

STEERING SYSTEM

SR015-01

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 4 RUNNER is equipped with an 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.

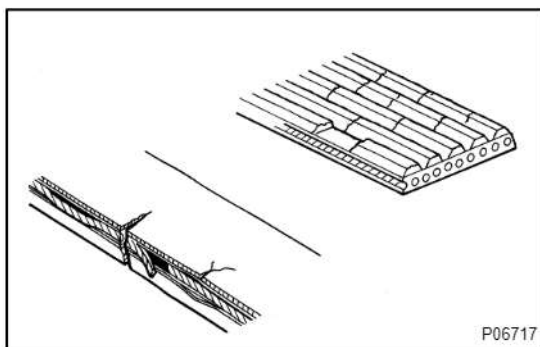
TROUBLESHOOTING

SR01T-06

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) 2. Power steering fluid level (Low) 3. Drive belt (Loose) 4. Front wheel alignment (Incorrect) 5. Steering system joints (Worn) 6. Suspension arm ball joints (Worn) 7. Steering column (Binding) 8. Power steering vane pump 9. Power steering gear	SA-4 SR-5 SR-3 SA-5 - SA-72 - SR-31 SR-42
Poor return	1. Tires (Improperly inflated) 2. Front wheel alignment (Incorrect) 3. Steering column (Binding) 4. Power steering gear	SA-4 SA-5 - SR-42
Excessive play	1. Steering system joints (Worn) 2. Suspension arm ball joints (Worn) 3. Intermediate shaft, Sliding yoke (Worn) 4. Front wheel bearing (Worn) 5. Power steering gear	- SA-72 - SA-9 SR-42
Abnormal noise	1. Power steering fluid level (Low) 2. Steering system joints (Worn) 3. Power steering vane pump 4. Power steering gear	SR-5 - SR-31 SR-42



DRIVE BELT INSPECTION

SR01U-06

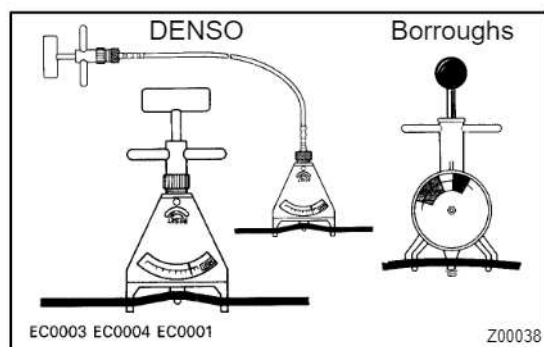
INSPECT DRIVE BELT

- (a) 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.



- (b) Using a belt tension gauge, measure the belt tension.

Belt tension gauge:

DENSO BTG-20 (95506-00020)

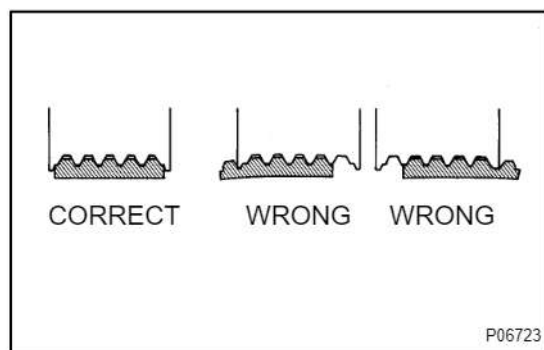
Borroughs No. BT-33-73F

Drive belt tension:

New belt: 135 - 180 lbf

Used belt: 85 - 120 lbf

If the belt tension is not as specified, adjust it.



HINT:

- "New belt" refers to a belt which has been used less than 5 minutes on a running engine.
- "Used belt" refers to a belt which has been used on a running engine for 5 minutes or more.
- 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.
- After installing a new belt, run the engine for about 5 minutes and recheck the belt tension.

POWER STEERING FLUID BLEEDING

SR01V-06

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.

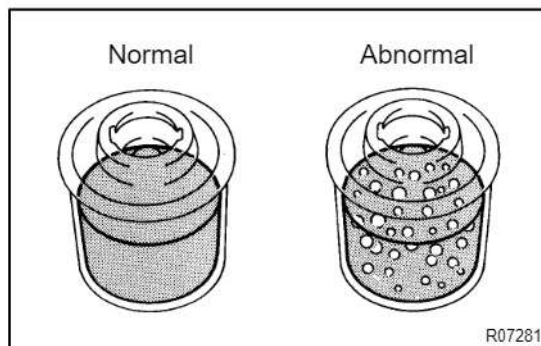
- (b) Repeat (a) several times.

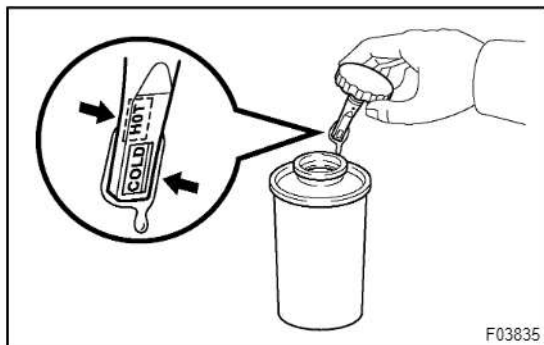
7. **STOP ENGINE**

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

- Keep the vehicle level.
- With the engine stopped, check the fluid level in the oil reservoir.

If necessary, add fluid.

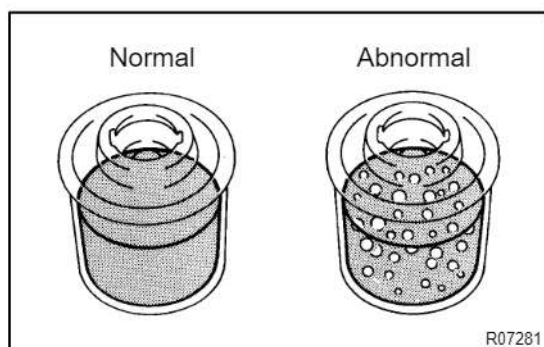
Fluid: ATF DEXRON® II or III

HINT:

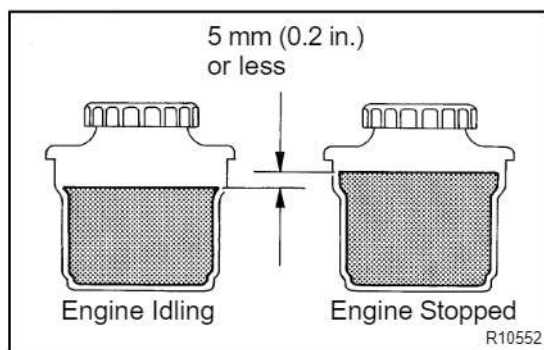
Check that the fluid level is within the HOT LEVEL range on the reservoir cap dipstick. If the fluid is cold, check that it is within the COLD LEVEL range.

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

Fluid temperature: 80°C (176°F)



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



- With the engine idling, measure the fluid level in the oil reservoir.
- Stop the engine.
- 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](#)).

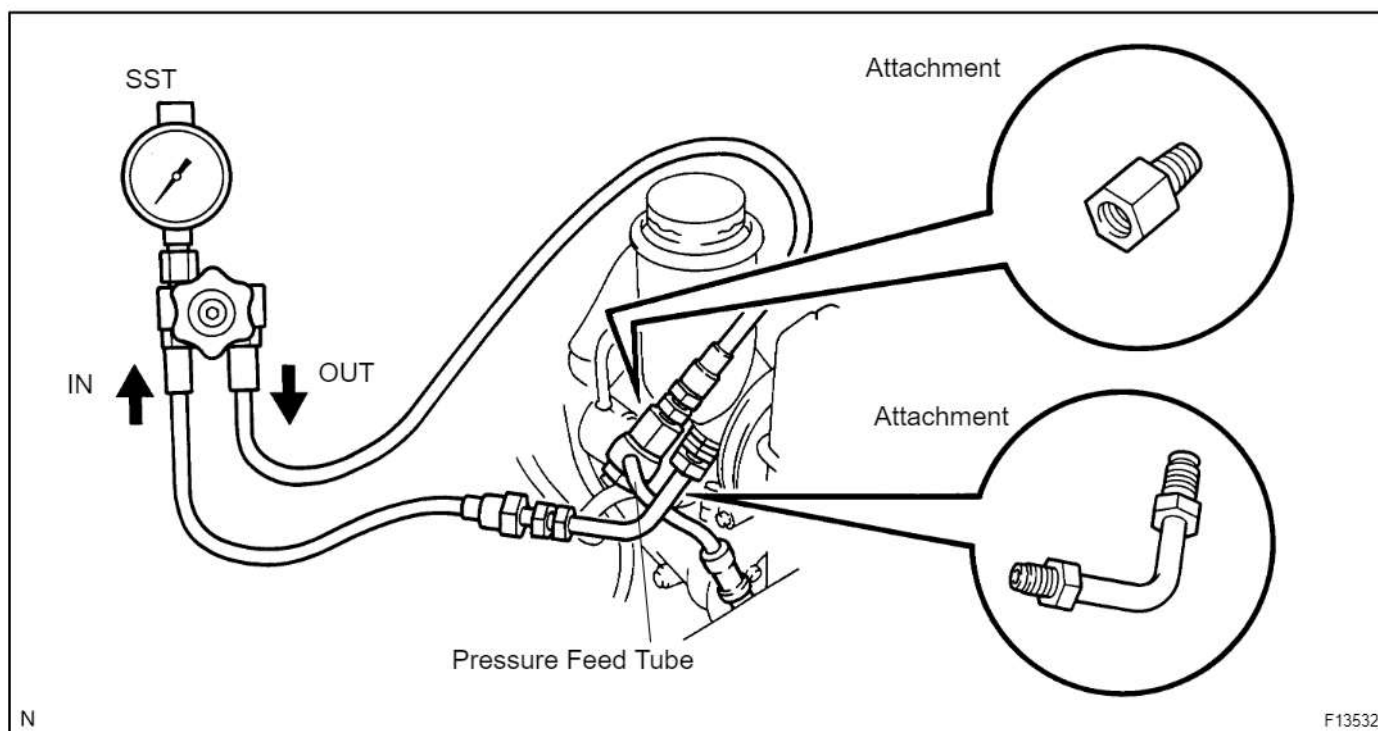
- Check the fluid level.

2. CHECK STEERING FLUID PRESSURE

- (a) Remove the 3 bolts and air cleaner assembly (See page [SR-31](#)).
- (b) Disconnect the pressure feed tube from the PS vane pump (See page [SR-33](#)).
- (c) Connect SST, as shown in the illustration below.
SST 09640-10010 (09641-01010, 09641-01030, 09641-01060)

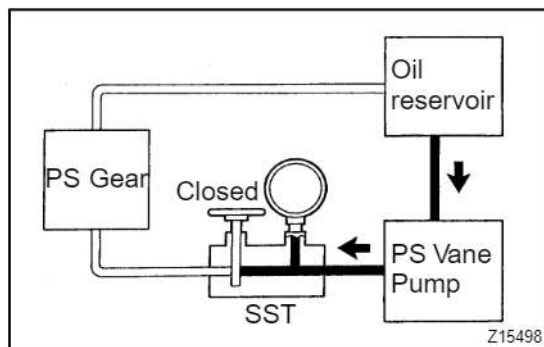
NOTICE:

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



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

Fluid temperature: 80 °C (176 °F)



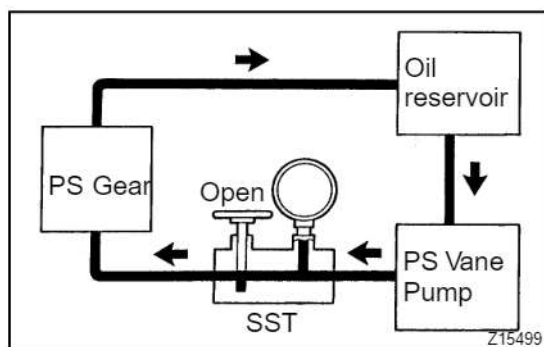
- (g) With the engine idling, close the valve of the SST and observe the reading on the SST.

Minimum fluid pressure:

8,336 kPa (85 kgf/cm², 1,209 psi)

NOTICE:

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



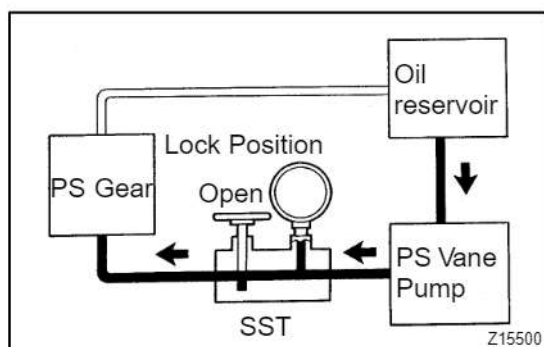
- (h) With the engine idling, open the valve fully.
(i) Measure the fluid pressure at engine speeds of 1,000 rpm and 3,000 rpm.

Difference fluid pressure:

490 kPa (5 kgf/cm², 71 psi) or less

NOTICE:

Do not turn the steering wheel.



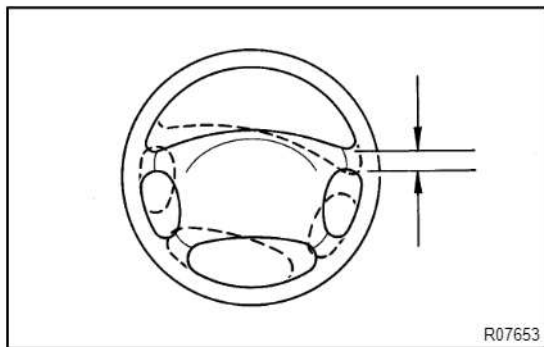
- (j) With the engine idling and valve fully opened, turn the steering wheel to full lock.

Minimum fluid pressure:

8,336 kPa (85 kgf/cm², 1,209 psi)

NOTICE:

- Do not maintain lock position for more than 10 seconds.
 - Do not let the fluid temperature become too high.
- (k) Disconnect the SST.
SST 09640-10010 (09641-01010, 09641-01030, 09641-01060)
- (l) Connect the pressure feed tube (See page [SR-41](#)).
(m) Install the air cleaner and 3 bolts (See page [SR-31](#)).
(n) Bleed the power steering system (See page [SR-4](#)).



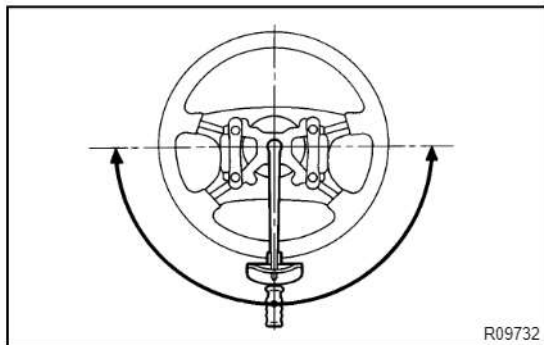
STEERING WHEEL INSPECTION

SR01Y-07

1. CHECK STEERING WHEEL FREEPLAY

- Stop the vehicle and face the tires straight ahead.
- 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

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

Steering effort (Reference):

4.9 N·m (50 kgf·cm, 43 in·lbf)

HINT:

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

- Torque the steering wheel set nut.

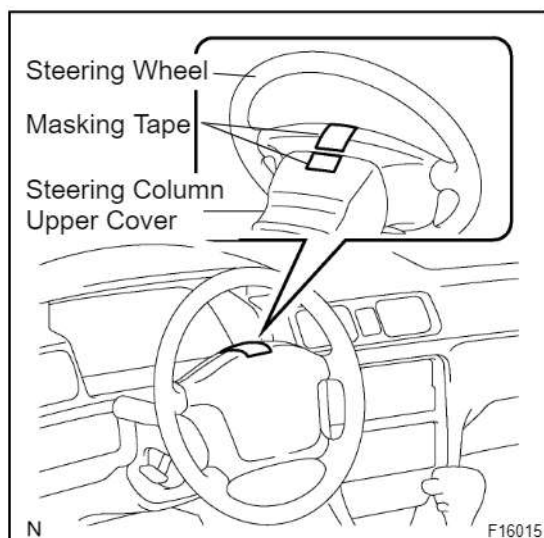
Torque: 50 N·m (510 kgf·cm, 37 ft·lbf)

- Install the steering wheel pad (See page [SR-20](#)).

REPAIR PROCEDURES

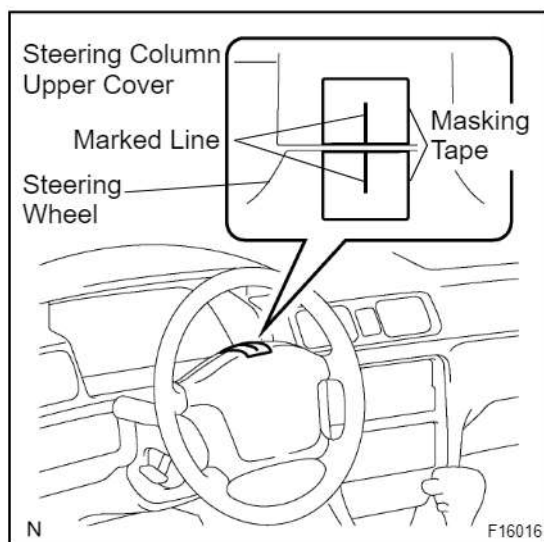
HINT:

This is the repair procedure for steering off center.

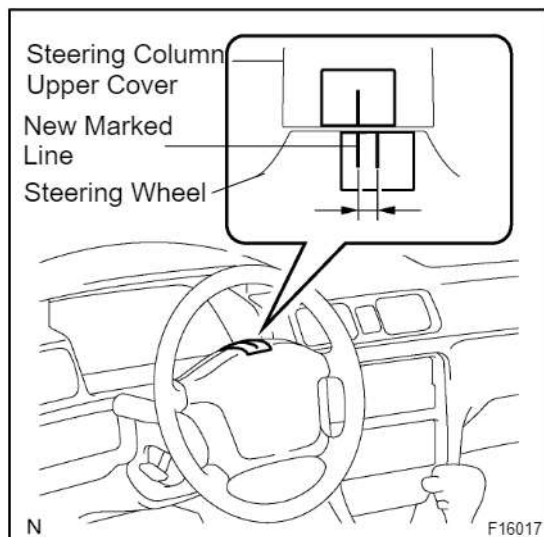


1. INSPECT STEERING WHEEL OFF CENTER

- (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

(a) Lift up the vehicle.

NOTICE:

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

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

(c) 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.

