

# 2007 Acura RL

2005-08 STEERING Steering - RL

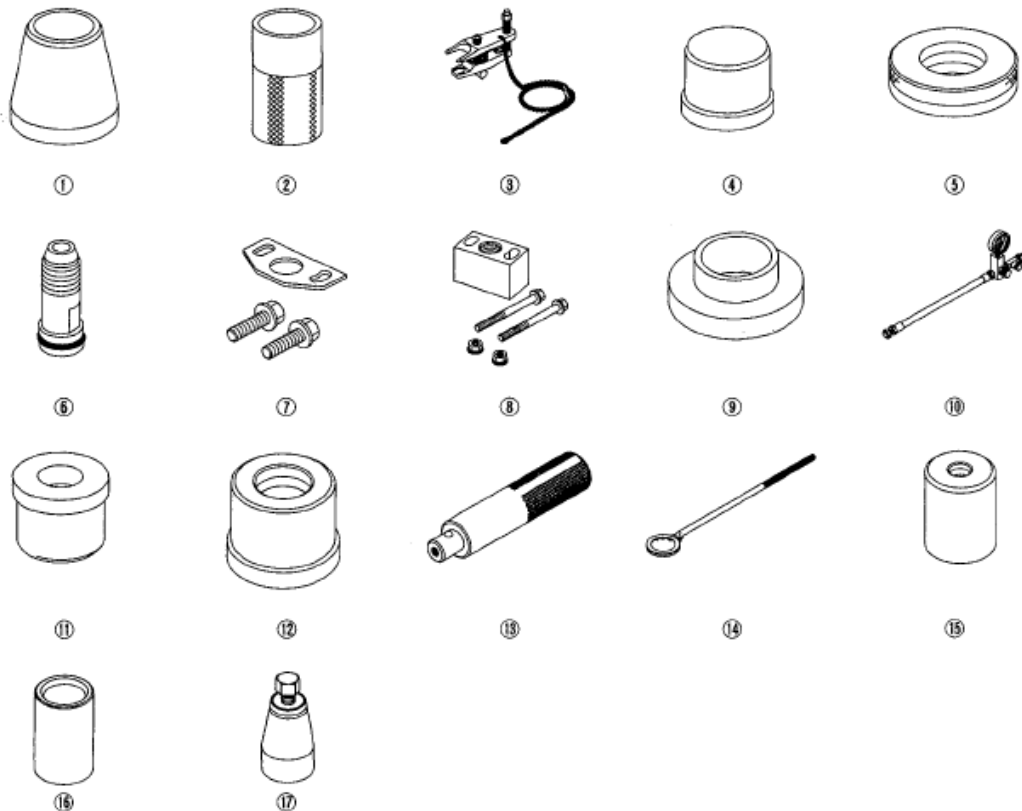
## 2005-08 STEERING

### Steering - RL

## POWER STEERING

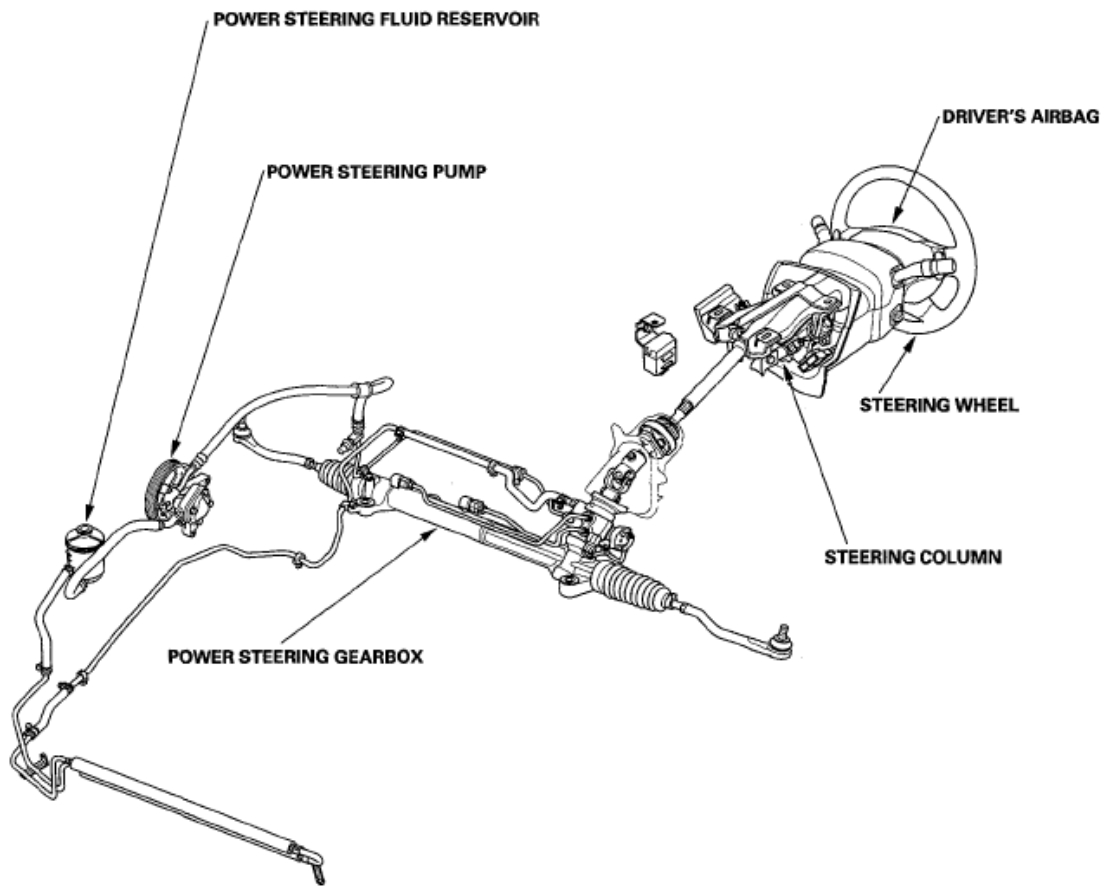
### SPECIAL TOOLS

Ref. No.	Tool Number	Description	Qty
①	07HAG-SF10100	Piston Seal Ring Guide	1
②	07HAG-SF1020A or 07HAG-SF10200	Piston Seal Ring Sizing Tool	1
③	07MAC-SL0A102	Ball Joint Remover, 32 mm	1
④	07NAD-SR3020A	Cylinder End Seal Remover Attachment	1
⑤	07NAG-SR3090A	Valve Seal Ring Sizing Tool	1
⑥	07VAK-P8A011A	P/S Joint Adapter (Pump)	1
⑦	07VAK-P8A012B	P/S Joint Adapter Plate (Pump)	1
⑧	07RAK-S040122	P/S Joint Adapter (Hose)	1
⑨	07ZAG-S5A0300	Cylinder End Seal Slider	1
⑩	07406-0010001 or 07406-001000A or 07406-001A101	P/S Pressure Gauge	1
⑪	07746-0010100	Attachment, 32 x 35 mm	1
⑫	07746-0010700	Attachment, 24 x 26 mm	1
⑬	07749-0010000	Driver	1
⑭	07916-SA50001	Locknut Wrench, 40 mm	1
⑮	07965-SA50500	Front Hub Dis/Assembly Tool	1
⑯	07974-SA5020A or 07974-SA50200	Sleeve Seal Ring Sizing Tool	1
⑰	07974-SA50800	Ball Joint Boot Clip Guide	1



**Fig. 1: Identifying Special Tools**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

### COMPONENT LOCATION INDEX



**Fig. 2: Identifying Power Steering Component Location**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

## 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 TROUBLESHOOTING INDEX

Symptom	Procedure(s)	Also check for:
Hard steering	Troubleshoot the system (see <b><u>HARD STEERING</u></b> ).	<ul style="list-style-type: none"> <li>Modified suspension</li> <li>Damaged suspension</li> <li>Tire sizes, tire varieties, and air pressure</li> </ul>
Assist (excessively light steering at high speed)	Check the rack guide adjustment (see <b><u>RACK GUIDE ADJUSTMENT</u></b> ).	<ul style="list-style-type: none"> <li>Front wheel alignment (see <b><u>WHEEL ALIGNMENT</u></b> )</li> </ul>
	1. Check the rack guide adjustment (see <b><u>RACK GUIDE ADJUSTMENT</u></b> ).	

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Shock or vibration when the steering wheel is turned to full lock	<ol style="list-style-type: none"><li>2. Check the drive belt for slippage (see <b><u>DRIVE BELT INSPECTION</u></b> ).</li><li>3. Check the power steering pump fluid pressure with T/N 07406-0010001 (see <b><u>PUMP PRESSURE TEST WITH T/N 07406-0010001</u></b> ) or T/N 07406-001000A (see <b><u>PUMP PRESSURE TEST WITH T/N 07406-001000A OR T/N 07406-001A101</u></b> ).</li><li>4. Overhaul the steering gearbox (see <b><u>STEERING GEARBOX OVERHAUL</u></b> ).</li></ol>	
Steering wheel will not return smoothly	<ol style="list-style-type: none"><li>1. Check cylinder lines for deformation.</li><li>2. Check upper and lower ball joints for binding.</li><li>3. Check wheel alignment (see <b><u>WHEEL ALIGNMENT</u></b> ).</li><li>4. Overhaul the steering gearbox (see <b><u>STEERING GEARBOX OVERHAUL</u></b> ).</li></ol>	
Uneven or rough steering	<ol style="list-style-type: none"><li>1. Check the rack guide adjustment (see <b><u>RACK GUIDE ADJUSTMENT</u></b> ).</li><li>2. Check the drive belt (see <b><u>DRIVE BELT INSPECTION</u></b> ).</li><li>3. Check for low or erratic engine idle speed (see <b><u>IDLE SPEED INSPECTION</u></b> ).</li><li>4. Check for air in the power steering system due to air entering inlet side of pump.</li><li>5. Check for low fluid level in the power steering reservoir due to possible leaks in system.</li><li>6. Overhaul the steering gearbox (see <b><u>STEERING GEARBOX OVERHAUL</u></b> ).</li></ol>	
Steering wheel kicks back during wide turns	<ol style="list-style-type: none"><li>1. Check the drive belt (see <b><u>DRIVE BELT INSPECTION</u></b> ).</li><li>2. Check the power steering pump fluid pressure with T/N 07406-0010001 (see <b><u>PUMP PRESSURE TEST WITH T/N 07406-0010001</u></b> ), T/N 07406-001000A or T/N 07406-001A101 (see <b><u>PUMP PRESSURE TEST WITH T/N 07406-001000A OR T/N 07406-001A101</u></b> ).</li></ol>	
	<ol style="list-style-type: none"><li>1. Check when the noise occurs:<ul style="list-style-type: none"><li>• If the noise is heard 2-3 minutes after starting the engine in cold weather, this is normal.</li><li>• If the noise is heard when the wheel</li></ul></li></ol>	

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Humming noise from the power steering system	<p>is turned with the vehicle stopped, this is normal due to the fluid pulsation.</p> <ol style="list-style-type: none"> <li>2. Check for the high-pressure hose touching the subframe or body.</li> <li>3. Check for automatic transmission converter noise.</li> <li>4. Check for air bubbles in the power steering fluid, leak on inlet side of pump.</li> <li>5. Check for particle contamination of the fluid and/or restricted filter in the reservoir.</li> </ol>	Pump pressure
Power steering rack rattle or chattering	<ol style="list-style-type: none"> <li>1. Check for loose steering components (tie-rod and ball joints). Tighten or replace as necessary.</li> <li>2. Check the steering column shaft for wobbling. If the steering column wobbles, replace the steering column assembly (see <b><u>STEERING COLUMN REMOVAL AND INSTALLATION</u></b> ).</li> <li>3. Check the rack guide adjustment (see <b><u>RACK GUIDE ADJUSTMENT</u></b> ).</li> <li>4. Check the power steering pump pulley: If the pump shaft is loose, replace the pump (see <b><u>PUMP REPLACEMENT</u></b> ).</li> </ol>	
Hissing from the power steering system/foaming fluid	<ul style="list-style-type: none"> <li>• Check the fluid level. If low, fill the reservoir to the proper level and check for leaks.</li> <li>• Check the reservoir for leaks.</li> <li>• Check for crushed inlet hose or loose hose clamp allowing air into the suction side of the system.</li> <li>• Check the power steering pump shaft oil seal for leaks.</li> </ul>	Air in the P/S fluid
Noise from the power steering pump	<ul style="list-style-type: none"> <li>• 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).</li> <li>• Remove and inspect the pump for wear and damage (see <b><u>PUMP OVERHAUL</u></b> ).</li> </ul>	<ul style="list-style-type: none"> <li>• P/S pump pressure</li> <li>• Air in the P/S fluid</li> </ul>
Squeaking from the power steering pump	Check the drive belt (see <b><u>DRIVE BELT INSPECTION</u></b> ).	
	<ul style="list-style-type: none"> <li>• Fluid leaks from the top of the valve body unit. Overhaul the valve body unit (see <b><u>STEERING GEARBOX OVERHAUL</u></b> ).</li> <li>• Fluid leaks from the driver's side boot.</li> </ul>	

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Fluid leaks from the steering gearbox	<p>Replace the valve oil seal on the pinion shaft. Replace the cylinder end seal on the gearbox side.</p> <ul style="list-style-type: none"> <li>Fluid leaks from the passenger's side boot. Replace the right cylinder end seal.</li> <li>Fluid leaks from pinion shaft near the lower steering joint bolt. Overhaul the valve body unit (see <b><u>STEERING GEARBOX OVERHAUL</u></b> ).</li> <li>Fluid leaks from the steering damping valve covers on the valve body unit. Replace the valve housing.</li> </ul>	
Fluid leaks from the power steering line	<ul style="list-style-type: none"> <li>Fluid leaks from the cylinder line connections (flare nuts). Tighten the connection and retest.</li> <li>Fluid leaks from a damaged cylinder line (s). Replace the cylinder line.</li> <li>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.</li> </ul>	
Fluid leaks from the power steering pump	<ul style="list-style-type: none"> <li>Fluid leaks from the front oil seal. Replace the front oil seal.</li> <li>Fluid leaks from the power steering pump housing. Replace the leaking O-rings or seals (see <b><u>PUMP OVERHAUL</u></b> ), and if necessary replace the power steering pump (see <b><u>PUMP REPLACEMENT</u></b> ).</li> </ul>	
Fluid leaks from the power steering reservoir	<ul style="list-style-type: none"> <li>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 pump.</li> <li>Fluid leaks from reservoir. Check the reservoir for cracks and replace as necessary.</li> </ul>	
Fluid leaks from the power steering pump outlet hose (high-pressure)	<ul style="list-style-type: none"> <li>Check the fitting for loose bolts. If the bolts are tight, replace the fitting O-ring.</li> <li>Fluid leaks at the swagged joint. Replace the outlet hose.</li> </ul>	
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.	
ECPS indicator does not go off after the engine is	Symptom troubleshooting (see <b><u>ECPS INDICATOR DOES NOT GO OFF AFTER</u></b>	

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started	<b><u>THE ENGINE IS STARTED</u></b> ).	
ECPS indicator comes on while driving the vehicle (but the ECPS indicator goes off after the engine is restarted)	Symptom troubleshooting (see <b><u>ECPS INDICATOR COMES ON WHILE DRIVING THE VEHICLE (BUT THE ECPS INDICATOR GOES OFF AFTER THE ENGINE IS RESTARTED)</u></b> ).	
ECPS indicator comes on, but there is no power assist	Symptom troubleshooting (see <b><u>ECPS INDICATOR COMES ON, BUT THERE IS NO POWER ASSIST</u></b> ).	

### SYMPTOM TROUBLESHOOTING

#### Hard Steering

1. Check the power assist (see **POWER ASSIST CHECK** ).

*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 P/S joint adapter (pump), P/S joint adapter (hose), and P/S pressure gauge T/N 07406-0010001 (see **PUMP PRESSURE TEST WITH T/N 07406-0010001** ), T/N 07406-001000A or T/N 07406-001A101 (see **PUMP PRESSURE TEST WITH T/N 07406-001000A OR T/N 07406-001A101** ) to the pump.
3. Measure steady-state fluid pressure from the pump at idle.

*Is the pressure 1,470 kPa (15 kgf/cm<sup>2</sup> , 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 9,604-9,996 kPa (98-102 kgf/cm<sup>2</sup> , 1,392-1,448 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 9,604-9,996 kPa (98-102 kgf/cm<sup>2</sup> , 1,392-1,448 psi) or more?*

**YES** - Go to step 7.

**NO** - Faulty steering gearbox.

7. Adjust the rack guide (see **STEERING LOCK REPLACEMENT** ), and retest.

*Is the steering OK?*

**YES** - Repair is completed.

**NO** - Faulty steering gearbox.

8. Check for feed and return lines between the pump and the steering 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 **PUMP OVERHAUL**).

10. Check the flow control valve for smooth movement and leaks (see step 9 ).

*Is the flow control valve OK?*

**YES** - Faulty pump assembly.

**NO** - Faulty flow control valve.

11. Check the cylinder lines A and B for deformation (see **POWER STEERING HOSE, LINE, AND PRESSURE SWITCH REPLACEMENT** ).

*Are the A or B lines deformed?*

**YES** - Replace the lines.

**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?*

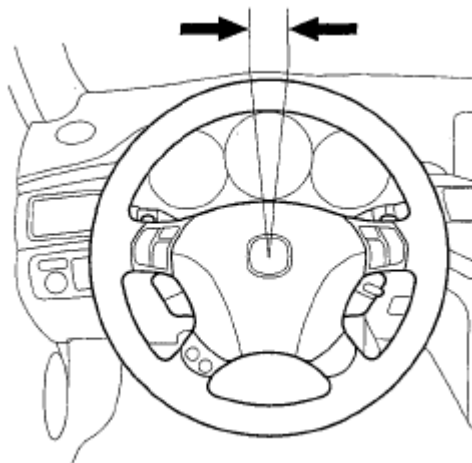
**YES** - Replace the rack shaft or readjust the rack guide.

**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 steering gearbox and linkages are OK.
  - If the play exceeds the limit, adjust the rack guide (see **STEERING LOCK REPLACEMENT**). If the play is still excessive after rack guide adjustment, inspect the steering linkage and steering gearbox (see **STEERING LINKAGE AND GEARBOX INSPECTION**).

**Rotational play: 0-10 mm (0-0.39 in.)**



**Fig. 3: Identifying Steering Wheel Rotational Play**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

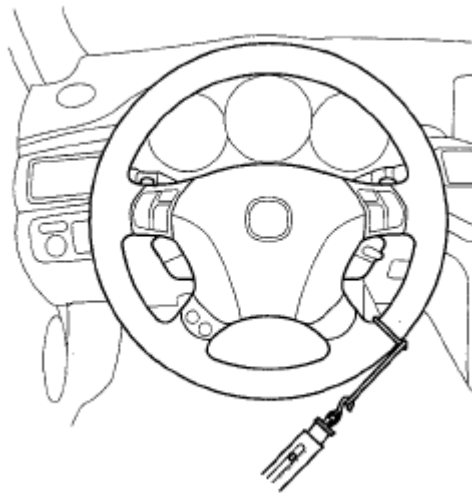
### POWER ASSIST CHECK

**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 **FLUID CHECK/REPLACEMENT** ).
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 steering gearbox and pump are OK.
  - If the scale reads more than the specification, troubleshoot the steering system (see **SYMPTOM TROUBLESHOOTING**).

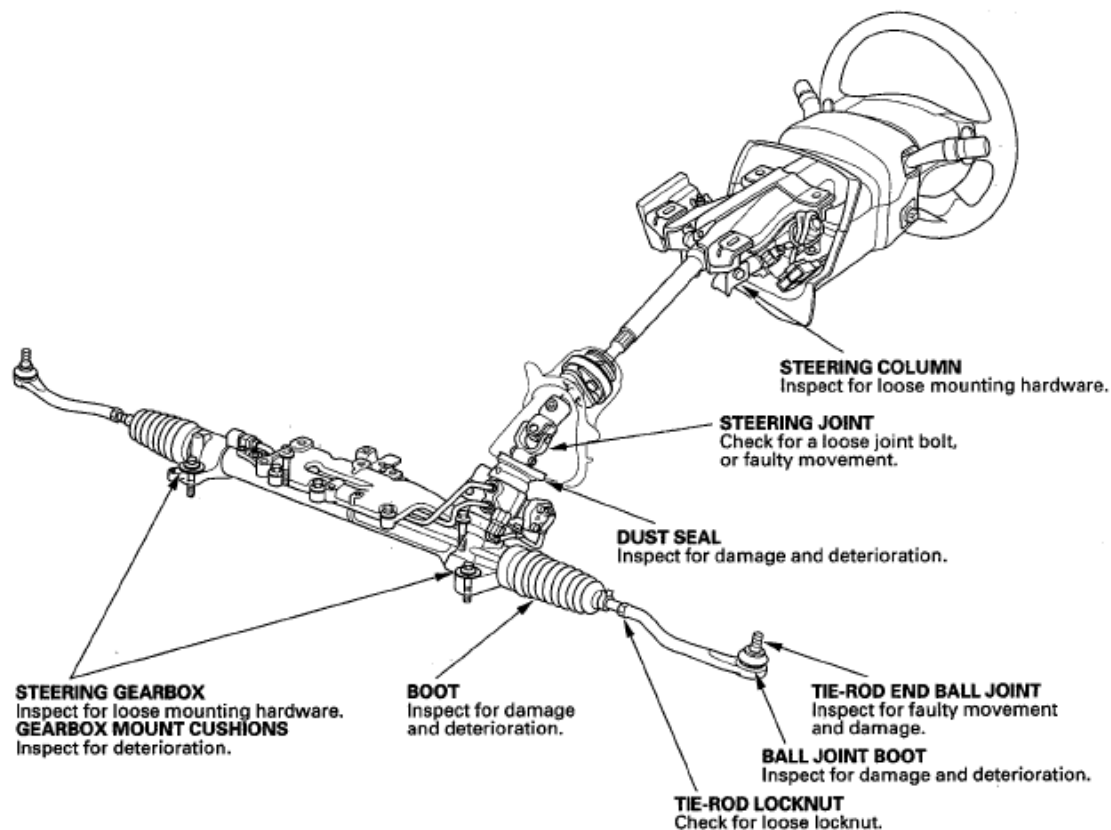
**Initial turning load: 29 N (3.0 kgf, 6.6 lbf)**





**Fig. 4: Attaching Spring Scale To Steering Wheel**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

## STEERING LINKAGE AND GEARBOX INSPECTION



**Fig. 5: Inspecting Steering Linkage And Gearbox Components**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

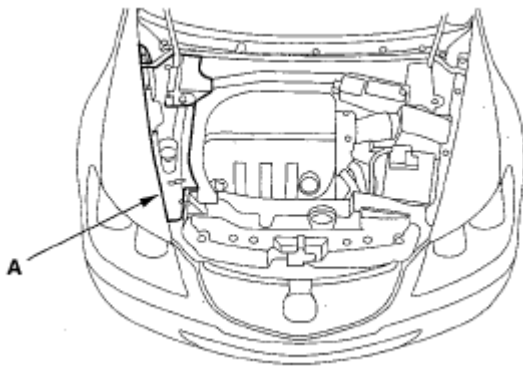
## PUMP PRESSURE TEST WITH T/N 07406-0010001

Special Tools Required

- P/S joint adapter (pump) 07VAK-P8A011A
- P/S joint adapter plate (pump) 07VAK-P8A012B
- P/S joint adapter (hose) 07RAK-S040122
- P/S pressure gauge 07406-0010001

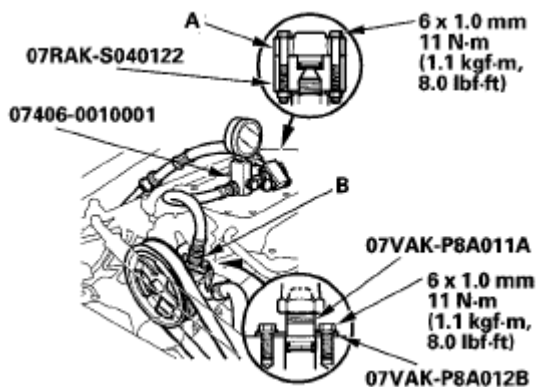
Check the fluid pressure as follows to determine whether the trouble is in the pump or steering gearbox.

1. Remove the right front fender trim (A).



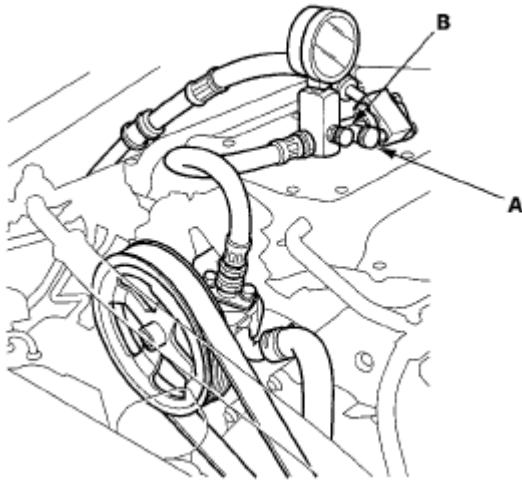
**Fig. 6: Identifying Right Front Fender Trim**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Check the power steering fluid level (see **FLUID CHECK/REPLACEMENT** ).
3. 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.



**Fig. 7: Installing P/S Pressure Gauge To P/S Joint Adapter (Pump) With Torque Specifications**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. 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).
5. Install the P/S pressure gauge to the P/S joint adapter (pump).
6. Fully open the shut-off valve (A).



**Fig. 8: Identifying Shut-Off Valve And Pressure Control Valve**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Fully open the pressure control valve (B).
8. Start the engine and let it idle.
9. Turn the steering wheel from lock-to-lock several times to warm the fluid to operating temperature.
10. 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/cm<sup>2</sup> , 213 psi).

If it reads high, check for:

- Clogged or deformed feed or return line between the pump and steering gearbox.
  - Clogged valve body unit.
11. Close the shut-off valve, then close the pressure control valve gradually until the pressure gauge needle is stable. Read the pressure.

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

12. Immediately open the shut-off valve fully. If the pump is in good condition, the gauge should read at least 9,604-9,996 kPa (98-102 kgf/cm<sup>2</sup> , 1,392-1,448 psi). A low reading means pump output is too low for full assist. Repair or replace the pump.

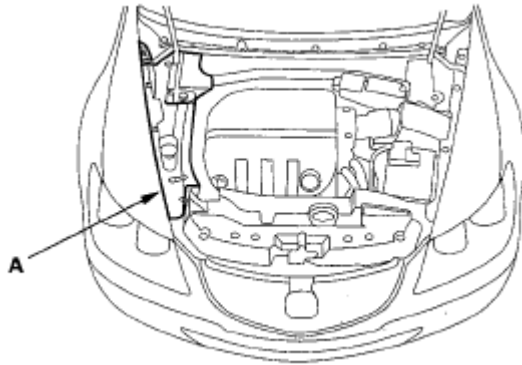
## **PUMP PRESSURE TEST WITH T/N 07406-001000A OR T/N 07406-001A101**

### **Special Tools Required**

- P/S joint adapter (pump) 07VAK-P8A011A
- P/S joint adapter plate (pump) 07VAK-P8A012B
- P/S joint adapter (hose) 07RAK-S040122
- P/S pressure gauge 07406-001000A or 07406-001A101

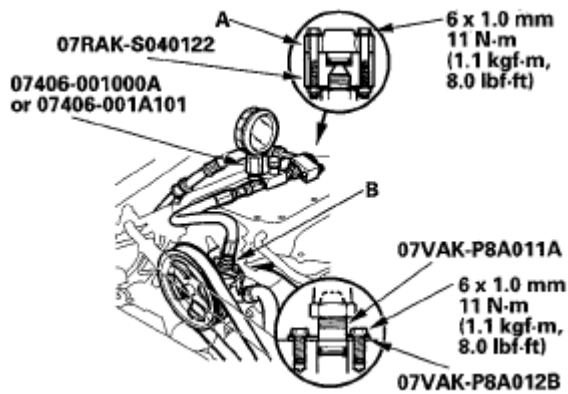
Check the fluid pressure as follows to determine whether the trouble is in the pump or steering gearbox.

1. Remove the right front fender trim (A).



**Fig. 9: Identifying Right Front Fender Trim**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Check the power steering fluid level (see **FLUID CHECK/REPLACEMENT**).
3. 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.



