

Steering

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SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

The VIGOR SRS includes a driver's side airbag, located in the steering wheel hub. In addition, the GS model has a front passenger's airbag located in the dashboard above the glove box. Information necessary to safely service the SRS is included in this Service Manual. Items marked with an asterisk (*) on the contents page include, or are located near, SRS components. Servicing, disassembling or replacing these items will require special precautions and tools, and should therefore be done by an authorized Acura dealer.

WARNING

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

NOTE The radio may have a coded theft protection circuit. Be sure to get the customer's code number before

- Disconnecting the battery
- Removing the No. 39 (10 A) fuse in the under hood fuse/relay box.
- Removing the radio

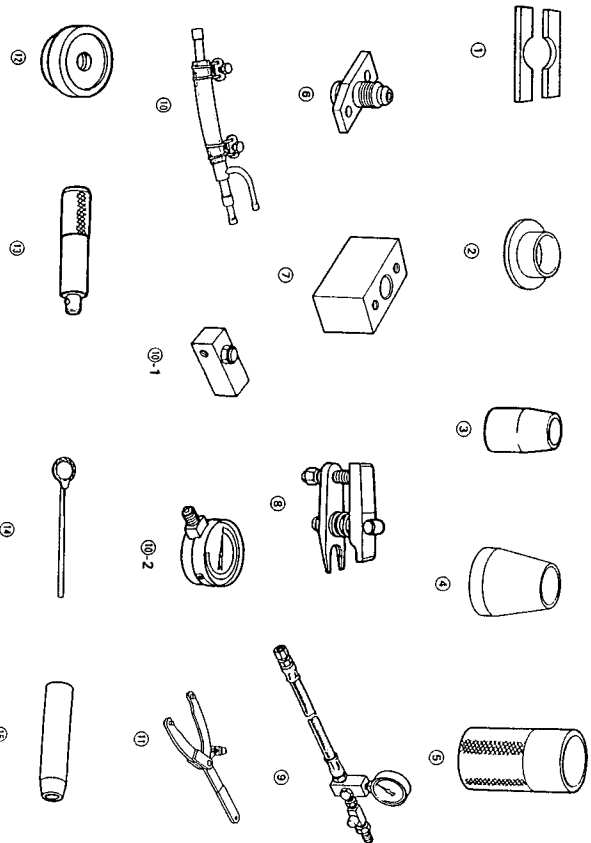
After service, reconnect power to the radio and turn it on. When the word "CODE" is displayed, enter the customer's 5 digit code to restore radio operation.



Special Tools

Ref. No.	Tool Number	Description	Qty	Page Reference
①	07GAF-SD40700	Hub Dis/Assembly Base	1	17-52
*②	07GAG-SD40300	Cylinder End Seal Slider	1	17-57, 58
*③	07GAG-SD40400	Cylinder End Seal Guide	1	17-59
④	07HAG-SF10100	Piston Seal Ring Guide	1	17-56
⑤	07HAG-SF10200	Piston Seal Ring Sizing Tool	1	17-56
⑥	07LAK-SM40110	P/S Joint Adapter (Pump)	1	17-18, 19
⑦	07LAK-SM40120	P/S Joint Adapter (Hose)	1	17-18, 19
⑧	07MAC-SL00200	Bail Joint Remover, 28 mm	1	17-40
⑨	07406-0010001	P/S Pressure Gauge	1	17-18, 19
⑩	07406-0010101	Bypass Tube Joint (Included with 07406-0010001)	1	17-11
⑩-1	07406-0010300	Pressure Control Valve	1	17-18, 19
⑩-2	07406-0010400	Pressure Gauge	1	17-18, 19
⑪	07725-0030000	Universal Holder	1	17-33
⑫	07746-0010300	Attachment, 42 x 47 mm	1	17-52, 54
⑬	07749-0010000	Locknut Wrench, 40 mm	1	17-54
⑭	07916-SA50001	Pinion Dust Seal Guide	1	17-17, 62
*⑮	07974-SA50600		1	17-48, 62

* Included in P/S Seal Tool kit 07GAG-SD40000
** Included in P/S Seal Tool kit 07900-SA50000



Component Location

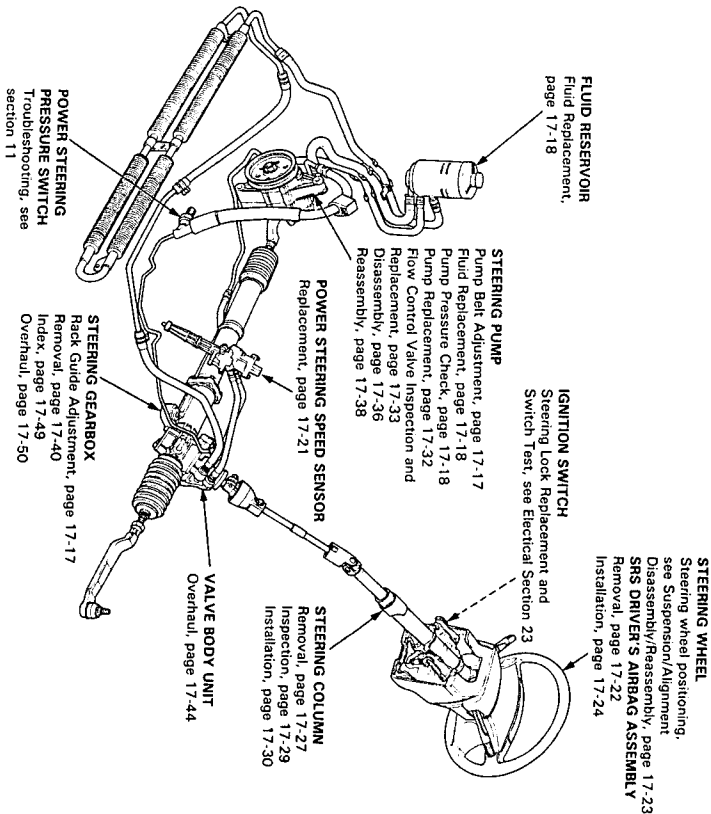
Illustrated Index

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 keep the steering shaft from turning.
- After installing the gearbox, check the wheel alignment and adjust if necessary.

CAUTION:

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- When disconnecting the SRS wire harness, install the short connector(s) on the airbag(s), then disconnect the wire harness (see page 23-330).
- Replace the entire affected SRS harness assembly if there is an open circuit or damage to the wiring.



System Description

Fluid Flow Diagram

The reservoir supplies power steering fluid to the pump; the pump pressurizes the fluid to about 8,000 kPa (80 kg/cm², 1,138 psi), and delivers it through a high pressure hose to the valve body unit on the gearbox.

The 4-way valve (in the valve body 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 valve body unit controls the amount of the assist by regulating the stroke of the 4-way valve.

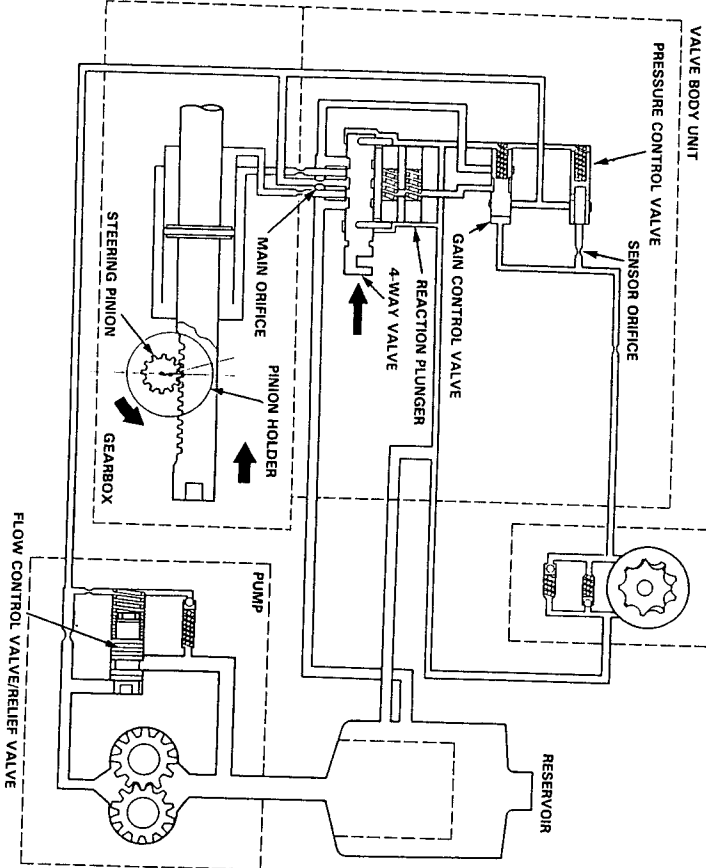
The operation of the gain control valve is effected by the fluid pressure, which is regulated by the pressure control valve, sensor orifice and power steering speed sensor.

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 power steering 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.

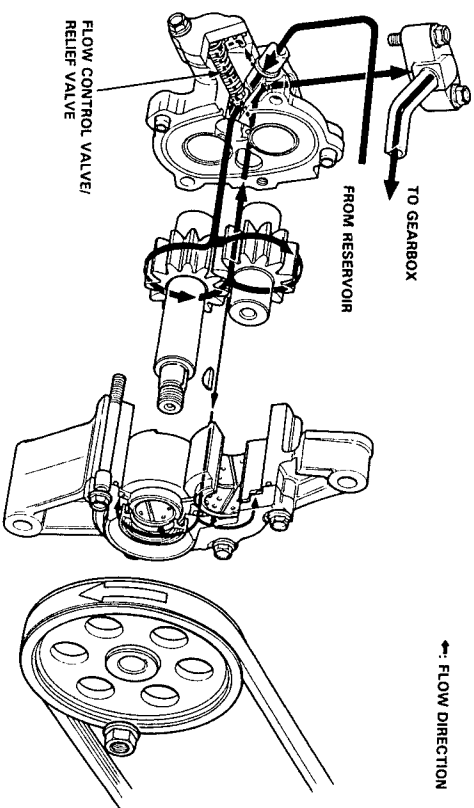
Therefore, the assist varies by regulating the fluid pressure in the valve body unit according to the speed of car.

Fluid returning from the power cylinder flows back through the 4-way valve and out to the reservoir through the cooler.



Steering Pump

The power steering pump is mounted at the right front corner of the engine and is driven by a V-belt from the crankshaft pulley. It uses a combination flow-control valve/relief valve to keep output pressure between 8,000—9,000 kPa (80—90 kg/cm², 1,135—1,280 psi). The pump is made of aluminum to reduce its weight and help it run cooler. It uses a pressure balance system which allows fluid pressurized by the pump to flow behind two "floating" plungers, automatically maintaining the correct clearance between the other ends of the plungers and the pump gears. This not only increases pump efficiency but also improves durability, since the plungers can move to compensate for the expansion caused by high temperatures; otherwise the clearance would decrease, allowing more rapid pump wear.



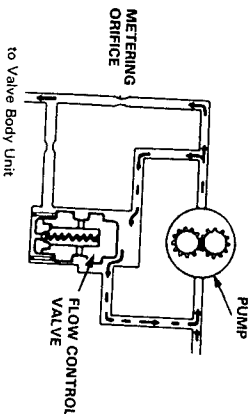
System Description

Steering Pump (cont'd)

Flow Control Valve

Fluid from the pump runs through a metering orifice to the valve body unit. This creates a pressure difference between the pump and valve body 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 valve body unit.

FLOW CONTROL VALVE OPEN:

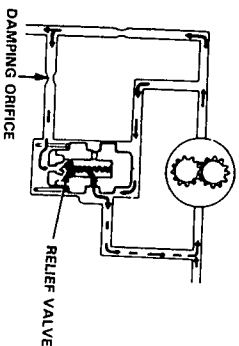


Pressure Relief Valve

As pressure on the valve body 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 8,000–9,000 kPa (80–90 kg/cm², 1,138–1,280 psi).

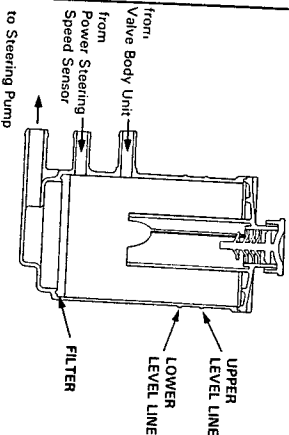
RELIEF VALVE OPEN:



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.



Reservoir Capacity 0.5 liter
(0.5 US qt., 0.4 imp. qt.)
System Capacity 1.8 liter
(1.9 US qt., 1.6 imp. qt.)

4-Way Valve

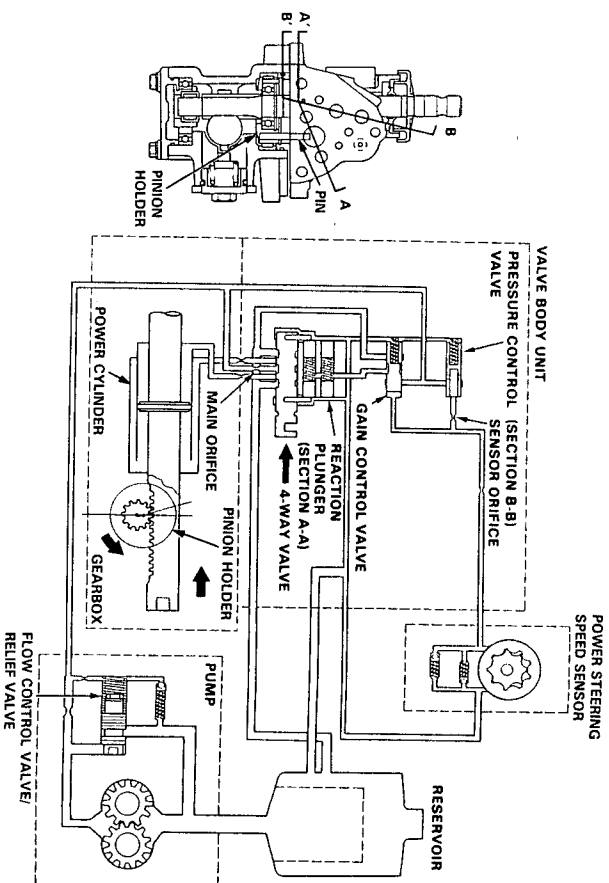
Mounted on the lower side of the gearbox is a 4-way valve that is moved horizontally by a pin on the pinion holder to shift fluid pressure to the right or left side of the power cylinder when the steering wheel is turned.

It has thrust pins at both ends, and two interconnected 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 4-way 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.



