

STEERING SYSTEM

SR0L4-09

PRECAUTION

- Care must be taken to replace parts properly because they could affect the performance of the steering system and result in a driving hazard.
- The LEXUS IS300 is equipped with SRS (Supplemental Restraint System) such as the driver airbag and front passenger airbag. Failure to carry out service operation in the 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 notices in the RS section.

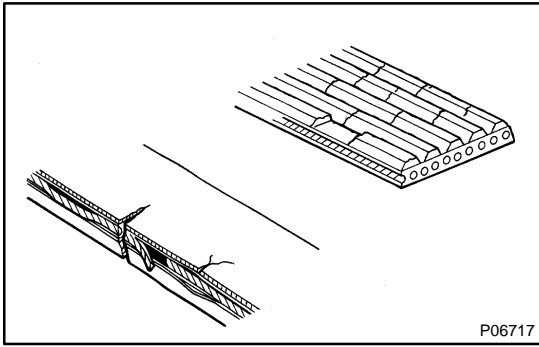
TROUBLESHOOTING

SR0L5-15

PROBLEM SYMPTOMS TABLE

Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely 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)	SA-3
	2. Power steering fluid level (Low)	SR-5
	3. Drive belt (Loose)	-
	4. Front wheel alignment (Incorrect)	SA-5
	5. Steering system joints (Worn)	-
	6. Suspension arm ball joints (Worn)	Upper SA-31 Lower SA-39
	7. Steering column (Binding)	-
	8. Power steering vane pump	SR-27
	9. Power steering gear	SR-38
Poor return	1. Tires (Improperly inflated)	SA-3
	2. Front wheel alignment (Incorrect)	SA-5
	3. Steering column (Binding)	-
	4. Power steering gear	SR-38
Excessive play	1. Steering system joints (Worn)	-
	2. Suspension arm ball joints (Worn)	Upper SA-31 Lower SA-39
	3. Intermediate shaft (Worn)	-
	4. Front wheel bearing (Worn)	SA-12
	5. Power steering gear	SR-38
Abnormal noise	1. Power steering fluid level (Low)	SR-5
	2. Steering system joints (Worn)	-
	3. Power steering vane pump	SR-27
	4. Power steering gear	SR-38



DRIVE BELT INSPECTION

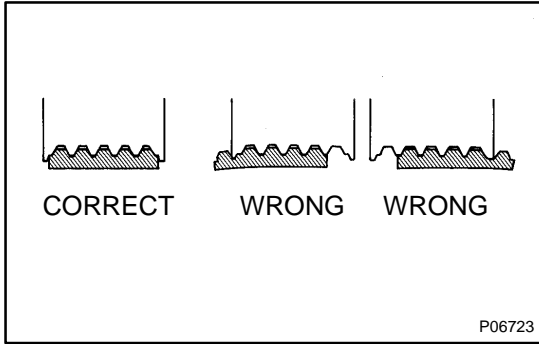
SR1BQ-02

INSPECT DRIVE BELT

Visually check the belt for excessive wear, frayed cords etc. If any defect has been 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.
- After installing a belt, check that it fits properly in the ribbed grooves.
- Check with your hand to confirm that the belt has not slipped out of the groove on the bottom of the pulley.



POWER STEERING FLUID BLEEDING

SR05P-16

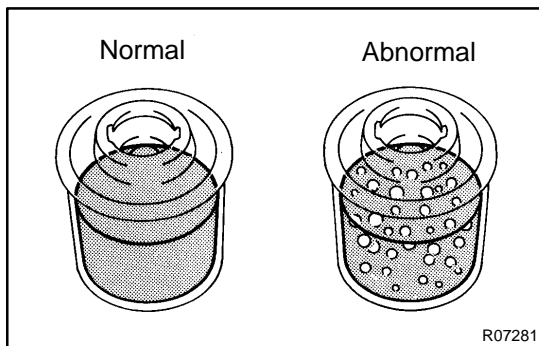
1. **CHECK FLUID LEVEL** (See page [SR-5](#))
2. **JACK UP FRONT OF VEHICLE AND SUPPORT IT WITH STANDS**
3. **TURN STEERING WHEEL**

With the engine stopped, turn the wheel slowly from lock to lock several times.

4. **LOWER VEHICLE**
5. **START ENGINE**

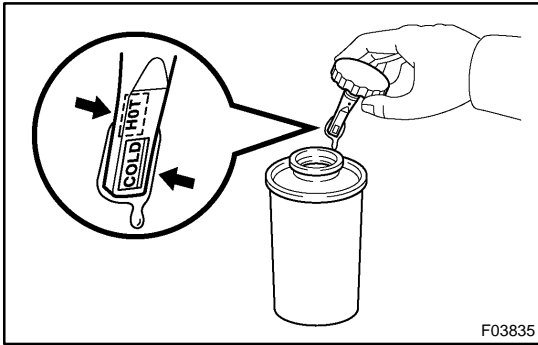
Run the engine at idle for a few minutes.

6. **TURN STEERING WHEEL**
 - (a) 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.
 - (b) Repeat (a) several times.
7. **STOP ENGINE**



R07281

8. **CHECK FOR FOAMING OR EMULSIFICATION**
If the system has to be bled twice specifically because of foaming or emulsification, check for fluid leaks in the system.
9. **CHECK FLUID LEVEL** (See page [SR-5](#))



INSPECTION

1. 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.

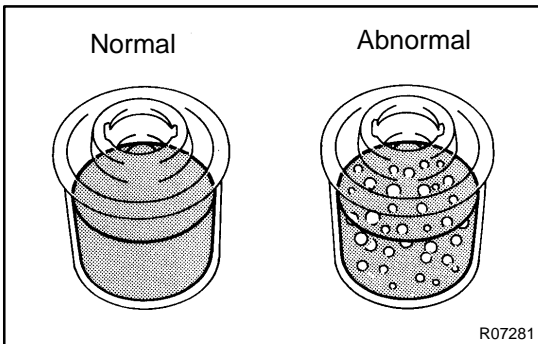
Fluid: ATF DEXRON® II or III

HINT:

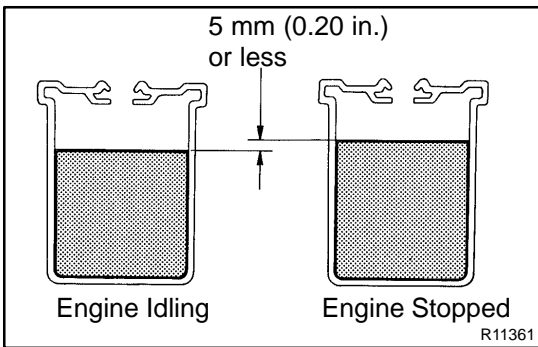
Check that the fluid level is within the HOT LEVEL range on the reservoir. If the fluid is cold, check that it is within the COLD LEVEL range.

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

Fluid temperature: 80°C (176°F)



- (e) Check for foaming or emulsification. If there is foaming or emulsification, bleed power steering system (See page [SR-4](#)).



- (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 power steering system (See page [SR-4](#)).

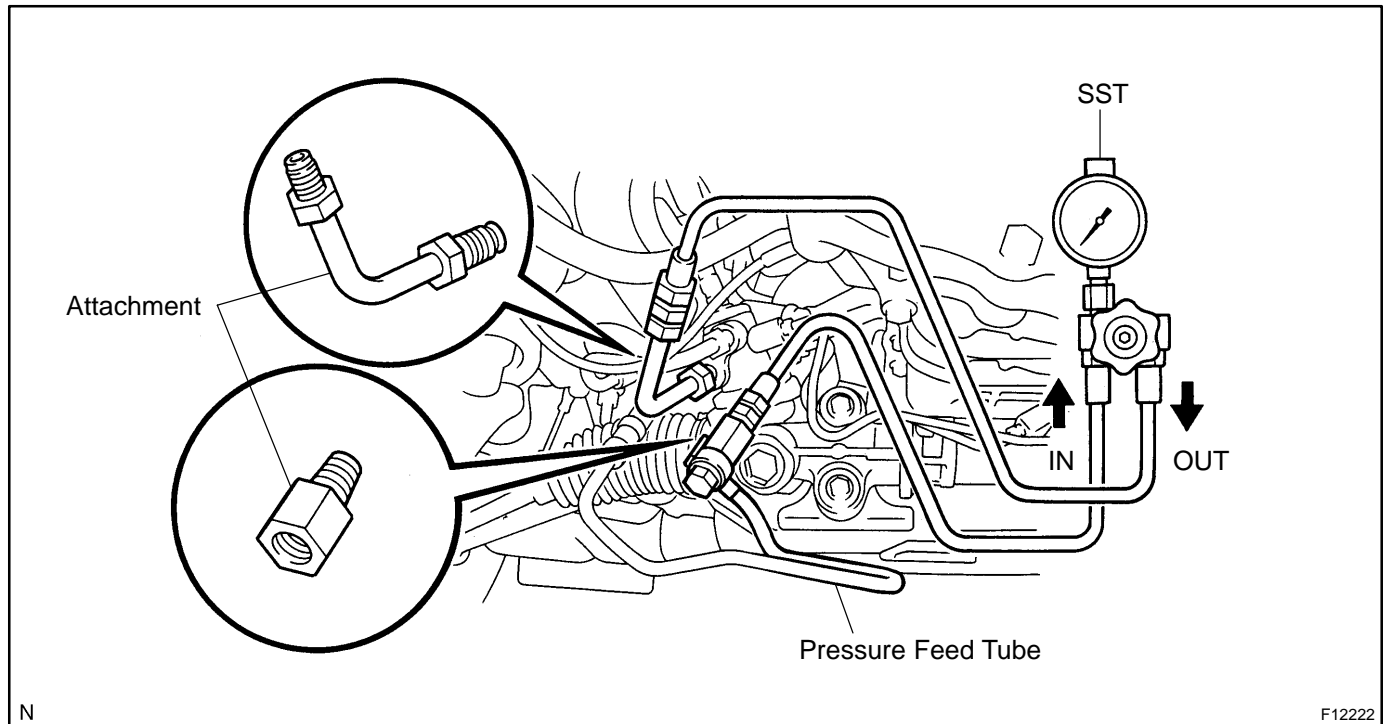
- (i) Check the fluid level.

2. CHECK STEERING FLUID PRESSURE

- (a) Disconnect the pressure feed tube from the PS gear (See page [SR-41](#)).
- (b) Connect SST, as shown in the illustration below.
SST 09640-10010 (09641-01010, 09641-01030, 09641-01060)

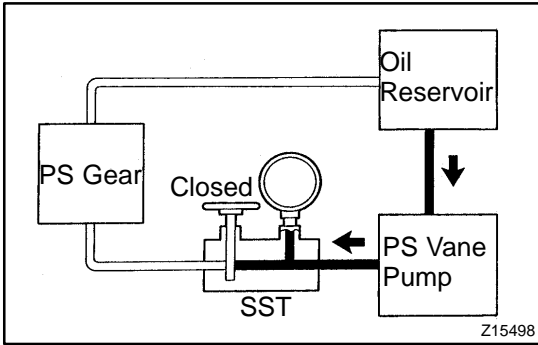
NOTICE:

Check that the valve of the SST is in the open position.



- (c) Bleed the power steering system (See page [SR-4](#)).
- (d) Start the engine and run it at idle.
- (e) Turn the steering wheel from lock to lock several times to boost fluid temperature.

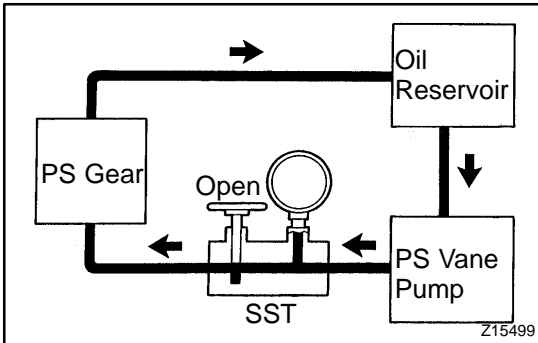
Fluid temperature: 80 °C (176 °F)



- (f) With the engine idling, close the valve of the SST and observe the reading on the SST.
Minimum fluid pressure:
6,900 kPa (70 kgf/cm², 996 psi)

NOTICE:

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

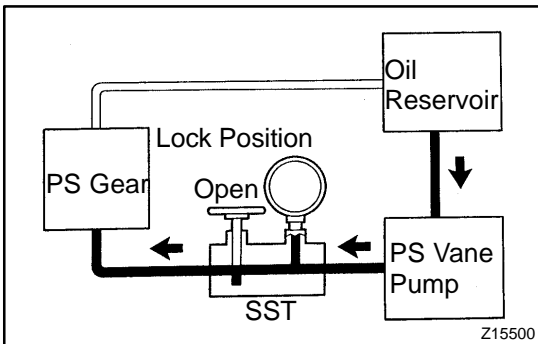


- (g) With the engine idling, open the valve fully.
 (h) Measure the fluid pressure at engine speeds of 1,000 rpm and 3,000 rpm.

Difference fluid pressure:
490 kPa (5 kgf/cm², 71 psi) or less

NOTICE:

Do not turn the steering wheel.



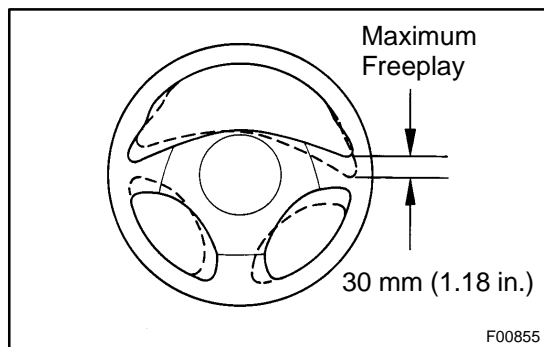
- (i) With the engine idling and valve fully opened, turn the steering wheel to full lock position.

Minimum fluid pressure:
6,900 kPa (70 kgf/cm², 996 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, 09641-01030, 09641-01060)
- (k) Connect the pressure feed tube to the PS gear (See page [SR-57](#)).
- (l) Bleed the power steering system (See page [SR-4](#)).



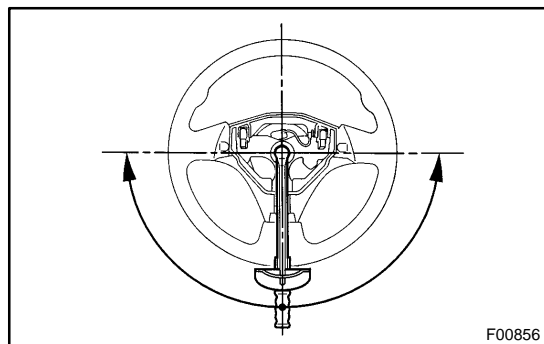
STEERING WHEEL INSPECTION

SR05R-20

1. CHECK STEERING WHEEL FREEPLAY

- (a) Stop the vehicle and face the tires straight ahead.
- (b) Rock the steering wheel gently up and down with a finger lightly, check the steering wheel freeplay.

Maximum freeplay: 30 mm (1.18 in.)



2. CHECK STEERING EFFORT

- (a) Center the steering wheel.
- (b) Remove the steering wheel pad (See page [SR-13](#)).
- (c) Start the engine and run it at idle.
- (d) Measure the steering effort in both directions.

Steering effort (Reference):

4.2 - 5.4 N·m (43 - 55 kgf·cm, 37 - 48 in.-lbf)

HINT:

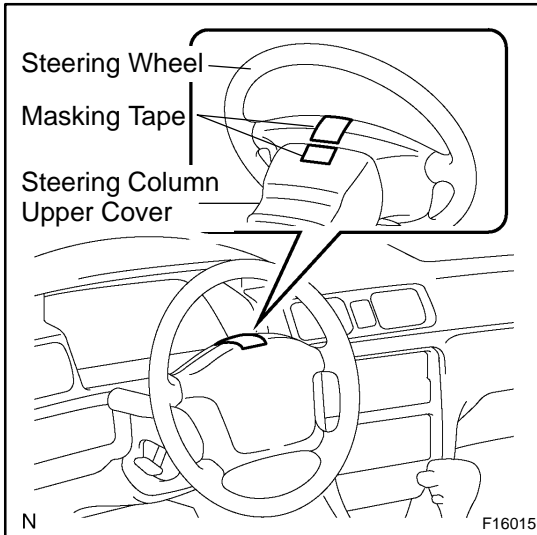
Take the tire type, pressure and contact surface into consideration before making your diagnosis.

- (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 [SR-25](#)).

REPAIR PROCEDURES

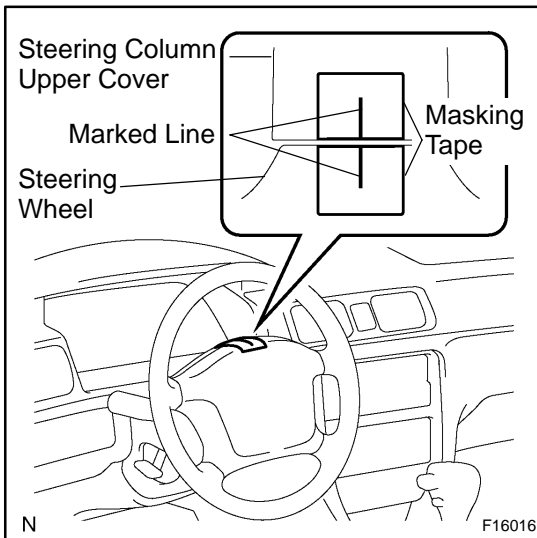
HINT:

This is the repair procedure for steering off center.

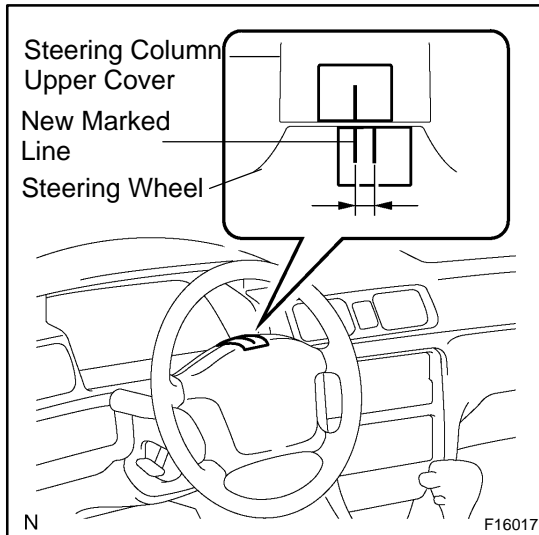


1. INSPECT STEERING WHEEL OFF CENTER

- (a) Apply masking tape on the top center of the steering wheel and steering column upper cover.



- (b) Drive the vehicle in a straight line for 100 meters at a constant speed of 35 mph (56 km/h), and hold the steering wheel to maintain the course.
- (c) Draw a line on the masking tape as shown in the illustration.



(d) Turn the steering wheel to its straight position.

HINT:

Refer to the upper surface of the steering wheel, steering spoke and SRS airbag line for the straight position.

(e) Draw a new line on the masking tape of the steering wheel as shown in the illustration.

(f) Measure the distance between the 2 lines on the masking tape of the steering wheel.

(g) Convert the measured distance to steering angle.

Measured distance 1 mm (0.04 in.) = Steering angle approximately 1 deg.

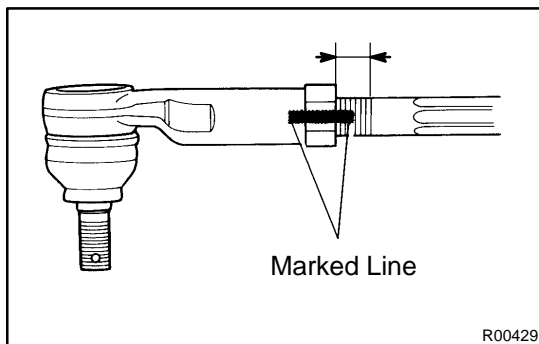
HINT:

Make a note of the steering angle.

2. ADJUST STEERING ANGLE

NOTICE:

The adjustment method for steering angle is different depending on the models. Check whether it is type A or B.

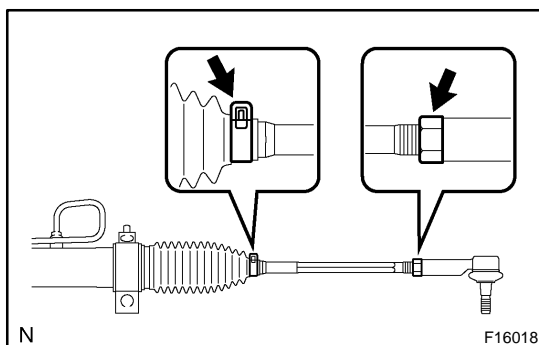


(a) Draw a line on the RH and LH tie rod and rack ends where it can easily be seen.

(b) Using a paper gauge, measure the distance from RH and LH tie rod ends to the rack end screws.

HINT:

- Measure the RH side and LH side.
- Make a note of the measured values.



(c) Remove the RH and LH boot clips from the rack boots.

(d) Loosen the RH and LH lock nuts.

(e) Turn the RH and LH rack end by the same amount (but in different directions) according to the steering angle.

1 turn 360 deg. of rack end (1.5 mm (0.059 in.) horizontal movement) = 12 deg. of steering angle

(f) Tighten the RH and LH lock nuts.

