

STEERING SYSTEM

SR0FC-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 TOYOTA RAV4 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 deployed 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.

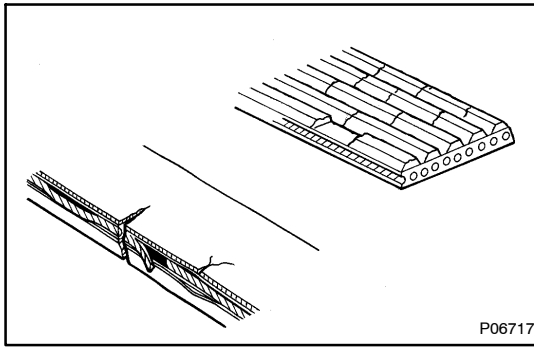
TROUBLESHOOTING

SR0FD-01

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-2 SR-5 SR-3 SA-4 – SA-45 – SR-31 SR-44
Poor return	1. Tires (Improperly inflated) 2. Front wheel alignment (Incorrect) 3. Steering column (Binding) 4. Power steering gear	SA-2 SA-4 – SR-44
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-45 – SA-4 SR-44
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-44



DRIVE BELT INSPECTION

SR0FH-01

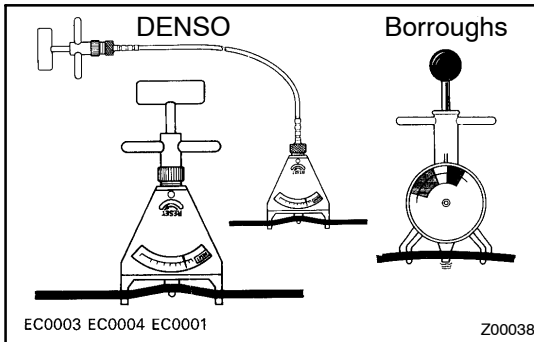
INSPECT DRIVE BELT

- (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 belt has chunks missing from the ribs, it should be replaced.



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

Belt tension gauge:

DENSO BTG-20 (95506-00020)

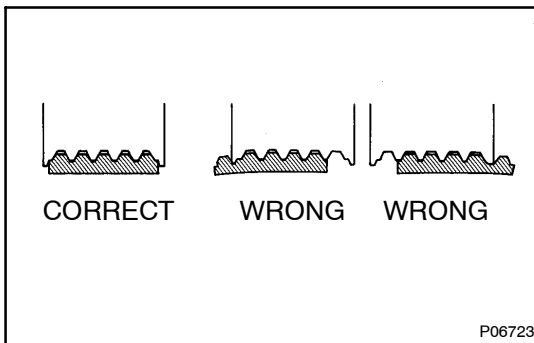
Borroughs No. BT-33-73F

Drive belt tension:

New belt: 95 – 145 lbf

Used belt: 60 – 100 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

SR0FF-01

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 and keep it there for 2–3 seconds, then turn the wheel to the opposite full lock and keep it there for 2–3 seconds.

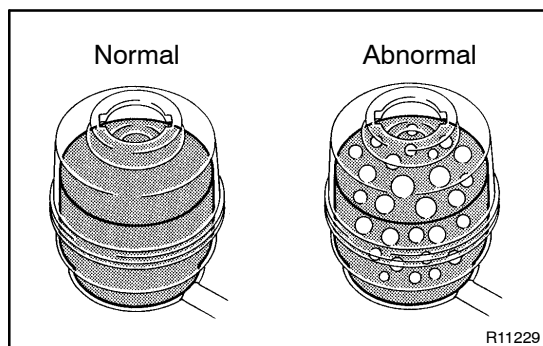
(b) Repeat (a) several times.

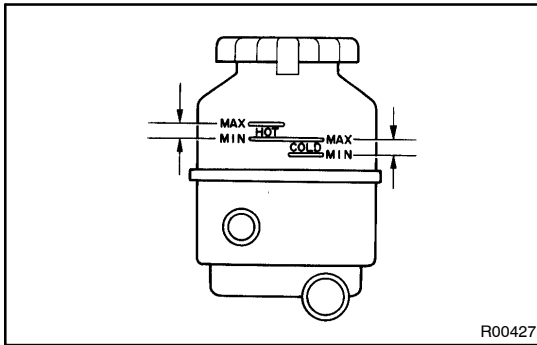
7. **STOP ENGINE**

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.

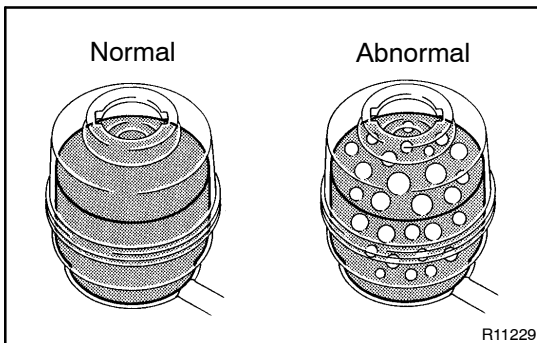
Fluid: ATF DEXRON® II or III

HINT:

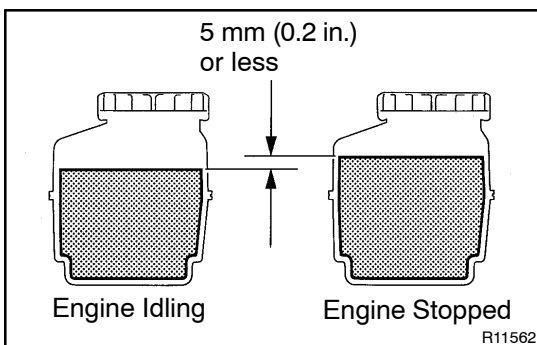
Check that the fluid level is within the HOT LEVEL range on the reservoir. If the fluid is cold, check that it is within the COLD LEVEL range.

- 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.

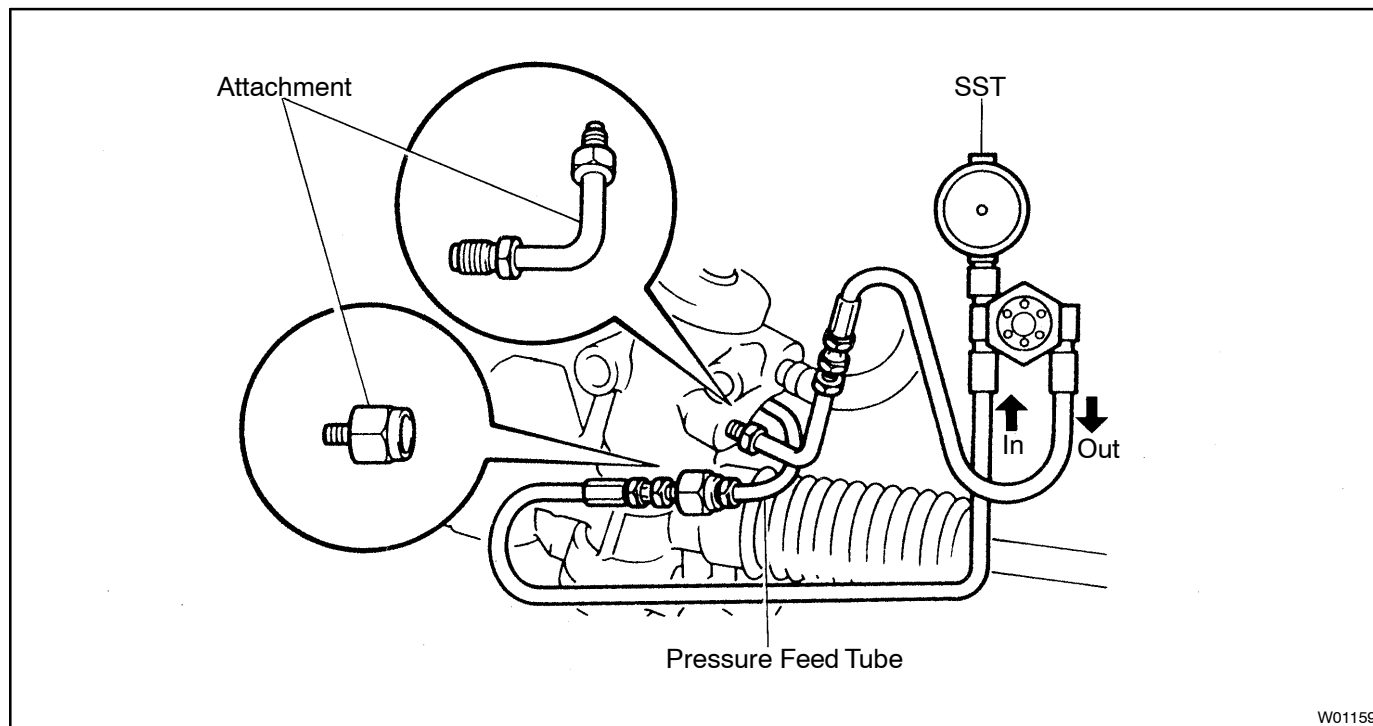
2. CHECK STEERING FLUID PRESSURE

- (a) Disconnect the pressure feed tube (See page [SR-33](#))
- (b) Connect SST, as shown below.

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

NOTICE:

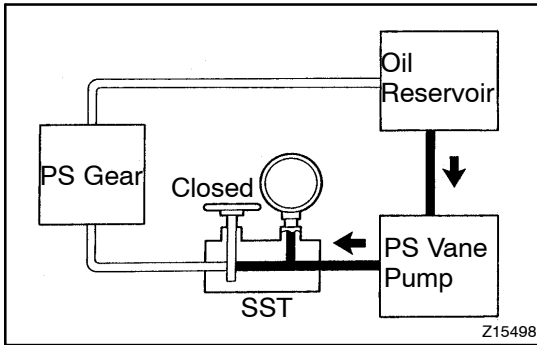
Check that the valve of the SST is in the open position.



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- (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)



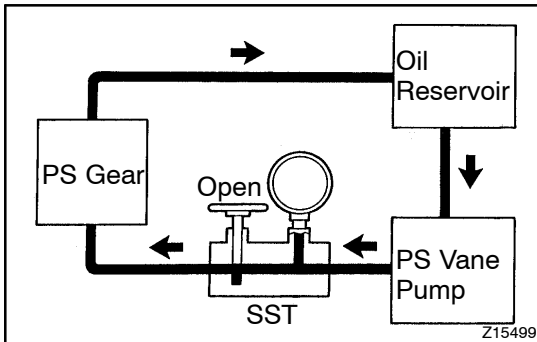
- (f) With the engine idling, close the valve of the SST and observe the reading on the SST.

