

SUPPLEMENTAL RESTRAINT SYSTEM (SRS) (If steering maintenance is required)

The Acura TL SRS includes a driver's airbag in the steering wheel hub, a passenger's airbag in the dashboard above the glove box, seat belt tensioners in the front seat belt retractors, side curtain airbags in the sides of the roof, and side airbags in the front seat-backs. Information necessary to safely service the SRS is included in this Service Manual. Items marked with an asterisk (*) on the contents page include or are located near SRS components. Servicing, disassembling, or replacing these items requires special precautions and tools, and should be done by an authorized Acura dealer.

- To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal or side collision, all SRS service work should be done by an authorized Acura dealer.
- Improper service procedures, including incorrect removal and installation of the SRS, could lead to personal injury caused by unintentional deployment of the airbags, side airbags, and/or side curtain airbags.
- Do not bump or impact the SRS unit, front impact sensors, side impact sensors, or rear safing sensor, especially when the ignition switch is in ON (II)/the ON mode, for at least 3 minutes after the ignition switch is turned to LOCK (0), or after the engine start/stop button is pressed to select the OFF mode; otherwise, the system may fail in a collision, or the airbags may deploy.
- SRS electrical connectors are identified by yellow color coding. Related components are located in the steering column, center console, dashboard, dashboard undercover, in the dashboard above the glove box, in the front seats, in the roof side, and around the floor. Do not use electrical test equipment on these circuits.

Steering

Steering

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EPS Components

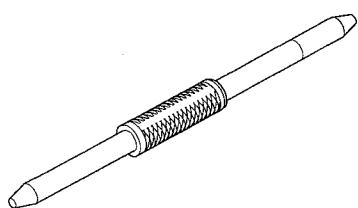
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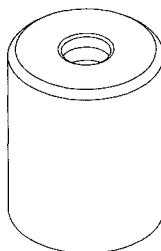
Steering

Special Tools

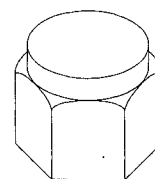
Ref.No.	Tool Number	Description	Qty
①	070AG-SJAA10S	Subframe Alignment Pin	1
②	07965-SA50500	Bearing Driver Attachment, 36 mm	1
③	07AAE-SJAA100	Ball Joint Thread Protector, 14 mm	1
④	07AAF-SDAA100	Ball Joint Thread Protector, 12 mm	1
⑤	07MAA-SL00100, 07916-SA50001, or 07AAA-TL2A100	Locknut Wrench, 40 mm	1
⑥	07MAC-SLOA202	Ball Joint Remover, 28 mm	1



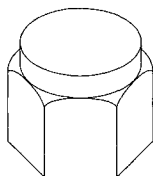
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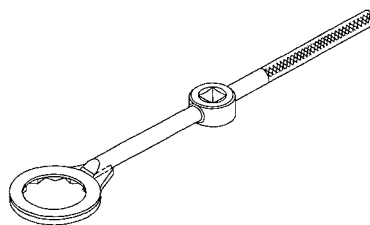
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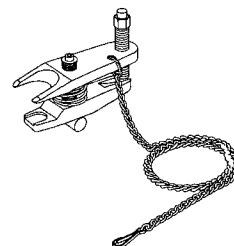
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④



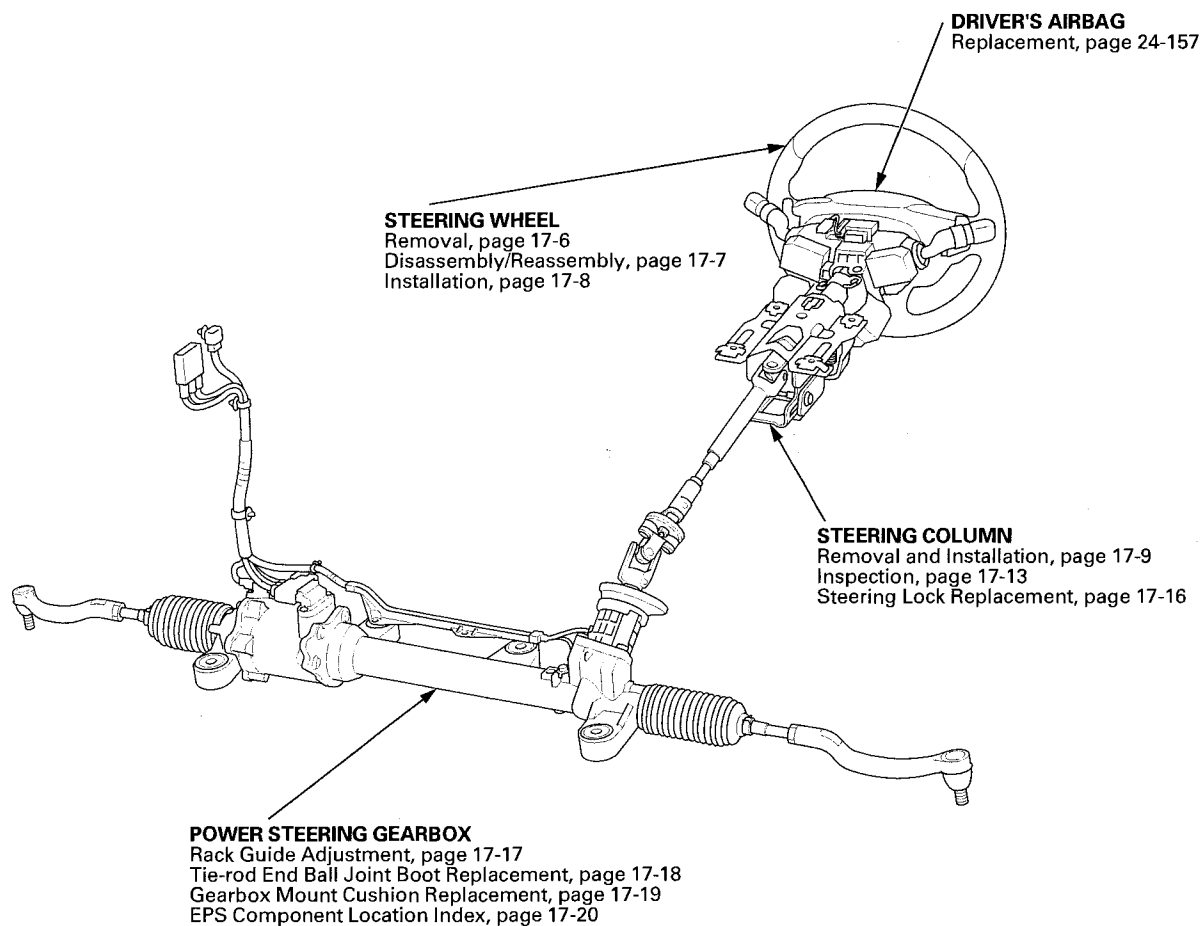
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⑥



Component Location Index

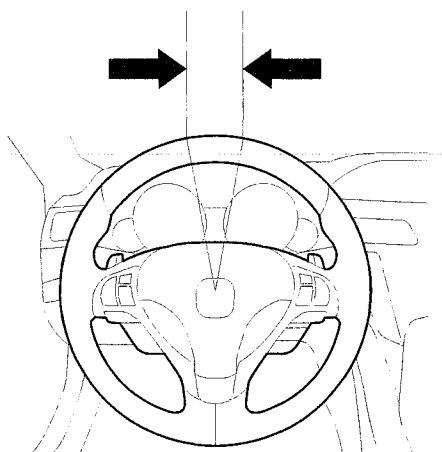


Steering

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 the steering linkage are OK.
 - If the play exceeds the limit, adjust the rack guide (see page 17-17). If the play is still excessive after rack guide adjustment, inspect the steering linkage and the steering gearbox (see page 17-5).

Rotational play: 0—10 mm (0—0.39 in)

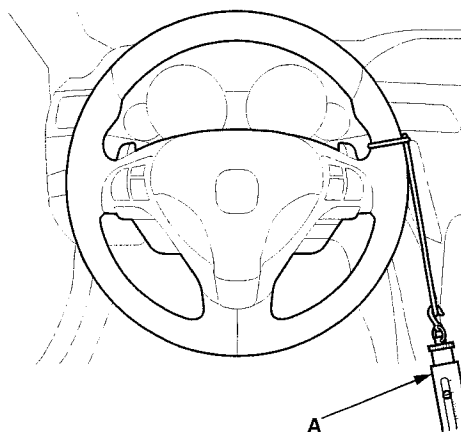


Power Assist Check

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

1. Start the engine, and let it idle.
2. Attach a commercially available spring scale (A) 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.

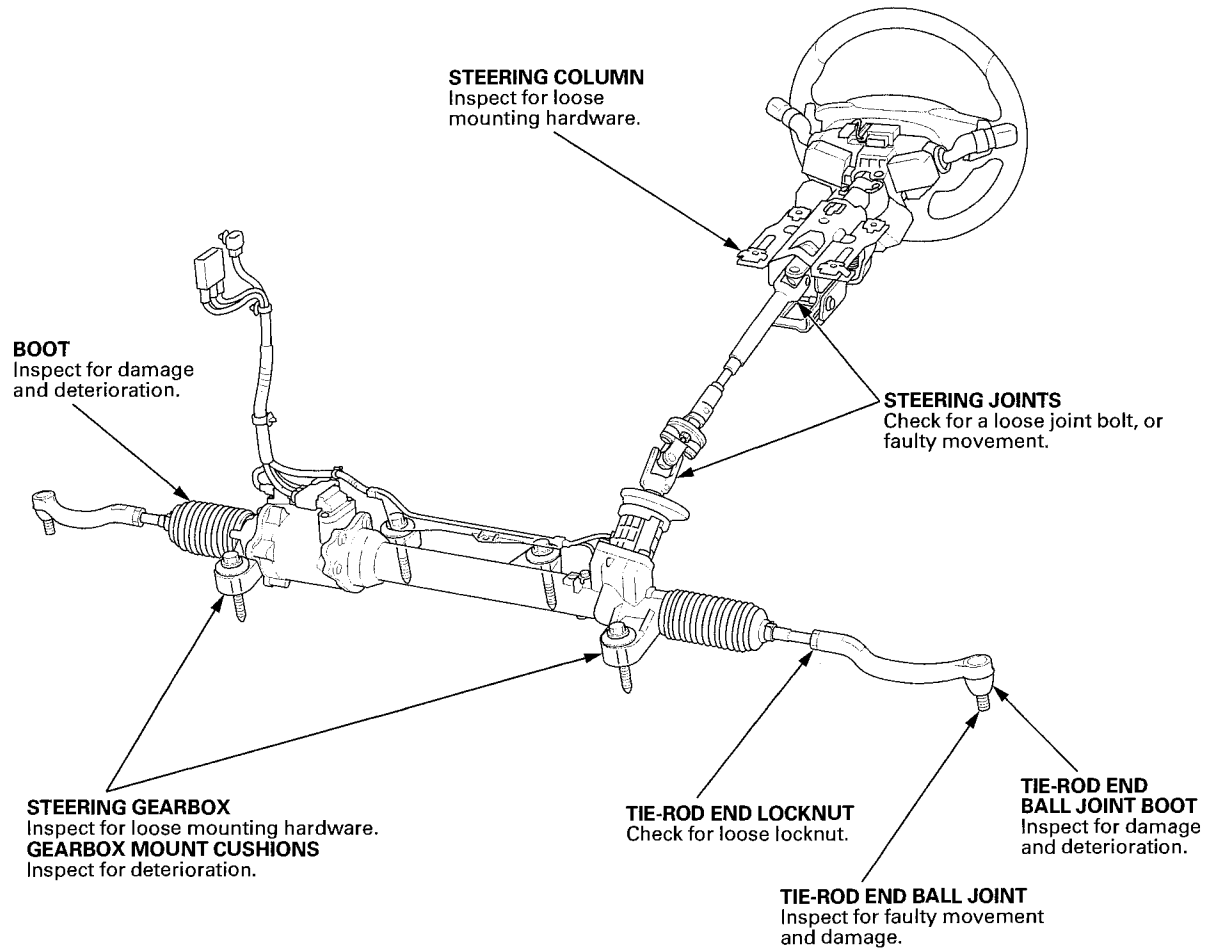
Initial turning load: 29 N (3.0 kgf, 6.6 lbf)



3. If the scale reads no more than the specification, the power assist is OK. If it reads more, check these items:
 - Steering linkage (see page 17-5)
 - Rack guide adjustment (see page 17-17)
 - EPS system (see page 17-21)



Steering Linkage and Gearbox Inspection

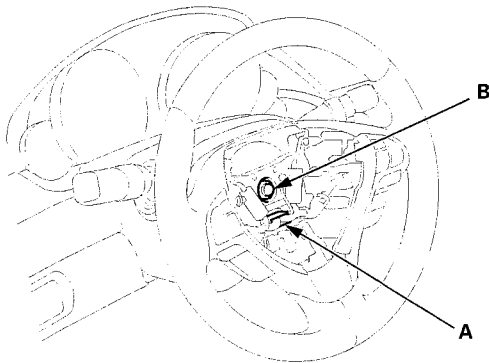


Steering

Steering Wheel Removal

SRS components are located in this area. Review the SRS component locations (see page 24-11) and the precautions and procedures (see page 24-13) before doing repairs or service.

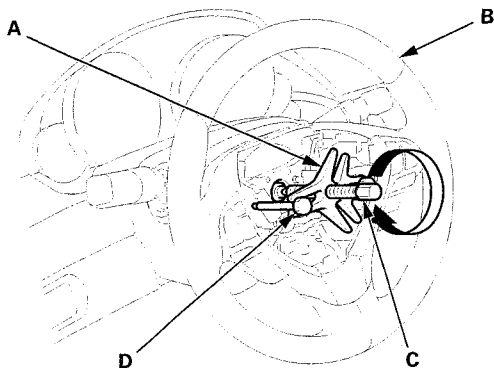
1. Do the battery terminal disconnection procedure (see page 22-86).
2. Set the front wheels in the straight ahead position, then remove the driver's airbag from the steering wheel (see page 24-157).
3. Disconnect the cable reel subharness connector (A).



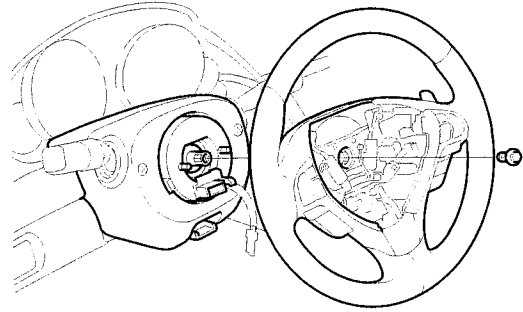
4. Loosen the steering wheel bolt (B) three turns.
5. Install a commercially available steering wheel puller (A) on the steering wheel (B). Free the steering wheel from the steering column shaft by turning the pressure bolt (C) of the puller.

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.



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





Steering Wheel Disassembly/Reassembly

A ▶ : Screw, 4 B ▶ : Screw, 3 C ▶ : Screw, 8



STEERING WHEEL TRIM/AUDIO REMOTE SWITCH/
HFL-VOICE CONTROL SWITCH

CABLE REEL SUBHARNESS

HARNESS GUIDE

CENTER TRIM

STEERING WHEEL TRIM/
CRUISE CONTROL
COMBINATION SWITCH/
MULTI-INFORMATION
SWITCH

PADDLE SHIFTER –
(DOWNSHIFT SWITCH)

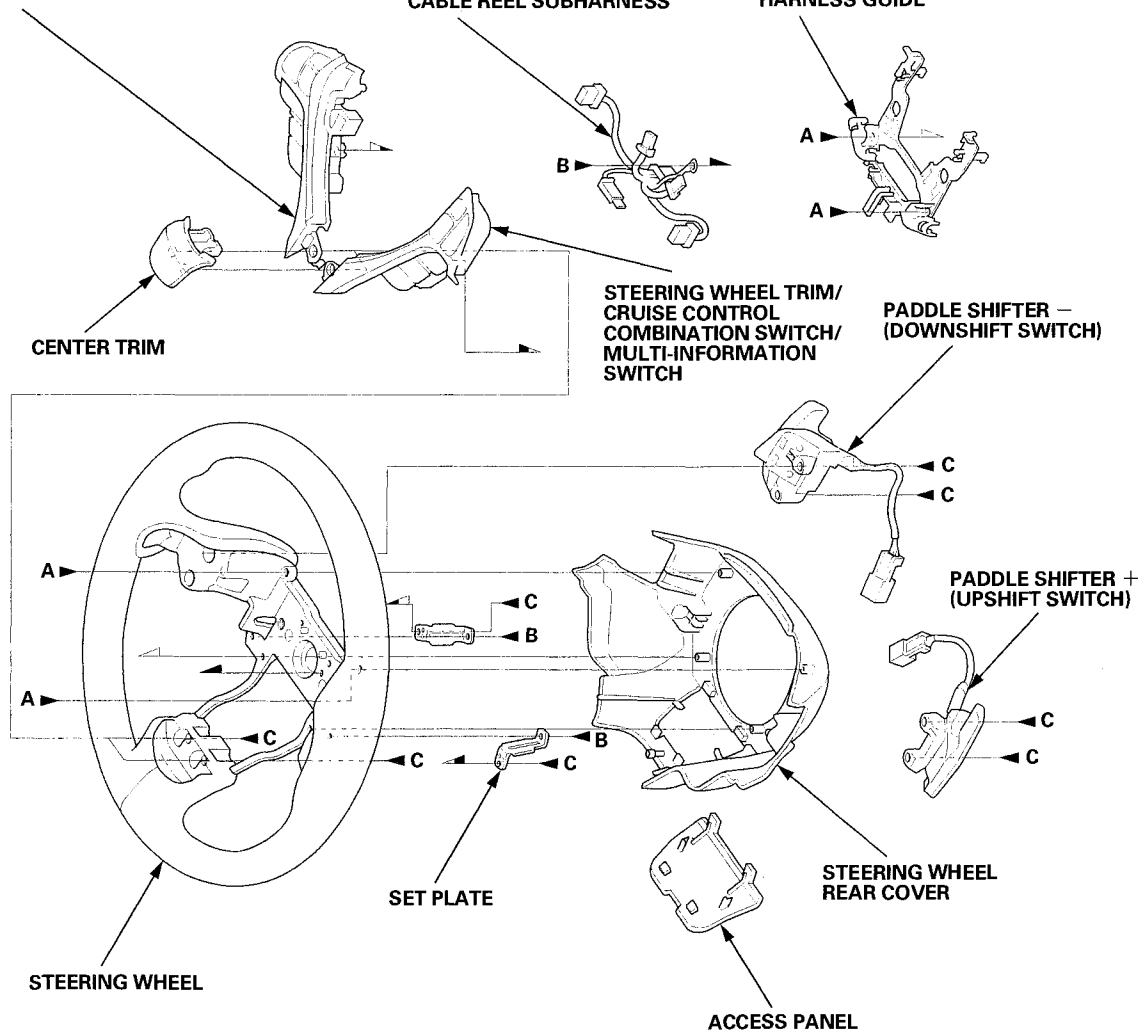
STEERING WHEEL

SET PLATE

ACCESS PANEL

STEERING WHEEL
REAR COVER

PADDLE SHIFTER +
(UPSHIFT SWITCH)

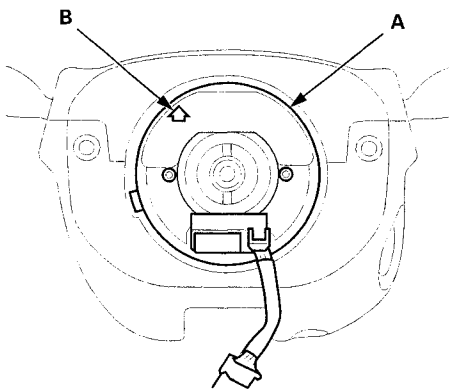


Steering

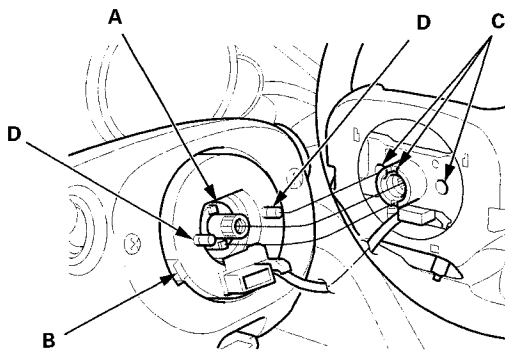
Steering Wheel Installation

SRS components are located in this area. Review the SRS component locations (see page 24-11), and the precautions and procedures (see page 24-13) before doing repairs or service.

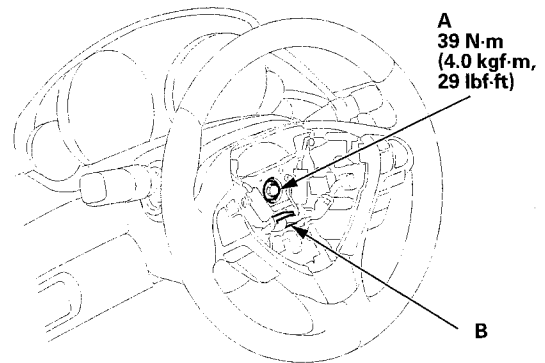
1. Before installing the steering wheel, make sure the front wheels are pointing straight ahead, then center the cable reel (A). Do this by first rotating the cable reel clockwise until it stops. Then rotate it counterclockwise about three full turns. The arrow mark (B) on the cable reel label should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



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



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



4. Install the driver's airbag (see page 24-157).
5. Do the battery terminal reconnection procedure (see page 22-86), and check these items:
 - Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode, and check that the SRS indicator comes on for about 6 seconds, and then goes off.
 - Make sure the horn and turn signal switches work properly.
 - Make sure the steering wheel switches work properly.
6. After installation, check these items:
 - Check the steering wheel spoke angle. If the steering spoke angles to the right and left are not equal (steering wheel is not centered), correct the engagement of the wheel/column shaft splines.
 - With SH-AWD: Do the VSA sensor neutral position memorization (see page 19-117).

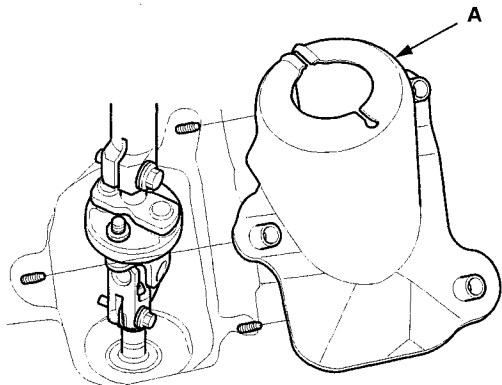


Steering Column Removal and Installation

SRS components are located in this area. Review the SRS component locations (see page 24-11) and the precautions and procedures (see page 24-13) before doing repairs or service.

Removal

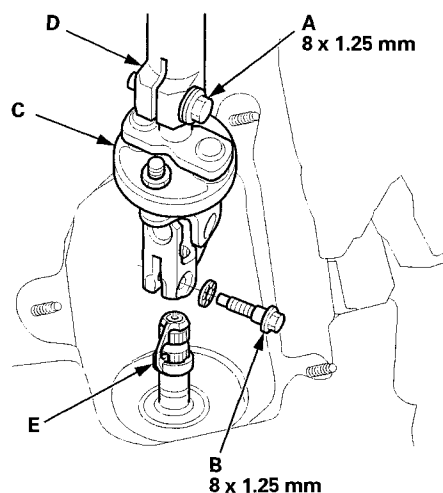
1. Adjust the steering column to the full tilt down position, and to the full telescopic out position.
2. Do the battery terminal disconnection procedure (see page 22-86).
3. Remove the driver's airbag (see page 24-157), and the steering wheel (see page 17-6).
4. Remove the driver's dashboard undercover (see page 20-118).
5. Remove the column covers (see page 20-126).
6. Remove the steering joint cover (A).



7. Loosen the upper steering joint bolt (A), and remove the lower steering joint bolt (B). Disconnect the steering joint (C) by sliding the steering joint into the column shaft (D). Tighten the upper steering joint bolt to hold the steering joint in place.

NOTE:

- Do not disconnect the steering joint from the column shaft.
- If the center guide (E) is in place and has not moved, leave it in place.
- If the center guide has come off, discard it.

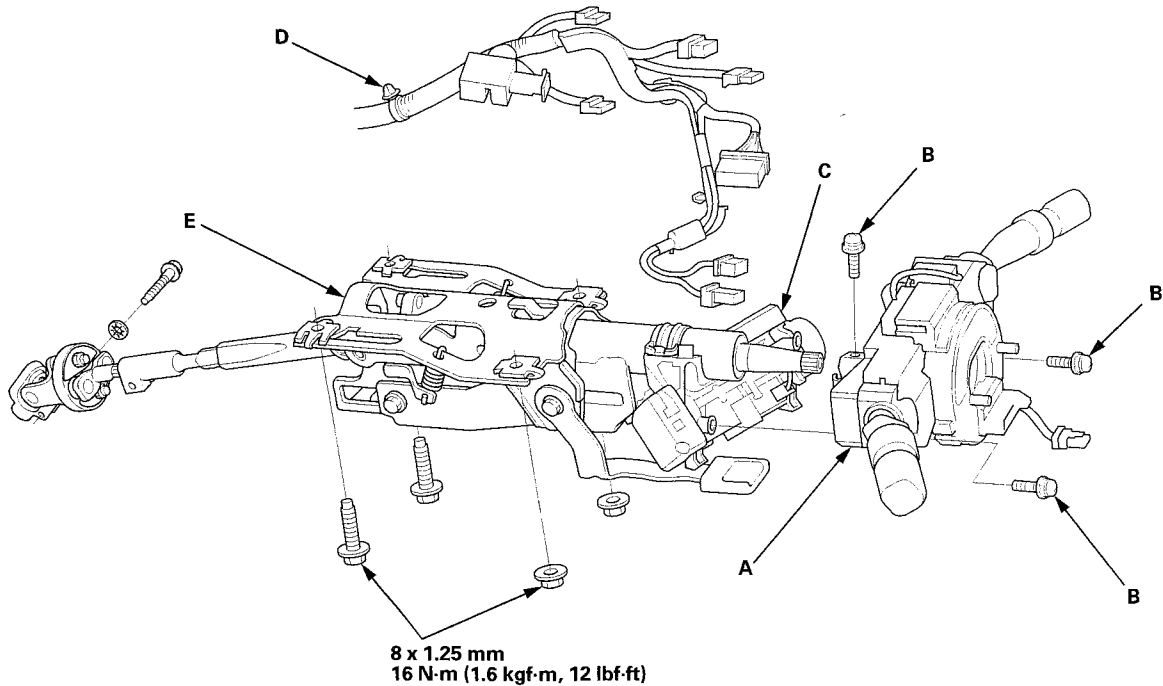


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Steering

Steering Column Removal and Installation (cont'd)

8. Disconnect the wire harness connectors from the combination switch assembly/cable reel (A).

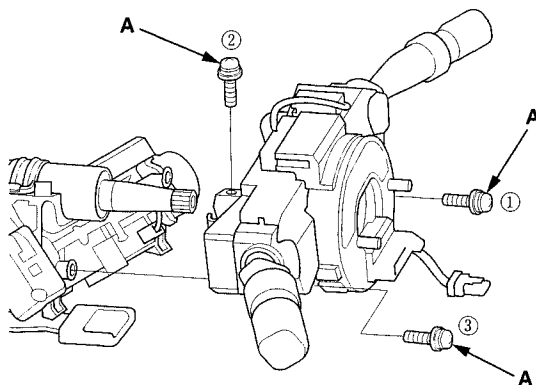


9. Remove the combination switch assembly/cable reel from the steering column shaft by removing the three screws (B).
10. Disconnect the connectors from the ignition switch (C), and release the wire harness clip (D) from the steering column.
11. Make sure that the lock lever is in the locked position. Remove the steering column (E) by removing the attaching nuts and bolts, and carefully guide it out of the dashboard.