Torque: 56 N·m (570 kgf·cm, 41 ft·lbf)

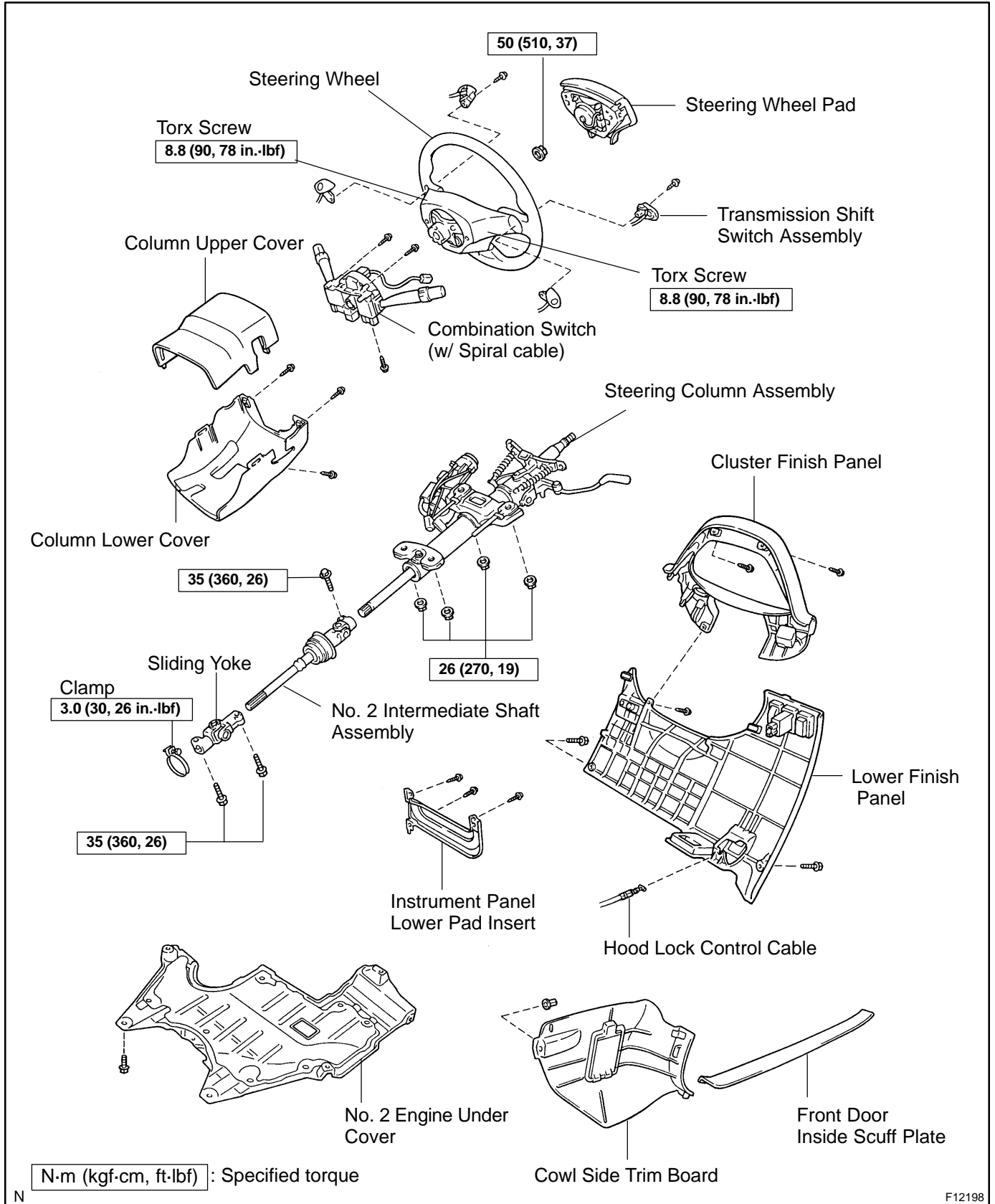
NOTICE:

Make sure that the difference in length between RH and LH tie rod ends and rack end screws are within 1.5 mm (0.059 in.).

(g) Install the RH and LH boot clips.

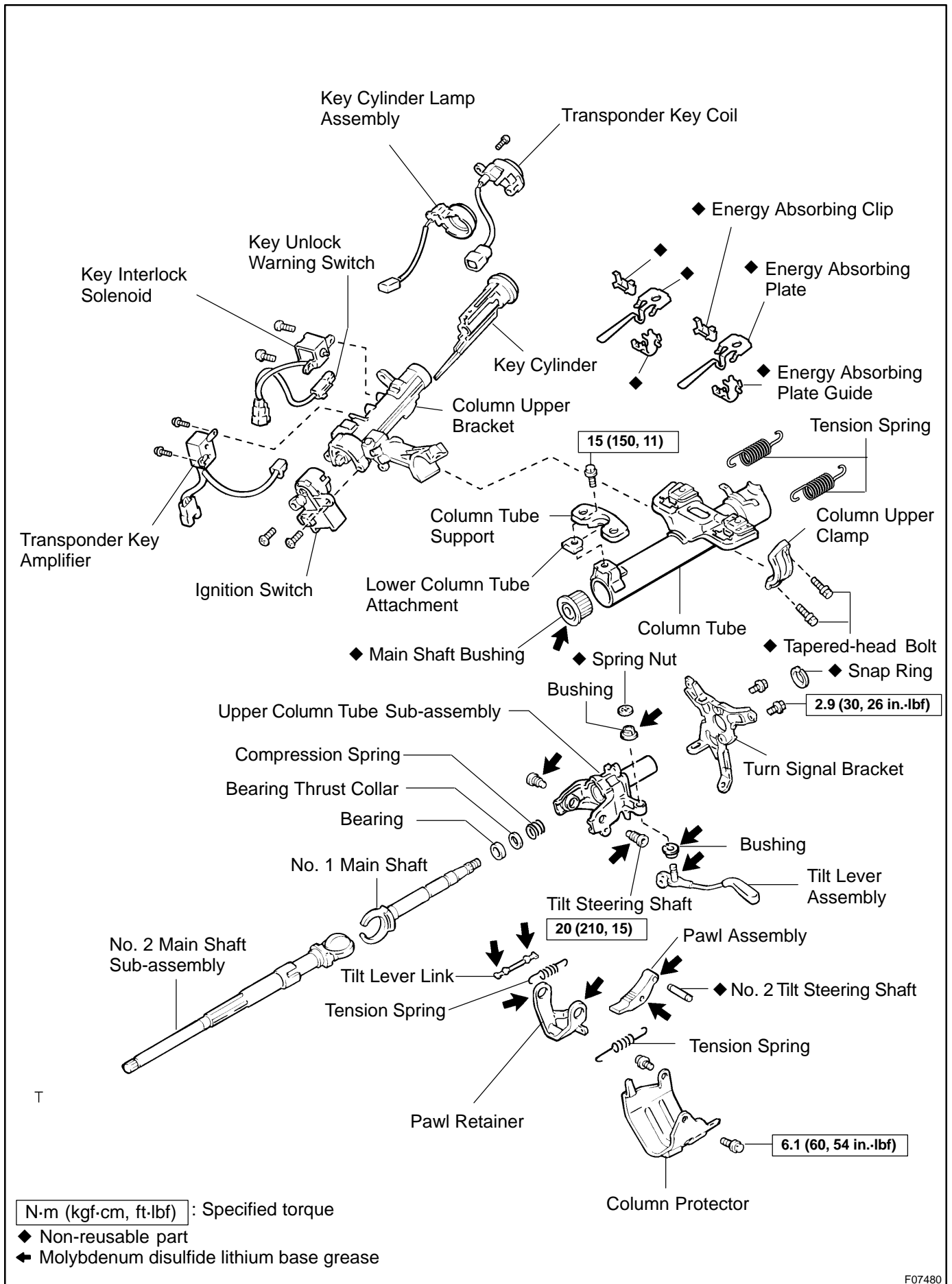
TILT STEERING COLUMN COMPONENTS

SR1BR-02



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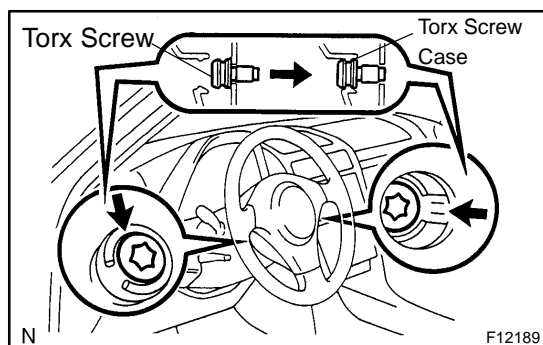
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REMOVAL

1. REMOVE STEERING WHEEL PAD

NOTICE:

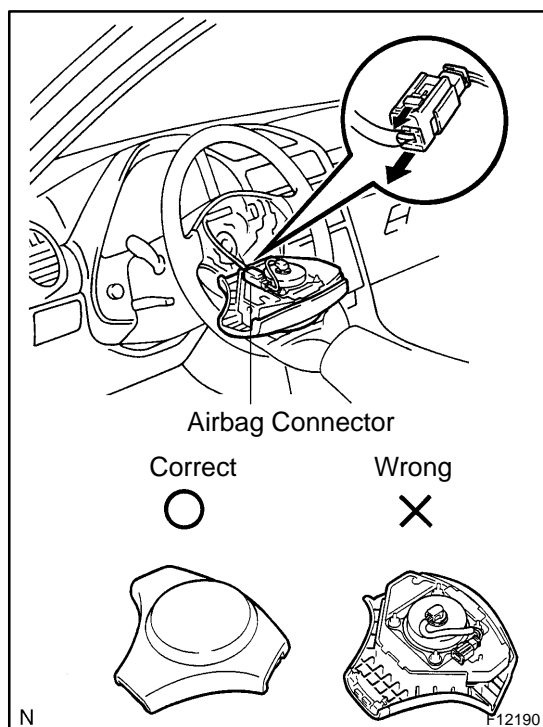
If the airbag connector is disconnected with the ignition switch at ON or ACC, DTCs will be recorded.



- Place the front wheels facing straight ahead.
- Remove the 2 steering wheel lower No. 2 covers.
- Using a torx socket wrench, loosen the 2 torx screws.

HINT:

Loosen the 2 screws until the groove along the screw circumference catches on the screw case.



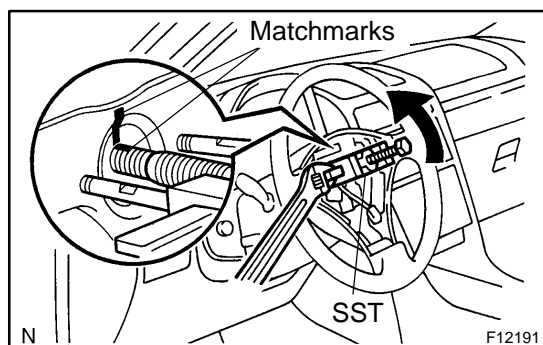
- Pull out the wheel pad from the steering wheel and disconnect the airbag connector.

CAUTION:

- When storing the wheel pad, keep the upper surface of the pad facing upward.
- Never disassemble the wheel pad.

NOTICE:

When removing the wheel pad, take care not to pull the airbag wire harness.



2. REMOVE STEERING WHEEL

- Disconnect the connector.
- Remove the steering wheel set nut.
- Place matchmarks on the steering wheel and main shaft assembly.
- Using SST, remove the wheel.

SST 09950-50013 (09951-05010, 09952-05010, 09953-05020, 09954-05021)

3. REMOVE FRONT DOOR INSIDE SCUFF PLATE AND COWL SIDE TRIM BOARD

- (a) Remove the front door inside scuff plate.
- (b) Remove the clip and cowl side trim board.

4. REMOVE LOWER FINISH PANEL

- (a) Remove the 3 screws.
- (b) Disconnect the connectors and remove the lower finish panel.
- (c) Disconnect the hood lock control cable.

5. REMOVE CLUSTER FINISH PANEL

- (a) Remove the 2 screws.
- (b) Disconnect the connector and remove the cluster finish panel.

6. REMOVE COLUMN UPPER AND LOWER COVERS

- (a) Remove the 3 screws and column lower cover.
- (b) Remove the column upper cover.

7. REMOVE COMBINATION SWITCH WITH SPIRAL CABLE

- (a) Disconnect the connectors.
- (b) Disconnect the airbag connector.
- (c) Remove the 3 screws and combination switch.

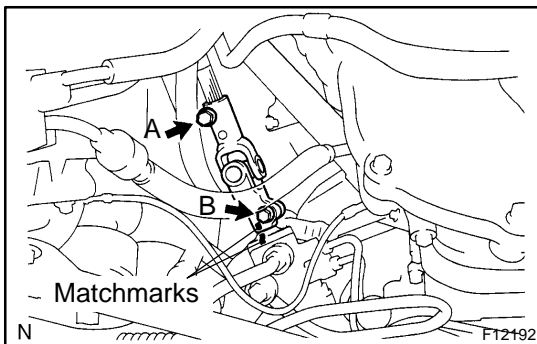
8. REMOVE SPIRAL CABLE

NOTICE:

Do not disassemble the cable or apply oil to it.

9. REMOVE UNDER COVER

Remove the 5 screws, 2 nuts and under cover.



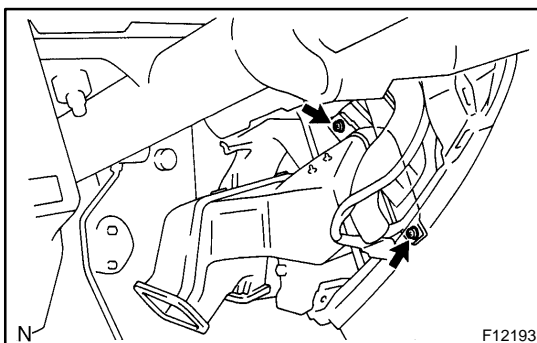
10. DISCONNECT SLIDING YOKE

- (a) Place matchmarks on the sliding yoke and control valve shaft.
- (b) Loosen the bolt "A" and remove the bolt "B".
- (c) Disconnect the sliding yoke.

11. DISCONNECT BRAKE PEDAL RETURN SPRING

12. REMOVE INSTRUMENT PANEL LOWER PAD INSERT

Remove the 3 bolts and instrument panel lower pad insert.



13. DISCONNECT HEATER TO REGISTER DUCT

Remove the 2 screws and disconnect heater to register duct.

14. REMOVE STEERING COLUMN ASSEMBLY

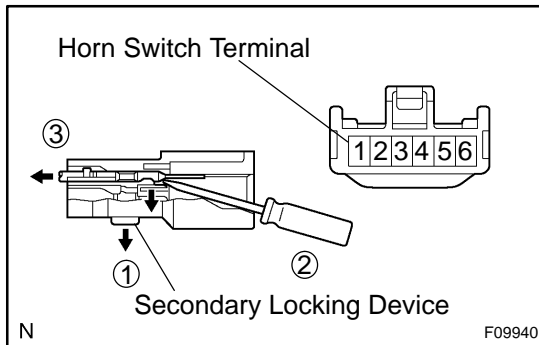
- (a) Loosen the clamp.
- (b) Disconnect the connectors.
- (c) Remove the 4 nuts and steering column assembly.

15. REMOVE SLIDING YOKE

Remove the bolt "A" and sliding yoke.

16. REMOVE NO. 2 INTERMEDIATE SHAFT ASSEMBLY

Remove the bolt and No. 2 intermediate shaft assembly.

**17. REMOVE TRANSMISSION SHIFT SWITCH ASSEMBLY FROM STEERING WHEEL**

- (a) Remove the 2 screws.
- (b) Disengage the secondary locking device of the connector.
- (c) Release the locking lug of the terminal 1 (horn switch terminal), and pull the terminal out of the rear.
- (d) Remove the transmission shift switch assembly.

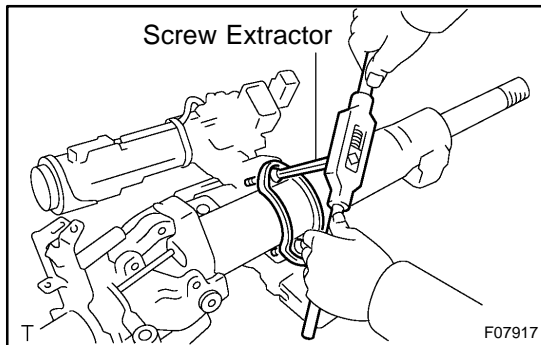
DISASSEMBLY

NOTICE:

When using a vise, do not overtighten it.

1. REMOVE TRANSPONDER KEY COIL AND KEY CYLINDER LAMP ASSEMBLY

Remove the screw, transponder key coil and key cylinder lamp assembly.

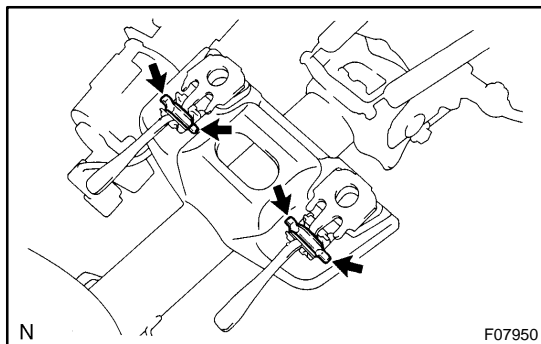


2. REMOVE COLUMN UPPER BRACKET AND COLUMN UPPER CLAMP

- Using a centering punch, mark the center of the 2 tapered-head bolts.
- Using a 3 - 4 mm (0.12 - 0.16 in.) drill, drill into the 2 bolts.
- Using a screw extractor, remove the 2 bolts, column upper bracket and column upper clamp.

3. REMOVE COLUMN TUBE SUPPORT

- Remove the bolt and column tube support with the lower column tube attachment.
- Remove the lower column tube attachment from the column tube support.

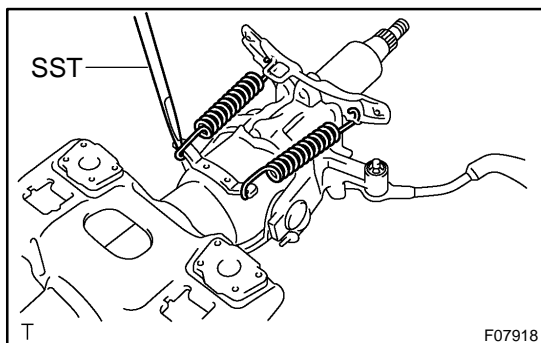


4. REMOVE 2 ENERGY ABSORBING PLATES

- Using pliers, remove the 2 energy absorbing clips.
- Remove the 2 energy absorbing plates and 2 energy absorbing plate guides.

5. REMOVE COLUMN PROTECTOR

Remove the 2 bolts and column protector.



6. REMOVE 2 TENSION SPRINGS

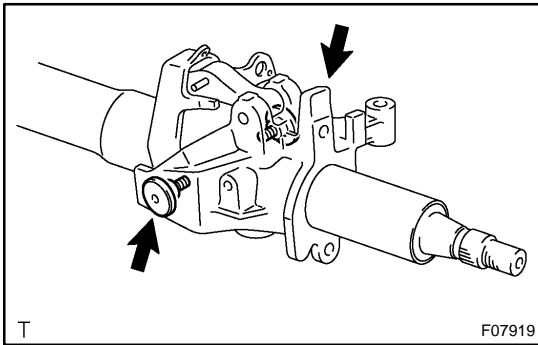
Using SST, remove the 2 tension springs.
SST 09703-30010

7. REMOVE TURN SIGNAL BRACKET

- Using pliers, remove the tension spring.
- Remove the 2 bolts and turn signal bracket.

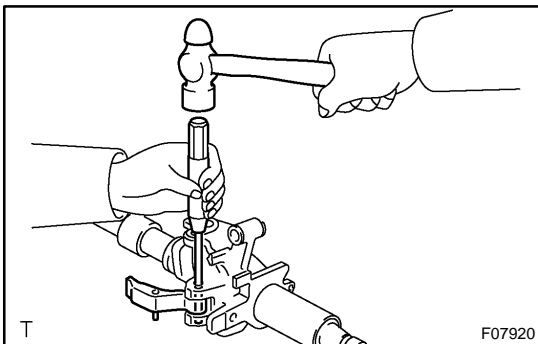
8. REMOVE TILT LEVER ASSEMBLY

- (a) Remove the tension spring.
- (b) Remove the spring nut, tilt lever assembly and tilt lever link.
- (c) Remove the 2 bushings from the upper column tube sub-assembly.

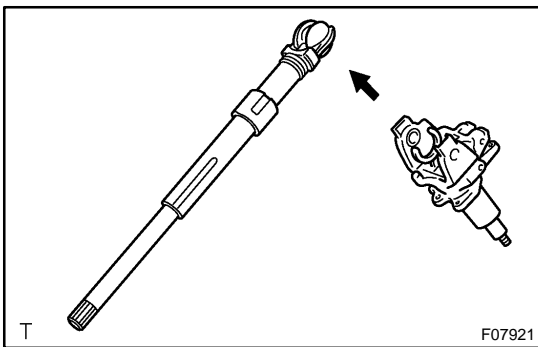


9. REMOVE MAIN SHAFT ASSEMBLY WITH UPPER COLUMN TUBE SUB-ASSEMBLY

- (a) Using a hexagon wrench (6 mm), remove the 2 tilt steering shafts.
- (b) Remove the pawl retainer and main shaft assembly with the upper column tube sub-assembly.

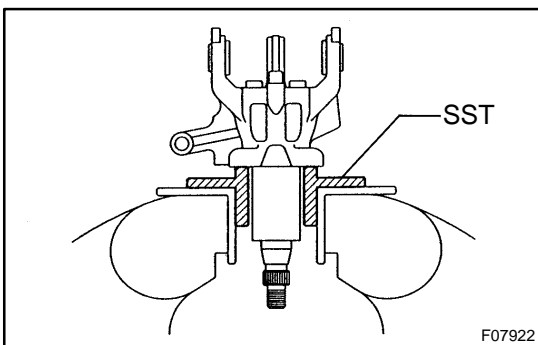


- (c) Using a pin punch (5 mm) and a hammer, remove the No. 2 tilt steering shaft and pawl assembly.