**Fig. 10: Installing P/S Pressure Gauge To P/S Joint Adapter (Pump) With Torque Specifications**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. 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).
5. Install the P/S pressure gauge to the P/S joint adapter (pump).
6. Open the shut-off valve (A) fully.



**Fig. 11: Identifying Shut-Off Valve**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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.
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 1,500 kPa (15 kgf/cm<sup>2</sup> , 213 psi).

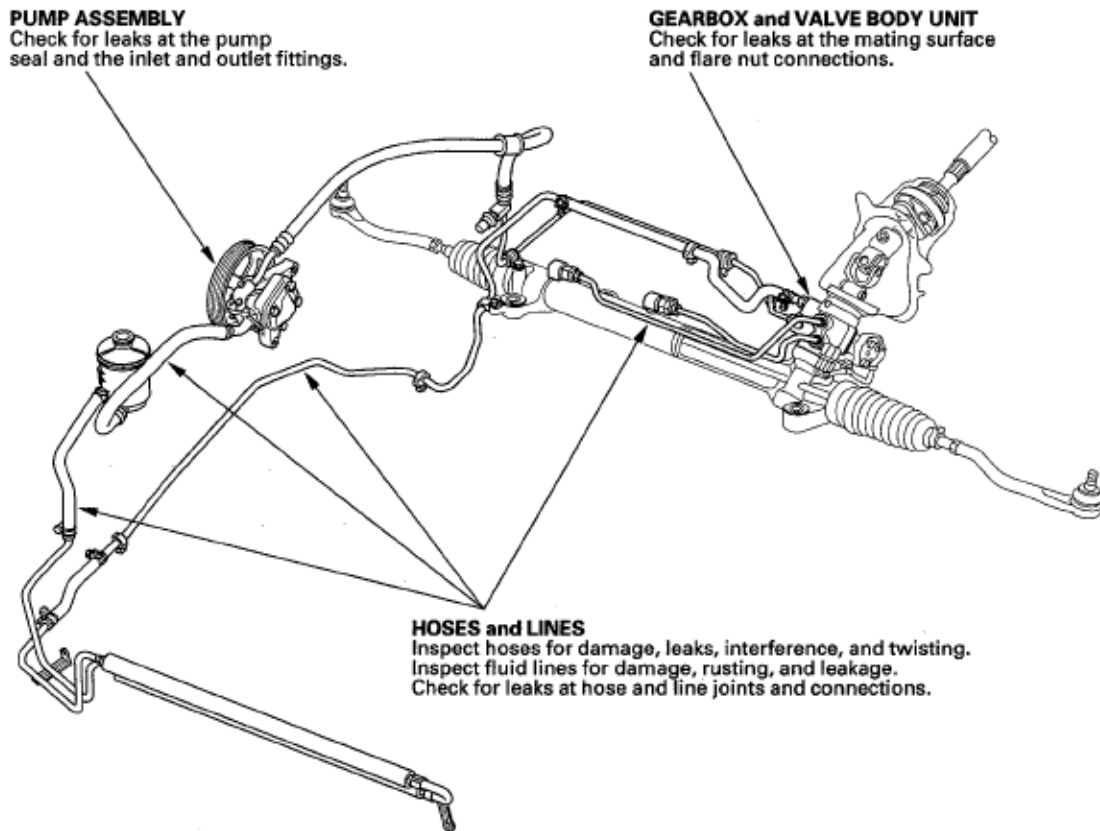
If it reads high, check for:

- Clogged or deformed feed or return line between the pump and gearbox.
  - Clogged valve body unit.
10. Let the engine idle, and gradually close the shut-off valve and immediately read the pressure.

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

11. Immediately open the shut-off valve fully. If the pump is in good condition, the gauge should read at least 9,604-9,996 kPa (98-102 kgf/cm<sup>2</sup> , 1,392-1,448 psi). A low reading means pump output is too low for full assist. Repair or replace the pump.

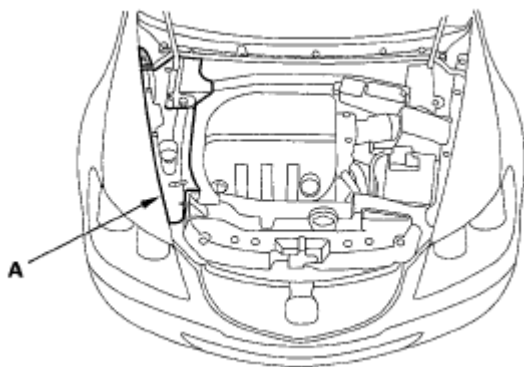
## **FLUID LEAKAGE INSPECTION**



**Fig. 12: Inspecting For Fluid Leakage**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

## FLUID CHECK/REPLACEMENT

1. Remove the right upper fender trim (A) (see [UPPER FENDER TRIM REPLACEMENT](#) ).



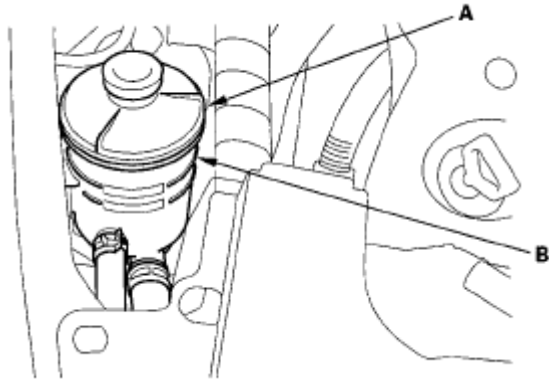
**Fig. 13: Identifying Right Upper Fender Trim**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Check the reservoir (A) at regular intervals, and add the recommended fluid as necessary to fill the reservoir to the upper level line (B). 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 dirty or contaminated, replace the fluid, go to step 3.

**System capacity:** 1.1 L (1.16 US. qt) at disassembly

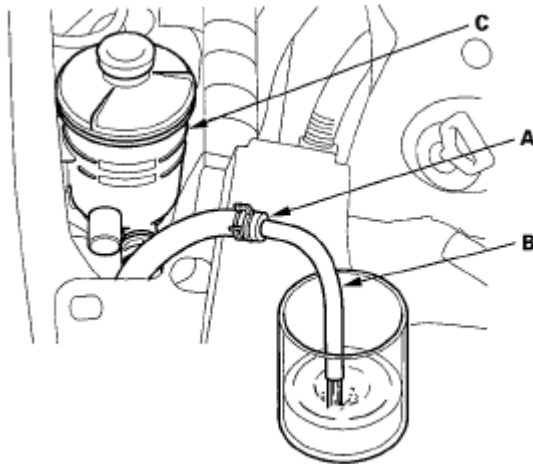
**Reservoir capacity:** 0.32 L (0.34 US. qt)



**Fig. 14: Identifying Reservoir And Upper Level Line**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. 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.



**Fig. 15: Identifying Return Hose And Hose**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Connect a hose (B) of suitable diameter to the disconnected return hose, and put the hose end in a suitable container.
5. 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.
6. Reinstall the return hose on the reservoir.

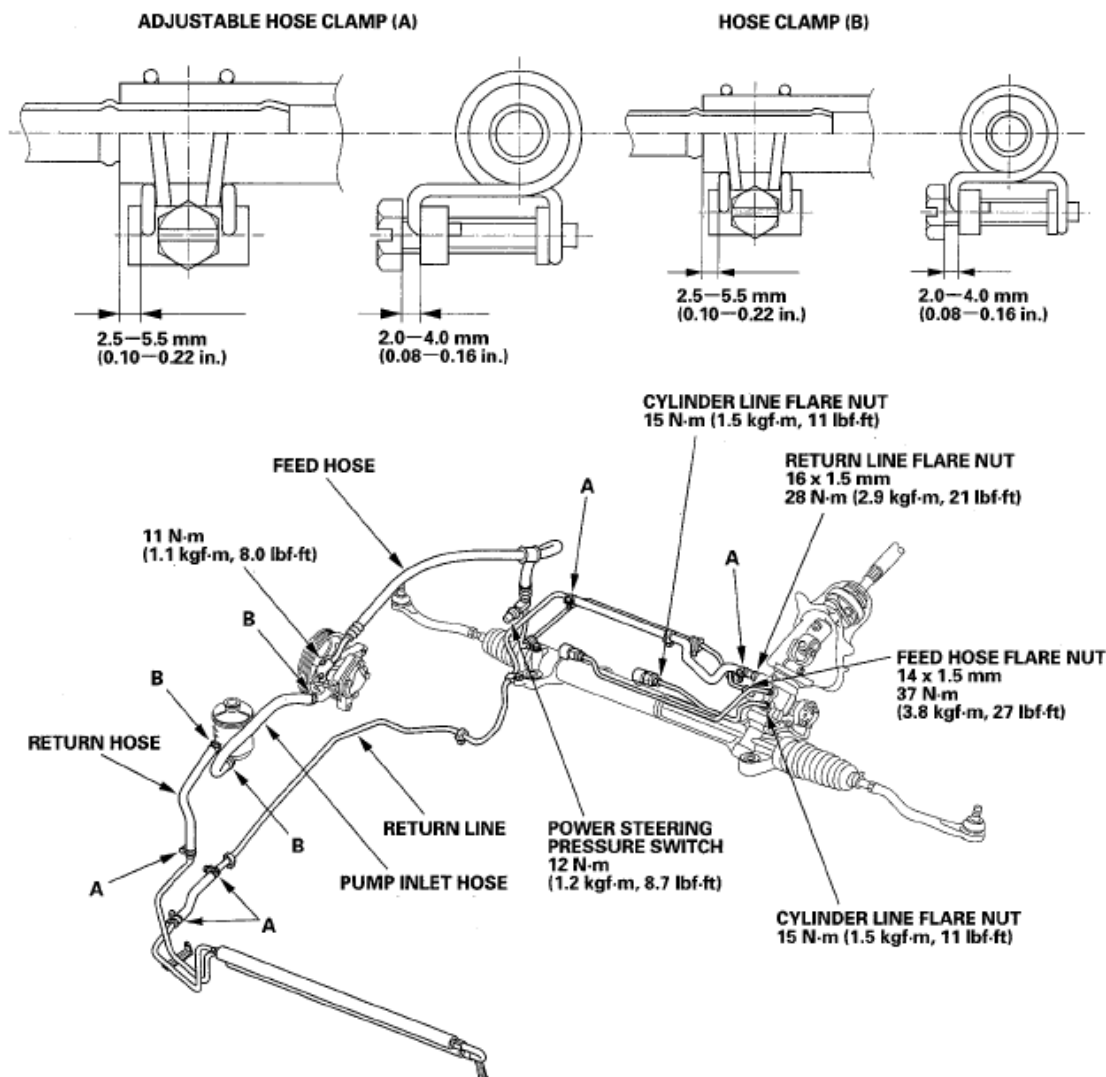


7. Fill the reservoir to the upper level line (C).
8. Start the engine and run it at fast idle, then turn the steering from lock-to-lock several times to bleed air from the system.
9. Recheck the fluid level and add some if necessary. Do not fill the reservoir beyond the upper level line.
10. If the fluid is contaminated, dark, or discolored, repeat the procedure as necessary.
11. Install the right upper fender trim (see **UPPER FENDER TRIM REPLACEMENT** ).

## 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.



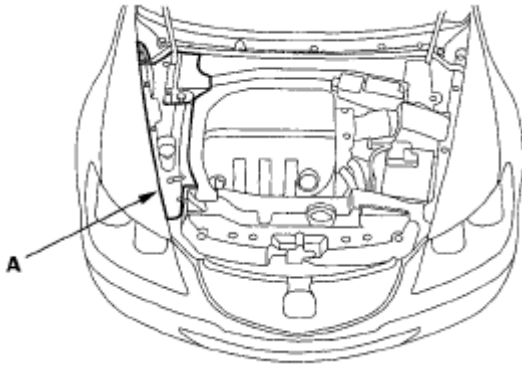
**Fig. 16: Identifying Power Steering Hose, Line And Pressure Switch With Torque Specifications**



Courtesy of AMERICAN HONDA MOTOR CO., INC.

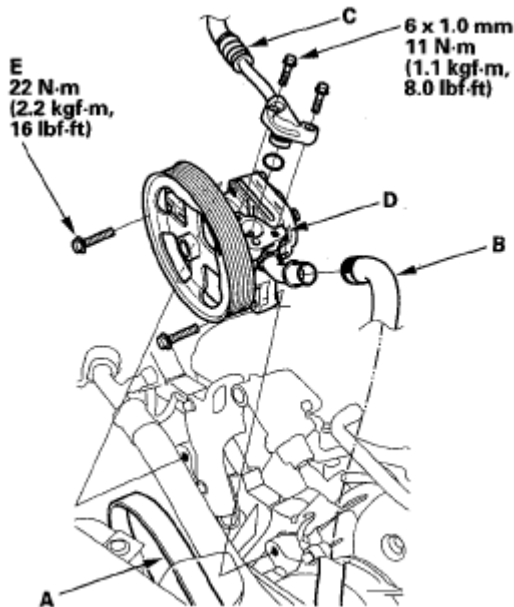
## PUMP REPLACEMENT

1. Place a suitable container under the vehicle.
2. Remove the right upper fender trim (A) (see UPPER FENDER TRIM REPLACEMENT ).



**Fig. 17: Identifying Right Upper Fender Trim**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Drain the power steering fluid from the reservoir.
4. Remove the drive belt (A) from the pump pulley (see DRIVE BELT REPLACEMENT ).



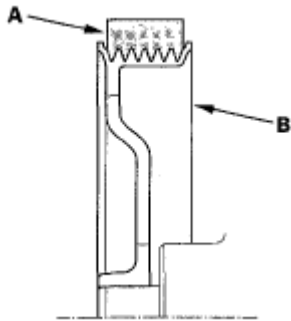
**Fig. 18: Identifying Pump Inlet Hose, Pump Outlet Hose And Pump With Torque Specifications**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. 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.
6. Remove the pump mounting bolts (E).

7. Cover the opening of the pump with a piece of tape to prevent foreign material from entering the pump.
8. Connect the pump inlet hose and pump outlet hose onto the new pump.
9. Loosely install the pump in the pump bracket with the mounting bolts, then tighten the pump fittings securely.
10. Tighten the pump mounting bolts to the specified torque.
11. 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 the auto-tensioner, alternator, A/C compressor, and drive belt or pulley faces. Clean off any fluid or grease before installation.



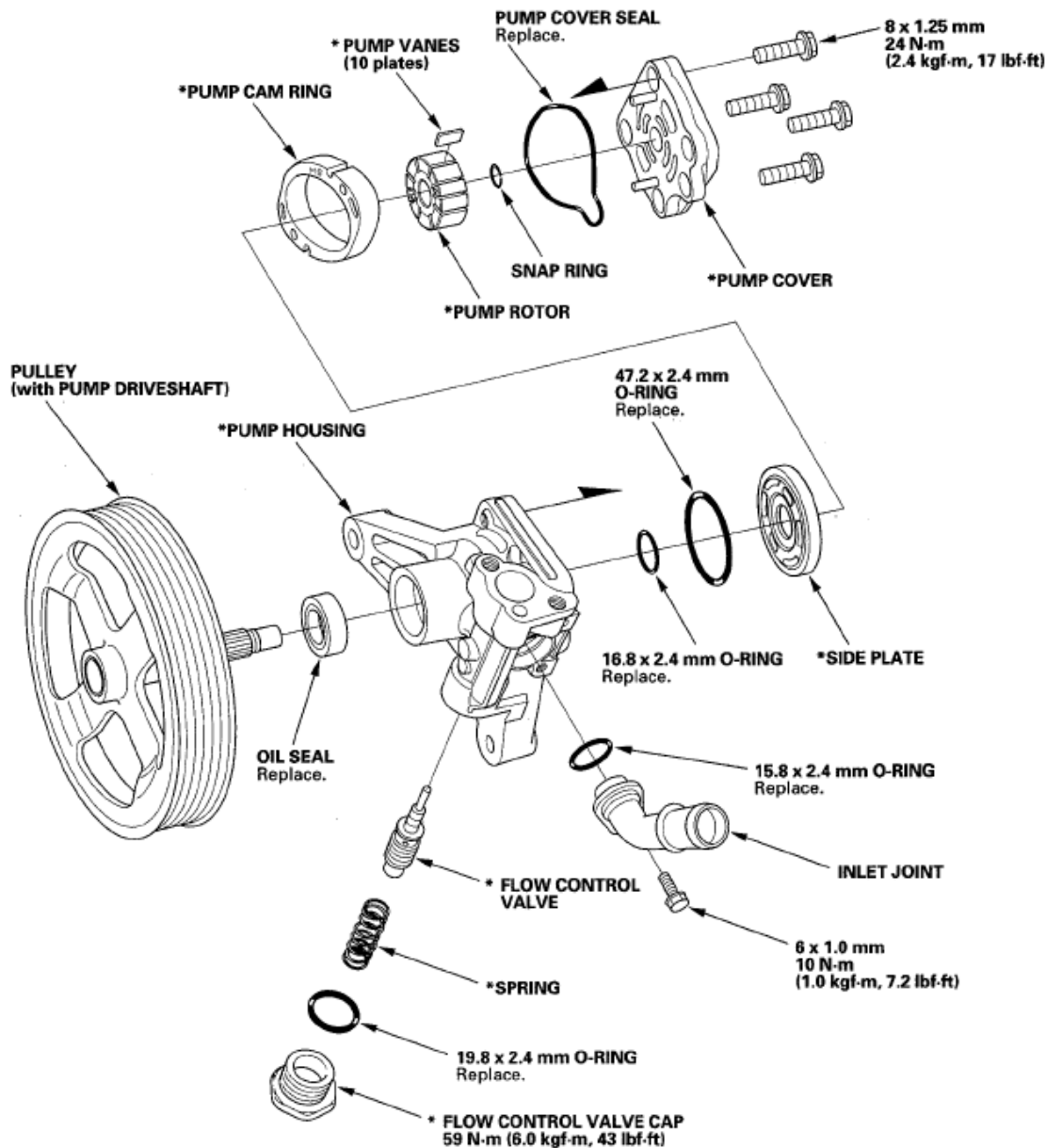
**Fig. 19: Identifying Drive Belt And Pulleys Alignment**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

12. Fill the reservoir to the upper level line (see **FLUID CHECK/REPLACEMENT** ).
13. Install the right upper fender trim (see **UPPER FENDER TRIM REPLACEMENT** ).

## **PUMP OVERHAUL**

### **Exploded View**

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



**Fig. 20: Exploded View Of Power Steering Pump With Torque Specifications**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

### Disassembly

**NOTE:** Refer to the EXPLODED VIEW as needed during the following procedure.

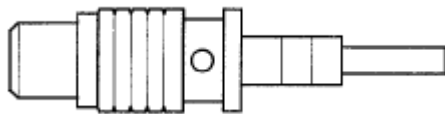
1. Drain the fluid from the pump.
2. Remove the power steering pump (see PUMP REPLACEMENT ).
3. Remove the inlet joint and O-ring.
4. Loosen the flow control valve cap with a hex wrench, and remove it and the O-ring, the flow control valve and spring.
5. Remove the pump cover and pump cover seal.
6. Remove the snap ring, then remove the outer side plate, cam ring, rotor, vanes, side plate, and O-

rings.

7. Remove the snap ring, then remove the pump driveshaft by tapping the shaft end with the plastic hammer.
8. Remove the seal from the pump housing.

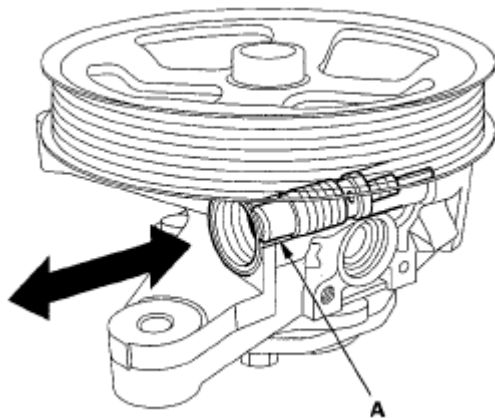
### Inspection

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



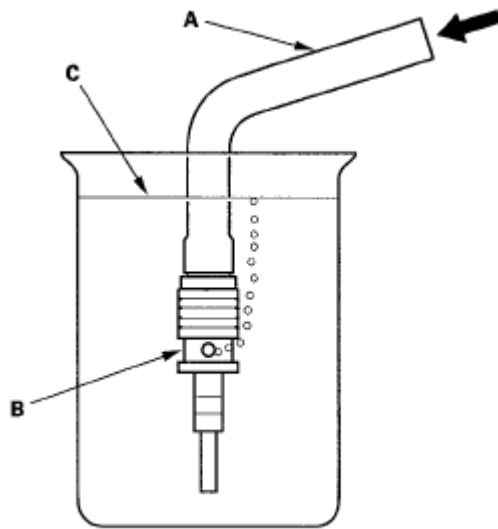
**Fig. 21: Identifying Flow Control Valve**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. Inspect the bore of the flow control valve on the pump housing for scratches and wear.
11. Slip the flow control valve back into the pump housing, and check that it moves in and out smoothly. If OK, go to step 12; if not, replace the pump as an assembly. The flow control valve (A) is not available separately.



**Fig. 22: Identifying Flow Control Valve**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

12. Attach a hose (A) to the end of the flow control valve (B) as shown. Then submerge the flow 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/cm<sup>2</sup>, 14.2 psi), replace the pump as an assembly. The flow control valve is not available separately.
  - If the flow control valve is OK, set it aside for reassembly later.

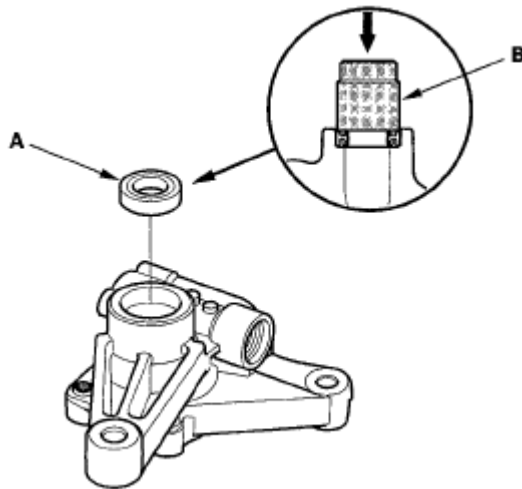


**Fig. 23: Inspecting Flow Control Valve In A Container Of Power Steering Fluid Or Solvent**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

### Reassembly

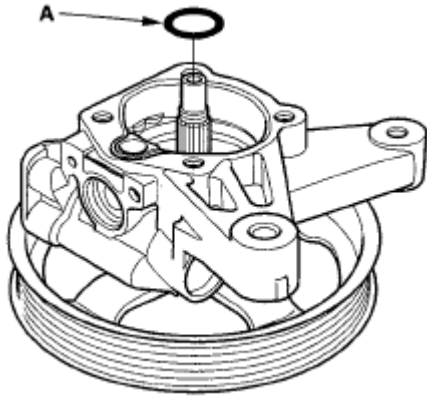
13. Install the oil seal (A) (with its grooved side facing in) into the pump housing by hand first. Press the oil seal with the appropriate size socket wrench (B) as shown.



**Fig. 24: Installing Oil Seal Into The Pump Housing**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

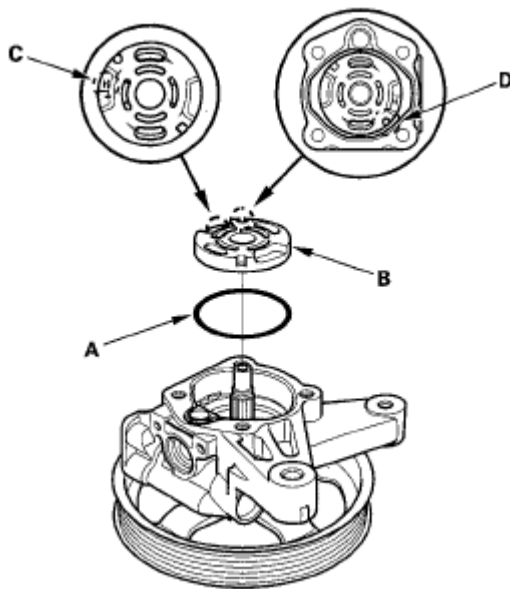
14. Install the pulley (with pump driveshaft) in the pump housing.
15. Coat the new 16.8 mm O-ring (A) with power steering fluid, and position it in the bottom of the pump housing.



**Fig. 25: Identifying O-Ring**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

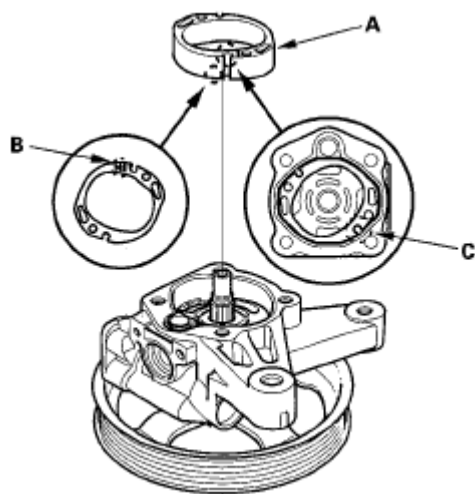
16. Coat the new 47.2 mm O-ring (A) with power steering fluid, and position it in the bottom of the pump housing.



**Fig. 26: Identifying O-Ring, Plate, Mark And Slot**

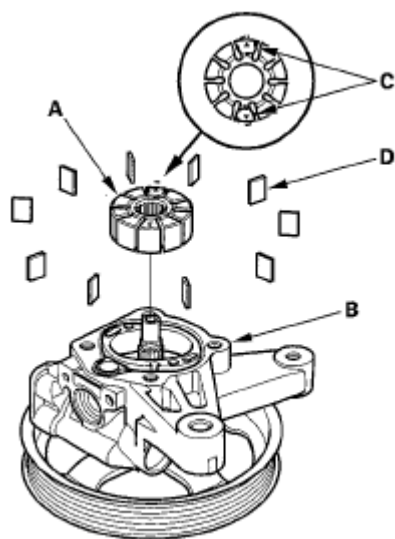
Courtesy of AMERICAN HONDA MOTOR CO., INC.

17. Set the plate (B) with its "H" mark (C) facing up, and align the slot (D) in the pump housing.
18. Set the pump cam ring (A) with its "MS" mark (B) facing down, and align the slot (C) in the pump housing.



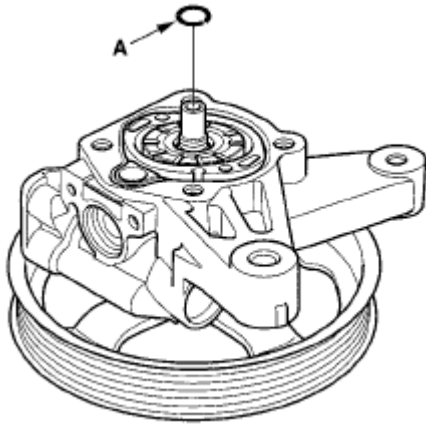
**Fig. 27: Identifying Pump Cam Ring, Mark And Slot**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

19. Assemble pump rotor (A) to the pump housing (B) with its "delta " mark (C) facing up.



**Fig. 28: Identifying Pump Rotor, Pump Housing And Mark**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

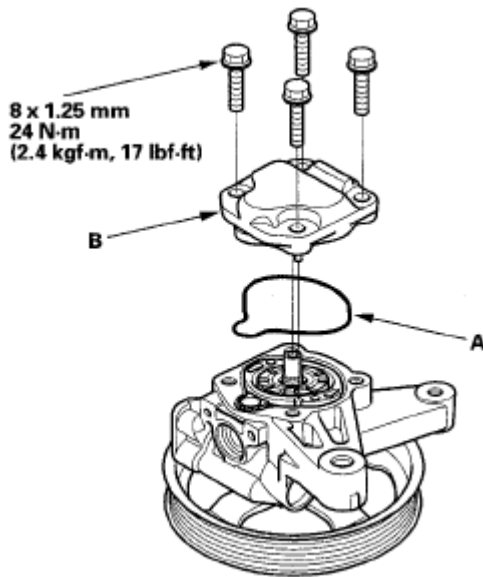
20. Set the 10 vanes (D) in the grooves in the rotor.
21. Install the snap ring (A).