Minimum fluid pressure:

7,355 kPa (75 kgf/cm², 1067 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.

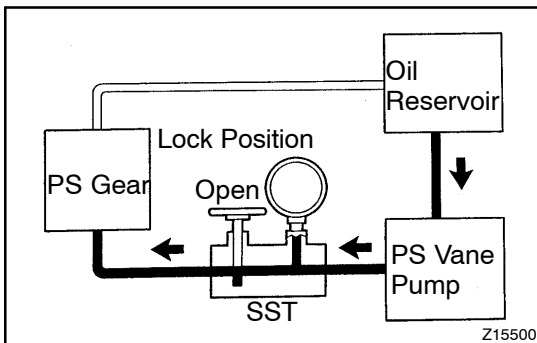
- (h) Measure the fluid pressure at engine speeds of 1,000 rpm and 3,000 rpm.

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.

Minimum fluid pressure:

7,355 kPa (75 kgf/cm², 1067 psi)

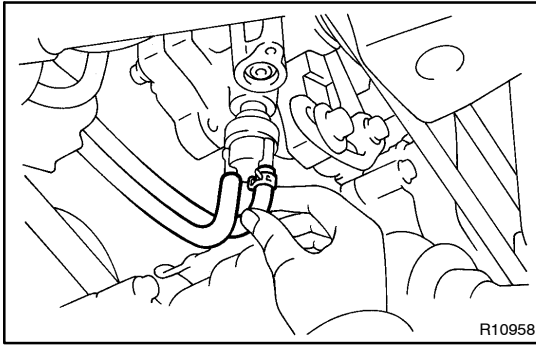
NOTICE:

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

- (j) Disconnect the SST.

- (k) Connect the pressure feed tube (See page [SR-42](#)).

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

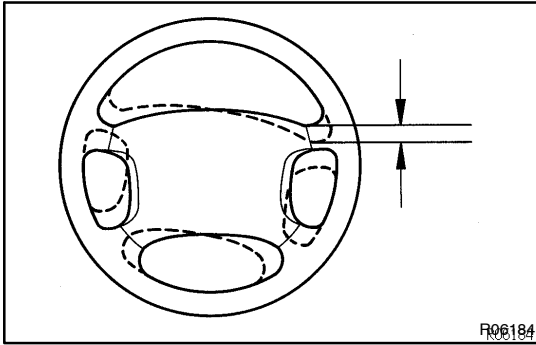


SR0FE-01

AIR CONTROL VALVE INSPECTION

INSPECT AIR CONTROL VALVE

- (a) Turn the air conditioner switch OFF.
- (b) Start the engine and run it at idle.
- (c) Full turn the steering wheel.
- (d) Check that the engine rpm decreases when the vacuum hose of the air control valve is pinched.
- (e) Check that the engine rpm increases when the hose is released.



STEERING WHEEL INSPECTION

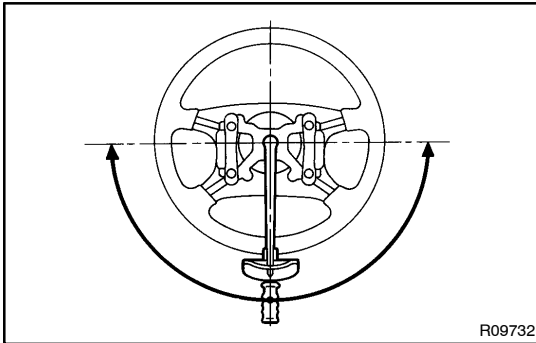
SR0FI-02

1. CHECK STEERING WHEEL FREEPLAY

With the vehicle stopped and tires facing straight ahead, rock the steering wheel gently back and forth with light finger pressure.

Freeplay should not exceed the maximum.

Maximum freeplay: 30 mm (1.18 in.)



2. CHECK STEERING EFFORT

- Center the steering wheel.
- Remove the steering wheel pad (See page [SR-12](#)).
- Start the engine and run it at idle.
- Measure the steering effort in both directions.

Reference: 5.9 N·m (60 kgf·cm, 52 in·lbf)

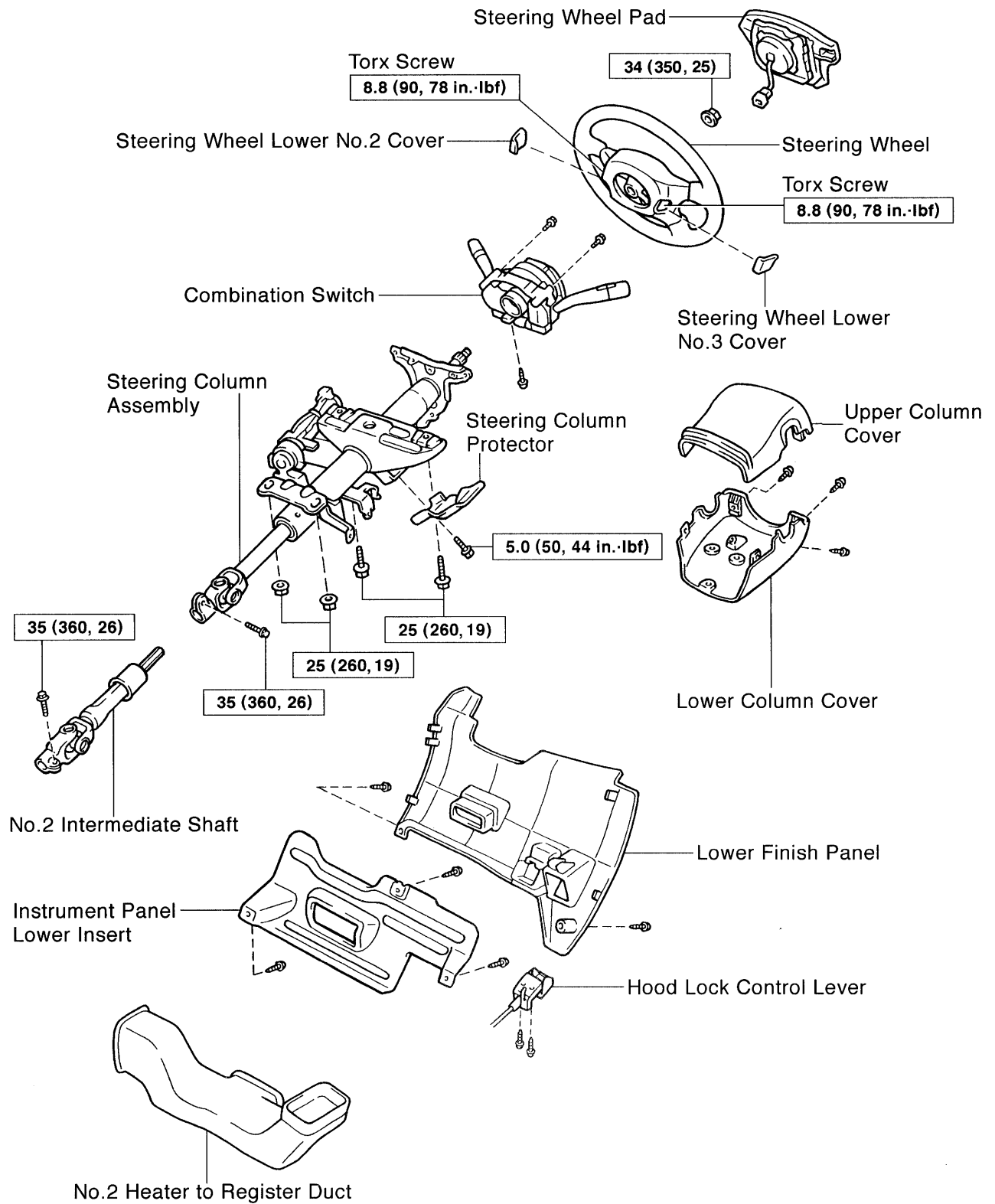
HINT:

Be sure to consider the tire type, pressure and contact surface before making your diagnosis.

- Torque the steering wheel set nut.
Torque: 34 N·m (350 kgf·cm, 25 ft·lbf)
- Install the steering wheel pad (See page [SR-19](#)).