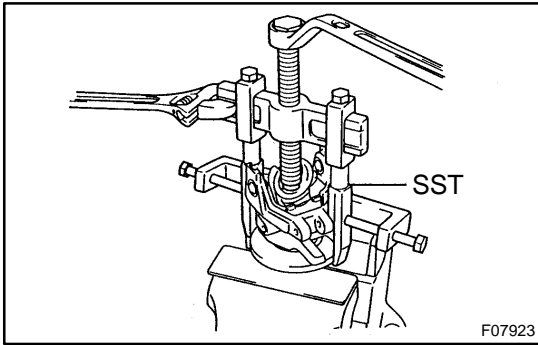


10. REMOVE UPPER COLUMN TUBE SUB-ASSEMBLY FROM MAIN SHAFT ASSEMBLY

- (a) Bent the joint of the main shaft at right angles, leaving the cross ball in the No. 2 main shaft sub-assembly, separate the main shaft into the No. 1 main shaft with upper column tube sub-assembly and No. 2 main shaft sub-assembly.



- (b) Secure the No. 1 main shaft with upper column tube sub-assembly and SST in a vise.
SST 09316-6001 1 (09316-00051)



- (c) Using SST, compress the spring of the upper column tube sub-assembly .

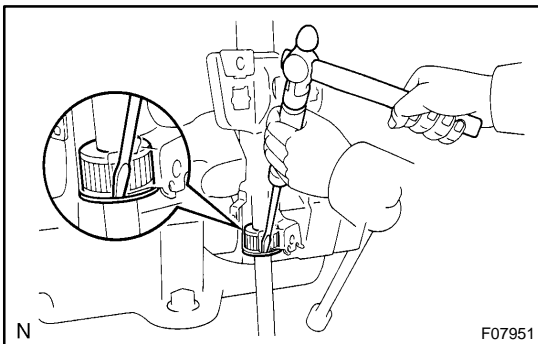
SST 09950-4001 1 (09951-04010, 09952-04010, 09953-04020, 09954-04010, 09955-04061, 09958-0401 1)

NOTICE:

Do not overtighten the SST.

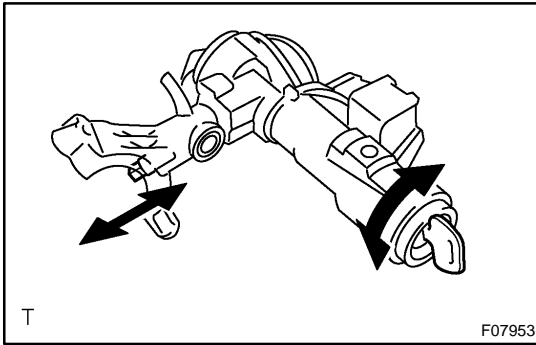
- (d) Using snap ring expander, remove the snap ring and No. 1 main shaft.

11. REMOVE COMPRESSION SPRING, BEARING THRUST COLLAR AND BEARING



12. REMOVE MAIN SHAFT BUSHING

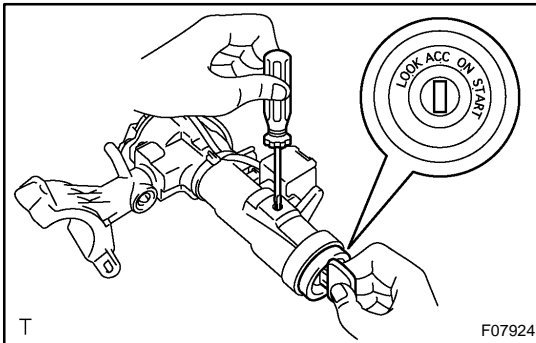
Using a screwdriver, tap out the main shaft bushing.



INSPECTION

1. INSPECT STEERING LOCK OPERATION

Check that the steering lock mechanism operates properly.



2. IF NECESSARY, REPLACE KEY CYLINDER

- (a) Place the ignition key at the ACC position.
- (b) Push down the stop pin with a screwdriver, and pull out the cylinder.
- (c) Install a new cylinder.

HINT:

Make sure the key is at the ACC position.

3. INSPECT IGNITION SWITCH (See page BE-21)

4. IF NECESSARY, REPLACE IGNITION SWITCH

- (a) Remove the 2 screws and ignition switch from the column upper bracket.
- (b) Install a new ignition switch with the 2 screws.

5. INSPECT KEY UNLOCK WARNING SWITCH (See page BE-21)

6. IF NECESSARY, REPLACE KEY UNLOCK WARNING SWITCH

- (a) Slide the key unlock warning switch out of the column upper bracket.
- (b) Slide a new key unlock warning switch in the column upper bracket.

7. INSPECT KEY INTERLOCK SOLENOID (See page AT-18)

8. IF NECESSARY, REPLACE KEY INTERLOCK SOLENOID

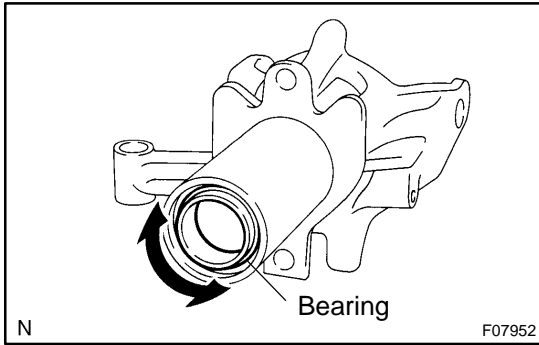
- (a) Remove the 2 screws and key interlock solenoid.
- (b) Install a new key interlock solenoid with the 2 screws.

9. INSPECT TRANSPONDER KEY COIL (See page BE-230)

10. IF NECESSARY, REPLACE TRANSPONDER KEY COIL

11. IF NECESSARY, REPLACE TRANSPONDER KEY AMPLIFIER

- (a) Remove the 2 screws and transponder key amplifier.
- (b) Install a new transponder key amplifier with the 2 screws.

**12. INSPECT BEARING**

Check the bearing rotation condition and check for abnormal noise.

If the bearing is worn or damaged, replace the upper column tube sub-assembly.

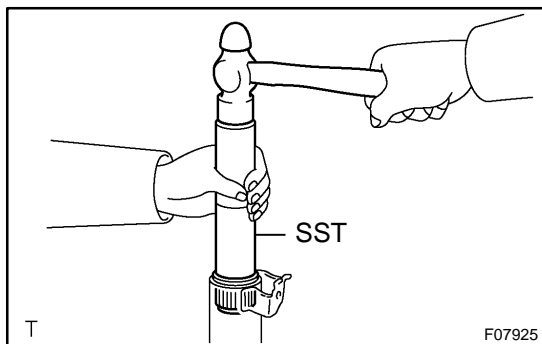
REASSEMBLY

NOTICE:

When using a vise, do not overtighten it.

1. COAT PARTS INDICATED BY ARROWS WITH MOLYBDENUM DISULFIDE LITHIUM BASE GREASE

(See page [SR-1 1](#))



2. INSTALL MAIN SHAFT BUSHING

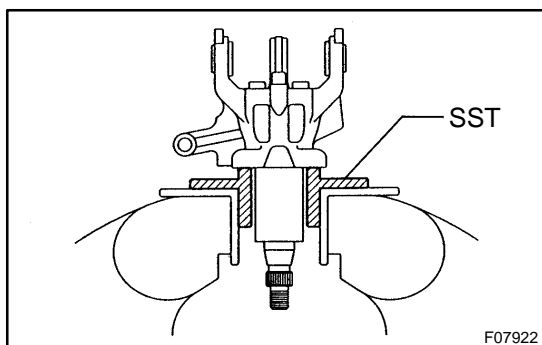
(a) Coat a new main shaft bushing with molybdenum disulfide lithium base grease.

(b) Using SST and a hammer, tap in the main shaft bushing.
SST 09612-2201 1

3. INSTALL COMPRESSION SPRING, BEARING THRUST COLLAR AND BEARING

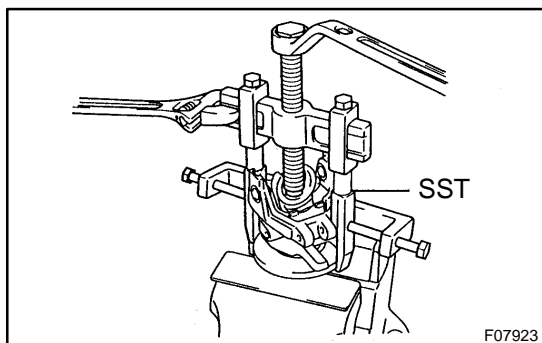
4. INSTALL UPPER COLUMN TUBE SUB-ASSEMBLY TO MAIN SHAFT ASSEMBLY

(a) Temporarily install the upper column tube sub-assembly to the No. 1 main shaft.



(b) Secure the No. 1 main shaft with upper column tube sub-assembly and SST in a vise.

SST 09316-6001 1 (09316-00051)



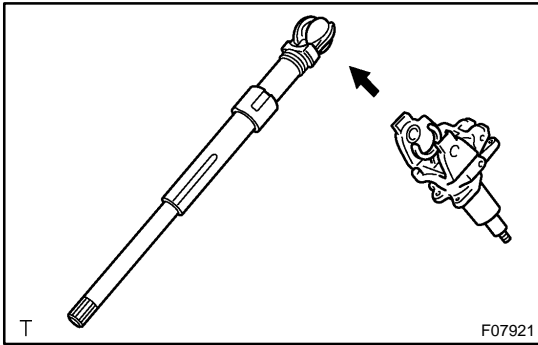
(c) Using SST, compress the spring of the upper column tube sub-assembly .

SST 09950-4001 1 (09951-04010, 09952-04010, 09953-04020, 09954-04010, 09955-04061, 09958-0401 1)

NOTICE:

Do not overtighten the SST.

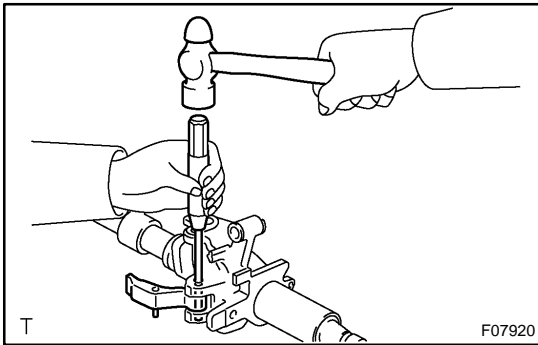
(d) Using a snap ring expander, install a new snap ring and No. 1 main shaft.



- (e) Assemble the No. 1 main shaft with upper column tube sub-assembly and No. 2 main shaft sub-assembly.

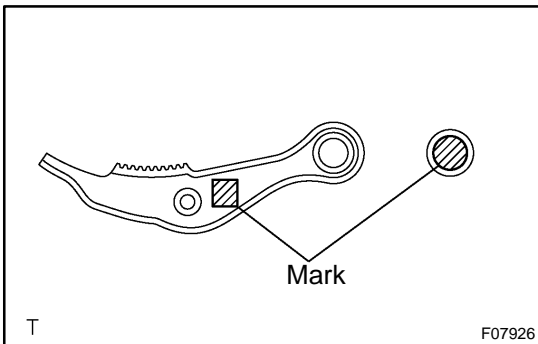
NOTICE:

Do not bend the universal joint of the shaft more than 20°.



5. INSTALL MAIN SHAFT ASSEMBLY WITH UPPER COLUMN TUBE SUB-ASSEMBLY

- (a) Using a pin punch (5 mm) and a hammer, install the pawl assembly with a new No. 2 tilt steering shaft.

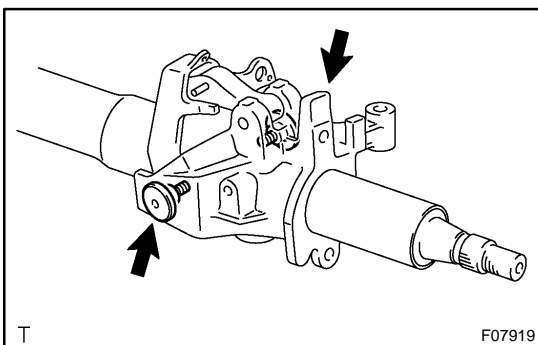


HINT:

Install a new No. 2 tilt steering shaft with the one having the mark corresponding to the mark stamped on the pawl assembly.

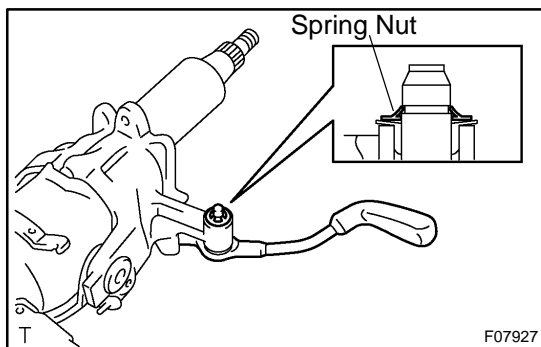
Pawl assembly mark	No. 2 tilt steering shaft color	No. 2 tilt steering shaft part number
1	White	45856-26010
2	Yellow	45856-26020
3	Black	45856-26030

- (b) Install the main shaft assembly with the upper column tube sub-assembly and pawl retainer.



- (c) Using a hexagon wrench (6 mm), install the 2 tilt steering shafts.

Torque: 20 N·m (210 kgf·cm, 15 ft·lbf)

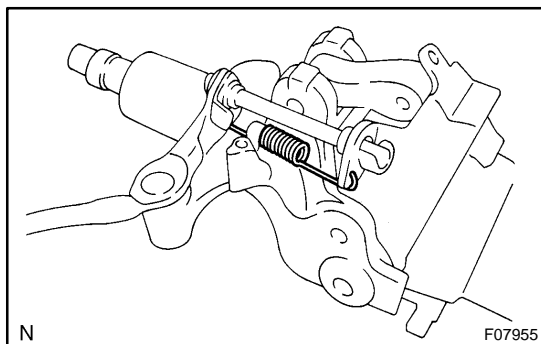
**6. INSTALL TILT LEVER ASSEMBLY**

- (a) Install the 2 bushings to the upper column tube sub-assembly.
- (b) Install the tilt lever assembly with a new spring nut.

NOTICE:

Make sure that the spring nut is installed facing in the correct direction.

- (c) Install the tilt lever link.



- (d) Install the tension spring.

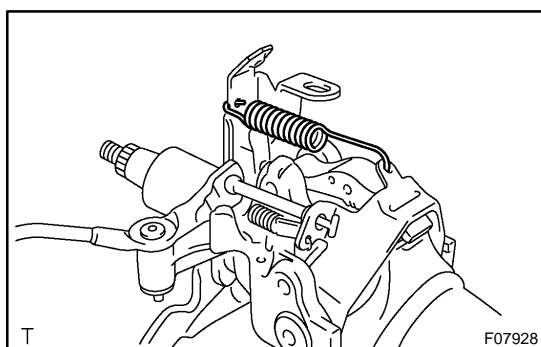
NOTICE:

Make sure that the tension spring is installed facing in the correct direction.

7. INSTALL TURN SIGNAL BRACKET

- (a) Install the turn signal bracket with the 2 bolts.

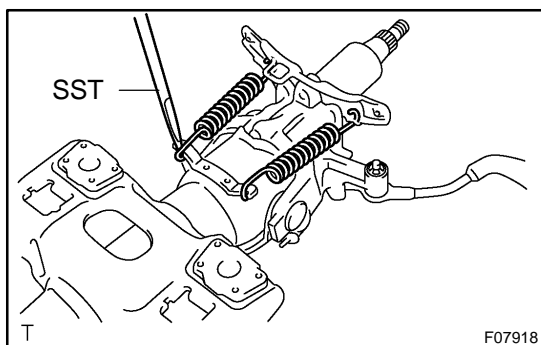
Torque: 2.9 N·m (30 kgf·cm, 26 in.-lbf)



- (b) Using pliers, install the tension spring.

NOTICE:

Make sure that the tension spring is installed facing in the correct direction.

**8. INSTALL 2 TENSION SPRINGS**

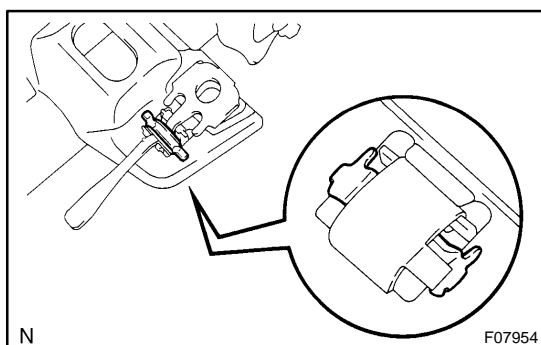
Using SST, install the 2 tension springs.

SST 09703-30010

9. INSTALL COLUMN PROTECTOR

Install the column protector with the 2 bolts.

Torque: 6.1 N·m (60 kgf·cm, 52 in.-lbf)

**10. INSTALL 2 ENERGY ABSORBING PLATES**

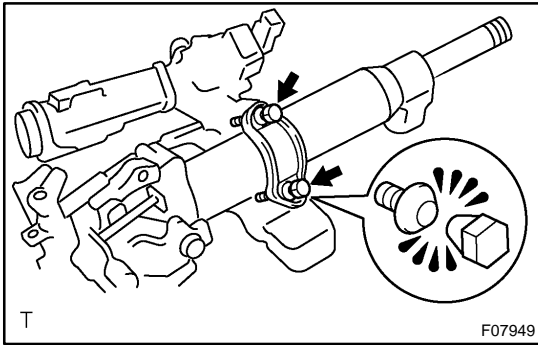
- (a) Install the 2 new energy absorbing plate guides and energy absorbing plates.
- (b) Install the 2 new energy absorbing clips.

11. INSTALL COLUMN TUBE SUPPORT

- (a) Install the lower column tube attachment to the column tube support.

- (b) Install the column tube support with the lower column tube attachment with the bolt.

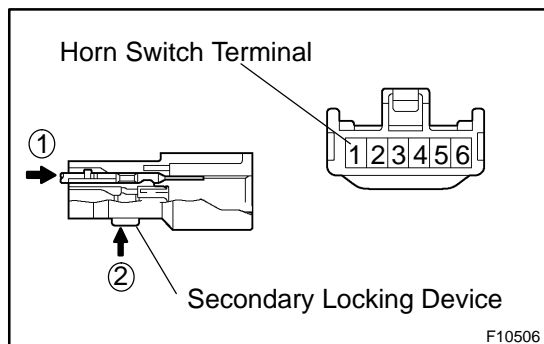
Torque: 15 N·m (150 kgf·cm, 11 ft.-lbf)

**12. INSTALL COLUMN UPPER BRACKET AND COLUMN UPPER CLAMP**

- (a) Install the column upper bracket and column upper clamp with 2 new tapered-head bolts.
- (b) Tighten the 2 tapered-head bolts until the bolt heads break off.

13. INSTALL TRANSPONDER KEY COIL AND KEY CYLINDER LAMP ASSEMBLY

Install the key cylinder lamp assembly and transponder key coil with the screw.



INSTALLATION

1. INSTALL TRANSMISSION SHIFT SWITCH ASSEMBLY TO STEERING WHEEL

- Install the transmission shift switch assembly.
- Push the terminal 1 (horn switch terminal) into the connector.
- Engage the secondary locking device of the connector.
- Install the 2 screws.

2. INSTALL NO. 2 INTERMEDIATE SHAFT ASSEMBLY

Install the No. 2 intermediate shaft assembly with the bolt.

Torque: 35 N·m (360 kgf·cm, 26 ft·lbf)

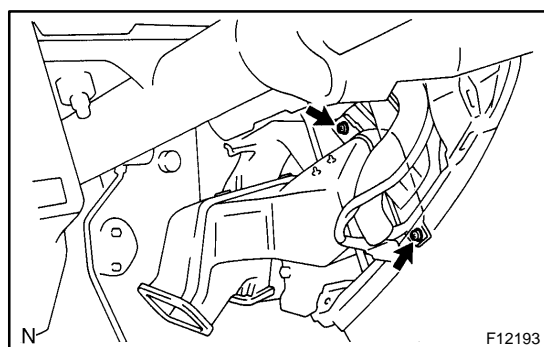
3. INSTALL SLIDING YOKE

Temporarily install sliding yoke with the bolt "A".

4. INSTALL STEERING COLUMN ASSEMBLY

Install the steering column assembly with the 4 nuts.

Torque: 26 N·m (270 kgf·cm, 19 ft·lbf)



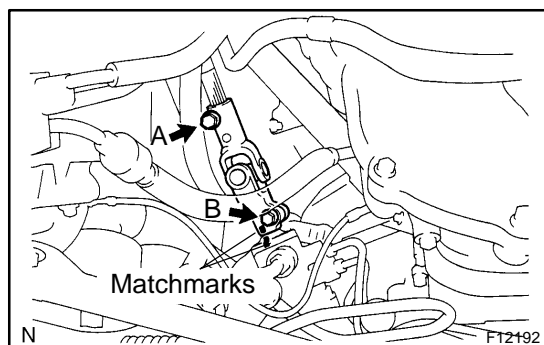
5. CONNECT HEATER TO REGISTER DUCT

Connect the heater to register duct with the 2 screws.

6. INSTALL INSTRUMENT PANEL LOWER PAD INSERT

Install the instrument panel lower pad insert with the 3 bolts.

7. CONNECT BRAKE PEDAL RETURN SPRING



8. CONNECT SLIDING YOKE

- Align the matchmarks on the sliding yoke and control valve shaft.
- Install the bolt "A" and "B".