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

(e) Loosen the RH and LH lock nuts.

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

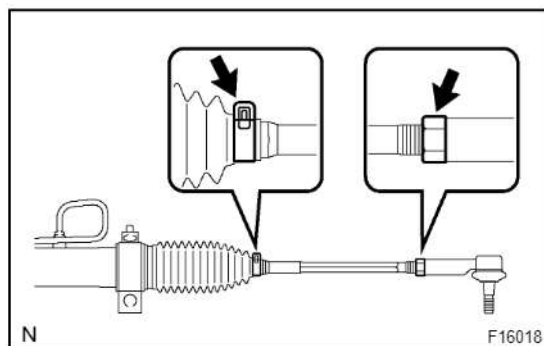
1 turn 360 deg. of rack end (1.5 mm (0.059 in.) horizontal movement) = 12 deg. of steering angle

(g) Tighten the RH and LH lock nuts by the specified torque.

NOTICE:

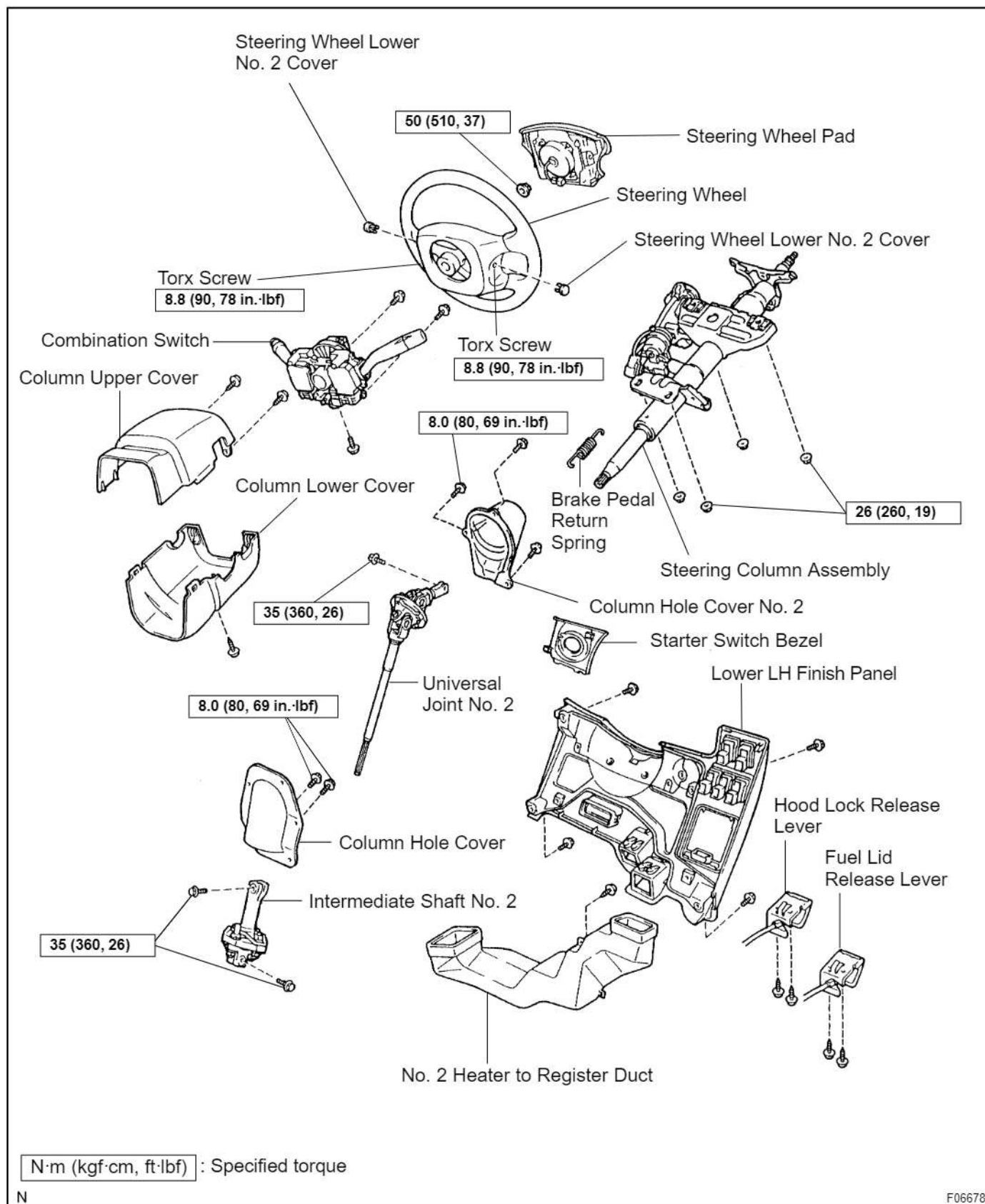
Make sure that the difference in length between RH and LH tie rod ends and rack end screws are within 1.5 mm (0.059 in.).

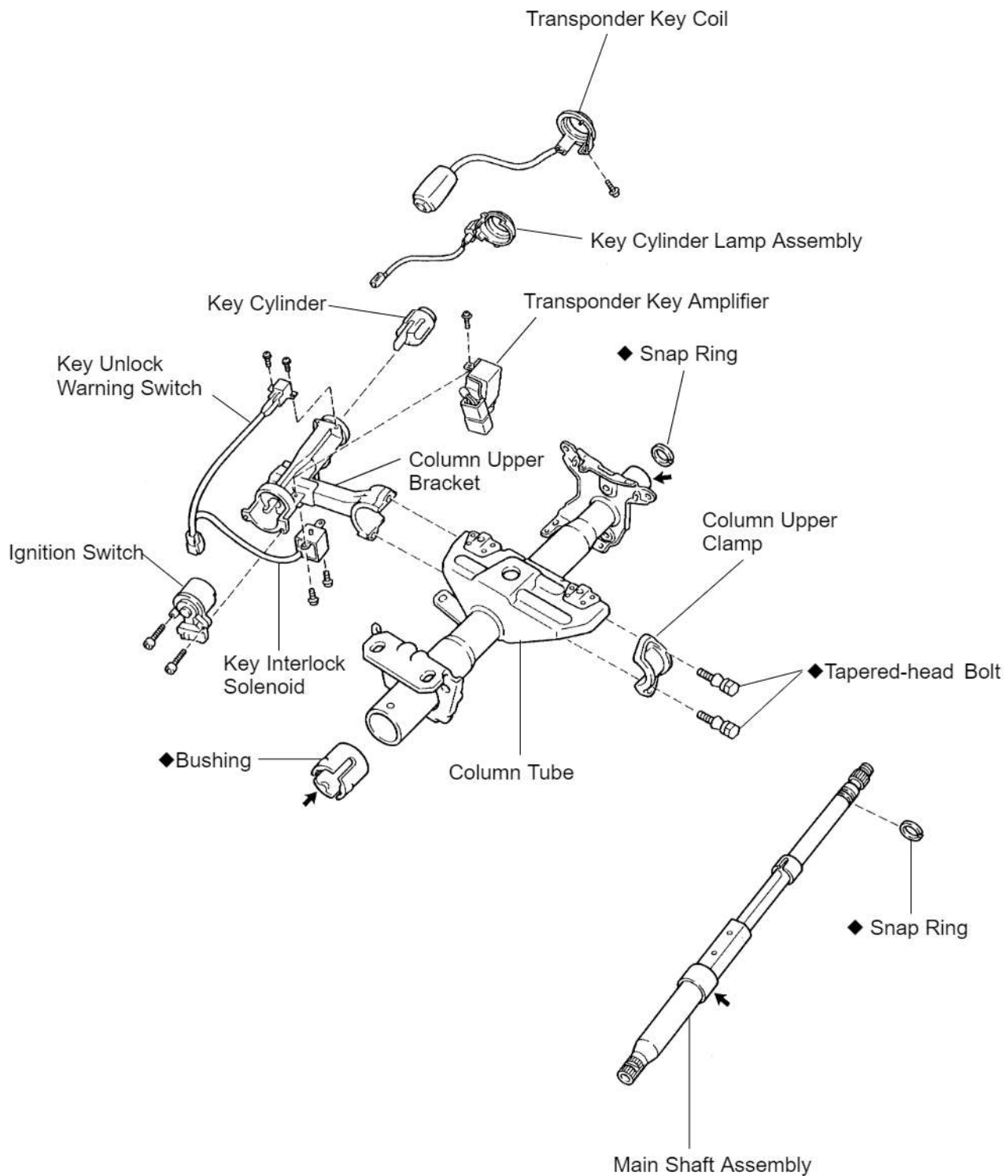
(h) Install the RH and LH boot clips.



NON-TILT STEERING COLUMN COMPONENTS

SR01Z-03





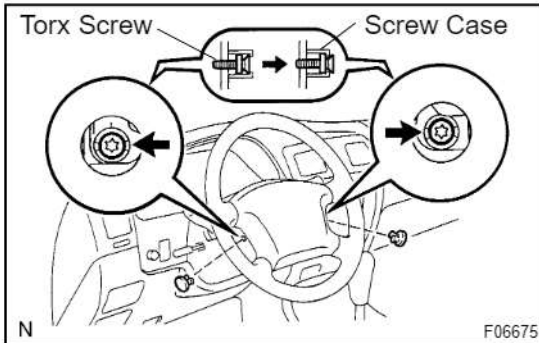
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REMOVAL

1. REMOVE STEERING WHEEL PAD

NOTICE:

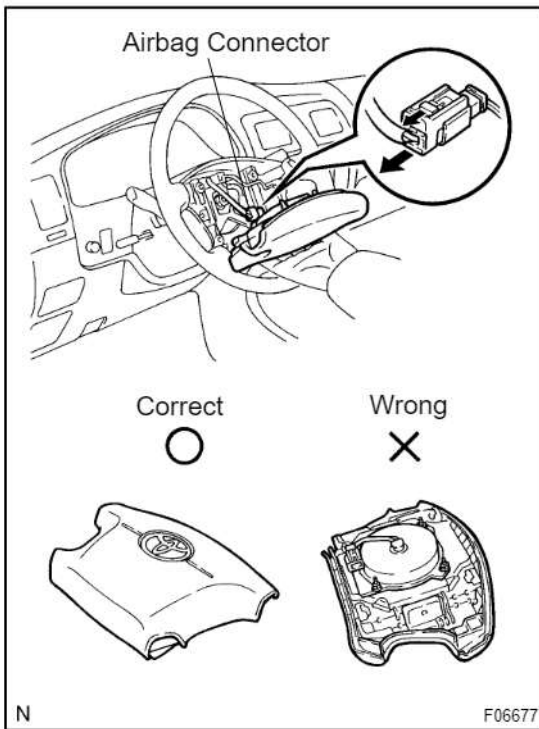
If the airbag connector is disconnected with the ignition switch at ON or ACC, DTCs will be recorded.



- 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 screw until the groove along the screw circumference catches on the screw case.



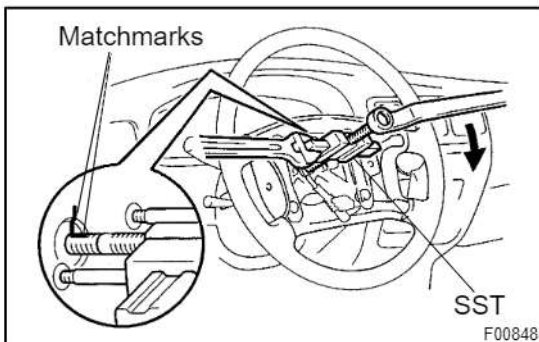
- Pull out the wheel pad from the steering wheel and disconnect the airbag connector.

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

- 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, 09953-05021, 09954-05020)
- Disconnect the connector.

3. REMOVE UPPER AND LOWER COLUMN COVERS

Remove the 3 screws, upper and lower column covers.

4. REMOVE LOWER LH FINISH PANEL

- (a) Remove the 2 screws and disconnect the hood lock release lever from the lower LH finish panel.
- (b) Remove the 2 screws and disconnect the fuel lid release lever from the lower LH finish panel.
- (c) Remove the 4 panel set bolts and lower LH finish panel.

5. REMOVE STARTER SWITCH BEZEL**6. REMOVE NO. 2 HEATER TO REGISTER DUCT**

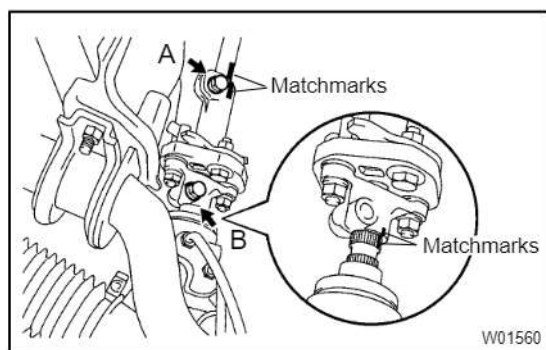
Remove the screw and No. 2 heater to register duct.

7. REMOVE COMBINATION SWITCH WITH SPIRAL CABLE

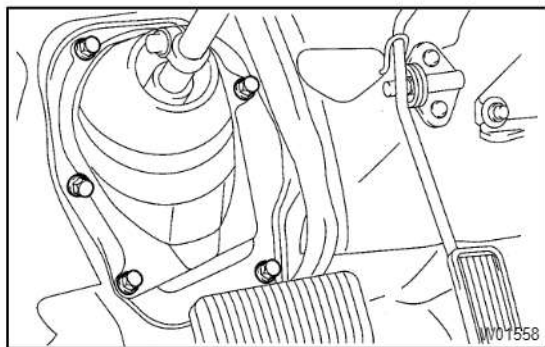
- (a) Disconnect the 3 connectors.
- (b) Disconnect the airbag connector.
- (c) Remove the 3 screws and combination switch with spiral cable.

8. REMOVE SPIRAL CABLE (See page [BE-14](#))**NOTICE:**

Do not disassemble the cable or apply oil to it.

9. REMOVE BRAKE PEDAL RETURN SPRING**10. REMOVE INTERMEDIATE SHAFT NO. 2**

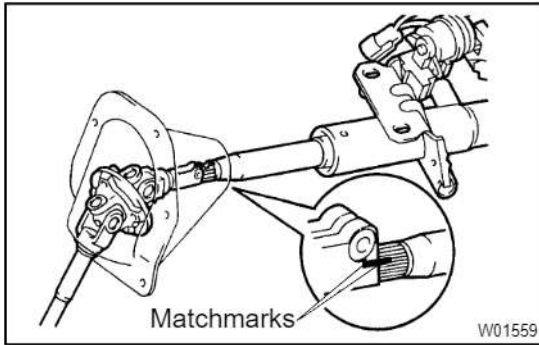
- (a) Place matchmarks on the universal joint No. 2 and intermediate shaft No. 2.
- (b) Remove the bolt "A".
- (c) Place matchmarks on the intermediate shaft No. 2 and control valve shaft.
- (d) Remove the bolt "B".
- (e) Slide the intermediate shaft No. 2 and remove the intermediate shaft No. 2.

**11. REMOVE COLUMN HOLE COVER AND COLUMN HOLE COVER NO. 2**

Remove the 5 bolts, column hole cover and column hole cover No. 2.

12. REMOVE STEERING COLUMN ASSEMBLY WITH UNIVERSAL JOINT NO. 2

- (a) Disconnect the connectors.
- (b) Remove the 4 steering column set nuts.
- (c) Pull out the steering column assembly with universal joint No. 2.

**13. DISCONNECT UNIVERSAL JOINT NO. 2**

- (a) Place matchmarks on the steering column assembly and universal joint No. 2.
- (b) Remove the bolt, universal joint No. 2, column hole cover and column hole cover No. 2.

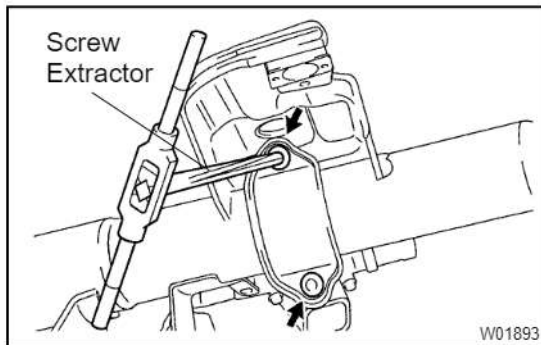
DISASSEMBLY

NOTICE:

When using a vise, do not overtighten it.

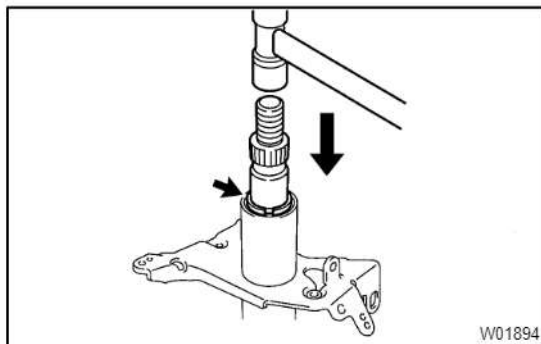
1. REMOVE TRANSPONDER KEY COIL WITH KEY CYLINDER LAMP ASSEMBLY

- (a) Remove the screw and transponder key coil with key cylinder lamp assembly.
- (b) Remove the key cylinder lamp assembly from the transponder key coil.



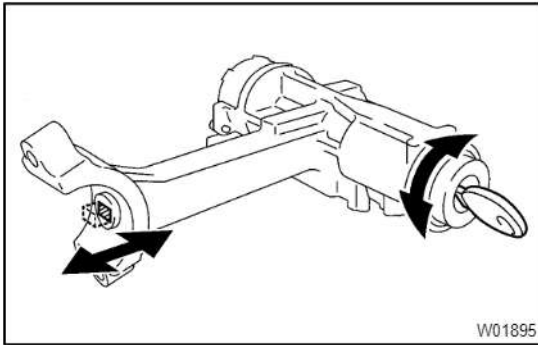
2. REMOVE COLUMN UPPER BRACKET AND COLUMN UPPER CLAMP

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



3. REMOVE MAIN SHAFT ASSEMBLY

- (a) Using a snap ring expander, remove the snap ring from the shaft assembly.
- (b) Using a plastic hammer, tap out the shaft assembly from the column tube.
- (c) Using a snap ring expander, remove the snap ring from the shaft assembly.