Installation

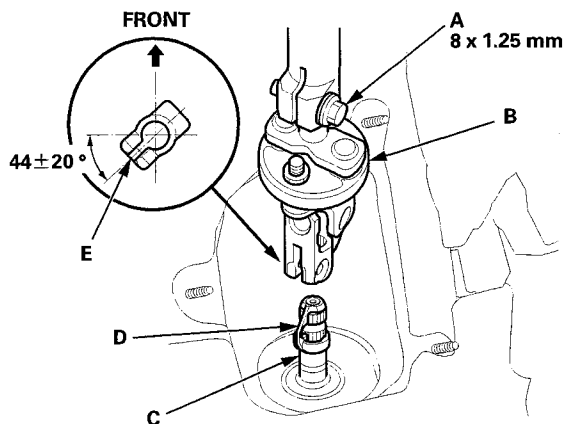
1. Install the steering column in the reverse order of removal, and note these items:
 - Make sure the wires are not caught or pinched by any parts.
 - Tighten the three screws (A) in the sequence shown.



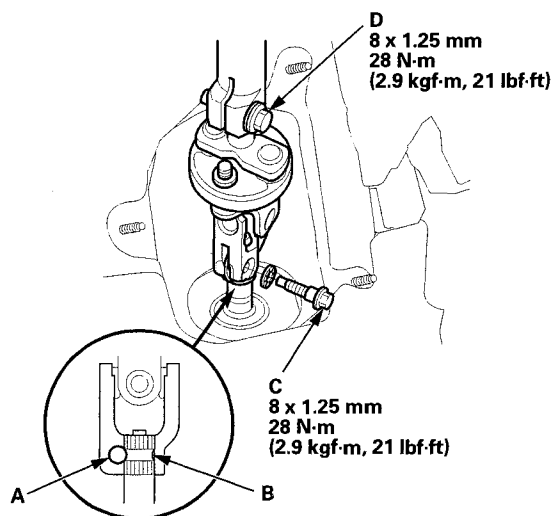
2. Center the steering rack within its stroke.
3. Loosen the upper steering joint bolt (A) and slip the lower end of the steering joint (B) onto the pinion shaft (C).

NOTE:

- Pinion shaft with center guide: Install steering joint by aligning the center guide (D).
- Pinion shaft without center guide: Position the steering column by aligning the gap (E) with the angle.



4. Align the bolt hole (A) on the steering joint with the groove (B) around the pinion shaft, then loosely install the lower steering joint bolt (C). Be sure that the joint bolt is securely in the groove in the pinion shaft.



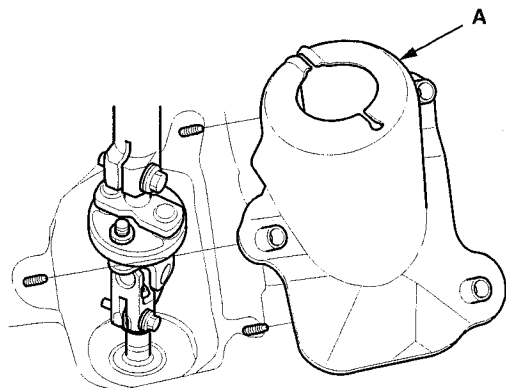
5. Pull on the steering joint to make sure that the steering joint is fully seated, then tighten the lower joint bolt to the specified torque.
6. Tighten the upper steering joint bolt (D) to the specified torque.

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Steering

Steering Column Removal and Installation (cont'd)

7. Install the steering joint cover (A).



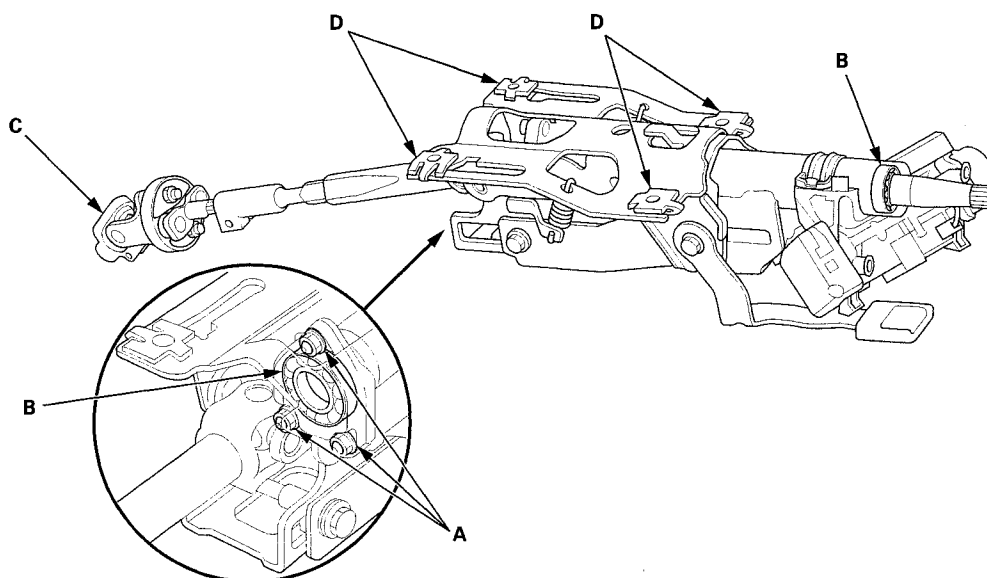
8. Install the column covers (see page 20-126).
9. Install the driver's dashboard undercover (see page 20-118).
10. Install the steering wheel (see page 17-8), and the driver's airbag (see page 24-157).
11. Do the battery terminal reconnection procedure (see page 22-86), and check these items:
- Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode, and check that the SRS indicator comes on for about 6 seconds, and then goes off.
 - Make sure the horn and turn signal switches work properly.
 - Make sure the steering wheel switches work properly.
12. After installation, check these items:
- 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 splines.
 - With SH-AWD: Do the VSA sensor neutral position memorization (see page 19-117).
 - Set the steering column to the center tilt position, and to the center telescopic position, then do the front toe inspection (see page 18-5).



Steering Column Inspection

Inspection

1. Remove the steering column (see page 17-9).
2. Check these items:
 - Check for loose bearing mounting nuts (A). If they are loose, replace the column as an assembly.
 - Check the steering column ball bearings (B) and the steering joints (C) 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 (D) 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.



3. Install the steering column (see page 17-11).

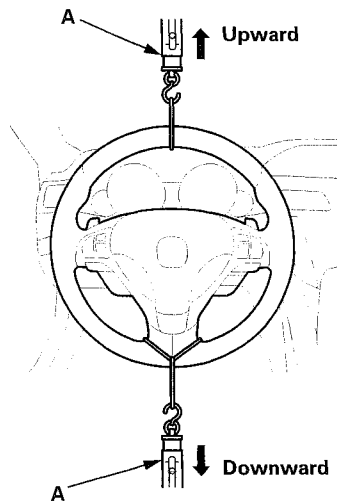
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Steering

Steering Column Inspection (cont'd)

Check of Tilting Force

1. Set the steering wheel in the straight ahead driving position, and loosen the lock lever fully.
2. Attach a commercially available spring scale (A) to the highest point of the steering wheel, and tilt the steering column to the lowest position.



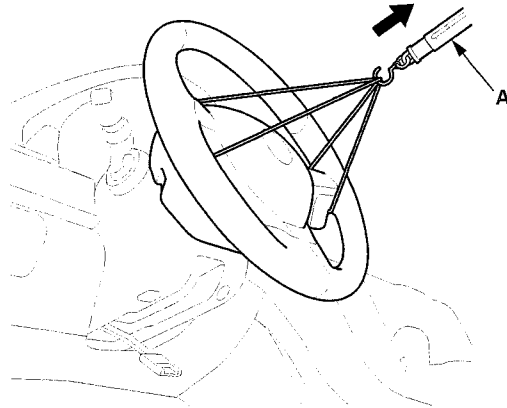
3. Pull the spring scale straight up, and read the force required to move the steering column.
4. Attach the spring scale to the lowest point of the steering wheel.
5. Pull the spring scale straight down, and read the force required to move the steering column.

Tilting force (upward/downward):
Standard: 70 N (7.1 kgf, 15 lbf) max.

6. If the measurement is higher than specified, or if the tilt function feels rough, do the following:
 - 1. Loosen the steering column mounting nuts and bolts so they are finger-tight.
 - 2. Release the lock lever, and tilt and telescope the steering column several times.
 - 3. Tilt the column down, then tighten the lock lever.
 - 4. Tighten the mounting nuts, then tighten the mounting bolts.
7. Test the tilting force again. If the force is still higher than the specification, replace the steering column as an assembly (see page 17-9).

Check of Telescoping Force

1. Set the steering wheel in the straight ahead driving position, and loosen the lock lever fully, and push in the steering wheel to the fully telescoped in position.
2. Attach a commercially available spring scale (A) to the center point of the steering wheel as shown.



3. Pull the spring scale, and read the force required to move the steering column during telescoping out.

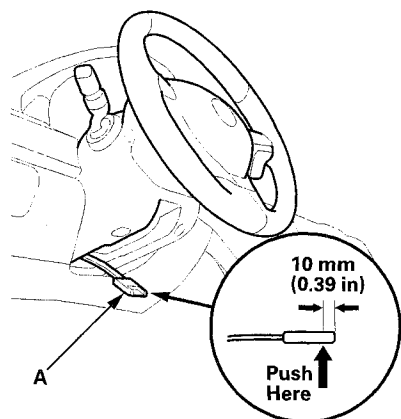
Telescoping force:
Standard: 116 N (11.8 kgf, 26.1 lbf) max.

4. If the measurement is higher than specified, replace the steering column as an assembly. (see page 17-9)



Check of Lock Lever Force

1. Move the lock lever (A) from the loosened position to the locked position three to five times, then release the lock lever. Adjust the steering column to the center tilt position and also to the full telescopic out position, and hold the steering wheel.



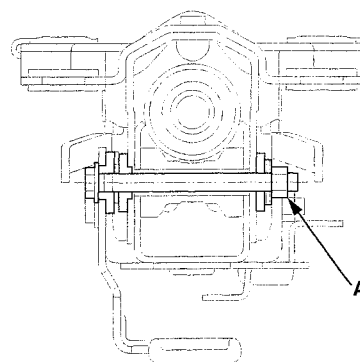
2. Using a commercially available push-pull gauge, push the lock lever 10 mm (0.39 in) in from its end, and measure the force required to move the lock lever.

Lock lever force:

50–70 N (5.1–7.1 kgf, 11–16 lbf) min.

3. If the measurement is out of the specification, adjust the lock lever force using the following procedures:

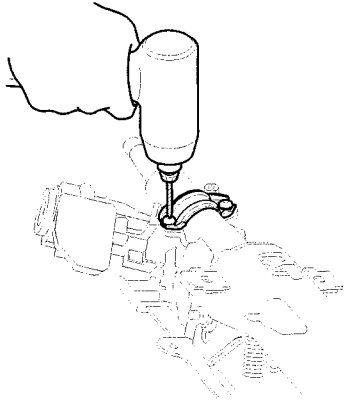
- 1. Remove the column covers (see page 20-126).
- 2. Adjust the lock lever force by turning the nut (A).
- 3. Check the lock lever force again. If the measurement is still out of specification, replace the steering column as an assembly (see page 17-9).
- 4. Install the column covers (see page 20-126).



Steering

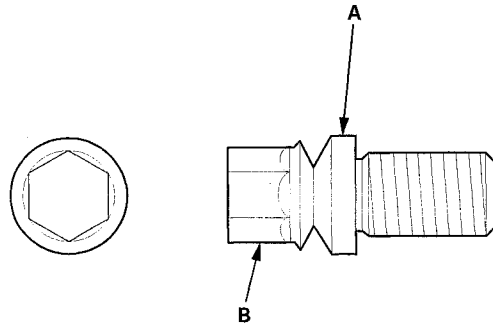
Steering Lock Replacement

1. Remove the steering column (see page 17-9).
2. Center-punch both of the shear bolts, and drill their heads off with a 5 mm (0.20 in) drill bit. Be careful not to damage the steering lock when removing the shear bolts.



3. Remove the shear bolts from the steering lock, then remove the steering lock.
4. Remove the immobilizer-keyless control unit from the steering lock, then install it on the new steering lock (see page 22-448).
5. Install the steering lock without the key inserted.
6. Loosely tighten the new shear bolts.
7. Insert the ignition key, and check for proper operation of the steering wheel lock and that the ignition key turns freely.

8. Tighten the shear bolts (A) until the hex heads (B) twist off.



9. Install the steering column (see page 17-11).
10. Rewrite all new keys to the immobilizer-keyless control unit (see page 22-447), and make sure the immobilizer system works properly.

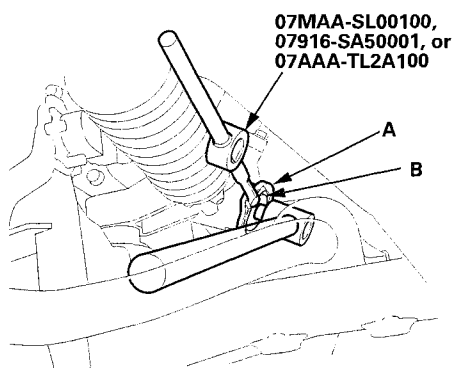


Rack Guide Adjustment

Special Tools Required

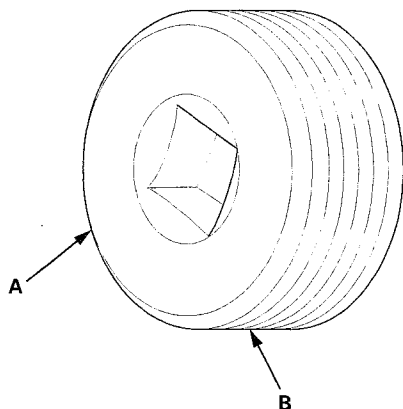
Locknut Wrench, 40 mm 07MAA-SL00100, 07916-SA50001, or 07AAA-TL2A100

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

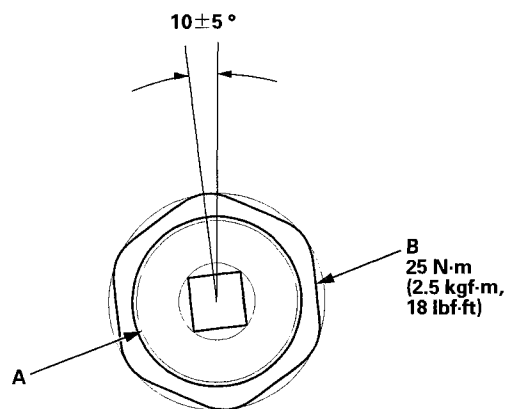


3. Remove the old sealant from the rack guide screw (A), and apply new sealant (Three Bond 1215 or Loctite 5699) to the middle of the threads (B). Loosely install the rack guide screw on the steering gearbox.

NOTE: If more than 5 minutes have passed after applying the sealant, remove the old sealant and residue, and reapply new sealant.



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



5. Retighten the rack guide screw to 5.9 N·m (0.6 kgf·m, 4 lbf·ft), then back it off to the specified angle.

Specified return angle: $10 \pm 5^\circ$

6. Hold the rack guide screw stationary with a wrench, and tighten the locknut (B) by hand until it's fully seated.
7. Install the locknut wrench on the locknut, and hold the rack guide screw stationary with a wrench. Tighten the locknut to the specified torque.
8. Check for unusual steering effort through the complete turning range.
9. Check the steering wheel rotational play (see page 17-4) and the power assist (see page 17-4).

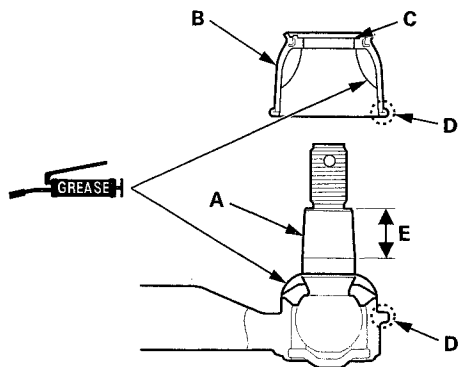
Steering

Tie-rod End Ball Joint Boot Replacement

Special Tools Required

Bearing Driver Attachment, 36 mm 07965-SA50500

1. Disconnect the tie-rod end ball joint from the knuckle (see step 12 on page 17-64).
2. Remove the tie-rod end from the rack end.
3. Remove the ball joint boot from the tie-rod end, and wipe the old grease off the ball pin.
4. Pack the lower area of the ball pin (A) with fresh multipurpose grease.

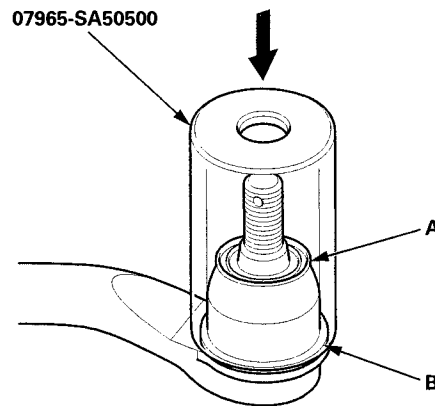


5. Pack the interior of the ball joint boot (B) and lip (C) with fresh multipurpose grease.

Note these items when installing new grease:

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

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

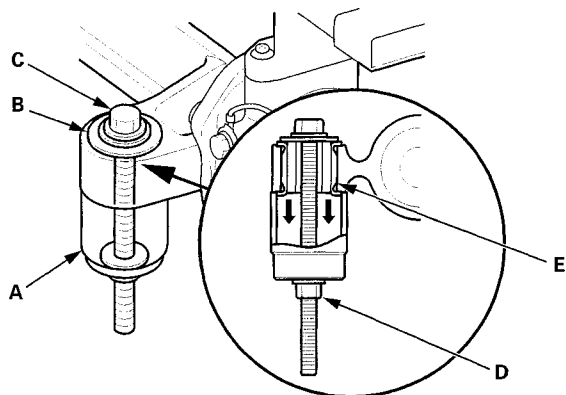


7. Install the tie-rod end to the rack end.
8. Connect the tie-rod end ball joint to the knuckle (see step 44 on page 17-77).
9. Check the wheel alignment, and adjust it if necessary (see page 18-5).

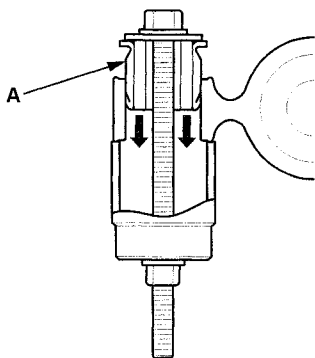


Gearbox Mount Cushion Replacement

1. Remove the steering gearbox (see page 17-63).
2. Position a 36 mm socket (A) on the flange part of the gearbox housing with a washer (B), a 10 x 150 mm flange bolt (C) and a 10 mm nut (D) as shown.

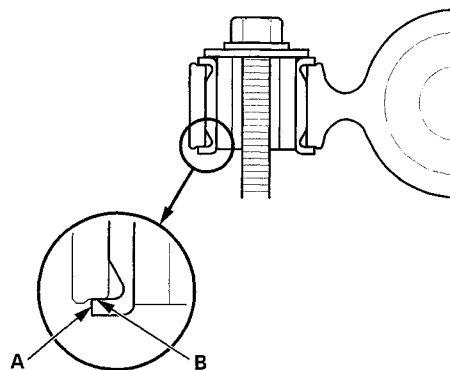


3. Hold the flange bolt with a wrench, and tighten the nut with a wrench. Remove the gearbox mount cushion (E).
4. Apply a mild soap and water solution to the new gearbox mount cushion surface (A), then place the mount cushion on the gearbox mounting cushion hole.



5. Position a 36 mm socket on the flange part of the gearbox housing with a washer, a flange bolt, and the nut as shown.

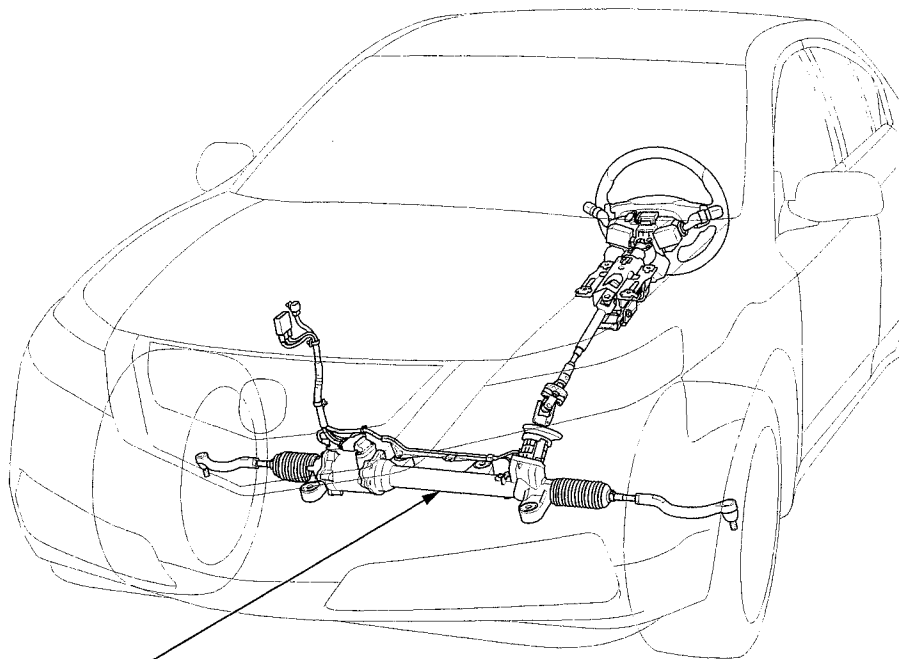
6. Install the gearbox mount cushion by tightening the nut until the mount cushion edge (A) properly fits on the gearbox flange surface (B).



7. Install the steering gearbox (see page 17-71).

EPS Components

Component Location Index

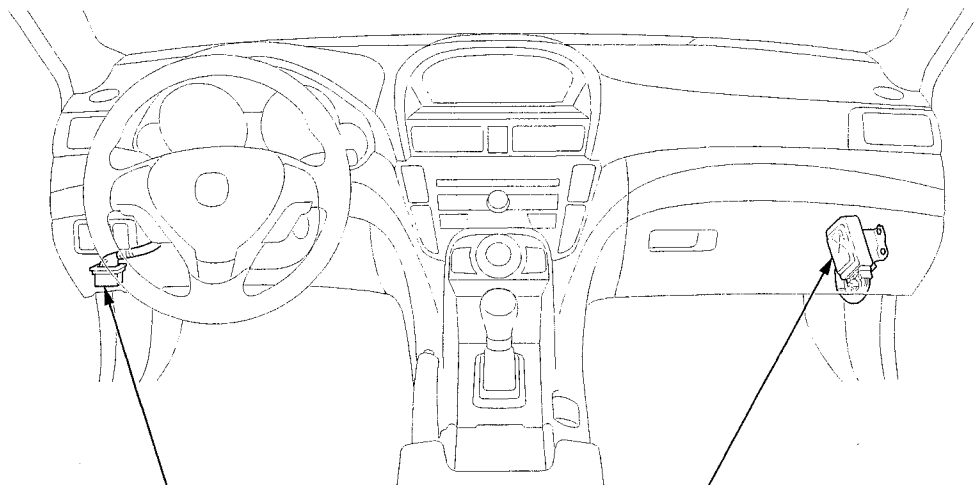


STEERING GEARBOX

Removal and Installation, page 17-63

Rack End Removal and Installation, page 17-79

Rack Guide Removal/Installation, page 17-83



DATA LINK CONNECTOR (DLC)

EPS CONTROL UNIT

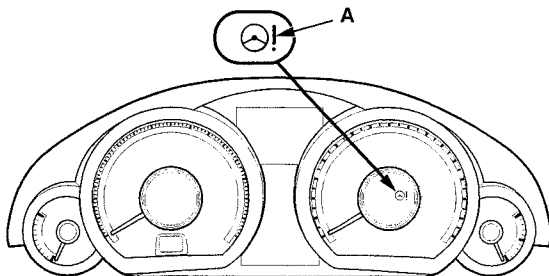
Removal/Installation, page 17-83



General Troubleshooting Information

EPS Indicator

Under normal conditions, the EPS indicator (A) comes on when the ignition switch is turned to ON (II), or press the engine start/stop button to select the ON mode, then goes off after the engine is started. This indicates that the LED and its circuit are operating correctly. If there is a failure in the system after the engine is started, the EPS indicator will stay on, and the power assist is turned off or restricted.



When the EPS indicator comes on, the control unit stores the DTC. In this case, the control unit will not activate the EPS system after the engine starts again, but it keeps the EPS indicator on.

When DTC 51-01, 51-02 or 51-06 is stored in the control unit, the EPS indicator will stay on until the DTC is erased. When a problem is detected and the EPS indicator comes on, there are cases when the indicator stays on until the ignition switch is turned to LOCK (0), or press the engine start/stop button to select the OFF mode, and cases when the indicator goes off automatically when the system returns to normal. Even though the system is operating normally, the EPS indicator will come on under some conditions with the vehicle stopped and the engine at high rpm with constant input from the steering wheel.

To determine the actual cause of the problem, question the client about the conditions during which the problem occurred, taking the above conditions into consideration.

