

Steering

Power Steering

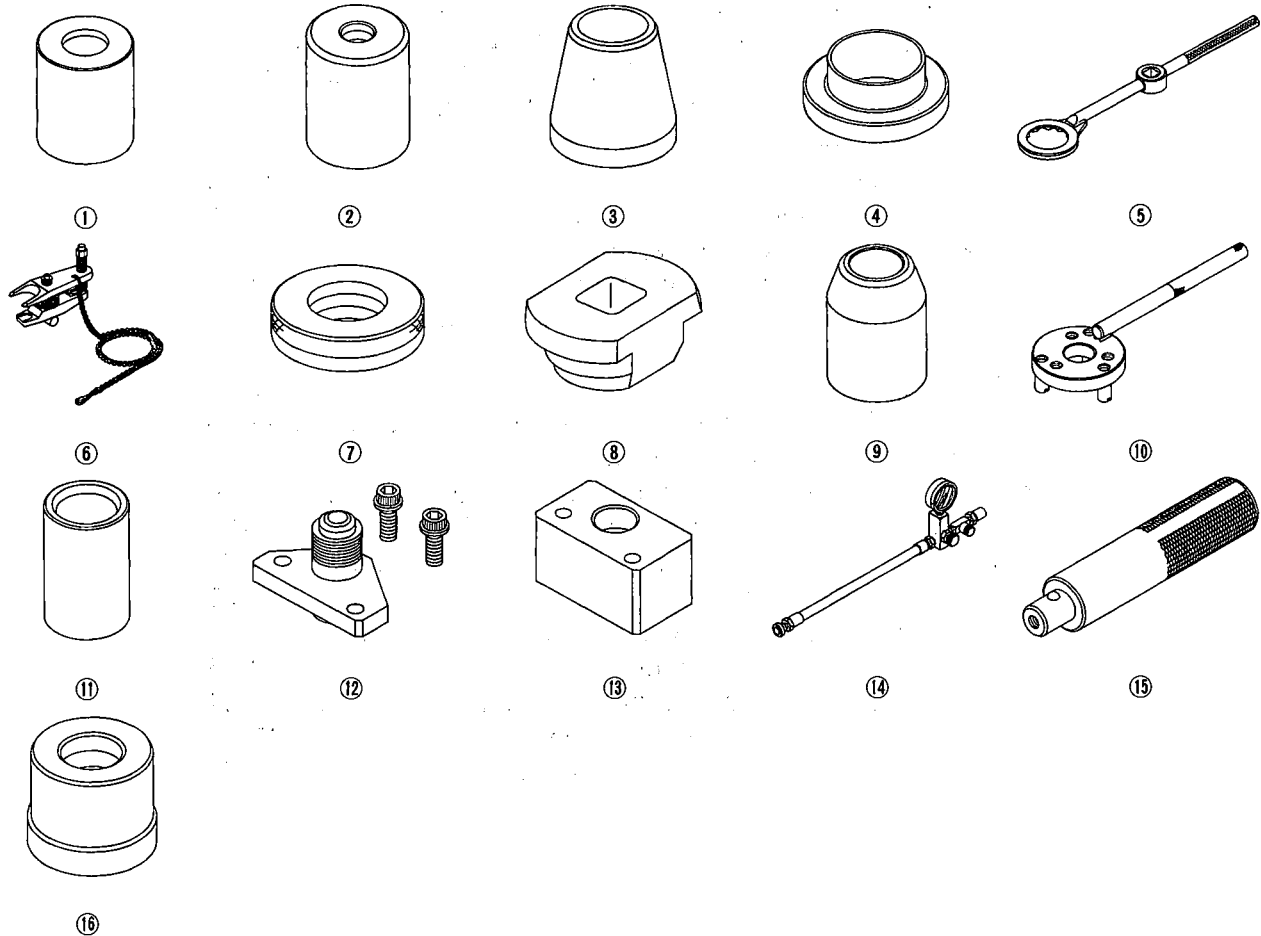
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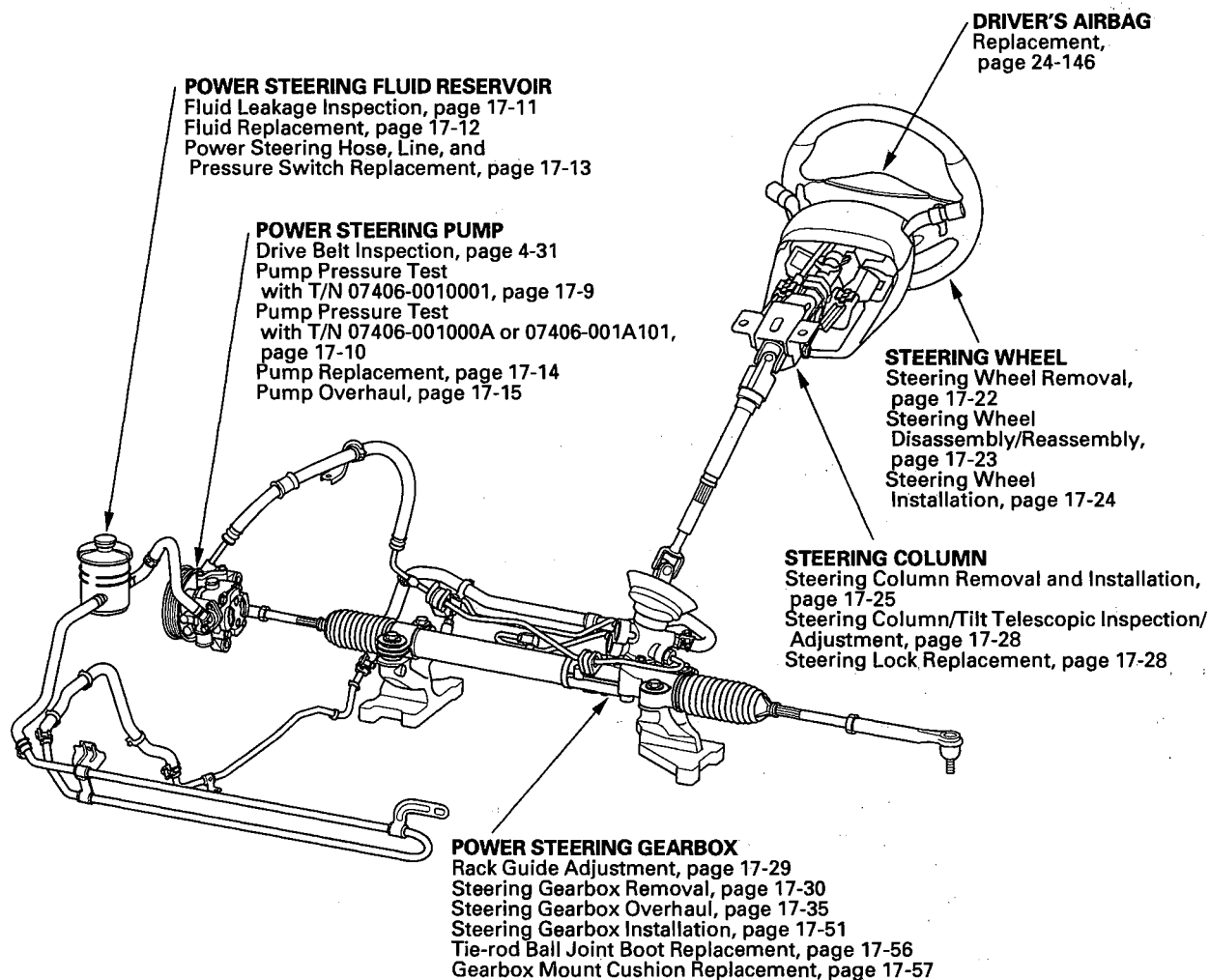
Special Tools

Ref. No.	Tool Number	Description	Qty
①	07HAG-SF1020A or 07HAG-SF10200	Piston Seal Ring Sizing Tool	1
②	07JAF-SH20330	Bushing Base	1
③	07LAG-SM40100	Piston Seal Ring Guide	1
④	07LAG-SM40300	Cylinder End Seal Slider	1
⑤	07MAA-SL00100	Locknut Wrench, 40 mm	1
⑥	07MAC-SL0A202	Ball Joint Remover, 28 mm	1
⑦	07NAG-SR3090A	Valve Seal Ring Sizing Tool	1
⑧	07TAF-SZ50100	Cylinder End Seal Remover Attachment	1
⑨	07YAG-S2X0100	Sleeve Seal Ring Guide	1
⑩	07ZAB-S5A0100	Pulley Holder	1
⑪	07ZAG-S5A0100	Sleeve Seal Ring Sizing Tool, 36 mm	1
⑫	07ZAK-S7CA100	P/S joint Adapter (Pump)	1
⑬	07ZAK-S7CA200	P/S joint Adapter (Hose)	1
⑭	07406-0010001 or 07406-001000A or 07406-001A101	P/S Pressure Gauge	1
⑮	07749-0010000	Driver	1
⑯	07946-1870100	Attachment, 28 x 30 mm	1





Component Location Index



Power Steering

Symptom Troubleshooting Index

Find the symptom in the chart below, and do the related procedures in the order listed until you find the cause.

Symptom	Procedure(s)	Also check for
Hard steering	Troubleshoot the system (see page 17-6).	- Modified suspension - Damaged suspension - Tire sizes, tire varieties, and air pressure
Assist (excessively light steering at high speed)	Check the rack guide adjustment (see page 17-29).	Front wheel alignment (see page 18-5)
Shock or vibration when the steering wheel is turned to full lock	- Check the rack guide adjustment (see page 17-29). - Check the drive belt for slippage (see page 4-31). - Check the power steering pump fluid pressure with T/N 07406-0010001 (see page 17-9) or T/N 07406-001000A or T/N 07406-001A101 (see page 17-10). - Overhaul the steering gearbox (see page 17-35).	
Steering wheel will not return smoothly	- Check cylinder lines for deformation. - Check the ball joints for binding. - Check wheel alignment (see page 18-5). - Overhaul the steering gearbox (see step 2 on page 17-36).	
Uneven or rough steering	- Check the rack guide adjustment (see page 17-29). - Check the drive belt (see page 4-31). - Check for low or erratic engine idle speed (see page 11-338). - Check for air in the power steering system due to air entering inlet side of pump. - Check for low fluid level in the power steering reservoir due to possible leaks in system (see page 17-12). - Overhaul the steering gearbox (see step 2 on page 17-36).	
Steering wheel kicks back during wide turns	- Check the drive belt (see page 4-31). - Check the power steering pump fluid pressure with T/N 07406-0010001 (see page 17-9) or T/N 07406-001000A or T/N 07406-001A101 (see page 17-10).	
Humming noise from the power steering system	- Check when the noise occurs: - If the noise is heard 2—3 minutes after starting the engine in cold weather, this is normal. - If the noise is heard when the wheel is turned with the vehicle stopped, this is normal due to the fluid pulsation. - Check for the high-pressure hose touching the subframe or body. - Check for automatic transmission converter noise (A/T). - Check for air bubbles in the power steering fluid, leak on inlet side of pump. - Check for particle contamination of fluid and restricted filter in the reservoir.	Pump pressure
Power steering rack rattle or chattering	- Check for loose steering components (tie-rod and ball joints). Tighten or replace as necessary. - Check the steering column shaft for wobbling. If the steering column wobbles, replace the steering column assembly (see page 17-25). - Check the rack guide adjustment (see page 17-29). - Check the power steering pump pulley: - If the pulley is loose, tighten it (see step 46 on page 17-21). - If the pump shaft is loose, replace the pump (see page 17-14).	



Symptom	Procedure(s)	Also check for
Hissing from the power steering system/foaming fluid	• Check the fluid level. If low, fill the reservoir to the proper level and check for leaks (see page 17-11). • Check the reservoir for leaks. • Check for crushed inlet hose or loose hose clamp allowing air into the suction side of the system (see page 17-11). • Check the power steering pump shaft oil seal for leaks.	• Air in the P/S fluid
Noise from the power steering pump	• Compare the pump noise at normal operating temperature to another like vehicle (pump noise for 2–3 minutes after starting the engine in cold weather is normal). • Remove and inspect the pump for wear and damage (see page 17-14).	• P/S pump pressure • Air in the P/S fluid
Squeaking from the power steering pump	Check the drive belt (see page 4-31).	
Fluid leaks from the steering gearbox	• Fluid leaks from the top of the valve body unit. Overhaul the valve body unit (see step 19 on page 17-39). • Fluid leaks from the driver's side boot. Replace the valve oil seal on the pinion shaft. Replace the cylinder end seal on the gearbox side. • Fluid leaks from the passenger's side boot. Replace the cylinder end seal on the cylinder side. • Fluid leaks from pinion shaft near the lower steering joint bolt. Overhaul the valve body unit (see step 19 on page 17-39). • Fluid leaks from the steering damping valve covers on the valve body unit. Replace the valve housing.	
Fluid leaks from the power steering line	• Fluid leaks from the cylinder line connections (flare nuts). Tighten the connection and retest (see page 17-13). • Fluid leaks from a damaged cylinder line. Replace the cylinder line (see page 17-13). • Fluid leaks from the pump outlet hose or return line fitting on the valve body unit (flare nuts). Tighten the fitting and retest. If it still leaks, replace the hose, the line, or valve body unit as necessary.	
Fluid leaks from the power steering pump	• Fluid leaks from the front oil seal. Replace the front oil seal. • Fluid leaks from the power steering pump housing. Replace the leaking O-rings or seals (see page 17-11), and if necessary replace the power steering pump (see page 17-14).	
Fluid leaks from the power steering reservoir	• Fluid leaks from around the reservoir cap because fluid level is too high. Drain the reservoir to the proper level. If the fluid is aerated check for an air leak on the inlet side of the pump. • Fluid leaks from reservoir. Check for the reservoir for cracks and replace as necessary.	
Fluid leaks from the power steering pump outlet hose (high-pressure)	• Check the fitting for loose bolts. If the bolts are tight, replace the fitting O-ring. • Fluid leaks at the swagged joint. Replace the pump outlet hose.	
Fluid leaks from the power steering pump inlet hose (low-pressure)	Check the hose for damage, deterioration, or improper assembly. Replace or repair as necessary.	

Power Steering

Symptom Troubleshooting

Hard Steering

1. Check the power assist (see page 17-7).

Is the initial turning load more than 29 N (3.0 kgf, 6.6 lbf) ?

YES—Go to step 2.

NO—Power assist is OK. ■

2. Connect the special tools and P/S pressure gauge T/N 07406-0010001 (see page 17-9), or T/N 07406-001000A or T/N 07406-001A101 (see page 17-10) to the pump.

3. Measure steady-state fluid pressure from the pump at idle.

Is the pressure 1,470 kPa (15 kgf/cm², 213 psi) or less?

YES—Go to step 4.

NO—Go to step 8.

4. Measure the pump relief pressure at idle.

Is the pressure 8,150–8,850 kPa (83–90 kgf/cm², 1,180–1,280 psi) or more?

YES—Go to step 5.

NO—Go to step 9.

5. With a spring scale, measure the power assist in both directions, to the left and to the right.

Are the two measurements within 5.0 N (0.51 kgf, 1.12 lbf) of each other?

YES—Go to step 6.

NO—Go to step 11.

6. Measure the fluid pressure with both pressure gauge valves open (if so equipped), while turning the steering wheel fully to the left and fully to the right.

Is the pressure 8,150–8,850 kPa (83–90 kgf/cm², 1,180–1,280 psi) or more?

YES—Go to step 7.

NO—Faulty gearbox. ■

7. Adjust the rack guide (see page 17-29), and retest.

Is the steering OK?

YES—Repair is completed. ■

NO—Faulty gearbox. ■

8. Check the outlet and return hoses and lines between the pump and the gearbox for clogging and deformation.

Are the lines clogged or deformed?

YES—Repair or replace the lines. ■

NO—Faulty valve body unit. ■

9. Disassemble the pump (see page 17-15).

10. Check the pressure control valve for smooth movement and leaks (see step 16 on page 17-17).

Is the pressure control valve OK?

YES—Faulty pump assembly. ■

NO—Faulty pressure control valve. ■

11. Check the cylinder lines for deformation (see page 17-13).

Are any of the lines deformed?

YES—Replace the deformed line. ■

NO—Go to step 12.

12. Check for a bent rack shaft or misadjusted rack guide (too tight).

Is the rack shaft bent or the rack guide adjusted too tight?

YES—Replace the rack shaft, or readjust the rack guide. ■

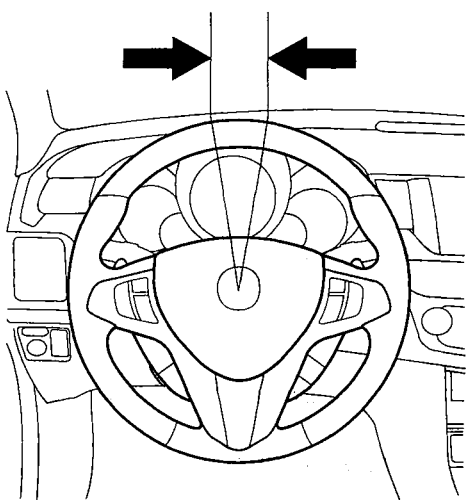
NO—Faulty valve body unit. ■



Steering Wheel Rotational Play Check

1. Turn the front wheels to the straight ahead position.
2. Measure how far you can turn the steering wheel left and right without moving the front wheels.
 - If the play is within the limit, the gearbox and linkages are OK.
 - If the play exceeds the limit, adjust the rack guide (see page 17-29). If the play is still excessive after rack guide adjustment, inspect the steering linkage and gearbox (see page 17-8).

Rotational play: 0—10 mm (0—0.39 in.)

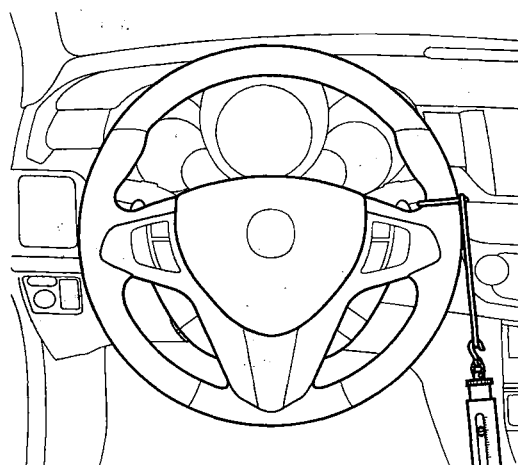


Power Assist Check

NOTE: This test should be done with original equipment tires and wheels at the correct tire pressure.

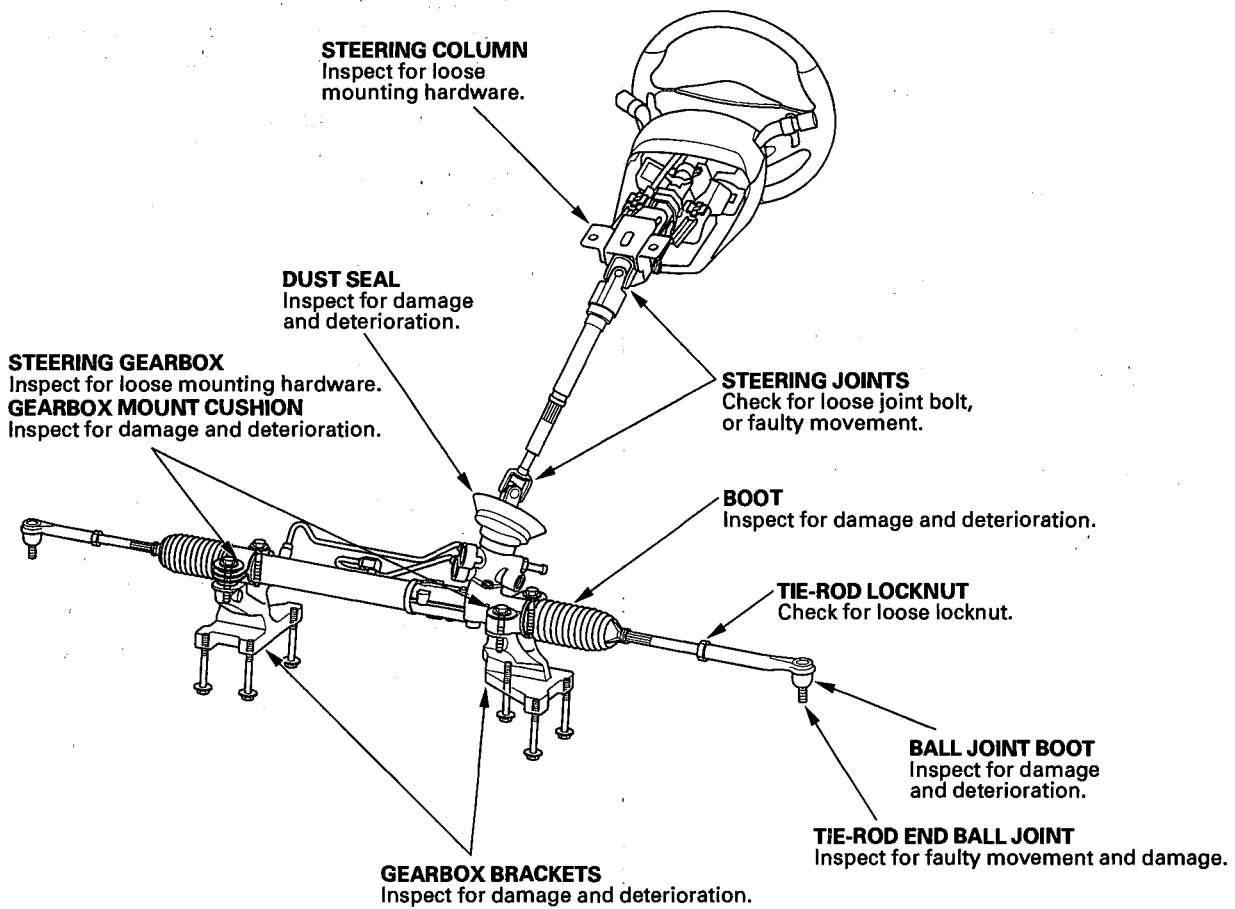
1. Check the power steering fluid level (see page 17-12).
2. Start the engine, let it idle, and turn the steering wheel from lock-to-lock several times to warm up the fluid.
3. Attach a commercially available spring scale to the steering wheel. With the engine idling and the vehicle on a clean, dry floor, pull the scale as shown and read it as soon as the tires begin to turn.
 - If the scale reads no more than the specification, the gearbox and pump are OK.
 - If the scale reads more than the specification, troubleshoot the steering system (see page 17-6).

