

POWER STEERING SYSTEM

PRECAUTION

1. HANDLING PRECAUTIONS FOR STEERING SYSTEM

- (a) Care must be taken when replacing parts. Incorrect replacement could affect the performance of the steering system and result in a driving hazard.

2. HANDLING PRECAUTIONS FOR SRS

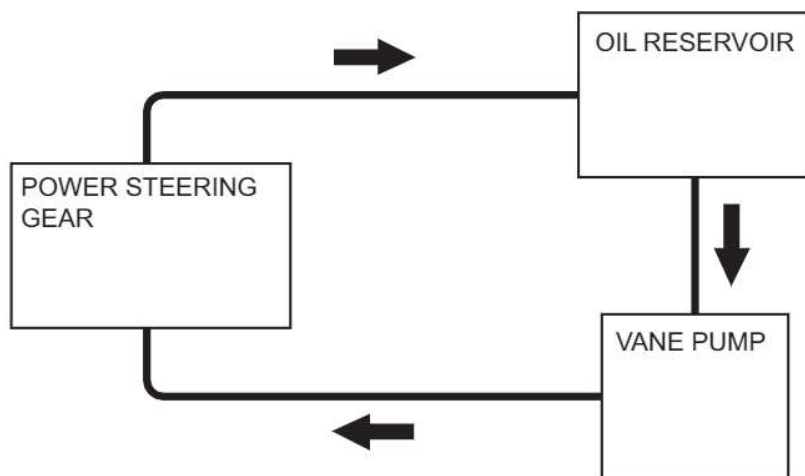
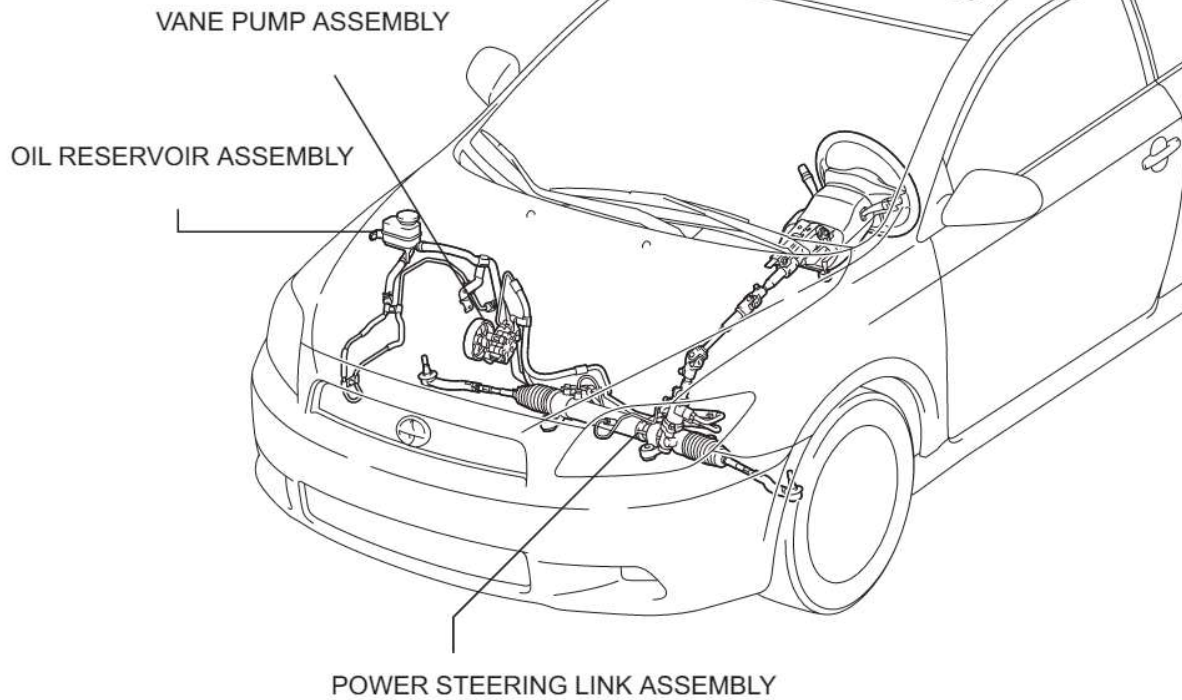
- (a) The vehicle is equipped with a Supplemental Restraint System (SRS) which includes a driver side airbag. Failure to carry out service procedures in the correct sequence may unexpectedly deploy the SRS and cause serious injuries. Furthermore, if a mistake is made in servicing the SRS, it may fail to operate when required. Before servicing (including installation, removal, inspection or replacement of parts), read the SRS section's "Precaution" (see page [RS-11](#)).

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POWER STEERING – POWER STEERING SYSTEM

SYSTEM DESCRIPTION

A rack and pinion type, engine revolution sensing power steering gear is used on all models.



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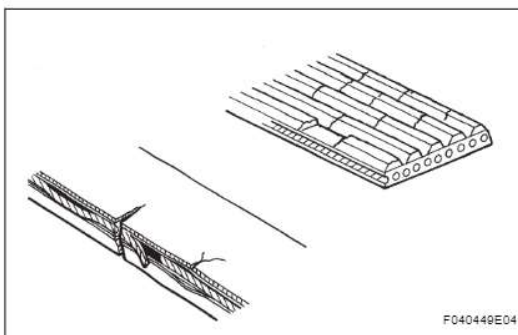
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POWER STEERING – POWER STEERING SYSTEM**PS-3****PROBLEM SYMPTOMS TABLE****HINT:**

Use the table below to help determine the cause of the problem symptom. The potential causes of the symptoms are listed in order of probability in the "Suspected Area" column of the table. Check each symptom by checking the suspected areas in the order they are listed. Replace parts as necessary.

Symptom	Suspected Area	See page
Hard steering	1. Tires (Improperly inflated)	TW-3
	2. Power steering fluid level (Low)	PS-4
	3. Drive belt (Loose)	-
	4. Front wheel alignment (Incorrect)	SP-2
	5. Steering system joints (Worn)	-
	6. Suspension arm ball joints (Worn)	SP-26
	7. Steering column (Binding)	-
	8. Power steering vane pump	PS-8
	9. Power steering gear	PS-21
Poor return	1. Tires (Improperly inflated)	TW-3
	2. Front wheel alignment (Incorrect)	SP-2
	3. Steering column (Binding)	-
	4. Power steering gear	PS-21
Excessive free play	1. Steering system joints (Worn)	-
	2. Suspension arm ball joints (Worn)	SP-26
	3. Intermediate shaft, Sliding yoke (Worn)	-
	4. Front wheel bearing (Worn)	AH-6
	5. Power steering gear	PS-21
Abnormal noise	1. Power steering fluid level (Low)	PS-4
	2. Steering system joints (Worn)	-
	3. Power steering vane pump	PS-8
	4. Power steering gear	PS-21

**ON-VEHICLE INSPECTION****1. INSPECT DRIVE BELT**

- (a) Visually check the belt for excessive wear, frayed cords, etc.

If any defect is found, replace the drive belt.

HINT:

Cracks on the rib side of a belt are considered acceptable. Replace the belt if there are any missing ribs.

2. BLEED POWER STEERING SYSTEM

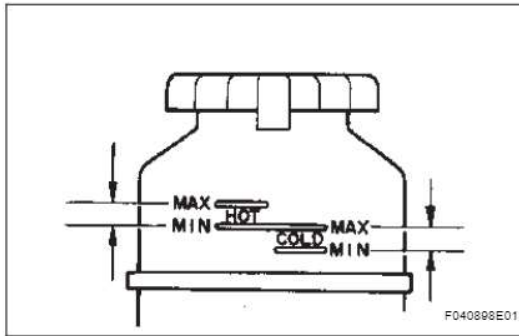
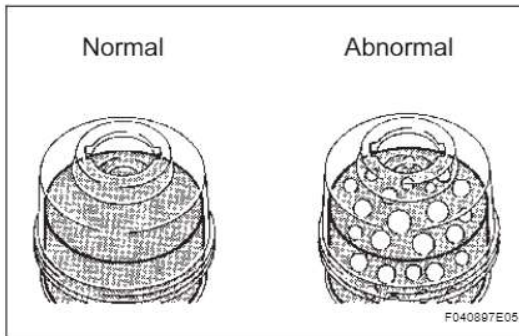
- (a) Check the fluid level.
- (b) Jack up the front of the vehicle and support it with stands.
- (c) Turn the steering wheel.
- (1) With the engine stopped, turn the wheel slowly from lock to lock several times.
- (d) Lower the vehicle.
- (e) Start the engine.
- (1) Run the engine at idle for a few minutes.

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POWER STEERING – POWER STEERING SYSTEM

- (f) Turn the steering wheel.
 - (1) With the engine idling, turn the steering wheel to the left or right full lock position and keep it there for 2 to 3 seconds, and then turn the wheel to the opposite full lock position and keep it there for 2 to 3 seconds.
 - (2) Repeat the step above several times.
- (g) Stop the engine.
- (h) Check for foaming or emulsification. Especially, if the system has to be bled twice because of foaming or emulsification, check for fluid leaks in the system.
- (i) Check the fluid level.



3. CHECK POWER STEERING FLUID LEVEL

- (a) Keep the vehicle level.
- (b) With the engine stopped, check the fluid level in the oil reservoir. If necessary, add fluid.

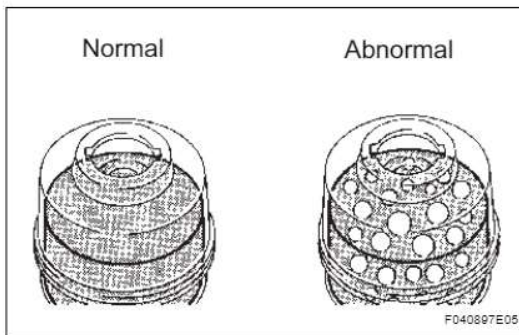
Fluid:**ATF "DEXRON" II or III****HINT:**

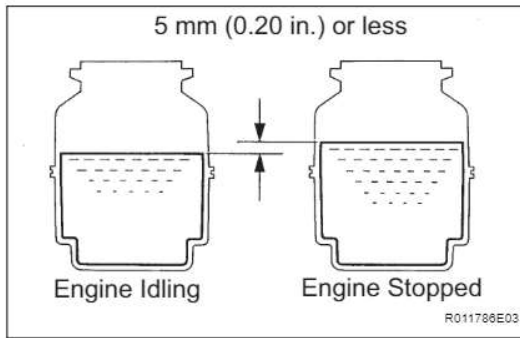
When hot, check that the fluid level is within the HOT range on the oil reservoir. If the fluid is cold, check that it is within the COLD range.

- (c) Start the engine and run it at idle.
- (d) Turn the steering wheel from lock to lock several times to raise fluid temperature.

Standard fluid temperature:**75 to 80°C (167 to 176°F)**

- (e) Check for foaming or emulsification. If foaming or emulsification is identified, bleed the power steering system.



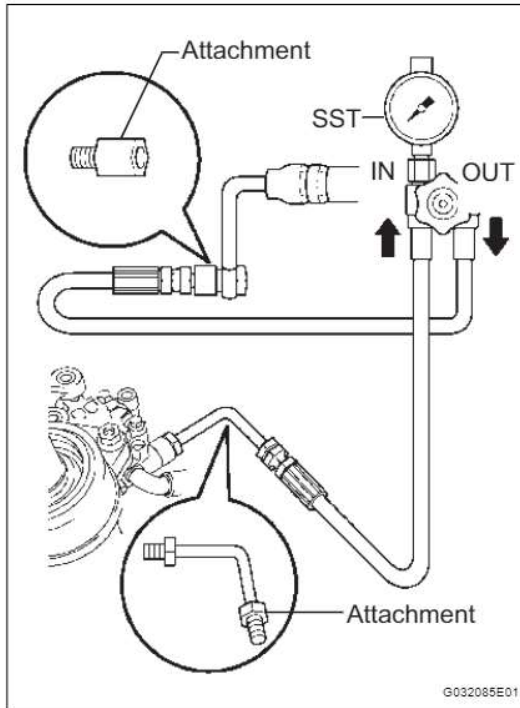
POWER STEERING – POWER STEERING SYSTEM**PS-5**

- (f) With the engine idling, measure the fluid level in the oil reservoir.
- (g) Stop the engine.
- (h) Wait a few minutes and remeasure the fluid level in the oil reservoir.

Maximum fluid level rise:**5 mm (0.20 in.)**

If a problem is found, bleed the power steering system.

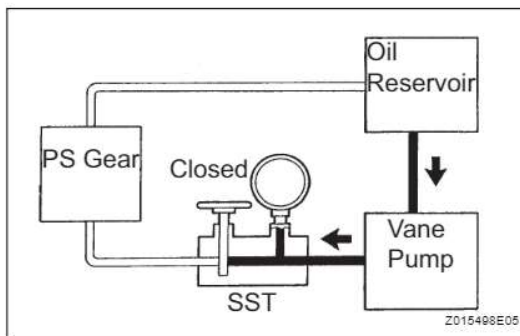
- (i) Check the fluid level.

**4. CHECK STEERING FLUID PRESSURE**

- (a) Disconnect the pressure feed tube (see page PS-8).
- (b) Connect SST, as shown in the illustration.
SST 09640-10010 (09641-01010, 09641-01060, 09641-01030)

NOTICE:**Check that the valve of the SST is in the open position.**

- (c) Bleed the power steering system.
- (d) Start the engine and run it at idle.
- (e) Turn the steering wheel from lock to lock several times to raise fluid temperature.

Standard fluid temperature:**75 to 80°C (167 to 176°F)**

- (f) With the engine idling, close the valve of the SST and observe the reading on the SST.

Standard fluid pressure:**7,800 to 8,300 kPa (80 to 85 kgf/cm², 1,131 to 1,204 psi)****NOTICE:**

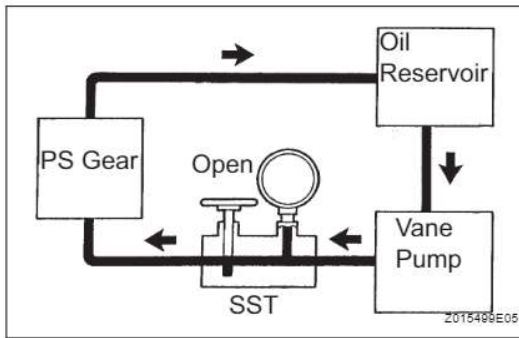
- Do not keep the valve closed for more than 10 seconds.
- Do not allow the fluid temperature to become too high.

If not within the specified range, check for fluid leaks and replace parts as necessary.

PS

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POWER STEERING – POWER STEERING SYSTEM



- (g) With the engine idling, open the valve fully.
 (h) Measure the fluid pressure at engine speeds of 1,000 rpm and 3,000 rpm.

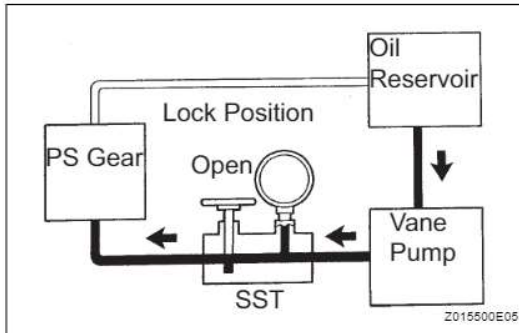
Standard difference in fluid pressure:

490 kPa (5 kgf/cm², 71 psi) or less

NOTICE:

Do not turn the steering wheel.

If not within the specified range, check for fluid leaks and replace parts as necessary.



- (i) With the engine idling and the valve fully opened, turn the steering wheel to the left or right full lock position.

Standard fluid pressure:

7,800 to 8,300 kPa (80 to 85 kgf/cm², 1,131 to 1,204 psi)

NOTICE:

- Do not keep the steering wheel in the full lock position for more than 10 seconds.
- Do not allow the fluid temperature to become too high.

If not within the specified range, check for fluid leaks and replace parts as necessary.

- (j) Disconnect the SST.

SST 09640-10010 (09641-01010, 09641-01060, 09641-01030)

Connect the pressure feed tube (see page PS-15).

- (k) Bleed the power steering system.

5. CHECK STEERING EFFORT

- (a) Center the steering wheel.
 (b) Remove the steering wheel pad (see page RS-344).
 (c) Start the engine and run it at idle.
 (d) Measure the steering effort in both directions.

Standard effort (Reference):

5.5 N*m (56 kgf*cm, 49 in.*lbf) or less

HINT:

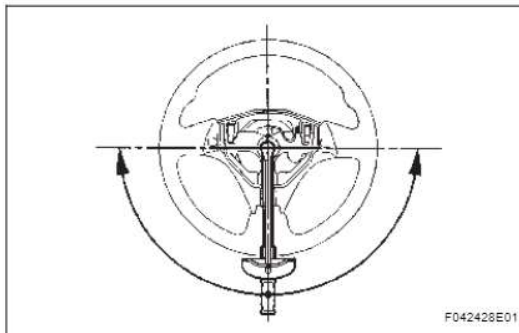
Check tire type, pressure and road surface before making your diagnosis.

If not within the specified range, check the power steering system (see page PS-2).

- (e) Torque the steering wheel set nut.