Diagnostic Trouble Code (DTC)

- If the CPU cannot be activated, or it fails, the EPS indicator comes on, but the DTC is not stored.
- The memory can hold any number of DTCs. However, when the same DTC is detected more than once, the most recent DTC is written over the prior DTC, therefore only one occurrence is stored.
- The lowest DTC is indicated first. The DTCs are indicated in ascending order, not in the order that they occurred.
- The DTCs are stored in the EEPROM (non-volatile memory) therefore the stored DTCs cannot be erased by disconnecting the battery. Do the specified procedures to clear the DTCs.

(cont'd)

EPS Components

General Troubleshooting Information (cont'd)

Self-diagnosis

Self-diagnosis can be classified into three categories:

- Initial diagnosis: Done right after the engine starts and until the EPS indicator goes off.
- Regular diagnosis: Done right after the initial diagnosis until the ignition switch is turned to LOCK (0), or press the engine start/stop button to select the OFF mode.
- Steering diagnosis: Done during regular diagnosis while turning the steering wheel.

The EPS control unit does these functions when a problem is detected by self-diagnosis:

1. Turns on the EPS indicator.
2. Stores the DTC.
3. Stops power assist and manual steering operation resumes.

NOTE: For DTCs 11-01, 11-02, 12-01, 21-01, 21-02, 22-01, 35-04, 36-02, and 37-01 the EPS indicator will go off automatically, and the system returns to normal.

Restriction on Power Assist Operation

Repeated extreme steering force, such as turning the steering wheel continuously back-and-forth with the vehicle stopped, causes an increase in electrical current draw by the EPS motor. The increase of electric current causes the EPS motor to heat up. Because this heat adversely affects the system, the control unit monitors the electric current draw of the EPS motor.

When the control unit detects heat build-up in the EPS motor, it reduces the electric current to the EPS motor gradually to protect the system, and it restricts the power assist operation. The EPS indicator does not come on during this function.

When steering torque is not applied to the steering wheel, or when the ignition is turned to LOCK (0), or press the engine start/stop button to select the OFF mode and the EPS motor cools, the control unit will restore the power assist gradually until it's fully restored (after about 8 minutes).

Torque Sensor Neutral Position

The EPS control unit stores the torque sensor neutral position in the EEPROM. The torque sensor neutral position must be memorized whenever the gearbox or the EPS control unit is replaced.

NOTE: The torque sensor neutral position is not affected when erasing the DTCs.

How to Troubleshoot DTCs

The troubleshooting procedures assume that the cause of the problem is still present and the EPS indicator is still on. Following the procedure when the EPS indicator does not come on can result in incorrect diagnosis.

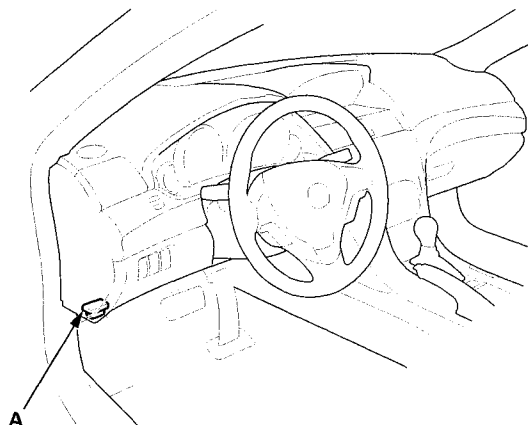
1. Question the client about the conditions when the problem occurred, and try to reproduce the same conditions for troubleshooting. Find out when the EPS indicator came on, such as while turning, after turning, when the vehicle was at a certain speed, etc.
2. When the EPS indicator does not come on during the test-drive, but troubleshooting is done based on the DTC, check for loose connectors, poor terminal contact, etc., in the affected circuit before you start troubleshooting.
3. After troubleshooting, clear the DTC and test-drive the vehicle. Be sure the EPS indicator does not come on.



How to Use the HDS (Honda Diagnostic System)

NOTE: Make sure the battery is in good condition and fully charged.

1. If the system indicators stay on, connect the HDS to the data link connector (DLC) (A) located under the driver's side of the dashboard.



2. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
3. Make sure the HDS communicates with the vehicle and the EPS control unit. If it doesn't, troubleshoot the DLC circuit (see page 11-258).
4. Check the diagnostic trouble code (DTC) and note it. Then refer to the indicated DTC's troubleshooting, and do the appropriate troubleshooting procedure.

NOTE:

- The HDS reads the DTC, the current data, and other system data.
- For specific operations, refer to the Help menu that came with the HDS.

How to Retrieve DTCs

1. With the ignition switch in LOCK (0), or the engine start/stop button in select the OFF mode, connect the HDS to the data link connector (DLC) under the driver's side of the dashboard.
2. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
3. Make sure the HDS communicates with the vehicle and the EPS control unit. If it doesn't, troubleshoot the DLC circuit (see page 11-258).
4. Follow the prompts on the HDS to display the DTC(s) on the screen. After determining the DTC, refer to the DTC troubleshooting. Do the all systems DTC check, and troubleshoot any powertrain DTCs first.
5. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.

How to Clear DTCs

1. With the ignition switch in LOCK (0), or the engine start/stop button in select the OFF mode, connect the HDS to the data link connector (DLC) under the driver's side of the dashboard.
2. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
3. Make sure the HDS communicates with the vehicle and the EPS control unit. If it doesn't, troubleshoot the DLC circuit (see page 11-258).
4. Clear the DTC(s) by following the screen prompts on the HDS.
5. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.

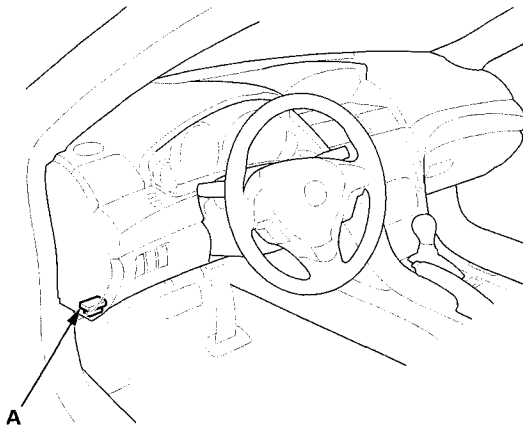
EPS Components

Memorizing the Torque Sensor Neutral Position

The torque sensor neutral position must be memorized whenever the steering gearbox or the EPS control unit is replaced. Note that the torque sensor neutral position is not affected when erasing the DTC.

NOTE: The torque sensor is temperature sensitive. When memorizing the torque sensor neutral position, the ambient temperature must be above 68 °F (20 °C).

1. With the ignition switch in LOCK (0) or with the vehicle ignition in the OFF mode, connect the HDS to the data link connector (DLC) (A) located under the driver's side of the dashboard.



2. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
3. Make sure the HDS communicates with the vehicle and the EPS control unit. If it doesn't, troubleshoot the DLC circuit (see page 11-258).
4. From the EPS MENU, select MISCELLANEOUS TEST, then TORQUE SENSOR LEARN, and follow the screen prompts on the HDS.

NOTE: See the HDS Help menu for specific instructions.

5. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.



DTC Troubleshooting Index

DTC	Detection Item	Note
11-01	Low/High IG1-terminal Voltage (Initial Diagnosis)	DTC Troubleshooting (see page 17-37)
11-02	Low/High IG1-terminal Voltage (Regular Diagnosis)	DTC Troubleshooting (see page 17-37)
12-01	Low/High VBU Voltage (Regular Diagnosis)	DTC Troubleshooting (see page 17-38)
21-01	Excessive Change of the Vehicle Speed Signal (Regular Diagnosis)	DTC Troubleshooting (see page 17-39)
21-02	Comparison between the Vehicle Speed and the Engine Speed Signal (Regular Diagnosis)	DTC Troubleshooting (see page 17-39)
22-01	Engine Speed Signal (Initial Diagnosis)	DTC Troubleshooting (see page 17-40)
31-01	Torque Sensor Neutral Position Not Memorized (Initial Diagnosis)	DTC Troubleshooting (see page 17-42)
32-01	EPS Control Unit Internal Circuit (Current Sensor) (Initial Diagnosis)	DTC Troubleshooting (see page 17-42)
32-02	EPS Control Unit Internal Circuit (Current Sensor) (Regular Diagnosis)	DTC Troubleshooting (see page 17-42)
32-07	EPS Control Unit Internal Circuit (Current Sensor) (Steering Diagnosis)	DTC Troubleshooting (see page 17-43)
32-08	Current Sensor (Regular Diagnosis)	DTC Troubleshooting (see page 17-43)
32-09	Current Sensor (Initial Diagnosis)	DTC Troubleshooting (see page 17-43)
33-01	Lower FET Stuck ON (Initial Diagnosis)	DTC Troubleshooting (see page 17-45)
33-02	Upper FET Stuck ON (Initial Diagnosis)	DTC Troubleshooting (see page 17-46)
33-06	Lower FET Stuck ON (Regular Diagnosis)	DTC Troubleshooting (see page 17-45)
33-07	Upper FET Stuck ON (Regular Diagnosis)	DTC Troubleshooting (see page 17-46)
34-01	Power Relay Stuck ON (Ignition Switch is in LOCK (0))	DTC Troubleshooting (see page 17-48)
34-02	Fail-safe Relay Stuck ON (Initial Diagnosis)	DTC Troubleshooting (see page 17-48)

NOTE:

- Initial Diagnosis: Done right after the engine starts and until the EPS indicator goes off.
- Regular Diagnosis: Done right after the initial diagnosis until the ignition switch is turned to LOCK (0), or press the engine start/stop button to select the OFF mode.
- Steering Diagnosis: Done during regular diagnosis while turning the steering wheel.

(cont'd)

EPS Components

DTC Troubleshooting Index (cont'd)

DTC	Detection Item	Note
35-01	EPS Control Unit Internal Circuit (CPU) (Initial Diagnosis/Regular Diagnosis)	DTC Troubleshooting (see page 17-42)
35-02	EPS Control Unit Internal Circuit (EEPROM) (Initial Diagnosis)	DTC Troubleshooting (see page 17-42)
35-04	EPS Control Unit Internal Circuit (CPU Communication) (Regular Diagnosis)	DTC Troubleshooting (see page 17-42)
35-05	EPS Control Unit Internal Circuit (EPS Motor/EPS CPU) (Initial Diagnosis)	DTC Troubleshooting (see page 17-49)
35-07	EPS Control Unit Internal Circuit (INHL/INHR Ports) (Initial Diagnosis/Regular Diagnosis)	DTC Troubleshooting (see page 17-42)
36-02	EPS Control Unit Internal Circuit (INH Output Circuit) (Initial Diagnosis)	DTC Troubleshooting (see page 17-42)
37-01	EPS Control Unit Internal Circuit (Step-up Circuit) (Initial Diagnosis)	DTC Troubleshooting (see page 17-42)
51-01	Low/High Voltage for the Torque Sensor (VT1 and VT2) (Regular Diagnosis)	DTC Troubleshooting (see page 17-50)
51-02	Torque Sensor (VT3 Differential-amplification Function) (Regular Diagnosis)	DTC Troubleshooting (see page 17-52)
51-03	Torque Sensor (VT1, VT2 Rapid Change) (Regular Diagnosis)	DTC Troubleshooting (see page 17-52)
51-06	Torque Sensor (VT1, VT2 Average) (Regular Diagnosis)	DTC Troubleshooting (see page 17-52)
51-07	Torque Sensor (VT1, VT2 Initial Check) (Initial Diagnosis)	DTC Troubleshooting (see page 17-52)
61-04	Open/Short in the EPS Motor Harness (Steering Diagnosis)	DTC Troubleshooting (see page 17-54)
71-01	EPS Motor Angle Sensor (SIN/COS Signals) (Steering Diagnosis)	DTC Troubleshooting (see page 17-56)
71-02	EPS Motor Angle Sensor (Neutral Position Learning of SIN/COS) (Initial Diagnosis)	DTC Troubleshooting (see page 17-56)
71-03	EPS Motor Angle Sensor (SIN/COS Signals) (Steering Diagnosis)	DTC Troubleshooting (see page 17-56)
71-04	EPS Motor Angle Sensor (Check Signals) (Regular Diagnosis)	DTC Troubleshooting (see page 17-59)

NOTE:

- Initial Diagnosis: Done right after the engine starts and until the EPS indicator goes off.
- Regular Diagnosis: Done right after the initial diagnosis until the ignition switch is turned to LOCK (0), or press the engine start/stop button to select the OFF mode.
- Steering Diagnosis: Done during regular diagnosis while turning the steering wheel.



Symptom Troubleshooting Index

Symptom	Diagnostic procedure	Also check for
HDS does not communicate with the EPS control unit or the vehicle	Troubleshoot the DLC circuit (see page 11-258)	
EPS indicator does not come on	Symptom Troubleshooting (see page 17-60)	
EPS indicator does not go off, and no DTCs are stored	Symptom Troubleshooting (see page 17-61)	
EPS indicator is not on, no DTCs are stored, but there is no power assist or power assist is reduced	1. Check the EPS motor power wires between the EPS control unit and the EPS motor for a short to body ground. Repair as needed. 2. If the EPS motor power wires are OK, replace the steering gearbox (short in the EPS motor) (see page 17-63). 3. Check the power and body ground connections at the EPS control unit.	

EPS Components

System Description

EPS Control Unit Inputs and Outputs for Connector A (2P) (Connector Disconnected)



Wire side of female terminals

Terminal number	Wire color	Terminal sign	Description	Signal
1	BLK	PG (Power ground)	Ground for the actuator EPS motor	Continuity to ground
2	WHT	+ B (Battery positive)	Power source for the actuator EPS motor	Battery voltage (about 12 V) at all times

EPS Control Unit Inputs and Outputs for Connector B (2P) (Connector Disconnected)



Wire side of female terminals

Terminal number	Wire color	Terminal sign	Description	Signal
1	WHT	MW	Drives the actuator EPS motor	———

EPS Control Unit Inputs and Outputs for Connector C (2P) (Connector Disconnected)

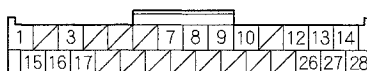


Wire side of female terminals

Terminal number	Wire color	Terminal sign	Description	Signal
1	RED	MU	Drives the actuator EPS motor	———
2	BLK	MV	Drives the actuator EPS motor	———



EPS Control Unit Inputs and Outputs for Connector D (28P) (Connector Disconnected)



Wire side of female terminals

Terminal number	Wire color	Terminal sign	Description	Signal
1	WHT	CAN H (CAN-HI)	CAN communication circuit	With ignition switch ON (II): pulses (2.5-3.5 V)
3	BLU	NEP (Engine speed pulse)	Detects tachometer signal	With engine running: pulses (0-12 V)
7	ORN	SCS (Service check signal)	Detects service check connector signal	With service check signal short using the HDS: about 0 V With service check signal short open: about 5 V
8	BLK	VS2 (Voltage sensor 2)	Detects torque sensor signal	With ignition switch ON (II): pulses (0-5 V)
9	BLK	PVF (Voltage fade)	Drives the torque sensor	With ignition switch ON (II): pulses (0-5 V)
10	WHT	VS1 (Voltage sensor 1)	Detects torque sensor signal	With ignition switch ON (II): pulses (0-5 V)
12	PNK	S1 (Signal 1)	Detects EPS motor angle sensor signal	With engine running: pulses (0-5 V)
13	BLU	R1 (EPS Motor angle sensor 1)	Detects EPS motor angle sensor signal	With engine running: pulses (0-5 V)
14	BRN	S2 (Signal 2)	Detects EPS motor angle sensor signal	With engine running: pulses (0-5 V)
15	BLK	CAN L (CAN-LO)	CAN communication circuit	With ignition switch ON (II): pulses (1.5-2.5 V)
16	PUR	IG1 (Ignition 1)	Power source for activating the system	With ignition switch ON (II): battery voltage (about 12 V)
17	LT BLU	K-LINE (Data link connector)	Communicates with HDS	With ignition switch ON (II) and the HDS disconnected: pulses or battery voltage (about 12 V)
26	BRN	S3 (Signal 3)	Detects EPS motor angle sensor signal	With engine running: pulses (0-5 V)
27	PNK	R2 (EPS Motor angle sensor 2)	Detects EPS motor angle sensor signal	With engine running: pulses (0-5 V)
28	BLU	S4 (Signal 4)	Detects EPS motor angle sensor signal	With engine running: pulses (0-5 V)

(cont'd)

EPS Components

System Description (cont'd)

System Outline

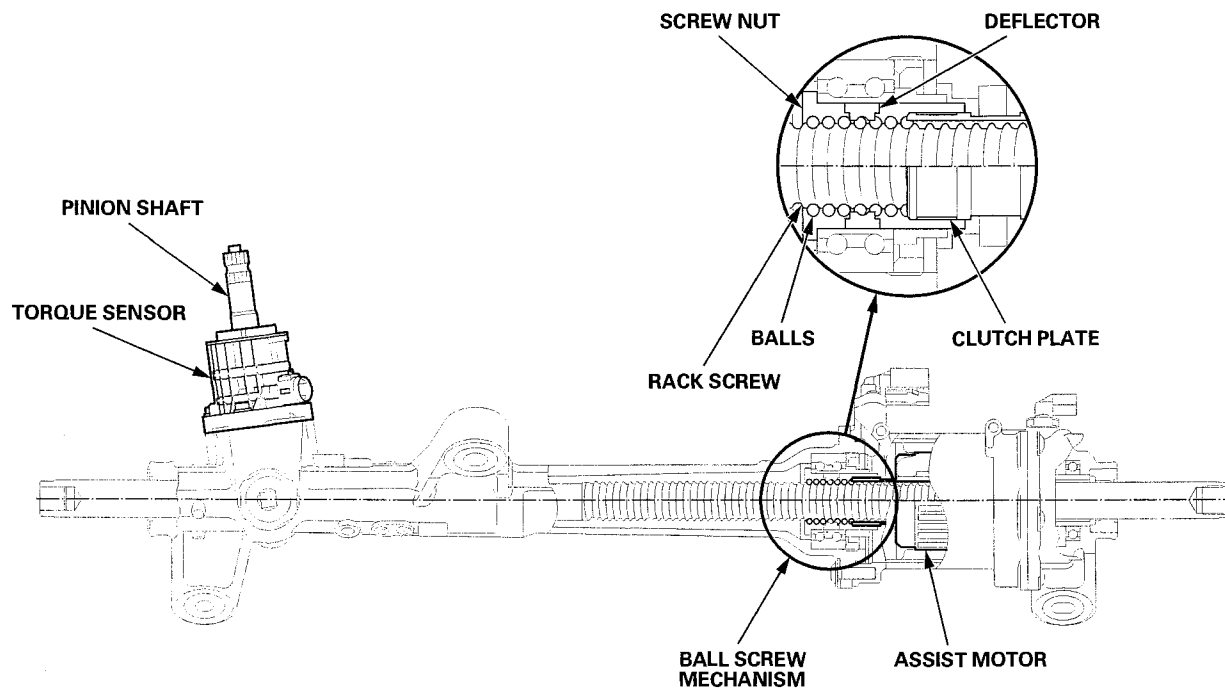
The TL is equipped with electric power steering (EPS). The driver's steering force is assisted by an electric motor at the steering gearbox. Compared to a hydraulic assist power steering system, the EPS is more efficient because it does not use engine power to drive an oil pump to generate hydraulic pressure.

The system uses an EPS control unit to monitor and control the EPS motor's assisting force to match driving conditions.

- Low vehicle speeds: High power assist (for easy handling)
- High speed driving: Low power assist (for stable handling)
- Low speed to high speed driving: Change smoothly from high assist to low assist

System Operation

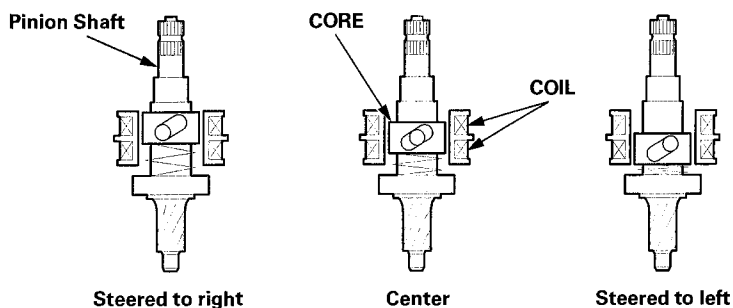
The steering force from the steering wheel is sent to the pinion shaft. The torque sensor measures the difference between the force applied to the pinion shaft and the resistance to turning the wheels due to road friction. The torque sensor converts steering torque input and its direction into voltage signals that are sent to the EPS control unit. The EPS control unit uses these signals along with the engine and the vehicle speed signals from the ECM/PCM to calculate the direction and the amount of assist needed. The EPS control unit then sends out the appropriate command to the EPS motor. The EPS motor transmits its power through a ball screw mechanism to push the steering rack right or left.





Torque Sensor Operation

When the steering wheel is turned, inductance is changed by the movement of the core within the Torque Sensor. The amount this voltage changes varies with the amount of movement, and direction of the core, then is amplified by the interface circuitry of the sensor coil and output to the EPS control unit as a steering signal.



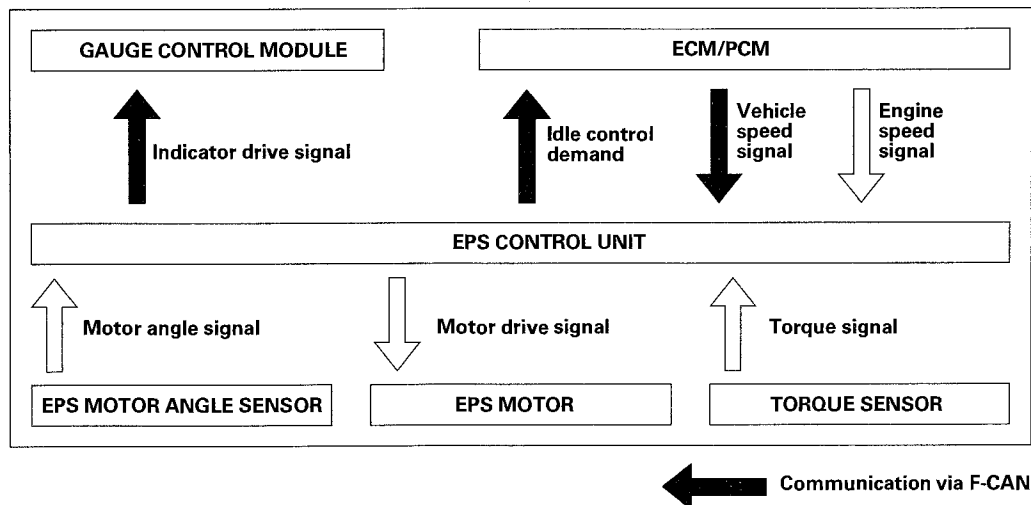
EPS Control Unit Operation

The EPS control unit controls the EPS motor by these signals:

- Vehicle speed signal (for ECM/PCM)
- Engine speed signal (for ECM/PCM)
- Torque sensor signal

At idle or low vehicle speeds, the EPS control unit sends a signal to the ECM/PCM to increase the engine idle speed to prevent the engine from stalling.

If the EPS control unit detects a failure in the system, it stores a DTC and sends a signal to the gauge control.



(cont'd)

EPS Components

System Description (cont'd)

Power relay (built into the EPS control unit)

When the system is operating normally, the CPU turns the power relay on, and the power is provided to the FET bridge. If the CPU detects a failure in the system which has the demand to shut down the system, the CPU turns the power relay off.

Fail-safe relay (built into the EPS control unit)

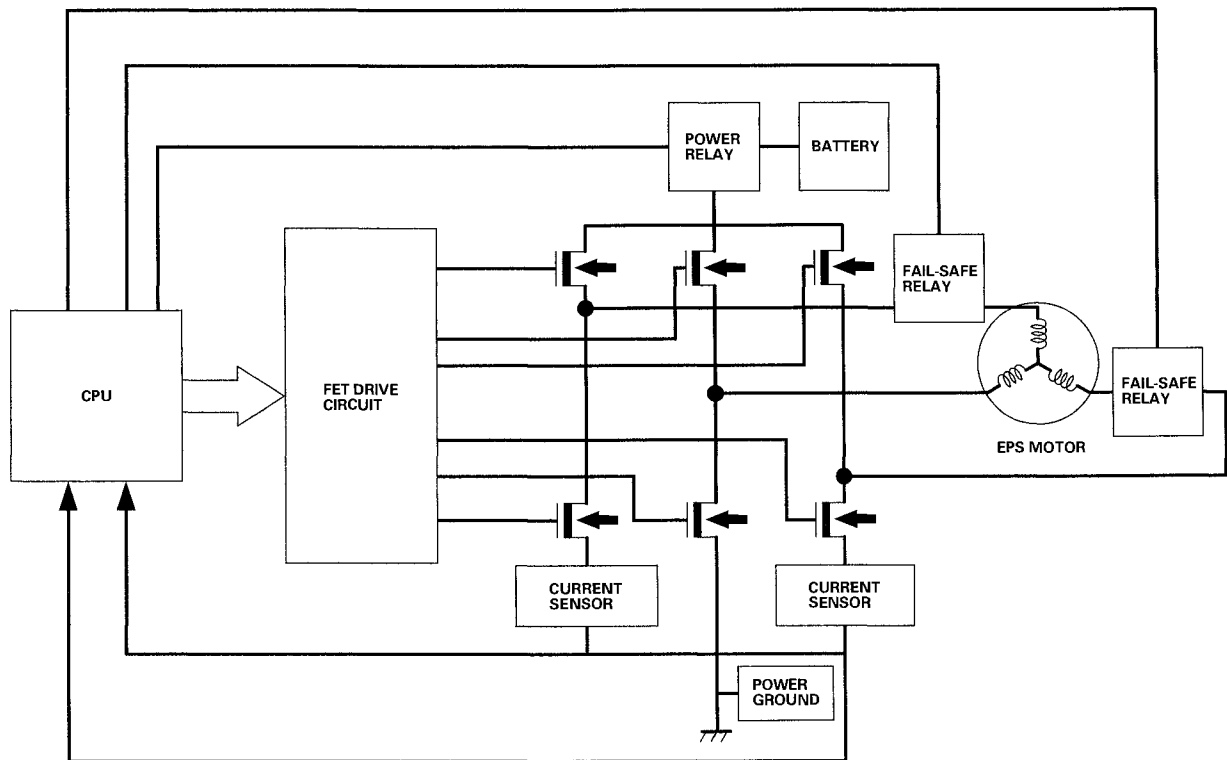
When the system is operating normally, the CPU turns the fail-safe relay on and power is provided to the EPS motor. If the CPU detects a failure in the system, the CPU turns the fail-safe relay off at the same time it turns the power relay off.

Current sensor

An electric current detection circuit monitors the current of each phase circuit to the motor and sends a signal to the CPU.

