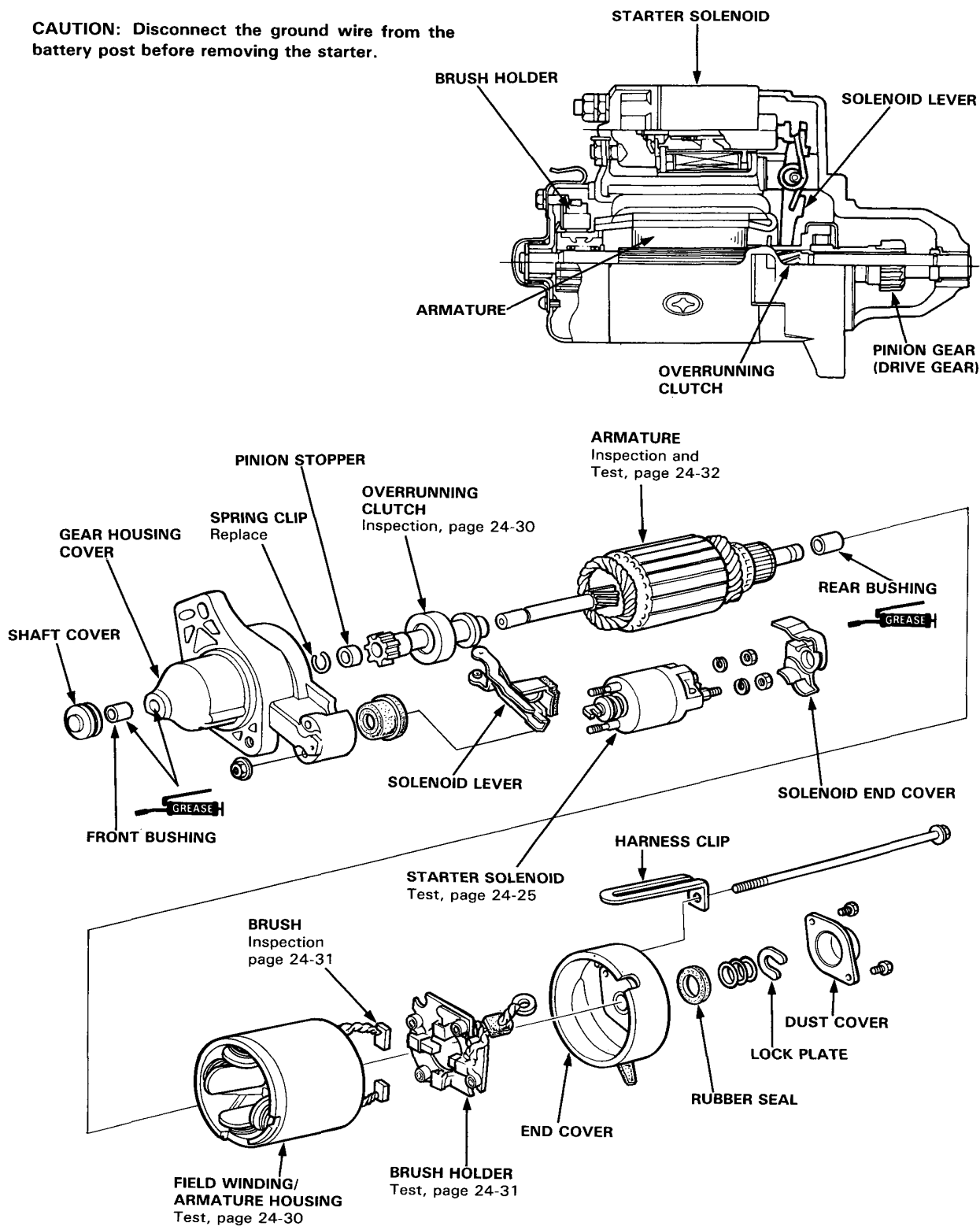






## — (Direct drive 0.8 kw ND)

**CAUTION:** Disconnect the ground wire from the battery post before removing the starter.

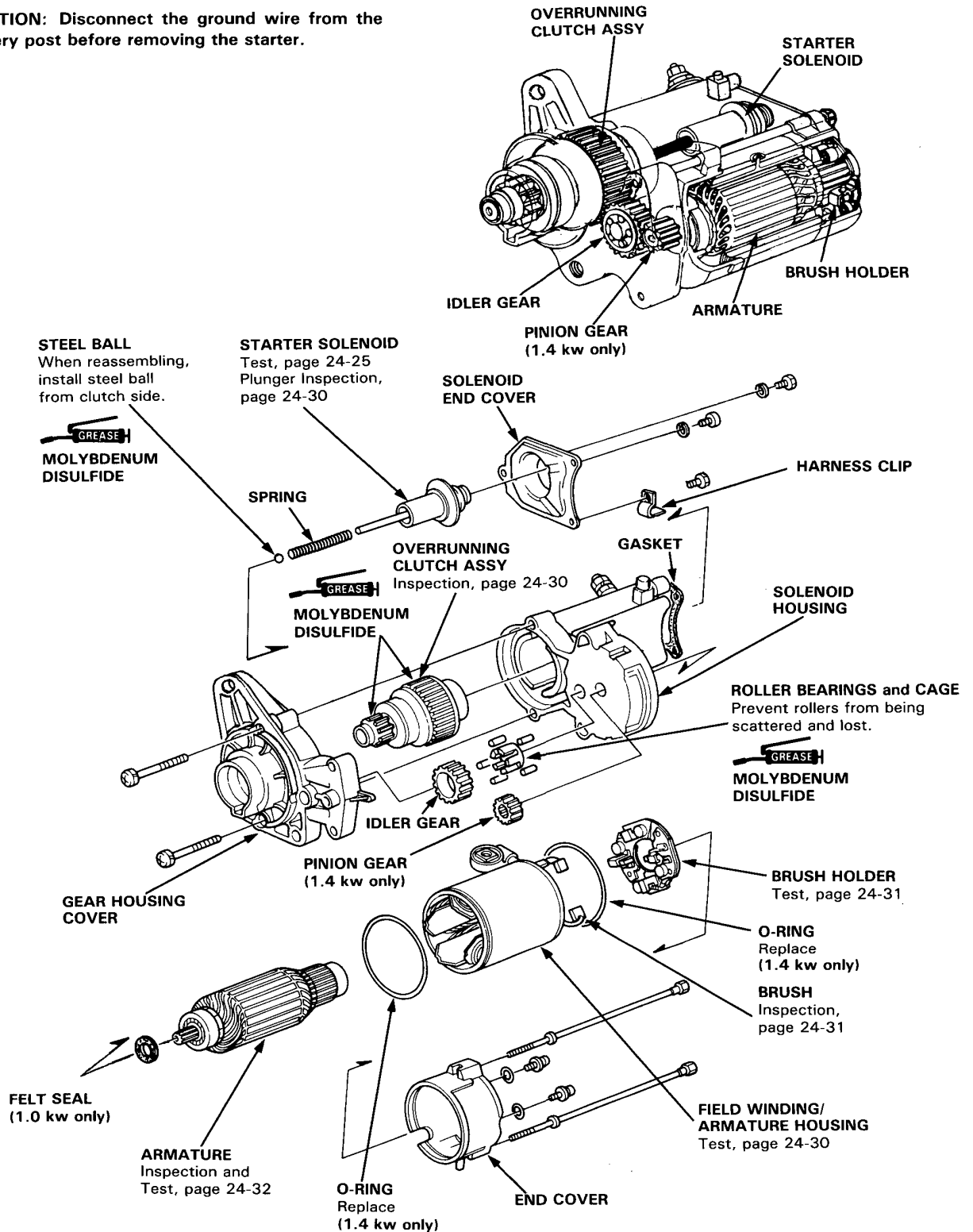




# Starter

## 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.

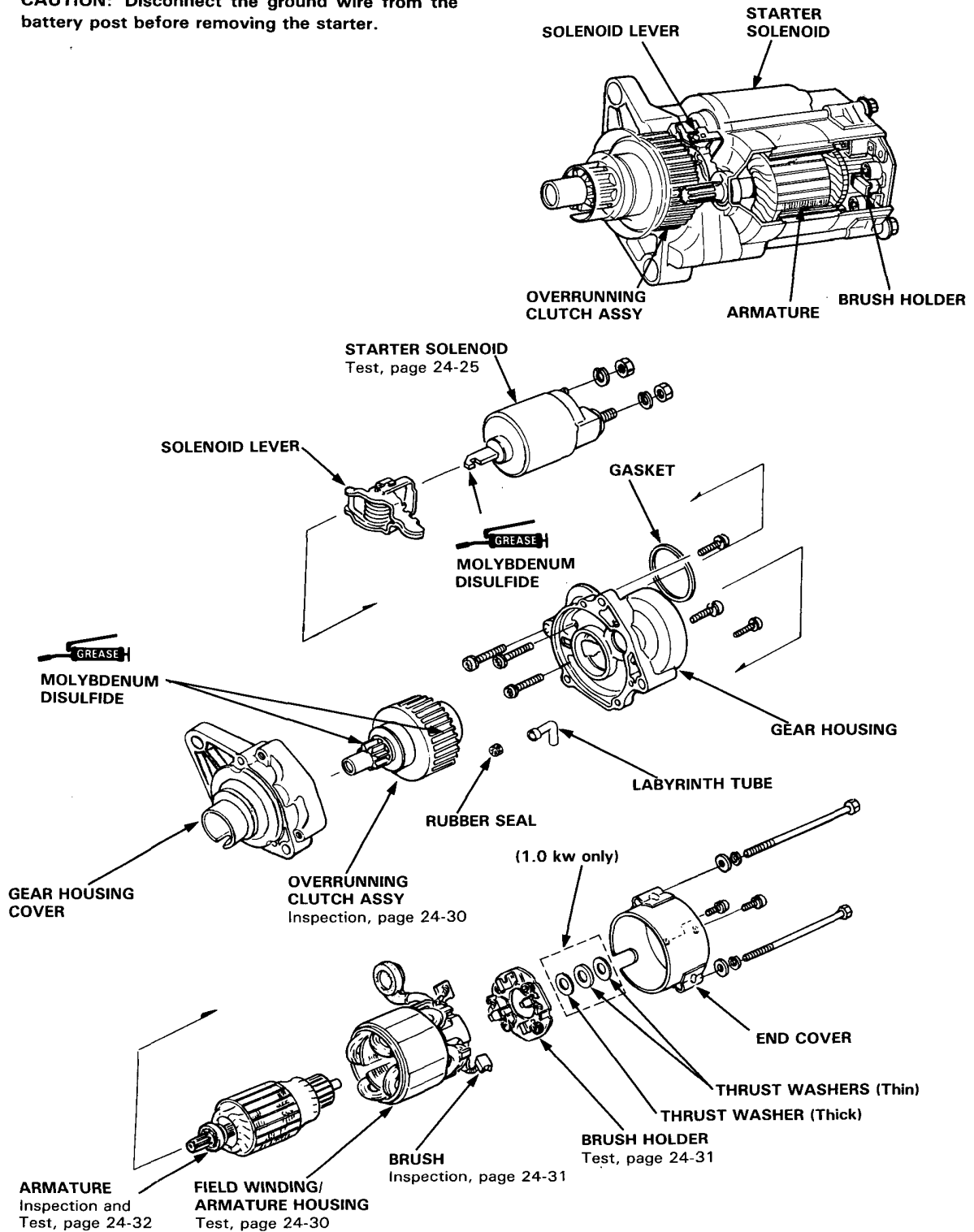






## (Gear reduction 1.0 kw and 1.4 kw Mitsuba)

**CAUTION:** Disconnect the ground wire from the battery post before removing the starter.





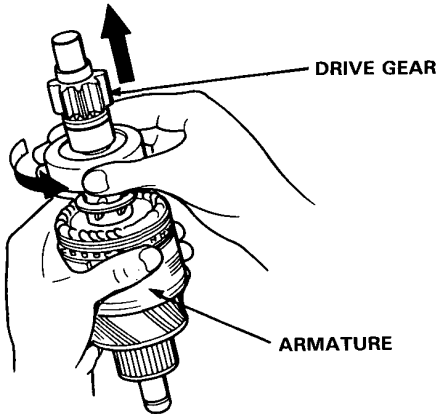
# Starter

## Overrunning Clutch Check

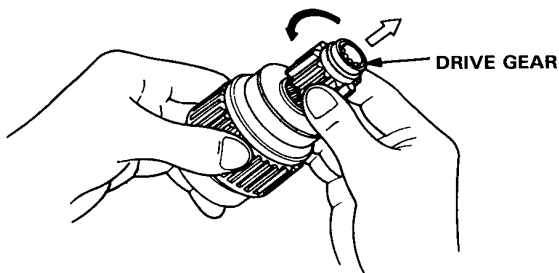
Move the overrunning clutch along the shaft.

If it doesn'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:**

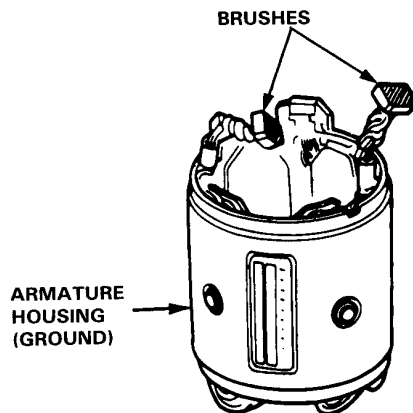


If the gear is worn or damaged, replace the overrunning clutch assembly; the gear is not available separately.

**NOTE:** Check condition of the flywheel or torque converter ring gear if the starter drive gear teeth are damaged.

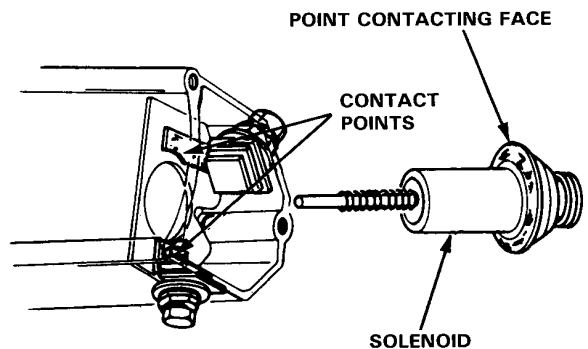
## Starter Field Winding Test

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.

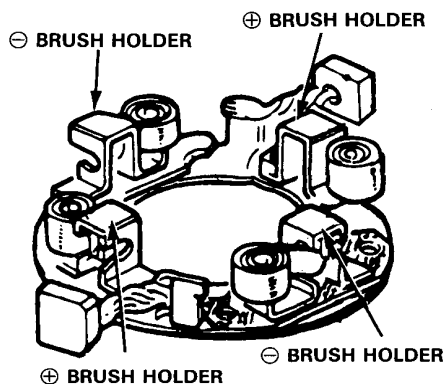






## Starter Brush Holder Test

Check that there is no continuity between the  $\oplus$  and  $\ominus$  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.)

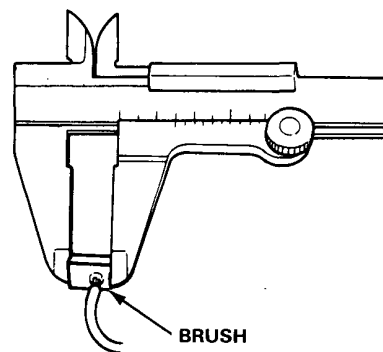
#### Service Limit:

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.)



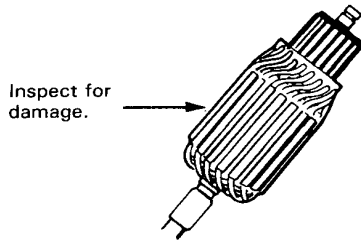
NOTE: To seat new brushes after installing them in their holders, slip a strip #500 or #600 sandpaper, with the grit side up, over the commutator, and smoothly rotate the armature. The contact surface of the brushes will be sanded to same contour as the commutator.



# Starter

## 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.)

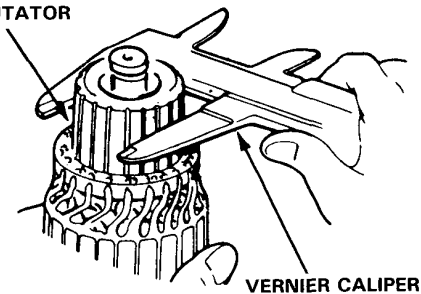
ND 1.0 kw and 1.4 kw:

29.0 mm (1.14 in.)

Mitsuba 1.0 kw and 1.4 kw:

27.5 mm (1.08 in.)

COMMUTATOR



### Commutator Runout

#### Standard (New):

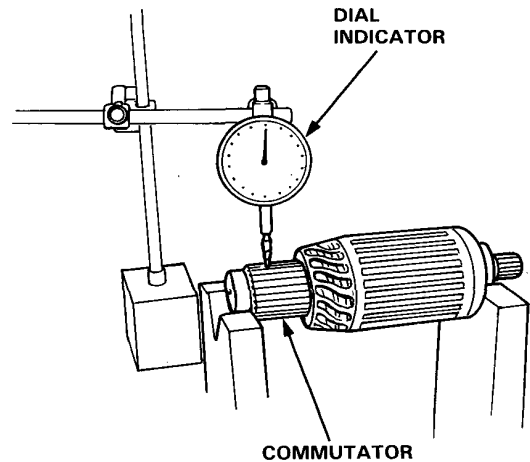
0.8 kw : 0–0.05 mm  
(0–0.002 in.)

1.0 kw and 1.4 kw: 0–0.02 mm  
(0–0.001 in.)

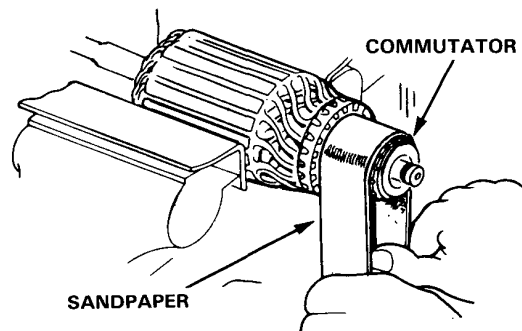
#### Service Limit:

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.)

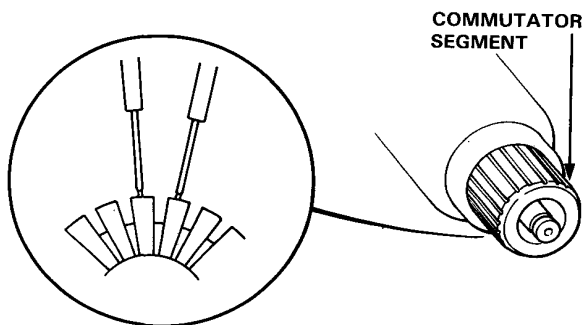
##### Service Limit:

Hitachi : 0.2 mm (0.008 in.)

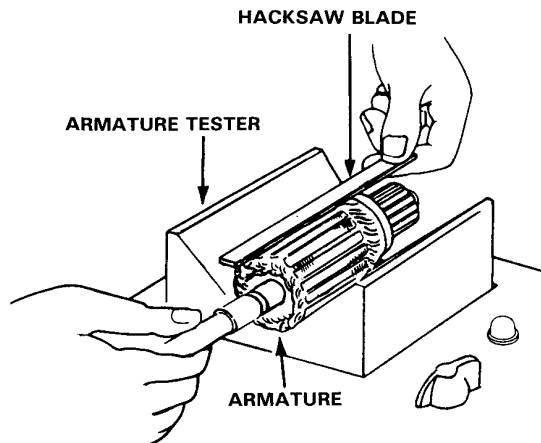
ND : 0.2 mm (0.008 in.)

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.

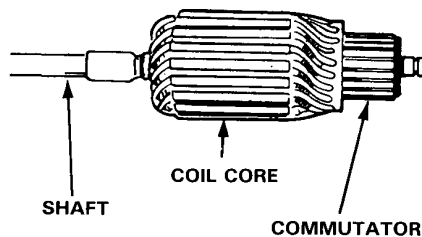


6. Place the armature on an armature tester. Hold a hacksaw blade on the armature core.



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.



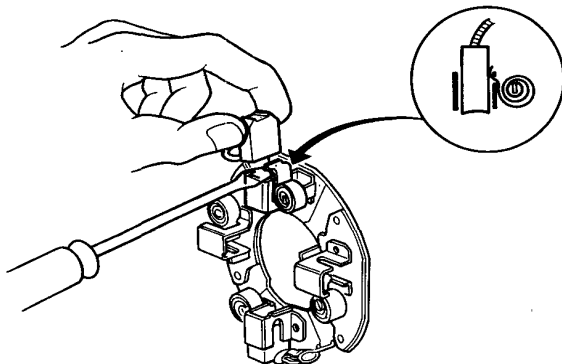


# Starter

## Starter Reassembly

Reassemble the starter in the reverse order of disassembly.

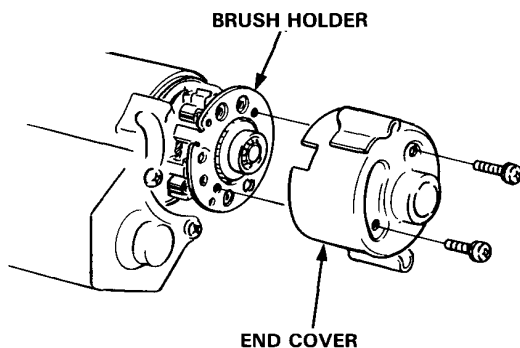
1. Pry back each brush spring with a screwdriver, then position the brush about halfway out of its holder, and release the spring to hold it there.



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

### Illustrated Index

Engine Compartment and Front .....	25-2
Dashboard Area .....	25-3
Door .....	25-6
Floor .....	25-7
Roof and Tail .....	25-8
Ignition Switch .....	25-9
Combination Switch .....	25-10
Interior Light .....	25-12
Clock .....	25-12
Horn .....	25-13
Dashlight Brightness Control .....	25-14
Rear Window Defogger .....	25-16
Cigarette Lighter .....	25-17
Wipers/Washers .....	25-18
Power Door Mirror .....	25-25
Power Door Locks .....	25-26
Power Windows .....	25-30
Sunroof .....	25-36
Cruise Control .....	25-38
Ignition Key Light .....	25-46
Seat Belt Reminder System .....	25-47
Heated Seat .....	25-48
Sound System .....	25-48
Gauge Assembly .....	25-50
Light-on Warning System .....	25-62
Safety Indicator .....	25-64
Shift Lever Position Indicator .....	25-70
Headlights .....	25-72





# 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:

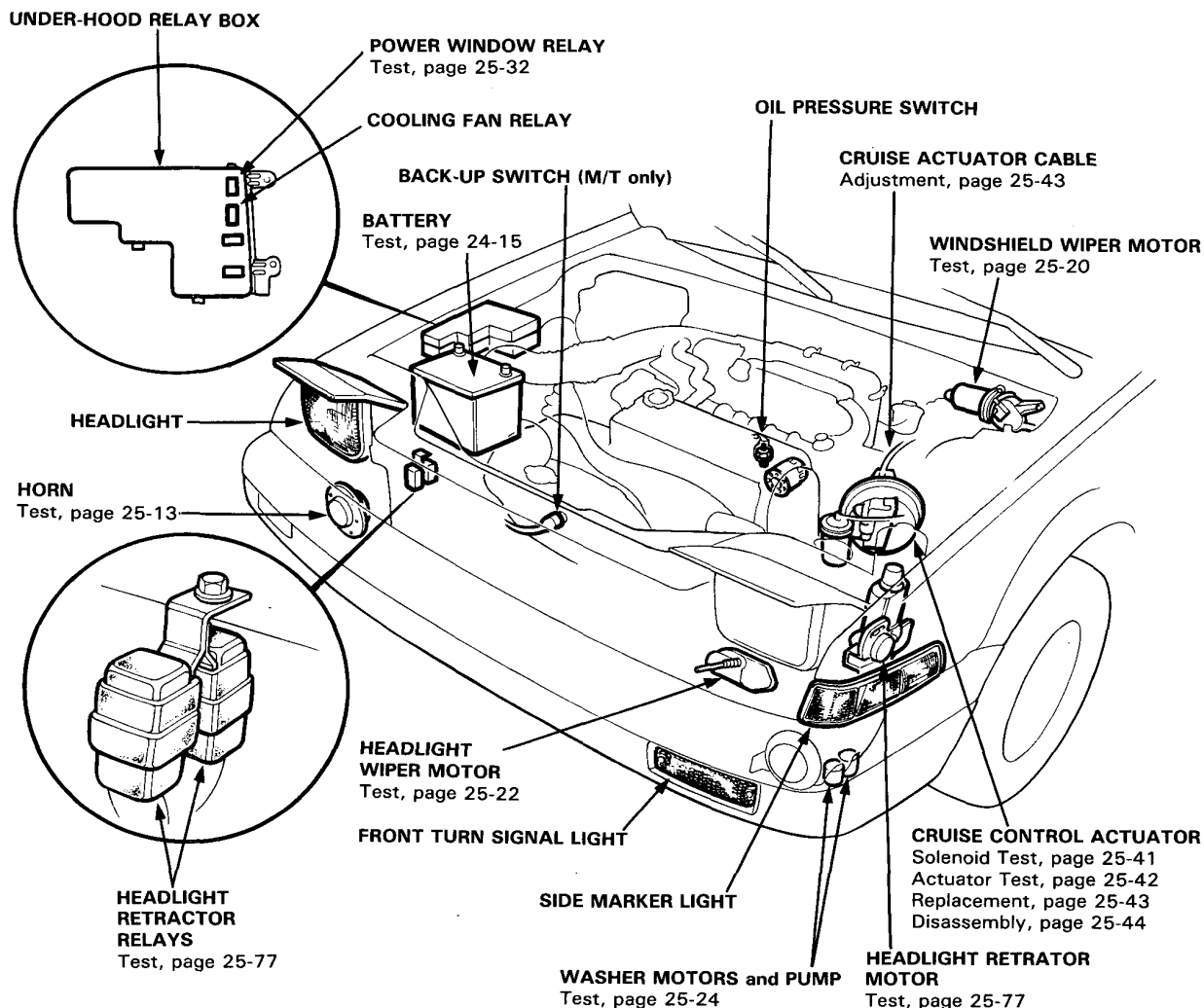
- Do not quick-charge a battery unless the battery ground cable has been disconnected, or you will damage the alternator diodes.
- Do not attempt to crank the engine with the ground cable disconnected or you will severely damage the wiring.
- Check the alternator belt tension.

### 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.

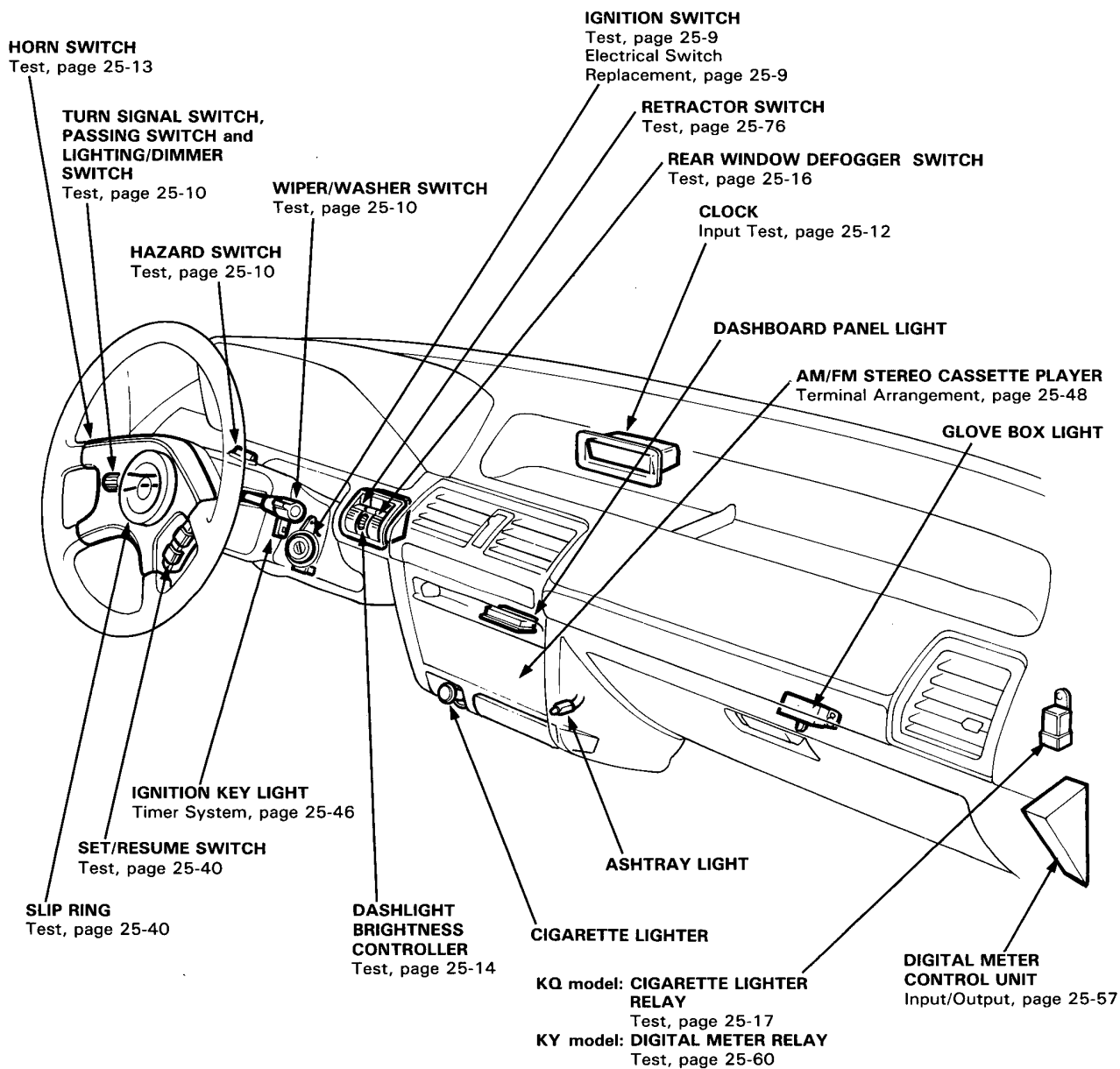
- When connecting a connector, push it until it clicks into place.
- Make sure multiple pin connectors are packed with silicone grease.