Initial turning load: 29 N (3.0 kgf, 6.6 lbf)



Power Steering

Steering Linkage and Gearbox Inspection





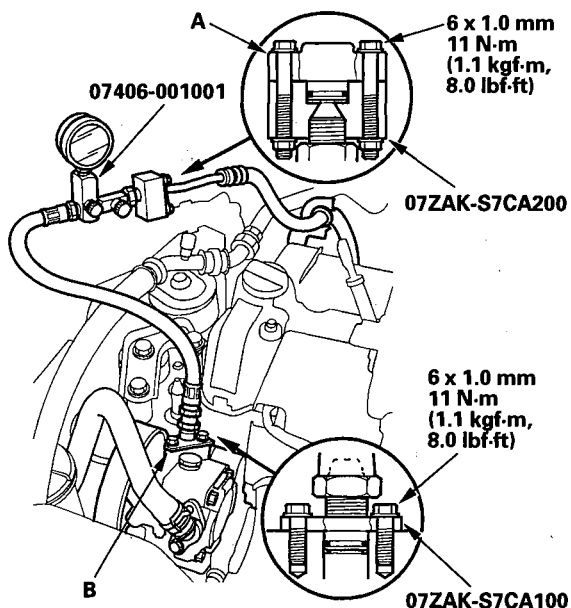
Pump Pressure Test with T/N 07406-0010001

Special Tools Required

- P/S joint adapter (pump) 07ZAK-S7CA100
- P/S joint adapter (hose) 07ZAK-S7CA200
- P/S pressure gauge 07406-0010001

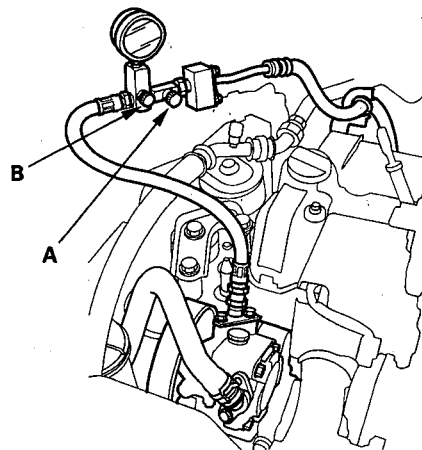
Check the fluid pressure as follows to determine whether the trouble is in the pump or gearbox.

1. Check the power steering fluid level (see page 17-12).
2. Disconnect the pump outlet hose (A) from the pump outlet with care so as not to spill the power steering fluid on the frame and other parts, then install the P/S joint adapter (pump) on the pump outlet (B) with the P/S joint outlet plate.



3. Connect the P/S joint adapter (hose) to the P/S pressure gauge, then connect the pump outlet hose to the P/S joint adapter (hose).
4. Install the P/S pressure gauge to the P/S joint adapter (pump).

5. Fully open the shut-off valve (A).



6. Fully open the pressure control valve (B).
7. Start the engine and let it idle.
8. Turn the steering wheel from lock-to-lock several times to warm the fluid to operating temperature at 158 °F (70 °C).
9. Measure steady-state fluid pressure while the engine is idling. If the pump is in good condition, the gauge should read no more than 1,470 kPa (15 kgf/cm², 213 psi). If it reads high, check for:
 - Clogged or deformed feed or return line between the pump and the gearbox.
 - Clogged valve body unit.
10. Close the shut-off valve, then close the pressure control valve gradually until the pressure gauge needle is stable. Read the pressure.

NOTICE

Do not keep the shut-off valve closed more than 5 seconds or the pump could be damaged by overheating.

11. Immediately open the shut-off valve fully. If the pump is in good condition, the gauge should read at least 8,150—8,850 kPa (83—90 kgf/cm², 1,180—1,280 psi). A low reading means pump output is too low for full assist. Repair or replace the pump.

Power Steering

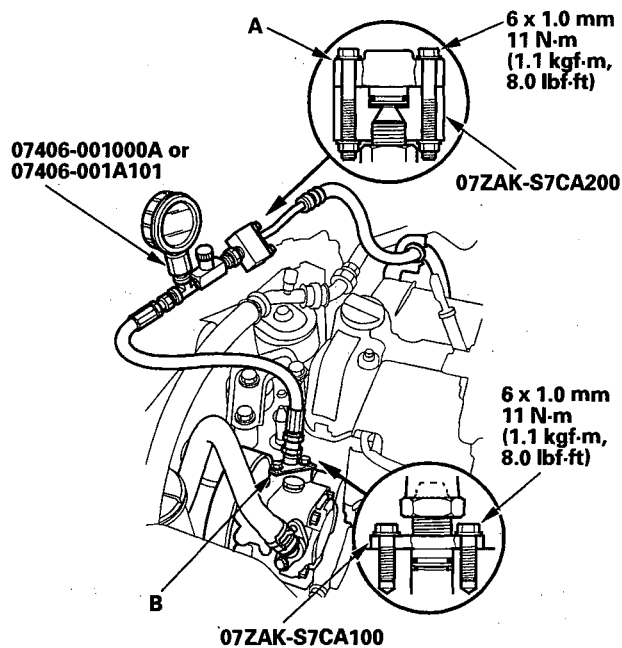
Pump Pressure Test with T/N 07406-001000A or T/N 07406-001A101

Special Tools Required

- P/S joint adapter (pump) 07ZAK-S7CA100
- P/S joint adapter (hose) 07ZAK-S7CA200
- P/S pressure gauge 07406-001000A or 07406-001A101

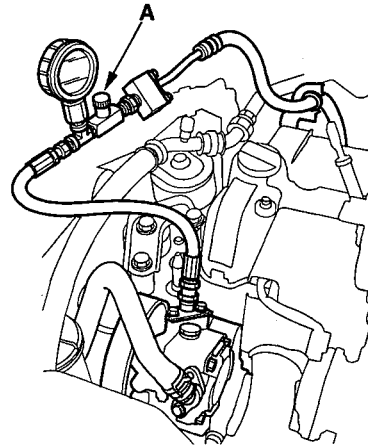
Check the fluid pressure as follows to determine whether the trouble is in the pump or gearbox.

1. Check the power steering fluid level (see page 17-12).
2. Disconnect the pump outlet hose (A) from the pump outlet with care so as not to spill the power steering fluid on the frame and other parts, then install the P/S joint adapter (pump) on the pump outlet (B) with the P/S joint outlet plate.



3. Connect the P/S joint adapter (hose) to the P/S pressure gauge, then connect the pump outlet hose to the P/S joint adapter (hose).
4. Install the P/S pressure gauge to the P/S joint adapter (pump).

5. Open the shut-off valve (A) 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 at 158 °F (70 °C).
8. Measure steady-state fluid pressure while the engine is idling. If the pump is in good condition, the gauge should read no more than 1,470 kPa (15 kgf/cm², 213 psi). If it reads high, check for:

- Clogged or deformed feed or return line between the pump and the gearbox.
- Clogged valve body unit.

9. Close the shut-off valve gradually and read the pressure.

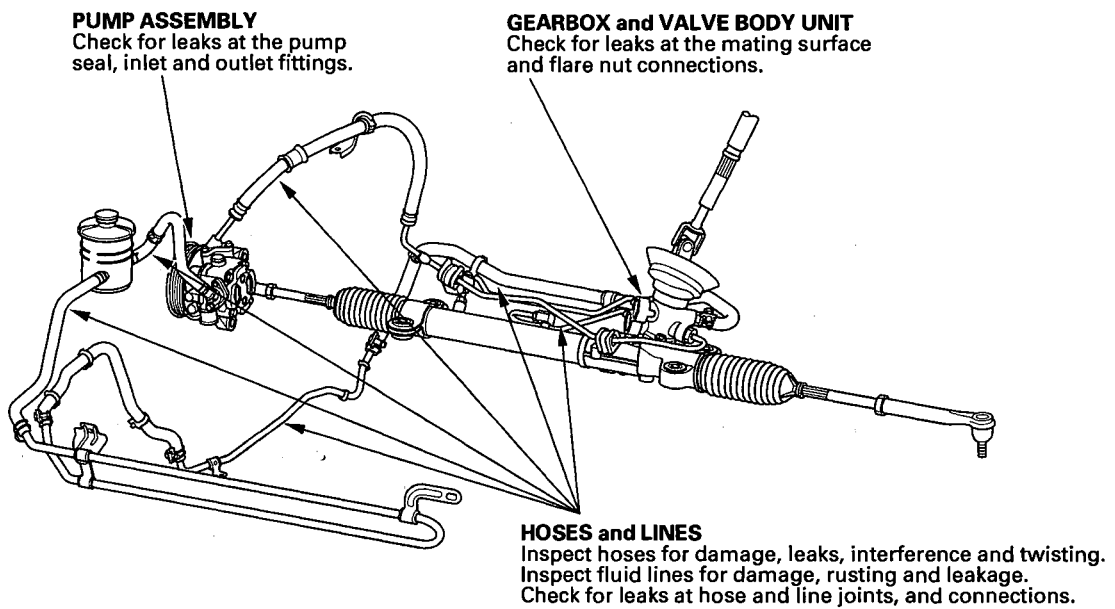
NOTICE

Do not keep the shut-off valve closed more than 5 seconds or the pump could be damaged by overheating.

10. Immediately open the shut-off valve fully. If the pump is in good condition, the gauge should read at least 8,150—8,850 kPa (83—90 kgf/cm², 1,180—1,280 psi). A low reading means pump output is too low for full assist. Repair or replace the pump.



Fluid Leakage Inspection



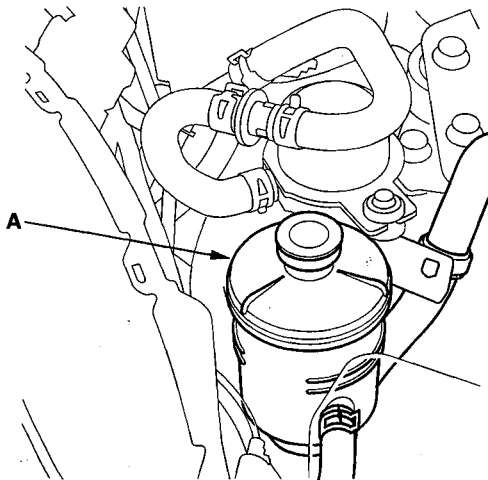
Power Steering

Fluid Replacement

Check the reservoir (A) at regular intervals, and add the recommended fluid as necessary. Always use Acura Power Steering Fluid. Using any other type of power steering fluid or automatic transmission fluid can cause increased wear and poor steering in cold weather.

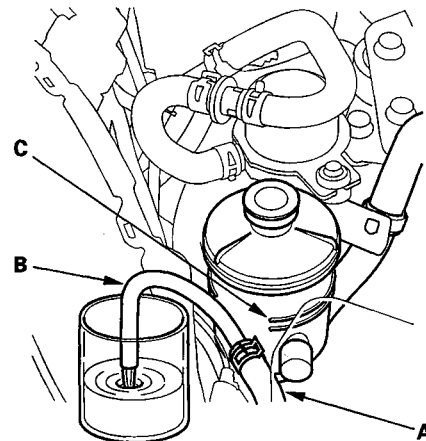
NOTE: If the fluid is contaminated, the screen in the reservoir may be partially blocked. Replace the reservoir if necessary.

System capacity:
0.9 L (0.96 US. qt) at disassembly
Reservoir capacity:
0.30 L (0.32 US. qt)



1. Remove the reservoir from its holder. Raise the reservoir, then disconnect the return hose (A) to drain the reservoir. Take care not to spill the fluid on the body and parts. Wipe off any spilled fluid at once.

NOTE: Inspect the reservoir screen for any debris. If the reservoir screen is clogged, replace the reservoir.



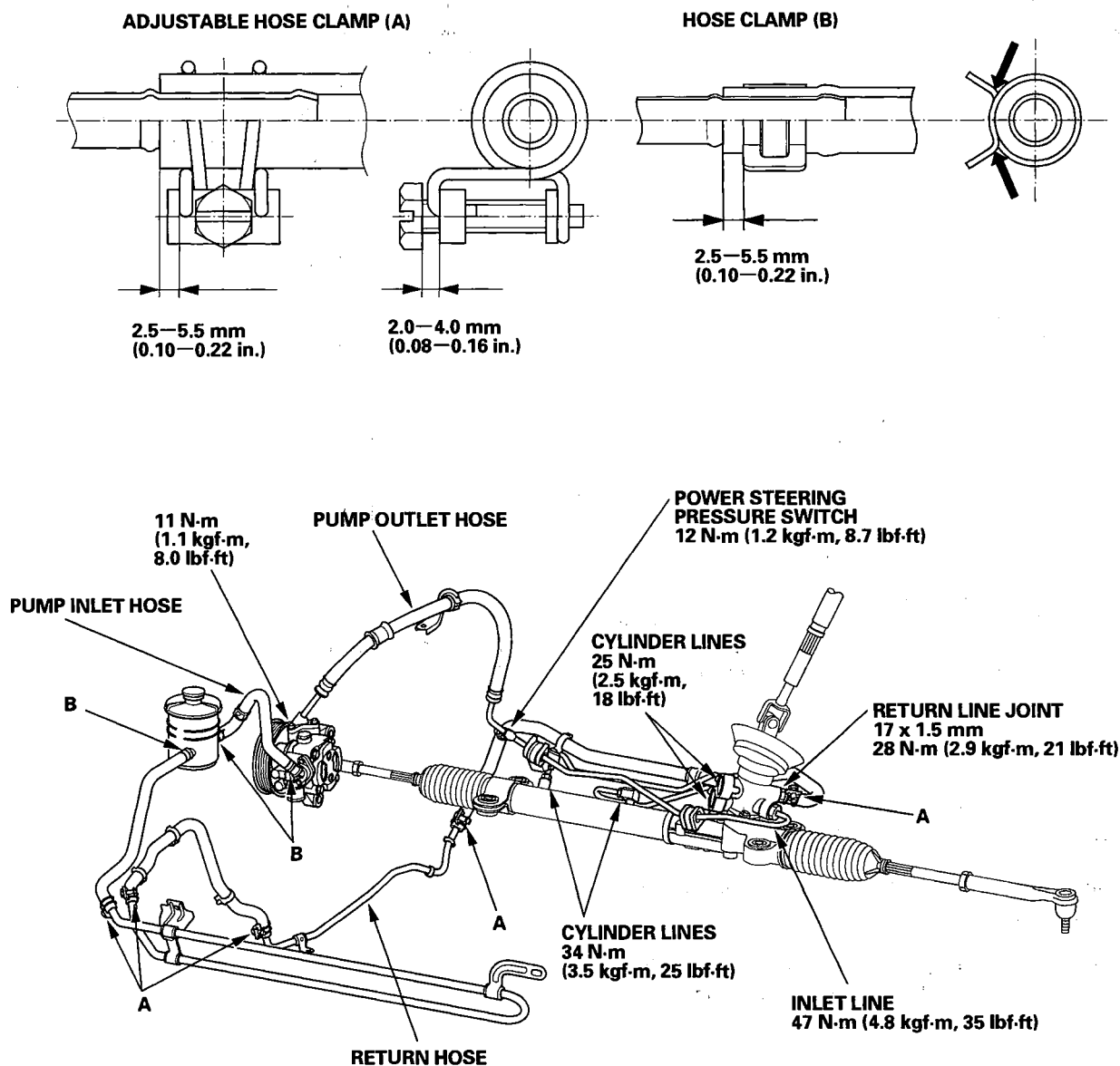
2. Connect a hose (B) of suitable diameter to the disconnected return hose, and put the hose end in a suitable container.
3. Start the engine, let it run at idle, and turn the steering wheel from lock-to-lock several times. When fluid stops running out of the hose, shut off the engine. Discard the fluid.
4. Reinstall the return hose on the reservoir.
5. Fill the reservoir to the upper level line (C).
6. Start the engine and run it at fast idle, then turn the steering from lock-to-lock several times to bleed air from the system.
7. Recheck the fluid level and add some if necessary. Do not fill the reservoir beyond the upper level line.
8. If the fluid is contaminated, dark, or discolored, repeat the procedure as necessary.



Power Steering Hose, Line, and Pressure Switch Replacement

Note these items during installation:

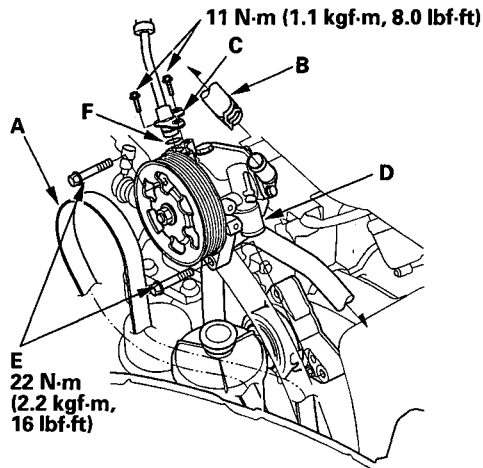
- Connect each hose to the corresponding line securely until it contacts the stop on the line. Install the clamp or adjustable clamp at the specified distance from the hose end as shown.
- Check all clamps for deterioration or deformation; replace the clamps with new ones if necessary.
- Add the recommended power steering fluid to the specified level on the reservoir and check for leaks.



Power Steering

Pump Replacement

1. Place a suitable container under the vehicle.
2. Drain the power steering fluid from the reservoir (see page 17-12).
3. Remove the drive belt (A) from the pump pulley (see page 4-31).



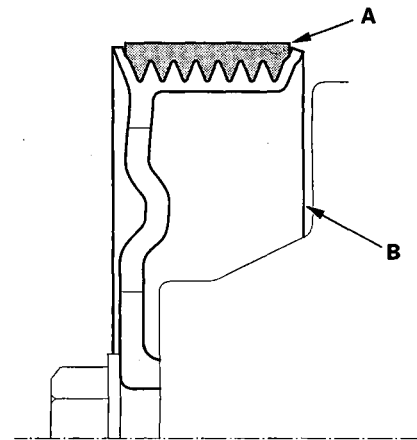
4. Cover the auto-tensioner, alternator, and A/C compressor with several shop towels to protect them from spilled power steering fluid. Disconnect the pump inlet hose (B) and pump outlet hose (C) from the pump (D), and plug them. Take care not to spill the fluid on the body or parts. Wipe off any spilled fluid at once. Do not turn the steering wheel with the pump removed.
5. Remove the pump mounting bolts (E).
6. Cover the opening of the pump with a piece of tape to prevent foreign material from entering the pump.
7. Connect the pump inlet hose and pump outlet hose onto the new pump with new O-ring (F).
8. Loosely install the pump in the pump bracket with the mounting bolts, then tighten the pump fittings securely.

9. Tighten the pump mounting bolts to the specified torque.

10. Install the drive belt (A).

Note these items during belt installation:

- Make sure that the belt is properly positioned on the pulleys (B).
- Do not get power steering fluid or grease on any parts around the power steering pump, drive belt, or pulley faces. Clean off any fluid or grease before installation.



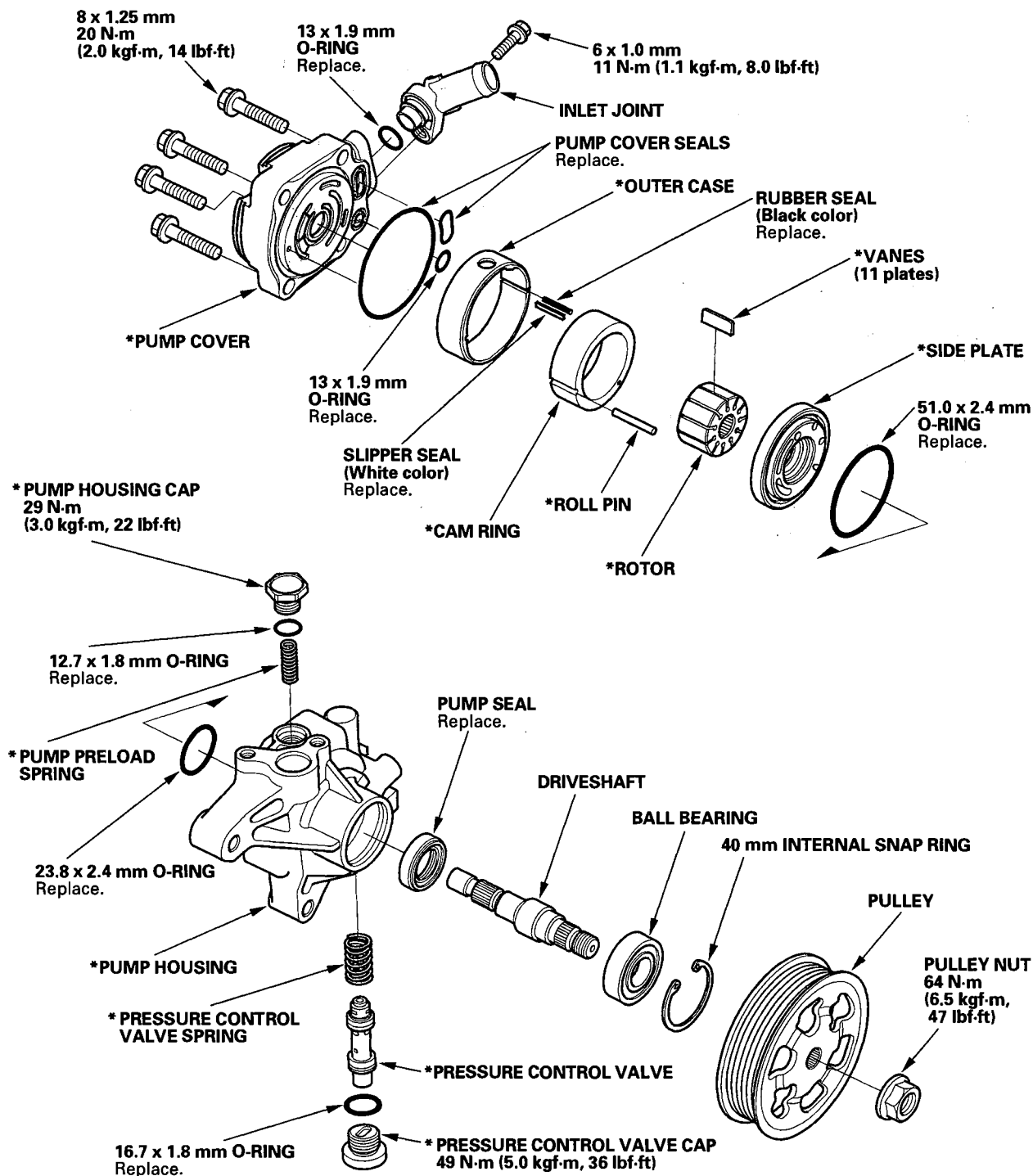
11. Fill the reservoir to the upper level line (see page 17-12).