EPS motor operation

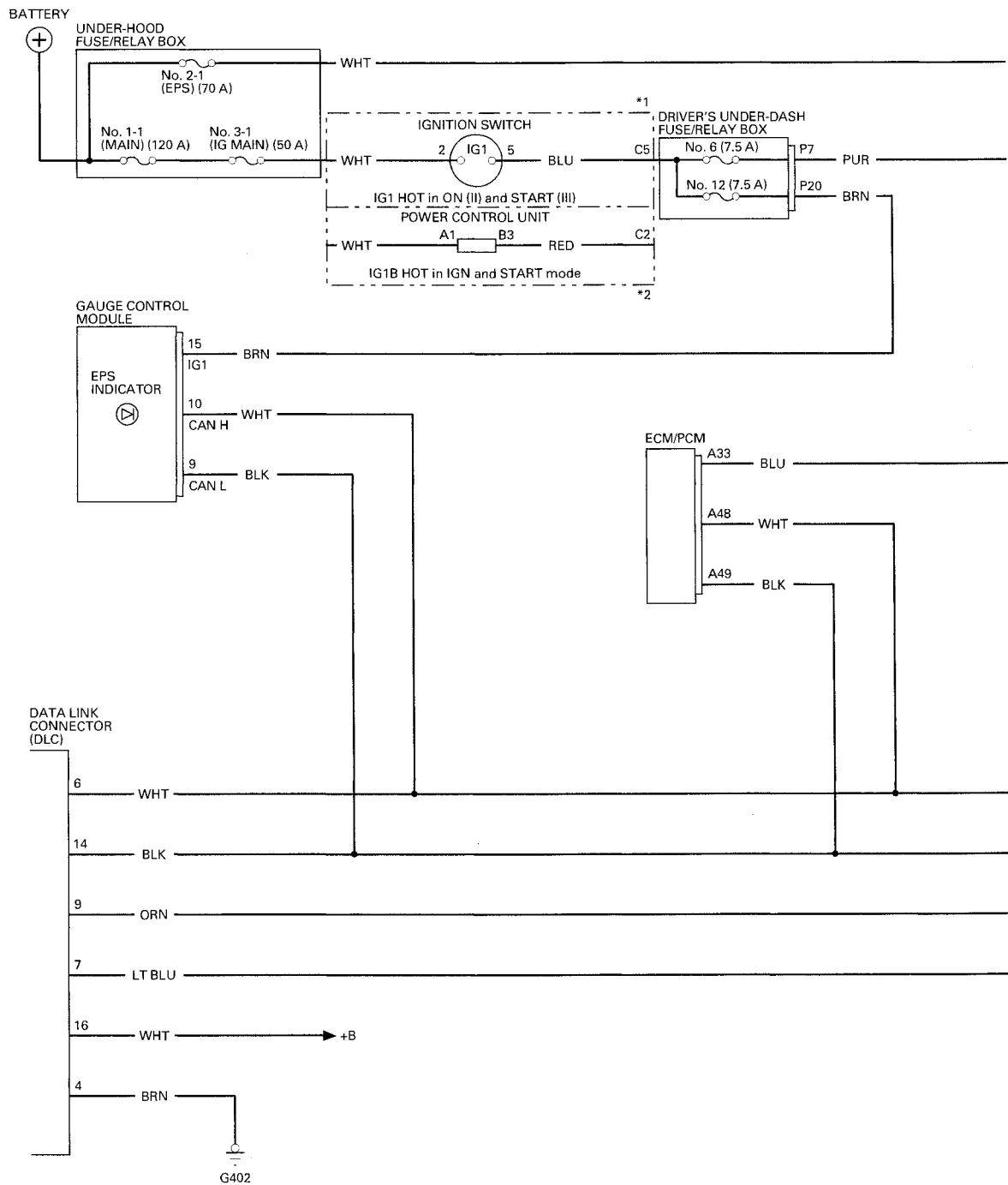
The EPS uses an efficient brushless DC type motor. The EPS motor control circuit is composed of a system control CPU, FET drive circuit, H type FET bridge, power relay, fail-safe relay, electric current sensor, and the EPS motor. From the input sensor signals, the CPU calculates and outputs the appropriate three-phase current for the FET drive circuit.

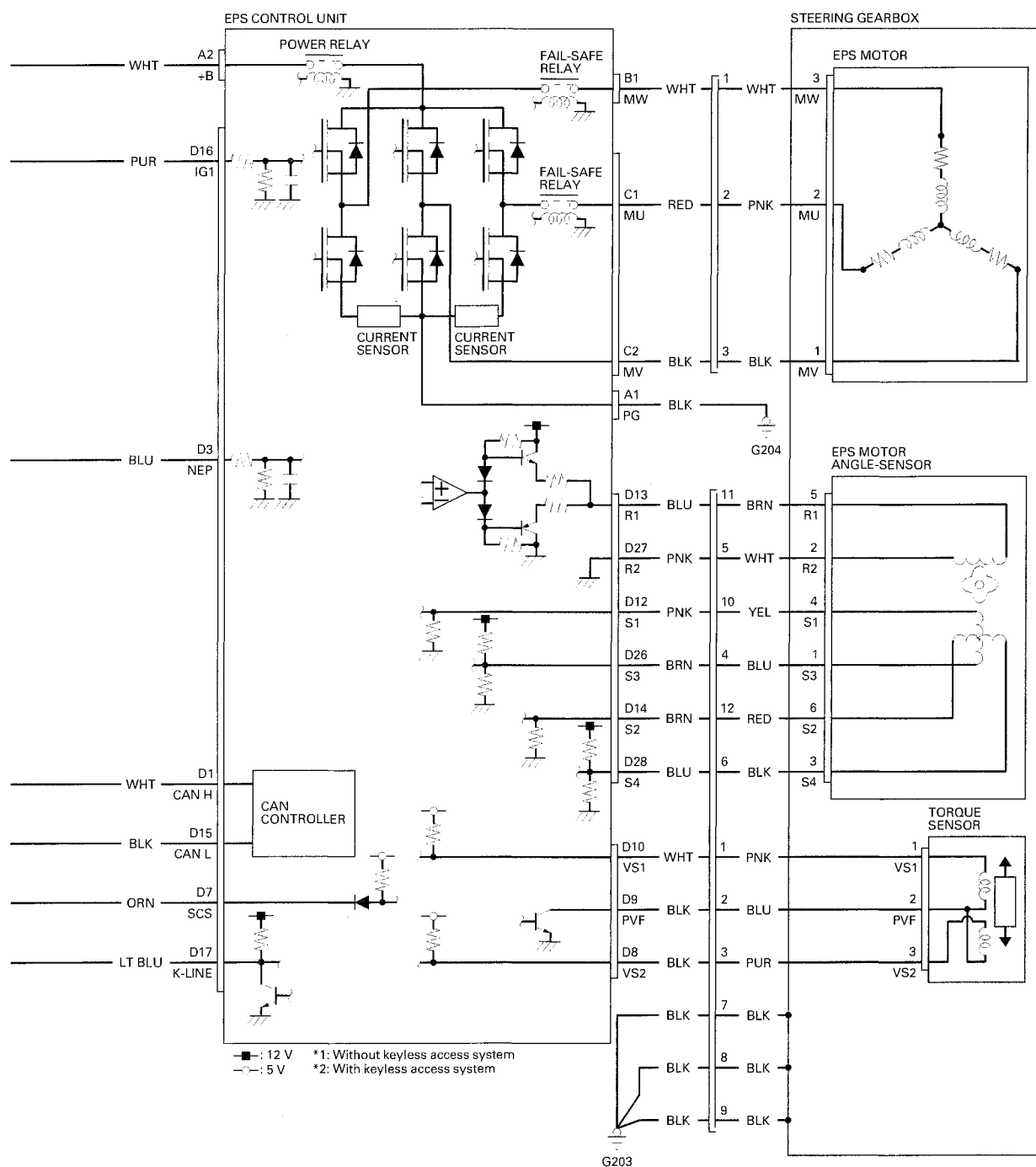




EPS Components

Circuit Diagram





(cont'd)

EPS CONTROL UNIT
CONNECTOR A (2P)



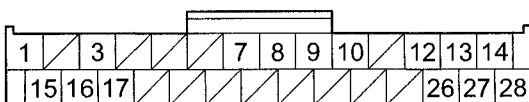
EPS CONTROL UNIT
CONNECTOR B (2P)



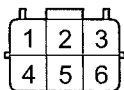
EPS CONTROL UNIT
CONNECTOR C (2P)



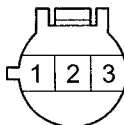
EPS CONTROL UNIT
CONNECTOR D (28P)



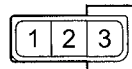
EPS MOTOR-ANGLE SENSOR
6P CONNECTOR



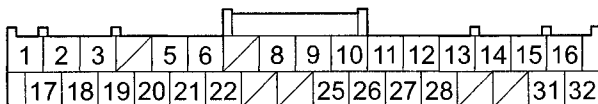
TORQUE SENSOR
3P CONNECTOR



EPS MOTOR 3P
CONNECTOR

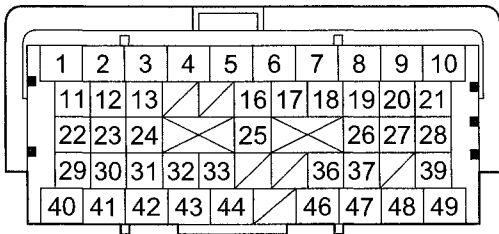


GAUGE CONTROL MODULE 32P CONNECTOR

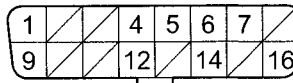


Wire side of female terminals

ECM/PCM CONNECTOR A (49P)



DATA LINK CONNECTOR (DLC)



Terminal side of female terminals



DTC Troubleshooting

DTC 11-01: Low/High IG1-terminal Voltage (Initial Diagnosis)

DTC 11-02: Low/High IG1-terminal Voltage (Regular Diagnosis)

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
4. Start the engine.
5. Wait at least 60 seconds.
6. Check for DTCs with the HDS.

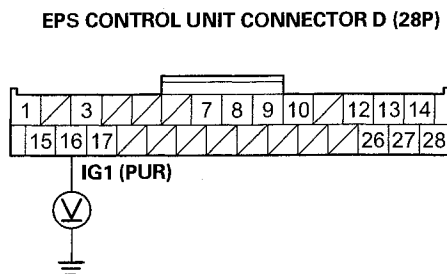
Is DTC 11-01 indicated?

YES—Go to step 7.

NO—Check for loose terminals or poor connections. If the connections are good, the system is OK at this time. ■

7. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
8. Disconnect EPS control unit connector D (28P).
9. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
10. Wait at least 60 seconds.

11. Measure the voltage between EPS control unit connector D (28P) terminal No. 16 and body ground.



Wire side of female terminals

Is there battery voltage?

YES—Check for loose terminals in the EPS control unit connectors and repair if necessary. If no poor connections are found, replace the EPS control unit (see page 17-83). ■

NO—If there is no voltage, or the voltage is lower than specified, repair an open or high resistance in the wire between the No. 6 (7.5 A) fuse in the driver's under-dash fuse/relay box and EPS control unit. If the wire checks OK, check the battery (see page 22-84), and troubleshoot the alternator regulator circuit (see page 4-41). ■

EPS Components

DTC Troubleshooting (cont'd)

DTC 12-01: Low/High VBU Voltage (Regular Diagnosis)

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
2. Check the BATTERY in the EPS DATA LIST with the HDS.

Is there battery voltage?

YES—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the EPS control unit.■

NO—Go to step 3.

3. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
4. Check the No. 2-1 (70 A) fuse in the under-hood fuse/relay box.

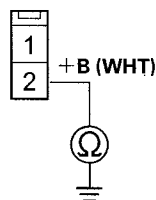
Is the fuse blown?

YES—Go to step 5.

NO—Reinstall the checked fuse, then go to step 13.

5. Disconnect EPS control unit connector A (2P).
6. Check for continuity between EPS control unit connector A (2P) terminal No. 2 and body ground.

EPS CONTROL UNIT CONNECTOR A (2P)



Wire side of female terminals

Is there continuity?

YES—Repair a short to body ground in the wire between the EPS control unit and the No. 2-1 (70 A) fuse in the under-hood fuse/relay box.■

NO—Install a new No. 2-1 (70 A) fuse in the under-hood fuse/relay box, then go to step 7.

7. Reconnect EPS control unit connector A (2P).
8. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.

9. Clear the DTC with the HDS.

10. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.

11. Start the engine.

12. Check for DTCs with the HDS.

Is DTC 12-01 indicated?

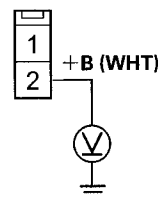
YES—Replace the EPS control unit (see page 17-83).■

NO—Troubleshooting is complete.■

13. Disconnect EPS control unit connector A (2P).

14. Measure the voltage between EPS control unit connector A (2P) terminal No. 2 and body ground.

EPS CONTROL UNIT CONNECTOR A (2P)



Wire side of female terminals

Is there battery voltage?

YES—Check for loose terminals in the EPS control unit connectors, and repair if necessary. If no poor connections are found, replace the EPS control unit (see page 17-83).■

NO—Repair an open in the wire between the EPS control unit and the No. 2-1 (70 A) fuse in the under-hood fuse/relay box.■



DTC 21-01: Excessive Change of the Vehicle Speed Signal (Regular Diagnosis)

DTC 21-02: Comparison between the Vehicle Speed and the Engine Speed Signal (Regular Diagnosis)

NOTE:

- If the MIL indicator is on, troubleshoot the fuel and emissions systems first.
 - Even though the system is operating normally, the EPS indicator will come on caused by the detecting condition of DTC 21-01 or DTC 21-02 when you raise the engine speed with the vehicle stopped.
 - Clear the DTC related to the ABS or VSA system.
1. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
 2. Raise and support the vehicle (see page 1-10), and allow all wheels to rotate freely.
 3. Connect the HDS to the data link connector (DLC).
 4. Turn off the VSA function by using the VSA OFF switch.
 5. Start the engine, then run the vehicle in the 4th (M/T), or D position (A/T).
 6. Check the VEHICLE SPEED in the EPS DATA LIST with the HDS.

Is the vehicle speed indicated?

YES—The system is OK at this time. ■

NO—Go to step 7.

7. Check for DTCs in the fuel and emissions systems (M/T) or A/T system (A/T) with the HDS.

Is DTC P0720 (M/T), P0721 (A/T), P0722 (A/T), or P0723 (A/T) indicated?

YES—Troubleshoot the indicated DTC(s). ■

NO—Go to step 8.

8. Start the engine, and check the tachometer.

Is the tachometer working correctly?

YES—Go to step 10.

NO—Go to step 9.

9. Check for DTCs in the gauge control module with the HDS.

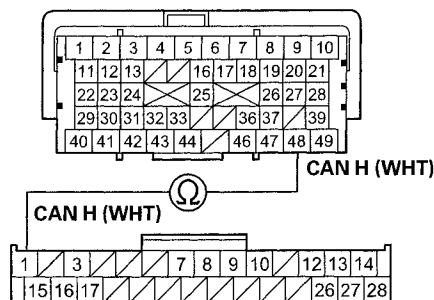
Are there any DTCs indicated?

YES—Troubleshooting the indicated DTC(s). ■

NO—Update the ECM/PCM if it does not have the latest software (see page 11-281), or substitute a known-good ECM/PCM (see page 11-7), then go to step 1 and recheck. If the ECM/PCM was updated and DTCs are not indicated, troubleshooting is complete. If the ECM/PCM was substituted and DTCs are not indicated, replace the original ECM/PCM (see page 11-282). ■

10. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
11. Short the SCS line with the HDS.
12. Disconnect EPS control unit connector D (28P) and ECM/PCM connector A (49P).
13. Check for continuity between EPS control unit connector D (28P) terminal No. 1 and ECM/PCM connector A (49P) terminal No. 48.

ECM/PCM CONNECTOR A (49P)
Terminal side of female terminals



EPS CONTROL UNIT CONNECTOR D (28P)
Wire side of female terminals

Is there continuity?

YES—Go to step 14.

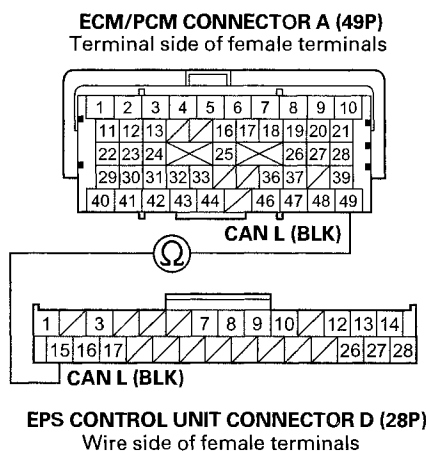
NO—Repair an open in the wire between the EPS control unit and the ECM/PCM. ■

(cont'd)

EPS Components

DTC Troubleshooting (cont'd)

14. Check for continuity between EPS control unit connector D (28P) terminal No. 15 and ECM/PCM connector A (49P) terminal No. 49.



Is there continuity?

YES—Replace the EPS control unit (see page 17-83). ■

NO—Repair an open in the wire between the EPS control unit and the ECM/PCM. ■

DTC 22-01: Engine Speed Signal (Initial Diagnosis)

NOTE: If the MIL indicator is on, troubleshoot the fuel and emissions systems first.

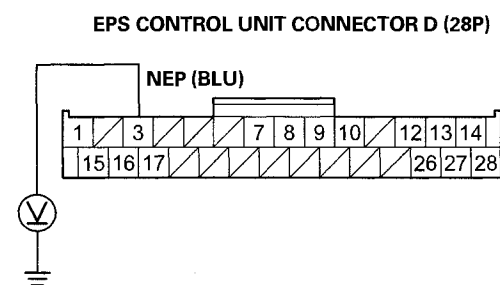
1. Start the engine.
2. Check the ENGINE SPEED in the EPS DATA LIST with the HDS.

Is there 0 rpm at idle?

YES—Go to step 3.

NO—The system is OK at this time. ■

3. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
4. Disconnect EPS control unit connector D (28P).
5. Start the engine.
6. Measure the voltage between EPS control unit connector D (28P) terminal No. 3 and body ground.



Wire side of female terminals

Is there any voltage?

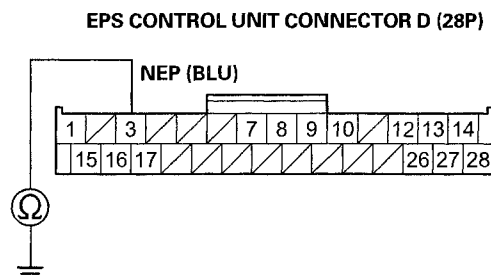
YES—Check for loose terminals in the EPS control unit connectors, and repair if necessary. If no poor connections are found, replace the EPS control unit (see page 17-83). ■

NO—Go to step 7.

7. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
8. Short the SCS line with the HDS.
9. Disconnect ECM/PCM connector A (49P).



10. Check for continuity between EPS control unit connector D (28P) terminal No. 3 and body ground.



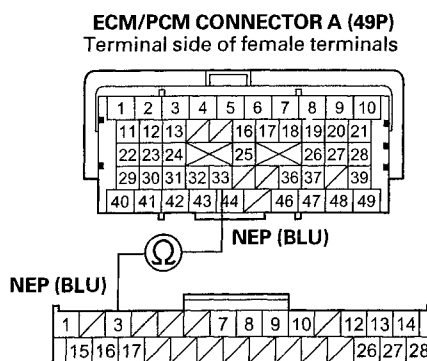
Wire side of female terminals

Is there continuity?

YES—Repair a short to body ground in the wire between the EPS control unit and the ECM/PCM. ■

NO—Go to step 11.

11. Check for continuity between EPS control unit connector D (28P) terminal No. 3 and ECM/PCM connector A (49P) terminal No. 33.



Is there continuity?

YES—Update the ECM/PCM if it does not have the latest software (see page 11-281), or substitute a known-good ECM/PCM (see page 11-7), then go to step 1 and recheck. If the ECM/PCM was updated and DTCs are not indicated, troubleshooting is complete. If the ECM/PCM was substituted and DTCs are not indicated, replace the original ECM/PCM (see page 11-282). ■

NO—Repair open in the wire between the EPS control unit and the ECM/PCM. ■

EPS Components

DTC Troubleshooting (cont'd)

DTC 31-01: Torque Sensor Neutral Position Not Memorized (Initial Diagnosis)

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
4. Do the memorizing of the torque sensor neutral position (see page 17-24).
5. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
6. Check for DTCs with the HDS.

Is DTC 31-01 indicated?

YES—Replace the EPS control unit (see page 17-83). ■

NO—The system is OK at this time. ■

DTC 32-01: EPS Control Unit Internal Circuit (Current Sensor) (Initial Diagnosis)

DTC 32-02: EPS Control Unit Internal Circuit (Current Sensor) (Regular Diagnosis)

DTC 35-01: EPS Control Unit Internal Circuit (CPU) (Initial Diagnosis/Regular Diagnosis)

DTC 35-02: EPS Control Unit Internal Circuit (EEPROM) (Initial Diagnosis)

DTC 35-04: EPS Control Unit Internal Circuit (CPU Communication) (Regular Diagnosis)

DTC 35-07: EPS Control Unit Internal Circuit (INHL/INHR Ports) (Initial Diagnosis/Regular Diagnosis)

DTC 36-02: EPS Control Unit Internal Circuit (INH Output Circuit) (Initial Diagnosis)

DTC 37-01: EPS Control Unit Internal Circuit (Step-up Circuit) (Initial Diagnosis)

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
4. Start the engine.
5. Check for DTCs with the HDS.

Is DTC 32-01, 32-02, 35-01, 35-02, 35-04, 35-07, 36-02, or 37-01 indicated?

YES—Check for loose terminals in the EPS control unit connectors, and repair if necessary. If no poor connections are found, replace the EPS control unit (see page 17-83). ■

NO—Troubleshoot the indicated DTC. If there are no DTCs, the system is OK at this time. ■



DTC 32-07: EPS Control Unit Internal Circuit (Current Sensor) (Steering Diagnosis)

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
4. Start the engine.
5. Turn the steering wheel to the right or left, and wait 10 seconds or more.
6. Check for DTCs with the HDS.

Is DTC 32-07 indicated?

YES—Check for loose terminals in the EPS control unit connectors, and repair if necessary. If no poor connections are found, replace the EPS control unit (see page 17-83).■

NO—Troubleshoot the indicated DTC. If there are no DTCs, the system is OK at this time.■

DTC 32-08: Current Sensor (Regular Diagnosis)

DTC 32-09: Current Sensor (Initial Diagnosis)

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
4. Start the engine.
5. Turn the steering wheel to the right or left, and wait 10 seconds or more.
6. Check for DTCs with the HDS.

Is DTC 32-08 or 32-09 indicated?

YES—Go to step 7.

NO—Troubleshoot the indicated DTC. If there are no DTCs, the system is OK at this time.■

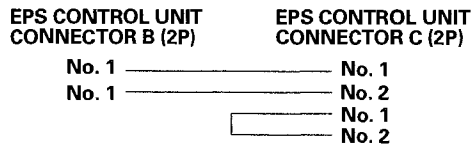
7. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
8. Disconnect EPS control unit connector B (2P) and connector C (2P).

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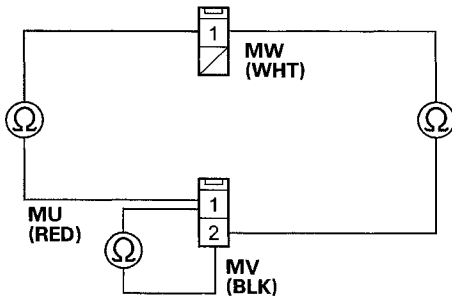
EPS Components

DTC Troubleshooting (cont'd)

9. Check for continuity between the following terminals of EPS control unit connector B (2P) and connector C (2P).



EPS CONTROL UNIT CONNECTOR B (2P)
Wire side of female terminals



EPS CONTROL UNIT CONNECTOR C (2P)
Wire side of female terminals

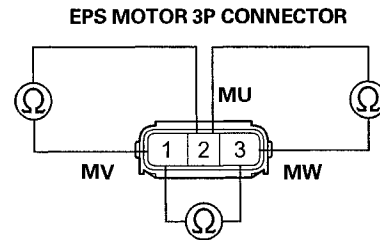
Is there continuity?

YES—Check for loose terminals in the EPS control unit connectors and EPS motor connectors, and repair if necessary. If no poor connections are found, replace the EPS control unit (see page 17-83). ■

NO—Go to step 10.

10. Disconnect the EPS motor 3P connector.

11. On the EPS motor side, check for continuity between the EPS motor 3P connector terminals No. 1 and No. 2, No. 1 and No. 3, and No. 2 and No. 3 individually.



Terminal side of male terminals

Is there continuity?

YES—Repair an open in the wire between the EPS control unit and the EPS motor. ■

NO—Replace the steering gearbox (see page 17-63). The fault is an open in the EPS motor internal circuit. ■



DTC 33-01: Lower FET Stuck ON (Initial Diagnosis)

DTC 33-06: Lower FET Stuck ON (Regular Diagnosis)

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
4. Start the engine.
5. Check for DTCs with the HDS.

Is DTC 33-01 or 33-06 indicated?

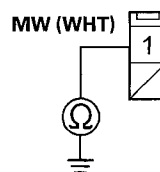
YES—Go to step 6.

NO—Troubleshoot the indicated DTC. If there are no DTCs, the system is OK at this time. ■

6. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
7. Disconnect EPS control unit connector B (2P) and connector C (2P).

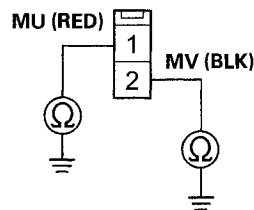
8. Check for continuity between body ground and EPS control unit connector B (2P) terminal No. 1, connector C (2P) terminal No. 1, and connector C (2P) terminal No. 2 individually.

EPS CONTROL UNIT CONNECTOR B (2P)



Wire side of female terminals

EPS CONTROL UNIT CONNECTOR C (2P)



Wire side of female terminals

Is there continuity?

YES—Go to step 9.

NO—Check for loose terminals in the EPS control unit connectors, and repair if necessary. If no poor connections are found, replace the EPS control unit (see page 17-83). ■

9. Disconnect the EPS motor 3P connector.

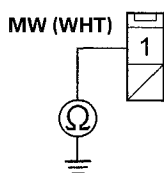
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EPS Components

DTC Troubleshooting (cont'd)

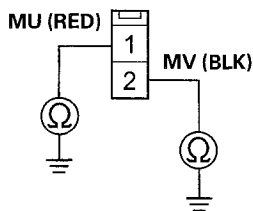
10. Check for continuity between body ground and EPS control unit connector B (2P) terminal No. 1, connector C (2P) terminal No. 1, and connector C (2P) terminal No. 2 individually.