(cont'd)

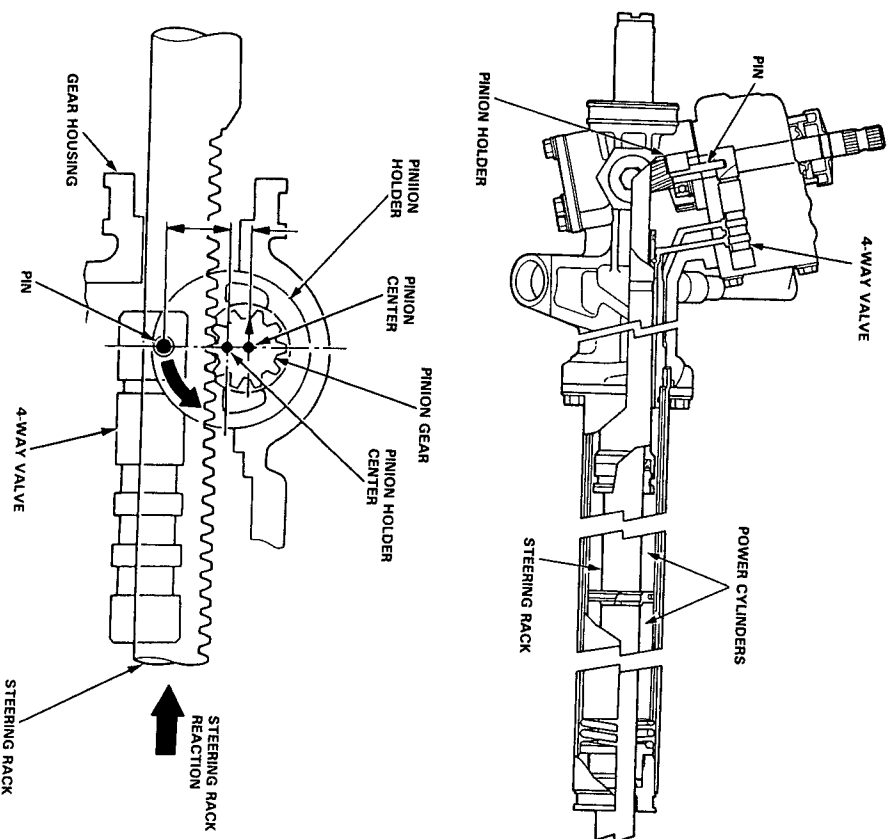
System Description

4-Way 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 cylinders.

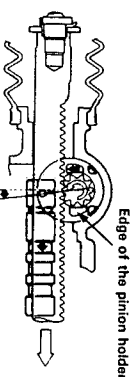
The back edges of the pinion holder (facing away from the rack) hit the stops cast into both sides of the gear housing to avoid pushing the 4-way valve too far in either direction. The front edge of the pinion holder cuts off assist at full lock as described on the next page.



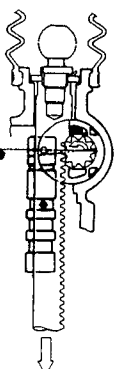
Full-Lock Unloader System

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.



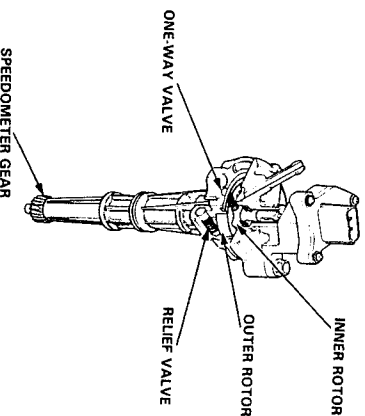
Control in "assist" position



4-Way valve moves back to "neutral" position

Power Steering Speed Sensor

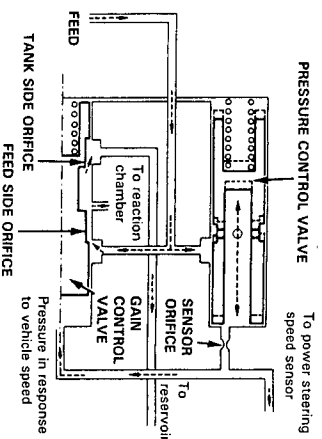
The power steering speed sensor is a trochoid-rotor, hydraulic pump combined with a relief valve and a one-way valve. It is driven by the speedometer gear shaft, which in turn is driven by a helical gear on the differential.



The power steering 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 power steering speed sensor through the sensor orifice, the pressure downstream of the orifice is changed according to the speed of the car.

This pressure is then used to operate the gain control valve.



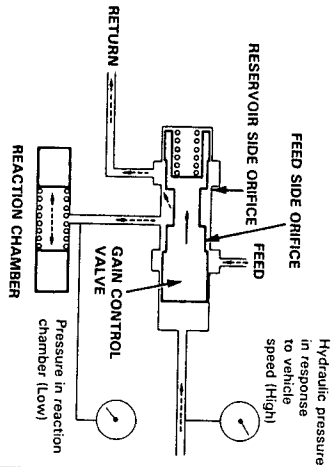


System Description

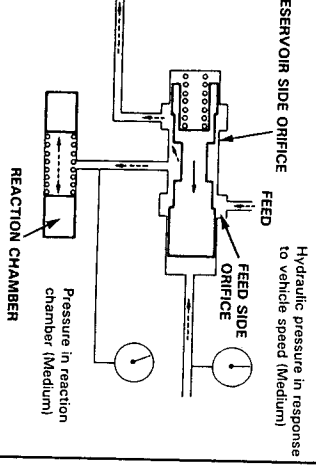
Power Steering Speed Sensor (cont'd)

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.

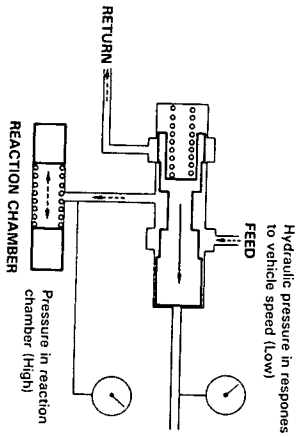
On the gain control valve, the orifice resistance is high on the pump side, while it is low on the reservoir side, with the result that pressure in the reaction chamber is lowered and the steering wheel operates with easily.



As the car is driven away, 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, and the orifice resistance on the pump and reservoir sides is appropriately balanced, with the result that the reaction chamber is in the medium range and the steering resistance is moderate.

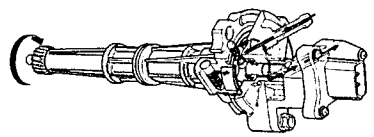


When the car is moving at high speed, the sensor reduces the pressure further and the gain control valve moves right. The orifice pressure on the pump side is low, and the pressure on the reservoir side is high, and the fluid pressure in the reaction chamber is also high, giving the steering wheel less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

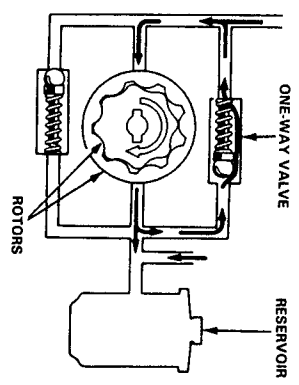


One-way Valve (In Power Steering Speed Sensor)

When the car is moving at high speed, negative pressure develops at the sensor inlet because the power steering 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.

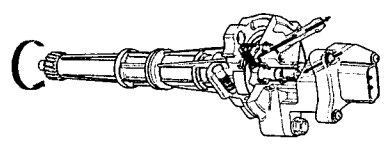


Driving at High Speed:

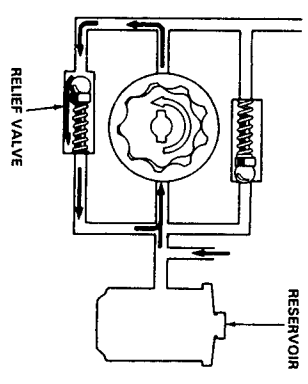


Relief Valve (In Power Steering Speed Sensor)

When the car is moving in reverse, the power steering 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 the sizes and air pressure correct?
- Is the steering wheel original equipment or equivalent?
- Is the power steering pump belt properly adjusted?
- Is the steering fluid reservoir filled to proper level?
- Is the engine idle speed correct and steady?

Hard Steering

Little or no assist in both directions with car parked.

Check for bubbles in power steering fluid.

If there are bubbles, check the reservoir input side hose and pump front seal for air leaks. Repair as necessary.

If there are no bubbles, check if assist improves when engine speed is increased to 3,000 rpm.

If assist does not improve, measure the force required to turn the wheel with the power steering speed sensor hose plugged and the car parked (see page 17-20).

If assist improves, check the flow control valve for internal leaking, and clean or replace as necessary (see page 17-33). If the valve is OK, replace the steering pump.

Assist in one direction only, little or no assist in the other.

Remove the valve body unit and check the pinion pin for free movement. If OK, check the 4-way valve for free movement (see page 17-44). Repair as necessary.

Steering effort below normal. Check fluid pressure, using power steering gauge with shut-off valve closed (see page 17-18).

Fluid pressure below 8,000 kPa (80 kg/cm², 1,138 psi).

Fluid pressure 8,000–9,000 kPa (80–90 kg/cm², 1,138–1,280 psi).

Check the flow control valve for internal leaking, and clean or replace as necessary (see page 17-33). If the valve is OK, replace the pump.

The power steering speed sensor is leaking internally; replace the power steering speed sensor (see page 17-21).

Uneven or rough steering

Belt slipping on the pulley.

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

Gain control valve sticking or leaking.

Check the gain control valve; clean or replace the gain control valve or valve body 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 section 11).

Air in reserve, or low power steering fluid level.

Check the power steering fluid level. If level is excessively low, check for leaks in the system. Add the 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 the rack guide (see page 17-17).

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



Troubleshooting

General Troubleshooting (cont'd)



Shock or vibration when wheel is turned to full lock.

Pump belt slipping on pulley (pump stops momentarily).

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

Install the power steering pressure gauge. Close the shut-off valve fully, and measure the pump pressure (see page 17-18).

The pump pressure should be 8,000–9,000 kPa (80–90 kg/cm², 1,138–1,280 psi) with needle fluctuation of ± 500 kPa (± 5 kg/cm², ± 70 psi) or less. If the needle fluctuation exceeds ± 500 kPa (± 5 kg/cm², ± 70 psi), check the flow control valve. If the flow control valve is OK, replace the pump.

Assist (excessively light steering) at high speed.

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

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

Pump belt slipping.

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

Sticking gain control valve or control valve.

Replace the gain control valve or valve body unit.

Rack guide adjusted too loose.

Adjust the rack guide (see page 17-17).

Tire pressure too low.

Inflate to correct pressure.

Improper front wheel alignment.

Readjust the front wheel alignment, or replace parts as necessary.

Improperly adjusted rack guide.

Adjust the rack guide (see page 17-17).

Wheel will not return smoothly.

Noise and Vibration

NOTE: Pump noise in first 2–3 minutes after starting in cold weather (–20°C, –4°F or colder) is normal.

Humming

Humming due to pulsation of fluid is normal, particularly when wheel is turned with car stopped.

If equipped with Automatic transmission, the hum could be torque converter or pump noise. Confirm by temporarily removing pump belt.

High pressure line touching the frame. Reposition the line.

Belt slipping. Tighten or replace the belt.

Squeaking

Pinion shaft seal not lubricated. Grease the pinion shaft seal.

Burrs on the pinion gear. Replace the pinion gear.

NOTE: A single "clunk" may be a normal amount of linkage clearance. To distinguish this type of clunk, turn the wheel back and forth with the engine OFF.

Loose pump pulley. Tighten or replace the pulley. If shaft is loose, replace the pump.

Loose steering shaft connector, tie rod, or ball joint. Check and tighten, or replace parts as necessary.

Column shaft wobbling. Replace the column assembly.

Lines or hoses from the valve body unit touching each other. Reposition lines so they don't touch.

Noise from the valve body unit. Replace the valve body unit.

NOTE: Pump noise up to 2.3 minutes after starting in cold weather (–20°C, –4°F or colder) is normal. Compare pump noise at operating temperature to another car. If pump noise is abnormally loud, check the pump drive and driven gears (see page 17-37).

Check fluid level. If low, fill reservoir to proper level, and check for leaks. Tighten or replace as necessary.

Cavitation caused by air bubbles in fluid. Check for crushed suction hose or a loose hose clamp allowing air into the system. Tighten or replace as necessary.

Grating noise from pump

Pump gear noise

Hissing

Rattle or chattering

Fluid Leaks



Pump Belt Adjustment

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

Rack Guide Adjustment

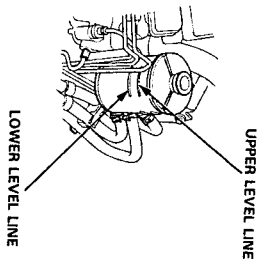
4. Check for tight or loose steering through the complete turning travel.
5. Recheck steering assist (see page 17-20).

On-Car Checks

Fluid Replacement

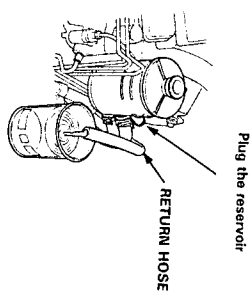
Fluid Level Inspection

Check the power steering fluid level with the engine cold and the car parked on level ground. Make sure the fluid level is between the UPPER and LOWER level line on the reservoir. If the level is near or below the lower level line, check the system for leaks. If the system is not leaking and fluid level is low, add fluid to the upper level line.



Fluid Replacement

1. Disconnect the return hose from the gearbox at the reservoir, and put the end in a suitable container.
2. Start the engine, let it run at idle, and turn the steering wheel from lock-to-lock several times. When fluid stops running out of the hose, shut off the engine. Discard the fluid.



3. Refit the return hose on the reservoir.
4. Fill the reservoir to the upper level line.

NOTE: Take care not to spill the fluid on the body and parts. Wipe off any spilled fluid at once.

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

System Capacity:

1.8 liter (1.9 US qt., 1.6 Imp. qt.)

Reservoir Capacity:

0.5 liter (0.5 US qt., 0.4 Imp. qt.)

5. Start the engine, let it run at idle, then turn the steering wheel lock-to-lock several times to bleed air from the system.
6. Recheck the fluid level, and add fluid if necessary.

CAUTION: Do not fill the reservoir beyond the upper level line.

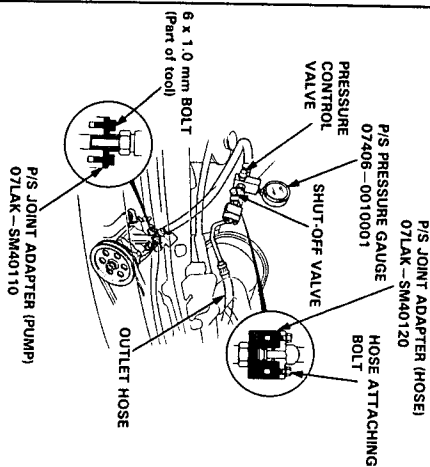
Pump Pressure Check

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 so as 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 adapter on the pump outlet.
2. Connect the hose joint adapter to the power steering pressure gauge, then connect the outlet hose to the adapter.
3. Install the power steering pressure gauge to the pump joint adapter as shown.

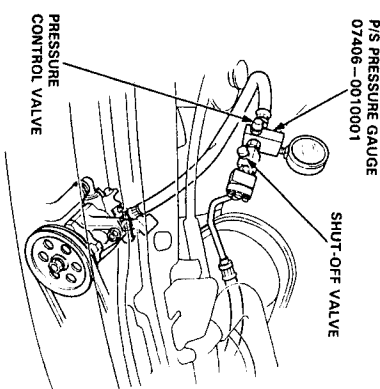


4. Open the shut-off valve fully.
5. Open the pressure control valve fully.

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

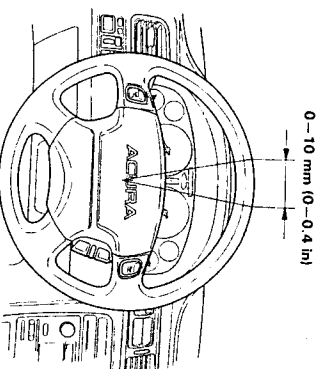
If the pump is in good condition, the gauge should read at least 8,000–9,000 Kpa (80–90 kg/cm², 1,138–1,280 psi). A low reading means pump output is too low for full assist. Repair or replace the pump.



On-Car Checks

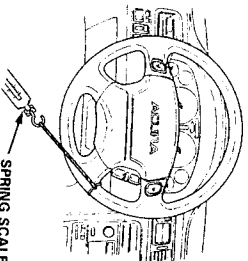
Steering Wheel Rotational Play

1. Place the front wheels in the 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.

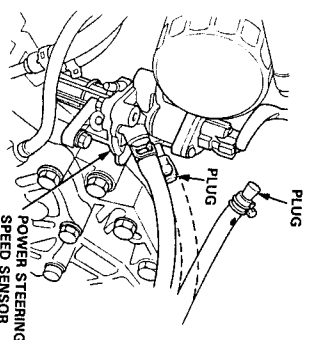


Power Assist Check with Car Parked

1. Check the power steering fluid level and pump belt tension.
2. Start the engine, let it warm up to normal operating temperature (the cooling fan comes on), and turn the steering wheel from lock-to-lock a few 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.