**Fig. 29: Identifying Snap Ring**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

22. Coat the new pump cover seal (A) with power steering fluid, and position it in the pump housing.

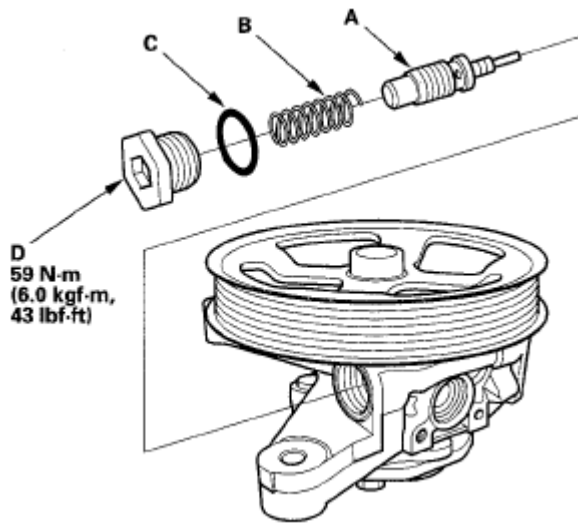


**Fig. 30: Identifying Pump Cover Seal And Pump Cover**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

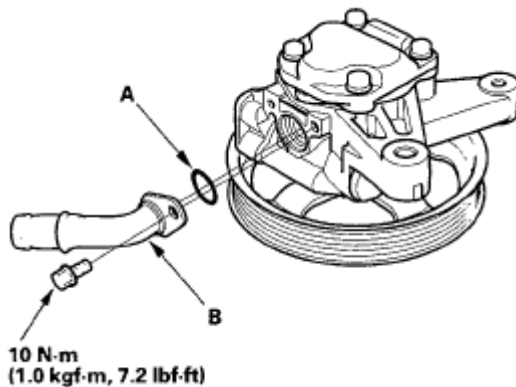
23. Install the pump cover (B) in the pump housing. Torque the bolts in a criss-cross pattern in two or more steps.
24. Coat the flow control valve (A) with power steering fluid, then install it and the spring (B) in the pump housing.





**Fig. 31: Identifying Flow Control Valve And Spring**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

25. Coat the new 19.8 mm O-ring (C) with power steering fluid, and install it on the flow control valve cap (D), then install the cap on the pump housing, and tighten it to the specified torque.
26. Coat the new 15.8 mm O-ring (A) with power steering fluid, and install it on the inlet joint (B). Install the inlet joint on the pump housing.



**Fig. 32: Identifying O-Ring And Inlet Joint**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

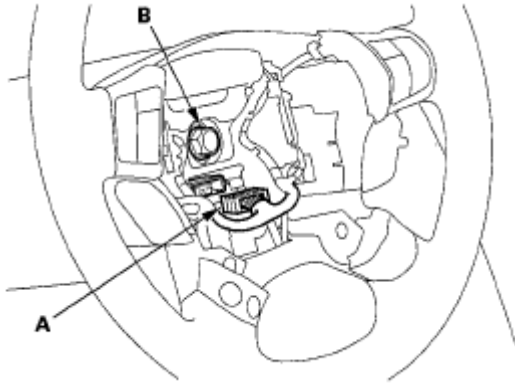
27. Check that the pump turns smoothly by turning the pulley by hand. If it turns hard, loosen the four flange bolts on the cover, then retighten them in same manner as in step 23. Turn the pump again by hand.

## STEERING WHEEL REMOVAL

SRS components are located in this area. Review the SRS component locations (see **COMPONENT LOCATION INDEX**) and the precautions and procedures (see **PRECAUTIONS AND PROCEDURES**) before doing repairs or service.

1. Make sure you have the anti-theft codes for the audio and the navigation system.
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 **DRIVER'S AIRBAG REPLACEMENT** ).
4. Disconnect the cable reel connector (A).
5. Loosen the steering wheel nut (B).

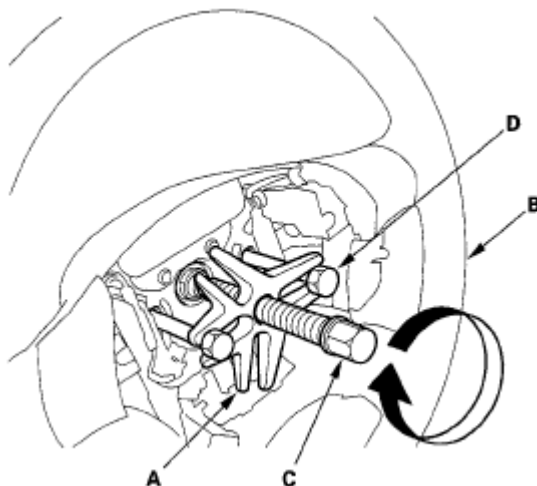


**Fig. 33: Identifying Cable Reel Connector And Steering Wheel Nut**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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:

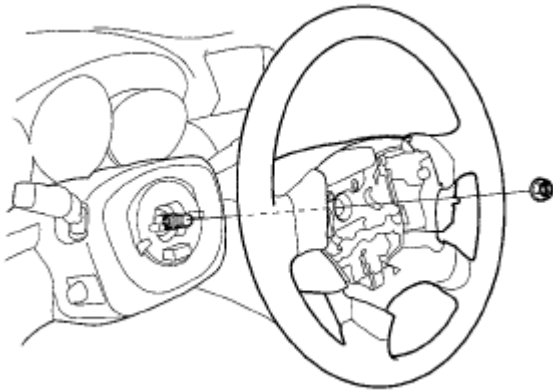
- Do not tap on the steering wheel or the steering column shaft when removing the steering wheel.
- If you thread the puller bolts (D) into the wheel hub more than five threads, the bolts will hit the cable reel and damage it. To prevent this, install a pair of jam nuts five threads up on each puller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



**Fig. 34: Identifying Steering Wheel Puller, Steering Wheel And Pressure Bolt**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

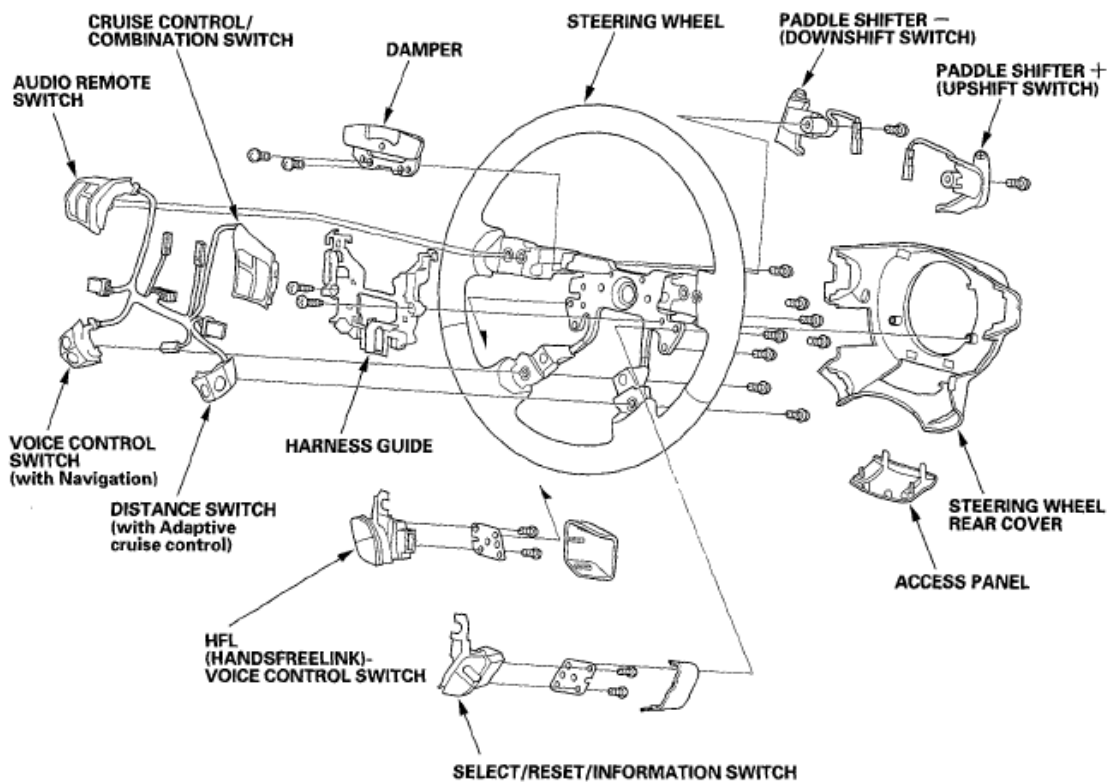
7. Remove the steering wheel puller, then remove the steering wheel nut and steering wheel from the

steering column.



**Fig. 35: Identifying Steering Wheel Nut And Steering Wheel**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

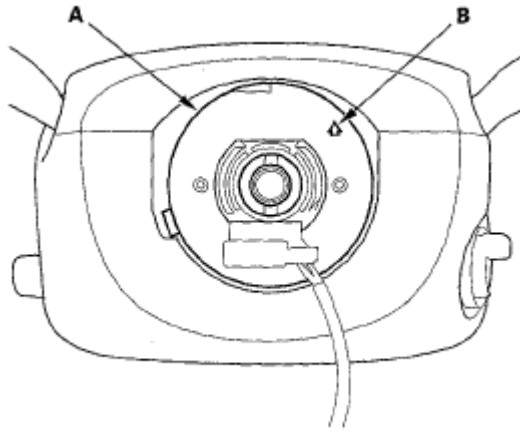
## STEERING WHEEL DISASSEMBLY/REASSEMBLY



**Fig. 36: Identifying Steering Wheel Components**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

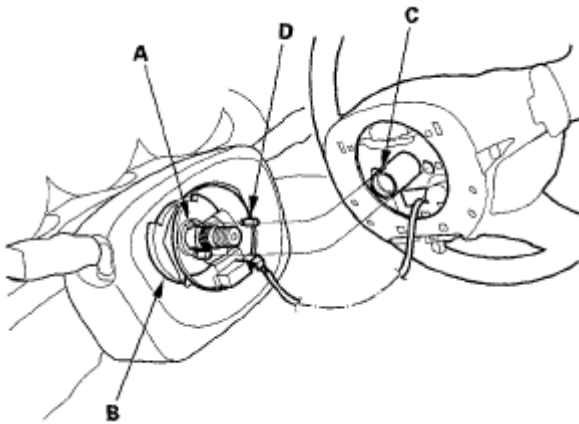
## STEERING WHEEL INSTALLATION

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 point should point straight up.



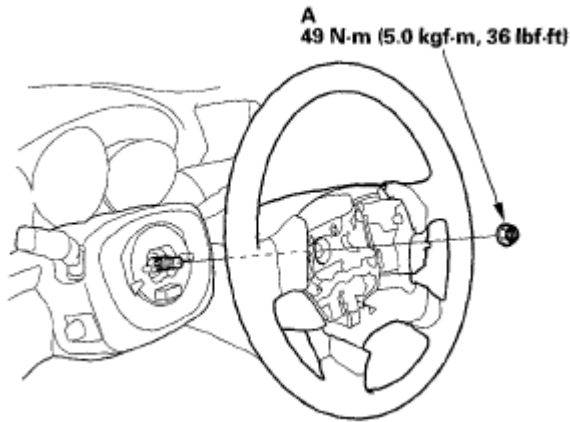
**Fig. 37: Identifying Cable Reel And Arrow Mark**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Position the two tabs (A) of the turn signal cancelling sleeve (B) as shown. Route the airbag connector through the steering wheel and 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.



**Fig. 38: Identifying Tabs, Turn Signal Cancelling Sleeve, Steering Wheel Hub And Pins**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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



**Fig. 39: Identifying Steering Wheel Nut With Torque Specifications**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

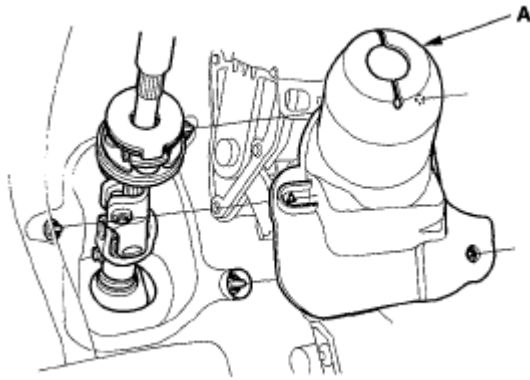
4. Install the driver's airbag, and confirm that the system is operating properly (see **DRIVER'S AIRBAG REPLACEMENT** ).
5. Reconnect the negative battery cable to the battery, and do these tasks:
  - Turn the ignition switch ON (II); the SRS indicator should come on for about 6 seconds and then go off.
  - Enter the anti-theft code for the audio system and the navigation system.
  - Make sure the horn and turn signal switches work properly.
  - Make sure the steering wheel switches work properly.
  - Make sure the steering wheel is centered.
  - Do the steering column position memorization (see **STEERING COLUMN POSITION MEMORIZATION** ).
  - Do the steering angle neutral position memorization (see **SH-AWD DIFFERENTIAL CLUTCH TORQUE MEMORIZATION** ).

## STEERING COLUMN REMOVAL AND INSTALLATION

SRS components are located in this area. Review the SRS component locations (see **COMPONENT LOCATION INDEX** ) and the precautions and procedures (see **PRECAUTIONS AND PROCEDURES** ) before doing repairs or service.

### Removal

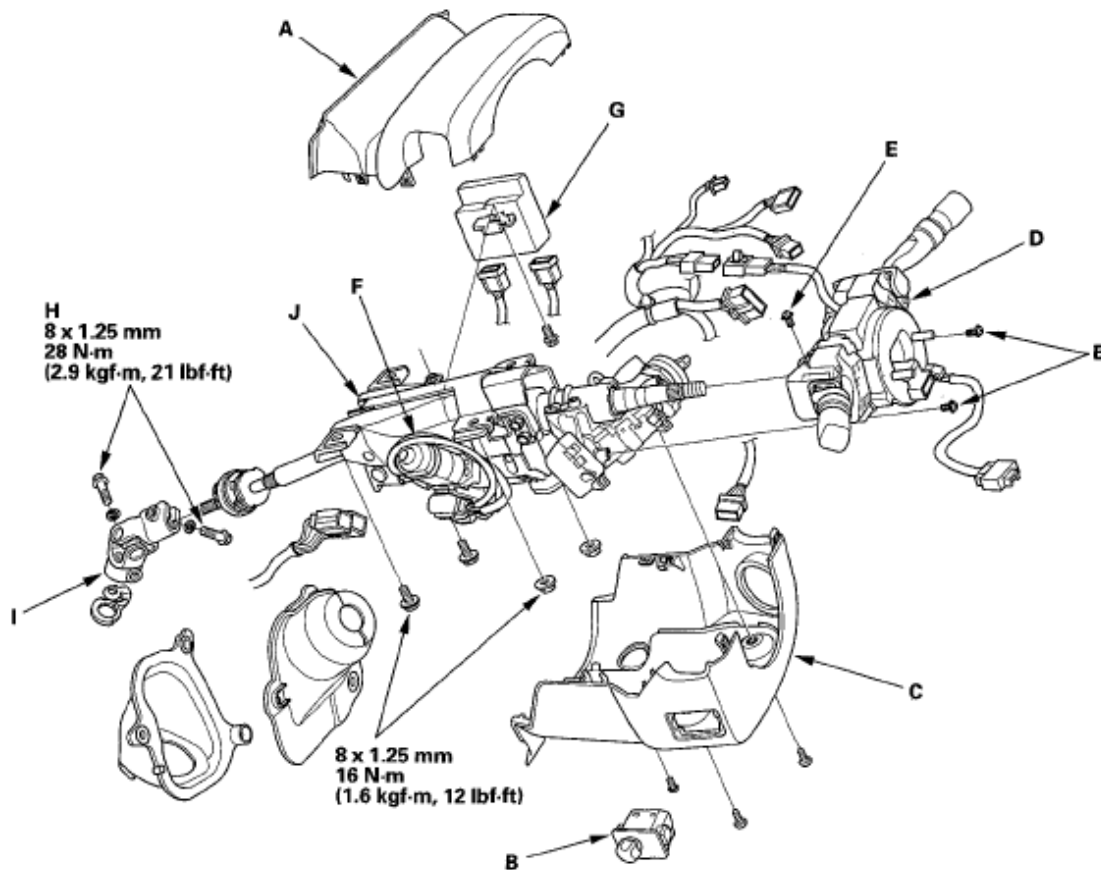
1. Make sure you have the anti-theft codes for the audio and the navigation system.
2. Adjust the steering column to full tilt down position, and to the full telescopic out position.
3. Disconnect the negative cable from the battery.
4. Remove the driver's airbag assembly and the steering wheel (see **STEERING WHEEL REMOVAL** ).
5. Remove the steering joint cover A.



**Fig. 40: Identifying Steering Joint Cover**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Remove the upper column cover (A), and disconnect the connectors from the tilt/telescopic switch (B) on the lower column cover (C).



**Fig. 41: Identifying Steering Column Components With Torque Specifications**

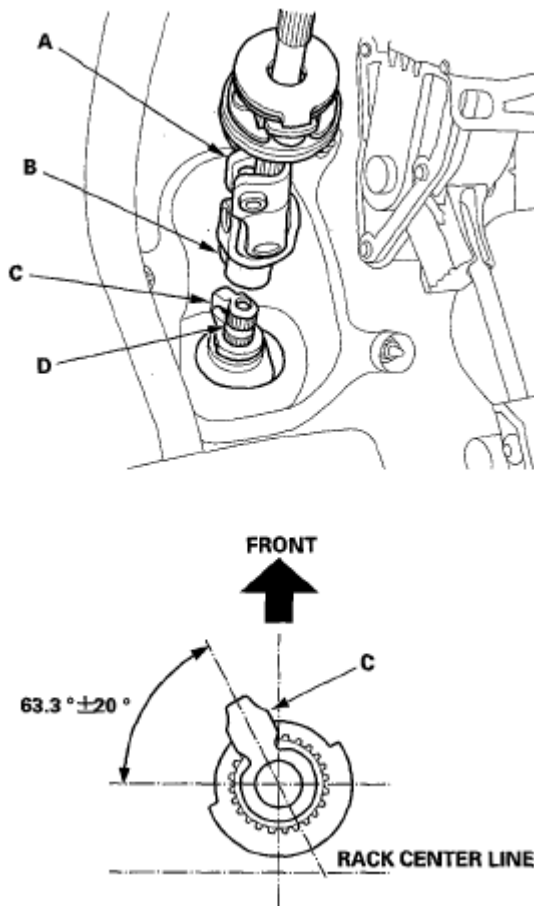
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Disconnect the wire harness connectors from the combination switch assembly (D).
8. Remove the combination switch assembly from the steering column shaft by removing the screws (E).
9. Disconnect the connectors from the ignition switch, and release the wire harness clips from the steering column.

10. Disconnect the connectors from the tilt/telescopic motors (F).
11. Disconnect the connectors from the tilt/telescopic control unit (G).
12. Remove the steering joint bolts (H), then disconnect the steering joint (I) from the pinion shaft and the steering column shaft.
13. Remove the steering column (J) by removing the attaching nuts and bolts.

### 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.
3. Install the steering joint (A) aligning the slit (B) of the steering joint with the tab (C) of the center guide. Position the angle of the center guide as shown if necessary.

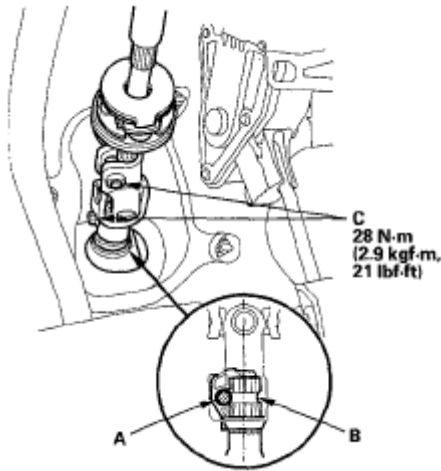


**Fig. 42: Identifying Steering Joint, Slit And Tab**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. With the rack in the straight ahead driving position, slip the lower end of the steering joint on to the pinion shaft (D).
5. Align the bolt hole (A) on the steering joint with the groove (B) around the pinion shaft, and loosely install the joint bolts (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.



**Fig. 43: Identifying Bolt Hole And Groove With Torque Specifications**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

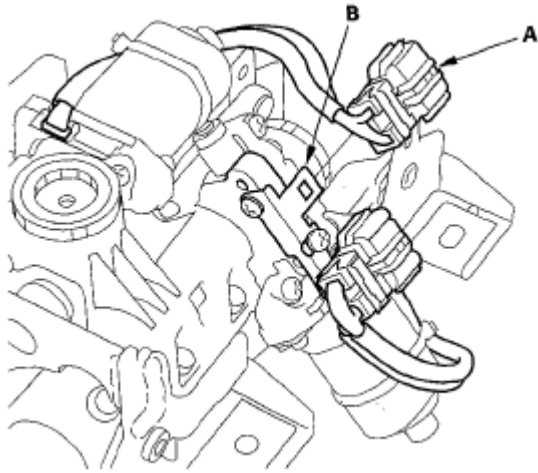
6. Install the steering wheel (see **STEERING WHEEL INSTALLATION** ).
7. Reconnect the negative battery cable to the battery, and do these tasks:
  - Turn the ignition switch ON (II); the SRS indicator should come on for about 6 seconds and then go off.
  - Enter the anti-theft code for the audio system and the navigation system.
  - Make sure the horn and turn signal switches work properly.
  - Make sure the steering wheel switches work properly.
  - Make sure the steering wheel is centered.
  - Do the steering column position memorization (see **STEERING COLUMN POSITION MEMORIZATION** ).
  - Do the steering angle neutral position memorization (see **SH-AWD DIFFERENTIAL CLUTCH TORQUE MEMORIZATION** ).
8. After installation, do these checks:
  - 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.
  - Set the steering column to the center tilt position, then do the front toe inspection (see **FRONT TOE INSPECTION/ADJUSTMENT** ).

## POWER TILT MOTOR/POSITION SENSOR REPLACEMENT

1. Remove the steering column (see **STEERING COLUMN REMOVAL AND INSTALLATION** ).
2. Remove the power tilt motor/position sensor connector (A) from connector bracket (B).

**NOTE:** The power tilt motor/position sensor connector is sky blue, and power telescopic motor/position sensor connector is white.

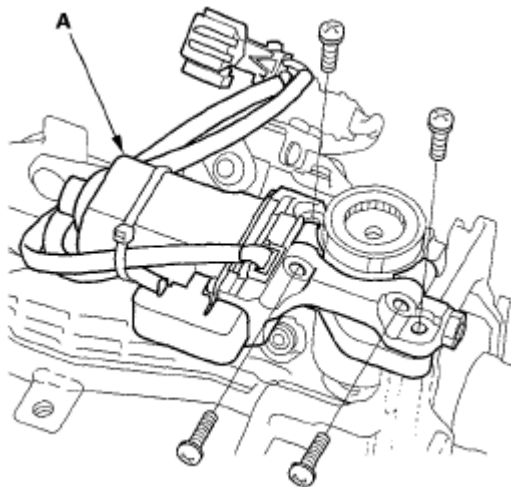




**Fig. 44: Identifying Motor/Position Sensor Connector And Connector Bracket**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Remove the power tilt motor/position sensor (A) from steering column.

**NOTE:** Do not let dirt or other foreign materials get inside of the steering column.

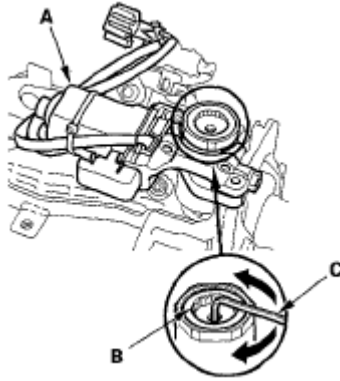


**Fig. 45: Identifying Power Tilt Motor/Position Sensor**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Install the new power tilt motor/position sensor (A) and align the matching surface and screw holes.

**NOTE:**

- Do not weight engagement part.
- If the tilt motor gear is not properly engage with the tilt gear, the screw holes can not be aligned with the steering column. In that case, move the tilt gear (B) with the hex wrench (C) to engage the tilt motor gear with the tilt gear.

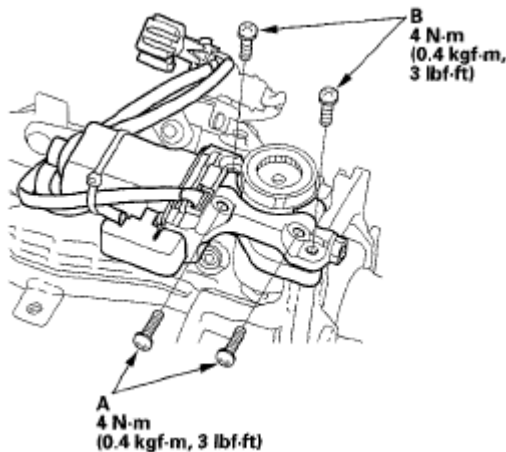


**Fig. 46: Identifying Power Tilt Motor/Position Sensor, Tilt Gear And Hex Wrench**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Loosely install the four screws, then tighten the screws (A) first, and tighten the screws (B) to the specified torque.

**NOTE:** If the screws are tighten forcibly without aligning the screw holes with the steering column, it may cause noise or malfunction.



**Fig. 47: Identifying Tilt Motor Screws With Torque Specifications**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

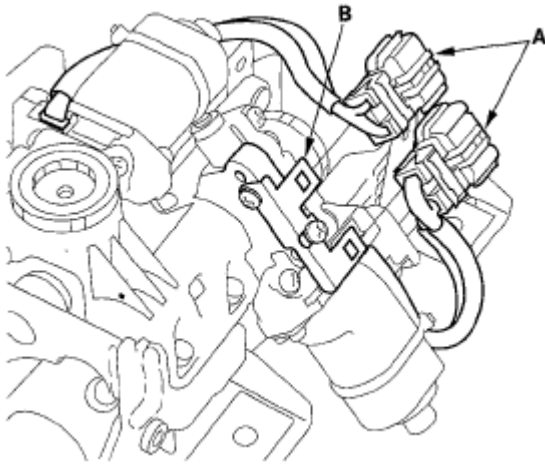
6. Install the power tilt motor/position sensor connector to the connector bracket.
7. Install the steering column (see **INSTALLATION**).
8. Check the tilt operation is smoothly.

## POWER TELESCOPIC MOTOR/POSITION SENSOR REPLACEMENT

1. Remove the steering column (see **STEERING COLUMN REMOVAL AND INSTALLATION**).
2. Remove the power telescopic motor connectors (A) from connector bracket (B).

**NOTE:** The power tilt motor/position sensor connector is sky blue, and power

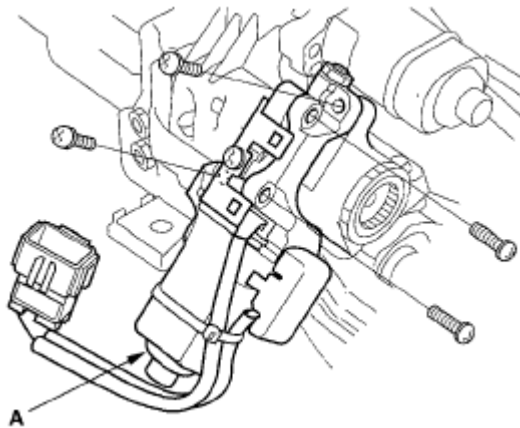
telescopic motor/position sensor connector is white.



**Fig. 48: Identifying Power Telescopic Motor Connectors And Connector Bracket**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Remove the power telescopic motor/position sensor (A) from steering column.

**NOTE:** Do not let dirt or other foreign materials get inside of the steering column.

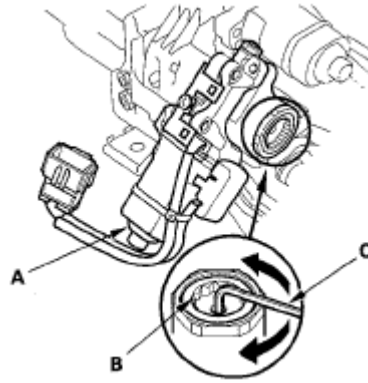


**Fig. 49: Identifying Power Telescopic Motor/Position Sensor And Screws**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Install the new power telescopic motor/position sensor (A) and align the matching surface and screw holes.