## (Dashboard Area)



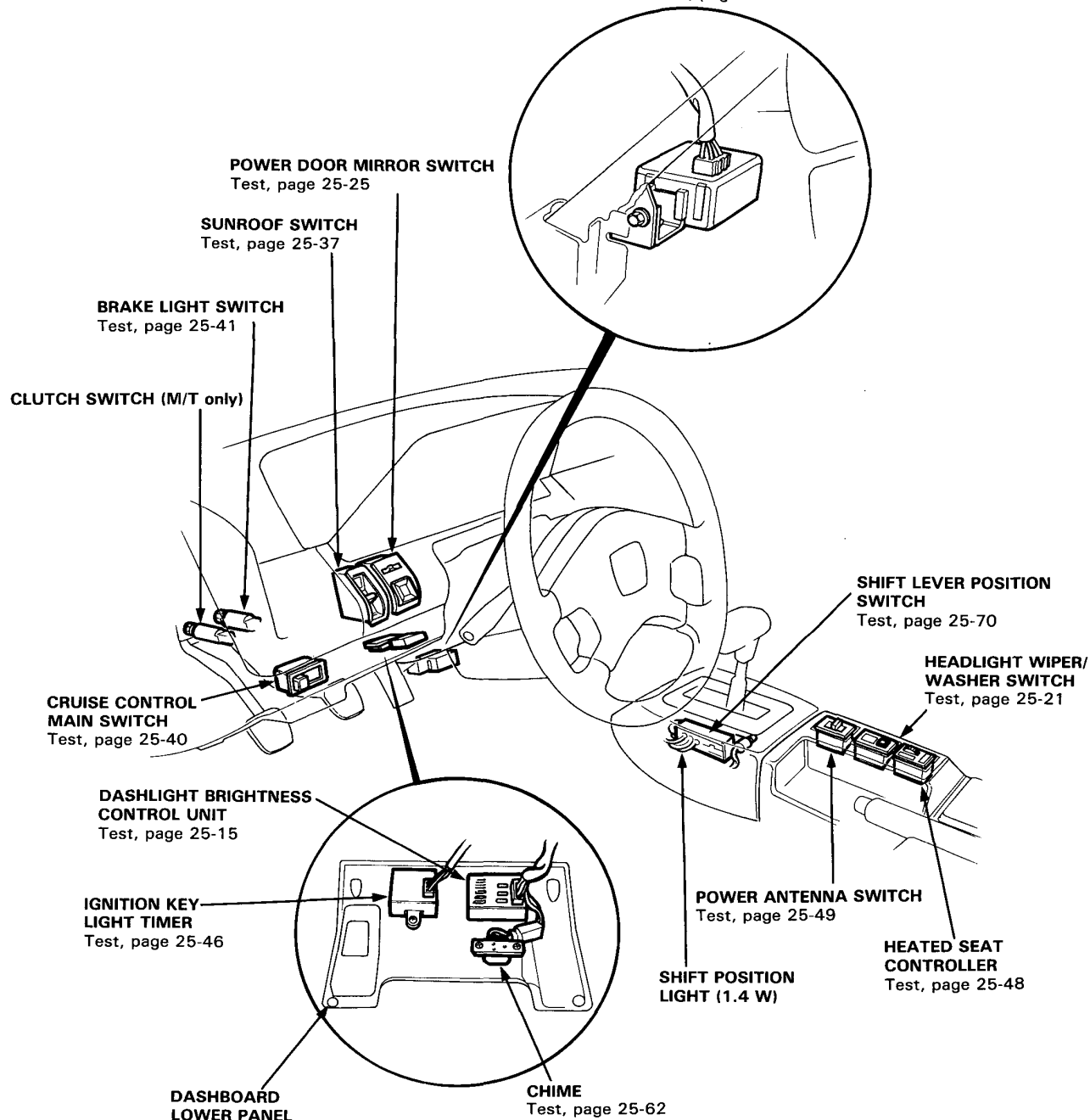
(cont'd)



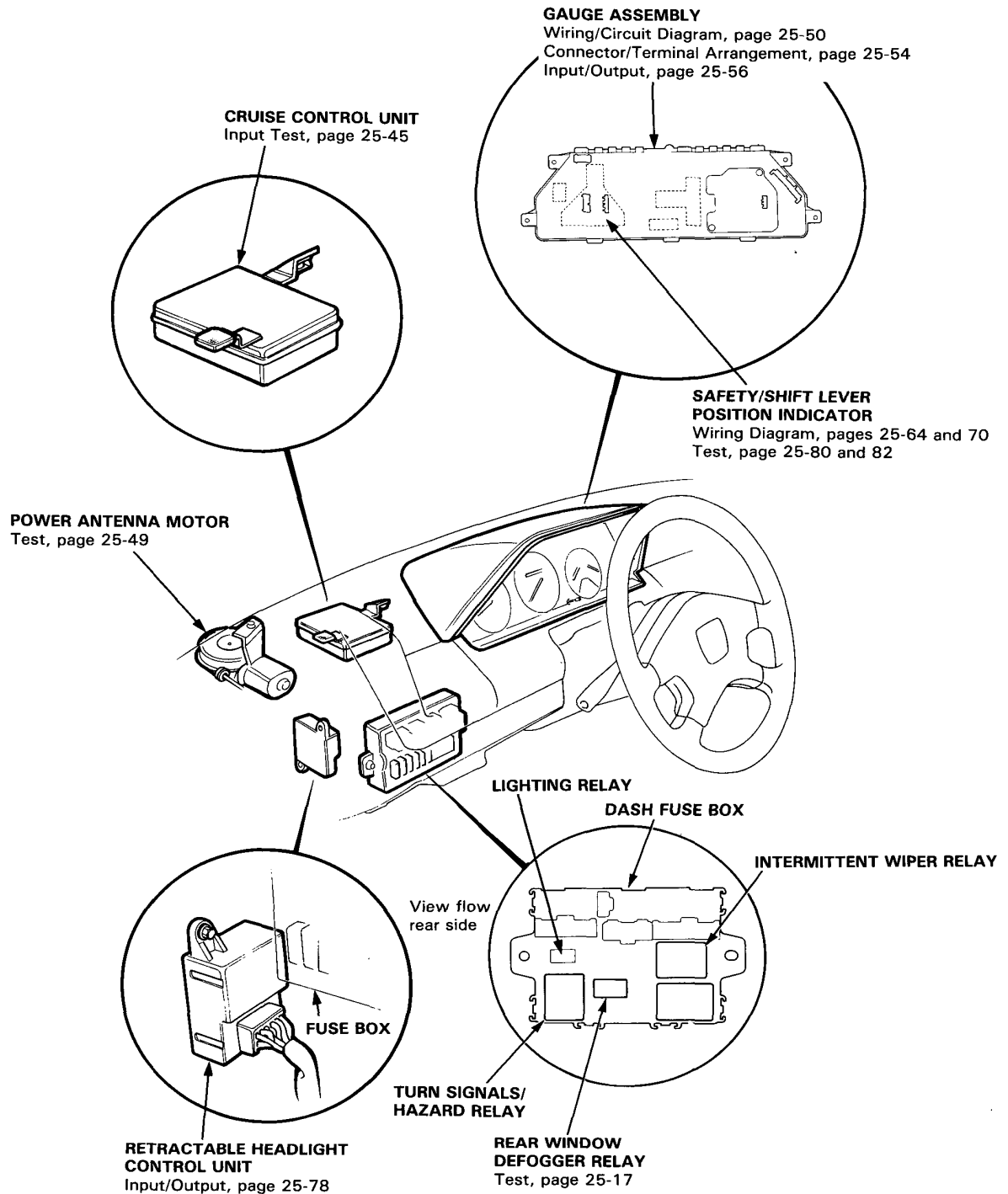
# Body Electrical

## Illustrated Index (Dashboard Area cont'd)

- **BRAKE LIGHT CIRCUIT FAILURE SENSOR**  
Test, page 25-69
- **DAY-TIME RUNNING LIGHT RELAY**  
Test, page 25-76
- **SEAT BELT TIMER**  
Test, page 25-47



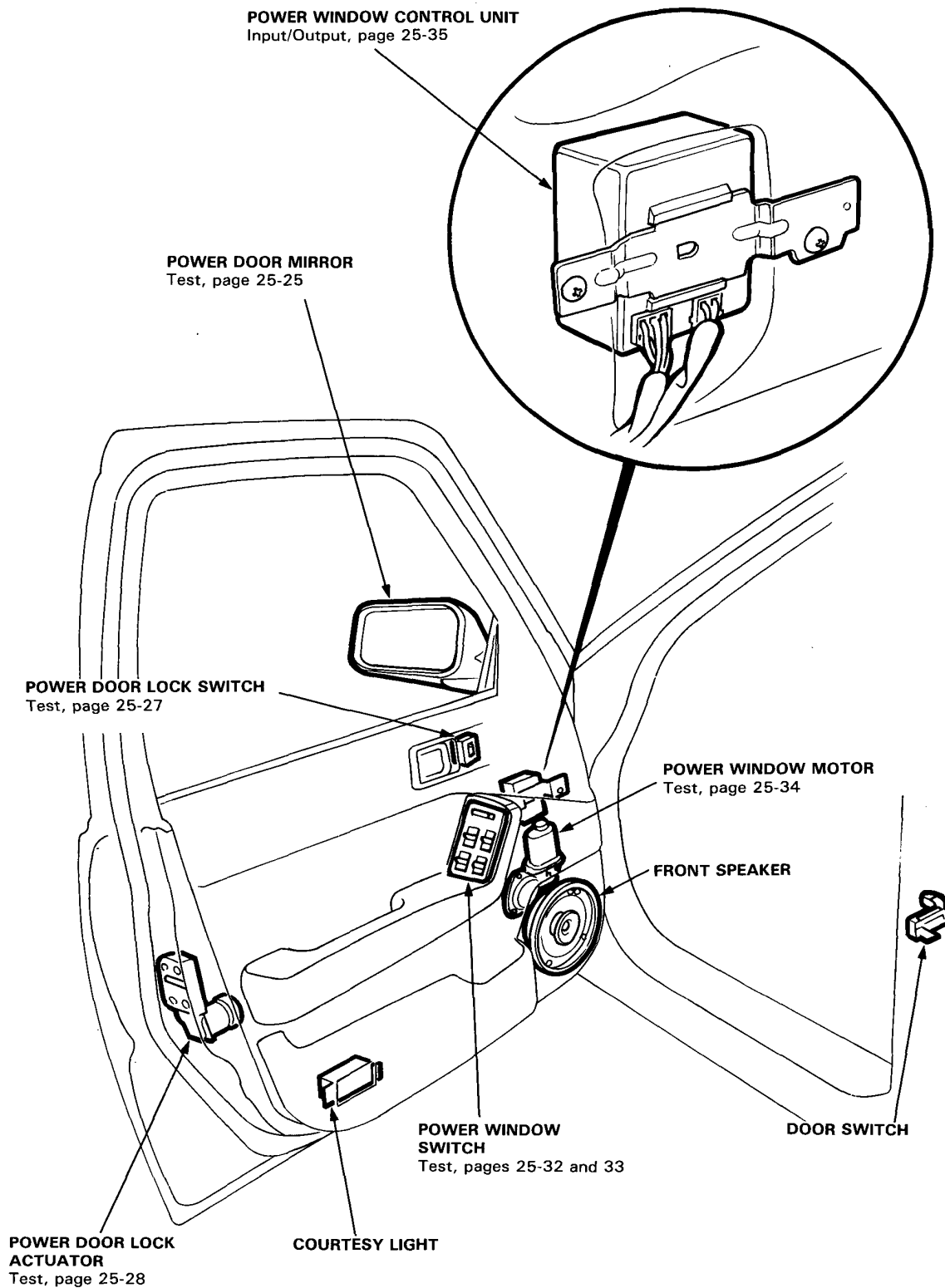






# Body Electrical

## Illustrated Index (Door)

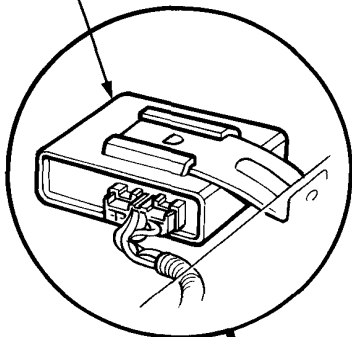




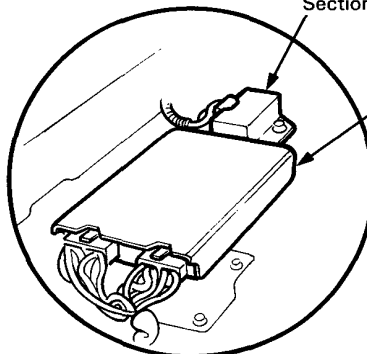


(Floor)

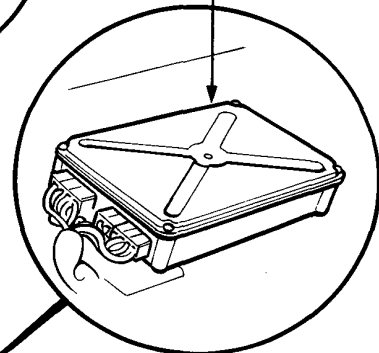
**POWER DOOR LOCK CONTROL UNIT**  
Test, page 25-29



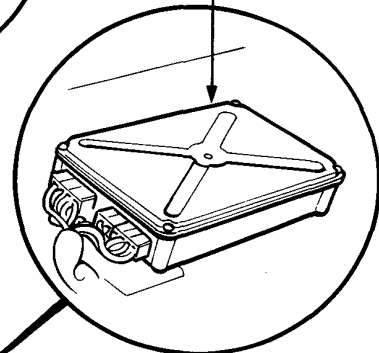
**EFE HEATER**  
Section 11



**SOLENOID VALVE CONTROL UNIT**  
Section 12



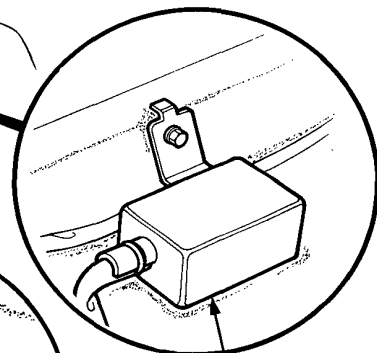
**FUEL-INJECTION CONTROL UNIT**  
Section 11



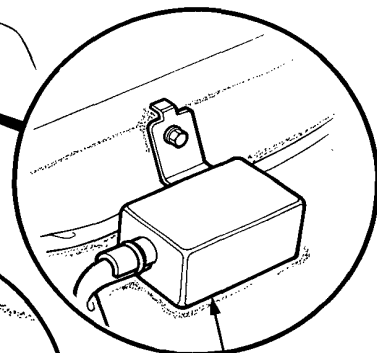
**A20A2 (KX,KQ) Engine**

**A20A4 Engine**

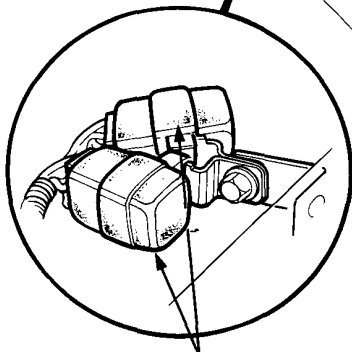
**SEAT BELT SWITCH**



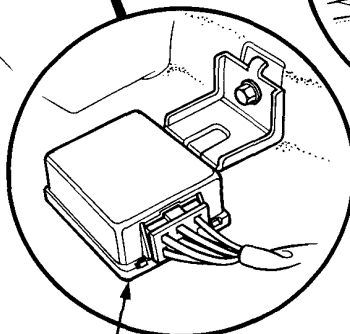
**HEATED SEAT CONTROL UNIT**



**SUNROOF RELAYS**  
Test, page 25-37



**HEADLIGHT WASHER CONTROL UNIT**  
Test, page 25-23

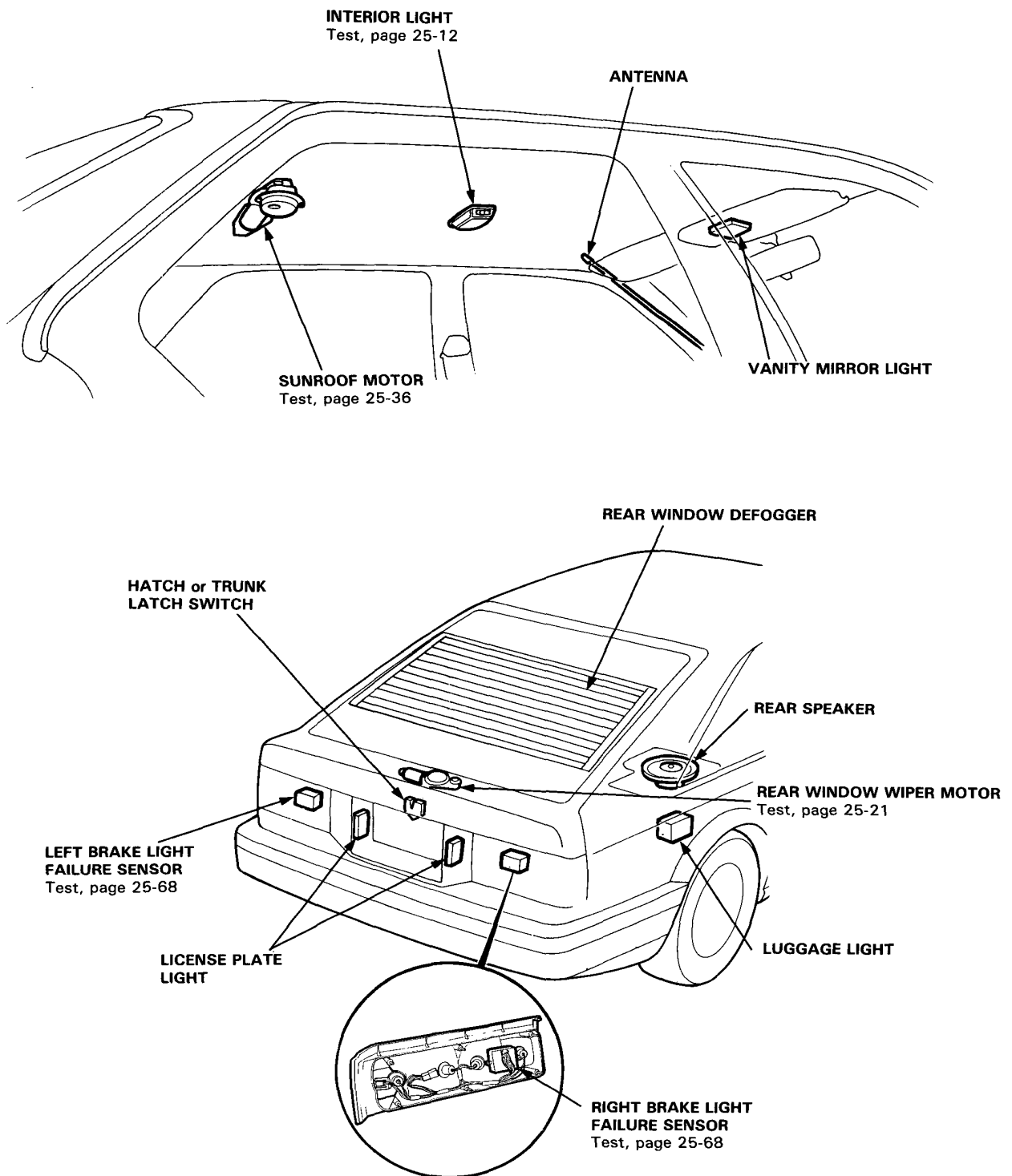




# Body Electrical

## Illustrated Index (Roof and Tail)

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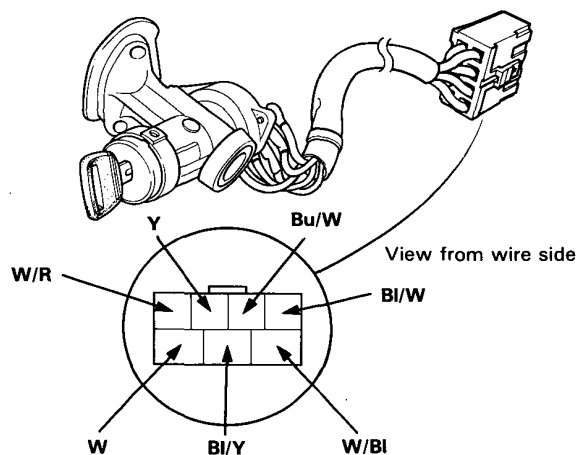


# Ignition Switch

## Test

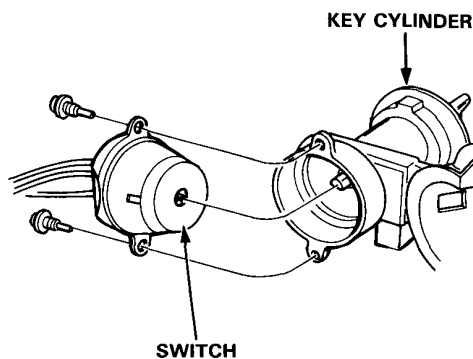
1. Disconnect the 7-P connector from the fuse box.
2. Check for continuity between the terminals in each switch position according to the table.

Terminal Position	W/R	W/BI	Bu/W	W	BI/Y	Y	BI/W
O							
I	○	○					
II	○	○	○	○	○	○	
III				○	○		○



## Electrical Switch Replacement

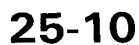
1. Remove the column lower panel and cover.
2. Disconnect the 7-P connector from the fuse box.
3. Insert the key and turn it to "O".
4. Remove the 2 bolts and replace the base of the switch.
5. If necessary, replace the key cylinder (section 18).





## Test

- NOTE: Several different wires have the same color; They have been given a number suffix to distinguish them (for example G<sup>1</sup> and G<sup>2</sup> are not the same).







### Windshield Wiper Switch

Terminal							
Position		Bu/Y	Bu	Bl	Bu/W	G/Bl <sup>1</sup>	G <sup>1</sup>
Wiper Switch	Mist Switch						
OFF	OFF		○		○		
	ON	○		○			
INT	OFF		○		○	○	○
	ON	○		○		○	○
LO	OFF		○	○			
	ON	○		○			
HI	OFF	○		○			
	ON	○		○			

### Windshield Washer Switch

Terminal			
Position		G/Bl <sup>1</sup>	Bl/Y
OFF			
ON		○	○

### Rear Window Wiper/Washer Switch

Terminal						
Position		G	Lg/Bl	Bl	G/Bl <sup>2</sup>	G/Bl <sup>1</sup>
OFF		○	○			
ON		○		○		
WASHER		○		○	○	○

(Internal connection)

(Internal connection)

### Lighting/Dimmer Switch

#### European model:

Terminal							
Position		W	R	R/Y	R/G	R/Bu	R/W
Lighting Switch	Dimmer Switch						
OFF			○	○			
•		○	○	○			
		○	○	○			
•	HIGH	○	○	○	○	○	
	LOW	○	○	○	○	○	○

(Internal connection)

(Internal connection)

#### Passing Switch

Terminal			
Position		W	R/Bu
OFF			
ON		○	○

#### Horn Switch

Terminal			
Position		Bu/R	
OFF			
ON		○	○

#### General Export model (Sedan only):

Terminal					
Position		W	R	R/Bu	R/W
Lighting Switch	Dimmer Switch				
OFF					
•		○	○		
		○	○		
•	HIGH	○	○	○	
	LOW	○	○	○	○

(Internal connection)

(Internal connection)

#### Others:

Terminal						
Position		W	R	R/G	R/Bu	R/W
Lighting Switch	Dimmer Switch					
OFF						
•		○	○			
		○	○			
•	HIGH	○	○	○	○	
	LOW	○	○	○	○	○

(Internal connection)

(Internal connection)

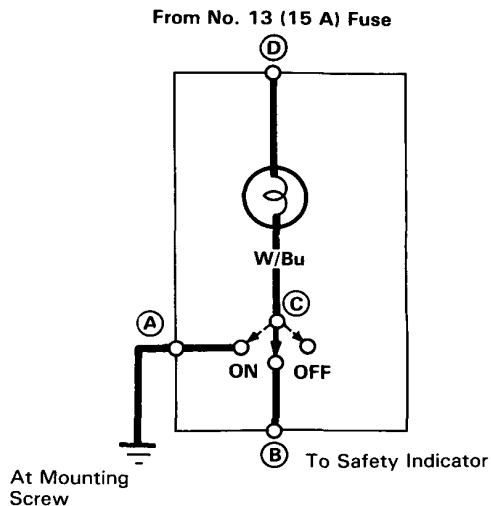
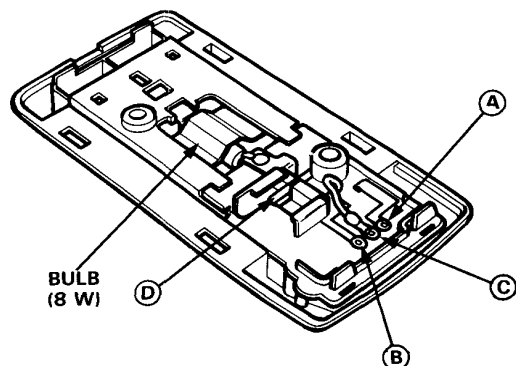


# Interior Light, Clock

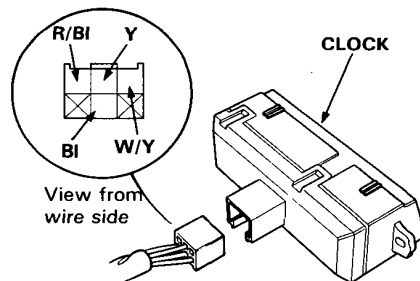
## Interior Light Test

1. Remove the interior light.
2. Check for continuity between the terminals in each switch position according to the table.

Terminal	(A)	(B)	(C)		(D)
Position					
OFF			○	○	○
MIDDLE		○	○	○	○
ON	○	○	○	○	○



## Clock Input Test



No.	Wire	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	BI	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/BI	Lighting switch ON		An open in the wire. Faulty lighting switch.

NOTE: Replace the clock if all tests prove OK.

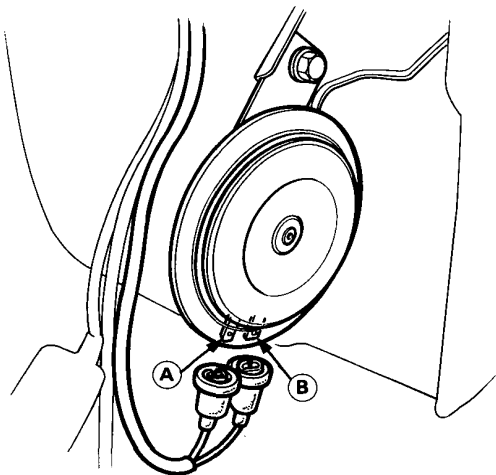


# Horn



## Horn Test

1. Remove the front bumper and disconnect the wires from the horn.
2. Test the horn by connecting battery wires to (A) and (B) terminals.
3. If the horn fails to sound, replace it.

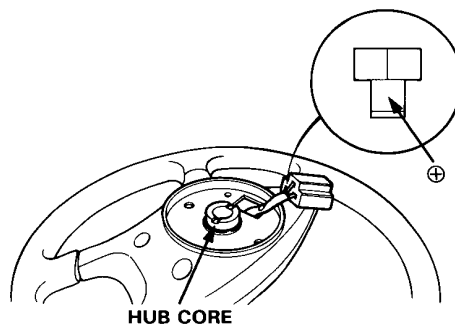


## Switch Test

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.