EPS CONTROL UNIT CONNECTOR B (2P)



Wire side of female terminals

EPS CONTROL UNIT CONNECTOR C (2P)



Wire side of female terminals

Is there continuity?

YES—Repair a short to body ground in the wire between the EPS control unit and the EPS motor. ■

NO—Replace the steering gearbox (see page 17-63). The fault is a short in the EPS motor internal circuit. ■

DTC 33-02: Upper FET Stuck ON (Initial Diagnosis)

DTC 33-07: Upper FET Stuck ON (Regular Diagnosis)

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
4. Start the engine.
5. Check for DTCs with the HDS.

Is DTC 33-02 or 33-07 indicated?

YES—Go to step 6.

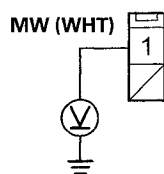
NO—Troubleshoot the indicated DTC. If there are no DTCs, the system is OK at this time. ■

6. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
7. Disconnect EPS control unit connector B (2P) and connector C (2P).
8. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.



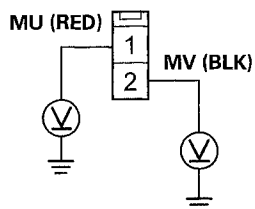
9. Measure the voltage between body ground and EPS control unit connector B (2P) terminal No. 1, connector C (2P) terminal No. 1, and connector C (2P) terminal No. 2 individually.

EPS CONTROL UNIT CONNECTOR B (2P)



Wire side of female terminals

EPS CONTROL UNIT CONNECTOR C (2P)



Wire side of female terminals

Is there battery voltage?

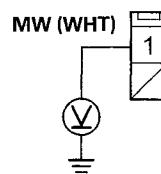
YES—Go to step 10.

NO—Check for loose terminals in the EPS control unit connectors and the EPS motor connectors, and repair if necessary. If no poor connections are found, replace the EPS control unit (see page 17-83). ■

10. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
11. Disconnect the EPS motor 3P connector.
12. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.

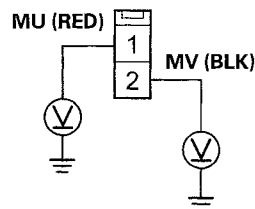
13. Measure the voltage between body ground and EPS control unit connector B (2P) terminal No. 1, connector C (2P) terminal No. 1, and connector C (2P) terminal No. 2 individually.

EPS CONTROL UNIT CONNECTOR B (2P)



Wire side of female terminals

EPS CONTROL UNIT CONNECTOR C (2P)



Wire side of female terminals

Is there battery voltage?

YES—Repair a short to power in the wire between the EPS control unit and the EPS motor. ■

NO—Replace the steering gearbox (see page 17-63). The fault is a short in the EPS motor internal circuit. ■

EPS Components

DTC Troubleshooting (cont'd)

DTC 34-01: Power Relay Stuck ON (Ignition Switch is in LOCK (0))

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
4. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
5. Check for DTCs with the HDS.

Is DTC 34-01 indicated?

YES—Check for loose terminals in the EPS control unit connectors, and repair if necessary. If no poor connections are found, replace the EPS control unit (see page 17-83).■

NO—Troubleshoot the indicated DTC. If there are no DTCs, the system is OK at this time.■

DTC 34-02: Fail-safe Relay Stuck ON (Initial Diagnosis)

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
4. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
5. Check for DTCs with the HDS.

Is DTC 34-02 indicated?

YES—Go to step 6.

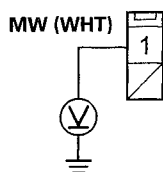
NO—Troubleshoot the indicated DTC. If there are no DTCs, the system is OK at this time.■

6. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
7. Disconnect EPS control unit connector B (2P) and connector C (2P).
8. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.



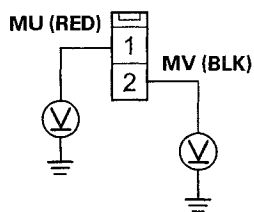
9. Measure the voltage between body ground and EPS control unit connector B (2P) terminal No. 1, connector C (2P) terminal No. 1, and connector C (2P) terminal No. 2 individually.

EPS CONTROL UNIT CONNECTOR B (2P)



Wire side of female terminals

EPS CONTROL UNIT CONNECTOR C (2P)



Wire side of female terminals

Is there battery voltage?

YES—Repair a short to power in the wire between the EPS control unit and the EPS motor.■

NO—Replace the EPS control unit (see page 17-83).■

DTC 35-05: EPS Control Unit Internal Circuit (EPS Motor/EPS CPU) (Initial Diagnosis)

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
4. Start the engine.
5. Wait 10 seconds or more.
6. Check for DTCs with the HDS.

Is DTC 35-05 indicated?

YES—Check for loose terminals in the EPS control unit connectors, and repair if necessary. If no poor connections are found, replace the EPS control unit (see page 17-83).■

NO—Troubleshoot the indicated DTC. If there are no DTCs, the system is OK at this time.■

EPS Components

DTC Troubleshooting (cont'd)

DTC 51-01: Low/High Voltage for the Torque Sensor (VT1 and VT2) (Regular Diagnosis)

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
2. Check the ADVT1 in the EPS DATA LIST with the HDS.

Is the voltage at 1.45—4.10 V?

YES—Go to step 3.

NO—Go to step 4.

3. Check the ADVT2 in the EPS DATA LIST with the HDS.

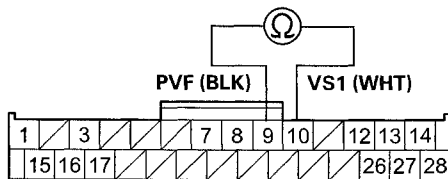
Is the voltage at 1.56—4.28 V?

YES—Check for loose terminals or poor connections. If the connections are good, the system is OK at this time. ■

NO—Go to step 4.

4. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
5. Disconnect EPS control unit connector D (28P).
6. Measure the resistance between EPS control unit connector D (28P) terminals No. 9 and No. 10.

EPS CONTROL UNIT CONNECTOR D (28P)



Wire side of female terminals

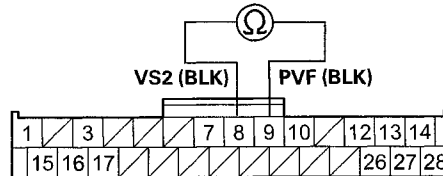
Is the resistance between 12—15 Ω?

YES—Go to step 7.

NO—Go to step 11.

7. Measure the resistance between EPS control unit connector D (28P) terminals No. 8 and No. 9.

EPS CONTROL UNIT CONNECTOR D (28P)



Wire side of female terminals

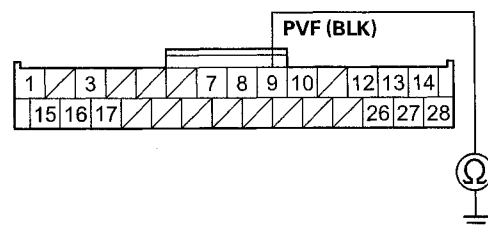
Is the resistance between 12—15 Ω?

YES—Go to step 8.

NO—Go to step 13.

8. Check for continuity between EPS control unit connector D (28P) terminal No. 9 and body ground.

EPS CONTROL UNIT CONNECTOR D (28P)



Wire side of female terminals

Is there continuity?

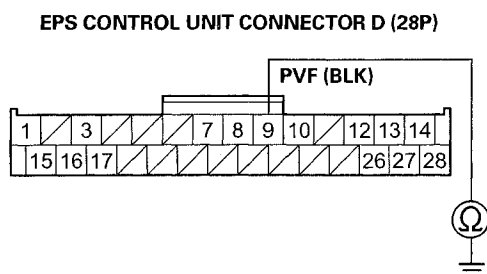
YES—Go to step 9.

NO—Check for loose terminals in the EPS control unit connectors, and repair if necessary. If no poor connections are found, replace the EPS control unit (see page 17-83). ■

9. Disconnect the torque sensor 3P connector from the steering gearbox.



10. Check for continuity between EPS control unit connector D (28P) terminal No. 9 and body ground.



Wire side of female terminals

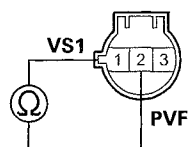
Is there continuity?

YES—Repair a short to body ground in the wire between the torque sensor and the EPS control unit. ■

NO—Replace the steering gearbox (see page 17-63). The fault is a short in the torque sensor internal circuit. ■

11. Disconnect the torque sensor 3P connector from the steering gearbox.
12. On the sensor side, measure the resistance between torque sensor 3P connector terminals No. 1 and No. 2.

TORQUE SENSOR 3P CONNECTOR



Terminal side of male terminals

Is the resistance between 12—15 Ω ?

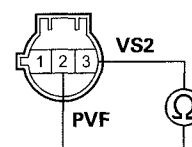
YES—Repair an open or short between the PNK and the BLU wires in the torque sensor circuit between the torque sensor and the EPS control unit. ■

NO—Replace the steering gearbox (see page 17-63). The fault is a short or an open in the torque sensor internal circuit. ■

13. Disconnect the torque sensor 3P connector from the steering gearbox.

14. On the sensor side, measure the resistance between torque sensor 3P connector terminals No. 2 and No. 3.

TORQUE SENSOR 3P CONNECTOR



Terminal side of male terminals

Is the resistance between 12—15 Ω ?

YES—Repair an open or short between the BLU and the PUR wires in the torque sensor circuit between the torque sensor and the EPS control unit. ■

NO—Replace the steering gearbox (see page 17-63). The fault is a short or an open in the torque sensor internal circuit. ■

EPS Components

DTC Troubleshooting (cont'd)

DTC 51-02: Torque Sensor (VT3 Differential -amplification Function) (Regular Diagnosis)

DTC 51-03: Torque Sensor (VT1, VT2 Rapid Change) (Regular Diagnosis)

DTC 51-06: Torque Sensor (VT1, VT2 Average) (Regular Diagnosis)

DTC 51-07: Torque Sensor (VT1, VT2 Initial Check) (Initial Diagnosis)

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS
3. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
4. Start the engine.
5. Check for DTCs with the HDS.

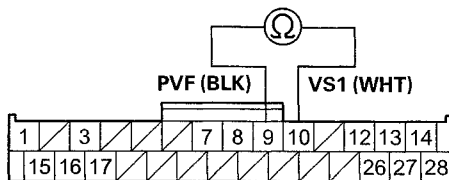
Is DTC 51-02, 51-03, 51-06, or 51-07 indicated?

YES—Go to step 6.

NO—Troubleshoot the indicated DTC. If there are no DTCs, the system is OK at this time. ■

6. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
7. Disconnect EPS control unit connector D (28P).
8. Measure the resistance between EPS control unit connector D (28P) terminals No. 9 and No. 10.

EPS CONTROL UNIT CONNECTOR D (28P)



Wire side of female terminals

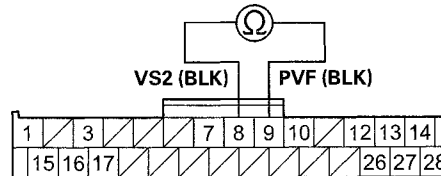
Is the resistance between 12—15 Ω?

YES—Go to step 9.

NO—Go to step 13.

9. Measure the resistance between EPS control unit connector D (28P) terminals No. 8 and No. 9.

EPS CONTROL UNIT CONNECTOR D (28P)



Wire side of female terminals

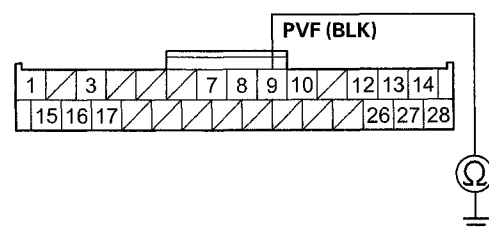
Is the resistance between 12—15 Ω?

YES—Go to step 10.

NO—Go to step 15.

10. Check for continuity between EPS control unit connector D (28P) terminal No. 9 and body ground.

EPS CONTROL UNIT CONNECTOR D (28P)



Wire side of female terminals

Is there continuity?

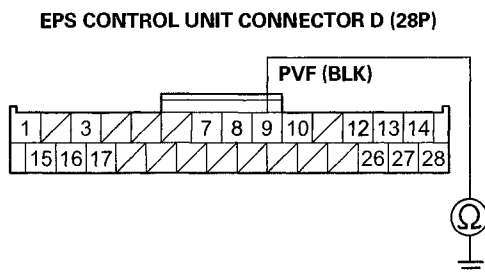
YES—Go to step 11.

NO—Check for loose terminals in the EPS control unit connectors, and repair if necessary. If no poor connections are found, replace the EPS control unit (see page 17-83). ■

11. Disconnect the torque sensor 3P connector from the steering gearbox.



12. Check for continuity between EPS control unit connector D (28P) terminal No. 9 and body ground.



Wire side of female terminals

Is there continuity?

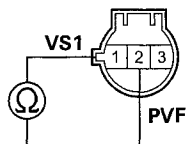
YES—Repair a short to body ground in the wire between the torque sensor and the EPS control unit. ■

NO—Replace the steering gearbox (see page 17-63). The fault is a short in the torque sensor internal circuit. ■

13. Disconnect the torque sensor 3P connector from the steering gearbox.

14. On the sensor side, measure the resistance between torque sensor 3P connector terminals No. 1 and No. 2.

TORQUE SENSOR 3P CONNECTOR



Terminal side of male terminals

Is the resistance between 12—15 Ω ?

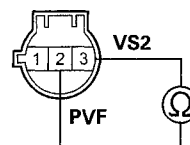
YES—Repair an open or short between the PNK and the BLU wires in the torque sensor circuit between the torque sensor and the EPS control unit. ■

NO—Replace the steering gearbox (see page 17-63). The fault is an open or a short in the torque sensor internal circuit. ■

15. Disconnect the torque sensor 3P connector from the steering gearbox.

16. On the sensor side, measure the resistance between torque sensor 3P connector terminals No. 2 and No. 3.

TORQUE SENSOR 3P CONNECTOR



Terminal side of male terminals

Is the resistance between 12—15 Ω ?

YES—Repair an open or short between the BLU and the PUR wires in the torque sensor circuit between the torque sensor and the EPS control unit. ■

NO—Replace the steering gearbox (see page 17-63). The fault is an open or a short in the torque sensor internal circuit. ■

EPS Components

DTC Troubleshooting (cont'd)

DTC 61-04: Open/Short in the EPS Motor Harness (Steering Diagnosis)

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
4. Start the engine.
5. Turn the steering wheel to the right or left, and wait 10 seconds or more.
6. Check for DTCs with the HDS.

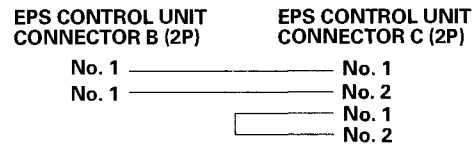
Is DTC 61-04 indicated?

YES—Go to step 7.

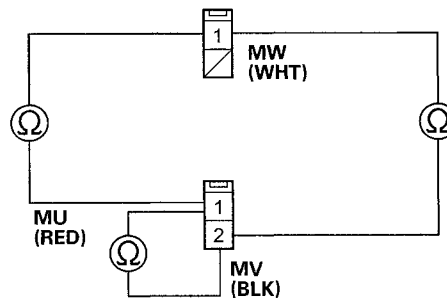
NO—Troubleshoot the indicated DTC. If there are no DTCs, the system is OK at this time. ■

7. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
8. Disconnect EPS control unit connector B (2P) and connector C (2P).

9. Check for continuity between the following terminals of EPS control unit connector B (2P) and connector C (2P).



EPS CONTROL UNIT CONNECTOR B (2P)
Wire side of female terminals



EPS CONTROL UNIT CONNECTOR C (2P)
Wire side of female terminals

Is there continuity?

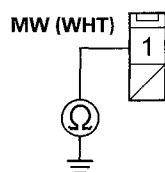
YES—Go to step 10.

NO—Go to step 13.



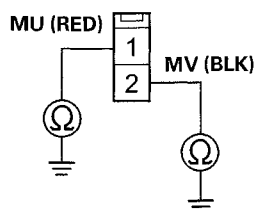
10. Check for continuity between body ground and EPS control unit connector B (2P) terminal No. 1, connector C (2P) terminal No. 1, and connector C (2P) terminal No. 2 individually.

EPS CONTROL UNIT CONNECTOR B (2P)



Wire side of female terminals

EPS CONTROL UNIT CONNECTOR C (2P)



Wire side of female terminals

Is there continuity?

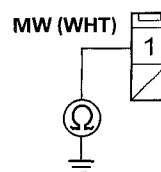
YES—Go to step 11.

NO—Check for loose terminals in the EPS control unit connectors, and repair if necessary. If no poor connections are found, replace the EPS control unit (see page 17-83).■

11. Disconnect the EPS motor 3P connector.

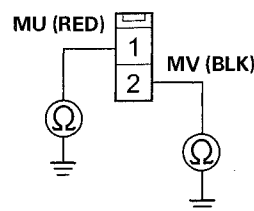
12. Check for continuity between body ground and EPS control unit connector B (2P) terminal No. 1, connector C (2P) terminal No. 1, and connector C (2P) terminal No. 2 individually.

EPS CONTROL UNIT CONNECTOR B (2P)



Wire side of female terminals

EPS CONTROL UNIT CONNECTOR C (2P)



Wire side of female terminals

Is there continuity?

YES—Repair a short to body ground in the wire between the EPS control unit and the EPS motor.■

NO—Replace the steering gearbox (see page 17-63). The fault is a short in the EPS motor internal circuit.■

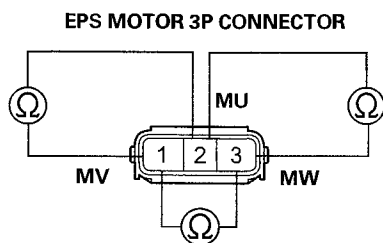
13. Disconnect the EPS motor 3P connector.

(cont'd)

EPS Components

DTC Troubleshooting (cont'd)

14. On the EPS motor side, check for continuity between the EPS motor 3P connector terminals No. 1 and No. 2, No. 1 and No. 3, and No. 2 and No. 3 individually.



Terminal side of male terminals

Is there continuity?

YES—Repair an open in the wire between the EPS control unit and the EPS motor. ■

NO—There is an open in the EPS motor internal circuit. Replace the steering gearbox (see page 17-63). ■

DTC 71-01: EPS Motor Angle Sensor (SIN/COS Signals) (Steering Diagnosis)

DTC 71-02: EPS Motor Angle Sensor (Neutral Position Learning of SIN/COS) (Initial Diagnosis)

DTC 71-03: EPS Motor Angle Sensor (SIN/COS Signals) (Steering Diagnosis)

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
4. Start the engine.
5. Turn the steering wheel to the right or left, and wait 10 seconds or more.
6. Check for DTCs with the HDS.

Is DTC 71-01, 71-02, or 71-03 indicated?

YES—Go to step 7.

NO—Troubleshoot the indicated DTC. If there are no DTCs, the system is OK at this time. ■

7. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
8. Disconnect EPS control unit connector D (28P).

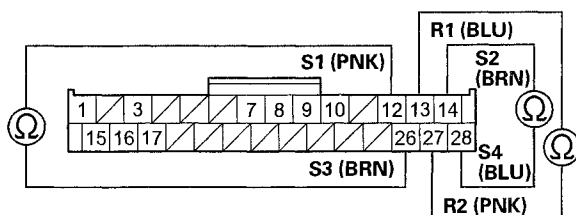


9. Measure the resistance between the following terminals of EPS control unit connector D (28P).

EPS CONTROL UNIT CONNECTOR D (28P)

No. 13 (R1) _____ No. 27 (R2)
No. 12 (S1) _____ No. 26 (S3)
No. 14 (S2) _____ No. 28 (S4)

EPS CONTROL UNIT CONNECTOR D (28P)



Wire side of female terminals

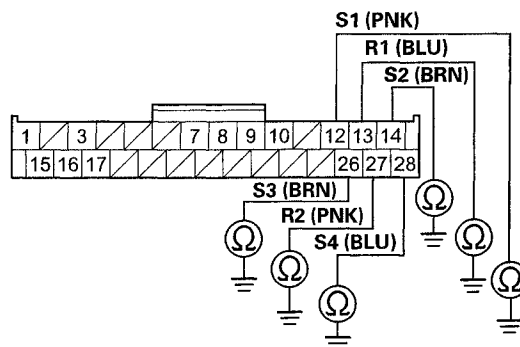
Is the resistance between R1—R2 5—50 Ω , S1—S3 10—100 Ω , and S2—S4 10—100 Ω ?

YES—Go to step 10.

NO—Go to step 13.

10. Check for continuity between body ground and EPS control unit connector D (28P) terminal No. 12, terminal No. 13, terminal No. 14, terminal No. 26, terminal No. 27, and terminal No. 28 individually.

EPS CONTROL UNIT CONNECTOR D (28P)



Wire side of female terminals

Is there continuity?

YES—Go to step 11.

NO—Check for loose terminals in the EPS control unit connectors, and repair if necessary. If no poor connections are found, replace the EPS control unit (see page 17-83). ■

11. Disconnect the EPS motor angle sensor 6P connector.

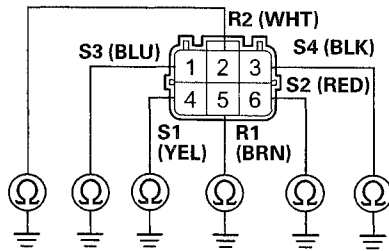
(cont'd)

EPS Components

DTC Troubleshooting (cont'd)

12. On the sensor side, check for continuity between body ground and EPS motor angle sensor 6P connector terminal No. 1, terminal No. 2, terminal No. 3, terminal No. 4, terminal No. 5, and terminal No. 6 individually.

EPS MOTOR ANGLE SENSOR 6P CONNECTOR



Terminal side of male terminals

Is there continuity?

YES—Replace the steering gearbox (see page 17-63). The fault is a short in the EPS motor angle sensor internal circuit. ■

NO—Repair a short to body ground in the wire between the EPS motor angle sensor 6P connector and the EPS control unit. ■

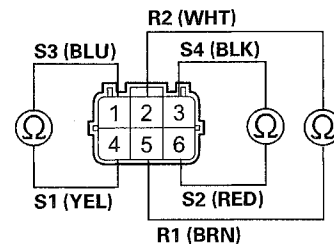
13. Disconnect the EPS motor angle sensor 6P connector.

14. On the sensor side, measure the resistance between the following terminals of the EPS motor angle sensor 6P connector.

EPS MOTOR ANGLE SENSOR 6P CONNECTOR

No. 5 (R1)	_____	No. 2 (R2)
No. 4 (S1)	_____	No. 1 (S3)
No. 6 (S2)	_____	No. 3 (S4)

EPS MOTOR ANGLE SENSOR 6P CONNECTOR



Terminal side of male terminals

Is the resistance between R1—R2 5—50 Ω , S1—S3 10—100 Ω , and S2—S4 10—100 Ω ?

YES—Repair an open or a short to body ground in the wire between the EPS motor angle sensor 6P connector and the EPS control unit. ■

NO—Replace the steering gearbox (see page 17-63). The fault is a short in the EPS motor angle sensor internal circuit. ■



DTC 71-04: EPS Motor Angle Sensor (Check Signals) (Regular Diagnosis)

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.
2. Clear the DTC with the HDS.
3. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
4. Start the engine.
5. Turn the steering wheel to the right or left, and wait 10 seconds or more.
6. Check for DTCs with the HDS.

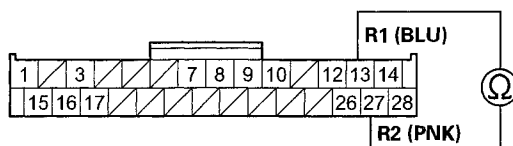
Is DTC 71-04 indicated?

YES—Go to step 7.

NO—Troubleshoot the indicated DTC. If there are no DTCs, the system is OK at this time. ■

7. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
8. Disconnect EPS control unit connector D (28P).
9. Measure the resistance between the EPS control unit connector D (28P) terminal No. 13 and No. 27.

EPS CONTROL UNIT CONNECTOR D (28P)



Wire side of female terminals

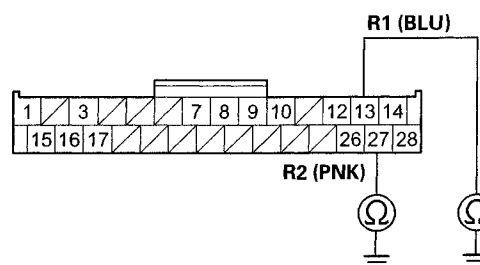
Is the resistance between 5—50 Ω ?

YES—Go to step 10.

NO—Go to step 13.

10. Check for continuity between body ground and EPS control unit connector D (28P) terminal No. 13 and terminal No. 27 individually.

EPS CONTROL UNIT CONNECTOR D (28P)



Wire side of female terminals

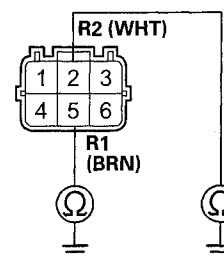
Is there continuity?

YES—Go to step 11.

NO—Check for loose terminals in the EPS control unit connectors, and repair if necessary. If no poor connections are found, replace the EPS control unit (see page 17-83). ■

11. Disconnect the EPS motor angle sensor 6P connector.
12. On the sensor side, check for continuity between body ground and EPS motor angle sensor 6P connector terminal No. 2 and terminal No. 5 individually.

EPS MOTOR ANGLE SENSOR 6P CONNECTOR



Terminal side of male terminals

Is there continuity?

YES—Replace the steering gearbox (see page 17-63). The fault is a short in the EPS motor angle sensor internal circuit. ■

NO—Repair a short to body ground in the wire between the EPS motor angle sensor 6P connector and the EPS control unit. ■

13. Disconnect the EPS motor angle sensor 6P connector.

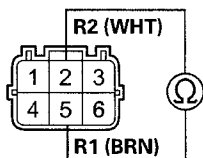
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EPS Components

DTC Troubleshooting (cont'd)

14. On the sensor side, measure the resistance between the EPS motor angle sensor 6P connector terminals No. 2 and No. 5.

EPS MOTOR ANGLE SENSOR 6P CONNECTOR



Terminal side of male terminals

Is the resistance between 5—50 Ω ?

YES—Repair an open or a short to body ground in the wire between the EPS motor angle sensor 6P connector and the EPS control unit.■

NO—Replace the steering gearbox (see page 17-63). The fault is a short or an open in the EPS motor angle sensor internal circuit.■

Symptom Troubleshooting

EPS indicator does not come on

1. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode, and watch the EPS indicator.

