

# Steering

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## SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

The Legend includes a driver's side Airbag, located in the steering wheel hub. Information necessary to safely service the SRS is included in this Shop Manual. Items marked \* in each section table of contents include, or are located near, SRS components. Servicing, disassembling or replacing these items will require special precautions and tools, and should therefore be done only by an authorized HONDA dealer.

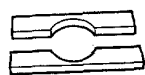
### WARNING

- To avoid rendering the SRS inoperative, which can lead to personal injury or death in the event of a severe frontal collision, all maintenance must be performed by an authorized HONDA dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the Airbag.
- All SRS electrical wiring harnesses are covered with yellow outer insulation. Related components are located in the steering column, center armrest and dashboard lower panel. Do not use electrical test equipment on these circuits.



# Special Tools

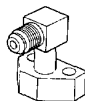
| Ref. No. | Tool Number   | Description                                        | Q'ty | Page Reference |
|----------|---------------|----------------------------------------------------|------|----------------|
| ①        | 07GAF-SD40700 | Hub Dis/Assembly Base                              | 2    | 17-36          |
| ②        | 07GAG-SD40300 | Cylinder End Seal Slider                           | 1    | 17-60          |
| ③        | 07GAK-SE00112 | P/S Joint Adapter (Pump)                           | 1    | 17-19          |
| ④        | 07GAK-SE00120 | P/S Joint Adapter (Hose)                           | 1    | 17-19          |
| ⑤        | 07GAG-SD40700 | Ball Joint Boot Clip Guide                         | 1    | 17-67          |
| ⑥        | 07JGG-0010100 | Belt Tension Gauge                                 | 1    | 17-17          |
| ⑦        | 07MAC-SL00200 | Ball Joint Remover, 28 mm                          | 1    | 17-41          |
| ⑧        | 07MAG-SP00100 | Pinion Seal Ring Guide                             | 1    | 17-59          |
| ⑨        | 07LAG-SM40200 | Piston Seal Ring Sizing Tool                       | 1    | 17-59          |
| ⑩        | 07406-0010001 | P/S Pressure Gauge Set                             | 2    | 17-18          |
| ⑩-1      | 07406-0010400 | P/S Pressure Gauge                                 | 1    | 17-18          |
| ⑩-2      | 07406-0010300 | P/S Pressure Control Valve                         | 1    | 17-18          |
| ⑪        | 07406-0010101 | Bypass Tube Joint<br>(Included with 07406-0010001) | 1    | 17-20          |
| ⑫        | 07725-0030000 | Universal Holder                                   | 1    | 17-32          |
| ⑬        | 07746-0010400 | Attachment, 52 × 55 mm                             | 1    | 17-57          |
| ⑭        | 07749-0010000 | Driver                                             | 1    | 17-57          |
| ⑮        | 07916-SA50001 | Locknut Wrench, 40 mm                              | 1    | 17-17, 64      |
| ⑯        | 07974-SA50600 | Pinion Dust Seal Guide                             | 1    | 17-51, 17-65   |



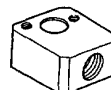
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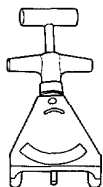
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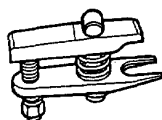
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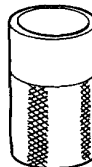
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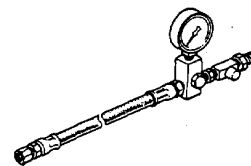
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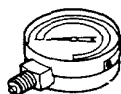
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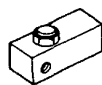
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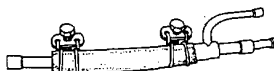
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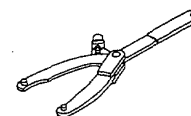
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⑩-2



⑪



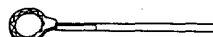
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⑬



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⑮



⑯

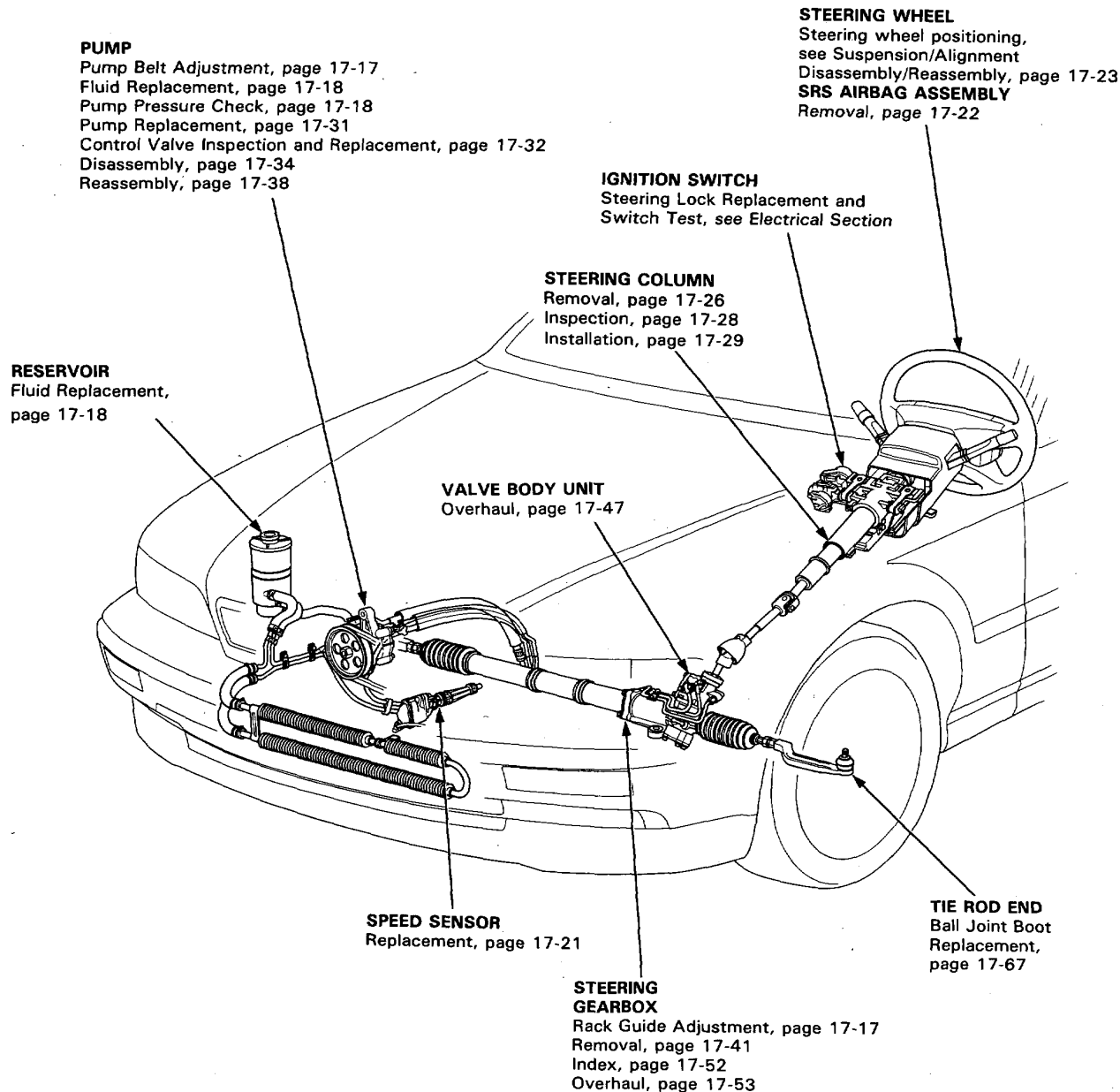
# Component Location

## Index



### NOTE:

- If an intact airbag assembly has been removed from a scrapped car or has been found defective or damaged during transit, storage or service, it should be deployed (See section 23).
- Before removing the gearbox, remove the ignition key to lock the steering shaft from turning.
- After installing the gearbox, check the wheel alignment and adjust if necessary.
- LH drive shown. RH drive is similar.



# System Description

## Fluid Flow Diagram

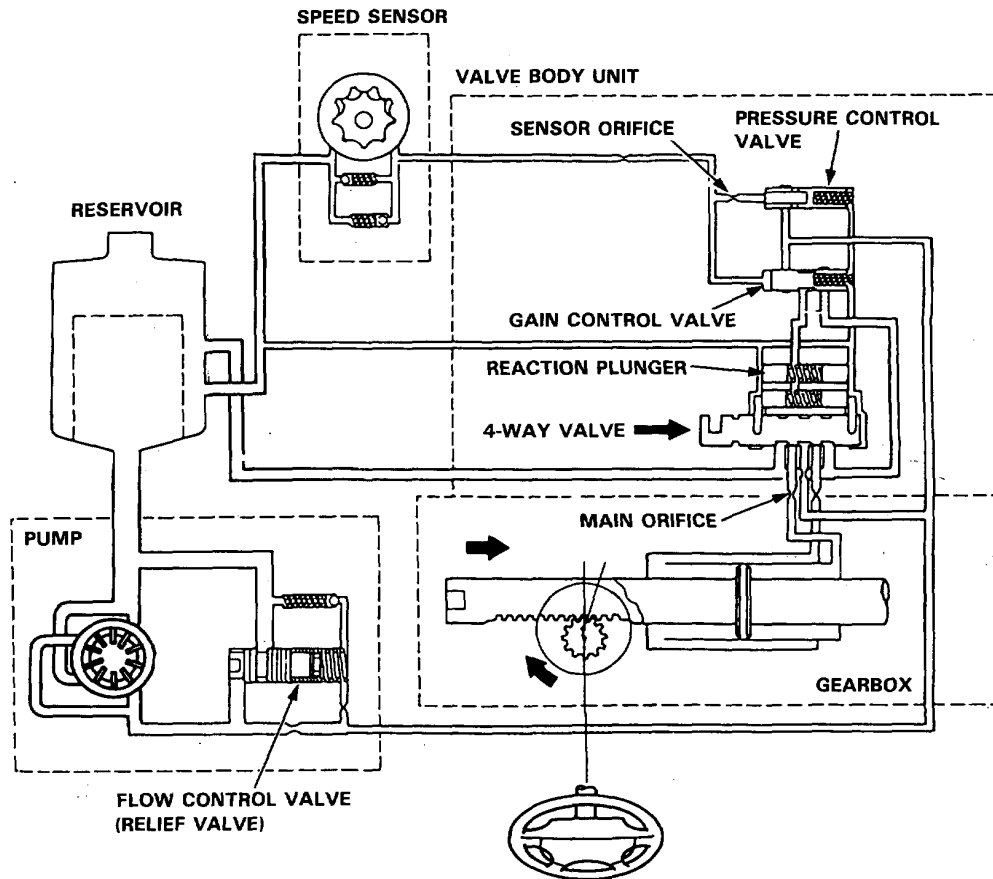
The reservoir supplies power steering fluid to the pump; the pump pressurizes the fluid to about 8,500 kPa (86 kg/cm<sup>2</sup>, 1,200 psi), and delivers it through a high pressure hose to the control unit on the gearbox.

The control valve (in the control unit) controls the direction of the turn by shifting fluid to the left or right side of the piston on the rack (in the power cylinder).

The gain control valve in the control unit controls the amount of the assist by regulating the stroke of the control valve. The operation of the gain control valve is affected by the fluid pressure, which is regulated by the pressure control valve, sensor orifice and speed sensor.

Constant pressure is generated by the pressure control valve. This pressure is used as a reference pressure for the response to the car speed. By introducing this pressure to the speed sensor through the sensor orifice, the pressure downstream of the orifice is changed according to the speed of car. This pressure is then used to operate the gain control valve. Two orifices are provided around the circumference of the gain control valve. These orifices provide the stepless reduction of the pressure from the pump according to the changes in the car speed. The reduced pressure is then sent to the reaction chambers. Therefore the assist varies by regulating the fluid pressure in the control unit according to the speed of car.

Fluid returning from the power cylinder flows back through the control valve and out to the reservoir through the cooler.

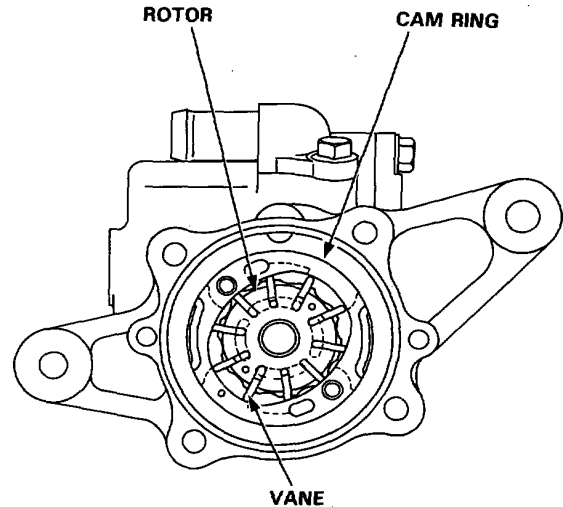
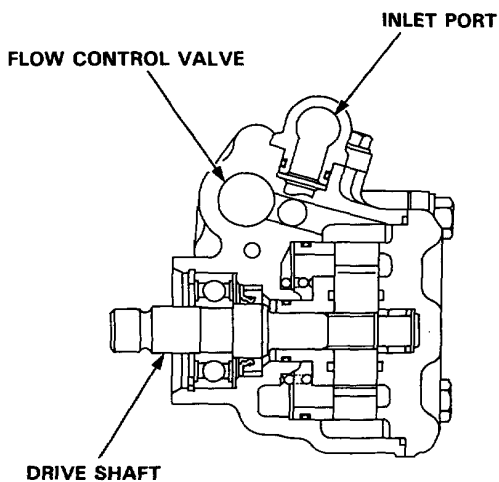




## Steering Pump

### Construction

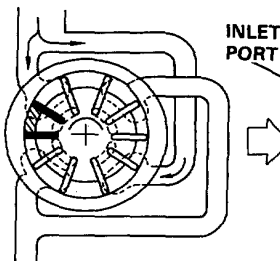
The pump is a vane-type incorporating a flow control valve (with an integrated relief valve) and is driven by a V-belt from the crank pulley. The pump features 10 vanes. Each vane performs two intake/discharge operations for every rotation of the rotor. This means that the hydraulic fluid pressure pulse becomes extremely small during discharge.



### Operation

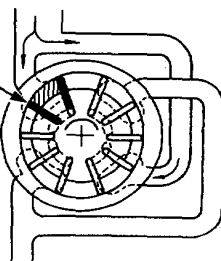
The belt-driven pulley rotates the rotor through the drive shaft. As the rotor rotates, the hydraulic pressure is applied to the vane chamber of the rotor and the vanes will rotate while being pushed onto the inner circumference of the cam ring. The inner circumference of the cam ring has an extended portion with respect to the center of the shaft, so the rollers move downward in the axial direction as the carrier rotates. As a result of this roller movement, the internal volume of the vane chamber will change, resulting in fluid intake and discharge.

#### START OF FLUID INTAKE



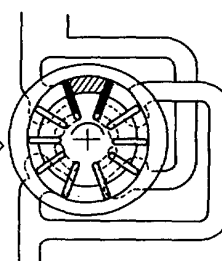
The vanes are pushed onto the inner circumference of the cam ring.

#### FLUID INTAKE



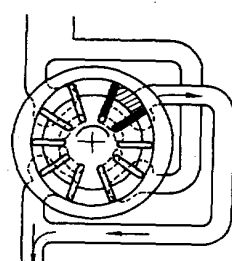
The volume of the vane chamber increases so that fluid is sucked in.

#### FLUID MOVEMENT



The sucked-in fluid moves toward the discharge port.

#### FLUID DISCHARGE



As the vanes return to their original position on the inner side, the volume of the vane chamber decreases so the fluid is discharged from the discharge port.

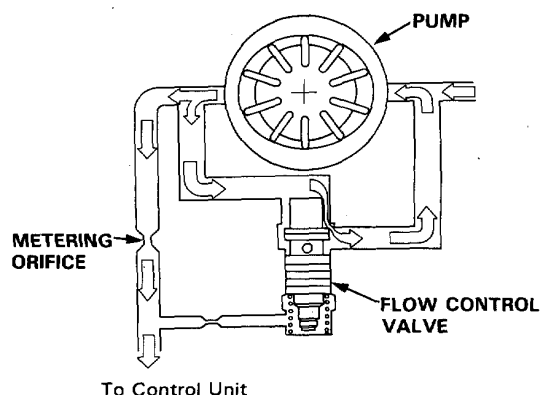
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# System Description

## Steering Pump (cont'd)

### Flow Control

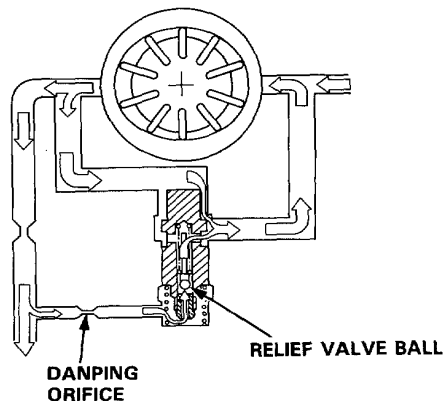
Fluid from the pump runs through a metering orifice to the control unit. This creates a pressure difference between the pump and control unit sides of the orifice. When pressure in the pump side is higher than the force of the spring holding the flow control valve closed, it pushes the valve down (open), and excess fluid returns to the pump inlet. The combined effect of the metering orifice and the flow control valve provides a relatively constant flow of fluid to the control unit.



### Pressure Relief

As pressure on the control unit side builds up it pushes the relief valve ball (inside the flow control valve) up against its spring, and excess fluid returns to the pump inlet. As the pressure under the flow control valve drops, the relief valve ball is closed by its spring, and the flow control valve is forced down again, allowing excess fluid from the pump side to return to the inlet. This flow control valve-relief valve cylinder keeps pump output pressure between 7845–8826 kPa (80–90 kg/cm<sup>2</sup>, 1138–1280 psi).

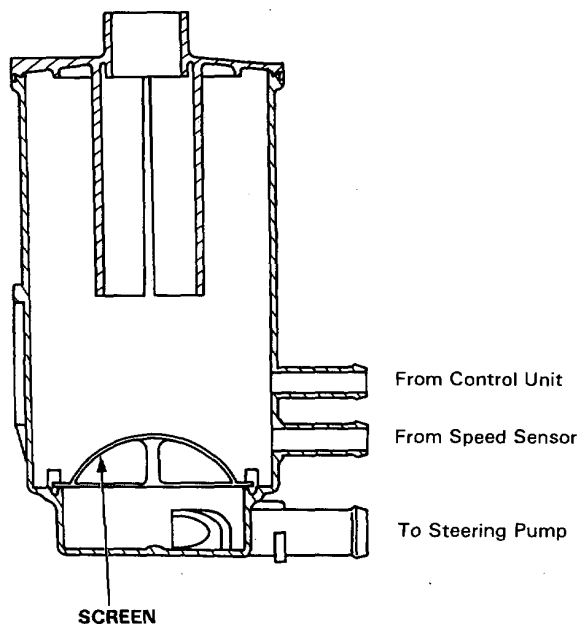
#### RELIEF VALVE OPEN



## Fluid Reservoir/Filter

A one piece reservoir and filter is attached to the fender apron on the right side of the engine compartment. The fluid and the filter/reservoir should be replaced if the system is opened for repairs, or if the fluid gets water or dirt in it.

**CAUTION:** Use only Honda Power Steering Fluid-V. The use of other fluid such as A.T.F., or other manufacturer's power steering fluid will cause damage to the system.



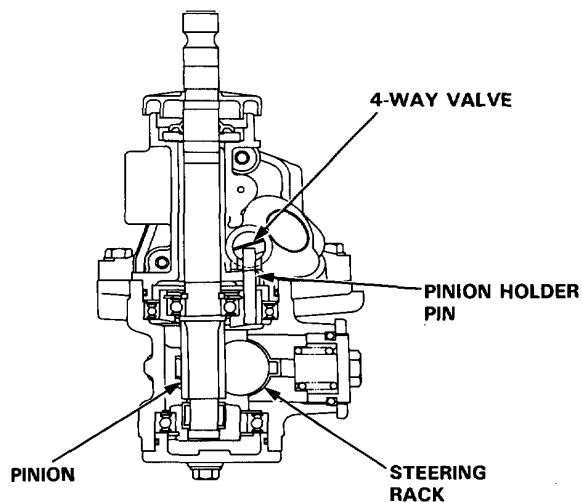
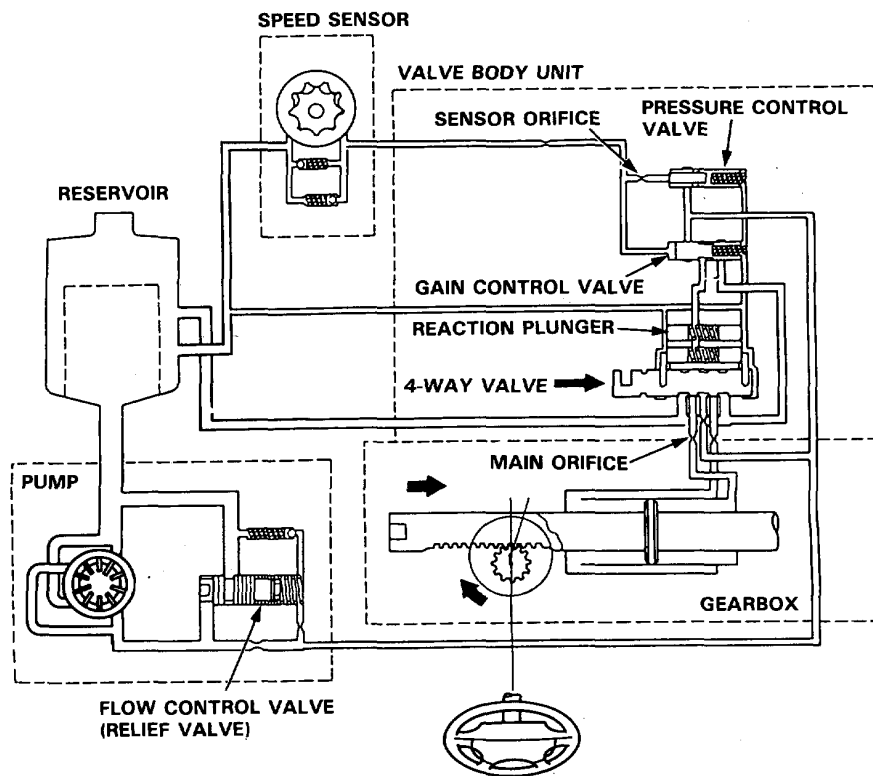


## Control Valve

Mounted on the upper side of the gearbox is a control valve that is moved horizontally by a pin on the pinion holder to shift fluid pressure to the right or left side of the Power Cylinder when the steering wheel is turned. It has thrust pins at both ends, and two inter-connected reaction chambers, one on each side.

Each reaction chamber contains a pair of spring-loaded plungers that rise against right and left thrust pins. The valve body fluid passages are controlled by the control valve.

Fluid pressure in the reaction chambers is reduced by the gain control valve in order to change the amount of the assist in accordance with the change of car speed.



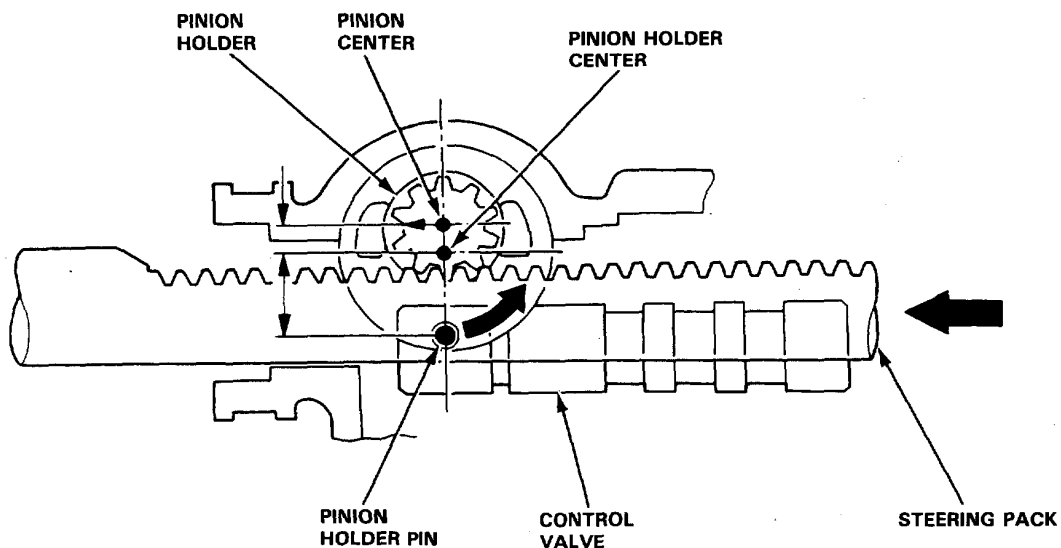
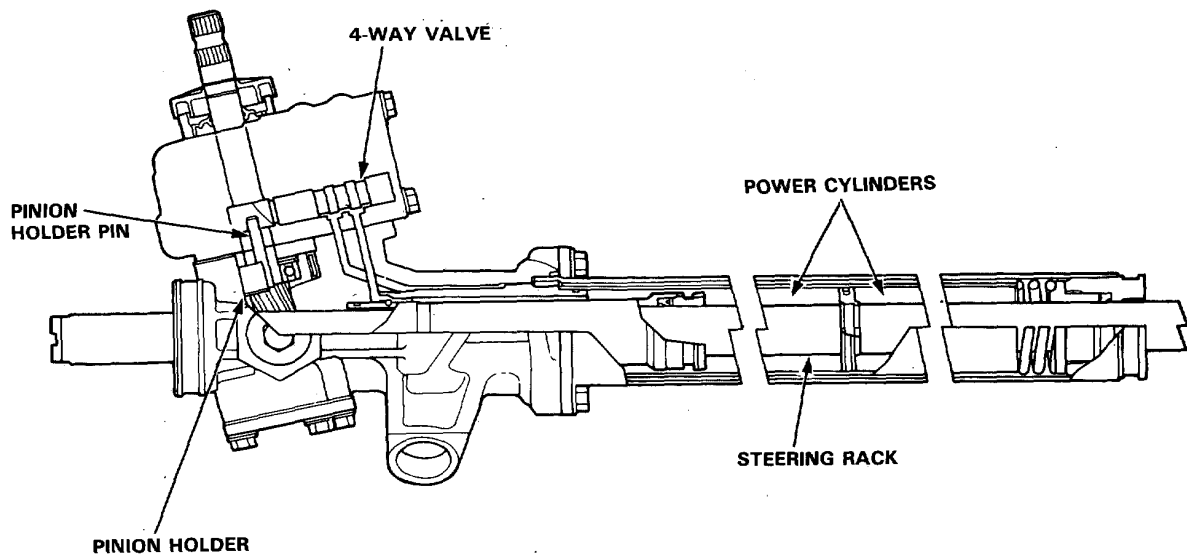
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# System Description

## Control Valve (cont'd)

In the power steering unit, the method used to direct a single source of fluid pressure in either of two directions (for left or right turns) involves the pinion gear transferring a "message" of direction to the fluid in the 4-way valve. The pinion is mounted slightly off-center in a pair of bearings, which are in turn mounted in a Pinion Holder cylinder that rotates, centered in its own outer bearings. At the top of the Pinion Holder is a pin which fits in a slot in the 4-way valve. As the pinion is turned (to turn left or right), because it is off-center, it also moves slightly along the rack. This movement is transferred to the holder. The pin in the holder then moves the 4-way valve to direct fluid pressure to either side of the rack in the Power Cylinder.

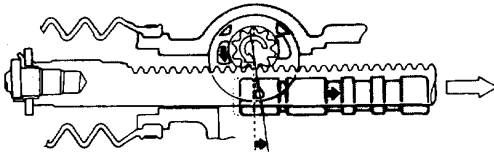
The back edges of the pinion holder (facing away from the rack) hit the stops cast into both sides of the gear housing to avoid pushing the control valve too far in either direction. The front edge of the pinion holder cuts off assist at full lock as described on the next page.



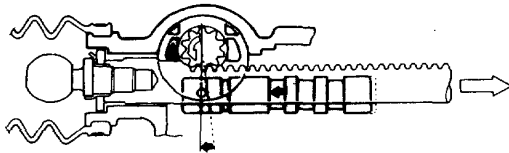


## Full-Lock Unloader System

The 4-way valve shifts the direction of fluid flow when the steering wheel is turned right or left. However, when the wheel is turned to the right or left lock at parking speed, the edge of the pinion holder rides up on the end of the rack, moving the pin in the opposite direction which pulls the 4-way valve back to neutral. This keeps pump pressure from building up (which could cause idle speed to drop), and improves steering feel by increasing resistance at left and right lock.