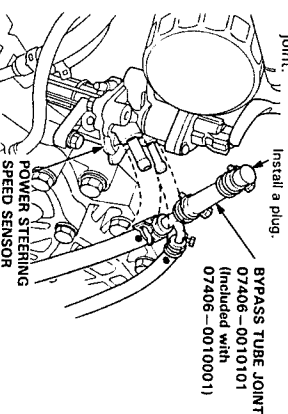
4. The scale should read no more than 32 N (3.2 kg, 7.1 lbs). If it reads more or less, go on to step 5.
5. Stop the engine. Disconnect the hose from the power steering speed sensor, and plug the hose and the sensor fitting as shown.



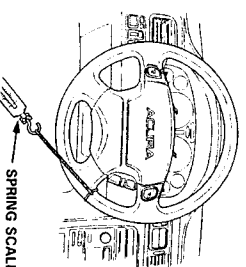
6. Start the engine, and let it idle.
 - If the reading is now 32 N (3.2 kg, 7.1 lbs) or less, replace the power steering speed sensor (see page 17-21).
 - If the reading is still more than 32 N (3.2 kg, 7.1 lbs), check the gearbox and pump.

Assist Check at Road Speed

1. Check the power steering fluid level (see page 17-18), and check the pump belt tension (see page 17-17).
2. Start the engine, let it warm up to normal operating 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 30 mph (50 km/h), disconnect the hoses from the power steering speed sensor and connect them to the bypass tube joint. Plug the end of the bypass tube joint.



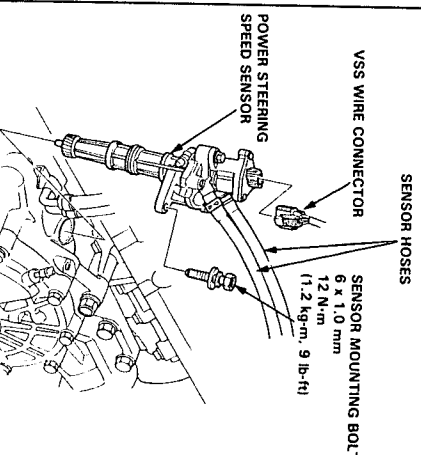
4. Attach the spring scale to the steering wheel. With the engine idling and the car on a clean, dry floor, pull the scale as shown and read it as soon as the tires begin to turn.



- If the scale reads a normal 50 N (5.0 kg, 11.0 lbs), or more, the assist problem at high speeds is being caused by reduced power steering speed sensor output. Replace the power steering speed sensor.
- If the scale reads less than 50 N (5.0 kg, 11.0 lbs), the power steering speed sensor is OK, and the problem is in the sensor feed line, the pump, or the valve body unit. See if the feed line is pinched or bent, then check the pump.
- See General Troubleshooting (see page 17-12).

Power Steering Speed Sensor Replacement

1. Disconnect the Vehicle Speed Sensor (VSS) wire connector from the power steering speed sensor.
2. Remove the sensor mounting bolt and pull the power steering speed sensor from the differential housing.
3. Disconnect the sensor hoses and plug the fittings.



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



Steering Wheel

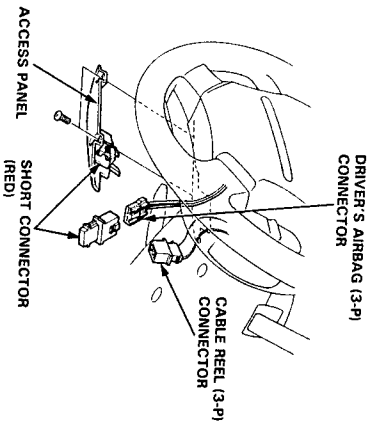
Removal

Driver's Airbag Removal

CAUTION:

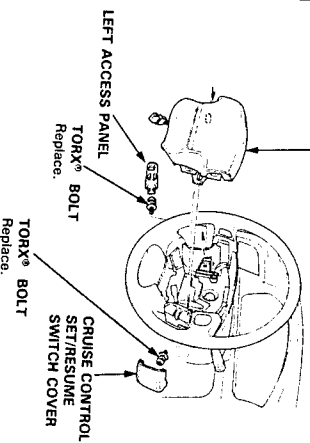
- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Before disconnecting the SRS wire harness, install the short connector(s) on the airbag(s) (see page 23-330).
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.

1. Disconnect the negative and positive cables from the battery.
2. Remove the access panel from the steering wheel lower cover, then remove the short connector.
3. Disconnect the connector (3-P) between the driver's airbag and cable reel.
4. Connect the short connector to the driver's airbag side of the connector.

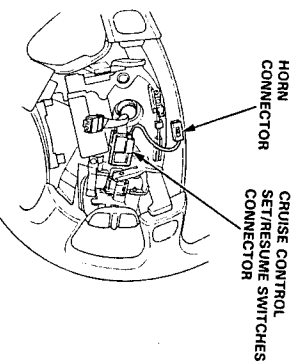


5. Remove the left access panel and cruise control set/resume switch cover.
6. Remove the two TORX® T30 bit bolts, then remove the driver's airbag assembly.

DRIVER'S AIRBAG ASSEMBLY

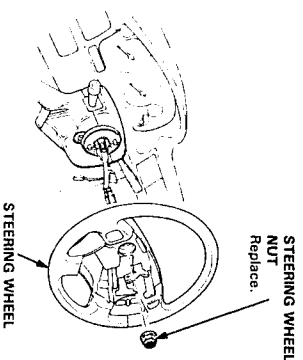


7. Disconnect the connectors from the horn and cruise control set/resume switches.



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.

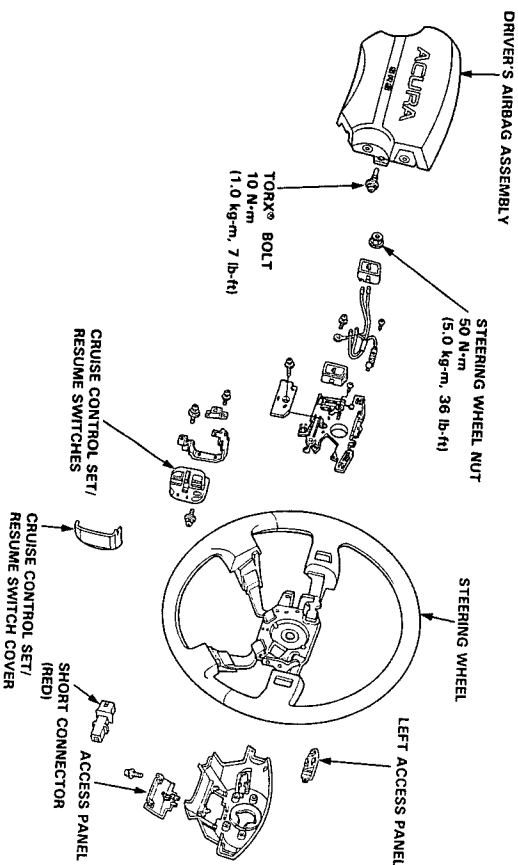


Steering Wheel Disassembly/Reassembly

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

NOTE: If an intact driver's 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 driver's 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(s) on the airbag(s) when the harness is disconnected.
 - Do not disassemble or tamper with the driver's airbag assembly.



Installation

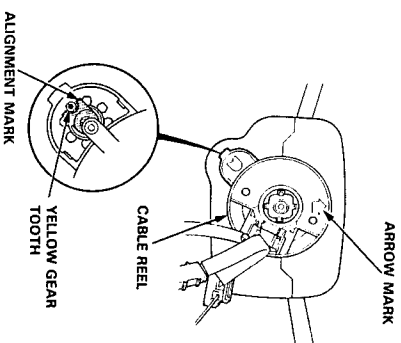
Airbag Installation

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. (Use only 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.

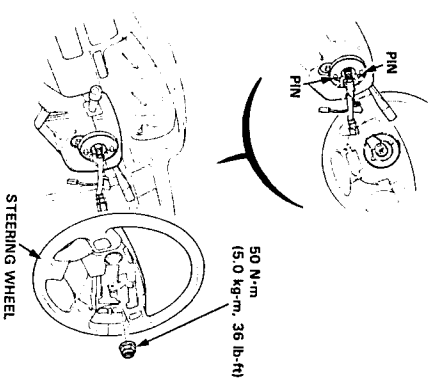
WARNING Confirm that the driver's airbag assembly is securely attached to the steering wheel; otherwise, severe personal injury could result during driver's airbag deployment.

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 alignment mark on the cover.
— The arrow mark on the cable reel label points straight up.

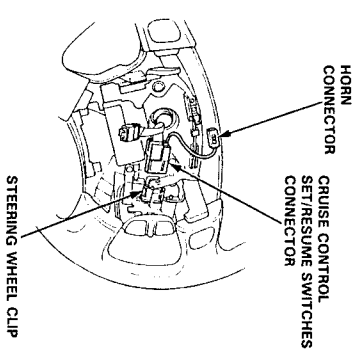


2. Install the steering wheel, and tighten the steering wheel nut.

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



3. Insert the cruise control set/resume switches connector into the steering wheel clips.
4. Connect the horn connector.



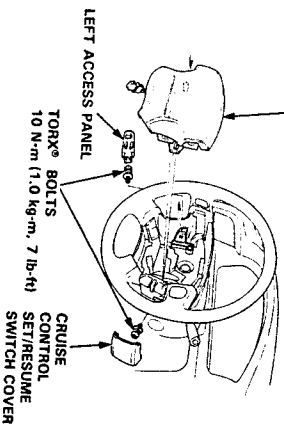
(cont'd)

Steering Wheel

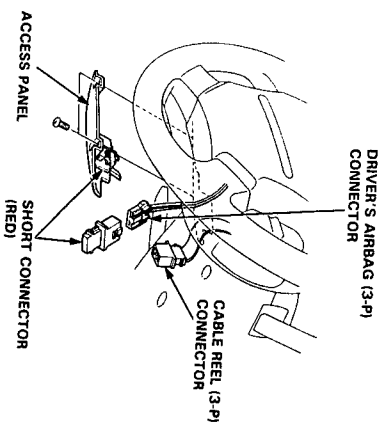
Installation (cont'd)

5. Install the driver's airbag assembly with new TORX® bolts.

DRIVER'S AIRBAG ASSEMBLY

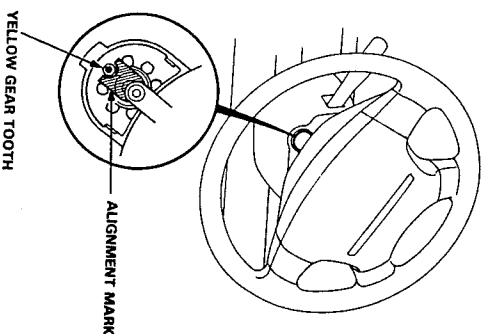


6. Disconnect the short connector from the driver's airbag connector.
7. Connect the driver's airbag (3-P) connector and cable reel (3-P) connector.
8. Attach the short connector on the access panel, and install the access panel on the steering lower cover.



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 six 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.



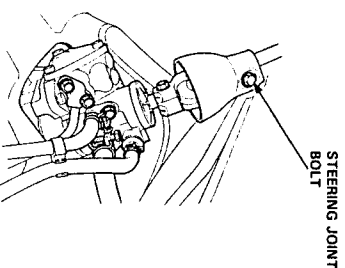
Steering Column

Removal

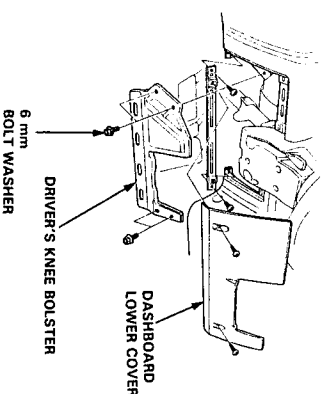
CAUTION:

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- When disconnecting the SRS wire harness, install the short connector(s) on the airbag(s), then disconnect the wire harness (see page 23-330).
- Replace the entire affected SRS harness assembly if there is an open circuit or damage to the wiring.

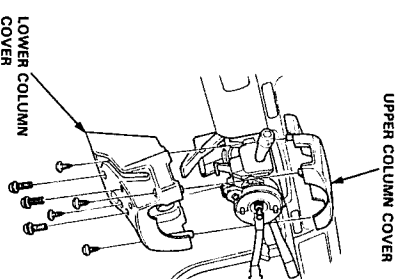
1. Remove the driver's airbag assembly and steering wheel (see page 17-22).
2. Remove the steering joint bolt. (from the engine compartment.)



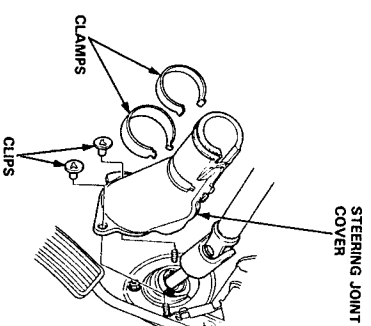
3. Remove the dashboard lower cover and driver's knee bolster.



4. Remove the upper and lower column covers.



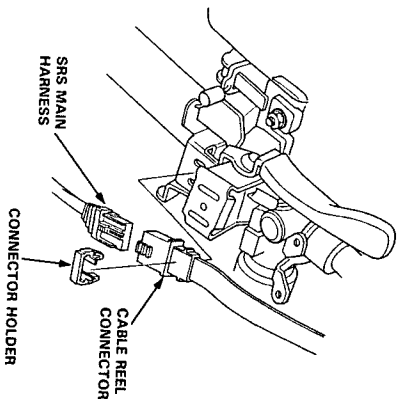
5. Remove the steering joint cover.



(cont'd)

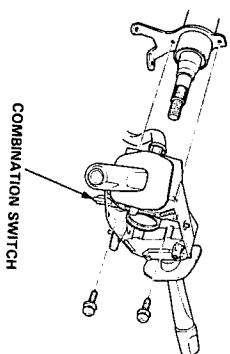
Steering Column Removal (cont'd)

6. Disconnect the cable reel connector from the SRS main harness, then remove the connector holder.

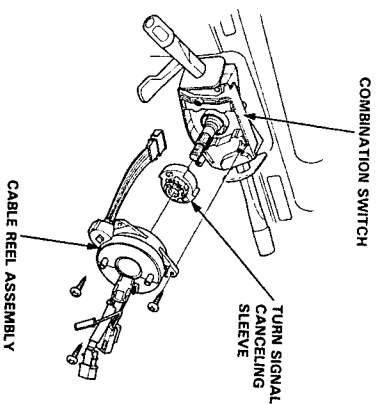


8. Remove the combination switch.

NOTE: After removing the combination switch, place it on the floor gently. Do not disconnect the cables from the combination switch.