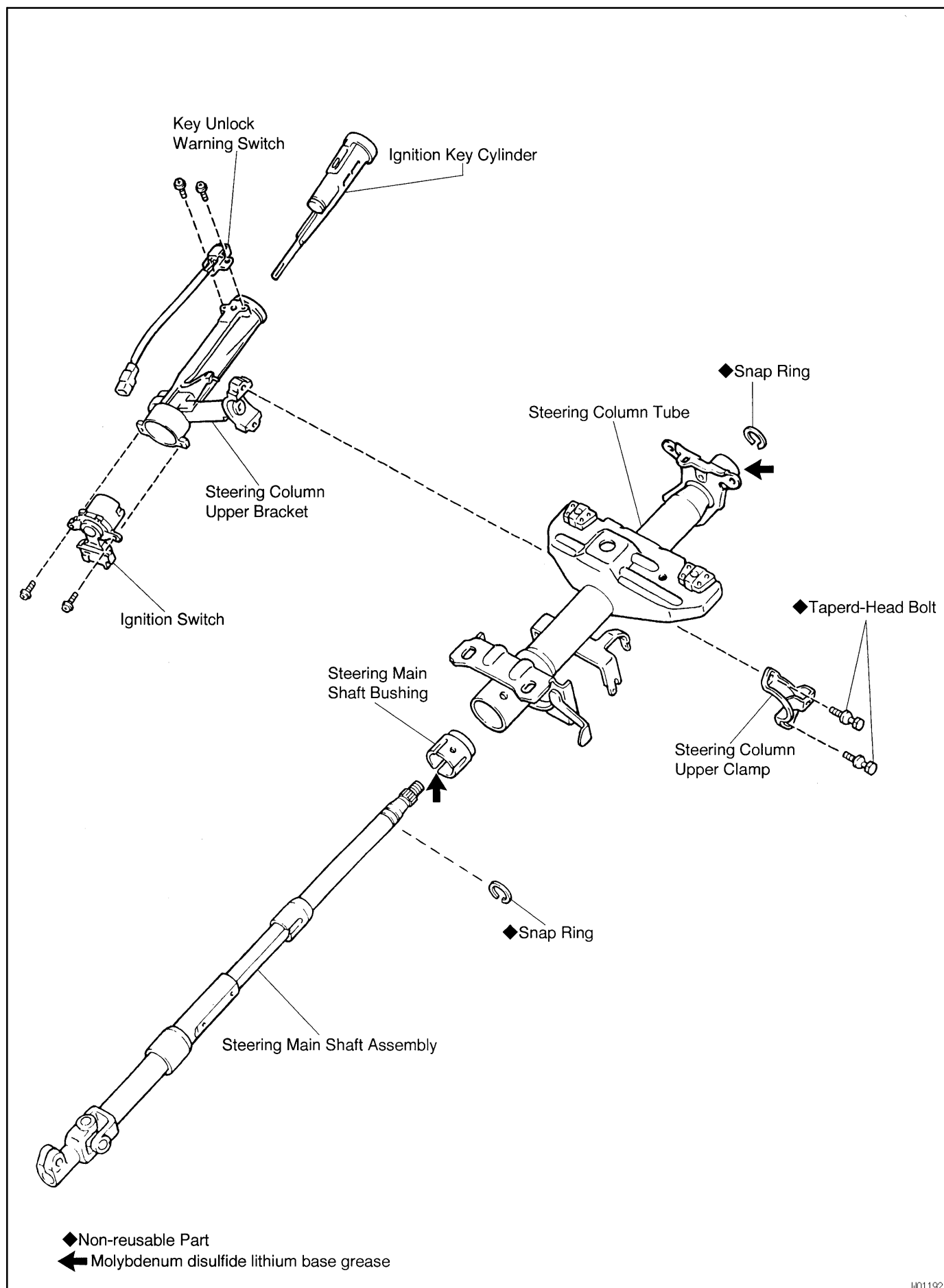
NON-TILT STEERING COLUMN COMPONENTS

SR0F0-03



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

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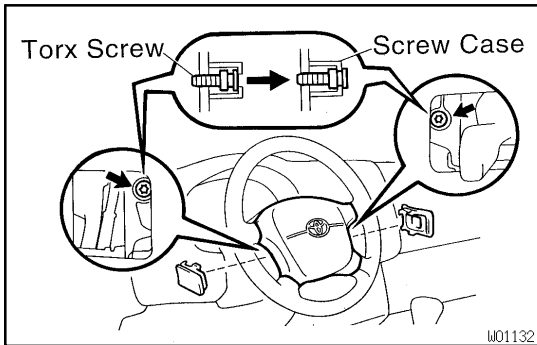
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REMOVAL

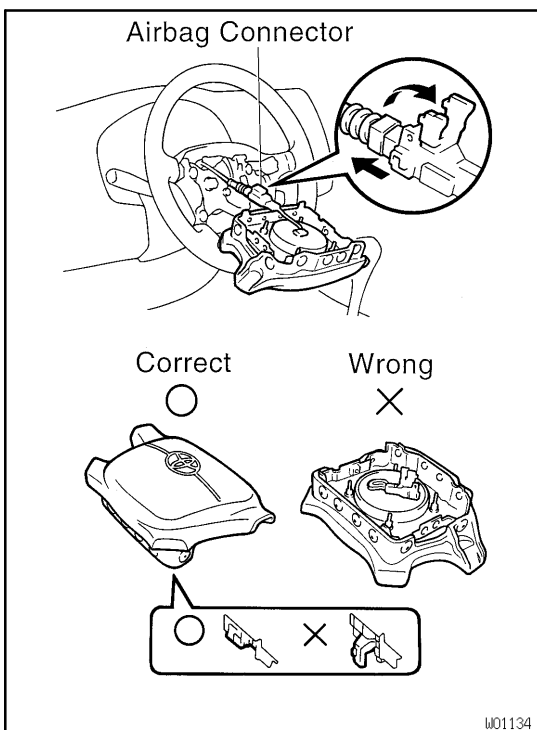
1. REMOVE STEERING WHEEL PAD

NOTICE:

- If the airbag connector is disconnected with the ignition switch at ON or ACC, DTCs will be recorded.
- Never use airbag parts from another vehicle. When replacing parts, replace with new ones.



- Place the front wheels facing straight ahead.
- Remove the steering wheel lower No.2 and No.3 covers.
- Using a torx socket wrench, loosen the 2 torx screws until the groove along the screw circumference catches on the screw case.



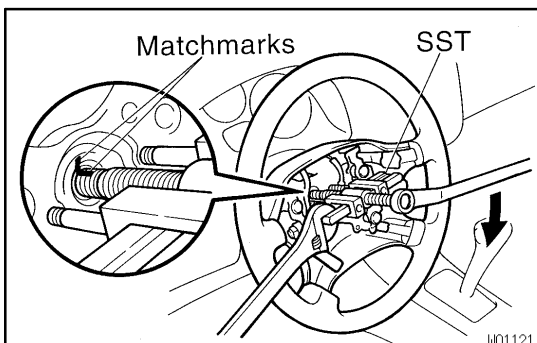
- Pull the wheel pad out from the steering wheel and disconnect the airbag connector.

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 09950-50010, (09951-05010, 09952-05010, 09953-05020, 09954-05020)

3. REMOVE LOWER FINISH PANEL

- (a) Remove the 2 screws and disconnect the hood lock control lever from the panel.
- (b) Remove the 2 panel set screws.

4. REMOVE INSTRUMENT PANEL LOWER INSERT

Remove the 3 screws.

5. Non-tilt Steering Column:**REMOVE UPPER AND LOWER COLUMN COVERS**

- (a) Loosen the 2 column assembly set bolts and 2 nuts.
- (b) Remove the 3 screws.
- (c) Remove the 3 screws and protector from lower cover.

6. Tilt Steering Column:**REMOVE UPPER AND LOWER COLUMN COVERS**

Remove the 3 screws.

7. REMOVE NO.2 HEATER TO REGISTER DUCT

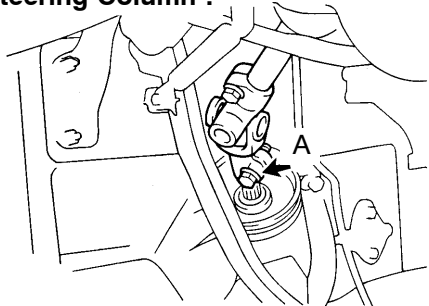
Remove the clip.

8. REMOVE COMBINATION SWITCH WITH SPIRAL CABLE

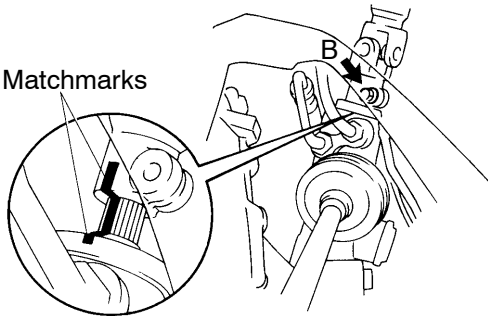
- (a) Disconnect the connectors.
- (b) Disconnect the airbag connector.
- (c) Remove the 3 switch set screws.

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

Do not disassemble the cable or apply oil to it.

Non-Tilt Steering Column :**Tilt Steering Column :**

Matchmarks



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10. DISCONNECT NO.2 INTERMEDIATE SHAFT

- (a) Loosen the bolt A.
- (b) Remove the bolt B.
- (c) Shift the No.2 intermediate shaft and place matchmarks on the control valve shaft and No.2 intermediate shaft.

11. REMOVE NO.2 INTERMEDIATE SHAFT**12. REMOVE STEERING COLUMN PROTECTOR**

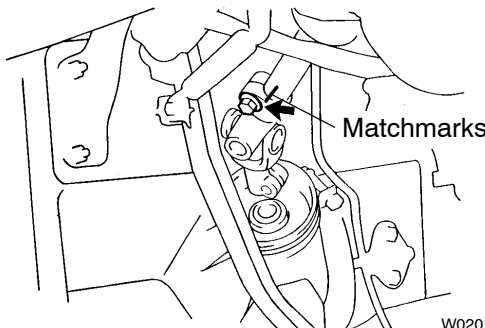
Remove the bolt.

13. REMOVE STEERING COLUMN ASSEMBLY

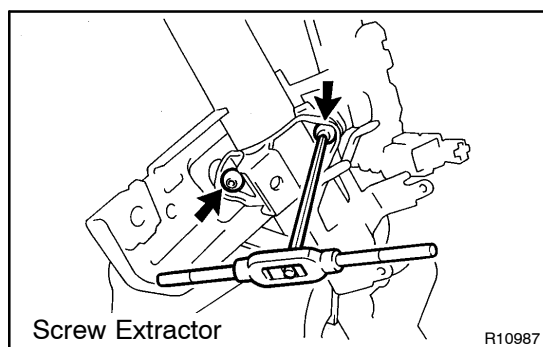
- (a) Disconnect the connectors.
- (b) Remove the 2 column assembly set bolts and 2 nuts.

**14. Tilt Steering Column:
REMOVE SLIDING YOKE**

- (a) Remove the bolt.
- (b) Shift the sliding yoke and place matchmarks on the main shaft and sliding yoke.



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DISASSEMBLY

NOTICE:

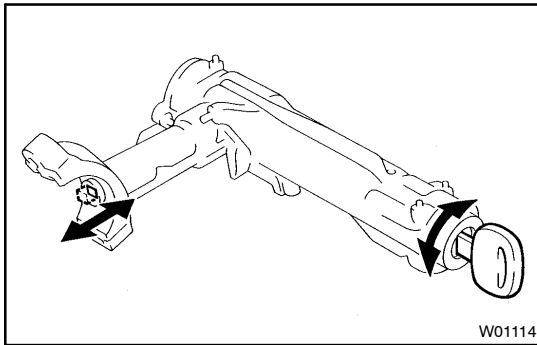
When using a vise, do not overtighten it.

1. REMOVE STEERING COLUMN UPPER BRACKET AND STEERING 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.

2. REMOVE STEERING MAIN SHAFT ASSEMBLY

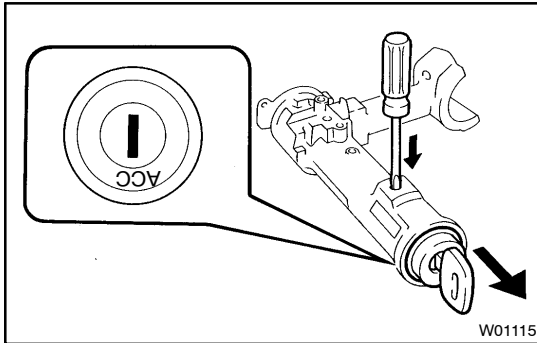
- (a) Using snap ring expander, remove the snap ring from the shaft assembly.
- (b) Tap out the shaft assembly from the steering column tube.
- (c) Using snap ring expander, remove the snap ring from the shaft assembly.