Does the EPS indicator come on?

YES—The system is OK at this time.■

NO—Troubleshoot the gauge control module (see page 22-342).■



EPS indicator does not go off, and no DTCs are stored

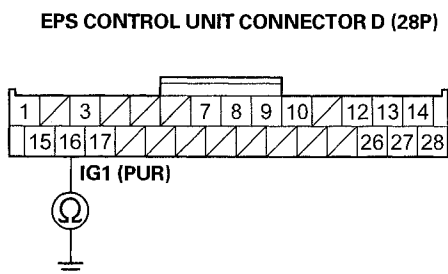
1. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
2. Check the No. 6 (7.5 A) fuse in the driver's under-dash fuse/relay box.

Is the fuse blown?

YES—Go to step 3.

NO—Reinstall the checked fuse, then go to step 7.

3. Disconnect EPS control unit connector D (28P).
4. Check for continuity between EPS control unit connector D (28P) terminal No. 16 and body ground.



Is there continuity?

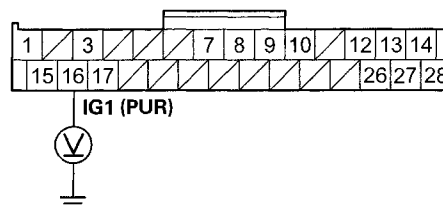
YES—Repair a short to body ground in the wire between the EPS control unit and the No. 6 (7.5 A) fuse in the driver's under-dash fuse/relay box. ■

NO—Install a new No. 6 (7.5 A) fuse in the driver's under-dash fuse/relay box, then go to step 5.

5. Reconnect EPS control unit connector D (28P).
6. Start the engine, and watch the EPS indicator.
Does the EPS indicator come on, then go off?
YES—Intermittent failure. The system is OK at this time. ■
NO—Replace the EPS control unit (see page 17-83). ■
7. Disconnect EPS control unit connector D (28P).
8. Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode.

9. Measure the voltage between EPS control unit connector D (28P) terminal No. 16 and body ground.

EPS CONTROL UNIT CONNECTOR D (28P)



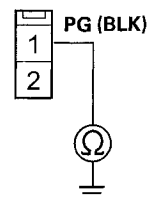
Is there battery voltage?

YES—Go to step 10.

NO—Repair an open in the wire between the EPS control unit and driver's under-dash fuse/relay box. ■

10. Turn the ignition switch to LOCK (0), or press the engine start/stop button to select the OFF mode.
11. Disconnect EPS control unit connector A (2P).
12. Check for continuity between EPS control unit connector A (2P) terminal No. 1 and body ground.

EPS CONTROL UNIT CONNECTOR A (2P)



Is there continuity?

YES—Go to step 13.

NO—Repair an open in the wire between the EPS control unit and body ground (G204). ■

13. Disconnect the gauge control module 32P connector.

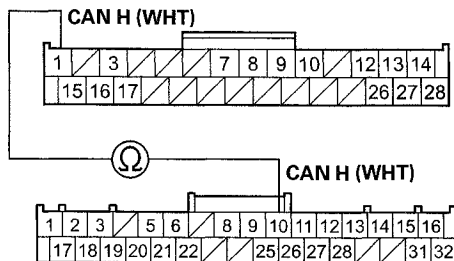
(cont'd)

EPS Components

Symptom Troubleshooting (cont'd)

14. Check for continuity between EPS control unit connector D (28P) terminal No. 1 and gauge control module 32P connector terminal No. 10.

EPS CONTROL UNIT CONNECTOR D (28P)
Wire side of female terminals



GAUGE CONTROL MODULE 32P CONNECTOR
Wire side of female terminals

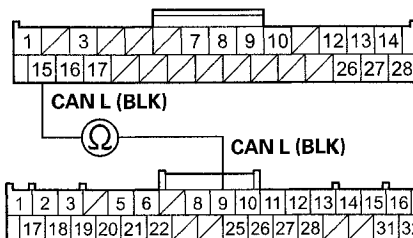
Is there continuity?

YES—Go to step 15.

NO—Repair an open in the wire between the EPS control unit and the gauge control module.■

15. Check for continuity between EPS control unit connector D (28P) terminal No. 15 and gauge control module 32P connector terminal No. 9.

EPS CONTROL UNIT CONNECTOR D (28P)
Wire side of female terminals



GAUGE CONTROL MODULE 32P CONNECTOR
Wire side of female terminals

Is there continuity?

YES—Check for loose terminals in the EPS control unit connectors, and repair if necessary. If no poor connections are found, replace the EPS control unit (see page 17-83).■

NO—Repair an open in the wire between the EPS control unit and the gauge control module.■



Steering Gearbox Removal and Installation

Special Tools Required

- Ball Joint Thread Protector, 12 mm 07AAF-SDAA100
- Ball Joint Remover, 28 mm 07MAC-SL0A202
- Engine Support Hanger, A and Reds AAR-T1256*
- Engine Hanger Balance Bar VSB02C000019*
- 2008 V6 Attachment Arm SIL02C000033*
- Ball Joint Thread Protector, 14 mm 07AAE-SJAA100
- Subframe Adapter VSB02C000016*
- Subframe Alignment Pin 070AG-SJAA10S

*Available through the Acura Tool and Equipment Program, 888-424-6857.

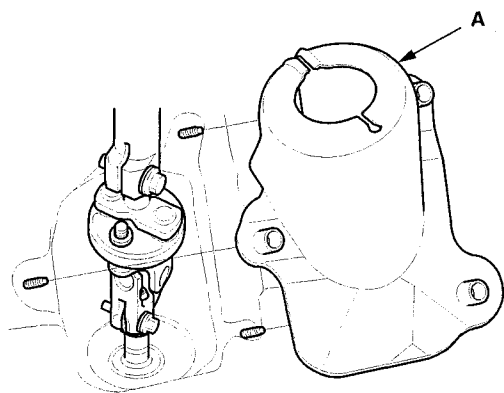
SRS components are located in this area. Review the SRS component locations (see page 24-11) and the precautions and procedures (see page 24-13) before doing repairs or service.

Note these items during removal:

- Use solvent and a brush, wash any oil and dirt off the end of the steering gearbox. Avoid any electrical parts. Blow dry with compressed air.
- Be sure to remove the steering wheel before disconnecting the steering joint, or damage to the cable reel can occur.

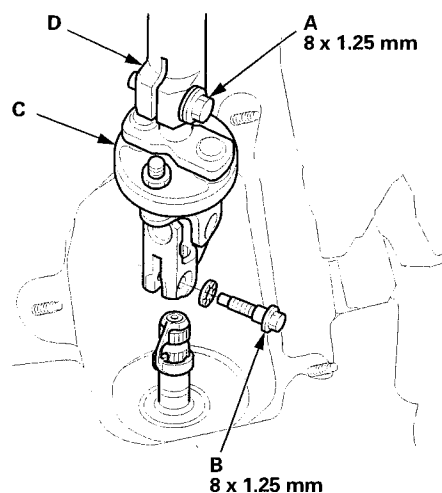
Removal

1. Do the battery terminal disconnection procedure (see page 22-86).
2. Raise and support the vehicle (see page 1-10).
3. Remove the front wheels.
4. Remove the driver's airbag (see page 24-157), and the steering wheel (see page 17-6).
5. Remove the steering joint cover (A).

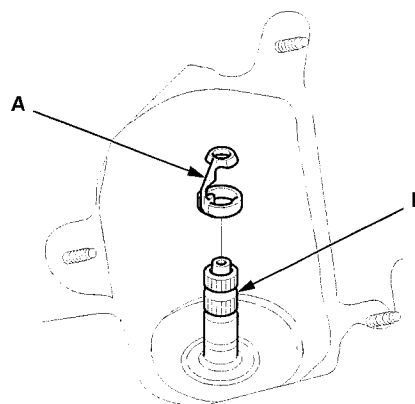


6. Loosen the upper steering joint bolt (A), and remove the lower steering joint bolt (B). Disconnect the steering joint (C) by sliding the steering joint into the column shaft (D). Tighten the upper steering joint bolt to hold the steering joint in place.

NOTE: Do not disconnect the steering joint from the column shaft.



7. Remove the center guide (A) (if equipped) from the top of the pinion shaft (B), and discard it.



8. Apply vinyl tape to the splines on the pinion shaft.

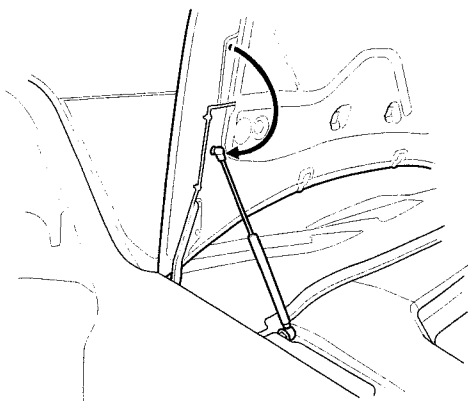
(cont'd)

EPS Components

Steering Gearbox Removal and Installation (cont'd)

9. Disconnect the hood support struts from both sides of the pivot ball (bolted to the hood). Secure the hood in a vertical position. Remove the right side pivot ball and install it into the lower threaded hole, then reattach the support strut.

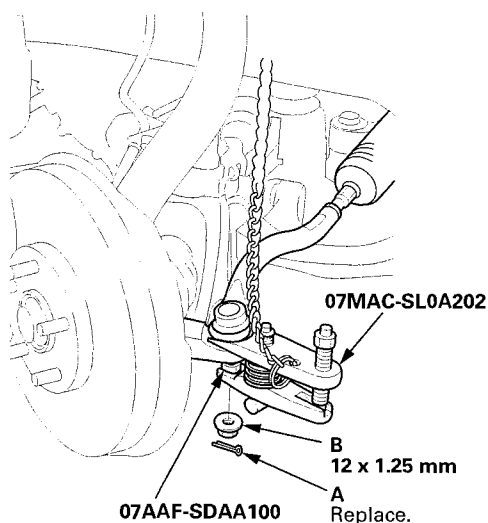
NOTE: Do not attempt to close the hood with the support strut in the vertical position, as it will damage the support strut and hood.



10. Remove the left and right engine compartment covers, the strut brace cover, and the front bulkhead cover (see page 20-189), then remove the cowl cover (see page 20-189).

11. Remove the strut brace (see page 20-210).

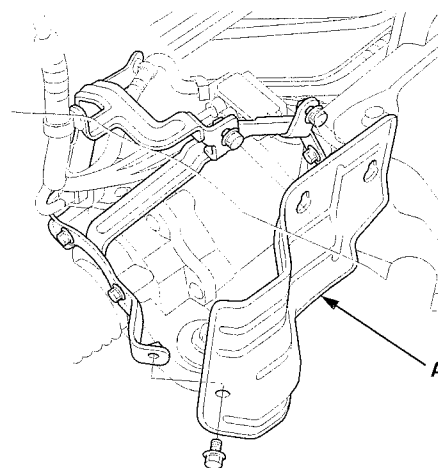
12. Remove the cotter pin (A) from the tie-rod end ball joint, then remove the nut (B) on both sides.



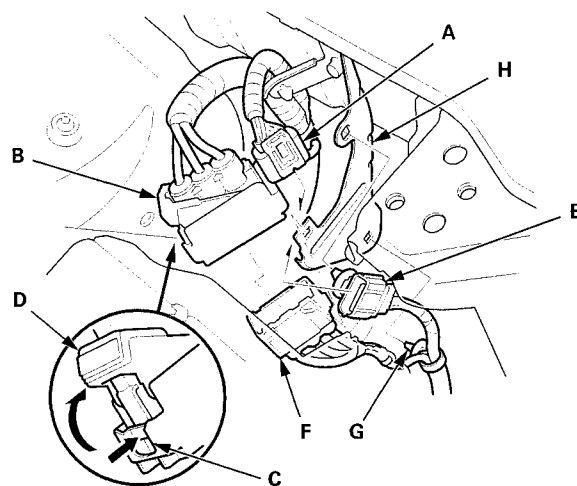
13. Disconnect the tie-rod end ball joint from the knuckle using the ball joint thread protector and the ball joint remover (see page 18-12).

NOTE: Be careful not to damage the ball joint boot when installing the remover.

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



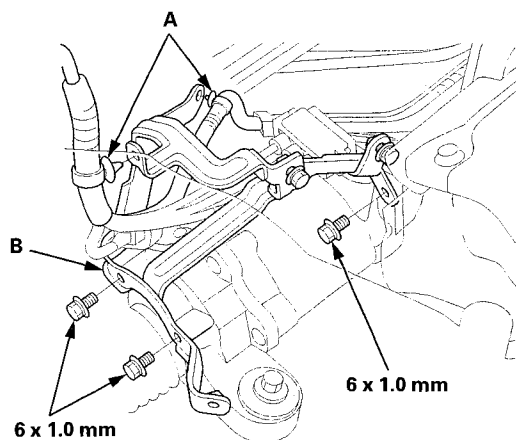
15. Disconnect the EPS subharness 12P connector (A) and the EPS subharness 3P connector (B) by pushing the lock (C) and pulling up the lever (D). Wrap the connectors with vinyl tape to avoid contamination from grease or water.



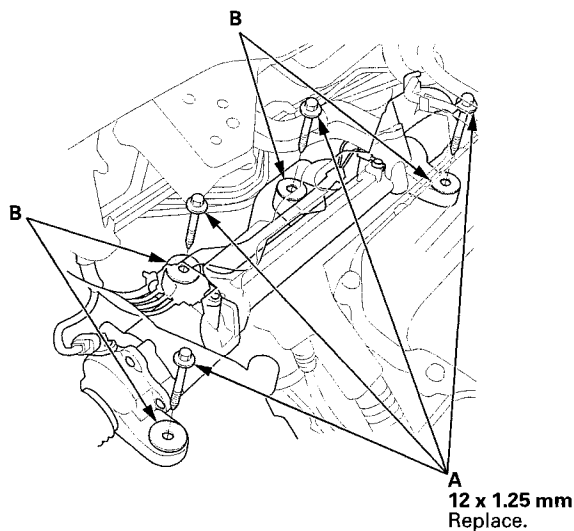
16. Remove the EPS subharness 12P connector (E), the EPS subharness 3P connector (F), and the harness clip (G) from the harness bracket (H).



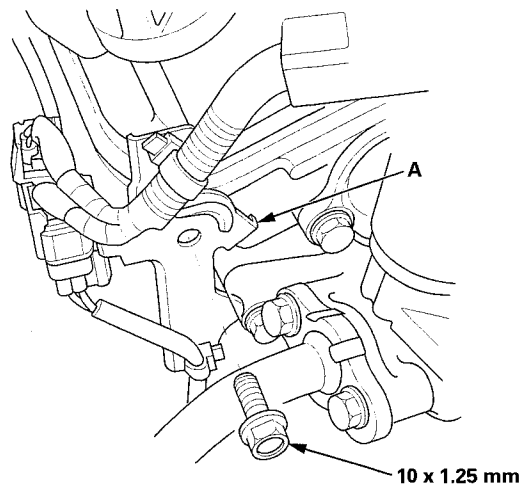
17. Remove the harness clips (A), then remove the heat shield bracket (B) from the steering gearbox.



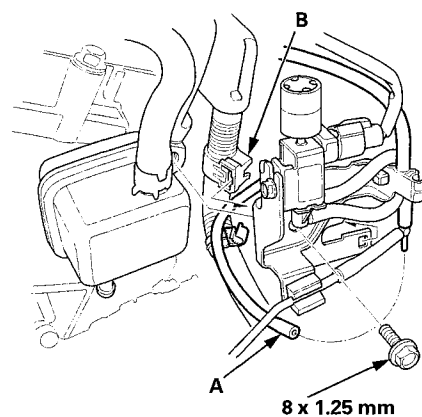
18. Remove the steering gearbox mounting bolts (A) and washers (B) from the steering gearbox.



19. Remove the connector bracket (A) from the front cylinder head; use the bracket bolt hole to attach the engine hanger balance bar front arm.



20. Disconnect the vacuum hose (A), and remove the harness clamp (B), then remove the engine mount control solenoid valve bracket from the rear cylinder head; use the bracket bolt hole to attach the 2008 V6 attachment arm.

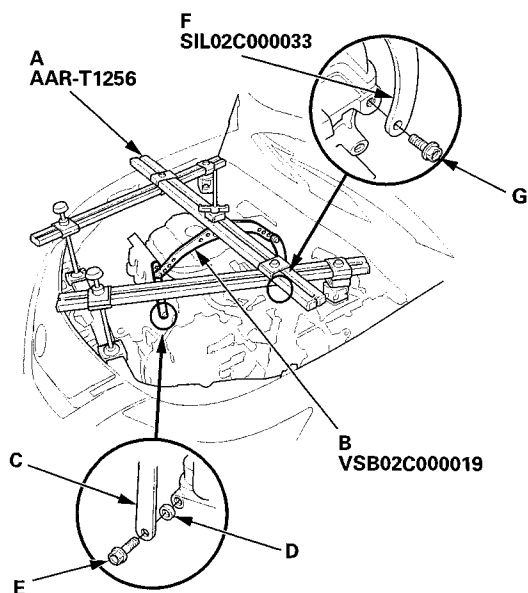


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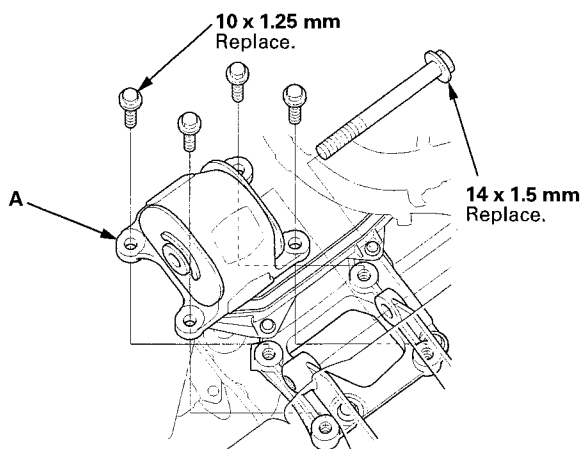
EPS Components

Steering Gearbox Removal and Installation (cont'd)

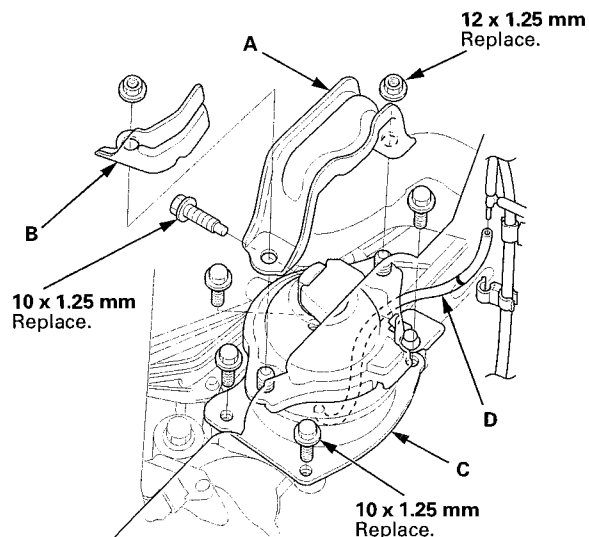
21. Lift and support the engine with the engine support hanger (A) and the engine hanger balance bar (B). Attach the front arm (C) to the front cylinder head with a spacer (D) and a 10 x 1.25 mm bolt (E). Remove the rear arm from the engine hanger balance bar, and install the 2008 V6 attachment arm (F), then attach the 2008 V6 attachment arm to the rear cylinder head with the 8 x 1.25 mm bolt (G).



22. M/T: Remove the rear engine mount (A).

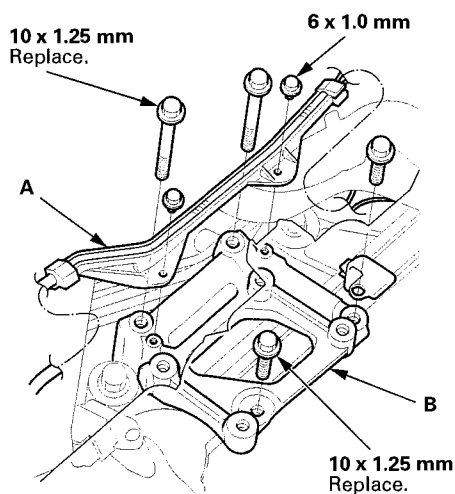


23. A/T: Remove the rear engine mount stop (A) and the heat shield (B), then remove the rear engine mount (C).



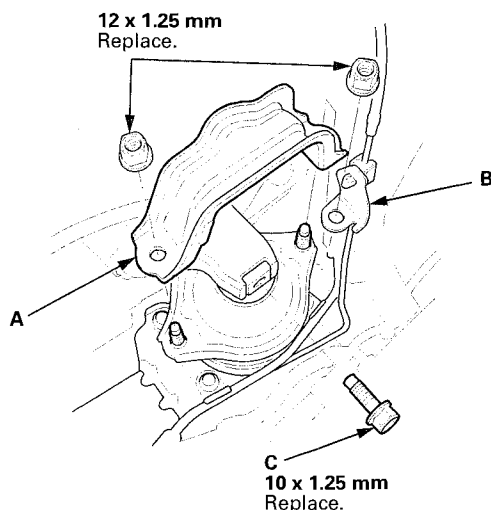
24. A/T: Disconnect the vacuum hose (D).

25. Remove the EPS subharness holder (A), then remove the rear engine mount base (B).

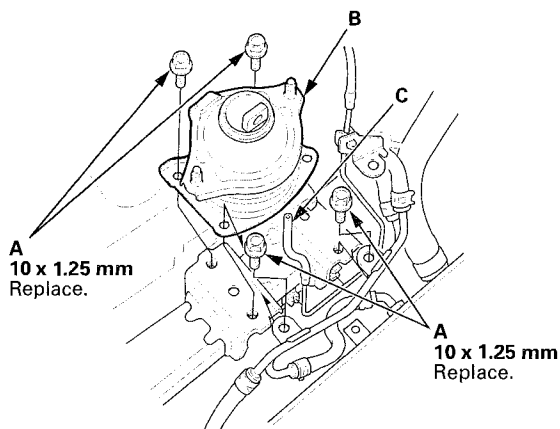




26. Remove the front engine mount stop (A) and the vacuum hose bracket (B), then remove the front engine mount bolt (C).



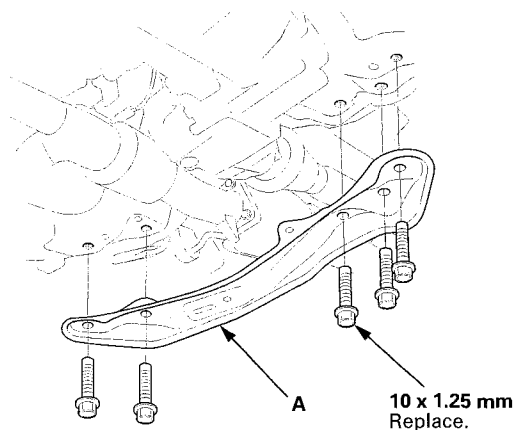
27. M/T: Remove the front engine mount mounting bolts (A), then remove the front engine mount (B), and disconnect the vacuum hose (C).



28. Raise the vehicle on a lift.

29. Remove the front splash shield (see page 20-205).

30. Remove the front subframe stiffener (A).



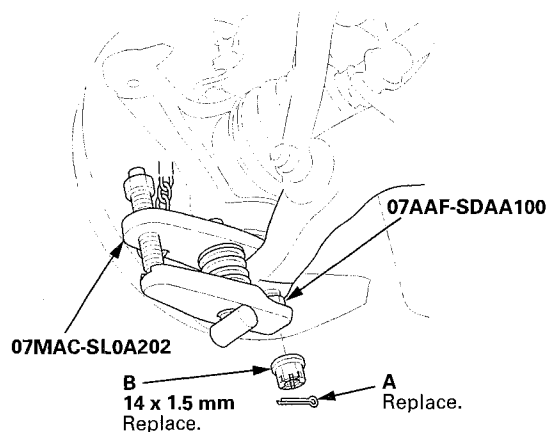
31. Remove exhaust pipe A:

- Without SH-AWD (see page 9-9)
- With SH-AWD (see page 9-10)

32. With SH-AWD: Remove the propeller shaft (see page 16-50).

33. M/T: Remove the transfer assembly (see page 13-102).

34. Remove the cotter pin (A) from the knuckle ball joint, then remove the castle nut (B).



35. Disconnect the knuckle ball joint from the lower arm using the ball joint thread protector and the ball joint remover (see page 18-12).

NOTE:

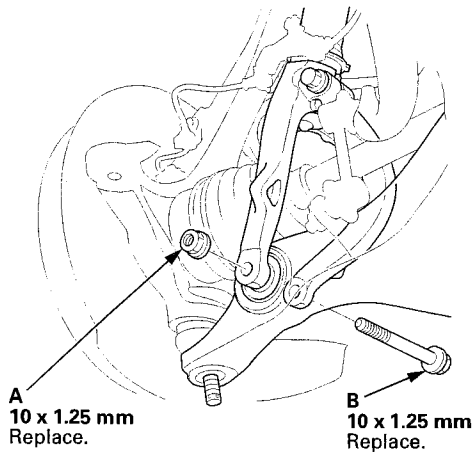
- Be careful not to damage the ball joint boot when installing the remover.
- Do not force or hammer on the lower arm, or pry between the lower arm and the knuckle. You could damage the ball joint.

(cont'd)

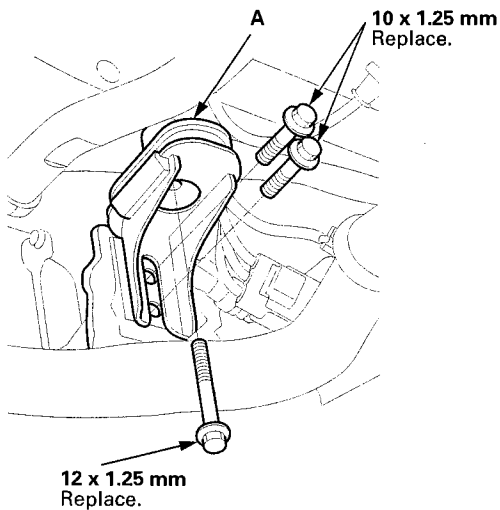
EPS Components

Steering Gearbox Removal and Installation (cont'd)

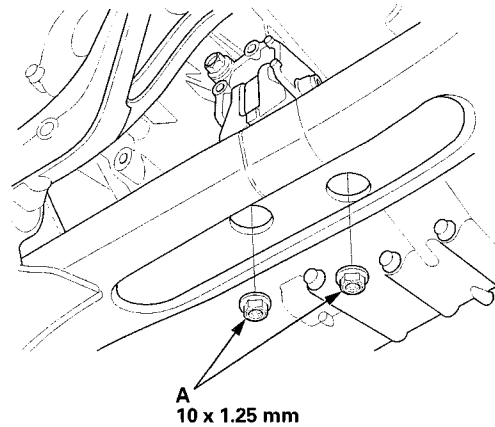
36. Remove the damper fork mounting nut (A) while holding the mounting bolt (B), then remove the mounting bolt.