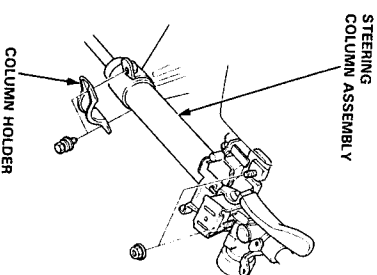


7. Remove the cable reel assembly and turn signal cancelling sleeve from the combination switch.

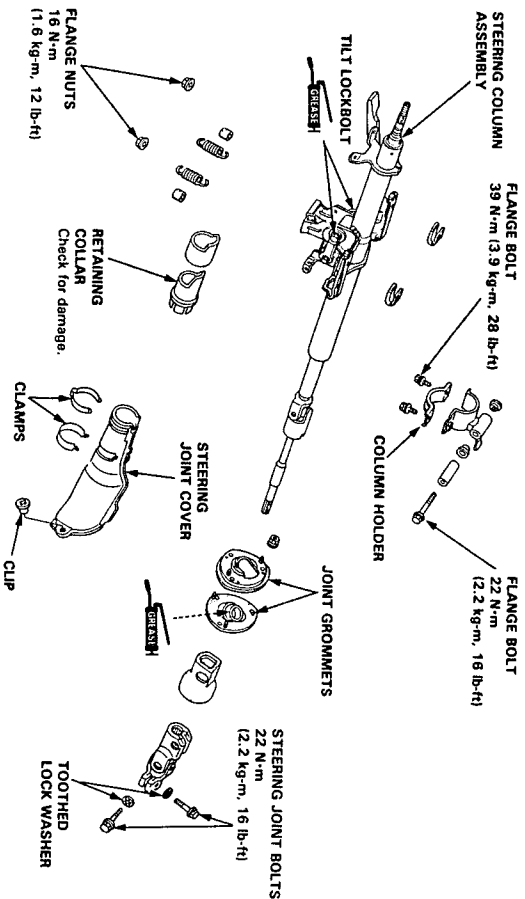


9. Disconnect the wire connector of the ignition switch.

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



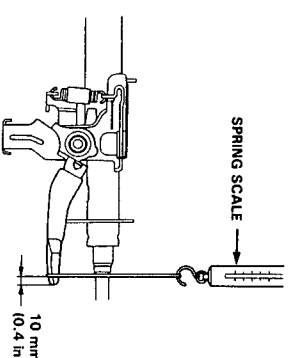
Inspection



NOTE: Check the tilt mechanism, steering joint bearings and steering shaft for proper movement and damage. Replace as an assembly if damaged or faulty.

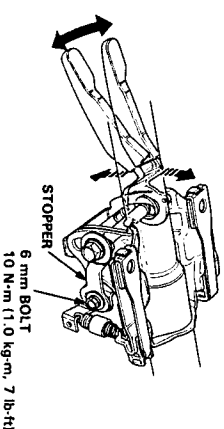
- Attach a spring scale to the knob of the tilt lever. Measure the force required to move the lever.

Preload: 70–90 N (7–9 kg, 15–20 lbs)



- If the preload measured is not within the specification, remove the 6 mm bolt and stopper. Then adjust the preload by tightening or loosening the tilt lock bolt.

- Reinstall the stopper and 6 mm bolt, and recheck the preload.



Steering Column

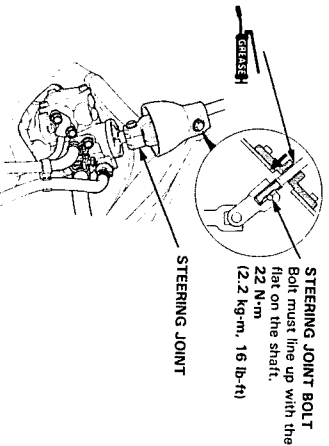
Installation

CAUTION:

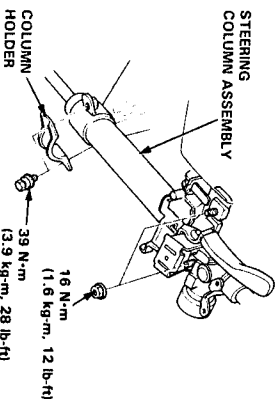
- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Before disconnecting the SRS wire harness, install the short connector(s) on the airbag(s) (see page 23-330).
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.

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.
1. Guide the steering shaft through the engine bulkhead. Align the bolt hole in the steering joint with the slot in the steering shaft, and insert the shaft into the steering joint.

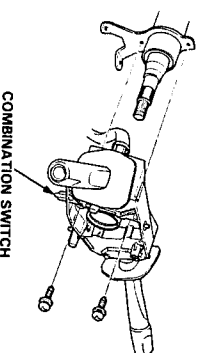


3. Install the steering column assembly with the nuts and column holder.
4. Connect the ignition switch connector.

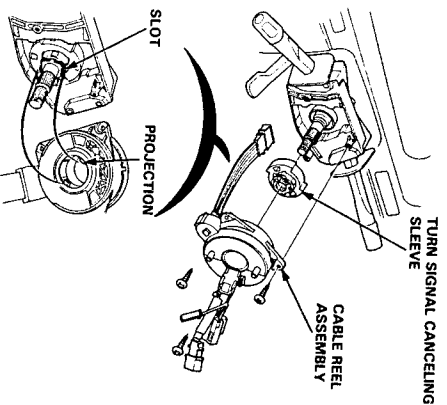


5. Install the combination switch.

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

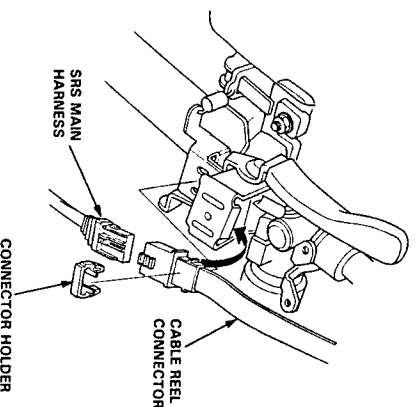


6. Install the turn signal canceling sleeve and cable reel onto the steering column.

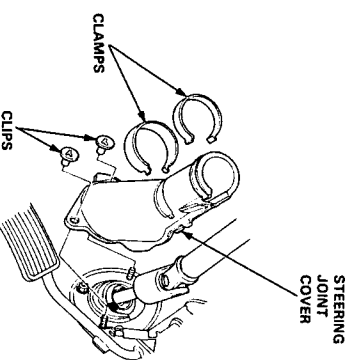


NOTE: Align the slot in the canceling sleeve with the projection on the cable reel.

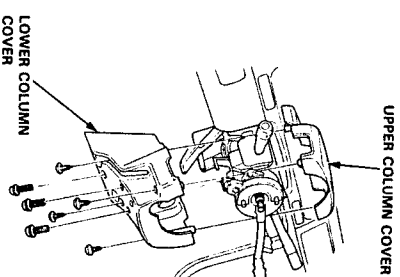
7. Connect the cable reel connector to the SRS main harness, then install the connector holder.



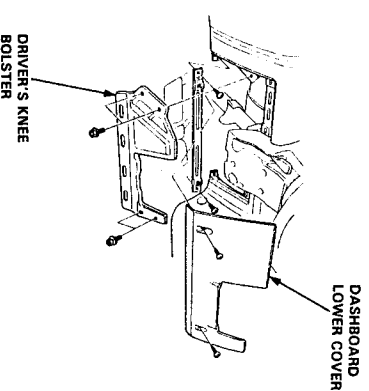
8. Install the steering joint cover with the clamps and clips.



9. Install the upper and lower column covers.



10. Install the driver's knee bolster and dashboard lower cover.



11. Install the steering wheel and driver's airbag assembly (see page 17-24).

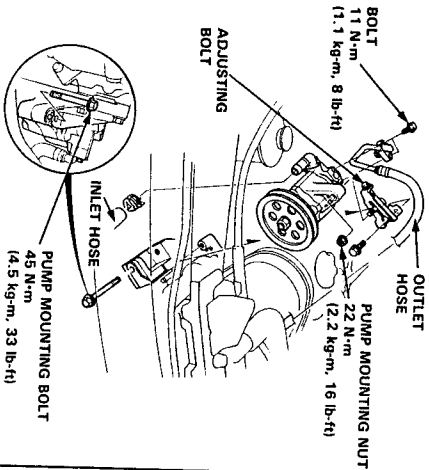


Steering Pump Replacement

Replacement

NOTE: Before disconnecting the hoses from the pump, place a suitable container under the car.

1. Drain the power steering fluid from the reservoir.
2. Remove the air cleaner cover and intake air duct (see section 11).
3. Disconnect the inlet and outlet hoses from the pump, and plug them.
4. Remove the power steering pump belt by loosening the pump mounting bolt, nut and adjusting bolt.
5. Remove the pump mounting bolt and nut, then remove the pump.

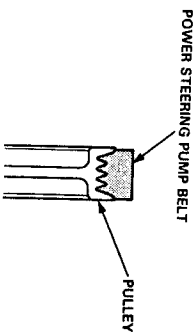


NOTE: Do not turn the steering wheel while the pump is removed.

6. Loosely install a new pump on the bracket.
7. Connect the inlet and outlet hoses to the pump.
8. Install and adjust the power steering pump belt (see page 17-17).

CAUTION:

- Make sure that the pump belt is securely on the groove of the pulleys.
- Do not get power steering fluid or grease in the pump belt or pulley faces. Clean off any fluid or grease before installation.

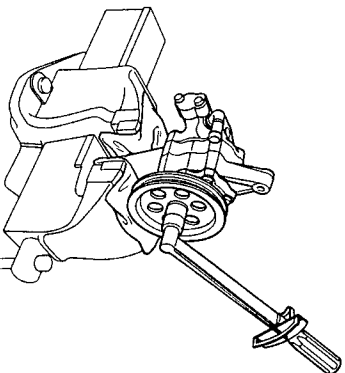


9. Fill the reservoir to the upper level (see page 17-18).

NOTE: Take care not to spill the fluid on the body and parts. Wipe off any spilled fluid at once.

Check the pump preload with a torque wrench after overhauling a pump or installing a replacement pump.

Preload: 8 N·m (0.8 kg-m, 5.8 lb-ft) max.

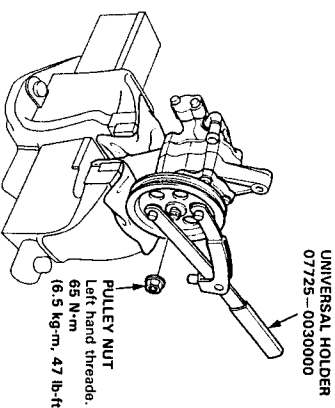


Pulley Replacement

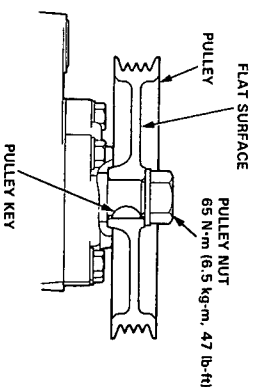
CAUTION: Be careful not to damage the pump housing with the jaws of the vise.

1. Drain the fluid from the steering pump.
2. Hold the steering pump in a vise with soft jaws, and hold the pulley with the special tool; then remove the pulley nut and pulley.

NOTE: Pulley nut has left hand threads.



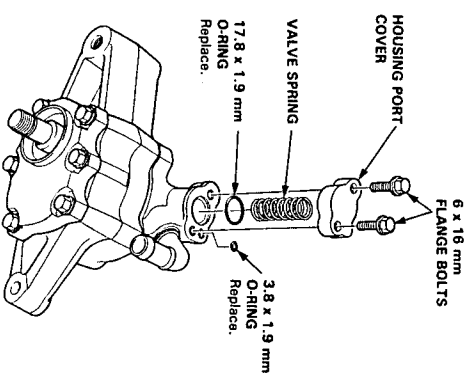
3. Install the pump pulley with its flat surface facing the nut as shown. Then install the pulley nut.
4. Hold the pulley with the special tool and tighten the pulley nut.



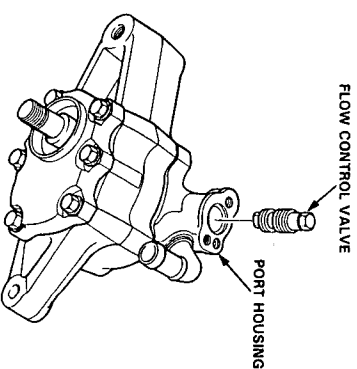
5. Check that the pump turns smoothly by turning the pulley.

Flow Control Valve Inspection and Replacement

1. Remove the two 6 x 16 mm flange bolts, then remove the housing port cover, valve spring and O-rings.



2. Remove the flow control valve from the port housing.



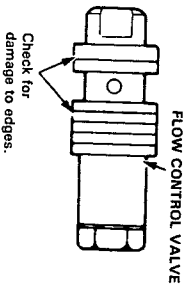
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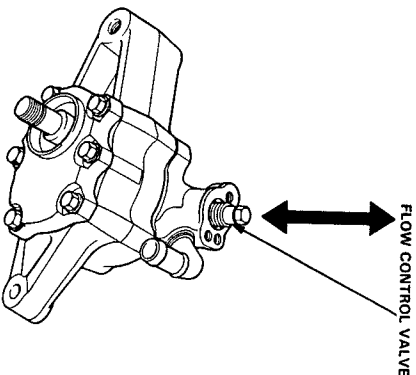
Steering Pump

Flow Control Valve Inspection and Replacement (cont'd)

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

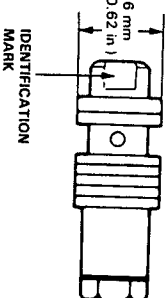


- Slip the flow control valve back in the pump and check that it moves in and out smoothly.



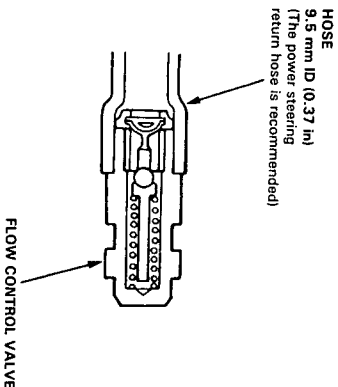
If OK, go on to step 5. If not, replace the valve:

- The original valve was selected for a precise fit in the port housing bore, so make sure the new one has the same identification mark.



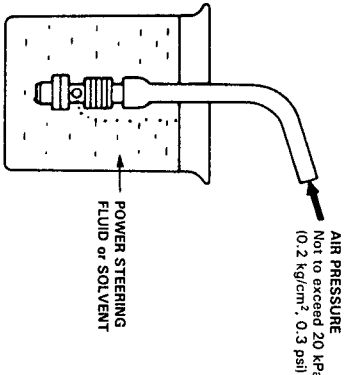
Mark	Part Name	Size mm(in)
A	FLOW CONTROL VALVE A	16.995 - 16.000 (0.6297 - 0.6299)
Without mark	FLOW CONTROL VALVE B	16.000 - 16.006 (0.6299 - 0.6302)

- Attach a hose to the end of the flow control valve as shown.

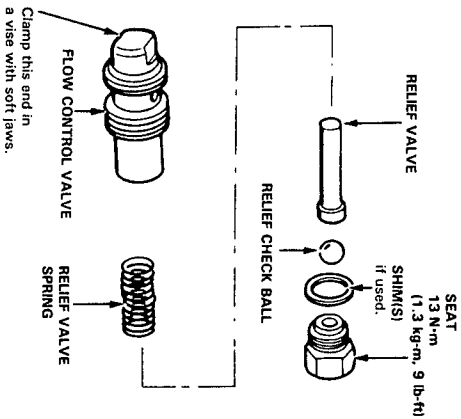


- Submerge the flow control valve in a container of power steering fluid or solvent and blow gently on the hose. If air bubbles leak through the flow control valve, replace or repair it as follows.

NOTE: Do not use compressed air.