Pump Overhaul

Exploded View

Replace the pump as an assembly if the parts indicated with asterisk (*) are worn or damaged.



(cont'd)

Power Steering

Pump Overhaul (cont'd)

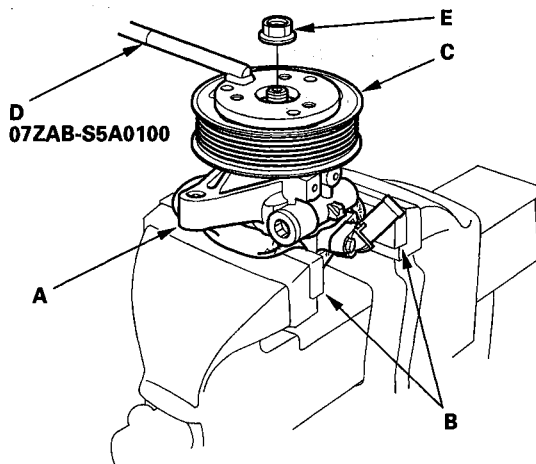
Special Tools Required

- Attachment, 28 x 30 mm 07946-1870100
- Driver 07749-0010000
- Pulley holder 07ZAB-S5A0100

Disassembly

NOTE: Refer to the Exploded View as needed during the following procedure.

1. Drain the fluid from the pump (see page 17-12).
2. Remove the power steering pump (see page 17-14).
3. Hold the steering pump (A) in a vise with soft jaws (B), hold the pulley (C) with the pulley holder (D), and remove the pulley nut (E) and pulley. Be careful not to damage the pump housing with the jaws of the vise.

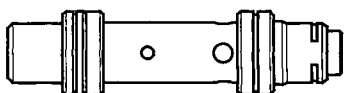


4. Remove the inlet joint and O-ring.
5. Remove the pressure control valve cap, O-ring, valve spring, and pressure control valve.
6. Remove the pump housing cap, O-ring, and pump preload spring.
7. Remove the pump cover, O-ring, and pump cover seals.
8. Pull out the roll pin.
9. Remove the outer case, cam ring, rotor, vanes, and side plate.
10. Remove the rubber seal and slipper seal from the outer case.
11. Remove the O-rings from the bottom of the housing.
12. Remove the 40 mm internal snap ring, then remove the driveshaft by tapping the shaft end with a plastic hammer.
13. Remove the seal from the pump housing.

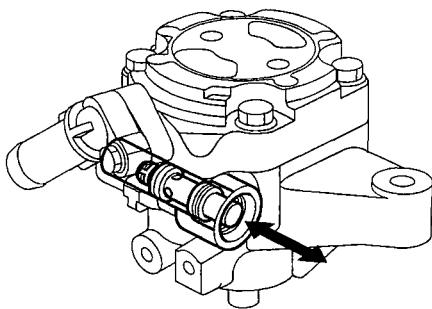


Inspection

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

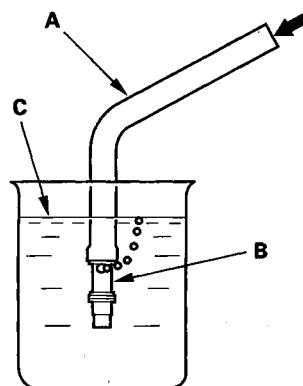


15. Inspect the bore of the pressure control valve on the pump housing for scratches and wear.
16. Slip the pressure control valve back in the pump housing, and check that it moves in and out smoothly. If OK, go to step 17; if not, replace the pump as an assembly. The pressure control valve is not available separately.

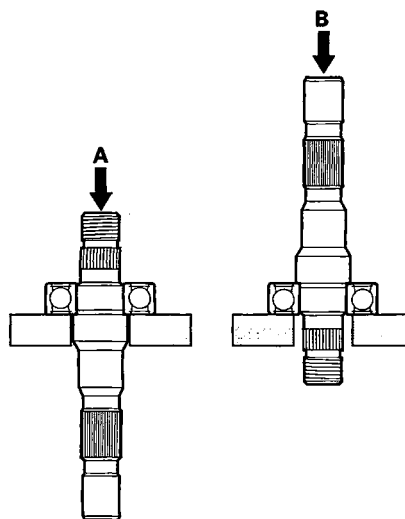


17. Attach a hose (A) to the end of the pressure control valve (B) as shown. Then submerge the pressure control valve in a container of power steering fluid or solvent (C), and blow in the hose.

- If air bubbles leak through the valve at less than 98 kPa (1.0 kgf/cm², 14.2 psi), replace the pump as an assembly. The pressure control valve is not available separately.
- If the pressure control valve is OK, set it aside for reassembly later.



18. Inspect the ball bearing by rotating the outer race slowly. If you feel any play (axial or radial) or roughness, remove the faulty ball bearing (A), and install a new one (B).



19. Inspect each part shown with an asterisk in the Exploded View; if any of them are worn or damaged, replace the pump as an assembly.

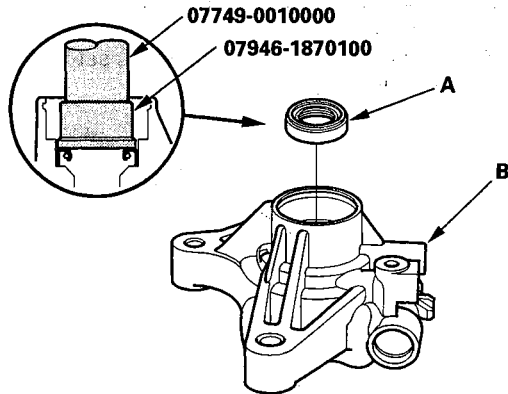
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Power Steering

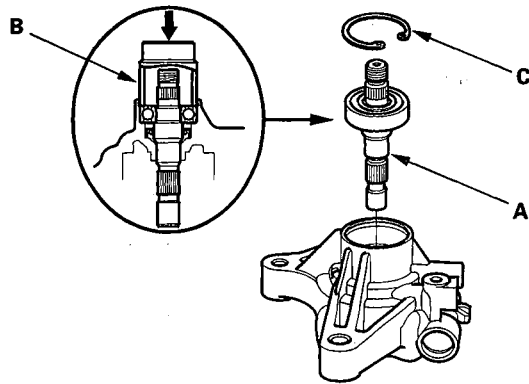
Pump Overhaul (cont'd)

Reassembly

20. Install the new pump seal (A) (with its grooved side facing in) into the pump housing (B) by hand, then drive it in using the driver until the seal is fully seated in the pump housing. Do not apply more than 1,370 N (140 kgf, 308 lbf) of pressure.

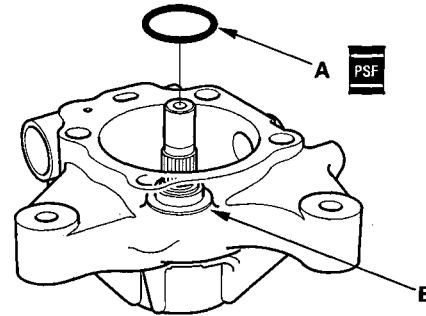


21. Position the pump driveshaft (A) in the pump housing, then press it in with the appropriate size socket wrench (B) as shown.



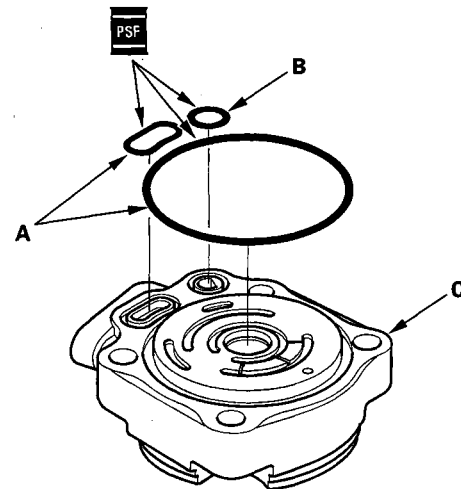
22. Install the 40 mm internal snap ring (C) with its radiused edge facing out.

23. Coat the new 23.8 mm O-ring (A) with power steering fluid, then position it on the bottom (B) of the pump housing.



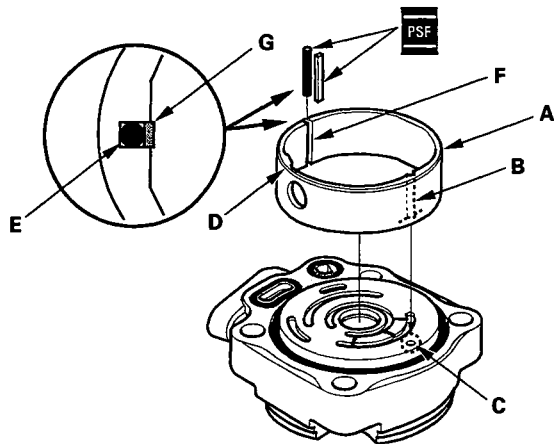
24. Coat the new cover seals (A) and new 13.0 mm O-ring (B) with power steering fluid, then position them into the grooves on the cover (C).

NOTE: Be careful not to install the inlet joint O-ring because they are same size.



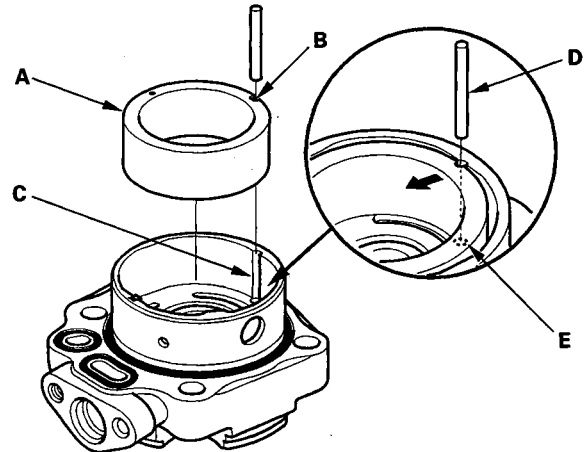


25. Install the outer case (A) by aligning the slot (B) inside the outer case with the cover roll pin hole (C). Be sure that the tapered side (D) of outer case is facing up.

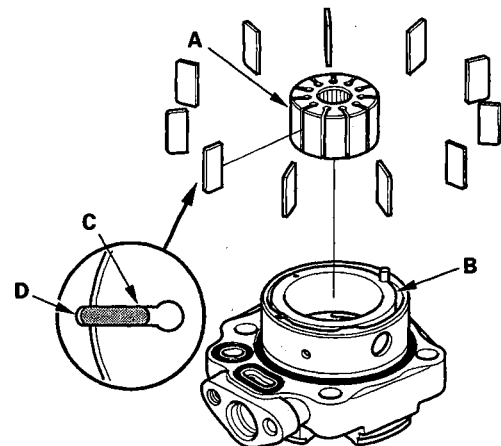


26. Apply power steering fluid to the rubber seal (E) (black), and install it in the slot (F) of the outer case.
27. Apply power steering fluid to the slipper seal (G) (white), and install it on top of the rubber seal you just installed.

28. Install the cam ring (A) by aligning the slot (B) with the slot (C) in the outer case.



29. Insert the roll pin (D) into the slots between the cam ring and outer case, then push the roll pin into the set hole (E).
30. Install the rotor (A) in the cam ring (B).



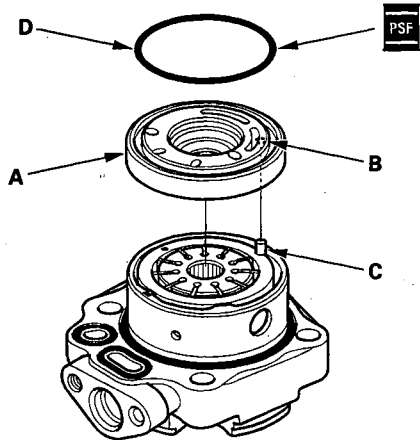
31. Set the 11 vanes (C) in the grooves in the rotor. Make sure that the gold color ends (D) of the vanes are in contact with the sliding surface of the cam ring.

(cont'd)

Power Steering

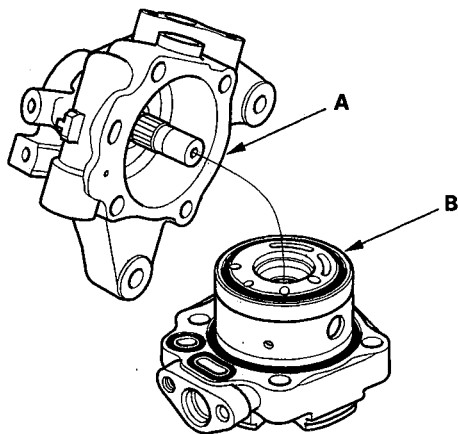
Pump Overhaul (cont'd)

32. Place the side plate (A) on the cam ring, and align the roll pin set hole (B) with the roll pin (C).

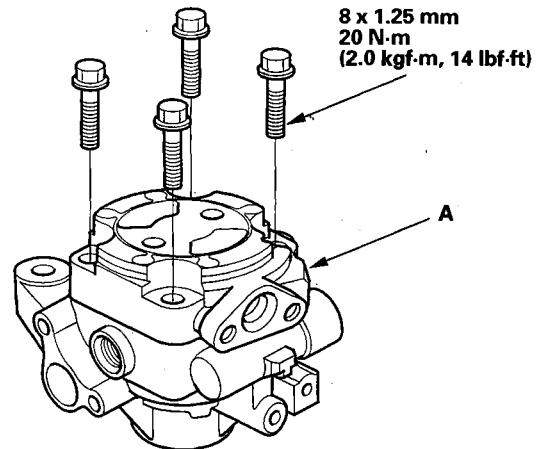


33. Coat the new O-ring (D) with power steering fluid, then position it into the groove on the side plate.

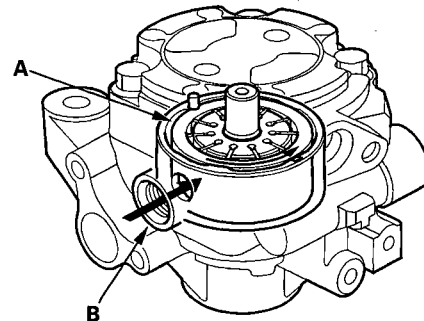
34. Install the pump housing (A) over the cover assembly (B).



35. Align the bolt holes in the cover (A) with the threaded holes in the pump housing. Install the flange bolts loosely first, then torque the flange bolts in a criss-cross pattern in two or more steps.

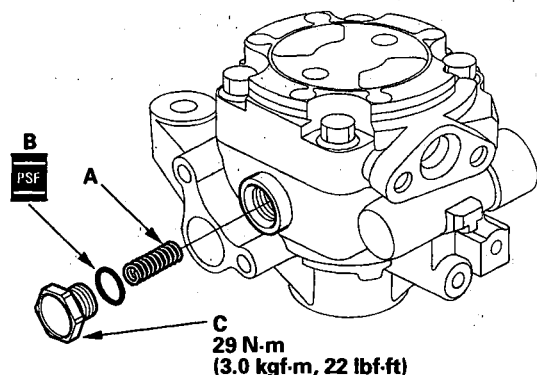


36. Push in the cam ring (A) from the pump housing cap hole (B) with a flat-tip screwdriver to make sure the cam ring is fully seated against the outer case.

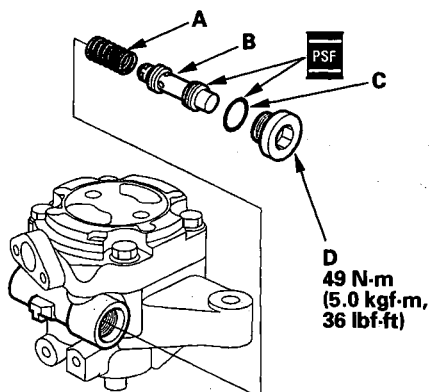




37. Install the pump preload spring (A) in the pump housing.

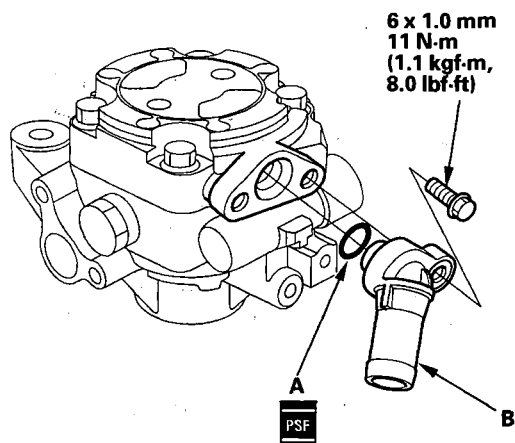


38. Coat the new 12.7 mm O-ring (B) with power steering fluid, and install it on the pump housing cap (C).
39. Install the pump housing cap on the pump housing, and tighten it to the specified torque.
40. Install the pressure control valve spring (A) in the pump housing.

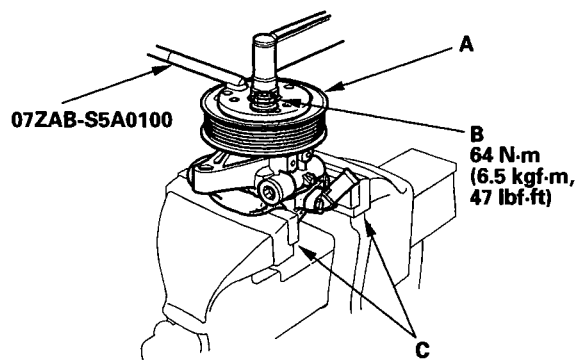


41. Coat the pressure control valve (B) with power steering fluid, and install it in the pump housing.
42. Coat the new 16.7 mm O-ring (C) with power steering fluid, and install it on the pressure control valve cap (D).
43. Install the pressure control valve cap on the pump housing, and tighten it to the specified torque.

44. Coat the new O-ring (A) with power steering fluid, and install it on the inlet joint (B).



45. Install the inlet joint on the pump housing.
46. Install the pulley (A), then loosely install the pulley nut (B). Hold the steering pump in a vise with soft jaws (C). Be careful not to damage the pump housing with the jaws of the vise.



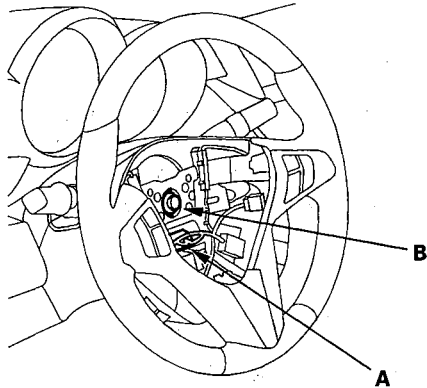
47. Hold the pulley with the pulley holder, and tighten the pulley nut to the specified torque.
48. Check that the pump turns smoothly by turning the pulley. If it turns hard, loosen the four flange bolts on the cover, then retighten them as in step 35, and check the pump again.

Power Steering

Steering Wheel Removal

SRS components are located in this area. Review the SRS component locations (see page 24-12) and the precautions and procedures (see page 24-14) before doing repairs or service.

1. Make sure you have the anti-theft code for the audio and the navigation system (if equipped), then write down the audio presets.
2. Make sure the ignition switch is OFF, then disconnect the negative cable from the battery.
3. Align the front wheels straight ahead, then remove the driver's airbag from the steering wheel (see page 24-146).
4. Disconnect the cable reel subharness connector (A).

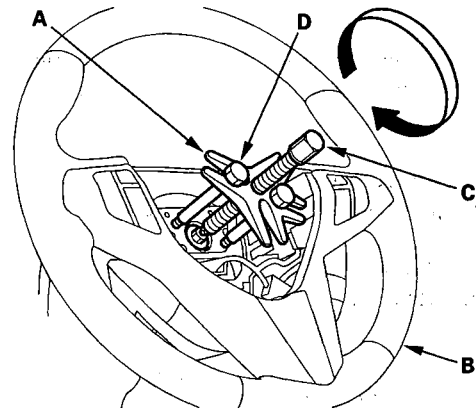


5. Loosen the steering wheel bolt (B).

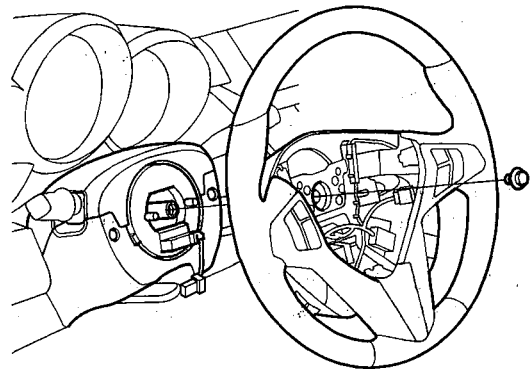
6. Install a commercially available steering wheel puller (A) on the steering wheel (B). Free the steering wheel from the steering column shaft by turning the pressure bolt (C) of the puller.