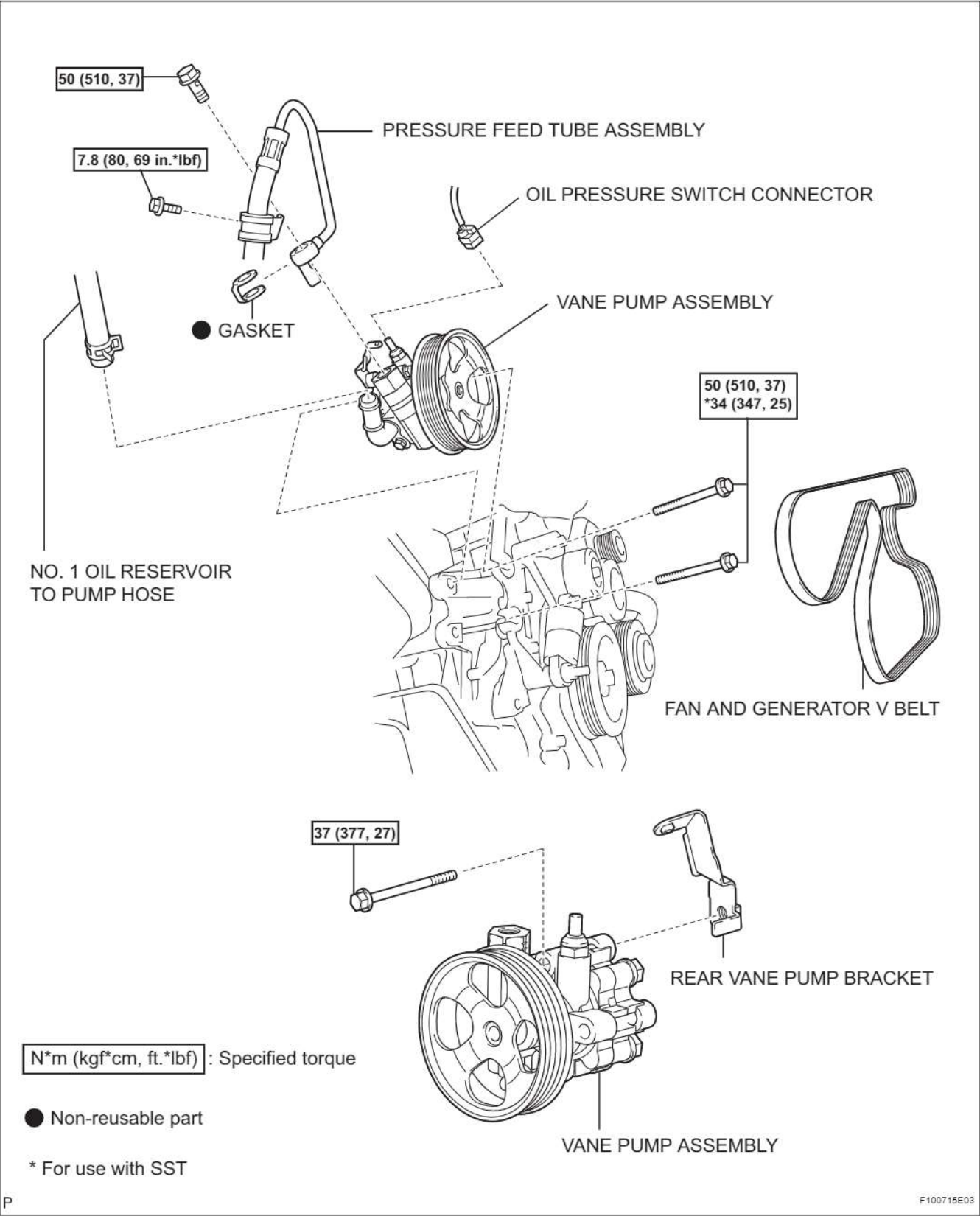
Torque: 50 N*m (510 kgf*cm, 37 ft.*lbf)

- (f) Install the steering wheel pad (see page RS-346).



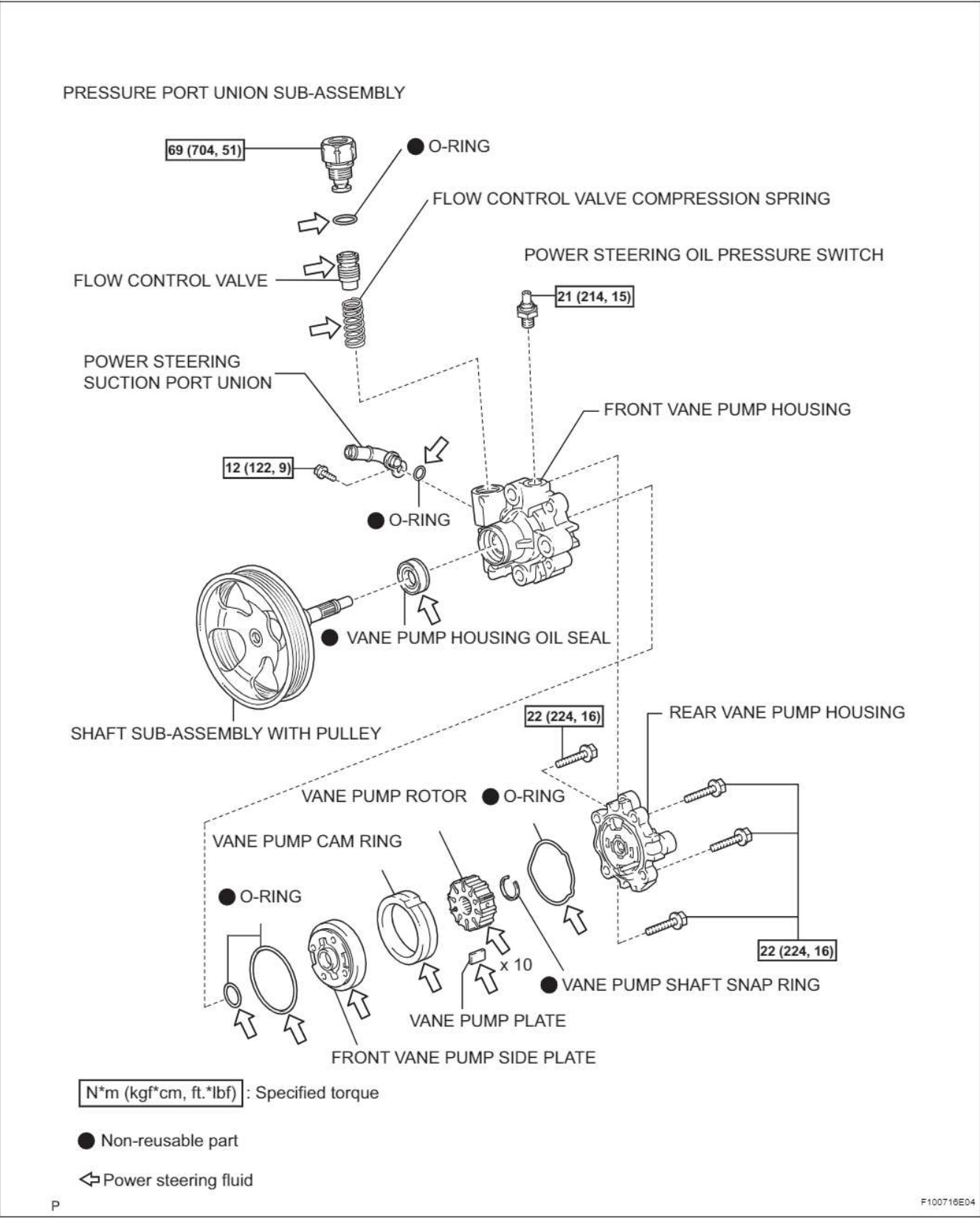
VANE PUMP

COMPONENTS



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POWER STEERING – VANE PUMP



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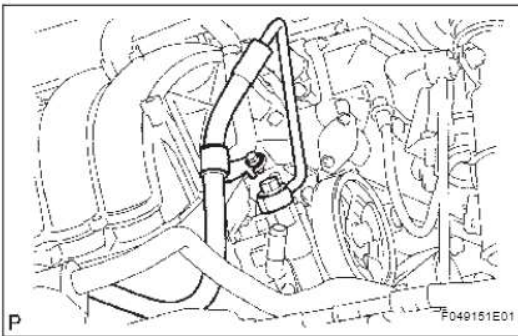
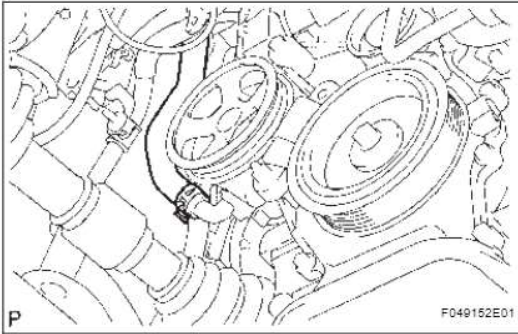
REMOVAL

1. REMOVE FRONT WHEEL RH
2. DRAIN POWER STEERING FLUID
3. REMOVE FRONT FENDER APRON SEAL RH (See page [CH-10](#))
4. REMOVE FAN AND GENERATOR V BELT (See page [EM-6](#))
5. DISCONNECT NO. 1 OIL RESERVOIR TO PUMP HOSE

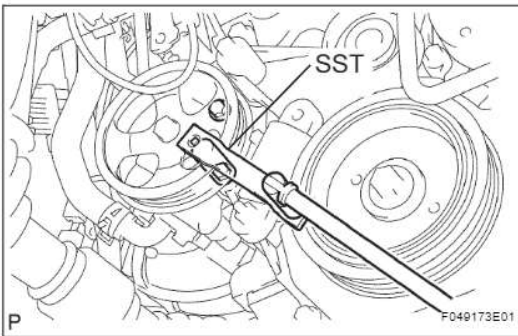
- (a) Remove the clip and disconnect the No. 1 oil reservoir to pump hose.

NOTICE:

Take care not to spill fluid on the V belt.



6. DISCONNECT PRESSURE FEED TUBE ASSEMBLY
 - (a) Remove the bolt and disconnect the pressure feed tube from the pump bracket rear.
 - (b) Using a 27 mm wrench to hold the pressure port union, remove the union bolt and gasket.



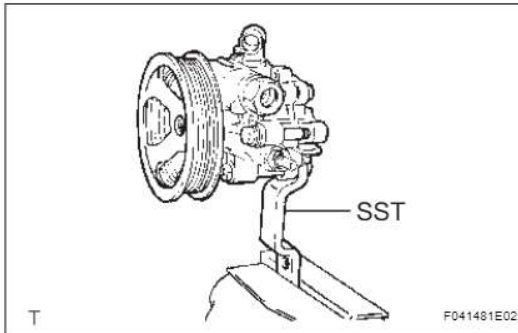
7. REMOVE VANE PUMP ASSEMBLY
 - (a) Disconnect the connector from the oil pressure switch.
 - (b) Using SST and a 14 mm deep socket, loosen the 2 bolts.
SST 09249-63010
 - (c) Remove the vane pump.

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POWER STEERING – VANE PUMP

DISASSEMBLY**NOTICE:**

Do not overtighten when using a vise.

**1. FIX VANE PUMP ASSEMBLY**

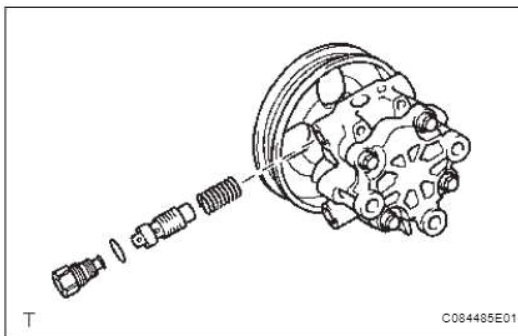
- (a) Using SST, hold the vane pump in a vise.
SST 09630-00014 (09631-00132)

2. REMOVE REAR VANE PUMP BRACKET

- (a) Remove the bolt and vane pump bracket.

3. REMOVE POWER STEERING SUCTION PORT UNION

- (a) Remove the bolt and suction port union.
(b) Remove the O-ring from the suction port union.

**4. REMOVE FLOW CONTROL VALVE**

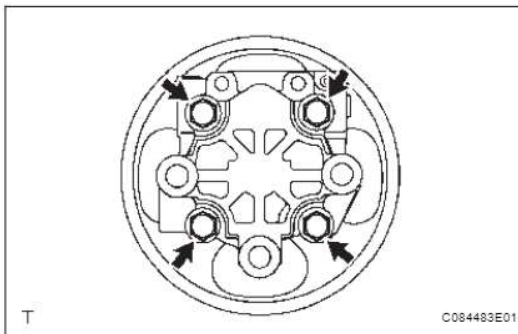
- (a) Remove the pressure port union.
(b) Remove the O-ring from the pressure port union.
(c) Remove the flow control valve and compression spring.

5. REMOVE POWER STEERING OIL PRESSURE SWITCH**NOTICE:**

If the oil pressure switch is dropped or damaged, replace it with a new one.

6. REMOVE REAR VANE PUMP HOUSING

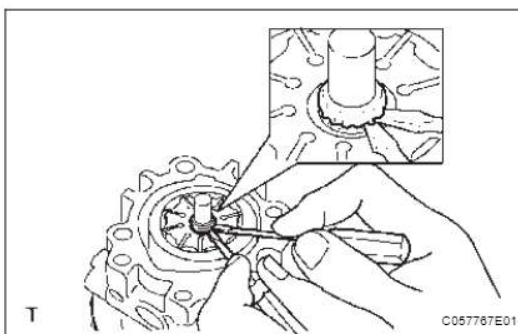
- (a) Remove the 4 bolts and rear housing from the front housing.
(b) Remove the O-ring from the rear housing.

**7. REMOVE SHAFT SUB-ASSEMBLY WITH PULLEY**

- (a) Using 2 screwdrivers, remove the snap ring from the shaft.
(b) Remove the shaft with pulley.

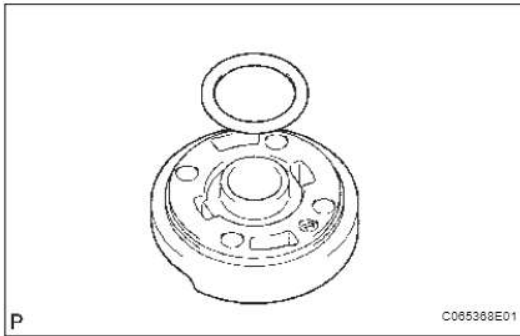
8. REMOVE VANE PUMP ROTOR

- (a) Remove the 10 vane pump plates.
(b) Remove the vane pump rotor.

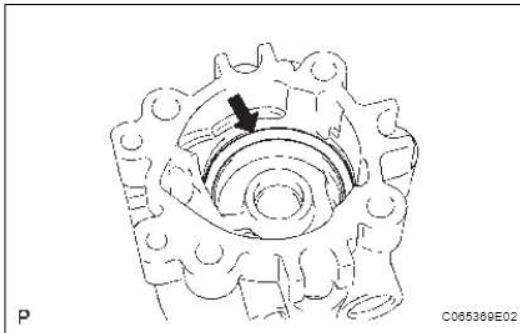
9. REMOVE VANE PUMP CAM RING

POWER STEERING – VANE PUMP

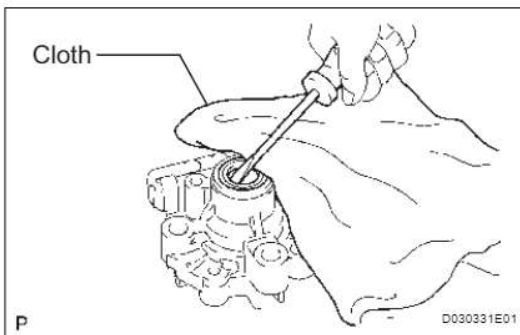
PS-11

**10. REMOVE FRONT VANE PUMP SIDE PLATE**

- (a) Remove the front side plate from the front housing.
- (b) Remove the O-ring from the front side plate.



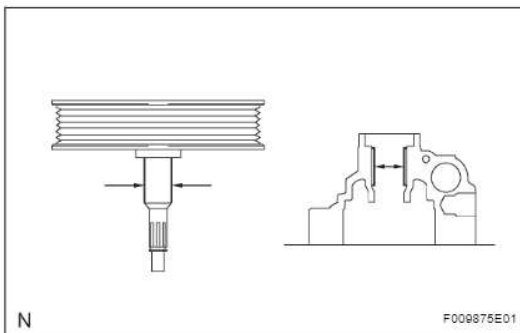
- (c) Remove the O-ring from the front housing.

**11. REMOVE VANE PUMP HOUSING OIL SEAL**

- (a) Using a screwdriver, remove the oil seal.

NOTICE:

Be careful not to damage the front housing.

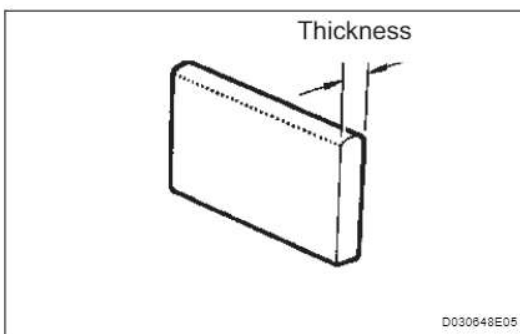
**INSPECTION****1. INSPECT VANE PUMP SHAFT AND BUSH IN HOUSING FRONT**

- (a) Using a micrometer and caliper gauge, measure the oil clearance.