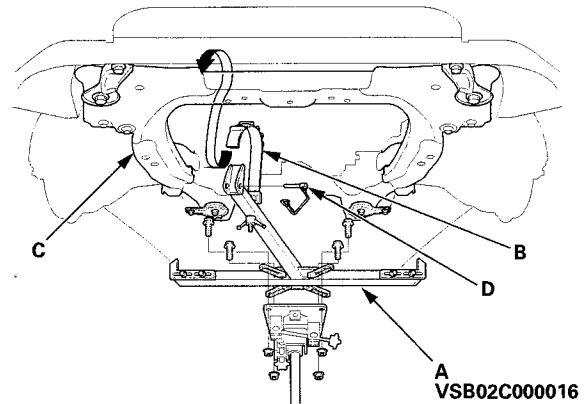
37. Remove the subframe middle mounts (A) on both sides.



38. Remove the transmission lower mount nuts (A).



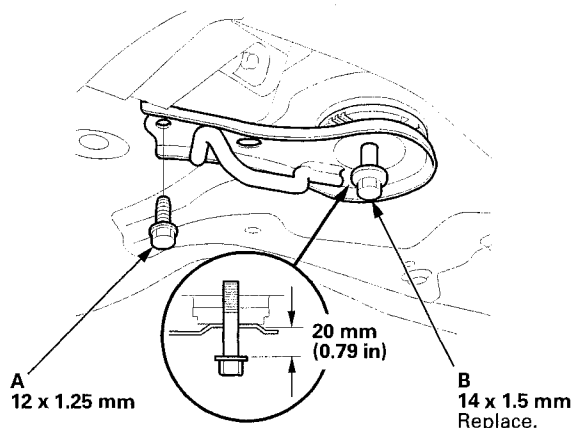
39. Attach the front subframe adapter (A) to the subframe by hanging the belt (B) over the front of the subframe (C), then secure the belt with its stop (D).



40. Raise the jack and line up the slots in the front subframe adapter arms with the bolt holes on the jack base, then securely attach them with four bolts.

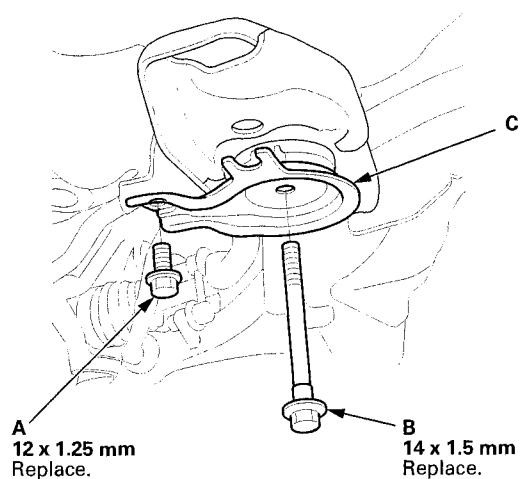


41. Remove the stiffener mounting bolts (A) on both sides.

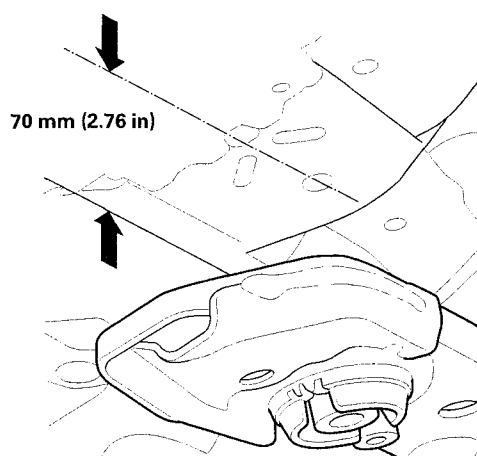


42. Loosen the subframe mounting bolts (B) so they are about 20 mm (0.79 in) from the mounting surface. Do not loosen the front subframe mounting bolts more than necessary.

43. Remove the stiffener mounting bolt (A) and subframe mounting bolts (B) from the rear stiffeners (C) on both sides.

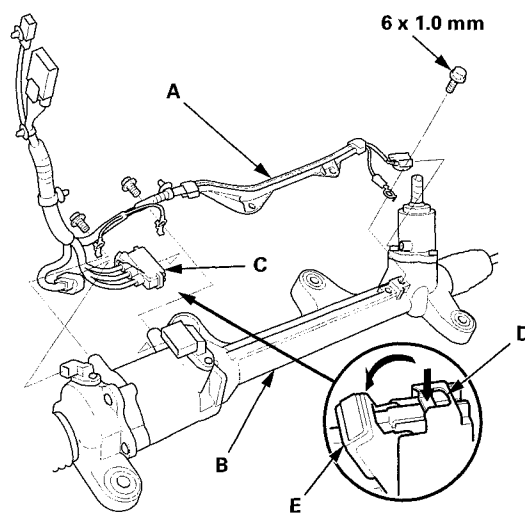


44. Lower the jack slowly until the front subframe has dropped about 70 mm (2.76 in).



45. Remove the EPS subharness (A) from the steering gearbox (B).

NOTE: Disconnect the EPS subharness 3P connector (C) by pushing the lock (D) and pulling down the lever (E).

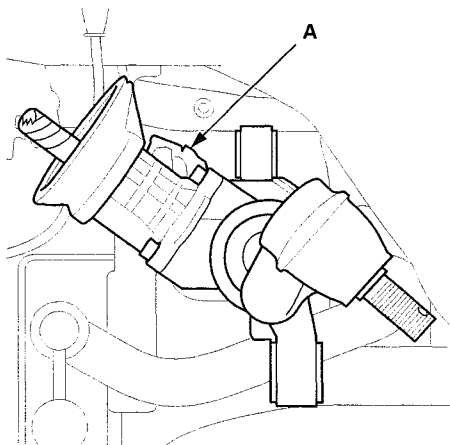


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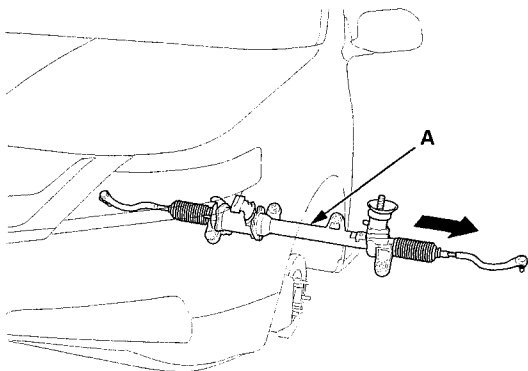
EPS Components

Steering Gearbox Removal and Installation (cont'd)

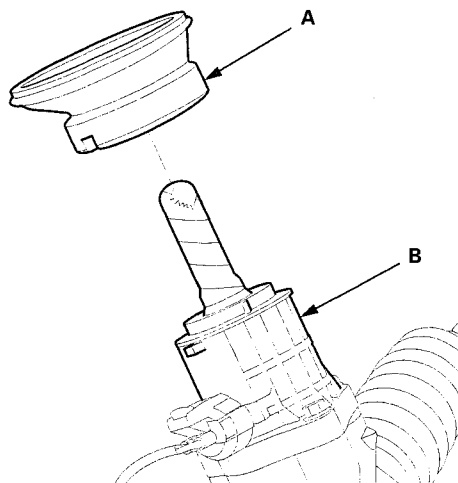
46. Carefully move the steering gearbox (A) toward the driver's side until the pinion shaft clears the fenderwell opening on the body.



47. Remove the steering gearbox (A) through the fenderwell opening on the driver's side.



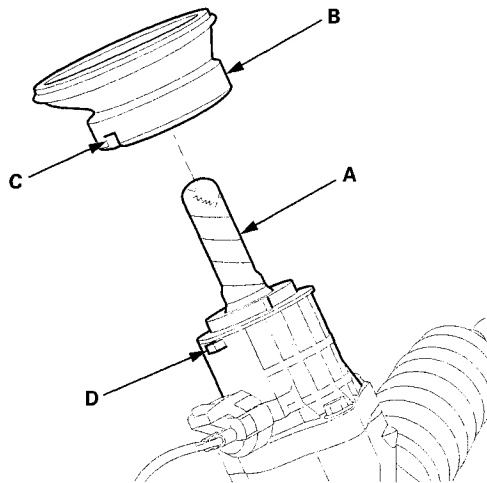
48. Remove the pinion shaft grommet (A) from the top of the torque sensor (B).



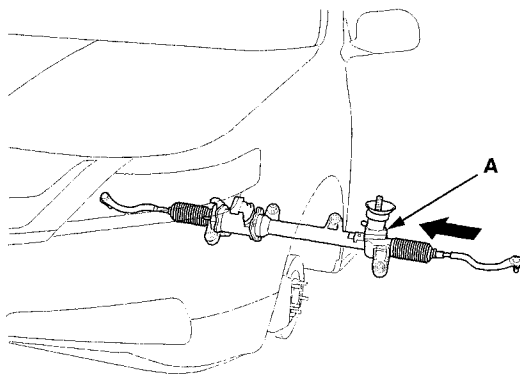


Installation

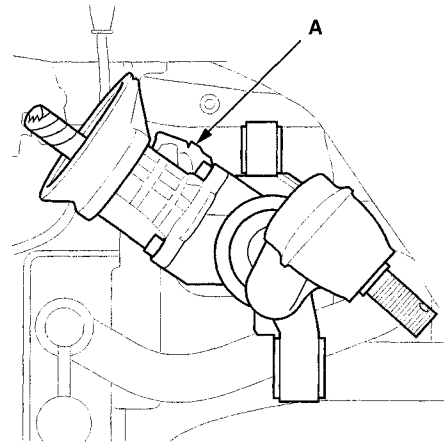
1. Before installing the steering gearbox, make sure that no grease is on the mating surface of the steering gearbox and the front subframe. To prevent the gearbox mounting bolts from loosening after the installation, remove any grease from the bolt holes.
2. Wrap vinyl tape around the splines on the pinion shaft (A).



3. Install the pinion shaft grommet (B). Align the cutout (C) in the pinion shaft grommet with the lug portion (D) on the torque sensor. The grommet must not have a gap at the mating surface of the grommet and torque sensor.
4. Slide the steering gearbox (A) between the front subframe and the body from the driver's side.

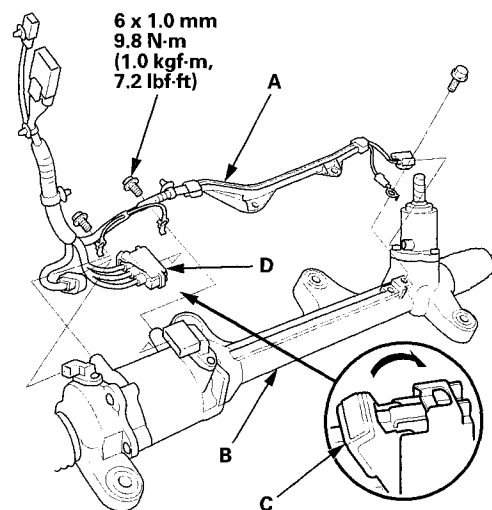


5. Carefully move the steering gearbox (A) toward the passenger's side until the pinion shaft clears the wheelwell opening on the body.



6. Continue moving the steering gearbox toward the passenger's side until the steering gearbox is in position.
7. Install the EPS subharness (A) to the steering gearbox (B).

NOTE: Pull up the lever (C) of the EPS motor 3P connector (D), then confirm the connector is fully seated.

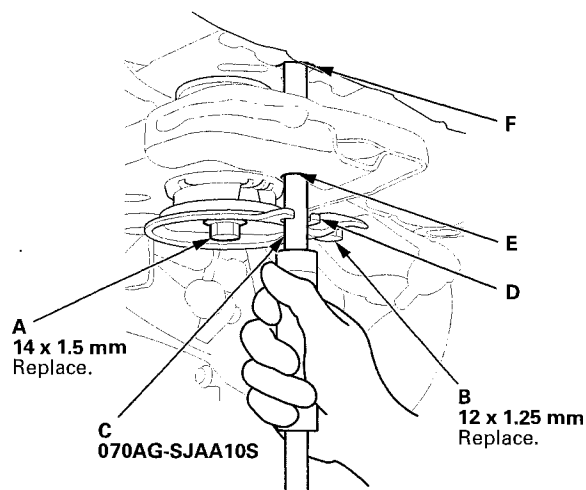


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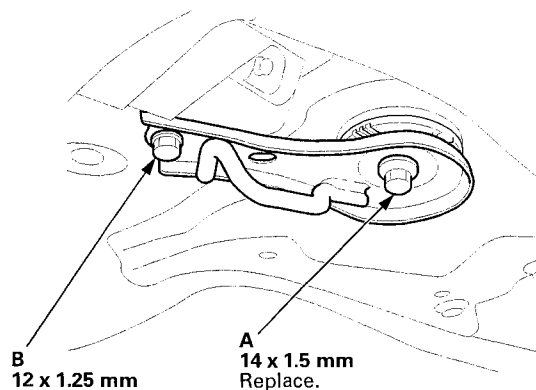
EPS Components

Steering Gearbox Removal and Installation (cont'd)

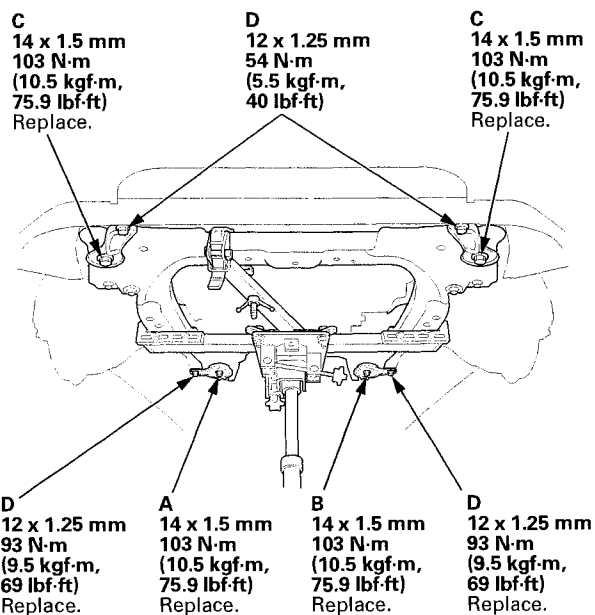
8. Loosely tighten the new right-rear subframe mounting bolt (A) and the new stiffener mounting bolt (B); insert the 15.7 mm side of the subframe alignment pin (C) through the positioning slot (D) on the rear stiffener, through the positioning hole (E) on the subframe, and into the positioning hole (F) on the body.



9. Loosely tighten the new left-rear subframe mounting bolt and the new stiffener mounting bolt with the same procedure as the right rear using the subframe alignment pin.
10. Loosely tighten the new front side subframe mounting bolt (A) and the stiffener mounting bolt (B) on both sides.



11. Tighten the right-rear subframe mounting bolt (A) to the specified torque.

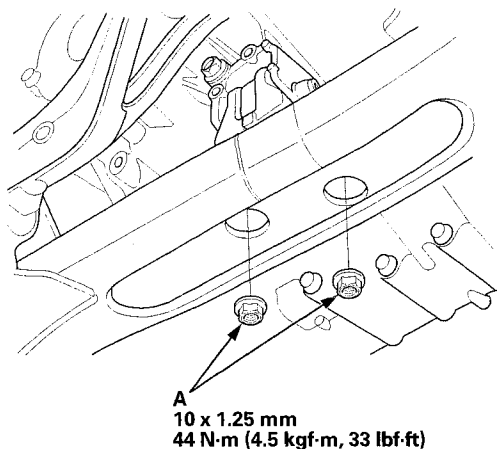


12. Tighten the left-rear subframe mounting bolt (B) to the specified torque.
13. Tighten the front subframe mounting bolts (C) to the specified torque.
- NOTE: Check all of the subframe mounting bolts, and retighten if necessary.
14. Tighten the stiffener mounting bolts (D) to the specified torque.

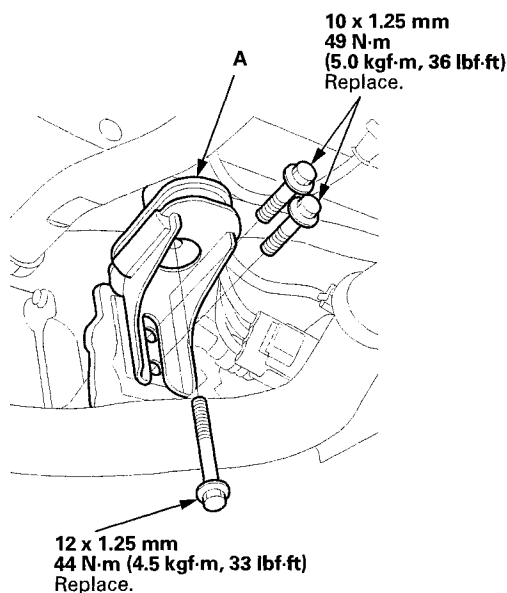
NOTE: Before tightening the stiffener mounting bolts, check that the positioning holes and slot are aligned using the subframe alignment pin.



15. Install the transmission lower mount nuts (A), and tighten them to the specified torque.

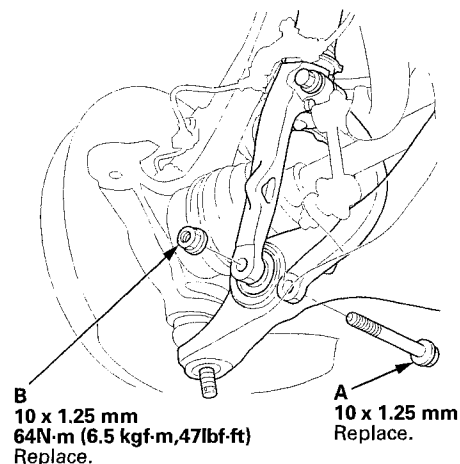


16. Install the subframe middle mounts (A) on both sides with new mounting bolts, and tighten them to the specified torque.



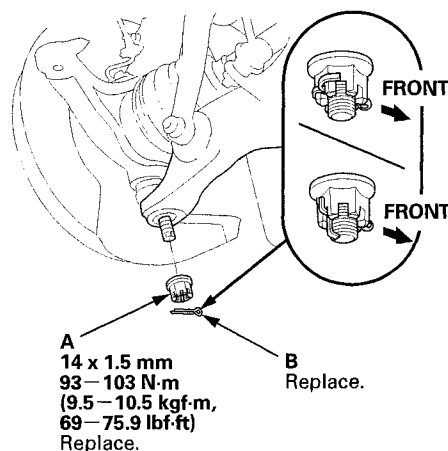
17. Remove the transmission jack supporting the front subframe.

18. Install the new damper fork mounting bolt (A) and new mounting nut (B), and loosely tighten the nut while holding the mounting bolt.



19. Tighten the new castle nut (A) to the lower torque specification, then tighten it only far enough to align the slot with the ball joint pin hole. Do not align the castle nut by loosening it.

NOTE: Insert the new cotter pin (B) into the ball joint pin hole from the front to the rear of the vehicle, and bend its end as shown. Check the ball joint pin hole direction before connecting the ball joint.



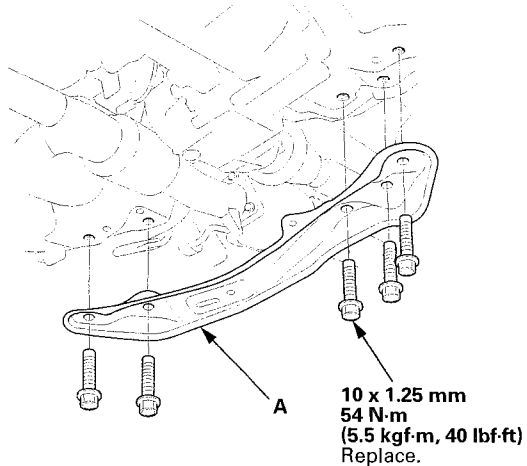
20. M/T: Install the transfer assembly (see page 13-103).
21. With SH-AWD: Install the propeller shaft (see page 16-52).
22. Install exhaust pipe A:
- Without SH-AWD (see page 9-9)
 - With SH-AWD (see page 9-10)

(cont'd)

EPS Components

Steering Gearbox Removal and Installation (cont'd)

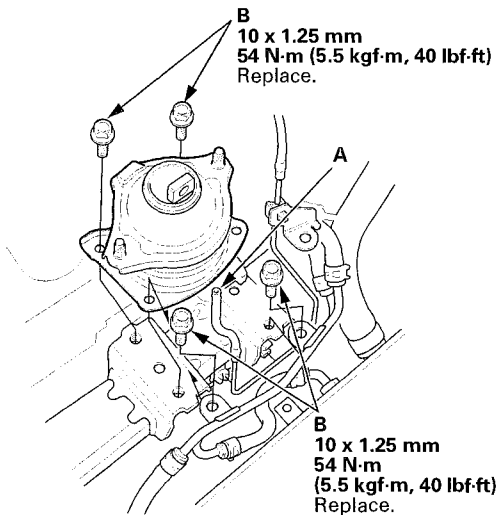
23. Install the front subframe stiffener (A).



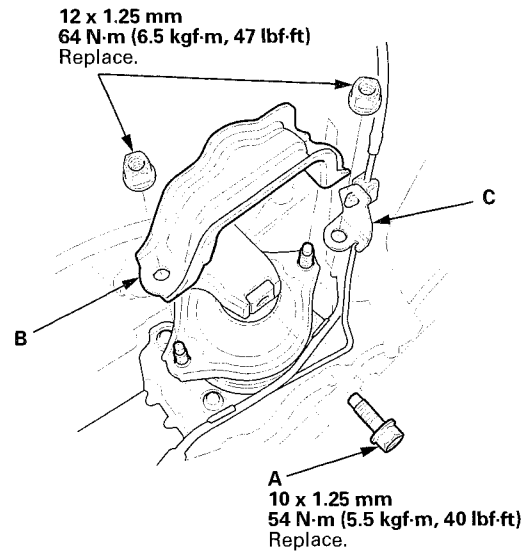
24. Install the front splash shield (see page 20-205).

25. Lower the vehicle.

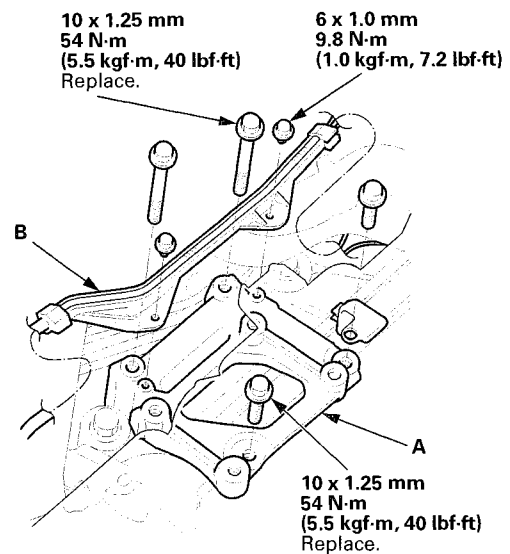
26. M/T: Connect the vacuum hose (A), then align the front engine mount with its mounting holes, and install new front engine mount mounting bolts (B).



27. Tighten the new front engine mount bolt (A), then install the front engine mount stop (B) and the vacuum hose bracket (C).

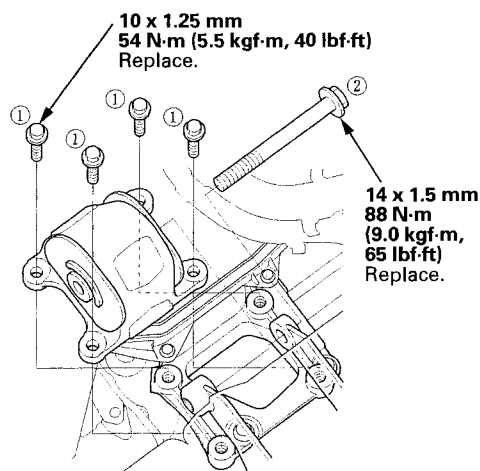


28. Install the rear engine mount base (A), then install the EPS subharness (B).

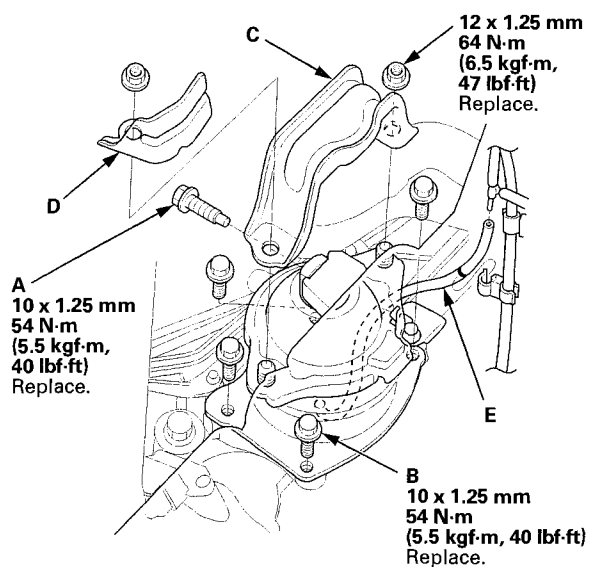




29. M/T: Tighten the new rear engine mount mounting bolts to the specified torque in the sequence shown.



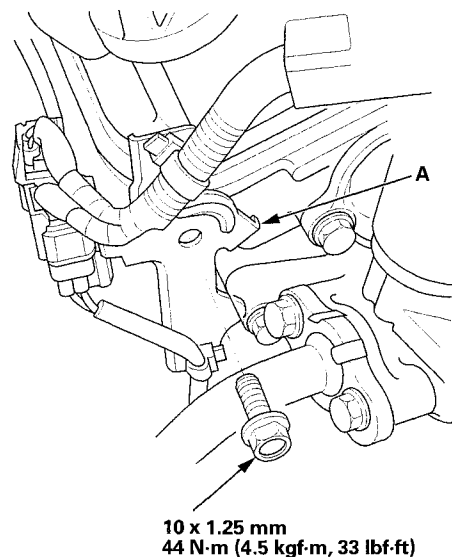
30. A/T: Tighten the new rear engine mount mounting bolt (A), (B), then install the rear engine mount stop (C) and the heat shield (D).