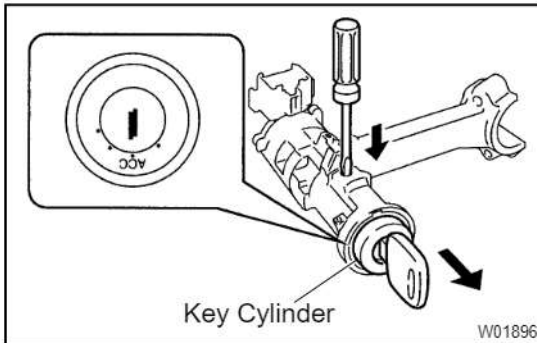
INSPECTION

NOTICE:

When using a vise, do not overtighten it.

1. INSPECT STEERING LOCK OPERATION

Check that the steering lock mechanism operates properly.



2. IF NECESSARY, REPLACE KEY CYLINDER

- Place the ignition key at the ACC position.
- Using a screwdriver, push down the stop pin of the key cylinder, and pull out the key cylinder.
- Install a new key cylinder.

HINT:

Make sure the key is at the ACC position.

3. INSPECT IGNITION SWITCH (See page [BE-12](#))

4. IF NECESSARY, REPLACE IGNITION SWITCH

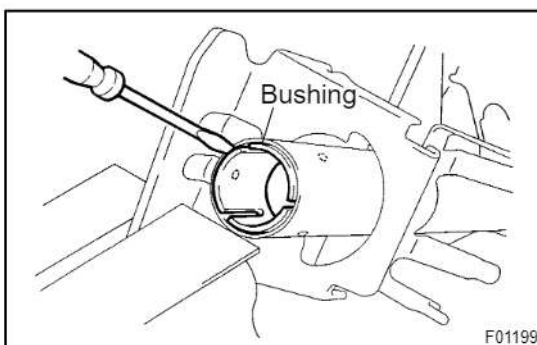
- Remove the 2 screws and ignition switch.
- Install a new ignition switch with the 2 screws.

5. INSPECT KEY UNLOCK WARNING SWITCH (See page [BE-12](#))

6. INSPECT KEY INTERLOCK SOLENOID (See page [AT-16](#))

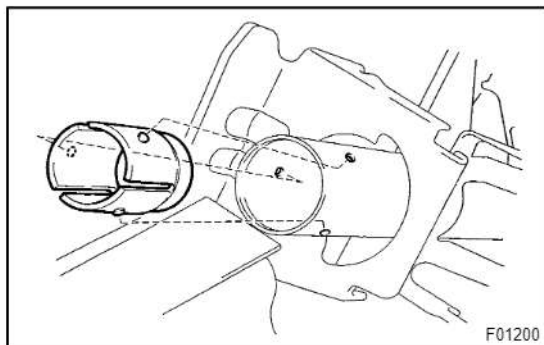
7. IF NECESSARY, REPLACE KEY UNLOCK WARNING SWITCH WITH KEY INTERLOCK SOLENOID

- Remove the 4 screws and key unlock warning switch with key interlock solenoid.
- Install a new key unlock warning switch and key interlock solenoid with the 4 screws.

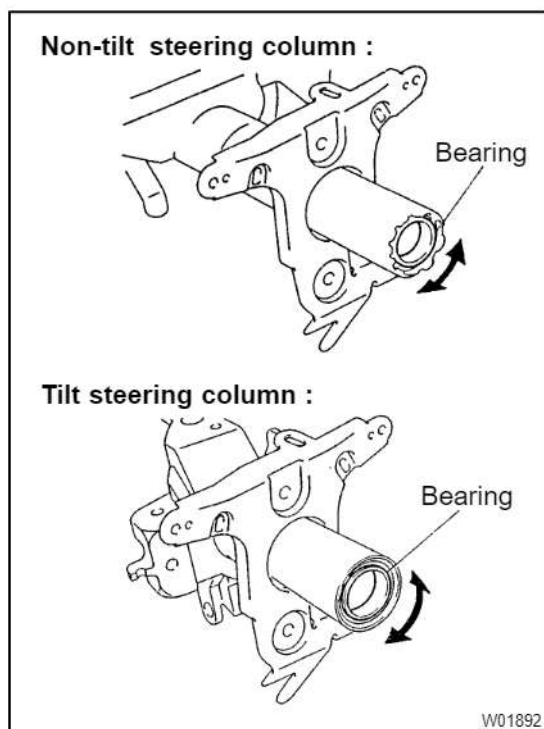


8. IF NECESSARY, REPLACE BUSHING

- Using a screwdriver, loosen the 3 projections of the bushing, and remove the bushing from the column tube.



- (b) Coat the inside of a new bushing with molybdenum disulfide lithium base grease.
- (c) Align the projections on the bushing with the holes in the column tube, then install the bushing until the projections are firmly engaged in the holes.

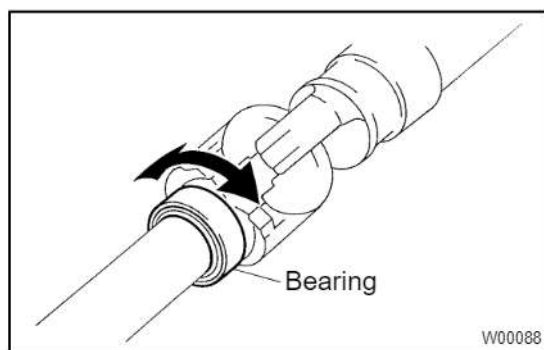


9. INSPECT BEARING

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

If the bearing is worn or damaged, replace the column tube/column upper tube.

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



10. Tilt steering column: INSPECT BEARING

- (a) Check the bearing rotation condition of the main shaft assembly and check for abnormal noise.

If necessary, replace bearing.

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

11. INSPECT TRANSPONDER KEY COIL (See page [BE-172](#))

12. IF NECESSARY, REPLACE TRANSPONDER KEY COIL

13. IF NECESSARY, REPLACE TRANSPONDER KEY AMPLIFIER

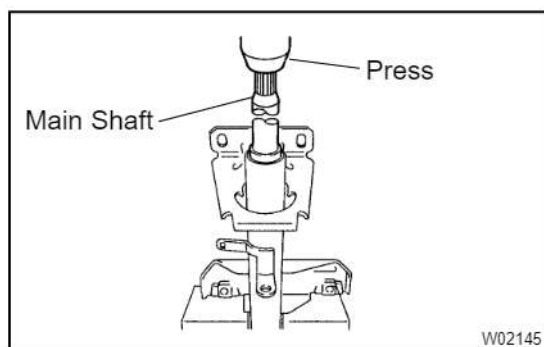
- (a) Remove the screw and transponder key amplifier.
- (b) Install a new transponder key amplifier with the screw.

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-11](#))



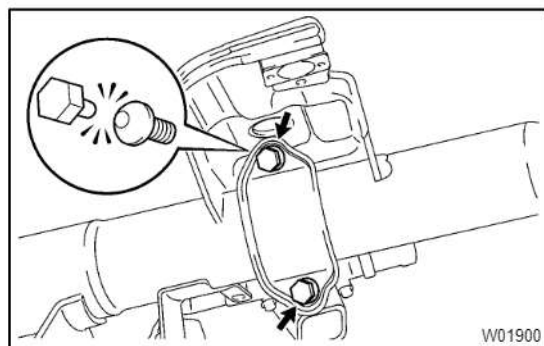
2. INSTALL MAIN SHAFT ASSEMBLY

- (a) Using a snap ring expander, install a new snap ring to the shaft assembly.
- (b) Install the main shaft assembly to the column tube.
If the shaft can not be installed by hand, use a press.

NOTICE:

Do not apply too much pressure.

- (c) Using a snap ring expander, install a new snap ring to the shaft assembly.

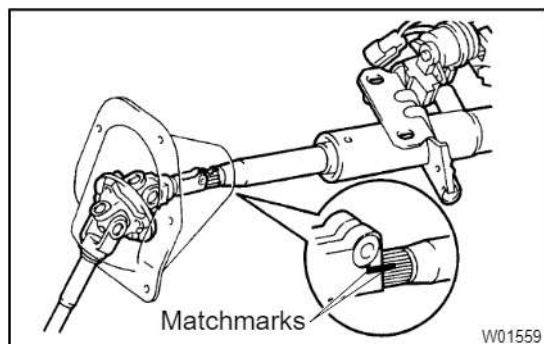


3. INSTALL COLUMN UPPER BRACKET AND COLUMN UPPER CLAMP

- (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.

4. INSTALL KEY CYLINDER LAMP ASSEMBLY AND TRANSPONDER KEY COIL

- (a) Install the key cylinder lamp assembly to the transponder key coil.
- (b) Install the transponder key coil and key cylinder lamp assembly with the screw.



INSTALLATION

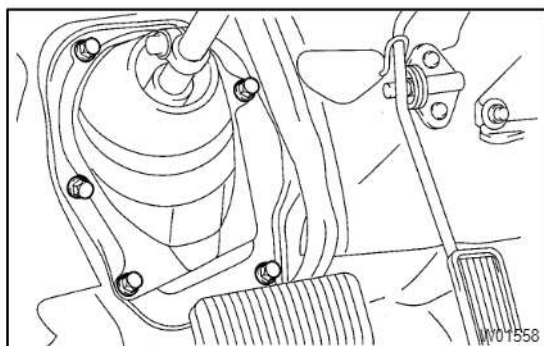
1. CONNECT UNIVERSAL JOINT NO. 2

- Insert the column hole cover and column hole cover No. 2.
- Align the matchmarks on the column assembly and universal joint No. 2.
- Install the bolt.

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

2. INSTALL STEERING COLUMN ASSEMBLY WITH UNIVERSAL JOINT NO. 2

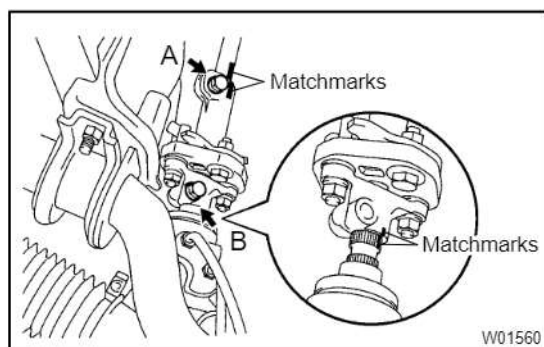
- Install the steering column assembly with universal joint No. 2.
- Install the 4 steering column set nuts.
Torque: 26 N·m (260 kgf·cm, 19 ft·lbf)
- Connect the connectors.



3. INSTALL COLUMN HOLE COVER AND COLUMN HOLE COVER NO. 2

Install the column hole cover and column hole cover No. 2 to body with the 5 bolts.

Torque: 8.0 N·m (80 kgf·cm, 69 ft·lbf)



4. INSTALL INTERMEDIATE SHAFT NO. 2

- Align the matchmarks on the universal joint No. 2 and intermediate shaft No. 2.
- Align the matchmarks on the control valve shaft and intermediate shaft No. 2.
- Install the bolt "A" and "B".

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

5. INSTALL BRAKE PEDAL RETURN SPRING

6. INSTALL SPIRAL CABLE (See page [BE-14](#))

7. INSTALL COMBINATION SWITCH WITH SPIRAL CABLE

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

8. INSTALL NO. 2 HEATER TO REGISTER DUCT

Install the No. 2 heater to register duct with the screw.

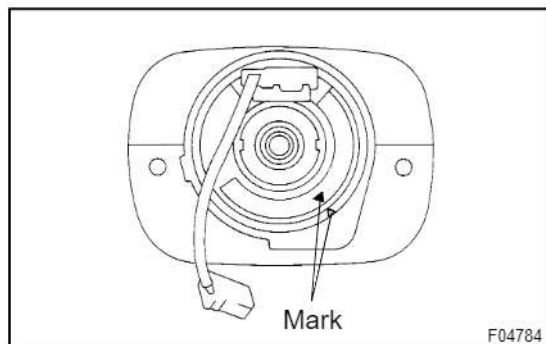
9. INSTALL STARTER SWITCH BEZEL

10. INSTALL LOWER LH FINISH PANEL

- (a) Install the lower LH finish panel with the 4 bolts.
- (b) Connect the fuel lid release lever with the 2 screws
- (c) Connect the hood lock release lever with the 2 screws.

11. INSTALL UPPER AND LOWER COLUMN COVERS

Install the upper and lower column covers with the 3 screws.

**12. CENTER SPIRAL CABLE**

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

HINT:

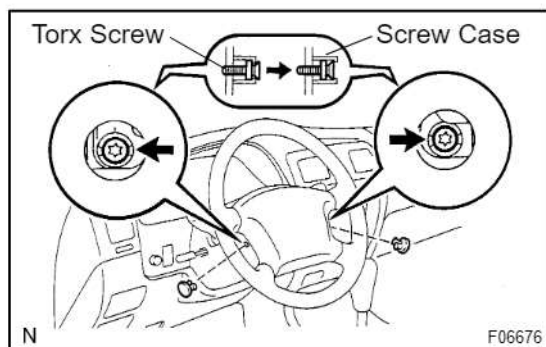
The spiral cable will rotate about 2.5 turns to either left or right of the center.

13. INSTALL STEERING WHEEL

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

14. 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 to the specified torque.**
- **If the wheel pad has been dropped, or there are cracks, dents or other defects in 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 are not pinched between other parts.**

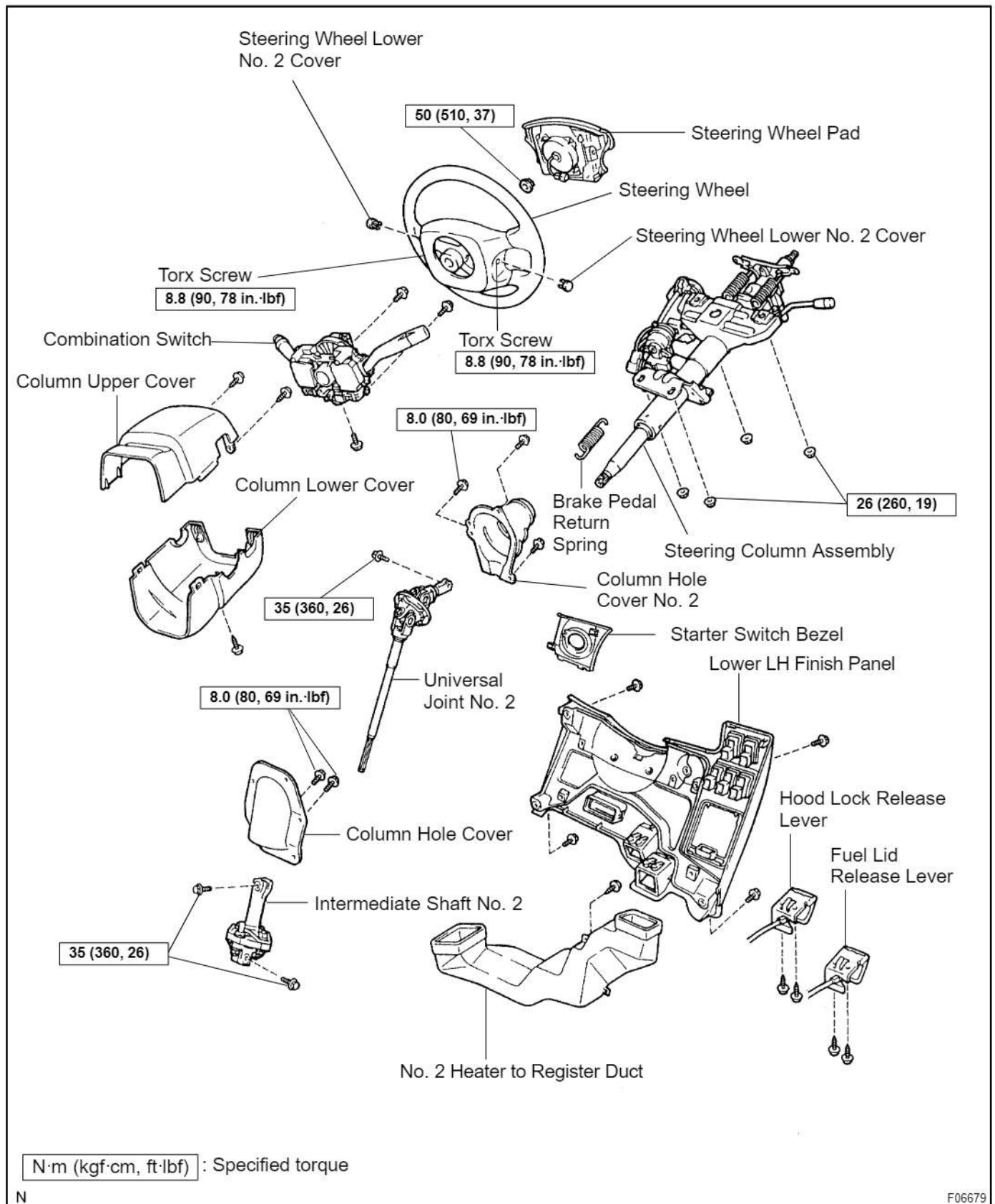


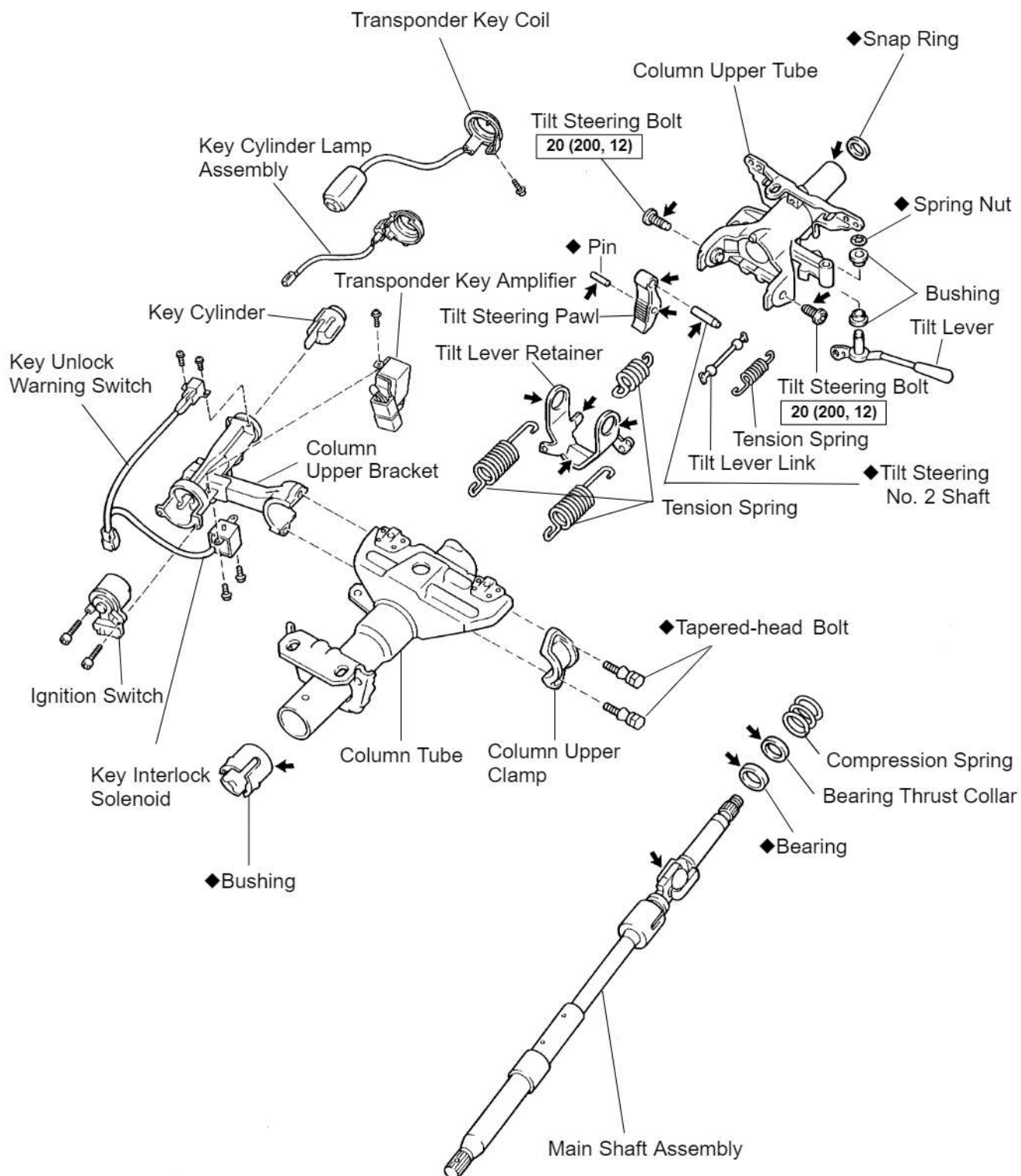
- (a) Connect the airbag connector.
- (b) Install the wheel pad after confirming that the circumference groove of the torx screw is caught on the screw case.
- (c) Using a torx socket wrench, torque the 2 screws.
Torque: 8.8 N·m (90 kgf·cm, 78 in·lbf)
- (d) Install the 2 steering wheel lower No. 2 covers.