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

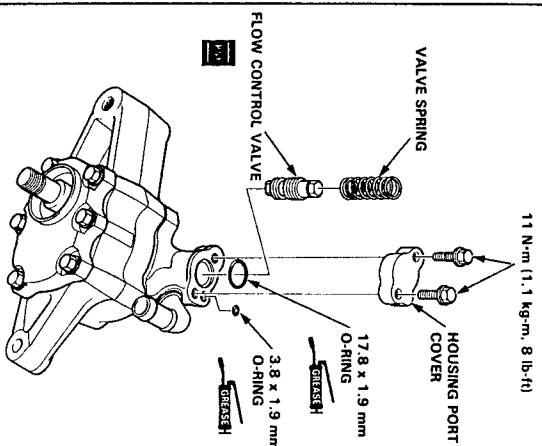


- Clean all the parts in solvent, dry them off, then re-assemble and retest the valve.

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.

- Install the flow control valve in the reverse order of removal.

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

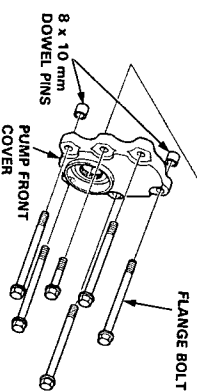
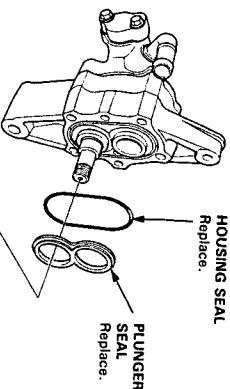


Steering Pump

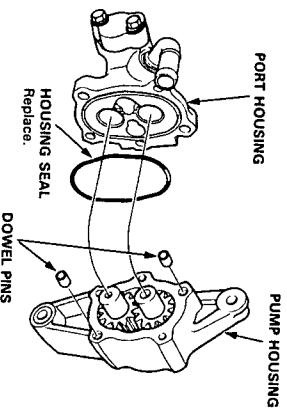
Housing Disassembly

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

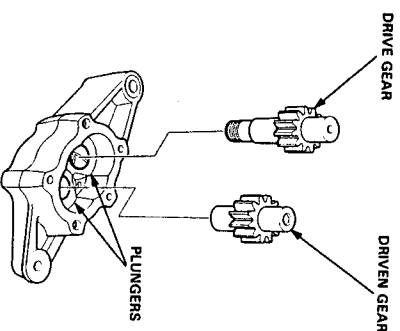
1. Remove the pump from car (see page 17-32).
2. Remove the pulley (see page 17-33).
3. Remove the flow control valve (see page 17-33).
4. Remove the flange bolts then remove the pump front cover, housing seal, plunger seal and dowel pins.



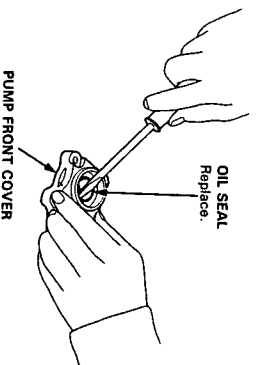
5. Separate the port housing from the pump housing.
6. Remove the dowel pins and housing seal from the port housing.



7. Remove the pump drive and driven gears from the pump housing.
8. Remove the plungers from the pump housing.



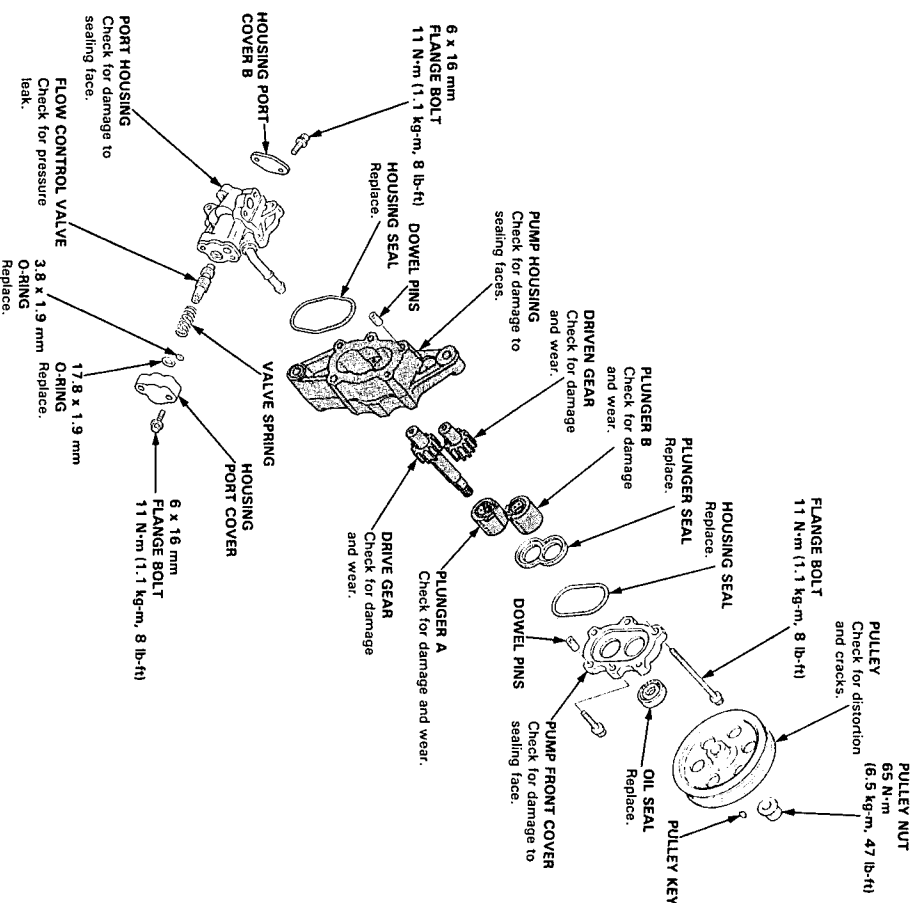
9. Pry the oil seal out of the pump front cover.



Disassembly/Inspection

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

- Clean all of the disassembled parts thoroughly.
- Replace all O-rings and seals. Do not dip new O-rings in solvent; coat O-rings with steering grease before installation, and make sure they stay in place during reassembly.
- The shaded parts are selectively fitted, and should not be disassembled except to replace seals. If any one of them is faulty, replace the whole pump as an assembly.

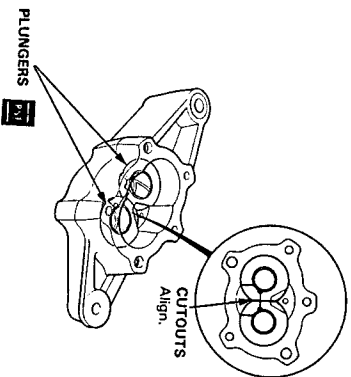


Steering Pump

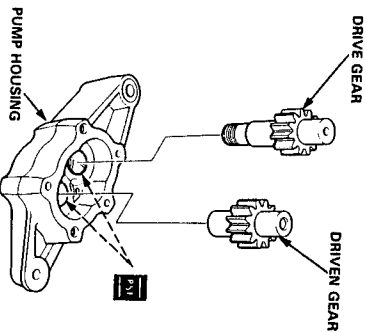
Housing Reassembly

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

NOTE: Install the plungers so the cutouts are aligned as shown.



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

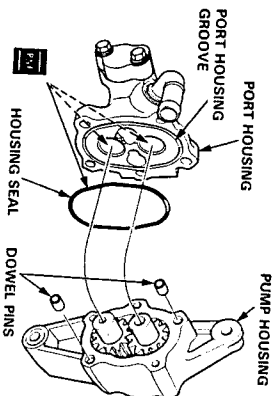


4. Coat the port housing groove with power steering fluid first, then position a new housing seal on the port housing.

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

6. Install the dowel pins in the pump housing.

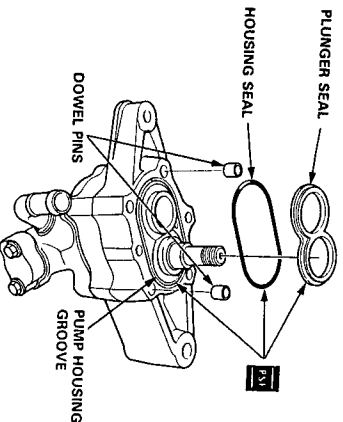
7. Install the port housing on the pump housing.



8. Coat the pump housing groove with power steering fluid, then position a new housing seal on the pump housing.

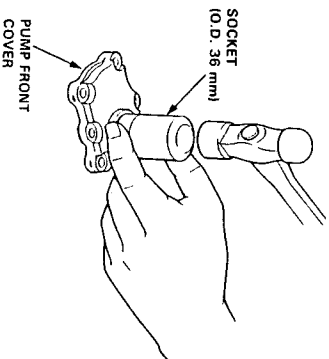
9. Coat the new plunger seal with power steering fluid, and install it over the plungers.

10. Install the dowel pins in the pump housing.

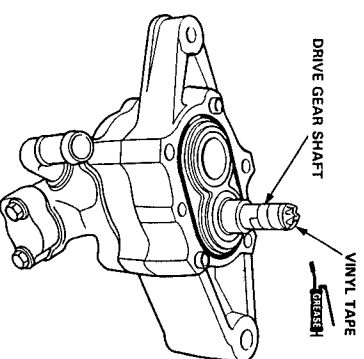


11. Install the new oil seal in the pump front cover, get it started by hand, then use a socket to push it in the rest of the way.

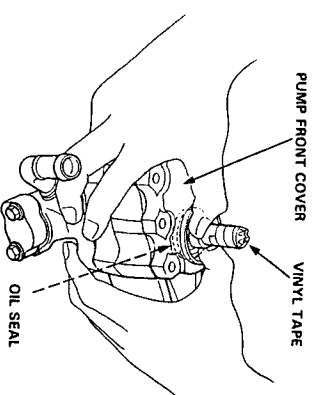
12. Coat the lip of the seal with steering grease (Honda P/N 08733-B070E).



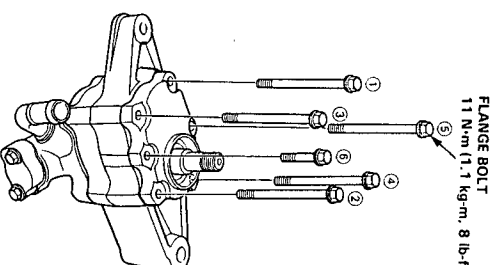
13. Wrap the splined area of the drive gear shaft with vinyl tape and grease the surface of the tape.



14. Slide the pump front cover over the drive gear shaft, being careful not to damage the sealing lip or dislodge the spring of the oil seal, then remove the vinyl tape.



15. Install the flange bolts. Torque them to the specified torque in the order shown.



16. Install the flow control valve (see page 17-35).

17. Install the pulley (see page 17-33) and check the pump preload with a torque wrench (see page 17-32).



Steering Gearbox Removal



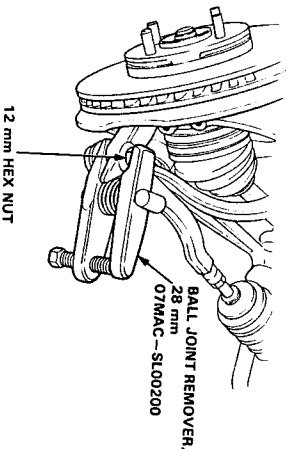
NOTE: Before removing the steering gearbox, align the front wheels straight ahead.

1. Drain the power steering fluid (see page 17-18).
2. Raise the front of car and support on safety stands in the proper locations (see section 1).
3. Remove the front wheels.
4. Remove the cotter pin from the castle 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: Remove the ball joint using the Ball Joint Remover. Refer to page 18-10 for how to use the ball joint remover.

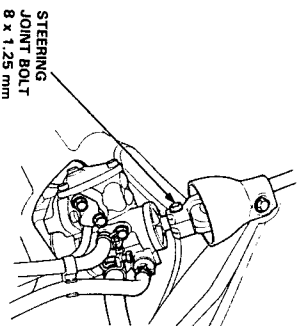
6. Separate the tie-rod ball joint and knuckle using the special tool.

CAUTION: Avoid damaging the ball joint boot.



7. Loosen the steering joint bolt. (from the engine compartment.)

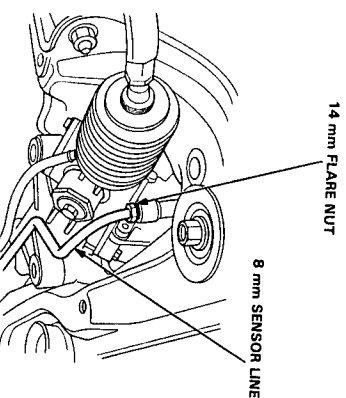
NOTE: Do not remove the bolt at this time.



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

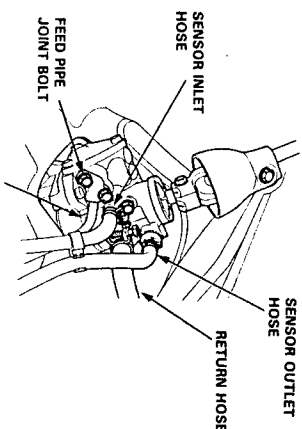
CAUTION: After disconnecting the hoses and pipes, plug or seal the hoses and pipes with a piece of tape or equivalent to prevent foreign materials from entering the valve body unit.

9. Remove the 8 mm sensor line by removing the 14 mm flare nut.



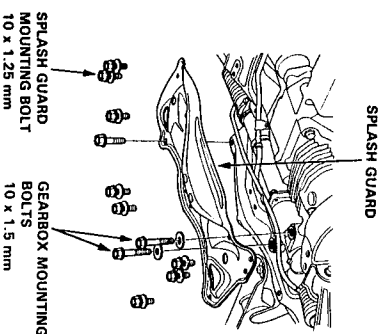
10. Remove the feed pipe joint bolts from the valve body unit.

11. Disconnect the feed line and three hoses from the valve body unit.

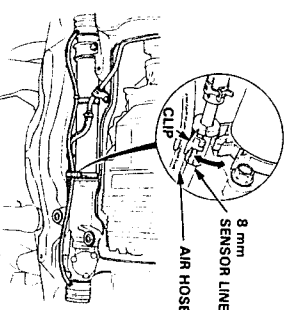


CAUTION: Some splash guard mounting bolts are also used as gearbox mounting bolts. The gearbox will tilt to the side when these bolts are removed. Be sure to remove the steering joint bolt when lowering the gearbox.

12. Remove the splash guard.



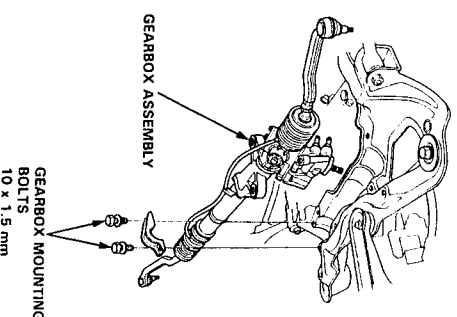
13. Remove the 8 mm sensor line from the gearbox by removing the pipe clip.



14. 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.

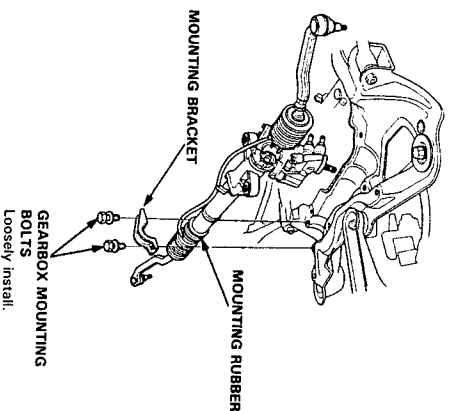
15. Remove the gearbox mounting bolts and gearbox assembly.