Maximum oil clearance:

0.07 mm (0.0028 in.)

If the oil clearance exceeds the maximum, replace the vane pump assembly.

**2. INSPECT VANE PUMP ROTOR AND VANE PUMP PLATES**

- (a) Using a micrometer, measure the thickness of the vane pump plates.

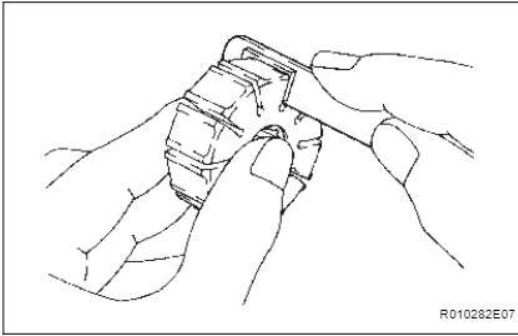
Standard thickness:

1.405 to 1.411 mm (0.05531 to 0.05555 in.)

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POWER STEERING – VANE PUMP

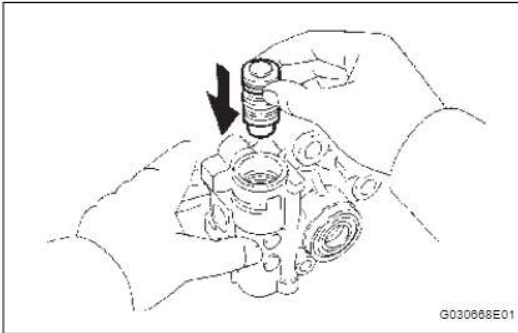


- (b) Using a feeler gauge, measure the clearance between a side face of the vane pump rotor groove and the vane plates.

Maximum clearance:

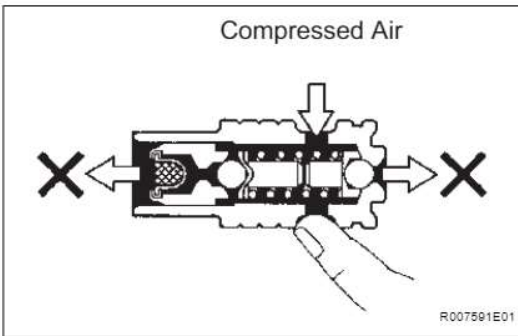
0.03 mm (0.0012 in.)

If the clearance exceeds the maximum, replace the vane pump assembly.

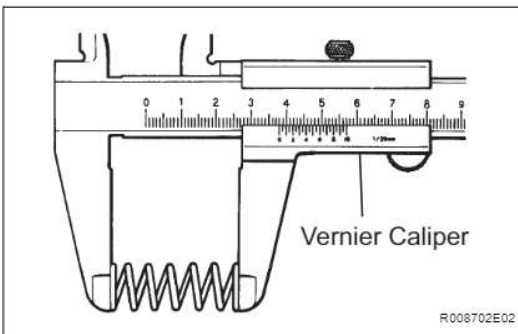


3. INSPECT FLOW CONTROL VALVE

- (a) Coat the flow control valve with power steering fluid and check that it falls smoothly into the flow control valve hole under its own weight. If it lacks smoothness, replace the vane pump assembly.



- (b) Check the flow control valve for leakage. Close one of the holes and apply compressed air, 392 to 490 kPa (4 to 5 kgf/cm², 57 to 71 psi), into the opposite side hole, and confirm that air does not come out from the end holes. If air leaks, replace the vane pump assembly.



4. INSPECT FLOW CONTROL VALVE COMPRESSION SPRING

- (a) Using a vernier caliper, measure the free length of the compression spring.

Minimum free length:

36.9 mm (1.453 in.)

If the length is less than the minimum, replace the vane pump assembly.

5. INSPECT PRESSURE PORT UNION

If the union seat in the pressure port union is severely damaged, it may cause fluid leakage. In that case, replace the vane pump assembly.

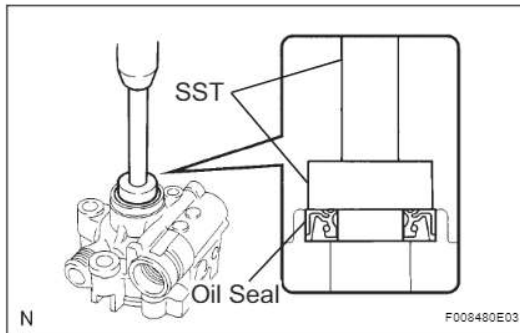
POWER STEERING – VANE PUMP

PS-13

REASSEMBLY

NOTICE:

- Do not overtighten when using a vise.
- When installing, coat the parts indicated by arrows with power steering fluid (see page PS-7).

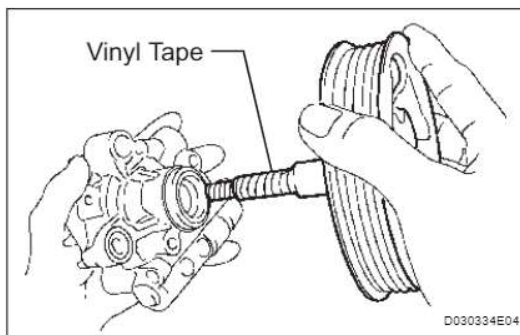


1. INSTALL VANE PUMP HOUSING OIL SEAL

- Coat a new oil seal lip with power steering fluid.
- Using SST and a press, press in the oil seal.
SST 09950-60010 (09951-00280), 09950-70010 (09951-07100)

NOTICE:

Make sure that the oil seal is installed in the correct direction as shown in the illustration.

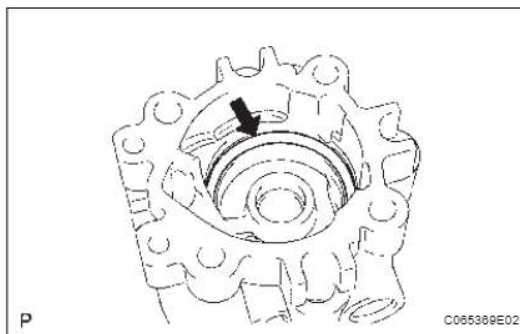


2. INSTALL SHAFT SUB-ASSEMBLY WITH PULLEY

- Coat the bush surface of the front housing with power steering fluid.
- Gradually insert the shaft with shaft from the pulley side.

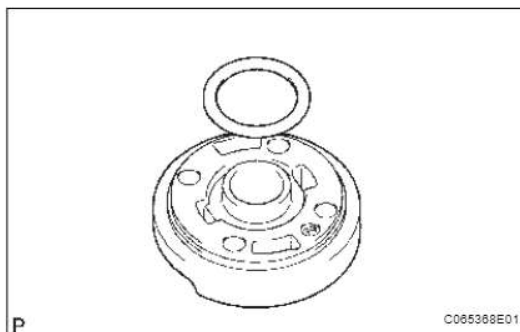
NOTICE:

Do not damage the oil seal lip in the front housing.



3. INSTALL FRONT VANE PUMP SIDE PLATE

- Coat a new O-ring with power steering fluid and install it into the front housing.

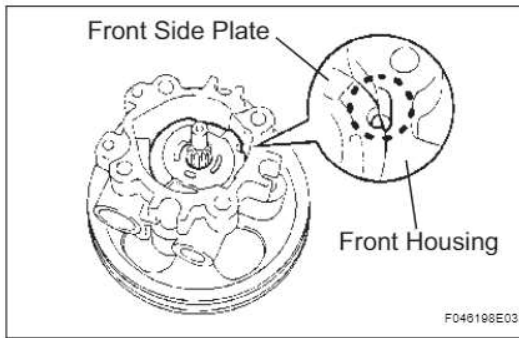


- Coat a new O-ring with power steering fluid and install it onto the front side plate.

PS

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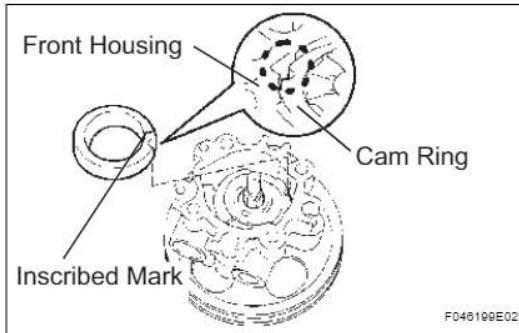
POWER STEERING – VANE PUMP



- (c) Align the dent of the front side plate with that of the front housing, and install the front side plate.

NOTICE:

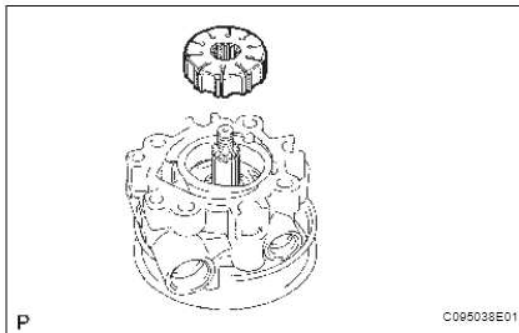
Make sure that the front side plate is installed in the correct direction as shown in the illustration.

**4. INSTALL VANE PUMP CAM RING**

- (a) Align the dent of the cam ring with that of the front side plate, and install the cam ring with the inscribed mark facing upward.

NOTICE:

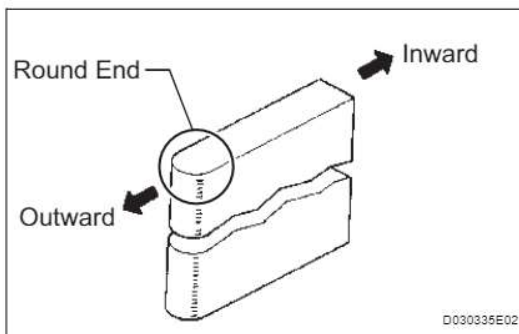
Make sure that the cam ring is installed in the correct direction.

**5. INSTALL VANE PUMP ROTOR**

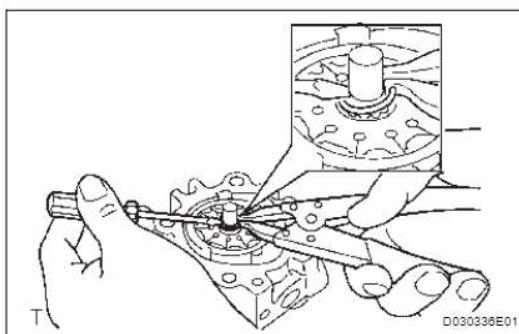
- (a) Coat the vane pump rotor with power steering fluid.
(b) Install the vane pump rotor.

NOTICE:

Vane pump rotor has no specific direction.



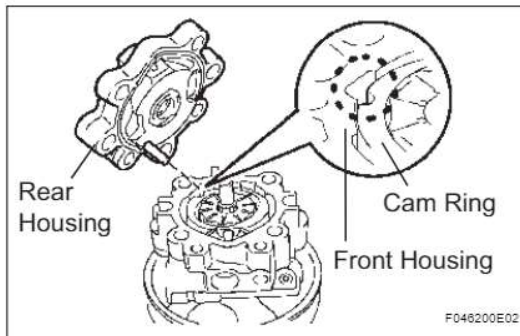
- (c) Coat all 10 vane pump plates with power steering fluid.
(d) Install the vane pump plates with the round end facing outward.

**6. INSTALL VANE PUMP SHAFT SNAP RING**

- (a) Using a screwdriver and snap ring expander, install a new snap ring to the shaft.

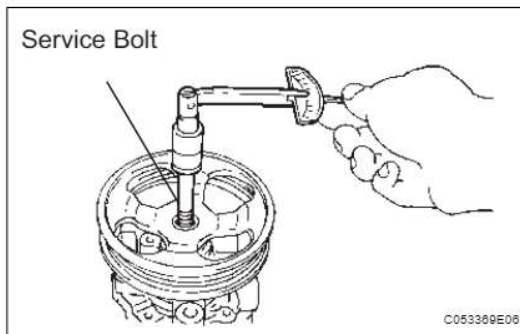
POWER STEERING – VANE PUMP

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**7. INSTALL REAR VANE PUMP HOUSING**

- Coat a new O-ring with power steering fluid and install it onto the rear housing.
- Align the straight pin of the rear housing with the dents of the cam ring, front side plate and the front housing, and install the rear housing with the 4 bolts.

Torque: 22 N*m (224 kgf*cm, 16 ft.*lbf)

**8. INSPECT PRELOAD**

- Check that the pump rotates smoothly without abnormal noise.
- Temporarily install the service bolt.

Recommended service bolt:

Thread diameter:

10 mm (0.39 in.)

Thread pitch:

1.25 mm (0.0492 in.)

Bolt length:

50 mm (1.97 in.)

- Using a torque wrench, check the pulley rotating torque.

Standard rotating torque:

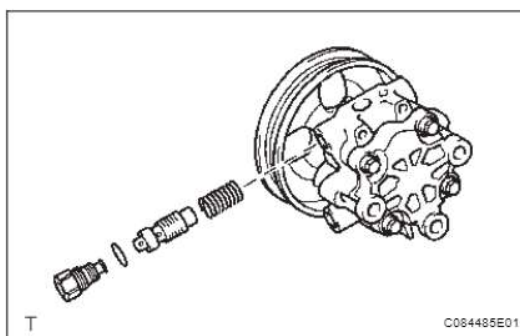
0.27 N*m (2.8 kgf*cm, 2.4 ft.*lbf) or less

If rotating torque is not as specified, check the installation condition of each part.

9. INSTALL POWER STEERING OIL PRESSURE SWITCH

- Install the oil pressure switch onto the vane pump assembly.

Torque: 21 N*m (214 kgf*cm, 15 ft.*lbf)

**10. INSTALL FLOW CONTROL VALVE**

- Coat the compression spring and flow control valve with power steering fluid.
- Install the compression spring and flow control valve.
- Coat a new O-ring with power steering fluid and install it onto the pressure port union.
- Install the pressure port union.

Torque: 69 N*m (704 kgf*cm, 51 ft.*lbf)

11. INSTALL REAR VANE PUMP BRACKET

- Install the rear vane pump bracket with the bolt.

Torque: 37 N*m (377 kgf*cm, 27 ft.*lbf)

HINT:

Make sure that the stopper of the bracket touches the vane pump body, and then torque the bolt.

12. INSTALL POWER STEERING SUCTION PORT UNION

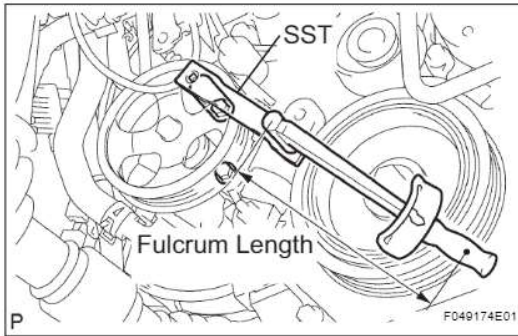
- Coat a new O-ring with power steering fluid, and install it to the suction port union.
- Install the suction port union with the bolt.

Torque: 12 N*m (122 kgf*cm, 9 ft.*lbf)

PS

PS-16

POWER STEERING – VANE PUMP



INSTALLATION

1. INSTALL VANE PUMP ASSEMBLY

- (a) Temporarily install the 2 bolts to the vane pump.
- (b) Install the vane pump with the 2 bolts.
- (c) Using SST and a 14 mm deep socket, fully tighten the bolts.

SST 09249-63010

Torque: 34 N*m (347 kgf*cm, 25 ft.*lbf)

NOTICE:

Use a torque wrench with a fulcrum length of 300 mm (11.81 in.).

This torque valve is effective when SST is parallel to the torque wrench.

- (d) Connect the connector to the oil pressure switch.

2. CONNECT PRESSURE FEED TUBE ASSEMBLY

- (a) Install the pressure feed tube and a new gasket to the vane pump with the union bolt.

HINT:

Make sure the stopper of the pressure feed tube touches the vane pump body.

- (b) Using a 27 mm wrench to hold the pressure port union, torque the union bolt.

Torque: 50 N*m (510 kgf*cm, 37 ft.*lbf)

- (c) Install the pressure feed tube with the bolt to the pump bracket rear.

Torque: 7.8 N*m (80 kgf*cm, 69 in.*lbf)

3. CONNECT NO. 1 OIL RESERVOIR TO PUMP HOSE

- (a) Connect the No. 1 oil reservoir to pump hose with the clip.

NOTICE:

Take care not to spill fluid on the V belt.