15. CHECK STEERING WHEEL CENTER POINT

TILT STEERING COLUMN COMPONENTS

SR025-03





N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

◀ Molybdenum disulfide lithium base grease

F13534

REMOVAL

(See page [SR-13](#))

DISASSEMBLY

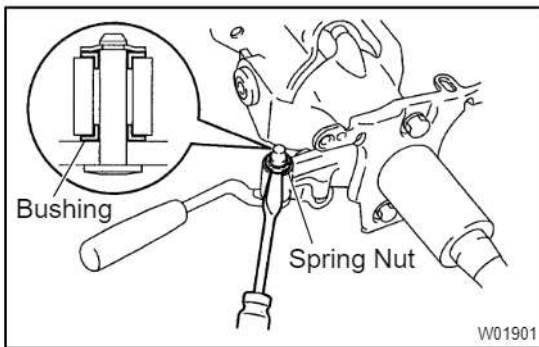
NOTICE:

When using a vise, do not overtighten it.

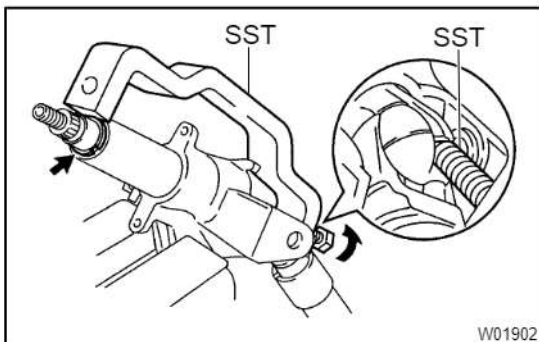
1. **REMOVE TRANSPONDER KEY COIL WITH KEY CYLINDER LAMP ASSEMBLY**
 - (a) Remove the screw and transponder key coil with key cylinder lamp assembly.
 - (b) Remove the key cylinder lamp assembly from the transponder key coil.
2. **REMOVE COLUMN UPPER BRACKET AND COLUMN UPPER CLAMP (See page SR-16)**
3. **REMOVE 3 TENSION SPRINGS**

HINT:

Remove the tension springs with the tilt function at maximum tilt up.



4. **REMOVE TILT LEVER**
 - (a) Using a screwdriver, remove the spring nut.
 - (b) Remove the tilt lever.
 - (c) Remove the 2 bushings from the column upper tube.
5. **REMOVE TILT LEVER LINK**
6. **REMOVE COLUMN UPPER TUBE WITH MAIN SHAFT ASSEMBLY**
 - (a) Using a hexagon wrench, remove the 2 tilt steering bolts.
 - (b) Remove the column upper tube with the main shaft assembly from the column tube.
7. **REMOVE TILT LEVER RETAINER**

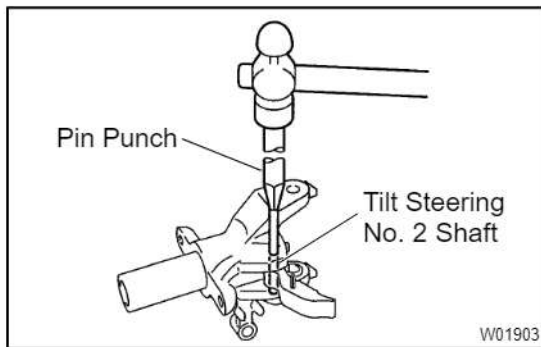


8. **REMOVE MAIN SHAFT ASSEMBLY**
 - (a) Using SST, compress the compression spring.
SST 09950-4001 1 (09958-04011)

NOTICE:

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

- (b) Using a snap ring expander, remove the snap ring from the shaft.
- (c) Remove the shaft assembly from the column upper tube.
- (d) Remove the compression spring and bearing thrust collar from the main shaft.

**9. REMOVE TILT STEERING PAWL**

- (a) Using a pin punch and hammer, tap out the tilt steering No. 2 shaft.
- (b) Remove the steering pawl from the column upper tube.
- (c) Remove the pin from the steering pawl.

INSPECTION

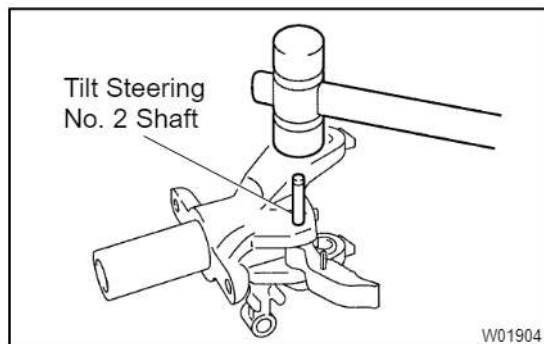
(See page [SR-17](#))

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-22](#))

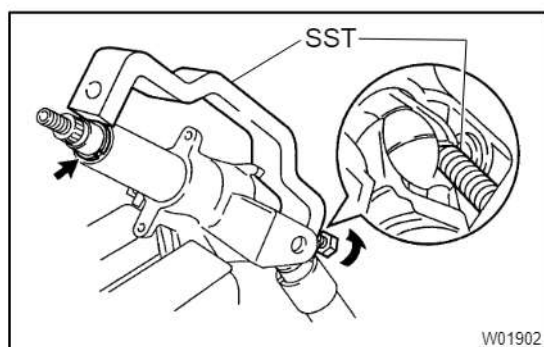


2. INSTALL TILT STEERING PAWL

- (a) Install a new pin to the steering pawl.
- (b) Install the steering pawl to the column upper tube.
- (c) Using a plastic hammer, tap in a new tilt steering No. 2 shaft.

NOTICE:

Tap the shaft completely into the steering column upper tube.



3. INSTALL MAIN SHAFT ASSEMBLY

- (a) Install the bearing thrust collar and compression spring to the main shaft.
- (b) Install the main shaft assembly to the column upper tube.
- (c) Using SST, compress the compression spring.
SST 09950-4001 1 (09958-04011)

NOTICE:

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

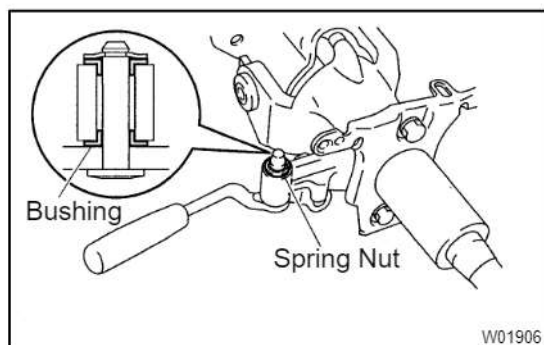
- (d) Using a snap ring expander, install a new snap ring to the main shaft.

4. INSTALL TILT LEVER RETAINER

5. INSTALL COLUMN UPPER TUBE WITH MAIN SHAFT ASSEMBLY

- (a) Install the column upper tube with main shaft to the column tube.
- (b) Using a hexagon wrench, torque the 2 tilt steering bolts.
Torque: 20 N·m (200 kgf·cm, 14 ft·lbf)
- (c) Check that the upper tube turns smoothly.

6. INSTALL TILT LEVER LINK



7. INSTALL TILT LEVER

- (a) Install the 2 bushings and tilt lever to the column upper tube, as shown in the illustration.
- (b) Install a new spring nut to the tilt lever.

8. INSTALL 3 TENSION SPRINGS**HINT:**

Install the tension springs with the tilt function at maximum tilt up.

9. INSTALL COLUMN UPPER BRACKET AND COLUMN UPPER CLAMP (See page [SR-19](#))**10. INSTALL KEY CYLINDER LAMP ASSEMBLY AND TRANSPONDER KEY COIL**

- (a) Install the key cylinder lamp assembly to the transponder key coil.
- (b) Install the transponder key coil and key cylinder lamp assembly with the screw.

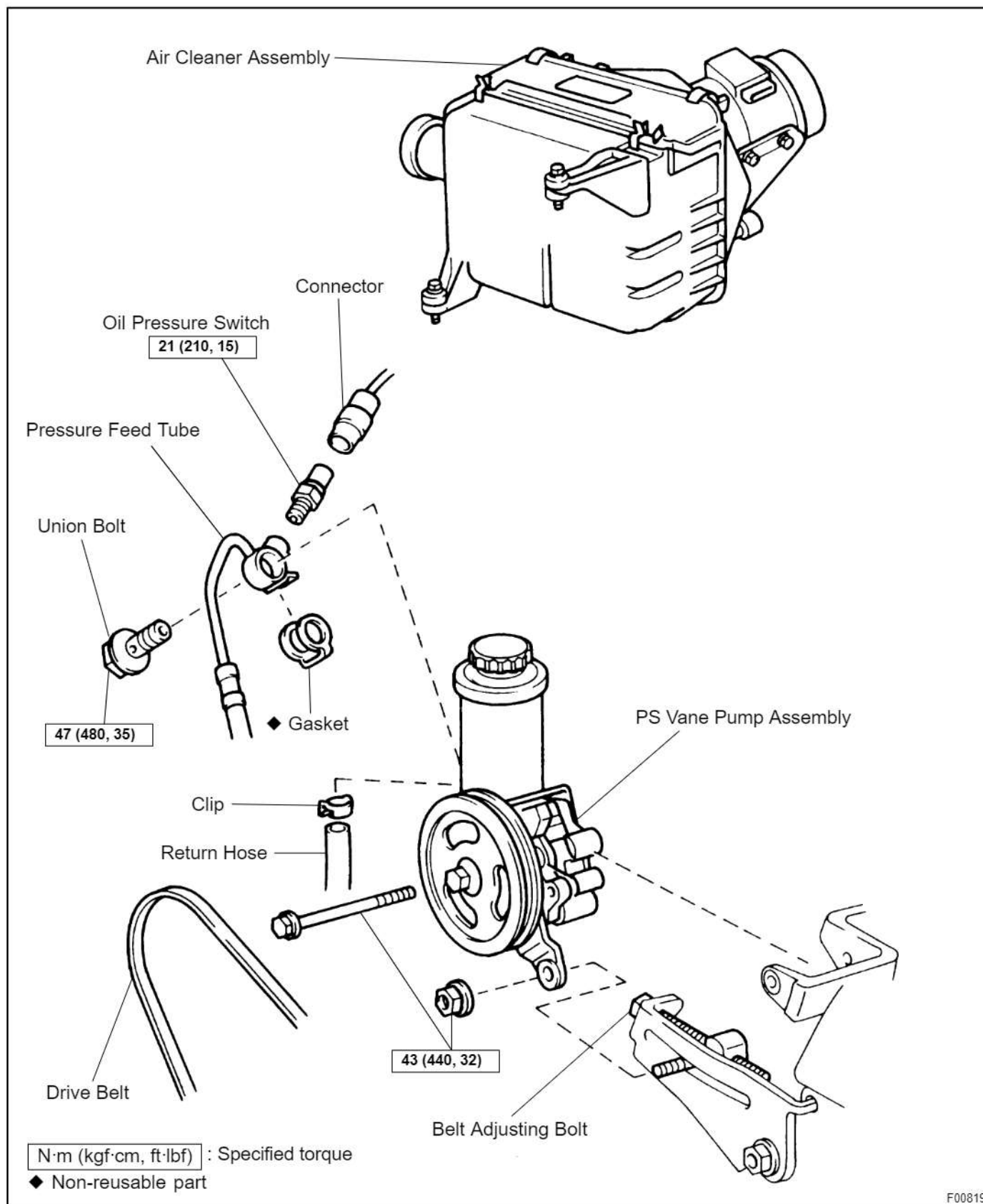
11. CHECK TILT STEERING OPERATION

INSTALLATION

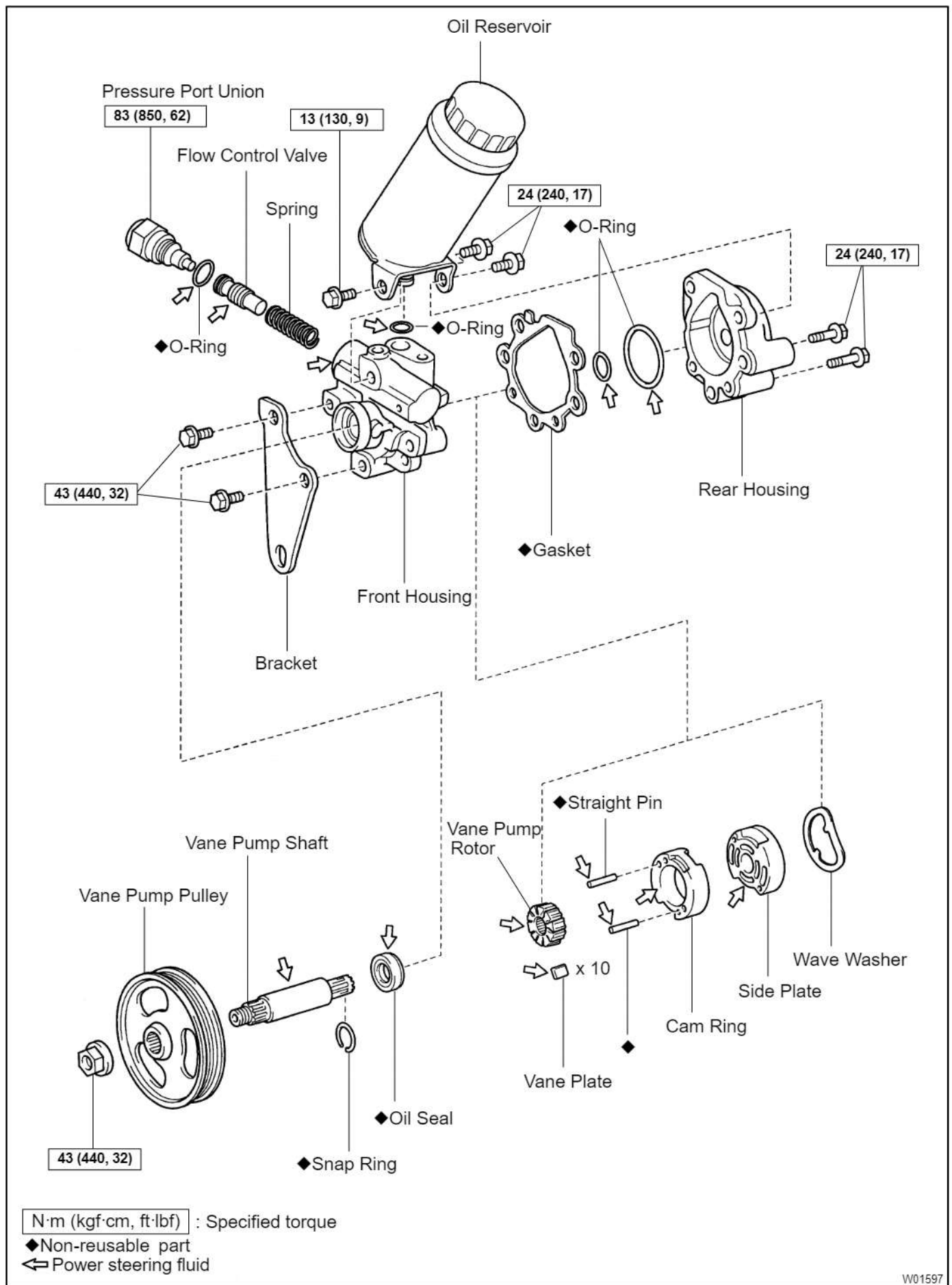
(See page [SR-20](#))

POWER STEERING VANE PUMP COMPONENTS

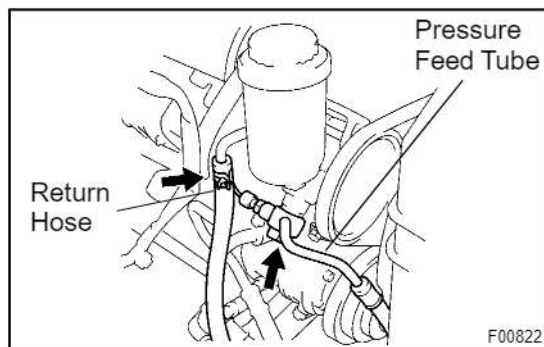
SR02H-04



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W01597



REMOVAL

1. REMOVE AIR CLEANER ASSEMBLY

Remove the 3 bolts and air cleaner assembly.