INSPECTION

1. INSPECT STEERING LOCK OPERATION

Check that the steering lock mechanism operates properly.



2. IF NECESSARY, REPLACE IGNITION KEY CYLINDER

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

HINT:

Make sure that the ignition key is at the ACC position.

3. INSPECT IGNITION SWITCH (See page BE-11)

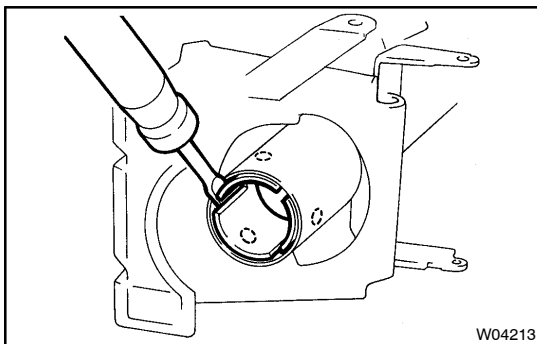
4. IF NECESSARY, REPLACE IGNITION SWITCH

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

5. INSPECT KEY UNLOCK WARNING SWITCH (See page BE-11)

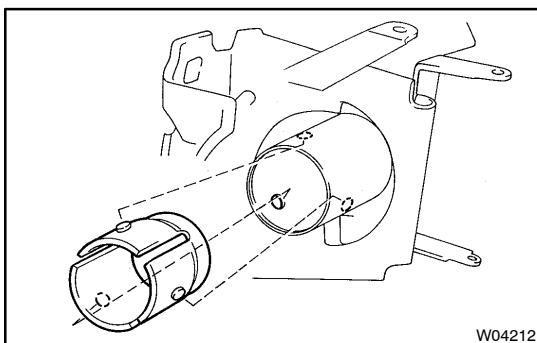
6. IF NECESSARY, REPLACE KEY UNLOCK WARNING SWITCH

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

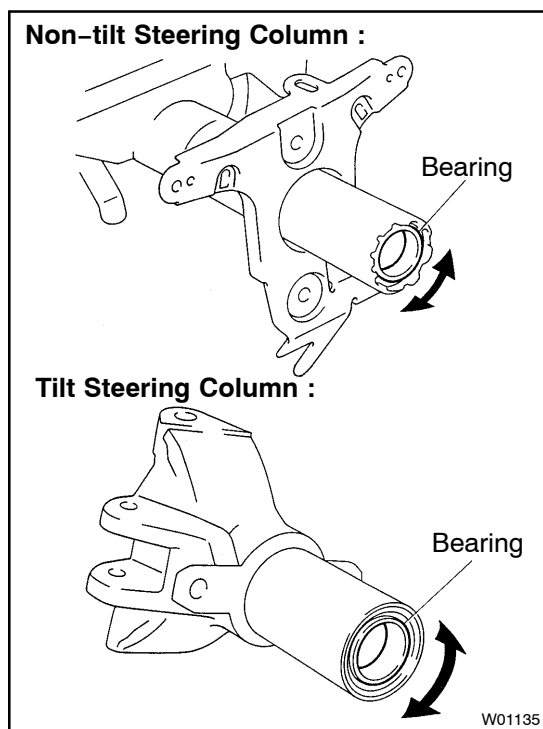


7. IF NECESSARY, REPLACE STEERING MAIN SHAFT BUSHING

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



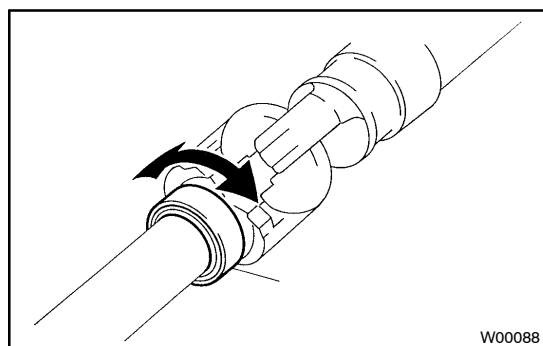
- Coat the inside of a new bushing with molybdenum disulfide lithium base grease.
- Align the projections on the bushing with the holes in the column tube, then install the bushing until the projections are firmly engaged in the holes.

**8. INSPECT BEARING**

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

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

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

**9. Tilt Steering Column:
INSPECT BEARING**

Check the bearing of the steering main shaft rotation condition and check for abnormal noise.

**10. Tilt Steering Column:
IF NECESSARY, REPLACE BEARING**

- (a) Remove the bearing from the steering main shaft.
- (b) Coat a new bearing with molybdenum disulfide lithium base grease.
- (c) Install the bearing.

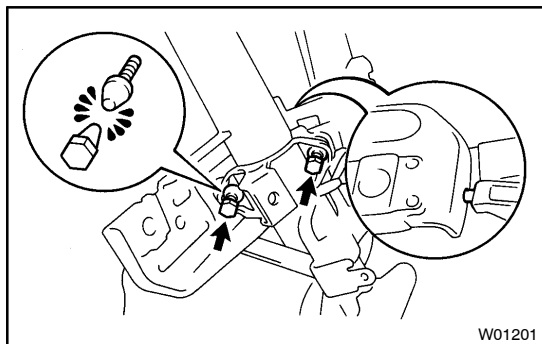
REASSEMBLY

NOTICE:

When using a vise, do not overtighten it.

1. INSTALL STEERING MAIN SHAFT ASSEMBLY

- (a) Using snap ring expander, install a new snap ring to the shaft assembly.
- (b) Install the shaft assembly into the steering column tube.
- (c) Using snap ring expander, install a new snap ring to the shaft assembly.



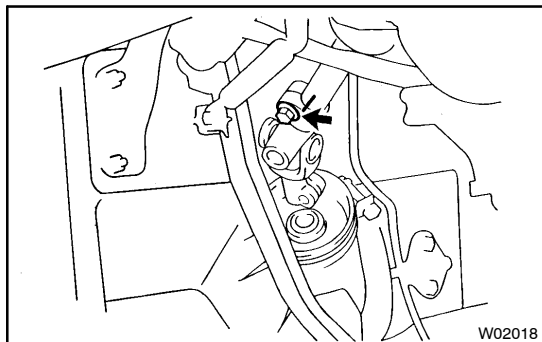
2. INSTALL STEERING COLUMN UPPER BRACKET AND COLUMN UPPER CLAMP

- (a) Install the bracket with 2 new tapered-head bolts.

HINT:

Insert the bracket pin into the column tube hole.

- (b) Tighten the tapered-head bolts until the bolt heads break off.



INSTALLATION

1. Tilt Steering Column:

CONNECT SLIDING YOKE

- (a) Align the matchmarks on the main shaft and sliding yoke, and connect them.
- (b) Torque the bolt.

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

2. Non-Tilt Steering Column:

INSTALL STEERING COLUMN ASSEMBLY

- (a) Temporarily tighten the 2 column assembly set bolts and 2 nuts.
- (b) Connect the connectors.

3. Tilt Steering Column:

INSTALL STEERING COLUMN ASSEMBLY

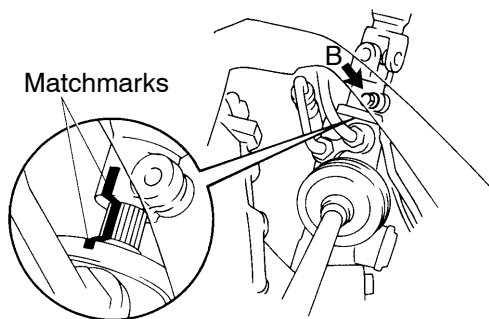
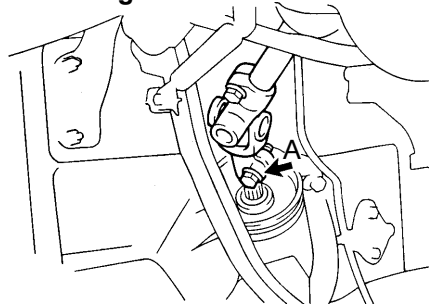
- (a) Torque the 2 column assembly set bolts and 2 nuts.
- (b) Connect the connectors.

Torque: 25 N·m (260 kgf·cm, 19 ft·lbf)

4. INSTALL STEERING COLUMN PROTECTOR

Torque the bolt.

Torque: 5.0 N·m (50 kgf·cm, 44 in·lbf)

Non-tilt Steering Column :**Tilt-Steering Column :**

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5. Non-Tilt Steering Column:**INSTALL NO.2 INTERMEDIATE SHAFT**

- (a) Connect the No.2 intermediate shaft to the main shaft.
- (b) Temporarily tighten the bolt A.

6. Tilt Steering Column:**INSTALL NO.2 INTERMEDIATE SHAFT**

- (a) Connect the No.2 intermediate shaft to the sliding yoke.
- (b) Temporarily tighten the bolt A.

7. CONNECT NO.2 INTERMEDIATE SHAFT

- (a) Align the matchmarks on the No.2 intermediate shaft and control valve shaft, and connect them.
- (b) Torque the bolt B.

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

- (c) Torque the bolt A.

Torque: 35 N·m (360 kgf·cm, 26 ft·lbf)**8. INSTALL SPIRAL CABLE (See page BE-14)****9. INSTALL COMBINATION SWITCH WITH SPIRAL CABLE**

- (a) Tighten the 3 screws.
- (b) Connect the connectors.
- (c) Connect the airbag connector.

10. INSTALL NO.2 HEATER TO REGISTER DUCT**11. Non-Tilt Steering Column:****INSTALL UPPER AND LOWER COLUMN COVERS**

- (a) Install the protector to the lower cover and tighten the 3 screws.
- (b) Tighten the 3 screws.
- (c) Torque the 2 column assembly set bolts and 2 nuts.

Torque: 25 N·m (260 kgf·cm, 19 ft·lbf)**12. Tilt Steering Column:****INSTALL UPPER AND LOWER COLUMN COVERS**

- (a) Install the protector to the lower cover and tighten the 3 screws.
- (b) Tighten the 3 screws.

13. INSTALL INSTRUMENT PANEL LOWER INSERT

Tighten the 3 screws.

14. INSTALL LOWER FINISH PANEL

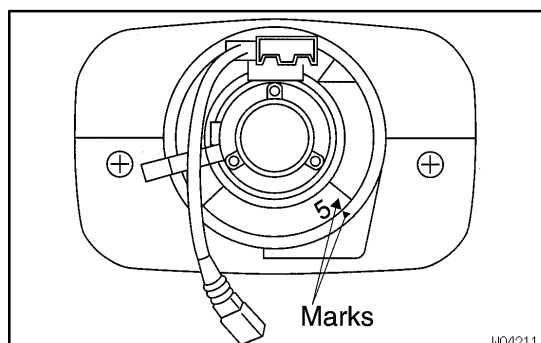
- (a) Tighten the 2 panel set bolts.
- (b) Connect the hood lock control lever with the 2 screws.