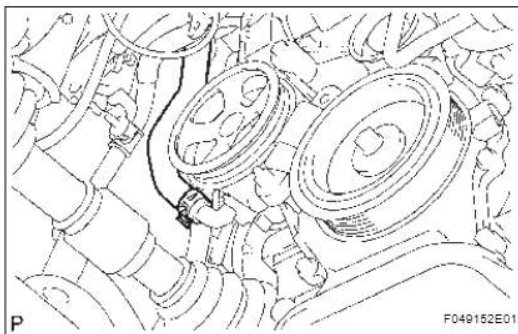
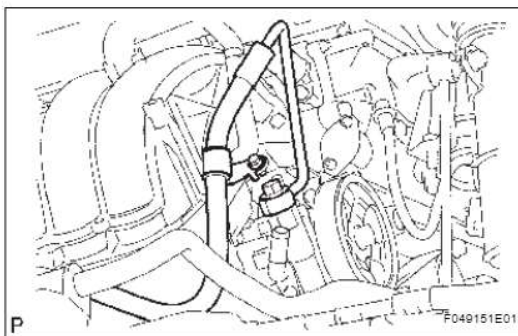
4. INSTALL FAN AND GENERATOR V BELT (See page [EM-6](#))

5. INSTALL FRONT FENDER APRON SEAL RH

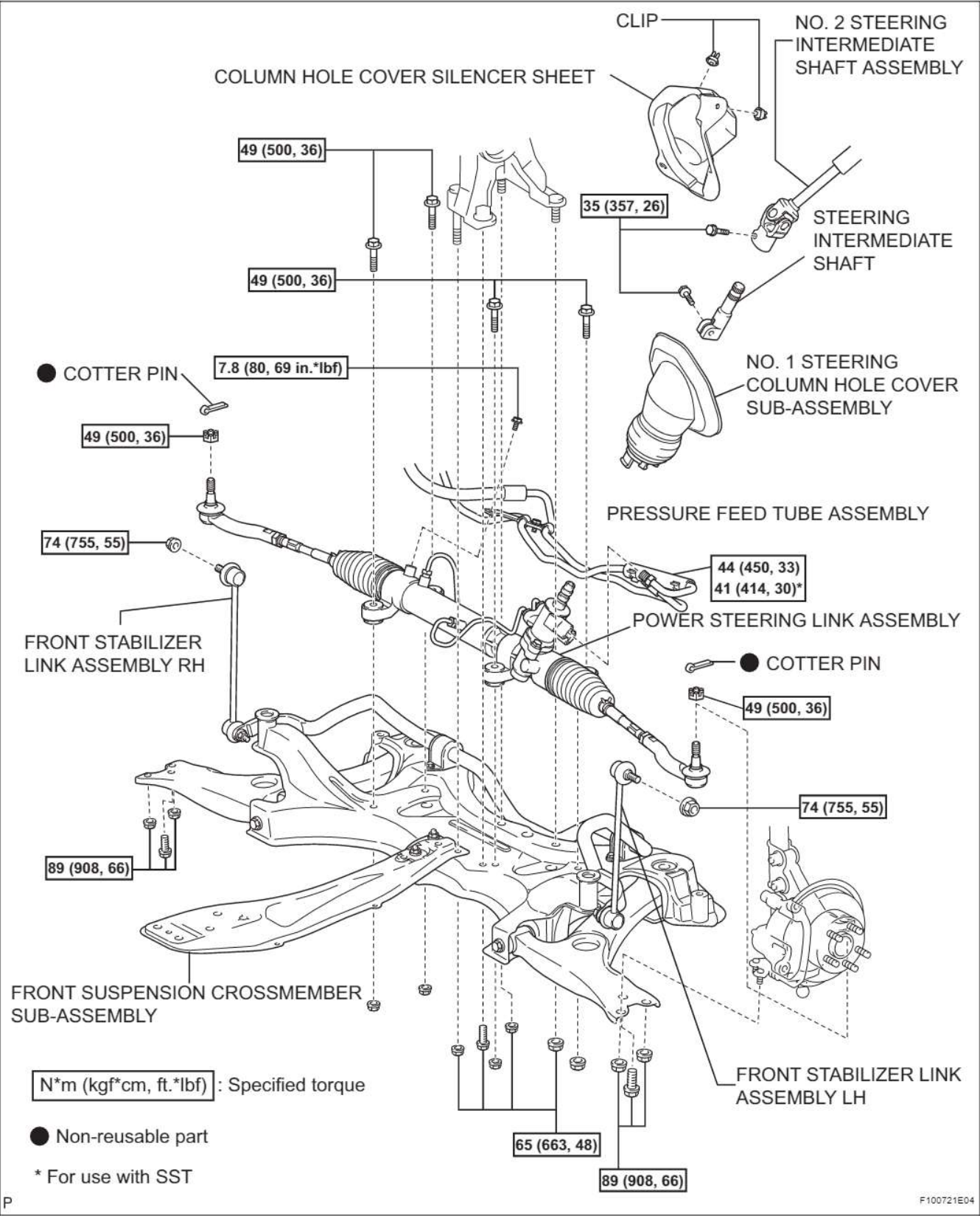
6. INSTALL FRONT WHEEL RH (See page [CH-18](#))

7. BLEED POWER STEERING FLUID

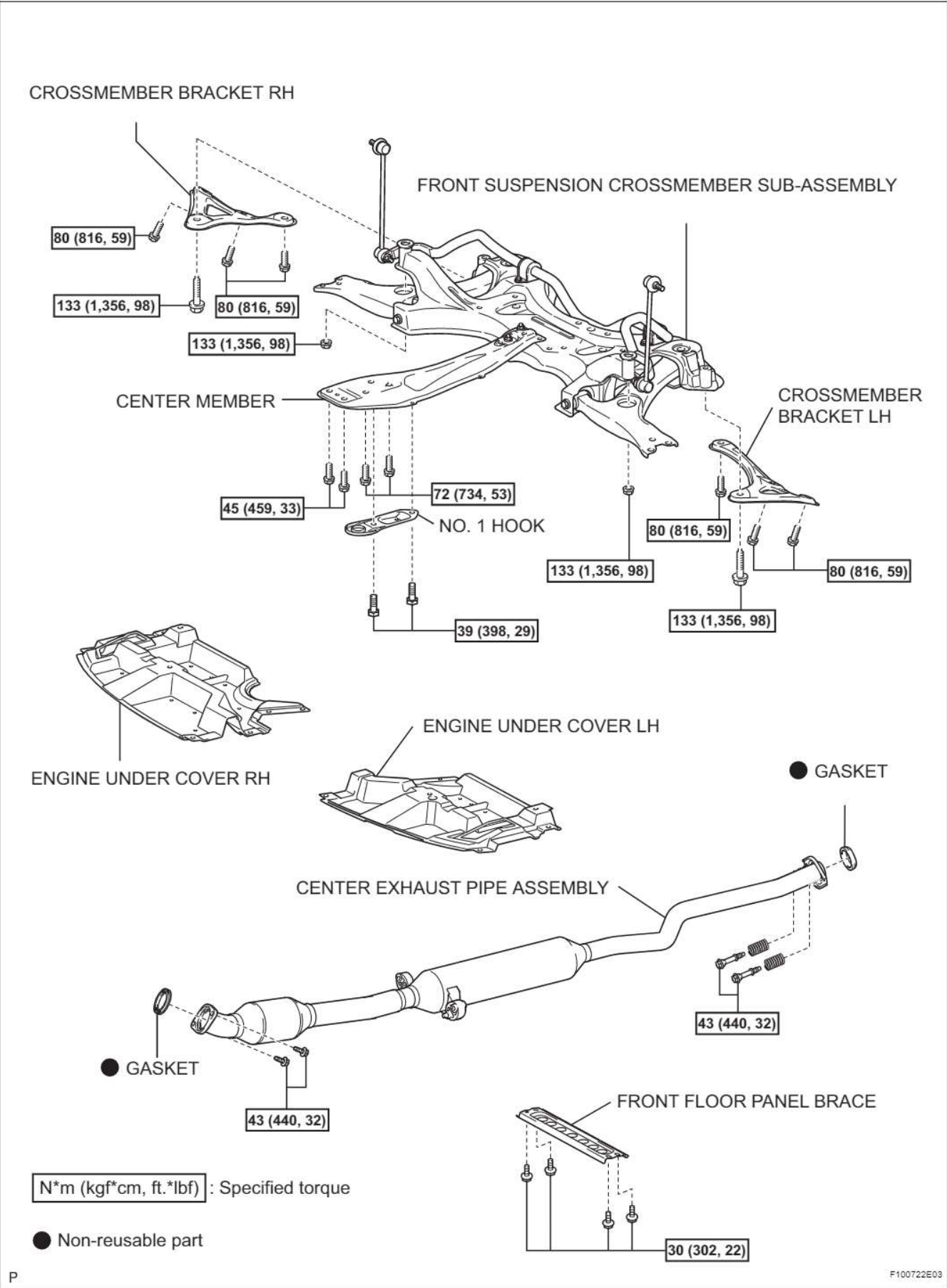
8. INSPECT FOR FLUID LEAK



STEERING LINKAGE
COMPONENTS

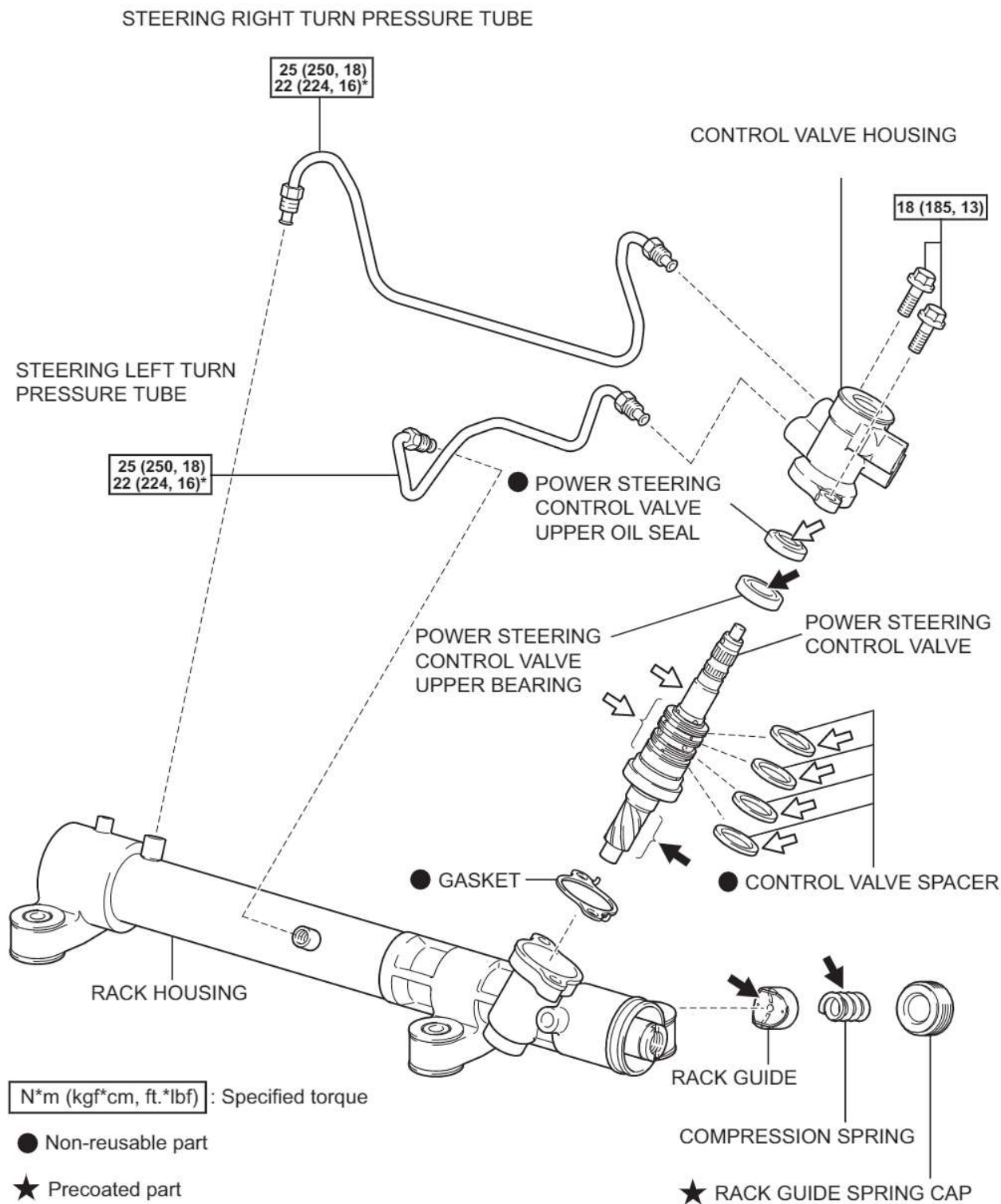


PS-18 POWER STEERING – STEERING LINKAGE



POWER STEERING – STEERING LINKAGE

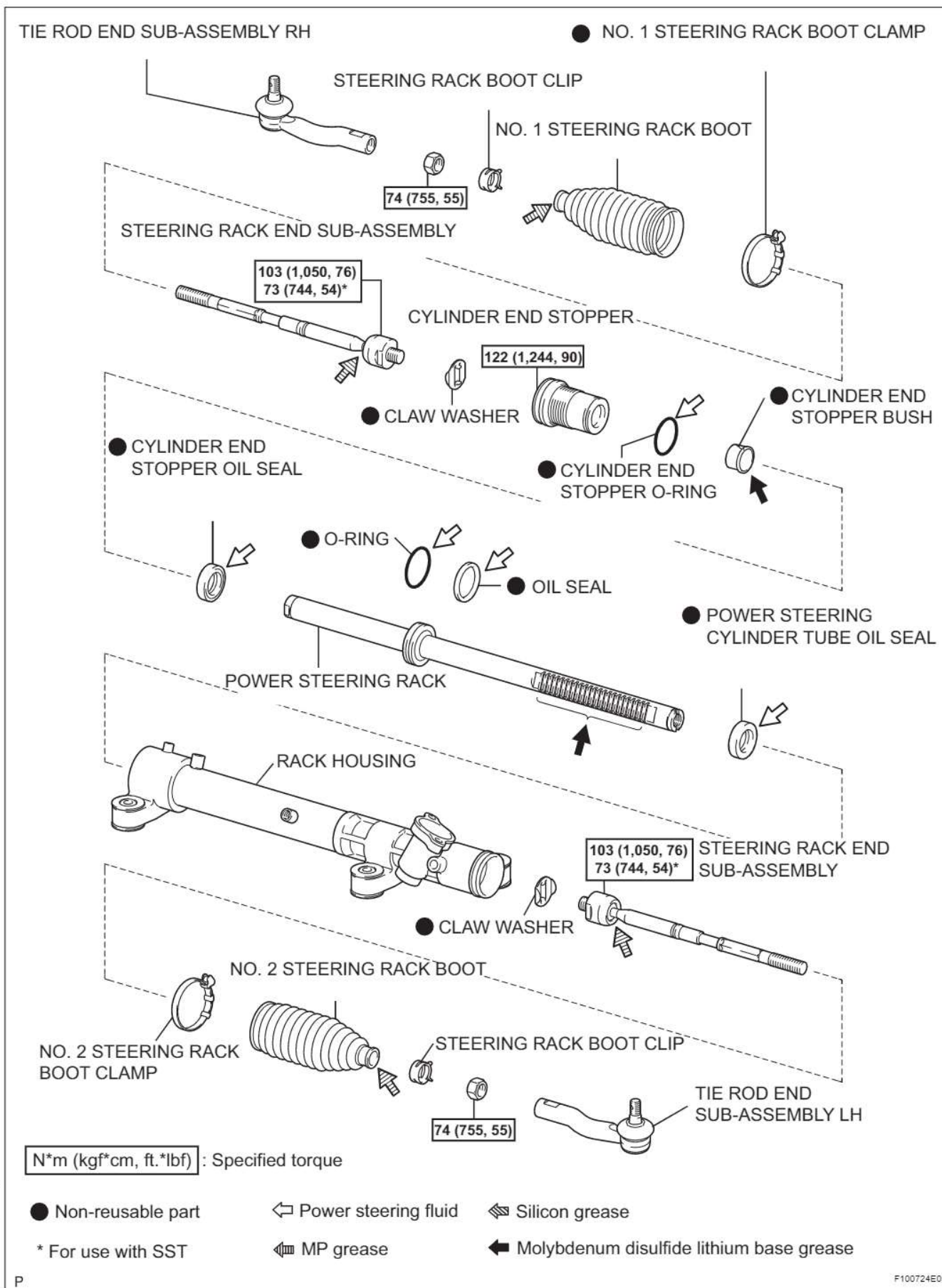
PS-19



PS

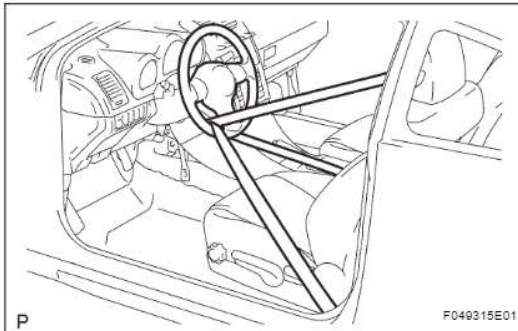
PS-20

POWER STEERING – STEERING LINKAGE



REMOVAL

1. PLACE FRONT WHEELS FACING STRAIGHT AHEAD
2. DRAIN POWER STEERING FLUID
3. REMOVE COLUMN HOLE COVER SILENCER SHEET (See page [SR-9](#))

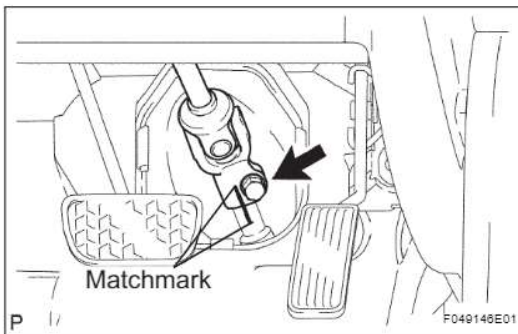


4. DISCONNECT NO. 2 STEERING INTERMEDIATE SHAFT ASSEMBLY

- (a) Fix the steering wheel with the seat belt in order to prevent rotation.