2. DISCONNECT RETURN HOSE

Remove the clip and disconnect the return hose.

NOTICE:

Take care not to spill fluid on the drive belt.

3. REMOVE OIL PRESSURE SWITCH

- Disconnect the connector.
- Remove the oil pressure switch from the pressure feed tube.

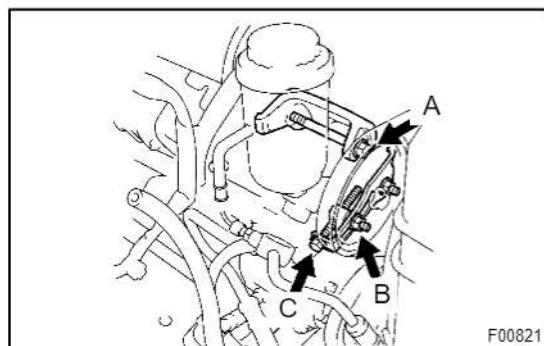
NOTICE:

Be careful not to drop the switch.

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

4. DISCONNECT PRESSURE FEED TUBE

Remove the union bolt and gasket, and disconnect the pressure feed tube from the PS vane pump assembly.

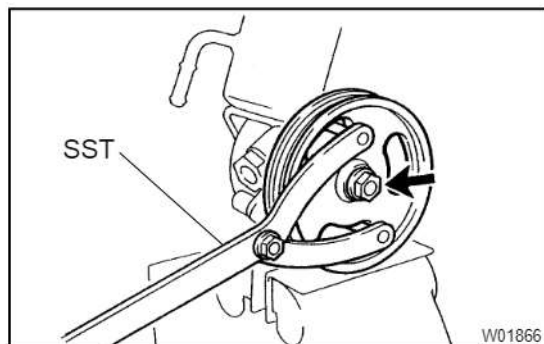
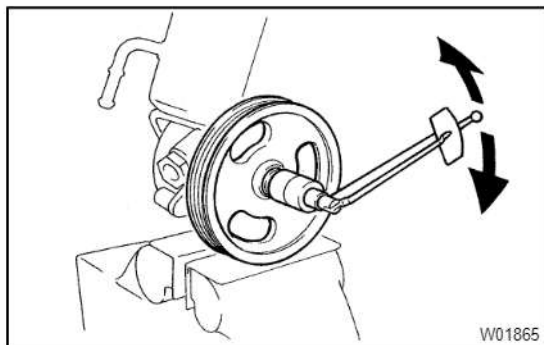


5. REMOVE DRIVE BELT

- Loosen the bolt "A" and nut "B".
- Loosen the bolt "C".

6. REMOVE PS VANE PUMP ASSEMBLY

Remove the bolt "A", nut "B" 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:

0.27 N·m (2.8 kgf·cm, 2.4 in.-lbf) or less

2. REMOVE VANE PUMP PULLEY

- (a) Using SST to stop the pulley rotating, loosen the nut.
SST 09960-10010 (09962-01000, 09963-01000)
- (b) Remove the nut and vane pump pulley from the vane pump shaft.

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 BRACKET

Remove the 2 bolts and bracket.

6. REMOVE REAR HOUSING

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

7. REMOVE WAVE WASHER

8. REMOVE SIDE PLATE

9. REMOVE GASKET

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

- (a) Using a screwdriver, remove the snap ring from the vane pump shaft.
- (b) Remove the cam ring, 10 vane plates and vane pump rotor.

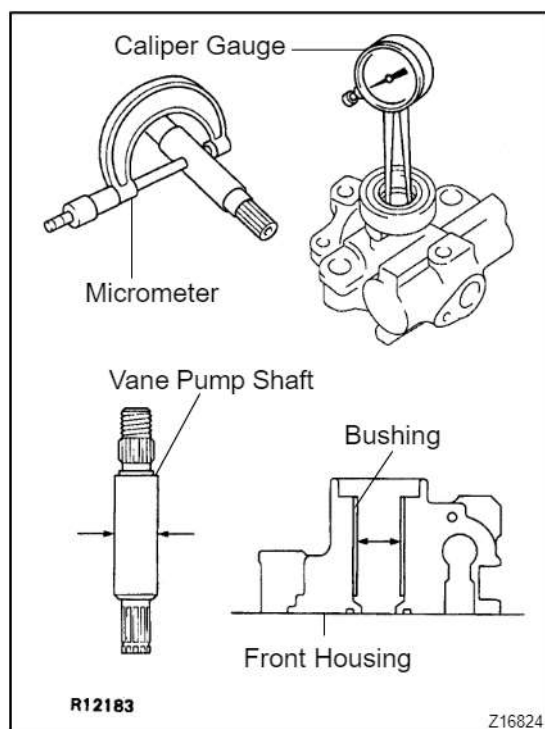
NOTICE:

Take care not to drop the vane plate.

11. REMOVE VANE PUMP SHAFT

12. REMOVE STRAIGHT PINS

Remove the 2 straight pins from the front housing.



INSPECTION

NOTICE:

When using a vise, do not overtighten it.

1. CHECK OIL CLEARANCE BETWEEN VANE PUMP SHAFT AND BUSHING

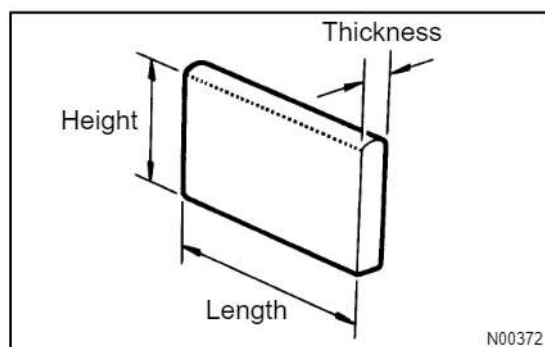
Using a micrometer and caliper gauge, measure the oil clearance.

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.



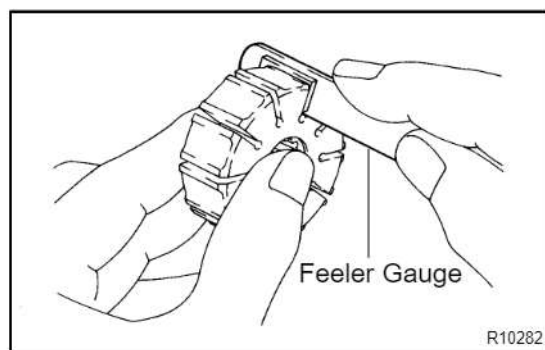
2. INSPECT VANE PUMP ROTOR AND VANE PLATES

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

Minimum height: 8.6 mm (0.339 in.)

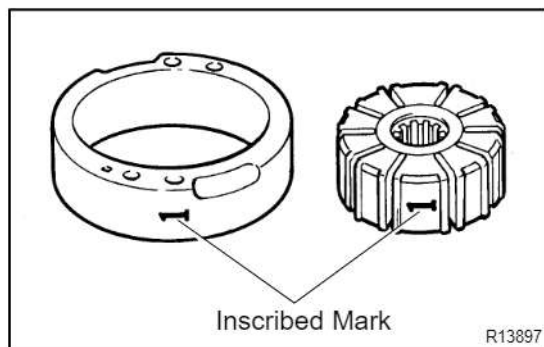
Minimum thickness: 1.397 mm (0.0550 in.)

Minimum length: 14.991 mm (0.5902 in.)



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

Maximum clearance: 0.035 mm (0.0014 in.)



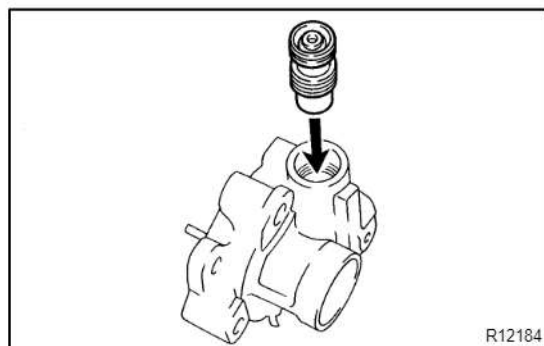
If it is more than the maximum, replace the vane plate and/or vane pump rotor with one having the same mark stamped on the cam ring.

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

HINT:

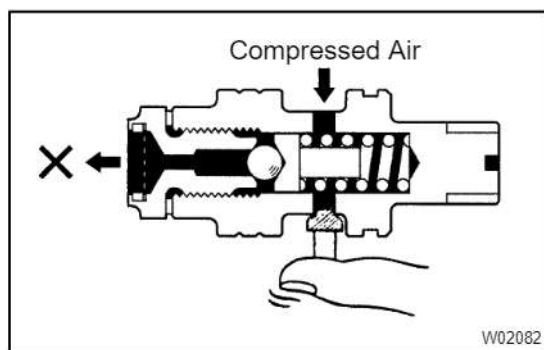
There are 5 vane plate lengths with the following vane pump rotor and cam ring marks:

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)

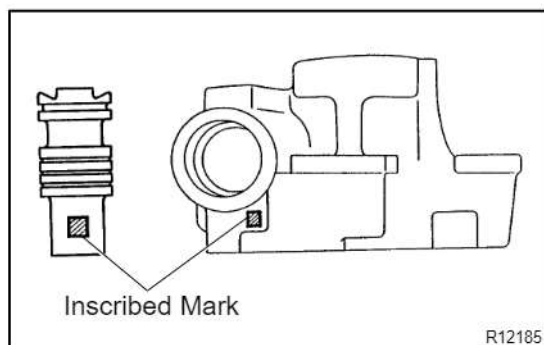


3. INSPECT FLOW CONTROL VALVE

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

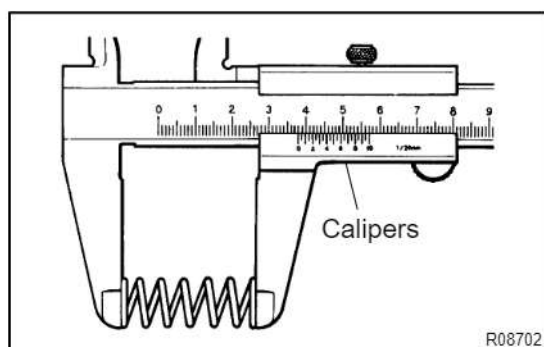


- (b) Check the flow control valve for leakage. Close one of the holes and apply 392 - 490 kPa (4 - 5 kgf/cm², 57 - 71 psi) of compressed air into the opposite side hole, and confirm that air does not come out from the end hole.



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

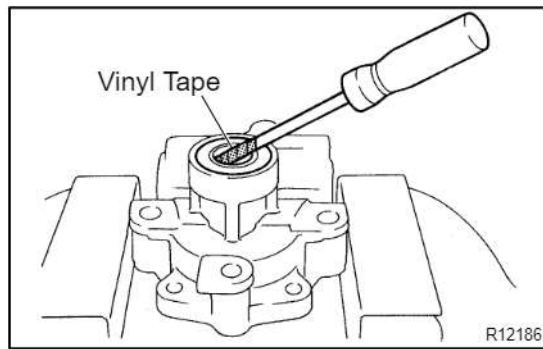


4. INSPECT SPRING

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

Minimum free length: 33.2 mm (1.307 in.)

If it is not within specification, replace the spring.



REPLACEMENT

NOTICE:

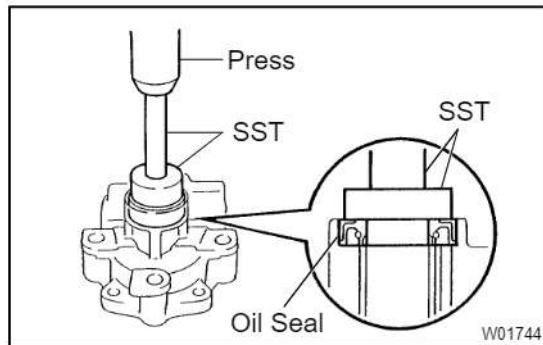
When using a vise, do not overtighten it.

IF NECESSARY, REPLACE OIL SEAL

- (a) Using a screwdriver with vinyl tape wound around its tip, remove the oil seal.

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.

REASSEMBLY

NOTICE:

When using a vise, do not overtighten it.

1. COAT PARTS INDICATED BY ARROWS WITH POWER STEERING FLUID (See page [SR-31](#))

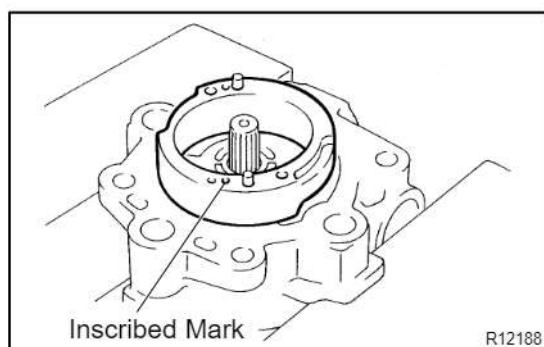
2. INSTALL STRAIGHT PINS

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

NOTICE:

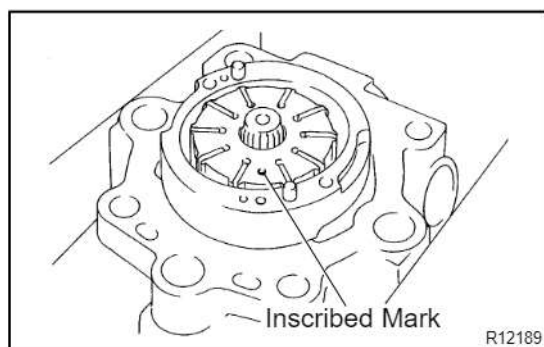
Be careful not to damage the straight pins.

3. INSTALL VANE PUMP SHAFT



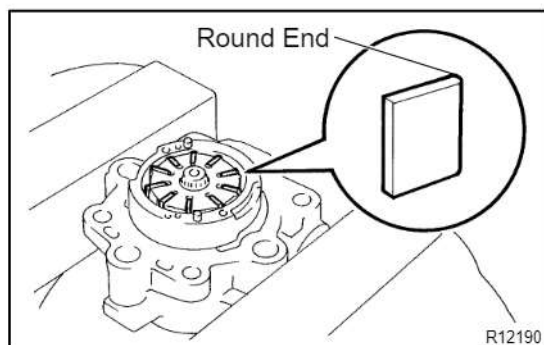
4. INSTALL CAM RING

Align the holes of the cam ring and 2 straight pins, and install the cam ring with the inscribed mark facing outward.



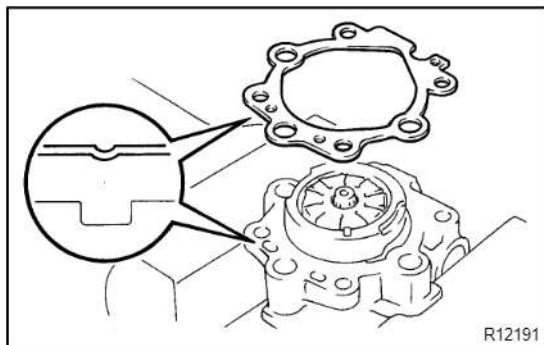
5. INSTALL VANE PUMP ROTOR

- (a) Install the vane pump rotor with the inscribed mark facing outward.
- (b) Install a new snap ring to the vane pump shaft.



6. INSTALL VANE PLATES

Install the 10 vane plates with the round end facing outward.



7. INSTALL GASKET

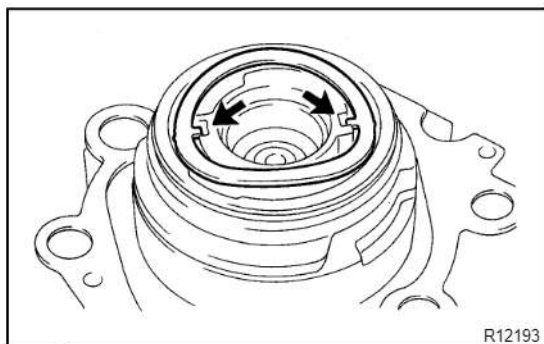
Install a new gasket on the front housing.

NOTICE:

Make sure that the gasket is installed facing in the correct direction.

8. INSTALL SIDE PLATE

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



9. INSTALL WAVE WASHER

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

10. INSTALL REAR HOUSING

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

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

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

11. 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-31](#)).

(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, 62 ft·lbf)

12. INSTALL BRACKET

Install the bracket with the 2 bolts.

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

13. INSTALL OIL RESERVOIR

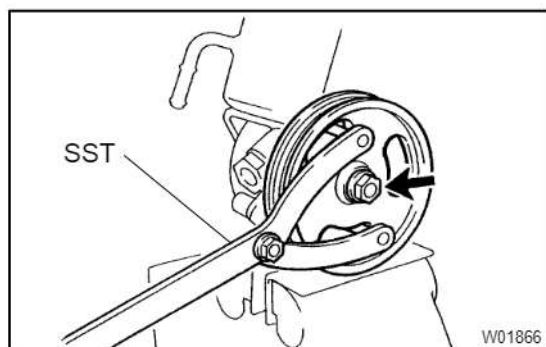
(a) Coat a new O-ring with power steering fluid and install it to the oil reservoir.

(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)



14. INSTALL VANE PUMP PULLEY

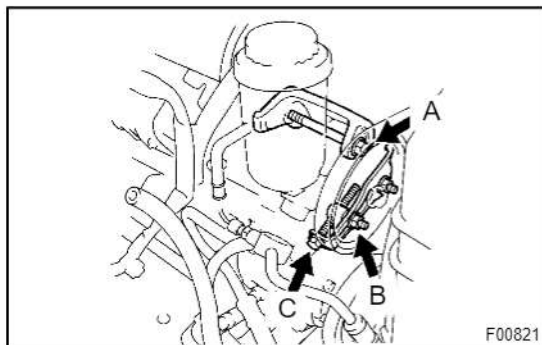
(a) Install the vane pump pulley and nut to the vane pump shaft.

(b) Using SST to stop the pulley rotating, torque the nut.
SST 09960-10010 (09962-01000, 09963-01000)

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

15. MEASURE PS VANE PUMP ROTATING TORQUE

(See page [SR-34](#))



INSTALLATION

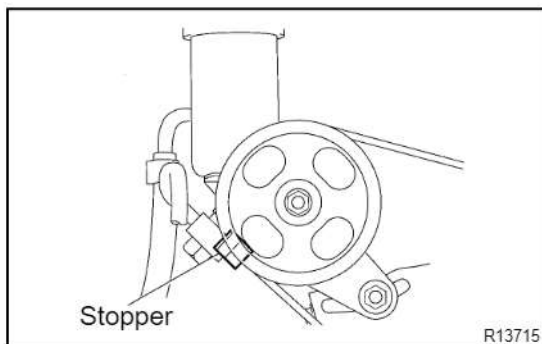
1. INSTALL PS VANE PUMP ASSEMBLY

Install the PS vane pump assembly, temporarily tighten the bolt "A" and nut "B".

