

# POWER STEERING SYSTEM

5107U-01

## PRECAUTION

### 1. HANDLING PRECAUTIONS ON SRS AIRBAG SYSTEM

- (a) The vehicle is equipped with SRS (Supplemental Restraint System) such as the driver airbag and front passenger airbag. Failure to carry out service operation in correct sequence could cause the SRS to unexpectedly deploy during servicing, possibly leading to a serious accident. Before servicing (including removal or installation of parts, inspection or replacement), be sure to read the precautionary notice for the supplemental restraint system (See page [60-1](#)).

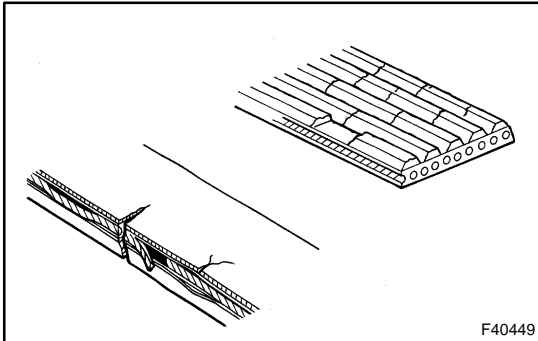
## PROBLEM SYMPTOMS TABLE

### HINT:

Use the table below to help you find the cause of the problem. The numbers indicate the probability of the cause of the problem. Check each part in the order shown. If necessary, repair or replace these parts.

Symptom	Suspect Area	See page
Hard steering	1. Tires (Improperly inflated)	28-1
	2. Power steering fluid level (Low)	51-3
	3. Drive belt (Loose)	14-4
	4. Front wheel alignment (Incorrect)	26-5
	5. Steering system joints (Worn)	–
	6. Suspension arm ball joints (Worn)	26-17
	7. Steering column (Binding)	–
	8. Power steering vane pump	51-8
	9. Power steering gear	51-18
Poor return	1. Tires (Improperly inflated)	28-1
	2. Front wheel alignment (Incorrect)	26-5
	3. Steering column (Binding)	–
	4. Power steering gear	51-18
Excessive play	1. Steering system joints (Worn)	–
	2. Suspension arm ball joints (Worn)	26-17
	3. Intermediate shaft, Sliding yoke (Worn)	–
	4. Front wheel bearing (Worn)	30-17
	5. Power steering gear	51-18
Abnormal noise	1. Power steering fluid level (Low)	51-3
	2. Steering system joints (Worn)	–
	3. Power steering vane pump	51-8
	4. Power steering gear	51-18

## ON-VEHICLE INSPECTION



### 1. INSPECT DRIVE BELT

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

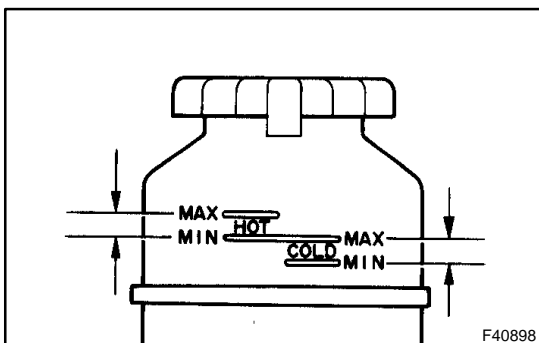
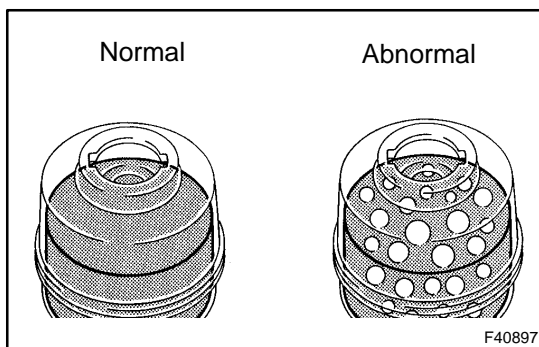
If any defect is found, replace the drive belt.

#### HINT:

Cracks on the rib side of a belt are considered acceptable. If the missing chunks from the ribs are found on the belt, it should be replaced.

### 2. BLEED POWER STEERING SYSTEM

- (a) Check the fluid level.
- (b) Jack up the front of the vehicle and support it with the 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.
- (f) Turn the steering wheel.
- (1) With the engine idling, turn the wheel to left or right full lock position and keep it there for 2 – 3 seconds, then turn the wheel to the opposite full lock position and keep it there for 2 – 3 seconds.
- (2) Repeat (1) 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 FLUID LEVEL

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

If necessary, add fluid.

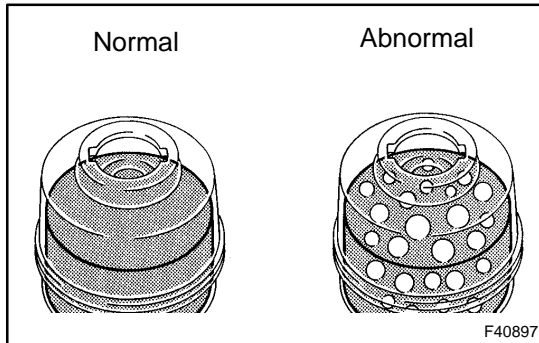
**Fluid: ATF DEXRON® II or III**

#### HINT:

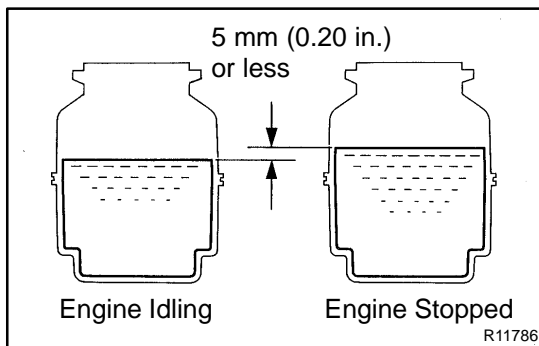
Check that the fluid level is within the HOT LEVEL range on the reservoir tank. If the fluid is cold, check that it is within the COLD LEVEL range.

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

**Fluid temperature: 75 – 80 °C (167 – 176 °F)**



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



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

**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

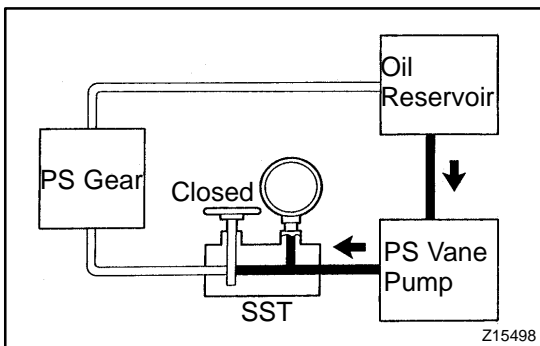
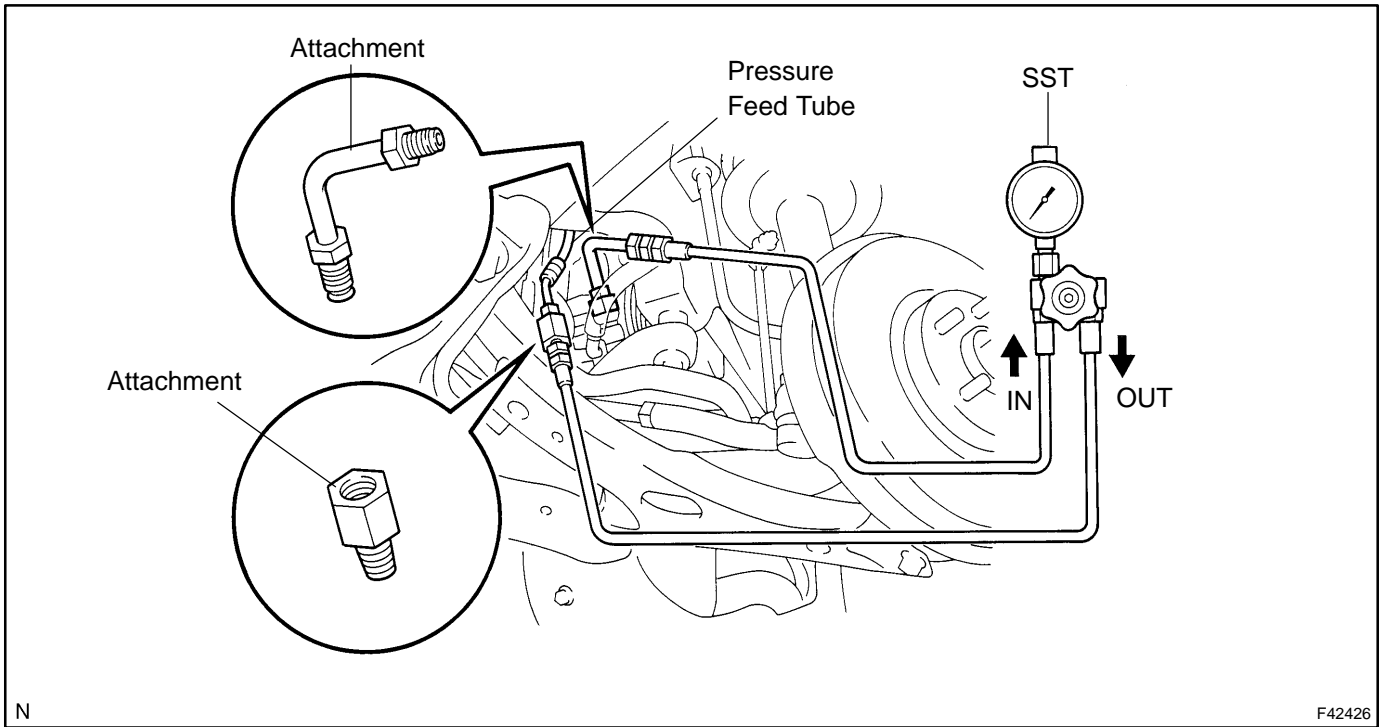
- (a) Disconnect the pressure feed tube from the PS gear (See page 51-18).
- (b) Connect SST, as shown in the illustration.  
SST 09640-10010 (09641-01010, 09641-01020, 09641-01030)

#### 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.

**Fluid temperature: 75 – 80 °C (167 – 176 °F)**

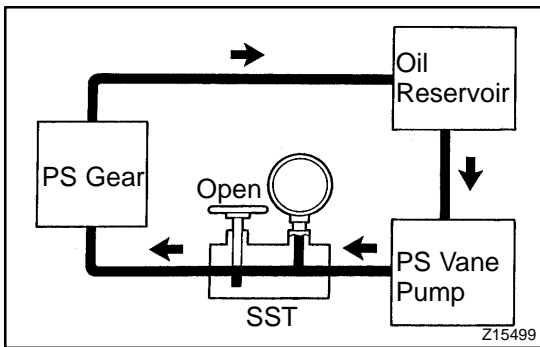


(f) With the engine idling, close the valve of the SST and observe the reading on the SST.

**Fluid pressure:**  
 7,300 – 7,800 kPa (75 – 80 kgf/cm<sup>2</sup>, 1,067 – 1,138 psi)

**NOTICE:**

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



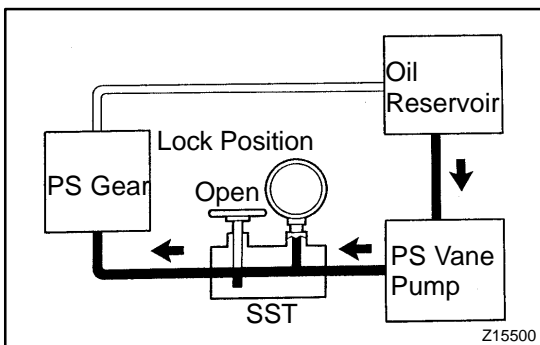
(g) With the engine idling, open the valve fully.

(h) Measure the fluid pressure at engine speeds of 1,000 rpm and 3,000 rpm.

**Fluid pressure difference:**  
 490 kPa (5 kgf/cm<sup>2</sup>, 71 psi) or less

**NOTICE:**

Do not turn the steering wheel.



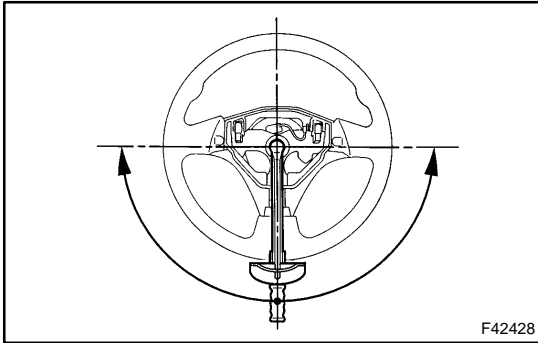
(i) With the engine idling and valve fully opened, turn the steering wheel to full lock position.

**Fluid pressure:**  
 7,300 – 7,800 kPa (75 – 80 kgf/cm<sup>2</sup>, 1,067 – 1,138 psi)

**NOTICE:**

- Do not maintain lock position for more than 10 seconds.
- Do not let the fluid temperature become too high.

- (j) Disconnect the SST.  
SST 09640-10010 (09641-01010, 09641-01020, 09641-01030)
- (k) Connect the pressure feed tube to the PS gear  
(See page 51-18).
- (l) Bleed the power steering system.



#### 5. CHECK STEERING EFFORT

- (a) Center the steering wheel assy.
- (b) Remove the horn button assy (See page 50-8).
- (c) Start the engine and run it at idle.
- (d) Measure the steering effort in both directions.