HINT:

This operation is useful to prevent damage to the spiral cable.



- (b) Put matchmarks on the No. 2 intermediate shaft assembly and the intermediate shaft.
- (c) Remove the bolt, and then disconnect the No. 2 intermediate shaft assembly from the intermediate shaft.

5. DISCONNECT NO. 1 STEERING COLUMN HOLE COVER SUB-ASSEMBLY

6. REMOVE FRONT WHEEL

7. REMOVE ENGINE UNDER COVER LH

8. REMOVE ENGINE UNDER COVER RH

9. SEPARATE TIE ROD END SUB-ASSEMBLY LH (See page [DS-6](#))

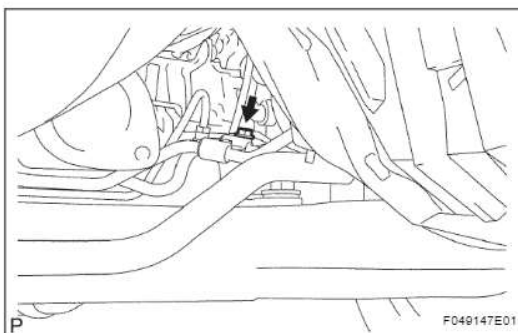
10. SEPARATE TIE ROD END SUB-ASSEMBLY RH

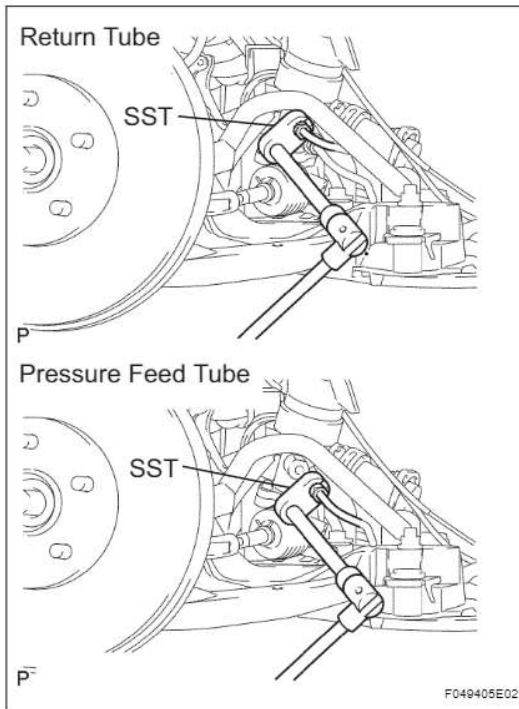
HINT:

Perform the same procedure as for the LH.

11. DISCONNECT PRESSURE FEED TUBE ASSEMBLY

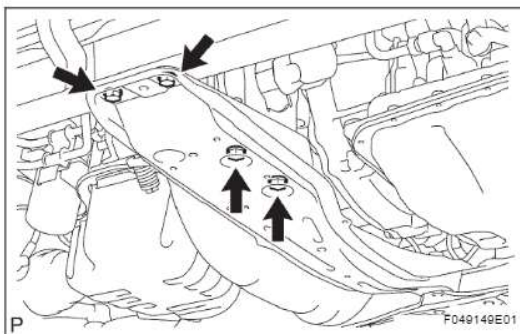
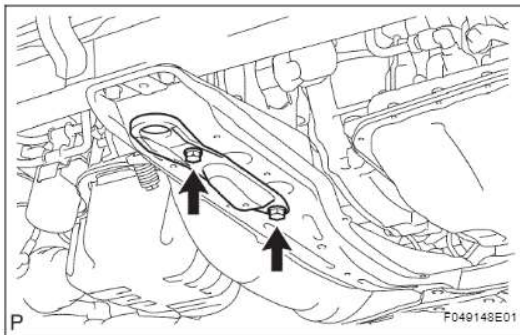
- (a) Remove the bolt and disconnect the tube clamp from the power steering link.



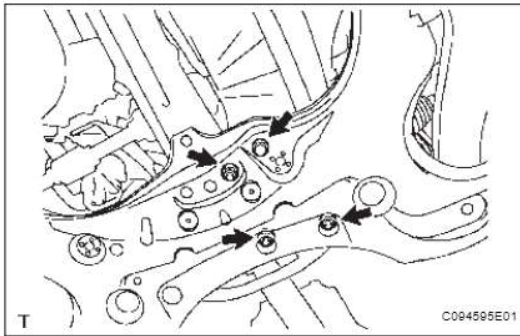
PS-22**POWER STEERING – STEERING LINKAGE**

(b) Using SST, disconnect the pressure feed tube.
SST 09023-12701

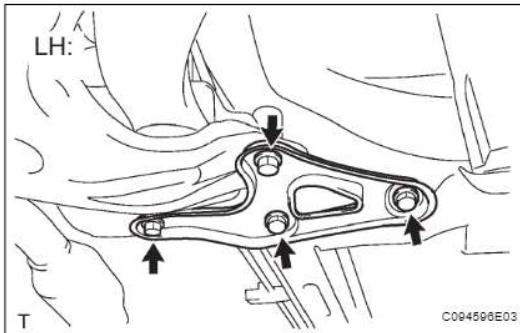
- 12. SEPARATE FRONT STABILIZER LINK ASSEMBLY LH**
 (See page [SP-29](#))
- 13. SEPARATE FRONT STABILIZER LINK ASSEMBLY RH**
HINT:
 Perform the same procedure as for the LH.
- 14. SEPARATE FRONT NO. 1 SUSPENSION ARM SUB-ASSEMBLY LH LOWER** (See page [SP-23](#))
- 15. SEPARATE FRONT NO. 1 SUSPENSION ARM SUB-ASSEMBLY RH LOWER**
HINT:
 Perform the same procedure as for the LH.
- 16. REMOVE FRONT FLOOR PANEL BRACE** (See page [EX-2](#))
- 17. REMOVE CENTER EXHAUST PIPE ASSEMBLY** (See page [EX-2](#))
- 18. REMOVE HOOD SUB-ASSEMBLY**
- 19. REMOVE NO. 1 ENGINE COVER SUB-ASSEMBLY**
 (See page [EM-22](#))
- 20. SUSPEND ENGINE ASSEMBLY** (See page [AX-149](#))
- 21. REMOVE NO. 1 HOOK**
 (a) Remove the 2 bolts and the hook.



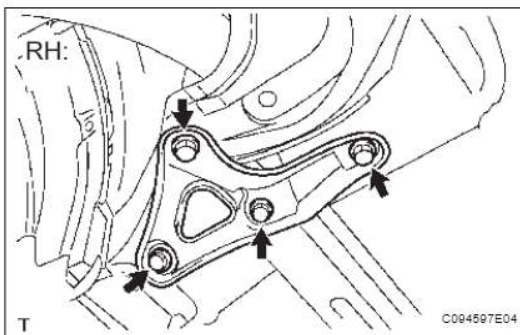
- 22. REMOVE FRONT SUSPENSION CROSSMEMBER SUB-ASSEMBLY**
 (a) Remove the 4 bolts and separate the center member.

POWER STEERING – STEERING LINKAGE**PS-23**

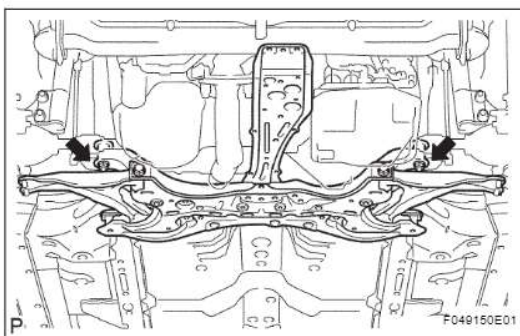
- (b) Remove the bolt and 3 nuts and disconnect the engine mounting insulator rear from the crossmember.
- (c) Using a transmission jack, support the crossmember.



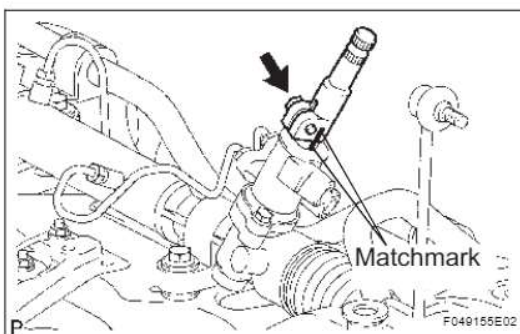
- (d) Remove the 4 bolts and crossmember bracket LH.



- (e) Remove the 4 bolts and crossmember bracket RH.



- (f) Remove the 2 nuts and crossmember with power steering link.

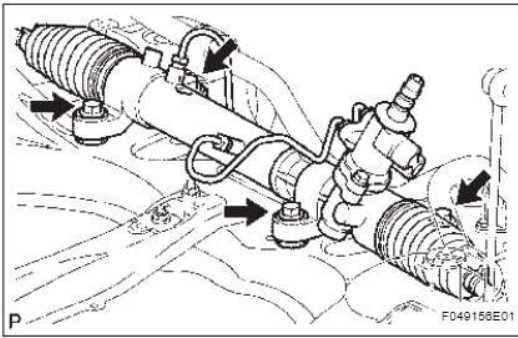
23. REMOVE NO. 1 STEERING COLUMN HOLE COVER SUB-ASSEMBLY**24. REMOVE STEERING INTERMEDIATE SHAFT**

- (a) Put matchmarks on the intermediate shaft and the pinion shaft.
- (b) Remove the bolt and intermediate shaft.

PS

PS-24

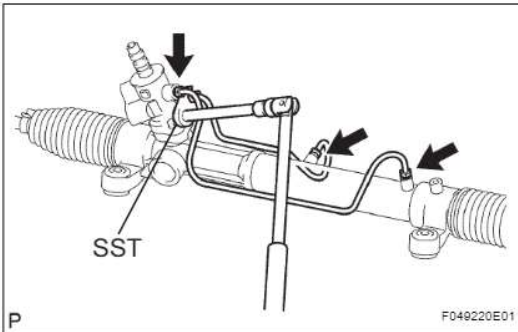
POWER STEERING – STEERING LINKAGE

**25. REMOVE POWER STEERING LINK ASSEMBLY**

- (a) Remove the 4 bolts, 4 nuts and power steering link from the crossmember.

NOTICE:

Because the nut has its own stopper, do not turn the nut. Loosen the bolt with the nut fixed.

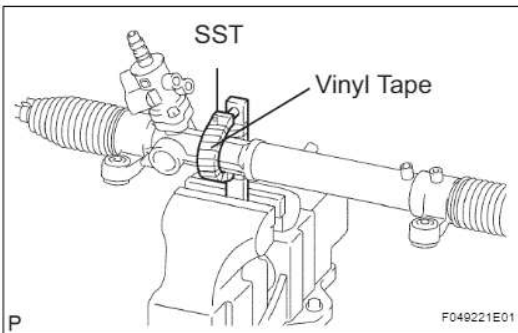
**DISASSEMBLY****1. FIX POWER STEERING LINK ASSEMBLY**

- (a) Using SST, remove the left turn pressure tube.

SST 09023-38201

Using SST, remove the right turn pressure tube.

SST 09023-38201

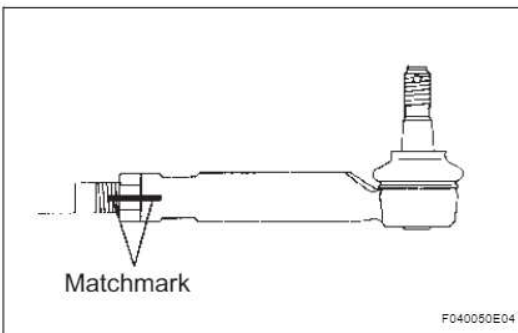


- (b) Using SST, secure the power steering link assembly.

SST 09612-00012

HINT:

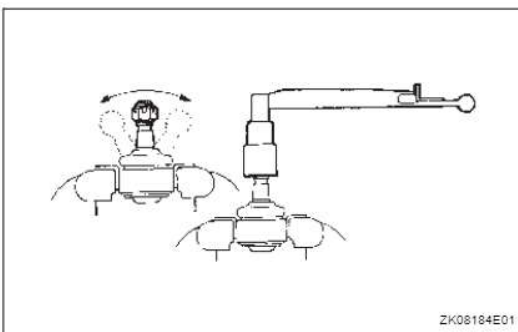
Tape the SST before use.

**2. REMOVE TIE ROD END SUB-ASSEMBLY LH**

- (a) Put matchmarks on the tie rod end and rack end.
(b) Loosen the lock nut, and remove the tie rod end and lock nut.

3. REMOVE TIE ROD END SUB-ASSEMBLY RH**HINT:**

Perform the same procedure as for the LH.

**4. INSPECT TIE ROD END SUB-ASSEMBLY LH**

- (a) Secure the tie rod end in a vise.
(b) Install the nut to the stud bolt.
(c) Flip the ball joint back and forth 5 times or more.
(d) Using a torque wrench, turn the nut continuously at a rate of 2 to 4 seconds per turn and take the torque reading on the 5th turn.

Torque: Turning torque

0.49 to 3.43 N*m (5.0 to 35 kgf*cm, 4.3 to 30.4 in.*lbf)

POWER STEERING – STEERING LINKAGE**PS-25**

If not within the specified torque range, replace the tie rod end sub-assembly.

5. INSPECT TIE ROD END SUB-ASSEMBLY RH**HINT:**

Perform the same procedure as for the LH.

6. REMOVE STEERING RACK BOOT CLIP

(a) Remove the 2 boot clips.

7. REMOVE NO. 2 STEERING RACK BOOT CLAMP

(a) Using pliers, loosen the clamp as shown in the illustration.

(b) Using a screwdriver, remove the clamp.

NOTICE:

Be careful not to damage the boot.

8. REMOVE NO. 1 STEERING RACK BOOT CLAMP**HINT:**

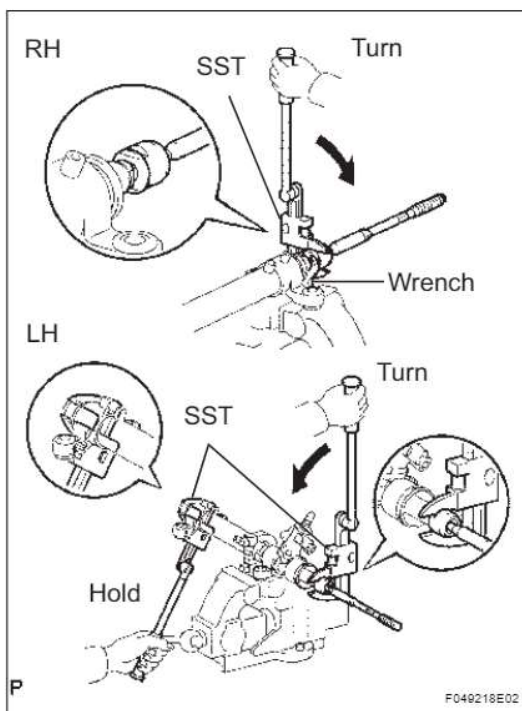
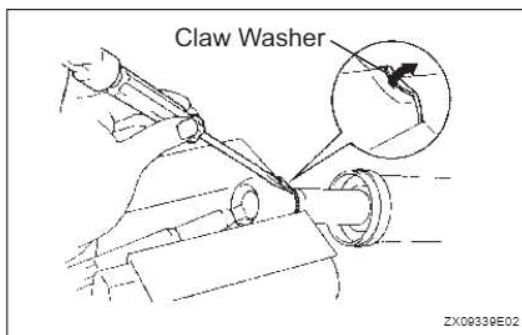
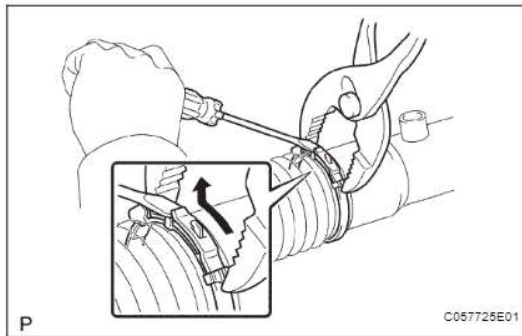
Perform the same procedure as for the clamp.

9. REMOVE NO. 2 STEERING RACK BOOT**10. REMOVE NO. 1 STEERING RACK BOOT****11. REMOVE STEERING RACK END SUB-ASSEMBLY**

(a) Using a screwdriver and hammer, unstake the RH and LH claw washers.

NOTICE:

Avoid any impact to the steering rack.



(b) Using a 22 mm wrench and a vise, hold the steering rack (RH side).

(c) Using SST, remove the rack end (RH side) and claw washer from the steering rack.

SST 09922-10010**NOTICE:**

Use SST 09922-10010 in the direction shown in the illustration.

(d) Using 2 SST, remove the rack end (LH side) and claw washer from the steering rack.