2. INSTALL DRIVE BELT

- Tightening the bolt "C", adjust drive belt tension (See page [SR-3](#)).
- Torque the bolt "A" and nut "B".

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



3. CONNECT PRESSURE FEED TUBE

- Install a new gasket and the union bolt to the pressure feed tube.
- Connect the pressure feed tube.

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: 47 N·m (480 kgf·cm, 35 ft·lbf)

4. INSTALL OIL PRESSURE SWITCH

- Install the oil pressure switch to the pressure feed tube.
- Connect the connector.

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

NOTICE:

Be careful to prevent oil from being attached to the connector.

5. CONNECT RETURN HOSE

- Connect the return hose.
- Install the clip.

6. INSTALL AIR CLEANER ASSEMBLY

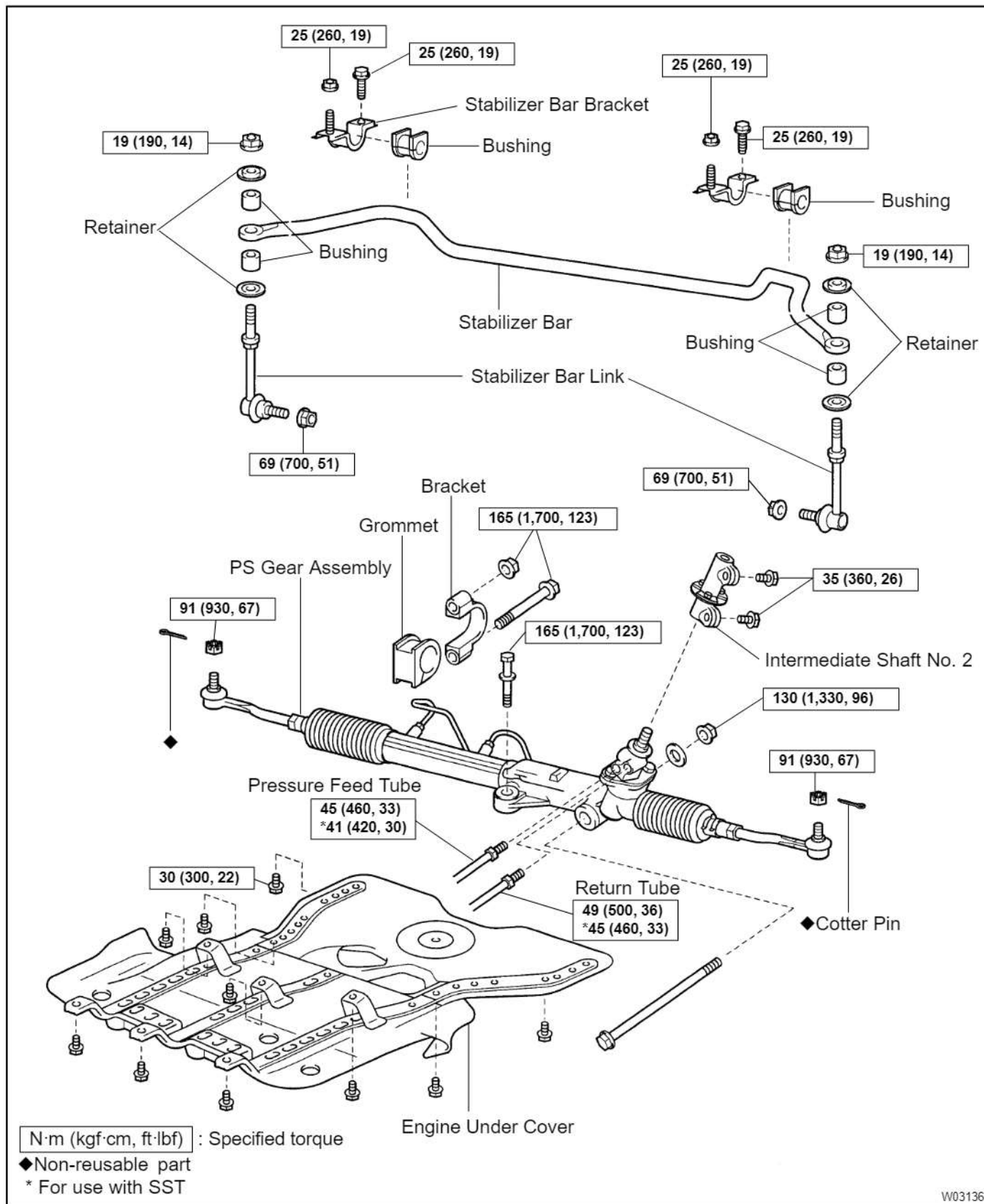
Install the air cleaner assembly with the 3 bolts.

7. BLEED POWER STEERING SYSTEM

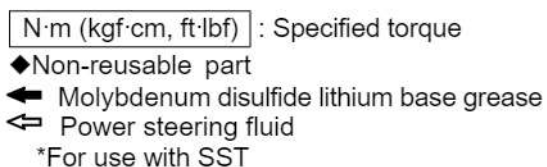
(See page [SR-4](#))

POWER STEERING GEAR COMPONENTS

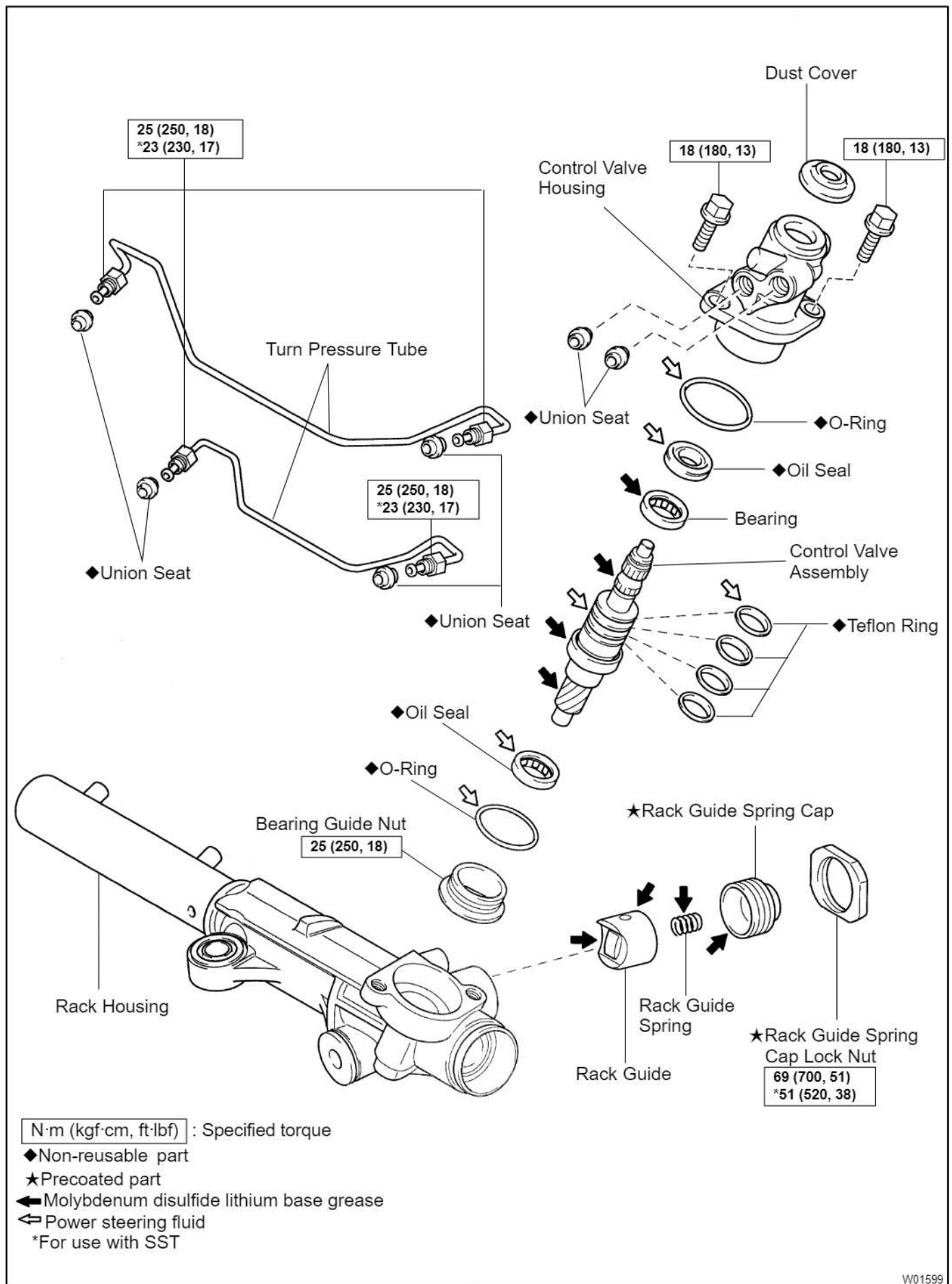
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REMOVAL

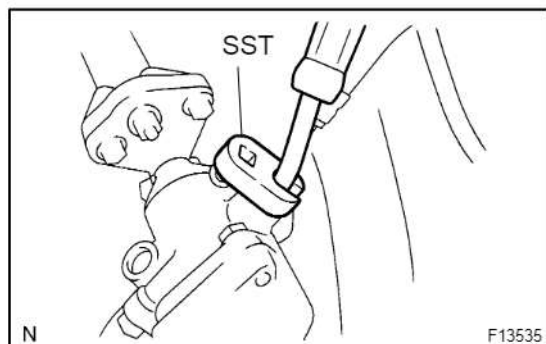
NOTICE:

Remove the steering wheel assembly before the steering gear removal, because there is possibility of breaking of the spiral cable.

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 ENGINE UNDER COVER

Remove the 10 bolts and engine under cover.

5. REMOVE STABILIZER BAR
(See page [SA-76](#))
6. DISCONNECT RH AND LH TIE ROD ENDS
(See page [SA-72](#))
7. DISCONNECT INTERMEDIATE SHAFT NO. 2
(See page [SR-13](#))

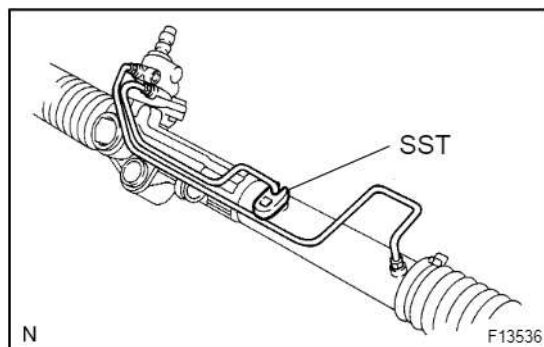


8. DISCONNECT PRESSURE FEED AND RETURN TUBES

Using SST, disconnect the tube.

SST 09023-38400

9. REMOVE PS GEAR ASSEMBLY
 - (a) Remove the bolt and nut from the bracket.
 - (b) Remove the 2 set bolts, nut, washer and PS gear assembly.
10. REMOVE BRACKET AND GROMMET



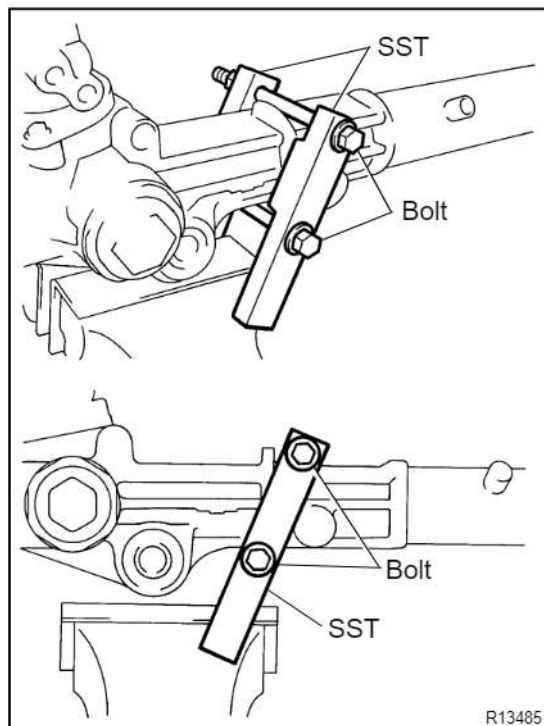
DISASSEMBLY

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
- Remove the 4 union seats from the rack housing and control valve housing.



2. SECURE PS GEAR ASSEMBLY IN VISE

Using SST and 2 bolts, secure the gear assembly in a vise, as shown in the illustration.

SST 09612-00012

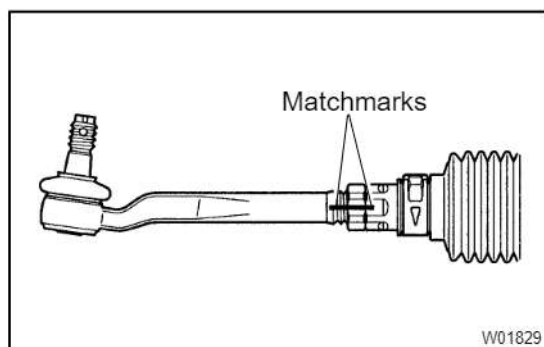
Reference:

Bolt: 90105-10346

Nut: 90170-10198

HINT:

Use 2 of the same type of SST.



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, 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

- Remove the clamp, clip and rack boot.

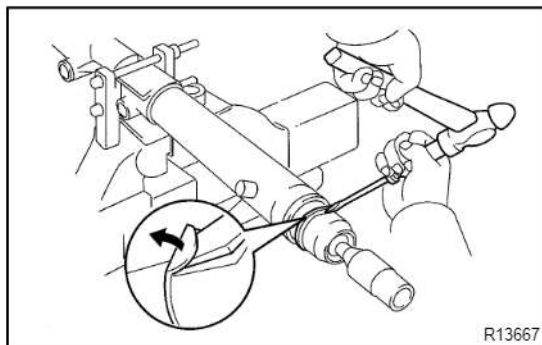
NOTICE:

Be careful not to damage the boot.

HINT:

Mark the RH and LH boots.

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

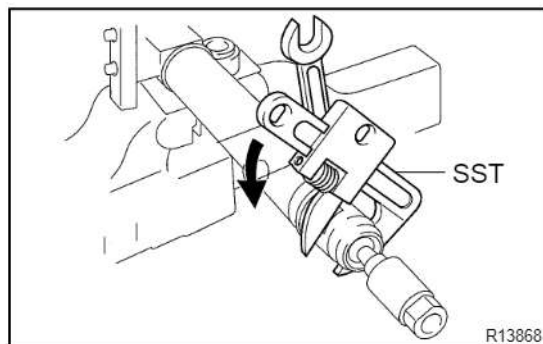


5. REMOVE RH AND LH RACK ENDS AND CLAW WASHERS

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

NOTICE:

Avoid any impact on the steering rack.



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

SST 09922-10010

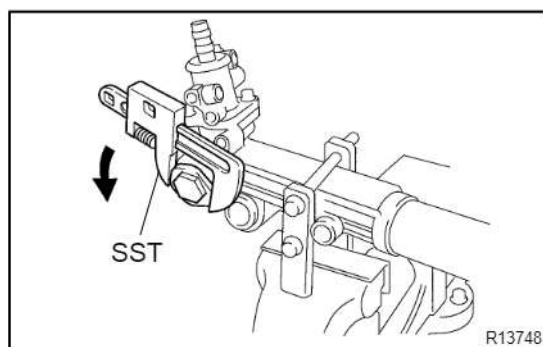
HINT:

Mark the RH and LH rack ends.

NOTICE:

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

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



6. REMOVE RACK GUIDE SPRING CAP LOCK NUT

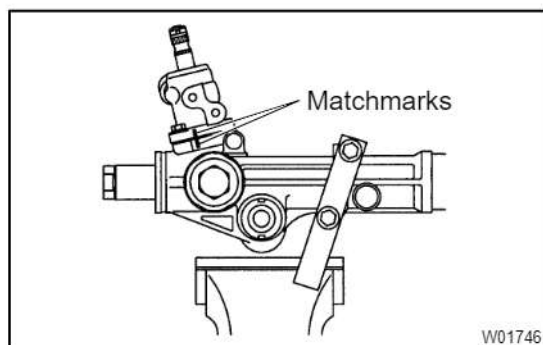
Using SST, remove the lock nut.

SST 09922-10010

NOTICE:

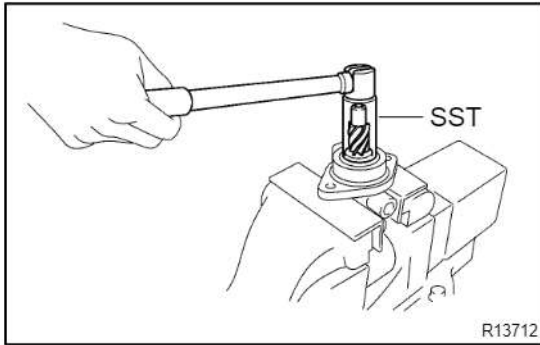
Use SST 09922-10010 in the direction shown in the illustration.

7. REMOVE RACK GUIDE SPRING CAP
8. REMOVE RACK GUIDE SPRING AND RACK GUIDE
9. REMOVE DUST COVER



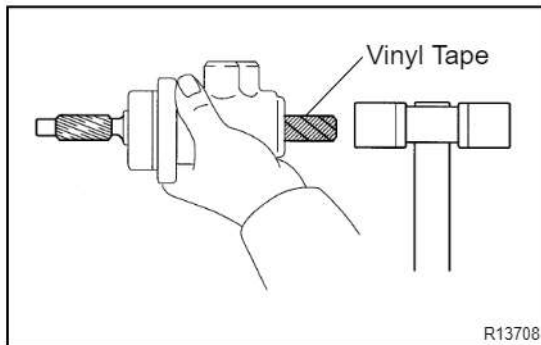
10. REMOVE CONTROL VALVE HOUSING WITH CONTROL VALVE ASSEMBLY

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



11. REMOVE CONTROL VALVE ASSEMBLY

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



- (b) Wind vinyl tape to 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:

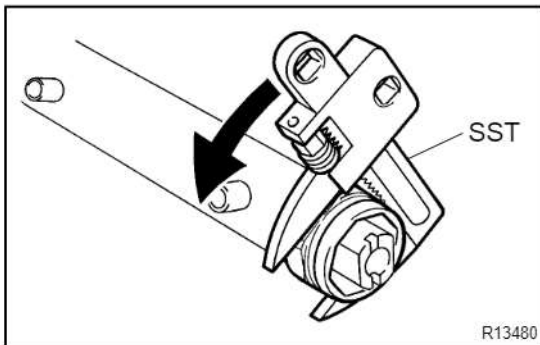
Be careful not to damage the oil seal lip.