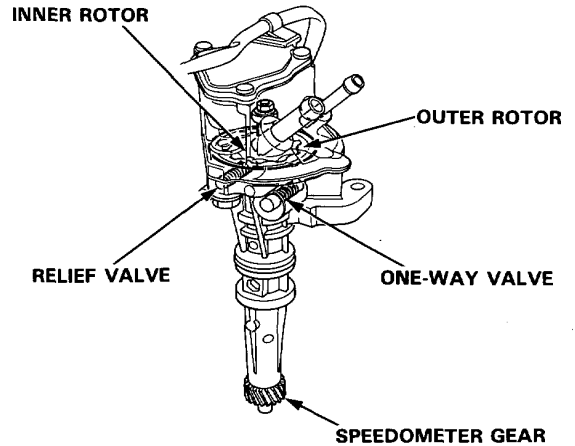
Control in "assist" position



Control valve moves back to "neutral" position

## Speed Sensor

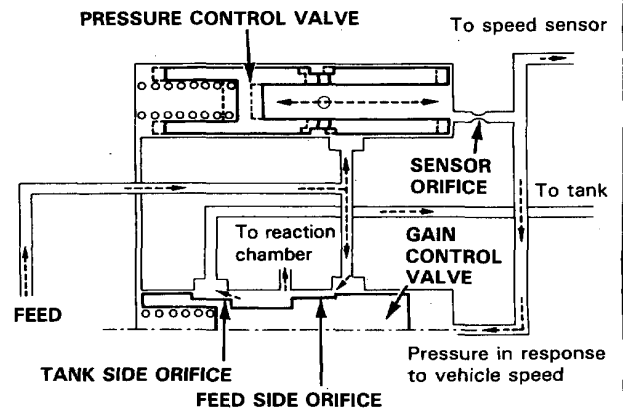
The speed sensor is a trochoid-rotor, hydraulic pump combined with a relief valve and a one-way valve. It is driven by the speedometer gear shaft which in turn is driven by a helical gear on the differential.



The speed sensor turns only when the car is moving, controlling the gain control valve.

The constant pressure is generated by the pressure control valve.

This pressure is used as a reference pressure for the response to the car speed. By introducing this pressure to the speed sensor through the sensor orifice, the pressure downstream of the orifice is changed according to the speed of the car.

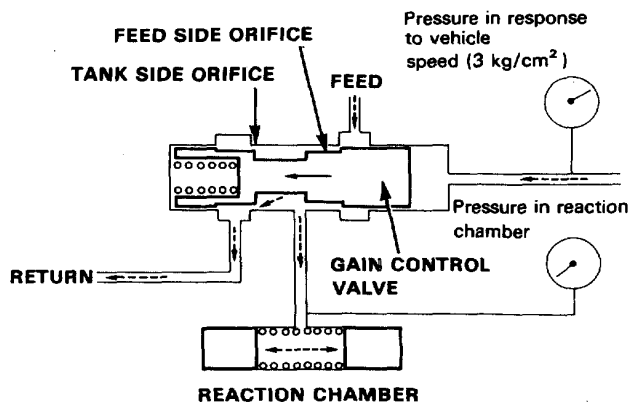


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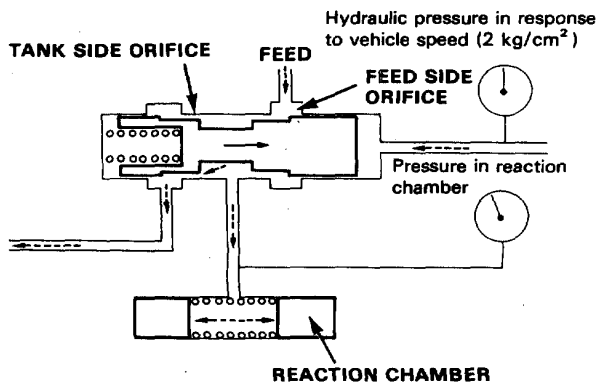
# System Description

## Speed Sensor (cont'd)

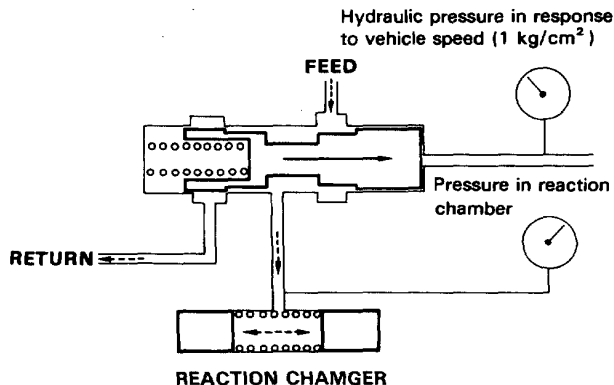
With the engine running at idle in a parked car, fluid flow through the sensor rotors is blocked because the rotors are not turning. Therefore the gain control valve moves left. On the gain control valve, the orifice resistance is high on pump side, while it is low on the tank side, with the result that pressure in the reaction chamber is lowered and steering assist is high.



As the car is driven, the rotors start turning and the fluid returns to the reservoir, reducing the fluid pressure at the gain control valve. Therefore, the gain control valve moves right. The orifice resistance on the pump and tank sides is appropriately balanced, with the result that the reaction chamber is in the medium range and the steering resistance is moderate.



When the car is moving at high speed, the sensor reduces the pressure further and the gain control valve moves right. The orifice pressure on the pump side is low and the pressure on the tank side is high, the fluid pressure in the reaction chamber is also high giving the steering wheel less assist.

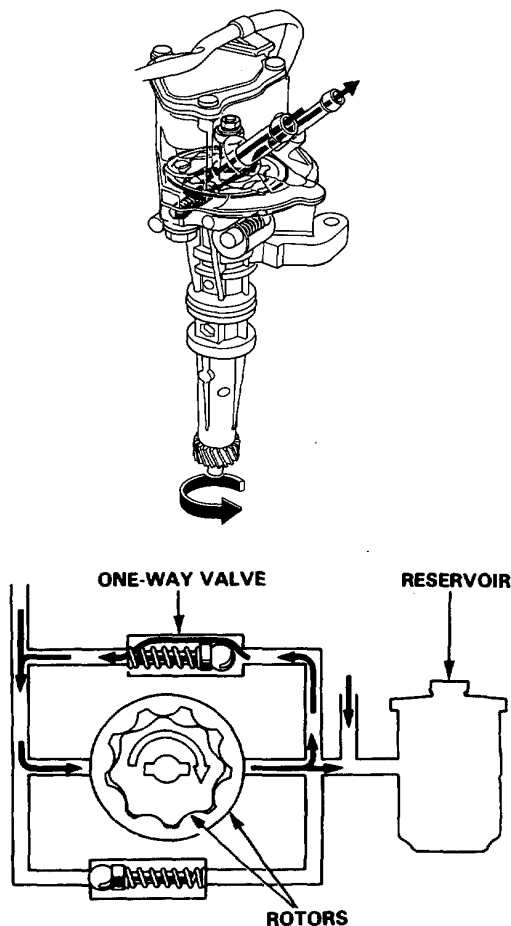




### One-way Valve (In Speed Sensor)

When the car is moving at high speed, negative pressure develops at the sensor inlet because the sensor is pumping faster than the fluid can be supplied. To compensate for this, the outlet and inlet ports are connected internally by a passage containing a one-way valve that lets output fluid recirculate to the inlet port to equalize pressure.

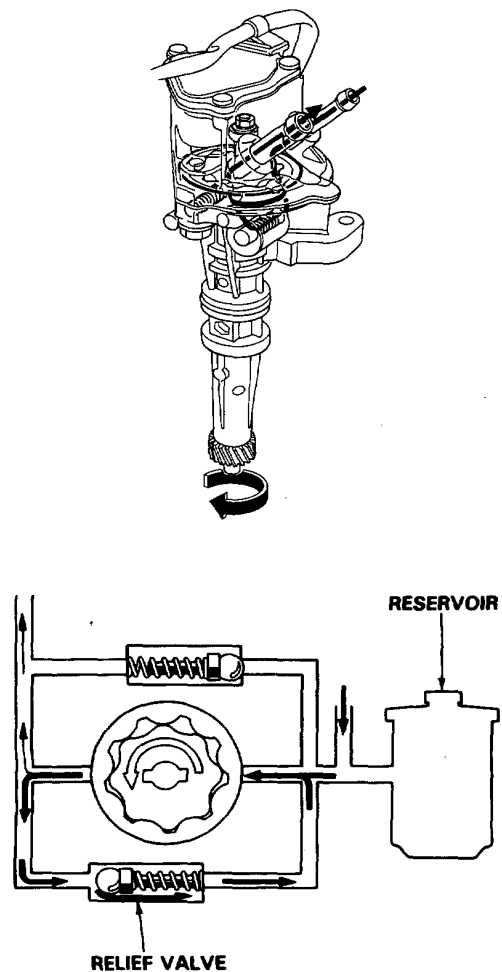
**Driving at High Speed:**



### Relief Valve (In Speed Sensor)

When the car is moving in reverse, the speed sensor also turns backward and pumps fluid in the opposite direction. To avoid building up pressure in the reaction chambers that would increase steering effort while driving in reverse, the inlet and outlet ports are connected by a second internal passage containing a relief valve that allows the fluid to recirculate.

**Driving in Reverse:**



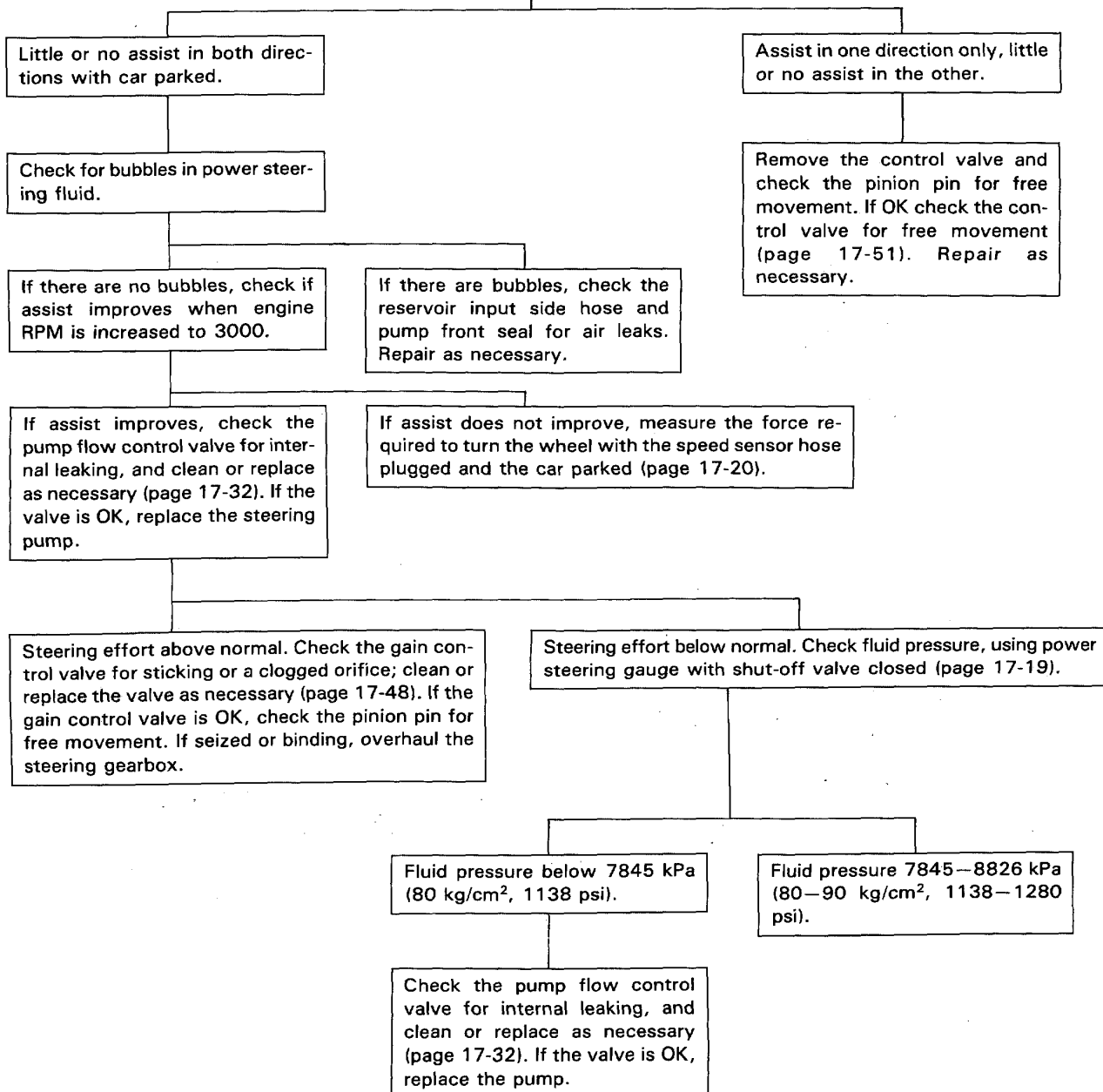
# Troubleshooting

## General Troubleshooting

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?

### Hard Steering



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Uneven or rough steering.

Belt slipping on pulley.

Adjust belt tension. Replace belt, if necessary (page 17-17).

Gain control valve sticking or leaking.

Check gain control valve; clean or replace the gain control valve or control unit.

Idle speed low or erratic.

If the engine stalls when wheel is turned while car is stopped or moving at low speed, adjust idle speed (see Fuel Section).

Air in reserve tank, or check power steering fluid level.

Check power steering fluid level. If level is excessively low, check for leaks in the system. Add fluid to the specified level.

If fluid level is OK, check O-rings and seals on both ends of the pump inlet hose, and the oil pump housing mating surfaces for suction leaks. Replace parts as necessary.

Improperly adjusted rack guide.

Adjust rack guide (page 17-18).

If the rack guide adjustment is OK, check the pinion bearings for wear or damage. Replace them as necessary.

(cont'd)

# Troubleshooting

## General Troubleshooting (cont'd)

Shock or vibration when wheel is turned to full lock.

Pump belt slipping on pulley (pump stops momentarily).

Adjust belt tension (page 17-17) or replace belt.

Set the power steering pressure gauge. Close the shut-off valve fully and measure the pump pressure (see page 17-19).

Check if pump pressure is within the range 7845-8826 kPa (80-90 kg/cm<sup>2</sup>, 1138-1280 psi) and the gauge needle travel is  $\pm 490$  kPa ( $\pm 5$  kg/cm<sup>2</sup>,  $\pm 70$  psi) or less. Check the flow control valve if the needle travel exceeds  $\pm 490$  kPa ( $\pm 5$  kg/cm<sup>2</sup>,  $\pm 70$  psi) (see page 17-33). If the flow control valve is normal, replace the pump as an assembly.

Assist (excessively light steering) at high speed:

Measure force required to turn wheel with bypass tube joint installed, and car parked on dry paved surface (page 17-20).

If below, check gain control/pressure control valves and control unit and replace parts as necessary.

Pump belt slipping.

Adjust belt tension (page 17-17) or replace belt.

Steering kicks back during wide turns.

Sticking gain control valve or control valve.

Replace gain valve or control valve.

Rack guide adjusted too loose.

Adjust rack guide (page 17-18).

Tire pressure too low.

Inflate to correct pressure.

Wheel will not return smoothly.

Improper front wheel alignment.

Readjust front wheel alignment or replace parts as necessary.

Improperly adjusted rack guide.

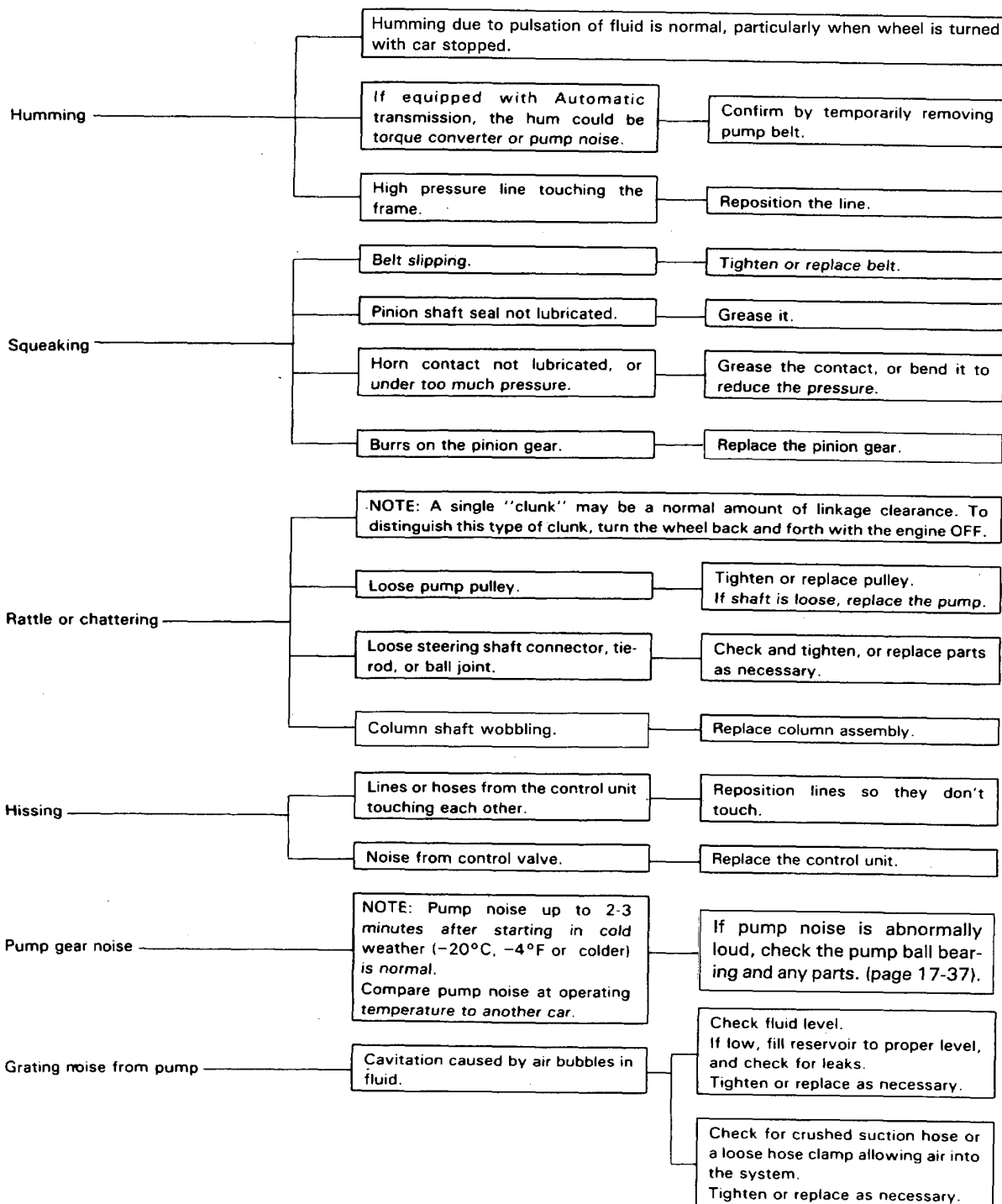
Adjust rack guide (page 17-18).

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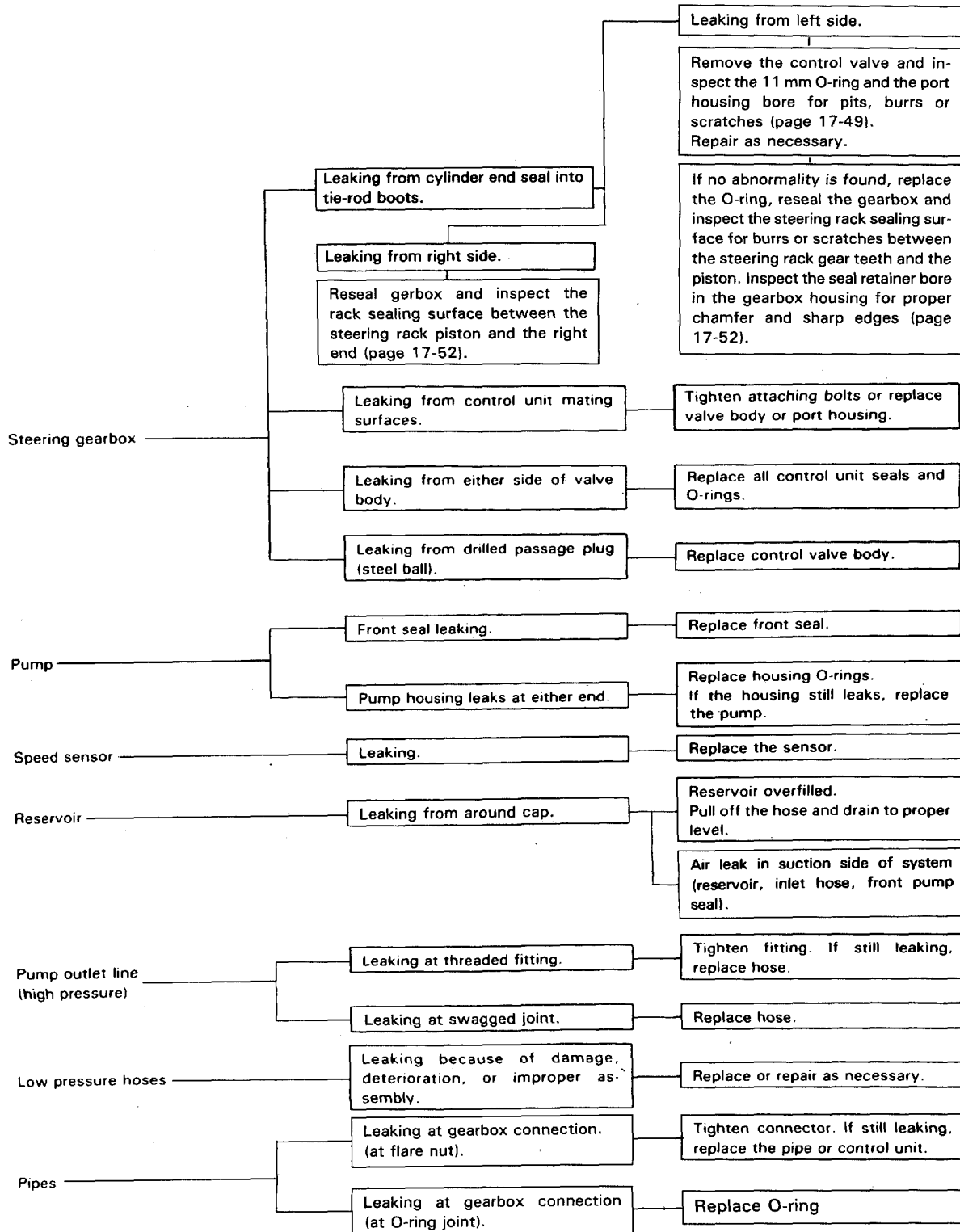
## Noise and Vibration

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



# Troubleshooting

## Fluid Leaks



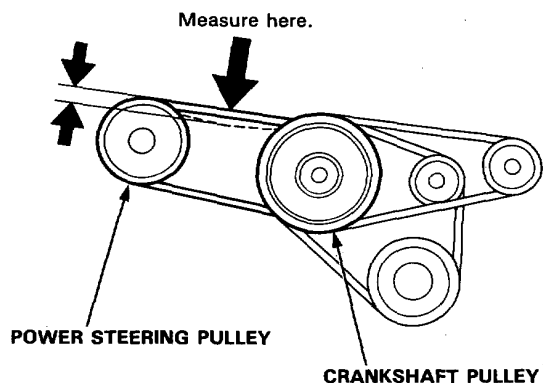


# Maintenance

## Pump Belt Adjustment

1. Remove the air cleaner cover and duct (Section 11).
2. A properly adjusted belt should deflect about 11.5–13.5 mm (0.45–0.53 in) when you push on it mid-way between the pulleys with a force of about 100 N (10 kg, 22 lbs).

**NOTE:** On a brand new belt, the deflection should be 7.5–9.5 mm (0.30–0.37 in) when first measured.



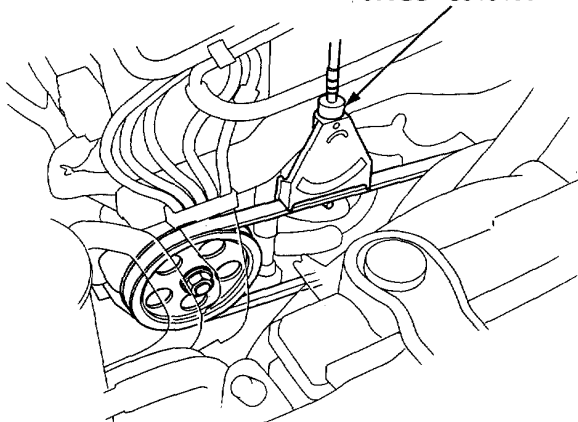
Test by the Belt Tension Gauge; 07JGG—0010100. Attach the tension gauge to the belt and measure the tension of the belt.

**Tension: 35–55 kg (77–121 lbs)**

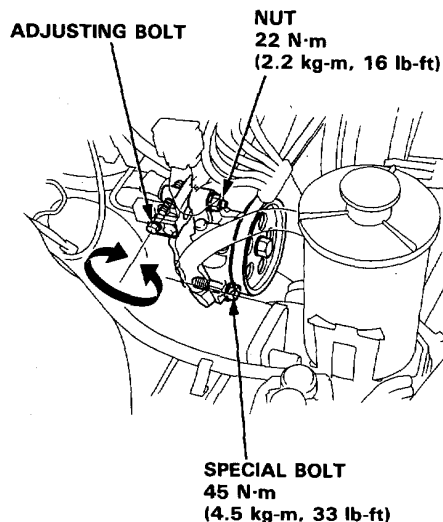
**NOTE:**

- On a brand new belt, the tension should be 70–90 kb (154–198 lbs) when first measured.
- See the instructions for the tension gauge.

**BELT TENSION GAUGE**  
07JGG—0010100



3. Loosen the special bolt and nut and turn the adjusting bolt to get proper tension, then retighten the special bolt and nut.

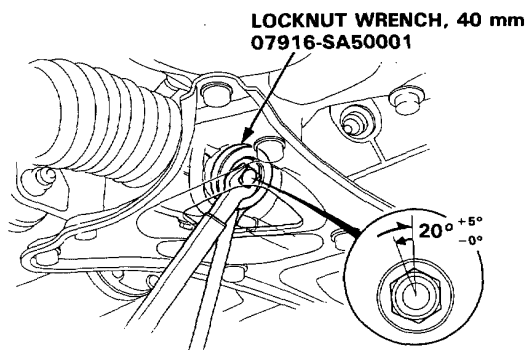


4. Start the engine and turn the steering wheel from lock-to-lock several times, then stop the engine and recheck the belt tension.

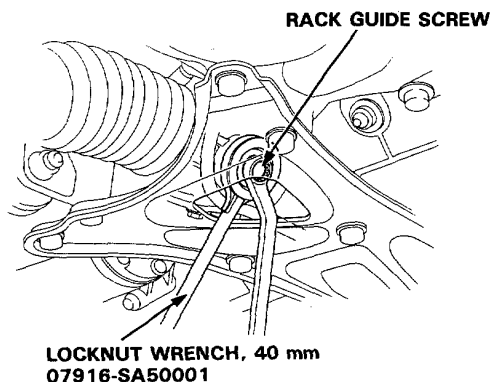
# On-Car Checks

## Rack Guide Adjustment

1. Loosen the rack guide screw locknut with the special tool.
2. Tighten, loosen and retighten the rack guide screw two times to 4 N·m (0.4 kg-m, 2.9 lb-ft), then back it off  $20^{\circ} +5^{\circ} -0^{\circ}$ .



3. Tighten the locknut to about 25N·m (2.5 kg-m, 18 ft-lb) while preventing the guide screw from turning.

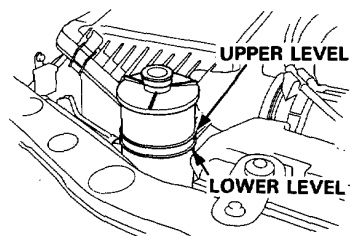


4. Check for tight or loose steering through the complete turning travel.
5. Recheck steering assist (page 17-20).

## Fluid Replacement

Check the reservoir at regular intervals, and add fluid as necessary.

**CAUTION:** Use only GENUINE HONDA Power Steering Fluid-V. Using other fluids such as ATF or other manufacturer's power steering fluid will damage the system.

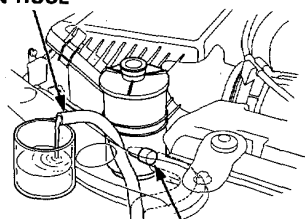


### Fluid Replacement

SYSTEM CAPACITY: 1.7 liter (1.8 US qt) at change  
RESERVOIR CAPACITY: 0.5 liter (0.7 US qt)

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.

### RETURN HOSE



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.



## Pump Pressure Check

Check the fluid pressure as follows to determine whether the trouble is in the pump or gearbox.