#### **Steering effort (Reference):**

**6 N·m (60 kgf·cm, 53 in.-lbf) or less**

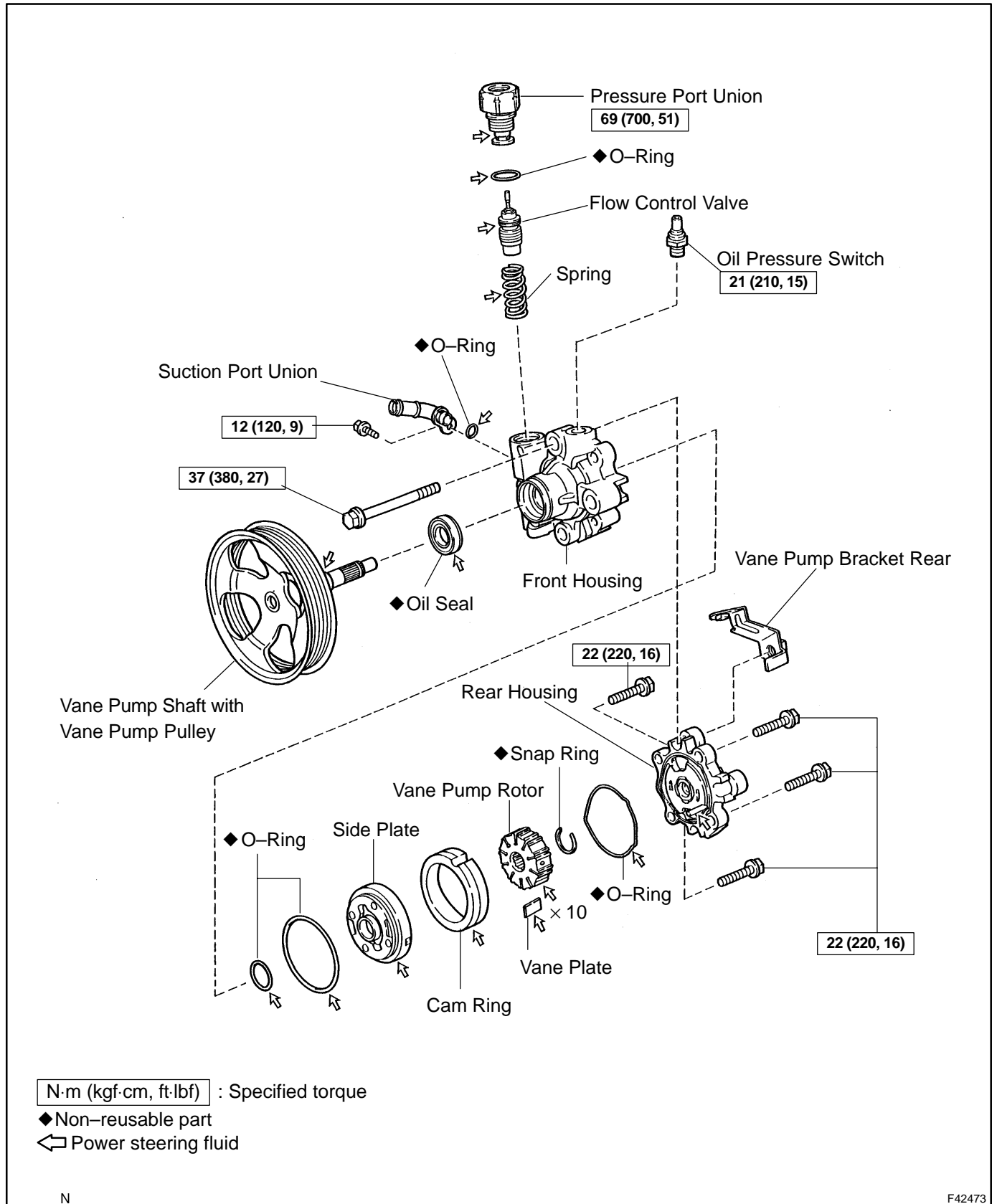
#### HINT:

Take the tire type, pressure and contact surface into consideration before making your diagnosis.

- (e) Install the steering wheel assy set nut.  
**Torque: 50 N·m (510 kgf·cm, 37 ft·lbf)**
- (f) Install the horn button assy (See page 50-8).

# VANE PUMP ASSY COMPONENTS

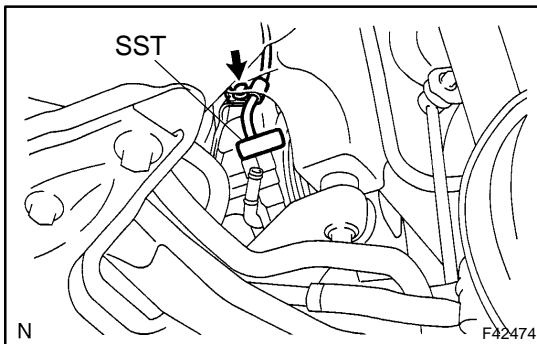
5107V-01



## OVERHAUL

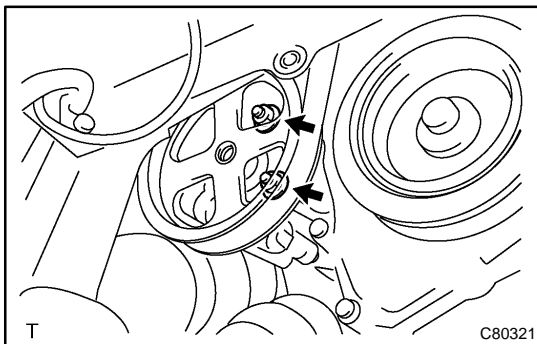
### NOTICE:

- When using a vise, do not over tighten.
  - When installing, coat the parts indicated by the arrows with power steering fluid (See page 51-7).
1. REMOVE FRONT WHEEL RH
  2. DRAIN POWER STEERING FLUID
  3. REMOVE ENGINE UNDER COVER RH
  4. REMOVE FAN AND GENERATOR V BELT
  5. DISCONNECT OIL RESERVOIR TO PUMP HOSE NO.1
    - (a) Remove the clip and disconnect the oil reservoir to pump hose No.1.



### 6. DISCONNECT PRESSURE FEED TUBE ASSY

- (a) Using SST, disconnect the pressure feed tube assy. SST 09023-38400
- (b) Remove the bolt and disconnect the pressure feed tube clamp.

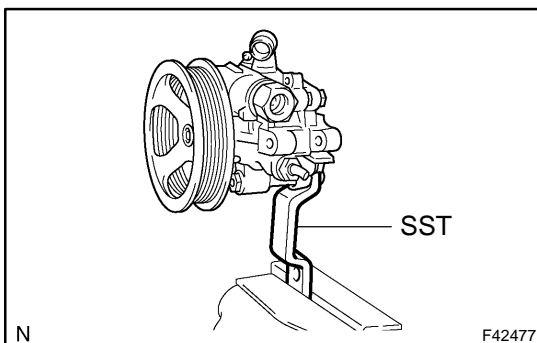


### 7. REMOVE VANE PUMP ASSY

- (a) Disconnect the oil pressure switch connector.
- (b) Remove the 2 bolts, nuts and vane pump assy.

### 8. REMOVE VANE PUMP BRACKET REAR

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



### 9. FIX VANE PUMP ASSY

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

**10. REMOVE POWER STEERING SUCTION PORT UNION**

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

**11. 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 flow control valve compression spring.

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

Be careful so that oil pressure switch is not dropped or strongly damaged, however if it is damaged replace it with a new one.

**13. REMOVE VANE PUMP HOUSING REAR**

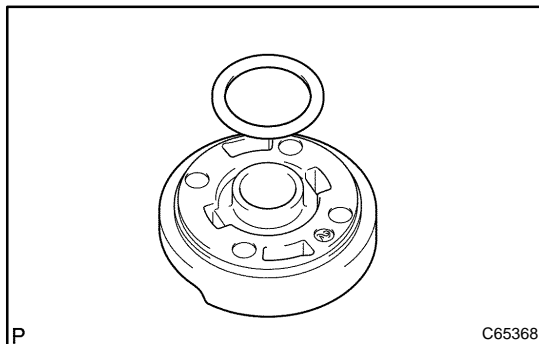
- (a) Remove the 4 bolts and vane pump housing rear from the vane pump housing front.
- (b) Remove the O-ring from the vane pump housing front.

**14. REMOVE W/PULLEY SHAFT SUB-ASSY**

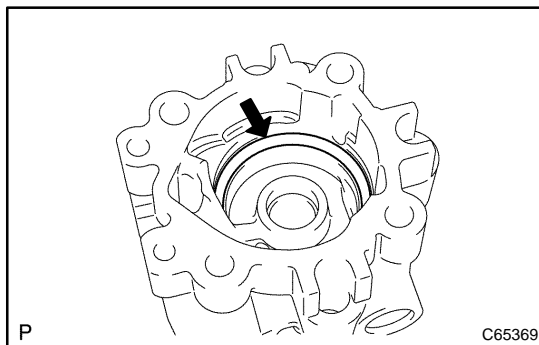
- (a) Using a screwdriver, remove the snap ring from the w/ pulley shaft sub-assy.
- (b) Remove the w/ pulley shaft sub-assy.

**15. REMOVE VANE PUMP ROTOR**

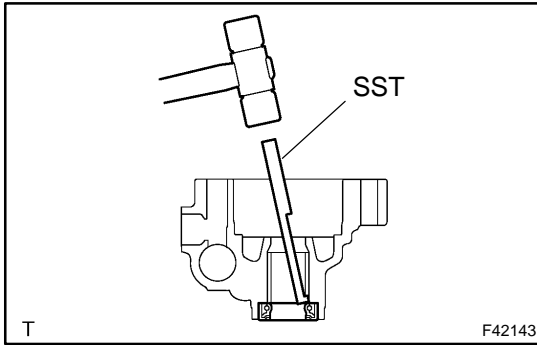
- (a) Remove the 10 vane plates.
- (b) Remove the vane pump rotor.

**16. REMOVE VANE PUMP CAM RING****17. REMOVE VANE PUMP SIDE PLATE FRONT**

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



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

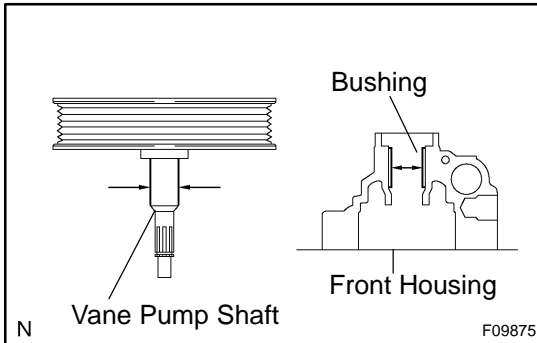
**18. REMOVE VANE PUMP HOUSING OIL SEAL**

- (a) Using SST and a hammer, remove the vane pump housing oil seal.

SST 09631-10030

**NOTICE:**

**Be careful not to damage the pump housing.**

**19. INSPECT OIL CLEARANCE**

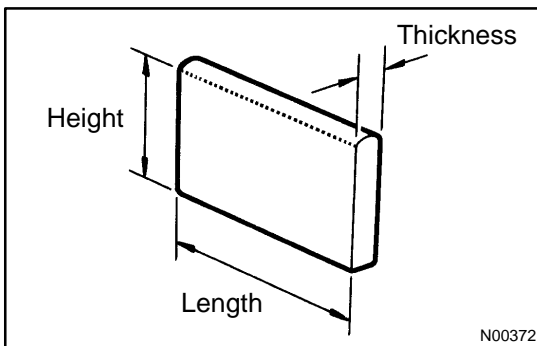
- (a) Using a micrometer and a caliper gauge, measure the oil seal clearance.

**Standard clearance:**

**0.021 – 0.043 mm (0.0008 – 0.0017 in.)**

**Maximum clearance: 0.07 mm (0.0028 in.)**

If it is more than the maximum, replace the vane pump assy.

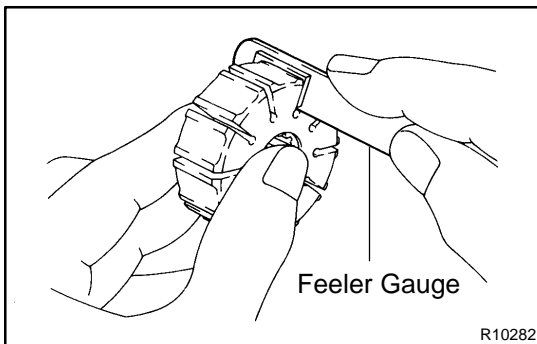
**20. INSPECT VANE PUMP ROTOR AND VANE PLATES**

- (a) Using a micrometer, measure the height, thickness and length of the vane plates.

**Minimum height: 7.6 mm (0.299 in.)**

**Minimum thickness: 1.405 mm (0.0553 in.)**

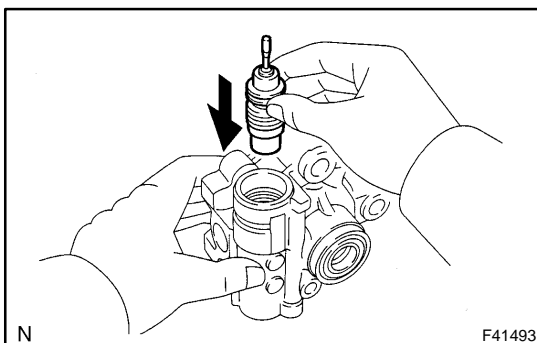
**Minimum length: 11.993 mm (0.4722 in.)**



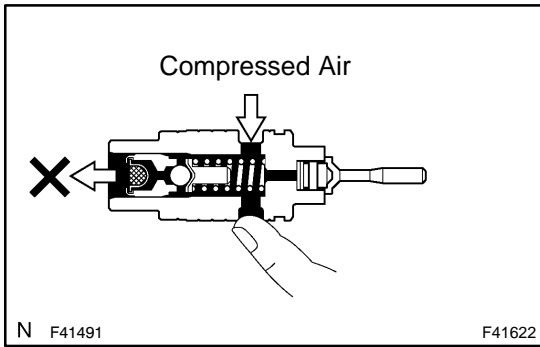
- (b) Using a feeler gauge, measure the clearance between a side face of the vane pump rotor groove and vane plate.