Torque: 35 N·m (360 kgf·cm, 26 ft·lbf)

9. INSTALL NO. 2 ENGINE UNDER COVER

Install the No. 2 engine under cover with the 5 screws.

10. INSTALL SPIRAL CABLE

11. INSTALL COMBINATION SWITCH WITH SPIRAL CABLE

- Install the combination switch with the 3 screws.
- Connect the airbag connector.
- Connect the connectors.

12. INSTALL COLUMN UPPER AND LOWER COVERS

- Install the column upper cover.
- Install the column lower cover with the 3 screws.

13. INSTALL CLUSTER FINISH PANEL

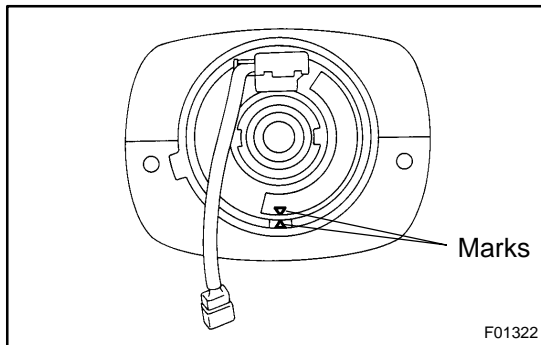
- Connect the connector and install the cluster finish panel.
- Install the 2 screws.

14. INSTALL LOWER FINISH PANEL

- (a) Connect the hood lock control cable to the lower finish panel.
- (b) Connect the connectors and install the lower finish panel.
- (c) Install the 3 screws.

15. INSTALL FRONT DOOR INSIDE SCUFF PLATE AND COWL SIDE TRIM BOARD

- (a) Install the cowl side trim board with the clip.
- (b) Install the front door inside scuff plate.

**16. CENTER SPIRAL CABLE**

- (a) Check that the front wheels are facing straight ahead.
- (b) Turn the cable counterclockwise by hand until it becomes harder to turn.
- (c) Then rotate the cable clockwise about 2.5 turns to align the marks.

HINT:

The cable will rotate about 2.5 turns to either left or right of the center.

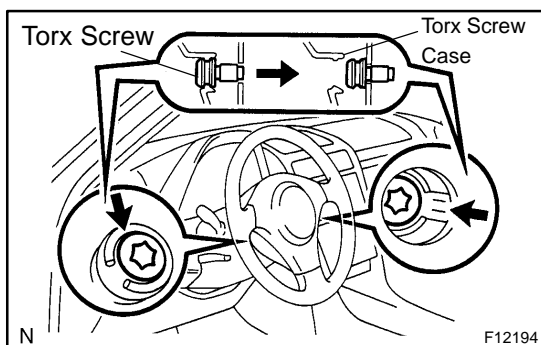
17. INSTALL STEERING WHEEL

- (a) Align the matchmarks on the steering wheel and main shaft assembly.
- (b) Install the steering wheel set nut.
Torque: 50 N·m (510 kgf-cm, 37 ft-lbf)
- (c) Connect the connector.

18. INSTALL STEERING WHEEL PAD**NOTICE:**

- **Never use airbag parts from another vehicle. When replacing parts, replace with new ones.**
- **Make sure the wheel pad is installed with the specified torque.**
- **If the wheel pad has been dropped, or there are cracks, dents or other defects on the case or connector, replace the wheel pad with a new one.**
- **When installing the wheel pad, take care that the wirings do not interfere with other parts and that they are not pinched between other parts.**

- (a) Connect the airbag connector.

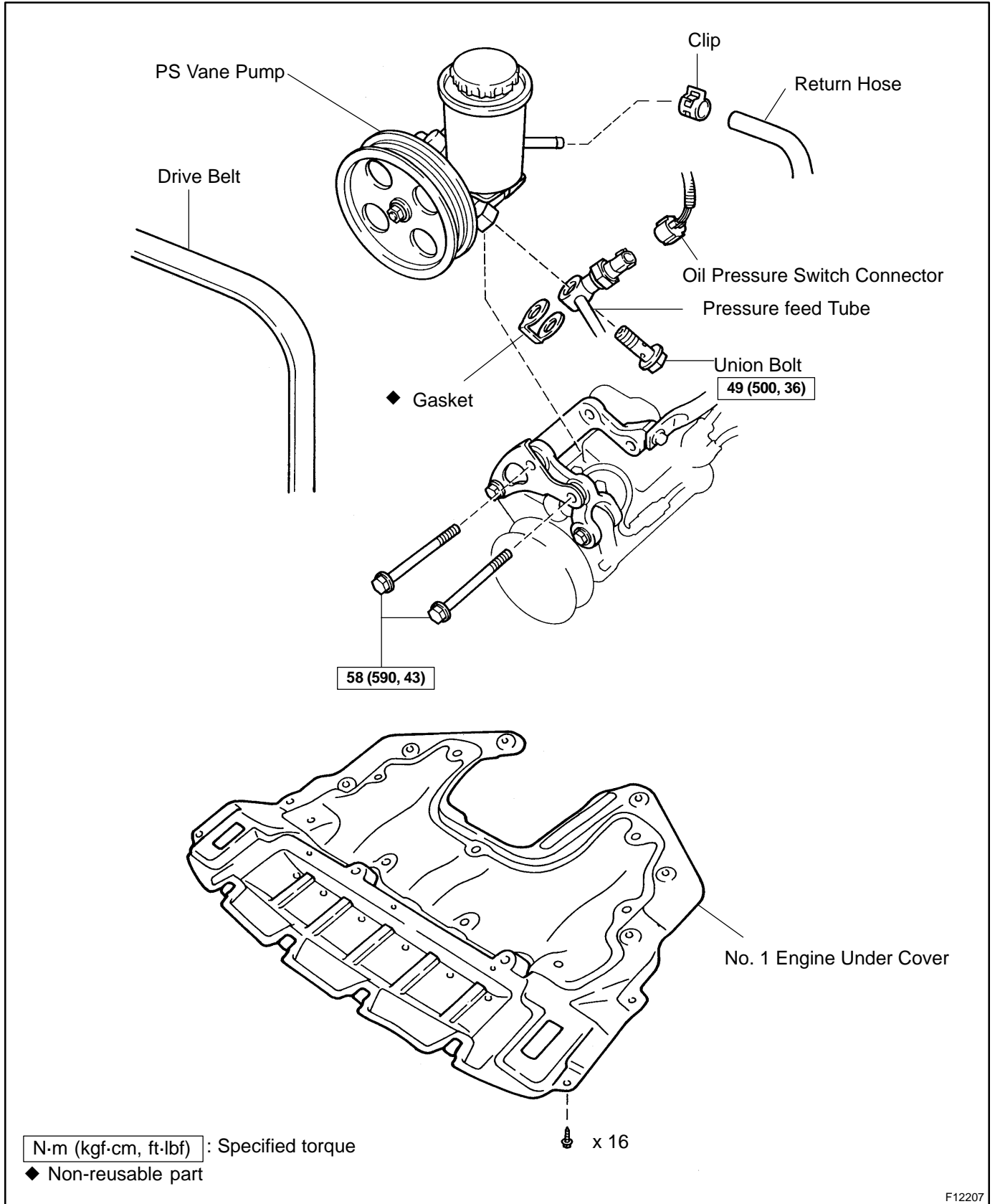


- (b) Install the steering wheel pad after confirming that the circumference groove of the torx screws is caught on the screw case.
- (c) Using a torx socket wrench, torque the 2 screws.
Torque: 8.8 N·m (90 kgf-cm, 78 in.-lbf)

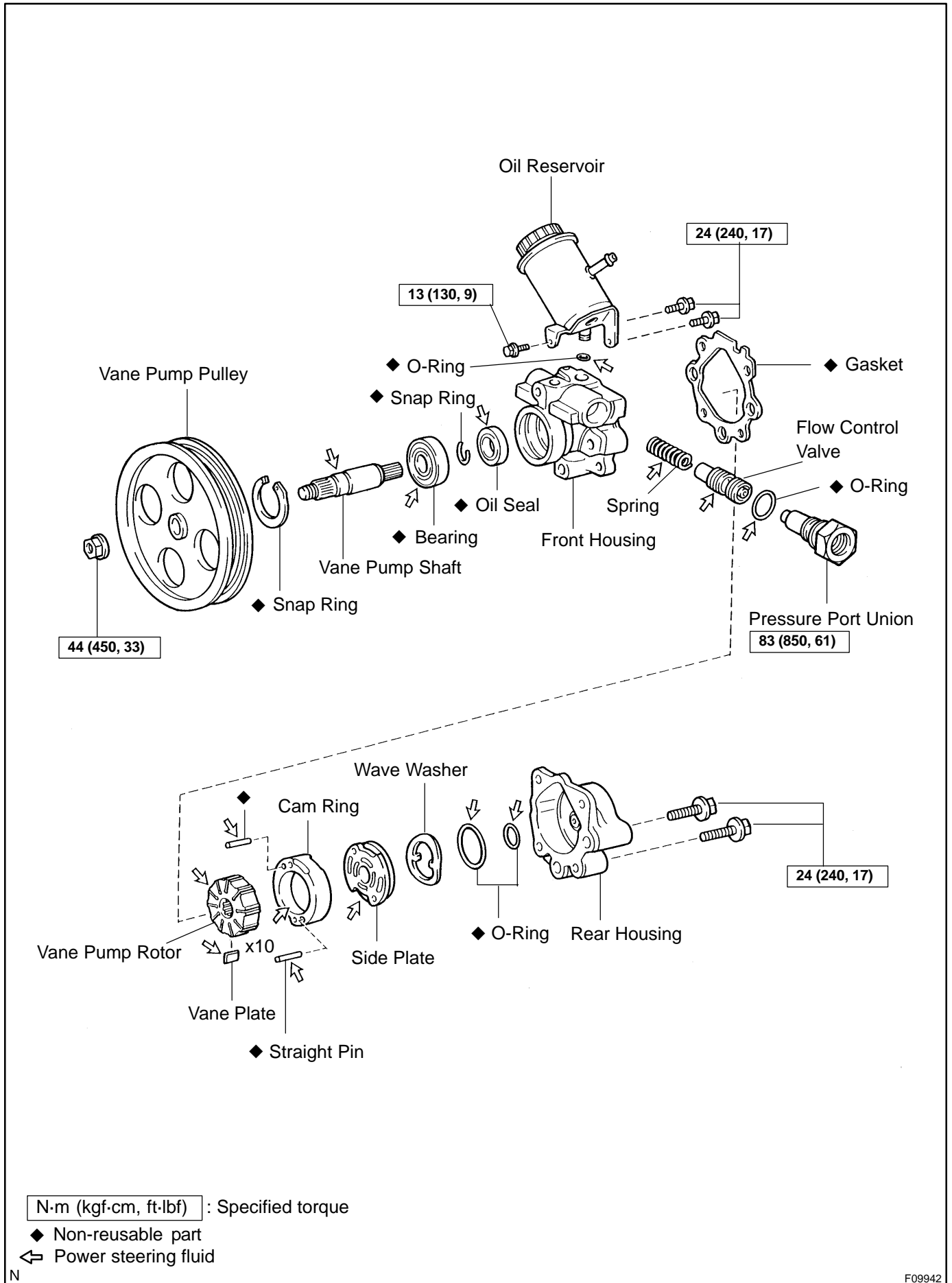
19. CHECK STEERING WHEEL CENTER POINT

POWER STEERING VANE PUMP COMPONENTS

SR1BU-02



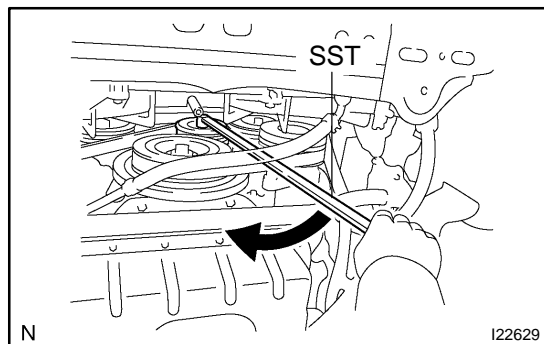
F12207



REMOVAL

1. REMOVE NO. 1 ENGINE UNDER COVER

Remove the 16 screws, clip and No. 1 engine under cover.



2. REMOVE DRIVE BELT

Using SST, loosen the drive belt tension by turning the drive belt tensioner clockwise from the bottom side, and remove the drive belt.

SST 09216-00041

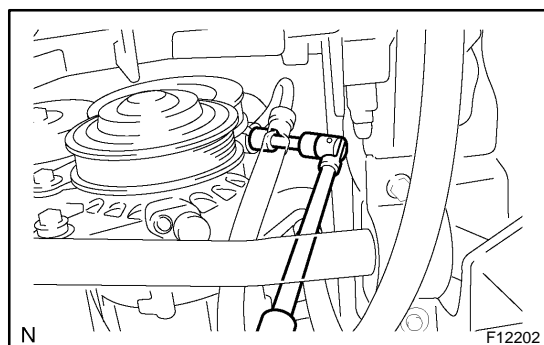
3. DISCONNECT OIL PRESSURE SWITCH CONNECTOR

4. DISCONNECT RETURN HOSE

Remove the clip and disconnect the return hose.

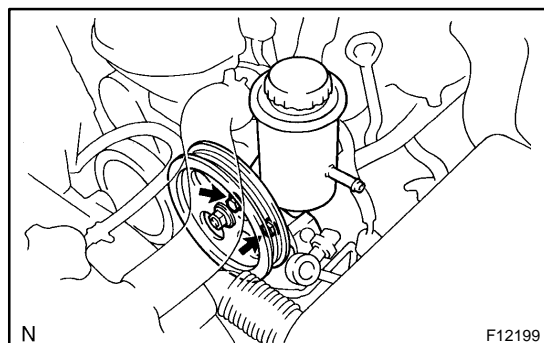
NOTICE:

Take care not to spill fluid on the drive belt and oil pressure switch connector.



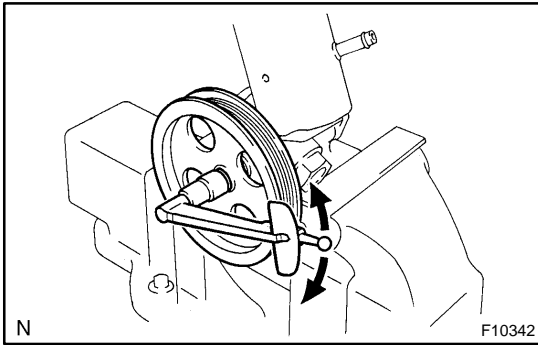
5. DISCONNECT PRESSURE FEED TUBE

Remove the union bolt and gasket and disconnect the pressure feed tube.



6. REMOVE PS VANE PUMP ASSEMBLY

Remove the 2 bolts and PS vane pump assembly.

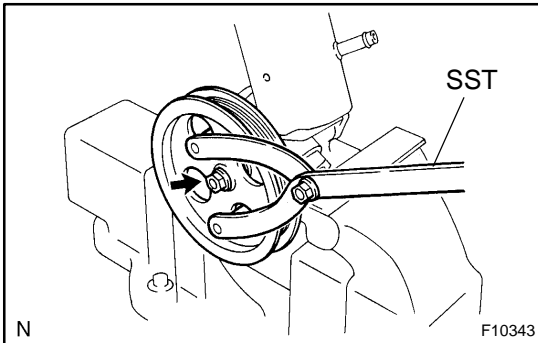


DISASSEMBLY

NOTICE:

When using a vise, do not overtighten it.

1. **MEASURE PS VANE PUMP ROTATING TORQUE**
 - (a) Check that the pump rotates smoothly without abnormal noise.
 - (b) Using a torque wrench, check the pump rotating torque.
Rotating torque:
0.25 N·m (2.5 kgf·cm, 2.2 in.-lbf) or less



2. **REMOVE VANE PUMP PULLEY**

Using SST, stop the pulley rotating and remove the pulley set nut.

SST 09960-10010 (09962-01000, 09963-01000)

3. **REMOVE OIL RESERVOIR**

- (a) Remove the 3 bolts and oil reservoir.
- (b) Remove the O-ring from the oil reservoir.

4. **REMOVE PRESSURE PORT UNION, FLOW CONTROL VALVE AND SPRING**

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

5. **REMOVE REAR HOUSING**

- (a) Remove the 2 bolts and rear housing.
- (b) Remove the 2 O-rings from the rear housing.

6. **REMOVE WAVE WASHER**

7. **REMOVE SIDE PLATE**

8. **REMOVE CAM RING, 10 VANE PLATES AND VANE PUMP ROTOR**

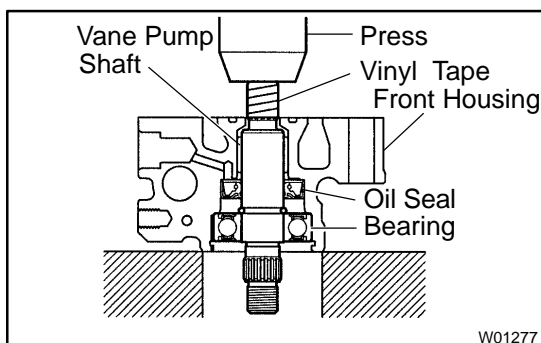
NOTICE:

Be careful not to drop the vane plate.

9. **REMOVE 2 STRAIGHT PINS**

Remove the 2 straight pins from the front housing.

10. **REMOVE GASKET**

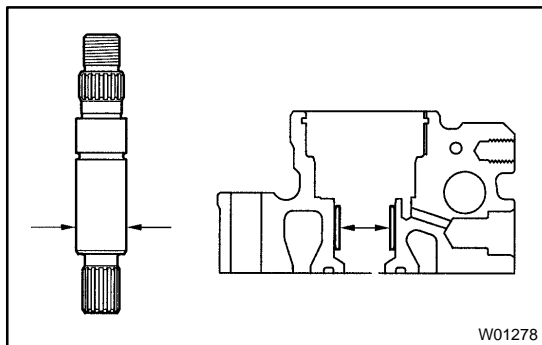


11. **REMOVE VANE PUMP SHAFT WITH BEARING**

- (a) Using snap ring pliers, remove the snap ring from the front housing.
- (b) To prevent oil seal lip damage, wind vinyl tape on the serrated part of the vane pump shaft.
- (c) Press out the vane pump shaft with the bearing.

NOTICE:

Be careful not to damage the oil seal lip.



INSPECTION

NOTICE:

When using a vise, do not overtighten it.

1. CHECK OIL CLEARANCE BETWEEN VANE PUMP SHAFT AND BUSHING

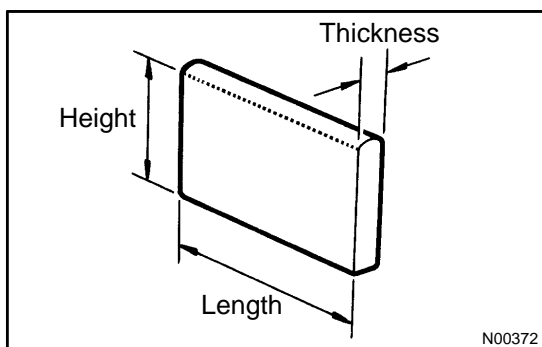
Using a micrometer and caliper gauge, measure the oil clearance.

Standard clearance:

0.03 - 0.05 mm (0.0012 - 0.0020 in.)

Maximum clearance: 0.07 mm (0.0028 in.)

If it is more than the maximum, replace the vane pump shaft and front housing.



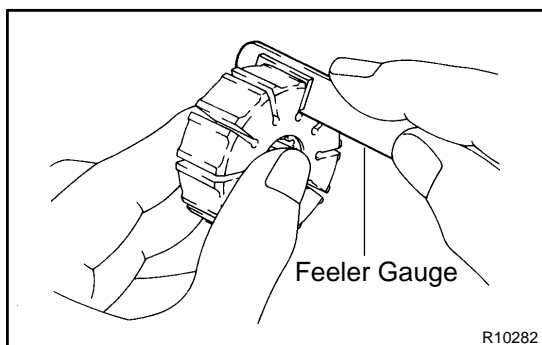
2. INSPECT VANE PUMP ROTOR AND VANE PLATES

(a) Using a micrometer, measure the height, thickness and length of the 10 vane plates.

Minimum height: 8.6 mm (0.339 in.)

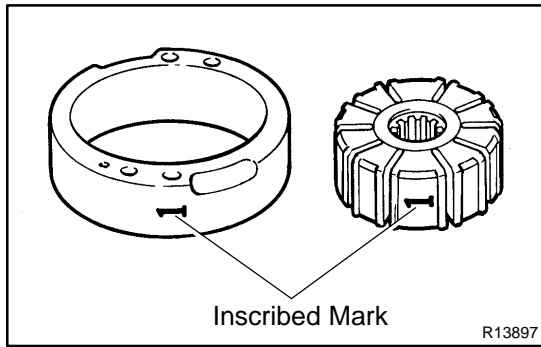
Minimum thickness: 1.40 mm (0.0551 in.)

Minimum length: 14.99 mm (0.5902 in.)



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

Maximum clearance: 0.033 mm (0.0013 in.)



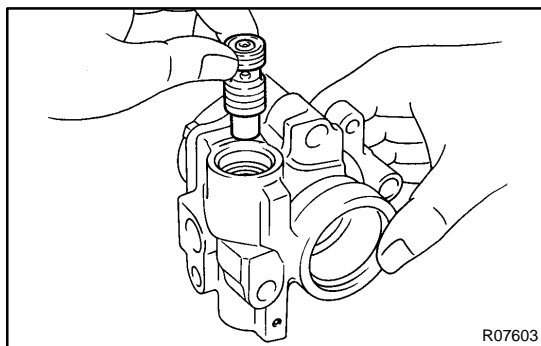
If it is more than the maximum, replace the vane plate and/or vane pump rotor with one having the same mark stamped on the cam ring.