15. CENTER SPIRAL CABLE

- (a) Check that the front wheels are facing straight ahead.
- (b) Turn the cable counterclockwise until it locks.
- (c) Then rotate the cable clockwise about 2.5 turns to left of the center.

HINT:

The spiral cable rotates approx. 5 turns maximum.



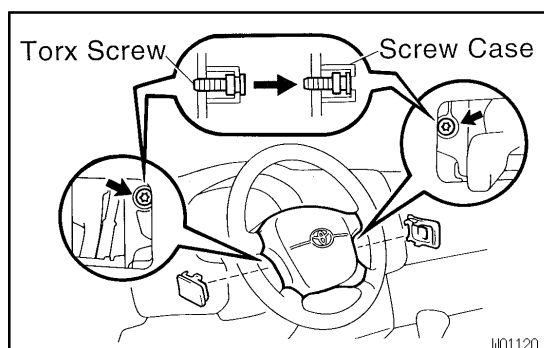
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16. INSTALL STEERING WHEEL

- (a) Align the matchmarks on the wheel and steering main shaft assembly.
- (b) Torque the wheel set nut.
Torque: 34 N·m (350 kgf·cm, 25 ft·lbf)
- (c) Connect the airbag connector.

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

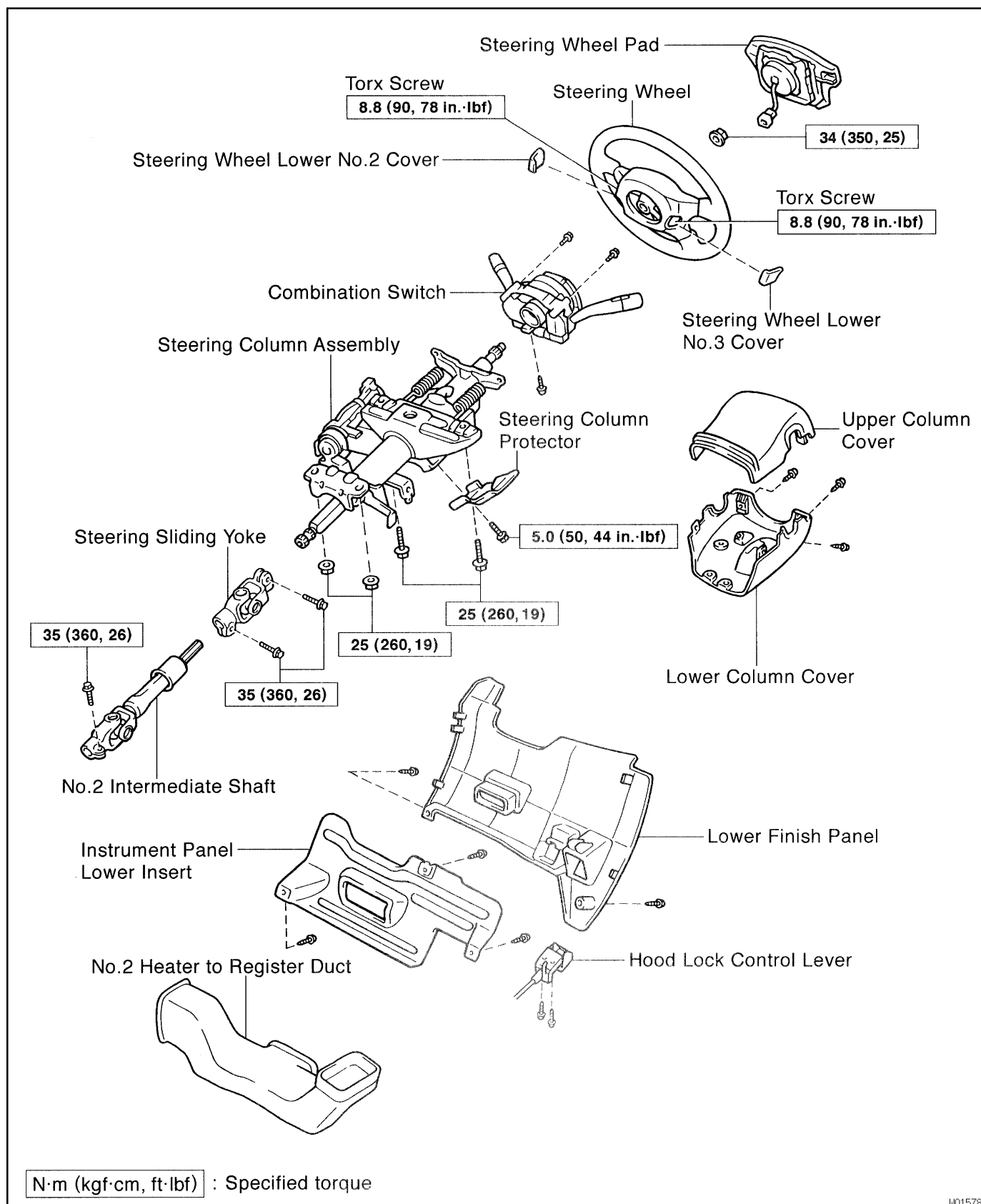
- Make sure that the pad is installed to the specified torque.
 - If the pad has been dropped, or there are cracks, dents or other defects in the case or connector, replace the wheel pad with a new one.
 - When installing the pad, take care that the wiring does not interfere with other parts and is not pinched between other parts.
- (a) Connect the airbag connector.



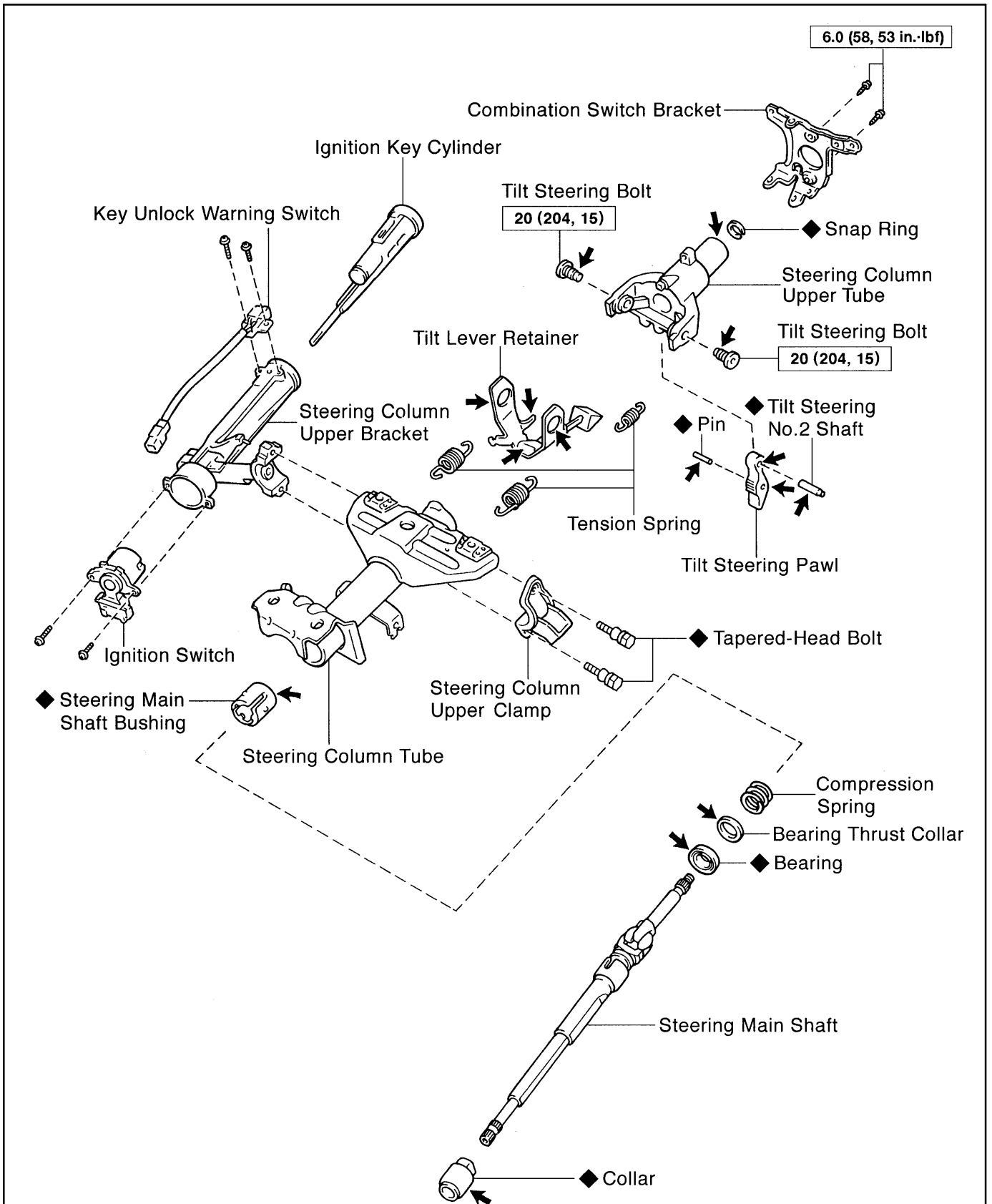
- (b) Install the pad after confirming that the circumference groove of the torx screws are caught on the screw case.
 - (c) Using a torx socket wrench, torque the 2 screws.
Torque: 8.8 N·m (90 kgf·cm, 78 in·lbf)
 - (d) Install the steering wheel lower No.2 and No.3 covers.
- 18. CHECK STEERING WHEEL CENTER POINT**

TILT STEERING COLUMN COMPONENTS

SR0F6-03



W01578



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

◆ Non-reusable part

◀ Molybdenum disulfide lithium base grease

W01579

REMOVAL

(See page [SR-12](#))

DISASSEMBLY

NOTICE:

When using a vise, do not overtighten it.

1. REMOVE 3 TENSION SPRINGS

HINT:

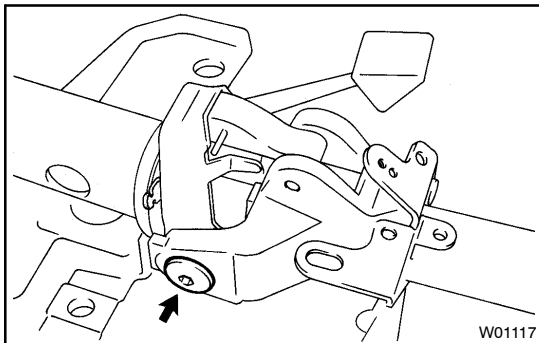
Remove the springs with the tilt function at maximum tilt up.