**Maximum clearance: 0.03 mm (0.0012 in.)**

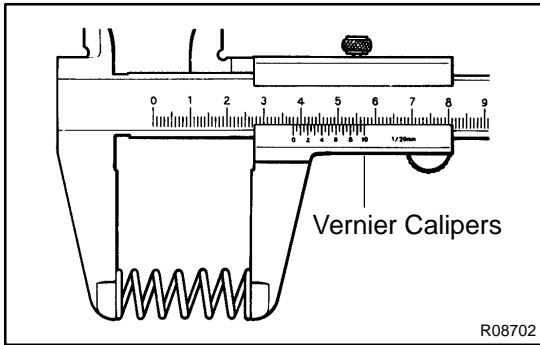
If it is more than the maximum, replace the vane pump assy.

**21. 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 by its own weight.



- (b) Check the flow control valve for leakage. Close one of the holes and apply compressed air of 392 – 490 kPa (4 – 5 kgf·cm<sup>2</sup>, 57 – 71 psi) into the opposite side hole, and confirm that air does not come out from the end holes. If necessary, replace the vane pump assy.

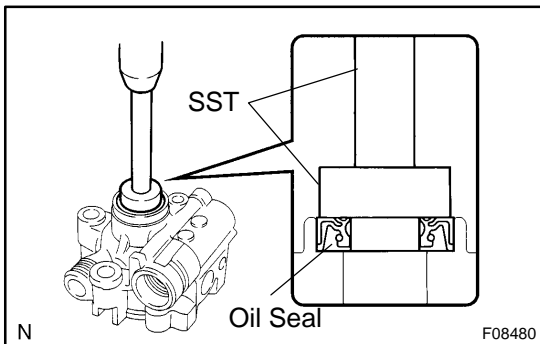


**22. INSPECT FLOW CONTROL VALVE COMPRESSION SPRING**

- (a) Using vernier calipers, measure the free length of the spring.  
**Minimum free length: 36.9 mm (1.453 in.)**  
 If it is not within the specification, replace the vane pump assy.

**23. INSPECT PRESSURE PORT UNION**

- (a) If the union seat in the pressure port union is remarkably damaged and it may cause fluid leakage, replace the vane pump assy.

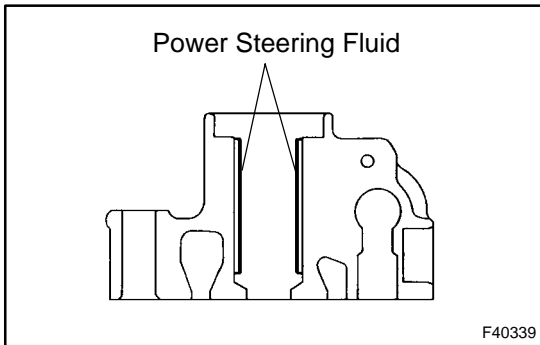


**24. INSTALL VANE PUMP HOUSING OIL SEAL**

- (a) Coat a new vane pump housing oil seal lip with power steering fluid.
- (b) Using SST and a press, install a new vane pump housing oil seal.  
 SST 09950-60010 (09951-00280), 09950-70010 (09951-07100)

**NOTICE:**

**Make sure that the vane pump housing oil seal is installed facing in the correct direction.**

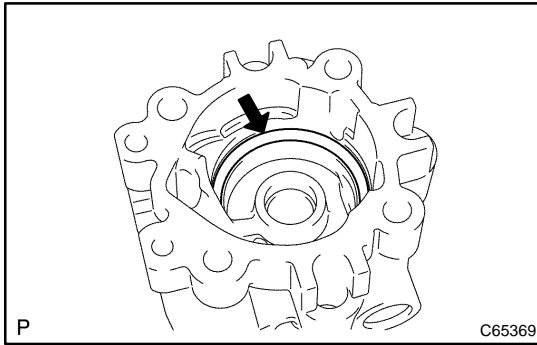


**25. INSTALL W/PULLEY SHAFT SUB-ASSY**

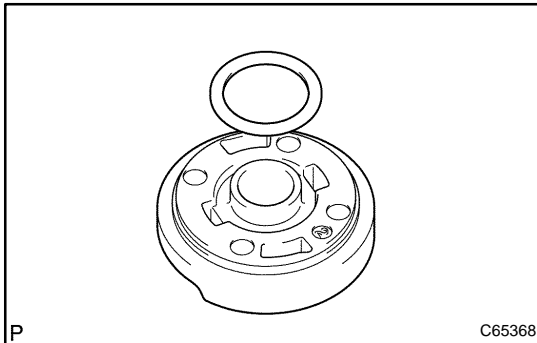
- (a) Coat inside bushing surface of the vane pump housing front with power steering fluid.
- (b) Gradually insert the vane pump shaft.

**NOTICE:**

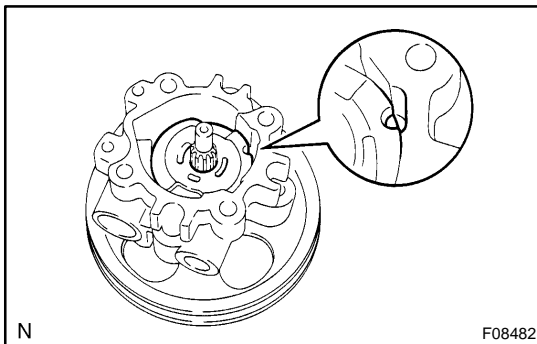
**Do not damage the vane pump housing oil seal lip in the vane pump housing front.**

**26. INSTALL VANE PUMP SIDE PLATE FRONT**

- (a) Coat a new O-ring with power steering fluid and install it to the vane pump housing front.



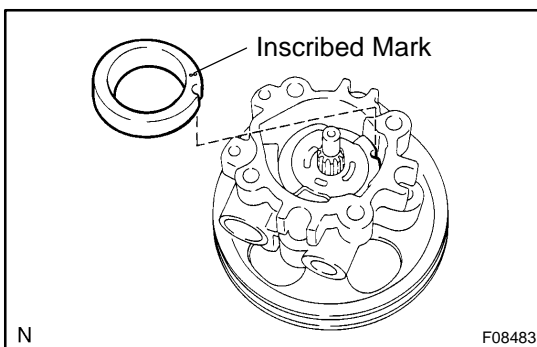
- (b) Coat a new O-ring with power steering fluid and install it to the side plate front.



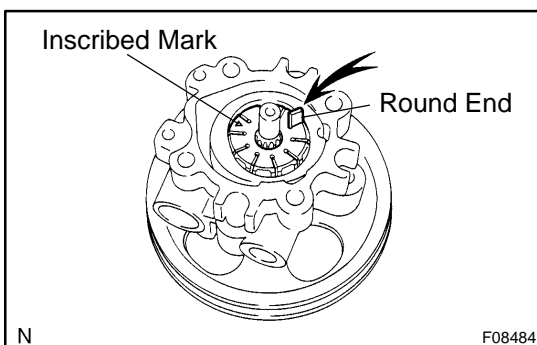
- (c) Align the dent of the vane pump side plate front with that of the vane pump housing front, and install the vane pump side plate front.

**NOTICE:**

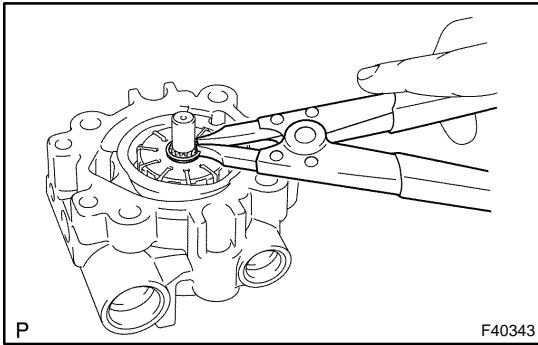
**Make sure that the side plate front is installed facing in the correct direction.**

**27. INSTALL VANE PUMP CAM RING**

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

**28. INSTALL VANE PUMP ROTOR**

- (a) Install the vane pump rotor with the inscribed mark facing outward.
- (b) Coat 10 vane plates with power steering fluid.
- (c) Install the vane plates with the round end facing outward.

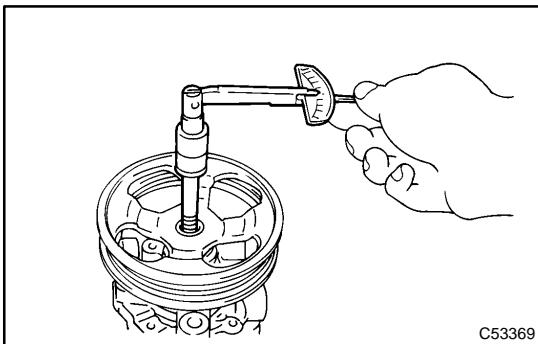


- (d) Using a snap ring expander, install a new snap ring to the w/ pulley shaft sub-assy.

### 29. INSTALL VANE PUMP HOUSING REAR

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

**Torque: 22 N·m (220 kgf·cm, 16 ft·lbf)**



### 30. INSPECT PRELOAD

- (a) Check that the pump rotates smoothly without abnormal noise.

- (b) Temporarily install the service bolt.

**Recommended service bolt:**

**Thread diameter: 10 mm (0.3937 in.)**

**Thread pitch: 1.25 mm (0.0492 in.)**

**Bolt length: 50 mm (1.9685 in.)**

- (c) Using a torque wrench, check the pump rotating torque.

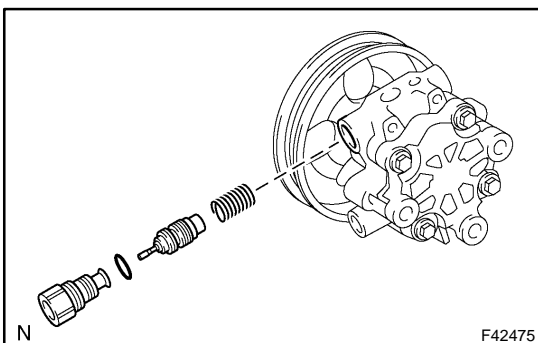
**Rotating torque:**

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

### 31. INSTALL POWER STEERING OIL PRESSURE SWITCH

- (a) Coat a new O-ring with power steering fluid and install it to the power steering oil pressure switch.  
 (b) Install the power steering oil pressure switch to the vane pump assy.

**Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)**



### 32. INSTALL FLOW CONTROL VALVE

- (a) Coat the flow control valve compression spring and flow control valve with power steering fluid.

- (b) Install the flow control valve compression spring and flow control valve.

- (c) Coat a new O-ring with power steering fluid and install it to the pressure port union.

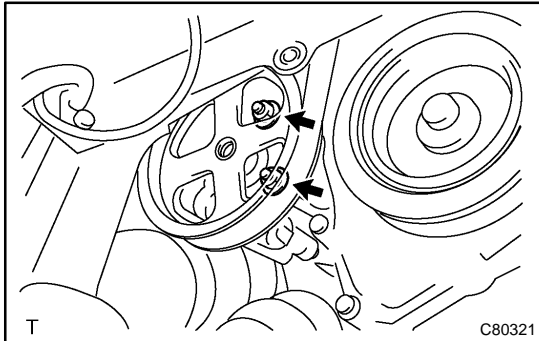
- (d) Install the pressure port union.

**Torque: 69 N·m (700 kgf·cm, 51 ft·lbf)**

**33. INSTALL POWER STEERING SUCTION PORT UNION**

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

**Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)**

**34. INSTALL VANE PUMP ASSY**

- (a) Install the vane pump assy with the 2 bolts and nuts.  
**Torque: 37 N·m (380 kgf·cm, 27 ft·lbf)**
- (b) Connect the oil pressure switch connector.

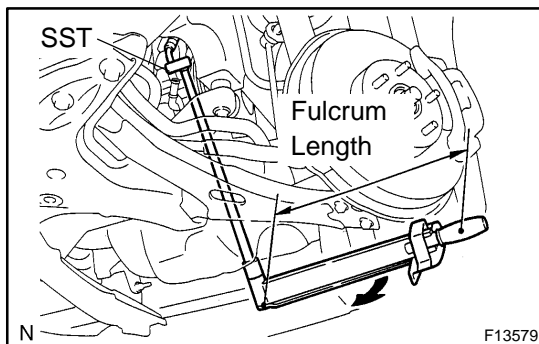
**NOTICE:**

**Be careful that the oil does not adhere to the connector.**

**35. INSTALL VANE PUMP BRACKET REAR**

- (a) Install the vane pump bracket rear with the bolt.

**Torque: 37 N·m (380 kgf·cm, 27 ft·lbf)**

**36. CONNECT PRESSURE FEED TUBE ASSY**

- (a) Using SST, connect the pressure feed tube assy.  
SST 09023-38400

**Torque: 41 N·m (420 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 a torque wrench.

- (b) Connect the pressure feed tube clamp with the bolt.