Note these items when removing the steering wheel:

- Do not tap on the steering wheel or the steering column shaft when removing the steering wheel.
- If you thread the puller bolts (D) into the wheel hub more than five threads, the bolts will hit the cable reel and damage it. To prevent this, install a pair of jam nuts five threads up on each puller bolt.

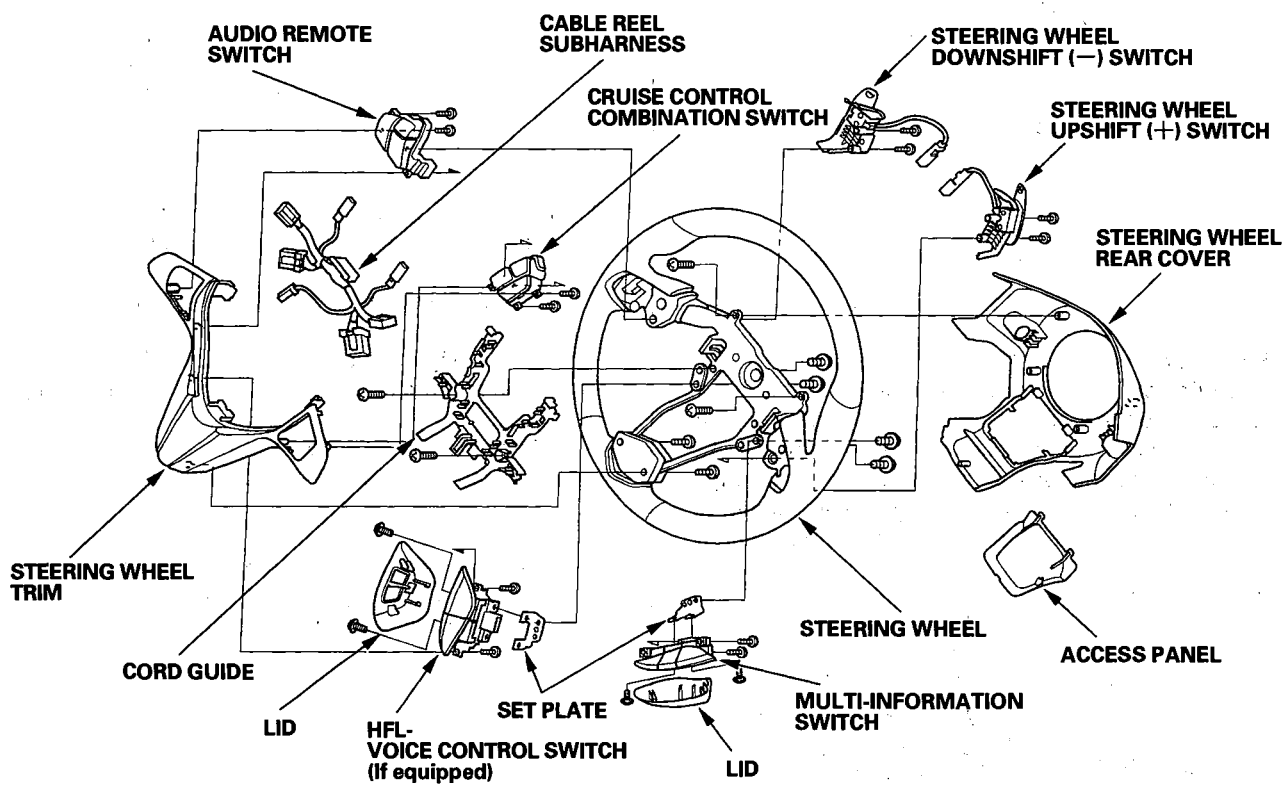


7. Remove the steering wheel puller, then remove the steering wheel bolt and steering wheel from the steering column.





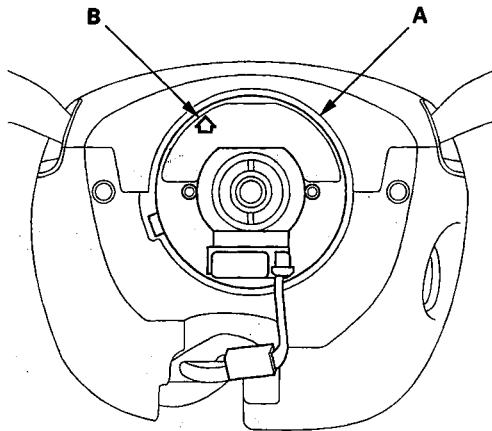
Steering Wheel Disassembly/Reassembly



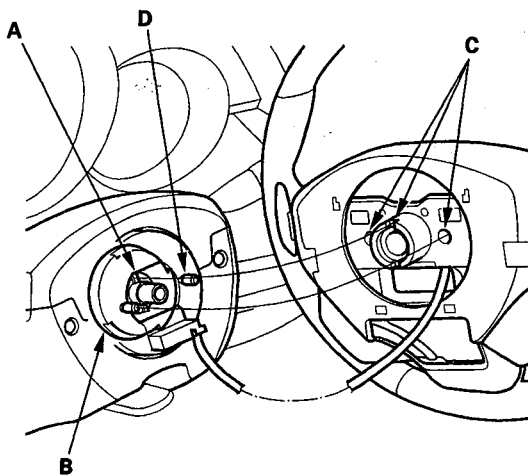
Power Steering

Steering Wheel Installation

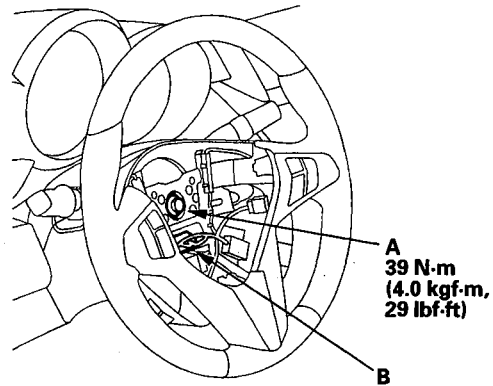
1. Before installing the steering wheel, make sure the front wheels are aligned straight ahead, then center the cable reel (A). Do this by first rotating the cable reel clockwise until it stops. Then rotate it counterclockwise about three full turns. The arrow mark (B) on the cable reel label should point straight up.



2. Position the two tabs (A) of the turn signal canceling sleeve (B) as shown. Install the steering wheel on to the steering column shaft, making sure the steering wheel hub (C) engages the pins (D) of the cable reel and tabs of the turn signal canceling sleeve. Do not tap on the steering wheel or steering column shaft when installing the steering wheel.



3. Install the steering wheel bolt (A), and tighten it to the specified torque. Connect the cable reel subharness connector (B). Make sure the wire harness is routed and fastened properly.



4. Install the driver's airbag, and confirm that the system is operating properly (see page 24-146).

5. Finish the installation, and note these items:

- Turn the ignition switch ON (II); the SRS indicator should come on for about 6 seconds and then go off.
- Enter the anti-theft code for the audio and the navigation system (if equipped), then enter the audio presets.
- Set the clock.
- Verify cruise control, audio remote, navigation guide and turn signal switch operation.
- Make sure the steering wheel is centered.



Steering Column Removal and Installation

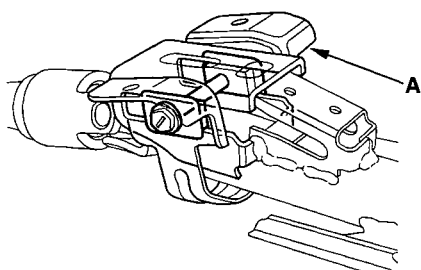
SRS components are located in this area. Review the SRS component locations (see page 24-12) and the precautions and procedures (see page 24-14) before doing repairs or service.

Removal

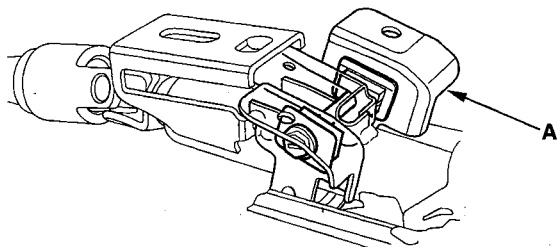
NOTICE

Be careful not to pull the bracket (A) on the front side of steering column out of its normal position. If the bracket accidentally comes out, replace the steering column as an assembly.

Normal position

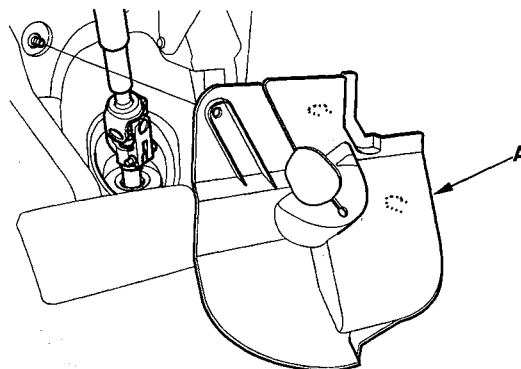


Out of position

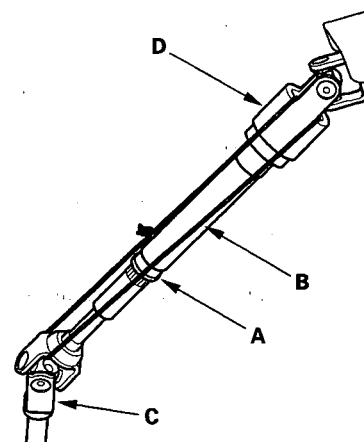


1. Make sure you have the anti-theft code for the audio and the navigation system (if equipped), then write down the audio presets.
2. Make sure the ignition switch is OFF, then disconnect the negative cable from the battery.
3. Remove the driver's airbag assembly and the steering wheel (see page 17-22).
4. Remove the driver's dashboard undercover (see page 20-102).
5. Remove the column covers (see page 20-107).

6. Remove the steering joint cover (A).



7. Release the tilt/telescopic lock lever, and adjust the steering column to the full tilt up position, and to the full telescopic in position.
8. Tighten the tilt/telescopic lock lever.
9. Hold the lower slide shaft (A) on the column with a piece of wire (B) between the joint yoke (C) of the lower slide shaft and joint yoke (D) of the upper shaft to prevent the slider shaft from pulling out.



10. Release the tilt/telescopic lock lever, and adjust the steering column to the full telescopic out position, then tighten the tilt/telescopic lock lever.

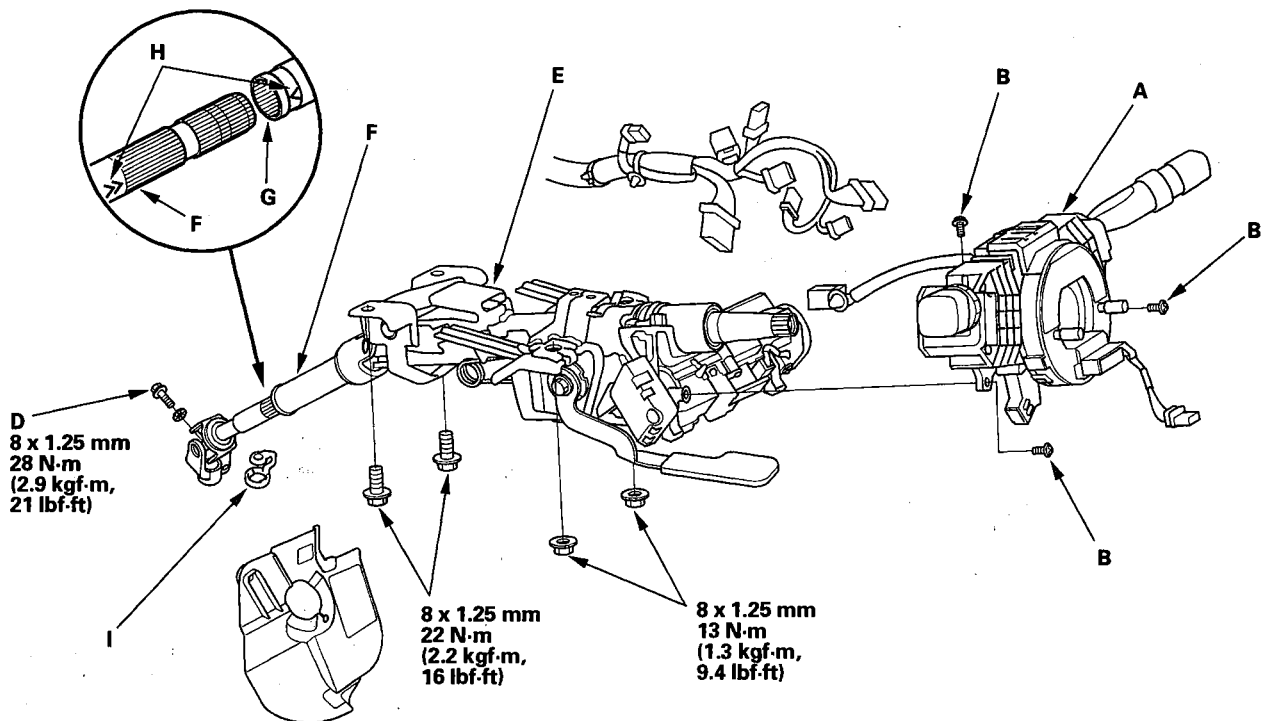
NOTE: Do not release the tilt/telescopic lock lever when removing the steering column from the frame.

(cont'd)

Power Steering

Steering Column Removal and Installation (cont'd)

11. Disconnect the wire harness connectors from the combination switch assembly and cable reel (A).

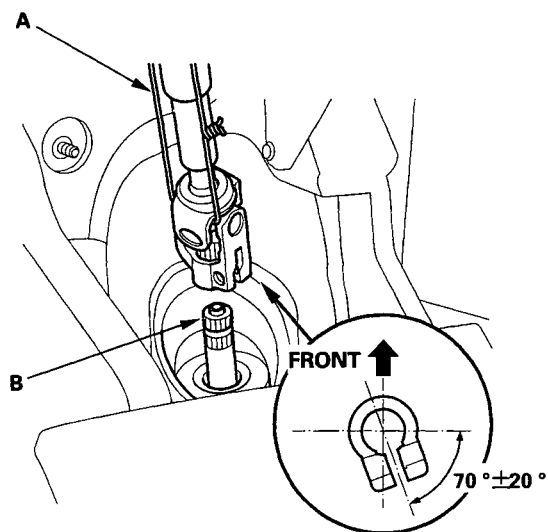


12. Remove the combination switch assembly from the steering column shaft by removing the three screws (B).
13. Disconnect the connectors from the ignition switch, and release the wire harness clips from the steering column.
14. Remove the steering joint bolt (C), then disconnect the steering joint (D) from the pinion shaft.
15. Remove the steering column (E) by removing the attaching nuts and bolts. If the lower slide shaft (F) is removed, slip it into the upper shaft (G) by aligning the paint or stamped marks (H).
16. Remove the center guide (I) (if equipped), and discard it. The center guide is for factory assembly only.

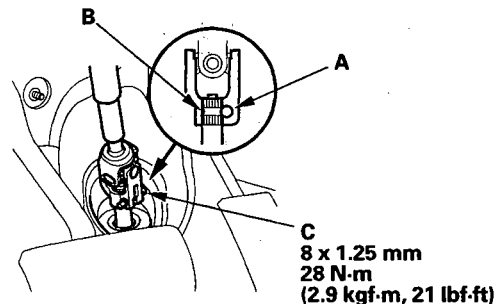


Installation

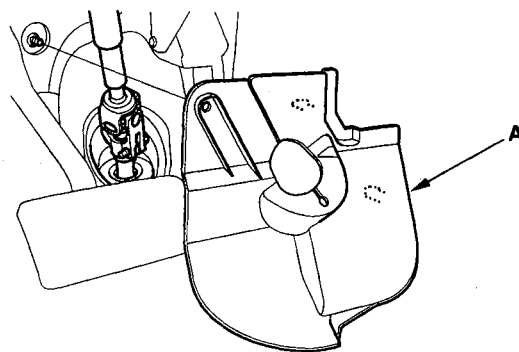
1. Install the steering column in the reverse order of removal, and note these items:
 - Make sure the wires are not caught or pinched by any parts.
 - Take care not to let the sliding capsules fall out of position during column installation.
2. Center the steering rack within its stroke in steering joint connection.
3. With the rack in the straight ahead driving position, cut the wire (A) and slip the lower end of the steering joint onto the pinion shaft (B) in the range shown.



4. Align the bolt hole (A) on the steering joint with the groove (B) around the pinion shaft, and loosely install the joint bolt (C). Be sure that the joint bolt is securely in the groove in the pinion shaft. Pull on the steering joint to make sure that the steering joint is fully seated. Tighten the steering joint bolt to the specified torque.



5. Install the steering joint cover (A).

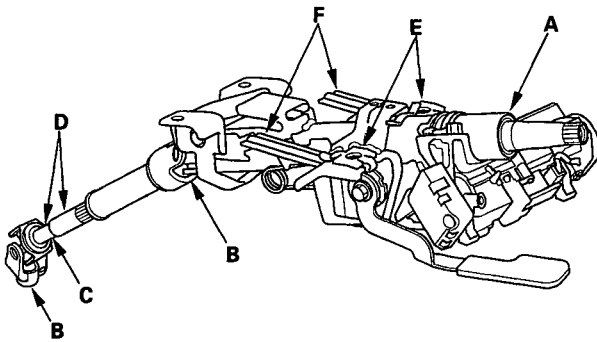


6. Install the steering wheel (see page 17-24).
7. Install the column covers (see page 20-107).
8. Install the driver's dashboard undercover (see page 20-102).
9. Connect the negative battery cable.
 - Turn the ignition switch ON (II); the SRS indicator should come on for about 6 seconds and then go off.
 - Enter the anti-theft code for the audio and the navigation system (if equipped), then enter the audio presets.
 - Set the clock.
 - Verify cruise control, audio remote, navigation guide, and turn signal switch operation.
 - Make sure the steering wheel is centered.

Power Steering

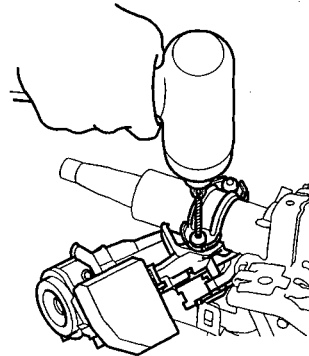
Steering Column/Tilt/Telescopic Inspection

- Check the steering column ball bearing (A) and the steering joint bearings (B) for play and proper movement. If any bearing is noisy or has excessive play, replace the steering column as an assembly.
- Check the lower side shaft (C) for smooth movement in and out. If the lower slide shaft is removed, slip it into the upper shaft by aligning the paint or stamped marks (D). If it sticks or binds, replace the steering column as an assembly.
- Check the sliding capsules (E) for distortion or breakage. If there is distortion or breakage, replace the steering column as an assembly.
- Check the tilt mechanism and telescopic mechanism for movement and damage.
- Check the absorbing plates (F) for distortion or breakage. If there is distortion or breakage, replace the steering column as an assembly.

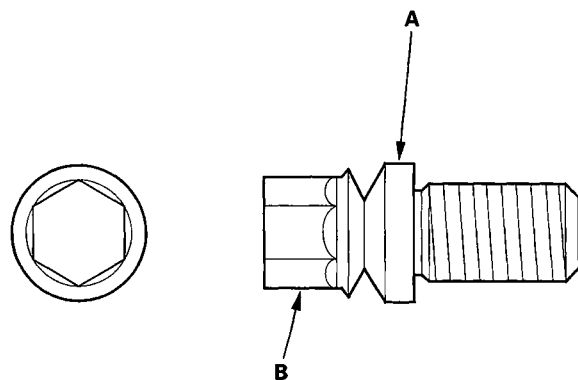


Steering Lock Replacement

1. Remove the steering column (see page 17-25).
2. Center-punch each of the two shear bolts, and drill the heads of the bolts off with a 5 mm (3/16 in.) drill bit. Be careful not to damage the switch body when removing the shear bolts.



3. Remove the shear bolts from the switch body.
4. Install the switch body without the key inserted.
5. Loosely tighten the new shear bolts.
6. Insert the ignition key, and check for proper operation of the steering wheel lock and that the ignition key turns freely.
7. Tighten the shear bolts (A) until the hex heads (B) twist off.



8. Register the immobilizer control unit-receiver (see page 22-341), and make sure the immobilizer system works properly.