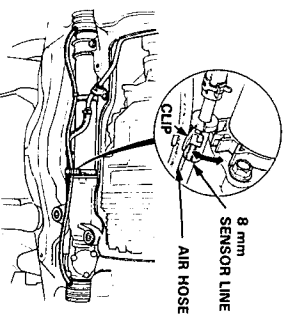
Steering Gearbox

Gearbox Installation

1. Loosely install the mounting bracket with the two gearbox mounting bolts on the right side.

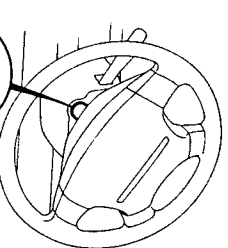


2. Install the 8 mm sensor line on the pipe clip at the gearbox.



3. Center the steering rack with its strokes.
4. Make sure that the cable reel of the airbag system is centered as follows:

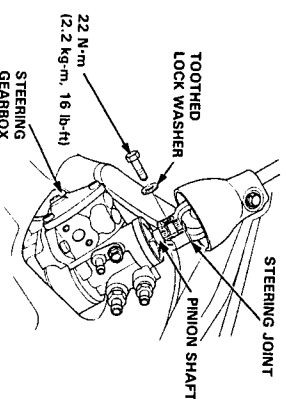
- Turn the steering wheel left approx. 150 degrees, and check that the cable reel is in position with the indicator.
- If the cable reel is centered, the yellow gear tooth lines up with the alignment mark in the cover.
- Return the steering wheel right approx. 150 degrees to position the steering wheel to the straight ahead position.



5. Slip the lower end of the steering joint onto the pinion shaft (line up the bolt hole with the groove around the shaft) and loosely install the lower bolt.

NOTE:

- Connect the steering joint and pinion shaft with the cable reel and steering rack centered.
- Be sure that the lower steering joint bolt is securely in the groove in the steering gearbox pinion.

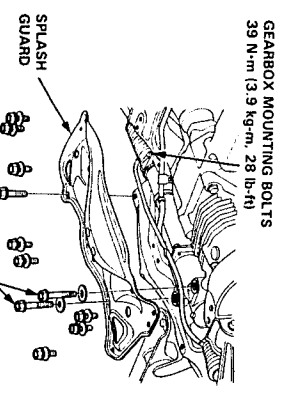


6. Tighten the two gearbox mounting bolts on the right side.

7. Install the splash guard with the two gearbox mounting bolts on the left side.

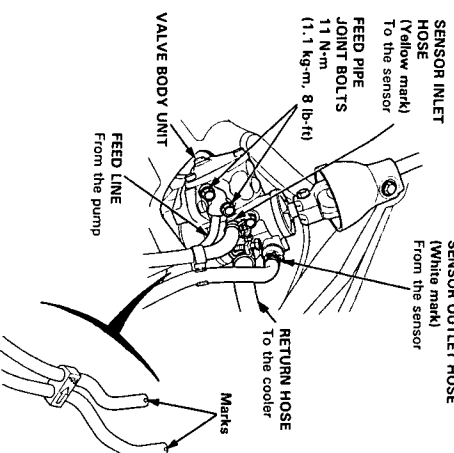
8. Tighten the splash guard attaching bolts.

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



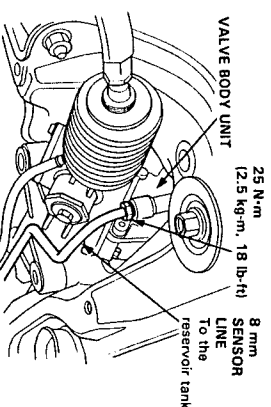
9. Reconnect the feed line and three hoses to the valve body unit as shown below.

10. Install the feed pipe joint bolts to the valve body unit.



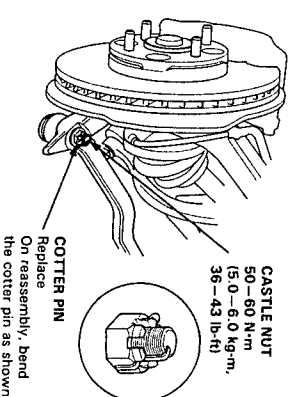
NOTE: Check the hose bands and clip for deformation or deterioration, and replace if necessary.

11. Install the 8 mm sensor line to the valve body unit.



12. Reconnect the tie-rod ends to the steering knuckles, tighten the castle 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.



13. Fill the system:

- Fill the reservoir with new Honda Power Steering Fluid-V.
- Start the engine and let it run at 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.

14. Check the gearbox for leaks.

15. Reinstall the front wheels.

16. Adjust the front toe (see section 18).

NOTE: If the steering wheel and rack are not centered, reposition the serrations at lower side of the steering joint.

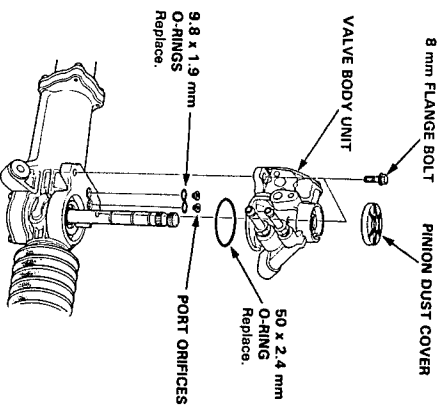


Steering Gearbox

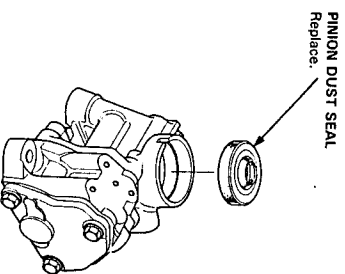
Valve Body Unit Overhaul



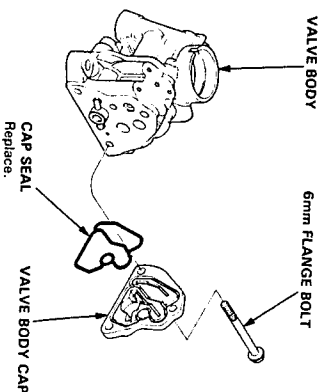
1. Remove the steering gearbox (see page 17-40).
2. Remove the pinion dust cover.
3. Remove the two 8 mm flange bolts and remove the valve body unit from the gearbox.
4. Remove the O-rings and port orifices from the gearbox.



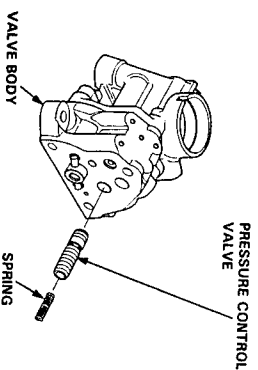
5. Remove the pinion dust seal.



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

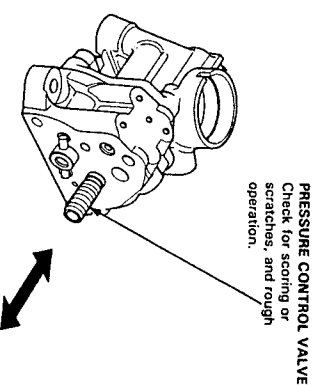


8. Remove the pressure control valve and spring from the valve body.

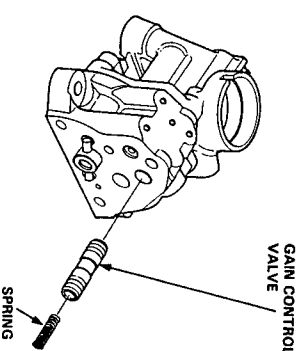


9. Check the pressure control valve:
 - Inspect its surface for scoring or scratches.
 - Slip it back into the valve body, and make sure it slides smoothly without drag and without side play.

NOTE: If any part of the valve body is damaged, replace the valve body unit (valve body, pressure control valve, gain control valve, 4-way valve) as an assembly.

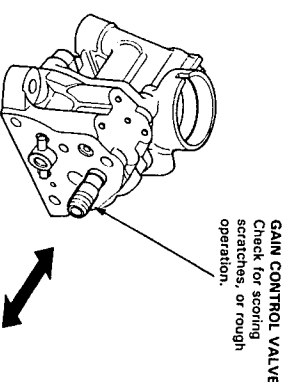


10. Remove the gain control valve and spring from the valve body.



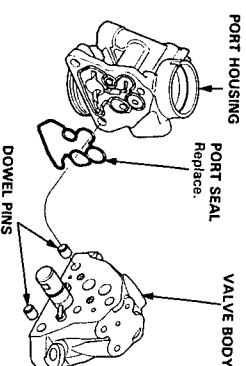
11. Check the gain control valve:
 - Inspect its surface for scoring or scratches.
 - Slip it back into the valve body and make sure it slides smoothly without drag and without side play.

NOTE: If any part of the valve body is damaged, replace the valve body unit (valve body, pressure control valve, gain control valve, 4-way valve) as an assembly.



12. Separate the valve body and port housing.

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



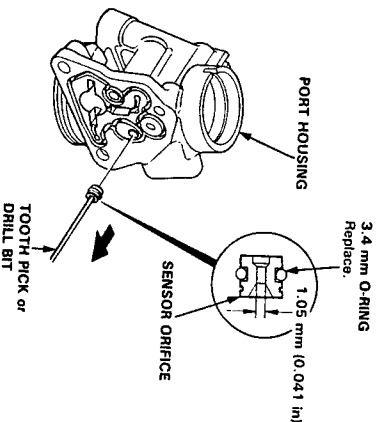
(cont'd)

Steering Gearbox

Valve Body Unit Overhaul (cont'd)



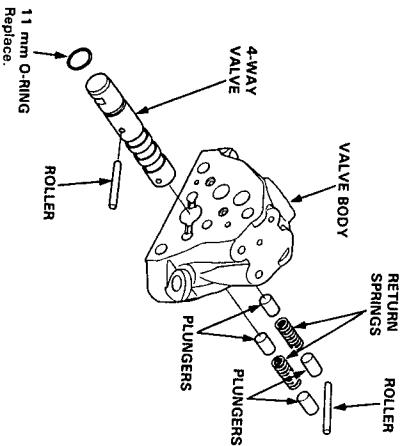
14. Using the 1.0 mm (0.04 in) tooth pick or drill bit, remove the sensor orifice and 3.4 mm O-ring.



15. Remove the rollers from the 4-way valve by pushing the valve out one side of the valve body, and then the other.

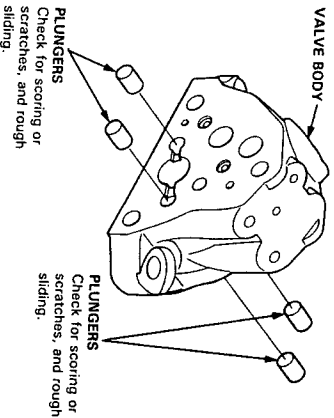
NOTE: When removing the rollers, hold the plungers with your fingers to keep them from popping out.

16. Remove the plungers, return springs and 4-way valve from the valve body.
17. Remove the 11 mm O-ring from the 4-way valve.



18. Check the plunger.

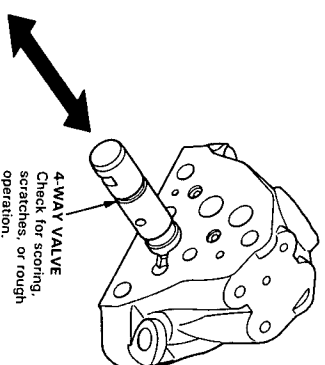
- Inspect their surface for scoring or scratches.
- Slip each plunger into the valve body. Make sure it slides smoothly, without drag or side play.
- If any plunger is damaged, replace it.



19. Check the 4-way 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, 4-way valve) as an assembly.



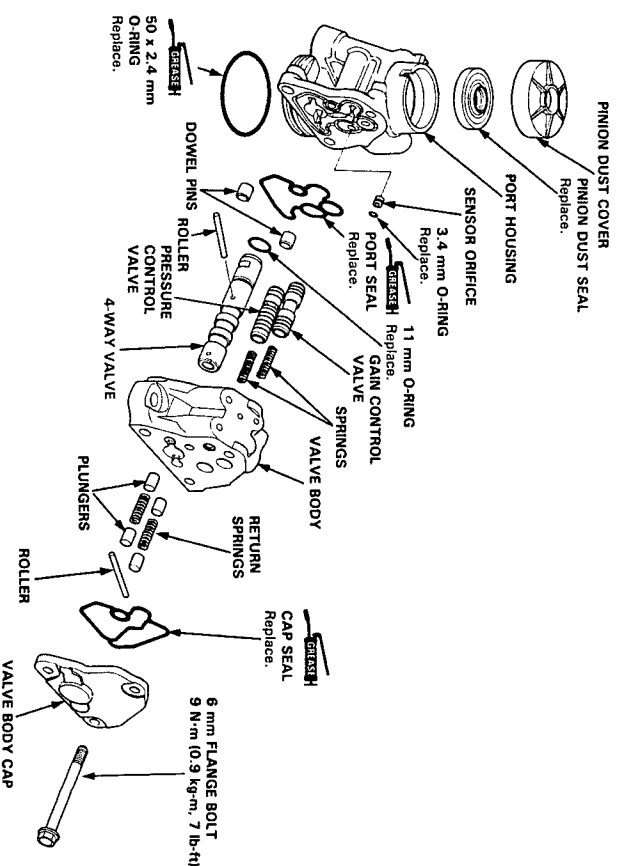
Assembly:

1. Thoroughly clean the disassembled parts shown below.
2. Coat the plungers, pressure control valve, gain control valve and 4-way 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

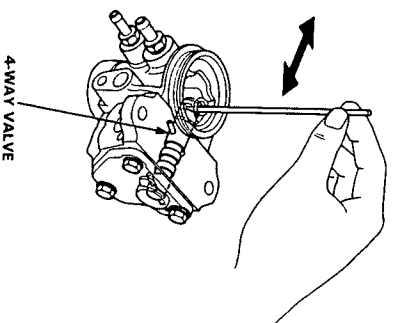


NOTE: If the valve body is damaged, replace the valve body unit (valve body, pressure control valve, gain control valve, 4-way valve) as an assembly.

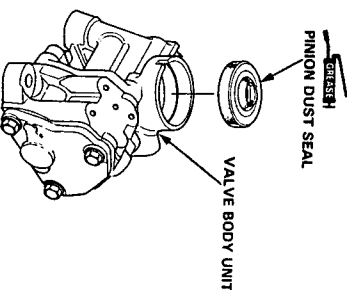
Steering Gearbox

Valve Body Unit Overhaul (cont'd)

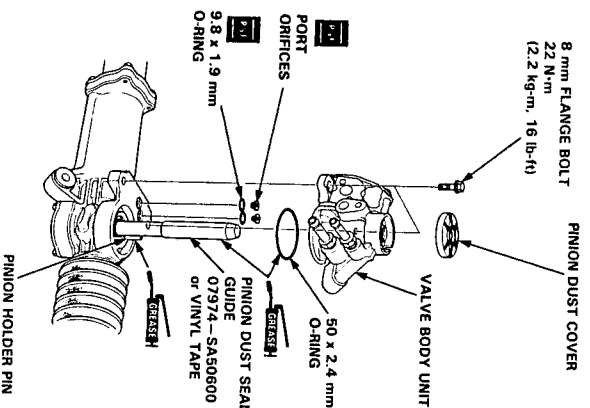
4. Make sure the 4-way valve moves smoothly, and returns to neutral position.



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



6. Coat the 9.8 x 1.9 mm O-rings with power steering fluid, and install them together with the orifices.
7. Install the special tool, or apply vinyl tape onto the pinion shaft and coat the special tool or vinyl tape with grease.
8. Coat the 50 x 2.4 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 flange bolts.