**Torque: 7.8 N·m (80 kgf·cm, 69 ft·lbf)**

**37. CONNECT OIL RESERVOIR TO PUMP HOSE NO.1**

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

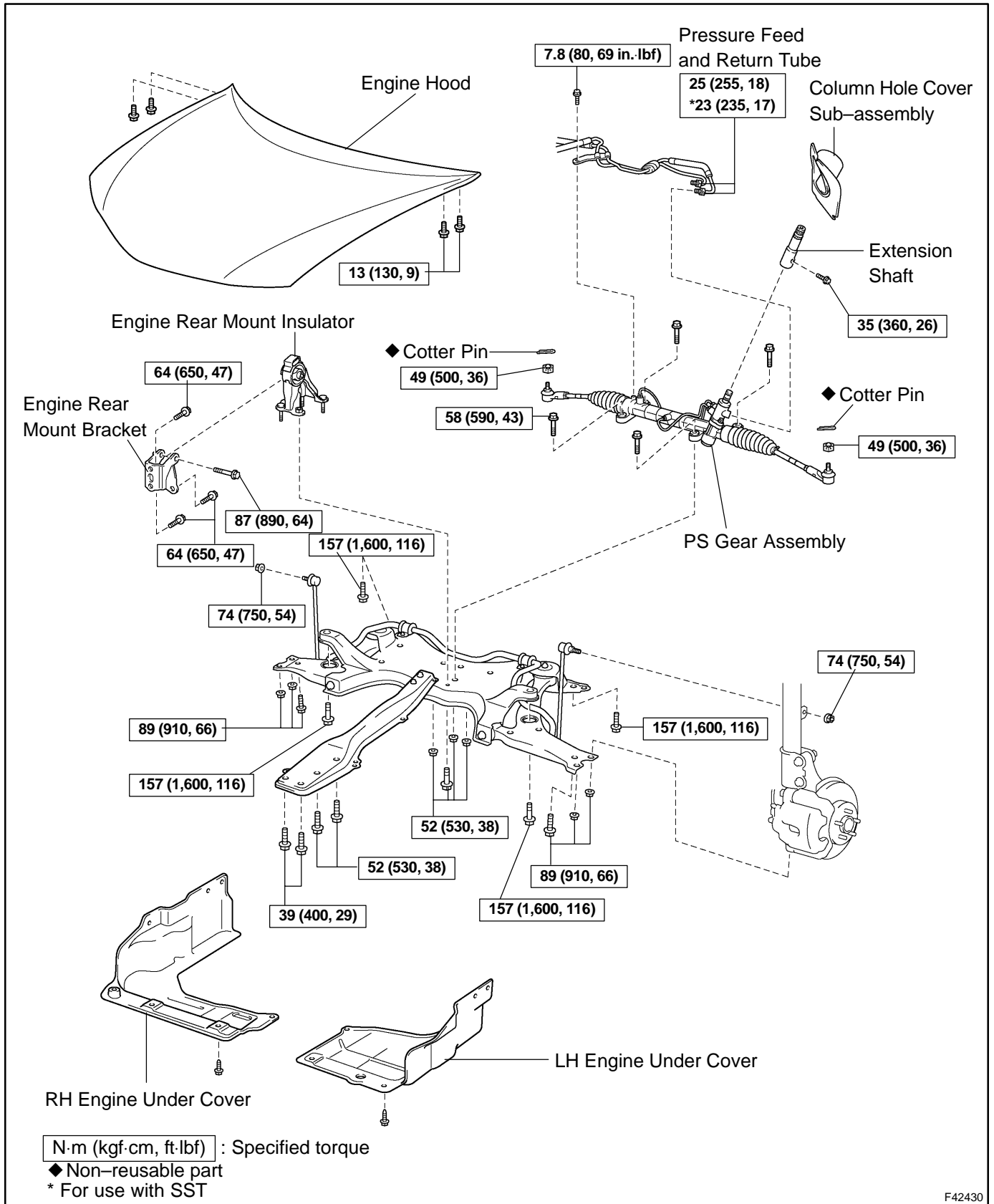
**38. INSTALL FAN AND GENERATOR V BELT****39. INSTALL FRONT WHEEL RH**

**Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)**

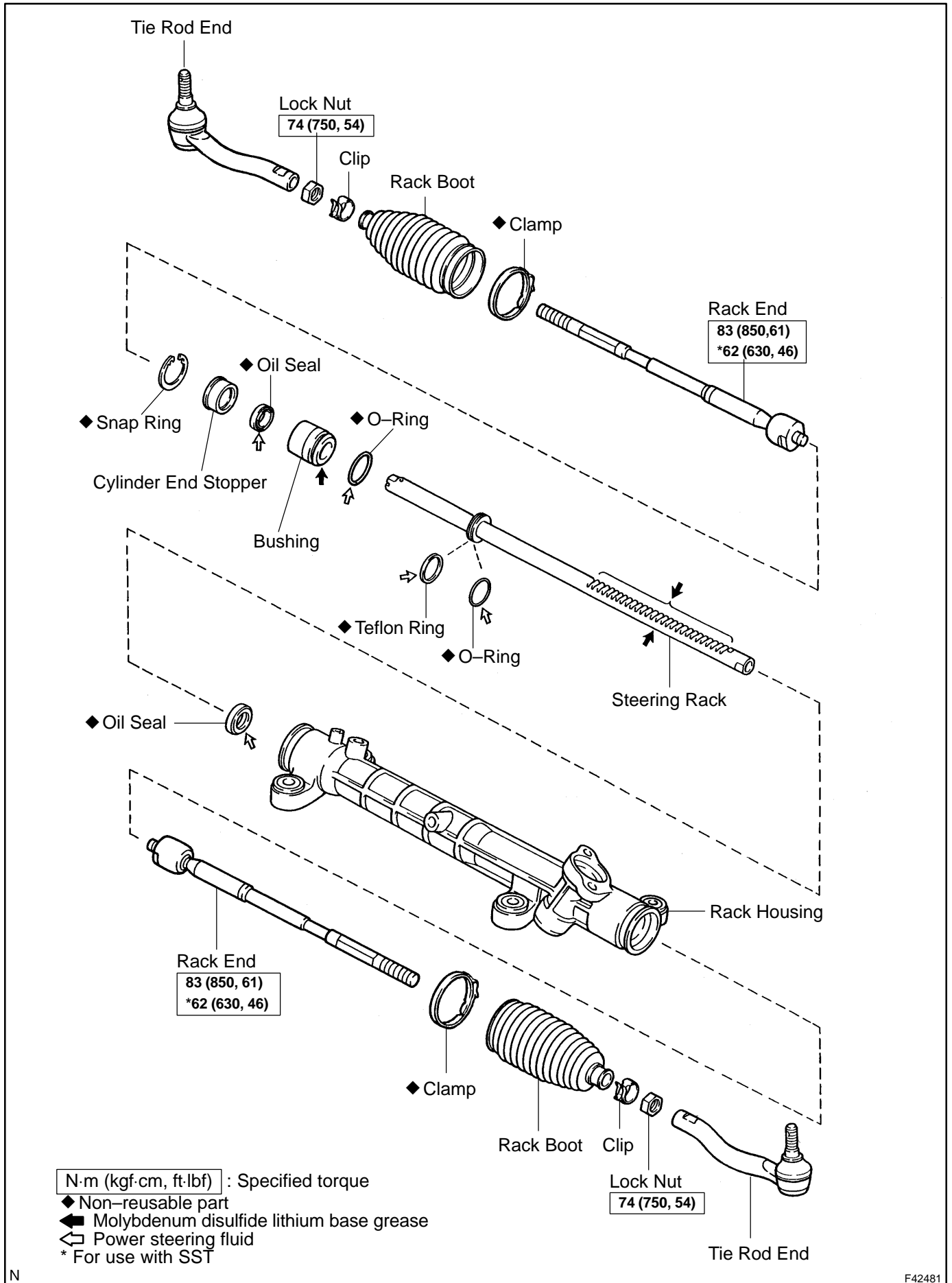
**40. ADD POWER STEERING FLUID****41. BLEED POWER STEERING FLUID(See page 51-3)****42. INSPECT FLUID LEAK****43. INSTALL ENGINE UNDER COVER RH**

# RACK & PINION POWER STEERING GEAR ASSY COMPONENTS

5107X-01

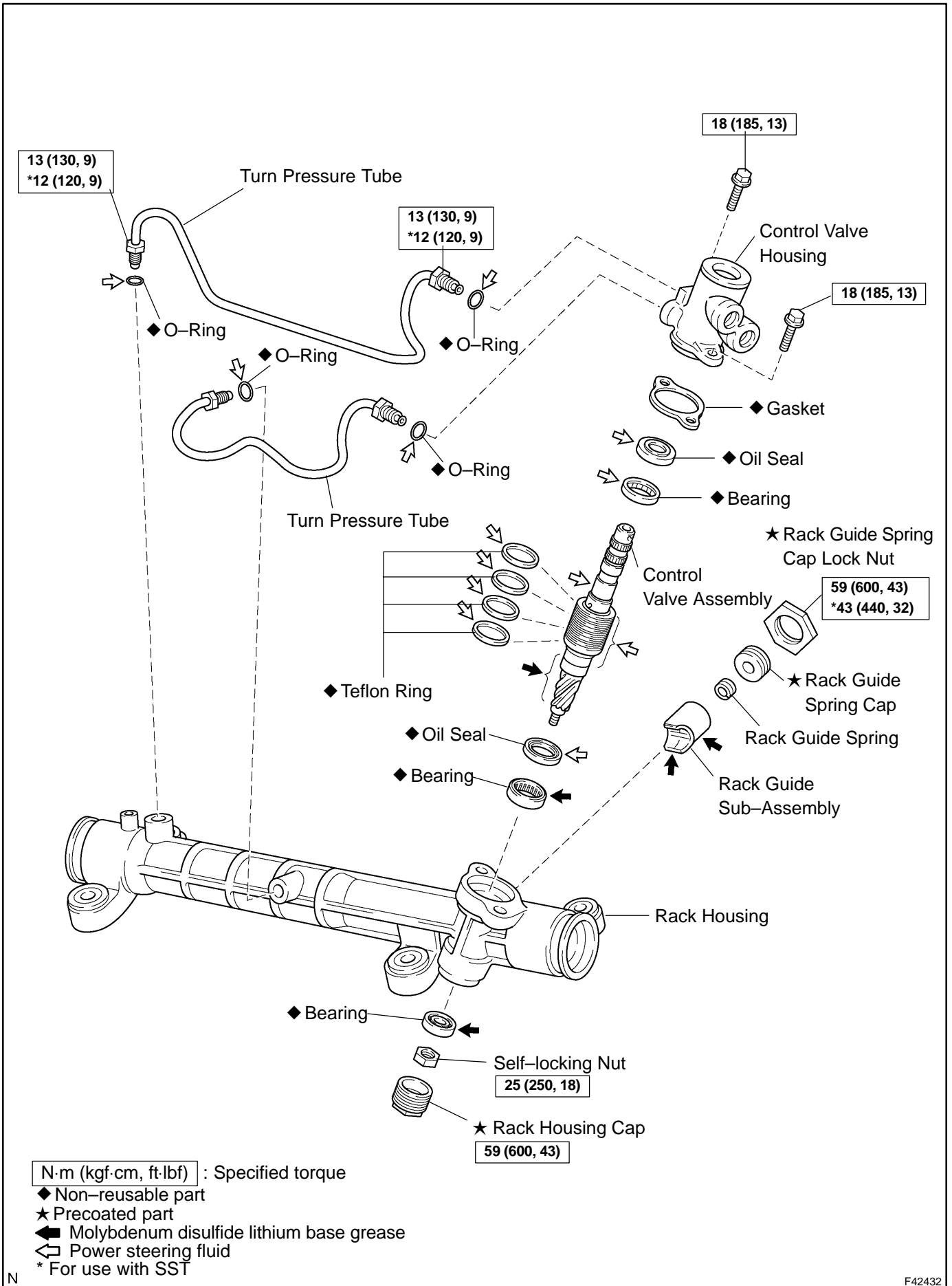


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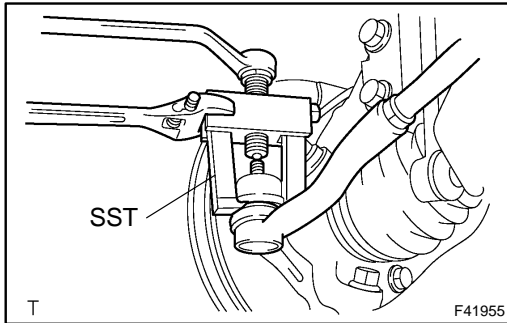


## OVERHAUL

### NOTICE:

When installing, coat the parts indicated by the arrow with power steering fluid or molybdenum disulfide lithium base grease(See page 51-15).

1. **PRECAUTION**(See page 60-1)
2. **DISCONNECT BATTERY NEGATIVE TERMINAL**
3. **INSPECT CENTER FRONT WHEEL**
4. **REMOVE HORN BUTTON ASSY**(See page 50-8)
5. **REMOVE STEERING WHEEL ASSY**(See page 50-8)  
SST 09950-50013 (09951-05010, 09952-05010, 09953-05020, 09954-05021)
6. **REMOVE FRONT WHEELS**
7. **REMOVE ENGINE UNDER COVER LH**
8. **REMOVE ENGINE UNDER COVER RH**



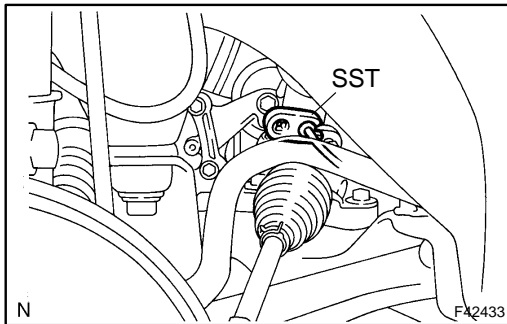
9. **DISCONNECT TIE ROD END SUB-ASSY LH**
  - (a) Remove the cotter pin and nut.
  - (b) Using SST, disconnect tie rod end sub-assy LH from the steering knuckle.  
SST 09628-62011

10. **DISCONNECT TIE ROD END SUB-ASSY RH**  
SST 09628-62011

### HINT:

Remove the RH side by the same procedures as of the LH side.