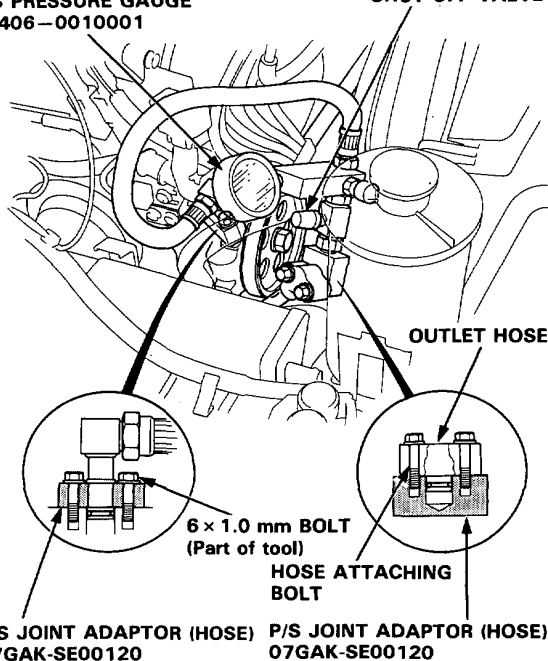
**NOTE:** First check the power steering fluid level and pump belt tension.

**CAUTION:** Disconnect the high pressure hose with care not to spill the power steering fluid on the frame and other parts.

1. Disconnect the outlet hose from the pump outlet fitting, and install the pump joint adaptor on the pump outlet.
2. Connect the hose joint adaptor to the power steering pressure gauge, then connect the outlet hose to the adaptor.
3. Install the power steering pressure gauge to the pump joint adaptor as shown.

P/S PRESSURE GAUGE  
07406-0010001

SHUT-OFF VALVE



4. Open the shut-off valve fully.
5. Open the pressure control valve fully.

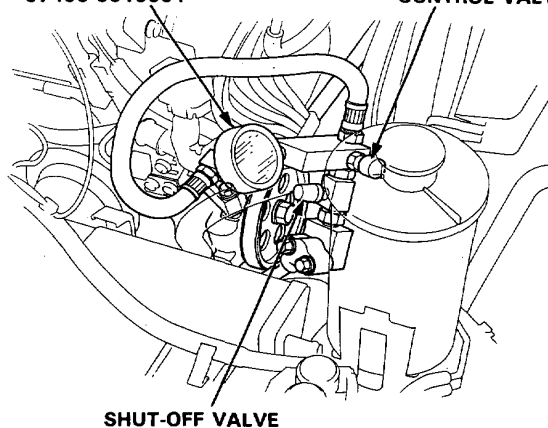
6. Start the engine and let it idle.
7. Turn the steering wheel from lock-to-lock several times to warm the fluid to operating temperature.
8. Close the shut-off valve, then close the pressure control valve gradually until the pressure gauge needle is stable. Read the pressure.
9. Immediately open the 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 7845–8826 kPa (80–90 kg/cm<sup>2</sup>, 1138–1280 psi). A low reading means pump output is too low for full assist. Repair or replace the pump.

P/S PRESSURE GAUGE  
07406-0010001

PRESSURE  
CONTROL VALVE

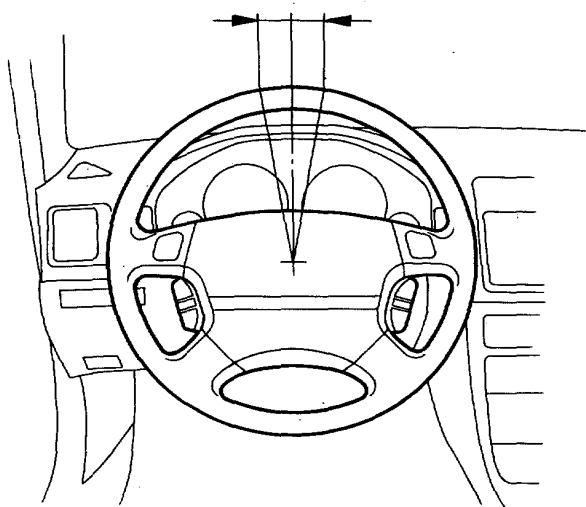


## On-Car Checks

### Steering Wheel Rotational Play

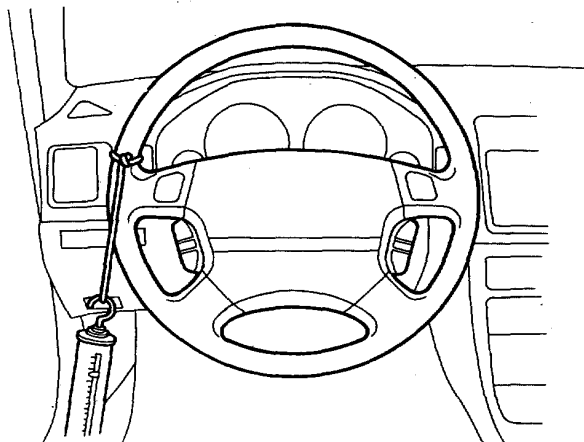
1. Place the front wheels in a straight ahead position and measure the distance the steering wheel can be turned without moving the front wheels.
2. If the play exceeds the service limit, check all steering components.

0–10 mm (0–0.4 in)

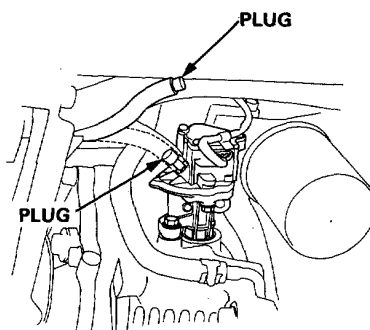


### Power Assist Check with Car Parked

1. Check the power steering fluid level and pump belt tension.
2. Start the engine, allow it 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.



4. The scale should read no more than 30 N (3.0 kg, 6.6 lbs). If it reads more or less, go on step 5.
5. Stop the engine. Disconnect the hose from the speed sensor and plug the hose and the sensor fitting as shown.



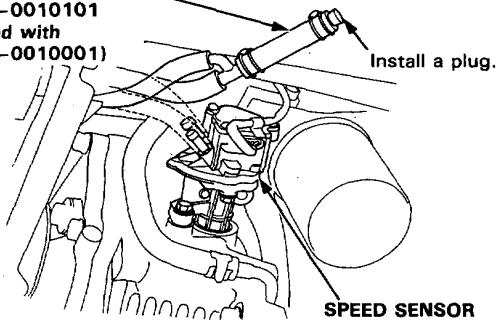
6. Start the engine and let it idle.
  - If the reading is now 30 N (3.0 kg, 6.6 lbs) or less, replace the speed sensor, see page 17-21.
  - If the reading is still more than 30 N (3.0 kg, 6.6 lbs), check the gearbox and pump.



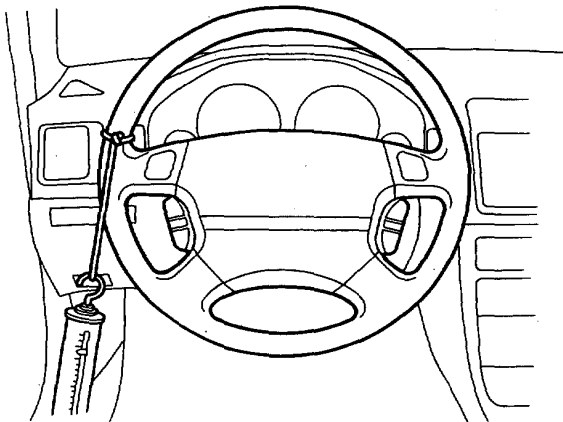
## Assist Check at Road Speed

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. Plug the end of the bypass tube joint.

**BYPASS TUBE JOINT**  
07406-0010101  
(Included with  
07406-0010001)



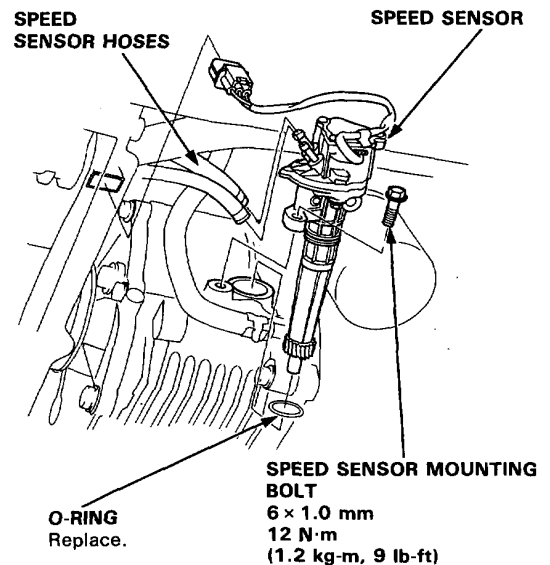
4. Attach the spring scale to the steering wheel. With the engine idling and the car on a clean, dry floor, pull the scale as shown and read it as soon as the tires begin to turn.



- If the scale reads a normal 40 N (4.0 kg, 8.8 lbs), or more, the assist problem at high speeds is being caused by reduced speed sensor output. Replace the sensor.
- If the scale reads less than 40 N (4.0 kg, 8.8 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.
- See General Troubleshooting (page 17-12).

## Speed Sensor Replacement

1. Remove the rear mount bracket stay.
2. Disconnect the speed sensor wire coupler from the speed sensor.
3. Remove the speed sensor mounting bolt and pull the speed sensor from the differential housing.
4. Disconnect the speed sensor hoses and plug the fittings.



5. After installing a new sensor, turn the steering wheel lock-to-lock with the engine idling to bleed air from the system.
6. Check the reservoir and add fluid if necessary.

# Steering Wheel

## Removal

### Airbag Removal

**⚠ WARNING** Store a removed airbag assembly with the pad surface up. If the airbag is improperly stored face down, accidental deployment could propel the unit with enough force to cause serious injury.

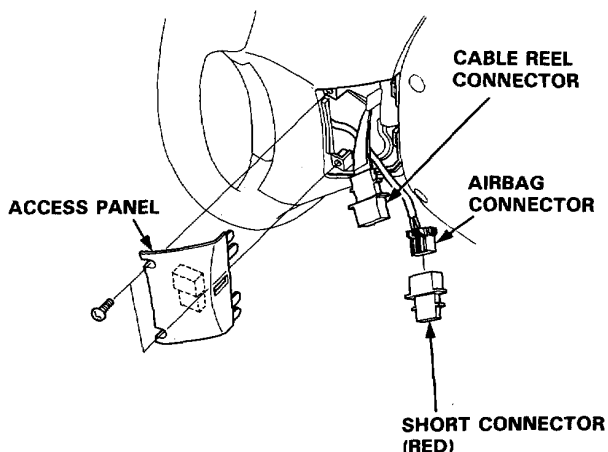
#### CAUTION:

- Before removing the steering wheel, align the front wheels straight ahead.
- Do not install used SRS parts from another car. When repairing, use only new SRS parts.
- Carefully inspect the airbag assembly before installing. Do not install an airbag assembly that shows signs of being dropped or improperly handled, such as dents, cracks or deformation.
- Always keep the short connector on the airbag connector when the harness is disconnected.
- Do not disassemble or tamper with the airbag assembly.

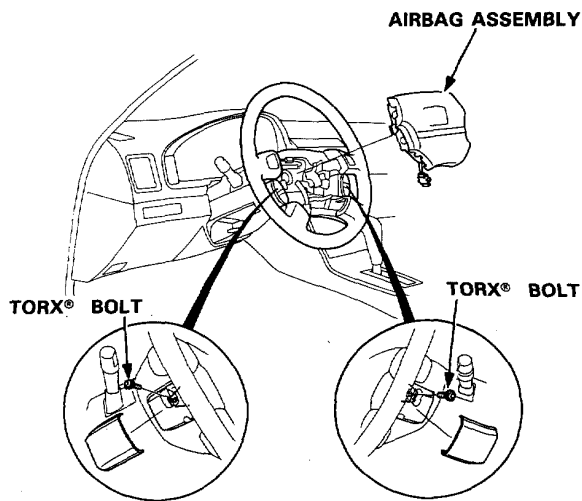
**NOTE:** If an intact airbag assembly has been removed from a scrapped car or has been found defective or damaged during transit, storage or service, it should be deployed (See section 23).

1. Disconnect the negative and positive cable from the battery.

2. Remove the access panel from the steering wheel lower cover, then remove the short connector.
3. Disconnect the connector between the airbag and cable reel.
4. Connect the short connector to the airbag side of the connector.



5. Remove the switch assembly covers.
6. Remove the two TORX® T30 bit bolts, then remove the airbag assembly.

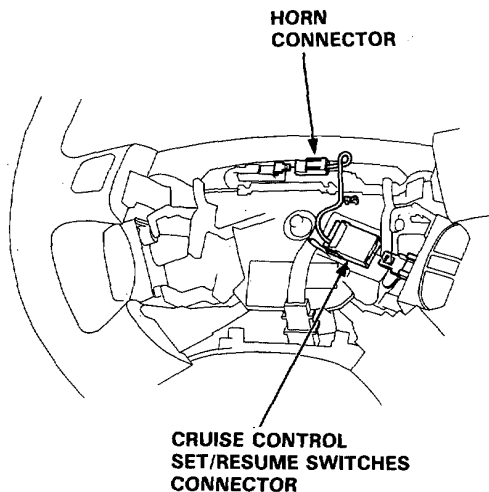


(cont'd)

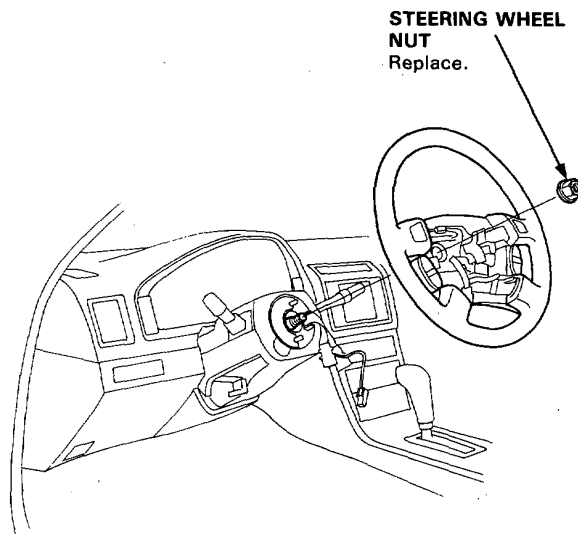


## Removal (cont'd)

7. Disconnect the connectors from the horn and cruise control set/resume switches.



8. Remove the steering wheel nut.
9. Remove the steering wheel by rocking it slightly from side-to-side as you pull steadily with both hands.



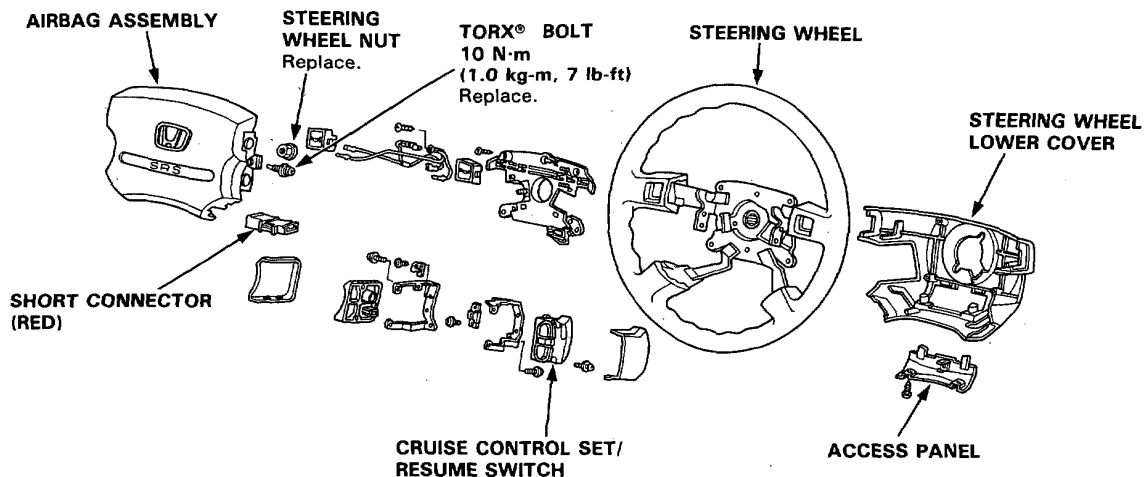
## Disassembly/Reassembly

**WARNING** Store a removed airbag assembly with the *pad surface up*. If the airbag is improperly stored face down, accidental deployment could propel the unit with enough force to cause serious injury.

NOTE: If an intact airbag assembly has been removed from a scrapped car or has been found defective or damaged during transit, storage or service, it should be deployed (See section 23).

### CAUTION:

- Carefully inspect the airbag assembly before installing. Do not install an airbag assembly that shows signs of being dropped or improperly handled, such as dents, cracks or deformation.
- Always keep the short connector on the airbag connector when the harness is disconnected.
- Do not disassemble or tamper with the airbag assembly.



# Steering Wheel

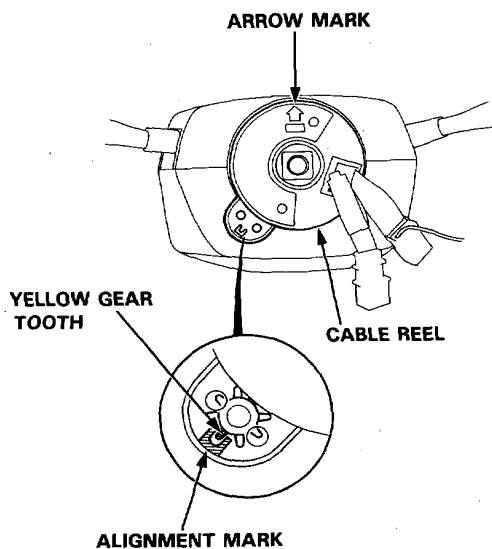
## Installation

### CAUTION:

- Before installing the steering wheel, align the front wheels straight ahead.
- Be sure to install the harness wires so that they are not pinched or interfering with other car parts.
- Do not replace the original steering wheel with any other design, since it will make it impossible to properly install the airbag. (Only use genuine HONDA replacement parts)
- After reassembly, confirm that the wheels are still straight ahead and that steering wheel spoke angle is correct. If minor spoke angle adjustment is necessary, do so only by adjustment of the tie rods, not by removing and repositioning the steering wheel.

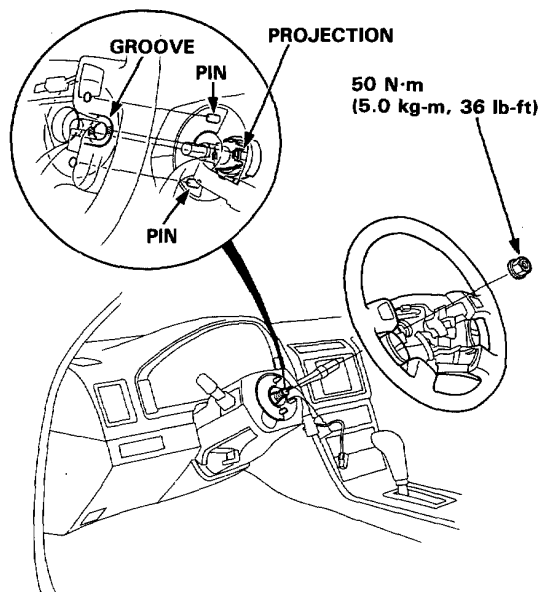
**▲ WARNING** Confirm that the airbag assembly is securely attached to the steering wheel; otherwise, severe personal injury could result during later airbag deployment.

1. Before installing the steering wheel, center the cable reel.  
Do this by first rotating the cable reel clockwise until it stops.  
Then rotate it counterclockwise (approximately two turns) until:
  - The yellow gear tooth lines up with the mark on the cover.
  - The arrow on the cable reel label points straight up.

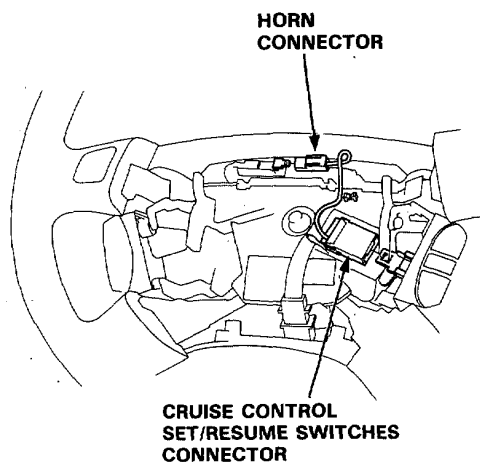


2. Install the steering wheel.

NOTE: Be sure the steering wheel shaft engages the cable reel.

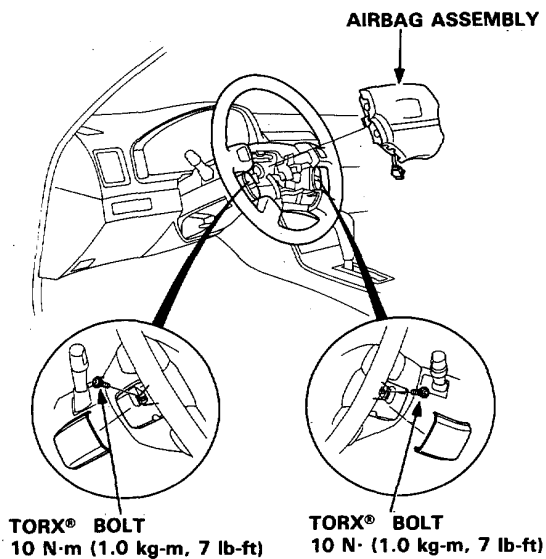


3. Insert the cruise control set/resume 4-P connector and airbag connector to the steering wheel clips.
4. Connect the horn connector.

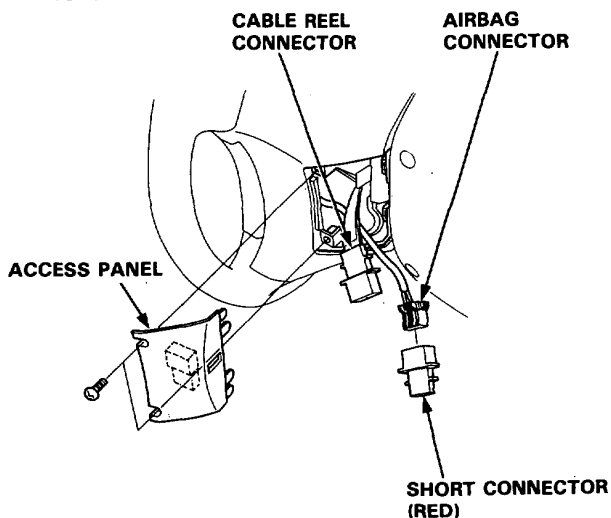




5. Install the airbag assembly with new TORX® bolts.



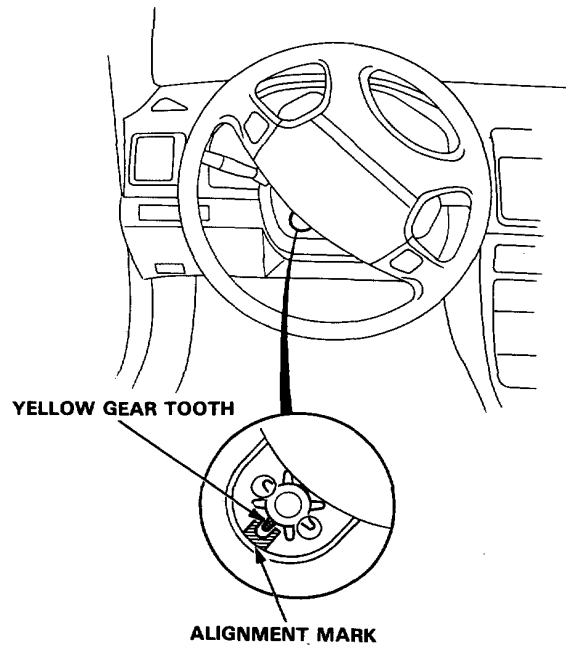
6. Disconnect the short connector from the airbag connector.
7. Connect the airbag 3-P connector and cable reel 3-P connector.
8. Attach the short connector to the access panel, and install the access panel on the steering wheel lower cover.



9. Connect the battery positive terminal and then connect the negative terminal.

10. After installing the airbag assembly, confirm proper system operation:

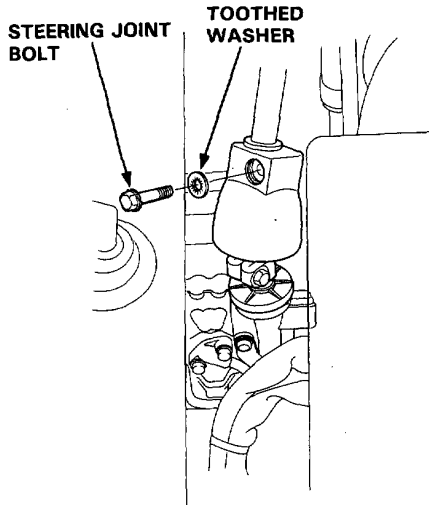
- Turn the ignition to II: the instrument panel SRS warning light should come on for about 6 seconds and then go off.
- Confirm operation of horn buttons.
- Confirm operation of cruise control set/resume switches.
- Turn the steering wheel counterclockwise and make sure the yellow gear tooth still lines up with the alignment mark.



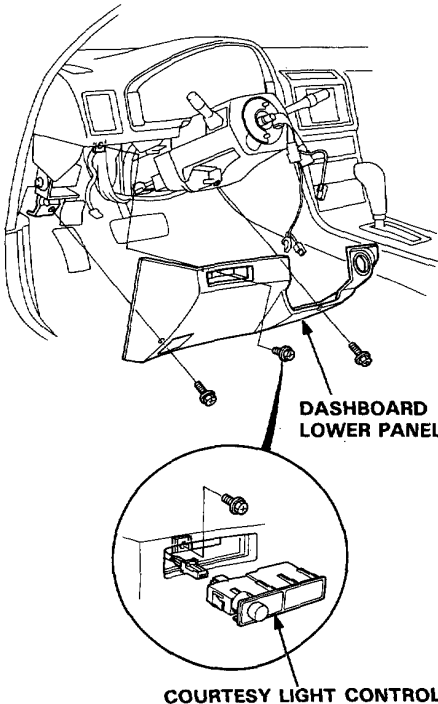
# Steering Column

## Removal

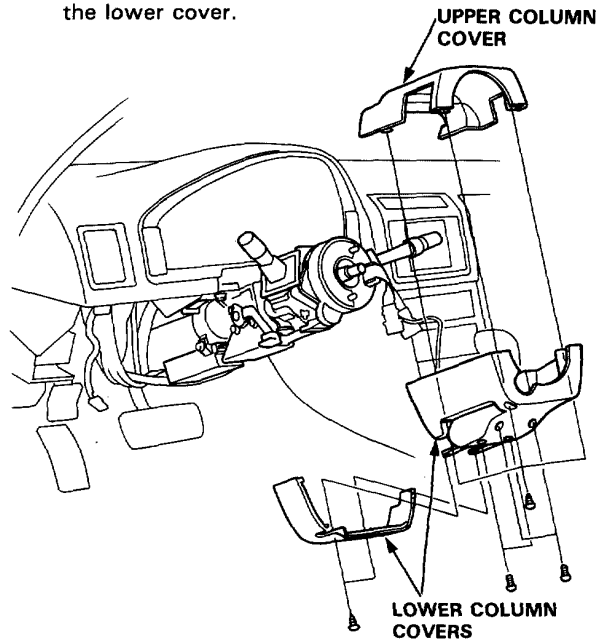
1. Remove the airbag assembly and steering wheel (page 17-22).
2. Remove the steering joint lower bolt and toothed washer (in the engine compartment.)



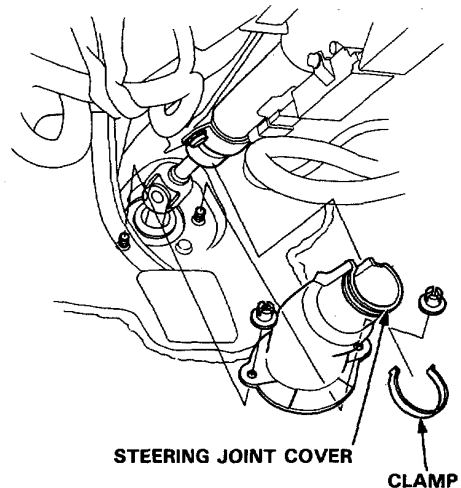
3. Remove the control courtesy light and disconnect the connector, then remove the dashboard lower panel.