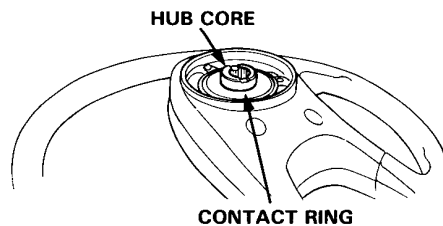
### With Cruise Control:

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

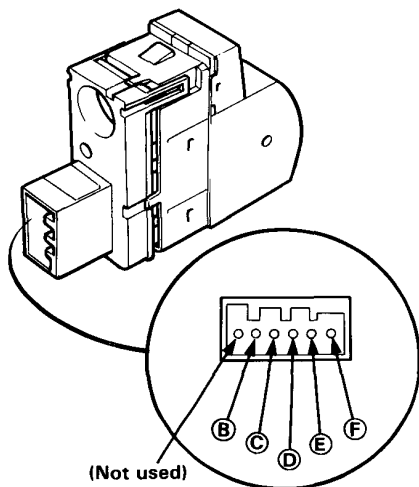
1. Remove the controller.
2. Measure resistance between (E) and (F) terminals.

**Resistance: 10 k $\Omega$**

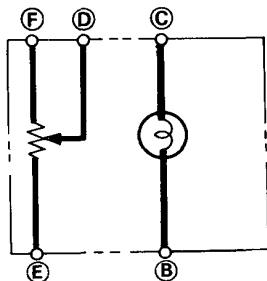
**NOTE:** Resistance will vary slightly with temperature.

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:**

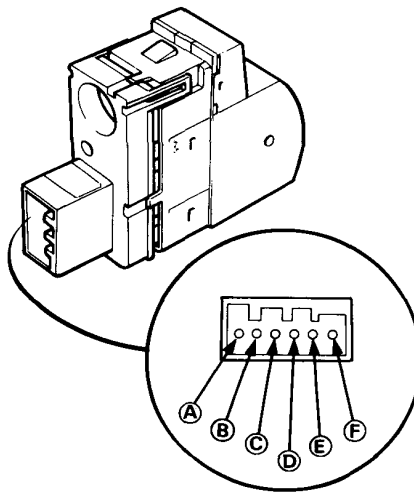


**Circuit Diagram**

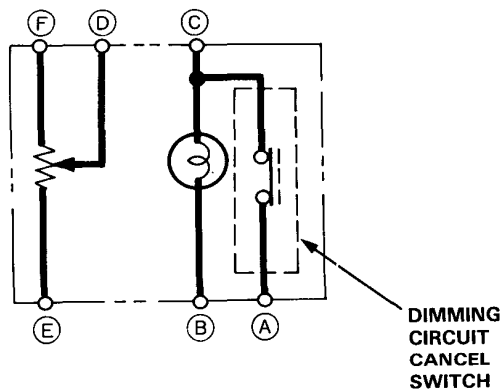


**With Digital Meter:**

4. Check for continuity between (A) and (C) terminals with dimming circuit cancel switch OFF.  
There should be no continuity.



**Circuit Diagram**

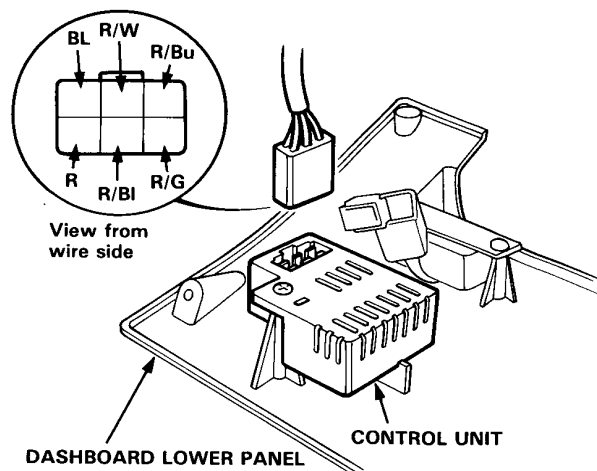






## Control Unit Test

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	BI	At all times under all conditions	Check for continuity to ground: should be continuity.	Poor ground. An open in the wire.
2	R/BI	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/BI 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 k $\Omega$ 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.



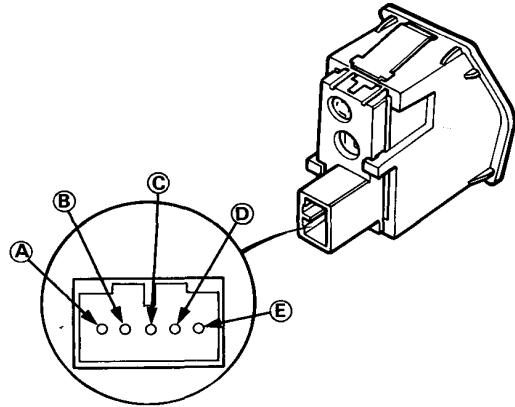
# Rear Window Defogger

## Switch Test

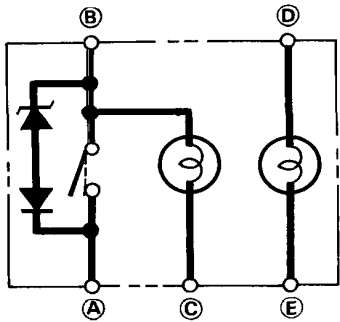
- 1. Remove the rear window defogger switch.
- 2. Check for continuity between the terminals in each switch position according to the table.

With Illumination:

Terminal	(A)	(B)		(C)	(D)		(E)
Position							
OFF		○	⊕	○	○	⊕	○
ON	○	○	⊕	○	○	⊕	○

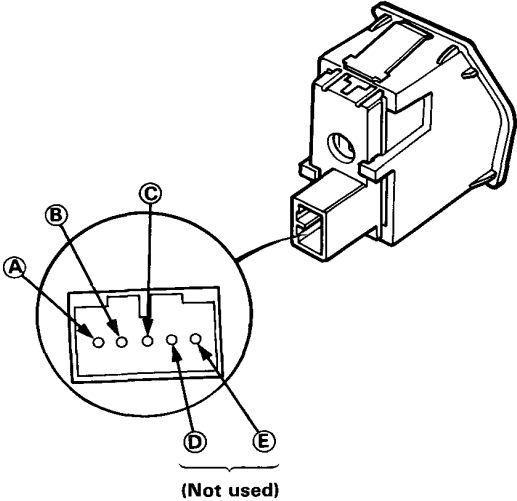


Circuit Diagram

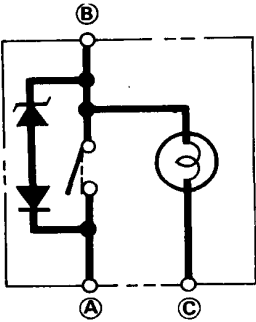


Without Illumination:

Terminal	(A)	(B)		(C)
Position				
OFF		○	⊕	○
ON	○	○	⊕	○



Circuit Diagram



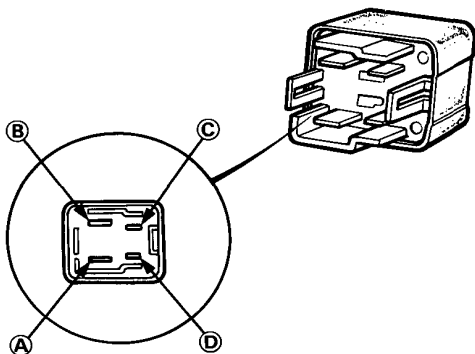




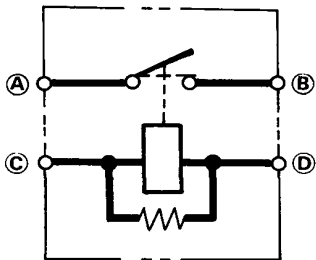
## Cigarette Lighter

### Relay Test

1. Remove the rear window defogger relay from the back of the fuse box.
2. There should be continuity between (A) and B terminals when the battery is connected to (C) and (D) terminals.  
There should be no continuity when the battery is disconnected.

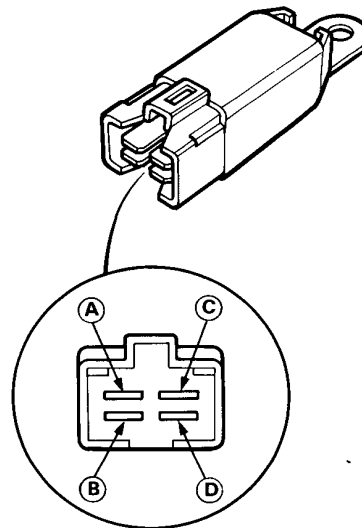


### Circuit Diagram

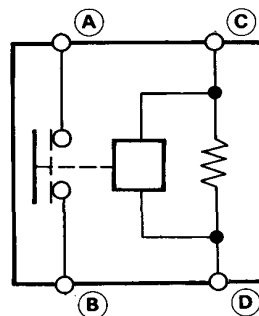


### Relay Test

1. Remove the cigarette lighter relay located on the right side under dash.
2. There should be continuity between (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





## Wiring Diagram

**BATTERY**

**UNDER-HOOD FUSE BOX**  
 No. 21 (70 A)  
 No. 25 (40 A)

**IGNITION SWITCH**  
 BAT IG1

**DASH FUSE BOX**  
 No. 3 (20 A)

**WINDSHIELD WIPER MOTOR**  
 B  
 CIRCUIT BREAKER  
 HI  
 LO  
 E  
 S  
 Bu/W  
 Bu/Y  
 Bu  
 L

**REAR WINDOW WIPER MOTOR**  
 B  
 CIRCUIT BREAKER  
 L  
 S  
 E

**WINDSHIELD WIPER SWITCH**  
 HI  
 MIST  
 INT  
 LO  
 OFF/INT

**INTERMITTENT WIPER RELAY**  
 G  
 Bu/W  
 BI

**WINDSHIELD WASHER SWITCH**  
 (With combined operation wiper washer)  
 BI/Y

**REAR WINDOW WIPER SWITCH**  
 ON  
 OFF

**REAR WINDOW WASHER SWITCH**

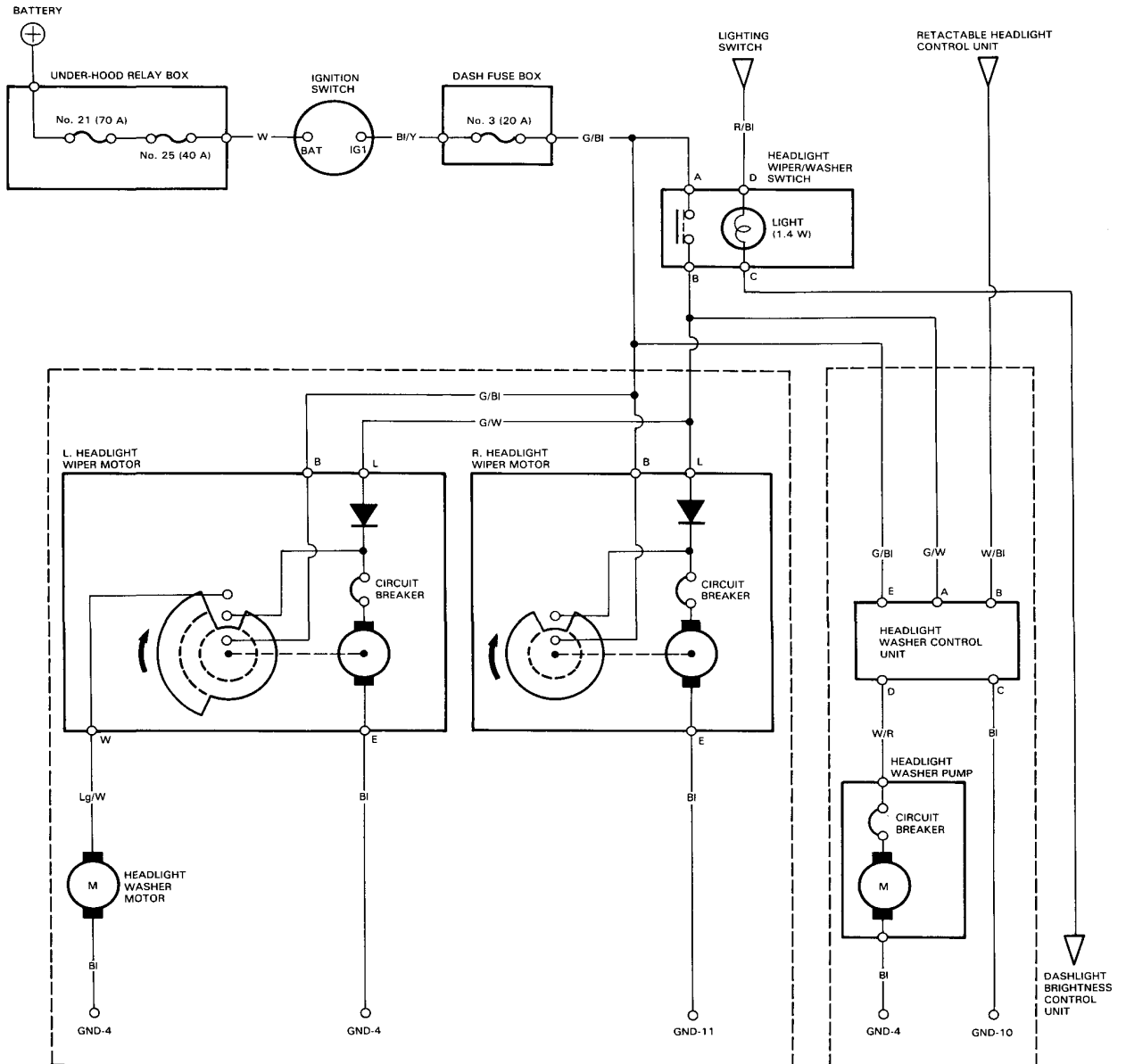
**REAR WINDOW WASHER MOTOR**

**GROUNDING POINTS:**  
 GND-6 or 7  
 GND-8  
 GND-11  
 GND-7  
 GND-8  
 GND-17  
 GND-4 or 7





## Headlight Wiper/Washer:



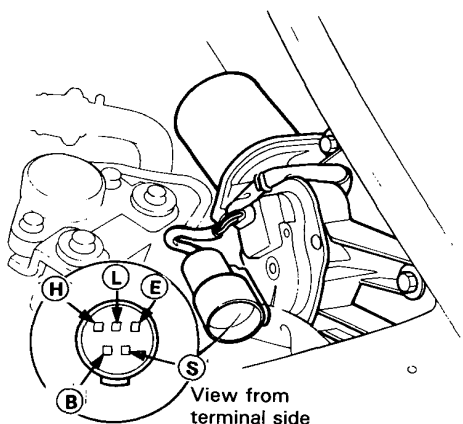


# Wipers/Washers

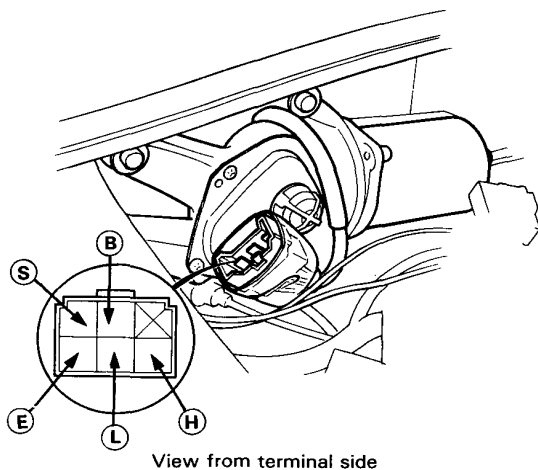
## Windshield Wiper Motor Test

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:



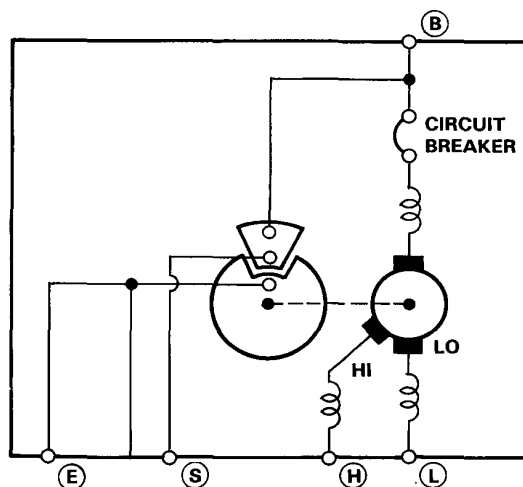
Others:



4. Check for continuity between the terminals according to the table.

Terminals	(B)	(S)	(E)
<b>Wiper Blade</b>			
At park position	○	○	
At center position		○	○

Circuit Diagram

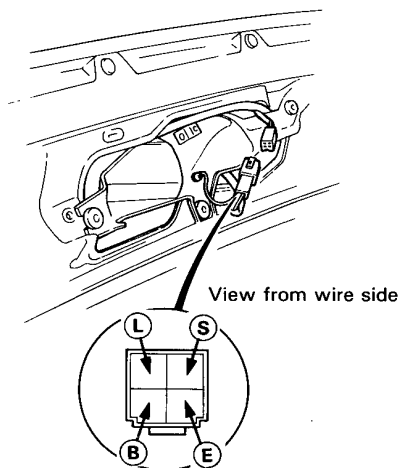






## Rear Window Wiper Motor Test

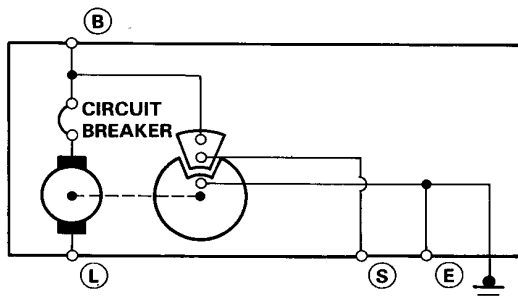
1. Remove the hatch trim panel and disconnect the 4-P connector.
2. Test motor operation by connecting battery positive wire to (B) terminal and negative to (L) .
3. If the motor fails to run smoothly, replace it.



4. Check for continuity between the terminals according to the table.

Terminal	(B)	(S)	(E)
Wiper Blade			
At park position	○	○	
At center position		○	○

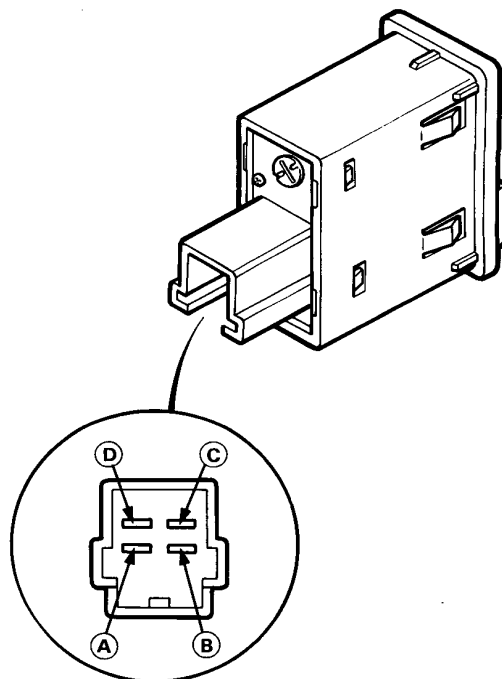
Circuit Diagram



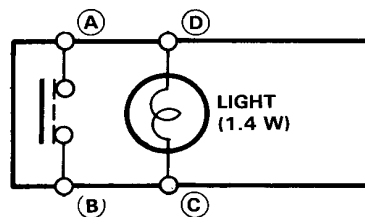
## Headlight Wiper/Washer Switch Test

1. Remove the switch from the center console.
2. Check for continuity between the terminals according to the table.

Terminal	(A)	(B)	(C)	(D)
Position				
OFF			○	○
ON	○	○	○	○



Circuit Diagram

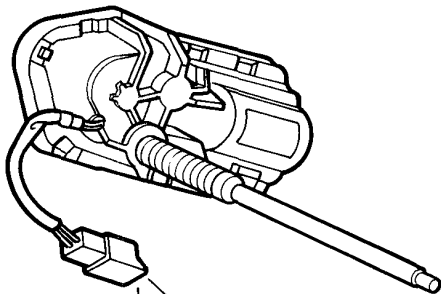




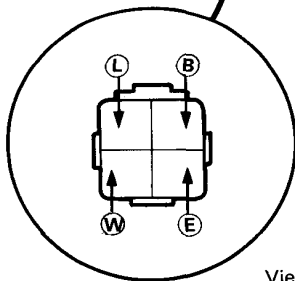
# Wipers/Washers

## Headlight Wiper Motor Test

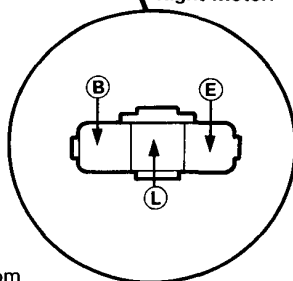
1. Remove the front bumper and disconnect the 3-P connector (for right motor), or 4-P (for left motor).
2. Test motor operation by connecting battery positive wire to (L) terminal and negative to (E).
3. If the motor fails to run smoothly, replace it.



Left Motor:



Right Motor:



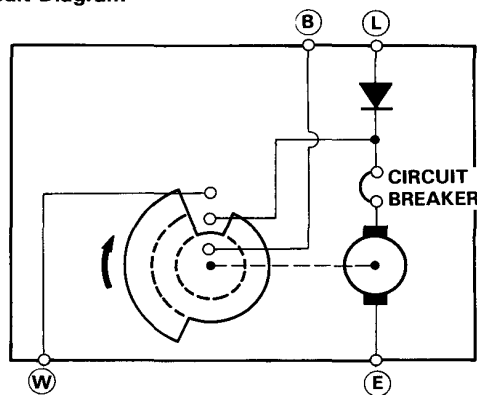
View from  
wire side

4. Check for continuity between the terminals according to the tables.

Left Motor:

Terminal	(W)	(B)		(L)
Wiper Blade				
At park position				
At quarter position	○	○	◀	○
At center position		○	◀	○

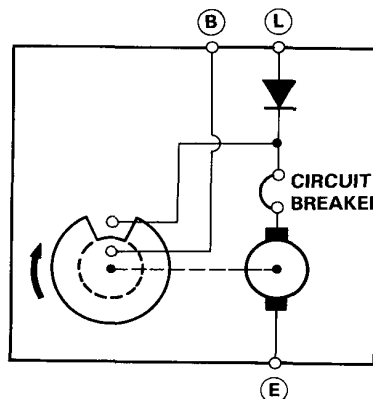
Circuit Diagram



Right Motor:

Terminal	(B)		(L)
Wiper Blade			
At park position			
At center position	○	◀	○

Circuit Diagram



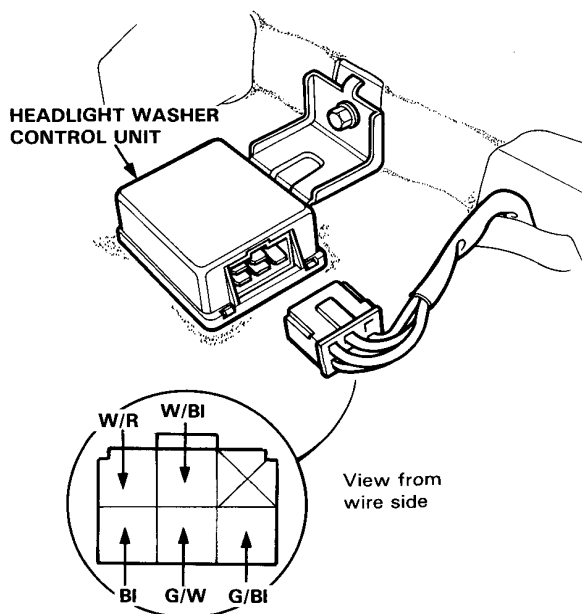




## Headlight Washer Control Unit Test

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	BI	Under all conditions.	Check for continuity to ground: should be continuity.	<ul style="list-style-type: none"> <li>• Poor ground.</li> <li>• An open in the wire.</li> </ul>
2	G/BI	Ignition switch ON.	Check for voltage to ground: should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No. 3 (20A) fuse.</li> <li>• An open in the wire.</li> </ul>
3	G/W	Ignition switch and headlight washer switch ON.	Check for voltage to ground: should be battery voltage.	<ul style="list-style-type: none"> <li>• Faulty headlight washer switch.</li> <li>• An open in the wire.</li> </ul>
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.	<ul style="list-style-type: none"> <li>• Faulty headlight washer pump.</li> <li>• An open in the wire.</li> <li>• Poor ground.</li> </ul>
5	W/G	Headlight ON.	Check for voltage to ground: should be battery voltage.	<ul style="list-style-type: none"> <li>• An open in the wire.</li> <li>• Faulty retractable headlight control unit.</li> </ul>

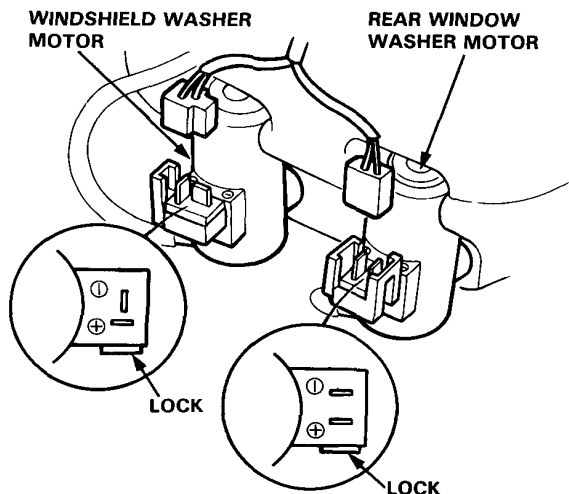


# Wipers/Washers

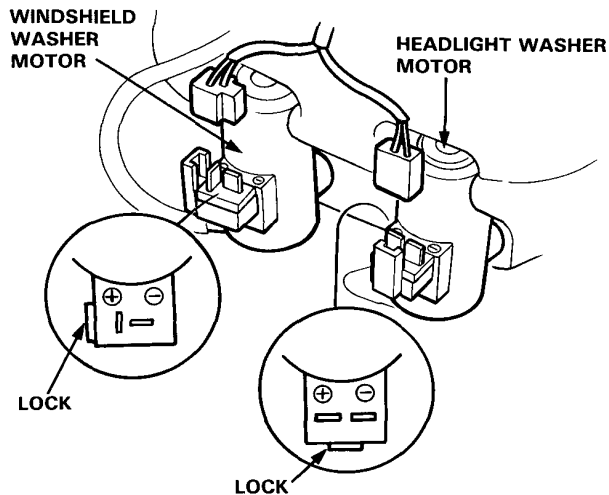
## Washer Motor Test

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  $\oplus$  terminal and negative to  $\ominus$ .
3. If the motor fails to run, replace it.

Hatchback:

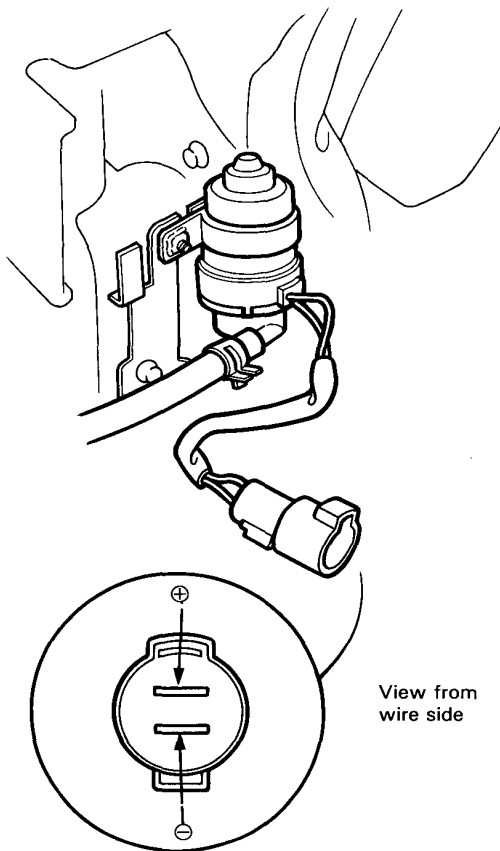


Sedan:



## Washer Pump Test

1. Remove the front bumper and disconnect the 2-P connector.
2. Test motor operation by connecting battery positive wire to  $\oplus$  terminal and negative to  $\ominus$ .
3. If the motor fails to run, replace it.