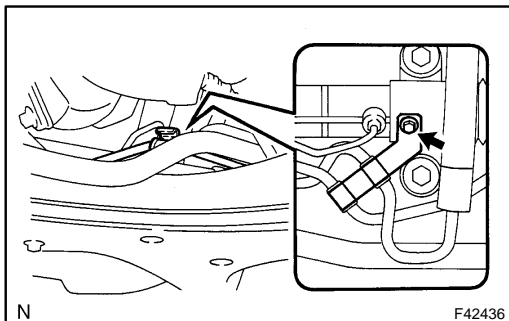
11. **REMOVE COLUMN HOLE COVER SILENCER SHEET**
12. **DISCONNECT STEERING INTERMEDIATE SHAFT**(See page 50-8)



13. **DISCONNECT PRESSURE FEED TUBE ASSY**
  - (a) Using SST, disconnect the pressure feed tube assy.  
SST 09023-38400

**14. DISCONNECT RETURN TUBE SUB-ASSY**

- (a) Using SST, disconnect the return tube sub-assy.  
SST 09023-38400



- (b) Remove the bolt and disconnect the tube clamp.

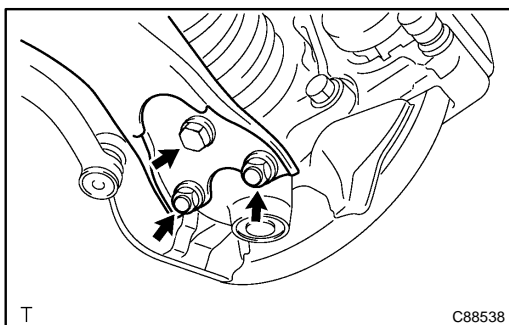
**15. DISCONNECT FRONT STABILIZER LINK ASSY LH**

- (a) Remove the nut and disconnect the front stabilizer link assy LH.

**16. DISCONNECT FRONT STABILIZER LINK ASSY RH**

HINT:

Remove the RH side by the same procedures as the LH side.

**17. DISCONNECT FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 LH**

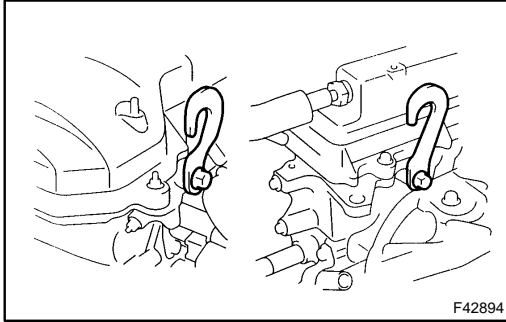
- (a) Remove the bolt and 2 nuts and disconnect the front suspension arm sub-assy lower No.1 LH from the lower ball joint.

**18. DISCONNECT FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 RH**

HINT:

Remove the RH side by the same procedures as the LH side.

**19. REMOVE HOOD SUB-ASSY****20. REMOVE CYLINDER HEAD COVER NO.2**

**21. SUSPEND ENGINE ASSEMBLY**

- (a) Install the 2 engine hangers with the bolts in the correct direction.

**Parts No.:**

**No.1 engine hanger: 12281 – 22021**

**No.2 engine hanger: 12281 – 15040**

**Bolt: 91512 – B1016**

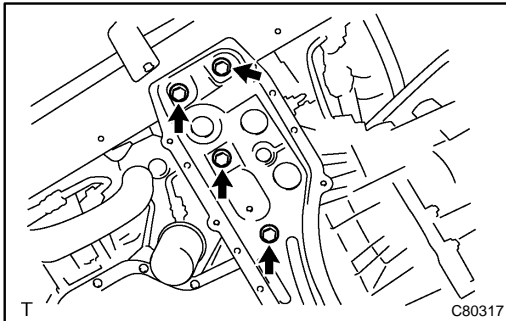
**Torque:**

**38 N·m (390 kgf·cm, 28 ft·lbf)**

- (b) Attach the engine chain hoist to the engine hangers.

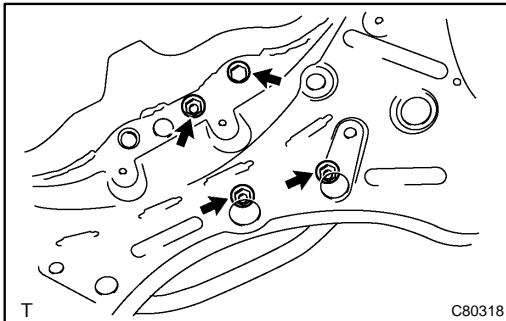
**CAUTION:**

**Do not attempt to hang the engine by hooking the chain to any other parts.**

**22. REMOVE FRONT SUSPENSION CROSSMEMBER SUB-ASSY**

- (a) Remove the 2 bolts and disconnect the center member from the engine mounting insulator FR.

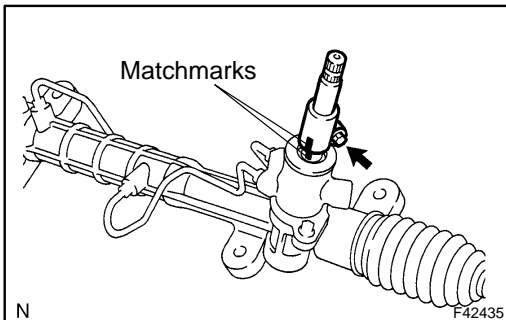
- (b) Remove the 2 bolts and disconnect the center member from the frame.



- (c) Remove the bolt and 3 nuts, disconnect the engine mounting insulator RR from the crossmember.

- (d) Using a transmission jack, support the crossmember.

- (e) Remove the 4 bolts and front suspension crossmember sub-assy with the steering gear assy.

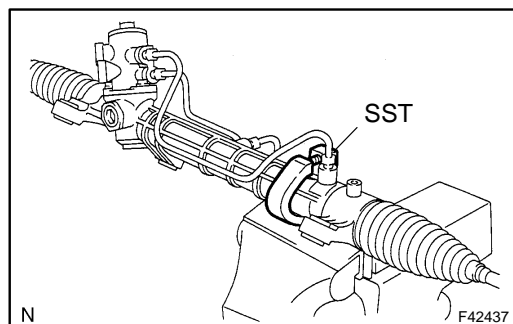
**23. REMOVE STEERING COLUMN HOLE COVER SUB-ASSY NO.1****24. REMOVE STEERING INTERMEDIATE SHAFT**

- (a) Place matchmarks on the intermediate shaft with control valve.

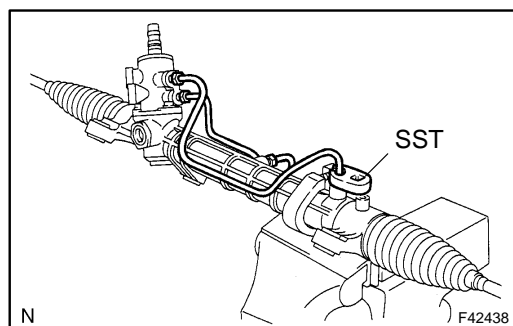
- (b) Remove the bolt and steering intermediate shaft.

**25. REMOVE RACK & PINION POWER STEERING GEAR ASSY**

- (a) Remove the 4 bolts and rack & pinion power steering gear assy from the crossmember.

**26. FIX RACK & PINION POWER STEERING GEAR ASSY**

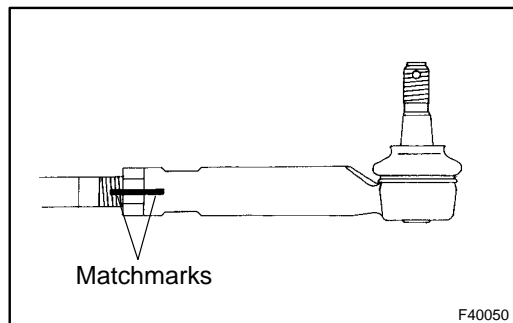
- (a) Using SST, secure the rack & pinion power steering gear assy in a vise.  
SST 09612-00012

**27. REMOVE STEERING LEFT TURN PRESSURE TUBE**

- (a) Using SST, remove the left turn pressure tube.  
SST 09023-38200
- (b) Remove the 2 O-rings from the left turn pressure tube.

**28. REMOVE STEERING RIGHT TURN PRESSURE TUBE**

- (a) Using SST, remove the right turn pressure tube.  
SST 09023-38200
- (b) Remove the 2 O-rings from the right turn pressure tube.

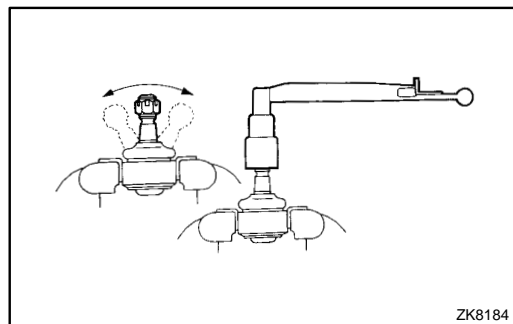
**29. REMOVE TIE ROD END SUB-ASSY LH**

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

**30. REMOVE TIE ROD END SUB-ASSY RH**

HINT:

Remove the RH side by the same procedures as the LH side.

**31. INSPECT TIE ROD END SUB-ASSY LH**

- (a) Secure the tie rod end LH in a vise.
- (b) Install the nut to the stud bolt.
- (c) Flip the ball joint stud back and forth 5 times.
- (d) Using a torx wrench, turn the nut continuously at a rate of 2 – 4 seconds per 1 turn and take the torque reading of the 5th turn.

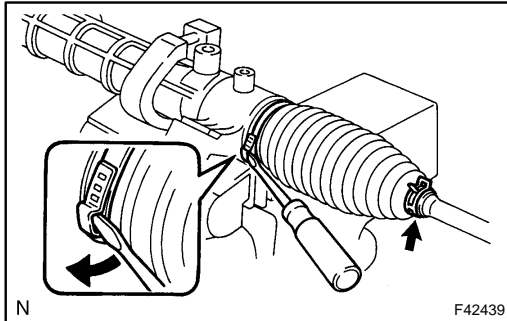
**Turning torque:**

**0.49 – 3.43 N·m (5.0 – 35 kgf·cm, 4.34 – 30.38 in.·lbf)**

**32. INSPECT TIE ROD END SUB-ASSY RH**

HINT:

Inspect the RH side by the same procedures as the LH side.

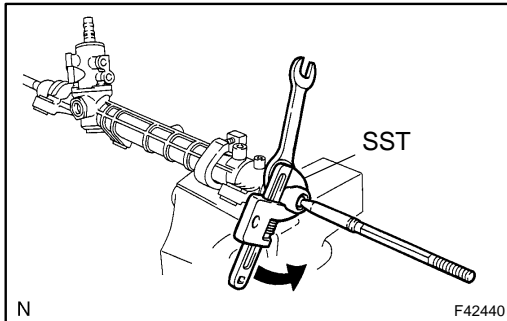
**33. REMOVE STEERING RACK BOOT NO.1**

- (a) Remove the steering rack boot clip.
- (b) Using a screwdriver, remove the clamp and steering rack boot No.1.

**34. REMOVE STEERING RACK BOOT NO.2**

HINT:

Remove the steering rack boot No.2 by same procedures as the No.1.

**35. REMOVE STEERING RACK END SUB-ASSY**

- (a) Using a spanner, hold the steering rack steadily and using SST, remove the rack end.  
SST 09922-10010

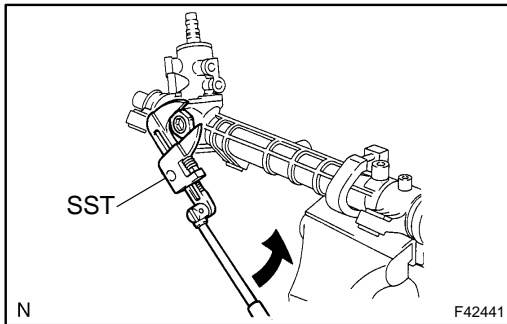
**NOTICE:**

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

HINT:

Mark the RH and LH rack ends.

- (b) Use the same manner described above to the other side.

**36. REMOVE RACK GUIDE**

- (a) Using SST, remove the rack guide spring cap nut.  
SST 09922-10010

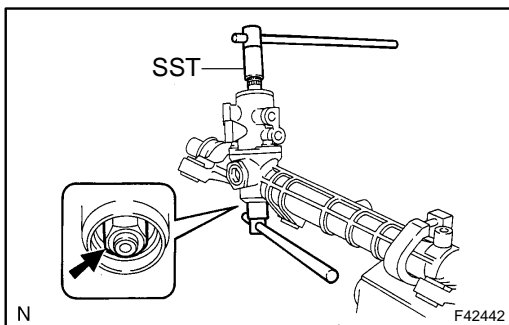
**NOTICE:**

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

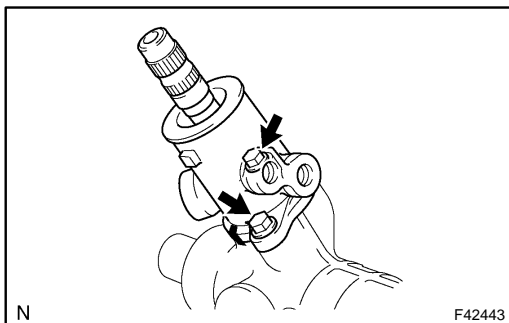
- (b) Using a hexagon wrench (19 mm), remove the rack guide spring cap.
- (c) Remove the conical spring, rack guide spring and rack guide.

**37. REMOVE POWER STEERING CONTROL VALVE**

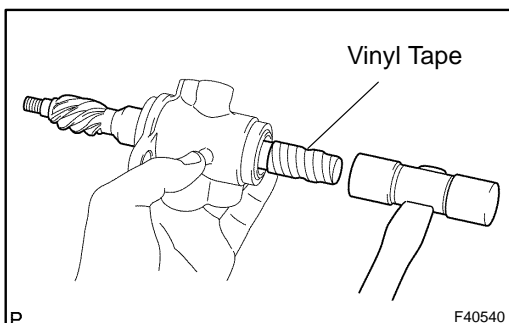
- (a) Remove the rack housing cap.