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

NOTICE:

Be careful not to damage the oil seal lip.

- (e) Remove the O-ring from the bearing guide nut.



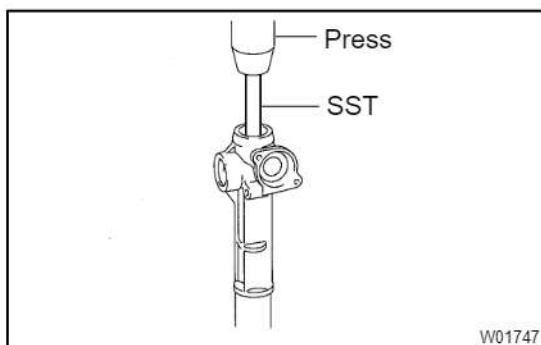
12. REMOVE CYLINDER END STOPPER

- (a) Using SST, remove the cylinder end stopper.
SST 09922-10010

NOTICE:

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

- (b) Remove the O-ring from the cylinder end stopper.



13. REMOVE STEERING RACK AND OIL SEAL

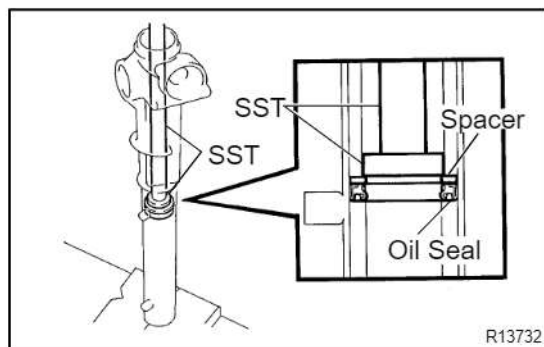
- (a) Using SST, press out the steering rack and oil seal.

NOTICE:

Take care not to drop the rack.

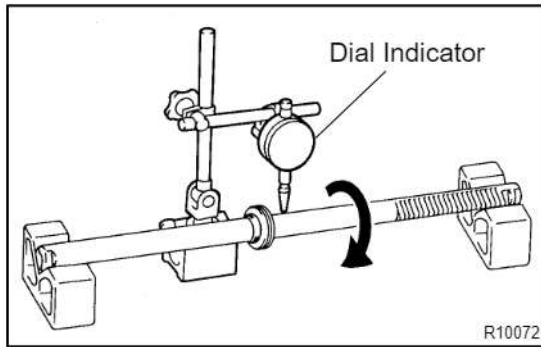
SST 09950-70010 (09951-07360)

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

**14. REMOVE OIL SEAL AND SPACER**

Using SST, press out the oil seal and spacer.

SST 09950-60010 (09951-00360),
09950-70010 (09951-07360)



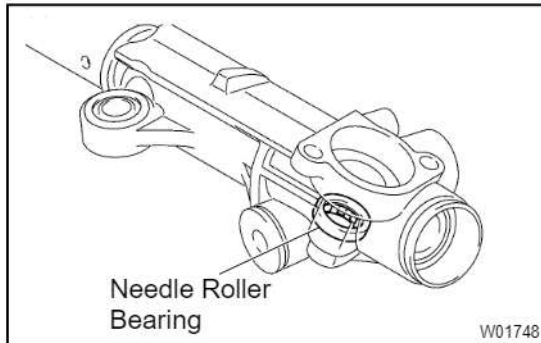
INSPECTION

1. INSPECT STEERING RACK

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

Maximum runout: 0.3 mm (0.012 in.)

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

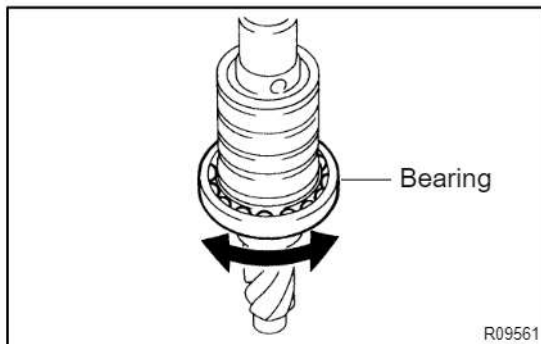


2. INSPECT BEARING

- (a) Check the needle roller bearing of the rack housing for pit-marks or damage.

If faulty, replace the rack housing.

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

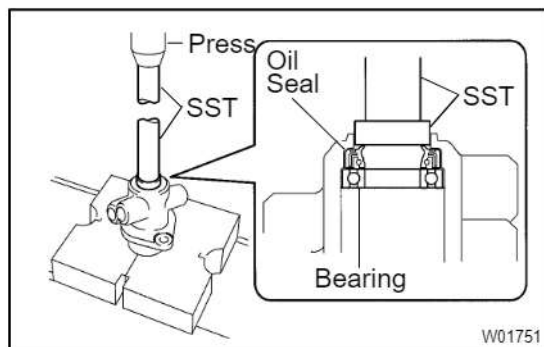


3. INSPECT BEARING

- (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.

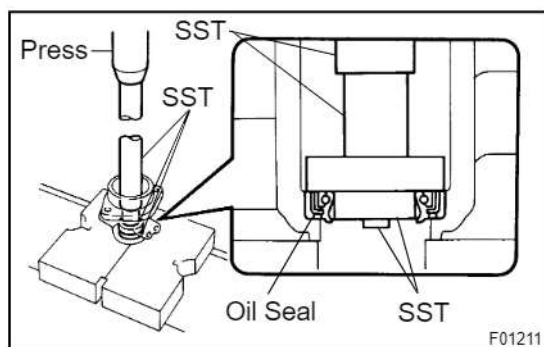


REPLACEMENT

1. IF NECESSARY, REPLACE OIL SEAL AND BEARING

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

SST 09950-60010 (09951-00260),
09950-70010 (09951-07150)



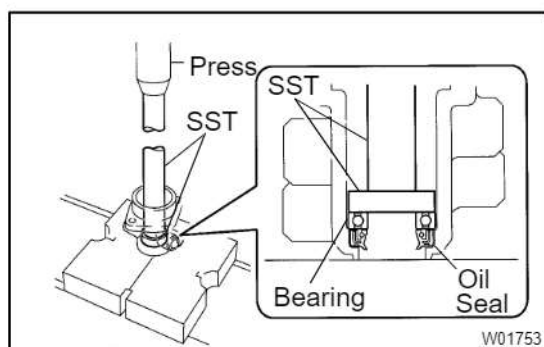
- (b) Coat a new oil seal lip with power steering fluid.

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

SST 09950-60010 (09951-00180, 09951-00330,
09952-06010), 09950-70010 (09951-07150)

NOTICE:

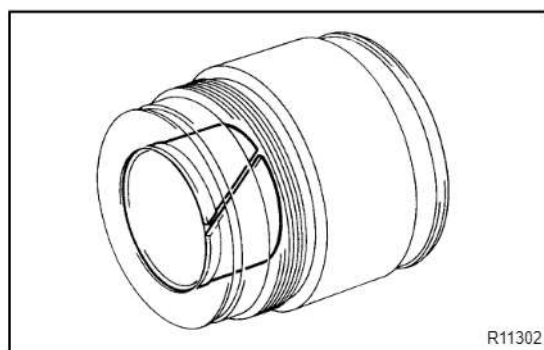
Make sure that the oil seal is installed facing in the correct direction.



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

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

SST 09950-60010 (09951-00330),
09950-70010 (09951-07150)

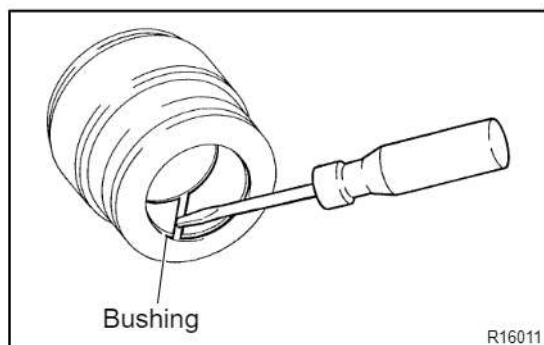


2. INSPECT BUSHING

- (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.



3. IF NECESSARY, REPLACE BUSHING

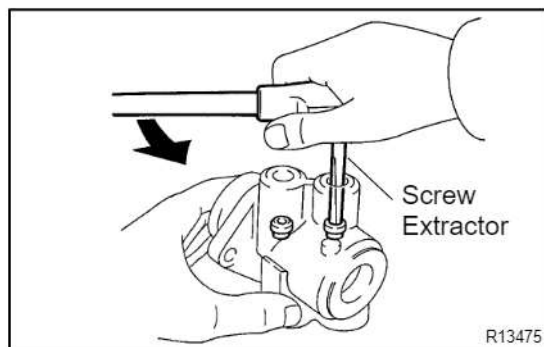
- (a) Using a screwdriver, remove the bushing from the cylinder end stopper.

NOTICE:

Be careful not to damage the cylinder end stopper.

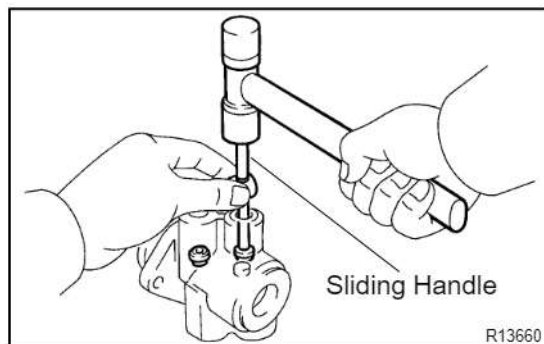
- (b) Coat the inside of a new bushing with molybdenum disulfide lithium base grease.

- (c) Install the bushing.



4. IF NECESSARY, REPLACE UNION SEATS

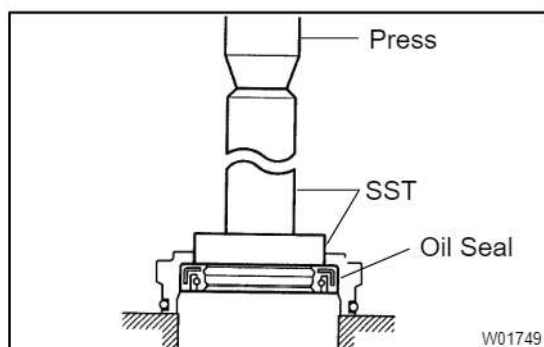
- (a) Using a screw extractor, remove the 2 union seats from the control valve housing.



- (b) Using a plastic hammer and sliding handle, lightly tap in 2 new seats.

NOTICE:

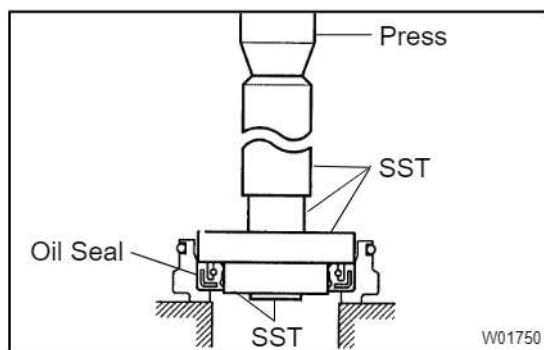
Before installing the union seat, remove dust sticking to the control valve housing.



5. IF NECESSARY, REPLACE OIL SEAL

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

SST 09950-60010 (09951-00320),
09950-70010 (09951-07100)



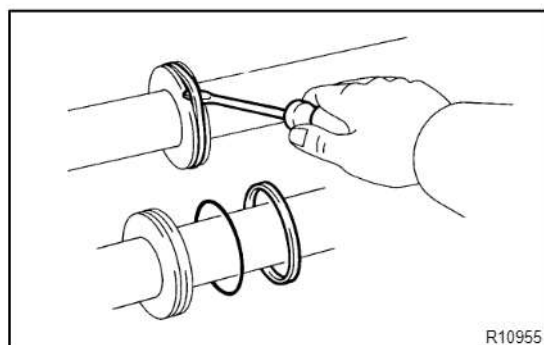
- (b) Coat a new oil seal lip with power steering fluid.

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

SST 09950-60010 (09951-00280, 09951-00360,
09952-06010), 09950-70010 (09951-07100)

NOTICE:

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



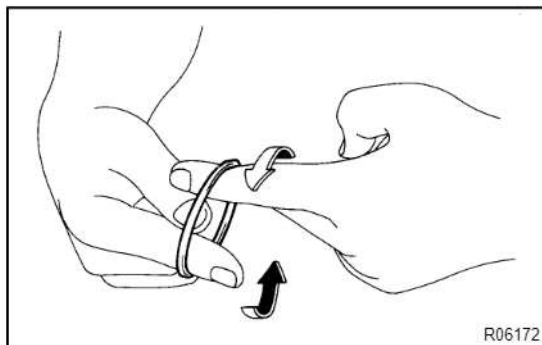
6. IF NECESSARY, REPLACE TEFLON RING AND O-RING

- (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 ring.

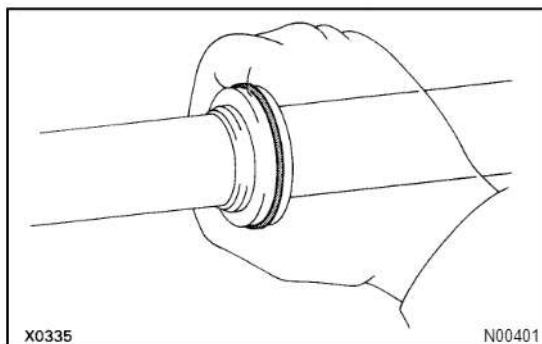
- (b) Coat a new O-ring with power steering fluid and install it.



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

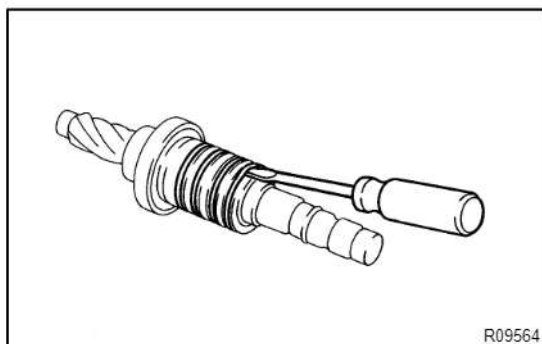
NOTICE:

Be careful not to overexpand the ring.



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

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



7. IF NECESSARY, REPLACE TEFLON RINGS

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

NOTICE:

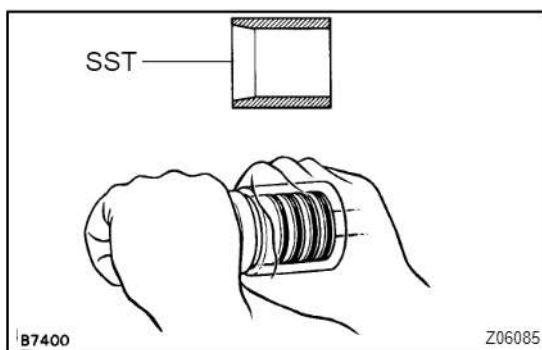
Be careful not to damage the grooves for the teflon ring.

- (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 then fits to the control valve assembly.

SST 09631-20081

NOTICE:

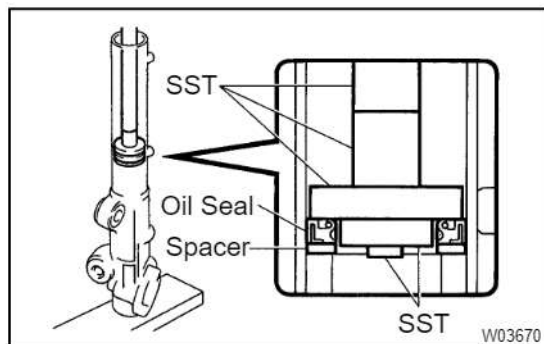
Be careful not to damage the teflon rings.

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-42](#))**



2. INSTALL SPACER AND OIL SEAL

- (a) Coat a new oil seal lip with power steering fluid.
- (b) Using SST, press in the oil seal and spacer.
SST 09951-60010 (09951-00330, 09951-00490, 09952-06010), 09950-70010 (09951-07360)

NOTICE:

- Make sure that the oil seal is installed facing in the correct direction.
- Take care that the oil seal does not get reversed as you install it.

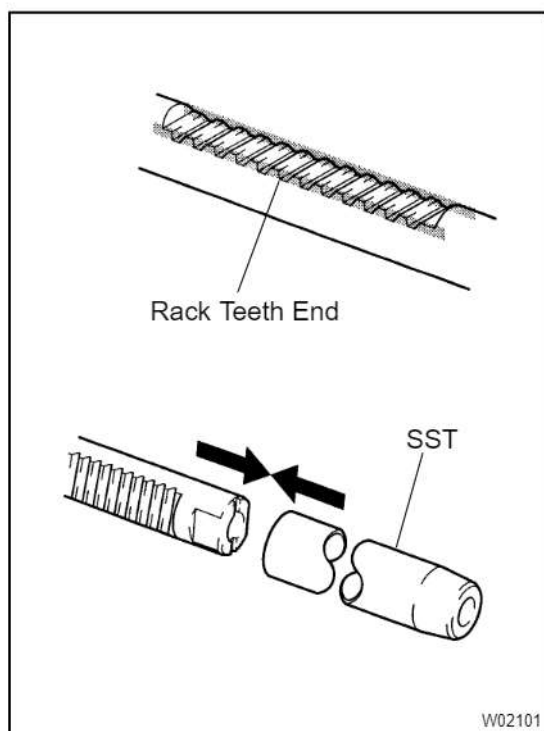
3. INSTALL STEERING RACK

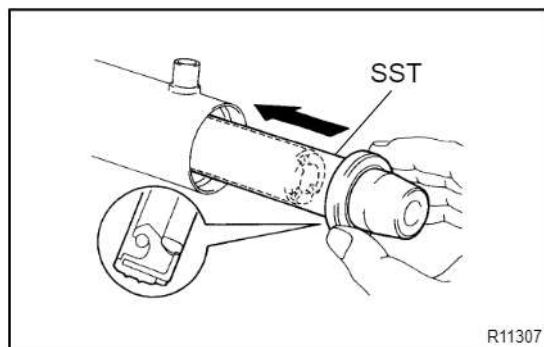
- (a) Install SST to the rack.
SST 09631-00350

HINT:

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

- (b) Coat SST with power steering fluid.
- (c) Install the rack into the rack housing.
- (d) Remove the SST.
SST 09631-00350





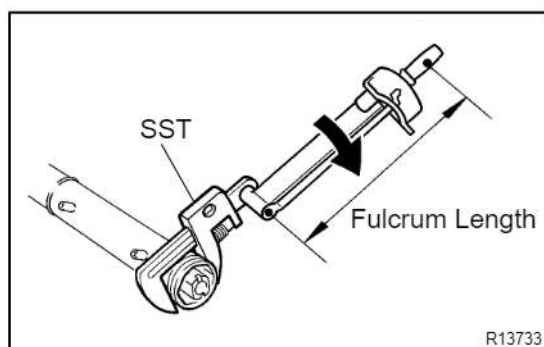
4. INSTALL OIL SEAL

- Install SST to the steering rack opposite end.
SST 09631-00350
- Coat SST with power steering fluid.
- Coat a new oil seal lip with power steering fluid.
- Install the oil seal by pushing it onto the SST without tilting.