10. Remove the special tool or vinyl tape.

CAUTION:

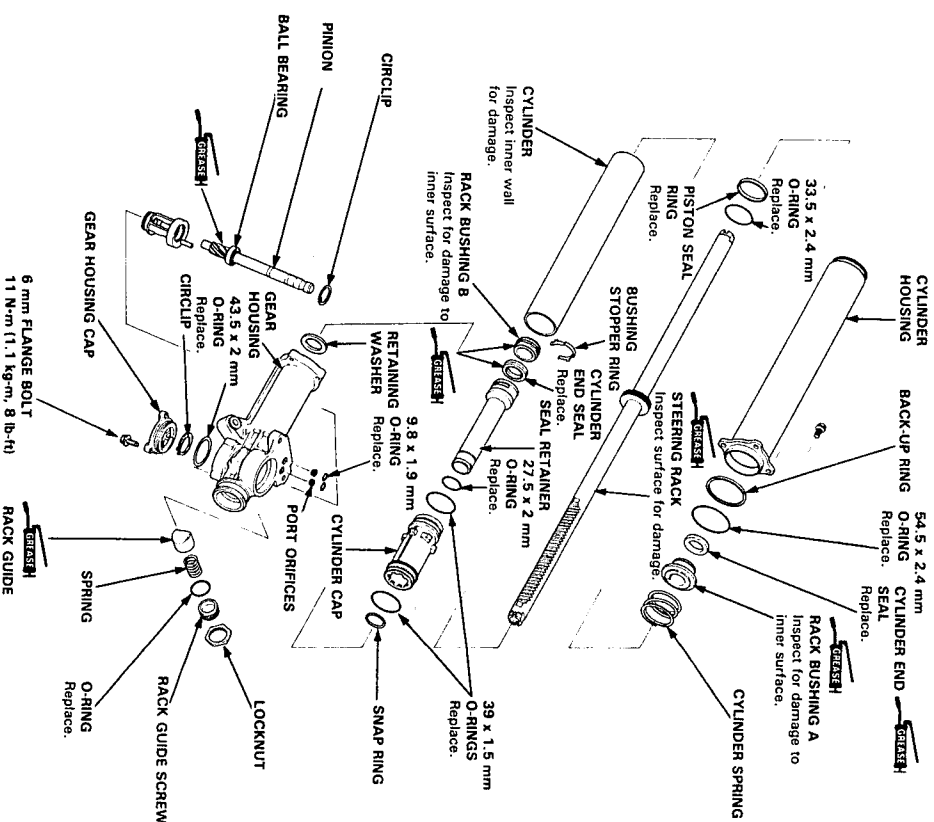
- When installing, be careful not to hit the pinion holder pin.
- Make sure the O-rings are in place and not pinched.

Disassembly/Inspection

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

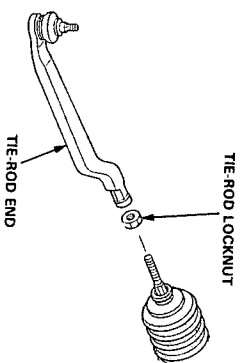
GREASE : STEERING GREASE Part Number 08733 - 8070E



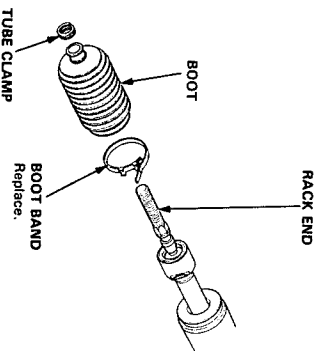
Steering Geabox

Overhaul

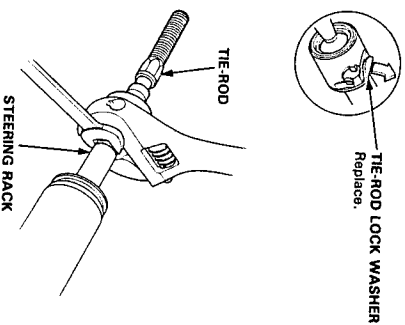
1. Remove the valve body unit (see page 17-44).
2. Carefully clamp the gearbox in a vise with soft jaws.
3. Remove the tie-rod ends.



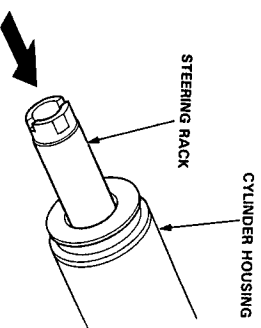
4. Remove the boot bands and tube clamps. Pull the boots away from the ends of the gearbox.



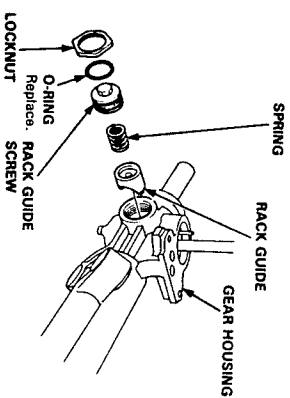
5. Unbend the tie-rod lock washers.
6. Hold the steering rack with a wrench and unscrew the tie-rod with a wrench.



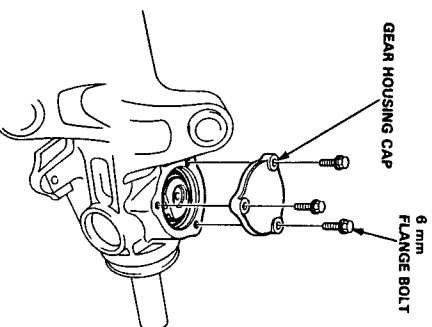
7. Push the right end of the rack back into the cylinder housing so the smooth surface that rides against the seal won't be damaged.



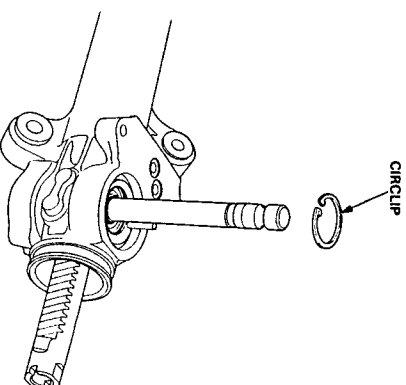
8. Loosen the locknut and remove the rack guide screw.
9. Remove the spring and rack guide from the gear housing.



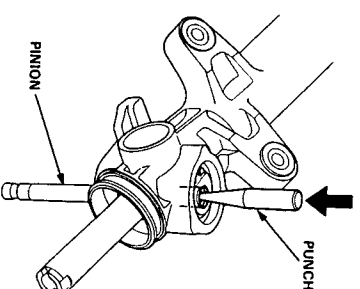
10. Remove the gear housing cap from the gear housing by removing the three 6 mm flange bolts.



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



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

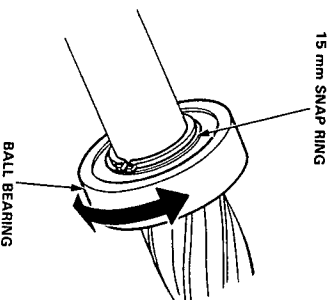




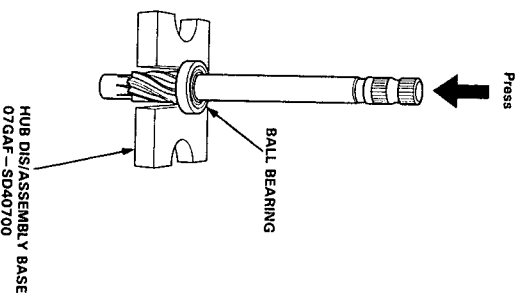
Steering Gearbox

Overhaul (cont'd)

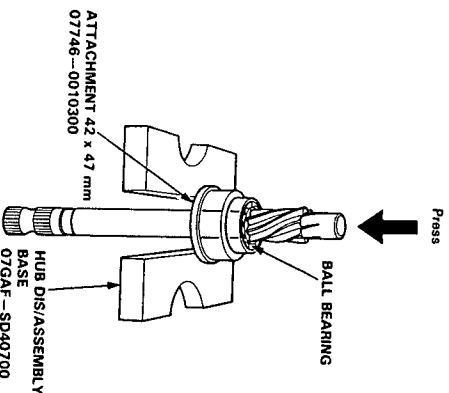
13. Check the ball bearing of the pinion for play; if it is good, go on step 14.
If the bearing is noisy or has excessive play, replace the bearing.
- Remove the 15 mm snap ring.



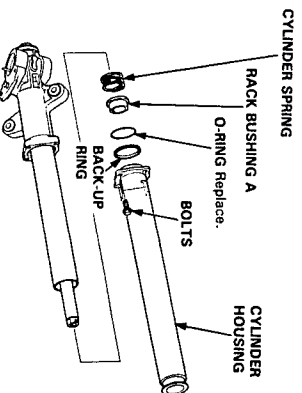
- Remove the ball bearing from the pinion using the special tool.



- Using a press and the special tool, install the ball bearing on the pinion.

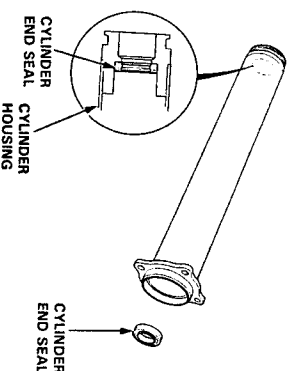


14. Remove the four bolts from the end of the cylinder housing, then slide the housing off the rack.

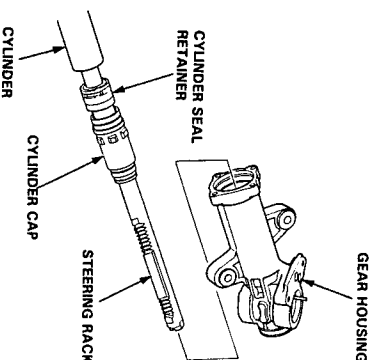


15. Remove the O-ring, back-up ring, rack bushing A and cylinder spring.

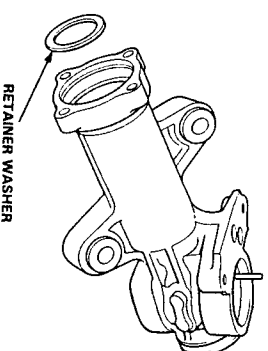
16. Remove the cylinder end seal from the cylinder housing.
- NOTE: Use your fingers or a wooden stick to avoid damaging the housing.



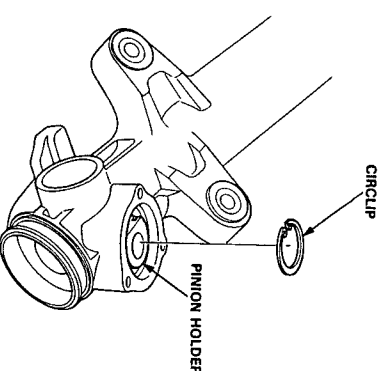
17. Remove the cylinder, cylinder seal retainer, cylinder cap and steering rack from the gear housing.



18. Remove the retainer washer from the gear housing.



19. Check the pinion holder for free movement, excessive play and rough movement; if it is in good condition, go on step 20.
If it is damaged, or if dirt has gone past the seal into the grease, replace the bearing.
- Remove the circlip from the pinion holder.

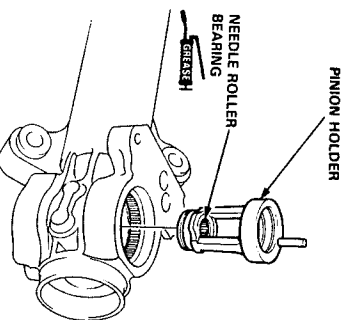


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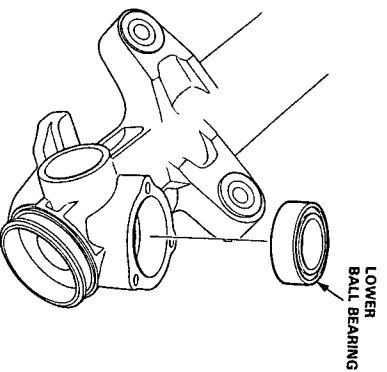
Steering Gearbox

Overhaul (cont'd)

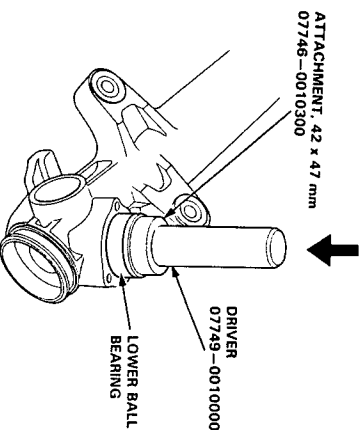
- Remove the pinion holder from the gear housing.
- Check the needle roller bearings in the pinion holder and gear housing for damage; if OK, pack the needle roller bearing with grease. If the bearings are damaged, replace them as a set.



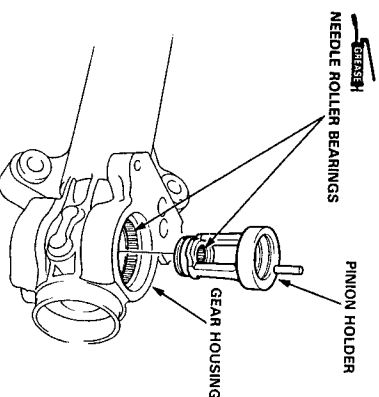
- Check the lower ball bearing for damage; if it is in good condition, go on step 20. If it is damaged, replace the lower ball bearing.
- Remove the lower ball bearing from the gear housing.



- Drive the new lower ball bearing into the gear housing using the special tools.

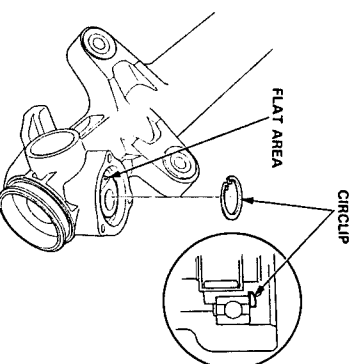


- Pack the needle roller bearings with grease, and install the pinion holder in the gear housing.

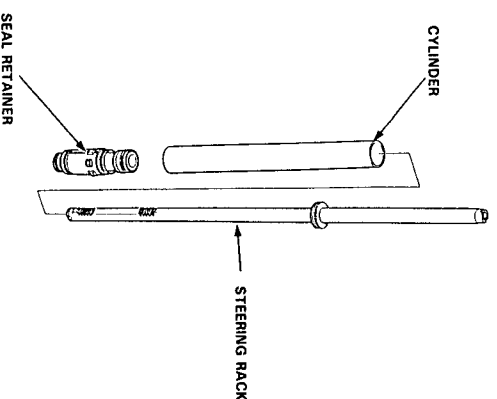


- Reinstall the circlip with its tapered side facing out.

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

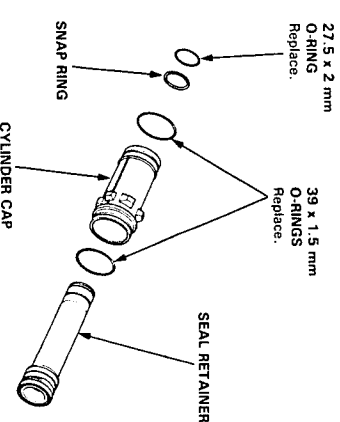


20. Remove the cylinder and seal retainer from the steering rack.



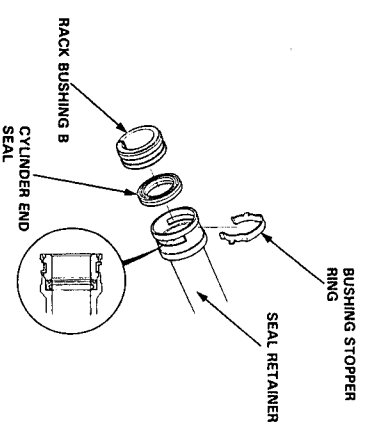
21. Remove the O-ring and snap ring from the seal retainer, then remove the cylinder cap from the seal retainer.

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.