**NOTE:**

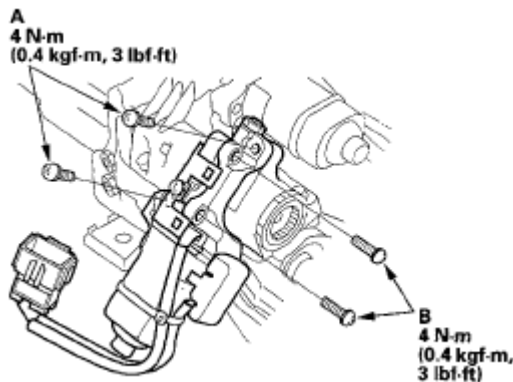
- Do not weight engagement part.
- If the telescopic motor gear is not properly engage with the telescopic gear, the screw holes can not be aligned with the steering column. In that case, move the telescopic gear (B) with the hex wrench (C) to engage the telescopic motor gear with the telescopic gear.



**Fig. 50: Identifying Power Telescopic Motor/Position Sensor, Telescopic Gear And Hex Wrench**  
**Courtesy of AMERICAN HONDA MOTOR CO., INC.**

5. Loosely install the four screws, then tighten the screws (A) first, and tighten the screws (B) to the specified torque.

**NOTE:** If the screws are tighten forcibly without aligning the screw holes with the steering column, it may cause noise or malfunction.



**Fig. 51: Identifying Power Telescopic Motor Screws With Torque Specifications**  
**Courtesy of AMERICAN HONDA MOTOR CO., INC.**

6. Install the connector bracket and power telescopic motor/position sensor connectors.
7. Install the steering column (see **INSTALLATION**).
8. Check the telescopic operation is smoothly.

## STEERING COLUMN POSITION MEMORIZATION

**NOTE:** If battery or the power tilt telescopic steering control unit is disconnected, the power tilt and telescopic steering wheel system needs to be reset when you reconnect the battery.

To reset the system when the auto tilt and telescopic feature is turned on ('05 model)

1. Push the ignition switch for at least 2 seconds and release it, or insert the built-in key into the ignition

switch, and remove it.

2. The steering wheel automatically moves fully in and up to let you know the system is reset.

If steering wheel does not move automatically, go to step 3.

3. Move the steering wheel to the highest position and hold that position by pushing and holding the adjustment button for at least 2 seconds.
4. Then, move the steering wheel to the most inward position, and hold that position by pushing and holding the adjustment button for at least 2 seconds.

**To reset the system when the auto tilt and telescopic feature is turned off ('05 model)**

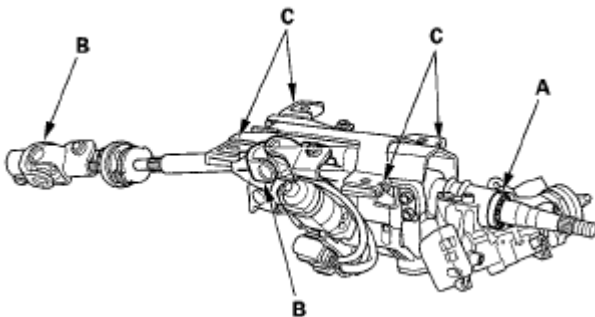
1. Move the steering wheel to the highest position and hold that position by pushing and holding the adjustment button for at least 2 seconds.
2. Then, move the steering wheel to the most inward position, and hold that position by pushing and holding the adjustment button for at least 2 seconds.

**To reset the system ('06-08 models)**

1. Push the ignition switch for at least 2 seconds and release it, or insert the built-in key into the ignition switch, and remove it.
2. The steering wheel automatically moves fully in and up to let you know the system is reset.

**STEERING COLUMN INSPECTION**

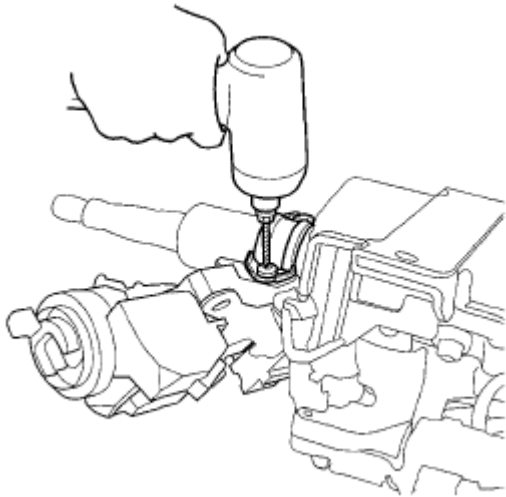
- Check the steering column ball bearing (A) and the steering joint bearings (B) for play and proper movement. If any bearing is noisy or has excessive play, replace the steering column as an assembly.
- Check the sliding capsules (C) for distortion or breakage. If there is distortion or breakage, replace the steering column as an assembly.
- Check the tilt mechanism and telescopic mechanism for movement and damage.



**Fig. 52: Identifying Steering Column Ball Bearing And Steering Joint Bearings**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

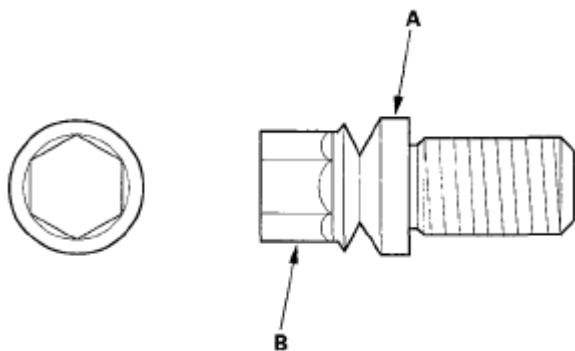
**STEERING LOCK REPLACEMENT**

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

**Fig. 53: Drilling Steering Column Bolts**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

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.

**Fig. 54: Identifying Shear Bolts And Hex Heads**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

8. Rewrite the new immobilizer control unit-receiver with the HDS, and make sure the immobilizer system works properly.

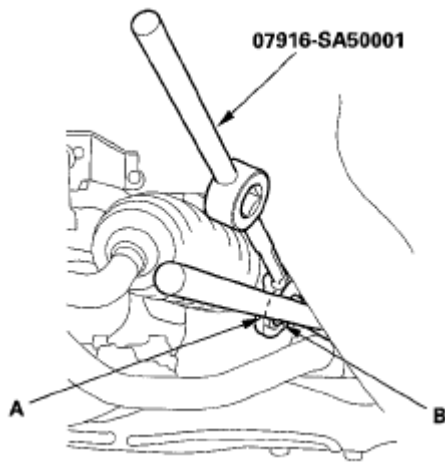
## **RACK GUIDE ADJUSTMENT**

### **Special Tools Required**

Locknut wrench, 40 mm 07916-SA50001

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

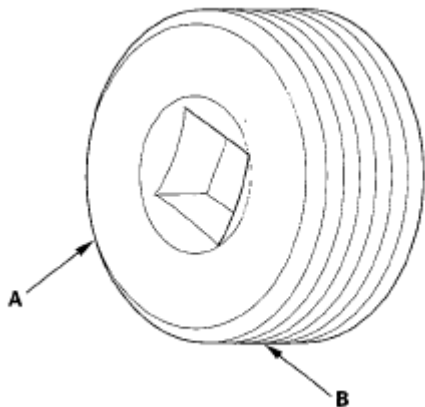
(B).



**Fig. 55: Identifying Rack Guide Screw Locknut And Rack Guide Screw**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

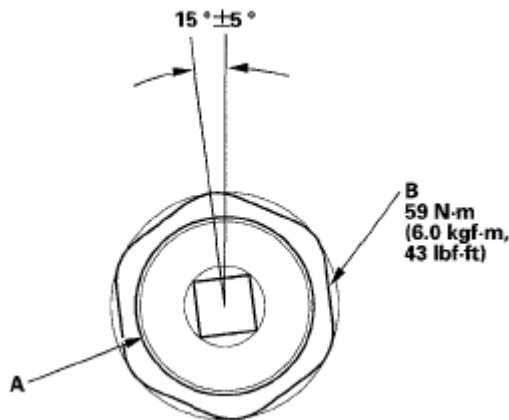
3. Remove the old sealant from the rack guide screw (A), and apply new sealant (Three Bond 1141 or Loctite 5699) to the middle of the threads (B). Loosely install the rack guide screw on the steering gearbox.

**NOTE:** If the within 5 minutes has passed after applying the sealant, remove the old sealant and residue, then reapply new sealant.



**Fig. 56: Identifying Rack Guide Screw And Threads**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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



**Fig. 57: Installing Rack Guide Screw With Torque Specifications**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

- Retighten the rack guide screw to 3.9 N.m (0.4 kgf.m, 4 lbf.ft), then back it off to the specified angle.

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

- Hold the rack guide screw stationary with a wrench, and tighten the locknut by hand until it's fully seated.
- Install the locknut wrench on the locknut (B), and hold the rack guide screw stationary with a wrench. Tighten the locknut an additional 30 "with the special tool.
- Check for unusual steering effort through the complete turning range.
- Check the steering wheel rotational play (see **STEERING WHEEL ROTATIONAL PLAY CHECK** ) and the power assist (see **POWER ASSIST CHECK** ).

## STEERING GEARBOX REMOVAL

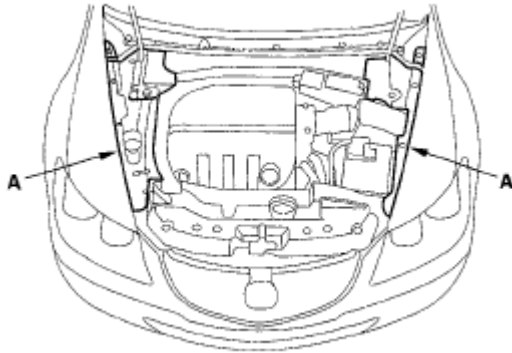
### Special Tools Required

Ball joint remover, 32 mm 07MAC-SL0A102

Note these items during removal:

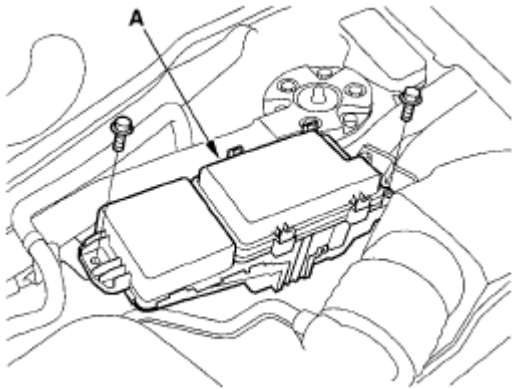
- Using solvent and a brush, wash any oil and dirt off the valve body unit, its lines, and the end of the gearbox. Blow dry with compressed air.
  - Make sure to remove the steering wheel before disconnecting the steering joint. Damage to the cable reel can occur.
- Remove the right upper fender trim (A) (see **UPPER FENDER TRIM REPLACEMENT** ).





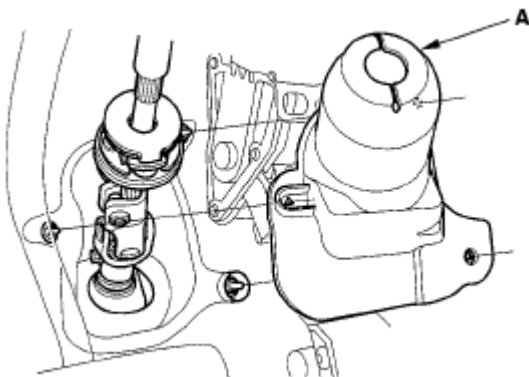
**Fig. 58: Identifying Left & Right Upper Fender Trim Pieces**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Drain the power steering fluid (see step 1 ).
3. Remove the relay box (A), then release the wire harness clips.



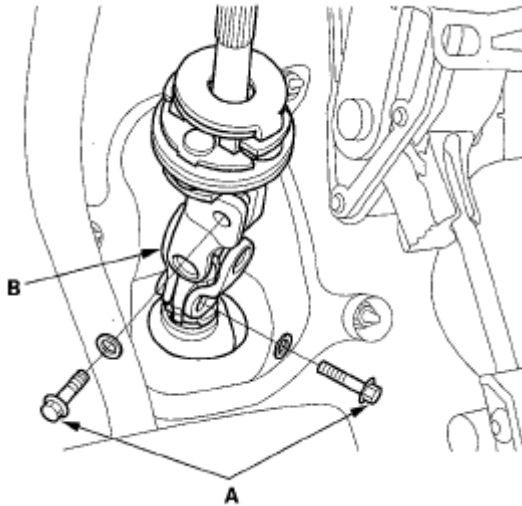
**Fig. 59: Identifying Relay Box And Fasteners**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Remove the front strut brace (see **FRAME BRACE REPLACEMENT** ).
5. Raise the front of the vehicle, and support it with safety stands in the proper locations (see **LIFT AND SUPPORT POINTS** ).
6. Remove the steering wheel (see **STEERING WHEEL REMOVAL** ).
7. Remove the steering joint cover A.

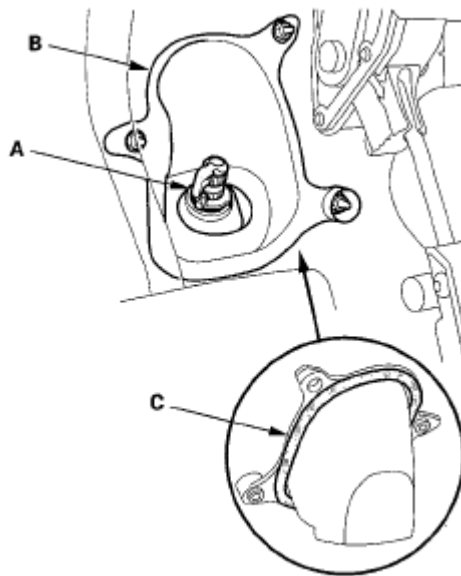


**Fig. 60: Identifying Steering Joint Cover****Courtesy of AMERICAN HONDA MOTOR CO., INC.**

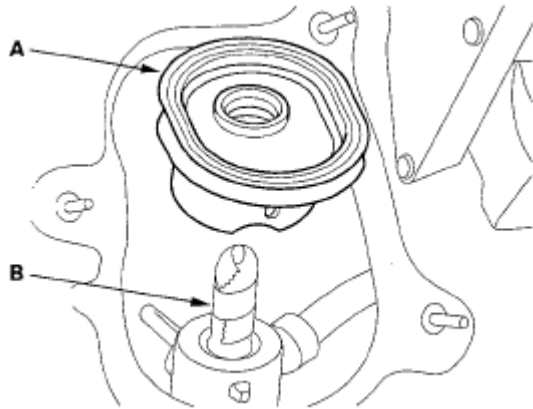
8. Remove the steering joint bolts (A), then disconnect the steering joint (B) from the pinion shaft and the steering column shaft.

**Fig. 61: Identifying Steering Joint Bolts And Steering Joint****Courtesy of AMERICAN HONDA MOTOR CO., INC.**

9. Remove the center guide (A).

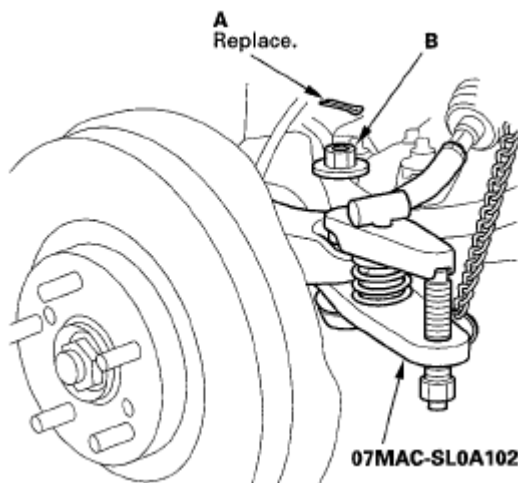
**Fig. 62: Identifying Center Guide And Steering Joint Cover****Courtesy of AMERICAN HONDA MOTOR CO., INC.**

10. Remove steering joint cover B. Be careful not to damage the mating surface on joint cover B and the pinion shaft grommet. Replace the cover seal (C) if necessary.
11. Remove the pinion shaft grommet (A) from the top of the valve body unit.



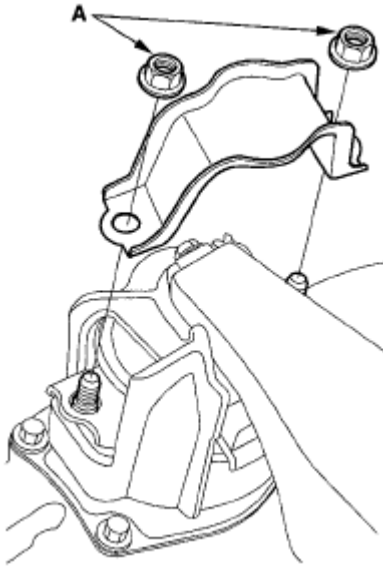
**Fig. 63: Identifying Pinion Shaft Grommet And Vinyl Tape**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

12. Apply vinyl tape (B) to the splines on the pinion shaft.
13. Remove and discard the cotter pin (A) from the tie-rod ball joint nut (B), and loosen the nut.



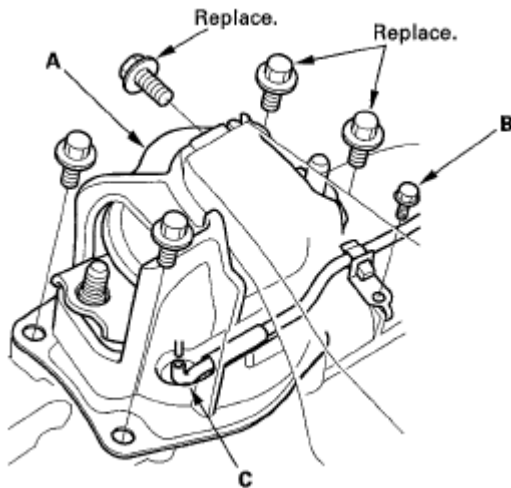
**Fig. 64: Identifying Cotter Pin And Tie-Rod Ball Joint Nut**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

14. Separate the tie-rod ball joint and knuckle using the ball joint remover (see **BALL JOINT REMOVAL** ).
15. Remove the nuts (A) from the rear engine mount.



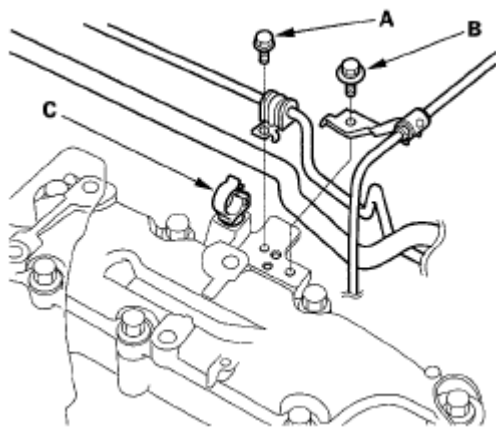
**Fig. 65: Identifying Rear Engine Mount Bracket And Fasteners**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

16. Remove the rear engine mount (A) and the engine mount pressure hose holder mounting bolt (B) on the gearbox stiffener.



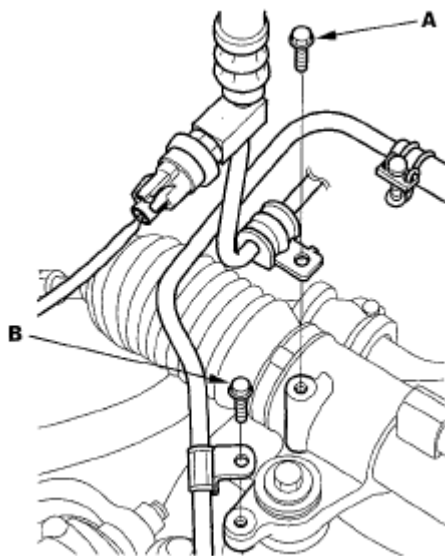
**Fig. 66: Identifying Rear Engine Mount And Fasteners**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

17. Disconnect the engine mount pressure hose (C) from the rear engine mount.
18. Remove the feed line holder mounting bolt (A) and A/T wire line holder mounting bolt (B) on the gearbox stiffener.



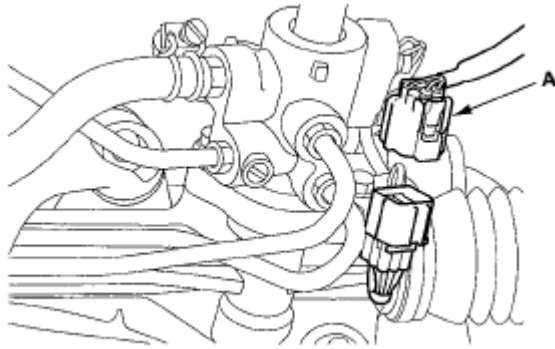
**Fig. 67: Identifying Feed Line Holder Mounting Bolt And A/T Wire Line Holder Mounting Bolt**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

19. Disconnect the return hose from the clamp (C).
20. Remove the feed line holder mounting bolt (A) and return line holder mounting bolt (B) on the gearbox.



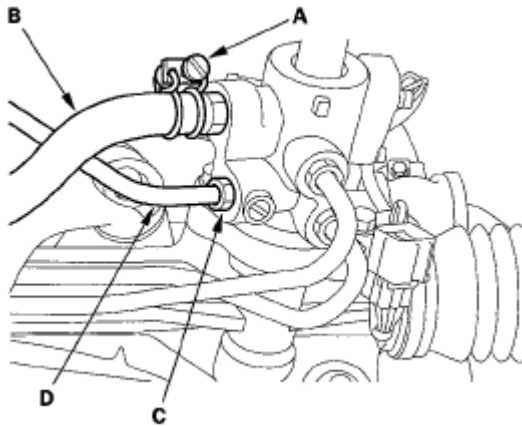
**Fig. 68: Identifying Feed Line Holder Mounting Bolt And Return Line Holder Mounting Bolt**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

21. Disconnect the stepping valve motor connector (A).



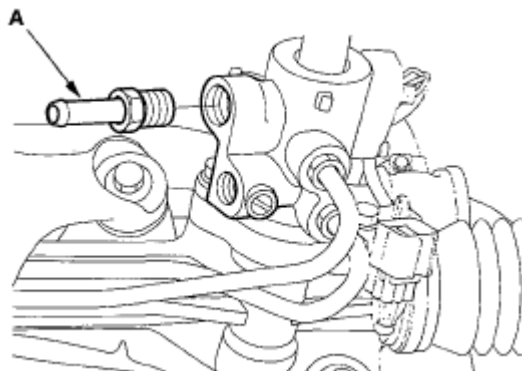
**Fig. 69: Identifying Stepping Valve Motor Connector**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

22. Place several shop towels under the line connections, and cover the gearbox mounting part to protect it from the power steering fluid. Loosen the adjustable hose clamp (A), and disconnect the return hose (B).



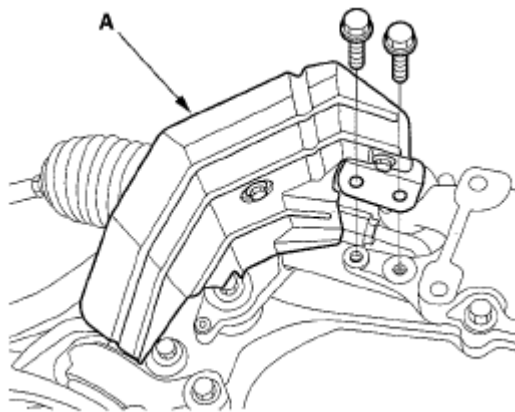
**Fig. 70: Identifying Adjustable Hose Clamp, Flare Nut And Return Hose**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

23. Loosen the 14 mm flare nut (C), and disconnect the feed line (D).
24. Remove the return line joint (A) from the steering gearbox.



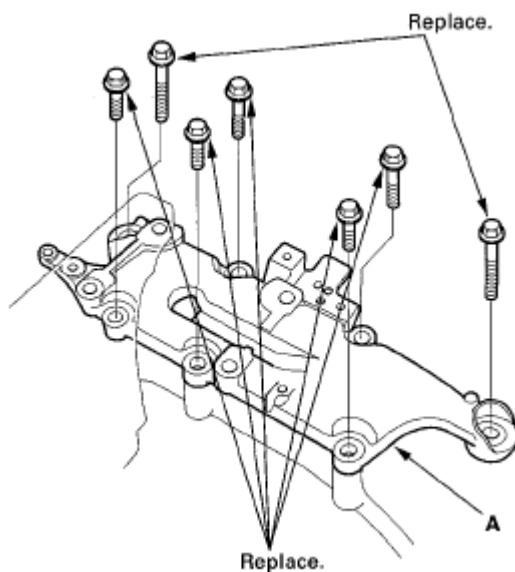
**Fig. 71: Identifying Return Line Joint**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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



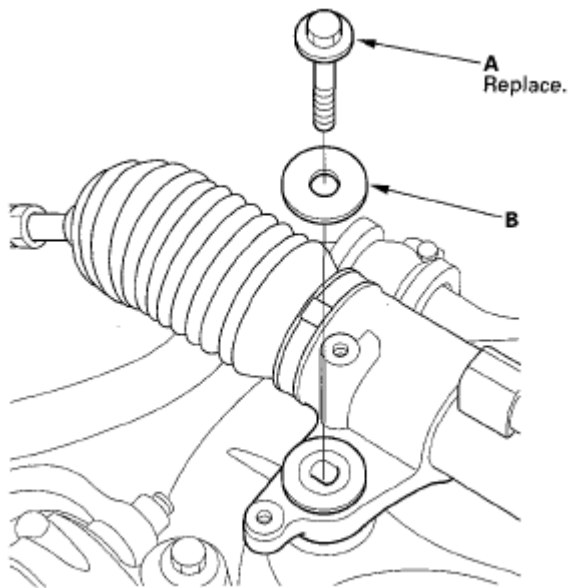
**Fig. 72: Identifying P/S Heat Shield**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

26. Remove the gearbox stiffener (A).



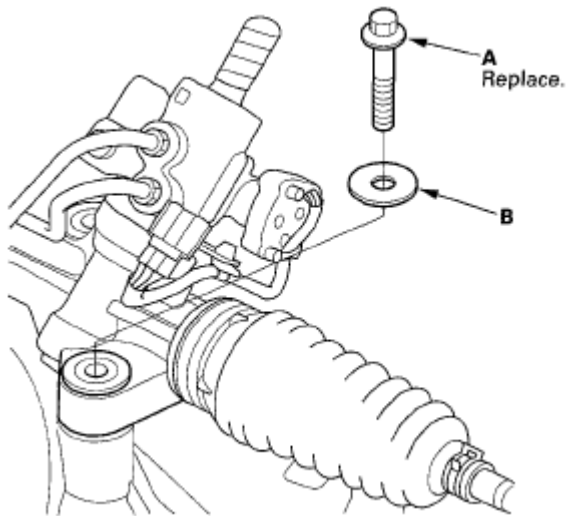
**Fig. 73: Identifying Gearbox Stiffener And Fasteners**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

27. Remove the dynamic damper between the gearbox stiffener and front suspension subframe.  
 28. Remove the steering gearbox mounting bolt (A) and washer (B) on the right gearbox mount.



**Fig. 74: Identifying Steering Gearbox Mounting Bolt And Washer**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

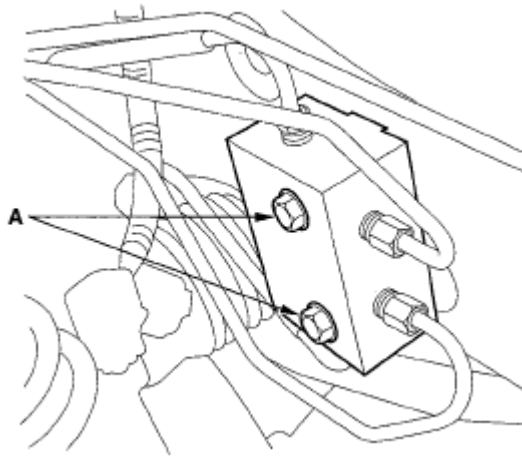
29. Remove the steering gearbox mounting bolt (A) and washer (B) on the left gearbox mount.