2. REMOVE STEERING COLUMN UPPER BRACKET AND STEERING COLUMN UPPER CLAMP

(See page [SR-15](#))

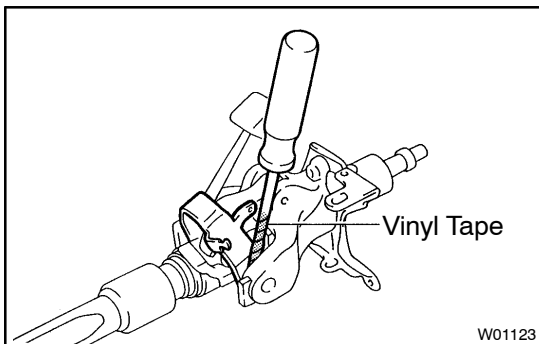
3. REMOVE COMBINATION SWITCH BRACKET

Remove the 2 bracket set bolts.



4. REMOVE STEERING COLUMN UPPER TUBE WITH STEERING MAIN SHAFT

- (a) Using a hexagon wrench, remove the 2 tilt steering bolts.
- (b) Remove the upper tube with the shaft from the steering column tube.

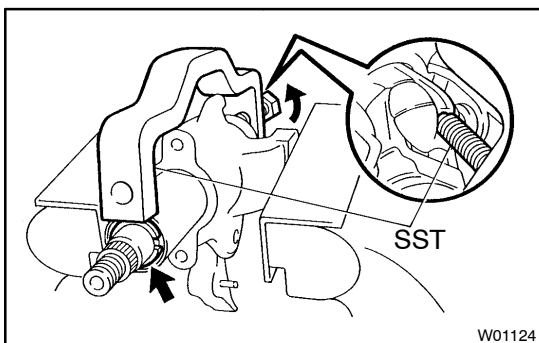


5. REMOVE TILT LEVER RETAINER

Using screwdriver, remove the retainer from the steering column upper tube.

NOTICE:

Tape the screwdriver tip before use.



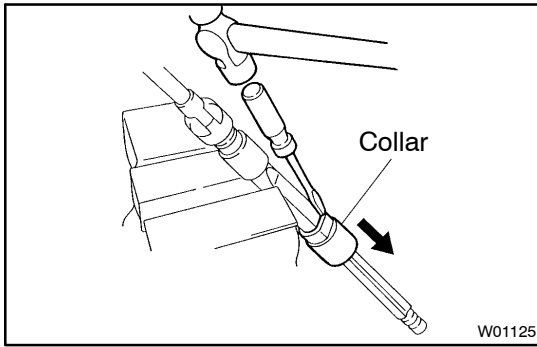
6. REMOVE STEERING MAIN SHAFT

- (a) Using SST, compress the compression spring.
SST 09950-40010 (09958-04010)

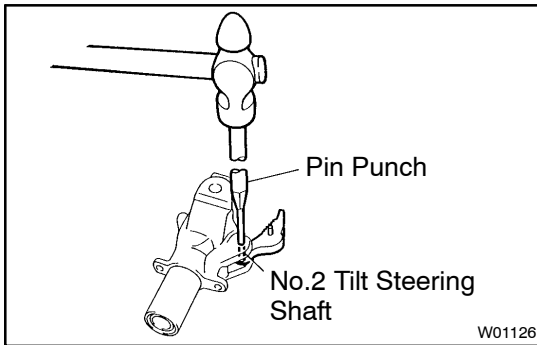
NOTICE:

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 from the steering column upper tube.



- (d) Remove the compression spring and bearing thrust collar from the shaft.
- (e) Using a screwdriver and a hammer, remove the collar from the shaft.



7. REMOVE TILT STEERING PAWL

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

INSPECTION

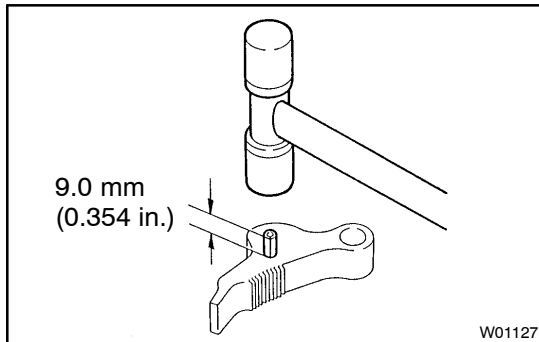
(See page [SR-16](#))

REASSEMBLY

NOTICE:

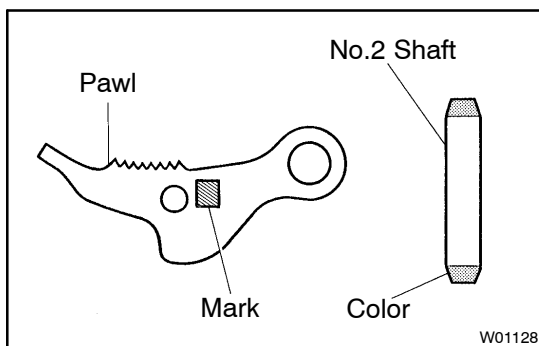
When using a vise, do not overtightened it.

1. **COAT WITH MOLYBDENUM DISULFIDE LITHIUM BASE GREASE** (See page [SR-22](#))



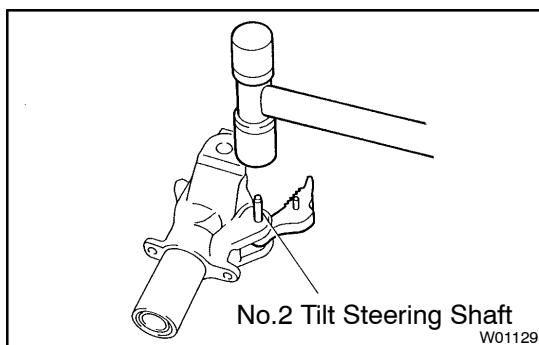
2. **INSTALL TILT STEERING PAWL**

- (a) Using a plastic hammer, tap in a new pin until the projection is 9.0 mm (0.354 in.)



- (b) Select a new tilt steering No.2 shaft according to the following table.

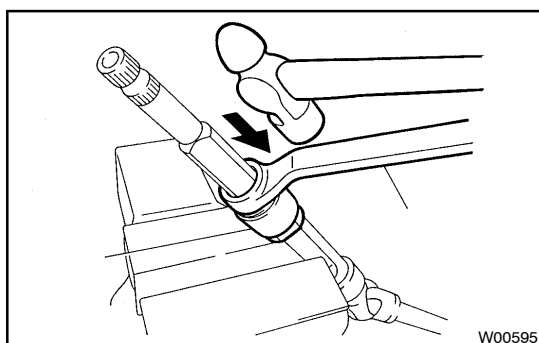
Pawl Mark	No.2 Shaft Color	No.2 Shaft Part No.
1	White	45856-42010
2	Yellow	45856-42020
3	Black	45856-42030



- (c) Using a plastic hammer, tap in the selected No.2 shaft and install the pawl.

NOTICE:

Tap the shaft completely into the steering column upper tube.



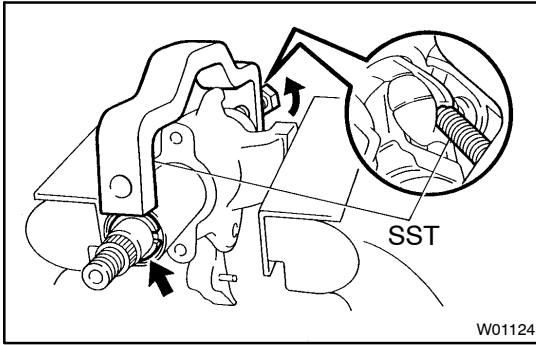
3. **INSTALL STEERING MAIN SHAFT**

- (a) Using an offset wrench and a hammer, drive in a new collar to the shaft.

NOTICE:

Be careful not to damage the collar.

- (b) Install the bearing thrust collar and compression spring to the shaft.
- (c) Install the shaft to the steering column upper tube.



- (d) Using SST, compress the compression spring.
SST 09950-40010 (09958-04010)

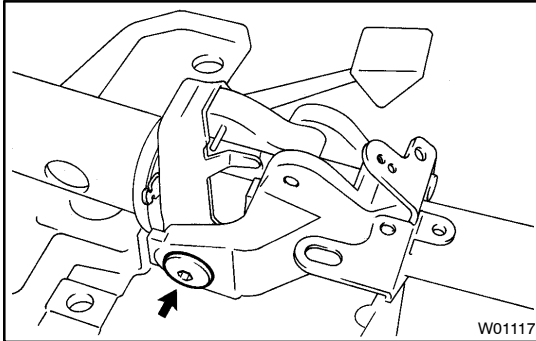
NOTICE:

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

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

4. INSTALL TILT LEVER RETAINER**NOTICE:**

Make sure to install the retainer facing the correct direction (See page [SR-22](#)).

**5. INSTALL STEERING COLUMN UPPER TUBE WITH STEERING MAIN SHAFT**

- (a) Install the upper tube with the shaft to the steering column tube.
(b) Using a hexagon wrench, torque the 2 tilt steering bolts.
Torque: 20 N·m (204 kgf·cm, 15 ft·lbf)
(c) Check that the upper tube turns smoothly.

6. INSTALL COMBINATION SWITCH BRACKET

Torque the 2 bracket set bolts.