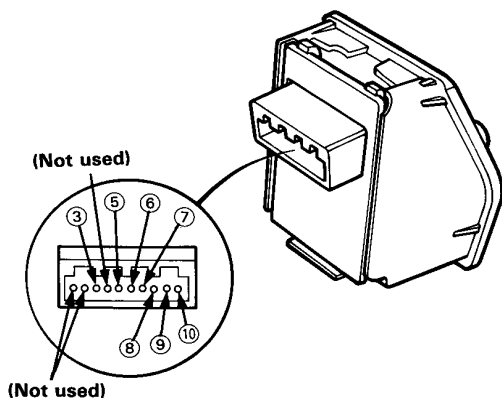


# Power Door Mirror

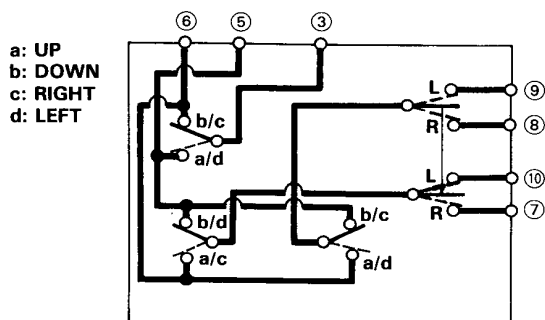
## Switch Test

1. Remove the power door mirror switch.
2. Check for continuity between the terminals in each switch position according to the table.

Terminal Position		⑧	⑨	③	⑦	⑩	⑤	⑥
R	UP			○			○	
	DOWN	○			○		○	
	LEFT			○	○		○	
	RIGHT	○					○	
				○	○			○
L	UP			○			○	
	DOWN		○			○	○	
	LEFT		○	○		○	○	
	RIGHT		○				○	
				○		○		○

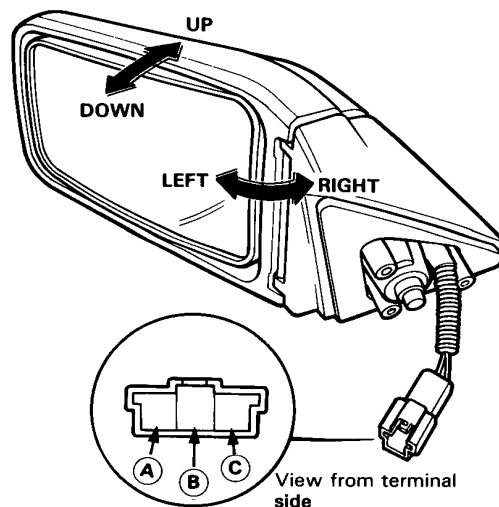


Circuit Diagram

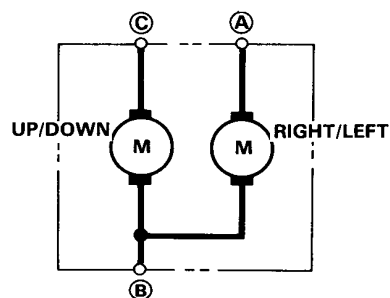


## Actuator Test

1. Remove the door trim panel and disconnect the 3-P connector.
2. Test mirror actuator operation:  
 TILT UP: Connect battery positive wire to **(C)** terminal and negative to **(B)** terminal.  
 TILT DOWN: Connect battery positive wire to **(B)** terminal and negative to **(C)** terminal.  
 SWING RIGHT: Connect battery positive wire to **(A)** terminal and negative to **(B)** terminal.  
 SWING LEFT: Connect battery positive wire to **(B)** terminal and negative to **(A)** terminal.
3. If the mirror fails to operate properly, replace it.



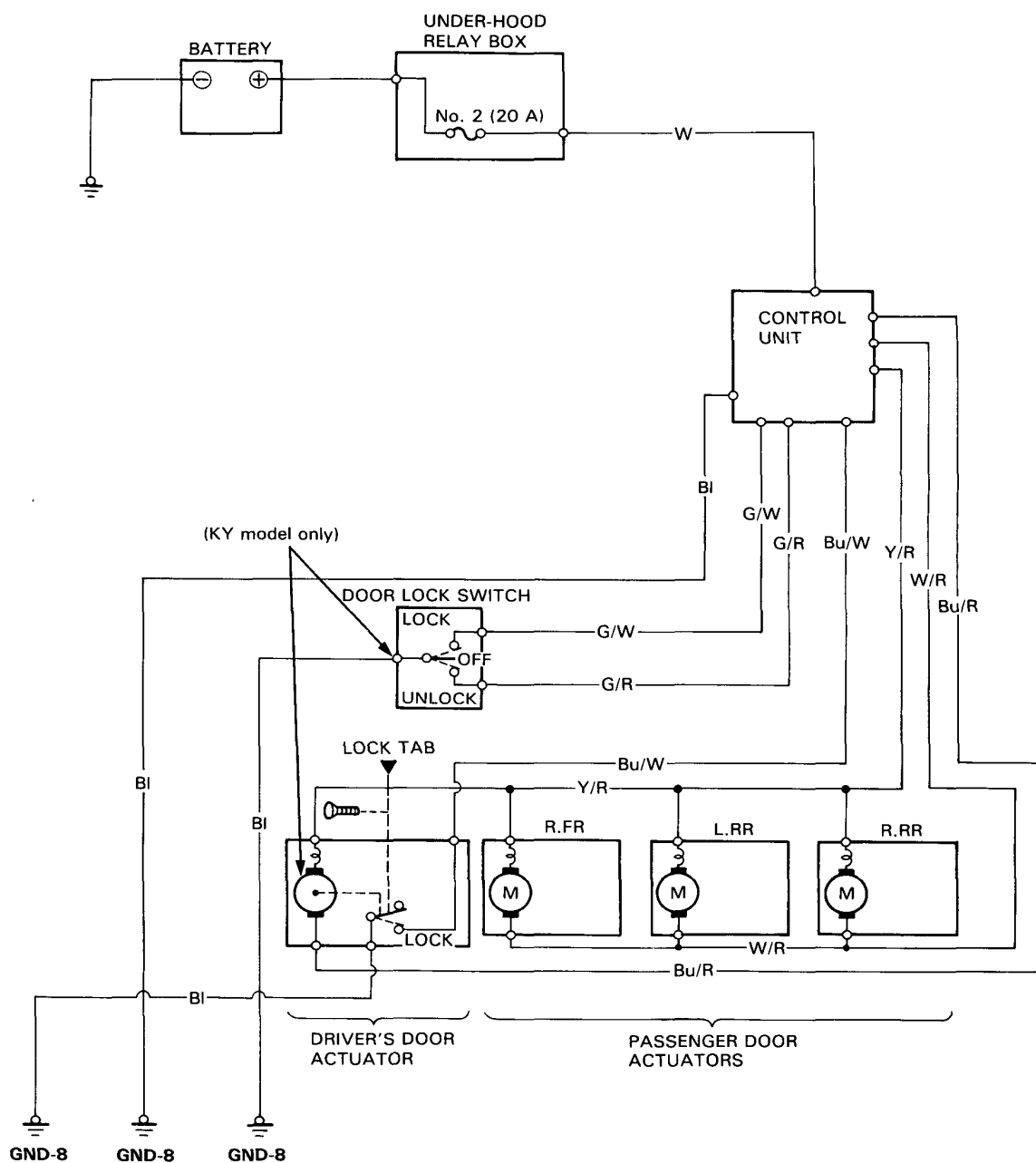
Circuit Diagram





## Power Door Locks

## Wiring Diagram







## Troubleshooting

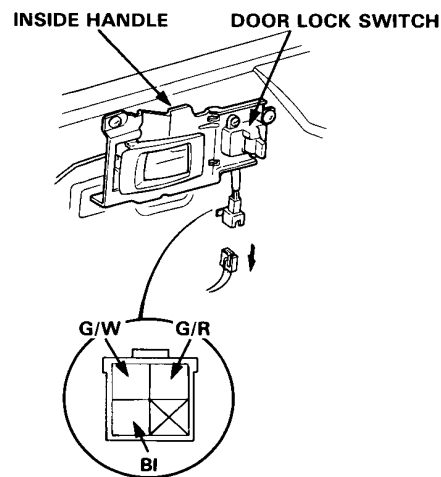
NOTE: The numbers in the table show the troubleshooting sequence.

Symptom \ Item to be inspected		Blown No. 2 (20 A ) fuse in relay box	Door lock switch	Driver's door actuator		Passenger door actuator	Control unit	Door lock rod/linkage (Section 21)	Poor ground	Open circuit in wires or loose or disconnected terminals
				Door lock knob switch	Motor					
KY model only	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
	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	BI	G/W
UNLOCK	○	○	
OFF			
LOCK		○	○



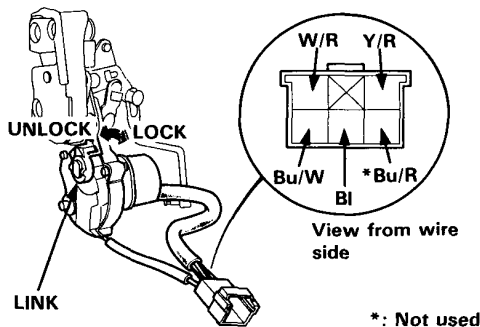


# Power Door Locks

## 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.

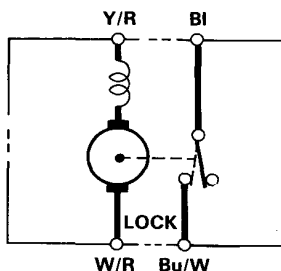
**CAUTION:** To prevent damage to the motor, apply battery voltage momentarily.



4. If the actuator fails to operate properly, replace it.
5. Check for continuity between the Bu/W and BI terminals according to the table.

Terminal	Bu/W	BI
Position		
LOCK	○	○
UNLOCK		

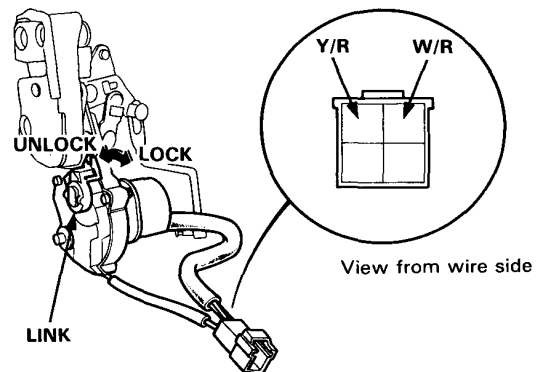
Circuit Diagram



## 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.





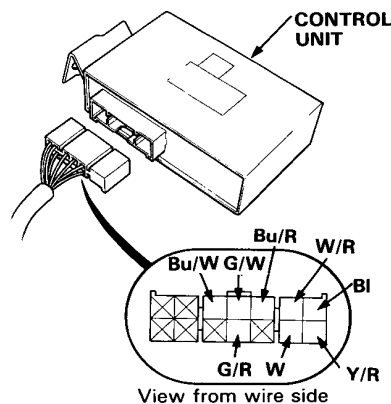
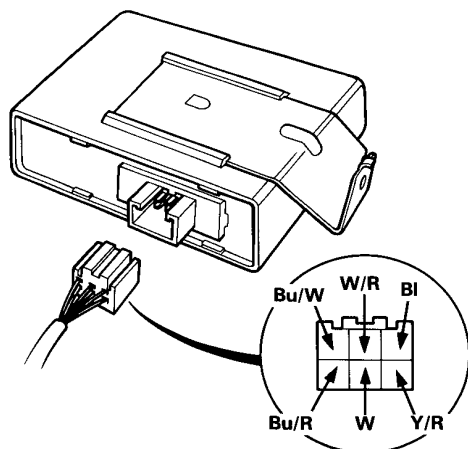
## Control Unit Test

### Input Test:

Remove the front passenger's seat and disconnect the 10-P connector from the control unit.

### KY model:

### Except KY model:



No.	Wire	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	BI	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 driver'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:

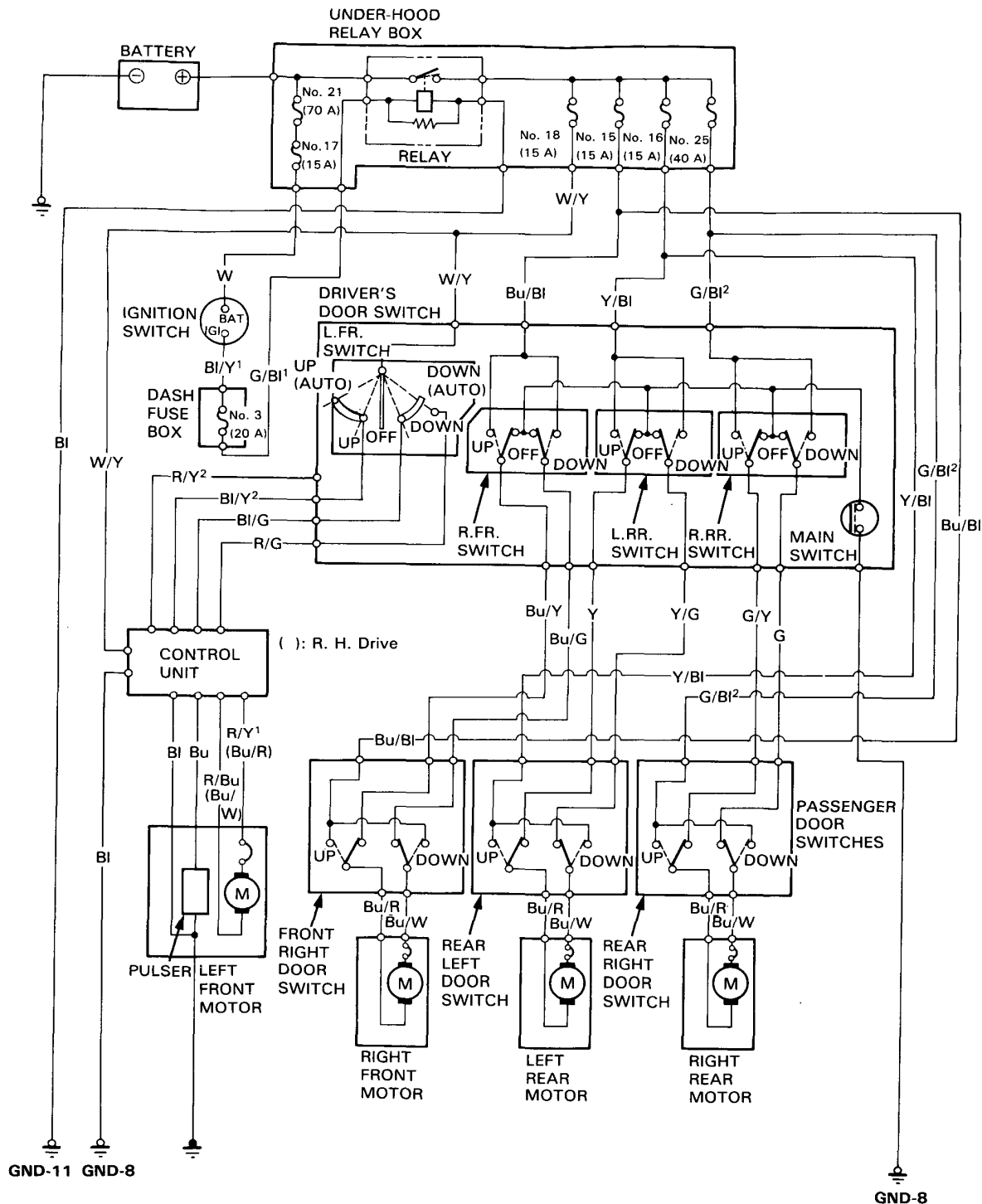
Reconnect the 10-P connector to the control unit.

6	Y/R	Door lock switch or driver's door lock knob in LOCK	Check momentarily for voltage to W/R or BI/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/R	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/Bi<sup>1</sup> and G/Bi<sup>2</sup> are not the same).





## Troubleshooting

NOTE: The numbers in the table show the troubleshooting sequence.

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
Symptom									Assistant	Left rear	Right rear				
All windows do not operate			1	3									2	GND-11	Bl/Y <sup>1</sup> or G/Bl <sup>1</sup>
Driver's door window does not operate		1			2	4		3				5		GND-8	W/Y, Bl/Y <sup>2</sup> , 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 <sup>2</sup>
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 <sup>2</sup> , G/Y, G, Bu/R or Bu/W

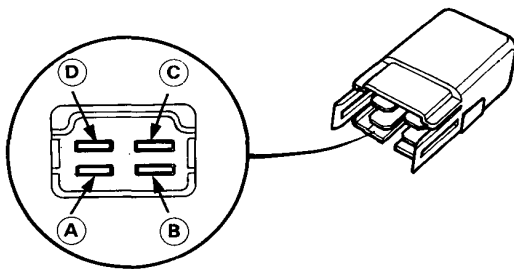
NOTE: Several different wires have the same color. They have been given a number suffix to distinguish them (for example G/Bl<sup>1</sup> and G/Bl<sup>2</sup> are not the same).



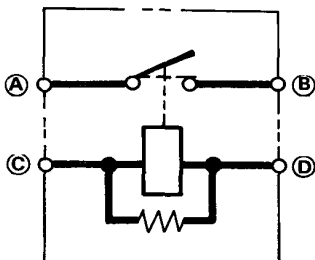
# Power Windows

## Relay Test

1. Remove the power window relay in the relay box.
2. There should be continuity between (A) and (B) terminals when the battery is connected to (C) and (D) terminals.  
There should be no continuity when the battery is disconnected.



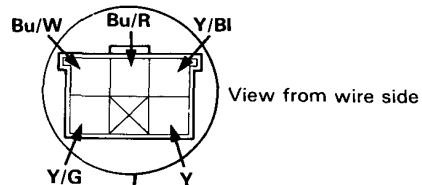
Circuit Diagram



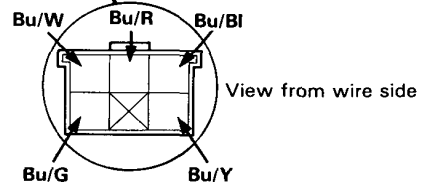
## Passenger Door Switch Test

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

Terminal Position	Y/Bl	Bu/R	Bu/W	Y	Y/G
UP	○—○				
OFF			○—○		
DOWN	○—○		○—○		

### Front Door Switch

Terminal Position	Bu/Bl	Bu/R	Bu/W	Bu/Y	Bu/G
UP	○—○				
OFF			○—○		
DOWN	○—○		○—○		

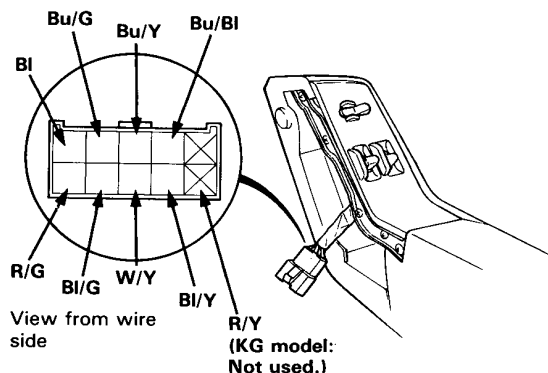




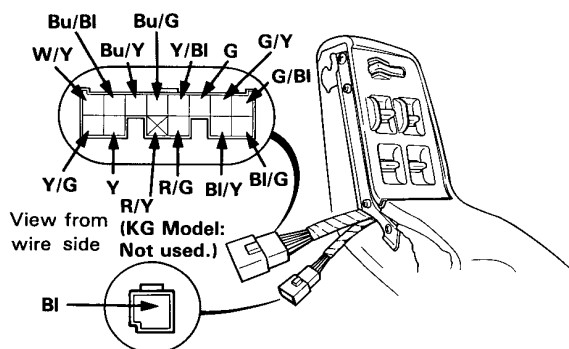
## Driver's Door Switch Test

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

Terminal Position	BI/Y	W/Y	BI/G	R/G	R/Y
UP (AUTO)	○—○				○
UP	○—○				
OFF					
DOWN		○—○			
DOWN (AUTO)		○—○	○—○		

### Assistant Switch

Terminal Position		Bu/BI	Bu/Y	Bu/G	BI
UP	ON	○—○	○—○	○—○	
	OFF	○—○	○—○		
OFF	ON		○—○	○—○	○
	OFF		○—○	○—○	
DOWN	ON	○		○—○	○
	OFF		○—○	○—○	
Main Switch					

### Left Rear Switch

Terminal Position		Y/BI	Y	Y/G	BI
UP	ON	○—○	○—○	○—○	
	OFF	○—○	○—○		
OFF	ON		○—○	○—○	○
	OFF		○—○	○—○	
DOWN	ON	○		○—○	○
	OFF		○—○	○—○	
Main Switch					

### Right Rear Switch

Terminal Position		G/BI	G/Y	G	BI
UP	ON	○—○	○—○	○—○	
	OFF	○—○	○—○		
OFF	ON		○—○	○—○	○
	OFF		○—○	○—○	
DOWN	ON	○		○—○	○
	OFF		○—○	○—○	
Main Switch					

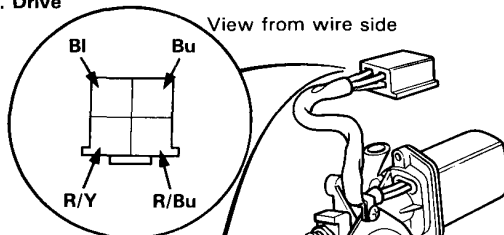


# Power Windows

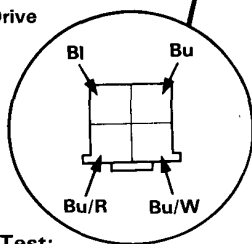
## Driver's Door Motor Test

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.

### L. H. Drive



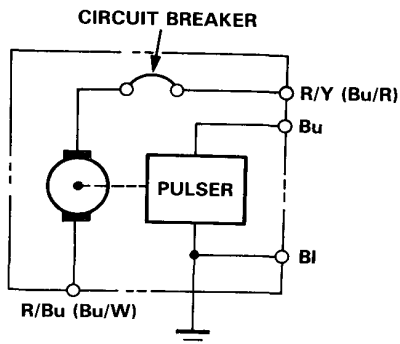
### R. H. Drive



### Pulser Test:

Measure resistance between the Bu and BI 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  $\Omega$  as the motor runs.

### Circuit Diagram

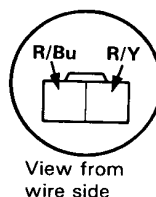


( ): R. H. Drive

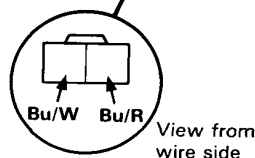
## Passenger Door Motor Test

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:



### Assistant and Right Rear Doors:





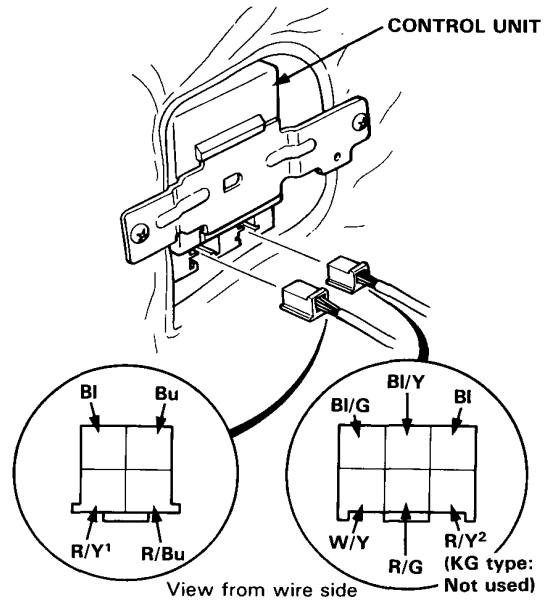


## Control Unit Input/Output

### 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: desired result	Possible cause (if result is not obtained)
1	BI	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	BI/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	BI/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.	



## Wiring Diagram



- 
- View from wire side

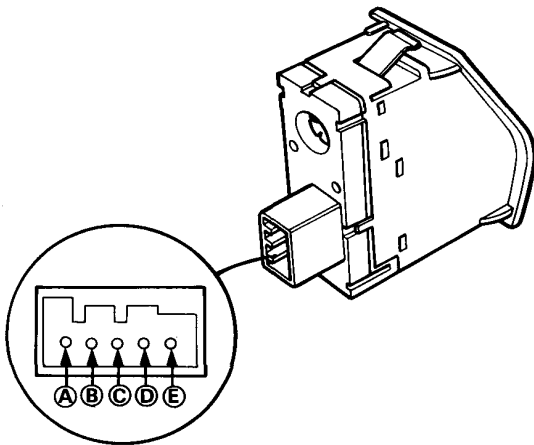




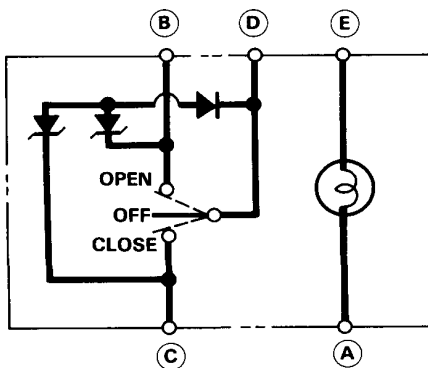
## Switch Test

1. Remove the sunroof switch.
2. Check for continuity between the terminals in each switch position according to the table.

Terminal Position	(A)	(B)	(C)	(D)	(E)
OPEN	○	○	○	○	○
OFF	○	○	○	○	○
CLOSE	○	○	○	○	○

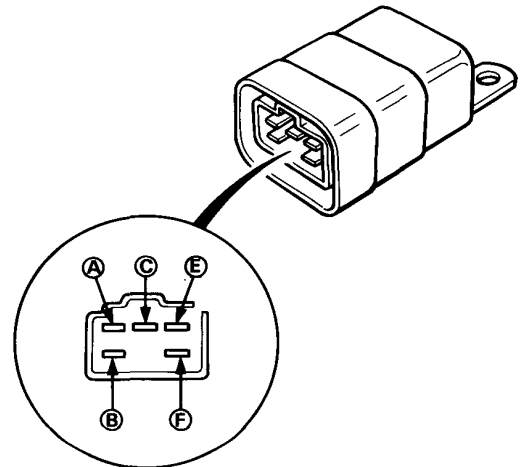


Circuit Diagram

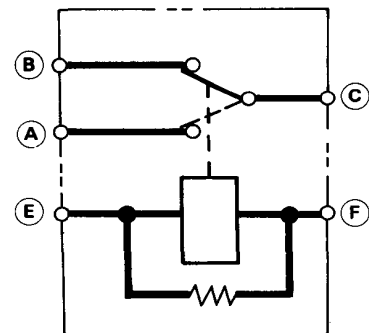


## Relay Test

1. Remove the sunroof relays under the front passenger's seat.
2. There should be continuity between (A) and (C) terminals when the battery is connected to (E) and (F) terminals.  
There should be continuity between (B) and (C) terminals when the battery is disconnected.