4. Remove the upper column and lower column covers, then disconnect the control switch connector from the lower cover.



5. Remove the steering joint cover.

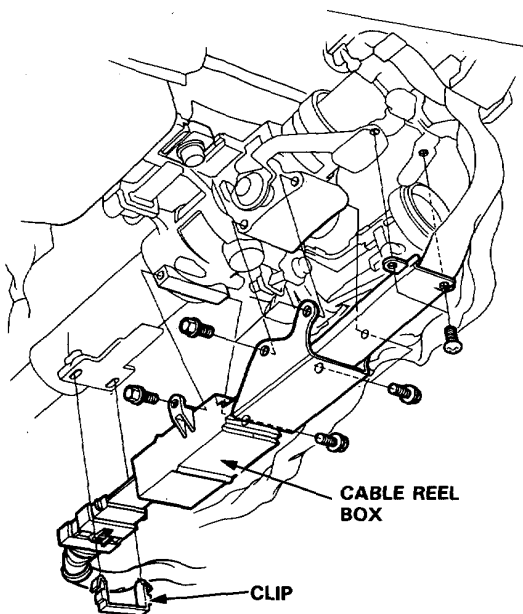




6. Remove the cable reel box from the underside of the column pipe.

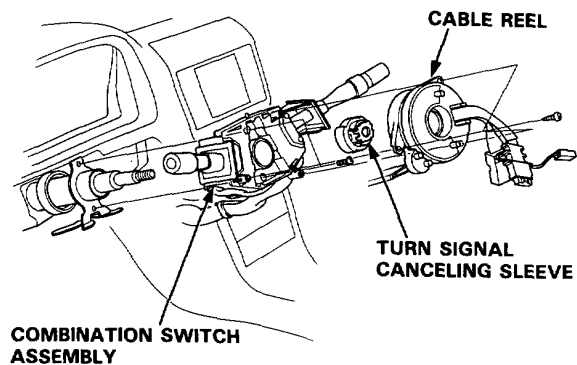
7. Remove the clip.

**CAUTION:** Do not disconnect the cable reel connector and the SRS wire harness. After removing the cable reel box, place it on the car floor so that it does not hinder you in service.

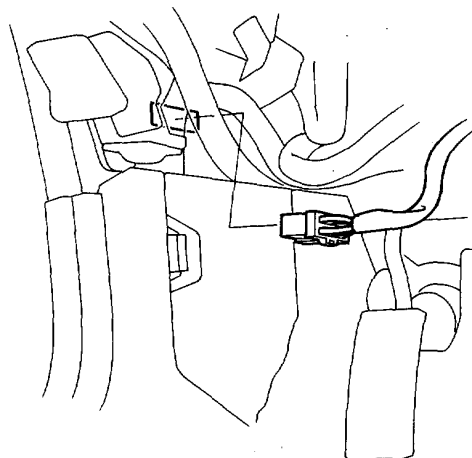


8. Remove the cable reel, turn signal canceling sleeve and combination switch assembly from the column shaft.

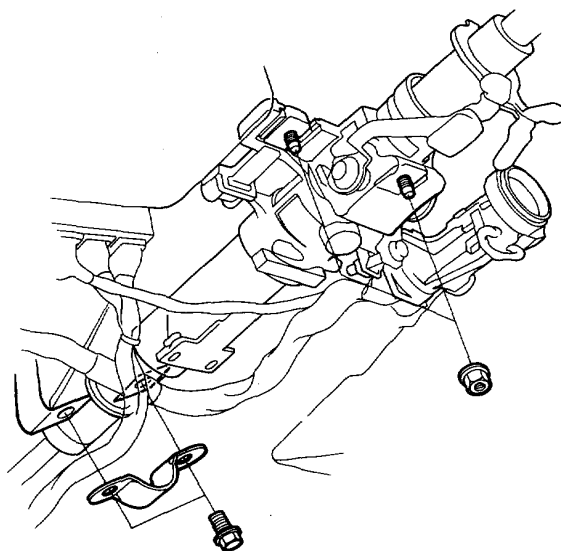
**NOTE:** After removing the combination switch assembly, place it on the floor gently so that it does not hinder you in service. Do not disconnect the cables from the combination switch assembly.



9. Disconnect the wire coupler of the ignition switch from the under-dash fuse box.

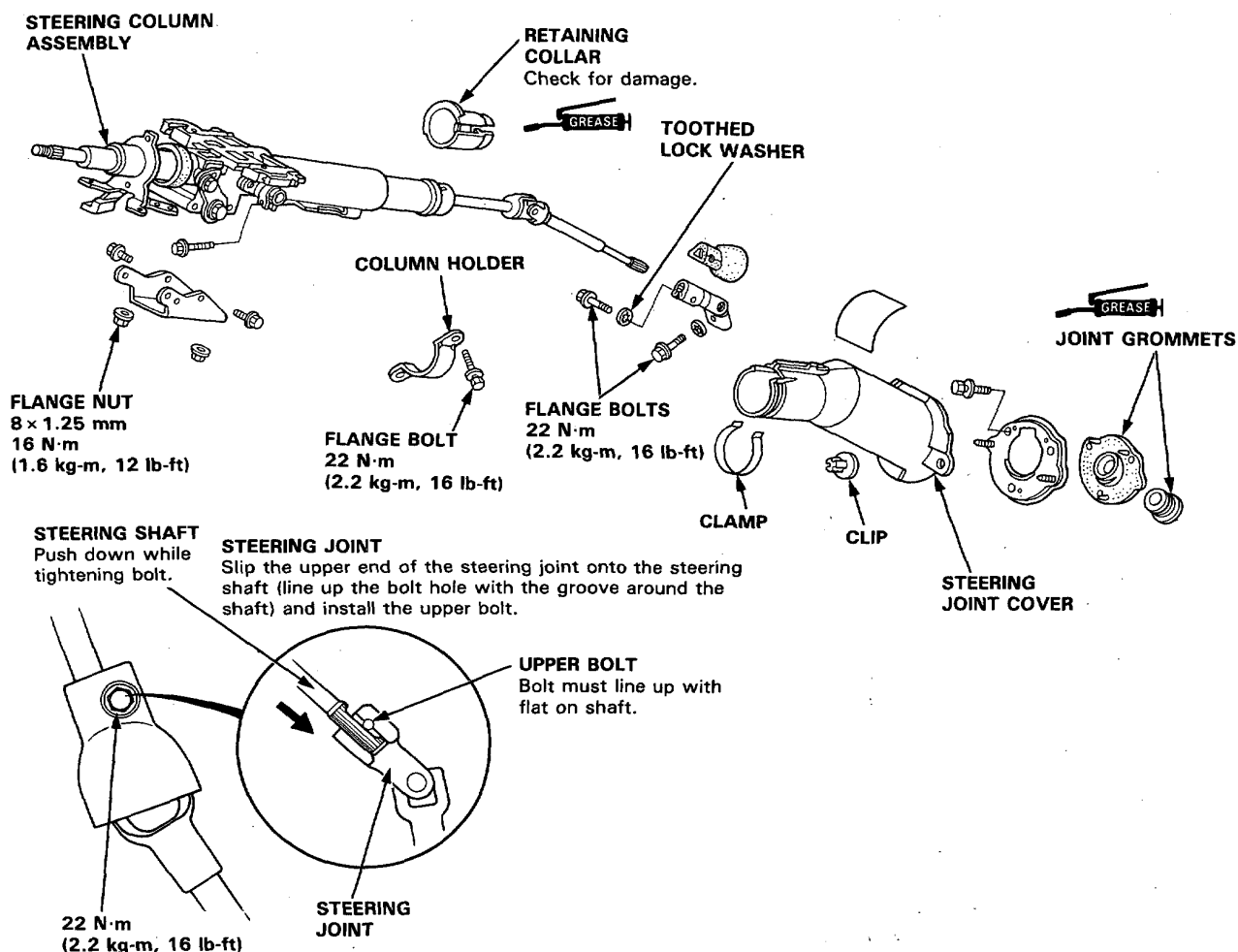


10. Remove the steering column assembly by removing the attaching nuts and bolts.



# Steering Column

## Inspection



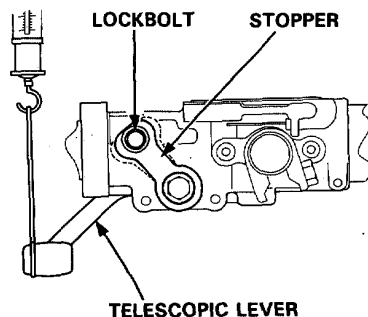
### NOTE:

- Check the telescopic mechanism and steering joint bearings or steering shaft for movement and damage. Replace as an assembly if damaged or faulty.

Attach a spring scale to the knob of the telescopic lever.  
Measure the force required to move the lever.

**Preload: 30–60 N (3–6 kg, 6.6–13.2 lbs)**

If the force measured is not within the specification, loosen the lockbolt then the stopper until the correct force can be obtained.



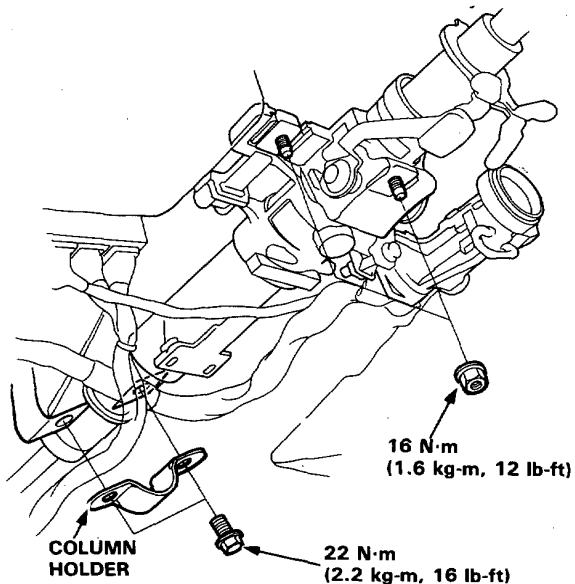


## Installation

1. Guide the steering shaft through the engine bulk-head. Align the bolt hole in the steering joint with the slot in the steering shaft, and insert the shaft into the steering joint.
2. Install the steering column assembly with the nuts and column holder.

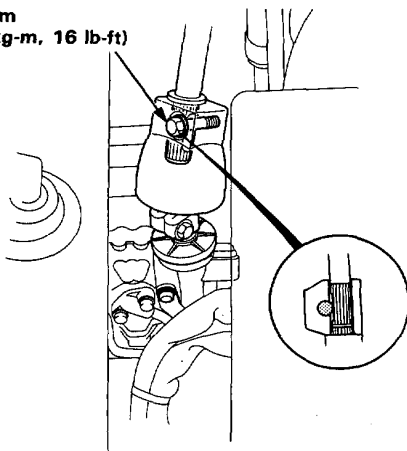
### NOTE:

- Be sure the pinion shaft and the steering column shaft are aligned; the joint should slip on freely. If not, reposition the steering rack to correct the misalignment.
- Coat the interior of the steering joint grommet with grease.

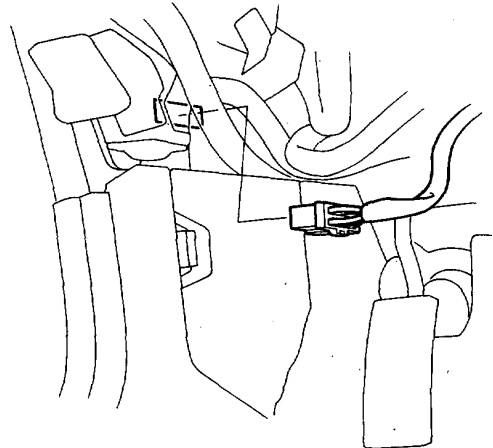


3. Install the upper bolt in the steering joint and tighten.

22 N·m  
(2.2 kg-m, 16 lb-ft)

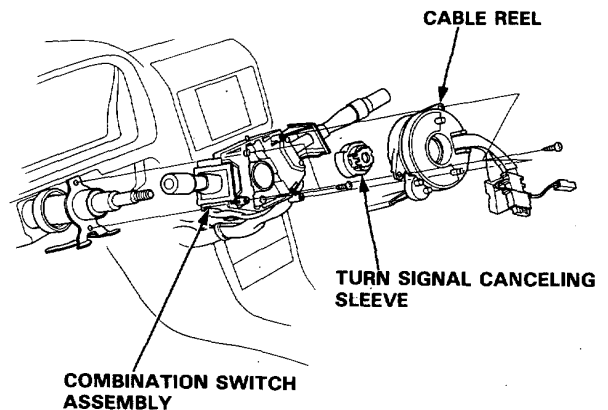


4. Connect the ignition switch connector to the under-dash fuse box.



5. Install the combination switch assembly, turn signal canceling sleeve and cable reel onto the steering column.

NOTE: Be sure the wires are not caught or pinched by any parts when connecting the combination switch and the cable reel.



NOTE: Align the slot in the canceling sleeve with the projection on the cable reel.

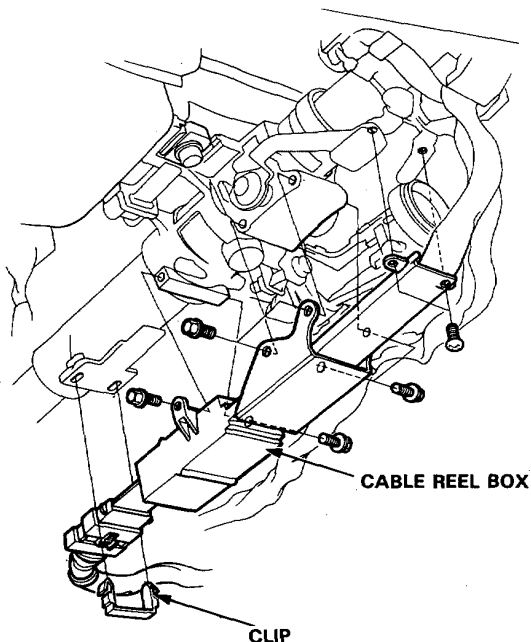
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# Steering Column

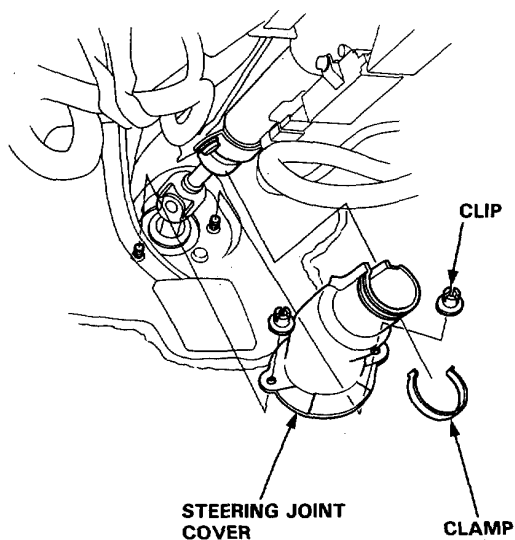
## Installation (cont'd)

6. Install the cable reel box on the steering column with the screws.

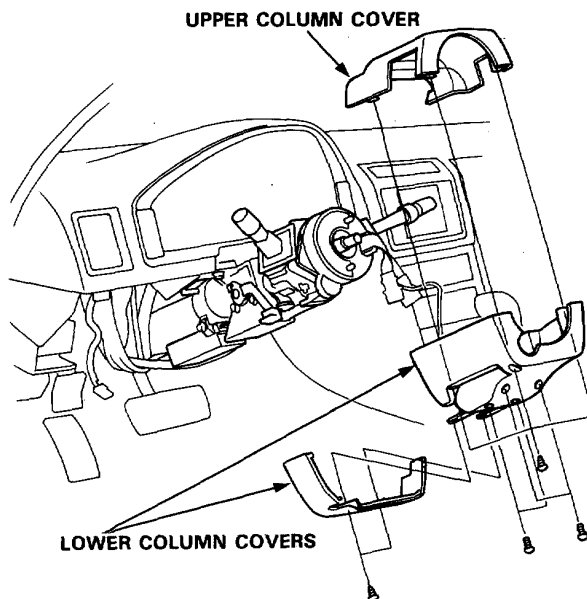
7. Install the cable reel coupler with the clip.



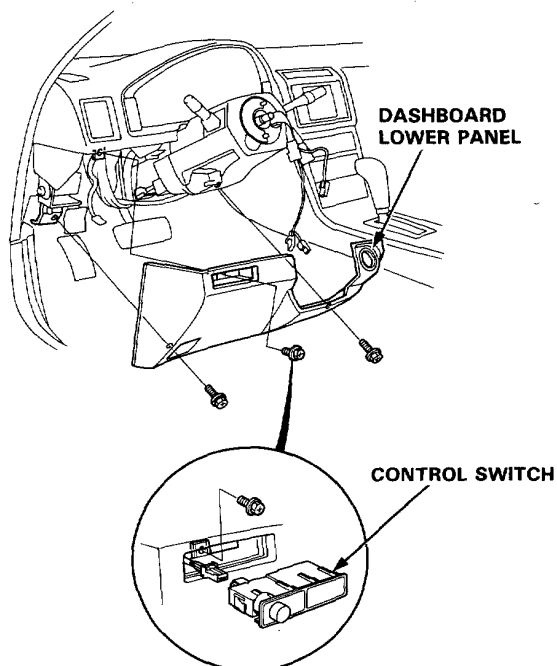
8. Install the steering joint cover with the clamp and clip.



9. Install the column covers.



10. Install the dashboard lower panel, then connect the switch connector to the control switch and install the control switch.



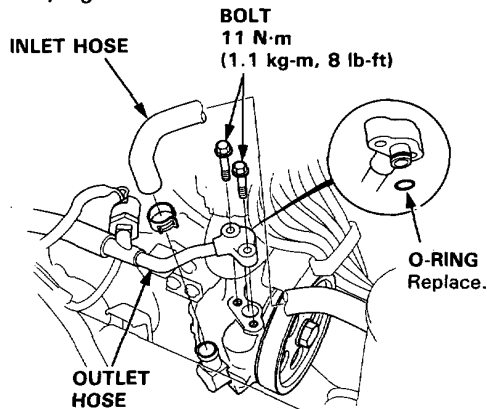
11. Install the steering wheel and airbag assembly (page 17-24).



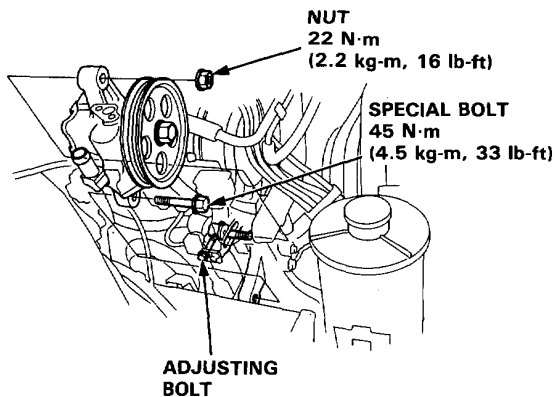
# Steering Pump

## Replacement

1. Drain the fluid from the system (page 17-18).
2. Remove the air cleaner cover and duct (Section 11).
3. Disconnect the inlet and outlet hoses from the pump and plug them.



4. Remove the belt by loosening the special bolt, nut and adjusting bolt.
5. Remove the special bolt and nut, then remove the pump.



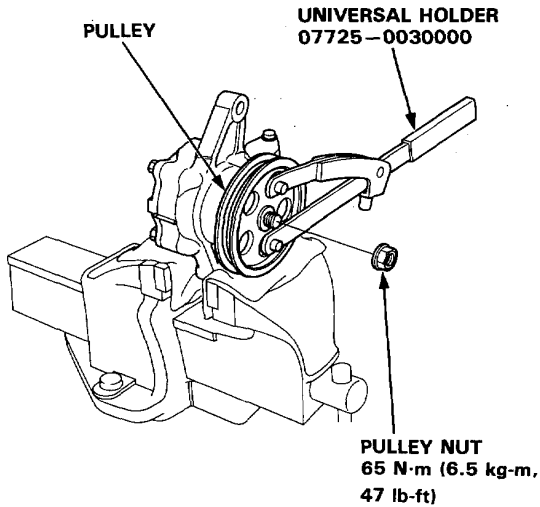
6. Loosely install a new pump on the bracket.
7. Connect the inlet and outlet hoses to the pump.
8. Install and adjust the belt (page 17-17).
9. Fill the reservoir with new fluid to the UPPER LEVEL On the reservoir.
10. Start the engine and let it run at fast idle while turning the steering wheel lock-to-lock several times to bleed air from the system.
11. Check the reservoir and add fluid if necessary.

# Steering Pump

## Pulley Replacement

Hold the steering pump in a vise with soft jaws, and hold the pulley with the special tool and remove the pulley nut and pulley.

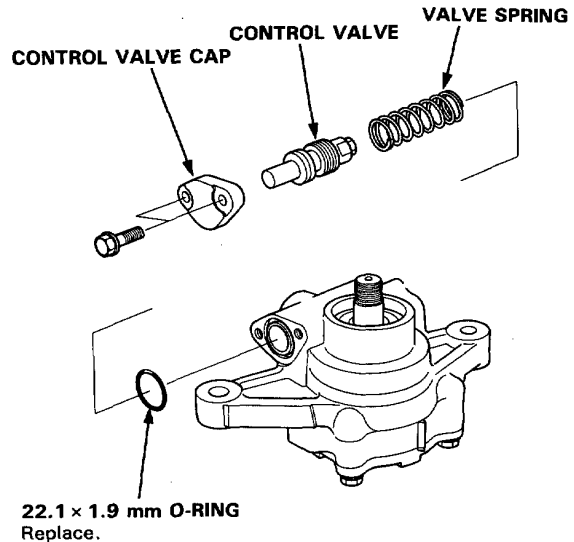
NOTE: Pulley nut has right hand threads.



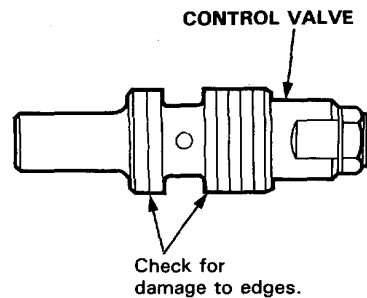
Hold the pulley with the special tool and tighten the pulley nut.

## Control Valve Inspection and Replacement

1. Remove the control valve cap by removing the two flange bolts.
2. Remove the control valve, control valve spring and 22.1 × 1.9 mm O-ring.

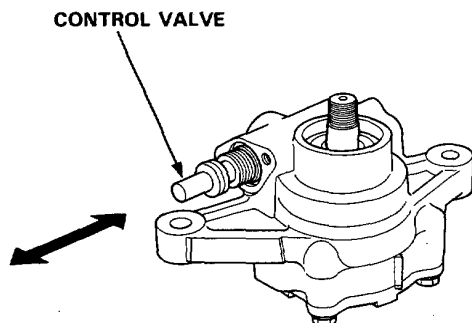


3. Check for wear, burrs, and other damage to the edges of the grooves in the valve.



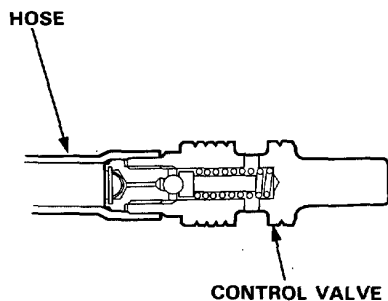


4. Slip the valve back in the pump and check that it moves in and out smoothly.

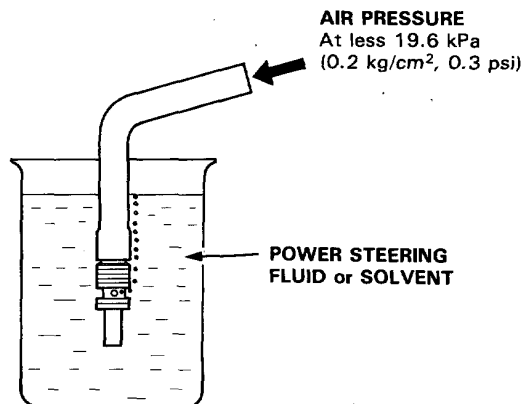


If OK, go on step 5, if not, replace the whole pump as an assembly.

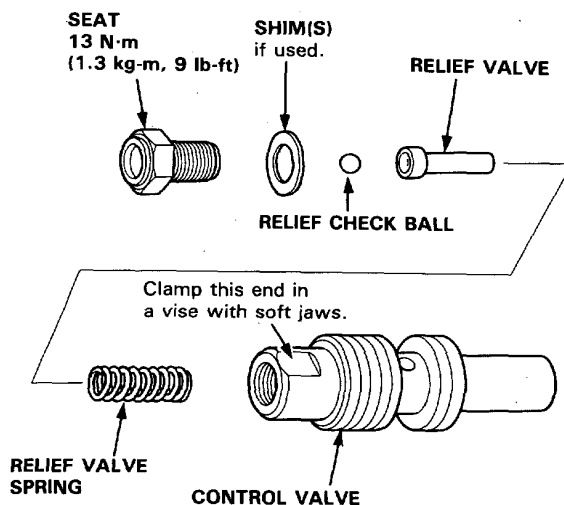
5. Attach a hose to the end of the valve as shown.



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



7. Clamp the bottom end of the valve in a vise with soft jaws.
8. Unscrew the seat in the top end of the valve, and remove any shims, the relief check ball, relief valve and relief valve spring.



(cont'd)

# Steering Pump

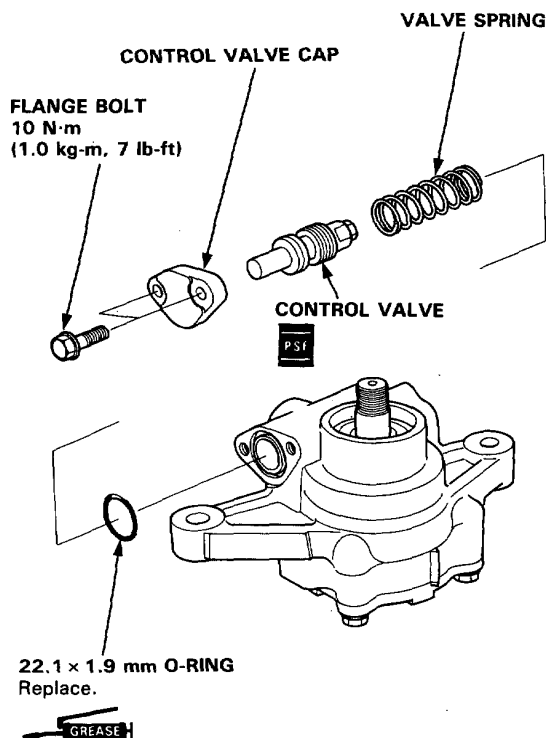
## Control Valve Inspection and Replacement (cont'd)

9. Clean all the parts in solvent, dry them off then reassemble and retest 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.

10. Install the control valve in the reverse order of removal.

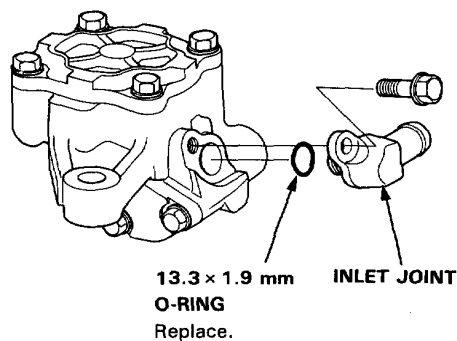
- Apply steering grease (Honda P/N 08733-B070E) to new O-ring.
- Coat the control valve with power steering fluid then install it and valve spring.



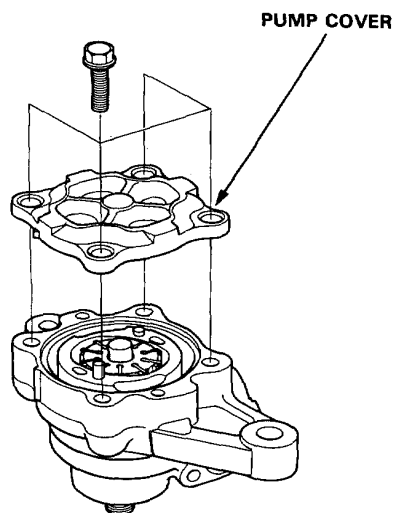
## Pump Disassembly

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

1. Remove the pump from car (page 17-31).
2. Remove the pulley (page 17-32).
3. Remove the control valve (page 17-32).
4. Remove the inlet joint and 13.3 × 1.9 mm O-ring.