Inscribed mark: 1, 2, 3, 4 or None

HINT:

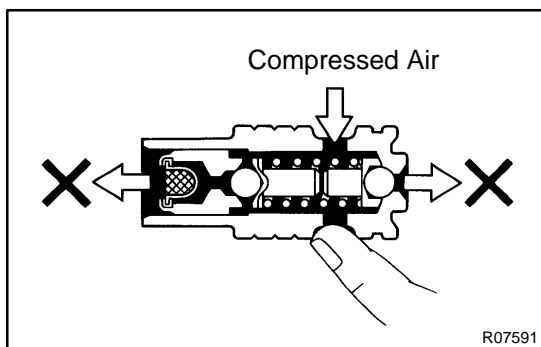
There are 5 vane plate lengths with the following rotor and cam ring marks:

Rotor and cam ring mark	Vane plate part number	Vane plate length mm (in.)
None	44345-26010	14.999-15.001 (0.59051-0.59059)
1	44345-26020	14.997-14.999 (0.59043-0.59051)
2	44345-26030	14.995-14.997 (0.59035-0.59043)
3	44345-26040	14.993-14.995 (0.59027-0.59035)
4	44345-26050	14.991-14.993 (0.59020-0.59027)

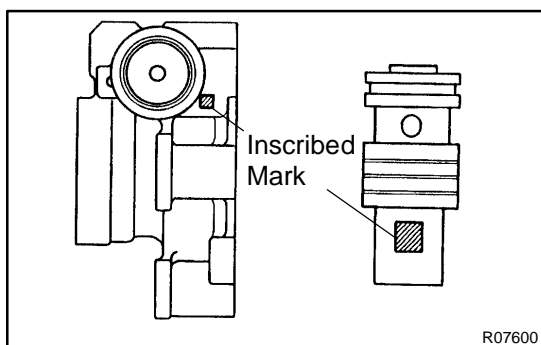


3. INSPECT FLOW CONTROL VALVE

(a) Coat the flow control valve with power steering fluid and check that it falls smoothly into the valve hole by its own weight.

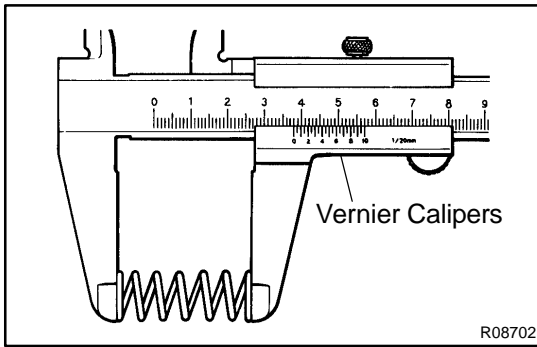


(b) Check the flow control valve for leakage. Close one of the holes and apply compressed air 392 - 490 kPa (4 - 5 kgf/cm², 57 - 71 psi) into the opposite side, and confirm that air does not come out from the end holes.



If necessary, replace the flow control valve with one having the same letter as inscribed on the front housing.

Inscribed mark: A, B, C, D, E or F

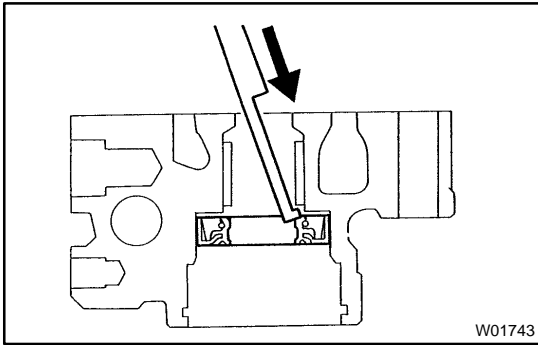


4. INSPECT SPRING

Using vernier calipers, measure the free length of the spring.

Minimum free length: 33.2 mm (1.307 in.)

If it is not within the specification, replace the spring.



REPLACEMENT

NOTICE:

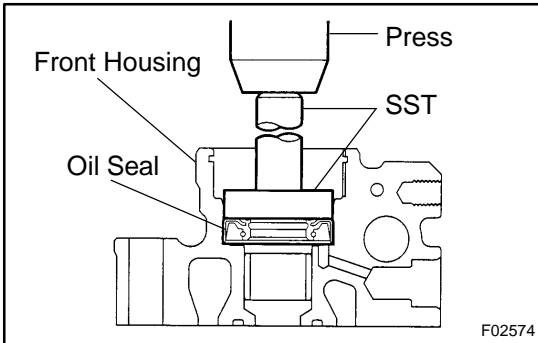
When using a vise, do not overtighten it.

1. IF NECESSARY, REPLACE OIL SEAL

- (a) Using SST, tap out the oil seal from the front housing.
SST 09631-10030

NOTICE:

Be careful not to damage the bushing of the front housing.

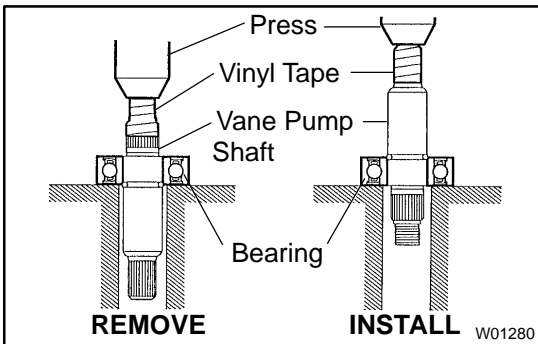


- (b) Coat a new oil seal lip with power steering fluid.

- (c) Using SST, press in the oil seal.
SST 09950-60010 (09951-00330),
09950-70010 (09951-07100)

NOTICE:

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



2. IF NECESSARY, REPLACE BEARING

- (a) Press out the bearing from the vane pump shaft.
- (b) Using snap ring expander, replace the snap ring with new one.

NOTICE:

Be careful not to damage the shaft.

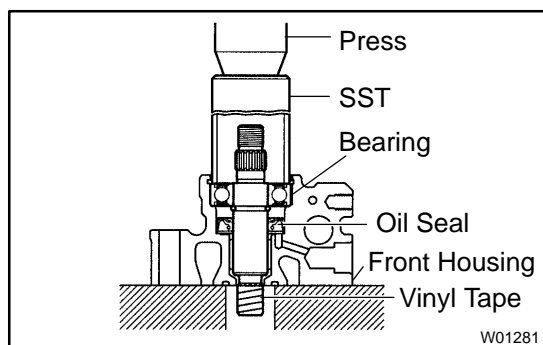
- (c) Coat a new bearing with power steering fluid.
- (d) Press in the bearing to the shaft.

REASSEMBLY

NOTICE:

When using a vise, do not overtighten it.

1. COAT PARTS INDICATED BY ARROWS WITH POWER STEERING FLUID (See page [SR-27](#))



2. INSTALL VANE PUMP SHAFT WITH BEARING

- (a) To prevent oil seal lip damage, wind vinyl tape on the serrated part of the vane pump shaft.
- (b) Using SST, press in the vane pump shaft with the bearing.
SST 09608-04031

NOTICE:

Be careful not to damage the oil seal.

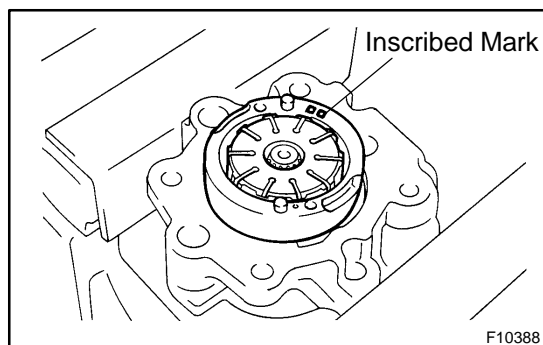
- (c) Using snap ring pliers, install a new snap ring to the front housing.

3. INSTALL 2 STRAIGHT PINS

Using a plastic hammer, tap in 2 new straight pins to the front housing.

NOTICE:

Be careful not to damage the straight pins.



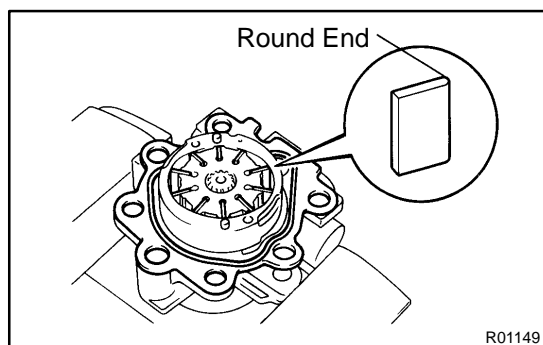
4. INSTALL CAM RING

Install the cam ring with the inscribed mark facing outward.

HINT:

Align the holes of the cam ring with the 2 straight pins.

5. INSTALL VANE PUMP ROTOR



6. INSTALL 10 VANE PLATES AND GASKET

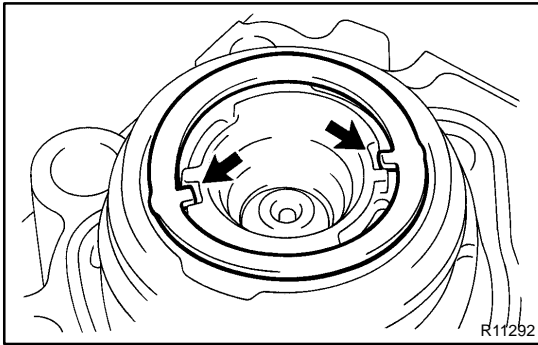
- (a) Install the 10 vane plates with the round end facing outward.
- (b) Install a new gasket on the front housing.

NOTICE:

Be careful the direction of the gasket.

7. INSTALL SIDE PLATE

Align the holes of the side plate and 2 straight pins.

**8. INSTALL WAVE WASHER**

Install the wave washer so that its protrusions fit into the slots in the side plate.

9. INSTALL REAR HOUSING

(a) Coat 2 new O-rings with power steering fluid and install them to the rear housing.

(b) Install the rear housing with the 2 bolts.

Torque: 24 N·m (240 kgf·cm, 17 ft·lbf)

10. INSTALL SPRING, FLOW CONTROL VALVE AND PRESSURE PORT UNION

(a) Install the spring.

(b) Install the flow control valve facing in the correct direction (See page [SR-27](#)).

(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: 83 N·m (850 kgf·cm, 61 ft·lbf)

11. INSTALL OIL RESERVOIR

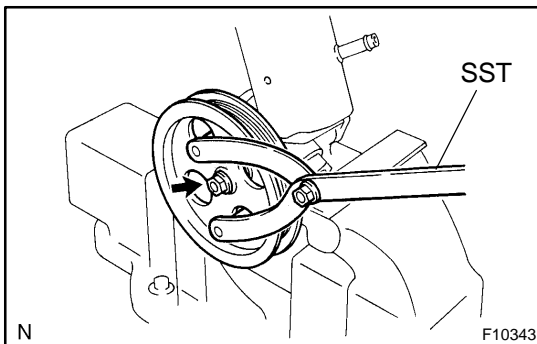
(a) Coat a new O-ring with power steering fluid and install it to the oil reservoir.

(b) Install the oil reservoir with the 3 bolts.

Torque:

Front side bolt: 13 N·m (130 kgf·cm, 9 ft·lbf)

Rear side bolts: 24 N·m (240 kgf·cm, 17 ft·lbf)

**12. INSTALL VANE PUMP PULLEY**

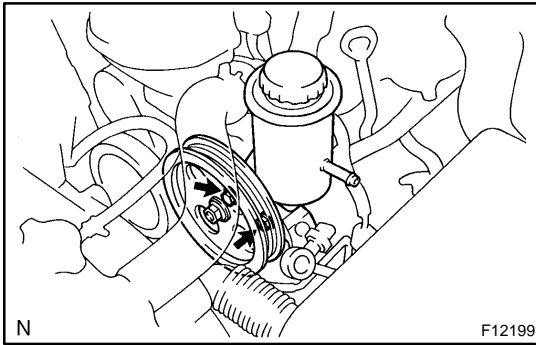
(a) Install the vane pump pulley and nut to the vane pump shaft.

(b) Using SST, stop the pulley rotating and torque the pulley set nut.

SST 09960-10010 (09962-01000, 09963-01000)

Torque: 44 N·m (450 kgf·cm, 33 ft·lbf)

13. MEASURE PS VANE PUMP ROTATING TORQUE (See page [SR-30](#))



INSTALLATION

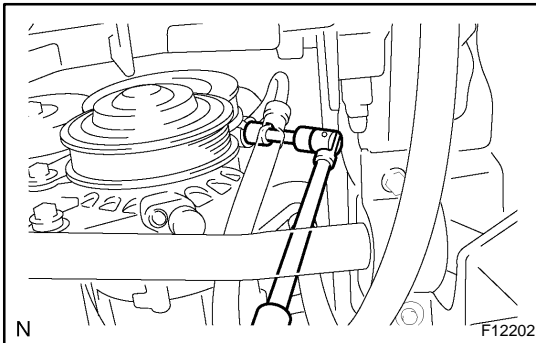
1. INSTALL PS VANE PUMP ASSEMBLY

Install the PS vane pump assembly with the 2 bolts.

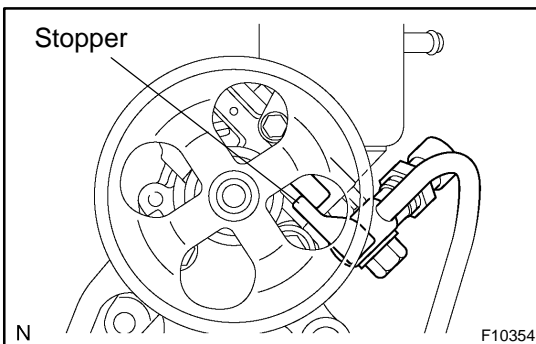
Torque: 58 N·m (590 kgf·cm, 43 ft·lbf)

2. CONNECT PRESSURE FEED TUBE

(a) Install a new gasket to the pressure feed tube.



(b) Connect the pressure feed tube with the union bolt.



HINT:

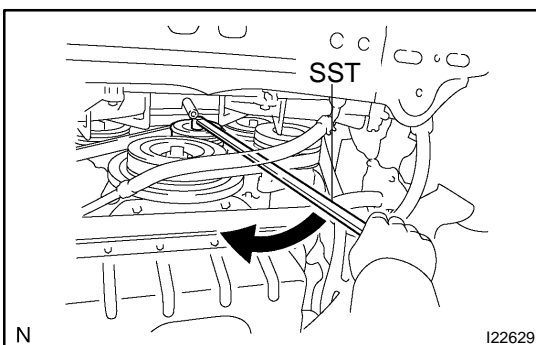
Make sure the stopper of the pressure feed tube touches the PS vane pump body as shown in the illustration, then install the union bolt.

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

3. CONNECT RETURN HOSE

Connect the return hose with the clip.

4. CONNECT OIL PRESSURE SWITCH CONNECTOR



5. INSTALL DRIVE BELT

Using SST, loosen the drive belt tension by tuning the drive belt tensioner clockwise from the bottom side, and install the drive belt.

SST 09216-00041

6. INSTALL NO. 1 ENGINE UNDER COVER

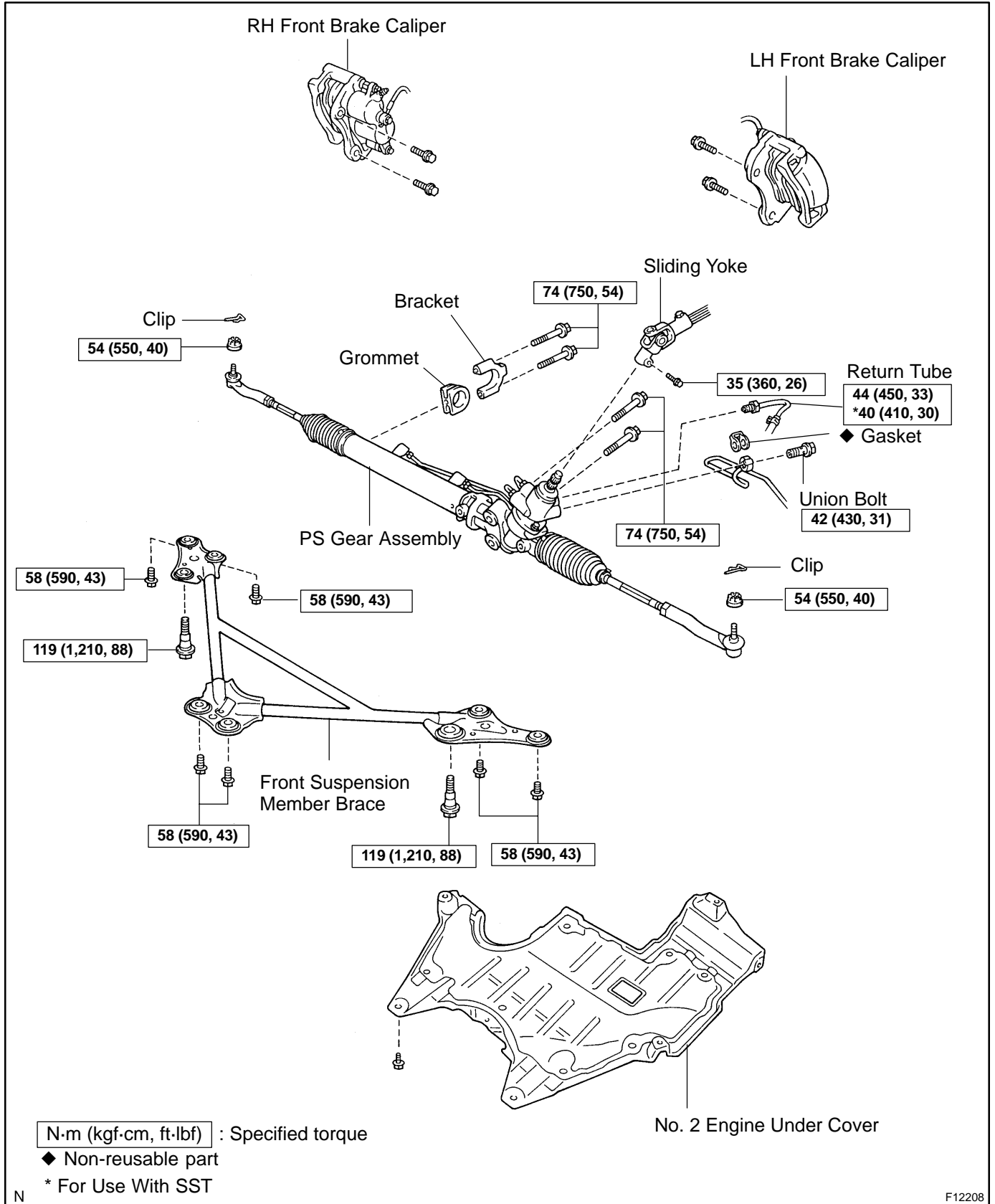
Install the No. 1 engine under cover with the 16 screws and clip.