**Fig. 75: Identifying Steering Gearbox Mounting Bolt And Washer**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

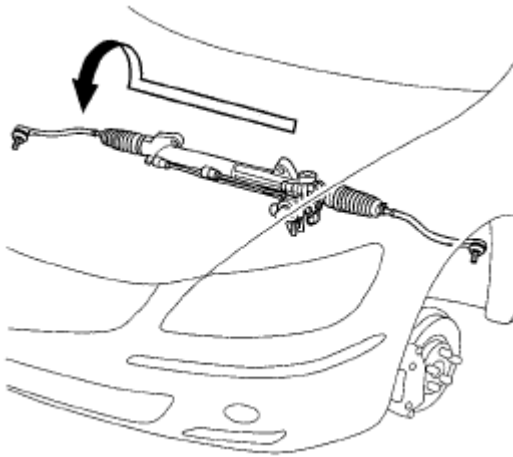
30. Remove the 4-way brake line joint bolts (A). Do not disconnect the lines.





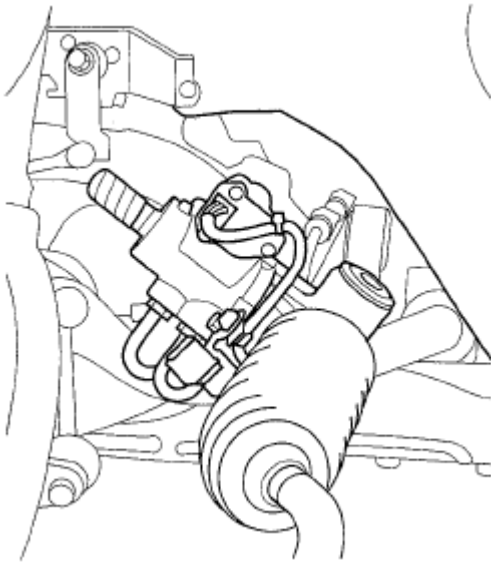
**Fig. 76: Identifying 4-Way Brake Line Joint Bolts**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

31. Move the steering gearbox to the passenger's side, and rotate it so the pinion shaft points toward the front of the vehicle.



**Fig. 77: Moving Steering Gearbox To Passenger's Side**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

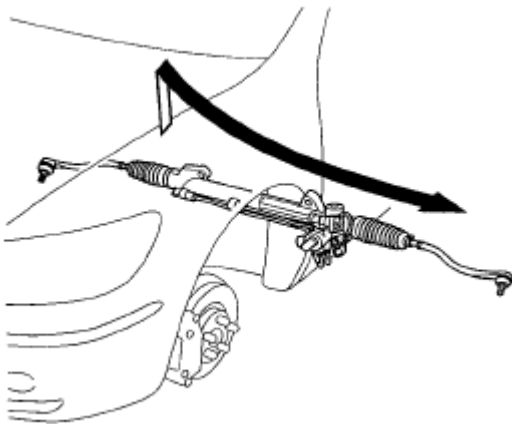
32. Carefully move the steering gearbox as an assembly toward the left side of the vehicle until the pinion shaft clears the wheelwell opening. Be careful not to damage the brake lines with the pinion shaft.



**Fig. 78: Identifying Steering Gearbox**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

33. Lift the passenger's side, and remove the steering gearbox through the wheelwell opening on the driver's side.



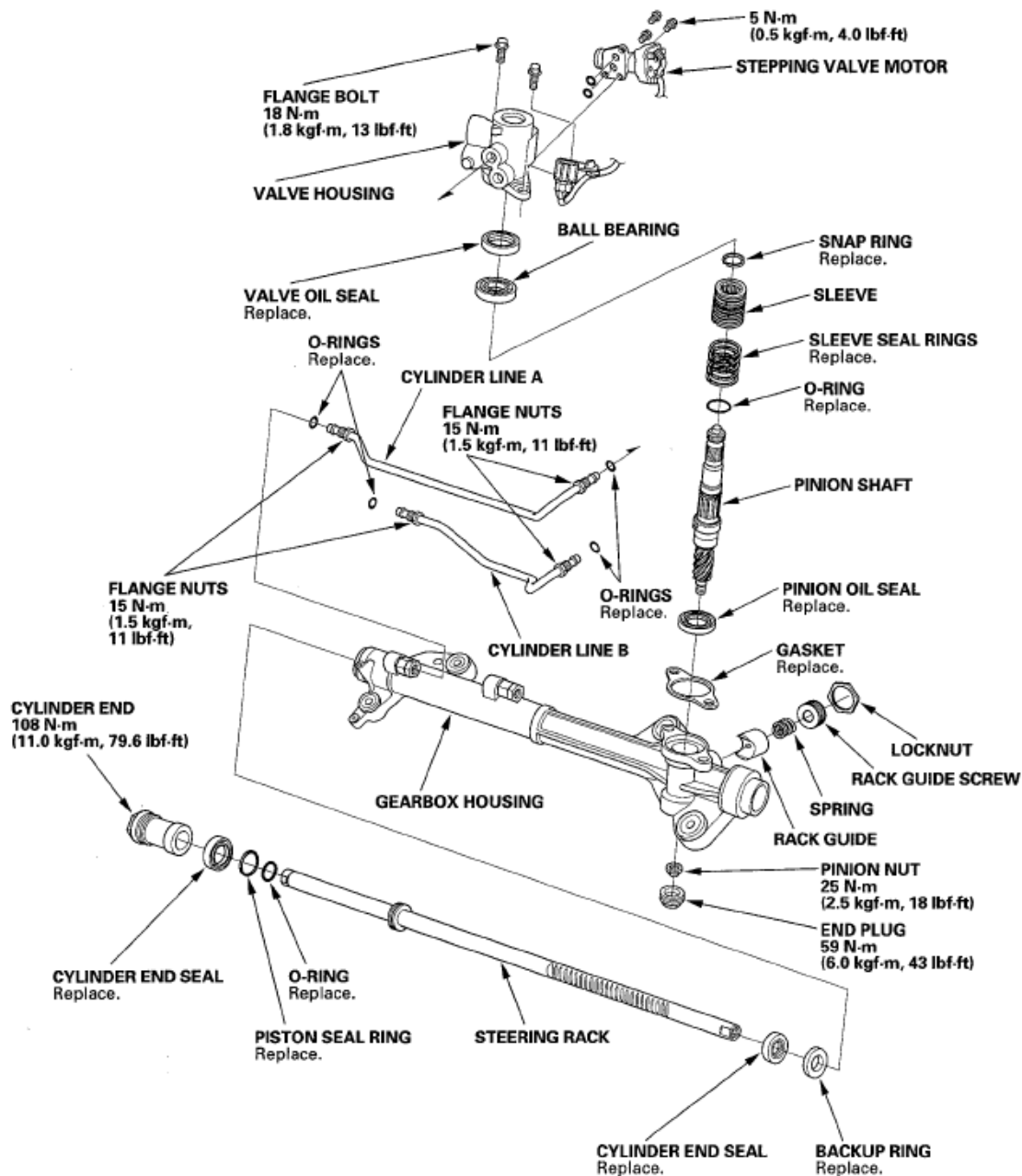
**Fig. 79: Removing Steering Gearbox Through Wheelwell Opening On Driver's Side**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

## STEERING GEARBOX OVERHAUL

### Exploded View



**Fig. 80: Exploded View Of Steering Gearbox With Torque Specifications**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

### Special Tools Required

- Cylinder end seal remover attachment 07NAD-SR3020A
- Valve seal ring sizing tool 07NAG-SR3090A
- Ball joint boot clip guide 07974-SA50800
- Sleeve seal ring sizing tool 07974-SA5020A or 07974-SA50200
- Attachment, 32 x 35 mm 07746-0010100
- Attachment, 24 x 26 mm 07746-0010700
- Driver 07749-0010000

- Piston seal ring guide 07HAG-SF10100
- Piston seal ring sizing tool 07HAG-SF1020A or 07HAG-SF10200
- Cylinder end seal slider 07ZAG-S5A0300
- Pincers Oetiker 1098 or equivalent, commercially available

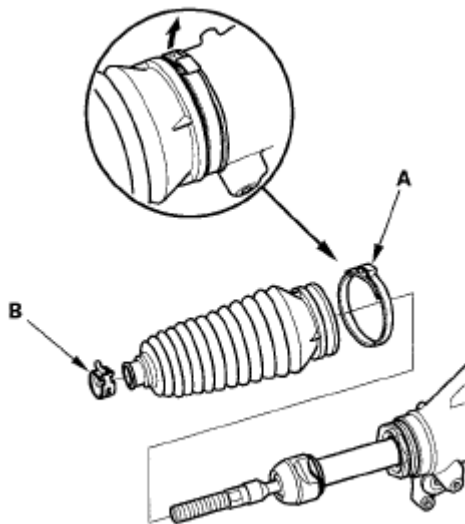
**NOTE:** Refer to the **EXPLODED VIEW** as needed during this procedure.

## Removal

1. Remove the steering gearbox (see **STEERING GEARBOX REMOVAL**).

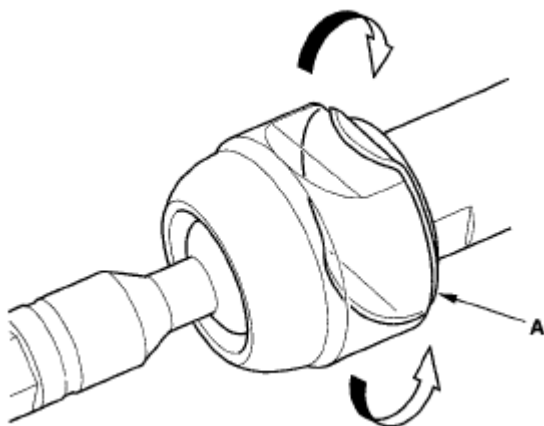
## Disassembly

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



**Fig. 81: Identifying Boot Bands And Tie-Rod Clips**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

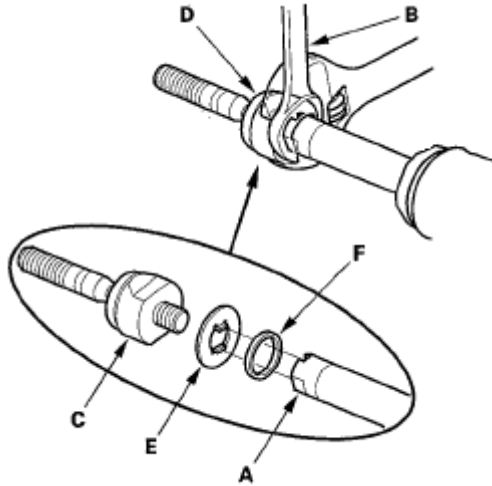
3. Unbend the lock washers (A).



**Fig. 82: Identifying Lock Washers**

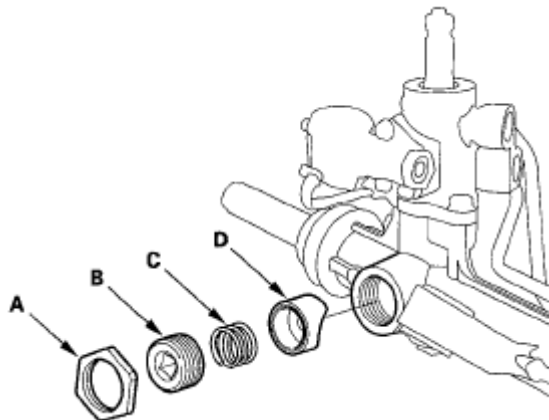
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

**Fig. 83: Identifying Flat Surface Sections, Wrench, Rack Ends And Wrench**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

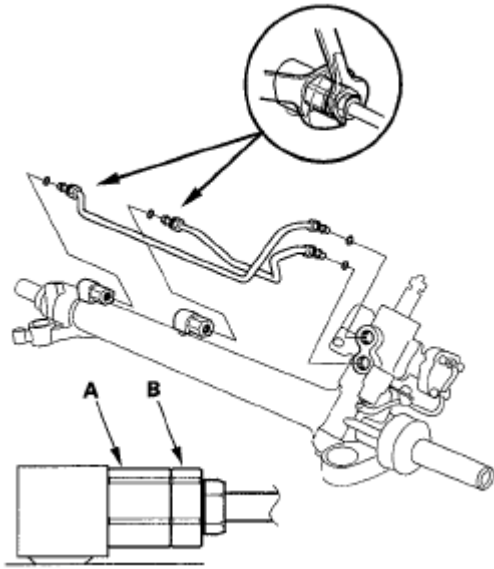
5. Remove the lock washer (E) and rubber stop (F).
6. Loosen the locknut (A), then remove the rack guide screw (B).

**Fig. 84: Identifying Locknut, Spring, Rack Guide And Rack Guide Screw**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

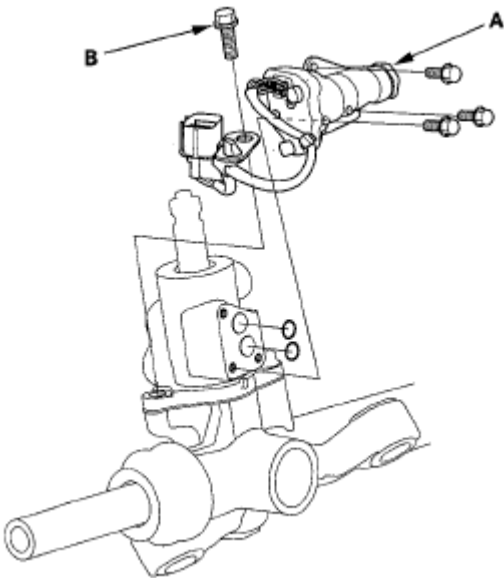
7. Remove the spring (C) and the rack guide (D) from the gearbox housing.
8. Remove the cylinder lines from the gearbox.

**NOTE:** Use a second wrench when loosening the cylinder lines to avoid damage to the fittings on the steering gearbox. Do not loosen the A and B connectors.



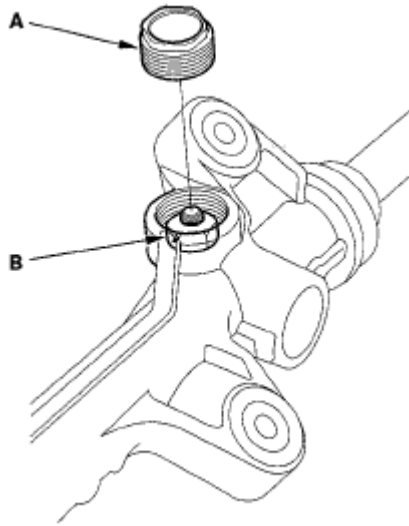
**Fig. 85: Identifying Gearbox Cylinder Lines**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

9. Drain the fluid from the cylinder fittings by slowly moving the steering rack back and forth.
10. Remove the stepping valve motor (A), then remove the connector holder mounting bolt (B) on the valve housing.



**Fig. 86: Identifying Stepping Valve Motor And Connector Holder Mounting Bolt**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

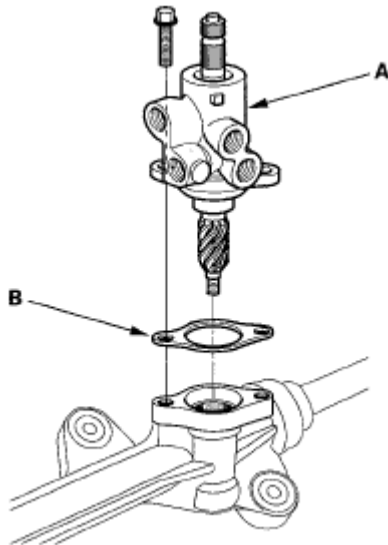
11. Remove the end plug (A) from the gearbox housing, then remove the nut (B) from the pinion shaft end.



**Fig. 87: Identifying End Plug And Nut**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

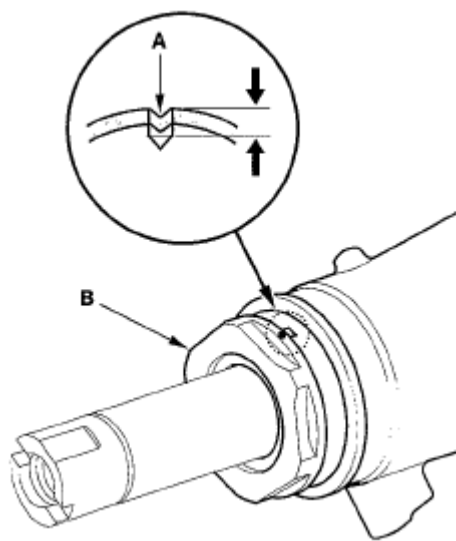
12. Remove the flange bolt, the valve body unit (A), and gasket (B) from the gearbox. Check that the valve turns smoothly by turning the pinion shaft. If any play or roughness is felt, replace the valve body unit with a new part if necessary. Do not try to disassemble the valve body unit.



**Fig. 88: Identifying Valve Body Unit And Gasket**

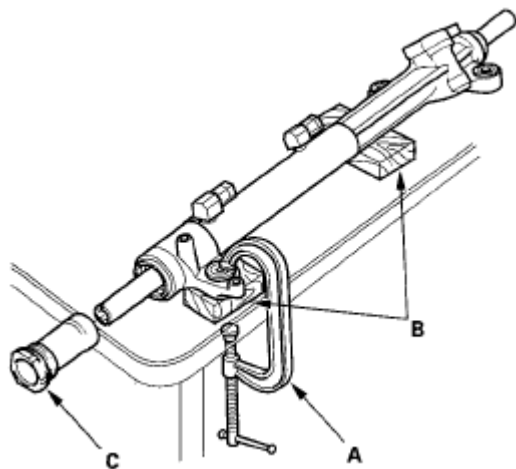
Courtesy of AMERICAN HONDA MOTOR CO., INC.

13. Slide the steering rack all the way to the left.
14. 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 housing. After removing the cylinder end (B), remove any burrs at the staked point.



**Fig. 89: Identifying Staked Point And Cylinder End**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

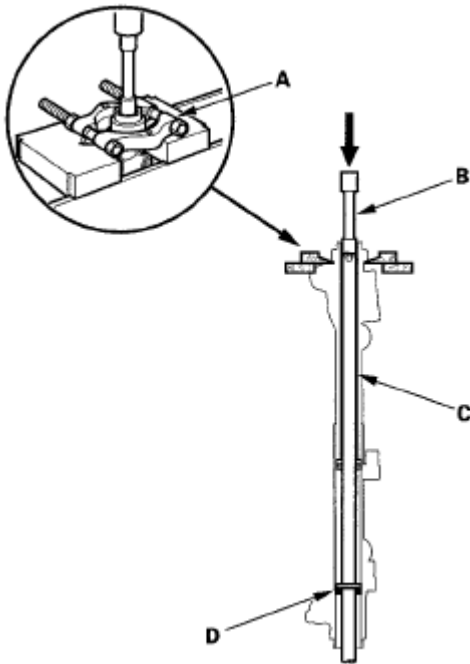
15. Hold the gearbox housing using a C-clamp (commercially available) (A) and the wooden blocks (B) as shown. Do not clamp the cylinder part of the gearbox housing in the vise. Then remove the cylinder end (C).



**Fig. 90: Securing Gearbox Housing To Work Area**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

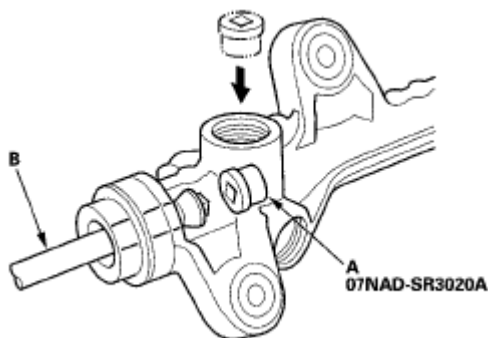
16. Install a commercially available bearing separator (A) in the gearbox housing as shown.





**Fig. 91: Identifying Bearing Separator, Extension And Steering Rack**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

17. Place an appropriate size extension (B) on the steering rack (C).
18. 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 housing with the tool.
19. Install the cylinder end seal remover attachment (A) so it will fit through the rack guide hole of the gearbox housing. Insert a 24" long, 3/8" drive extension (B), and install it on the Cylinder end seal remover attachment. Make sure the cylinder end seal remover attachment is securely positioned on the backup ring edges. Be careful not to damage the inner surface of the cylinder with the Cylinder end seal remover attachment.

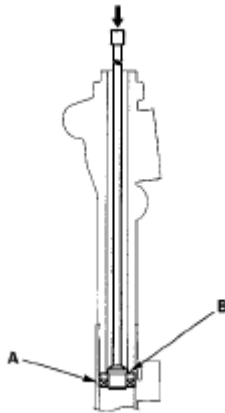


**Fig. 92: Identifying Seal Remover Attachment And Drive Extension**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

20. Place the steering gearbox in a press, then remove the cylinder end seal (A) and backup ring (B) from the gearbox by pressing on the 24" long, 3/8" drive extension.

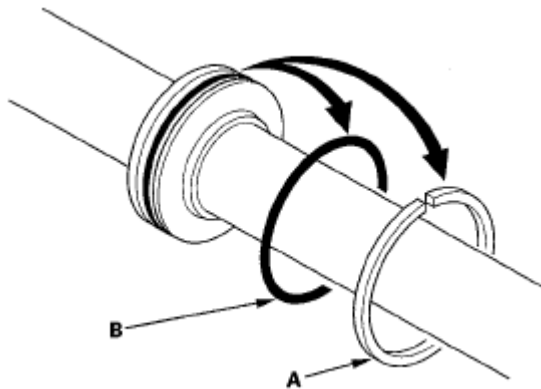
Note these items when pressing the cylinder end seal:

- 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 could break the backup ring, and the cylinder end seal would remain in the gearbox.



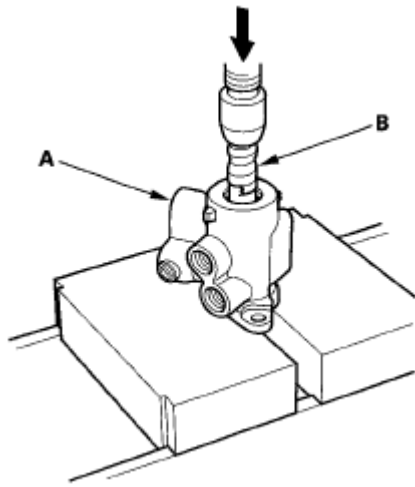
**Fig. 93: Identifying Cylinder End Seal And Backup Ring**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

21. 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.



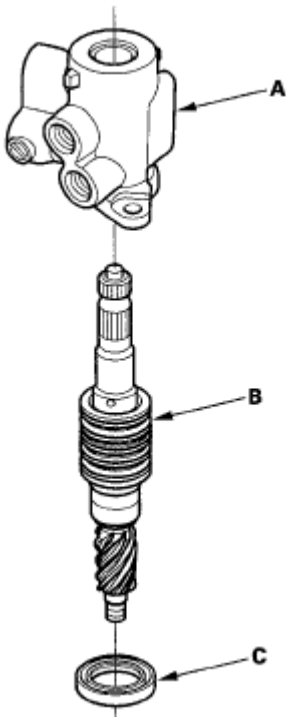
**Fig. 94: Identifying Piston Seal Ring And O-Ring**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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



**Fig. 95: Identifying Valve Housing And Vinyl Tape**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

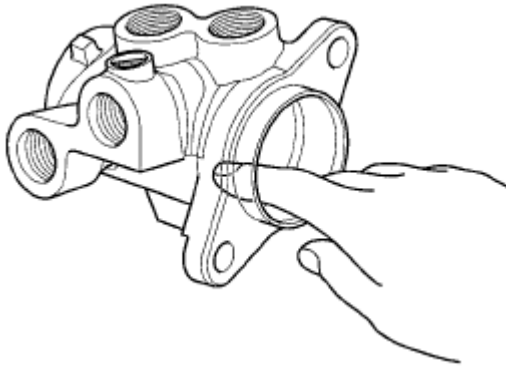
23. Separate the valve housing (A) from the pinion shaft/valve (B) using a press, then remove the pinion oil seal (C).



**Fig. 96: Identifying Valve Housing, Pinion Shaft/Valve And Pinion Oil Seal**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

24. 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.

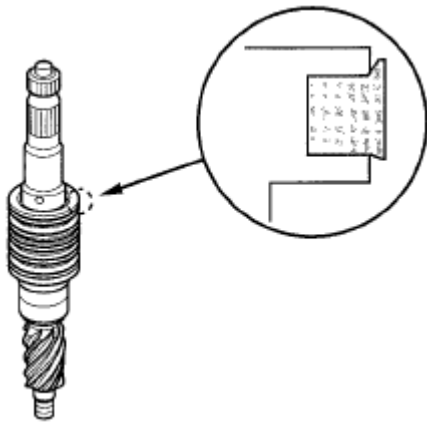
**NOTE:** There may be sliding marks from the seal ring on the wall of the valve housing. Replace the valve housing only if the wall is stepped.



**Fig. 97: Checking Inner Wall Of Valve Housing**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

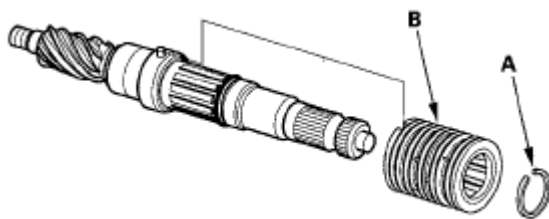
25. Check for wear, burrs, and other damage to the edges of the grooves in the sleeve.

**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.



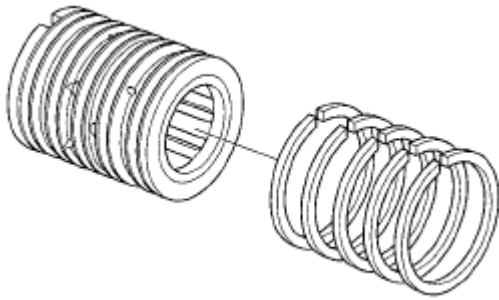
**Fig. 98: Identifying Edges Of The Grooves In The Sleeve**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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



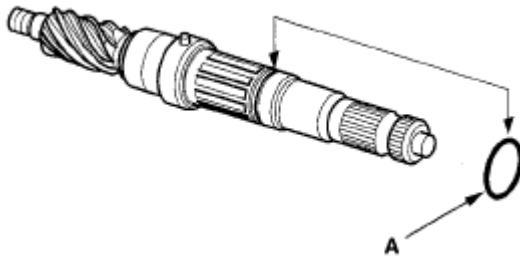
**Fig. 99: Identifying Snap Ring, Sleeve And Pinion Shaft**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

27. 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.

**Fig. 100: Identifying Seal Rings**

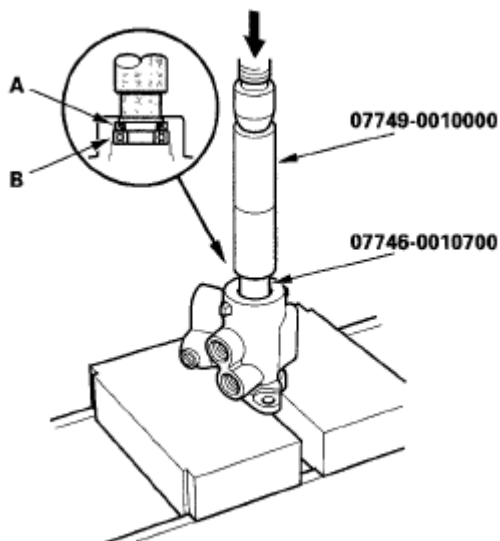
Courtesy of AMERICAN HONDA MOTOR CO., INC.

28. Remove the O-ring (A). Be careful not to damage the edges of the pinion shaft groove and outer surface when removing the O-ring.

**Fig. 101: Identifying O-Ring And Pinion Shaft**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

29. Press the valve oil seal (A) and ball bearing (B) out of the valve housing using a hydraulic press, driver and attachment, 24 x 26 mm.

**Fig. 102: Identifying Valve Oil Seal And Ball Bearing**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

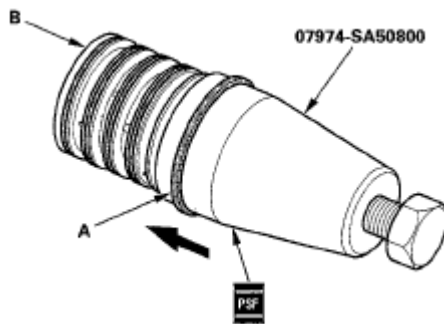
30. Clean the disassembled parts with solvent, and dry them with compressed air. Do not dip rubber parts in the solvent.