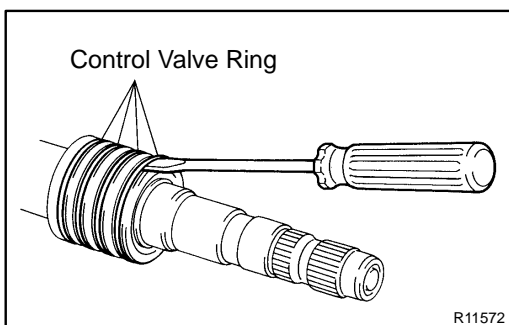
- (b) Using SST, hold the control valve shaft and remove the self-locking nut.  
SST 09616-00011



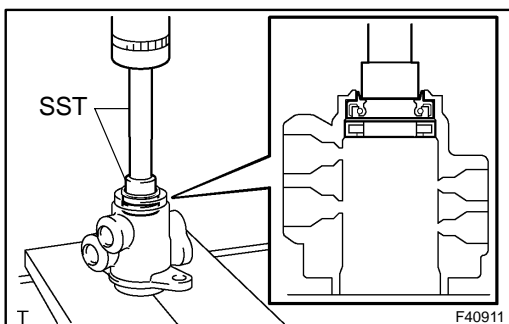
- (c) Remove the 2 bolts and power steering control valve.  
(d) Remove the gasket.



- (e) To prevent oil seal lip damage, wind vinyl tape around the serrated part of the control valve.  
(f) Using a plastic hammer, remove the control valve with oil seal from the control valve housing.  
(g) Remove the oil seal from the control valve.



- (h) Using a screwdriver, remove the 4 control valve rings.  
**NOTICE:**  
**Be careful not to damage the grooves for the control valve ring.**

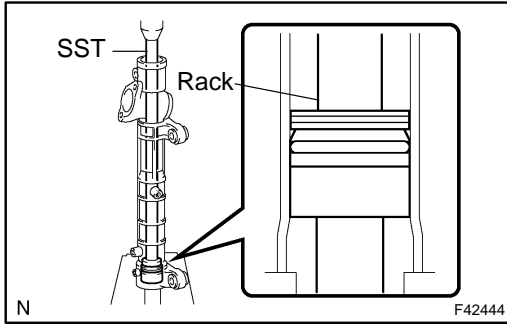


### 38. REMOVE POWER STEERING CONTROL VALVE UPPER OIL SEAL

- (a) Using SST and a press, remove the control valve upper bearing and upper oil seal from the control valve housing.  
SST 09950-60010 (09951-00260), 09950-70010 (09951-07150)

### 39. REMOVE CYLINDER END STOPPER

- (a) Using snap ring pliers, remove the snap ring.  
(b) Pull out the cylinder end stopper.

**40. REMOVE POWER STEERING RACK**

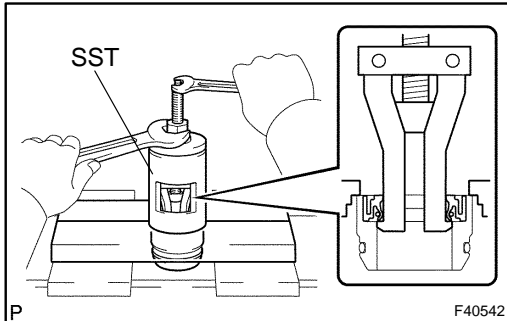
- (a) Using SST and a press, remove the steering rack with the bushing.

SST 09612-24014 (09612-10061)

**NOTICE:**

**Take care not to drop the steering rack.**

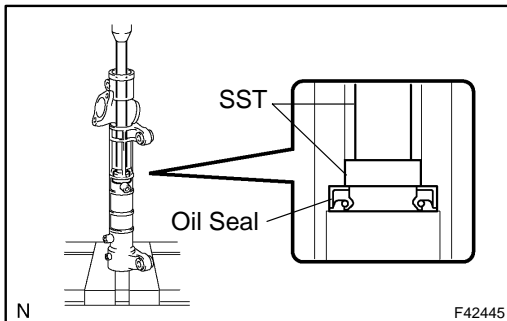
- (b) Remove the O-ring from the bushing.

**41. REMOVE POWER STEERING RACK BUSH SUB-ASSY**

- (a) Remove the power steering rack bush from the power steering rack.

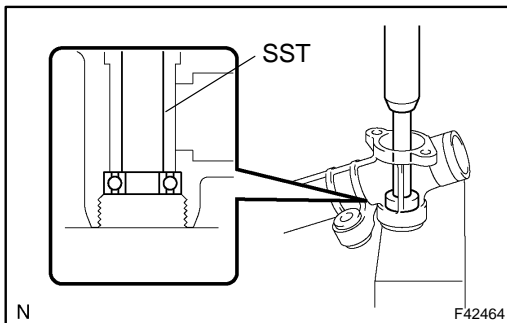
- (b) Using SST, remove the rack bush oil seal.

SST 09612-24014 (09613-22011)

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

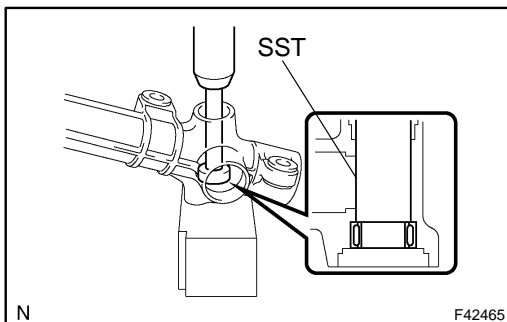
- (a) Using SST and a press, remove the power steering cylinder tube oil seal.

SST 09950-60010 (09951-00260), 09950-70010 (09951-07360)

**43. REMOVE POWER STEERING CONTROL VALVE LOWER BEARING**

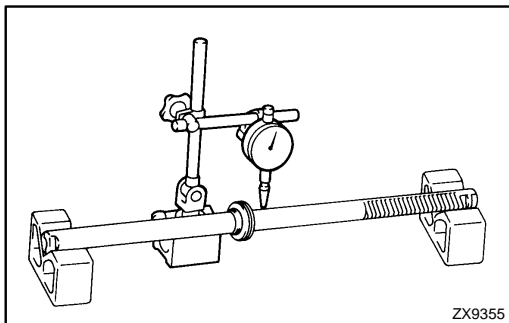
- (a) Using SST and a press, remove the power steering control valve lower bearing.

SST 09950-70010 (09951-07100)



- (b) Using SST and a press, remove the power steering control valve center bearing.

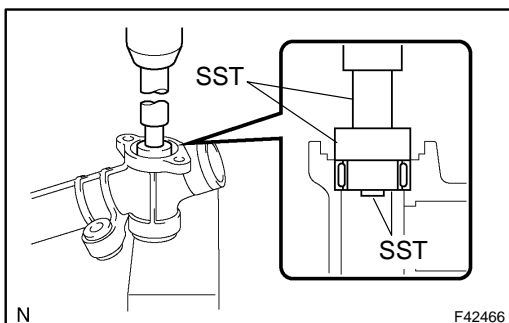
SST 09950-70010 (09951-07100)

**44. INSPECT POWER STEERING RACK**

- (a) Using a screwdriver, remove the O-ring from the power steering rack bush sub-assy.
- (b) Using a dial indicator, check the steering rack for run out and for teeth wear and damage.

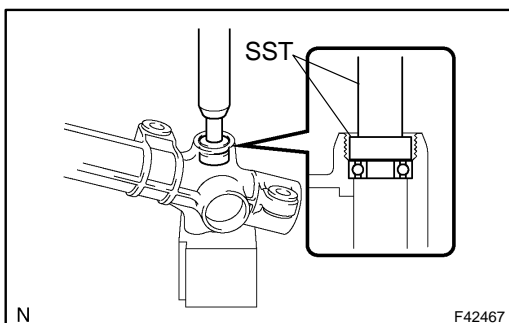
**Maximum run out: 0.1 mm (0.004 in.)**

- (c) Check the back surface for wear and damage.

**45. INSTALL POWER STEERING CONTROL VALVE LOWER BEARING**

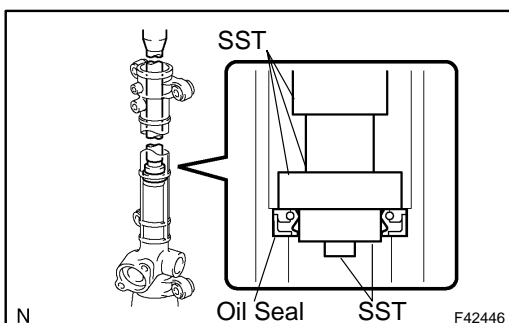
- (a) Coat a new bearing with molybdenum disulfide lithium base grease.
- (b) Using SST and a press, install the control valve center bearing.

SST 09950-60010 (09951-00220, 09951-00280, 09952-06010), 09950-70010 (09951-07100)



- (c) Coat a new bearing with molybdenum disulfide lithium base grease.
- (d) Using SST and a press, install the control valve lower bearing.

SST 09950-60010 (09951-00280), 09950-70010 (09951-07100)

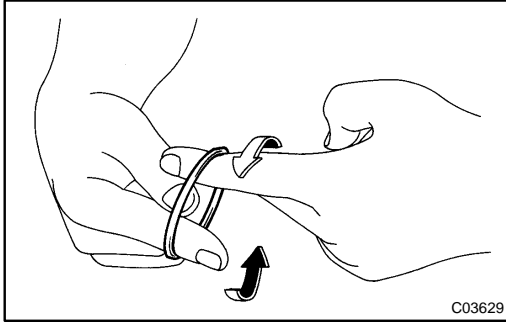
**46. INSTALL POWER STEERING CYLINDER TUBE OIL SEAL**

- (a) Coat a new power steering cylinder tube oil seal lip with power steering fluid.
- (b) Using SST and a press, install the power steering cylinder tube oil seal.

SST 09950-60010 (09951-00240, 09951-00400, 09952-06010), 09950-70010 (09951-07360)

**NOTICE:**

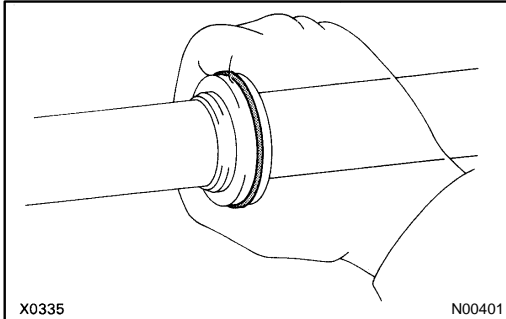
- **Make sure that the power steering cylinder tube oil seal is installed facing in the correct direction.**
- **Take care so that the power steering cylinder tube oil seal will not be reversed when you install it.**

**47. INSTALL POWER STEERING RACK**

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

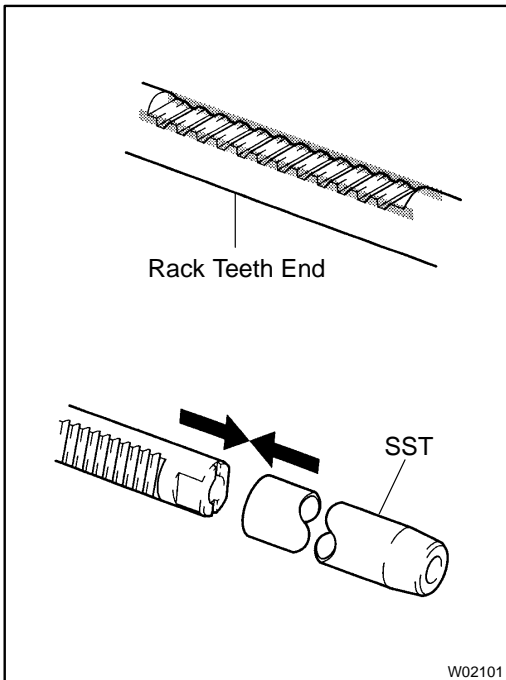
**NOTICE:**

**Be careful not to expand the power piston oil seal excessively.**



- (d) Install the power piston oil seal to the steering rack, and settle it down with your fingers.

SST 09631-16020



- (e) Install SST to the steering rack.

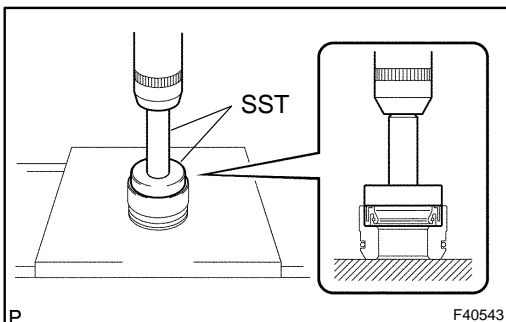
SST 09631-16020

**HINT:**

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

- (f) Coat the SST with power steering fluid.
- (g) Install the steering rack into the rack housing.
- (h) Remove the SST.

SST 09631-16020

**48. INSTALL POWER STEERING RACK BUSH SUB-ASSY**

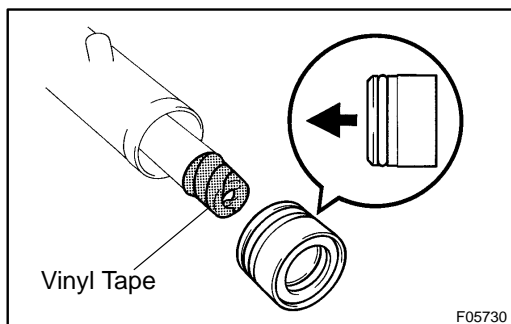
- (a) Using SST and a press, install the rack bush oil seal to the power steering rack bush.