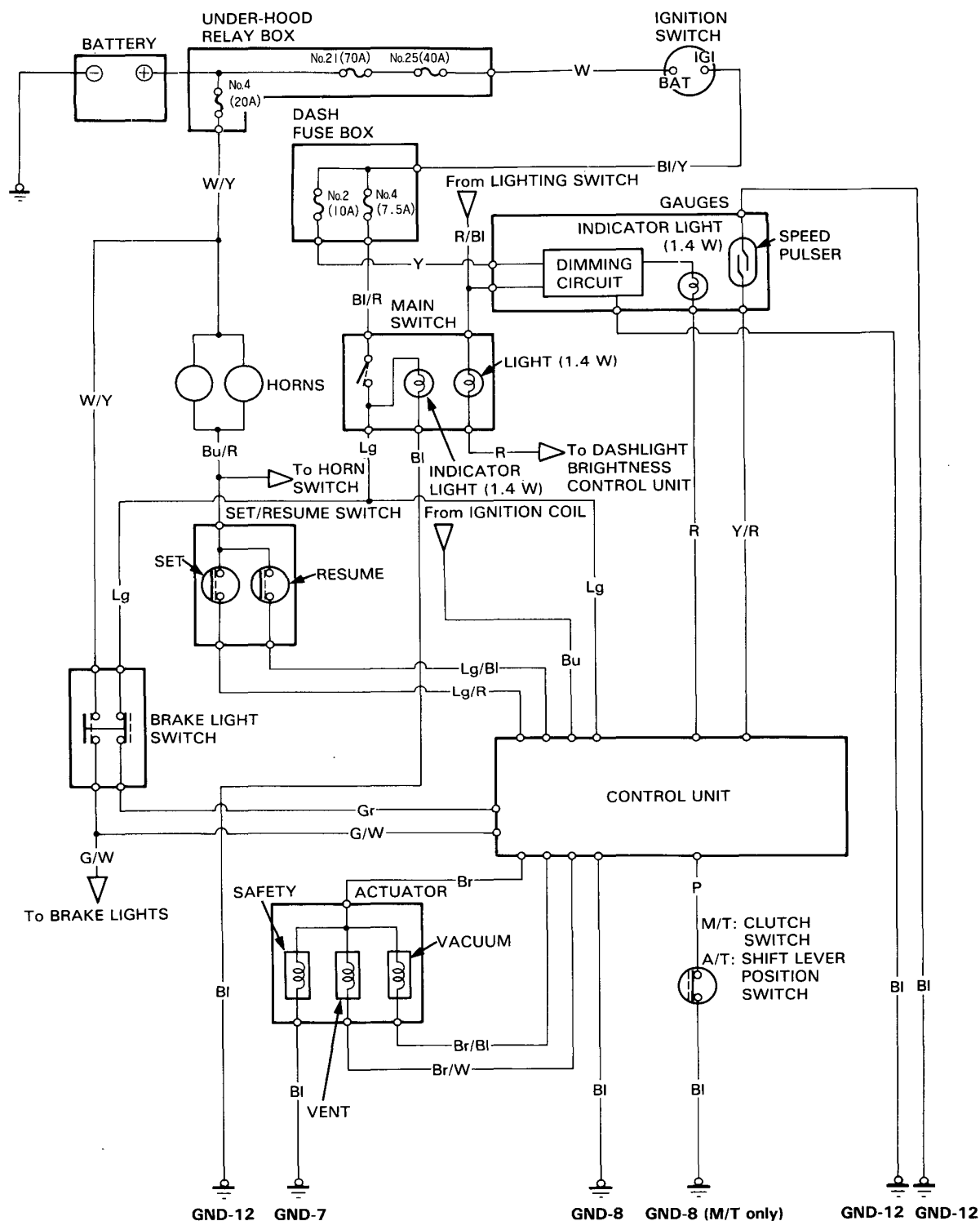
Circuit Diagram





# 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

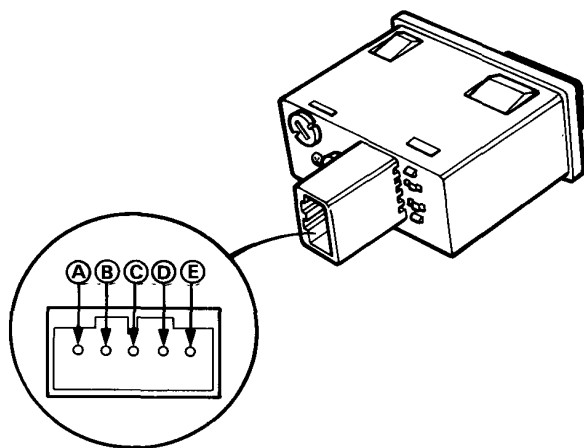


# Cruise Control

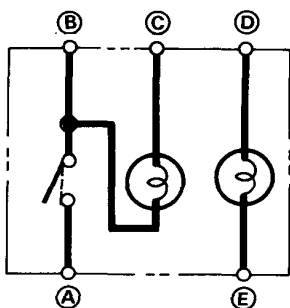
## Main Switch Test

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.

Terminal Position	(A)	(B)	(C)	(D)	(E)
OFF		○	○	○	○
ON	○	○	○	○	○



Circuit Diagram

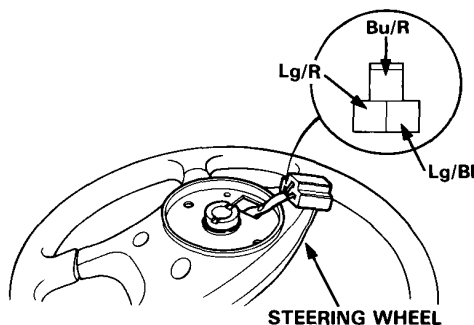


## Set/Resume Switch Test

### Switch Test:

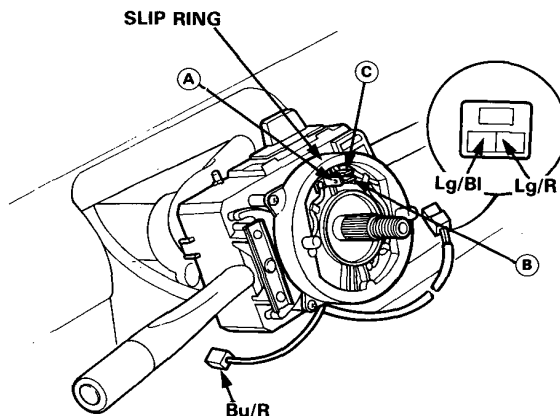
1. Remove the steering wheel.
2. Check for continuity between the terminals in each switch position according to the table.

Terminal Position	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 (A) terminals, the Lg/R and (B) terminals, and the Lg/B and (C) terminals, as you turn the slip ring.



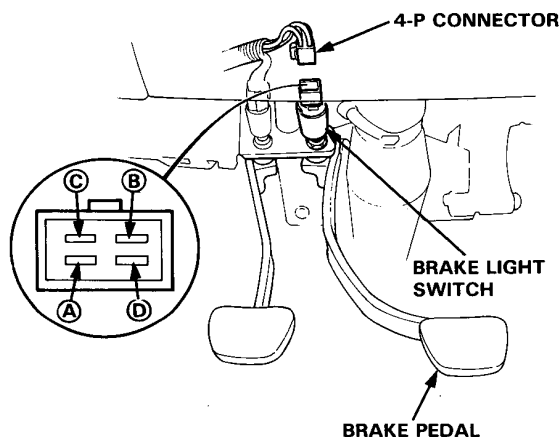




## Brake Light Switch Test

1. Disconnect the 4-P connector from the switch.
2. Check for continuity between the terminals according to the table.

Terminal	A	B	C	D
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.

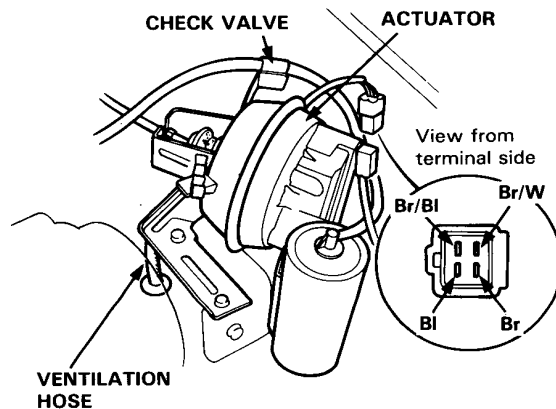
Resistance:

**VACUUM SOLENOID** (between Br/W and BI):  
30–50  $\Omega$

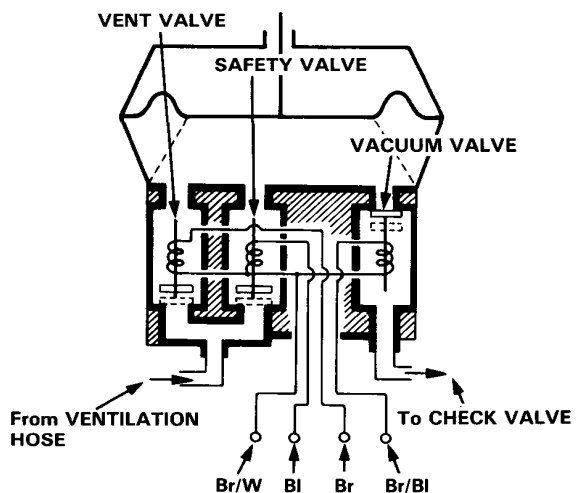
**VENT SOLENOID** (between Br/W and Br):  
40–60  $\Omega$

**SAFETY SOLENOID** (between Br/W and BI):  
40–60  $\Omega$

NOTE: Resistance will vary slightly with temperature; specified resistance is at 20°C (70°F).



### Circuit Diagram

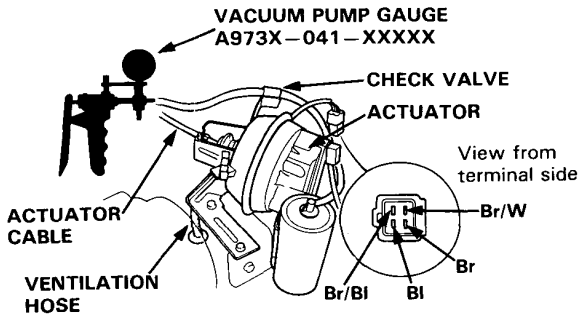




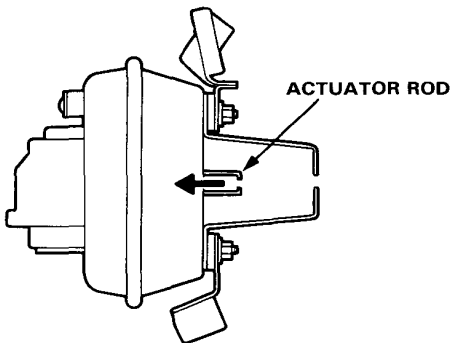
# Cruise Control

## Actuator Test

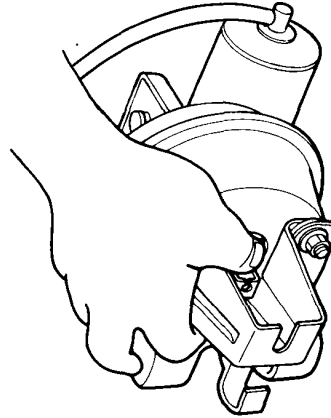
1. Disconnect the actuator cable from the actuator rod and the 4-P connector.
2. Connect battery positive wire to the Br/W terminal and negative to the Br/BI, Br and BI terminals.
3. Connect a vacuum pump to the check valve. Then apply vacuum to the actuator.



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.



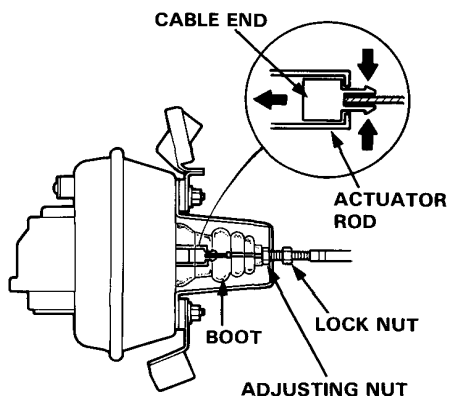
6. Disconnect battery negative wire from the Br/BI terminal. The actuator rod should return. If the actuator rod does not return, and the ventilation hose and filter are free, the solenoid valve assembly is defective.
7. Repeat the steps 2-6, but this time disconnect battery negative wire from the BI 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.



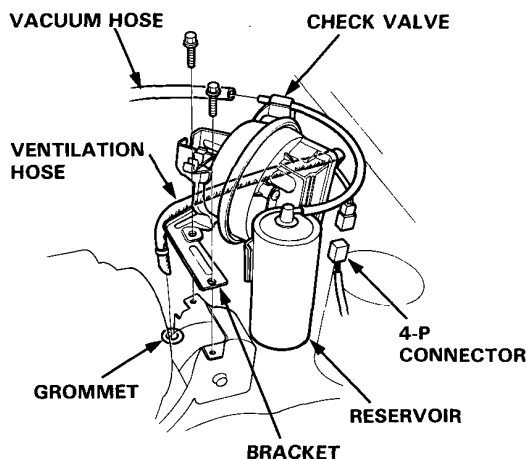


## Actuator/Cable Replacement

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.



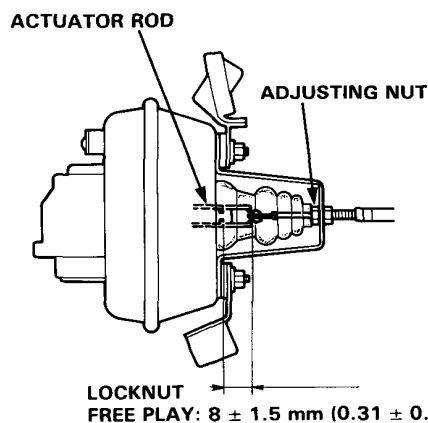
3. Disconnect the 4-P connector.
4. Pull the ventilation hose from the grommet.
5. Disconnect the vacuum hose from the check valve.
6. Remove the 2 mount bolts and the actuator with the bracket and reservoir.



7. If necessary, disconnect the cable end from the linkage over the accelerator pedal, then turn the grommet 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  $8 \pm 1.5$  mm ( $0.31 \pm 0.06$  in.).



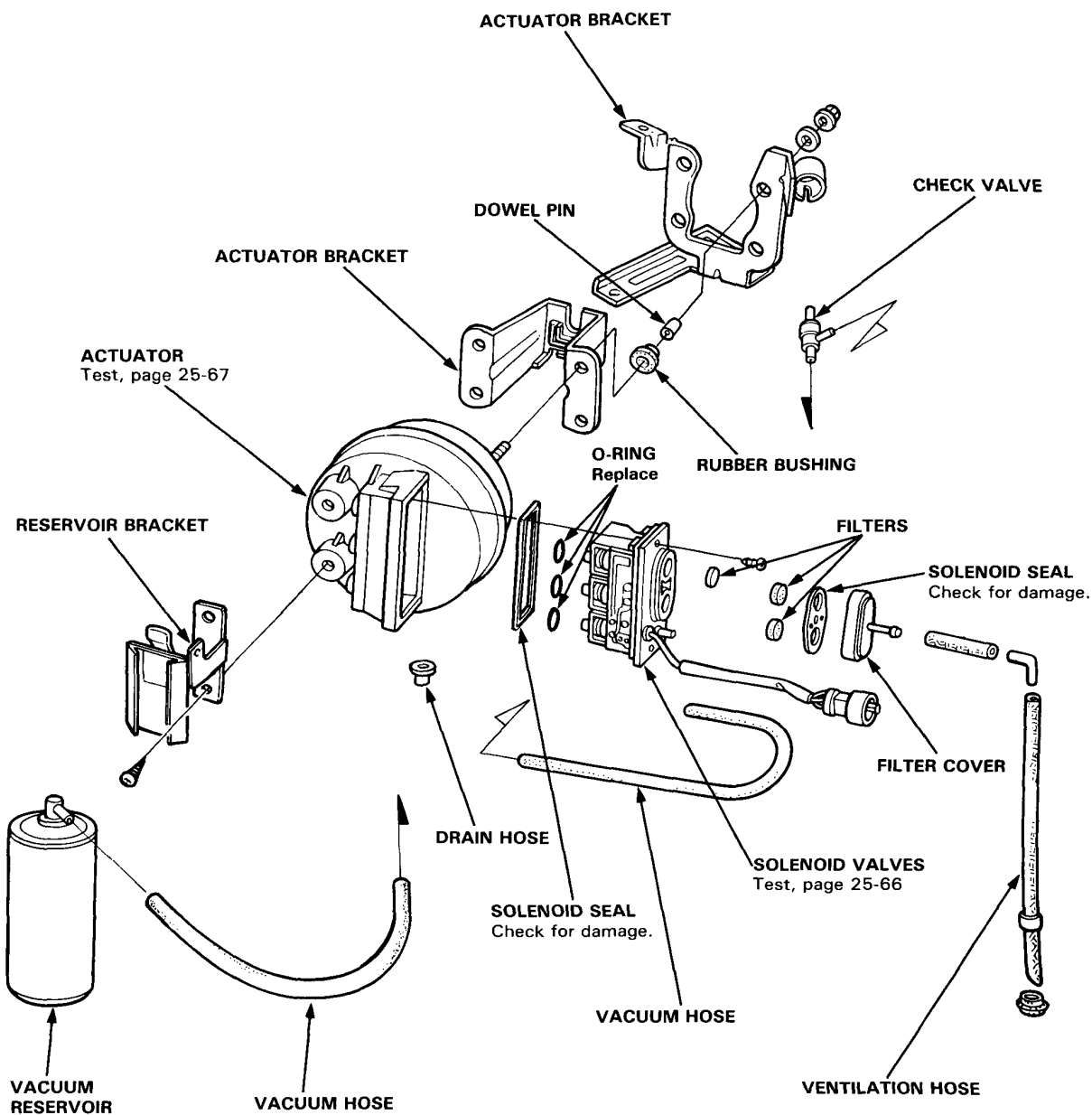
4. If free play is not within specs, loosen the locknut and turn the adjusting nut as required.
5. Retighten the locknut and recheck the free play.
6. Test drive the car to make sure that over and undershoot are held within  $\pm 2$  mph of the set speed.

NOTE: If necessary, check the throttle cable free play, then recheck the actuator rod free play.



# Cruise Control

## Actuator Disassembly





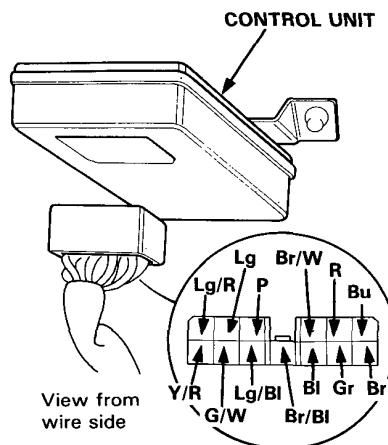


## Control Unit Input Test

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, D <sup>3</sup> or D <sup>4</sup>	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.



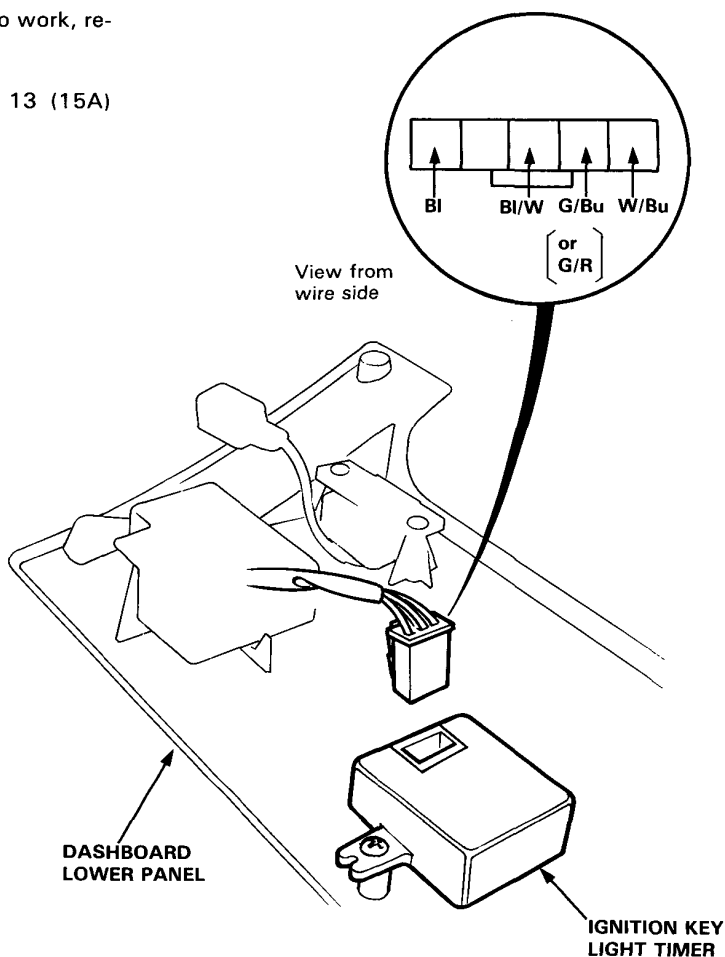
# Ignition Key Light

## 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	BI	Under all conditions.	Check for continuity to ground: should be continuity.	<ul style="list-style-type: none"> <li>• Poor ground.</li> <li>• An open in the wire.</li> </ul>
2	W/Bu	Under all conditions.	Check for voltage to ground: should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No. 13 (15A) fuse.</li> <li>• An open in the wire.</li> </ul>
3	BI/W	Under all conditions.	Attach to ground: Ignition key light should come on.	<ul style="list-style-type: none"> <li>• Blown bulb.</li> <li>• An open in the wire.</li> </ul>
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.	<ul style="list-style-type: none"> <li>• Faulty driver's door switch.</li> <li>• An open in the wire.</li> </ul>



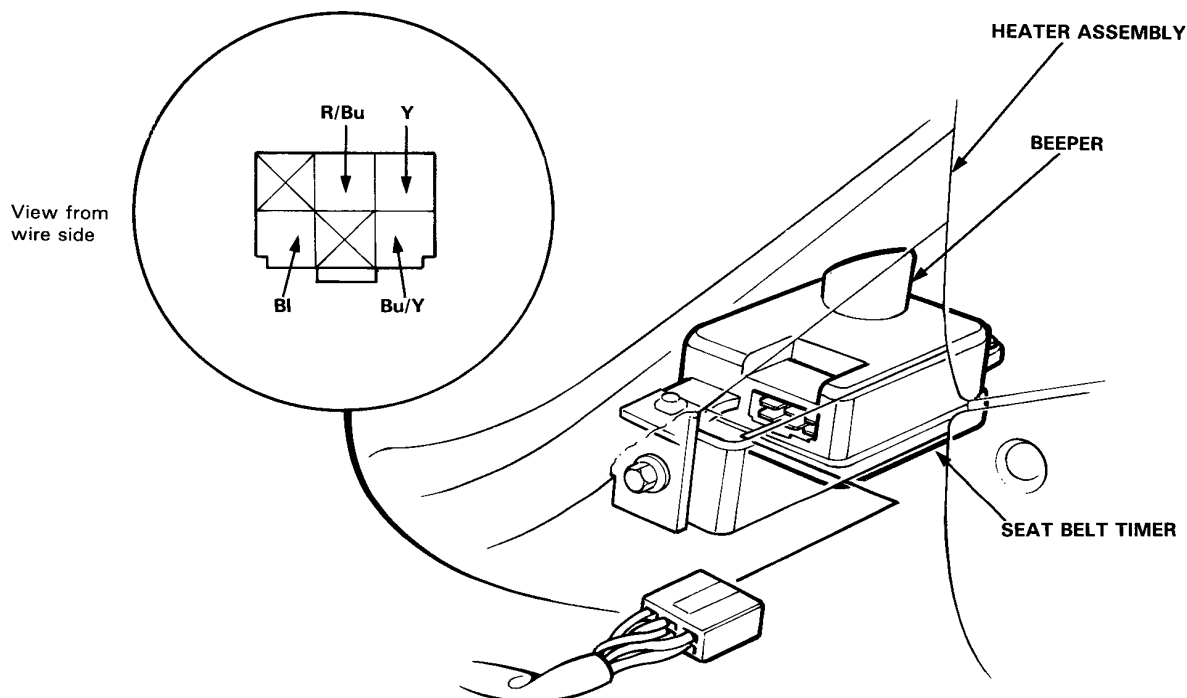
# Seat Belt Reminder System



## 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.



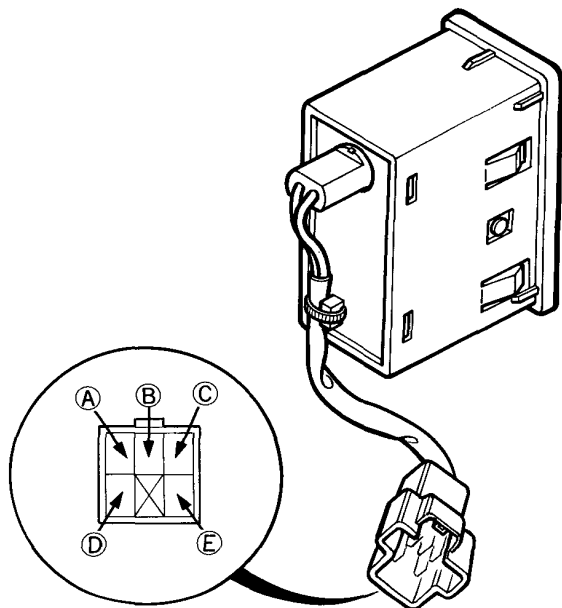
No.	Wire	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	Bl	Under all conditions.	Check for continuity to ground: should be continuity.	<ul style="list-style-type: none"> <li>• Poor ground.</li> <li>• An open in the wire.</li> </ul>
2	Y	Ignition switch ON.	Check for voltage to ground: should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No. 2 (10A) fuse.</li> <li>• An open in the wire.</li> </ul>
3	R/Bu	Driver's seat belt not buckled.	Check for continuity to ground: should be continuity.	<ul style="list-style-type: none"> <li>• Faulty driver's seat belt switch.</li> <li>• An open in the wire.</li> </ul>
4	Bu/Y	Ignition switch ON.	Attach to ground: Seat belt reminder light should come on as the ignition switch ON.	<ul style="list-style-type: none"> <li>• Blown bulb.</li> <li>• An open in the wire.</li> </ul>



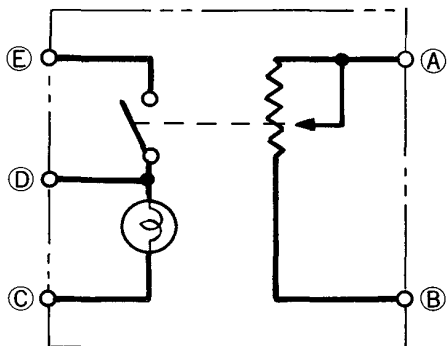
# Heated Seat

## Controller Test

1. Remove the controller.
2. Measure resistance between (A) and (B) terminals while rotating the adjusting dial. Resistance should vary from 0 to 10,000 ohms as dial is rotated.

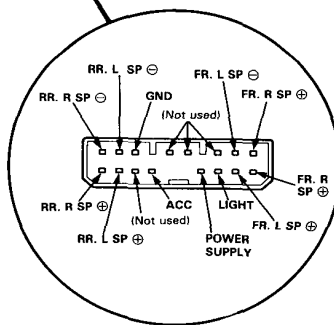
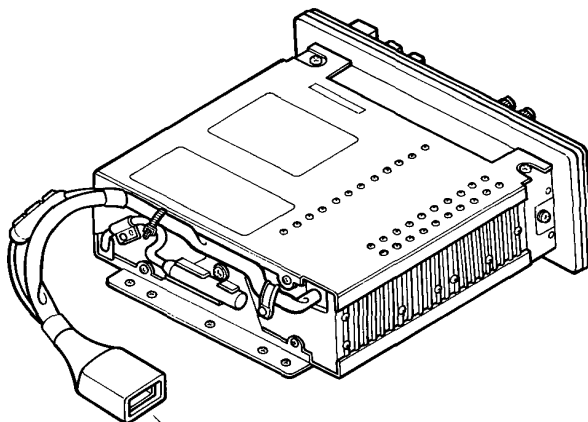


View from terminal side



# Sound System

## Terminal Arrangement



View from terminal side

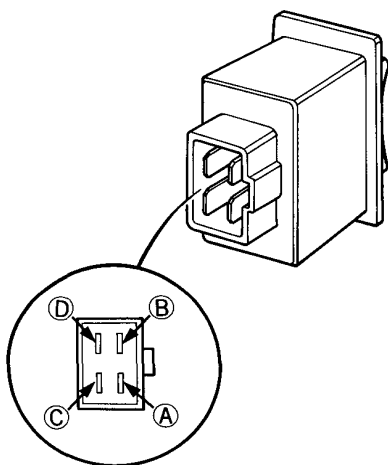




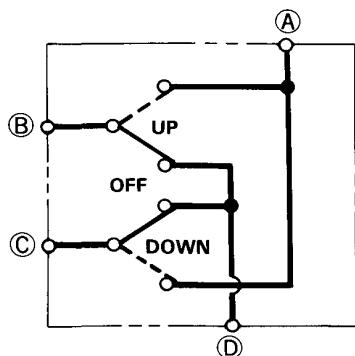
## Power Antenna Switch Test

1. Remove the antenna switch.
2. Check for continuity between the terminals in each switch position according to the table.

Terminal Position	(A)	(B)	(C)	(D)
UP	○—○			
OFF		○—○—○		
DOWN	○—○			
		○—○—○		

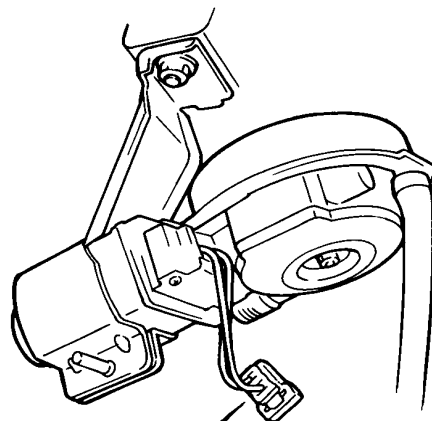


Circuit Diagram

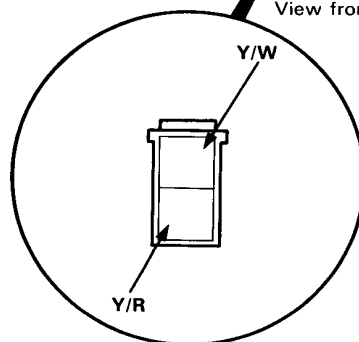


## Power Antenna Motor Test

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.