## Reassembly

31. Apply power steering fluid to the surface of the ball joint boot clip guide. Slip two new seal rings (A) over the ball joint boot clip 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).

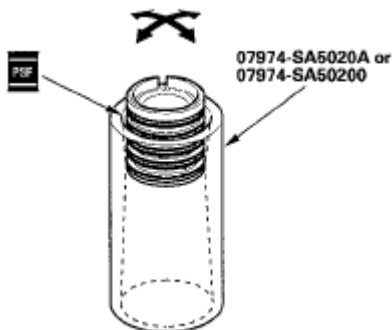
Note these items when installing the seal ring:

- 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 sleeve seal ring 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.



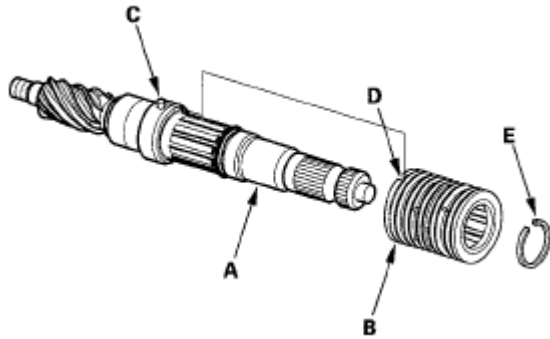
**Fig. 103: Identifying Seal Rings And Pinion Shaft Sleeve**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

32. Align the ball joint boot clip 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.
33. 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 sleeve seal ring sizing tool.



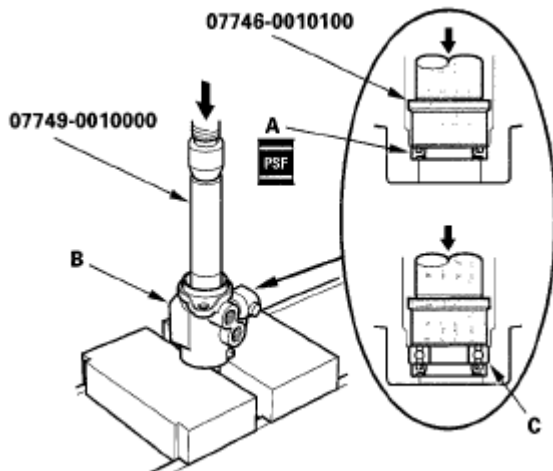
**Fig. 104: Identifying Seal Rings And Sleeve Seal Ring Sizing Tool**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

34. Move the sleeve back and forth several times to make the seal rings snugly fit in the sleeve. Make sure the seal rings are not twisted.
35. 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.



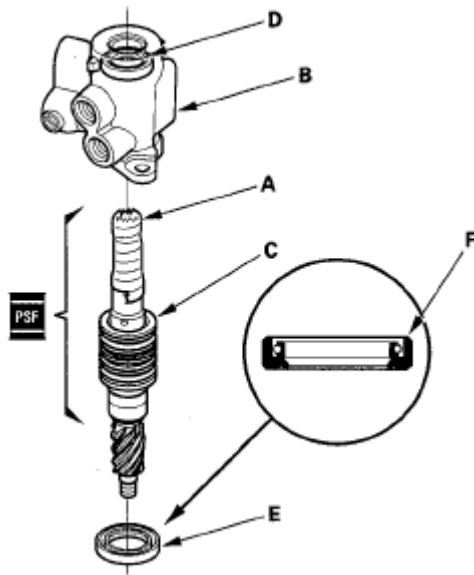
**Fig. 105: Identifying Pinion Shaft, Sleeve, Pin And Cutout**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

36. 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, driver and attachment, 32 x 35 mm. Install the seal with its grooved side facing the tool.



**Fig. 106: Identifying Valve Oil Seal And Valve Housing**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

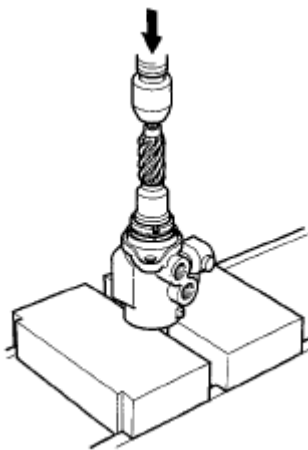
37. Press the ball bearing (C) into the valve housing with a hydraulic press and special tools.
38. Apply vinyl tape (A) to the pinion shaft, then coat the vinyl tape with power steering fluid.



**Fig. 107: Identifying Vinyl Tape, Valve Housing, Valve Seal Rings And Valve Oil Seal Sealing Lip**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

39. Insert the pinion shaft into the valve housing (B). Be careful not to damage the valve seal rings (C) and valve oil seal sealing lip (D).
40. Install the pinion oil seal (E) onto the pinion shaft with its grooved side (F).
41. Remove the vinyl tape from the pinion shaft, then remove any residue from the tape adhesive.
42. 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.



**Fig. 108: Pressing Pinion Shaft/Sleeve Into Valve Housing**

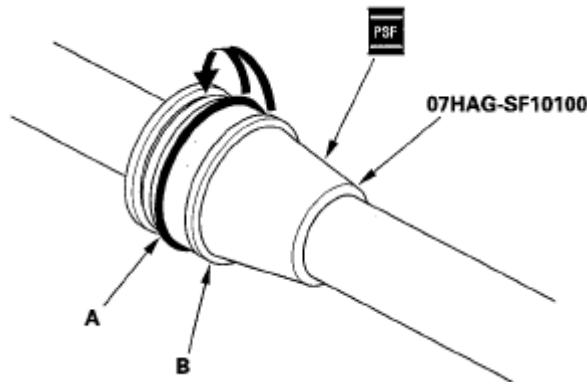
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

Note these items during reassembly:

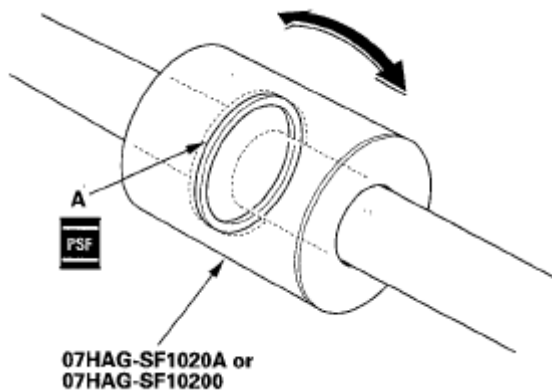


- Do not over expand the resin seal rings. Install the resin seal rings with care so as not to damage them. After installation, make sure you contract the seal ring using the piston seal ring sizing tool.
- Replace the piston's O-ring and seal ring as a set.



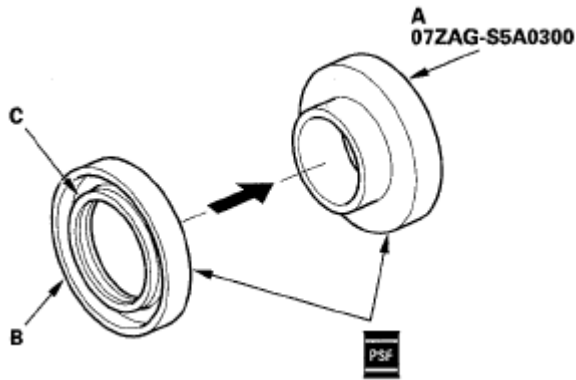
**Fig. 109: Identifying O-Ring**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

45. 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.
46. 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.



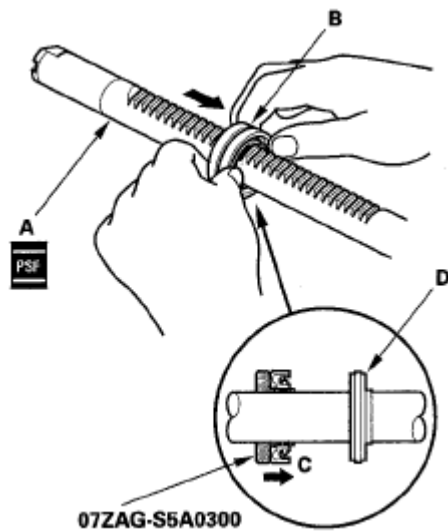
**Fig. 110: Identifying Piston Seal Ring**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

47. Move the piston seal ring sizing tool back and forth several times to make sure the piston seal ring fits snugly in the piston.
48. 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 cylinder end seal slider with its grooved side (C) facing opposite the cylinder end seal slider.



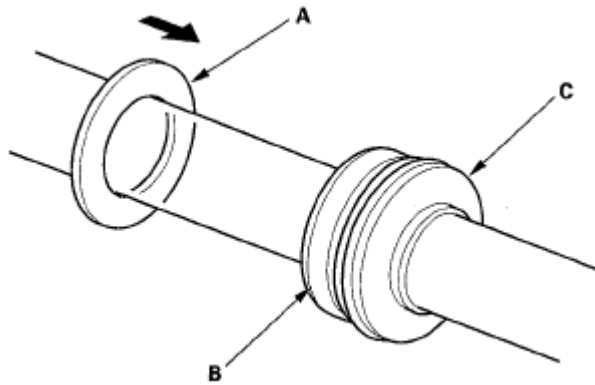
**Fig. 111: Identifying Cylinder End Seal Slider And Cylinder End Seal**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

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



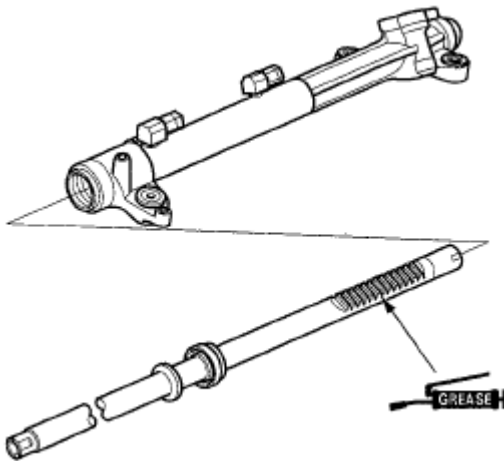
**Fig. 112: Identifying Steering Rack, End Seal And Grooved Side**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

50. Install the cylinder end seal (B) onto the steering rack with its grooved side (C) toward the piston (D).
51. Separate the cylinder end seal from the special tool, then remove the special tool.
52. Install the new backup ring (A) on the steering rack, then place the backup ring and cylinder end seal (B) against the piston (C).



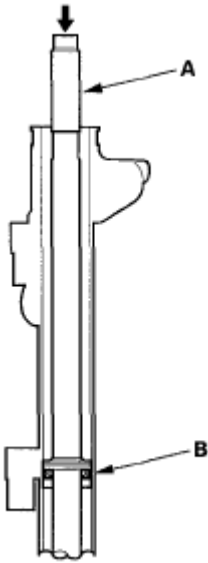
**Fig. 113: Identifying Backup Ring, Cylinder End Seal And Piston**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

53. Apply multipurpose 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.



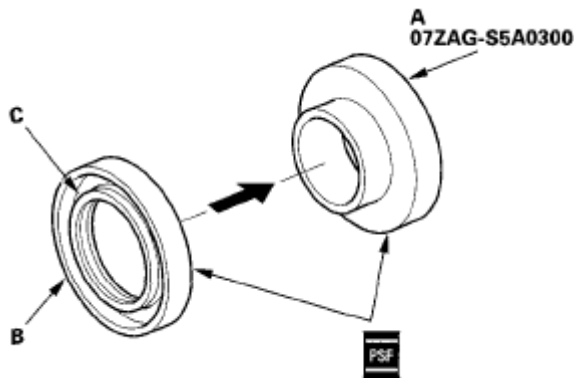
**Fig. 114: Identifying Steering Rack And Gearbox Housing**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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



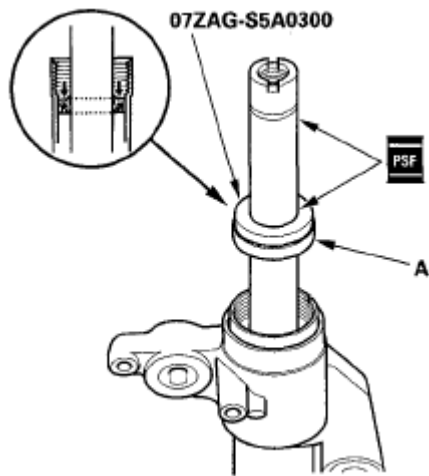
**Fig. 115: Identifying Deep Socket Wrench And Cylinder End Seal**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

55. 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.
56. Remove the tool, and center the steering rack.
57. 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 cylinder end seal slider with its grooved side (C) facing opposite the cylinder end seal slider.



**Fig. 116: Identifying Cylinder End Seal Slider, Cylinder End Seal And Grooved Side**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

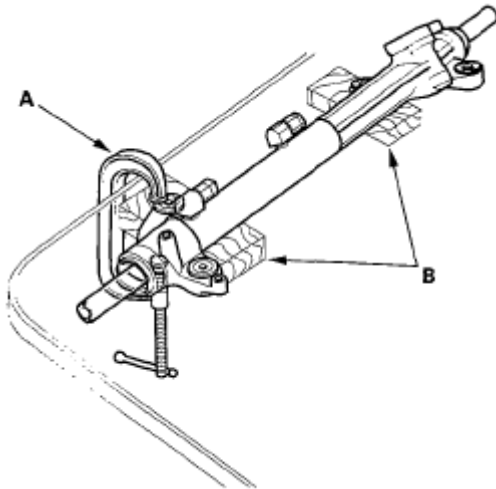
58. Coat the inside surface of the cylinder end seal slider and steering rack with power steering fluid, then install the cylinder end seal (A) onto the steering rack with its grooved side toward the cylinder.



**Fig. 117: Identifying Cylinder End Seal**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

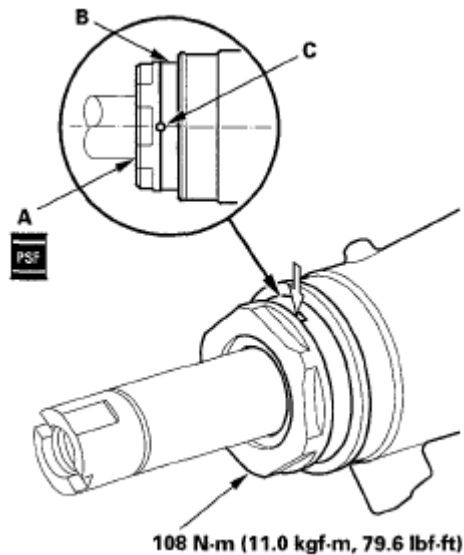
59. Separate the cylinder end seal from the cylinder end seal slider, then remove the cylinder end seal slider.
60. Push in the cylinder end seal with your finger. Be careful not to damage the face of the seal with the threads and burrs at the staked position of the cylinder housing.
61. Hold the gearbox 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.



**Fig. 118: Securing Gearbox Housing To Work Area**

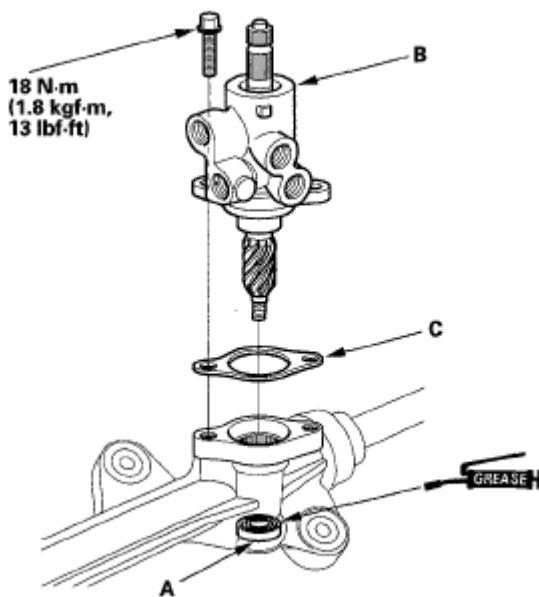
Courtesy of AMERICAN HONDA MOTOR CO., INC.

62. 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.



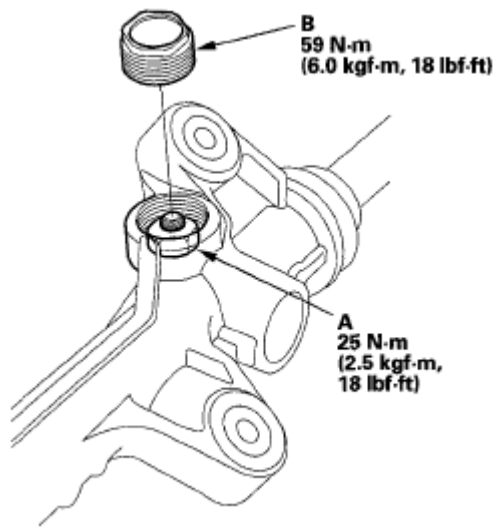
**Fig. 119: Identifying Cylinder End And Cylinder With Torque Specifications**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

63. Stake (C) the point of the cylinder shown (opposite from where the stake was removed during disassembly).
64. Apply multipurpose grease to the bearing (A) in the gearbox housing, and install the valve body unit (B) and new gasket (C) by engaging the gears. Note the valve body unit installation position (direction of line connections). Then loosely install the two flange bolts.



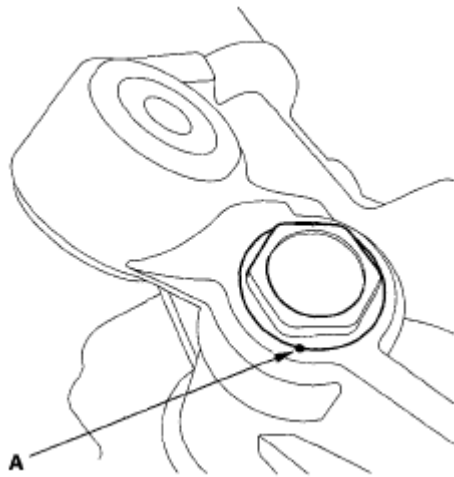
**Fig. 120: Identifying Bearing, Valve Body Unit And New Gasket With Torque Specifications**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

65. Install the new self-locking nut (A) onto the pinion shaft end, and tighten to the specified torque.



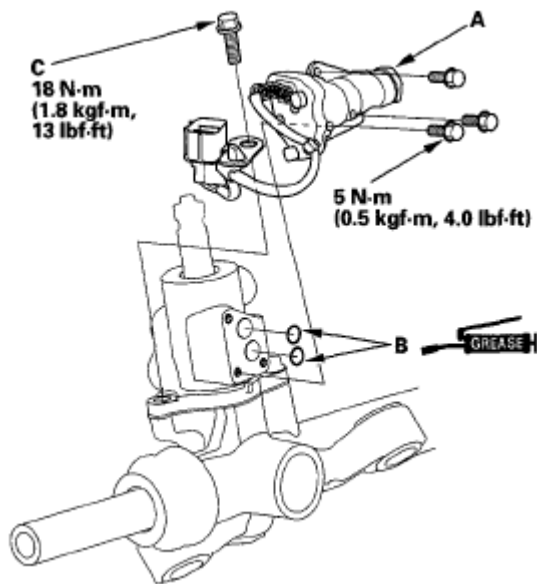
**Fig. 121: Identifying Self-Locking Nut And End Plug With Torque Specifications**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

66. Tighten the flange bolts to the specified torque.
67. Apply new sealant (Loctite 565) all the way around the threads on the end plug (B), install the end plug onto the gearbox housing, and tighten it to the specified torque.
68. After tightening, use a drift to stake (A) the end plug shoulder against the gearbox housing.



**Fig. 122: Staking End Plug**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

69. Install the stepping valve motor (A), with coat the new O-ring (B) with multipurpose grease.



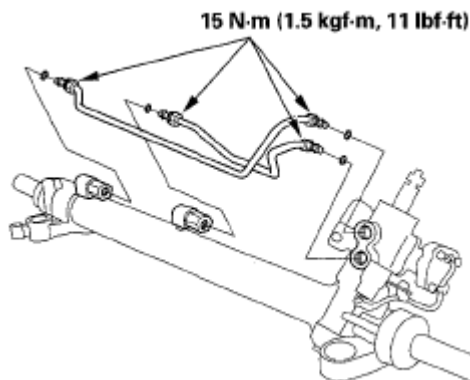
**Fig. 123: Identifying Stepping Valve Motor And O-Ring With Torque Specifications**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

70. Tighten the flange bolts (C) to the specified torque.
71. Before installing the cylinder lines, coat the new O-rings with power steering fluid, then install the lines.

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.

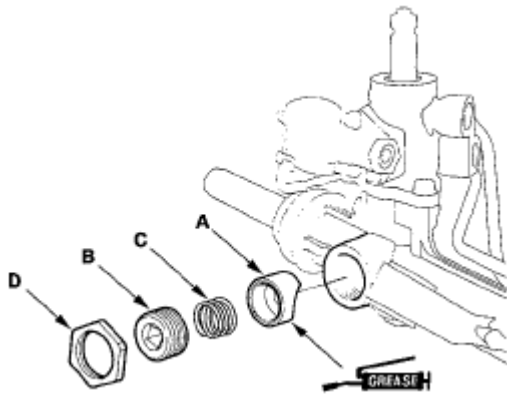
**NOTE:** Use a second wrench when tightening the cylinder lines to avoid damaging to the fittings on the steering gearbox.



**Fig. 124: Identifying Gearbox Cylinder Lines With Torque Specifications**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

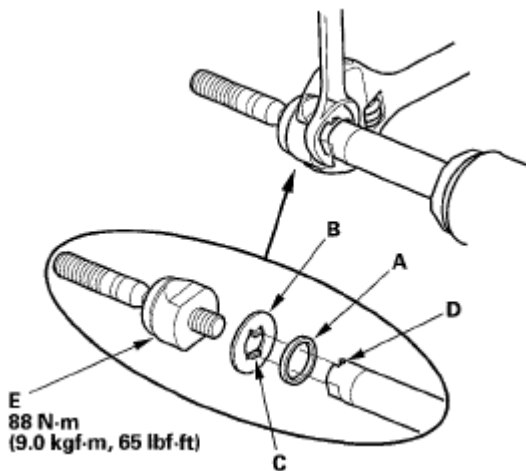
72. Apply multipurpose grease to the sliding surface of the rack guide (A), and install it onto the gearbox housing.





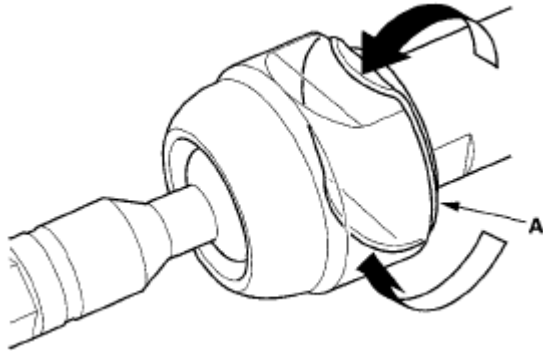
**Fig. 125: Applying Multipurpose Grease To Sliding Surface Of Rack Guide**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

73. Apply new sealant (Three Bond 1141) all the way around the first three threads of the rack guide screw (B), then install the spring (C), rack guide screw, and locknut (D).
74. Adjust the rack guide screw (see **RACK GUIDE ADJUSTMENT** ). After adjusting, check that the rack moves smoothly by sliding it right and left.
75. Install the new rubber stop (A) and lock washer (B). Align the lock washer tabs (C) with the slots (D). Install the rack end (E) while holding the lock washer in place. Repeat this step for the other side of the rack.



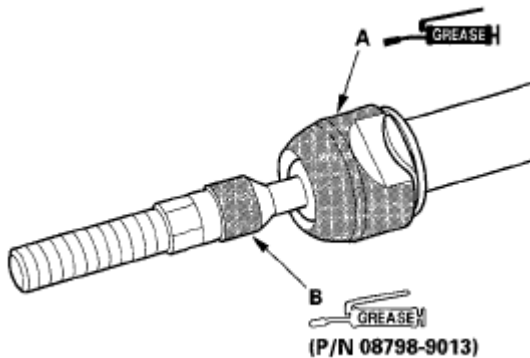
**Fig. 126: Identifying Rubber Stop, Lock Washer, Lock Washer Tabs And Slots With Torque Specifications**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

76. Hold the flat surface sections of the steering rack with a wrench, and tighten both rack ends. Be careful not to damage the rack surface with the wrench.
77. Bend the lock washer (A) back against the flat spots on the rack end joint housing.



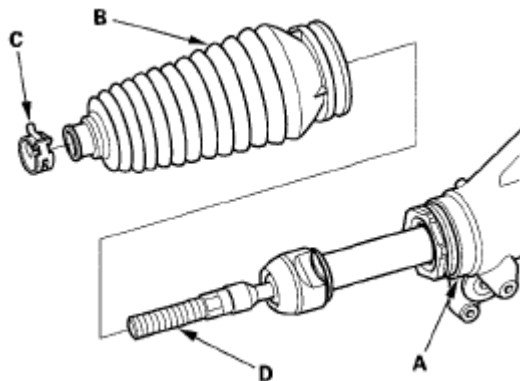
**Fig. 127: Identifying Lock Washer**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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



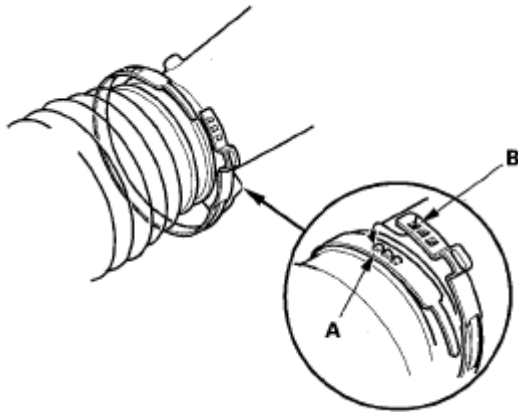
**Fig. 128: Applying Multipurpose Grease To Rack End Joint Housing And Boot Grooves**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

79. Apply a light coat of silicone grease to the boot grooves (B) on the rack ends.  
80. Center the steering rack within its stroke.  
81. Clean off any grease or contamination from the boot installation grooves (A) and around 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.



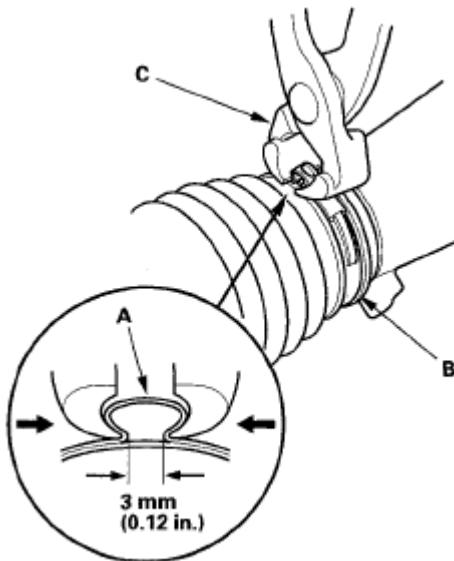
**Fig. 129: Identifying Boot And Tie-Rod Clip**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

82. After installing the boots, wipe any grease off the threaded section (D) of the rack end.
83. Install the new boot bands by aligning the tabs (A) with the holes (B) of the band.