SST 09950-60010 (09951-00400), 09950-70010 (09951-07100)

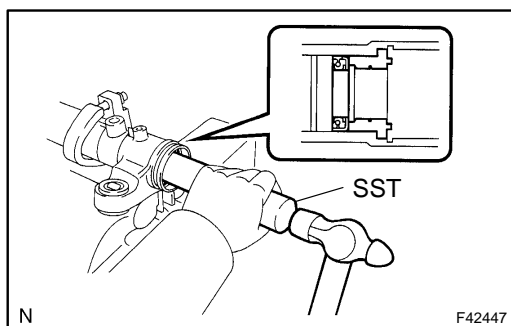
**NOTICE:**

**Make sure that the rack bush oil seal is installed facing in the correct direction.**

- (b) Coat a new O-ring with power steering fluid and install it to the power steering rack bush.

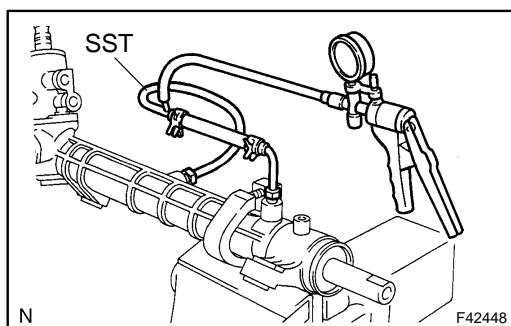


- (c) To prevent rack bush oil seal lip damage, wind vinyl tape around the steering rack end, and apply power steering fluid.
- (d) Install the rack bush to the steering rack.



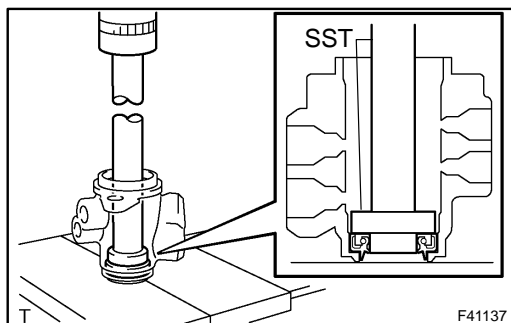
#### 49. INSTALL CYLINDER END STOPPER

- (a) Using SST and a hammer, drive in the cylinder end stopper.  
SST 09612-22011
- (b) Using snap ring pliers, install a new snap ring to the rack housing.



#### 50. INSPECT RACK & PINION POWER STEERING GEAR ASSY

- (a) Install SST to the rack housing.  
SST 09631-12071 (09633-00010)
- (b) Apply vacuum of 53 kPa (400 mmHg, 15.75 in. Hg) for about 30 seconds.
- (c) Check that there is no change in the vacuum.  
If there is a change in the vacuum, check the installation of the oil seals.

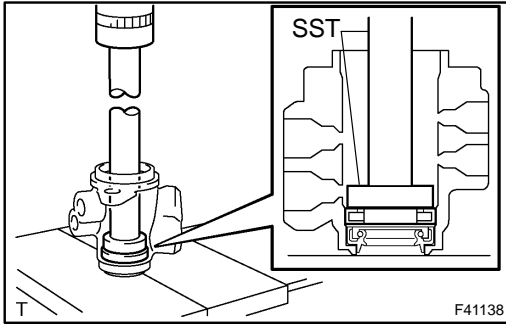


#### 51. INSTALL POWER STEERING CONTROL VALVE UPPER OIL SEAL

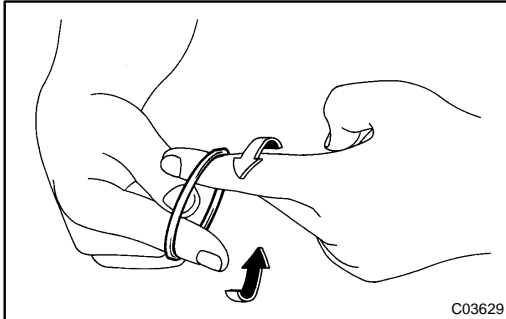
- (a) Coat an upper bearing and a new upper oil seal with power steering fluid.
- (b) Using SST and a press, install the upper oil seal.  
SST 09950-60010 (09951-00180, 09951-00320, 09952-06010), 09950-70010 (09951-07100)

#### NOTICE:

**Make sure that the oil seal is installed facing in the correct direction.**



- (c) Using SST and a press, install the upper bearing.  
 SST 09950-60010 (09951-00190, 09951-00360,  
 09952-06010), 09950-70010 (09951-07100)



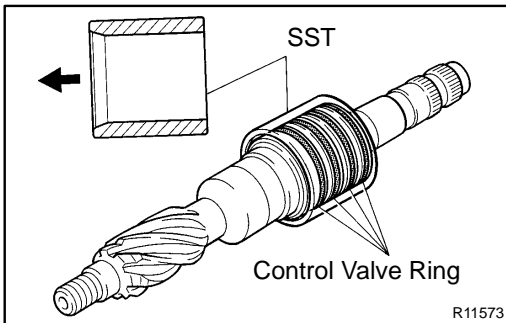
## 52. INSTALL POWER STEERING CONTROL VALVE

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

### NOTICE:

**Be careful not to over expand the valve ring.**

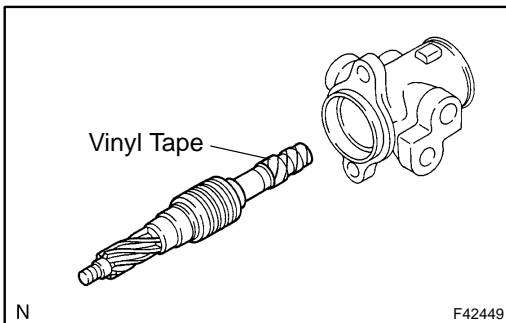
- (b) Coat the 4 control valve rings with power steering fluid.  
 (c) Install the 4 control valve rings to the control valve, and settle them down with your fingers.



- (d) Carefully slide the tapered end of SST over the control valve rings until they fit to the control valve.  
 SST 09631-20081

### NOTICE:

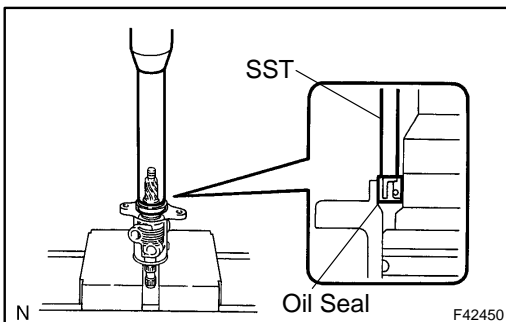
**Be careful not to damage the control valve rings.**



- (e) To prevent oil seal lip damage, wind vinyl tape around the serrated part of the control valve.  
 (f) Install the control valve to the valve housing.

### NOTICE:

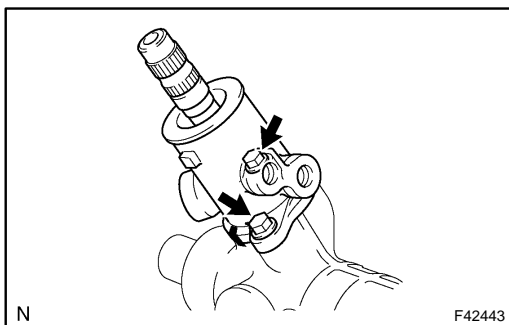
**Be careful not to damage the control valve rings and oil seal lip.**



- (g) Coat a new oil seal lip with power steering fluid.  
 (h) Using SST and a press, install the oil seal.  
 SST 09612-22011

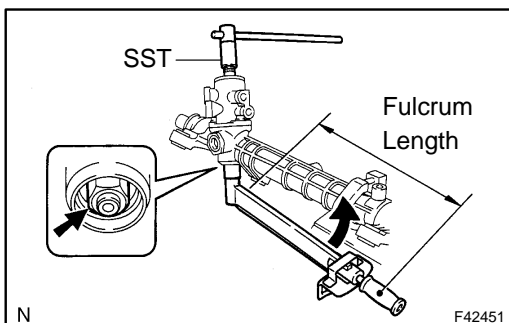
### NOTICE:

**Make sure that the oil seal is installed facing in the correct direction.**



- (i) Apply grease to the needle bearing.
- (j) Install a new gasket to the valve housing.
- (k) Wind vinyl tape around the serration part of the control valve.
- (l) Install the valve housing to the rack housing with the 2 bolts.

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



- (m) Using SST, stop the control valve shaft rotation and install a self-locking nut.

SST 09616-00011

**Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)**

- (n) Apply sealant to 2 or 3 threads of the rack housing cap.

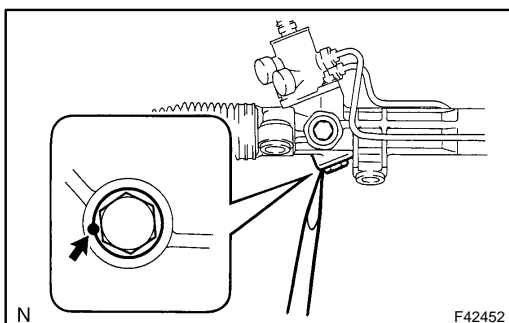
**Sealant:**

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

- (o) Install the rack housing cap.

**Torque: 59 N·m (600kgf·cm, 43 ft·lbf)**

- (p) Using a punch and a hammer, stake the rack housing cap and rack housing.



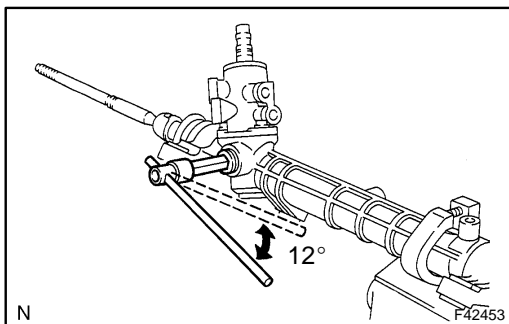
### 53. INSTALL RACK GUIDE

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

**Sealant:**

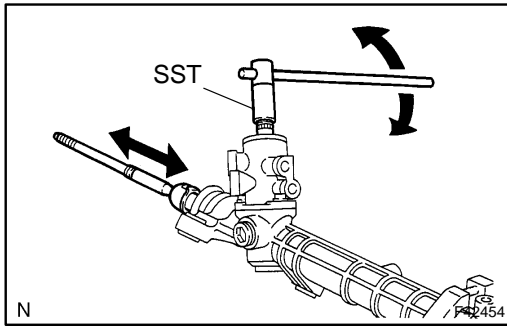
**Part No. 0.8833-00080, THREE bOND 1344, LOCTITE 242 or equivalent**

- (d) Temporarily install the rack guide spring cap.

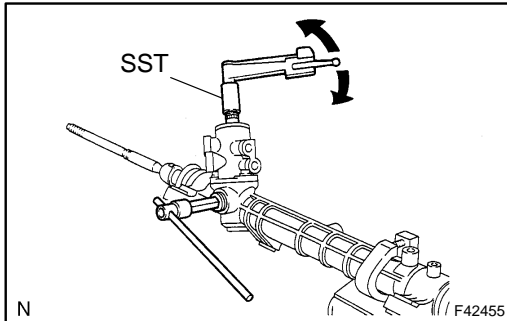


### 54. INSPECT TOTAL PRELOAD

- (a) To prevent the steering rack teeth from damaging the oil seal lip, temporarily install the RH and LH rack ends.
- (b) Torque the rack guide spring cap.
- (c) Back off the rack guide spring cap 12°.



- (d) Using SST, turn the control valve shaft right and left 1 or 2 times.  
SST 09616-00011
- (e) Loosen the rack guide spring cap until the rack guide spring is not functioning.



- (f) Using SST and torque wrench, tighten the rack guide spring cap until the preload is within the specification.  
SST 09616-00011

**Preload (turning):**

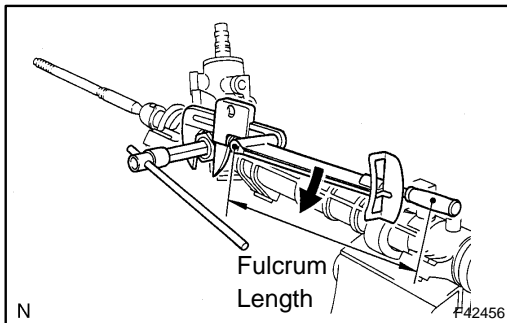
**1.0 – 1.8 N·m (20 – 18 kgf·cm, 8.6 – 15.7 ft·lbf)**

- (g) Apply sealant to 2 or 3 threads of the rack guide spring cap lock nut.

**Sealant:**

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

- (h) Temporarily install the lock nut.



- (i) Using a hexagon wrench (19 mm), hold the rack guide spring cap and using SST, torque the nut.  
SST 09922-10010

**Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)**

**NOTICE:**

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

**HINT:**

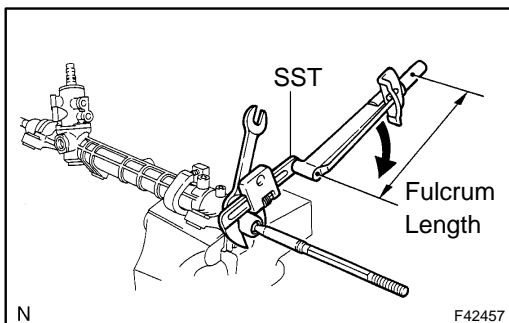
Use a torque wrench with a fulcrum length of 345 mm (13.58 in.).

- (j) Recheck the total preload.

**Preload (turning):**

**1.0 – 1.8 N·m (10 – 18 kgf·cm, 8.6 – 15.7 ft·lbf)**

- (k) Remove the RH and LH rack ends.