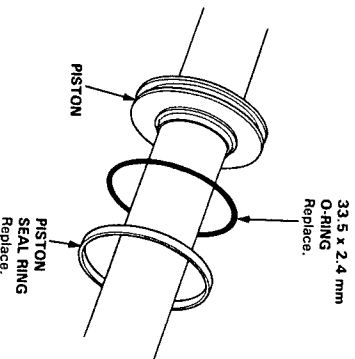


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Steering Gearbox Overhaul (cont'd)

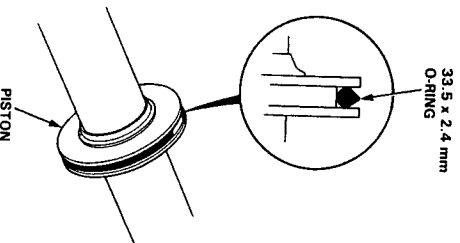


25. Carefully pry the piston seal ring and the O-ring off the piston.



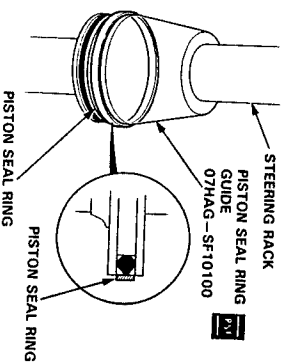
NOTE: Before reassembling any parts, inspect them as described on page 17-49, and make sure they are clean. Replace worn or damaged parts.

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



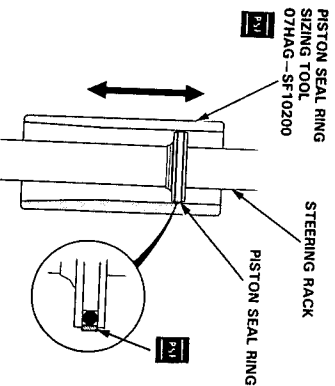
27. Coat the piston seal ring guide with power steering fluid, then slide it onto the rack, big end first.

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.

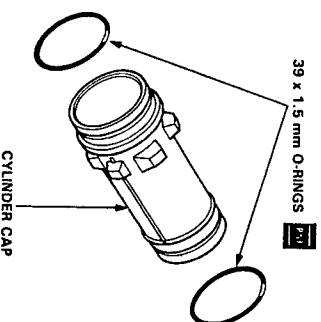


29. Coat the piston seal ring and inside of the special tool with power steering fluid.

30. Carefully slide the tool onto the steering rack and over the piston seal ring, then rotate the tool as you move it up and down to seat the piston seal ring.

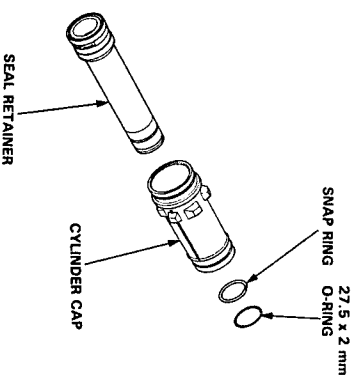


31. Coat the new O-rings with power steering fluid, and install them on the cylinder cap.

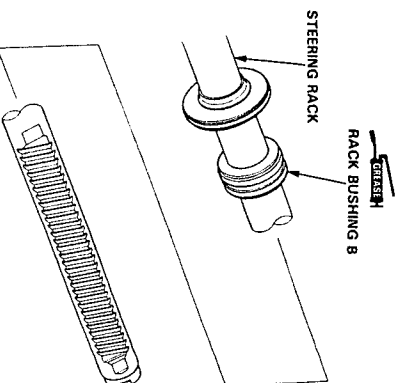


32. Slide the cylinder cap onto the seal retainer.

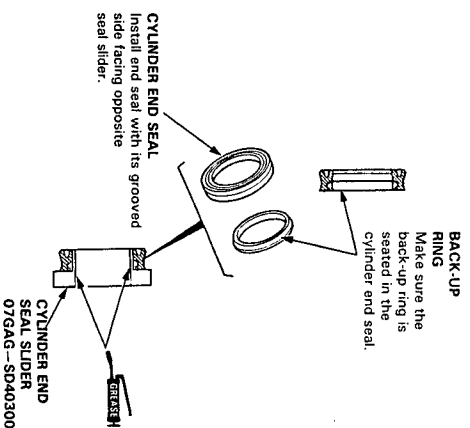
33. Install the snap ring and O-ring on the seal retainer.



34. Grease the sliding surface of the new rack bushing B, and install the bushing on the steering rack.



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.



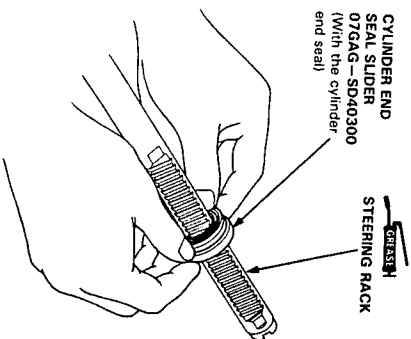
(cont'd)

Steering Gearbox

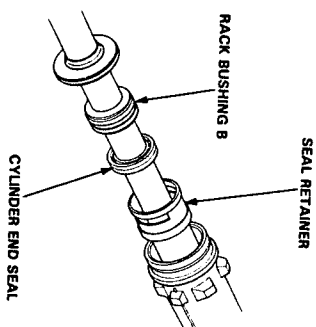
Overhaul (cont'd)



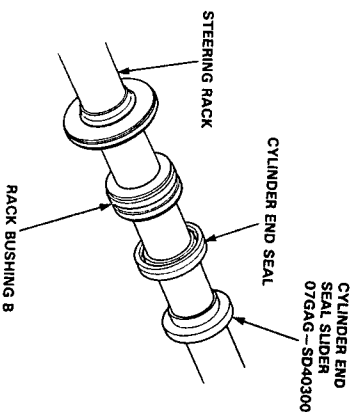
36. Install the special tool and cylinder end seal.



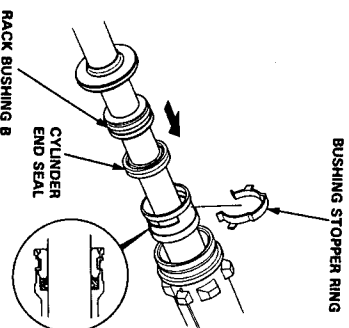
38. Fit the seal retainer on the steering rack.



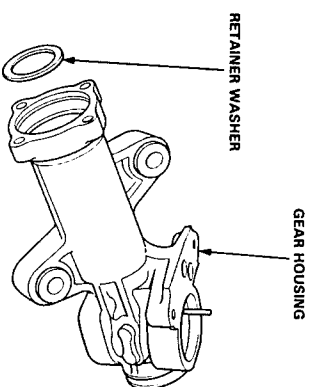
37. Separate the cylinder end seal from the special tool, then remove the special tool from the rack.



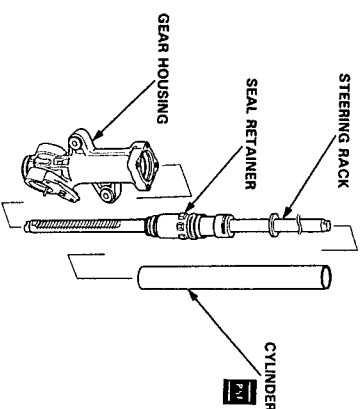
39. Push the rack bushing B toward the seal retainer by hand until the cylinder end seal is seated in the retainer. Fit the bushing stopper ring in the groove of the seal retainer securely. Then grease the steering rack.



40. Install the retainer washer on the gear housing.



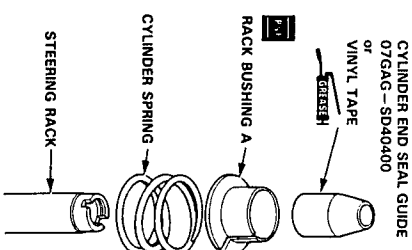
41. Place the gear housing on the work bench and insert the seal retainer and steering rack into the gear housing.



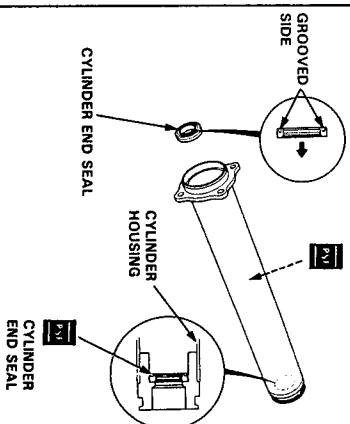
42. Coat the inside surface of the cylinder with power steering fluid, slide it over the rack and into the gear housing; press it into the housing until it seats.

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. Install the special tool, or apply vinyl tape onto the steering rack and coat the special tool or vinyl 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.



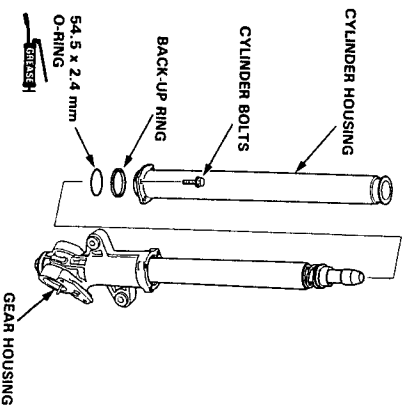
Steering Gearbox Overhaul (cont'd)



46. Coat the new O-ring with the grease, then install the O-ring and back-up ring on the gear housing.

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

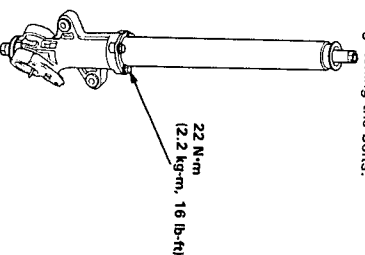
CAUTION: Be careful not to damage the end seal in the cylinder housing.



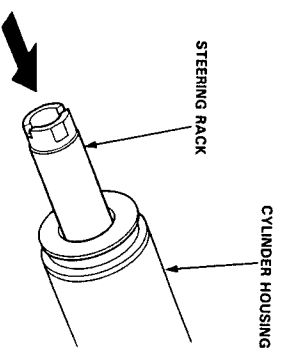
48. Remove the vinyl tape or special tool from the steering rack.

49. Tighten the cylinder housing to the gear housing.

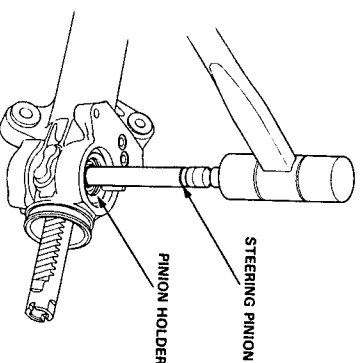
NOTE: Before tightening the bolts, make sure the mating surfaces of the cylinder and gear housing fit properly by pushing them together; hold them together while tightening the bolts.



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

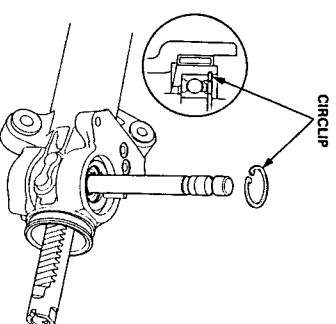


51. Install the steering pinion in the pinion holder by tapping lightly with a rubber mallet.

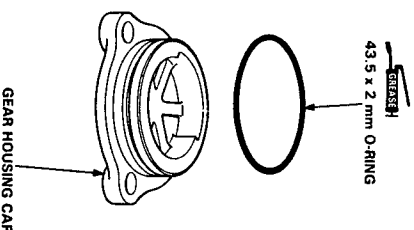


52. Install the circlip securely in the pinion holder groove.

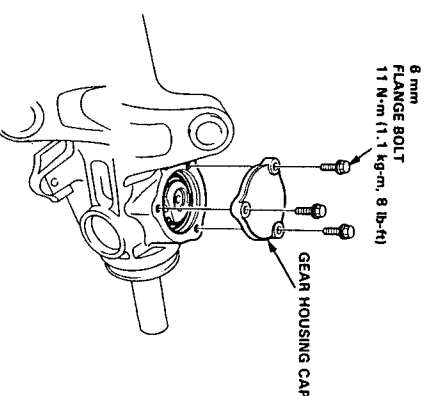
NOTE: Install the circlip with its tapered side facing out.



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



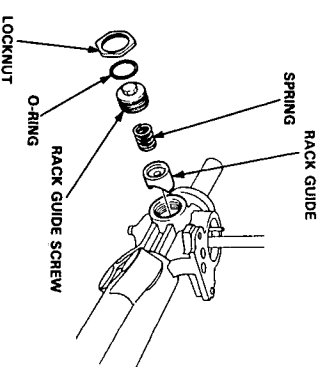
54. Install the gear housing cap on the gear housing.



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.



Steering Gearbox

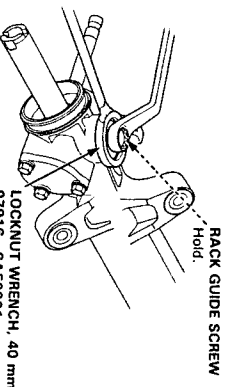
Overhaul (cont'd)



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 it off about 20°, then install the locknut on the rack guide screw.

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

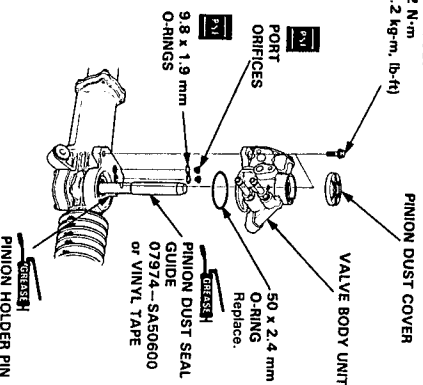


61. Coat the 9.8 x 1.9 mm O-rings with power steering fluid, and install them together with the orifices.

62. Install the special tool, or apply vinyl tape onto the pinion shaft and coat the special tool or vinyl tape with grease.

63. Coat the 50 x 2.4 mm O-ring and pinion holder pin with grease, then install the valve body unit.

64. Install the valve body unit on the gear housing with the two 8 mm bolts.



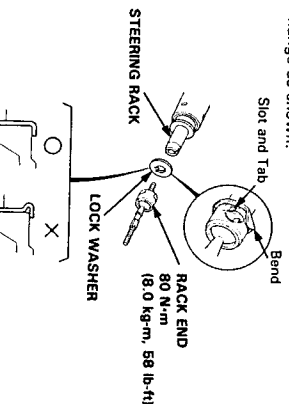
CAUTION:

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

65. Remove the special tool or vinyl tape and install the pinion dust cover.

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 65 N·m (6.5 kg-m, 47 lb-ft). Then bend the lock washer back against the flat on the flange as shown.

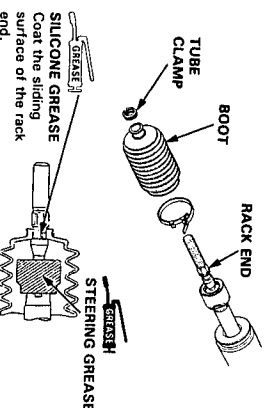


NOTE: Bend the lock washer tab securely. Make sure it fits against the rack end tightly, as shown.

68. Apply grease to the circumference of the rack end housing.

69. 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.



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

70. 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.)

CAUTION: Stake the band locking tabs firmly.

71. Install new boot bands on the boot and band both sets of locking tabs.

72. Lightly tap on the doubled-over portions to reduce their height.

73. Install the band cushion and air hose band; position the band as shown and tighten it. Then install the air hose.

74. After assembling, slide the rack right and left to be certain that the boots are not deformed or twisted.

75. Install the right and left tie-rod ends on the right and left rack ends.