View from wire side

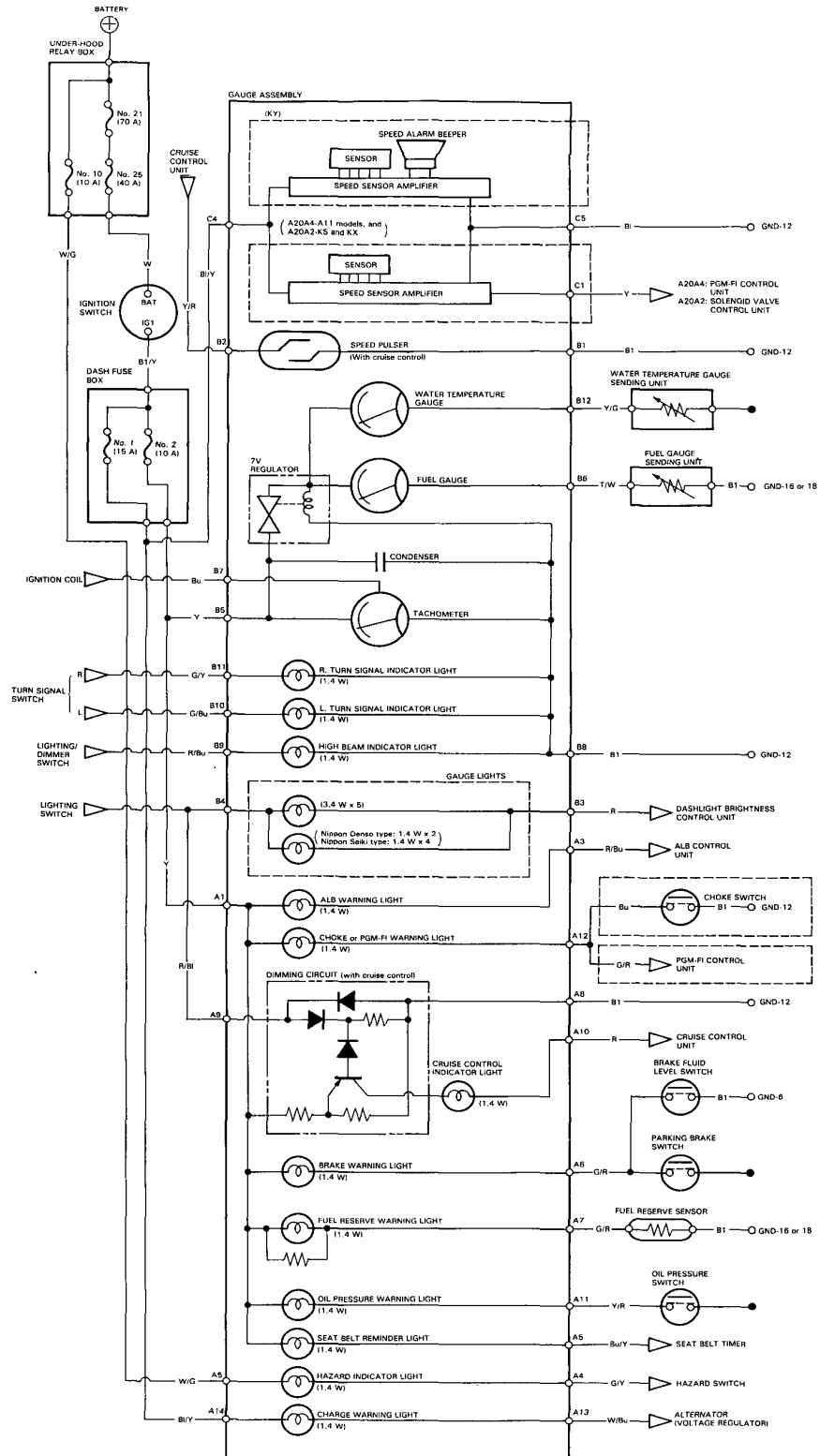




# Gauge Assembly

## Wiring/Circuit Diagram (Analog meter)

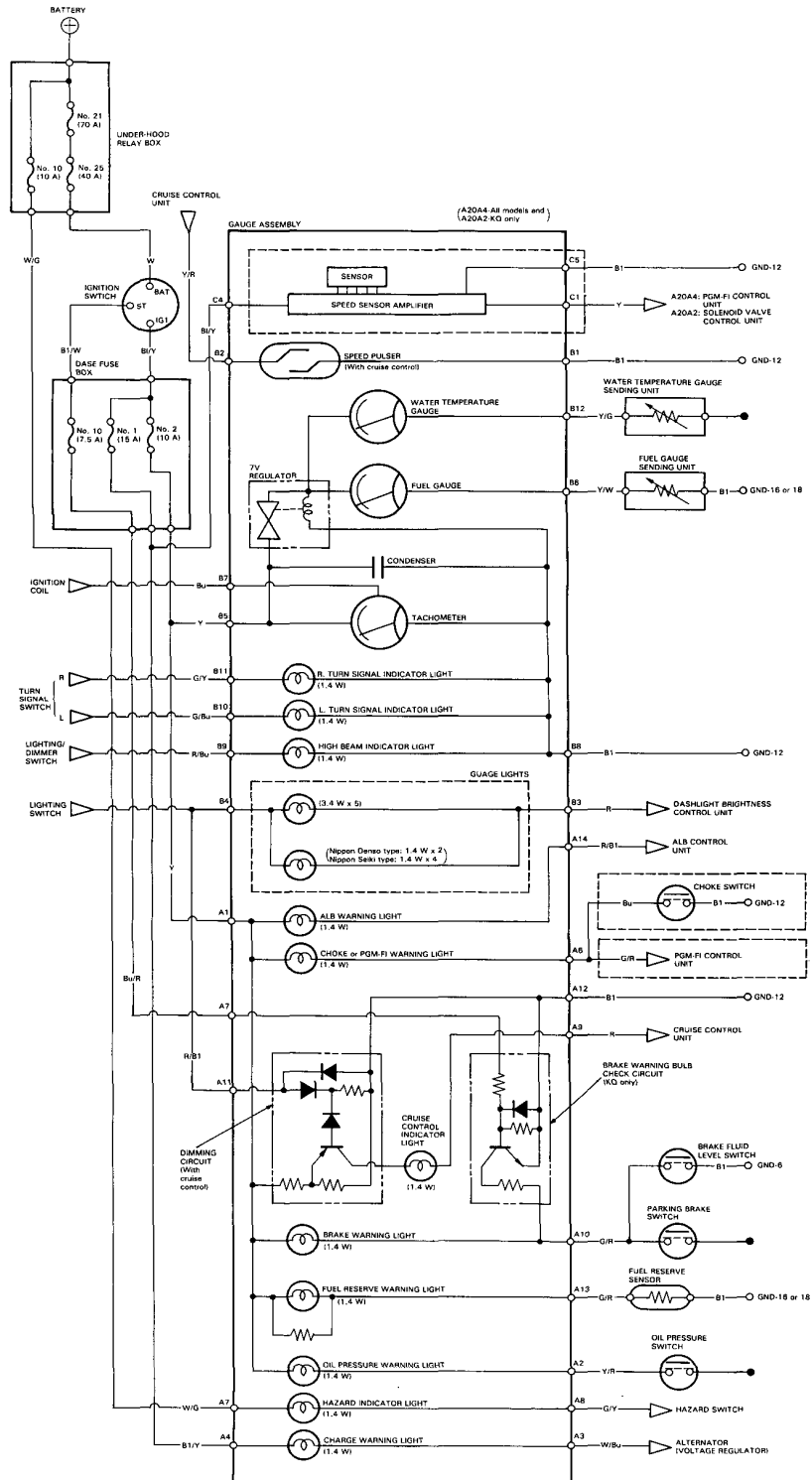
L. H. Drive:







## R. H. Drive:

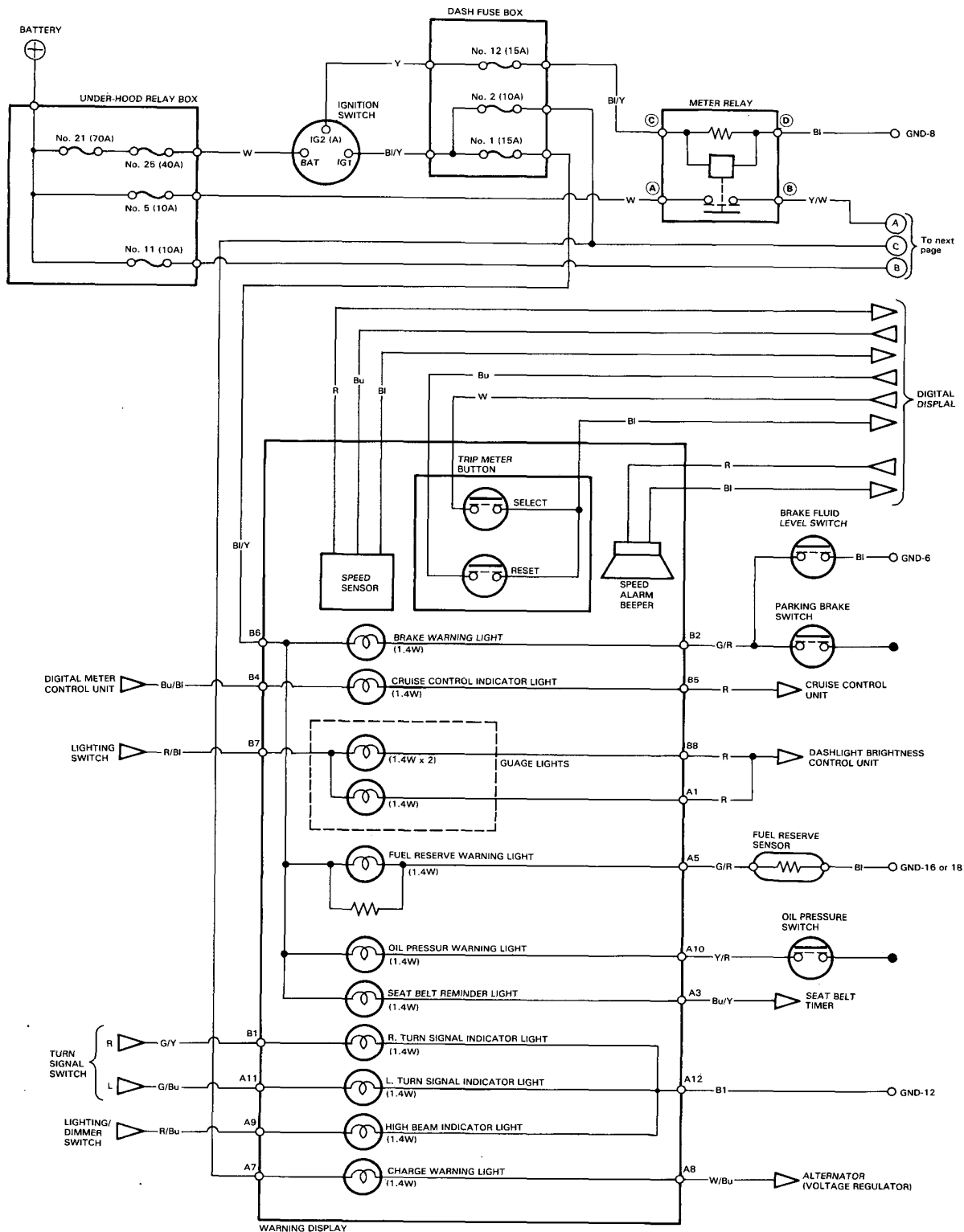




# Gauge Assembly

## Wiring/Circuit Diagram (Digital meter)

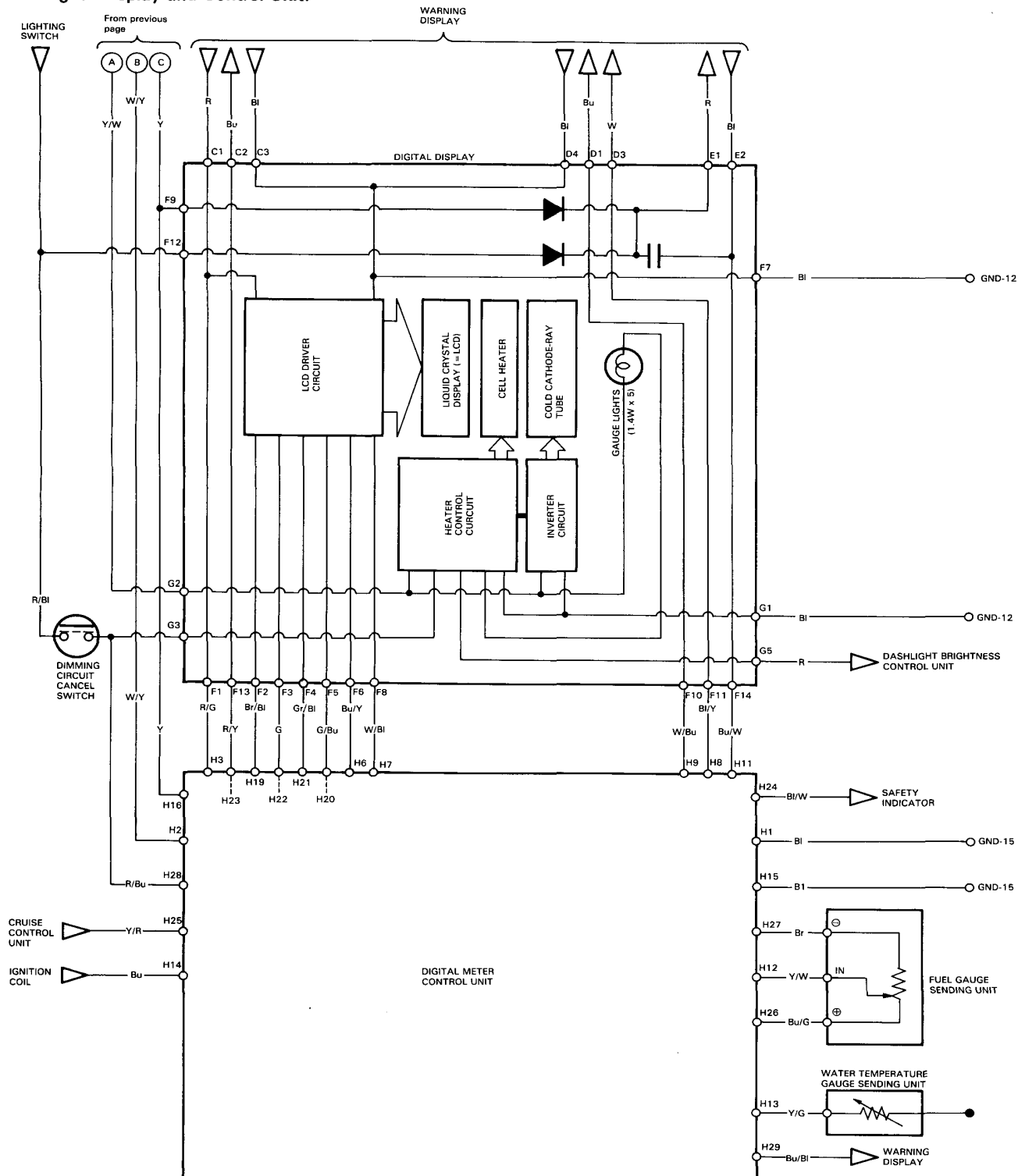
### Warning Display:







## Digital Display and Control Unit:

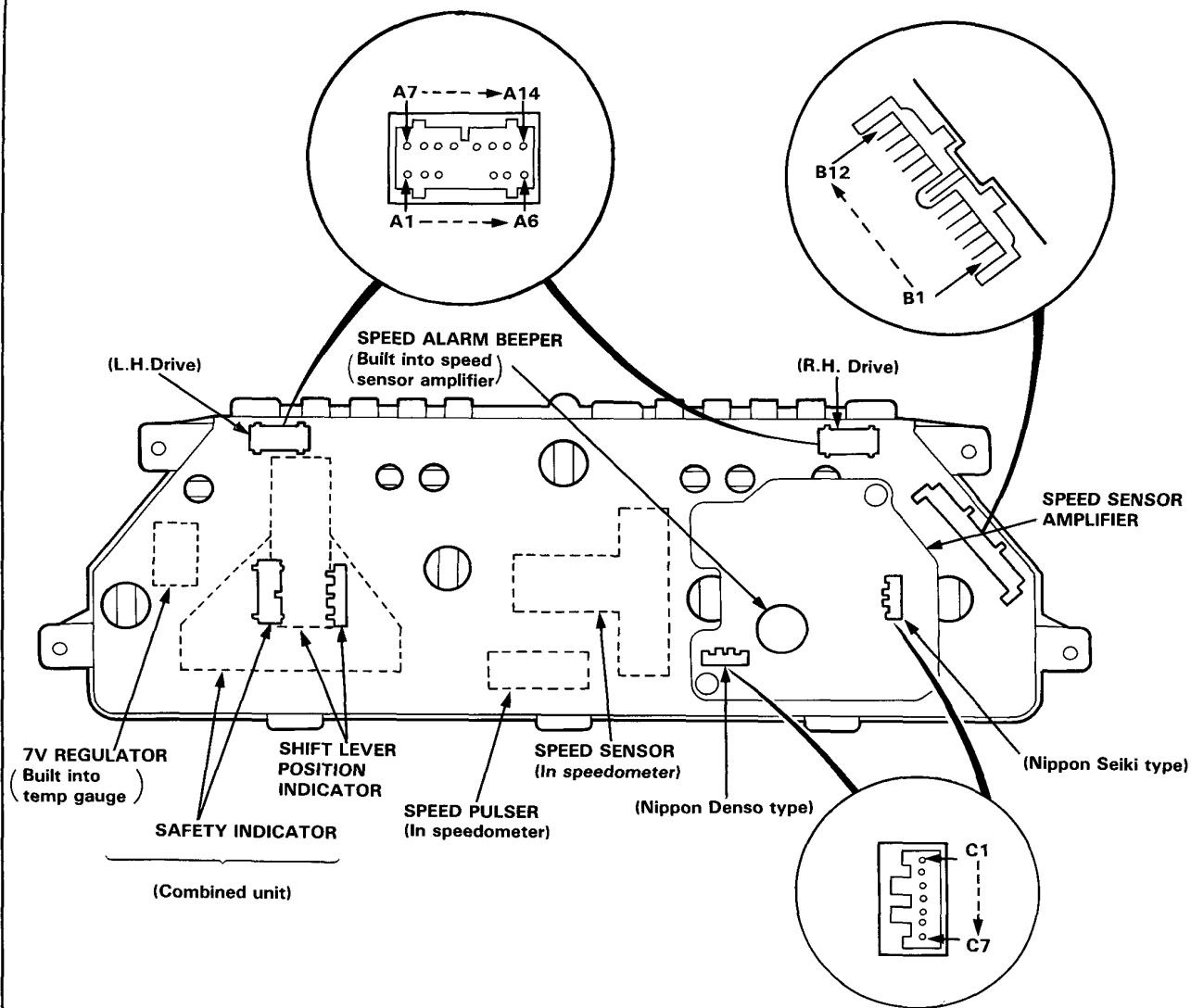




# Gauge Assembly

## Connector/Terminal Arrangement

Analog Meter:

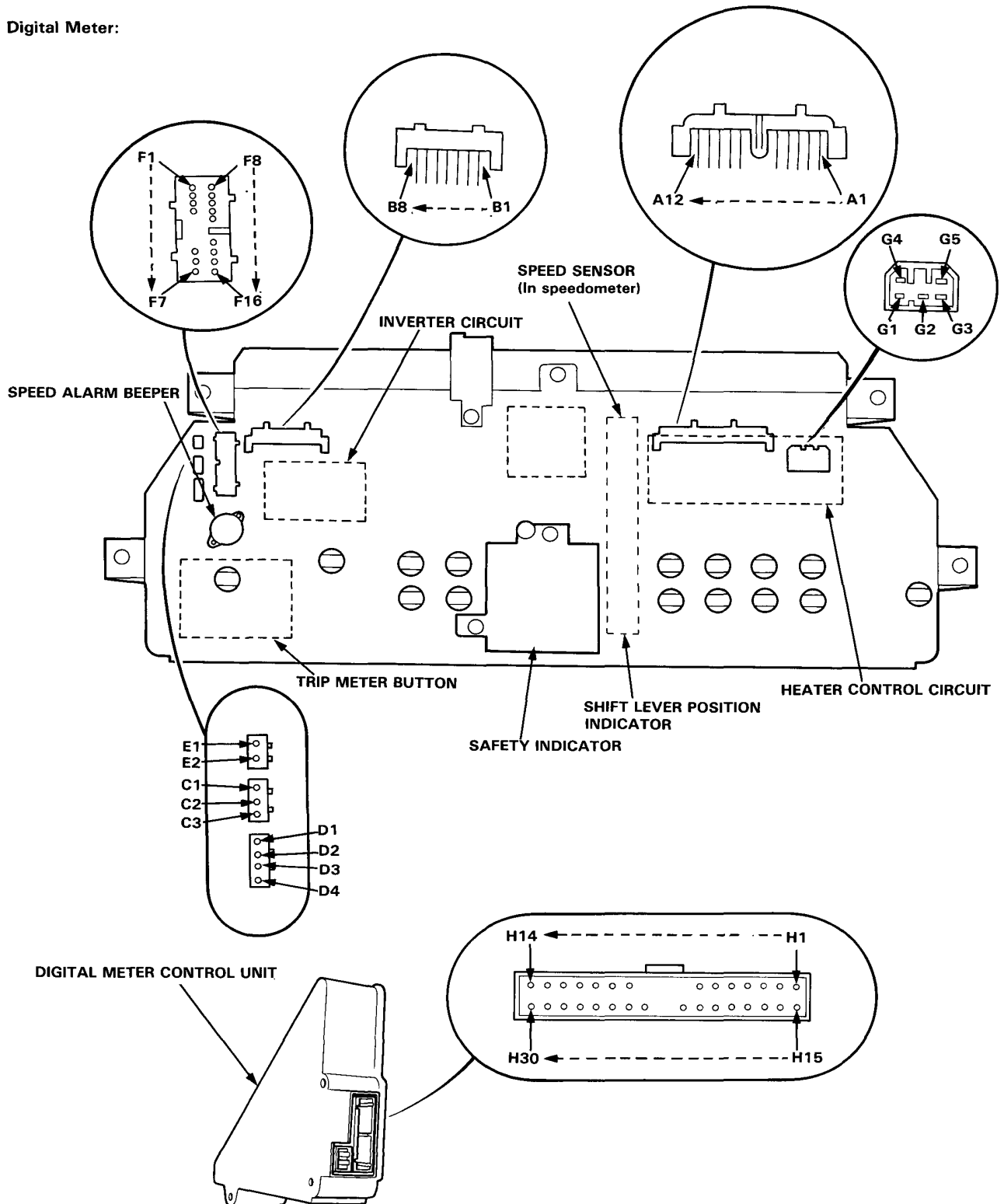


NOTE: The brake warning bulb check and dimming circuits are built into the top circuit board.





**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)

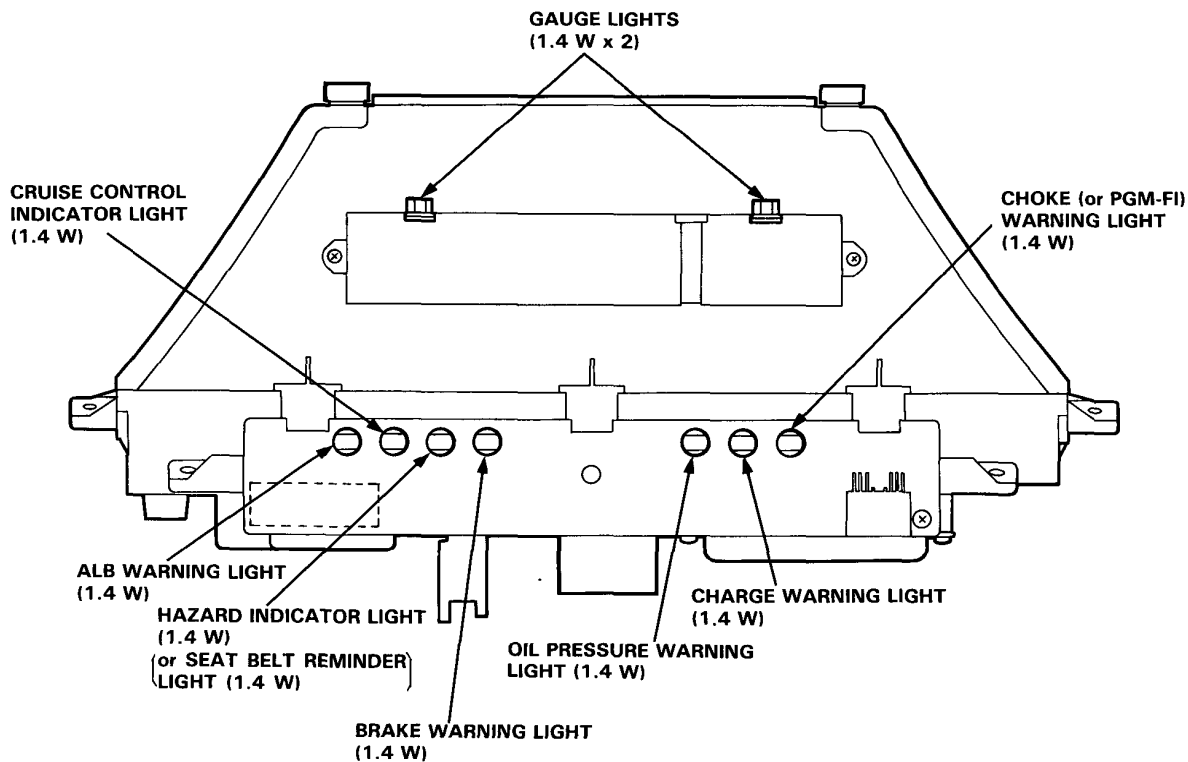
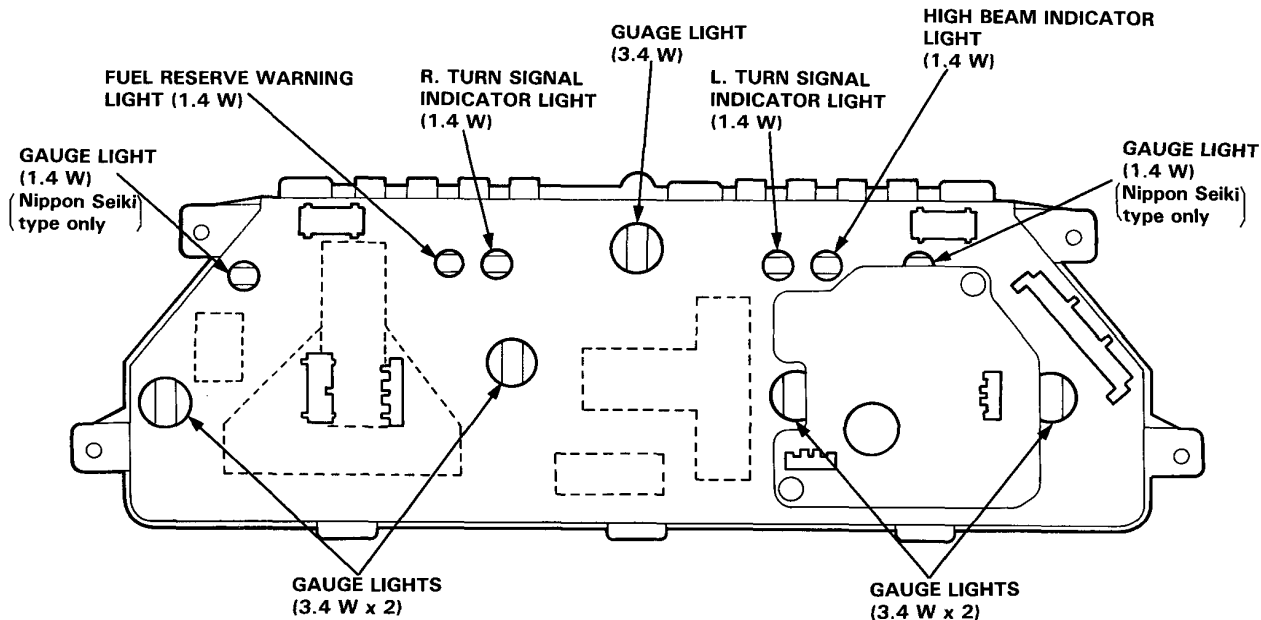
A1	Gauge light ⊖	F12	Speed alarm beeper (light on)
A2	Not used	F13	Speed sensor output
A3	Seat belt reminder light ⊖	F14	Speed alarm beeper ⊖
A4	Not used	F15	Not used
A5	Fuel reserve warning light ⊖	F16	Not used
A6	Not used	G1	Heater control/Inverter circuit ground
A7	Charge warning light (IG1)	G2	Heater control/Inverter circuits and Gauge light (+ B)
A8	Charge warning light ⊖	G3	Gauge light dimming circuit (cancel signal)
A9	High beam indicator light ⊕	G4	Not used
A10	Oil pressure warning light ⊖	G5	Gauge light ⊖
A11	L.Turn signal indicator light ⊕	H1	Unit ground
A12	Indicator lights ground	H2	Unit (+ B)
B1	R.Turn signal indicator light ⊕	H3	Speed sensor/LCD driver circuit (IG1)
B2	Brake warning light ⊖	H4	Not used
B3	Not used	H5	Not used
B4	Cruise control indicator light ⊕	H6	LCD driver circuit output
B5	Cruise control indicator light ⊖	H7	LCD driver circuit output
B6	Warning lights (IG1)	H8	Trip meter input (SELECT)
B7	Gauge light ⊕	H9	Trip meter input (RESET)
B8	Gauge light ⊖	H10	Not used
C1	Speed sensor (IG1)	H11	Speed alarm beeper ⊖
C2	Speed sensor input	H12	Fuel gauge input (IN)
C3	Speed sensor ground	H13	Water temperature gauge input
D1	Trip meter (RESET button)	H14	Tachometer input
D2	Trip meter (SELECT button)	H15	Unit ground
D3	Trip meter button ground	H16	Unit (IG1)
D4	Not used	H17	Not used
E1	Speed alarm beeper ⊕	H18	Not used
E2	Speed alarm beeper ⊖	H19	LCD driver circuit output
F1	Speed sensor/LCD driver circuit (IG1)	H20	LCD driver circuit output
F2	LCD driver circuit input	H21	LCD driver circuit output
F3	LCD driver circuit input	H22	LCD driver circuit output
F4	LCD driver circuit input	H23	Speed sensor amplifier input
F5	LCD driver circuit input	H24	Safety indicator bulb check circuit ⊕
F6	LCD driver circuit input	H25	Speed pulser output (4 pulses with each full turn of the speedometer cable)
F7	Speed sensor/LCD driver circuit/Trip meter button ground	H26	Fuel gauge input (+)
F8	LCD driver circuit input	H27	Fuel gauge input (-)
F9	Speed alarm beeper (IG1)	H28	Dimming circuit (cancel signal)
F10	Trip meter (RESET button)	H29	Cruise control indicator light ⊕
F11	Trip meter (SELECT button)	H30	Not used