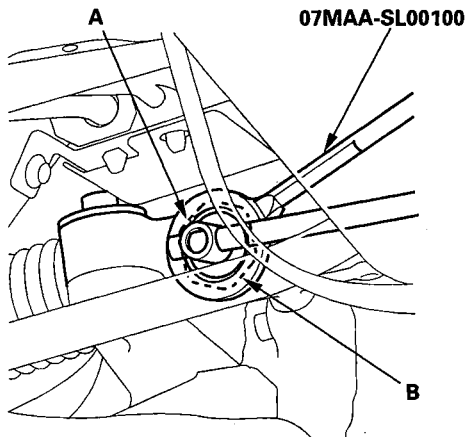


Rack Guide Adjustment

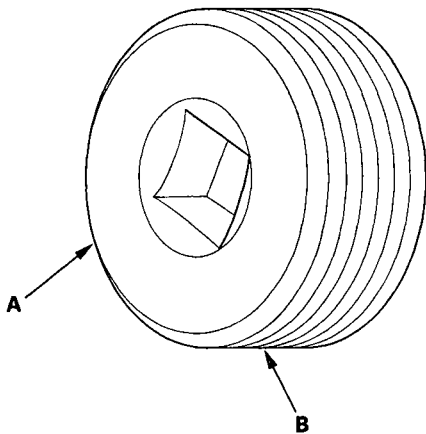
Special Tools Required

Locknut wrench, 40 mm 07MAA-SL00100

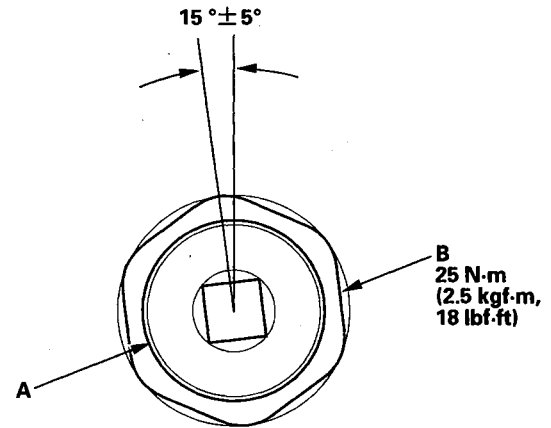
1. Set the wheels in the straight ahead position.
2. Loosen the rack guide screw locknut (A) with the locknut wrench, then remove the rack guide screw (B).



3. Remove the old sealant from the rack guide screw (A), and apply new sealant (Three Bond 1215 or Loctite 5699) to the middle of the threads (B). Loosely install the rack guide screw on the steering gearbox.



4. Tighten the rack guide screw (A) to 25 N·m (2.5 kgf·m, 18 lbf·ft), then loosen it.



5. Retighten the rack guide screw to 8 N·m (0.8 kgf·m, 6 lbf·ft), then back it off to the specified angle.

Specified return angle: $15^{\circ} \pm 5^{\circ}$

6. Hold the rack guide screw stationary with a wrench, and tighten the locknut (B) by hand until it's fully seated.
7. Install the locknut wrench on the locknut, and hold the rack guide screw stationary with a wrench. Tighten the locknut to the specified torque.
8. Check for unusual steering effort through the complete turning range.
9. Check the steering wheel rotation play (see page 17-7) and the power assist (see page 17-7).

Power Steering

Steering Gearbox Removal

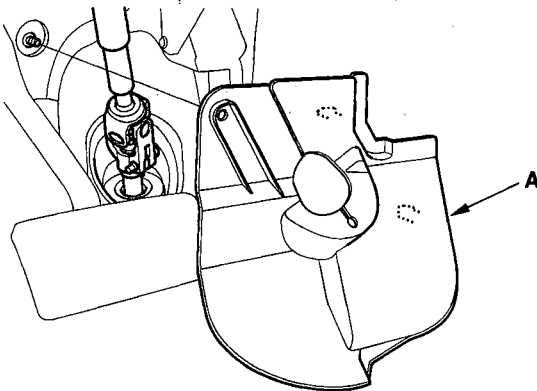
Special Tools Required

Ball joint remover, 28 mm 07MAC-SL0A202

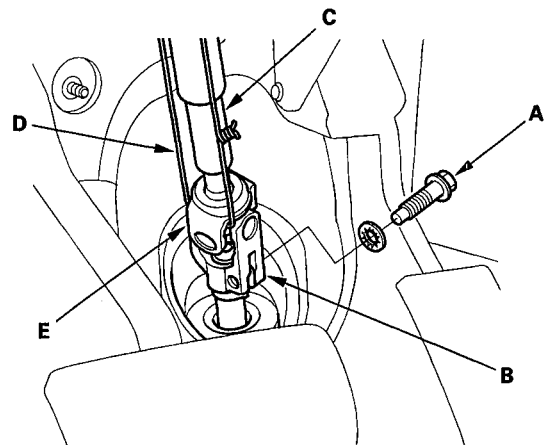
Note these items during removal:

- 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.
- Be sure to remove the steering wheel before disconnecting the steering joint. Damage to the cable reel can occur.

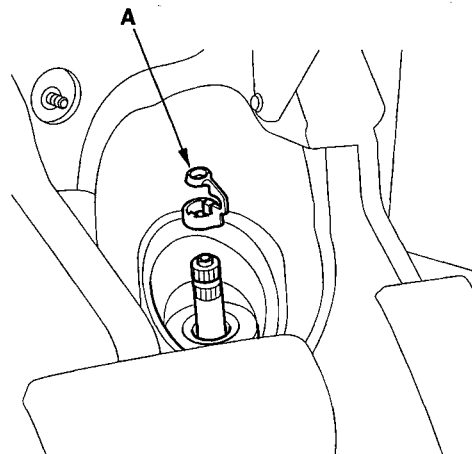
1. Drain the power steering fluid (see page 17-12).
2. Make sure you have the anti-theft code for the audio and the navigation system (if equipped), then write down the audio presets.
3. Make sure the ignition switch is OFF, then disconnect the negative cable from the battery.
4. Raise the front of vehicle, and support it with safety stands in the proper locations (see page 1-7).
5. Remove the front wheels.
6. Remove the steering wheel (see page 17-22).
7. Remove the driver's dashboard undercover (see page 20-102).
8. Remove the steering joint cover (A).



9. Remove the steering joint bolt (A), and disconnect the steering joint by moving the steering joint (B) toward the column. Hold the lower slide shaft (C) on the column with a piece of wire (D) between the joint yoke (E) on the lower slide shaft to the joint yoke on the upper shaft (see step 9 on page 17-25).

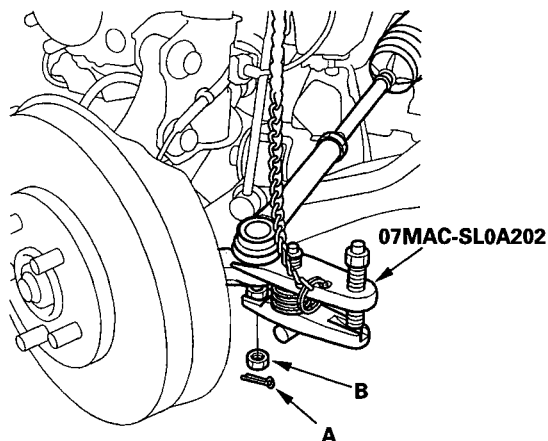


10. Remove the center guide (A) (if equipped), and discard it. The center guide is for factory assembly only.



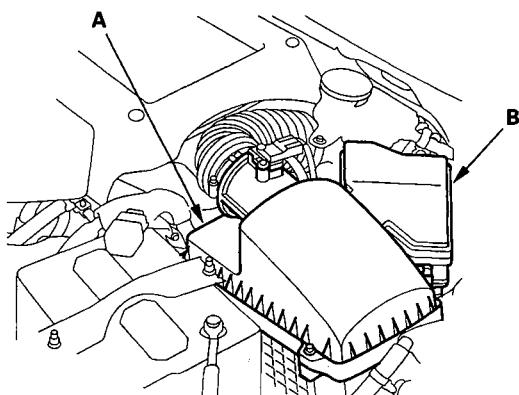


11. Remove the cotter pin (A) from the 12 mm nut (B), and loosen the nut.



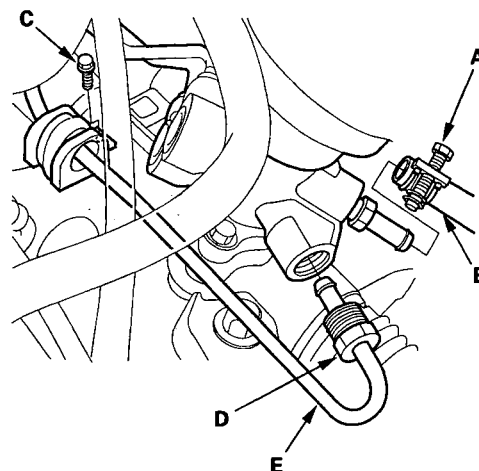
12. Separate the tie-rod ball joint and knuckle using the ball joint remover (see page 18-11).

13. Remove the air cleaner housing (A) (see page 11-394).



14. Remove the under-hood fuse/relay box (B) (see page 22-61).

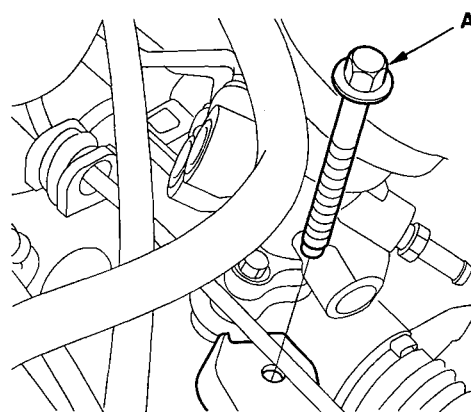
15. Loosen the adjustable hose clamp (A), and disconnect the return hose (B).



16. Remove the inlet line clamp bolt (C).

17. Loosen the 18 mm flare nut (D), and disconnect the inlet line (E).

18. Remove the 10 mm flange bolt (A) from the driver's side of the steering gearbox.

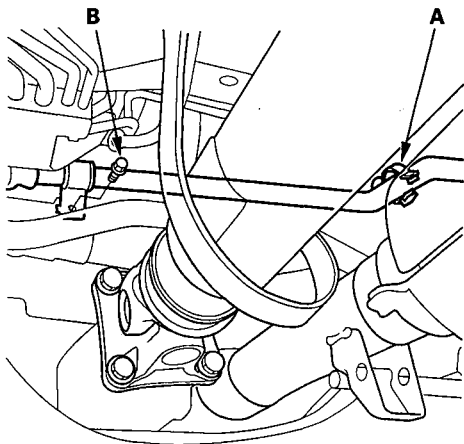


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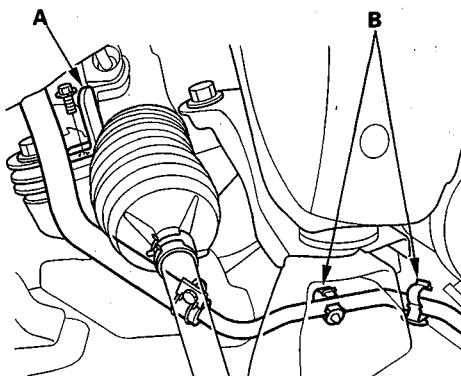
Power Steering

Steering Gearbox Removal (cont'd)

19. Disconnect the return line holder (A), and remove the return line clamp bolt (B).

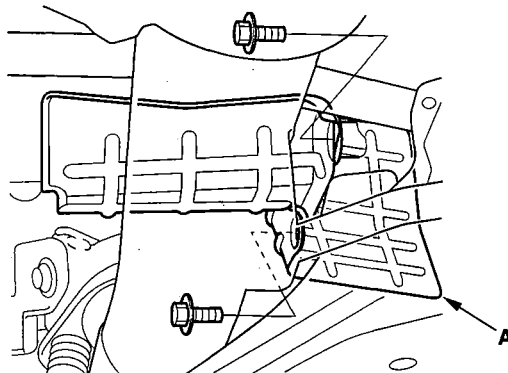


20. Remove the pump outlet hose clamp (A) from the steering gearbox.

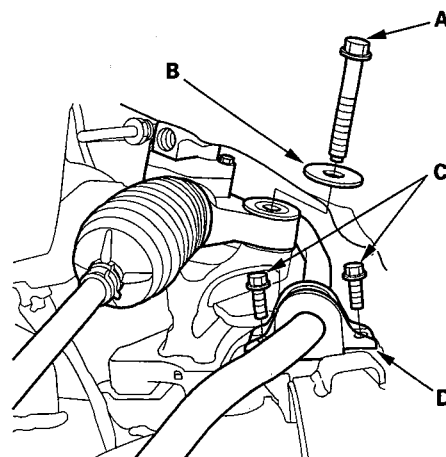


21. Disconnect the return hose clips (B).

22. Remove the P/S heat shield (A).



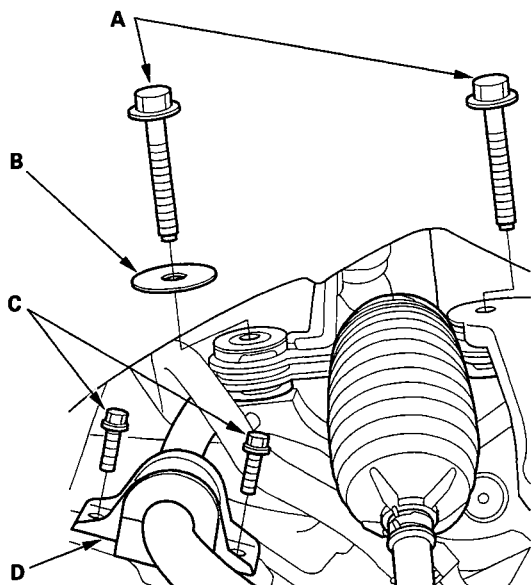
23. Remove the 10 mm flange bolt (A) and washer (B) from the driver's side of the steering gearbox.



24. Remove the flange bolts (C), then remove the stabilizer bar bushing holder (D) (see page 18-22).

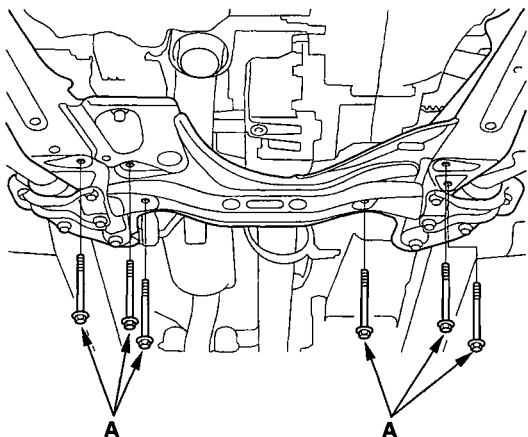


25. Remove the 10 mm flange bolts (A) and washer (B) from the passenger's side of the steering gearbox.

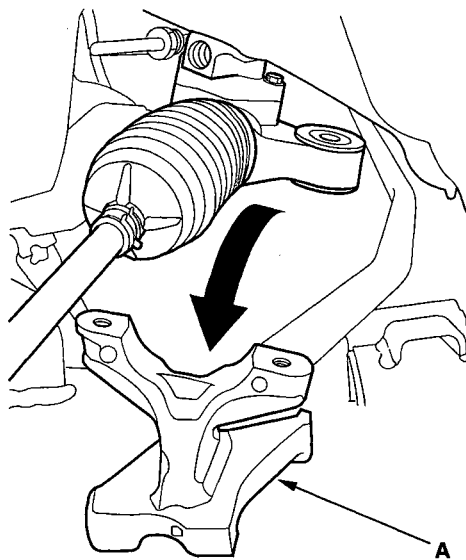


26. Remove the flange bolts (C), then remove the stabilizer bar bushing holder (D) (see page 18-22).

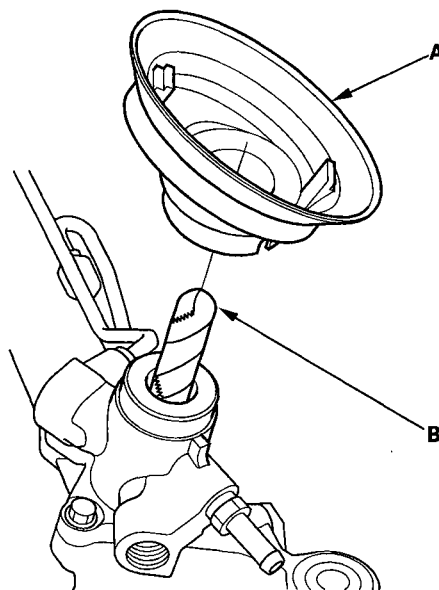
27. Remove the steering gearbox bracket mounting bolts (A) from the both sides of the subframe.



28. Remove the gearbox brackets (A).



29. Move the steering gearbox toward the front, and remove the pinion shaft grommet (A) from the top of the valve housing.



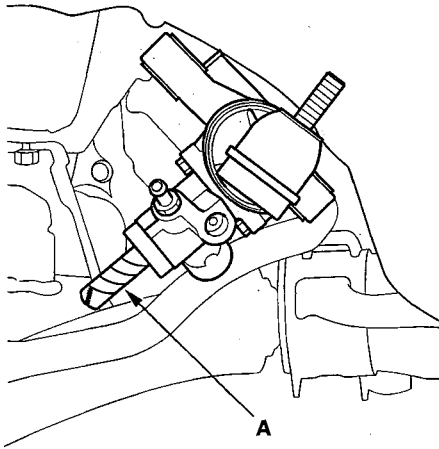
30. Apply vinyl tape (B) to the splines on the pinion shaft.

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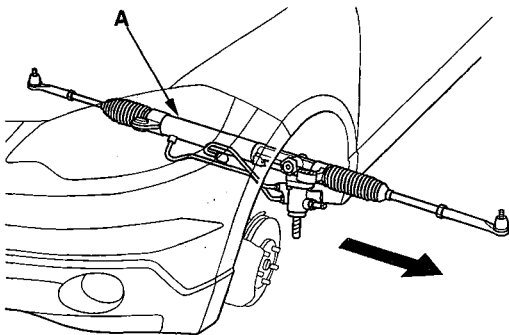
Power Steering

Steering Gearbox Removal (cont'd)

31. Carefully move the steering gearbox and tie-rods as an assembly toward the front side until the pinion shaft (A) clears the wheelwell opening on the frame.



32. Remove the steering gearbox (A) through the wheelwell opening on the driver's side.

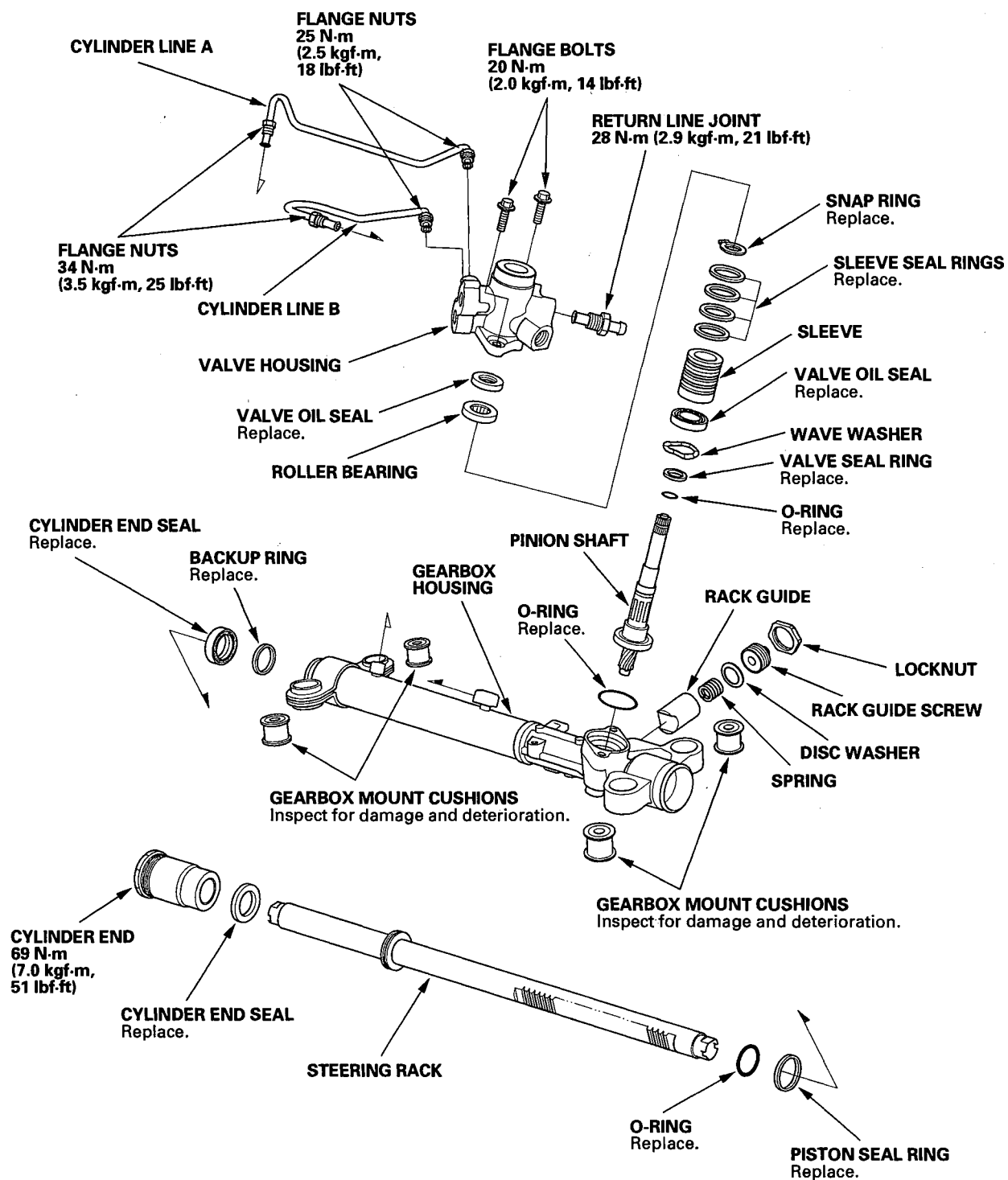


33. After removing the steering gearbox, make sure that no power steering fluid gets on the gearbox mount cushions, gearbox housing, surface of the front subframe. Wipe off any spilled fluid at once.