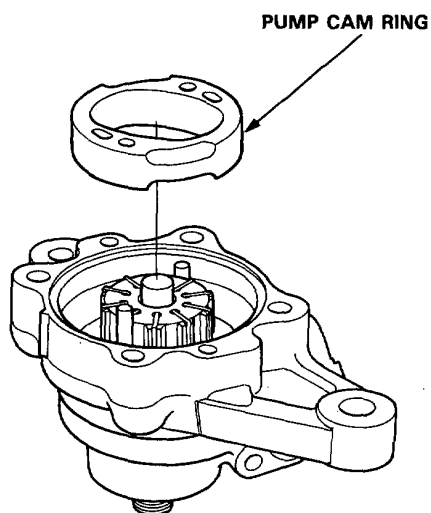


5. Remove the pump cover.

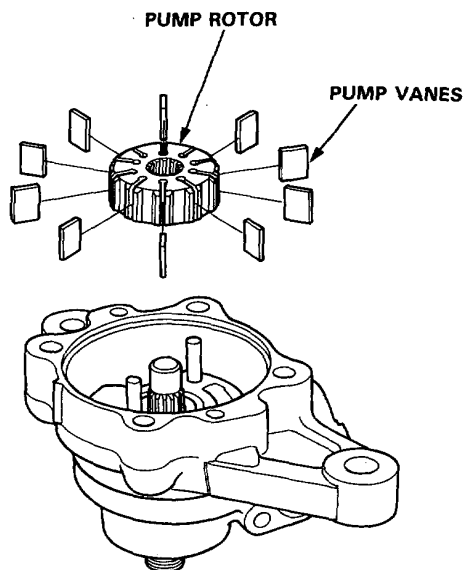




6. Remove the pump cam ring from the pump housing.

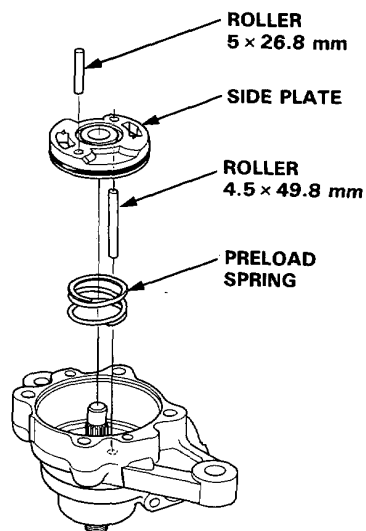


7. Remove the pump rotor and vanes.



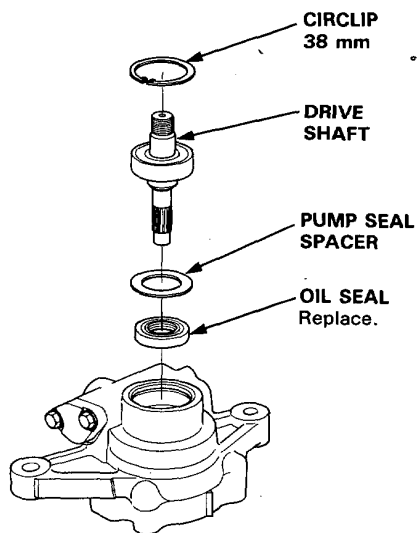
8. Remove the two rollers from the side plate.

9. Remove the side plate and preload spring.



10. Remove the circlip, then remove the drive shaft assembly from the pump housing using a plastic hammer.

11. Remove the seal spacer and oil seal.



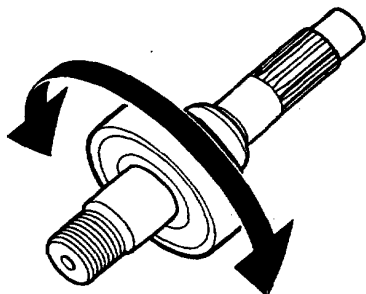
(cont'd)

# Steering Pump

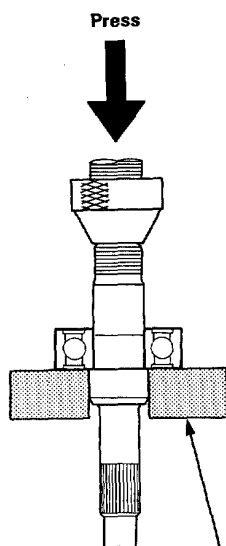
## Pump Disassembly (cont'd)

12. Check the pump ball bearing for play; if it is good and the grease in it is clean, go on step 13.

- If the bearing is noisy or has excessive play, replace the bearing.

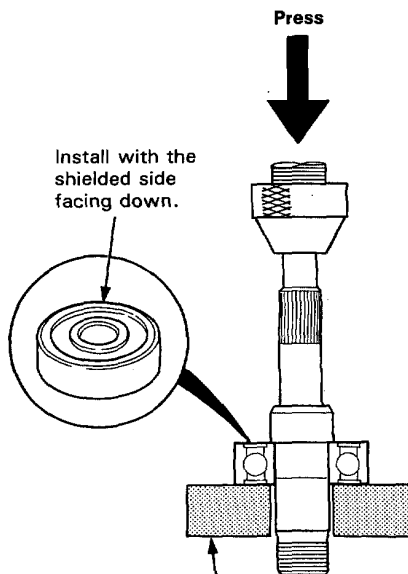


- Remove the bearing using the special tool and press.



HUB DIS/ASSEMBLY  
BASE  
07GAF-SD40700

- Install the new bearing using the press and special tool.



HUB DIS/ASSEMBLY  
BASE  
07GAF-SD40700  
NOTE: Hold the inner race  
with the tool securely.

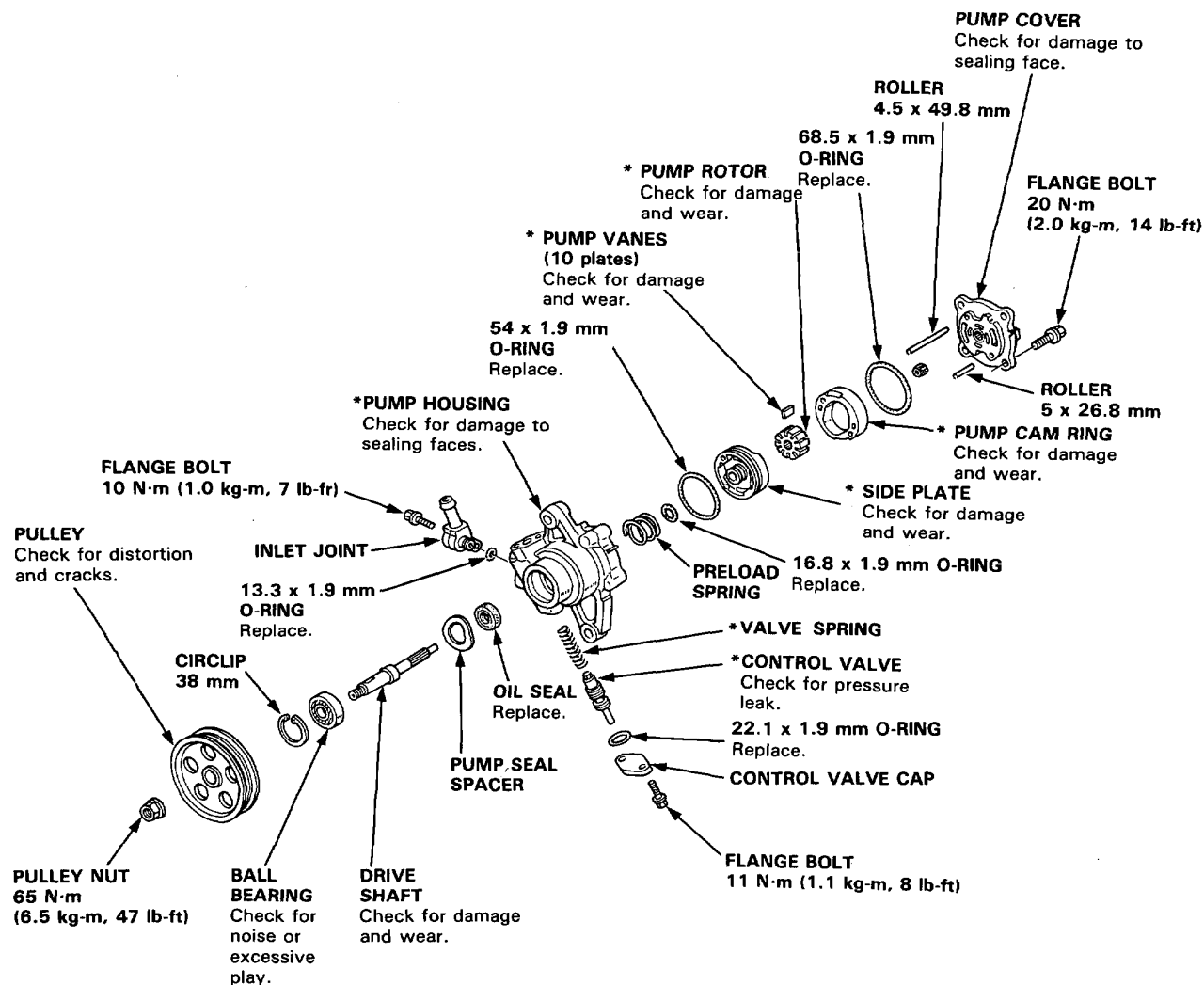


## Illustrated Index

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

**NOTE:**

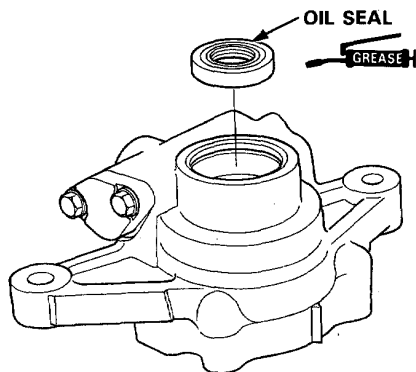
- Clean all of the disassembled parts thoroughly.
- Replace all O-rings and seals. Do not dip new O-rings and seals in solvent; coat O-rings with steering grease before installation, and make sure they stay in place during reassembly.
- If any part denoted with an asterisk is worn or damaged, replace the complete pump.



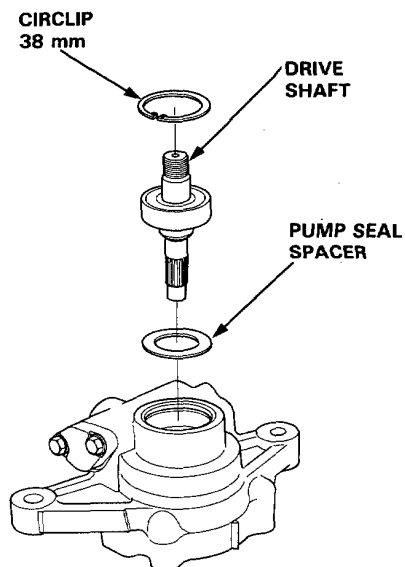
# Steering Pump

## Pump Assembly

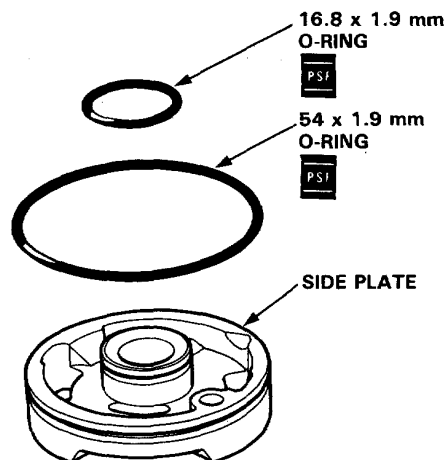
1. Coat the lip of the new oil seal with steering grease (Honda P/N 08733-B070E).
2. Install the new oil seal in the pump housing by hand.



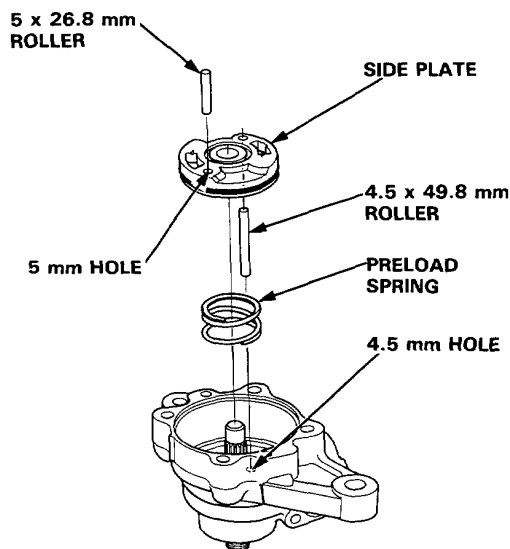
3. Install the pump seal spacer, then install the pump drive shaft assembly.
4. Install the 38 mm circlip with its tapered side facing out.



5. Coat the side plate grooves with power steering fluid, then position the 16.8x1.9 mm and 54x1.9 mm O-rings on the side plate.



6. Install the preload spring in the pump housing.
7. Set the 4.5x49.8 mm roller in the 4.5 mm hole in the pump housing.
8. Set the side plate over the roller and install it on the pump housing.
9. Set the 5x26.8 mm roller in the 5 mm hole in the side plate.

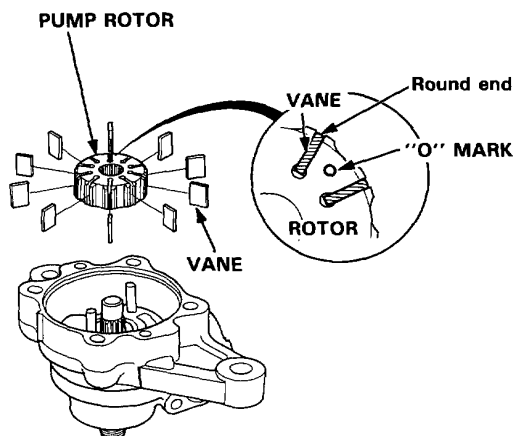




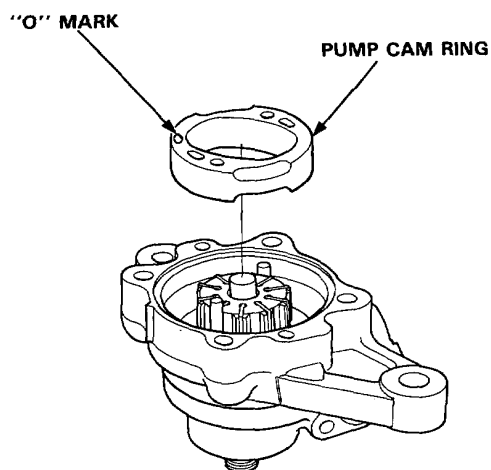
10. Assemble pump rotor to the drive shaft with the "O" mark on the rotor facing upward.

11. Set the 10 vanes in the grooves in the rotor.

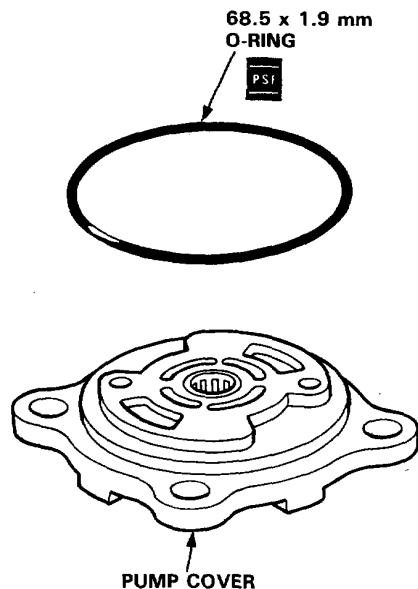
NOTE: Be sure that the round end of the vanes is in contact with the sliding surface of the cam ring.



12. Set the pump cam ring over the two rollers with the "O" mark on the cam ring upward.

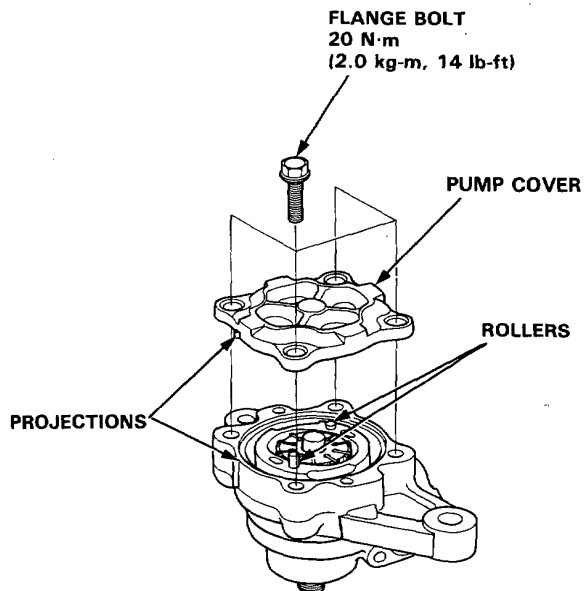


13. Install the 68.5 x 1.9 mm O-ring on the pump cover.



14. Align the roller set holes in the pump cover with the rollers.

15. Align the projection on the pump housing and the projection on the pump cover and tighten the four bolts.



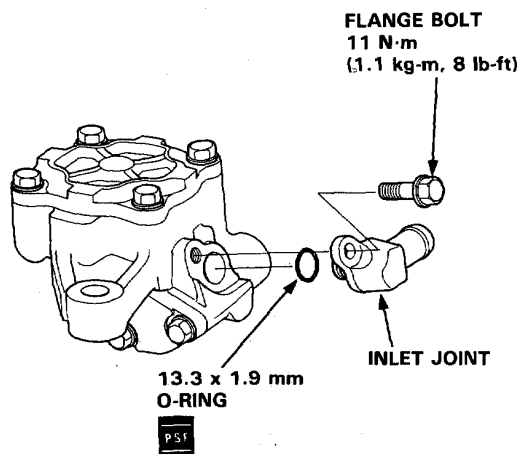
(cont'd)

# Steering Pump

## Pump Assembly (cont'd)

16. Set the 13.3 x 1.9 mm O-ring on the inlet joint.

17. Install the inlet joint on the pump housing.



18. Install the control valve (page 17-34).

19. Install the pulley (page 17-32) and check that the pump turns smoothly by turning the pulley.



# Steering Gearbox

## Gearbox Removal

### NOTE:

- Before removing the steering gearbox, align the front wheels straight ahead.
- Disconnect the battery negative terminal and then disconnect the positive terminal.

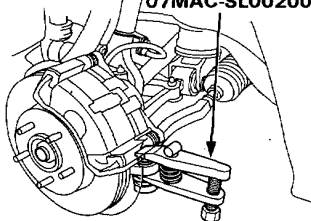
1. Drain the power steering fluid as described on page 17-18.
2. Raise the front of car and support on safety stands in the proper locations.
3. Remove the front wheels.
4. Remove the cotter pin from the tie-rod ball joint nut and remove the nut.
5. Install the 12 mm hex nut on the ball joint. Be sure that the 12 mm hex nut is flush with the ball joint pin end, or the threaded section of the ball joint pin might be damaged by the ball joint remover.

NOTE: Use the ball joint remover, 28mm (07MAC-SL00200) as shown on page 18-12 to separate the steering arm.

6. Separate the tie-rod ball joint and knuckle using the special tool.

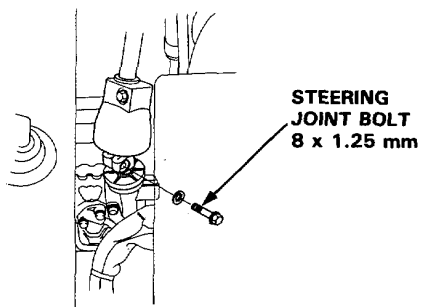
**CAUTION:** Avoid damaging the ball joint boot.

**BALL JOINT REMOVER, 28mm  
07MAC-SL00200**



7. Loosen the steering joint bolt.

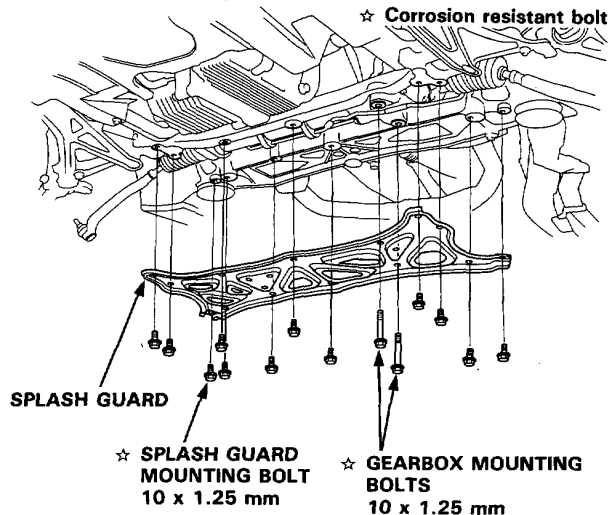
NOTE: Do not remove the bolt at this time.



**CAUTION:** Some splash guard mounting bolts are also used as gearbox mounting bolts. The gearbox will tilt to the side when these bolts are removed. Be sure to remove the joint bolt when lowering the gearbox.

### LH Drive (From step 15 for RH drive)

8. Remove the splash guard.

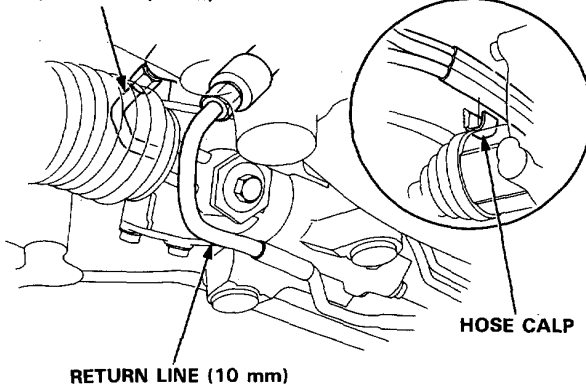


9. Using solvent and a brush, wash any oil and dirt off the control unit, its lines, and the end of the gearbox. Blow dry with compressed air.

10. Remove the hoses from the hose clamp on the right side.

11. Disconnect the four lines from the control unit.

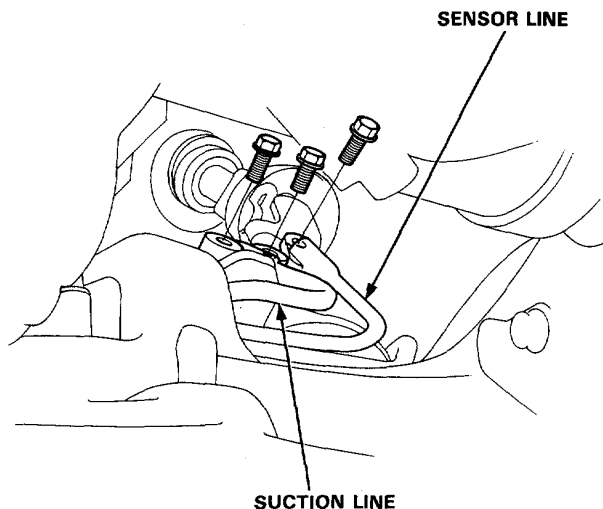
### RETURN LINE (6 mm)



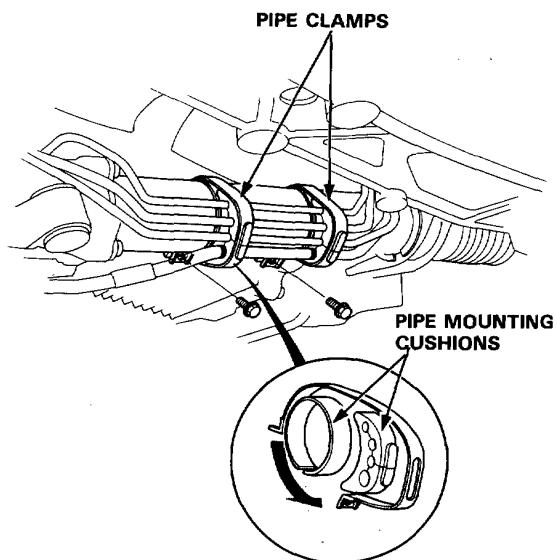
(cont'd)

# Steering Gearbox

## Gearbox Removal (cont'd)



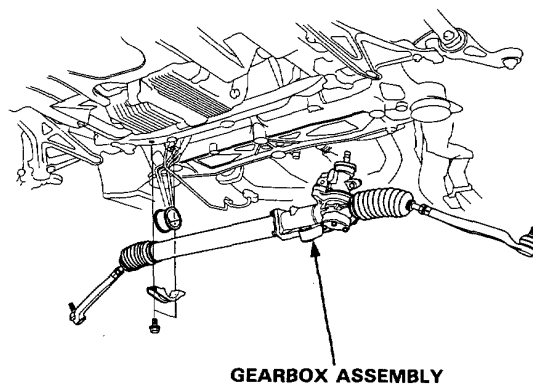
12. Remove the pipe clamps from the gearbox.



13. Separate the gearbox pinion shaft and column shaft by removing the steering joint bolt.

NOTE: Before removing the gearbox, place a jack stand under the gearbox.

14. Remove the gearbox mounting bolts and gearbox assembly.

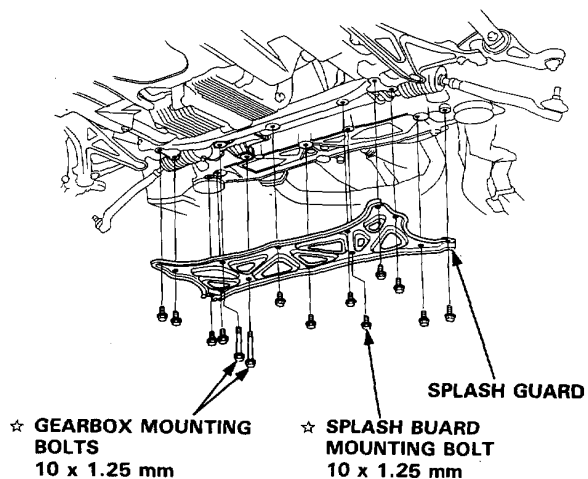




## RH Drive

15. Remove the splash guard.

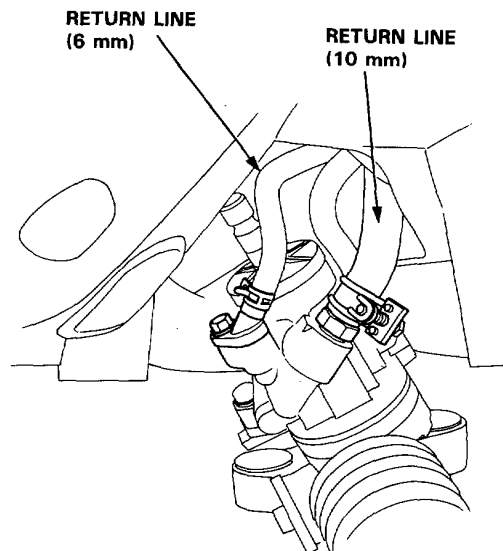
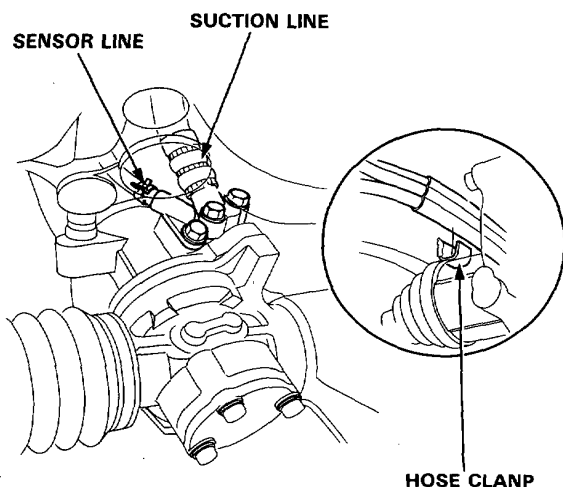
☆ Corrosion resistant bolt



16. Using solvent and a brush, wash any oil and dirt off the control unit, its lines, and the end of the gearbox. Blow dry with compressed air.

17. Remove the hoses from the hose clamp on the right side.

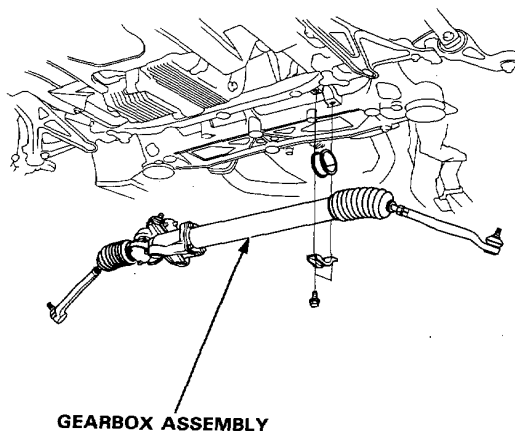
18. Disconnect the four lines from the control unit.



19. Separate the gearbox pinion shaft and column shaft by removing the steering joint bolt.

NOTE: Before removing the gearbox, place a jack stand under the gearbox.

20. Remove the gearbox mounting bolts and gearbox assembly.



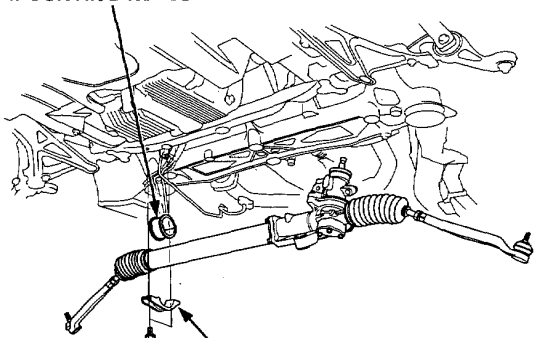
# Steering Gearbox

## Gearbox Installation

### LH Drive (From step 9 for RH drive)

1. Loosely install the two mounting bolts on the right side.

MOUNTING RUBBER



☆ 39 N·m  
(3.9 kg-m, 28 lb-ft)  
loosely tighten.

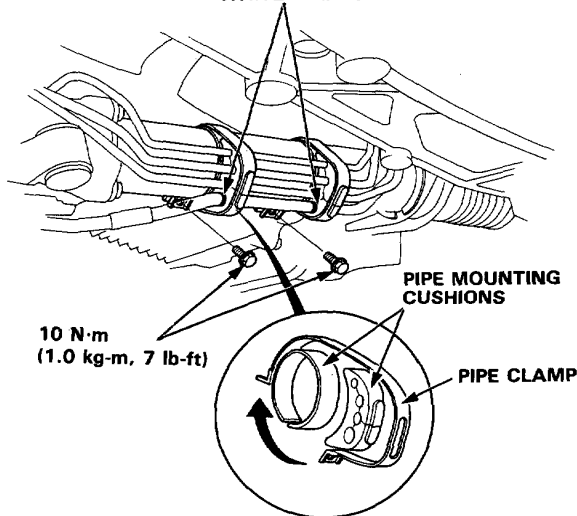
MOUNTING BRACKET

☆ Corrosion resistant bolt

2. Reinstall the pipe mounting cushions with the pipe clamps.

NOTE: Loosely reconnect the four lines first to the control unit and install the pipe mounting cushions onto the gearbox by aligning the white marks of the 10 mm return line (large diameter pipe).