Torque: 6.0 N·m (58 kgf·cm, 53 in·lbf)

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

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

8. INSTALL STEERING COLUMN UPPER BRACKET AND STEERING COLUMN UPPER CLAMP

(See page [SR-18](#))

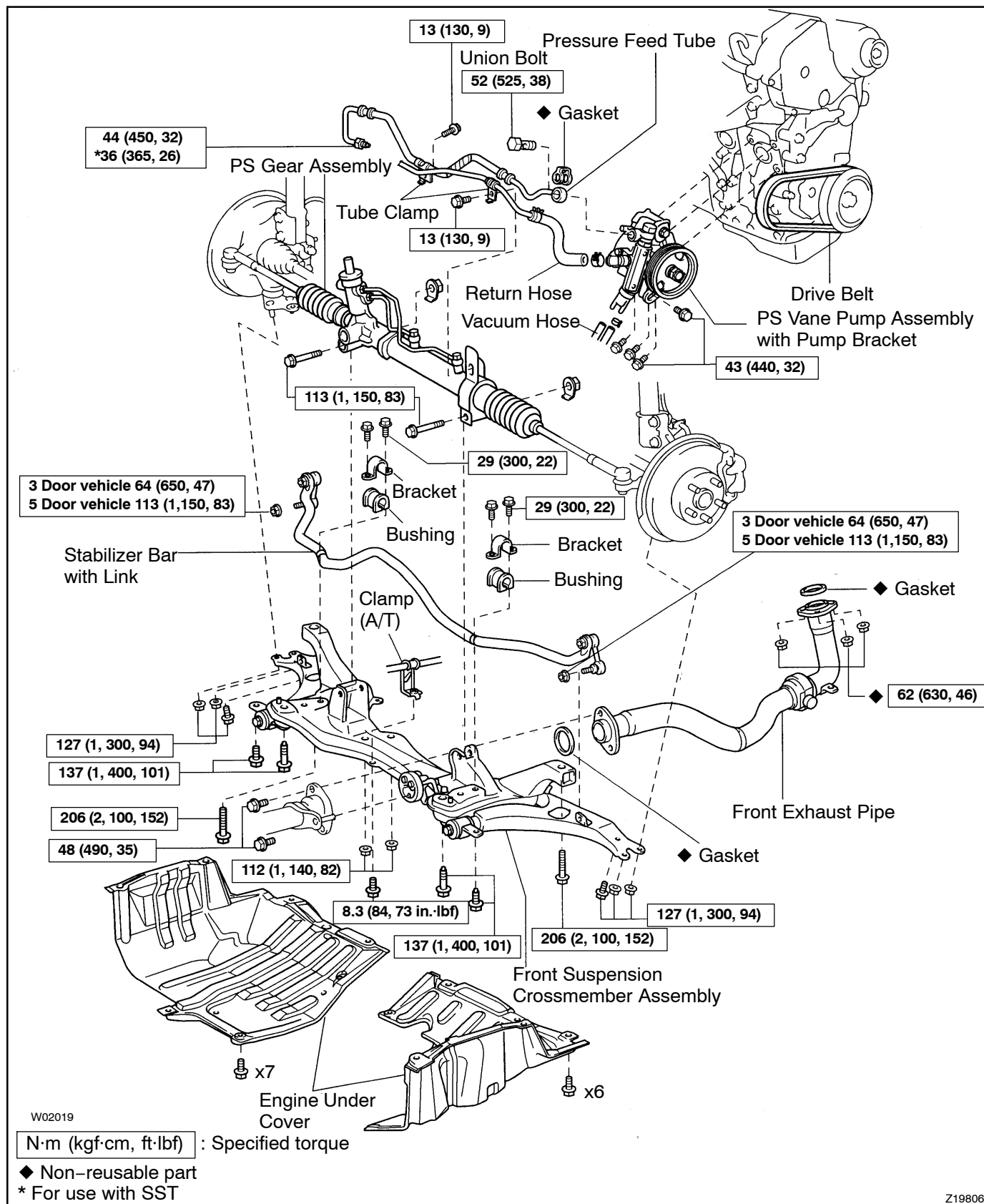
9. CHECK TILT STEERING OPERATION

INSTALLATION

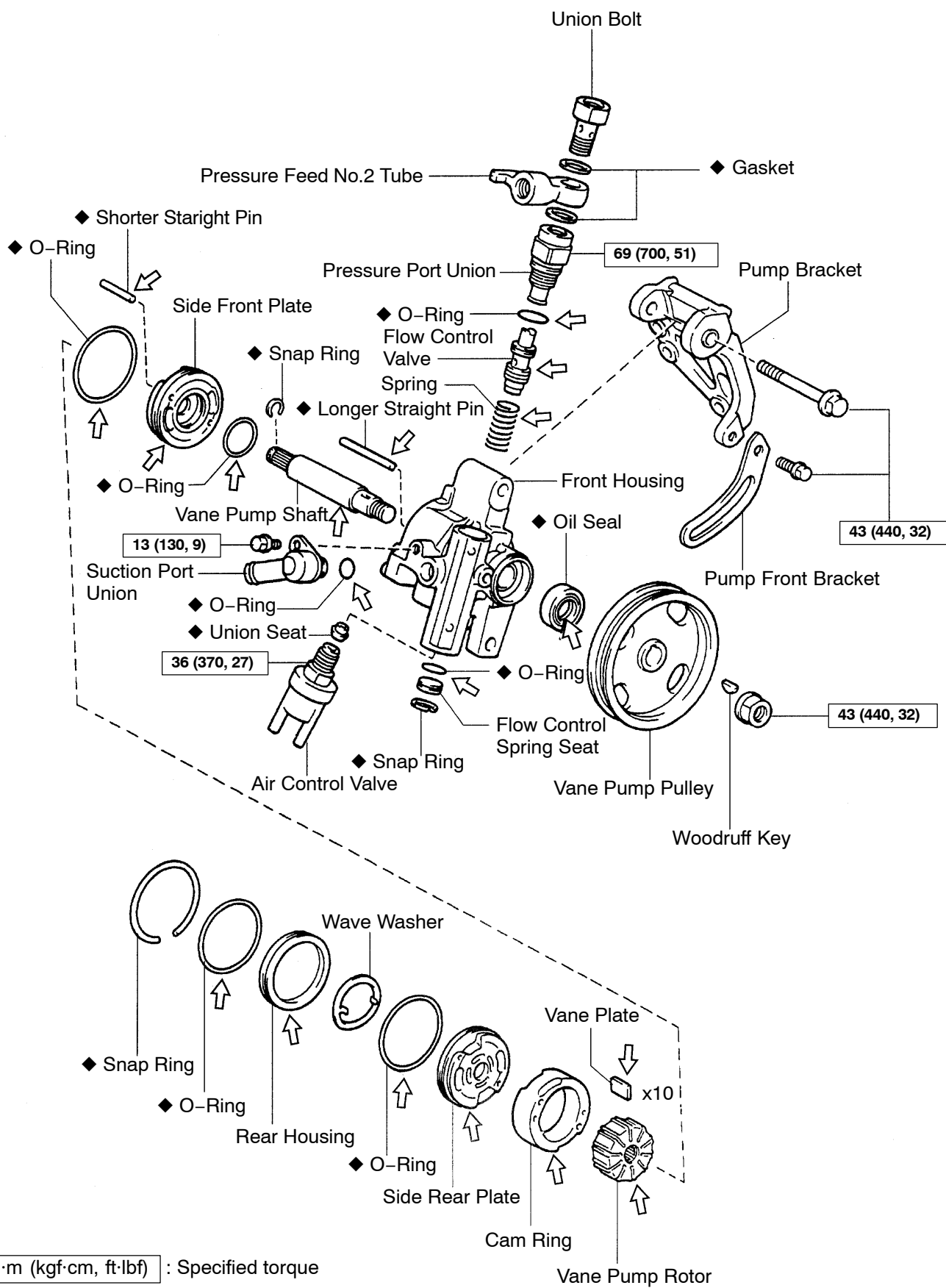
(See page [SR-19](#))

POWER STEERING VANE PUMP COMPONENTS

SR0FV-02



Z19806



REMOVAL

1. REMOVE RH AND LH ENGINE UNDER COVERS

Remove the 13 bolts.

2. REMOVE FRONT EXHAUST PIPE

Remove the 2 bolts, 3 nuts and 2 gaskets.

3. REMOVE STABILIZER BAR WITH LINK

(See page [SA-48](#))

4. DISCONNECT RH AND LH LOWER SUSPENSION ARMS (See page [SA-40](#))

5. REMOVE 2 PS GEAR ASSEMBLY SET BOLTS AND NUTS

6. REMOVE FRONT SUSPENSION CROSSMEMBER ASSEMBLY (See page [SA-40](#))

7. DISCONNECT 2 TUBE CLAMPS

Remove the bolt.

8. DISCONNECT 2 VACUUM HOSES

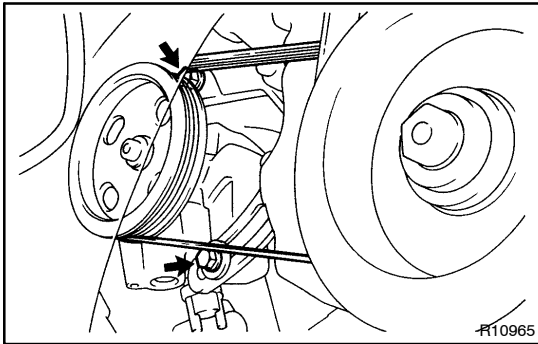
9. DISCONNECT RETURN HOSE

NOTICE:

Take care not to spill fluid on the drive belt.

10. REMOVE DRIVE BELT

Loosen the 2 bolts.

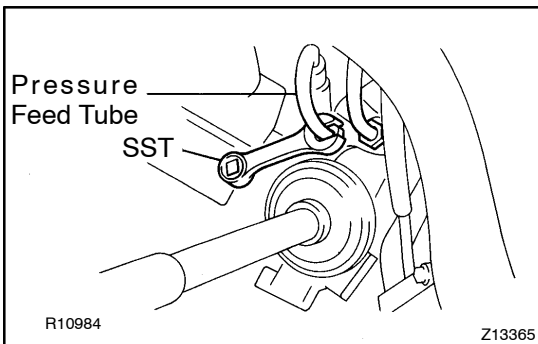


R10965

11. DISCONNECT PRESSURE FEED TUBE

Using SST, disconnect the tube.

SST 09631-22020



R10984

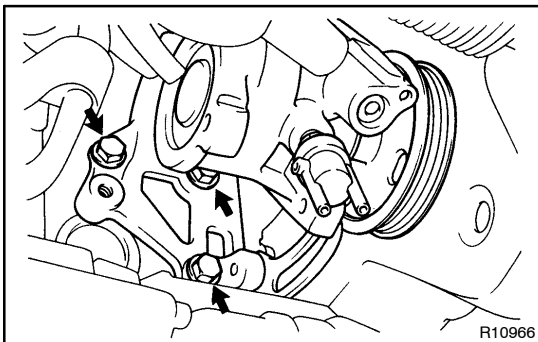
Z13365

12. REMOVE PS VANE PUMP ASSEMBLY WITH PUMP BRACKET

Remove the 3 bolts.