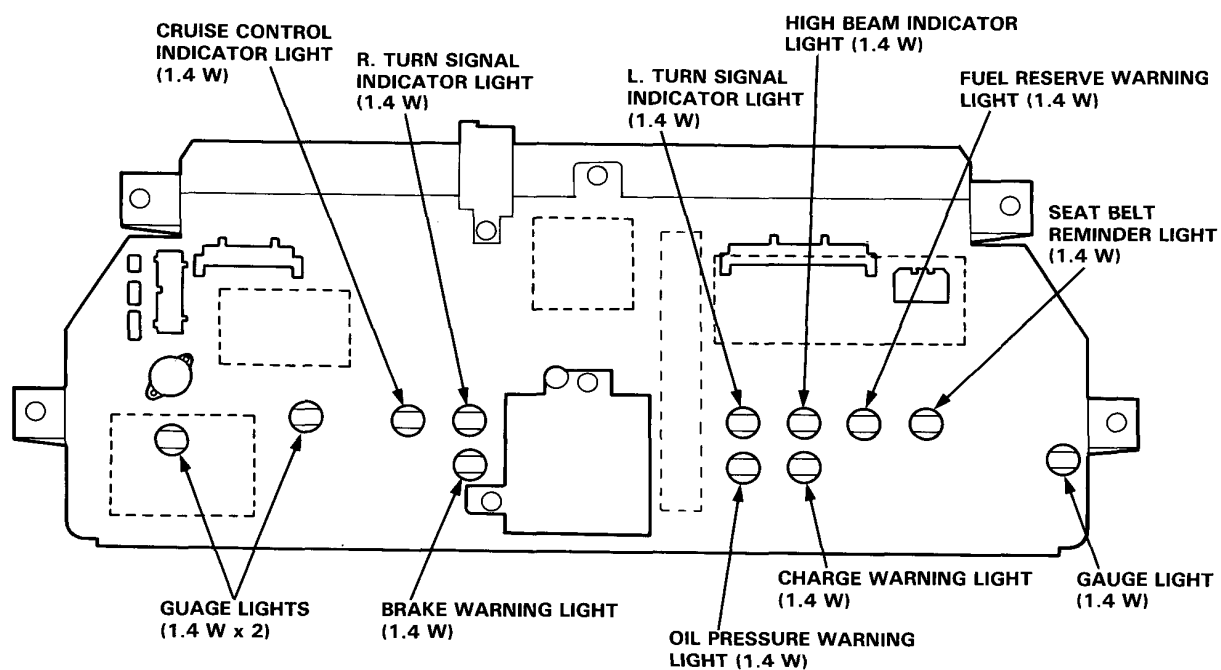
# Gauge Assembly

## Bulb Location

Analog Meter:





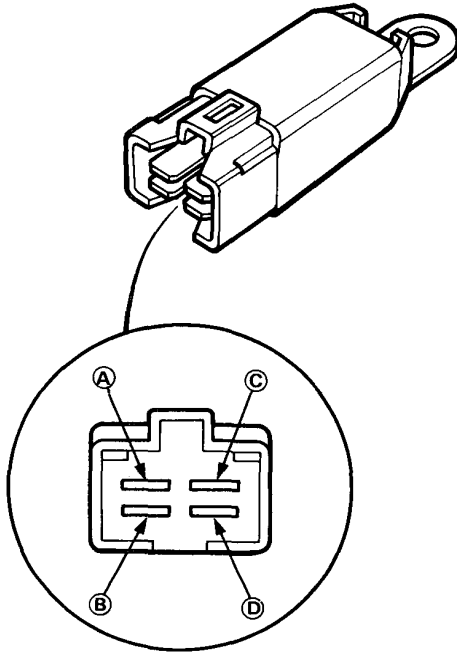




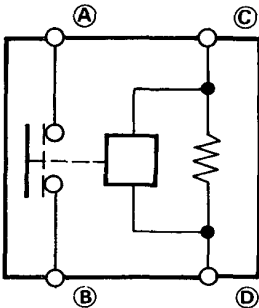
# Gauge Assembly

## 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.



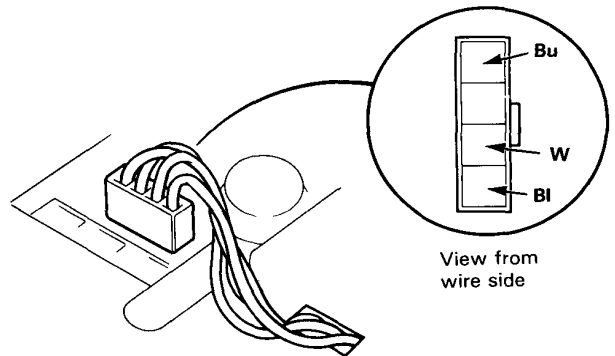
Circuit Diagram



## 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	BI	Bu	W
Position			
OFF			
RESET	○	○	
SELECT	○		○

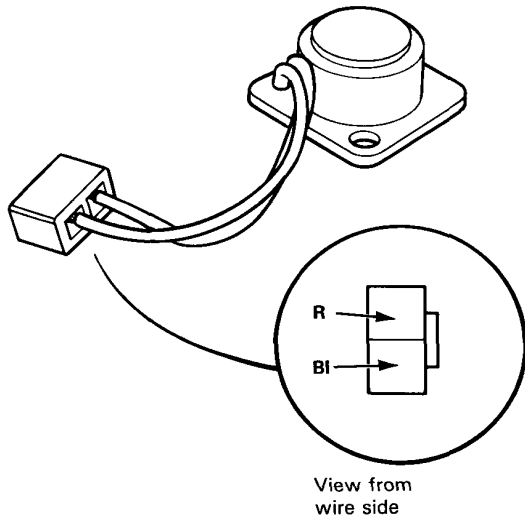






## Speed Alarm Beeper Test

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 BI.
3. If the beeper fails to sound, replace it.



## 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:

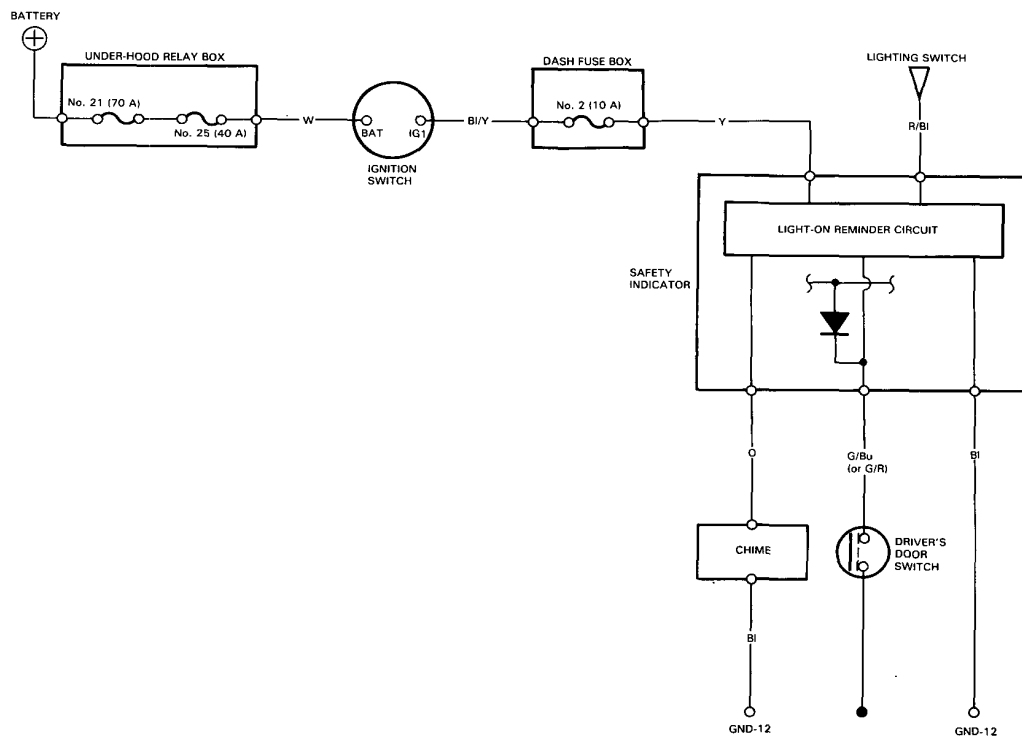
With the ignition switch in "Start", voltage is applied through the No. 10 (7.5 A) fuse to the bulb check circuit built into the top circuit board in the gauge assembly. The bulb check circuit contacts close, and current flows through the brake warning light and bulb check circuit contacts to ground. 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.



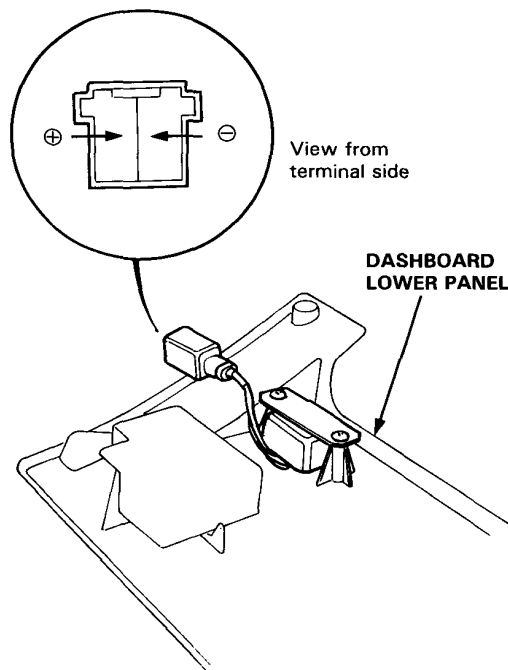
# Light-on Warning System

## 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  $\oplus$  terminal, and negative to  $\ominus$ , 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.

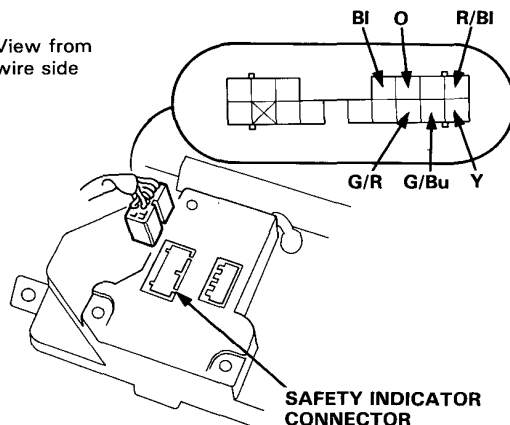
Make the following input tests at the harness pins. If all tests prove OK, yet the system still fails to work, replace the safety indicator assembly.

### NOTE:

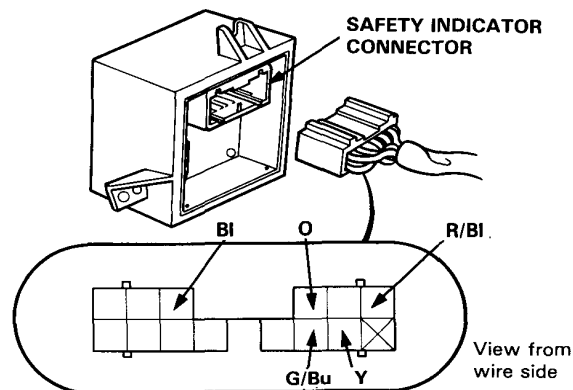
- Before troubleshooting, check the No. 2 (10A) fuse in the dash fuse box.
- G/Bu wire: L.H. Drive
- G/R: R.H. Drive

### With analog meter:

View from wire side



### With digital meter:

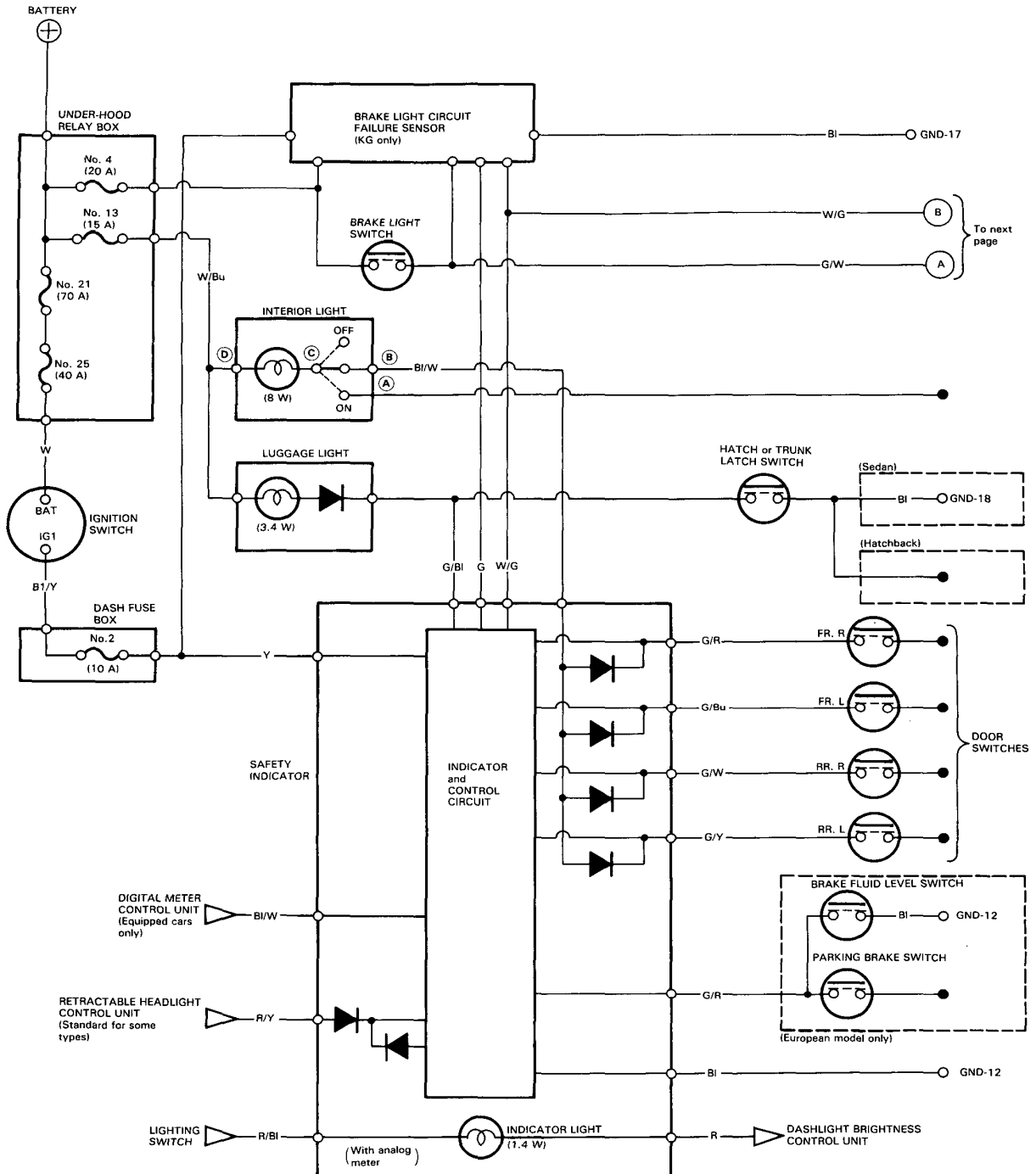


No.	Wire	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	BI	Under all conditions.	Check for continuity to ground: should be continuity.	<ul style="list-style-type: none"> <li>• Poor ground.</li> <li>• An open in the wire.</li> </ul>
2	Y	Ignition switch ON.	Check for voltage to ground: should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No. 2 (10 A) fuse.</li> <li>• An open in the wire.</li> </ul>
3	R/BI	Lighting switch ON.	Check for voltage to ground: should be battery voltage.	<ul style="list-style-type: none"> <li>• Faulty lighting switch.</li> <li>• An open in the wire.</li> </ul>
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.	<ul style="list-style-type: none"> <li>• Faulty chime.</li> <li>• An open in the wire.</li> </ul>
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.	<ul style="list-style-type: none"> <li>• Faulty driver's door switch.</li> <li>• An open in the wire.</li> </ul>

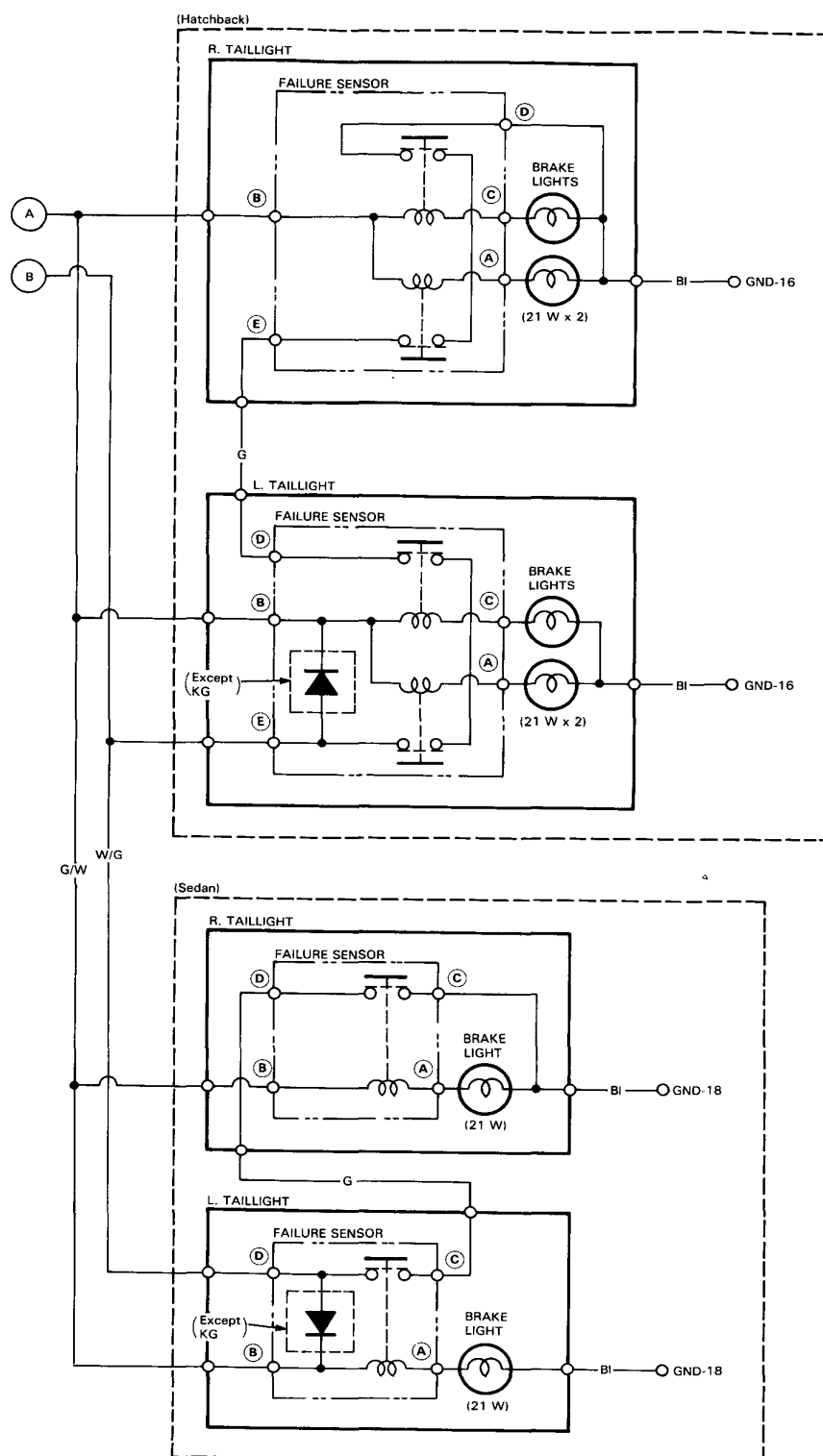


# Safety Indicator

## Wiring Diagram









# 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.

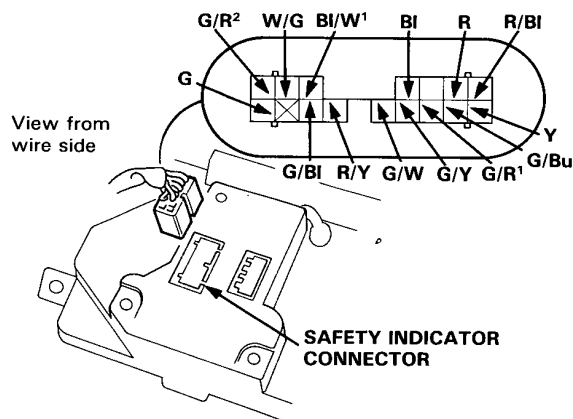
Make the following input tests at the harness pins.

If all tests prove OK, yet the indicator still fails to work, replace the indicator assembly.

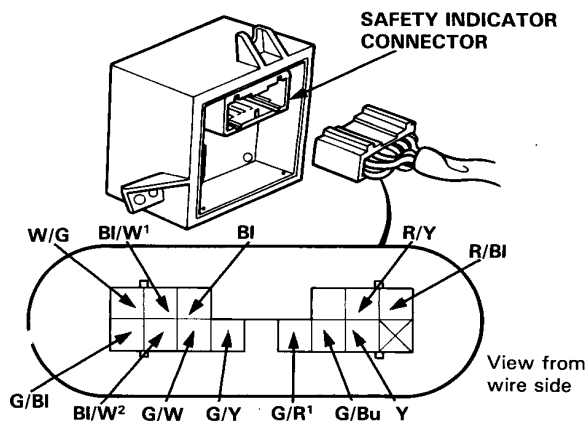
### NOTE:

- Several different wires have the same color; They have been given a number suffix to distinguish them (for example G/R<sup>1</sup> and G/R<sup>2</sup> 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<sup>2</sup> wire: European model only  
G: KG model only  
R: Cars with analog meter  
BI/W<sup>2</sup>: 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.	<ul style="list-style-type: none"> <li>• Poor ground.</li> <li>• An open in the wire.</li> </ul>
2	Y	Ignition switch ON.	Check for voltage to ground: should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No. 2 (10A) fuse.</li> <li>• An open in the wire.</li> </ul>
3	Bl/W <sup>1</sup>	Interior light switch in MIDDLE.	Attach to ground: Interior light should come on as the interior light switch in MIDDLE.	<ul style="list-style-type: none"> <li>• Faulty interior light.</li> <li>• An open in the wire.</li> </ul>
4	G/Bl	Hatch or trunk lid opened.	Check for continuity to ground: should be continuity. NOTE: Before testing, remove No. 13 (15A) fuse.	<ul style="list-style-type: none"> <li>• Faulty hatch or trunk latch switch.</li> <li>• An open in the wire.</li> </ul>
5	G/R <sup>1</sup>	Right front door opened.	Check for continuity to ground: should be continuity.  NOTE: Before testing, remove No. 13 (15A) fuse.	<ul style="list-style-type: none"> <li>• Faulty door switch.</li> <li>• An open in the wire.</li> </ul>
	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.	<ul style="list-style-type: none"> <li>• Frozen, stuck, or improperly installed retractor linkage.</li> <li>• Faulty retractable headlight control unit.</li> </ul>
7	G/R <sup>2</sup>	Parking brake set (or brake fluid level too low).	Check for continuity to ground: should be continuity.	<ul style="list-style-type: none"> <li>• Faulty parking brake switch (or brake fluid level switch).</li> <li>• An open in the wire.</li> </ul>
8	W/G	Brake pedal pushed.	Check for continuity to ground: should be continuity.	<ul style="list-style-type: none"> <li>• Blown brake light bulbs.</li> <li>• Faulty brake light failure sensors.</li> <li>• An open in the wire.</li> <li>• Faulty brake light switch.</li> </ul>
9	Bl/W <sup>2</sup>	Ignition switch ON.	Check for voltage to ground: should be below 2V for 2 sec. with the ignition switch ON.	<ul style="list-style-type: none"> <li>• Faulty digital meter control unit.</li> <li>• An open in the wire.</li> </ul>
10	G	Ignition switch ON.	Check for continuity to ground: should be continuity.	<ul style="list-style-type: none"> <li>• Faulty brake light circuit failure sensor.</li> <li>• An open in the wire.</li> <li>• Poor ground.</li> </ul>
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.	<ul style="list-style-type: none"> <li>• Faulty dashlight brightness control unit.</li> <li>• An open in the wire.</li> </ul>

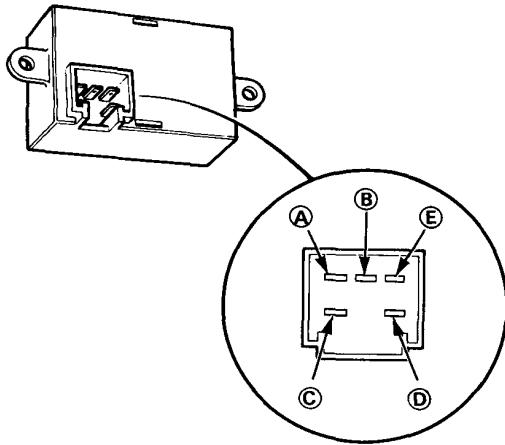


# Safety Indicator

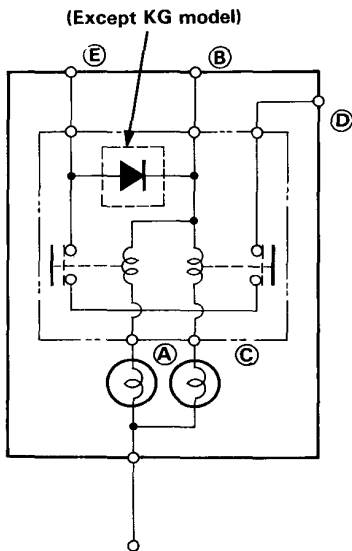
## Brake Light Failure Sensor Test

### 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.

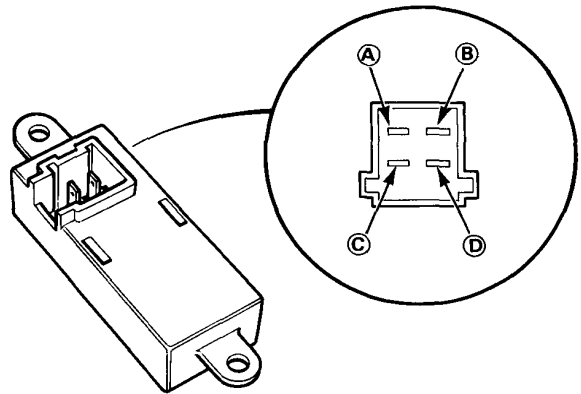


### Circuit Diagram

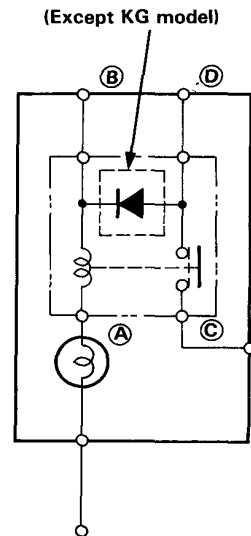


### Sedan:

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



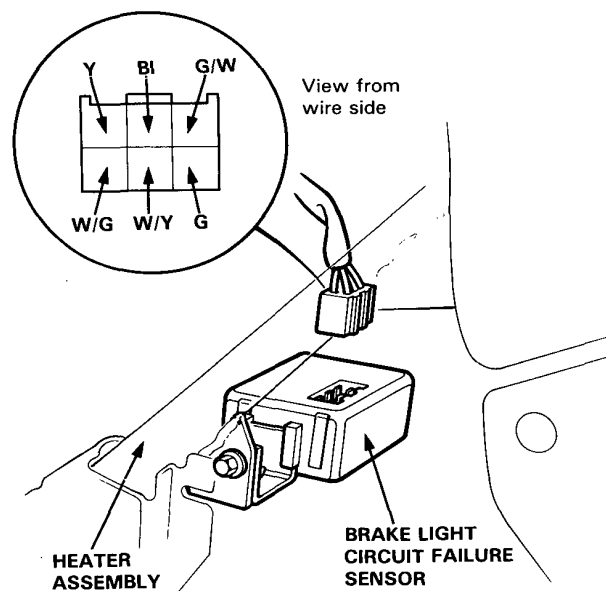




## Brake Light Circuit Failure Sensor Test

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.