WHITE MARKS



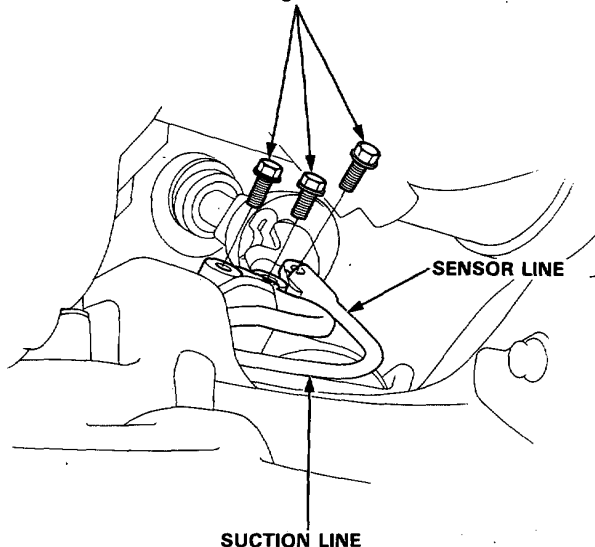
10 N·m  
(1.0 kg-m, 7 lb-ft)

PIPE MOUNTING CUSHIONS

PIPE CLAMP

3. Connect the four lines to the control unit.

11 N·m  
(1.1 kg-m, 8 lb-ft)

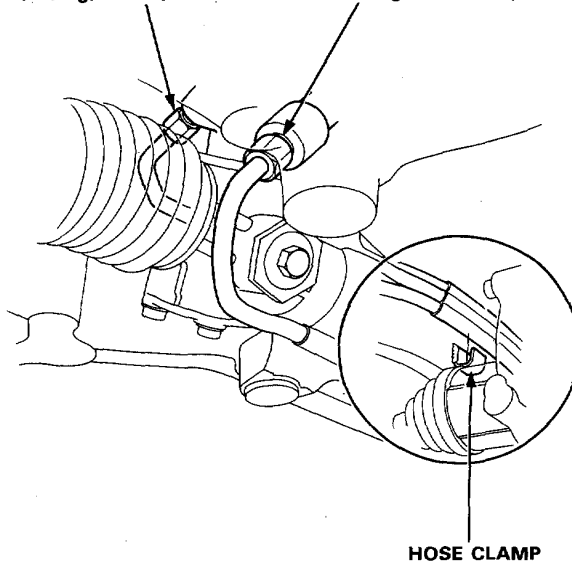


SENSOR LINE

SUCTION LINE

RETURN LINE ( 6 mm )  
13 N·m  
(1.3 kg, 9 lb-ft)

RETURN LINE (10 mm)  
29 N·m  
(2.9 kg-m, 21 lb-ft)



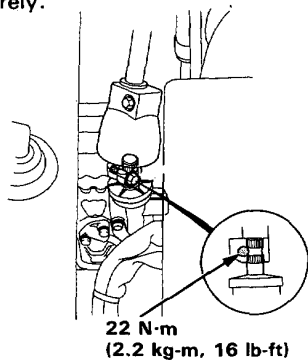
HOSE CLAMP

4. Install the hoses on the hose clamps.



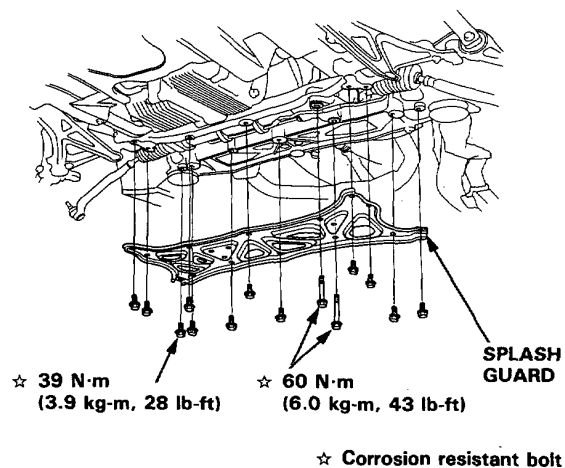
5. Reconnect the pinion shaft and column shaft.

**NOTE:** Pass the bolt through the groove in the pinion shaft securely.



6. Tighten the two mounting bolts on the right side.
7. Install the splash guard with the two gearbox mounting bolts on the left side.
8. Tighten the splash guard attaching bolts.

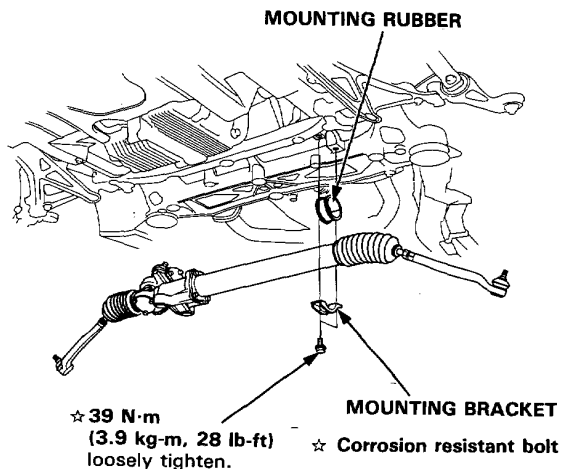
**NOTE:** Install the bolts loosely first, then tighten them securely.



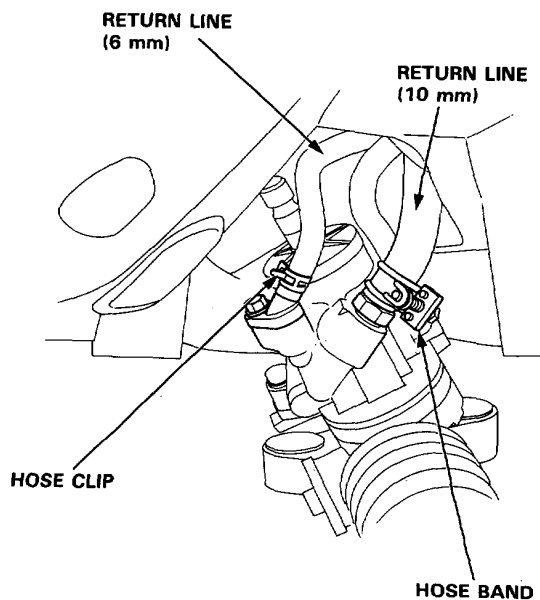
**NOTE** Reconnect the tie-rods to the steering knuckles (see step 17).

#### RH Drive

9. Loosely install the two mounting bolts on the left side.



10. Connect the return lines to the control unit.



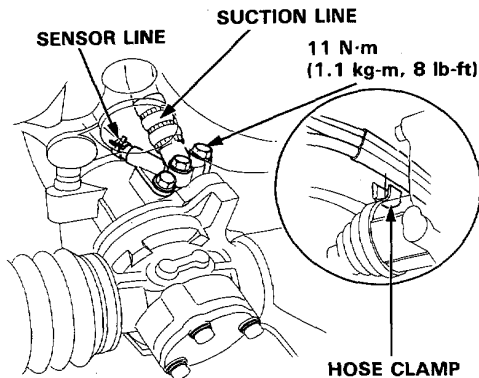
(cont'd)

# Steering Gearbox

## Gearbox Installation (cont'd)

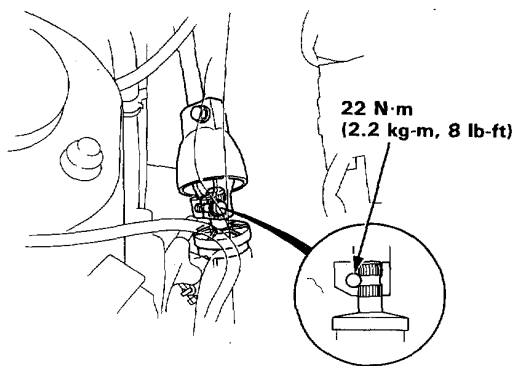
11. Connect the sensor line and suction line to the control unit.

12. Install the hoses on the hose clamp.



13. Reconnect the pinion shaft and column shaft.

**NOTE** Pass the bolt through the groove in the pinion shaft securely.

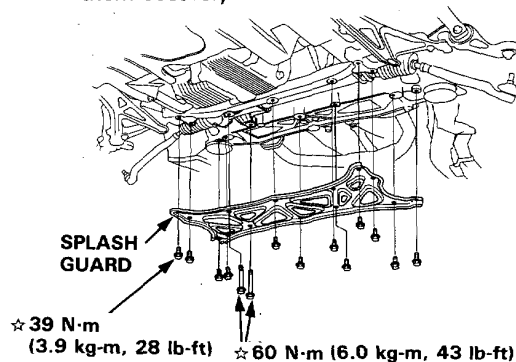


14. Tighten the two mounting bolts on the left side.

15. Install the splash guard with the two gearbox mounting bolts on the right side.

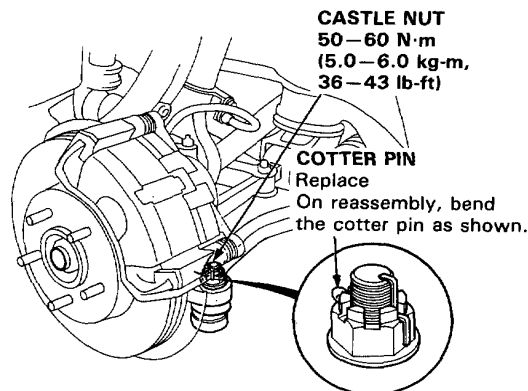
16. Tighten the splash guard attaching bolts.

**NOTE** Install the bolts loosely first, then tighten them securely.



17. Reconnect the tie-rods to the steering knuckles, tighten the ball joint nut to the specified torque, and install new cotter pins.

**CAUTION:** Torque the castle nut to the lower torque specification, then tighten it only far enough to align the slot with the pin hole. Do not align the nut by loosening.



18. Fill the system:

- Fill the reservoir with new Honda Power Steering Fluid-V.

19. Connect the battery positive terminal and then connect the negative terminal.

- 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.

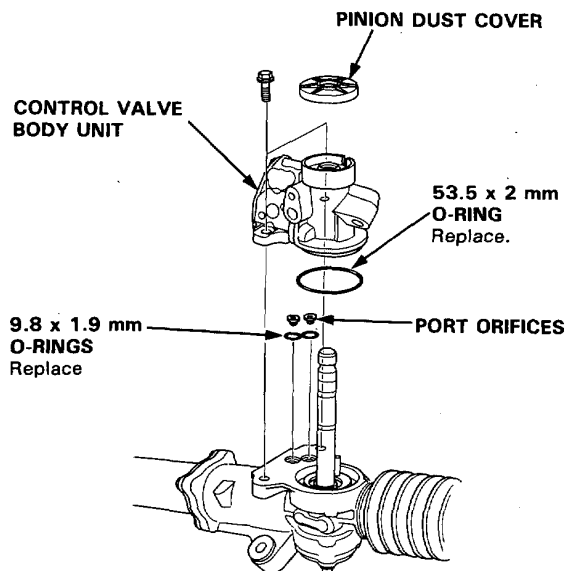
20. Check the gearbox for leaks.

21. Reinstall the front wheels.

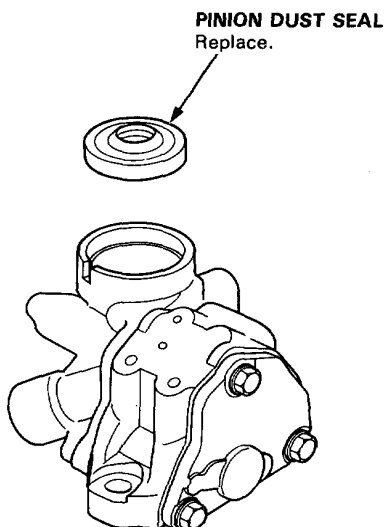


## Valve Body Unit Overhaul

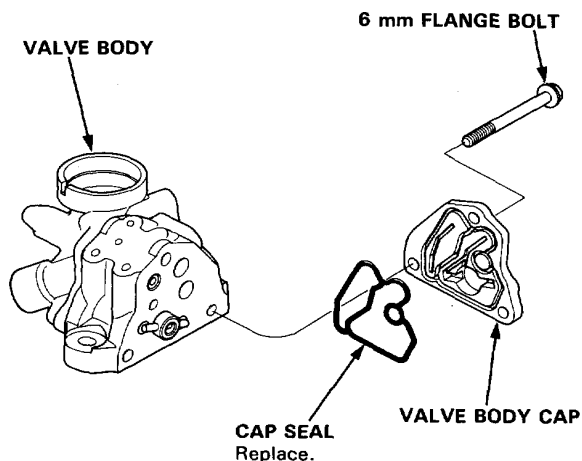
1. Remove the steering gearbox (page 17-41).
2. Remove the pinion dust cover.
3. Remove the two 8 mm flange bolts and remove the control valve body unit from the gearbox.
4. Remove the O-rings and orifices from the gearbox.



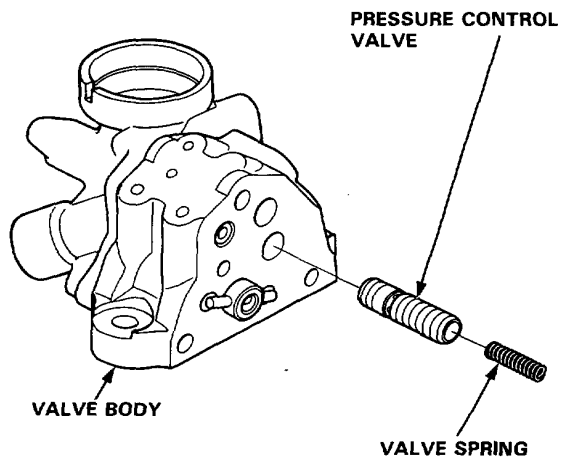
5. Remove the pinion dust seal.



6. Remove the three 6 mm flange bolts, and remove the cap from the valve body.
7. Remove the cap seal from the cap.



8. Remove the pressure control valve and spring from the valve body.



(cont'd)

# Steering Gearbox

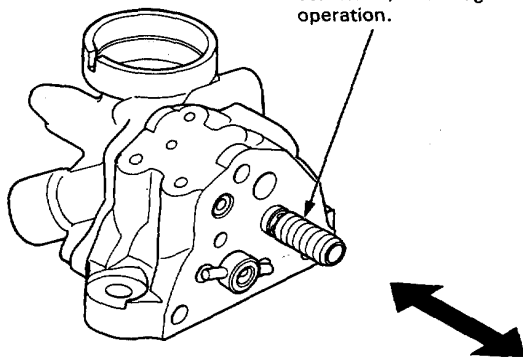
## Valve Body Unit Overhaul (cont'd)

### 9. Check the pressure control valve:

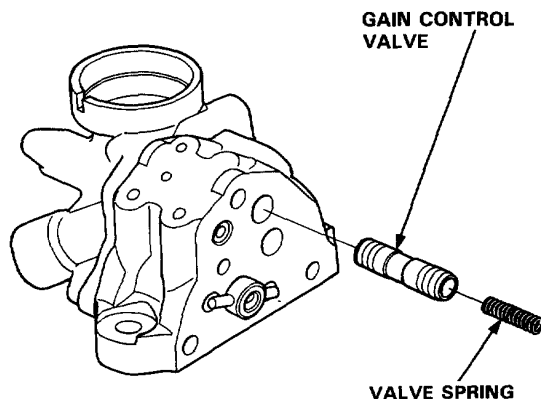
- Inspect its surface for scoring or scratches.
- Slip it back into the valve body, and make sure it slides smoothly without drag and without side play.

NOTE: If any part of the valve body is damaged, replace the valve body unit (valve body, pressure control valve, gain control valve, control valve) as an assembly.

**PRESSURE CONTROL VALVE**  
Check for scoring or scratches, and rough operation.



### 10. Remove the gain control valve and spring from the valve body.

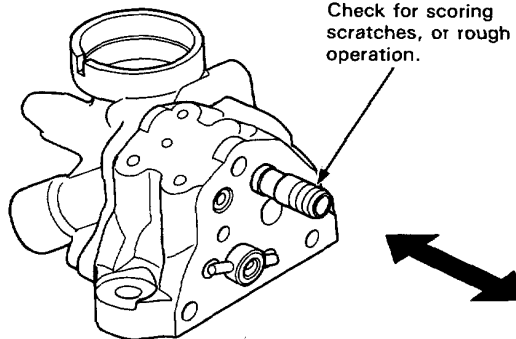


### 11. Check the gain control valve:

- 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.

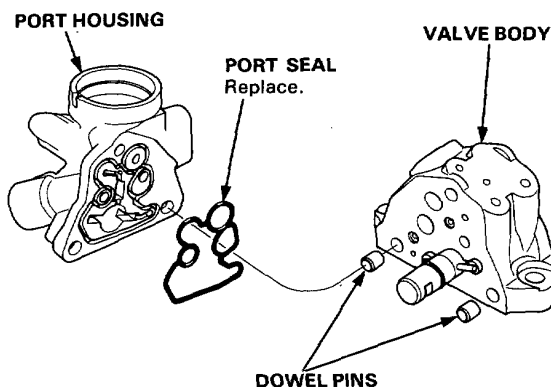
NOTE: If any part of the valve body is damaged, replace the valve body unit (valve body, pressure control valve, gain control valve, control valve) as an assembly.

**GAIN CONTROL VALVE**  
Check for scoring scratches, or rough operation.



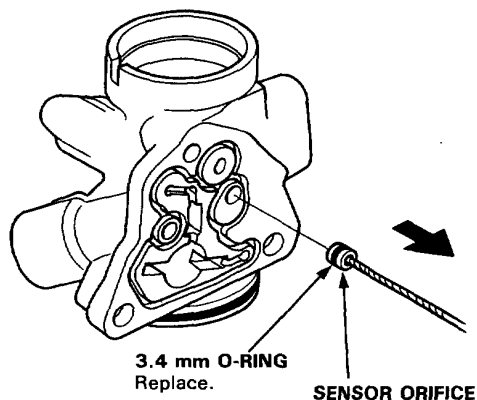
### 12. Separate the valve body and port housing.

### 13. Remove the seal and dowel pins from the port housing.



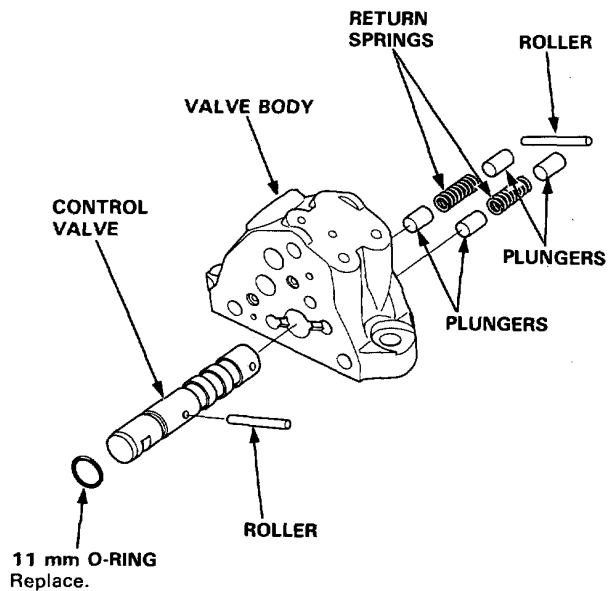


14. Using 1.5 mm (0.06 in) drill bit, remove the sensor orifice and 3.4 mm O-ring.



15. 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.

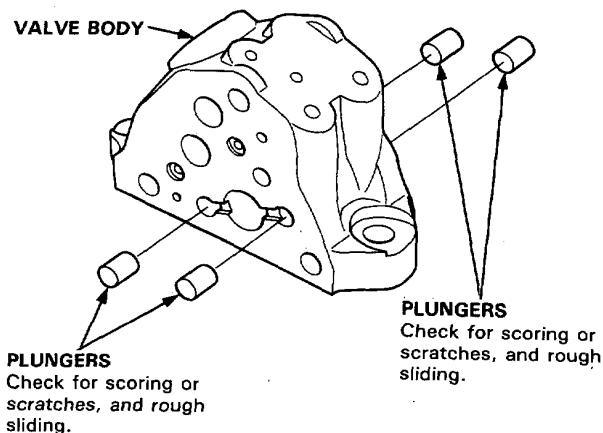


16. Remove the plungers, return springs and control valve from the valve body.

17. Remove the 11 mm O-ring from the control valve.

18. Check the plungers.

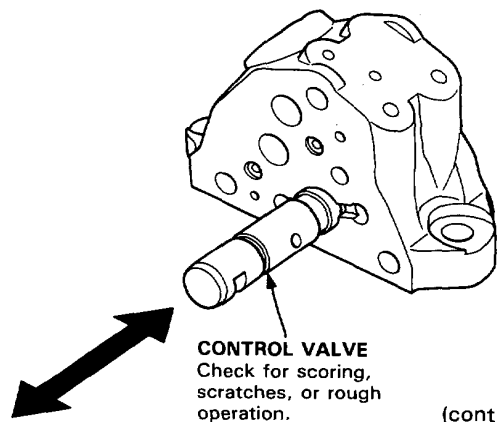
- Inspect their surface for scoring or scratches.
- Slip each plunger into the valve body. Make sure it slides smoothly, without drag or side play. If any plunger is damaged, replace it.



19. 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:** If any part of the valve body is damaged, replace the valve body unit (valve body, pressure control valve, gain control valve, control valve) as an assembly.



(cont'd)

# Steering Gearbox

## Valve Body Unit Overhaul (cont'd)

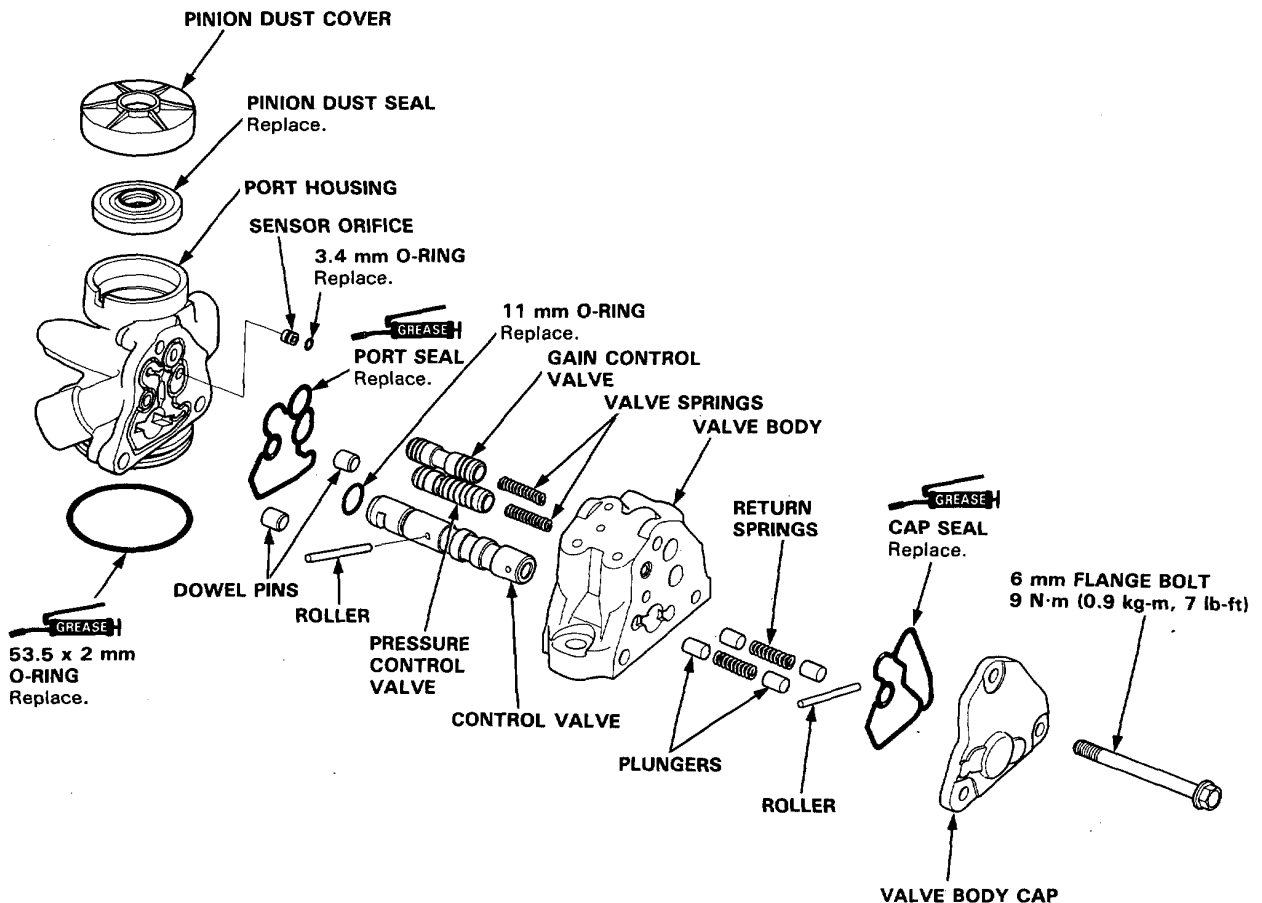
### Assembly:

1. Thoroughly clean the disassembled parts shown below.
2. Coat the plungers, pressure control valve, gain control valve and control valve surfaces with power steering fluid.
3. Reassemble the parts in the reverse order of disassembly.

### CAUTION:

- Replace the O-rings and seals with new ones.
- Do not dip the O-rings and seals in solvent.
- Apply grease in the seal grooves to keep the seals in place.
- Apply grease to new O-rings to keep them in place.

-  **STEERING GREASE** ..... Part Number 08733-B070E

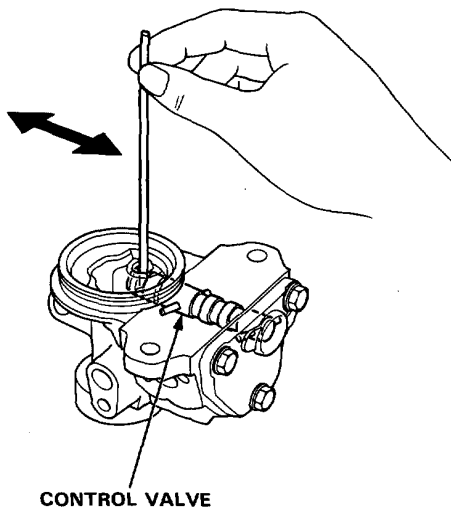


### NOTE

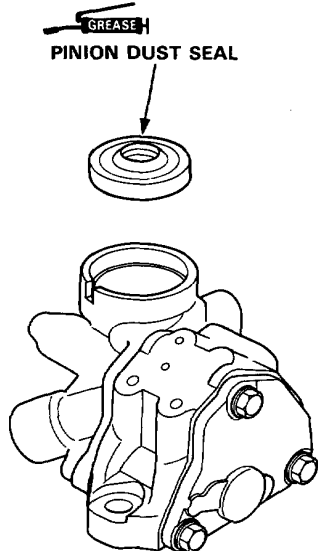
- If the valve body is damaged, replace the valve body unit (valve body, pressure control valve, gain control valve, control valve) as an assembly.
- LH drive shown. RH drive is similar.



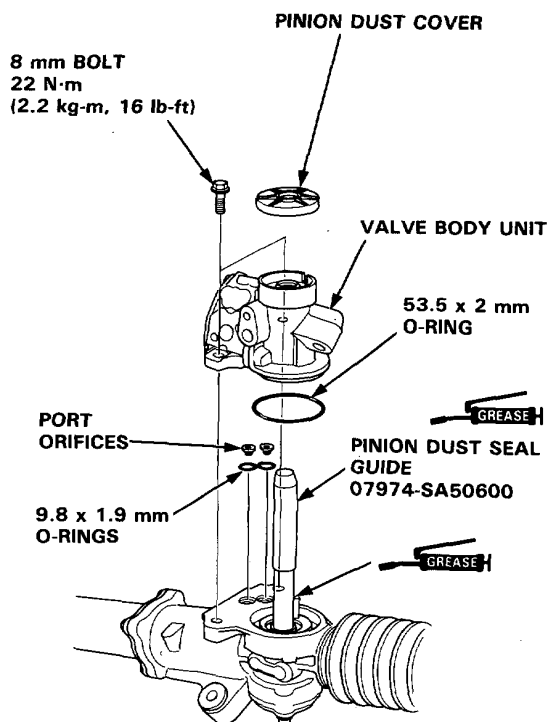
4. Make sure the control valve moves smoothly, and returns to neutral position.