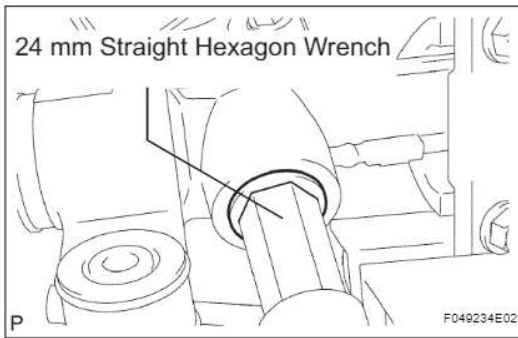
SST 09922-10010**NOTICE:**

Use SST 09922-10010 in the direction shown in the illustration.

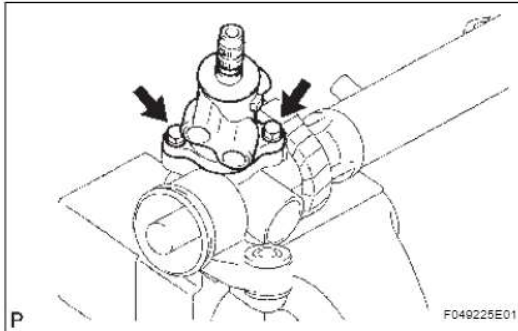
PS

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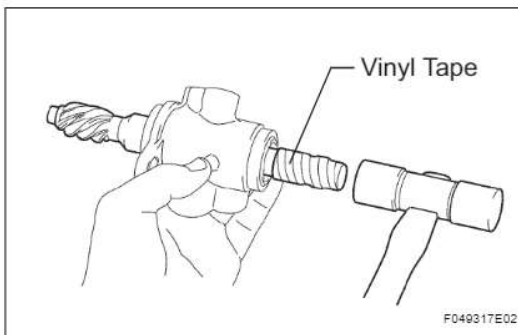
POWER STEERING – STEERING LINKAGE

**12. REMOVE RACK GUIDE**

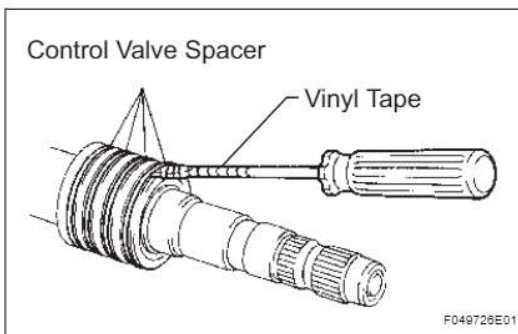
- (a) Using a 24 mm straight hexagon wrench, remove the rack guide spring cap.
- (b) Remove the compression spring and the rack guide.

**13. REMOVE POWER STEERING CONTROL VALVE**

- (a) Remove the 2 bolts and the control valve housing with the control valve.
- (b) Remove the gasket.



- (c) Wrap vinyl tape around the spline of the control valve in order to prevent damaging the oil seal.
- (d) Using a plastic-faced hammer, tap out the control valve.



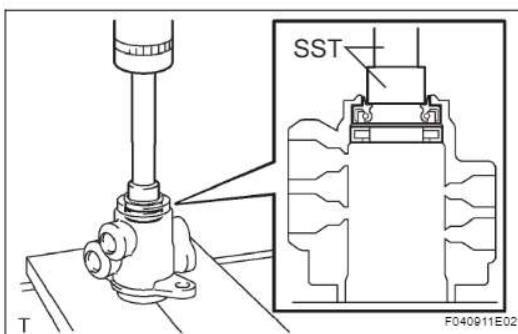
- (e) Using a screwdriver, remove the 4 control valve spacers.

NOTICE:

Be careful not to damage the spacer grooves on the control valve.

HINT:

Tape the screwdriver tip before use.

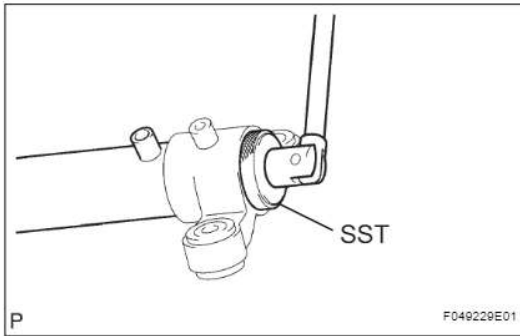
**14. REMOVE POWER STEERING CONTROL VALVE UPPER OIL SEAL**

- (a) Using SST and a press, press out the control valve upper bearing and the upper oil seal from the control valve housing.

SST 09950-70010 (09951-07100), 09950-60010 (09951-00240)

POWER STEERING – STEERING LINKAGE

PS-27

**15. REMOVE CYLINDER END STOPPER**

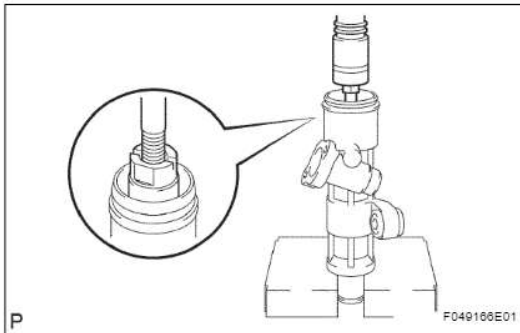
- (a) Using SST, remove the cylinder end stopper from the rack housing.

SST 09631-20120

- (b) Using a screwdriver, remove the cylinder end stopper O-ring from the cylinder end stopper.
 (c) Using a screwdriver, remove the cylinder end stopper bush from the cylinder end stopper.

NOTICE:

Do not damage the cylinder end stopper.

**16. REMOVE POWER STEERING RACK**

- (a) Using a bolt (M14 x P1.5) and a press, press out the power steering rack with the cylinder end stopper oil seal.
 (b) Remove the cylinder end stopper oil seal from the power steering rack.

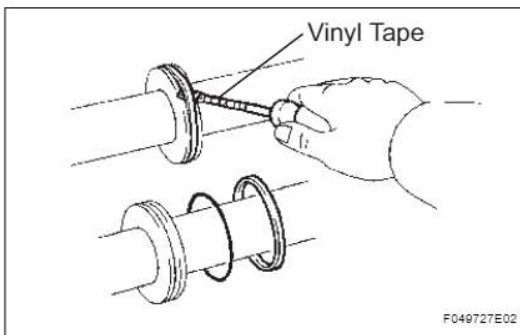
- (c) Using a screwdriver, remove the oil seal and the O-ring.

NOTICE:

Be careful not to damage the oil seal groove on the power steering rack.

HINT:

Tape the screwdriver tip before use.

**17. REMOVE POWER STEERING CYLINDER TUBE OIL SEAL**

- (a) Set the SST.

SST 09612-70100 (09612-07110, 09612-07210)

NOTICE:

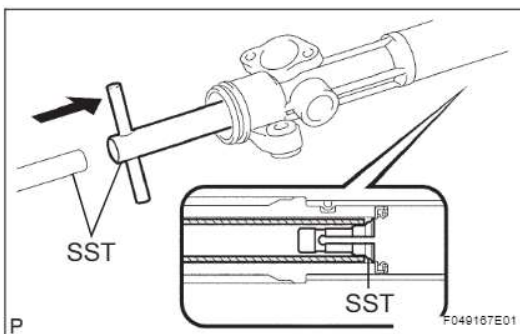
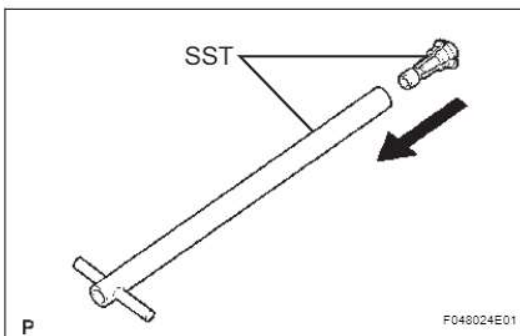
- Lightly apply MP grease to the tip of SST (09612-07230) and inside of SST (09612-07210 and 09612-07110) before use.
- Completely install SST (09612-07110) to SST (09612-07210) to prevent damage to the inside of the rack housing.

- (b) Insert SST (09612-07210) into the rack housing at a slant until it comes in contact with the power steering cylinder tube oil seal. Install SST (09612-07220) to SST (09612-07210).

SST 09612-70100 (09612-07110, 09612-07210, 09612-07220)

NOTICE:

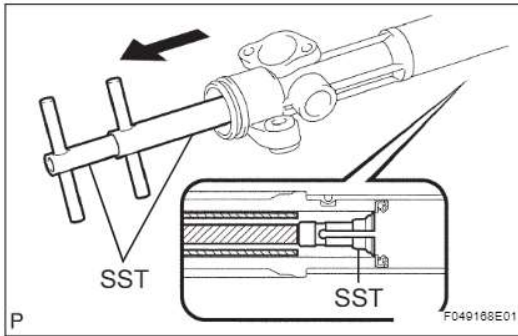
Do not damage the inside of the power steering rack housing.



PS

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POWER STEERING – STEERING LINKAGE

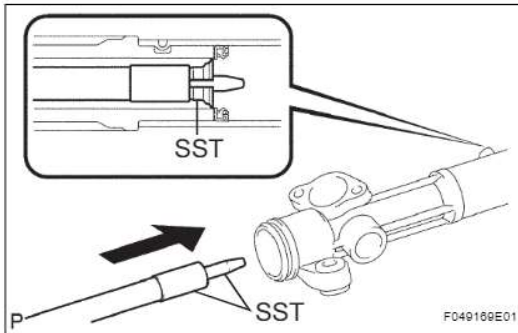


- (c) Hold SST (09612-07220) and pull SST (09612-07210) to position SST (09612-07110) to the inside of the rack housing.

SST 09612-70100 (09612-07110, 09612-07210, 09612-07220)

HINT:

Ensure that SST (09612-07110) is positioned at the chamfered part between the power steering cylinder tube oil seal and the rack housing.



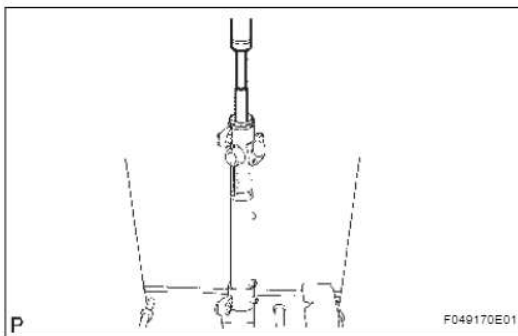
- (d) Install SST (09612-07240) to SST (09612-07230). Insert the tip of SST (09612-07230) into the service hole of SST (09612-07110) in the rack housing.

SST 09612-70100 (09612-07110, 09612-07230, 09612-07240)

SST 09612-70100 (09612-07110, 09612-07230, 09612-07240)

NOTICE:

- Ensure the SST (09612-07240) is installed to prevent damage to SST (09612-07110).
- Do not damage the inside of the rack housing.



- (e) Install SST (09951-07150) to SST (09612-07230). Using a press, remove the power steering cylinder tube oil seal.

SST 09612-70100 (09612-07110, 09612-07230, 09612-07240), 09950-70010 (09951-07150)

SST 09612-70100 (09612-07110, 09612-07230, 09612-07240), 09950-70010 (09951-07150)

NOTICE:

Do not damage the rack housing.

HINT:

Change SST (09951-07150) for another, from the set, with different length as needed.

INSPECTION

1. INSPECT POWER STEERING RACK

- (a) Using a dial indicator, check for runout of the steering rack and teeth wear.

Maximum runout:

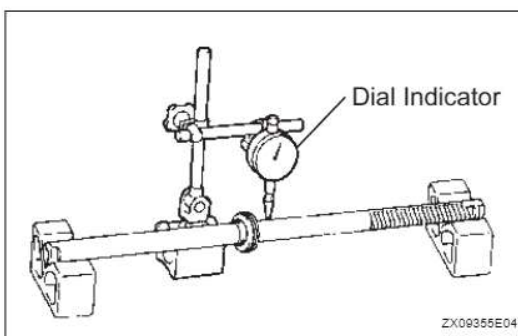
0.1 mm (0.004 in.)

If runout exceeds the maximum, replace the power steering rack.

NOTICE:

Make sure that the steering rack is placed horizontally.

- (b) Check the rack surface for wear and damage. If runout exceeds the maximum, replace the power steering link assembly.



REASSEMBLY

NOTICE:

When installing, coat the parts indicated by arrows with power steering fluid, molybdenum disulfide lithium base grease, MP grease or silicon grease (see page PS-17).

1. INSTALL POWER STEERING CYLINDER TUBE OIL SEAL

- Apply power steering fluid to the lip of a new power steering cylinder tube oil seal.
- Install the power steering cylinder tube oil seal to the rack housing at a slant.

NOTICE:

- Ensure the power steering cylinder tube oil seal is installed in the correct direction as shown in the illustration.
- Install the power steering cylinder tube oil seal at an angle of approximately 15° so that the lowermost part comes to the point, indicated by the arrow in the illustration, to prevent damage to the side of the oil seal when it passes the 2 ports.

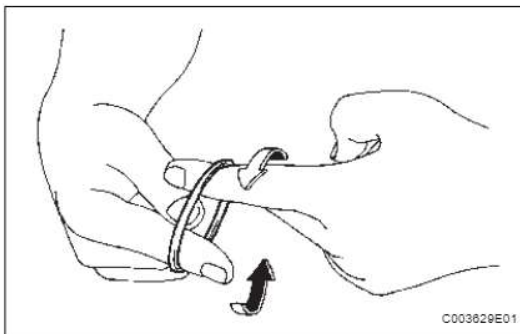
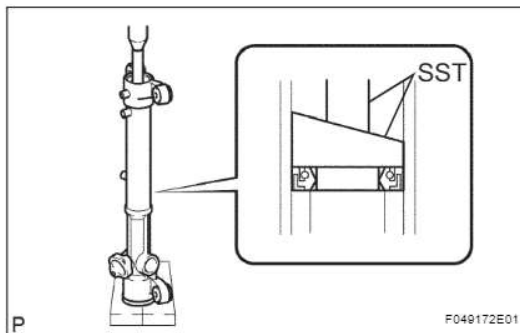
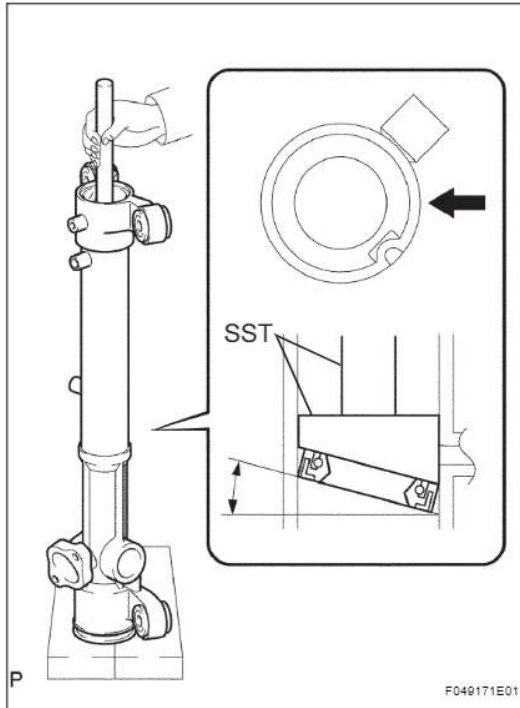
- Using SST, insert the power steering cylinder tube oil seal by pushing the SST in by hand until the oil seal passes the 2 ports.

NOTICE:

Do not turn the SST when inserting the oil seal.

- Install SST (09631-00200) to SST (09951-07360) upside down.
- Using SST, level the power steering cylinder tube oil seal by pushing the SST in by hand. Using SST and a press, install the oil seal.

SST 09950-70010 (09951-07360), 09631-00200



2. INSTALL POWER STEERING RACK

- Coat a new O-ring with power steering fluid and install it to the steering rack.
- Expand the new oil seal with your fingers.

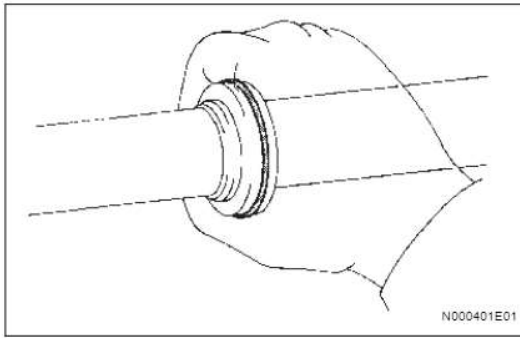
NOTICE:

Be careful not to overly expand the oil seal.

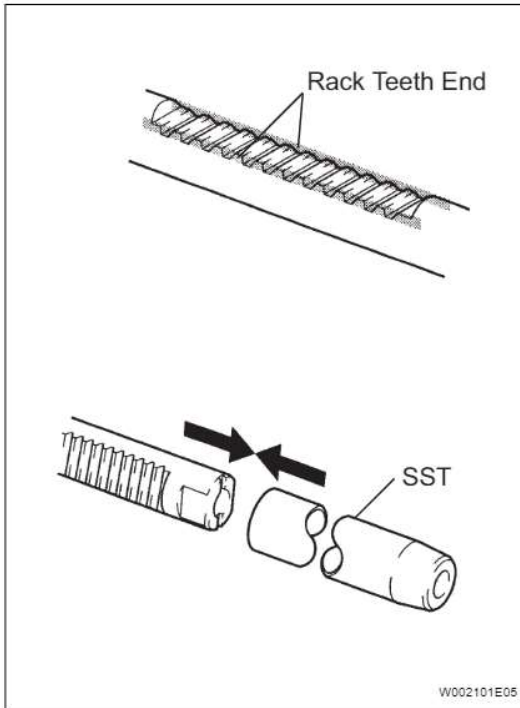
- Coat the oil seal with power steering fluid.