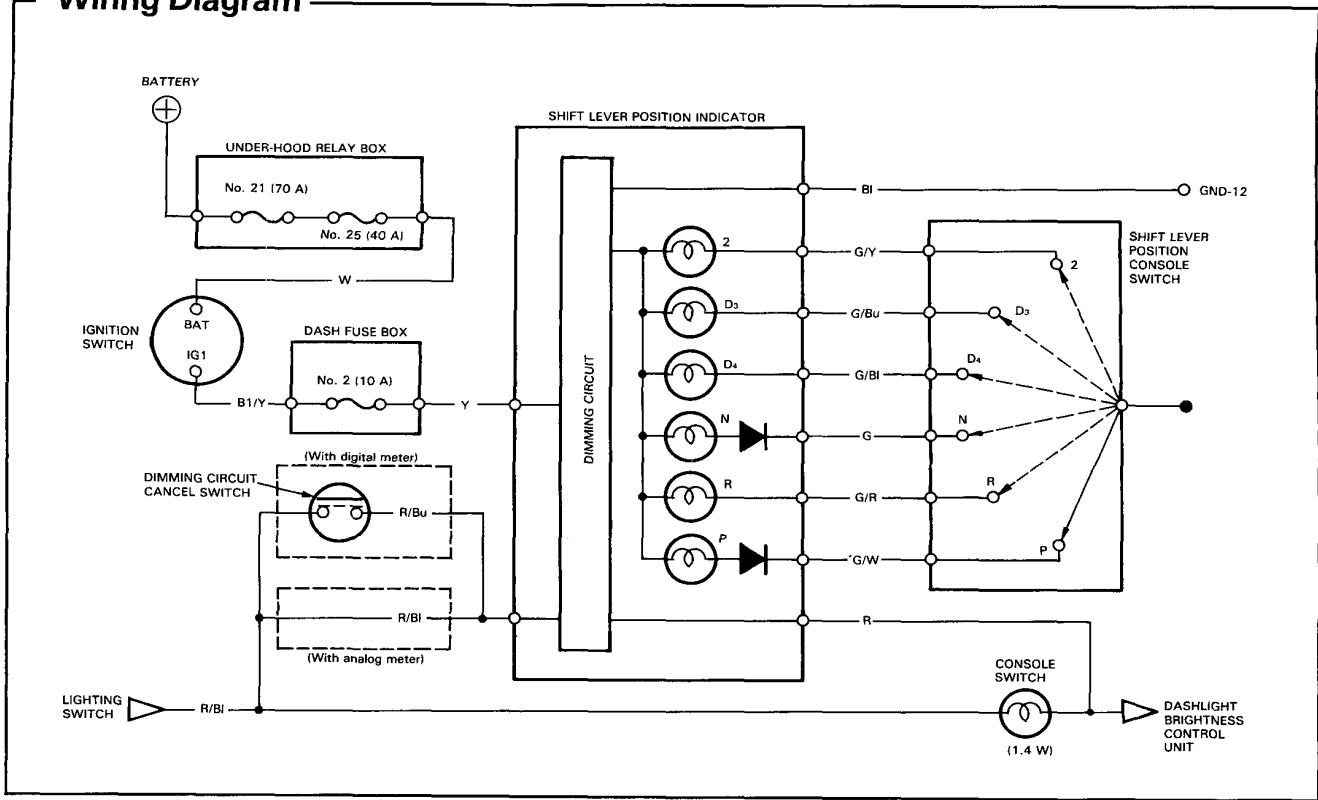


No.	Wire	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	BI	Under all conditions.	Check for continuity to ground: should be continuity.	<ul style="list-style-type: none"> <li>• Poor ground.</li> <li>• An open in the wire.</li> </ul>
2	Y	Ignition switch ON.	Check for voltage to ground: should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No. 2 (10A) fuse.</li> <li>• An open in the wire.</li> </ul>
3	G	Ignition switch ON.	Attach to ground: "BRAKE LAMP" should light up as the ignition switch ON.	<ul style="list-style-type: none"> <li>• Faulty safety indicator.</li> <li>• An open in the wire.</li> </ul>
4	W/Y	Under all conditions	Check for voltage to ground: should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No. 4 (20A) fuse.</li> <li>• An open in the wire.</li> </ul>
5	G/W	Brake pedal pushed.	Check for voltage to ground: should be battery voltage.	<ul style="list-style-type: none"> <li>• Faulty brake light switch.</li> <li>• An open in the wire.</li> </ul>
6	W/G	Brake pedal pushed.	Check for continuity to ground: should be continuity.	<ul style="list-style-type: none"> <li>• Blown brake light bulbs.</li> <li>• Faulty brake light failure sensors.</li> <li>• An open in the wire.</li> </ul>



# Shift Lever Position Indicator

## Wiring Diagram



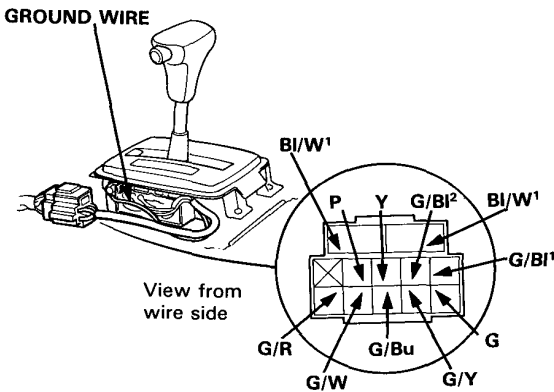
## Console Switch Test

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/Bi<sup>1</sup> and G/Bi<sup>2</sup> are not the same).

Terminal Position	G/W	G/R	G	G/Bi <sup>1</sup>	G/Bu	G/Y	GROUND WIRE
2							
D <sub>3</sub>							
D <sub>4</sub>							
N							
R							
P							

Terminal Position	GROUND WIRE	P	Bi/W <sup>1</sup>	Y	Bi/W <sup>2</sup>	G/Bi <sup>2</sup>
2						
D <sub>3</sub>						
D <sub>4</sub>						
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.

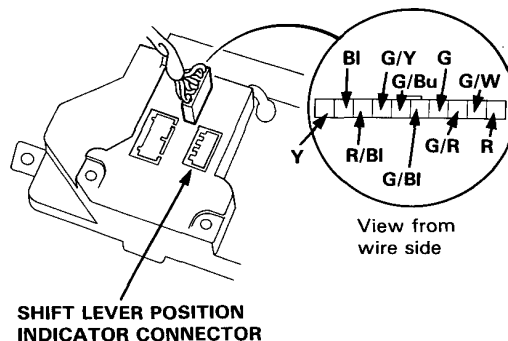
Make the following input tests at the harness pins.

If all tests prove OK, yet the indicator still fails to work, replace the indicator assembly.

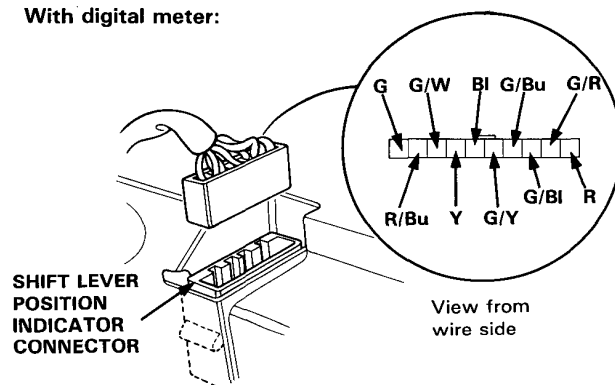
### NOTE:

- Before troubleshooting, check the No. 2 (10A) fuse in the dash fuse box.
- R/BI wire: Cars with analog meter
- R/Bu: Cars with digital meter

With analog meter:



With digital meter:



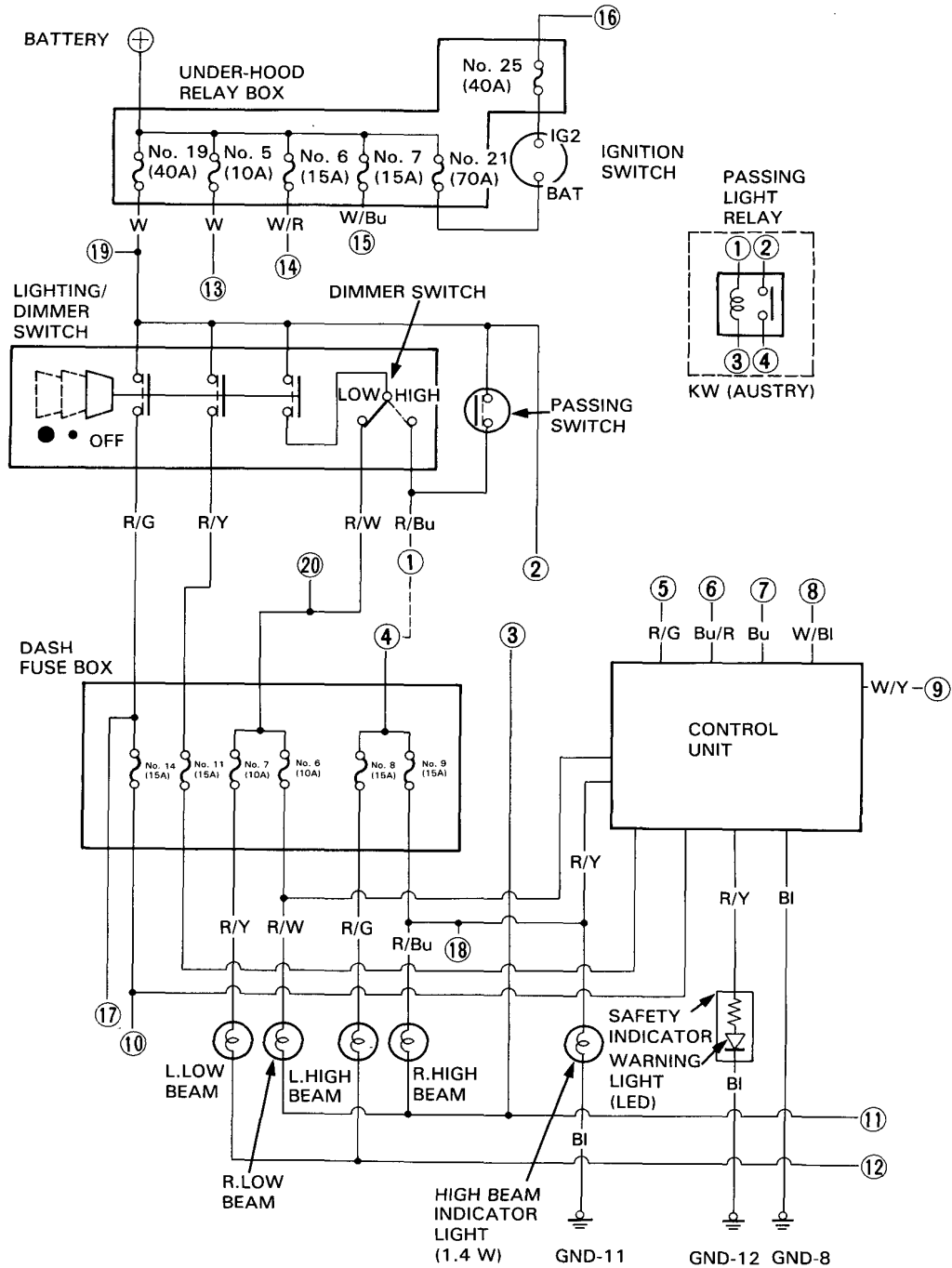
No.	Wire	Test condition	Test: desired result	Possible cause (if result is not obtained)
1	BI	Under all conditions.	Check for continuity to ground: should be continuity.	<ul style="list-style-type: none"> <li>• Poor ground.</li> <li>• An open in the wire.</li> </ul>
2	Y	Ignition switch ON.	Check for voltage to ground: should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No. 2 (10A) fuse.</li> <li>• An open in the wire.</li> </ul>
3	G/W G/R G G/BI G/Bu G/Y	Shift lever position	In P In R In N In D <sub>4</sub> In D <sub>3</sub> In 2 Check for continuity to ground: should be continuity.	<ul style="list-style-type: none"> <li>• Faulty shift lever position</li> <li>• An open in the wire.</li> <li>• Poor ground.</li> </ul>
4	R/BI and R	Lighting switch ON and dashlight brightness control dial in full bright.	Check for voltage between R/BI and R terminals: should be battery voltage.	<ul style="list-style-type: none"> <li>• Faulty dashlight brightness control unit.</li> <li>• An open in the wire.</li> </ul>
	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.	<ul style="list-style-type: none"> <li>• Faulty dashlight brightness control unit.</li> <li>• An open in the wire.</li> </ul>



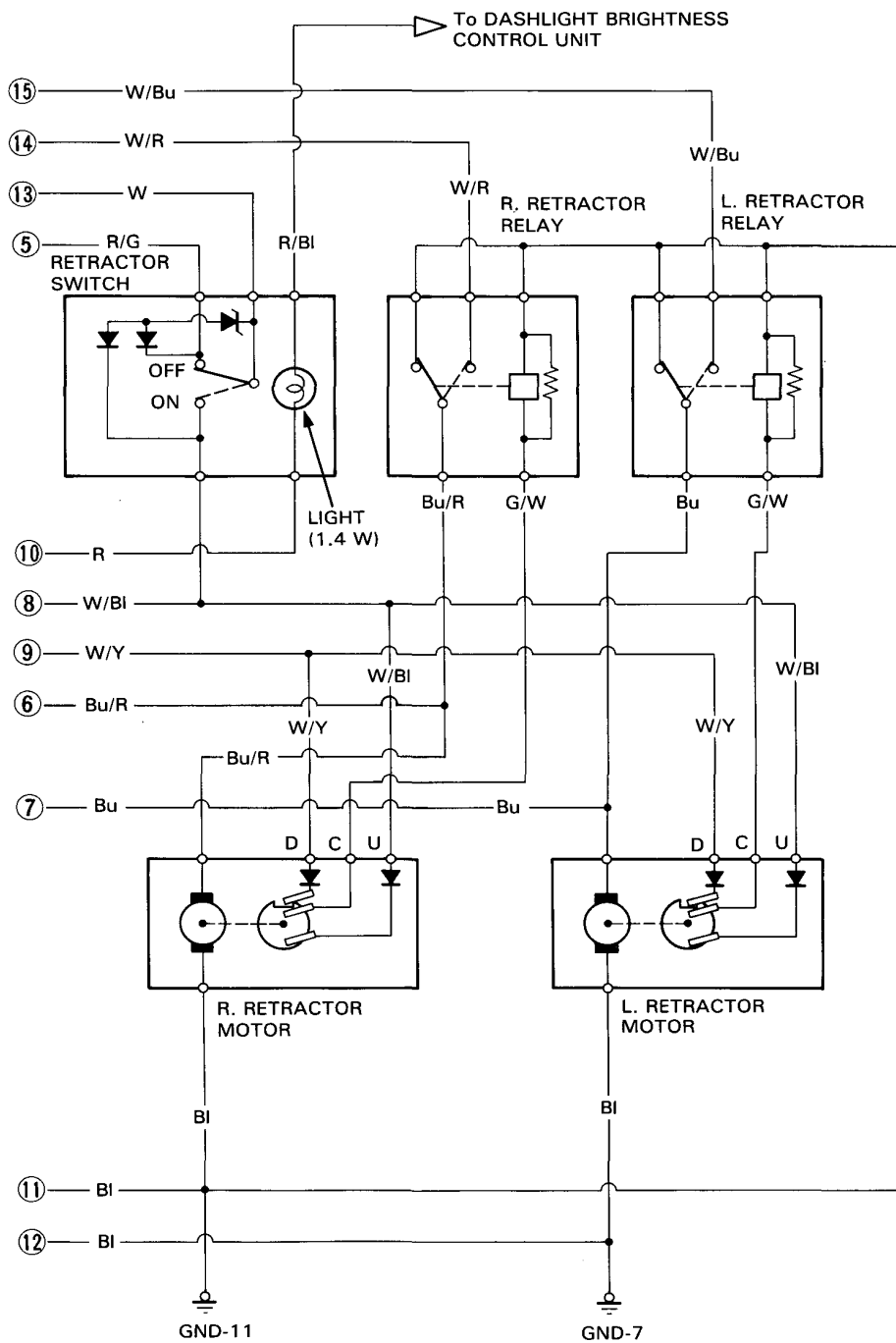
# Headlights

## Wiring Diagram

Retractable Headlight:







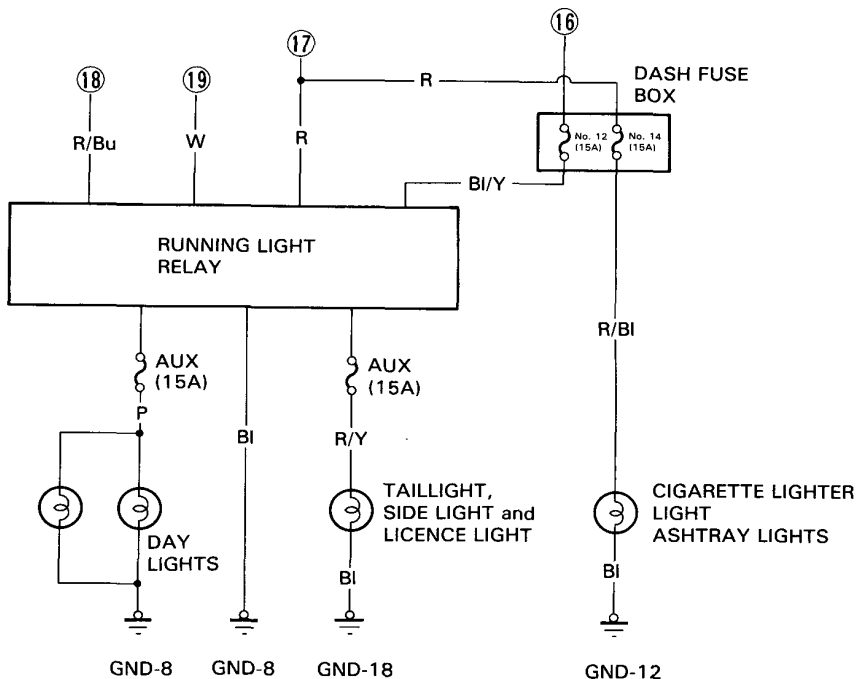


# Headlights

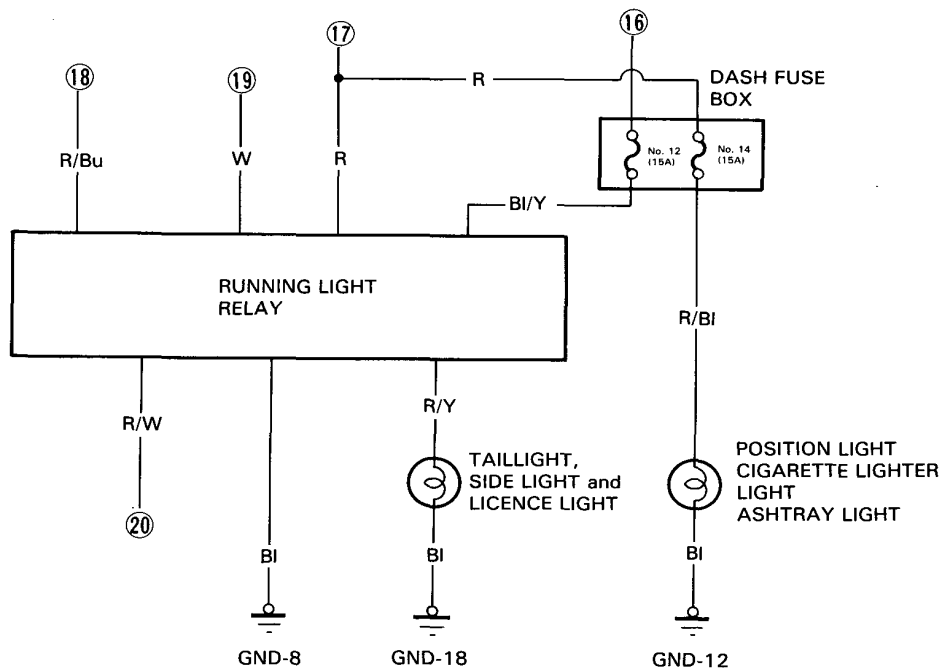
## Wiring Diagram

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/BI) 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.

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
Symptom									
Warning light ON			3			2	1		
Both headlights won't open	With either switch (lighting and retractor)							GND-7	W/BI
	With lighting switch			1		2		GND-2	R/W or R/W
	With retractor switch				1				W or W/BI
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/BI

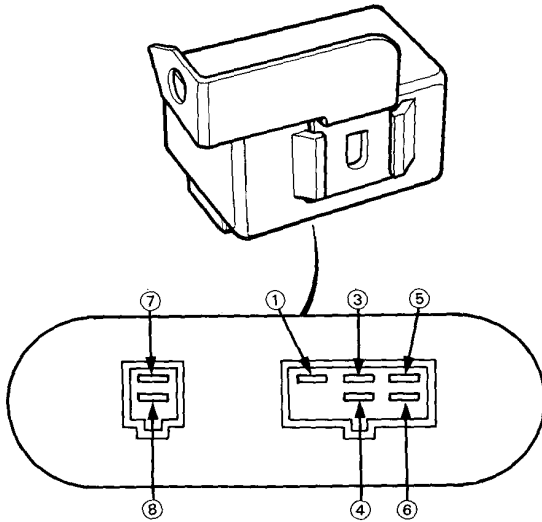
NOTE: Several different wires have the same color. They have been given a number suffix to distinguish them (for example G/BI<sup>1</sup> and G/BI<sup>2</sup> are not the same).



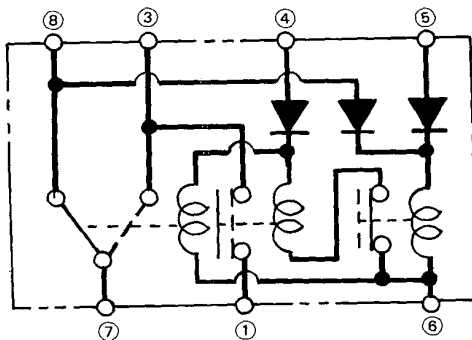
# Headlights

## 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.



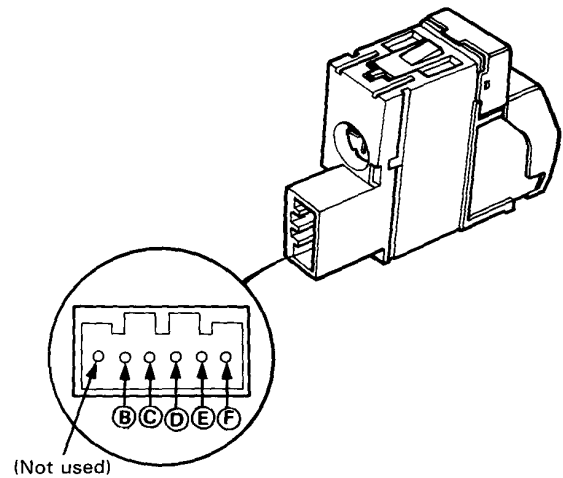
Circuit Diagram



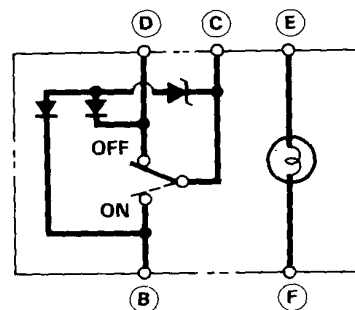
## Retractor Switch Test

1. Remove the retractor switch.
2. Check for continuity between the terminals in each switch position according to the table.

Terminal	B	C	D	E	F
Position					
OFF (RETRACT)		○	○	○	○
ON (RAISE)	○	○		○	○



Circuit Diagram

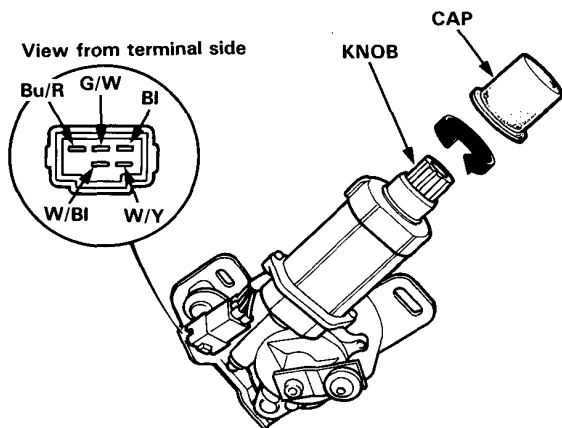






## Retractor Motor Test

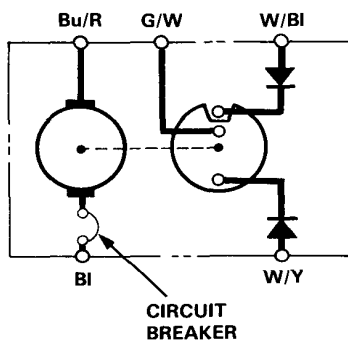
1. Remove the retractor motor.
2. Test motor operation by connecting battery positive wire to the Bu/R terminal and negative to the BI terminal.  
The motor should run continuously.
3. If the motor fails to run smoothly, replace it.



4. Disconnect the power supply and check for continuity between the terminals according to the table while turning the knob clockwise, as shown above.

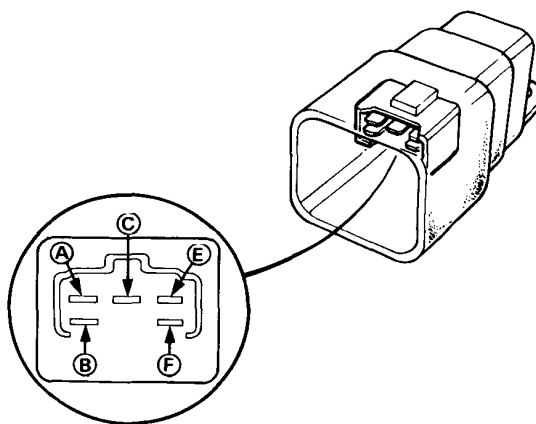
Terminal	W/BI	G/W	W/Y
<b>Headlight</b>			
At raised position		○ ← ○	○
At retracted position	○ → ○		

Circuit Diagram

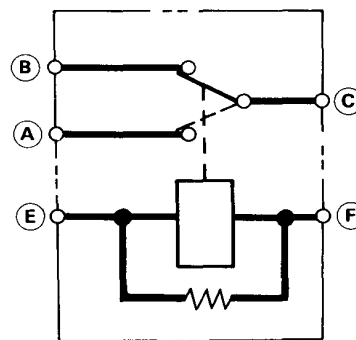


## Retractor Relay Test

1. Remove the retractor relays located on the left side of the engine compartment.
2. There should be continuity between (A) and (C) terminals when the battery is connected to (E) and (F) terminals.  
There should be continuity between (B) and (C) terminals when the battery is disconnected.



Circuit Diagram

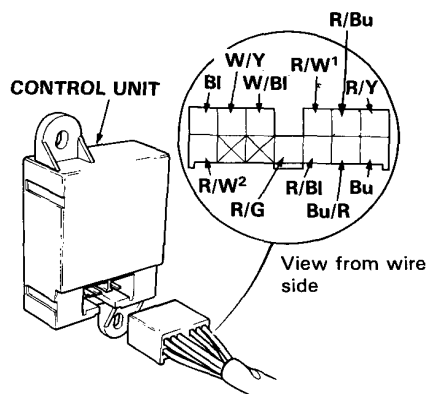




# Headlights

## 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	BI	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/BI	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/BI	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		