7. BLEED POWER STEERING SYSTEM

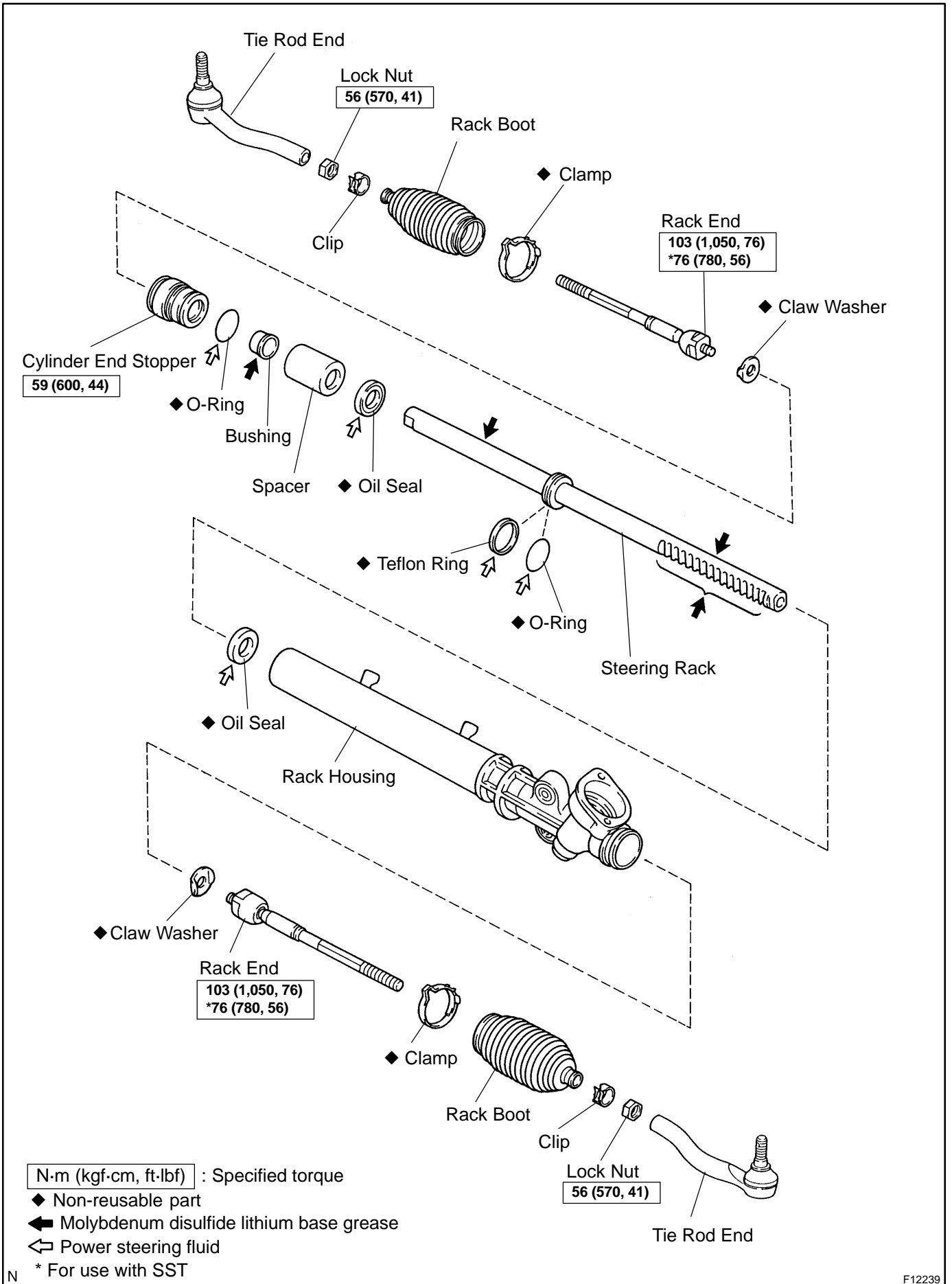
(See page [SR-4](#))

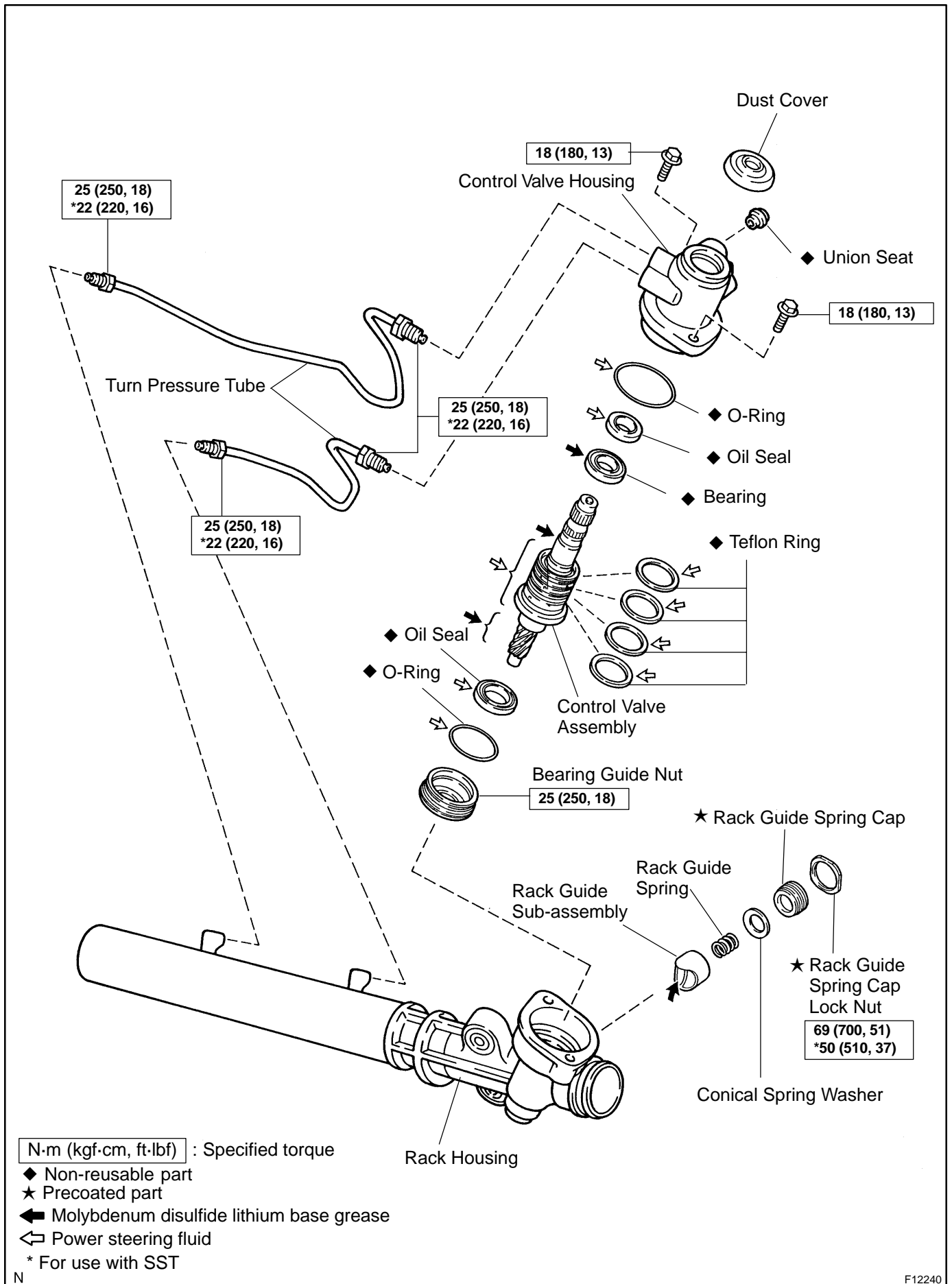
POWER STEERING GEAR COMPONENTS

SR1C1-02



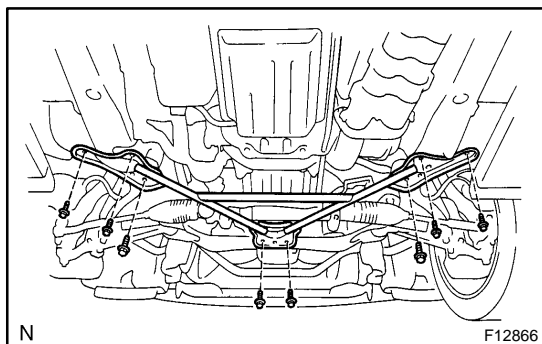
F12208





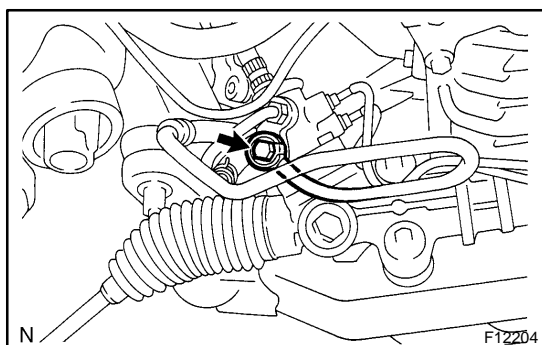
REMOVAL

1. PLACE FRONT WHEELS FACING STRAIGHT AHEAD
2. REMOVE STEERING WHEEL PAD (See page [SR-13](#))
3. REMOVE STEERING WHEEL (See page [SR-13](#))
4. REMOVE RH AND LH FRONT BRAKE CALIPERS
(See page [BR-27](#))
5. DISCONNECT RH AND LH TIE ROD ENDS
(See page [SA-34](#))
6. REMOVE NO. 2 ENGINE UNDER COVER
7. DISCONNECT SLIDING YOKE (See page [SR-13](#))



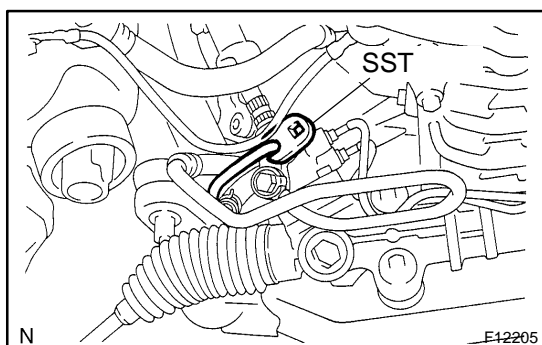
8. REMOVE FRONT SUSPENSION MEMBER BRACE

Remove the 8 bolts and front suspension member brace.



9. DISCONNECT PRESSURE FEED TUBE

Remove the union bolt and gasket, and disconnect the pressure feed tube.



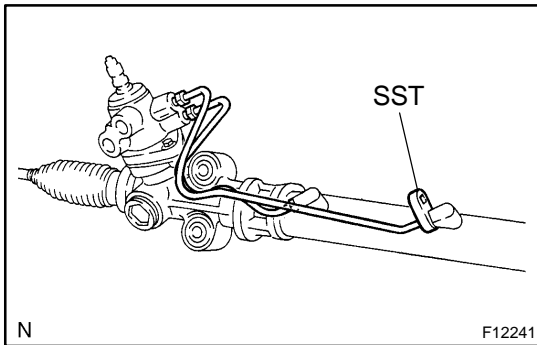
10. DISCONNECT RETURN TUBE

Using SST, disconnect the return tube.

SST 09023-38400

11. REMOVE PS GEAR ASSEMBLY, BRACKET AND GROMMET

Remove the 4 bolts, PS gear assembly, bracket and grommet.



DISASSEMBLY

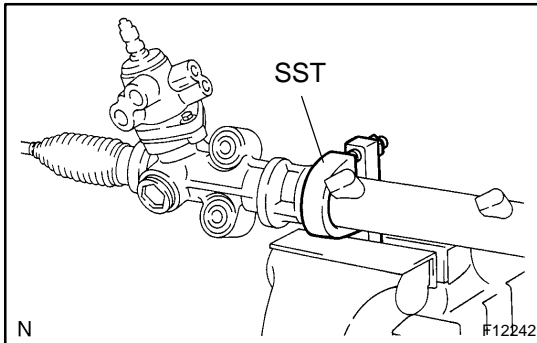
NOTICE:

When using a vise, do not overtighten it.

1. REMOVE 2 TURN PRESSURE TUBES

Using SST, remove the 2 turn pressure tubes.

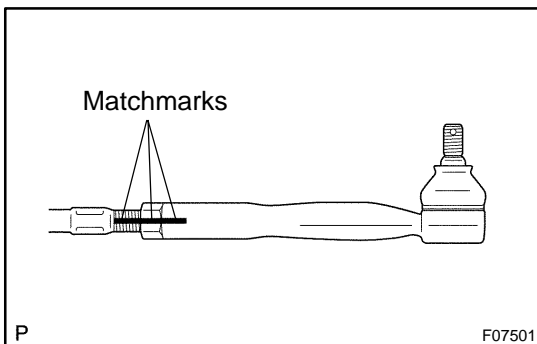
SST 09023-38200



2. SECURE PS GEAR ASSEMBLY IN VISE

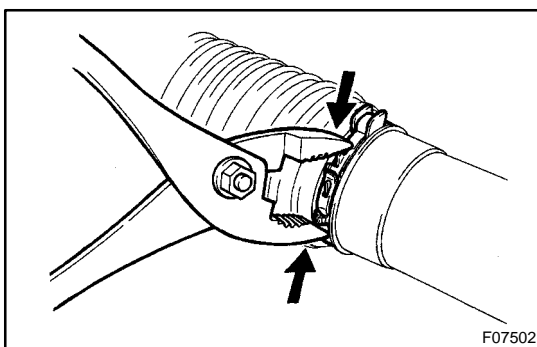
Using SST, secure the PS gear assembly in a vise.

SST 09612-00012



3. REMOVE RH AND LH TIE ROD ENDS AND LOCK NUTS

- Place matchmarks on the tie rod end, lock nut and rack end.
- Loosen the lock nut, and remove the tie rod end and lock nut.
- Employ the same manner described above to the other side.



4. REMOVE RH AND LH CLIPS, RACK BOOTS AND CLAMPS

- Using pliers, loosen the clamp as shown in the illustration.
- Remove the clamp, clip and rack boot.

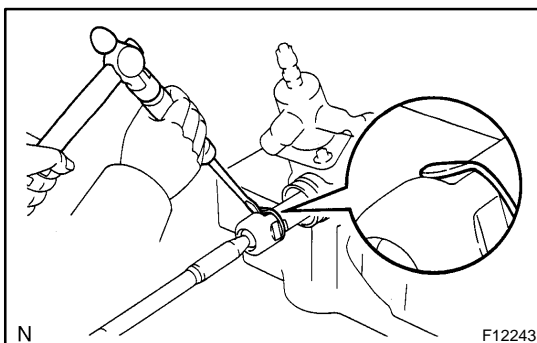
NOTICE:

Be careful not to damage the boot.

HINT:

Mark the RH and LH rack boots.

- Employ the same manner described above to the other side.

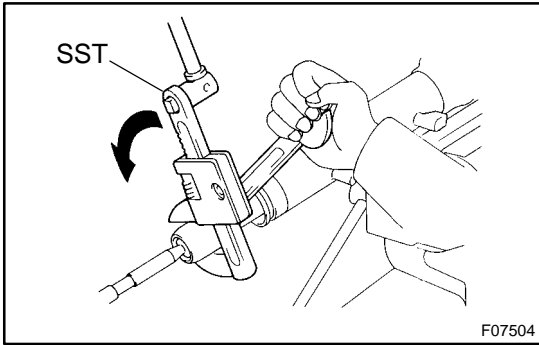


5. REMOVE RH AND LH RACK ENDS AND CLAW WASHERS

- Using a screwdriver and a hammer, unstake the washer.

NOTICE:

Avoid any impact on the steering rack.



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

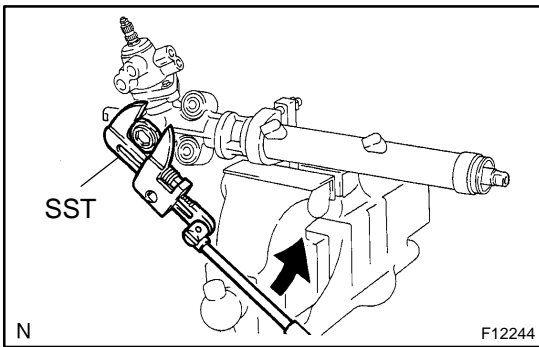
NOTICE:

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

HINT:

Mark the RH and LH rack ends.

- (c) Remove the claw washer.
- (d) Employ the same manner described above to the other side.



6. REMOVE RACK GUIDE SPRING CAP LOCK NUT

Using SST, remove the rack guide spring cap lock nut.
SST 09922-10010

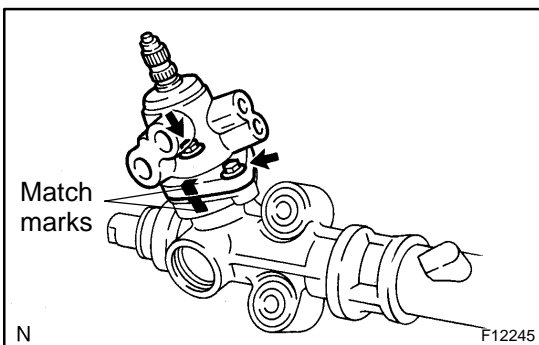
NOTICE:

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

7. REMOVE RACK GUIDE SPRING CAP, CONICAL SPRING, RACK GUIDE SPRING AND RACK GUIDE SUB-ASSEMBLY

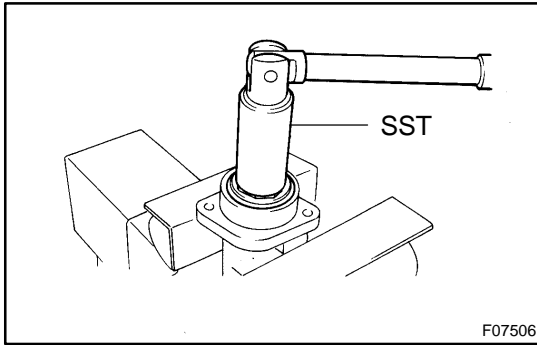
- (a) Using a hexagon wrench (24 mm), remove the rack guide spring cap.
- (b) Remove the conical spring, rack guide spring and rack guide sub-assembly.

8. REMOVE DUST COVER



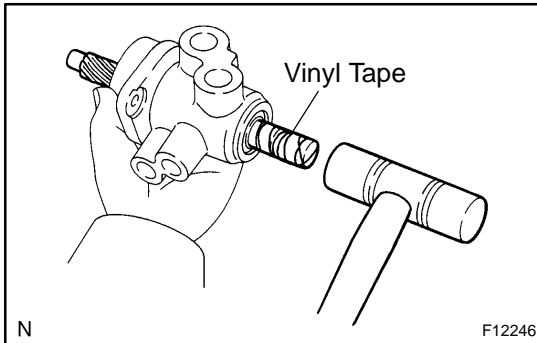
9. REMOVE CONTROL VALVE HOUSING WITH CONTROL VALVE ASSEMBLY

- (a) Place matchmarks on the control valve housing and rack housing.
- (b) Remove the 2 bolts and pull out the control valve housing with control valve assembly.
- (c) Remove the O-ring from the control valve housing.



10. REMOVE BEARING GUIDE NUT AND CONTROL VALVE ASSEMBLY

- (a) Using SST, loosen the bearing guide nut.
SST 09631-20060

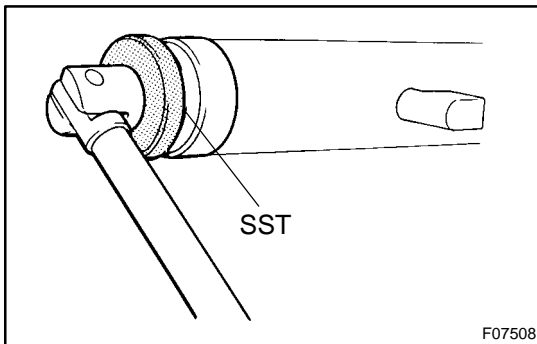


- (b) To prevent oil seal lip damage, wind vinyl tape on the serrated part of the control valve shaft.
(c) Using a plastic hammer, tap out the control valve assembly with the bearing guide nut from the control valve housing.

NOTICE:

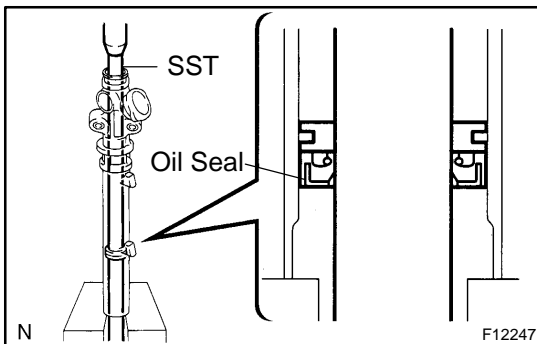
Be careful not to damage the oil seal lip

- (d) Remove the bearing guide nut from the control valve assembly.
(e) Remove the O-ring from the bearing guide nut.



11. REMOVE CYLINDER END STOPPER AND SPACER

- (a) Using SST, remove the cylinder end stopper.
SST 09631-20090
(b) Remove the O-ring from the cylinder end stopper.
(c) Remove the spacer.



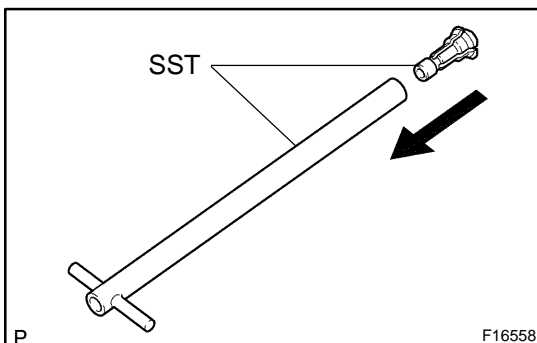
12. REMOVE STEERING RACK WITH OIL SEAL

- (a) Using SST, press out the steering rack with the oil seal.
SST 09950-70010 (09951-07200)

NOTICE:

Take care not to drop the steering rack.

- (b) Remove the oil seal from the steering rack.

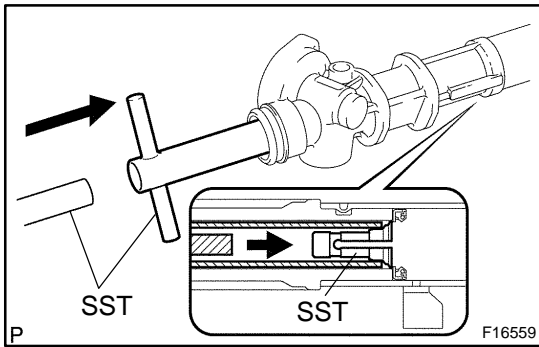


13. REMOVE OIL SEAL

- (a) Install SST (09612-07130) on SST (09612-07210).
SST 09612-70100 (09612-07130, 09612-07210)

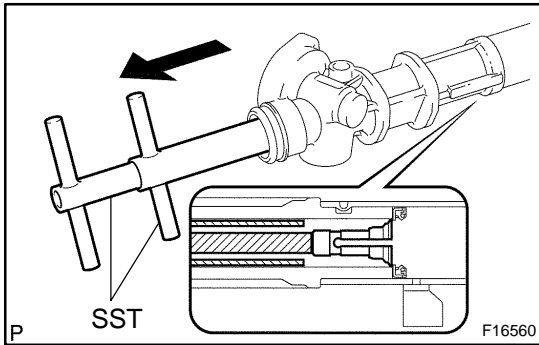
NOTICE:

- Before using them, apply a small dab of grease to the inside wall of SST (09612-07210, 09612-07130).
- To prevent the inside of the housing from being damaged securely install SST (09612-07130) on SST (09612-07210).



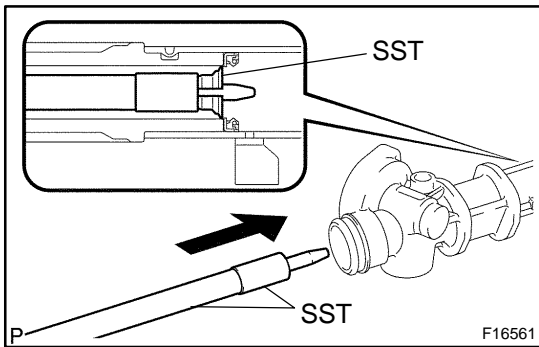
- (b) Diagonally insert SST (09612-07210) into the housing until it contacts with the oil seal, and then further insert the SST (09612-07210) until the tip of SST (09612-07220) contacts with SST (09612-07130).
 SST 09612- 70100 (09612- 07130, 09612- 07210, 09612-07220)

NOTICE:
 Do not damage the inside of the housing.