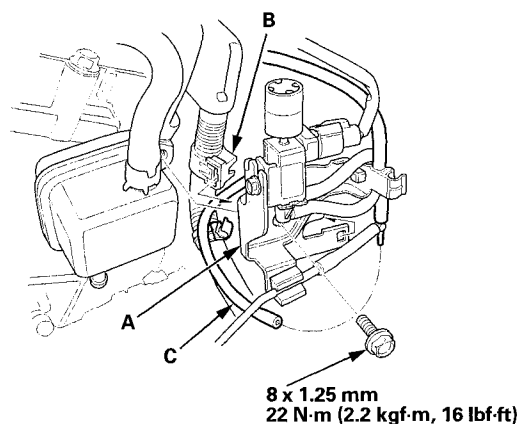
31. A/T: Connect the vacuum hose (E).

32. Remove the engine support hanger and the engine hanger balance bar.

33. Install the connector bracket (A) to the front cylinder head.



34. Install the engine mount control solenoid valve bracket (A) to the rear cylinder head, then install the harness clamp (B) and connect the vacuum hose (C).



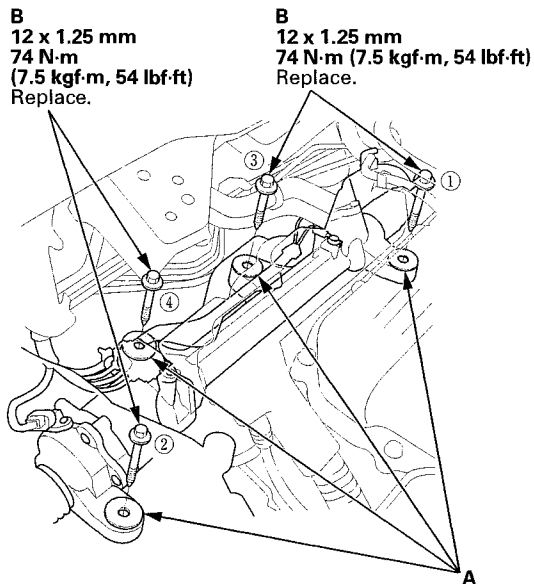
(cont'd)

EPS Components

Steering Gearbox Removal and Installation (cont'd)

35. Install the washers (A) and new steering gearbox mounting bolts (B) to the steering gearbox, then loosely tighten them.

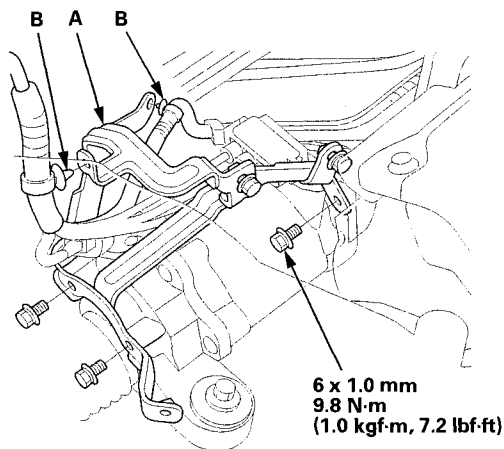
NOTE: Make sure that the washers are in the correct position.



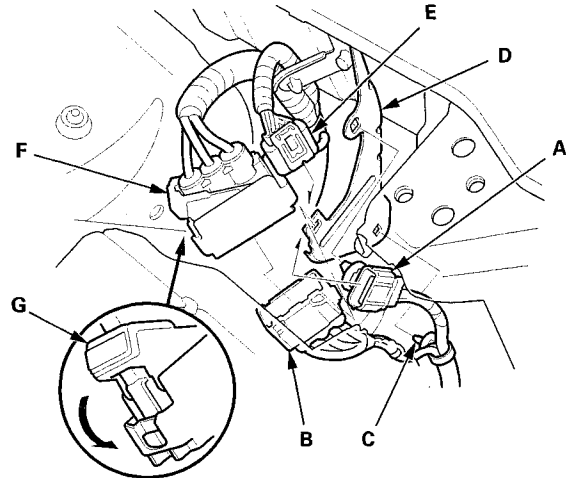
36. Tighten the steering gearbox mounting bolts to the specified torque in the sequence shown.

NOTE: Check all of the steering gearbox mounting bolts, and retighten if necessary.

37. Install the heat shield bracket (A) to the steering gearbox, then install the harness clips (B).

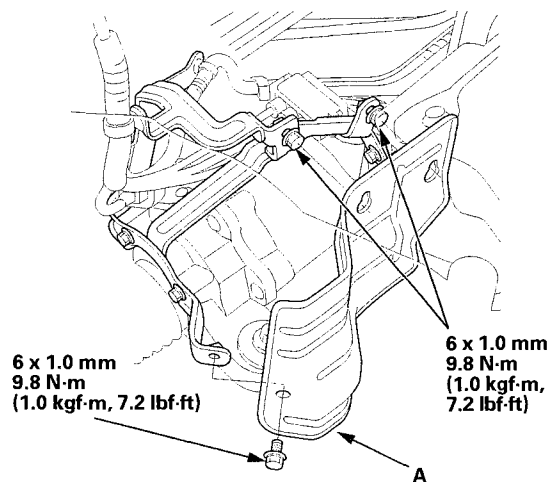


38. Install the EPS subharness 12P connector (A), the EPS subharness 3P connector (B), and the harness clip (C) to the harness bracket (D).



39. Connect the EPS subharness 12P connector (E) and EPS subharness 3P connector (F), and pull down the lever (G), then confirm the connector is fully seated.

40. Install the P/S heat shield (A) with the flange bolts, and tighten them to the specified torque.



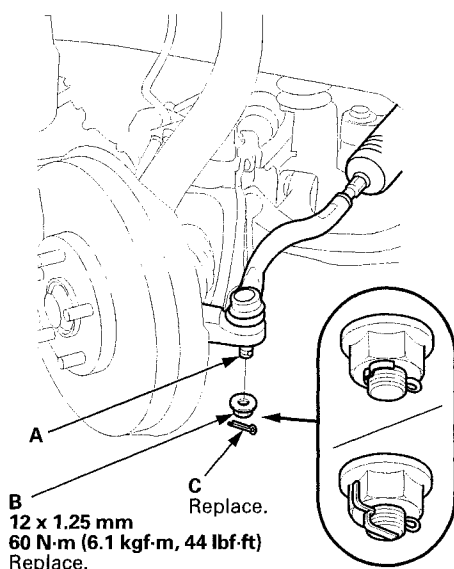
41. Install the strut brace (see page 20-210).

42. Install the cowl cover (see page 20-189) and engine compartment cover (see page 20-186).

43. Install the hood support struts to the upper location on both sides of the hood.



44. Wipe off any grease contamination from the ball joint tapered section and threads. Connect the tie-rod end ball joint (A) to the knuckle. Install the new nut (B), and tighten it to the specified torque.

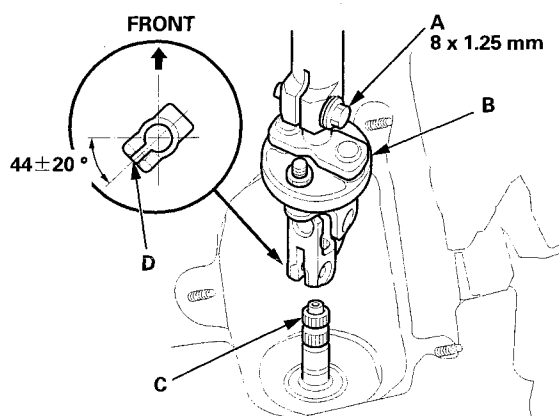


45. Install a new cotter pin (C), and bend it as shown.
46. Place a floor jack under the lower arm, and raise the suspension to load it with the vehicle's weight. Do not place the jack against the ball joint pin of the knuckle.
47. Tighten the damper fork mounting nut while holding the mounting bolt to the specified torque.
48. Install the front wheels, then set the wheels in the straight ahead position.

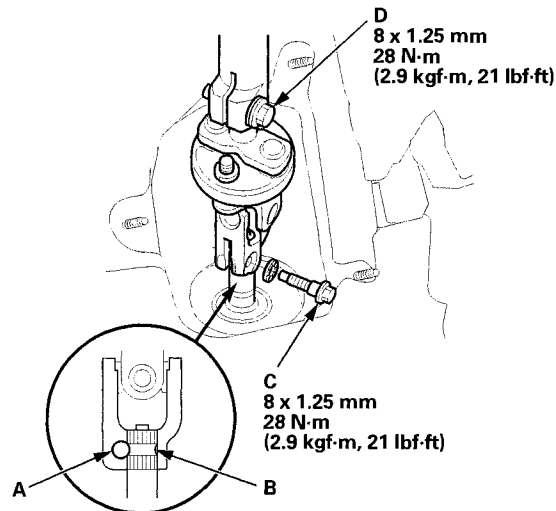
NOTE: Before installing the wheel, clean the mating surface between the brake disc and the inside of the wheel.

49. Remove the vinyl tape around the splines on the pinion shaft.

50. Loosen the upper steering joint bolt (A), and slip the lower end of the steering joint (B) onto the pinion shaft (C) taking care to align the gap (D) within the angle.



51. Align the bolt hole (A) on the steering joint with the groove (B) around the pinion shaft, then loosely install the lower steering joint bolt (C). Be sure that the joint bolt is securely in the groove in the pinion shaft.



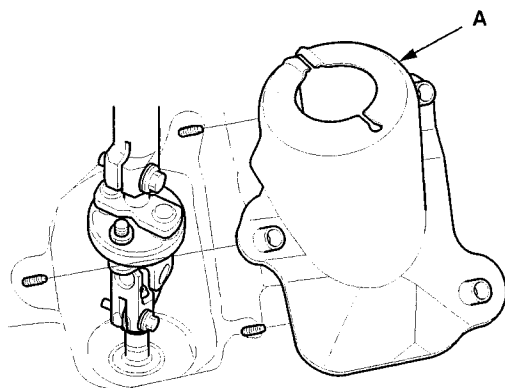
52. Pull on the steering joint to make sure that the steering joint is fully seated, then tighten the lower joint bolt to the specified torque.
53. Tighten the upper steering joint bolt (D) to the specified torque.

(cont'd)

EPS Components

Steering Gearbox Removal and Installation (cont'd)

54. Install the steering joint cover (A).



55. Install the steering wheel (see page 17-8), and the driver's airbag (see page 24-157).

56. With the tires raised off the ground (vehicle on a lift), check for the following symptoms by turning the steering wheel fully to the right and left several times.

Symptom	Probable cause
Rubbing sound coming from the lower steering column area.	Steering column joint is contacting the cover.
Grating sound from the lower steering column area, or a rough feeling during steering.	Poor engagement of the pinion shaft splines.
Noise from around the steering wheel during steering.	Poor engagement of the SRS cable reel with the steering wheel, or a damaged cable reel.

57. Do the battery terminal reconnection procedure (see page 22-86), and check these items:

- Turn the ignition switch to ON (II), or press the engine start/stop button to select the ON mode, and check that the SRS indicator comes on for about 6 seconds, and then goes off.
- Make sure the horn and turn signal switches work properly.
- Make sure the steering wheel switches work properly.

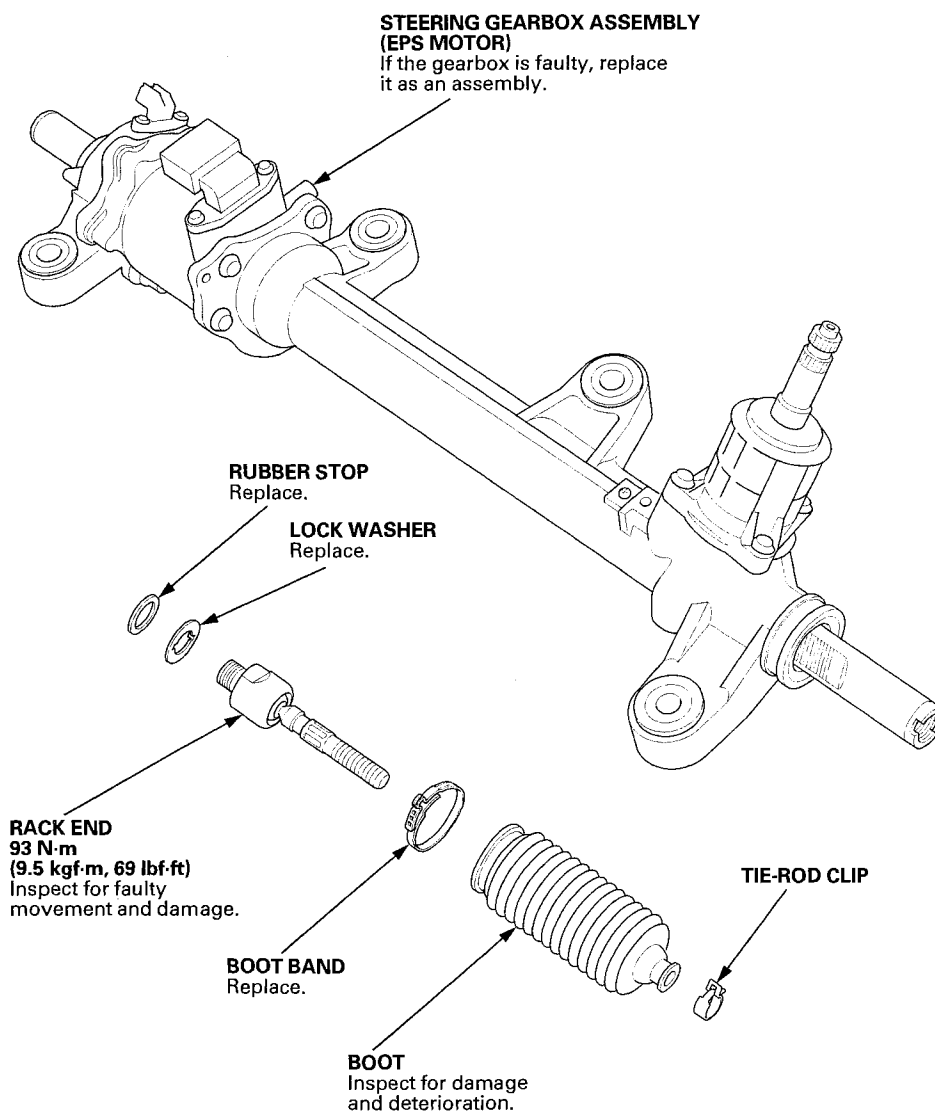
58. After installation, check these items:

- Start the engine, allow it to idle, and turn the steering wheel from lock to lock several times.
- Check that the EPS indicator does not come on.
- 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 splines.
- Do the torque sensor neutral position memorization (see page 17-24).
- With SH-AWD: Do the VSA sensor neutral position memorization (see page 19-117).
- Check the wheel alignment, and adjust it if necessary (see page 18-5).



Rack End Removal and Installation

Exploded View



(cont'd)

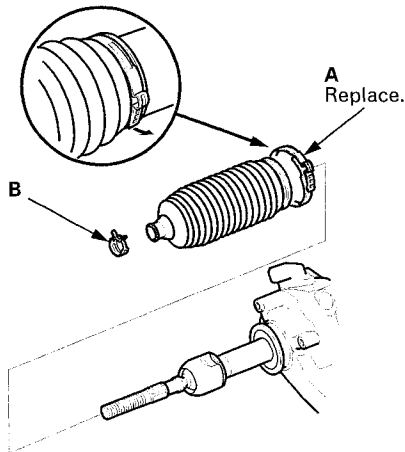
EPS Components

Rack End Removal and Installation (cont'd)

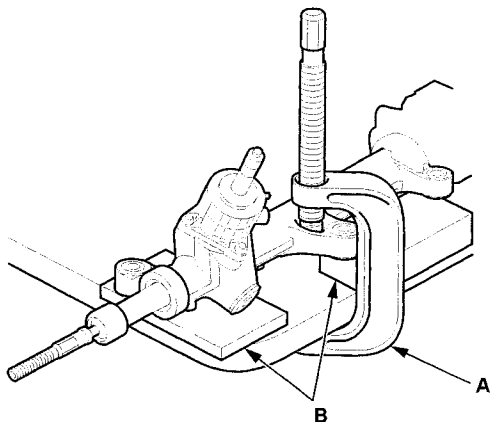
Removal

NOTE:

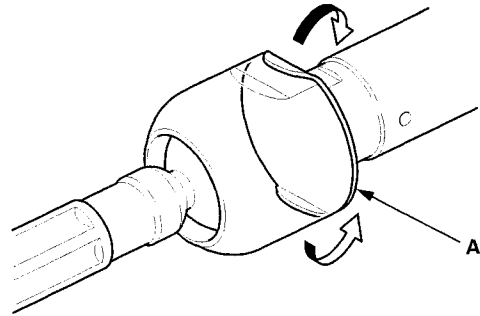
- Do not allow dust, dirt, or other foreign materials to enter the steering gearbox.
 - Refer to the Exploded View as needed during the following procedure.
1. Remove the steering gearbox (see page 17-63).
 2. Remove the tie-rod ends.
 3. Remove the boot bands (A), and discard them. Remove the tie-rod clips (B), and pull the boots away from the ends of the steering gearbox.



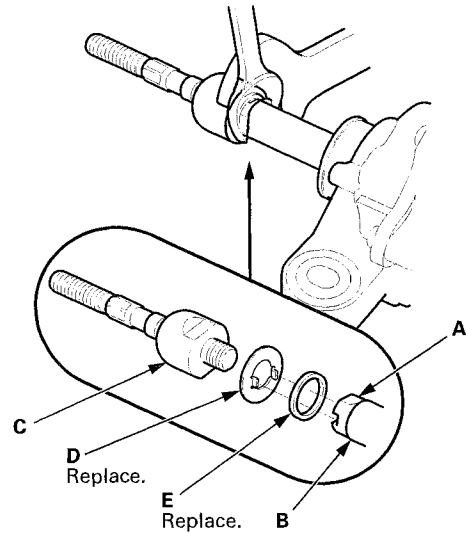
4. Hold the gearbox housing using a C-clamp (A) and wooden blocks (B) to a work bench as shown. Do not clamp the cylinder part of the gearbox housing in a vise.



5. Unbend the lock washers (A).



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

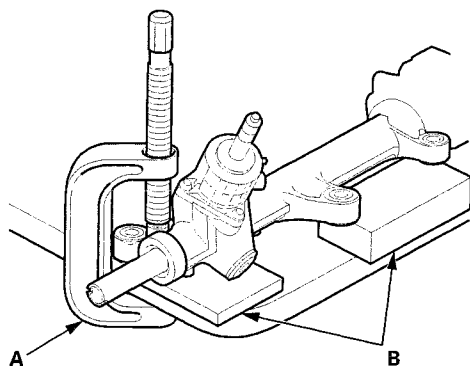


7. Remove the lock washer (D) and the rubber stop (E).

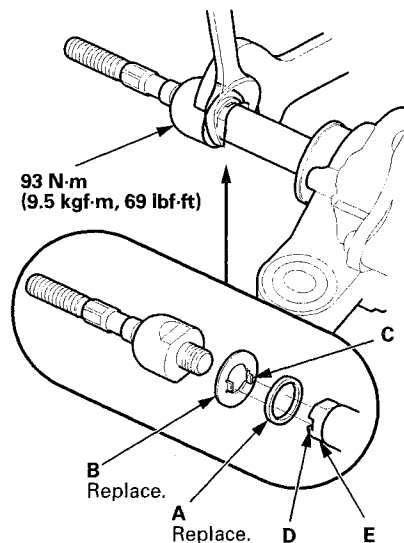


Installation

1. Hold the gearbox housing using a C-clamp (A) and wooden blocks (B) to a work bench as shown. Do not clamp the cylinder part of the gearbox housing in a vise.

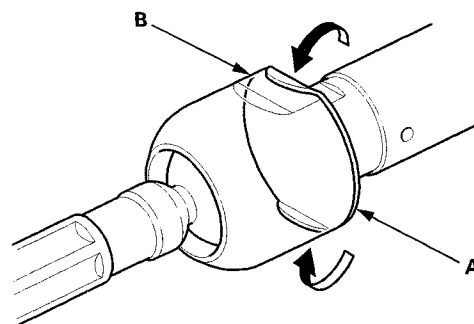


2. Install a new rubber stop (A) and a new lock washer (B). Align the lock washer tabs (C) with the slots (D) on the rack end (E) while holding the lock washer in place. Repeat this step for the other side of the rack.

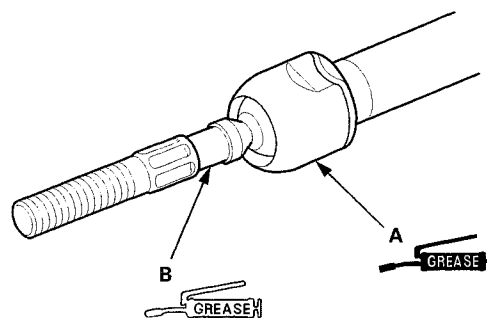


3. Hold the flat surface sections of the steering rack with one wrench, and tighten both rack ends with another wrench. Be careful not to damage the rack surface with the wrench.

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



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



6. Apply a light coat of silicone grease to the boot fitting grooves (B) on the rack end.

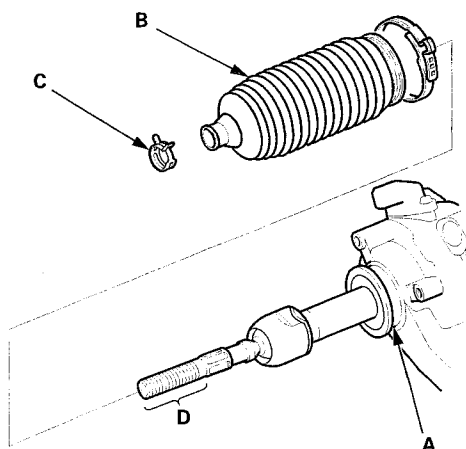
NOTE: Make sure not to get any silicone grease on the terminal part of the connectors and switches, especially if you have silicone grease on your hands or gloves.

(cont'd)

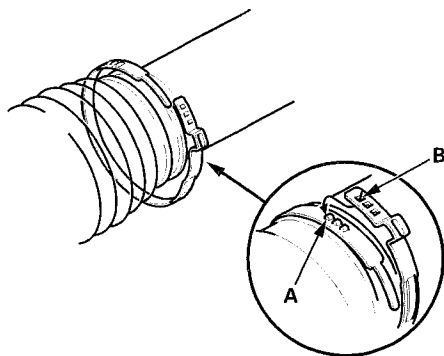
EPS Components

Rack End Removal and Installation (cont'd)

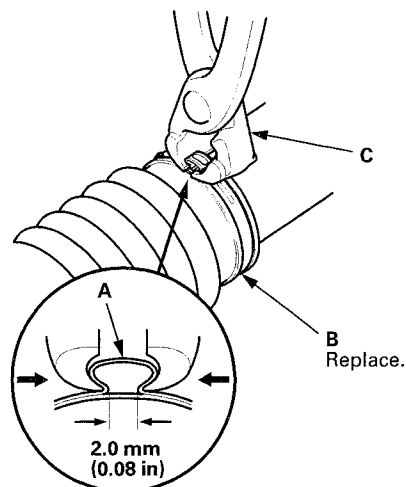
7. Clean off any grease or contamination from the boot installation grooves (A) around the gearbox housing. Install the boots (B) on the rack ends with the tie-rod clips (C), and fit the boot end in the installation grooves in the housing properly.



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



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



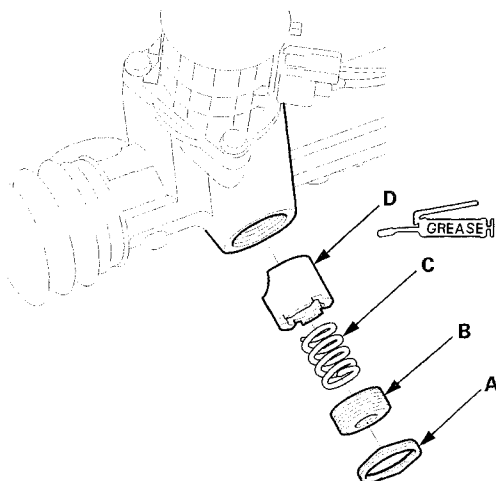
11. Slide the rack shaft right and left to be certain that the boots are not deformed or twisted.
12. Install the tie-rod end to the rack end.
13. Install the steering gearbox (see page 17-71).



Rack Guide Removal/Installation

NOTE: During removal/installation, do not allow dust, dirt, or other foreign materials to enter the steering gearbox.

1. Loosen the locknut (A), then remove the rack guide screw (B), the spring (C), and the rack guide (D).



2. Apply steering grease to the sliding surface and the circumference of the rack guide, and install it onto the gearbox housing. Wipe the grease off the threaded section of the gearbox housing.

3. Install the spring onto the gearbox housing.

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

NOTE: If more than 5 minutes have passed after applying the sealant, remove the old sealant and residue, and reapply new sealant.

5. Loosely install the locknut.

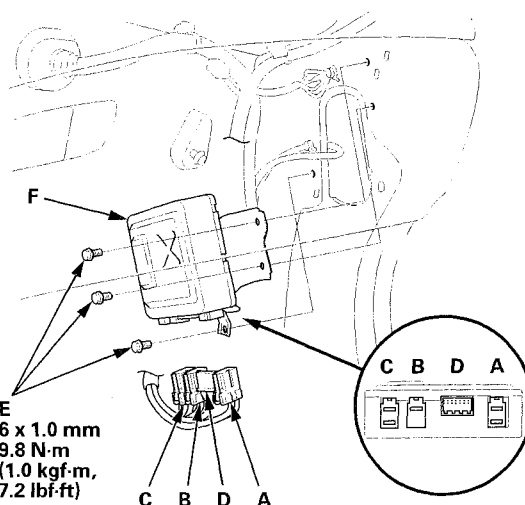
6. Adjust the rack guide screw (see page 17-17). After adjusting, check that the rack moves smoothly by sliding the rack right and left.

EPS Control Unit Removal/Installation

1. Do the battery terminal disconnection procedure (see page 22-86).

2. Remove these items:

- Passenger's dashboard undercover (see page 20-125)
- Passenger's front door sill trim (see page 20-81)
- Passenger's kick panel (see step 3 on page 20-81)
- Passenger's under-dash fuse/relay box (see page 22-83)



3. Disconnect EPS control unit connector A (2P), connector B (2P), connector C (2P), and connector D (28P).

4. Remove the bolts (E) from the EPS control unit (F).

5. Remove the EPS control unit.

6. Install the EPS control unit in the reverse order of removal.

7. Do the battery terminal reconnection procedure (see page 22-86).

8. Do the torque sensor neutral position memorization (see page 17-24).

9. After installation, start the engine, allow it to idle, and turn the steering wheel from lock to lock several times. Check that the EPS indicator does not come on.