**Fig. 130: Identifying Boot And Boot Band**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

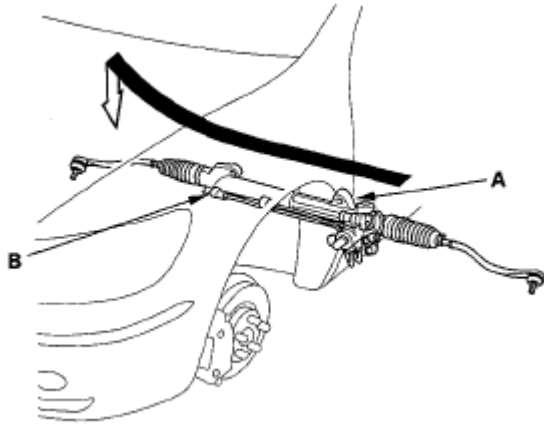


**Fig. 131: Closing Ear Portion Of Boot Band**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

85. Slide the rack right and left to be certain that the boots are not deformed or twisted.

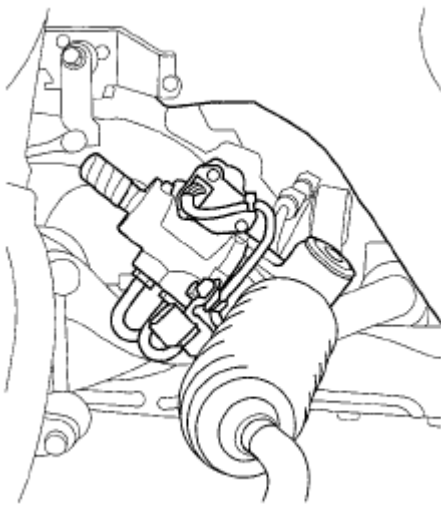
## STEERING GEARBOX INSTALLATION

1. Before installing the steering gearbox, make sure that no power steering fluid is on the mating surface of the gearbox and front suspension subframe. To prevent the gearbox mounting bolts from loosening after the installation, remove any power steering fluid from the mount cushions and bolt holes.
2. Apply a mild soap and water solution to both sides of the mount cushion mating surfaces (A).



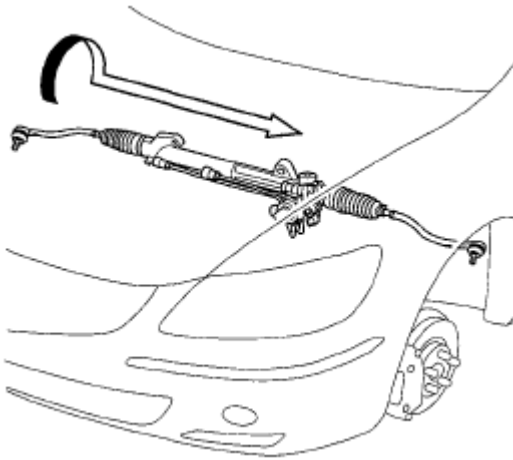
**Fig. 132: Guiding Steering Gearbox Through Wheelwell Opening On Driver's Side**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Lift and pass the passenger's side of the steering gearbox (B) through the wheelwell opening on the driver's side.
4. Carefully move the steering gearbox toward the passenger's side until the pinion shaft clears the wheelwell opening on the body.



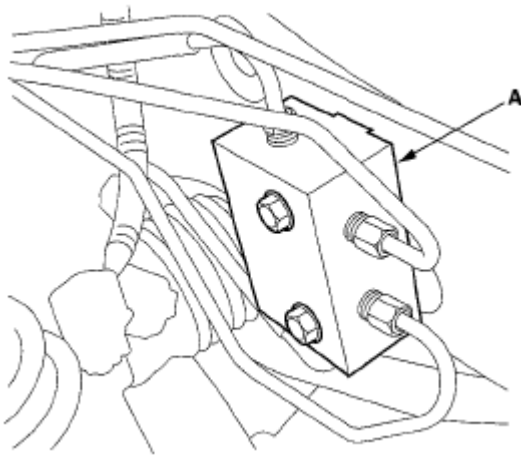
**Fig. 133: Identifying Steering Gearbox**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Rotate the steering gearbox so the pinion shaft points upward, then move the steering gearbox to the driver's side.



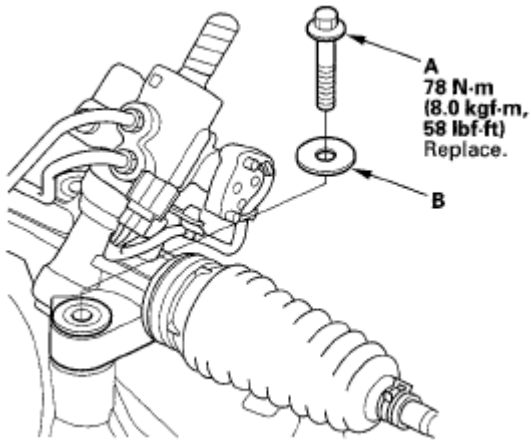
**Fig. 134: Rotating Steering Gearbox So Pinion Shaft Points Upward**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Install the 4-way brake line joint (A).



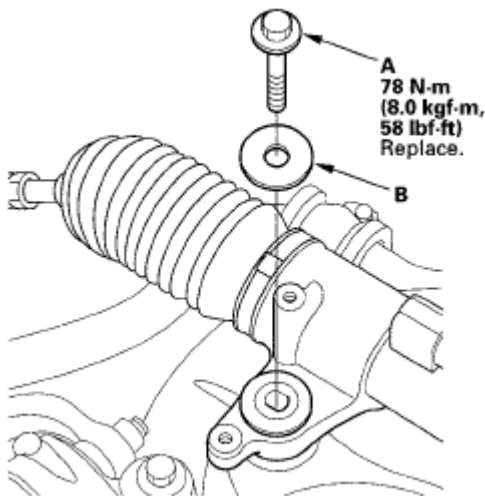
**Fig. 135: Identifying 4-Way Brake Line Joint**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Install the new steering gearbox mounting bolt (A) and washer (B) on the left gearbox mount, then tighten them to the specified torque.



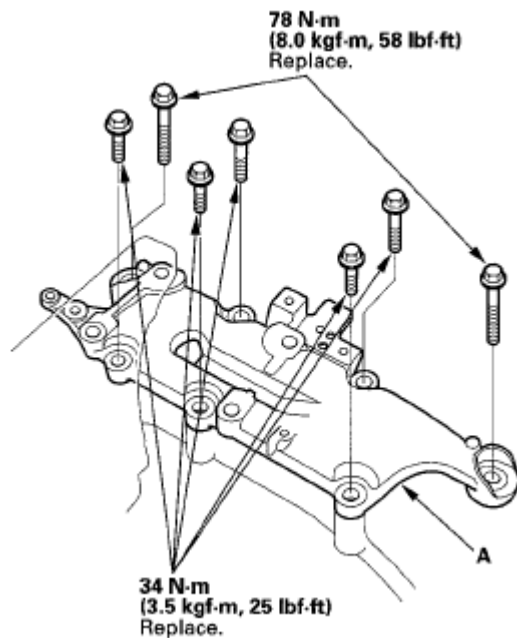
**Fig. 136: Identifying Steering Gearbox Mounting Bolt And Washer With Torque Specifications**  
**Courtesy of AMERICAN HONDA MOTOR CO., INC.**

8. Install the new steering gearbox mounting bolt (A) and washer (B) on the right gearbox mount, then tighten them to the specified torque.



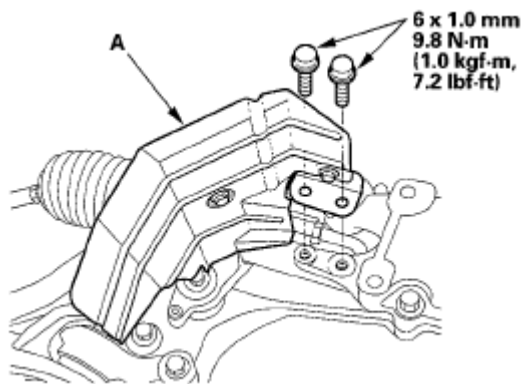
**Fig. 137: Identifying Steering Gearbox Mounting Bolt And Washer With Torque Specifications**  
**Courtesy of AMERICAN HONDA MOTOR CO., INC.**

9. Install the gearbox stiffener (A), then tighten the new mounting bolts to the specified torque.



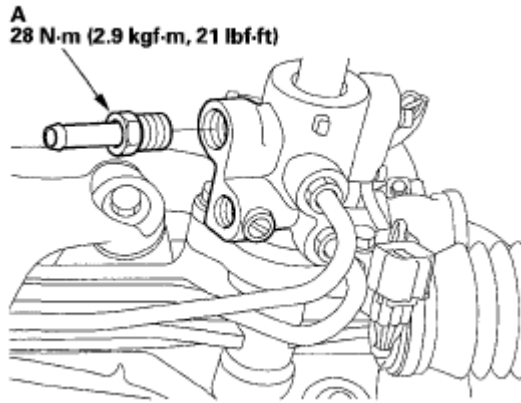
**Fig. 138: Identifying Gearbox Stiffener With Torque Specifications**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. Install a dynamic damper in the reverse order of removal. Portion the gearbox stiffener and front suspension subframe.
11. Install the P/S heat shield (A).



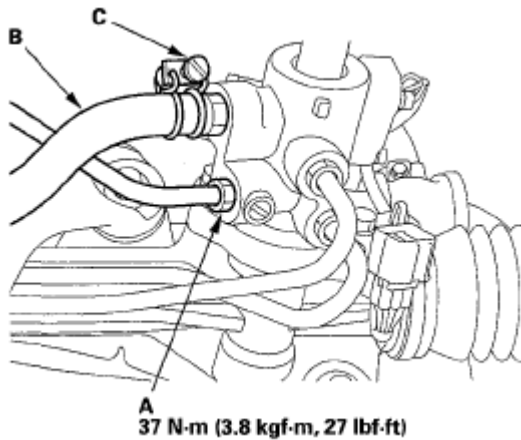
**Fig. 139: Identifying P/S Heat Shield With Torque Specifications**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

12. Install the return line joint (A) in the steering gearbox, then tighten it to the specified torque.



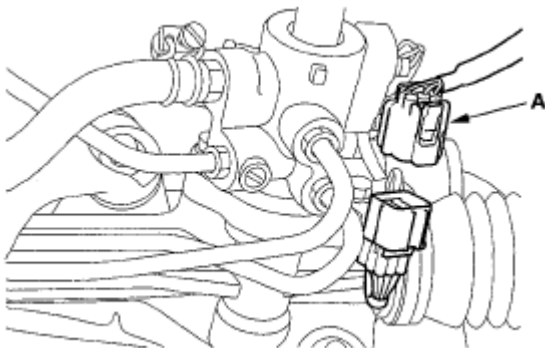
**Fig. 140: Identifying Return Line Joint With Torque Specifications**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

13. Connect the feed line (A), and tighten the 14 mm flare nut to the specified torque.



**Fig. 141: Identifying Return Hose And Feed Line With Torque Specifications**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

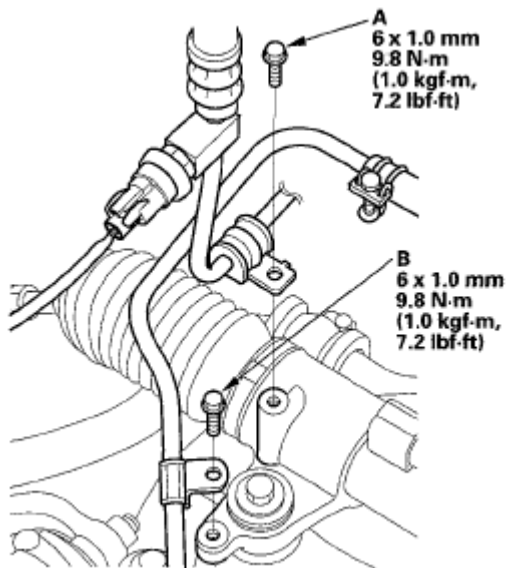
14. Connect the return hose (B) securely, and tighten the adjustable hose clamp (C) (see **POWER STEERING HOSE, LINE, AND PRESSURE SWITCH REPLACEMENT** ).
15. Connect the stepping valve motor connector (A).



**Fig. 142: Identifying Stepping Valve Motor Connector**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.



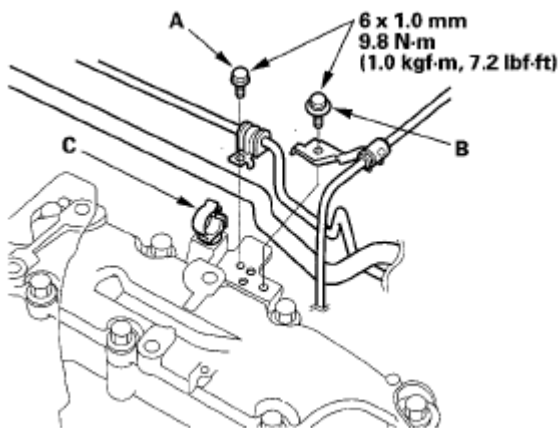
16. Install the feed line holder mounting bolt (A) and return line holder mounting bolt (A) on the gearbox.



**Fig. 143: Identifying Feed Line Holder Mounting Bolt And Return Line Holder Mounting Bolt With Torque Specifications**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

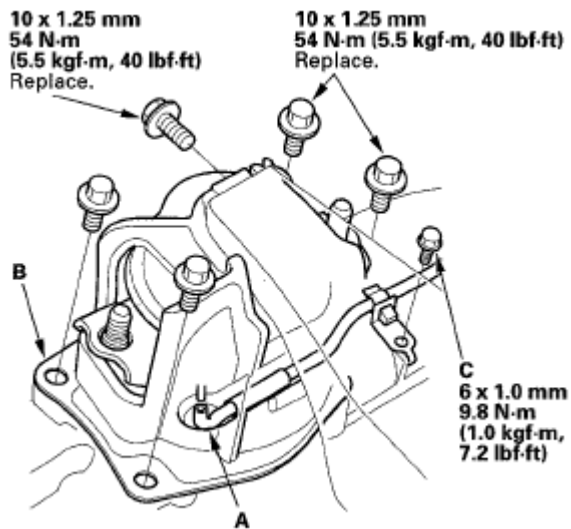
17. Install the feed line holder mounting bolt (A) and A/T wire line holder mounting bolt (B) on the gearbox stiffener.



**Fig. 144: Identifying Feed Line Holder Mounting Bolt And A/T Wire Line Holder Mounting Bolt With Torque Specifications**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

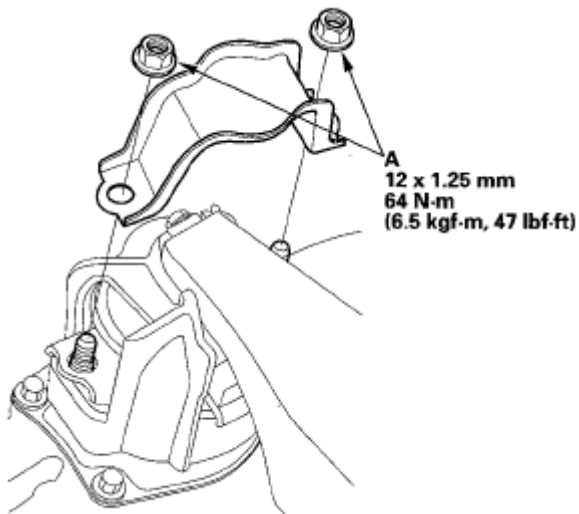
18. Install the return hose in the clamp (C).
19. Connect the engine mount pressure hose (A) in the rear engine mount.



**Fig. 145: Identifying Engine Mount Pressure Hose And Rear Engine Mount With Torque Specifications**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

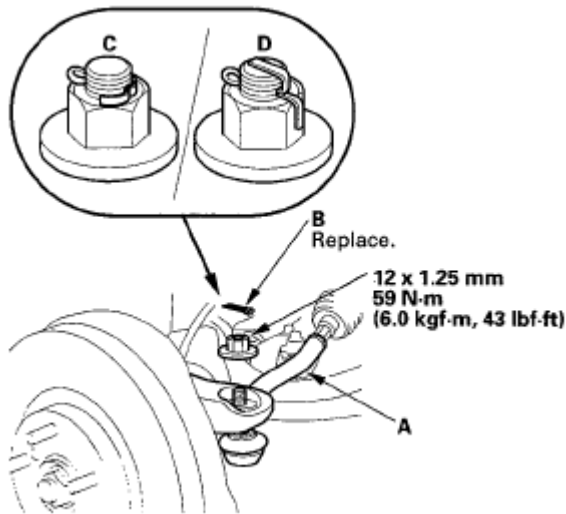
20. Install the rear engine mount (B), then tighten the new mounting bolts and the engine mount pressure hose holder mounting bolt (C) on the gearbox stiffener to the specified torque.
21. Install the nuts (A) on the rear engine mount, then tighten them to the specified torque.



**Fig. 146: Installing Rear Engine Mount With Torque Specifications**

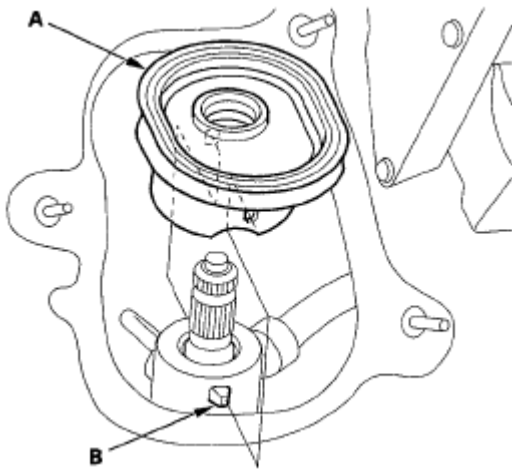
Courtesy of AMERICAN HONDA MOTOR CO., INC.

22. Wipe off any grease from the ball joint tapered section and threads. Then reconnect the tie-rod end (A) to the knuckle arms.



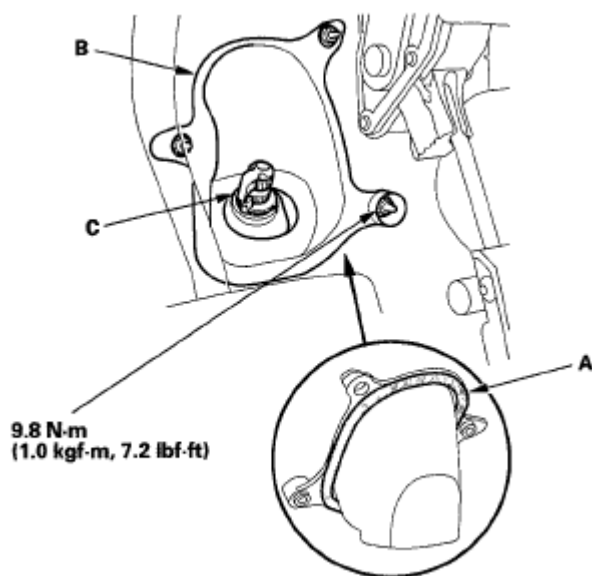
**Fig. 147: Identifying Tie-Rod End With Torque Specifications**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

23. Install the tie-rod end ball joint nut, and tighten it to the specified torque. Then install the new cotter pin (B), and bend it as shown (C) or (D).
24. Remove the vinyl tape from the 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.



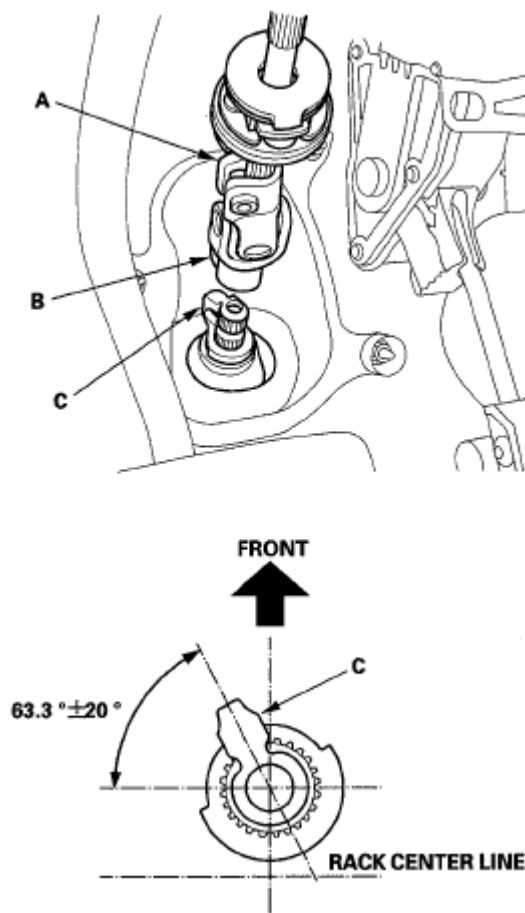
**Fig. 148: Identifying Pinion Shaft Grommet And Lug Portion**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

25. Install the new cover seal (A) all the way around in the steering joint cover B. Make sure there are no wrinkles in the seal, then install the steering joint cover B.



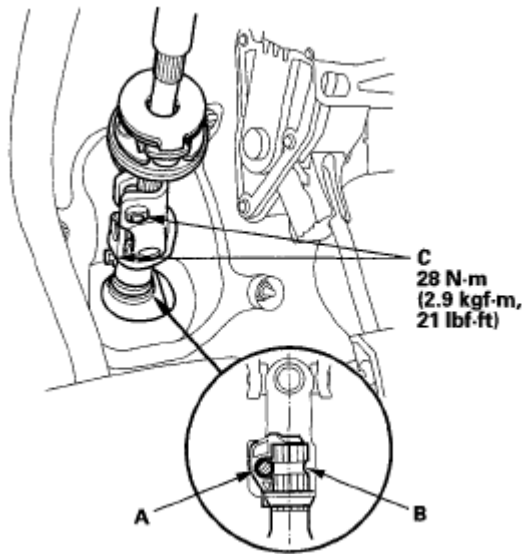
**Fig. 149: Identifying Cover Seal And Steering Joint Cover With Torque Specifications**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

26. Install the center guide (C).
27. Install the steering joint (A) aligning the slit (B) of the steering joint with the tab (C) of the center guide. Position the angle of the center guide as shown if necessary.



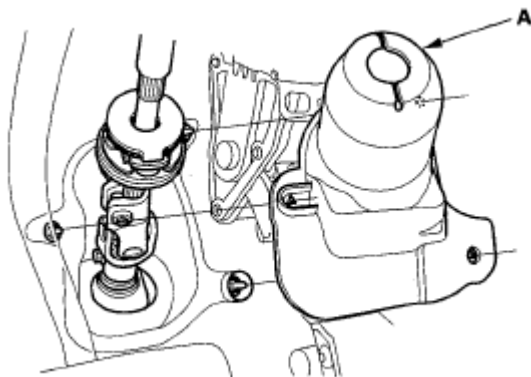
**Fig. 150: Identifying Steering Joint, Slit And Tab**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

28. Align the bolt hole (A) on the steering joint with the groove (B) around the pinion shaft, and loosely install the joint bolts (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.



**Fig. 151: Identifying Bolt Hole, Groove And Joint Bolts With Torque Specifications**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

29. Install the steering joint cover A.



**Fig. 152: Identifying Steering Joint Cover**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

30. Install the relay box (A), then connect the wire harness clips.
31. Install the front strut brace (see **FRAME BRACE REPLACEMENT** ).
32. Install the front wheels, then set the wheels in the straight ahead position.
33. Center the cable reel by first rotating it clockwise until it stops. Then rotate it counterclockwise (about three full turns) until the arrow mark on the label points straight up. Reinstall the steering wheel (see **STEERING WHEEL INSTALLATION** ).

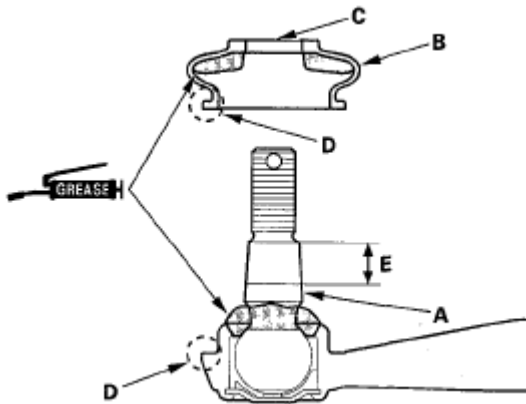
34. Fill the system with power steering fluid, and bleed air from the system (see **FLUID CHECK/REPLACEMENT** ).
35. After installation, do the following checks.
  - Start the engine, allow it to idle, and turn the steering wheel from lock-to-lock several times to warm up to the fluid. Check the gearbox for leaks (see **FLUID LEAKAGE INSPECTION** ).
  - Check the steering wheel spoke angle. If the 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.
  - Set the steering column to the center tilt position, then do the front toe inspection (see **FRONT TOE INSPECTION/ADJUSTMENT** ).
36. Install the right and left front fender trim.

## TIE-ROD BALL JOINT BOOT REPLACEMENT

### Special Tools Required

Front hub dis/assembly tool 07965-SA50500

1. Remove the boot from the tie-rod end, and wipe the old grease off the ball pin.
2. Pack the lower area of the ball pin (A) with fresh multipurpose grease.

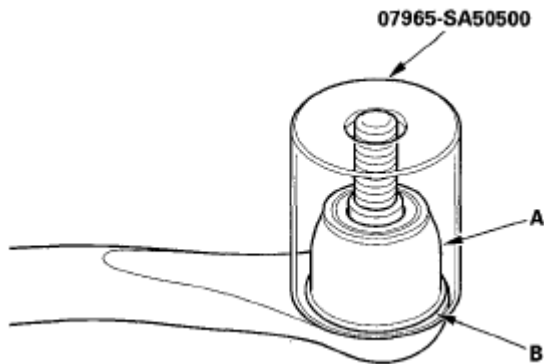


**Fig. 153: Applying Multipurpose Grease To Ball Joint**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

Note these items when installing new grease:

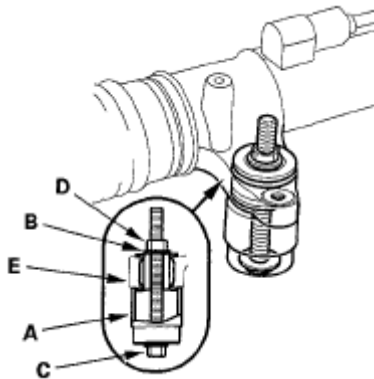
- Keep grease off the boot mounting area (D) and the tapered section (E) of the ball pin.
  - Do not allow dust, dirt, or other foreign materials to enter the boot.
4. Install the new boot (A) using the special tool. The boot must not have a gap at the boot installation sections (B). After installing the boot, check the ball pin tapered section for grease contamination, and wipe it if necessary.



**Fig. 154: Identifying Boot And Boot Installation Sections**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

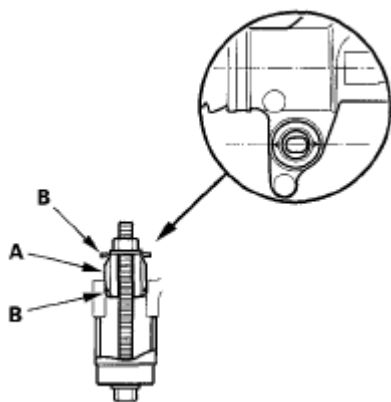
## REPLACEMENT

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



**Fig. 155: Removing Gearbox Mount Cushion**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Hold the flange bolt with a wrench, and tighten the nut 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.