5. Install the new pinion dust seal in the control valve body unit by hand.



6. Coat the 9.8 x 1.9 mm O-rings with grease, and install them together with the orifices.
7. Install the special tool onto the pinion shaft and coat the special tool with grease.
8. Coat the 53.5 x 2 mm O-ring and pinion holder pin with grease, and install the valve body unit.
9. Install the valve body unit on the gear housing with the two 8 mm bolts.



10. Remove the special tool.

**CAUTION:**

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

# Steering Gearbox

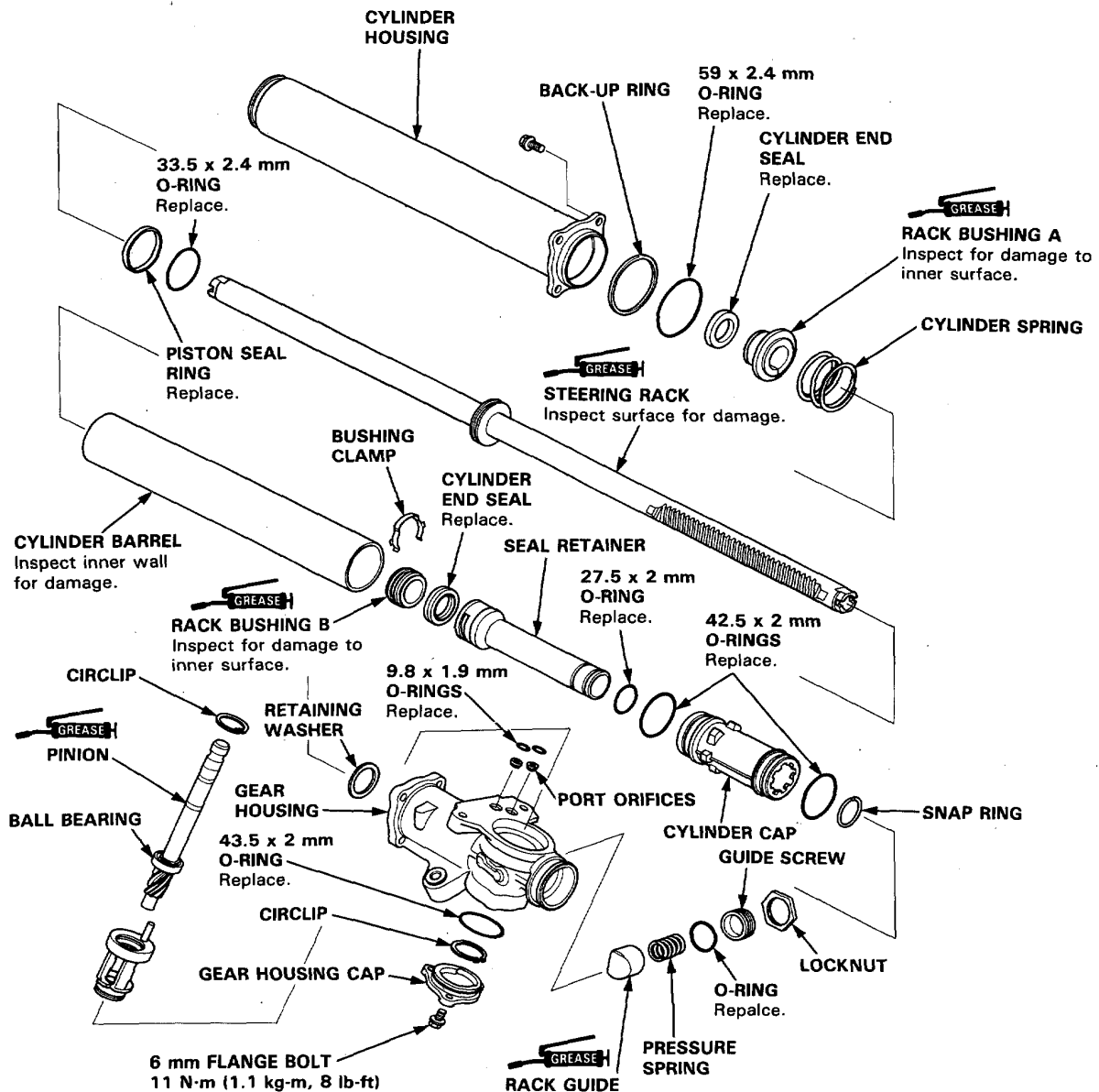
## Illustrated Index

NOTE: LH drive shown. RH drive is similar.

### CAUTION:

- 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, make sure they stay in position during reassembly, and use appropriate special tools to install them where necessary.

-  **STEERING GREASE** ..... Part Number 08733-B070E

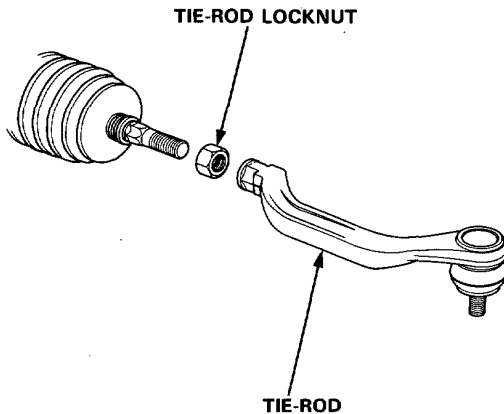




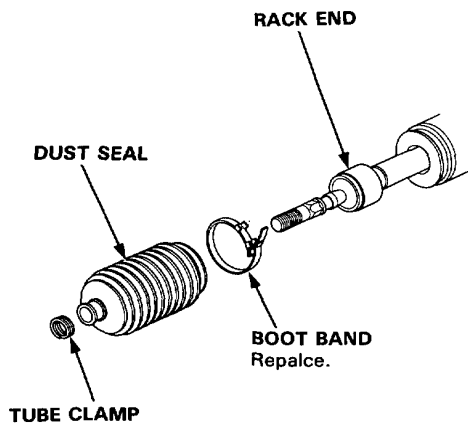
# Steering Gearbox

## Overhaul

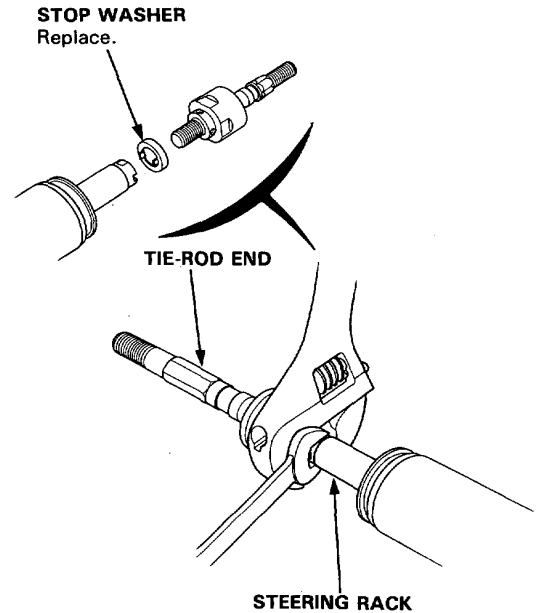
1. Remove the control unit body as described on page 17-47.
2. Carefully clamp the gearbox in a vise with soft jaws.
3. Remove the tie-rod assembly.



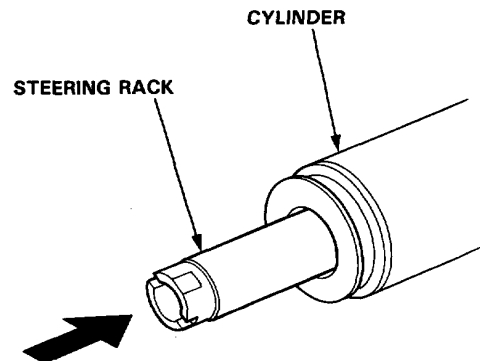
4. Remove the boot bands and tube clamps. Pull the dust seals away from the ends of the gearbox.



5. Hold the steering rack with a wrench and unscrew the tie-rod end with a wrench.
6. Remove the stop washer.



7. 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.

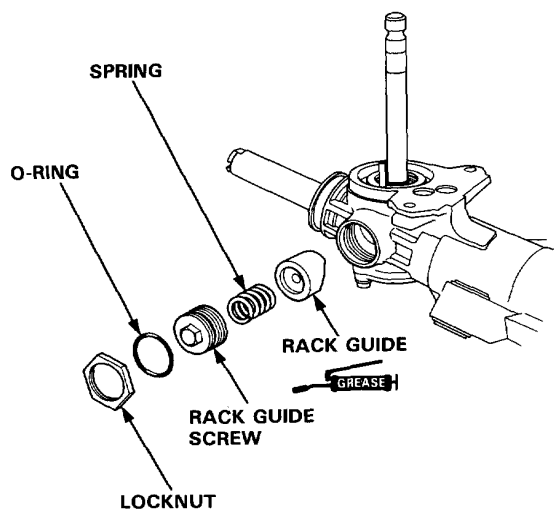


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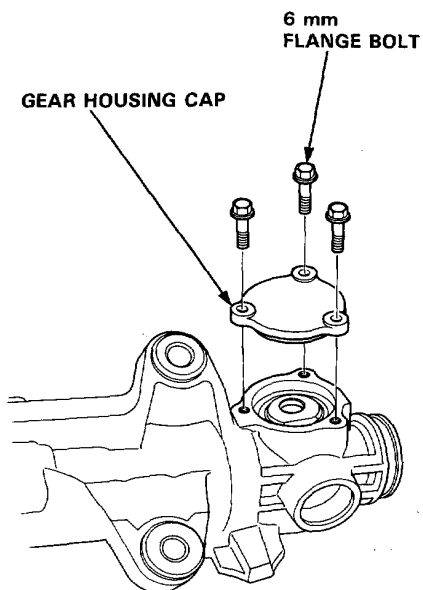
# Steering Gearbox

## Overhaul (cont'd)

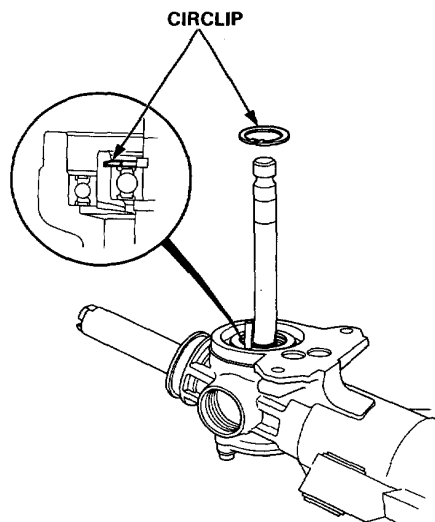
8. Loosen the rack screw locknut and remove the rack guide screw.
9. Remove the spring and rack guide from the gear housing.



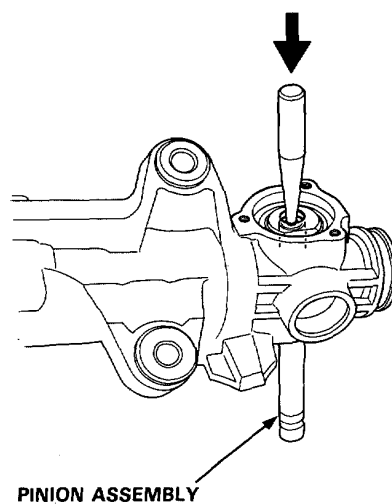
10. Remove the gear housing cap from the gear housing by removing the three 6 mm flange bolts.



11. Remove the circlip from the bottom of the gear housing.

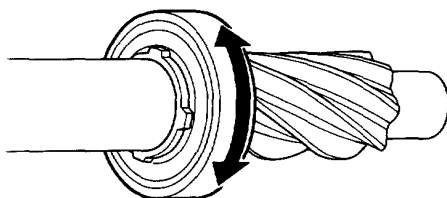


12. Remove the pinion assembly from the gear housing by tapping it lightly with a punch.

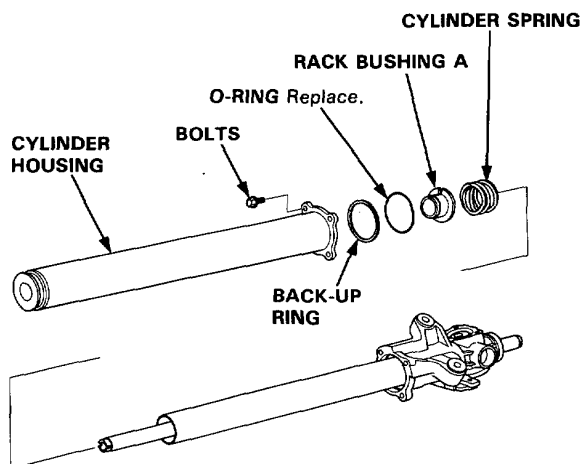




13. Check the pinion lower ball bearing for play; if it is good and the grease in it is clean, go on step 14. If the bearing is noisy or has excessive play, or the grease is contaminated, replace the pinion assembly.



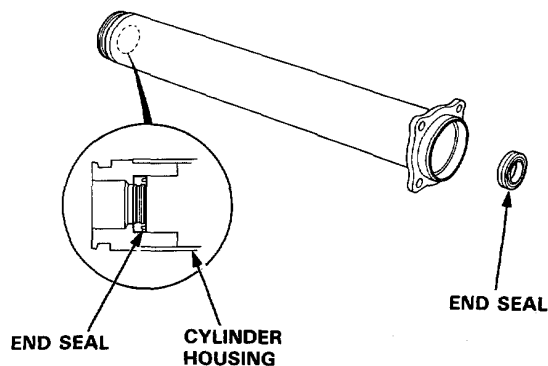
14. Remove the four bolts from the end of the cylinder housing, then slide the housing off the rack.



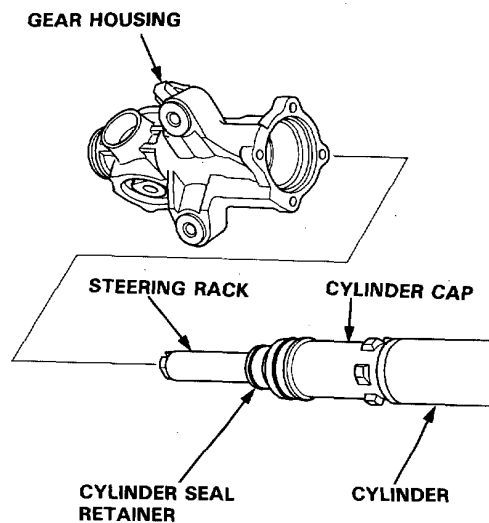
15. Remove the O-ring, back-up ring, steering rack bushing A and cylinder spring.

16. Remove the cylinder end seal from the cylinder housing.

NOTE: Use your fingers or a wooden stick to avoid damaging the housing.



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

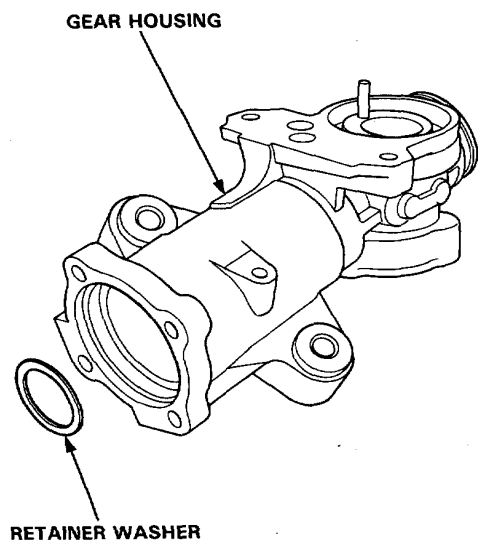


(cont'd)

# Steering Gearbox

## Overhaul (cont'd)

18. Remove the retainer washer from the gear housing.



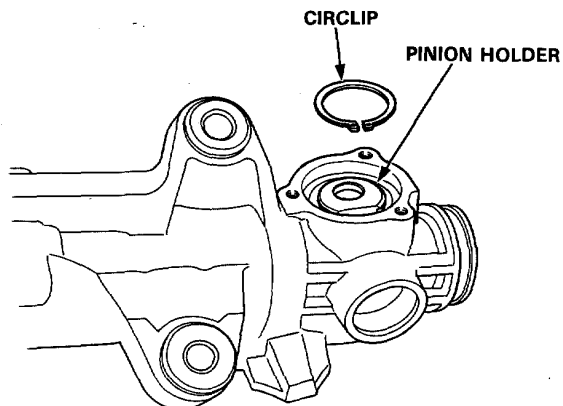
19. Check the lower bearing for free movement and excessive play; if it is good and the grease in it is clean, go on step 20.

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

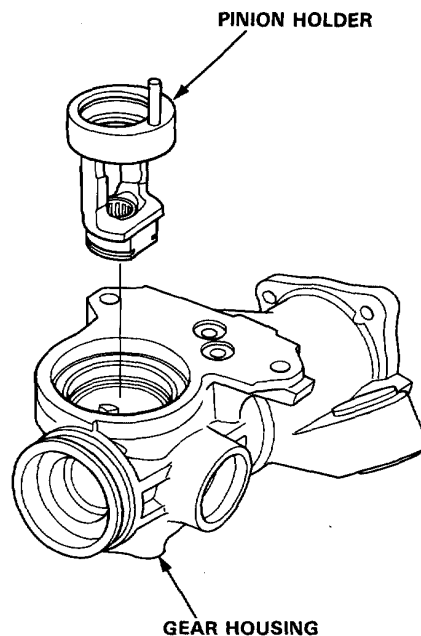
Check the upper bearing for rough movement or excessive play; if it is good and the grease in it is clean, go on step 20.

If it is damaged, replace the gear housing.

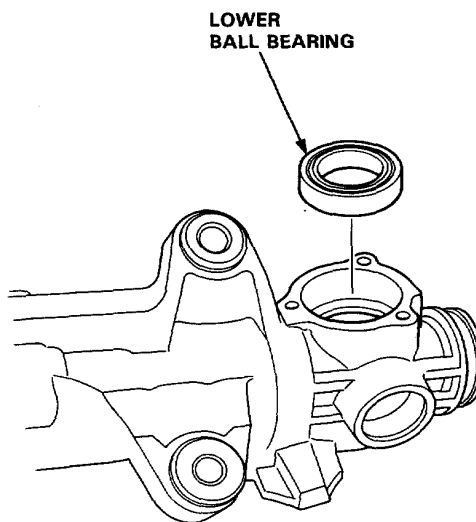
- Remove the circlip from the pinion holder.



- Remove the pinion holder from the gear housing.

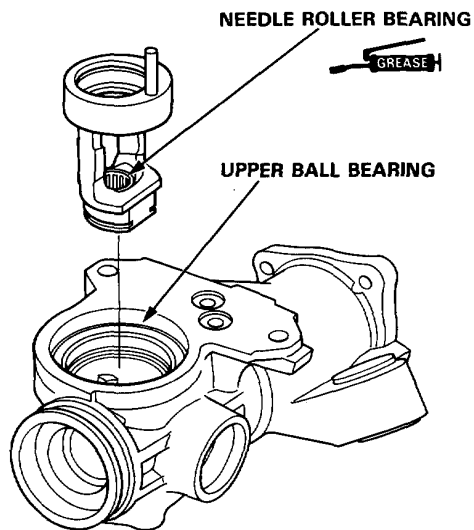


- Remove the pinion lower ball bearing from the gear housing.

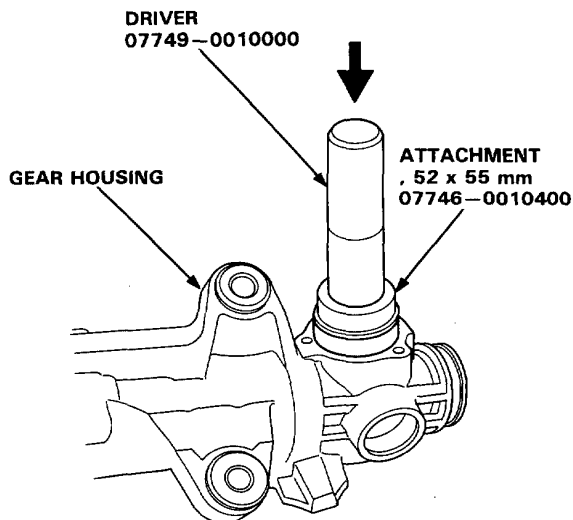




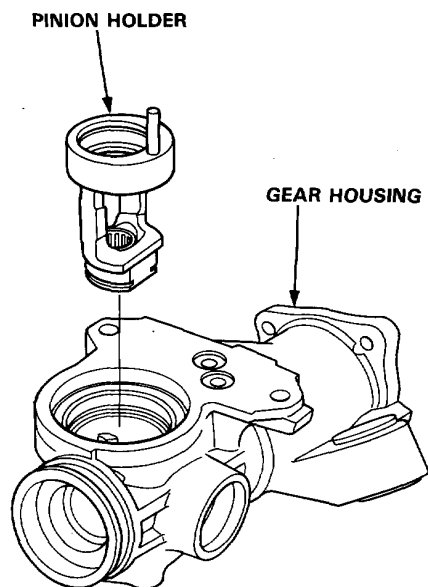
- Check the needle roller bearing in the pinion holder and the ball bearing in the gear housing for damage; if OK, pack the needle roller bearing with grease. If the bearings are damaged, replace them as a set.



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

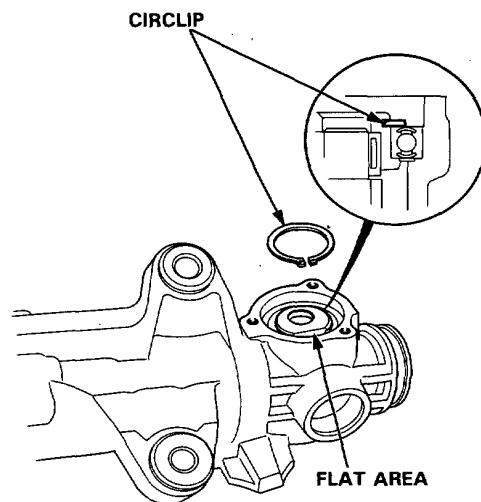


- Install the pinion holder in the gear housing.



- Reinstall the circlip with its tapered side facing out.

NOTE: Circlip ends must be aligned with the flat area.

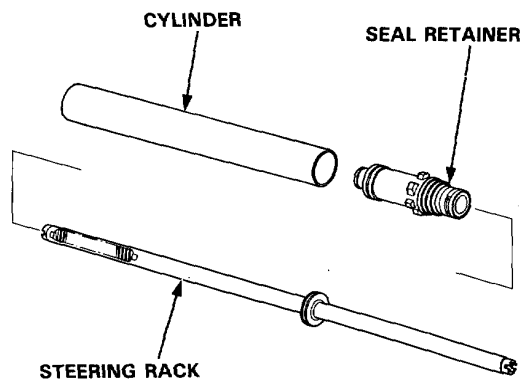


(cont'd)

# Steering Gearbox

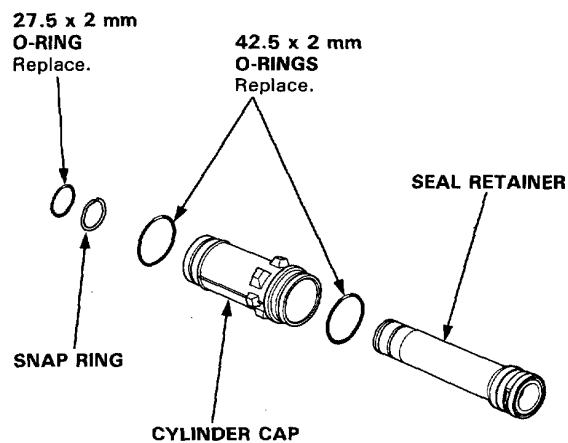
## Overhaul (cont'd)

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



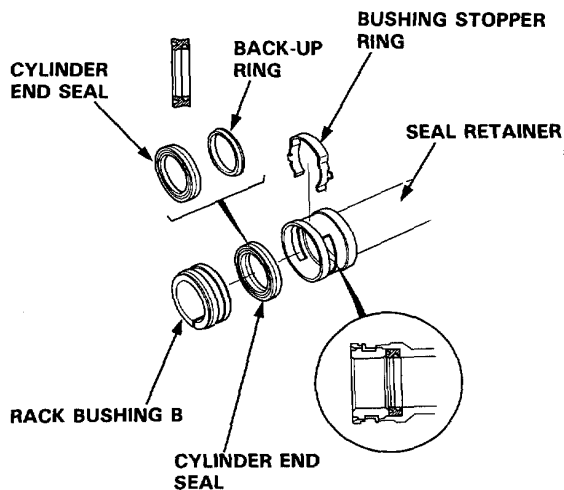
21. Remove the O-ring and snap ring from the seal retainer, then remove the cylinder cap from the seal retainer.

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

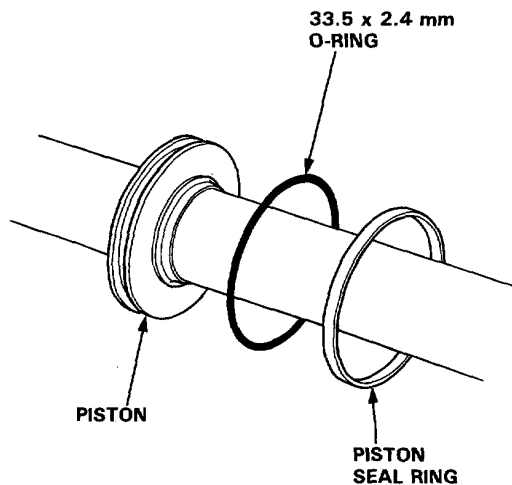


23. Remove the bushing stopper ring from the seal retainer.

24. Remove the cylinder end seal and rack bushing B.



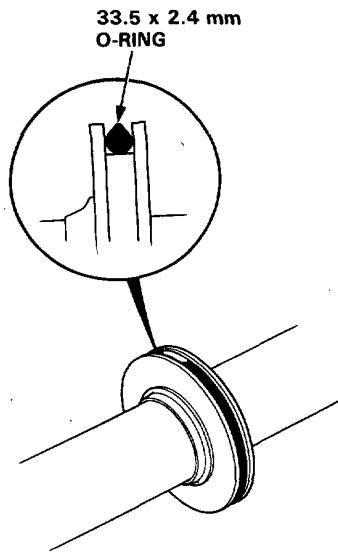
25. Carefully pry the piston seal ring and O-ring off the rack.



**NOTE:** Before reassembling any parts, inspect them as described on page 17-50 and make sure they are clean. Replace worn or damaged parts.

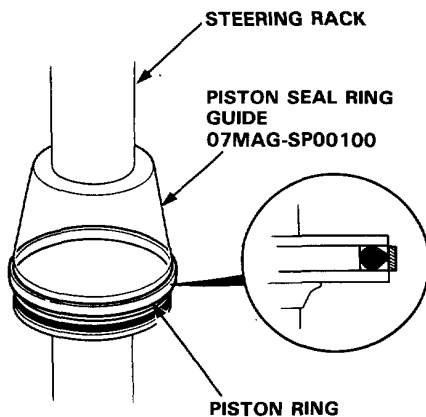


26. Install a new O-ring on the rack with its narrow edge facing out.



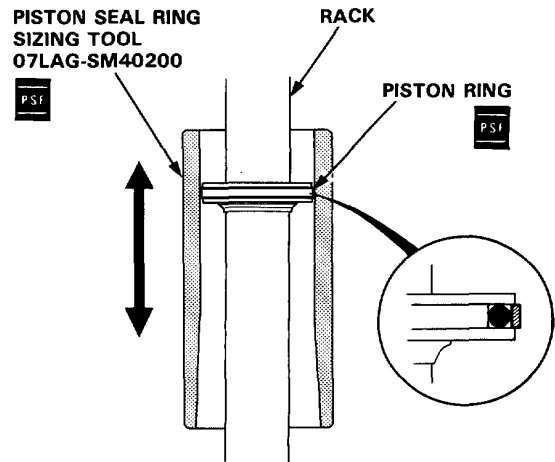
27. Coat the pinion seal ring guide with power steering fluid, then slide it onto the rack, big end first.

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

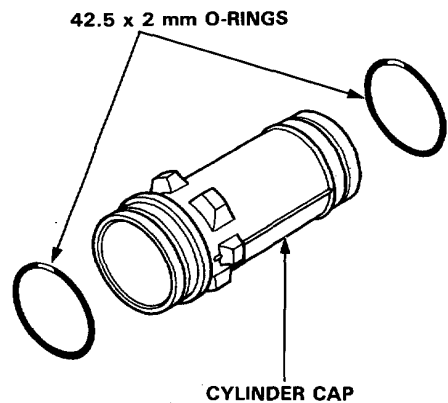


29. Coat the piston seal ring and inside of the special tool with power steering fluid.

30. 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.