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POWER STEERING – STEERING LINKAGE



- (d) Install the oil seal to the steering rack, and adjust with your fingers.



- (e) Apply molybdenum disulfide lithium base grease to the rack teeth ends.

HINT:

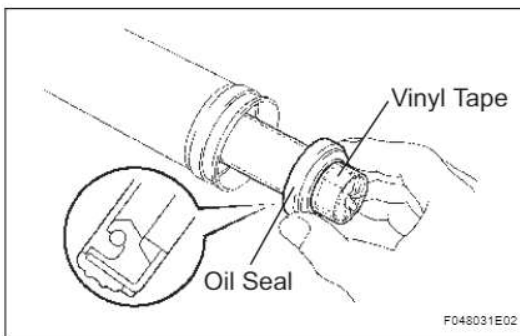
If necessary, scrape the burrs off the rack teeth ends and burnish.

- (f) Affix SST to the steering rack.

SST 09631-20102

Coat SST with power steering fluid.

- (g) Install the steering rack to the rack housing.
(h) Remove SST.



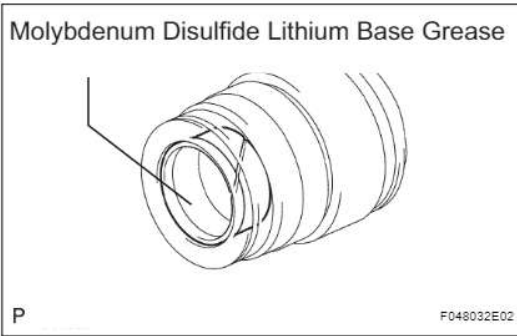
3. INSTALL CYLINDER END STOPPER

- (a) Wrap vinyl tape around the RH side of the power steering rack and apply power steering fluid.
(b) Apply power steering fluid to the lip of a new cylinder end stopper oil seal.
(c) Install the cylinder end stopper oil seal to the RH side of the rack housing.

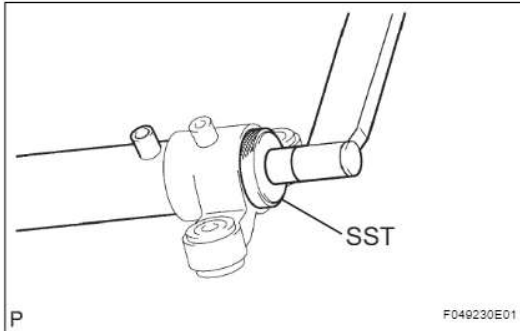
NOTICE:

- Ensure that the cylinder end stopper oil seal is installed in the correct direction as shown in the illustration.
- Do not damage the cylinder end stopper oil seal.

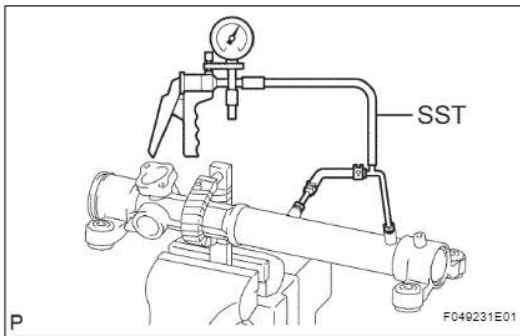
- (d) Remove the vinyl tape from the power steering rack.
(e) Apply power steering fluid to a new cylinder end stopper O-ring.
(f) Install the cylinder end stopper O-ring to the cylinder end stopper.

POWER STEERING – STEERING LINKAGE**PS-31**

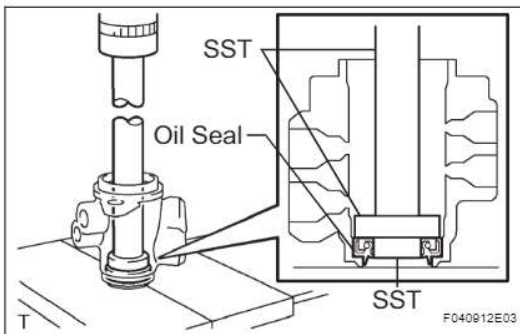
- (g) Install a new cylinder end stopper bush to the cylinder end stopper.
- (h) Apply molybdenum disulfide lithium base grease to the entire inner side of the cylinder end stopper bush.



- (i) Using SST, install the cylinder end stopper to the rack housing.

SST 09631-20120**Torque: 122 N*m (1,244 kgf*cm, 90 ft.*lbf)****4. AIR TIGHTNESS TEST**

- (a) Install SST to the rack housing.
SST 09631-12071 (09633-00010)
- (b) Apply a vacuum of 53 kPa (398 mmHg, 15.65 in.Hg) for approximately 30 seconds.
- (c) Check that there is no change in the vacuum pressure.
If there is a change in the vacuum pressure, check the installation of the oil seals.

**5. INSTALL POWER STEERING CONTROL VALVE UPPER OIL SEAL**

- (a) Coat the control valve upper bearing with molybdenum disulfide lithium base grease, and a new control valve upper oil seal lip with power steering fluid.
- (b) Using SST and a press, press in the control valve upper oil seal.
SST 09950-70010 (09951-07150), 09950-60010 (09952-06010, 09951-00180, 09951-00300)

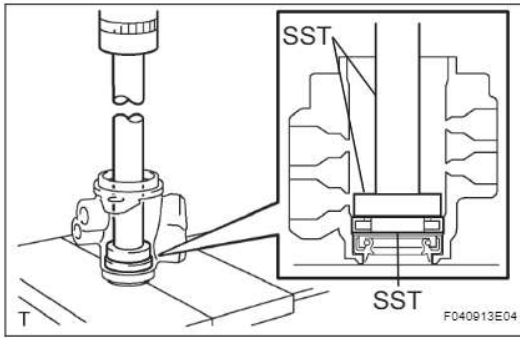
NOTICE:

Make sure that the oil seal is installed in the correct direction as shown in the illustration.

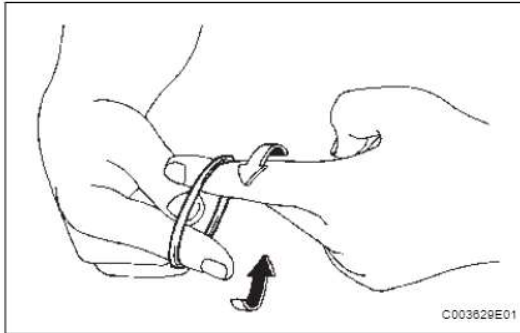
PS

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POWER STEERING – STEERING LINKAGE



- (c) Using SST and a press, press in the control valve upper bearing.
SST 09950-70010 (09951-07150), 09950-60010 (09952-06010, 09951-00180, 09951-00320)



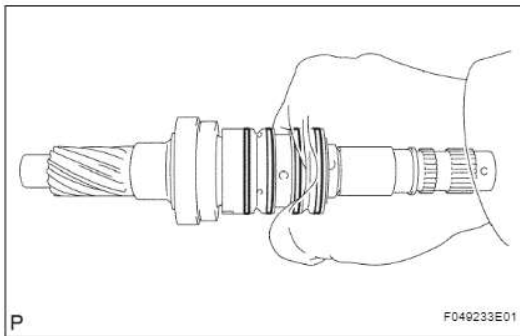
6. INSTALL POWER STEERING CONTROL VALVE

- (a) Expand 4 new valve spacers with your fingers.

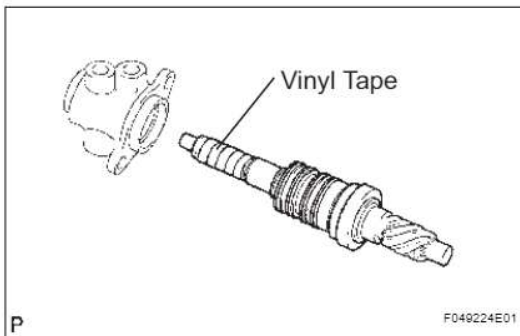
NOTICE:

Be careful not to overly expand the valve spacers.

- (b) Coat the 4 valve spacers with power steering fluid.



- (c) Install the 4 valve spacers to the control valve, and adjust with your fingers.



- (d) Coat the control valve with power steering fluid.

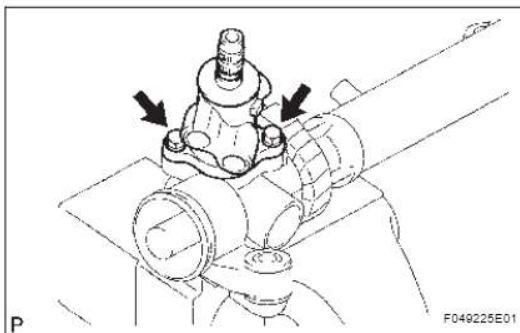
- (e) Install the control valve into the valve housing.

NOTICE:

Be careful not to damage the valve spacers and oil seal lip.

HINT:

Wrap vinyl tape around the end of the steering rack in order to prevent damaging the oil seal.

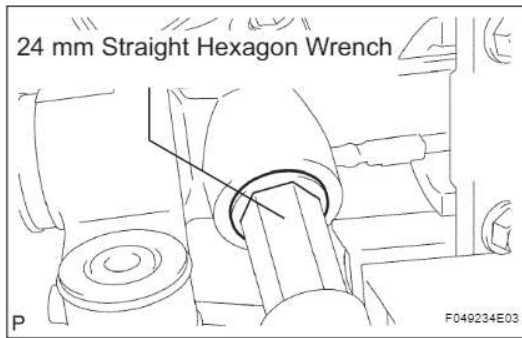


- (f) Install the control valve housing with the control valve and a new gasket to the rack housing with the 2 bolts.

Torque: 18 N*m (185 kgf*cm, 13 ft.*lbf)

POWER STEERING – STEERING LINKAGE

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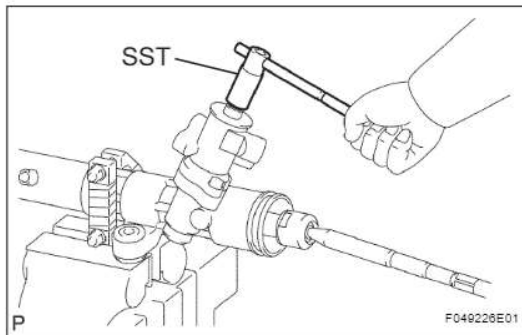
**7. INSTALL RACK GUIDE**

- (a) Apply molybdenum disulfide lithium base grease to the compression spring and the contact surface of the rack guide and the power steering rack.
- (b) Install the rack guide and the compression spring.
- (c) Apply sealant to 2 or 3 threads of the rack guide spring cap.

Sealant:

Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

- (d) Using a 24 mm straight hexagon wrench, temporarily install the rack guide spring cap.

**8. INSPECT TOTAL PRELOAD**

- (a) Using a 24 mm straight hexagon wrench, loosen and retighten the rack guide spring cap.
- (b) Temporarily install the steering rack ends to the power steering rack.

NOTICE:

Do not fully turn the power steering rack without the steering rack end as it may damage the oil seal in the rack housing and the cylinder end stopper bush.

- (c) Using SST, fully turn the power steering rack right and left 10 times to settle.

SST 09616-00011

- (d) While turning the control valve using SST, loosen the rack guide spring cap in small amounts until the preload falls within the specified range.

SST 09616-00011

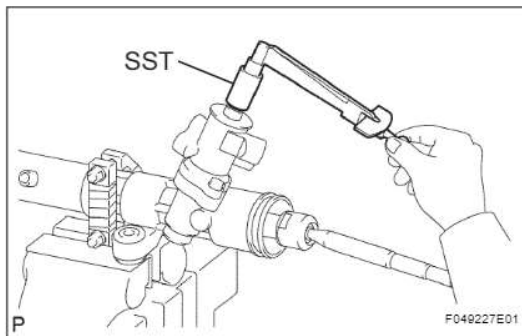
Standard preload (turning):

0.9 to 1.6 N*m (9.2 to 16.3 kgf*cm, 8.0 to 14.2 in.*lbf)

NOTICE:

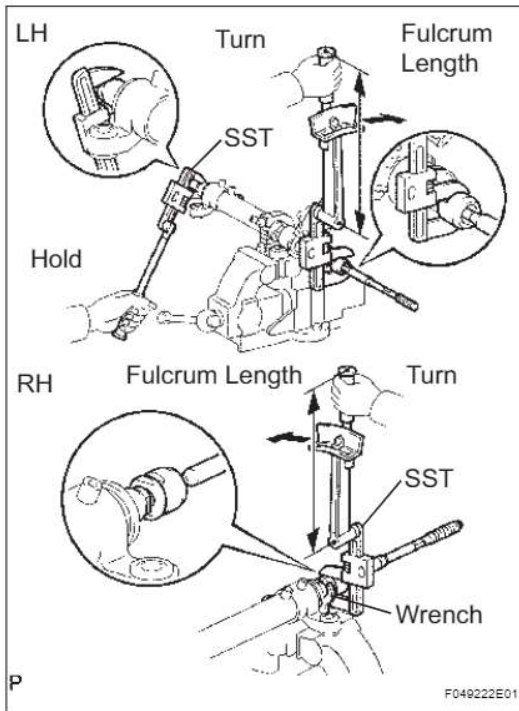
Retighten and loosen the rack guide spring cap if preload falls below the specified range.

- (e) Remove the steering rack ends from the power steering rack.



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POWER STEERING – STEERING LINKAGE

**9. INSTALL STEERING RACK END SUB-ASSEMBLY**

- (a) Install 2 new claw washers, and temporarily install the rack ends.

HINT:

Align the claws of the claw washers with the steering rack grooves.

- (b) Apply MP grease to the rack end ball joint.
 (c) Using 2 SST, install the rack end sub-assembly (LH side).

SST 09922-10010

Torque: 73 N*m (744 kgf*cm, 54 ft.*lbf)

HINT:

- Use SST 09922-10010 in the direction shown in the illustration.
 - Use a torque wrench with a fulcrum length of 345 mm (13.58 in.).
 - Using SST, hold the rack and install the rack end sub-assembly.
- (d) Using SST and a 22 mm wrench, tighten the rack end sub-assembly (RH side).

SST 09922-10010

Torque: 73 N*m (744 kgf*cm, 54 ft.*lbf)

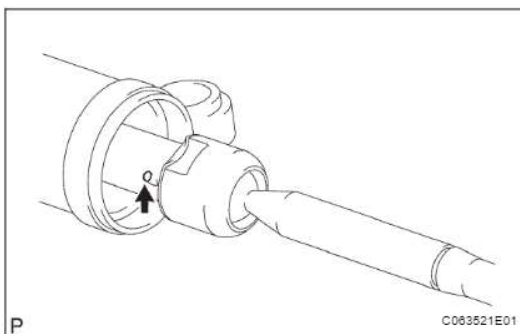
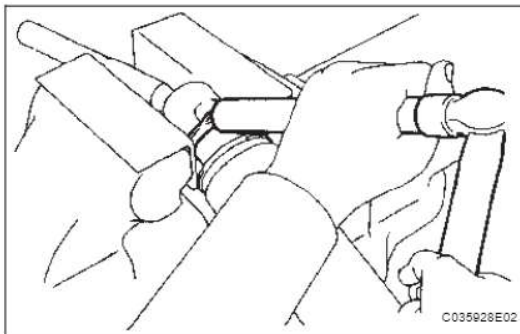
HINT:

- Use SST 09922-10010 in the direction shown in the illustration.
- Use a torque wrench with a fulcrum length of 345 mm (13.58 in.).
- Using SST, hold the rack and install the rack end sub-assembly.

- (e) Using a brass bar and hammer, stake the 2 claw washers.

NOTICE:

Avoid any impact to the steering rack.



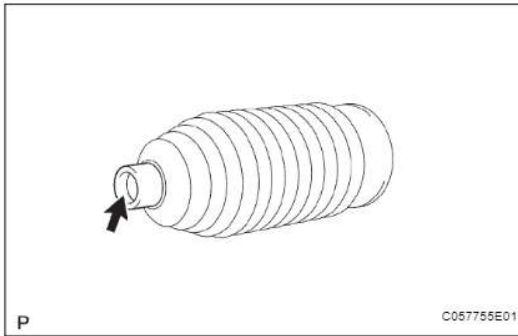
- (f) Ensure that the steering rack hole is not clogged with grease.