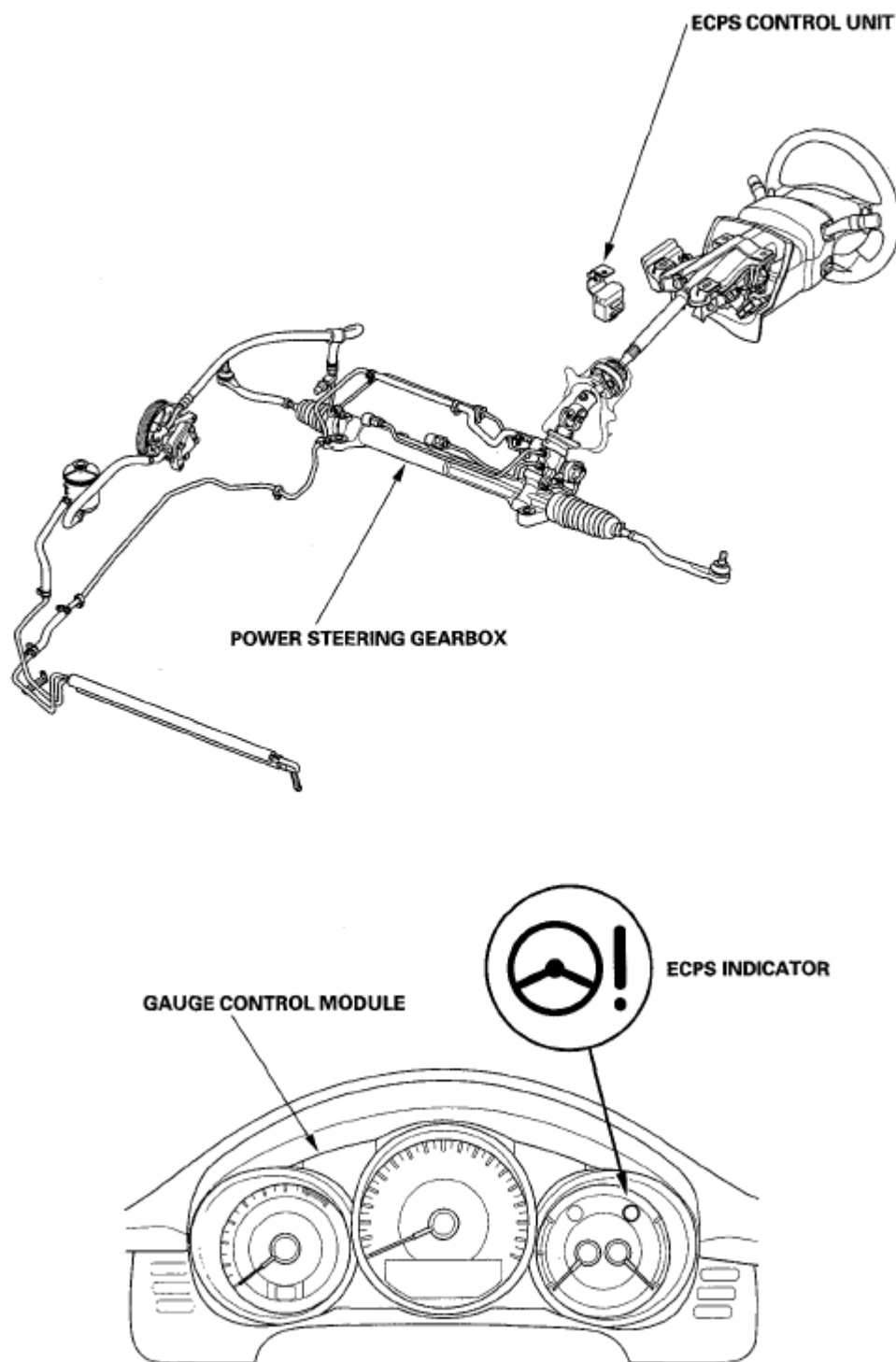
**Fig. 156: Installing Gearbox Mount Cushion**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

## **ELECTRONICALLY CONTROLLED POWER STEERING SYSTEM**

### **COMPONENT LOCATION INDEX**





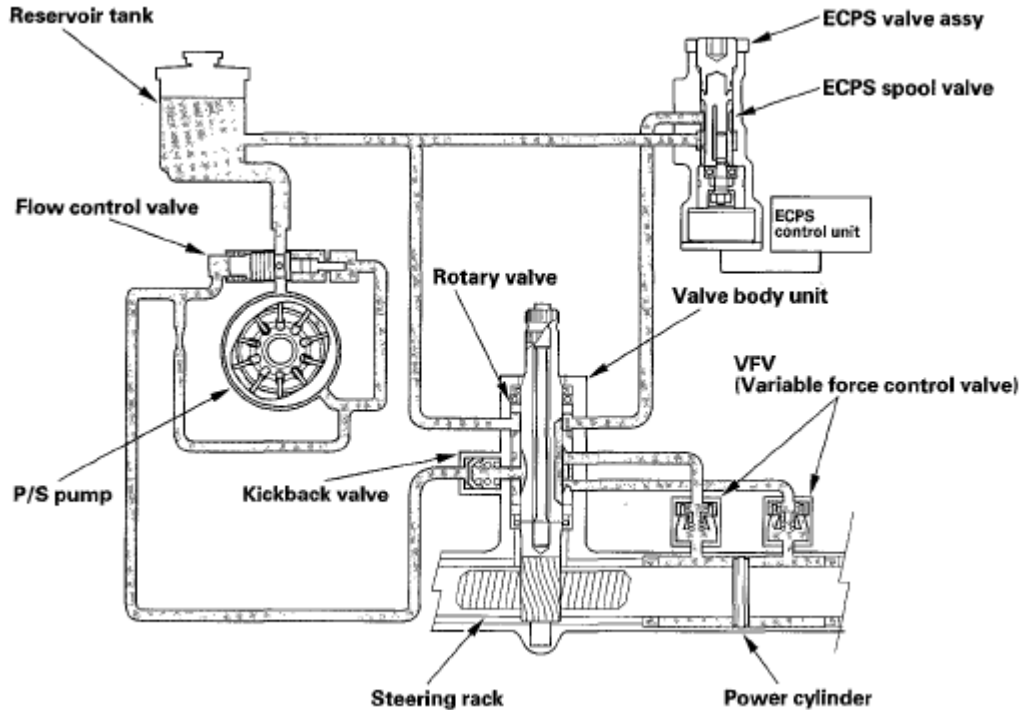
**Fig. 157: Identifying Electronically Controlled Power Steering System Component Location**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

## SYSTEM DESCRIPTION

### System Outline

This vehicle is equipped with an Electronically Controlled Power Steering System (ECPS). Depending on the vehicle speed, the ECPS control unit controls the ECPS valve. The ECPS valve changes the P/S fluid

pressure of the pressure side of the power cylinder. By controlling the P/S fluid pressure electrically, it made possible to supply stable P/S fluid pressure to the power cylinder that ensures the steering feel that is not influence the fluctuation of the engine speed, and corresponds to the driving situation.



**Fig. 158: Electronically Controlled Power Steering System - System Diagram**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

#### Flow control valve

This valve stabilizes the oil P/S fluid pressure of the power steering pump output.

#### ECPS valve assy

The spool valve built in the ECPS valve assy is operated by the stepping motor which is controlled by the ECPS control unit. It changes the P/S fluid pressure to the power cylinder. When this valve closes, the pressure to the power cylinder increases.

#### Valve body unit

The rotary valve built in the valve body unit is driven by the rotation of the steering wheel. This changes the oil passage between the power steering pump side, power cylinder side, reservoir side, and the ECPS valve side.

#### Kickback valve

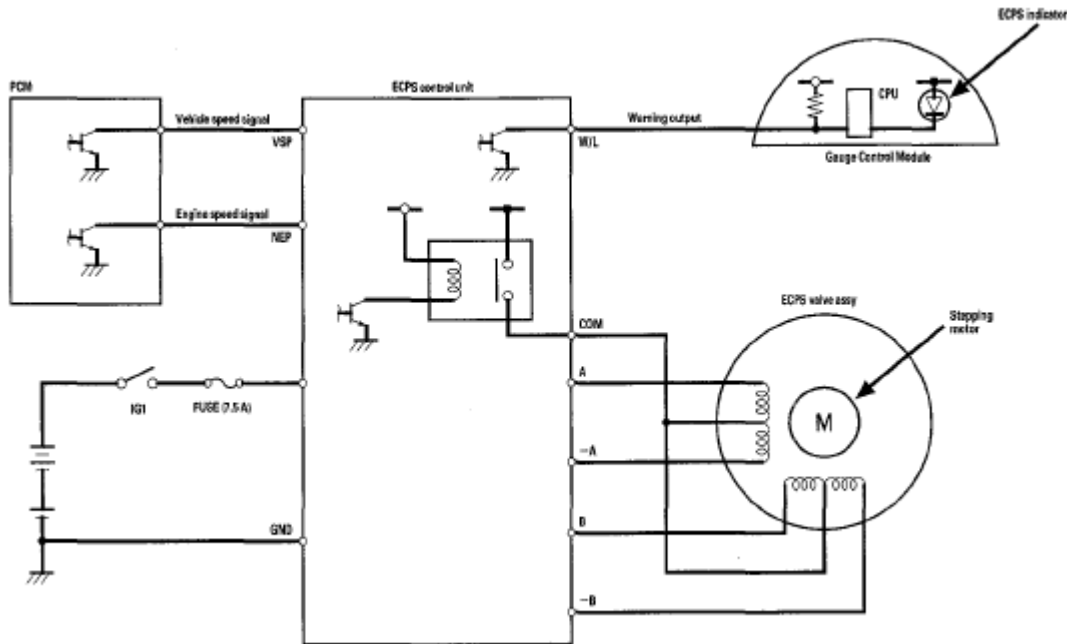
When kickback is occurred from steering rack, the kickback valve in the feed port decreases the kickback to the steering wheel.

#### VFCV (Variable force control valve)

The valve attenuates rapid P/S oil pressure change.

**ECPS control unit**

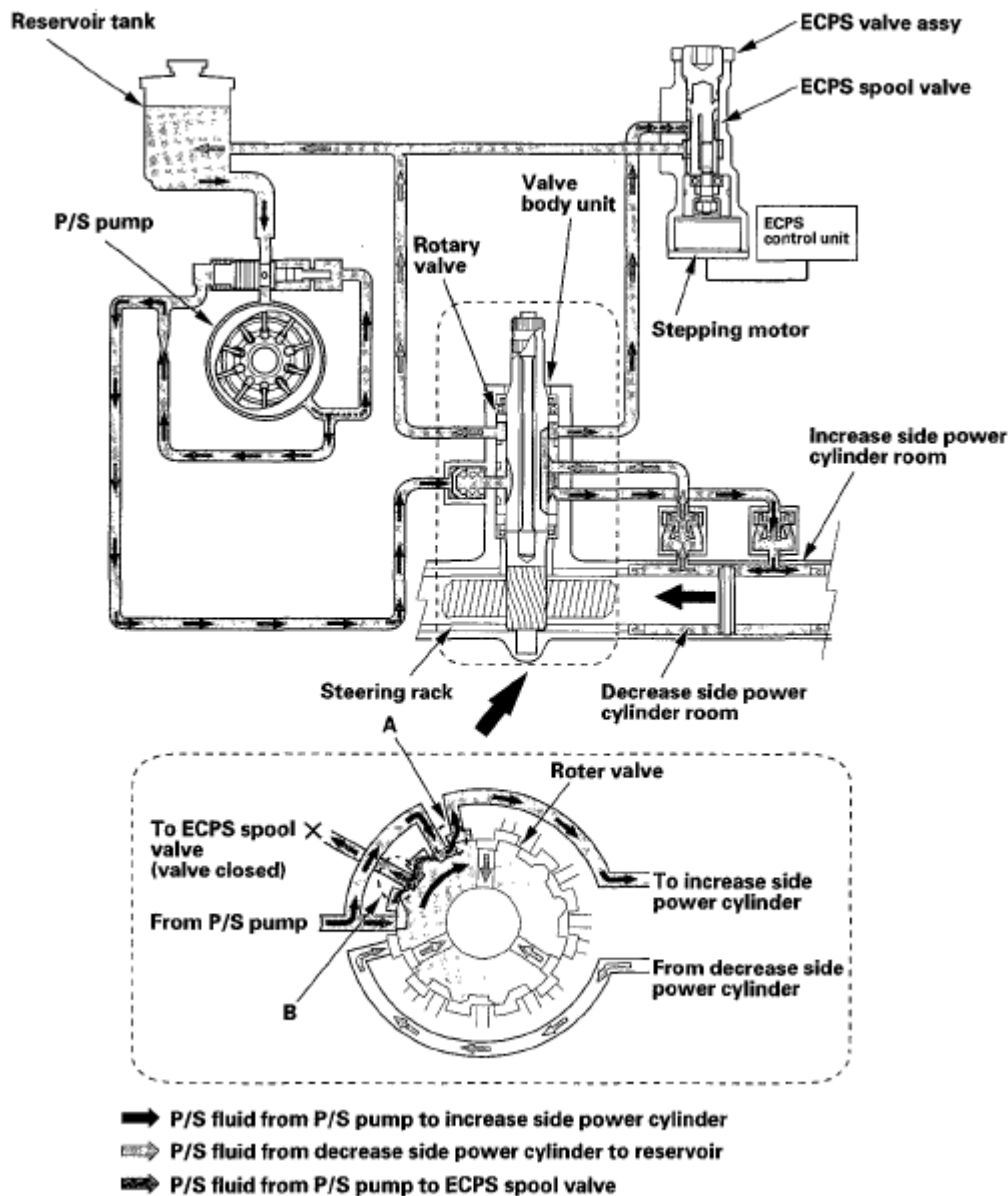
The ECPS control unit controls the stepping motor built inside the ECPS valve assy depending on the engine speed signal and the vehicle speed signal from the PCM. When a failure occurs, this unit stores a DTC and sends a signal to the gauge assembly to turn on the ECPS indicator.



**Fig. 159: ECPS Control Unit - Circuit Diagram**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

**Operation when the vehicle stopped (high assist)**

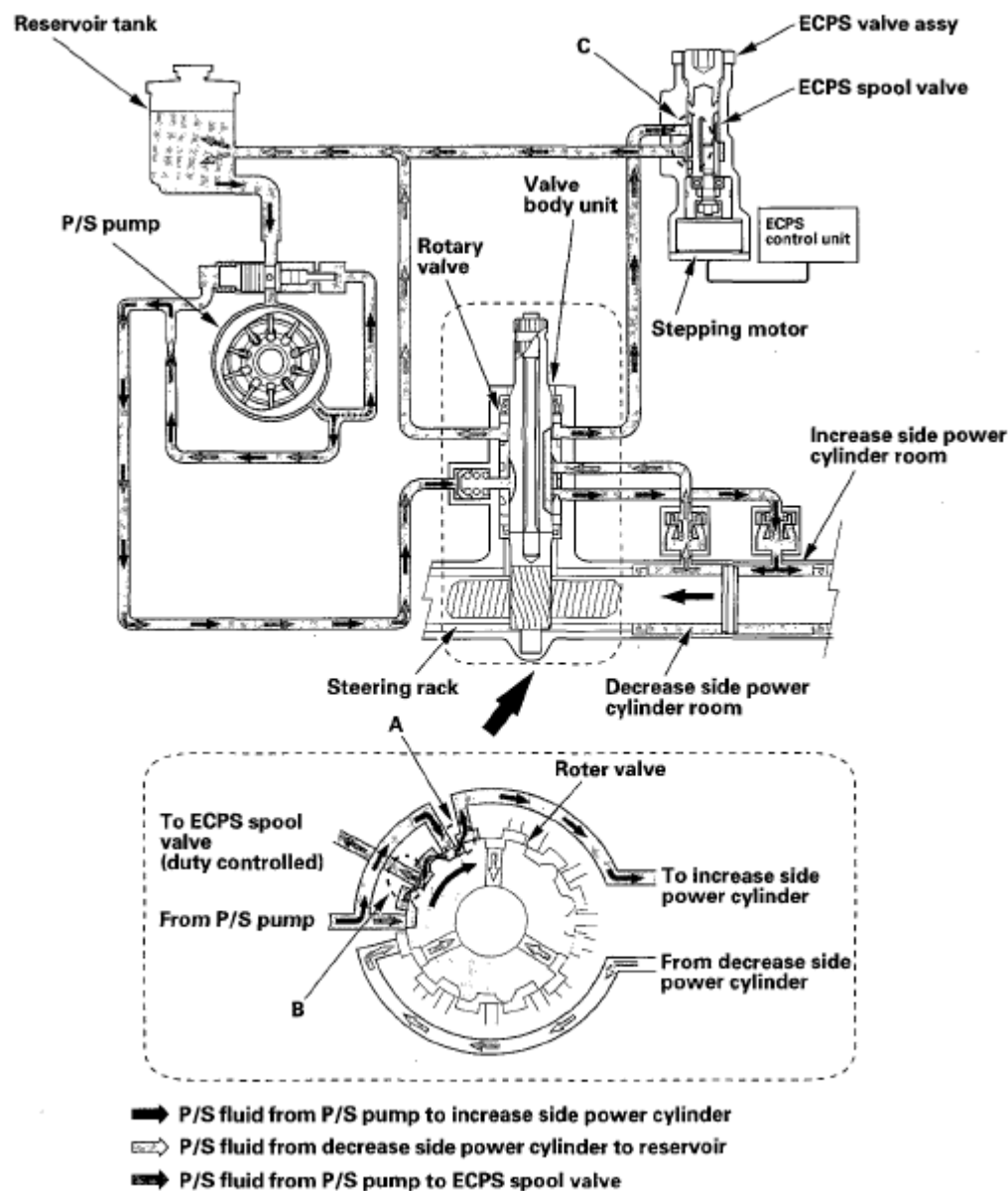
When the vehicle is stopped, the ECPS control unit closes the ECPS spool valve. When the steering wheel is turned, the passage between the increase side power cylinder room and the pump opens at the rotary valve. Because the spool valve is closed, all P/S fluid pressure is guided to the increase side power cylinder room passing the variable aperture of vehicle moving (A) at the rotary valve. At the same time, the passage between the decrease pressure side of the power cylinder room and the reservoir opens at the rotary valve, and the P/S fluid inside the decrease side of the power cylinder room returns to the reservoir. By this operation, the power steering system assists with strong force depending on the variable aperture of stationary steering (B) clearance.



**Fig. 160: Electronically Controlled Power Steering System - System Diagram**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

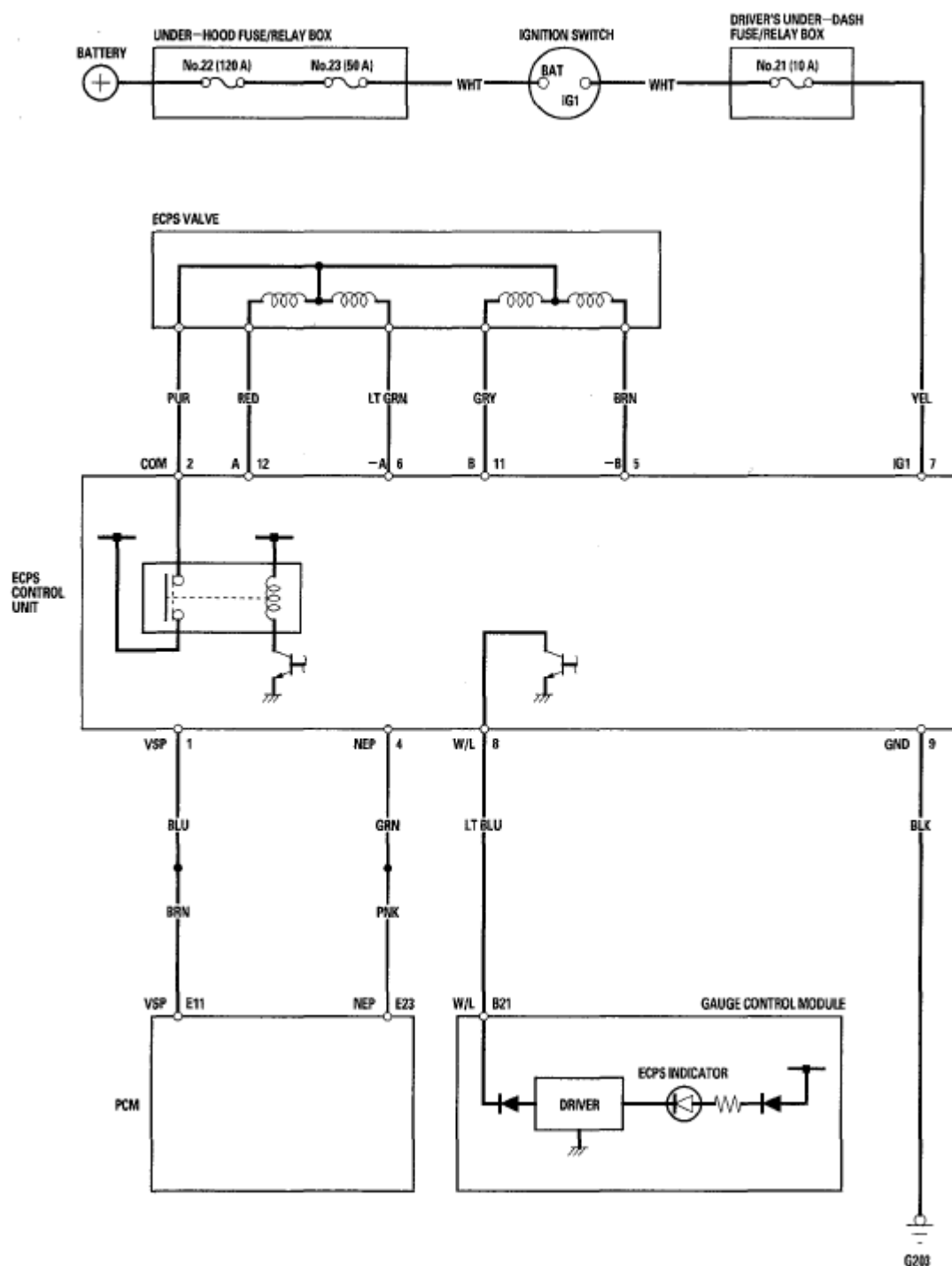
#### Operation when the vehicle moving (duty assist)

The ECPS control unit duty controls the ECPS spool valve depending on the vehicle speed. When the steering wheel is rotated, the P/S fluid amount to the increase side of the power cylinder room changes depending on the clearance of the variable aperture of stationary steering (A), variable aperture of high speed steering (B), and the variable aperture of the ECPS spool valve (C). The assist force is controlled with the synthetic valve of these three aperture clearance. Because the synthetic clearance is larger than the vehicle in stopped condition, the power steering assist force is controlled lower.



**Fig. 161: Electronically Controlled Power Steering System - System Diagram**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

Circuit Diagram



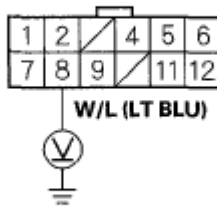
**Fig. 162: Electronically Controlled Power Steering System - Circuit Diagram**  
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

### SYMPTOM TROUBLESHOOTING

ECPS indicator does not go off after the engine is started

**NOTE:** High engine speed (1,700 RPM or above) when the vehicle is not moving may cause the ECPS indicator to come on.

1. Disconnect the ECPS control unit 12P connector.
2. Turn the ignition switch ON (II).
3. Measure the voltage between ECPS control unit 12P connector terminal No. 8 and body ground.

**ECPS CONTROL UNIT 12P CONNECTOR**

Wire side of female terminals

**Fig. 163: Measuring Voltage Between ECPS Control Unit 12P Connector Terminal No. 8 And Body Ground**

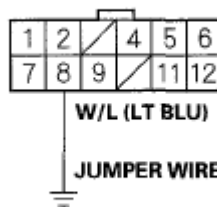
Courtesy of AMERICAN HONDA MOTOR CO., INC.

*Is there about 5 V?*

**YES** - Go to step 4.

**NO** - Repair open in the wire between the ECPS control unit and the gauge assembly module.

4. Connect ECPS control unit 12P connector terminal No. 8 and body ground with a jumper wire.

**ECPS CONTROL UNIT 12P CONNECTOR**

Wire side of female terminals

**Fig. 164: Connecting ECPS Control Unit 12P Connector Terminal No. 8 And Body Ground With Jumper Wire**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

*Does the ECPS indicator go off?*

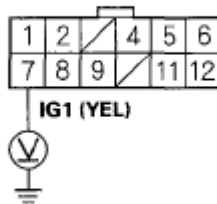
**YES** - Go to step 5.

**NO** - Do the troubleshooting for the gauge control module (see **GAUGE CONTROL MODULE INPUT TEST** ).

5. Disconnect the jumper wire.

6. Measure the voltage between body ground and ECPS control unit 12P connector terminal No. 7.

**ECPS CONTROL UNIT 12P CONNECTOR**



Wire side of female terminals

**Fig. 165: Measuring Voltage Between Body Ground And ECPS Control Unit 12P Connector Terminal No. 7**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

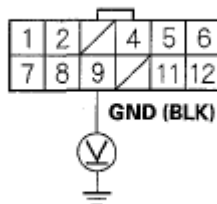
*Is there battery voltage?*

**YES** - Go to step 7.

**NO** - Repair open in the wire between the ECPS control unit 12P connector and the under-dash fuse/relay box.

7. Check for voltage between body ground and the ECPS control unit 12P connector terminal No. 9.

**ECPS CONTROL UNIT 12P CONNECTOR**



Wire side of female terminals

**Fig. 166: Checking Voltage Between Body Ground And ECPS Control Unit 12P Connector Terminal No. 9**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

*Is there less than 0.1 V?*

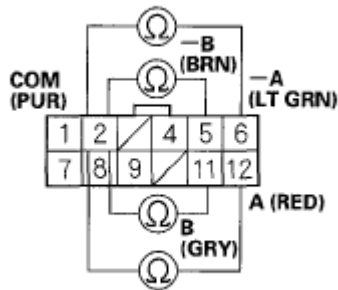
**YES** - Go to step 8.

**NO** - Repair open in the wire between the ECPS control unit 12P connector and body ground (G203).

8. Check for resistance between ECPS control unit 12P connector terminals No. 2 and No. 5, No. 6, No. 11, and No. 12 individually.



## ECPS CONTROL UNIT 12P CONNECTOR



Wire side of female terminals

**Fig. 167: Checking Resistance Between ECPS Control Unit 12P Connector Terminals No. 2 And No. 5, No. 6, No. 11, And No. 12**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

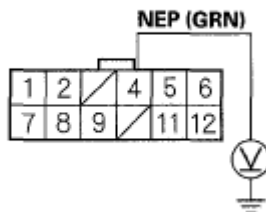
*Is the resistance between 19.8 to 24.2 ohms (at 20°C, 68°F)?*

**YES** - Go to step 9.

**NO** - Check for and repair open/short in the wires between the ECPS control unit 12P connector and the stepping valve motor. If the wires are OK, the ECPS valve is faulty; replace the ECPS valve.

9. Start the engine.
10. Measure the voltage between ECPS control unit 12P connector terminal No. 4 and body ground.

## ECPS CONTROL UNIT 12P CONNECTOR



Wire side of female terminals

**Fig. 168: Measuring Voltage Between ECPS Control Unit 12P Connector Terminal No. 4 And Body Ground**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

*Is there about 5.0 V?*

**YES** - Check for loose connector terminals in the ECPS control unit 12P connector and repair if necessary. If the terminals are OK, replace the ECPS control unit (see **ECPS CONTROL UNIT REMOVAL/INSTALLATION** ).

**NO** - Repair open in the GRN wire between the ECPS control unit and PCM connector A.

**ECPS indicator comes on while driving the vehicle (but the ECPS indicator goes off after the engine is restarted)**

Repair open in the BLU wire between the ECPS control unit 12P connector and PCM connector A (31P), or repair the poor connection in the ECPS circuit.

**ECPS indicator comes on, but there is no power assist**

- Hard steering
- Uneven or rough steering

1. Turn the ignition switch ON (II).

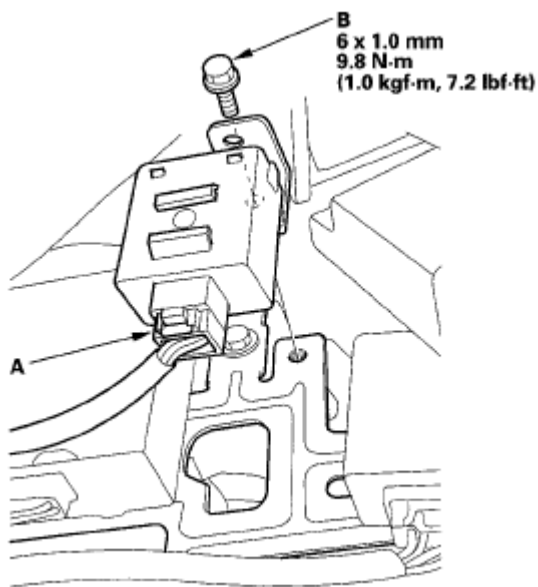
*Is there a clicking noise from the ECPS valve for 2 to 3 seconds?*

**YES** - The ECPS system is OK at this time. Go to **SYMPTOM TROUBLESHOOTING** .

**NO** - Faulty ECPS control unit or the ECPS valve, replace the ECPS control unit (see **ECPS CONTROL UNIT REMOVAL/INSTALLATION** ) or the valve housing and stepping valve motor (see **STEERING GEARBOX OVERHAUL** ).

## **ECPS CONTROL UNIT REMOVAL/INSTALLATION**

1. Remove the driver's dashboard undercover (see **DRIVER'S DASHBOARD UNDERCOVER REMOVAL/INSTALLATION** ), and the driver's dashboard lower cover (see **DRIVER'S DASHBOARD LOWER COVER REMOVAL/INSTALLATION** ).
2. Disconnect the connector (A) from the ECPS control unit, and remove the bolt (B).



**Fig. 169: Identifying ECPS Control Unit Connector And Fastener With Torque Specifications**  
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Install the ECPS control unit in the reverse order of removal.