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



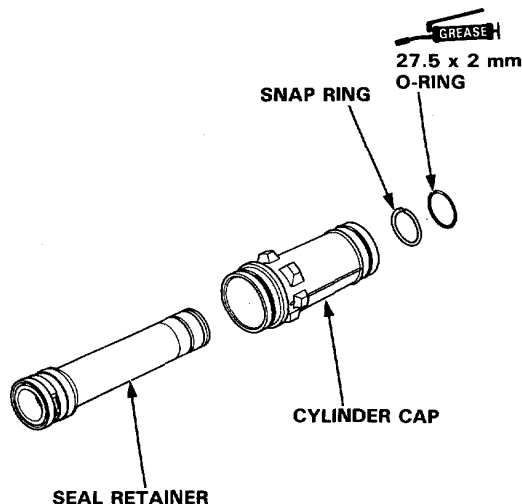
(cont'd)

# Steering Gearbox

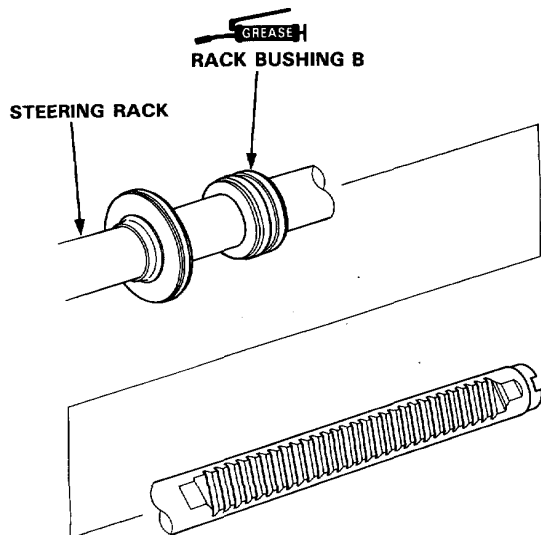
## Overhaul (cont'd)

32. Slide the cylinder cap onto the seal retainer.

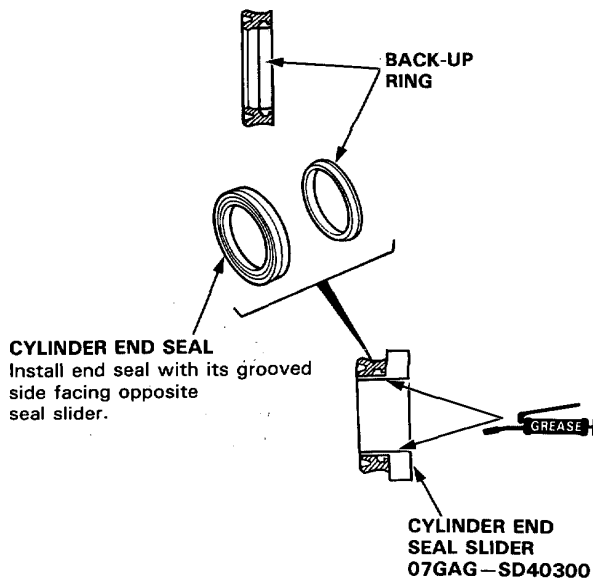
33. Install the snap ring and O-ring on the seal retainer.



34. Grease the sliding surface of the steering rack bushing B, and install the bushing on the steering rack with the groove of the bushing facing the steering rack piston.

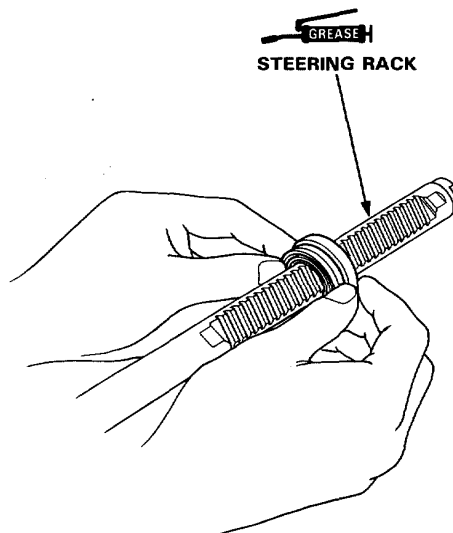


35. Grease the sliding surfaces of the new cylinder end seal and the special tool, then place the seal on the special tool with its grooved side facing opposite the slider.



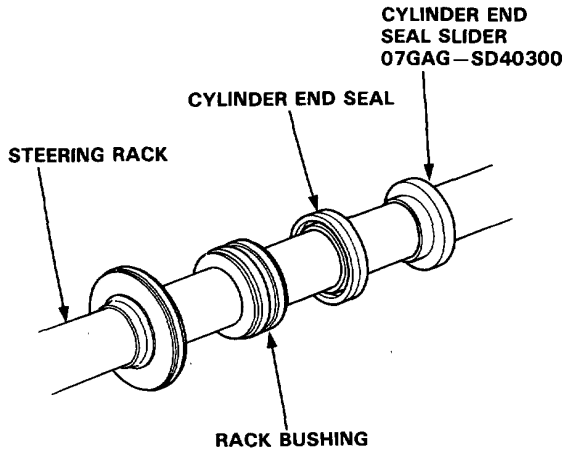
36. Install the special tool and cylinder end seal.

**CAUTION:** Make sure the rack teeth do not face the slot in the special tool.

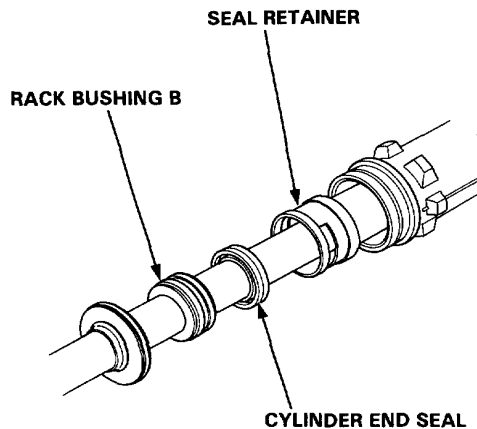




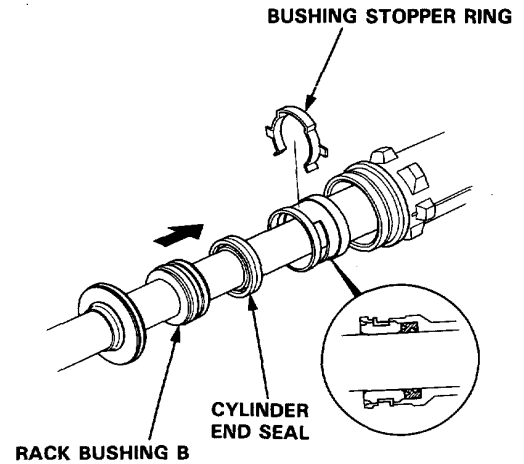
37. Remove the special tool from the cylinder end seal, then separate the ends of the tool and remove it from the rack.



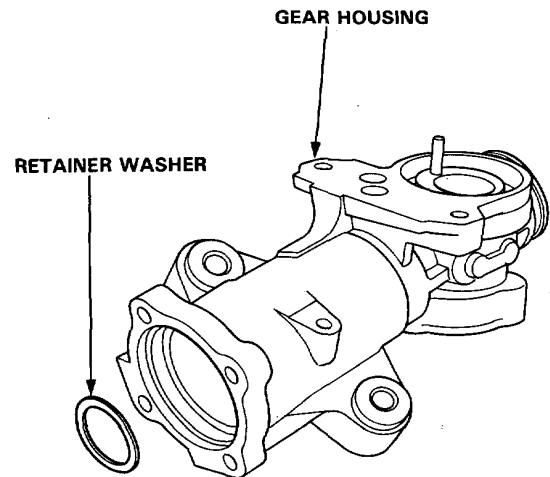
38. Fit the seal retainer on the steering rack.



39. Push the rack bushing B toward the seal retainer by hand until the cylinder end seal is seated in the retainer. Fit the seal stopper ring in the groove of the seal retainer securely. Then grease the steering rack.



40. Install the retainer washer on the gear housing.



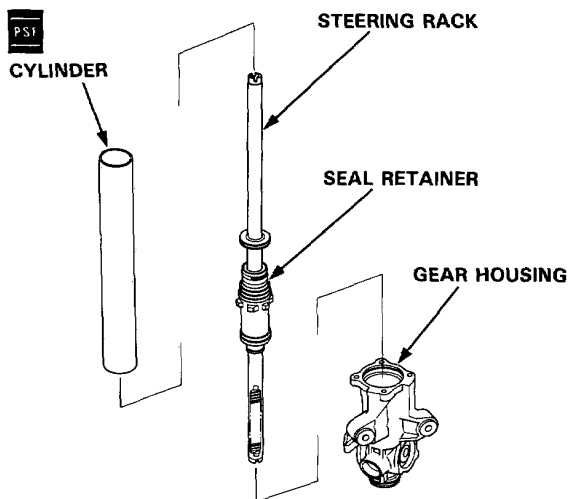
(cont'd)

# Steering Gearbox

## Overhaul (cont'd)

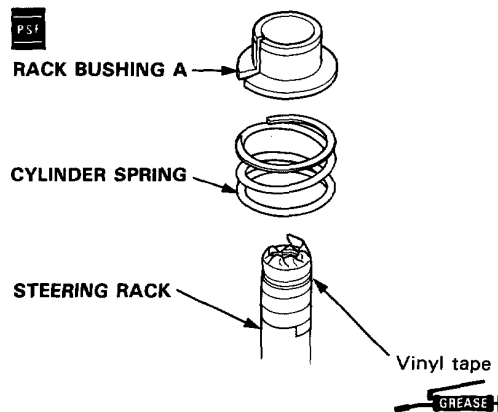
41. Place the gear housing on the work bench and insert the seal retainer and steering rack into the gear housing.

42. Coat the inside surface of the cylinder with power steering fluid, slide it over the rack and into the gear housing; press it into the housing until it seats.

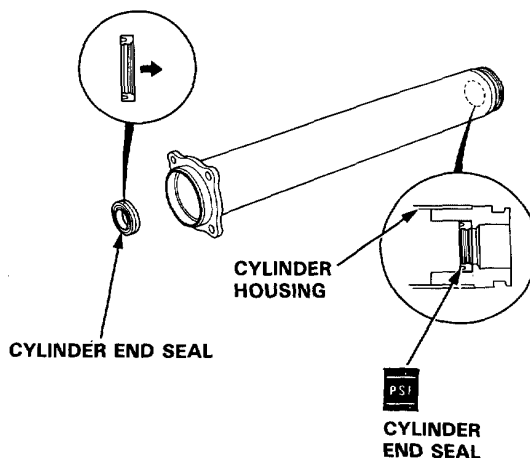


43. Install the cylinder spring over the rack, then coat the rack bushing A with power steering fluid and install it on the spring.

44. Wrap the end of the steering rack with vinyl tape. Coat the tape with grease.



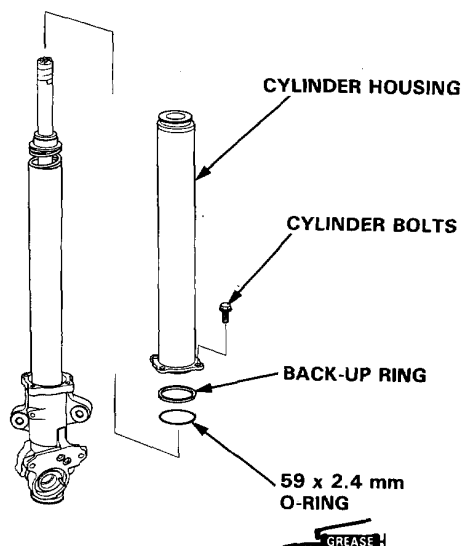
45. Coat the inside surface of the cylinder with power steering fluid and install the cylinder end seal with its grooved side facing out.



46. Install the O-ring and back-up ring on the gear housing.

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

**CAUTION:** Be careful not to damage the end seal in the cylinder housing.

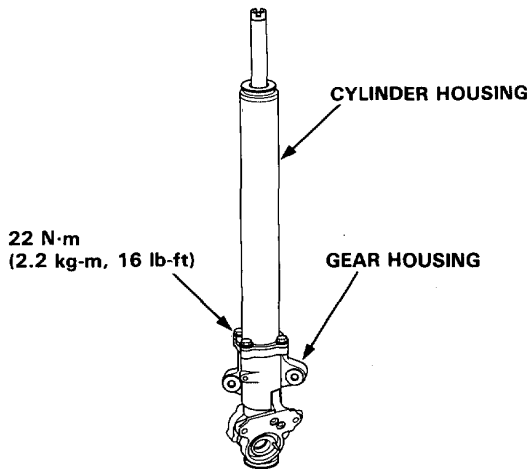




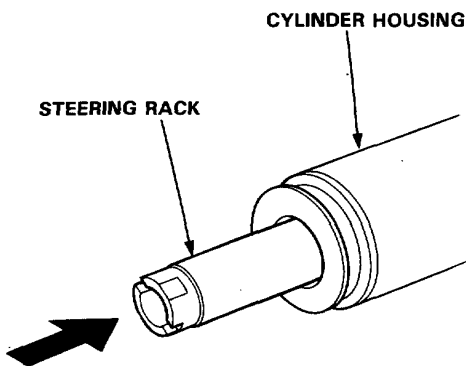
48. Remove the vinyl tape from the steering rack.

49. Tighten the cylinder housing to the gear housing.

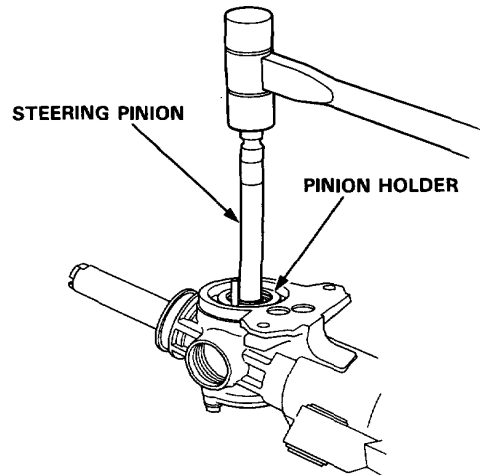
NOTE: Before tightening the bolts, make sure the mating surfaces of the cylinder and gear housing fit properly by pushing them together; hold them together while tightening the bolts.



50. Insert the steering rack into the cylinder housing, being careful not to damage the steering rack sliding surface.

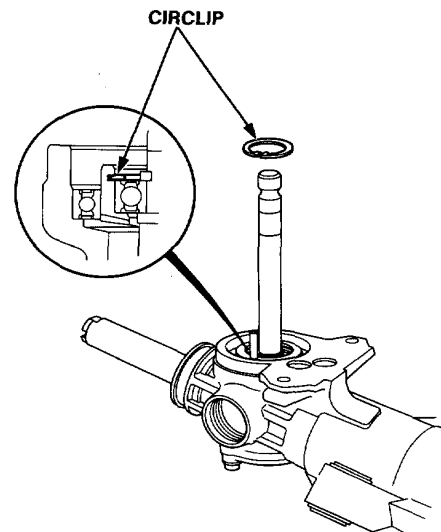


51. Install the steering pinion in the pinion holder.



52. Install the circlip securely in the pinion holder groove.

NOTE: Install the circlip with its tapered side facing out.

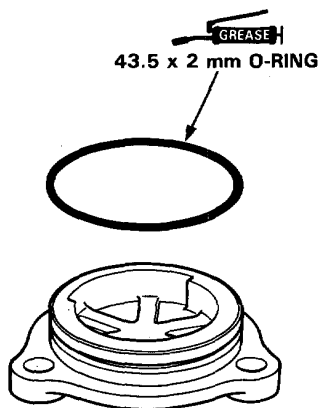


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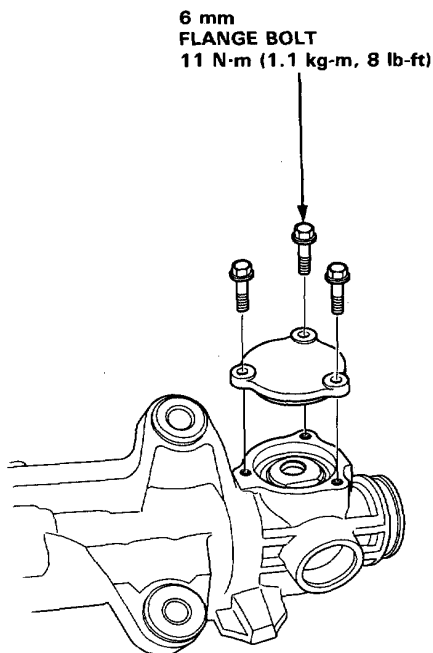
# Steering Gearbox

## Overhaul (cont'd)

53. Grease the new O-ring and install it in the groove in the gear housing cap.



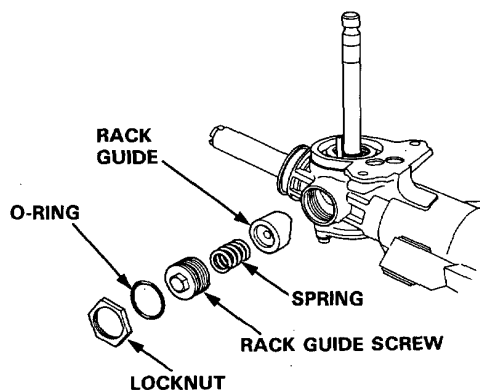
54. Tighten the three flange bolts.



55. Install the O-ring on the rack guide screw.

56. Coat the rack guide with grease.

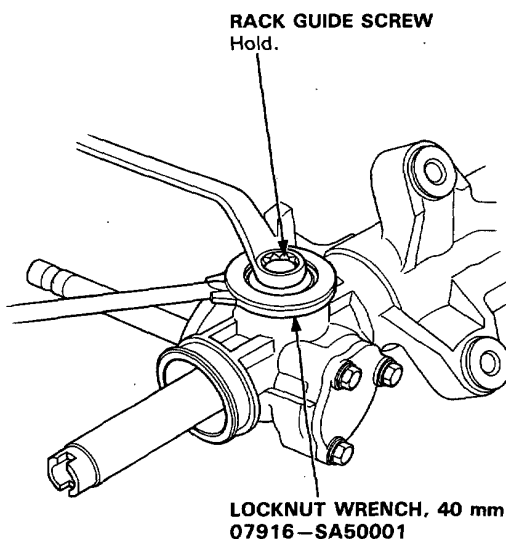
57. Install the rack guide, spring and rack guide screw on the gear housing.



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

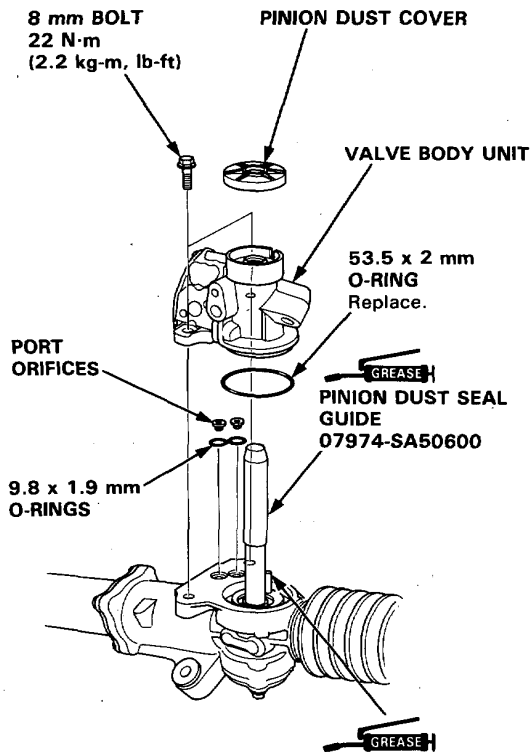
59. Retighten it to 4 N·m (0.4 kg-m, 2.9 lb-ft), back off about  $20^{\circ} \pm 5^{\circ}$  and install the locknut on the rack guide screw.

60. Tighten the locknut while holding the rack guide screw with the special tool.





61. Coat the 9.8 x 1.9 mm O-rings with grease, and install them together with the orifices.
62. Install the special tool onto the pinion shaft and coat the special tool with grease.
63. Coat the 53.5 x 2 mm O-ring and pinion holder pin with grease, and install the valve body unit.
64. Install the valve body unit on the gear housing with the two 8 mm bolts.

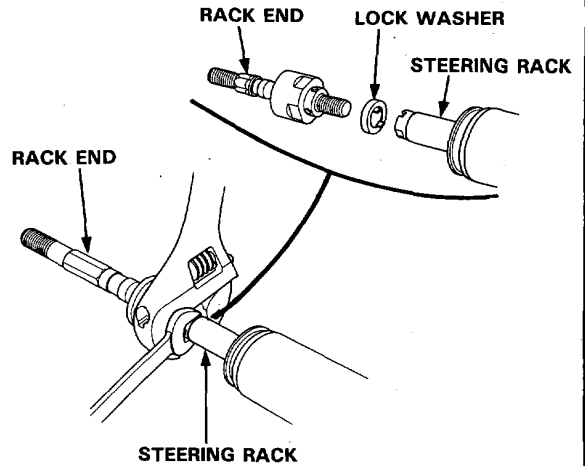


65. Remove the special tool.

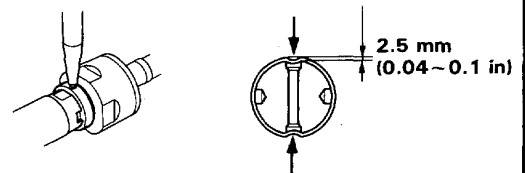
**CAUTION:**

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

66. Install the new lock washer in the groove in the steering rack.
67. Hold the steering rack with a wrench and tighten the rack end to 80 N·m (8.0 kg-m, 58 lb-ft).



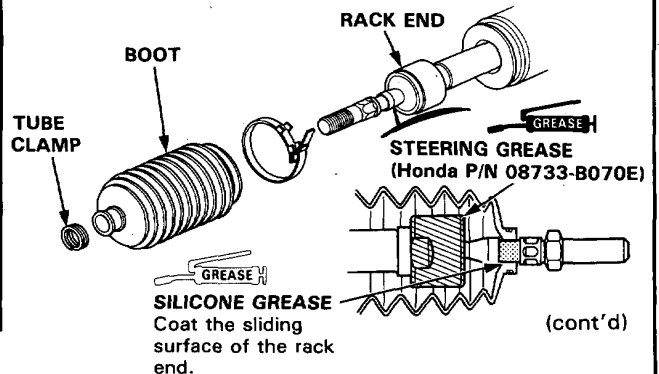
68. After tightening the rack end, stake the two sections of the lock washer.



69. Apply steering grease to the circumference of the rack end housing.
70. Install the boots on the rack end with the tube clamps.

**NOTE:**

- Coat the rack end groove and inside of the boot with silicone grease.



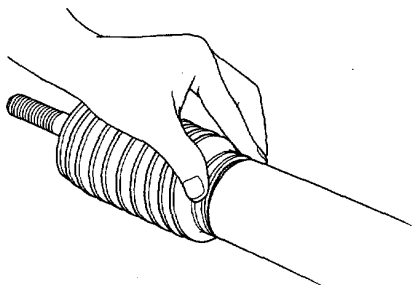
# Steering Gearbox

## Overhaul (cont'd)

71. Before installing the boot band, turn up the right and left dust seals at the gear housing side and adjust the pressure inside the dust seals to atmospheric pressure.

NOTE: Install the boot band with the rack in the straight ahead position (i.e. right and left tie-rods are equal in length).

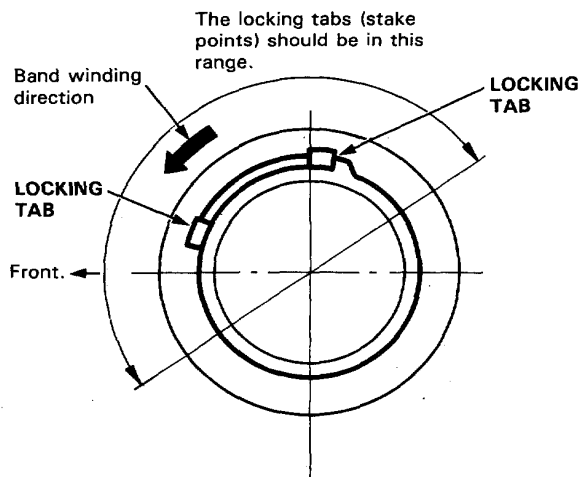
72. Install the boot band so that the locking tabs of the band (stake points) are in the range shown below. (Tabs should face up and slightly forward.)



### Left Dust Seal Installation:

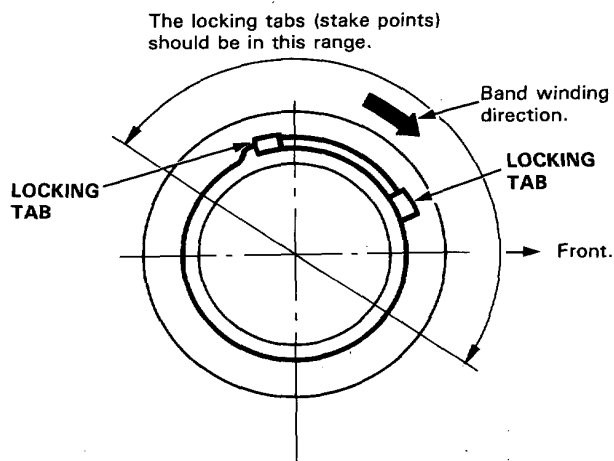
NOTE: When the car is the left-hand drive type, wind the boot band as shown below when viewed from the left side (i.e. gearbox side).

When the car is the right-hand drive type, wind the boot band in the same manner as the left-hand drive type when viewed from the left side (cylinder side).



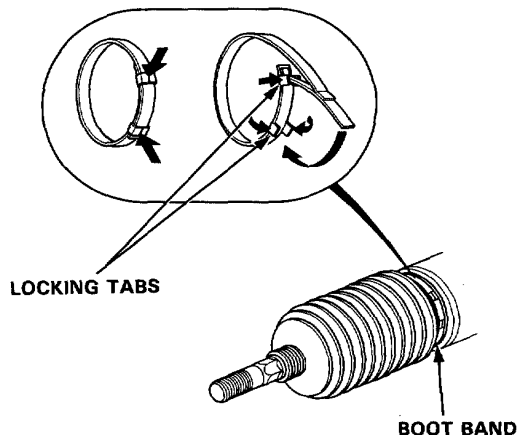
### Right Dust Seal Installation:

NOTE: When the car is the left-hand drive type, wind the boot band as shown below when viewed from the right side (i.e. cylinder side). When the car is the right-hand drive type, wind the band in the same manner as the left-hand drive type when viewed from the right side (gearbox side).



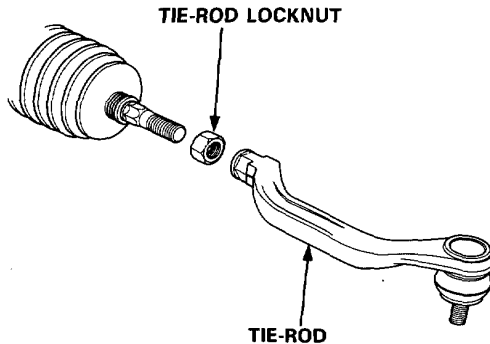
**CAUTION: Stake the band locking tabs firmly.**

73. Install new boot bands on the boot and bend both sets of locking tabs.
74. Lightly tap on the doubled-over portions to reduce their height.
75. After assembling, slide the rack right and left to be certain that the boots are not deformed or twisted.





76. Install the right and left tie-rods on the right and left rack ends.

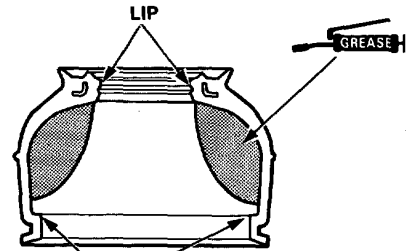


## Ball Joint Boot Replacement

1. Remove the circlip and the boot.

**CAUTION:** Do not contaminate the boot installation section with grease.

2. Pack the interior of the boot and lip with grease.

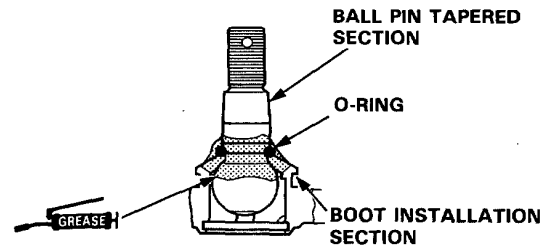


BOOT INSTALLATION SECTION

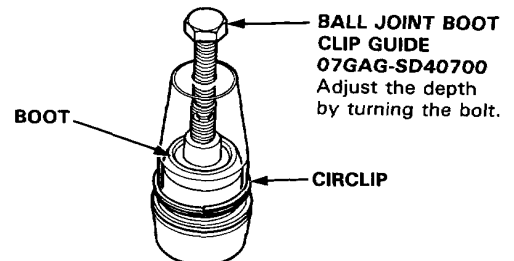
3. Wipe the grease off the sliding surface of the ball pin, then pack the lower area with fresh grease.

**CAUTION:**

- Keep grease off the boot installation section and the tapered section of the ball pin.
- Do not allow dust, dirt, or other foreign materials to enter the boot.



4. Install the boot in the groove of the boot installation section securely, then bleed air.
5. Insert the special tool into the threads in the ball pin and align the end of the bolt with the groove in the boot.
6. Slide the clip over the tool and into position.



**CAUTION:** After installing the boot, check the ball pin tapered section for grease contamination and wipe it if necessary.