- (c) Secure SST (09612-07220), and pull SST (09612-07210) to place SST (09612-07130) in the housing.
 SST 09612- 70100 (09612- 07130, 09612- 07210, 09612-07220)

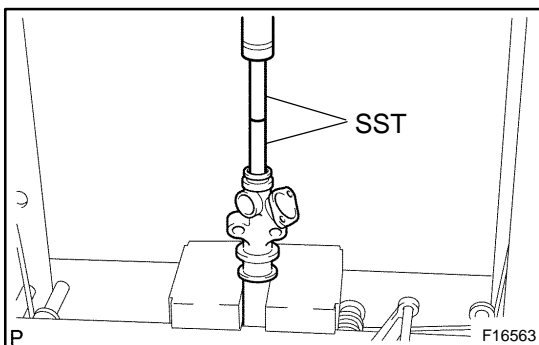
HINT:
 Place SST on the chamfering position between the oil seal and rack housing.



- (d) Remove the SST (09612-07210, 09612-07220).
 SST 09612-70100 (09612-07210, 09612-07220)
- (e) After installing SST (09612-07240) on SST (09612-07210), insert the tip of SST (09612-07230) in the service hole of SST (09612-07130).
 SST 09612- 70100 (09612- 07130, 09612- 07230, 09612-07240)

NOTICE:

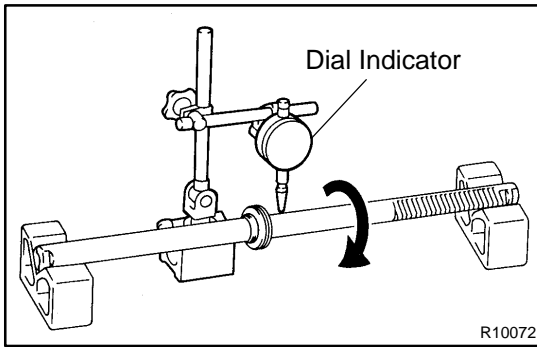
- Before using them, apply a small dab of grease to the tip of SST (09612-07230).
- To prevent SST (09612-07130) from being damaged, be sure to install SST (09612-07240).
- Do not damage the inside of the rack housing.



- (f) Install SST (09951-07100) on SST (09612-07230) and remove the oil seal using a press.
 SST 09612- 70100 (09612- 07130, 09612- 07230, 09612-07240), 09950-70010 (09951-07100)

NOTICE:
 Do not damage the rack housing.

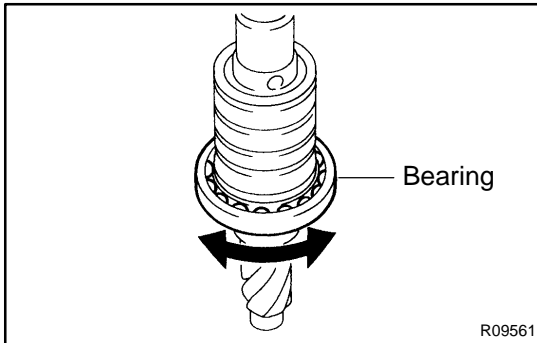
HINT:
 Replace SST (09951-07100) with SST that is different in length in the set, if necessary.



INSPECTION

1. INSPECT STEERING RACK

- (a) Using a dial indicator, check the steering rack for runout and for teeth wear and damage.
Maximum runout: 0.15 mm (0.0059 in.)
- (b) Check the back surface for wear and damage.

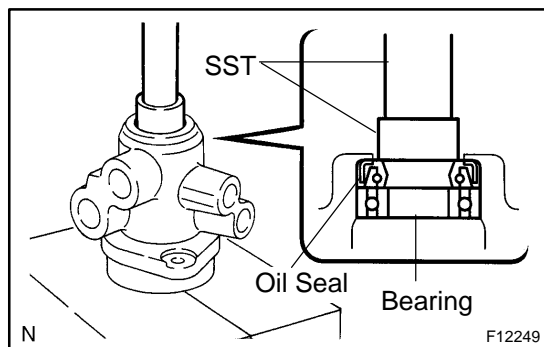


2. INSPECT BEARING

- (a) Check the bearing rotation condition and check for abnormal noise.

If the bearing is worn or damaged, replace the control valve assembly.

- (b) Coat the bearing with molybdenum disulfide lithium base grease.



REPLACEMENT

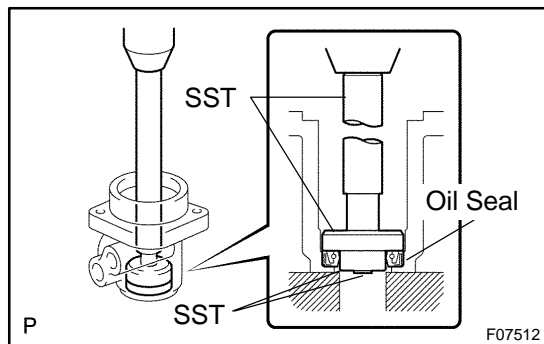
NOTICE:

When using a vise, do not overtighten it.

1. IF NECESSARY, REPLACE OIL SEAL AND BEARING

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

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



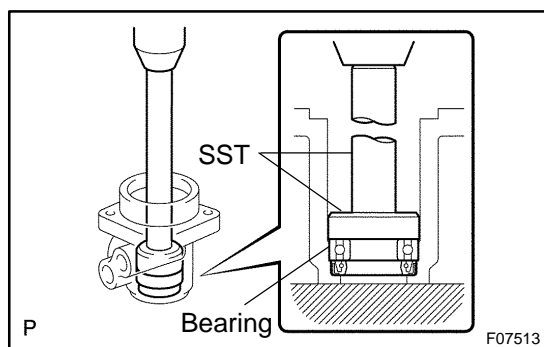
- (b) Coat a new oil seal lip with power steering fluid.

- (c) Using SST, press in the oil seal.

SST 09950-60010 (09951-00180, 09951-00320,
09952-06010), 09950-70010 (09951-07150)

NOTICE:

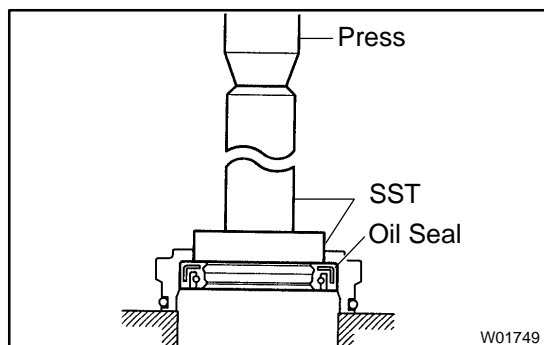
Make sure that the oil seal is installed facing in the correct direction.



- (d) Coat a new bearing with molybdenum disulfide lithium base grease.

- (e) Using SST, press in the bearing.

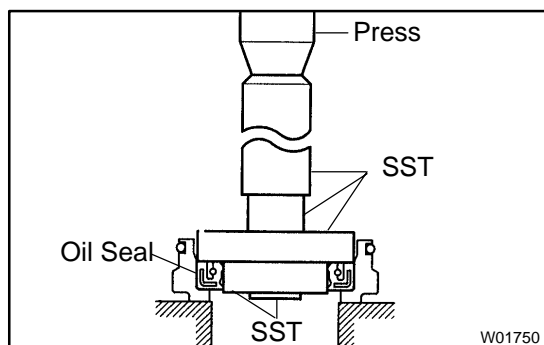
SST 09950-60010 (09951-00340),
09950-70010 (09951-07150)



2. IF NECESSARY, REPLACE OIL SEAL

- (a) Using SST, press out the oil seal from the bearing guide nut.

SST 09950-60010 (09951-00310),
09950-70010 (09951-07100)



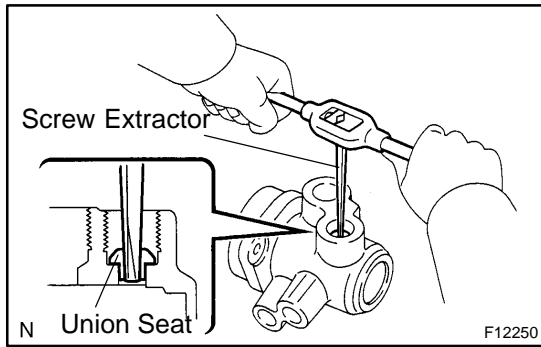
- (b) Coat a new oil seal lip with power steering fluid.

- (c) Using SST, press in the oil seal.

SST 09950-60010 (09951-00250, 09951-00360,
09952-06010), 09950-70010 (09951-07100)

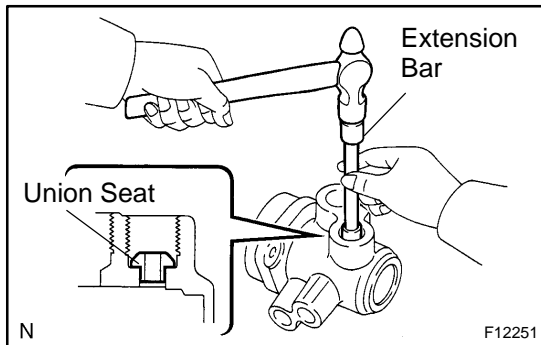
NOTICE:

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

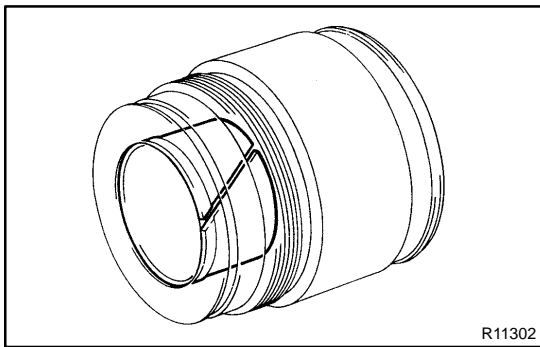


3. IF NECESSARY, REPLACE UNION SEAT

- (a) Using a screw extractor, remove the union seat from the control valve housing.

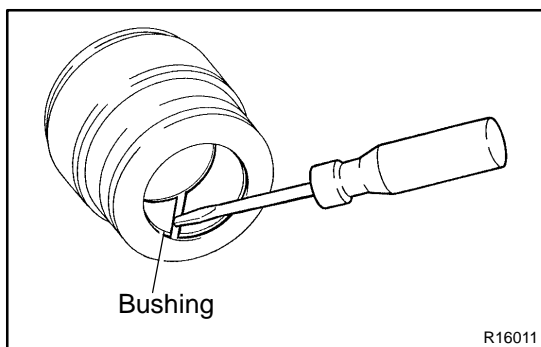


- (b) Using a plastic hammer and extension bar, lightly tap in a new union seat.



4. INSPECT BUSHING

- (a) Check the inside of the bushing of the cylinder end stopper for cracks. If faulty, replace the bushing.
- (b) Apply molybdenum disulfide lithium base grease to the inside of the bushing.



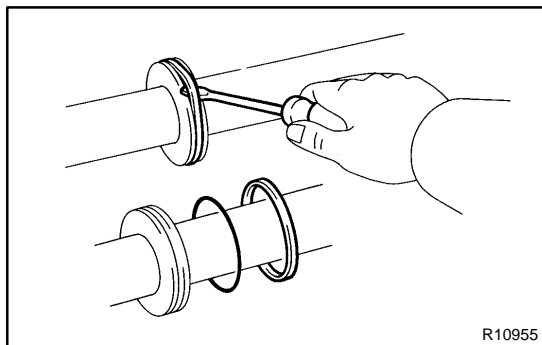
5. IF NECESSARY, REPLACE BUSHING

- (a) Using a screwdriver, remove the bushing from the cylinder end stopper.

NOTICE:

Be careful not to damage the cylinder end stopper.

- (b) Coat the inside of a new bushing with molybdenum disulfide lithium base grease.
- (c) Install the bushing.



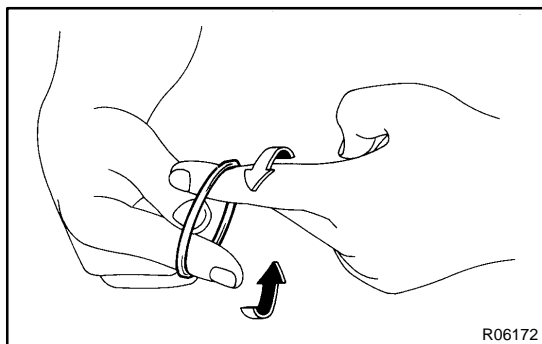
6. IF NECESSARY, REPLACE TEFLON RING AND O-RING

- (a) Using a screwdriver, remove the teflon ring and O-ring from the steering rack.

NOTICE:

Be careful not to damage the groove for the teflon ring.

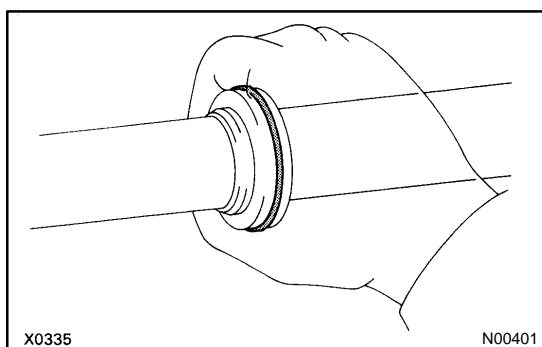
- (b) Coat a new O-ring with power steering fluid and install it to the steering rack.



- (c) Expand a new teflon ring with your fingers.

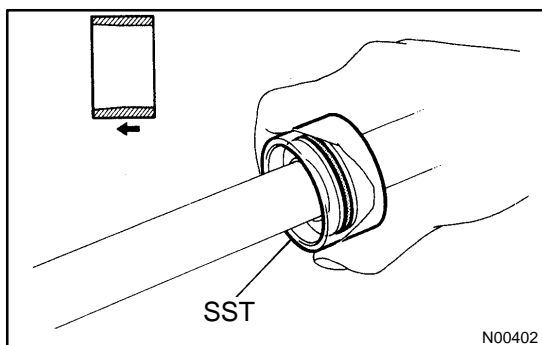
NOTICE:

Be careful not to overexpand the teflon ring.



- (d) Coat the teflon ring with power steering fluid.

- (e) Install the teflon ring to the steering rack and settle it down with your fingers.

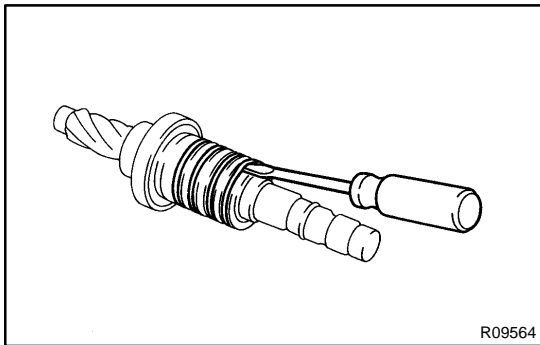


- (f) Carefully slide the tapered end of SST over the teflon ring until it fits to the steering rack.

SST 09630-24014 (09620-24051)

NOTICE:

Be careful not to damage the teflon ring.

**7. IF NECESSARY, REPLACE 4 TEFLON RINGS**

- (a) Using a screwdriver, remove the 4 teflon rings from the control valve assembly.

NOTICE:

Be careful not to damage the grooves for the teflon ring.

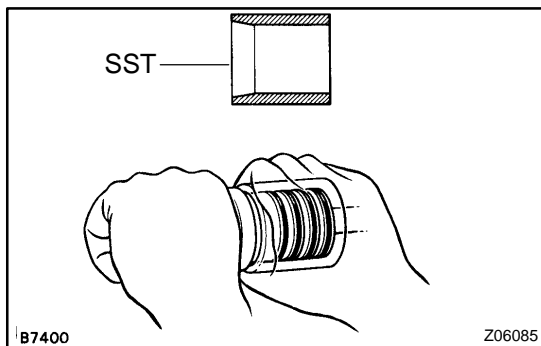
- (b) Expand 4 new teflon rings with your fingers.

NOTICE:

Be careful not to overexpand the teflon ring.

- (c) Coat the teflon rings with power steering fluid.

- (d) Install the teflon rings to the control valve assembly, and settle them down with your fingers.



- (e) Carefully slide the tapered end of SST over the teflon rings until they fit to the control valve assembly.

SST 09631-20081

NOTICE:

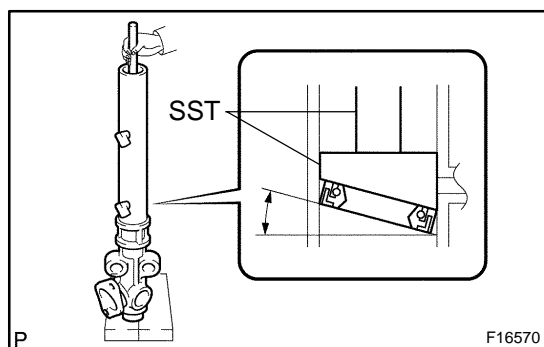
Be careful not to damage the teflon rings.

REASSEMBLY

NOTICE:

When using a vise, do not overtighten it.

1. COAT PARTS INDICATED BY ARROWS WITH POWER STEERING FLUID OR MOLYBDENUM DISULFIDE LITHIUM BASE GREASE (See page [SR-38](#))



2. INSTALL OIL SEAL

- (a) Apply power steering fluid to a new oil seal, and install the oil seal on the rack housing at an angle.

NOTICE:

Install the oil seal in the correct direction.

HINT:

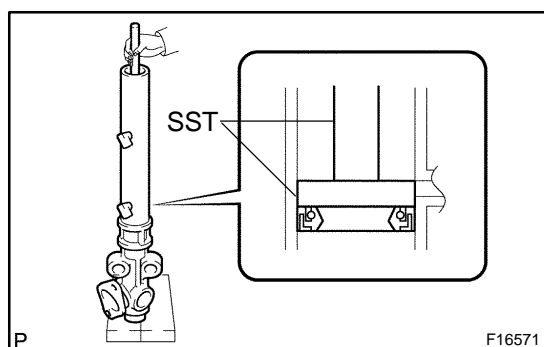
Install the oil seal so that the port faces downward with approx. 15 degrees.

- (b) Using SST, push in the oil seal by hand until it passes through the 2 ports.

SST 09631-00180, 09950-70010 (09951-07360)

NOTICE:

Do not turn SST when inserting the oil seal.

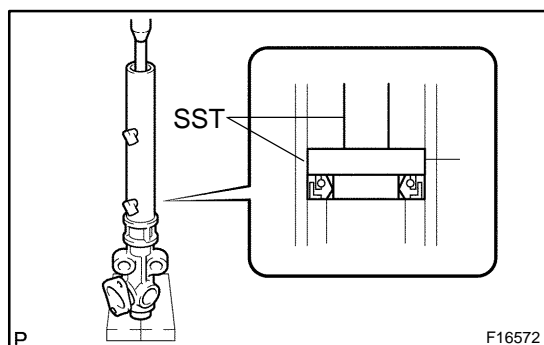


- (c) After the oil seal has passed through the ports, push in the oil seal by hand until it becomes level, using SST.

SST 09950-60010 (09951-00430), 09950-70010 (09951-07360)

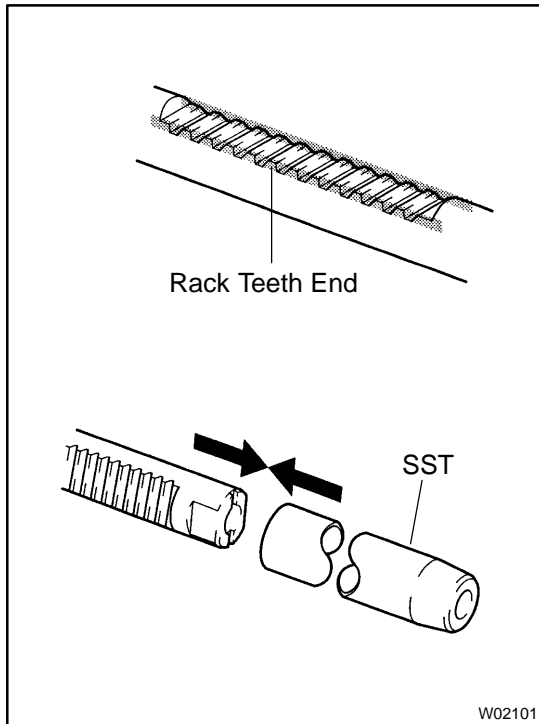
NOTICE:

When SST is set, do not damage the inside surface of the rack housing.



- (d) After the oil seal has become level, using SST and press, install the oil seal.

SST 09950-60010 (09951-00430), 09950-70010 (09951-07360)



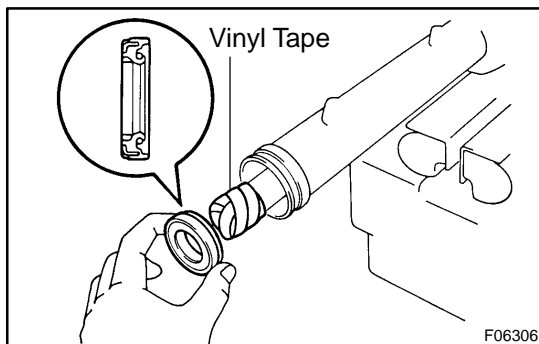
3. INSTALL STEERING RACK

- (a) Install SST to the rack.
SST 09631-33010

HINT:

If necessary, scrape the burrs off the rack teeth end and bur-nish.