Steering Gearbox Overhaul

Exploded View



(cont'd)

Power Steering

Steering Gearbox Overhaul (cont'd)

Special Tools Required

- Cylinder end seal remover attachment 07TAF-SZ50100
- Valve seal ring sizing tool 07NAG-SR3090A
- Sleeve seal ring guide 07YAG-S2X0100
- Sleeve seal ring sizing tool, 36 mm 07ZAG-S5A0100
- Attachment, 28 x 30 mm 07946-1870100
- Driver 07749-0010000
- Piston seal ring guide 07LAG-SM40100
- Piston seal ring sizing tool 07HAG-SF1020A or 07HAG-SF10200
- Cylinder end seal slider 07LAG-SM40300
- Pincers Oetiker 1098 or equivalent, commercially available

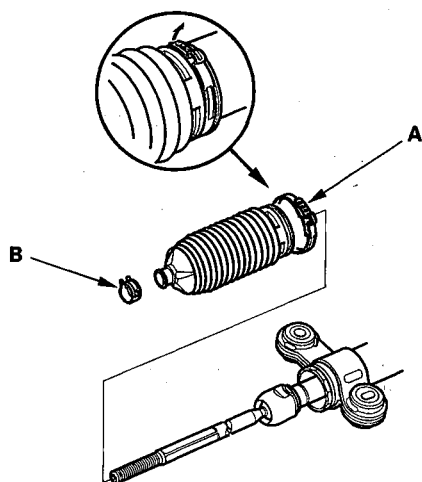
NOTE: Refer to the Exploded View as needed during this procedure.

Removal

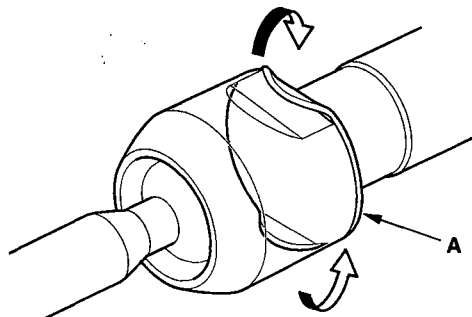
1. Remove the steering gearbox (see page 17-30).

Disassembly

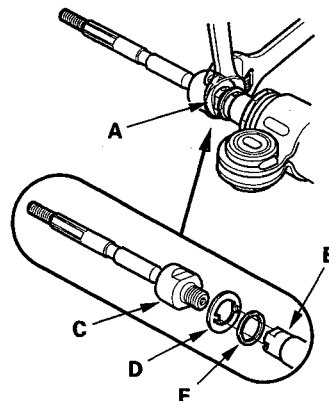
2. Remove the boot bands (A) and tie-rod clips (B). Pull the boot away from the ends of the steering gearbox.



3. Unbend the lock washers (A).



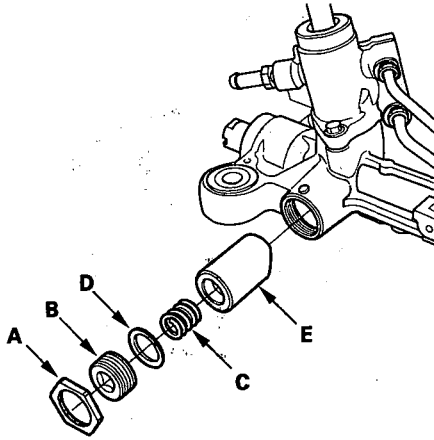
4. Hold the flat surface sections (A) of the steering rack (B) with a wrench, and unscrew both rack ends (C) with another wrench. Be careful not to damage the rack surface with the wrench.



5. Remove the lock washer (D) and stop rubber (E).

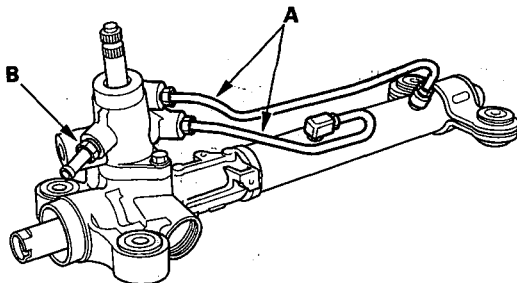


6. Loosen the locknut (A), then remove the rack guide screw (B).



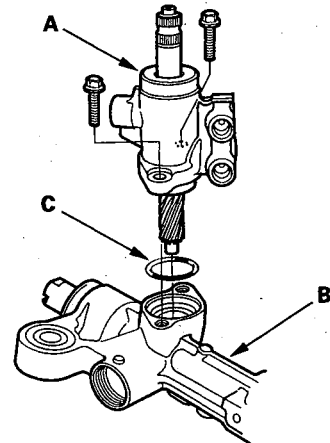
7. Remove the spring (C), disc washer (D) and the rack guide (E) from the gearbox housing.

8. Remove the cylinder lines (A) and return line joint (B) from the gearbox.

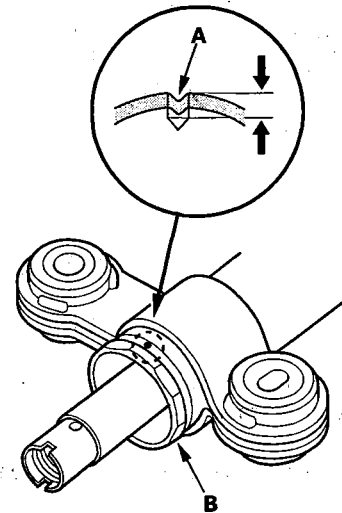


9. Drain the fluid from the cylinder fittings by slowly moving the steering rack back and forth.

10. Remove the two flange bolts, then remove the valve body unit (A) from the gearbox (B). Remove the O-ring (C).



11. Drill a 3 mm (0.12 in.) diameter hole about 2.5—3.0 mm (0.10—0.12 in.) in depth in the staked point (A) on the cylinder. Do not allow metal shavings to enter the cylinder side on the gearbox housing. After removing the cylinder end (B), remove any burrs at the staked point.

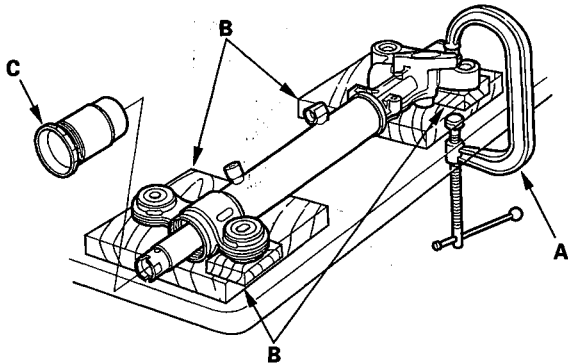


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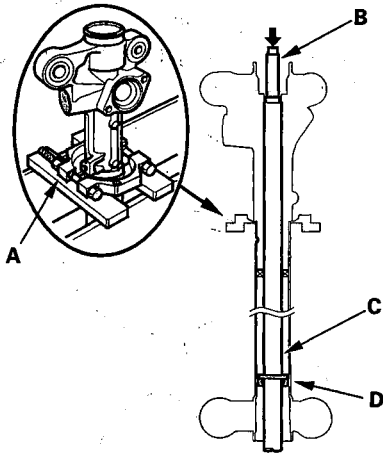
Power Steering

Steering Gearbox Overhaul (cont'd)

12. Hold the gearbox housing using a C-clamp (commercially available) (A) and the wooden blocks (B) as shown. Do not clamp the cylinder part of the gearbox housing in the vise. Then remove the cylinder end (C).

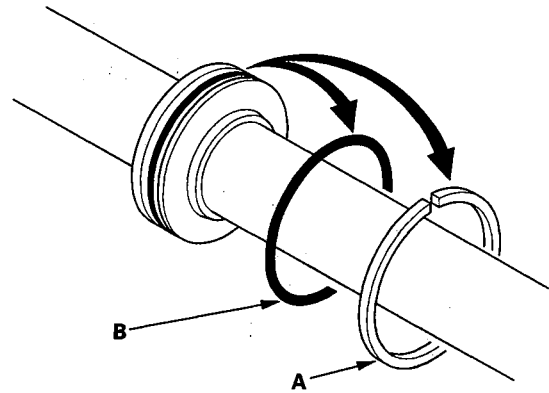


13. Install a commercially available bearing separator (A) in the gearbox housing as shown.

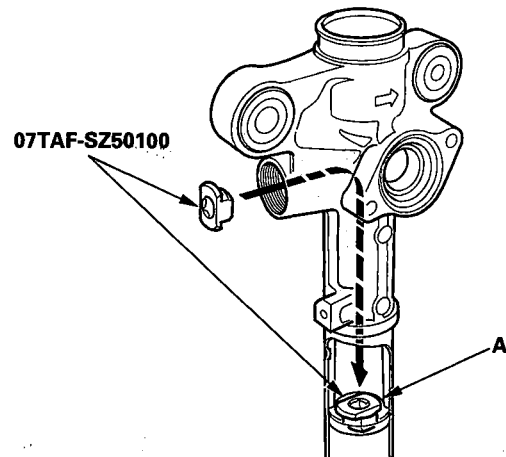


14. Place an appropriate size deep socket wrench (B) on the steering rack (C).
15. Set the steering gearbox in a press so the gearbox housing side points upward, then press the cylinder end seal (D) and steering rack out of the gearbox. Hold the steering rack to keep it from falling when pressed clear. Be careful not to damage the inner surface of the cylinder side on the gearbox housing with the tool.

16. Carefully pry the piston seal ring (A) and O-ring (B) off the rack piston. Be careful not to damage the inside of the seal ring groove and piston edges when removing the seal ring.



17. Turn the cylinder end seal remover attachment so it will fit through the rack guide hole of the steering gearbox, then position the seal remover on the cylinder end seal (A). Make sure that the seal remover is securely positioned on the seal edges.

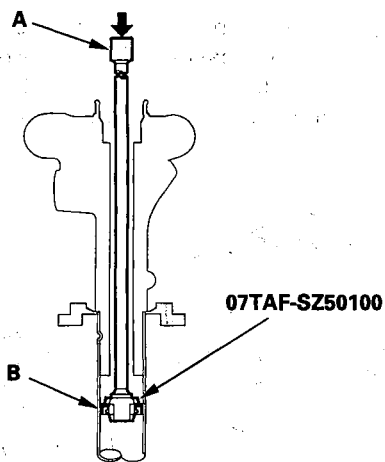




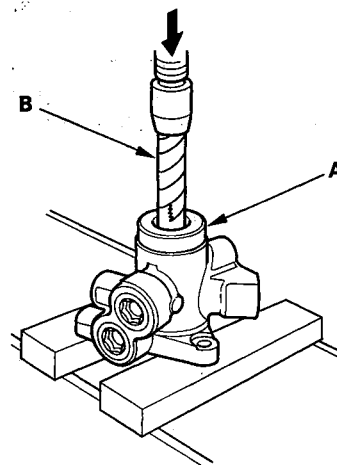
18. Insert 24 "long, 3/8" drive extension (A), on the cylinder end seal remover attachment. Place the steering gearbox in a press, then remove the cylinder end seal (B) from the gearbox by pressing on the 24 "long 3/8" drive extension.

Note these items when pressing the cylinder end seal:

- Keep the tool straight to avoid damaging the cylinder wall. Check the tool angle, and correct it if necessary, when removing the cylinder end seal.
- Use a press to remove the cylinder end seal. Do not try to remove the seal by striking the tool; striking the tool would brake the cylinder end seal, and the seal would remain in the gearbox.



19. Before removing the valve housing (A), apply vinyl tape (B) to the splines on the pinion shaft.



20. Separate the valve housing from the pinion shaft/valve using a press.

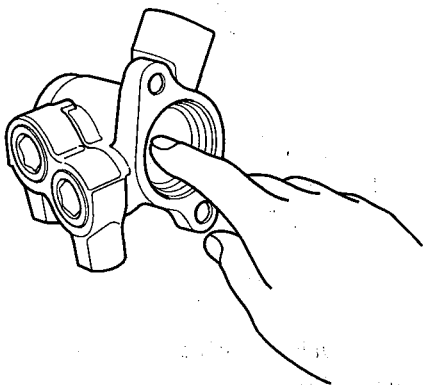
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Power Steering

Steering Gearbox Overhaul (cont'd)

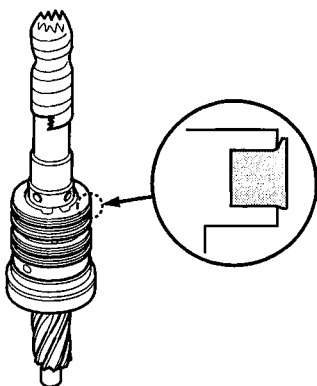
21. With your finger, check the inner wall of the valve housing where the seal ring slides. If there is a step in the wall, the housing is worn. Replace it.

NOTE: There may be sliding marks from the seal ring on the wall of the valve housing. Replace the valve housing only if the wall is stepped.

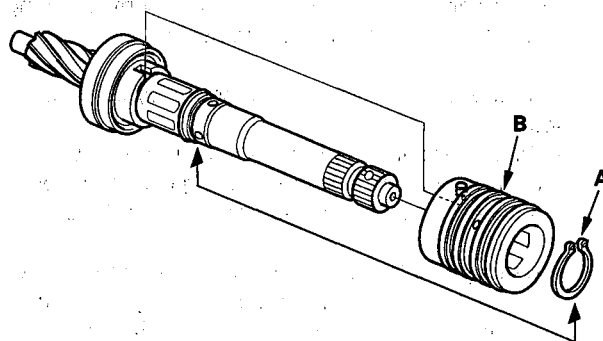


22. Check for wear, burrs, and other damage to the edges of the grooves in the sleeve.

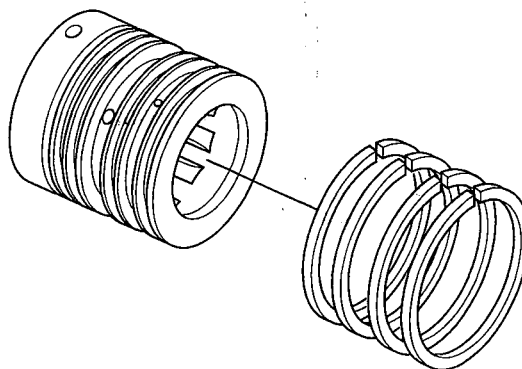
NOTE: The pinion shaft and sleeve are a precision matched set. If either the pinion shaft or sleeve must be replaced, replace both parts as a set.



23. Remove the snap ring (A) and sleeve (B) from the pinion shaft.

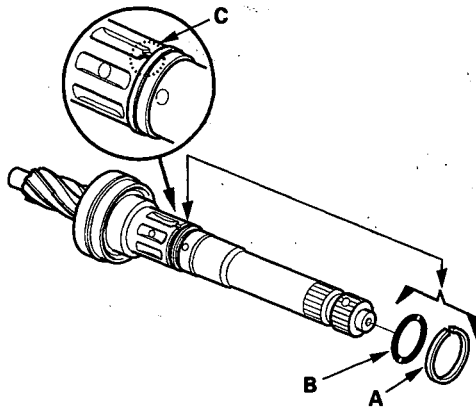


24. Using a cutter or an equivalent tool, cut and remove the four seal rings from the sleeve. Be careful not to damage the edges of the sleeve grooves and outer surface when removing the seal rings.





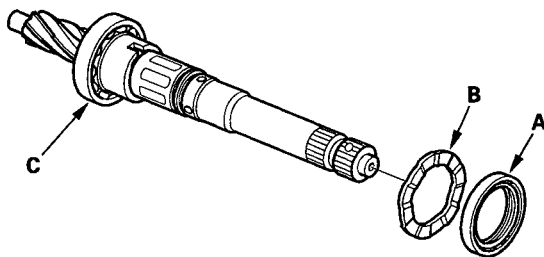
25. Using a cutter or an equivalent tool, cut the valve seal ring (A) and O-ring (B) at the cutting groove position (C) in the pinion shaft. Remove the valve seal ring and O-ring. Be careful not to damage the edges of the pinion shaft groove and outer surface when removing the valve seal ring and O-ring.



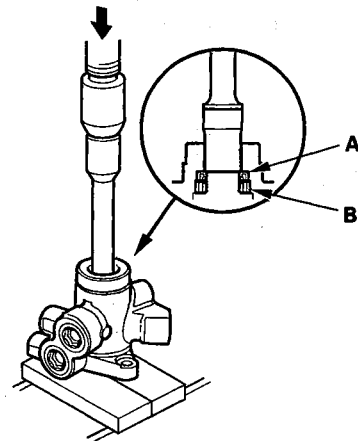
26. Remove the valve oil seal (A) and wave washer (B) from the pinion shaft.

Note these items during disassembly:

- Inspect the ball bearing (C) by rotating the outer race slowly. If there is any excessive play or wear, replace the pinion shaft and sleeve as an assembly.
- The pinion shaft and sleeve are a precise fit; do not intermix old and new pinion shafts and sleeves.



27. Remove the valve oil seal (A) and roller bearing (B) out of the valve housing using a hydraulic press and an appropriate size socket wrench.



28. Clean the disassembled parts with solvent, and dry them with compressed air. Do not dip rubber parts in the solvent.

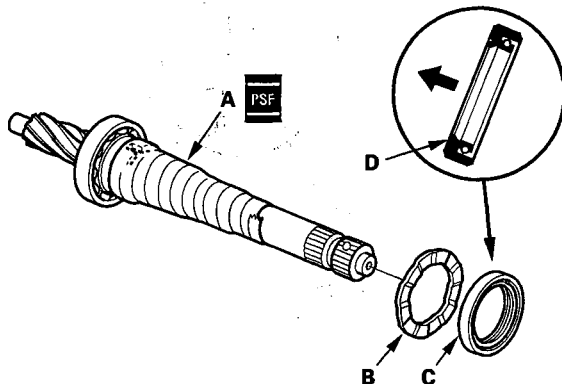
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Power Steering

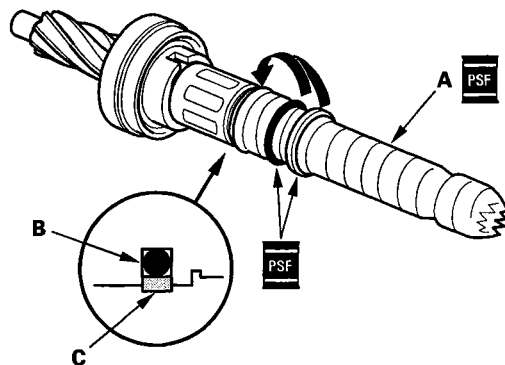
Steering Gearbox Overhaul (cont'd)

Reassembly

29. Apply vinyl tape (A) to the stepped portion of the pinion shaft, and coat the surface of the vinyl tape with power steering fluid.

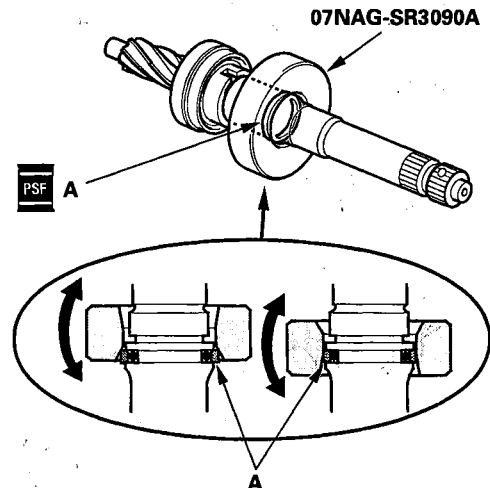


30. Install the wave washer (B).
31. Coat the inside surface of the new valve oil seal (C) with power steering fluid, and install the seal with its grooved side facing opposite the bearing, then slide it over the pinion shaft, being careful not to damage its sealing lip (D).
32. Apply vinyl tape (A) to the splines and stepped portion of the shaft, and coat the surface of the vinyl tape with power steering fluid.



33. Fit the new O-ring (B) in the groove of the pinion shaft. Then slide the new valve seal ring (C) over the shaft and in the groove on the pinion shaft.

34. Remove the tape, and apply power steering fluid to the surface of the valve seal ring (A).



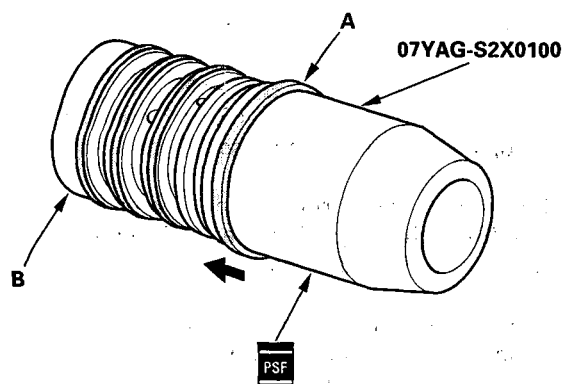
35. Apply power steering fluid to the inside of the valve seal ring sizing tool. Set the larger diameter end of the sizing tool over the valve seal ring, and move the sizing tool up and down several times to make the valve seal ring fit in the pinion shaft groove.
36. Remove the sizing tool; turn it over, slide the smaller diameter end over the valve seal ring. Move it up and down several times to make the valve seal ring fits snugly in the pinion shaft groove.



37. Apply power steering fluid to the surface of the sleeve seal ring guide. Slip two new seal rings (A) over the ring guide from the smaller diameter end, and expand them. Install only two rings at a time from each end of the pinion shaft sleeve (B).

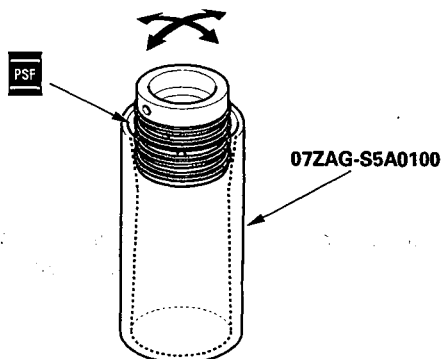
Note these items when installing the seal ring:

- Do not over-expand the seal ring. Install the resin seal rings with care so as not to damage them. After installation, make sure you contract the seal rings using the sizing tool.
- There are two types of sleeve seal rings; black and brown. Do not mix the different types of rings as they are not compatible.