NOTICE:

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

- Remove the SST.
SST 09631-00350



5. INSTALL CYLINDER END STOPPER

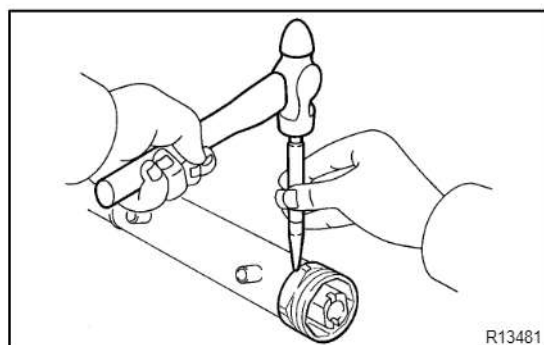
- Coat a new O-ring with power steering fluid, and install it to the cylinder end stopper.
- Using SST, install the cylinder end stopper.
SST 09922-10010
Torque: 58 N·m (590 kgf·cm, 43 ft·lbf)

NOTICE:

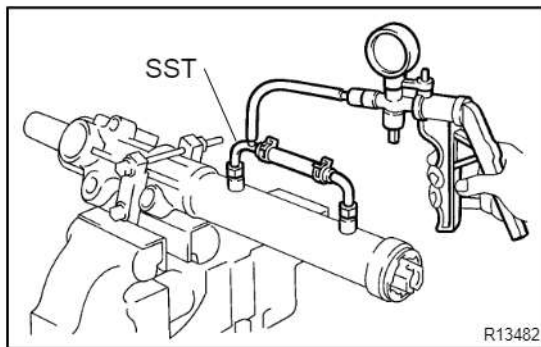
Use SST 09922-10010 in the direction shown in the illustration.

HINT:

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

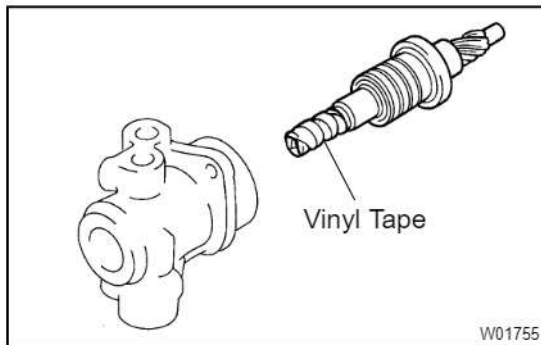


- Using a punch and a hammer, stake the rack housing.



6. AIR TIGHTNESS TEST

- Install SST to the unions of 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 change in the vacuum, check the installation of the oil seals.

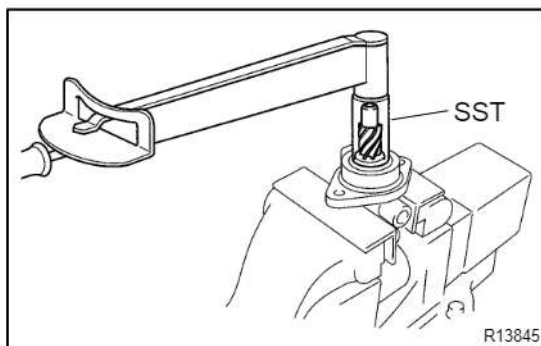


7. INSTALL CONTROL VALVE ASSEMBLY

- 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 valve assembly into the control valve housing.

NOTICE:

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

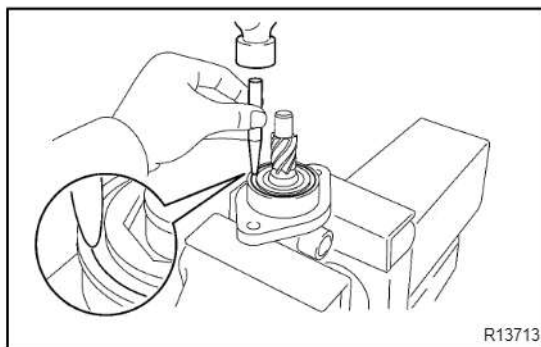


- Coat a new O-ring with power steering fluid, and install it to the bearing guide nut.
- Using SST, install the bearing guide nut.
SST 09631-20060

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.

8. INSTALL CONTROL VALVE HOUSING WITH CONTROL VALVE ASSEMBLY

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

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

9. INSTALL DUST COVER

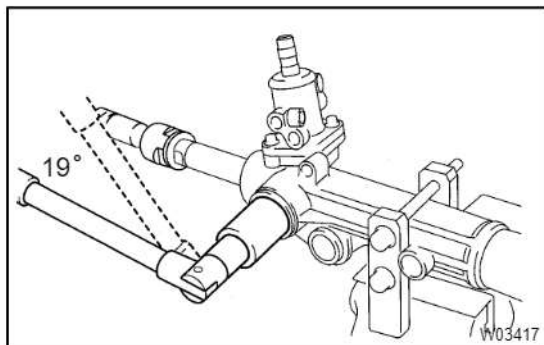
10. INSTALL RACK GUIDE, RACK GUIDE SPRING AND RACK GUIDE SPRING CAP

- Install the rack guide and rack guide spring.
- Apply sealant to 2 or 3 threads of the rack guide spring cap.

Sealant:

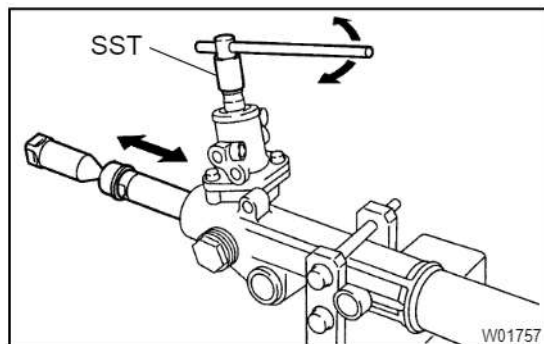
Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent

- Temporarily install the rack guide spring cap.

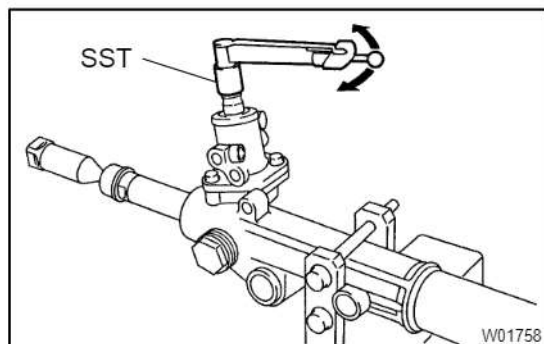


11. ADJUST TOTAL PRELOAD

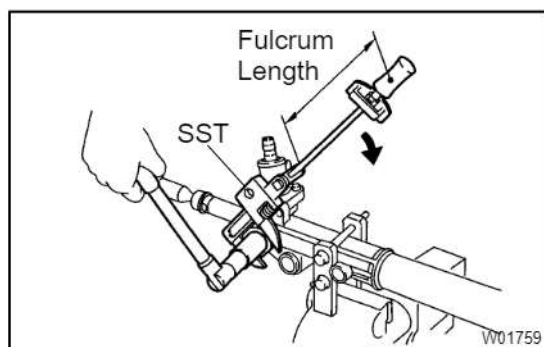
- To prevent the steering rack teeth from damaging the oil seal lip, temporarily install the RH and LH rack ends.
- Torque the rack guide spring cap.
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)
- Return the cap 19°.



- Using SST, turn the control valve shaft right and left 1 or 2 times.
SST 09616-0001 1
- Loosen the cap until the rack guide spring is not functioning.



- Using SST and a torque wrench, tighten the cap until the preload is within specification.
SST 09616-0001 1
Preload (turning):
0.5 - 1.7 N·m (4.7 - 17.2 kgf·cm, 4.1 - 14.9 in·lbf)



12. INSTALL RACK GUIDE SPRING CAP LOCK NUT

- Apply sealant to 2 or 3 threads of the lock nut.
Sealant:
Part No.08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent
- Temporarily install the lock nut.
- Holding the rack guide spring cap rotating, and using SST, torque the lock nut.
SST 09922-10010
Torque: 51 N·m (520 kgf·cm, 38 ft·lbf)

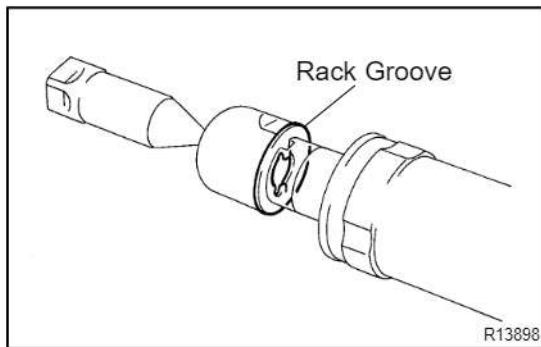
NOTICE:

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.).

- Recheck the total preload.
Preload (turning):
0.5 - 1.7 N·m (4.7 - 17.2 kgf·cm, 4.1 - 14.9 in·lbf)
- Remove the RH and LH rack ends.

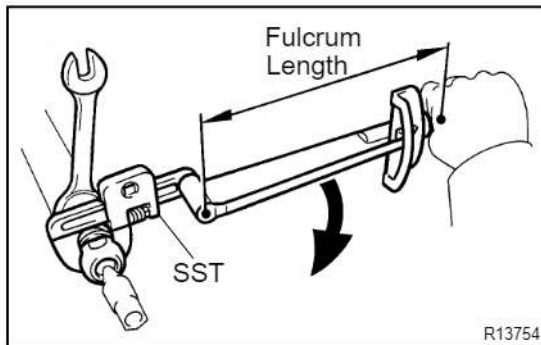


13. INSTALL RH AND LH CLAW WASHERS AND RACK ENDS

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

HINT:

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



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

SST 09922-10010

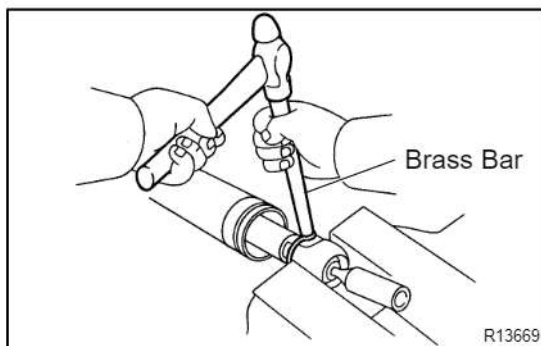
Torque: 76 N·m (770 kgf·cm, 56 ft·lbf)

NOTICE:

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

HINT:

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

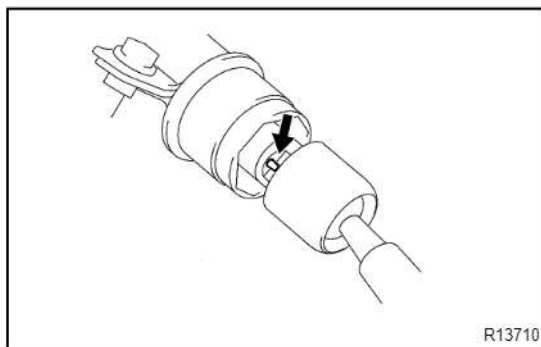


- (c) Using a brass bar and a hammer, stake the washer.

NOTICE:

Avoid any impact on the rack.

- (d) Employ the same manner described above to the other side.



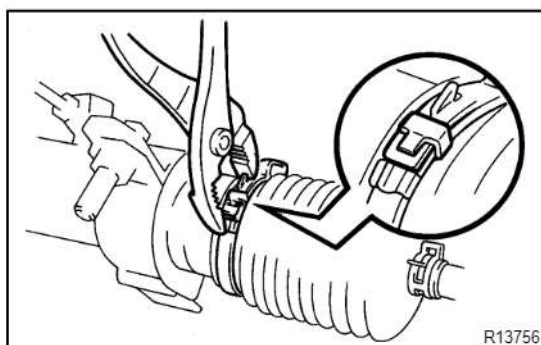
14. INSTALL RH AND LH RACK BOOTS, CLAMPS AND CLIPS

- (a) Ensure that the tube hole is not clogged with grease.

HINT:

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

- (b) Set a new clamp to the groove of the rack boot.

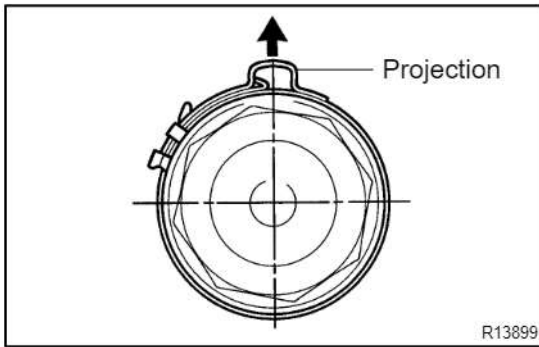


- (c) Install the boot, clip and a new clamp.

NOTICE:

Be careful not to damage or twist the boot.

- (d) Tighten a new clamp, as shown in the illustration.

**HINT:**

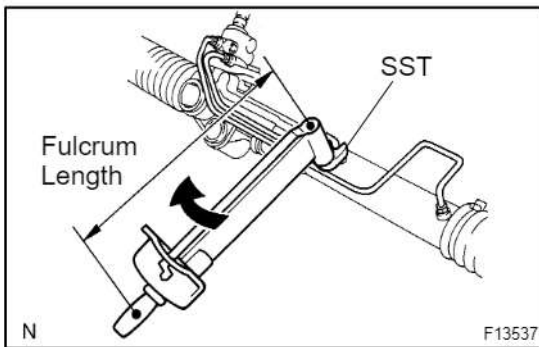
Face the projection to upper side of the vehicle.

- (e) Install the clip to the rack boot.
- (f) Employ the same manner described above to the other side.

15. 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: 55 N·m (560 kgf·cm, 41 ft·lbf)

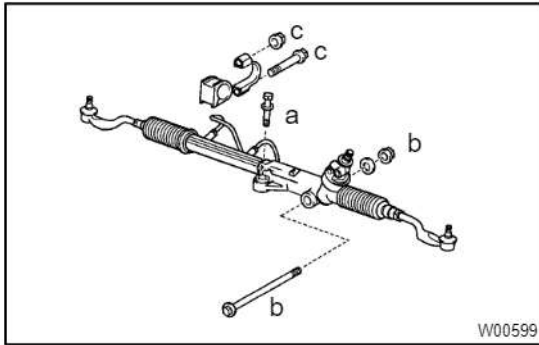
**16. INSTALL 2 TURN PRESSURE TUBES**

- (a) Install 4 new union seats to the rack housing and control valve housing.
- (b) Using SST, install the 2 turn pressure tubes.
SST 09023-38200

Torque: 23 N·m (230 kgf·cm, 17 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 AND BRACKET

2. INSTALL PS GEAR ASSEMBLY

- (a) Install the PS gear assembly with the gear assembly set bolt.

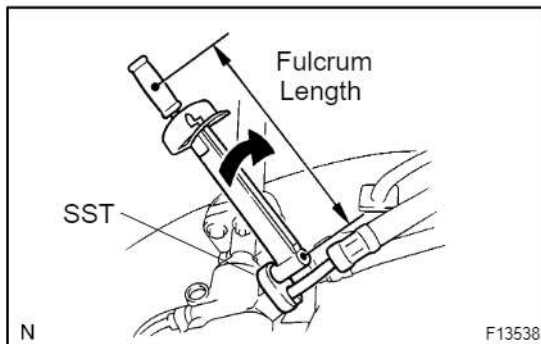
Torque: 165 N·m (1,700 kgf·cm, 123 ft·lbf)

- (b) Install the gear assembly set bolt, nut and washer.

Torque: 130 N·m (1,330 kgf·cm, 96 ft·lbf)

- (c) Install the bolt and nut to the bracket.

Torque: 165 N·m (1,700 kgf·cm, 123 ft·lbf)



3. CONNECT PRESSURE FEED AND RETURN TUBES

Using SST, connect the tube.

SST 09023-38400

Torque:

Pressure feed tube: 41 N·m (420 kgf·cm, 30 ft·lbf)

Return tube: 45 N·m (460 kgf·cm, 33 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.

4. CONNECT INTERMEDIATE SHAFT NO. 2 (See page [SR-20](#))

5. CONNECT RH AND LH TIE ROD ENDS (See page [SA-72](#))

6. INSTALL STABILIZER BAR (See page [SA-76](#))

7. POSITION FRONT WHEEL FACING STRAIGHT AHEAD

HINT:

Do it with the front of the vehicle jacked up.

8. CENTER SPIRAL CABLE (See page [SR-20](#))

9. INSTALL STEERING WHEEL

- (a) Align the matchmarks on the wheel and steering column main shaft.
- (b) Temporarily tighten the wheel set nut.
- (c) Connect the connector.

10. BLEED POWER STEERING SYSTEM (See page [SR-4](#))

11. CHECK STEERING WHEEL CENTER POINT

12. TORQUE STEERING WHEEL SET NUT

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

13. INSTALL STEERING WHEEL PAD (See page [SR-20](#))**14. CHECK FRONT WHEEL ALIGNMENT (See page [SA-5](#))****15. INSTALL ENGINE UNDER COVER**

Install the engine under cover with the 10 bolts.

Torque: 30 N·m (300 kgf·cm, 22 ft·lbf)