- (b) Coat SST with power steering fluid.
(c) Install the steering rack into the rack housing.
(d) Remove the SST.
SST 09631-33010

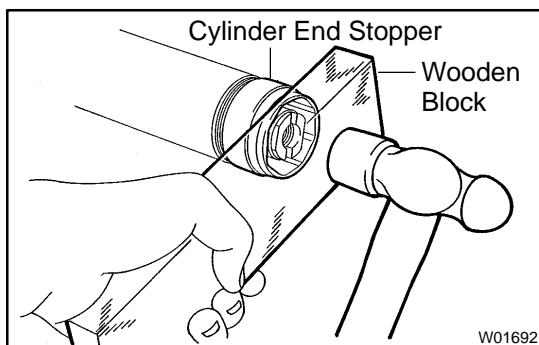


4. INSTALL OIL SEAL

- (a) Coat a new oil seal lip with power steering fluid.
(b) To prevent oil seal lip damage, wind vinyl tape on the steering rack end, and apply power steering fluid.
(c) Install the oil seal by pushing it into the rack housing with-out tilting.

NOTICE:

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

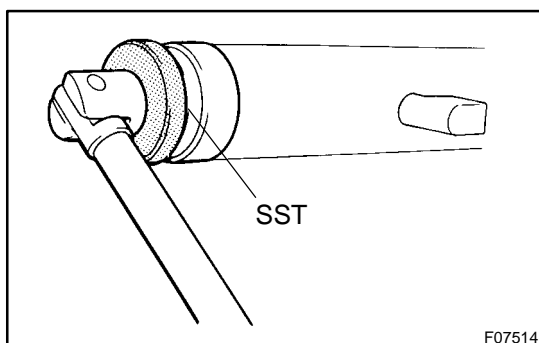


5. INSTALL CYLINDER END STOPPER AND SPACER

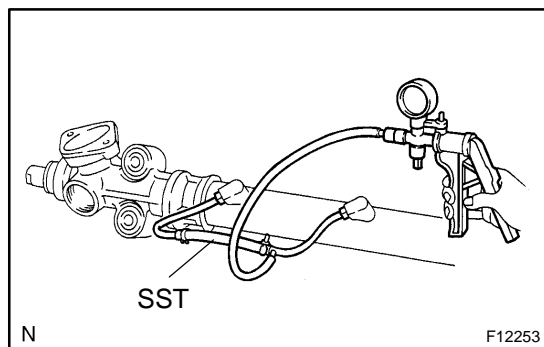
- (a) Install the spacer.
(b) Coat a new O-ring with power steering fluid and install it to the cylinder end stopper.
(c) Using a wooden block and hammer, drive in the cylinder end stopper until it is tightly installed.

NOTICE:

Be careful not to damage the O-ring.

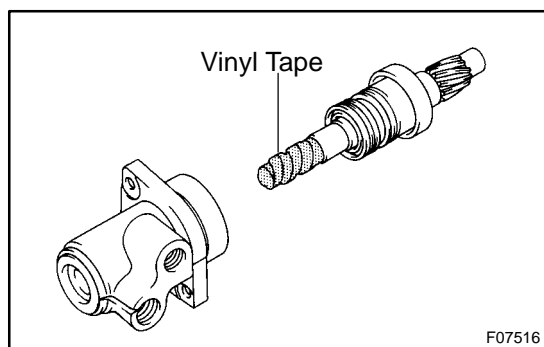


- (d) Using SST, torque the cylinder end stopper.
SST 09631-20090
Torque: 59 N·m (600 kgf·cm, 44 ft·lbf)



6. AIR TIGHTNESS TEST

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

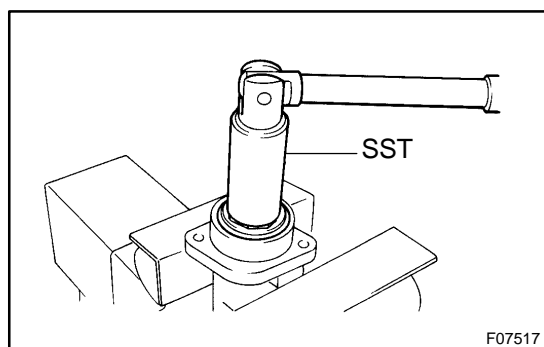


7. INSTALL CONTROL VALVE ASSEMBLY

- Coat the teflon rings with power steering fluid.
- To prevent oil seal lip damage, wind vinyl tape on the serrated part of the control valve shaft.
- Push the control valve assembly into the control valve housing.

NOTICE:

Be careful not to damage the teflon rings and oil seal lip.

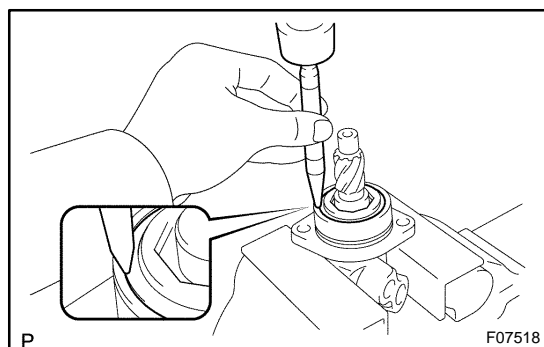


8. INSTALL BEARING GUIDE NUT

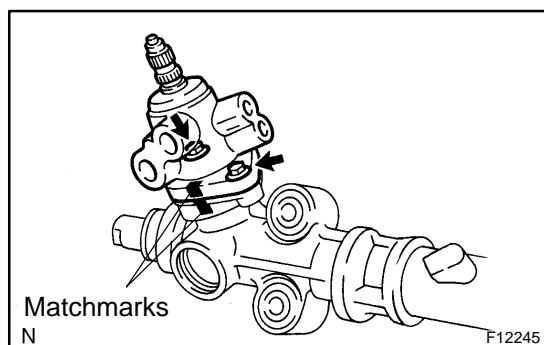
- Coat a new O-ring with power steering fluid, and install it to the bearing guide nut.
- Using SST, install the bearing guide nut.
SST 09631-20060
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

NOTICE:

Be careful not to damage the oil seal lip.



- Using a punch, stake the bearing guide nut.

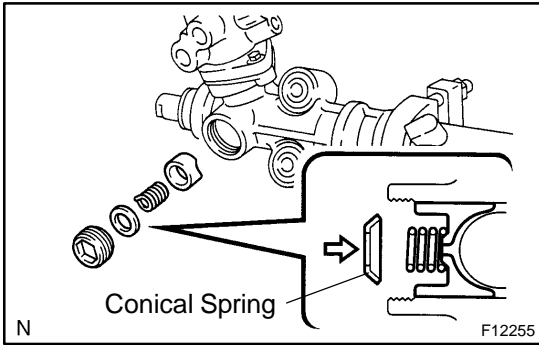


9. INSTALL CONTROL VALVE HOUSING WITH CONTROL VALVE ASSEMBLY

- Coat a new O-ring with power steering fluid, and install it to the control valve housing.
- Align the matchmarks on the valve housing and rack housing.
- Install the 2 bolts.

Torque: 18 N·m (180 kgf·cm, 13 ft·lbf)

10. INSTALL DUST COVER



11. INSTALL RACK GUIDE SUB-ASSEMBLY, RACK GUIDE SPRING, CONICAL SPRING AND RACK GUIDE SPRING CAP

- (a) Install the rack guide sub-assembly, rack guide spring and conical spring.

NOTICE:

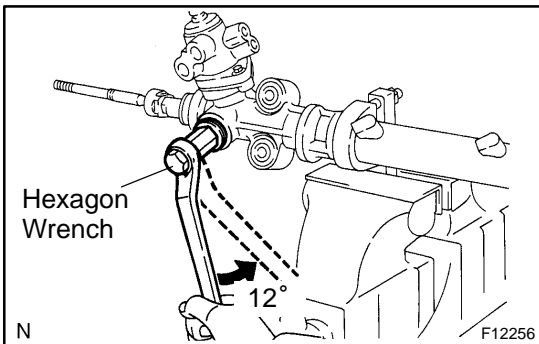
Make sure that the conical spring is installed facing in the correct direction.

- (b) 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

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



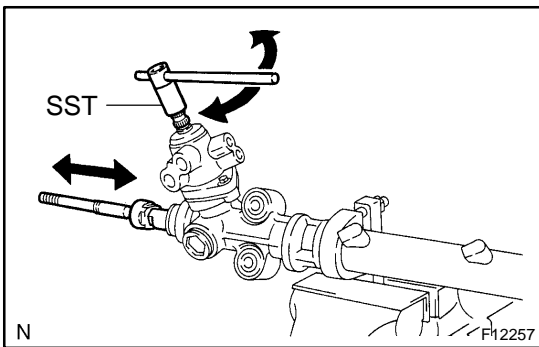
12. ADJUST TOTAL PRELOAD

- (a) To prevent the steering rack teeth from damaging the oil seal lip, temporarily install the RH and LH rack ends.

- (b) Using a hexagon wrench (24 mm), torque the rack guide spring cap.

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

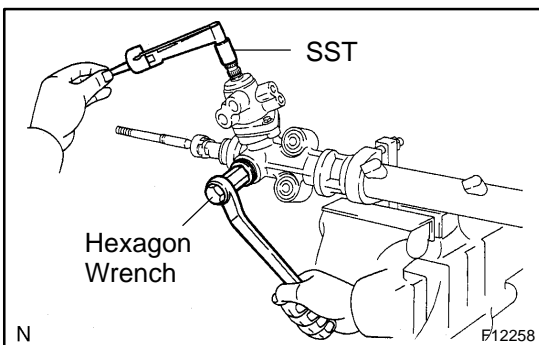
- (c) Using a hexagon wrench (24 mm), return the rack guide spring cap 12°.



- (d) Using SST, turn the control valve shaft right and left 1 or 2 times.

SST 09616-0001 1

- (e) Using a hexagon wrench (24 mm), loosen the rack guide spring cap until the rack guide spring is not functioning.

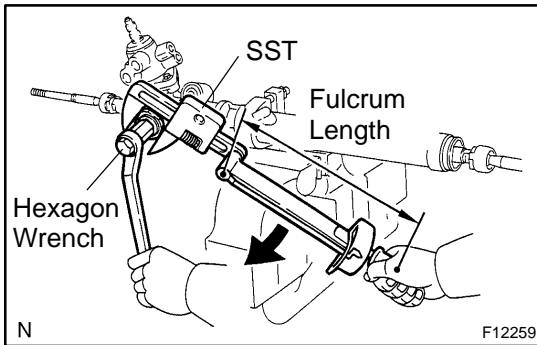


- (f) Using SST, a torque wrench and hexagon wrench (24 mm), tighten the rack guide spring cap until the preload is within the specification.

SST 09616-0001 1

Preload (turning):

1.2 - 1.7 N·m (12.2 - 17.3 kgf·cm, 10.6 - 15.0 in.-lbf)

**13. INSTALL RACK GUIDE SPRING CAP LOCK NUT**

- (a) 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**

- (b) Temporarily install the rack guide spring cap lock nut.
(c) Using a hexagon wrench (24 mm), hold the rack guide spring cap and using SST, torque the rack guide spring cap lock nut.

SST 09922-10010

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

NOTICE:

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

HINT:

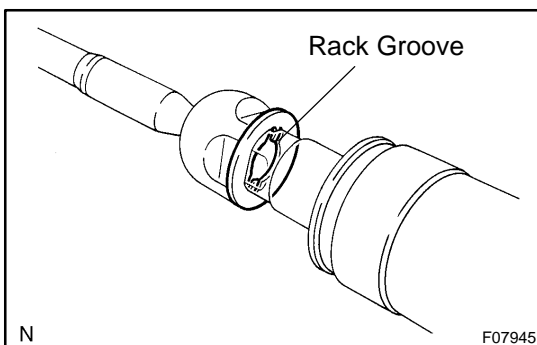
Use a torque wrench with a fulcrum length of 345 mm (13.58 in.).

- (d) Recheck the total preload.

Preload (turning):

1.2 - 1.7 N·m (12.2 - 17.3 kgf·cm, 10.6 - 15.0 in.-lbf)

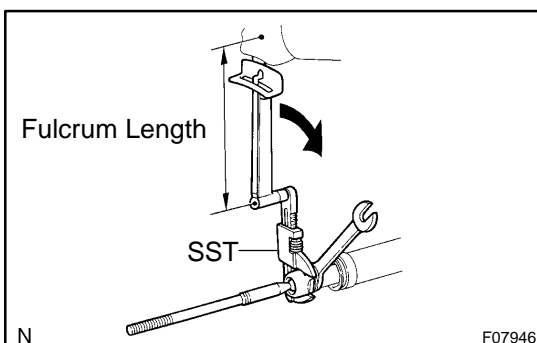
- (e) Remove the RH and LH rack ends.

**14. INSTALL RH AND LH CLAW WASHERS AND RACK ENDS**

- (a) Install a new claw washer, and temporarily install the rack end.

HINT:

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



- (b) Using a spanner, hold the steering rack steadily and using SST, torque the rack end.

SST 09922-10010

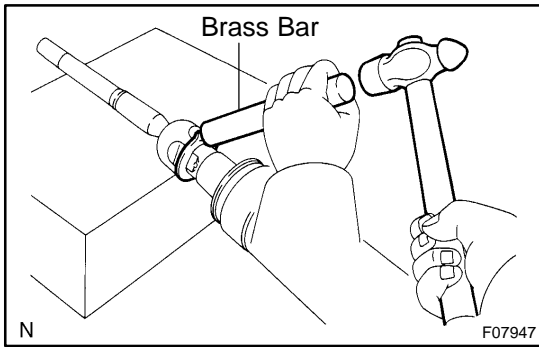
Torque: 76 N·m (780 kgf·cm, 56 ft·lbf)

NOTICE:

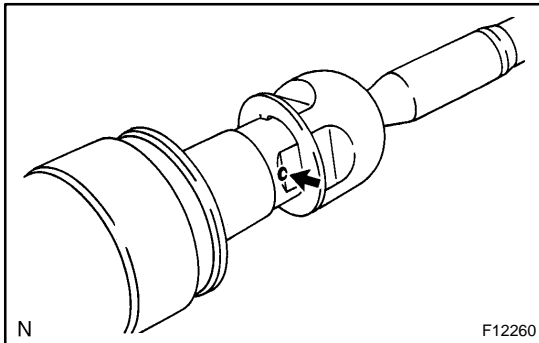
Use SST 09922-10010 in the direction shown in the illustration.

HINT:

Use a torque wrench with a fulcrum length of 380 mm (14.96 in.).



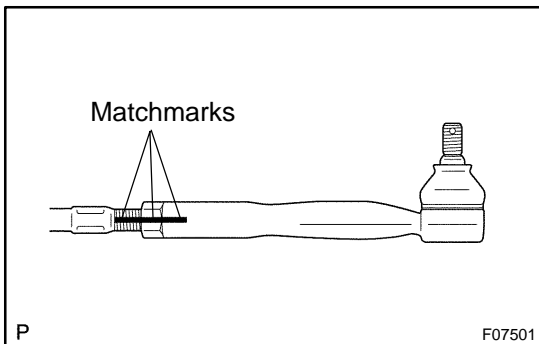
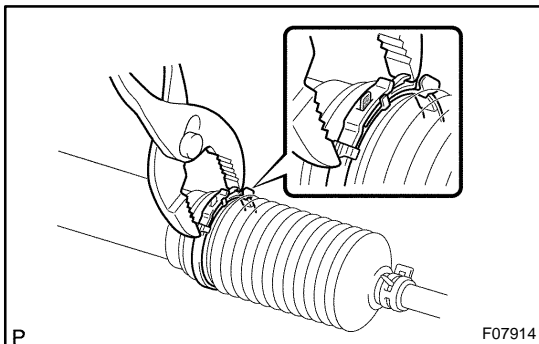
- (c) Using a brass bar and a hammer, stake the washer.
NOTICE:
Avoid any impact on the steering rack.
 (d) Employ the same manner described above to the other side.



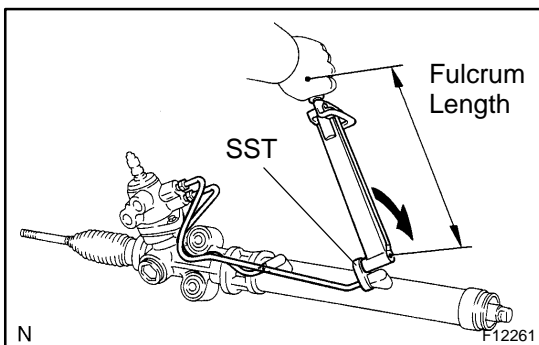
- 15. INSTALL RH AND LH RACK BOOTS, CLAMPS AND CLIPS**
 (a) Ensure that the steering rack hole is not clogged with grease.

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

- (b) Install the boot, clip and a new clamp.
NOTICE:
Be careful not to damage or twist the boot.
 (c) Tighten the clamp as shown in the illustration.
 (d) Employ the same manner described above to the other side.



- 16. INSTALL RH AND LH TIE ROD ENDS AND LOCK NUTS**
 (a) Screw the lock nut and tie rod end onto the rack end until the matchmarks are aligned.
 (b) After adjusting toe-in, torque the nut
 (See page SA-5).
Torque: 56 N·m (570 kgf-cm, 41 ft-lbf)
 (c) Employ the same manner described above to the other side.



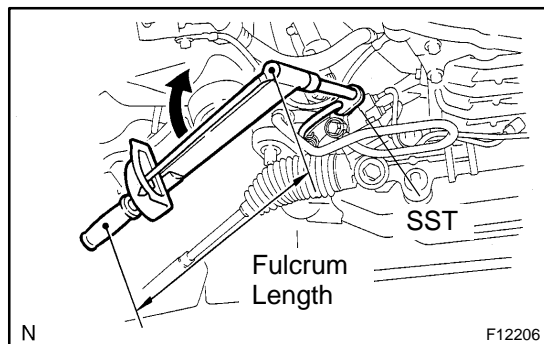
- 17. INSTALL 2 TURN PRESSURE TUBES**
 Using SST, install the 2 turn pressure tubes.
 SST 09023-38200
Torque: 22 N·m (220 kgf-cm, 16 ft-lbf)
HINT:
- Use a torque wrench with a fulcrum length of 300 mm (11.81 in.).
 - This torque value is effective in case that SST is parallel to a torque wrench.

INSTALLATION

1. INSTALL GROMMET, BRACKET AND PS GEAR ASSEMBLY

Install the grommet, bracket and PS gear assembly with the 4 bolts.

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



2. CONNECT RETURN TUBE

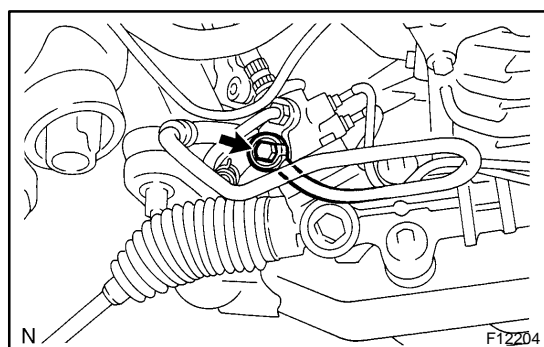
Using SST, connect the return tube.

SST 09023-38400

Torque: 40 N·m (410 kgf·cm, 30 ft·lbf)

HINT:

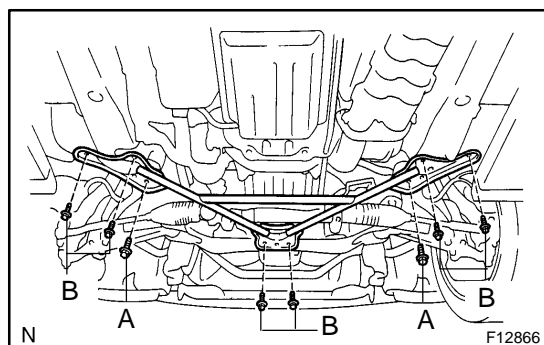
- Use a torque wrench with a fulcrum length of 345 mm (13.58 in).
- This torque value is effective in case that SST is parallel to a torque wrench.



3. CONNECT PRESSURE FEED TUBE

Install a new gasket, then connect the pressure feed tube with the union bolt.

Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)



4. INSTALL FRONT SUSPENSION MEMBER BRACE

Install the front suspension member brace with the 8 bolts.

Torque:

Bolt A: 119 N·m (1,210 kgf·cm, 88 ft·lbf)

Bolt B: 58 N·m (590 kgf·cm, 43 ft·lbf)

5. CONNECT SLIDING YOKE (See page [SR-25](#))

6. INSTALL NO. 2 ENGINE UNDER COVER

7. CONNECT RH AND LH TIE ROD ENDS

(See page [SA-37](#))

8. INSTALL RH AND LH FRONT BRAKE CALIPERS

(See page [BR-26](#))

9. PLACE FRONT WHEELS FACING STRAIGHT AHEAD

HINT:

Do it with the front of the vehicle jacked up.

10. CENTER SPIRAL CABLE (See page [SR-25](#))

11. INSTALL STEERING WHEEL

- Align the matchmarks on the steering wheel and steering column main shaft.
- Temporarily tighten the steering wheel set nut.
- Connect the connector.

12. BLEED POWER STEERING SYSTEM
(See page [SR-4](#))
13. CHECK STEERING WHEEL CENTER POINT
14. TORQUE STEERING WHEEL SET NUT
Torque: 50 N·m (510 kgf·cm, 37 ft·lbf)
15. INSTALL STEERING WHEEL PAD (See page [SR-25](#))
16. CHECK FRONT WHEEL ALIGNMENT
(See page [SA-5](#))