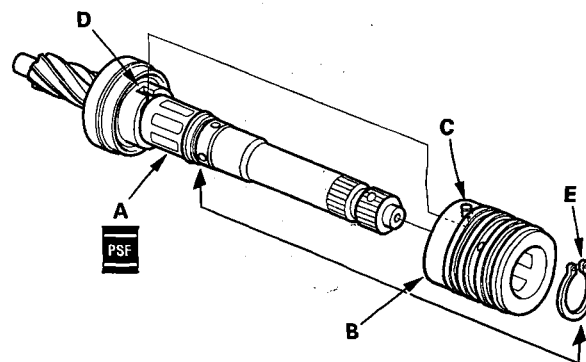
38. Align the ring guide with each groove in the sleeve, and slide a sleeve seal ring into each groove. After installation, compress the seal rings with your fingers temporarily.

39. Apply power steering fluid to the seal rings on the sleeve, and to the entire inside surface of the sleeve seal ring sizing tool, then slowly insert the sleeve into the sizing tool.

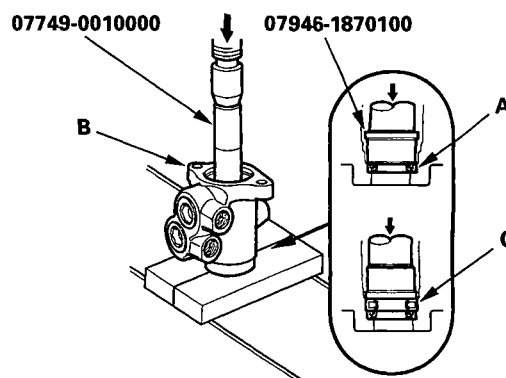


40. Move the sleeve back and forth several times to make the seal rings fit snugly in the sleeve. Make sure the seal rings are not twisted.

41. Apply power steering fluid to the surface of the pinion shaft (A). Slide the sleeve (B) onto the pinion shaft by aligning the locating pin (C) on the inside of the sleeve with the cutout (D) in the shaft. Then install the new snap ring (E) securely in the pinion shaft groove. Be careful not to damage the valve seal ring when inserting the sleeve.



42. Apply power steering fluid to the seal ring lip of the new valve oil seal (A), then install the seal in the valve housing (B) using a hydraulic press and driver. Install the seal with its grooved side facing the tool.



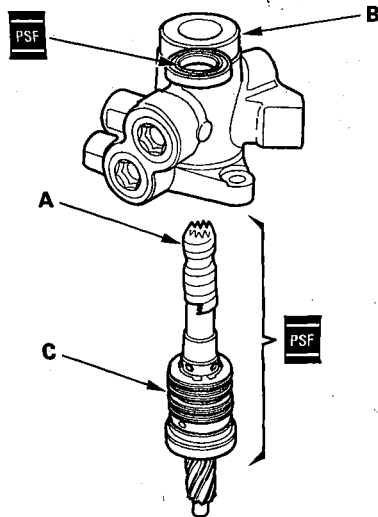
43. Press the roller bearing (C) into the valve housing with a hydraulic press and attachment.

(cont'd)

Power Steering

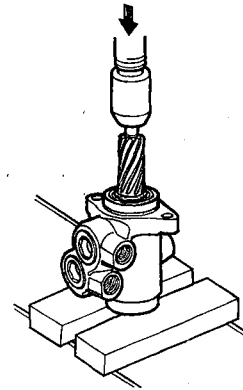
Steering Gearbox Overhaul (cont'd)

44. Apply vinyl tape (A) to the pinion shaft, then coat the vinyl tape with power steering fluid.



45. Insert the pinion shaft into the valve housing (B). Be careful not to damage the valve seal rings (C).
46. Remove the vinyl tape from the pinion shaft, then remove any residue from the tape adhesive.

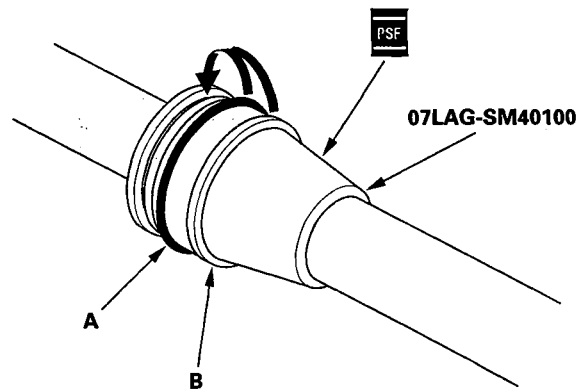
47. Press the pinion shaft/sleeve into the valve housing with a hydraulic press. Check that the pinion shaft/sleeve turns smoothly by hand after installing it.



48. Coat the piston seal ring guide with power steering fluid, then slide it onto the rack, big end first.
49. Position the new O-ring (A) and new piston seal ring (B) on the ring guide, then slide them down toward the big end of the tool.

Note these items during reassembly:

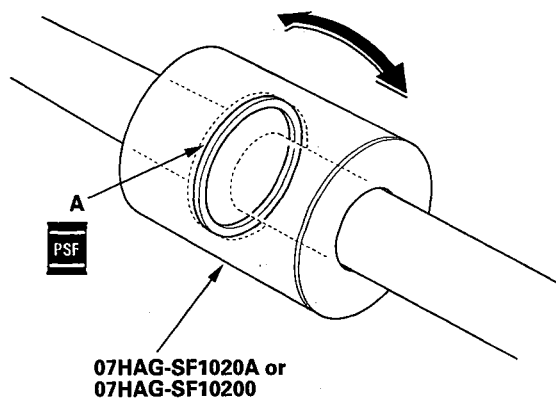
- Do not over expand the resin seal rings. Install the resin seal rings with care so as not to damage them. After installation, make sure you contract the seal ring using the sizing tool.
- Replace piston's O-ring and seal ring as a set.



50. Pull the O-ring off into the piston groove, then pull the piston seal ring off into the piston groove on top of the O-ring.

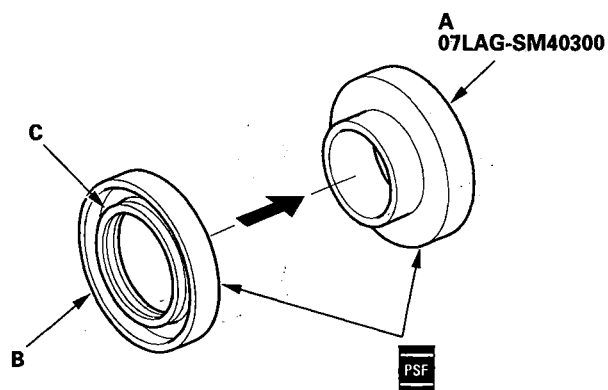


51. Coat the piston seal ring (A) and the inside of the piston seal ring sizing tool with power steering fluid, then carefully slide the tool onto the rack and over the piston seal ring.

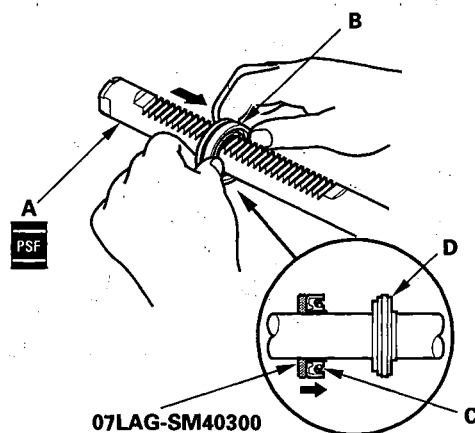


52. Move the sizing tool back and forth several times to make the piston seal ring fit snugly in the piston.

53. Coat the sliding surface of the cylinder end seal slider (A) and new cylinder end seal (B) with power steering fluid. Place the seal on the special tool with its grooved side (C) facing opposite the special tool.



54. Coat the surface of the steering rack (A) with power steering fluid.



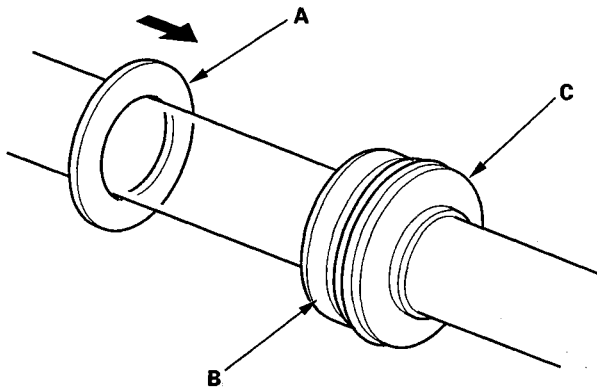
55. Install the cylinder end seal (B) onto the steering rack with its grooved side (C) toward the piston (D).
56. Separate the cylinder end seal from the cylinder end seal slider, then remove the seal slider.

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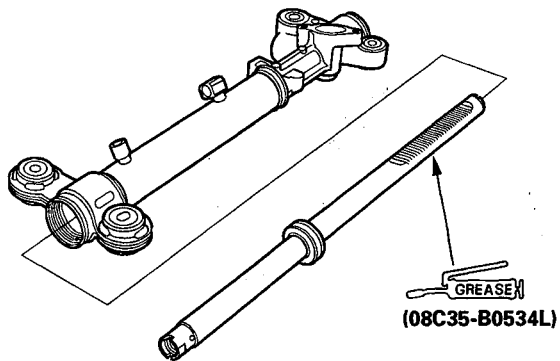
Power Steering

Steering Gearbox Overhaul (cont'd)

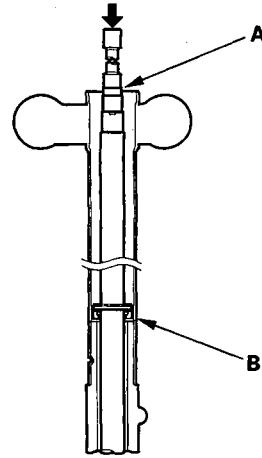
57. Install the new backup ring (A) on the steering rack, then place the backup ring and cylinder end seal (B) against the piston (C).



58. Apply steering grease to the steering rack teeth, then insert the steering rack into the gearbox housing. Be careful not to damage the inner surface of the cylinder wall with the rack edges.



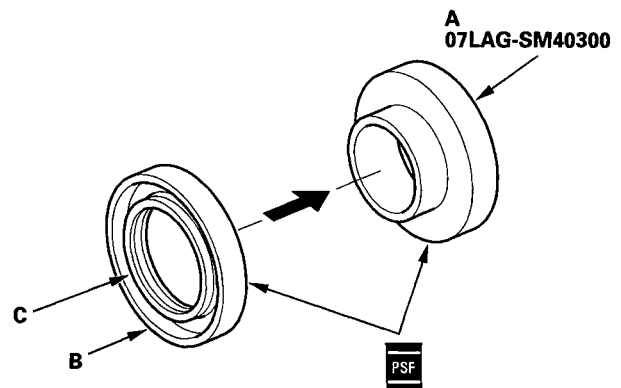
59. Insert an appropriate size socket wrench (A) onto the steering rack as shown.



60. Install the cylinder end seal (B) into the bottom of the cylinder by pressing on the tool with a press. Do not push on the tool with excessive force as it may damage the cylinder end seal.

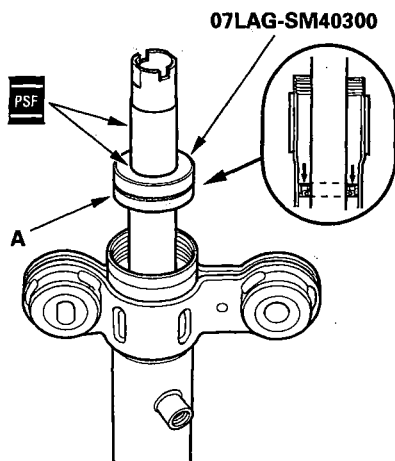
61. Remove the tool, and center the steering rack.

62. Coat the sliding surface of the cylinder end seal slider (A) and new cylinder end seal (B) with power steering fluid. Place the seal on the seal slider with its grooved side (C) facing opposite the seal slider.

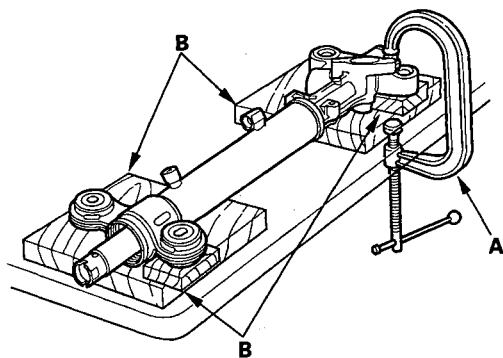




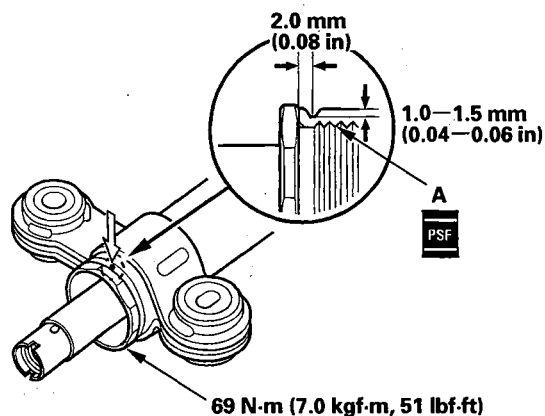
63. Coat the inside surface of the cylinder end seal slider and steering rack with power steering fluid, then install the cylinder end seal (A) onto the steering rack with its grooved side toward the cylinder.



64. Separate the cylinder end seal from the seal slider, then remove the seal slider.
65. Push in the cylinder end seal with your finger. Be careful not to damage the face of the seal with the threads and burrs at the staked position of the cylinder housing.
66. Hold the gearbox housing using a C-clamp (commercially available) (A) and the wooden blocks (B). Do not clamp the cylinder part of the gearbox housing in the vise.



67. Coat the inside surface of the cylinder end (A) with power steering fluid, then install the cylinder end by screwing it into the cylinder (B). Tighten the cylinder end to the specified torque.



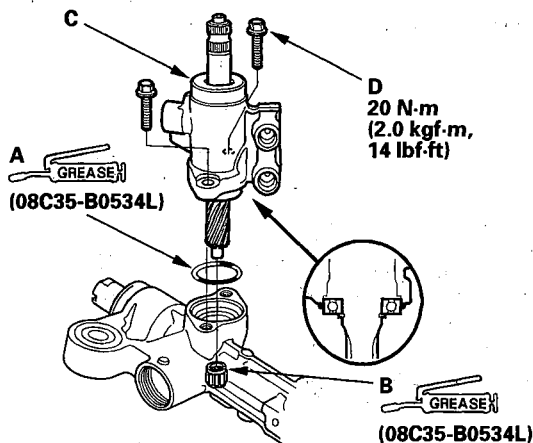
68. Stake the point of the cylinder shown (opposite from where the stake was removed during disassembly).

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Power Steering

Steering Gearbox Overhaul (cont'd)

69. Coat the new O-ring (A) with steering grease, and carefully fit it on the valve housing.



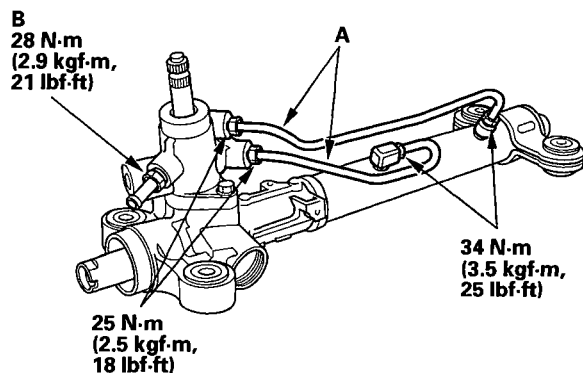
70. Apply steering grease to the needle bearing (B) in the gearbox housing, then install the valve body unit (C) by engaging the gears. Note the valve body unit installation position (direction of the line connections).

71. Tighten the flange bolts (D) to the specified torque.

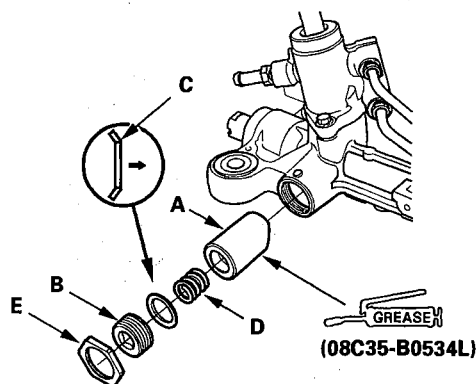
72. Install the cylinder lines (A) and return line joint (B).

Note these items during reassembly:

- Thoroughly clean the joints of the cylinder lines. The joints must be free of foreign material.
- Install the cylinder lines by tightening the flare nuts by hand first, then tighten the flare nuts to the specified torque.



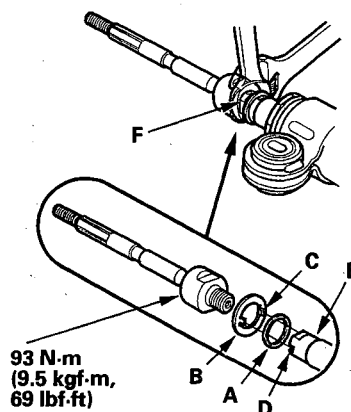
73. Apply steering grease to the sliding surface of the rack guide (A), and install it onto the gearbox housing.



74. Remove the old sealant from the rack guide screw (B), then apply new sealant (Three Bond 1215 or Loctite 5699) to the middle of the threads. Install the disc washer (C) with its convex side facing the rack guide, the spring (D), rack guide screw and locknut (E).

75. Adjust the rack guide screw (see page 17-29). After adjusting, check that the rack moves smoothly by sliding it right and left.

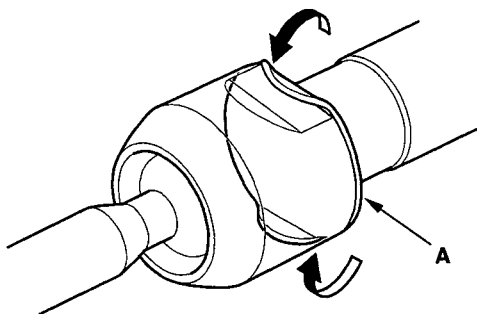
76. Install a new stop rubber (A) and a new lock washer (B). Align the lock washer tabs (C) with the slots (D) on the rack end (E) while holding the lock washer in place. Repeat this step for the other side of the rack.



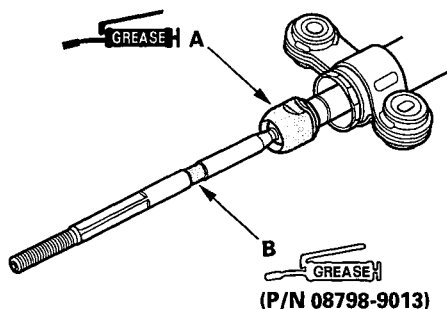
77. Hold the flat surface sections (F) of the steering rack with a wrench, and tighten both rack ends. Be careful not to damage the rack surface with the wrench.



78. Bend the lock washer (A) back against the flat spots on the rack end joint housing.



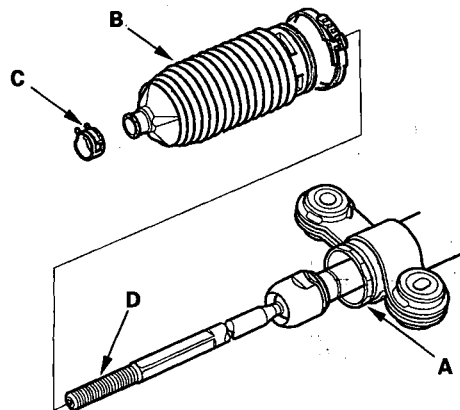
79. Apply multipurpose grease to the circumference of the rack end joint housing (A).



80. Apply a light coat of silicone grease (P/N 08798-9013) to the boot grooves (B) on the rack end.

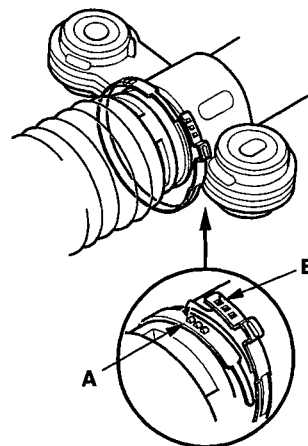
81. Center the steering rack within its stroke.

82. Clean off the any grease or contamination from the boot installation grooves (A) around on the gearbox housing. Install the boots (B) on the rack ends with the tie-rod clips (C), and fit the boot end in the installation grooves in the housing properly.



83. After installing the boots, wipe the grease off the threaded section (D) of the rack end.

84. Install the new boot bands by aligning the tabs (A) with the holes (B) on the band.

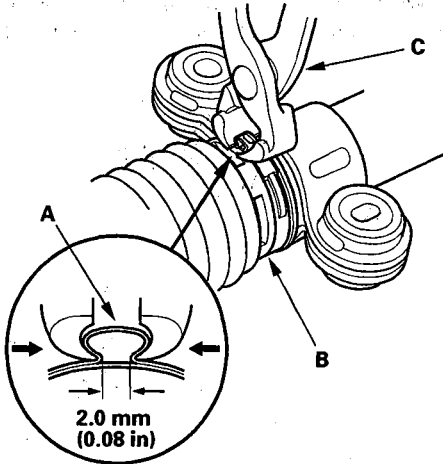


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Power Steering

Steering Gearbox Overhaul (cont'd)

85. Close the ear portion (A) of the band (B) with commercially available pincers, Oetiker 1098 or equivalent (C).

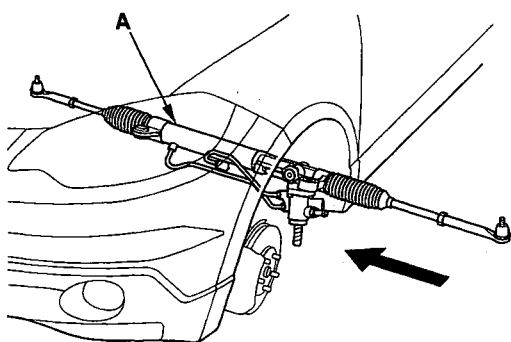


86. Slide the rack right and left to be certain that the boots are not deformed or twisted.
87. Reinstall the steering gearbox (see page 17-51).