HINT:

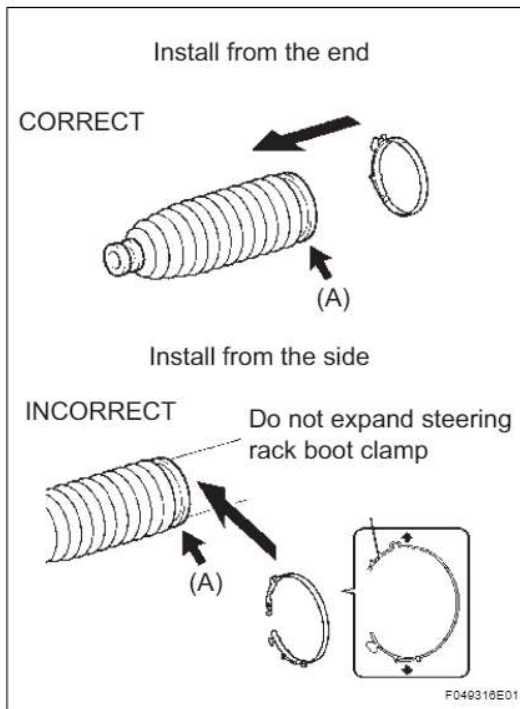
If the hole is clogged, the pressure inside the boot will change after it is assembled and the steering wheel is turned.

POWER STEERING – STEERING LINKAGE

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**10. INSTALL NO. 2 STEERING RACK BOOT**

- (a) Apply silicon grease to the inside of the small opening of the No. 2 rack boot.



- (b) Temporarily install a new steering rack boot clamp to the large opening of the steering rack boot at the position shown by arrow (A).

NOTICE:

- Use a new steering rack boot clamp.
- Do not expand the steering rack boot clamp more than necessary to perform installation.
- Do not deform the steering rack boot clamp.
- Tightening force of the steering rack boot clamp becomes uneven if it is installed after being expanded as shown in the illustration. As a result, rust is caused by water entering from the clearance between the boot and rack housing, causing a malfunction.
- Use only the supply parts which are applicable to the vehicle to secure the boot.

HINT:

After disengaging the claw of a new steering rack boot clamp, temporarily install it from the end without expanding the clamp diameter as much as possible.

- (c) Install the rack boot to the groove on the rack housing.

NOTICE:

- Be careful not to damage or twist the boot.
- Do not damage the steering rack boot.
- Ensure that the steering rack boot clamp is installed before installing the steering rack boot to the rack housing.

11. INSTALL NO. 1 STEERING RACK BOOT**HINT:**

Perform the same procedure as for the No. 2 rack boot.

12. INSTALL NO. 2 STEERING RACK BOOT CLAMP

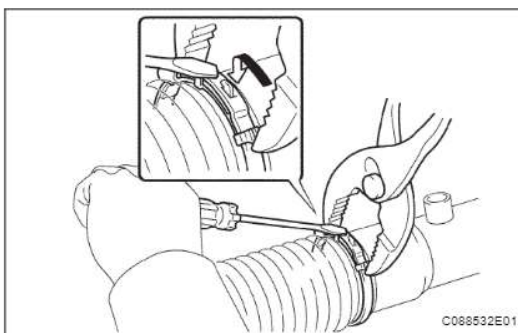
- (a) Using pliers and a screwdriver, install a new rack boot clamp.

NOTICE:

- Be careful not to damage or twist the rack boot.
- Do not twist the steering rack boot.

13. INSTALL NO. 1 STEERING RACK BOOT CLAMP**HINT:**

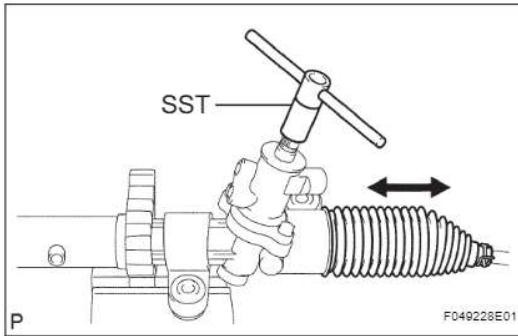
Perform the same procedure as for the clamp.



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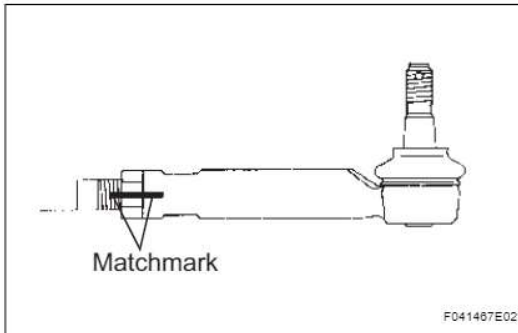
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POWER STEERING – STEERING LINKAGE

**14. INSTALL STEERING RACK BOOT CLIP**

- (a) Using pliers, install the 2 boot clips.
- (b) Using SST, turn the control valve, and check that the rack boots expand and contract smoothly.

SST 09616-00011

**15. INSTALL TIE ROD END SUB-ASSEMBLY LH**

- (a) Screw the lock nut and the tie rod end to the rack end until the matchmarks are aligned.

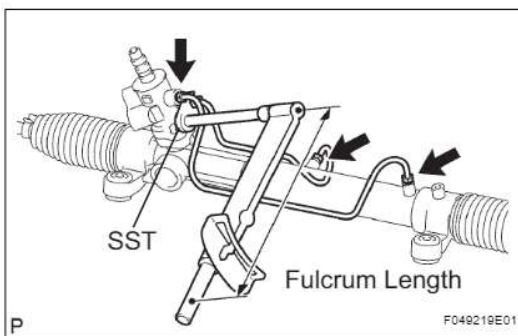
HINT:

After adjusting toe-in, torque the lock nut.

16. REMOVE TIE ROD END SUB-ASSEMBLY RH

HINT:

Perform the same procedure as for the LH.

**INSTALLATION****1. INSTALL POWER STEERING LINK ASSEMBLY**

- (a) Using SST, install the left turn pressure tube to the steering link assembly.

SST 09023-38201

Torque: 22 N*m (224 kgf*cm, 16 ft.*lbf)

HINT:

- Use a torque wrench with a fulcrum length of 300 mm (11.81 in.).
- This torque value is effective when SST is parallel to the torque wrench.

- (b) Using SST, install the right turn pressure tube to the steering link assembly.

SST 09023-38201

Torque: 22 N*m (224 kgf*cm, 16 ft.*lbf)

HINT:

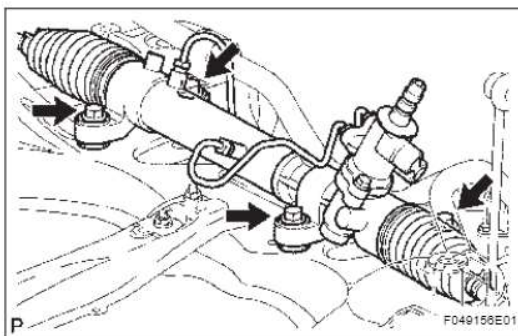
- Use a torque wrench with a fulcrum length of 300 mm (11.81 in.).
- This torque value is effective when SST is parallel to the torque wrench.

- (c) Install the power steering link assembly with the 4 bolts and 4 nuts.

Torque: 49 N*m (500 kgf*cm, 36 ft.*lbf)

NOTICE:

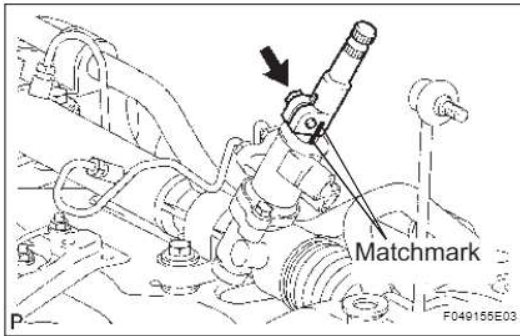
Because the nut has its own stopper, do not turn the nut. Torque the bolt with the nut fixed.



PS

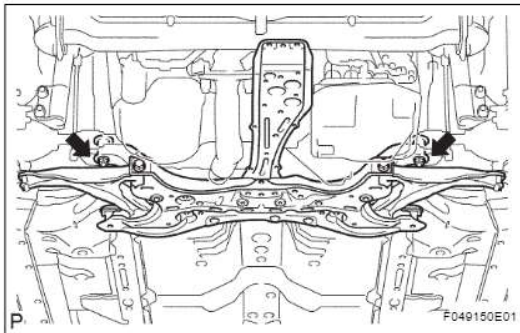
POWER STEERING – STEERING LINKAGE

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**2. INSTALL STEERING INTERMEDIATE SHAFT**

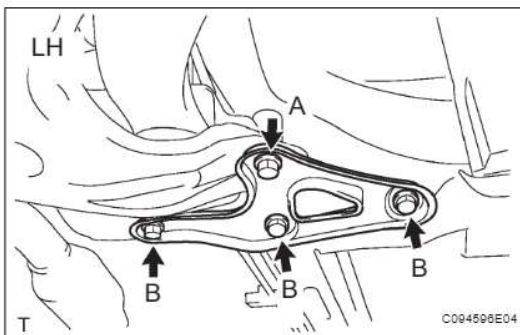
- (a) Align the matchmarks on the intermediate shaft and the pinion shaft.
- (b) Install the bolt.

Torque: 35 N*m (357 kgf*cm, 26 ft.*lbf)

3. INSTALL NO. 1 STEERING COLUMN HOLE COVER SUB-ASSEMBLY**4. INSTALL FRONT SUSPENSION CROSSMEMBER SUB-ASSEMBLY**

- (a) Using a transmission jack, support the crossmember with power steering link.
- (b) Install the crossmember with the 2 nuts.

Torque: 133 N*m (1,356 kgf*cm, 98 ft.*lbf)



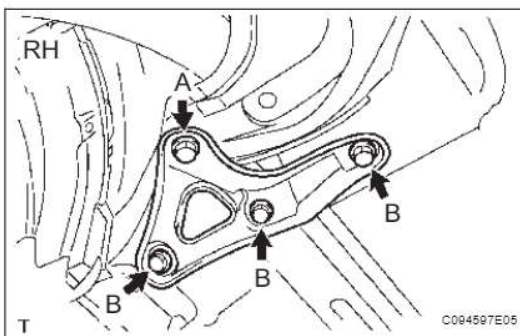
- (c) Install the crossmember bracket LH with the 4 bolts.

Torque: Bolt A

133 N*m (1,356 kgf*cm, 98 ft.*lbf)

Bolt B

80 N*m (816 kgf*cm, 59 ft.*lbf)



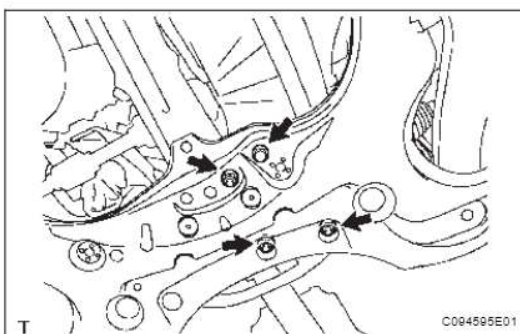
- (d) Install the crossmember bracket RH with the 4 bolts.

Torque: Bolt A

133 N*m (1,356 kgf*cm, 98 ft.*lbf)

Bolt B

80 N*m (816 kgf*cm, 59 ft.*lbf)



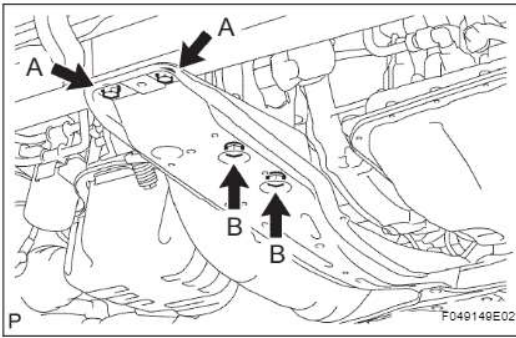
- (e) Install the engine mounting insulator rear to the crossmember with the bolt and the 3 nuts.

Torque: 65 N*m (663 kgf*cm, 48 ft.*lbf)

PS

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POWER STEERING – STEERING LINKAGE



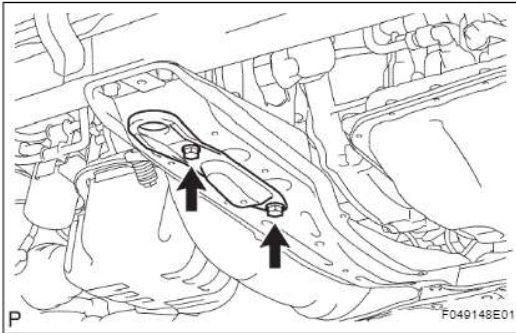
- (f) Install the center member with the 4 bolts.

Torque: Bolt A

45 N*m (459 kgf*cm, 33 ft.*lbf)

Bolt B

72 N*m (734 kgf*cm, 53 ft.*lbf)



5. INSTALL NO. 1 HOOK

- (a) Install the hook with the 2 bolts.

Torque: 39 N*m (398 kgf*cm, 29 ft.*lbf)

6. CONNECT FRONT NO. 1 SUSPENSION ARM SUB-ASSEMBLY LH LOWER (See page [SP-23](#))

7. CONNECT FRONT NO. 1 SUSPENSION ARM SUB-ASSEMBLY RH LOWER

HINT:

Perform the same procedure as for the LH.

8. CONNECT FRONT STABILIZER LINK ASSEMBLY LH (See page [SP-19](#))

9. CONNECT FRONT STABILIZER LINK ASSEMBLY RH

HINT:

Perform the same procedure as for the LH.

10. CONNECT PRESSURE FEED TUBE ASSEMBLY

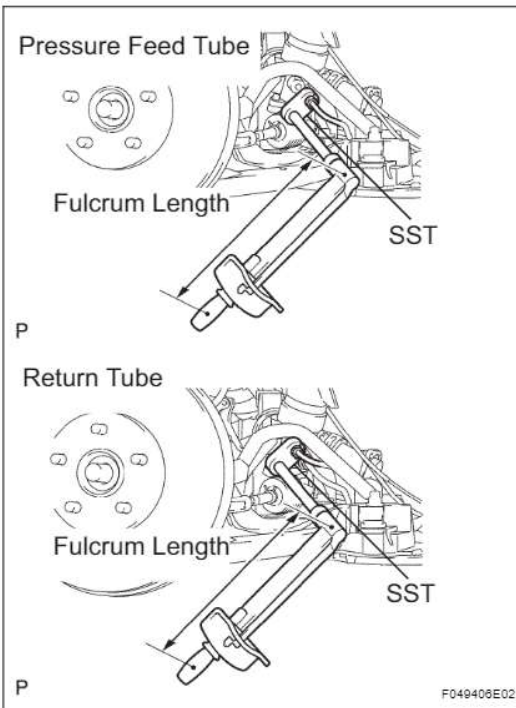
- (a) Using SST, connect the pressure feed tube assembly.

SST 09023-12701

Torque: 41 N*m (414 kgf*cm, 30 ft.*lbf)

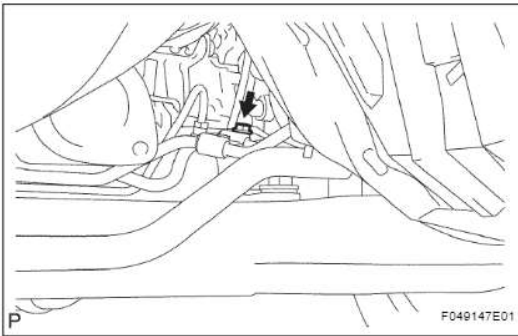
HINT:

- Use a torque wrench with a fulcrum length of 345 mm (13.58 in.).
- This torque value is effective when SST is parallel to the torque wrench.



POWER STEERING – STEERING LINKAGE

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- (b) Install the tube clamp with the bolt to the power steering link assembly.

Torque: 7.8 N*m (80 kgf*cm, 69 in.*lbf)

11. **CONNECT TIE ROD END SUB-ASSEMBLY LH** (See page [DS-17](#))
12. **CONNECT TIE ROD END SUB-ASSEMBLY RH**
HINT:
Perform the same procedure as for the LH.
13. **INSTALL EXHAUST PIPE ASSEMBLY CENTER** (See page [EX-4](#))
14. **INSTALL FRONT FLOOR PANEL BRACE** (See page [EX-5](#))
15. **INSTALL FRONT WHEELS**
Torque: 103 N*m (1,050 kgf*cm, 76 ft.*lbf)
16. **CONNECT NO. 1 STEERING COLUMN HOLE COVER SUB-ASSEMBLY**
17. **CONNECT NO. 2 STEERING INTERMEDIATE SHAFT ASSEMBLY**
 - (a) Align the matchmarks on the intermediate shaft assembly and the intermediate shaft.
 - (b) Install the bolt.
Torque: 35 N*m (357 kgf*cm, 26 ft.*lbf)
18. **INSTALL COLUMN HOLE COVER SILENCER SHEET** (See page [SR-15](#))
19. **INSTALL NO. 1 ENGINE COVER SUB-ASSEMBLY** (See page [EM-42](#))
20. **ADD POWER STEERING FLUID**
21. **BLEED POWER STEERING FLUID** (See page [PS-3](#))
22. **CHECK POWER STEERING FLUID LEVEL IN RESERVOIR** (See page [PS-4](#))
23. **CHECK FOR FLUID LEAKS**
24. **INSTALL HOOD SUB-ASSEMBLY** (See page [EM-81](#))
25. **ADJUST HOOD SUB-ASSEMBLY** (See page [ED-1](#))
26. **INSPECT AND ADJUST FRONT WHEEL ALIGNMENT**
 - (a) Inspect and adjust front wheel alignment (see page [SP-2](#)).
27. **INSTALL ENGINE UNDER COVER LH**
28. **INSTALL ENGINE UNDER COVER RH**