**55. INSTALL STEERING RACK END SUB-ASSY**

- (a) Using a spanner, hold the steering rack steadily and using SST, install the 2 rack ends.

SST 09922-10010

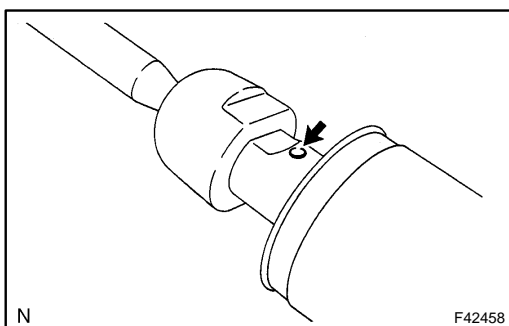
**Torque: 62 N·m (630 kgf·cm, 46 ft·lbf)**

**NOTICE:**

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

**HINT:**

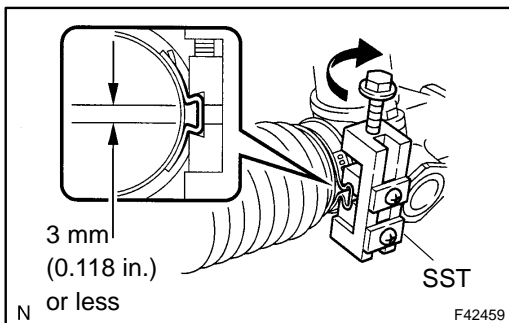
- Using SST, hold the rack and install the rack and sub-assy.
- Use a torque wrench with a fulcrum length of 380 mm (14.96 in.).



- (b) 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 steering wheel is turned.

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

- (a) Install the steering rack boot No.2.  
 (b) Using SST, tighten the steering rack boot No.2 clamp, as shown in the illustration.

SST 09521-24010

**Clearance: 3.0 mm (0.118 in.) or less**

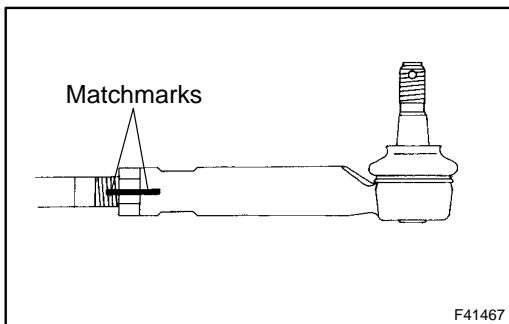
**NOTICE:**

**Be careful not to damage the boot.**

- (c) Using a pliers, install the rack boot clip.

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

Install the rack boot No.1 by the same procedures as the rack boot No.2.

**58. INSTALL TIE ROD END SUB-ASSY LH**

- (a) Screw the lock nut and tie rod end sub-assy LH onto the rack end until the matchmarks are aligned.

**HINT:**

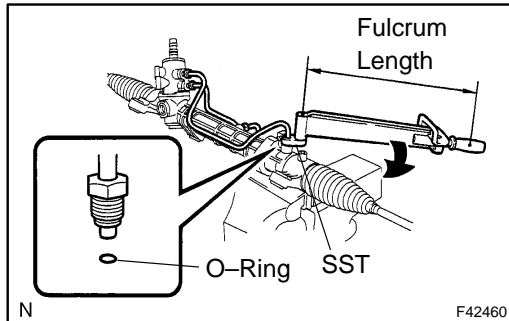
After adjusting toe-in, torque the lock nut (See page 26-5).

**Torque: 74 N·m (750 kgf·cm, 54 ft·lbf)**

**59. INSTALL TIE ROD END SUB-ASSY RH**

HINT:

Install the RH side by the same procedures as the LH side.

**60. INSTALL STEERING RIGHT TURN PRESSURE TUBE**

- (a) Coat 2 new O-rings with power steering fluid and install them to the right turn pressure tube.
- (b) Using SST, install the right turn pressure tube to the steering gear assy.

SST 09023-38200

**Torque: 12 N·m (120 kgf·cm, 8 ft·lbf)**

HINT:

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

**61. INSTALL STEERING LEFT TURN PRESSURE TUBE**

- (a) Coat 2 new O-rings with power steering fluid and install them to the left turn pressure tube.
- (b) Using SST, install the left turn pressure tube to the steering gear assy.

SST 09023-38200

**Torque 12 N·m (120 kgf·cm, 8 ft·lbf)**

HINT:

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

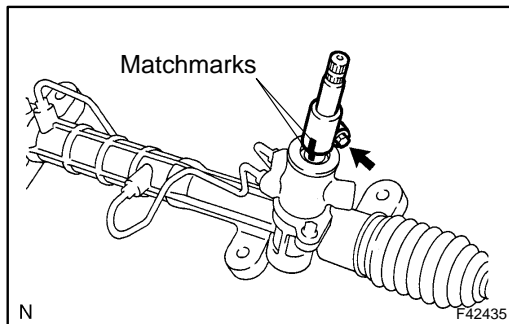
**62. INSTALL RACK & PINION POWER STEERING GEAR ASSY**

- (a) Install the power steering gear assy with the 4 bolts and nuts.

**Torque 58 N·m (590 kgf·cm, 43 ft·lbf)**

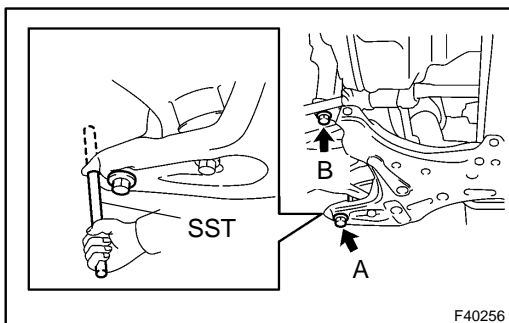
NOTICE:

- The 4 bush must be securely installed to the power steering gear assy.
- When tightening the installation bolt for power steering gear, the bush should not bitten in.

**63. INSTALL STEERING INTERMEDIATE SHAFT**

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

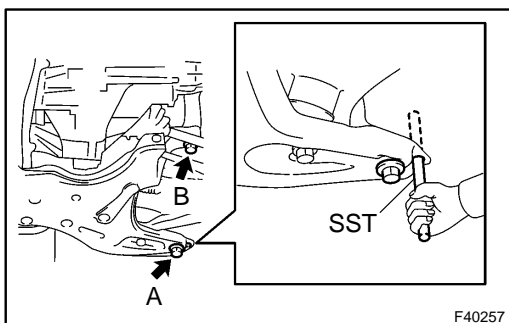
**Torque: 35 N·m (360 kgf·cm, 26 ft·lbf)****64. INSTALL STEERING COLUMN HOLE COVER SUB-ASSY NO.1**



## 65. INSTALL FRONT SUSPENSION CROSSMEMBER SUB-ASSY

- (a) Using SST, align the holes of the front suspension member RH and body, and temporarily tighten the bolt in order of A, B.

SST 09670-00010



- (b) Using SST, align the holes of the front suspension member LH and body, and temporarily tighten the bolt in order of A, B.

SST 09670-00010

- (c) Using SST, align the holes of the front suspension member RH and body, and torque the bolt A and B.

SST 09670-00010

### Torque:

**Bolt A: 157 N·m (1,600 kgf·cm, 116 ft·lbf)**

**Bolt B: 157 N·m (1,600 kgf·cm, 116 ft·lbf)**

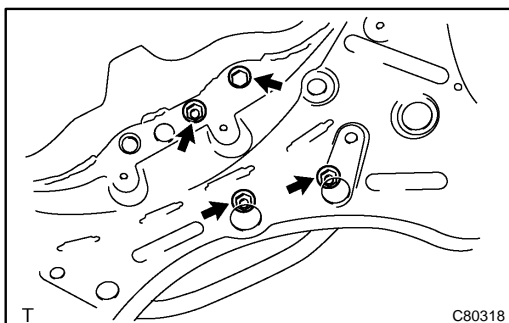
- (d) Using SST, align the holes of the front suspension member LH and body, and torque the bolt A and B.

SST 09670-00010

### Torque:

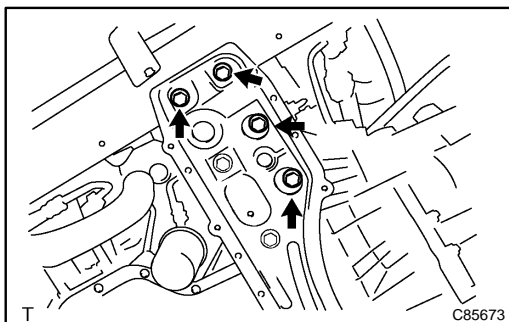
**Bolt A: 157 N·m (1,600 kgf·cm, 116 ft·lbf)**

**Bolt B: 157 N·m (1,600 kgf·cm, 116 ft·lbf)**



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

**Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)**

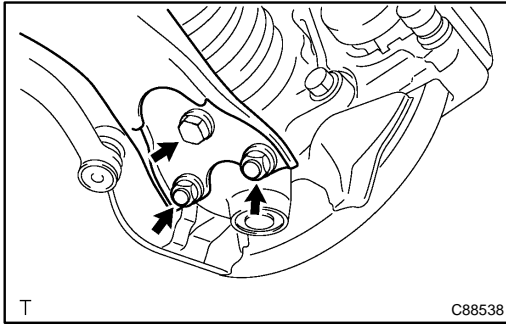


- (f) Install the center member to the frame with the 2 bolts.

**Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)**

- (g) Connect the engine mounting insulator FR to the center member with the 2 bolts.

**Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)**



**66. CONNECT FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 LH**

- (a) Connect the front suspension lower arm No.1 to the lower ball joint with the bolt and 2 nuts.

**Torque: 89 N·m (910 kgf·cm, 66 ft·lbf)**

**67. CONNECT FRONT SUSPENSION ARM SUB-ASSY LOWER NO.1 RH**

HINT:

Use the same manner described above to the other side.

**68. CONNECT FRONT STABILIZER LINK ASSY LH**

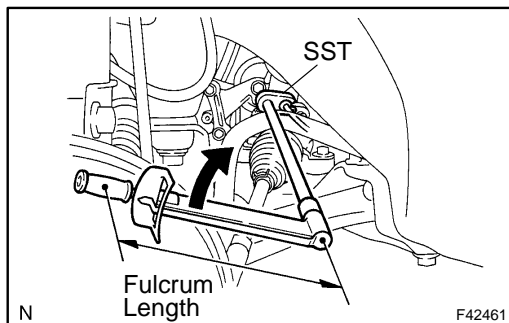
- (a) Connect the front stabilizer link assy LH with the nut.

**Torque: 74 N·m (755 kgf·cm, 55 ft·lbf)**

**69. CONNECT FRONT STABILIZER LINK ASSY RH**

HINT:

Use the same manner described above to the other side.



**70. CONNECT RETURN TUBE SUB-ASSY**

- (a) Using SST, connect the return tube sub-assy.  
SST 09023-38400

**Torque: 23 N·m (235 kgf·cm, 17 ft·lbf)**

HINT:

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

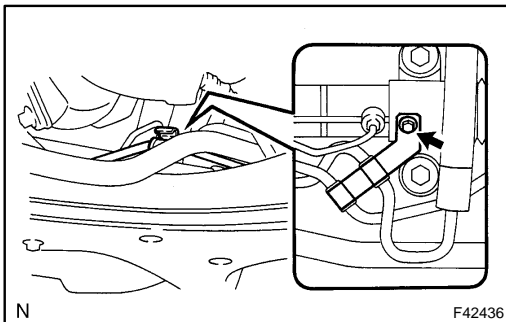
**71. CONNECT PRESSURE FEED TUBE ASSY**

- (a) Using SST, connect the pressure feed tube assy.  
SST 09023-38400

**Torque: 23 N·m (235 kgf·cm, 17 ft·lbf)**

HINT:

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



- (b) Connect the tube clamp with the bolt.  
**Torque: 7.8 N·m (80 kgf·cm, 69 ft·lbf)**

**72. CONNECT STEERING INTERMEDIATE SHAFT(See page 50-8)****73. CONNECT TIE ROD END SUB-ASSY LH**

- (a) Connect the tie rod end sub-assy LH with the nut.

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

- (b) Install a new cotter pin.

**NOTICE:**

If the holes for a new cotter pin are not aligned, tighten the nut further up to 60°.

**74. CONNECT TIE ROD END SUB-ASSY RH****HINT:**

Use the same manner described above to the other side.

**75. INSTALL ENGINE UNDER COVER LH****76. INSTALL ENGINE UNDER COVER RH****77. INSTALL FRONT WHEELS**

**Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)**

**78. INSPECT CENTER FRONT WHEEL****79. INSTALL COLUMN HOLE COVER SILENCER SHEET**

- (a) Install the column hole cover silencer sheet with the 2 nuts.

**80. ADD POWER STEERING FLUID****81. BLEED POWER STEERING FLUID(See page 51-3)****82. INSPECT FLUID LEAK****83. INSTALL CYLINDER HEAD COVER NO.2**

- (a) Install the cylinder head cover No.2 with 2 nuts and 2 clips.

**Torque: 7.0 N·m (71 kgf·cm, 62 ft·lbf)**

**84. INSTALL HOOD SUB-ASSY****85. INSPECT HOOD SUB-ASSY****86. ADJUST HOOD SUB-ASSY(See page 75-1)****87. CENTER SPIRAL CABLE(See page 50-8)****88. INSTALL STEERING WHEEL ASSY(See page 50-8)****89. INSTALL HORN BUTTON ASSY(See page 50-8)****90. INSPECT AND ADJUST FRONT WHEEL ALIGNMENT(See page 26-5)****91. INSPECT SRS WARNING LIGHT(See page 05-424)**