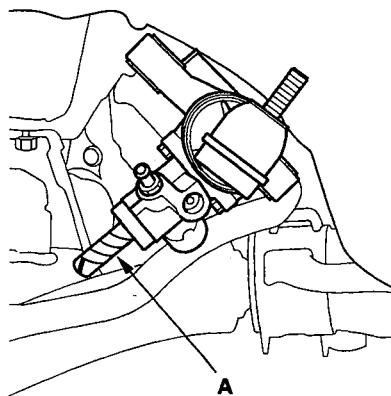


Steering Gearbox Installation

1. Before installing the steering gearbox, make sure that no power steering fluid is on the mating surface of the gearbox and the front subframe. To prevent the gearbox mounting bolts from loosening after the installation, remove the power steering fluid from the mount cushions and bolt holes.
2. Slide the steering gearbox (A) between the front subframe and body from the driver's side. Place the gearbox in position on the front subframe.

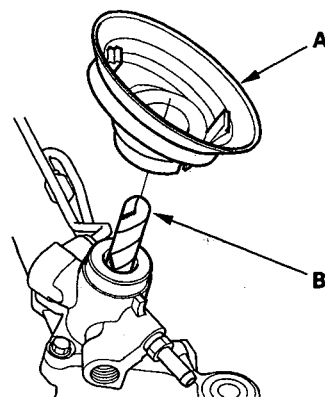


3. Rotate the steering gearbox so the pinion shaft (A) points downward.



4. Continue moving the gearbox toward the passenger's side until the steering gearbox is in position. Make sure the power steering return line and feed line are routed above the gearbox.

5. Remove the vinyl tape from pinion shaft, and install the pinion shaft grommet (A). Align the slot in the pinion shaft grommet with the lug portion (B) on the valve housing.

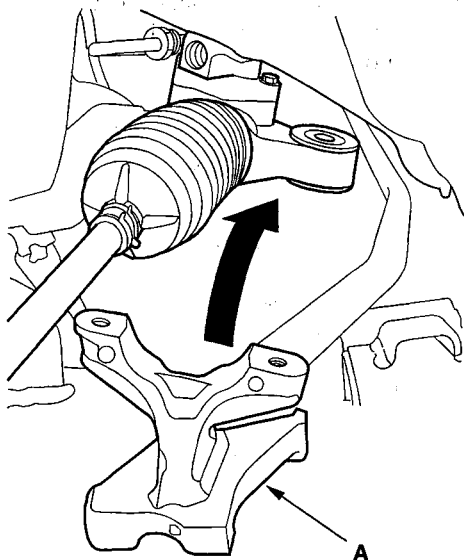


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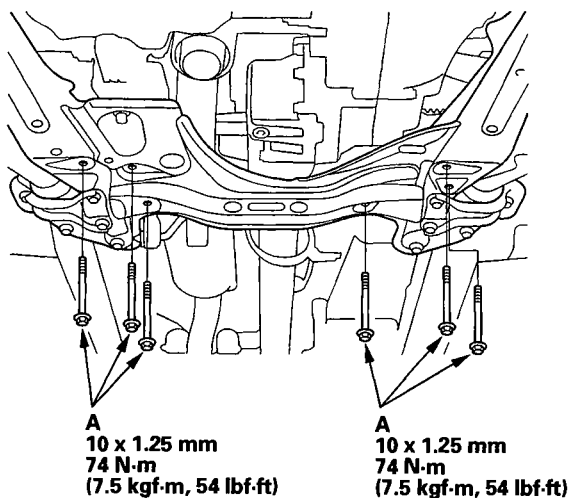
Power Steering

Steering Gearbox Installation (cont'd)

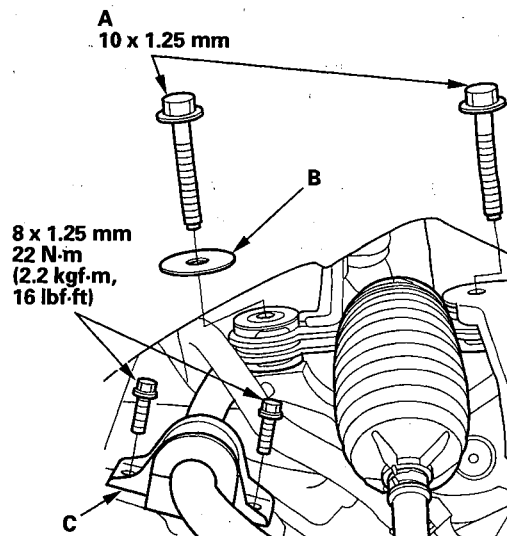
6. Install the gearbox brackets (A).



7. Tighten the steering gearbox bracket mounting bolts (A) to the specified torque.

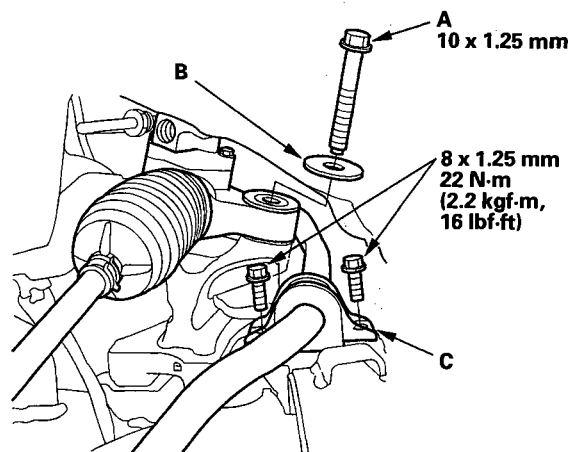


8. Loosely install the gearbox mounting bolts (A) and washer (B).



9. Install the stabilizer bar bushing holder (C) (see page 18-22).

10. Loosely install the gearbox mounting bolts (A) and washer (B).

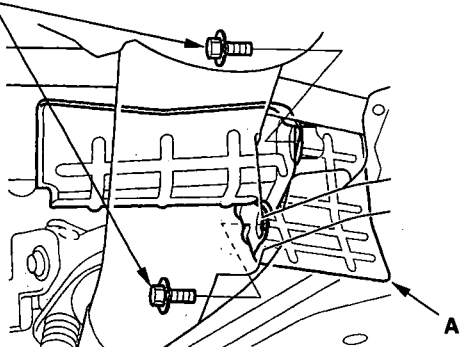


11. Install the stabilizer bar bushing holder (C) (see page 18-22).

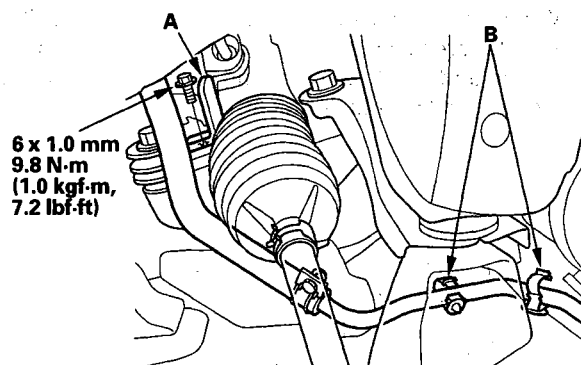


12. Install the P/S heat shield (A).

6 x 1.0 mm
9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)

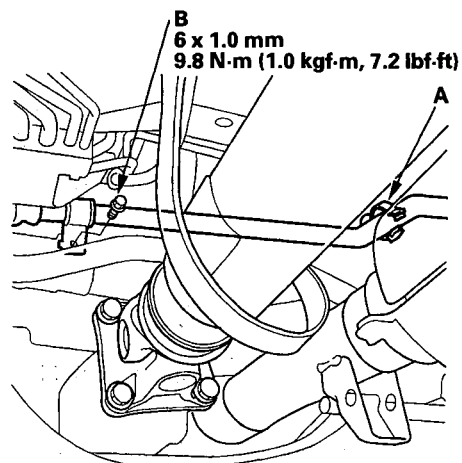


13. Install the pump outlet hose clamp (A) on the steering gearbox.

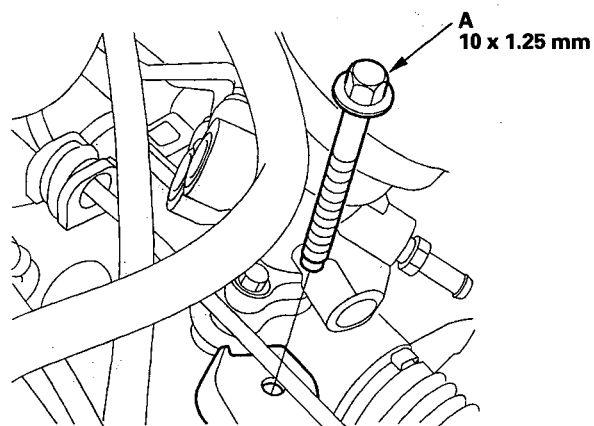


14. Connect the return hose clips (B).

15. Connect the return line holder (A), and install the return line clamp bolt (B).



16. Loosely install the gearbox mounting bolts (A).

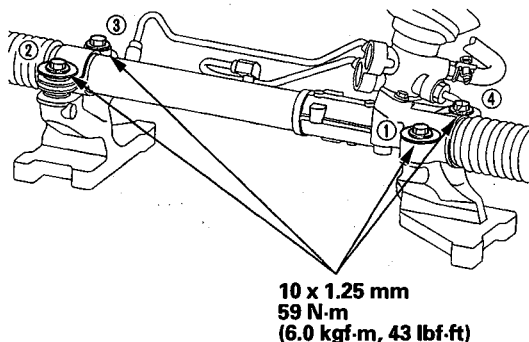


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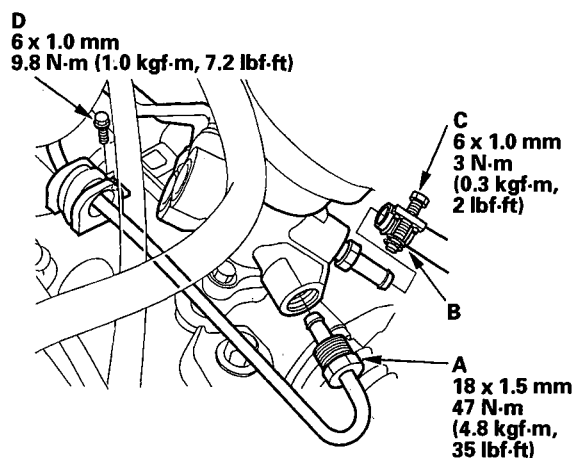
Power Steering

Steering Gearbox Installation (cont'd)

17. Tighten the gearbox mounting bolts to the specified torque in the sequence shown.



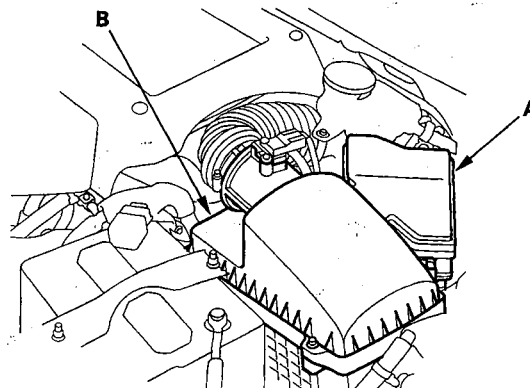
18. Connect the inlet line (A), and tighten the 18 mm flare nut to the specified torque.



19. Connect the return hose (B) securely, and tighten the adjustable hose clamp (C) (see page 17-13).

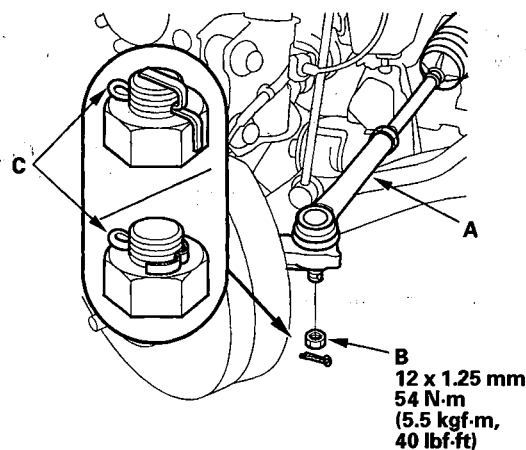
20. Install the inlet line clamp bolt (D).

21. Install the under-hood fuse/relay box (A) (see page 22-61).



22. Install the air cleaner housing (B) (see page 11-394).

23. Wipe off any grease contamination from the ball joint tapered section and threads. Reconnect the tie-rod ends (A) to the steering knuckles. Install the 12 mm nut (B), and tighten it.

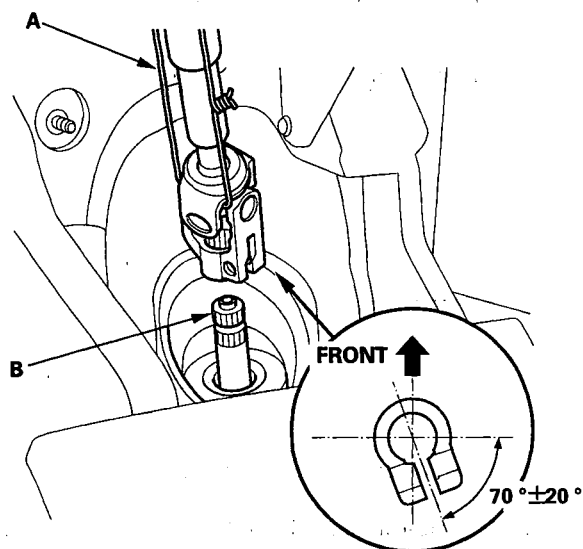


24. Install the new cotter pin (C), and bend it as shown.

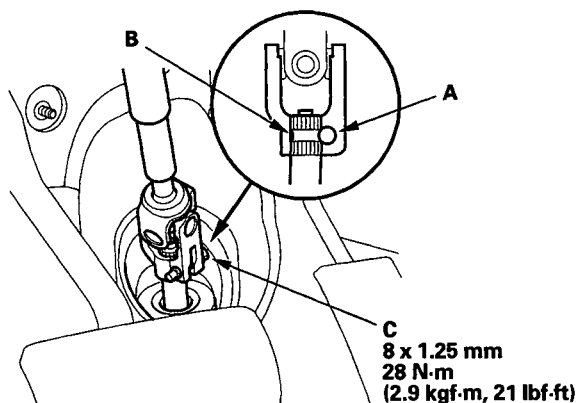
25. Center the steering rack within its stroke in steering joint connection.



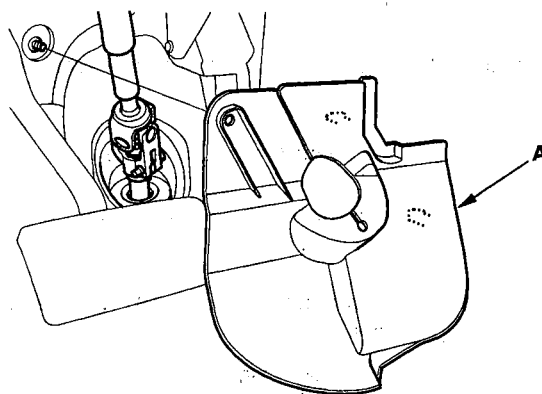
26. With the rack in the straight ahead driving position, cut the wire (A) and slip the lower end of the steering joint onto the pinion shaft (B) in the range shown.



27. Align the bolt hole (A) on the steering joint with the groove (B) around the pinion shaft, then loosely install the joint bolt (C). Be sure that the joint bolt is securely in the groove in the pinion shaft. Pull on the steering joint to make sure that the steering joint is fully seated. Tighten the steering joint bolt to the specified torque.



28. Install the steering joint cover (A).



29. Install the driver's dashboard undercover (see page 20-102).

30. Install the front wheel, then set the wheels in the straight ahead position.

31. Install the steering wheel (see page 17-24).

32. Connect the negative battery cable.

- Enter the anti-theft code for the audio and the navigation system (if equipped), then enter the audio presets.
- Set the clock.
- Verify cruise control, audio remote, navigation guide, and turn signal switch operation.
- Make sure the steering wheel is centered.

33. Fill the system with power steering fluid, and bleed air from the system (see page 17-12).

34. After installation, do the following checks:

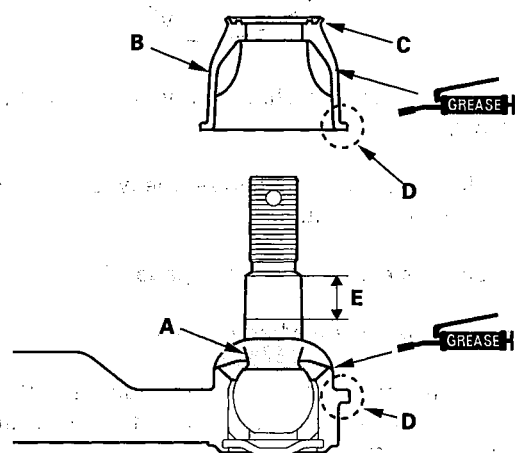
- Start the engine, allow it to idle, and turn the steering wheel from lock-to-lock several times to warm up to the fluid. Check the gearbox for leaks (see page 17-11).
- Do the front toe inspection (see page 18-7).
- Check the steering wheel spoke angle. If steering spoke angles to the right and left are not equal (steering wheel and rack are not centered), correct the engagement of the joint/pinion shaft serrations, then adjust the front toe by turning the tie-rod ends, if necessary.

Tie-rod Ball Joint Boot Replacement

Special Tools Required

Bushing base 07JAF-SH20330

1. Remove the tie-rod ball joint from the knuckle (see step 11 on page 17-31).
2. Remove the tie-rod end from the rack end.
3. Remove the boot from the tie-rod end, and wipe the old grease off the ball pin.
4. Pack the lower area of the ball pin (A) with fresh multipurpose grease.

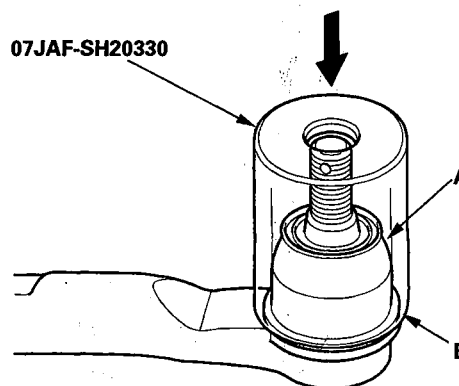


5. Pack the interior of the new boot (B) and lip (C) with fresh multipurpose grease.

Note these items when installing new grease:

- Keep grease off the boot mounting area (D) and the tapered section (E) of the ball pin.
- Do not allow dust, dirt, or other foreign materials to enter the boot.

6. Install the new boot (A) using the bushing base. The boot must not have a gap at the boot installation sections (B). After installing the boot, check the ball pin tapered section for grease contamination, and wipe it if necessary.

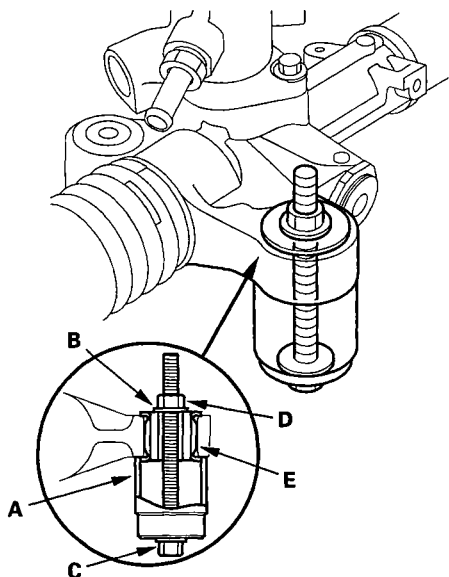


7. Install the tie-rod end to the rack end.
8. Install the tie-rod ball joint to the knuckle (see step 23 on page 17-54).
9. Check the wheel alignment, and adjust it if necessary (see page 18-5).



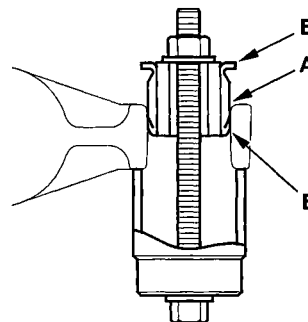
Gearbox Mount Cushion Replacement

1. Remove the steering gearbox (see page 17-30).
2. Position the 34 mm socket wrench (A) on the flange part of the gearbox housing with a washer (B), 10 x 105 mm flange bolt (C) and the 10 mm nut (D) as shown.



3. Hold the nut with a wrench, and tighten the flange bolt with another wrench. Remove the gearbox mount cushion (E).

4. Apply a mild soap and water solution to the new gearbox mount cushion surface (A), then place it on the gearbox mounting cushion hole.



5. Position the 34 mm socket wrench on the flange part of the gearbox housing with a washer, flange bolt, and the nut as shown.
6. Install the gearbox mount cushion by tightening the flange bolt until the mount cushion edges (B) properly fit on the gearbox flange surface.
7. Install the steering gearbox (see page 17-51).

BACK