13. REMOVE PRESSURE FEED TUBE

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



R10966

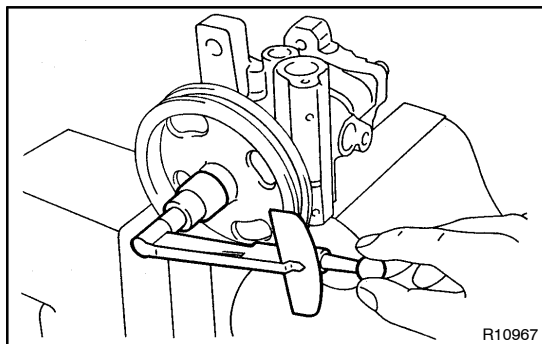
DISASSEMBLY

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.



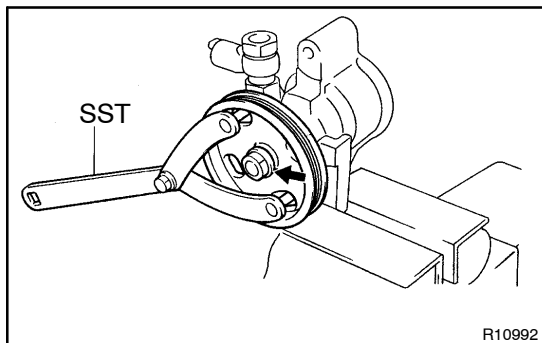
- (b) Using a torque wrench, check the pump rotating torque.

Rotating torque:

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

2. REMOVE PUMP FRONT BRACKET AND PUMP BRACKET

Remove the 2 bolts.



3. REMOVE VANE PUMP PULLEY

- (a) Using SST to stop the pulley rotating, remove the pulley set nut.

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

- (b) Remove the woodruff key from the vane pump shaft.

4. REMOVE AIR CONTROL VALVE

Remove the union seat.

5. REMOVE PRESSURE FEED NO.2 TUBE

Remove the union bolt and 2 gaskets.

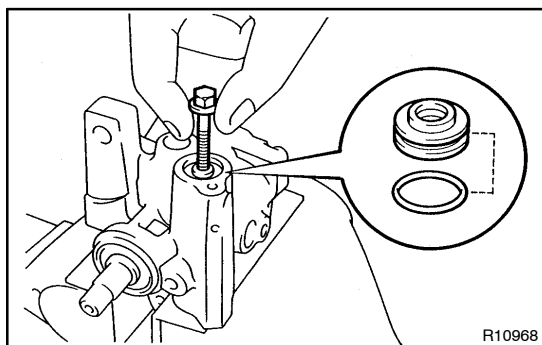
6. REMOVE SUCTION PORT UNION

- (a) Remove the union set bolt.
(b) Remove the O-ring from the union.

7. REMOVE PRESSURE PORT UNION

Remove the O-ring from the union.

8. REMOVE FLOW CONTROL VALVE AND SPRING



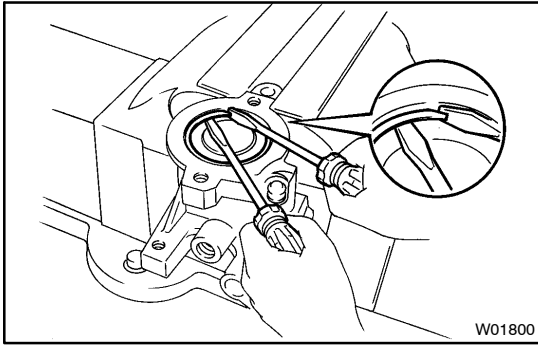
9. REMOVE FLOW CONTROL SPRING SEAT

- (a) Using snap ring pliers, remove the snap ring.
(b) Install the 2 or 3 threads of a bolt (6 mm normal diameter, 1.0 mm pitch, 50 mm length).

Reference

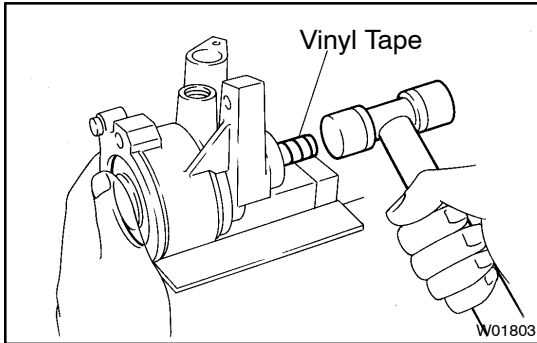
Bolt: 91651-60650

- (c) Using pliers, remove the spring seat from the front housing.
(d) Remove the O-ring from the flow control spring seat.



10. REMOVE REAR HOUSING, WAVE WASHER AND SIDE REAR PLATE

- (a) Using 2 screwdrivers, remove the snap ring.



- (b) To prevent oil seal lip damage, wind vinyl tape on the serrated part of the vane pump shaft.
 (c) Using a plastic hammer, tap out the housing, washer and plate.
 (d) Remove the O-ring from the housing.
 (e) Remove the O-ring from the plate.

11. REMOVE CAM RING AND 10 VANE PLATES

12. REMOVE VANE PUMP SHAFT WITH VANE PUMP ROTOR AND SIDE FRONT PLATE

13. REMOVE VANE PUMP ROTOR AND SIDE FRONT PLATE

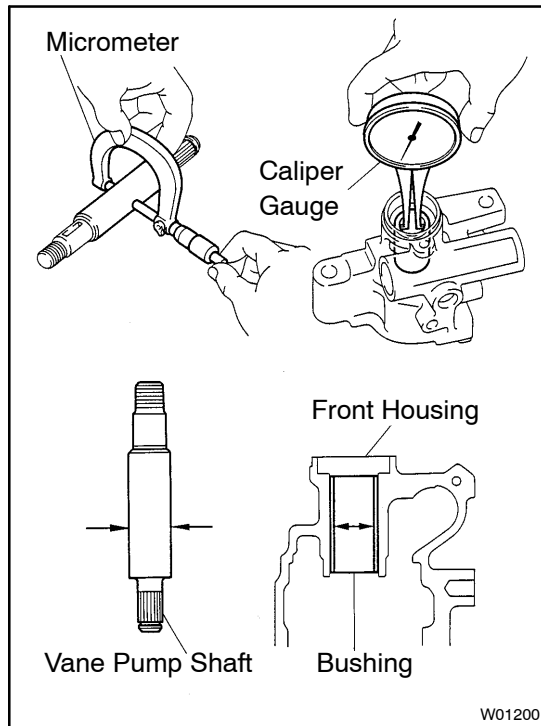
- (a) Using a screwdriver, remove the snap ring from the vane pump shaft.
 (b) Remove the 2 O-rings from the plate.

14. REMOVE SHORTER STRAIGHT PIN

Using pliers, remove the pin from the side front plate.

15. REMOVE LONGER STRAIGHT PIN

Using pliers, remove the pin from the front housing.



INSPECTION

NOTICE:

When using a vise, do not overtighten it.

1. MEASURE OIL CLEARANCE BETWEEN VANE PUMP SHAFT AND BUSHING

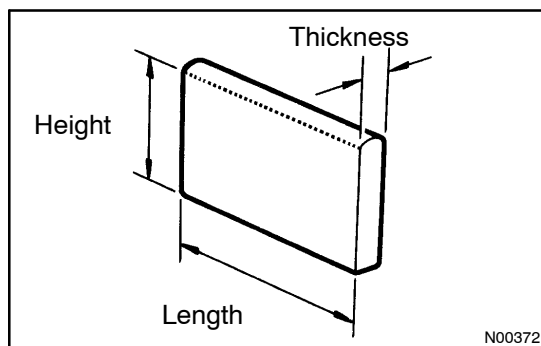
Using a micrometer and a caliper gauge, measure the oil clearance.

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 front housing and vane pump shaft.



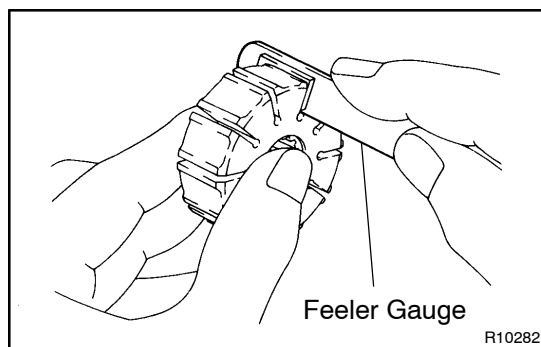
2. INSPECT VANE PUMP ROTOR AND VANE PLATES

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

Minimum height: 8.1 mm (0.319 in.)

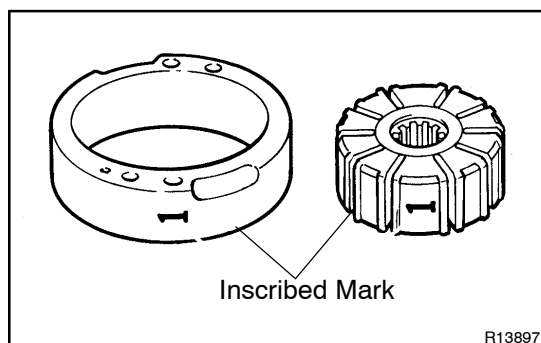
Minimum thickness: 1.797 mm (0.0707 in.)

Minimum length: 14.988 mm (0.59008 in.)



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

Maximum clearance: 0.03 mm (0.0012 in.)



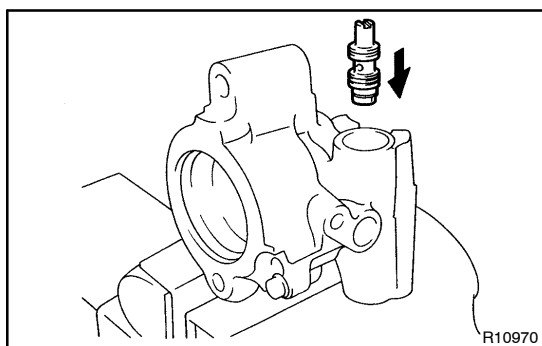
If it is more than the maximum, replace the plate and/or rotor with one having the same mark stamped on the cam ring.

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

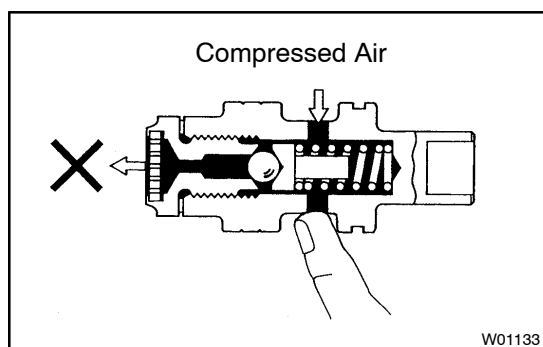
HINT:

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

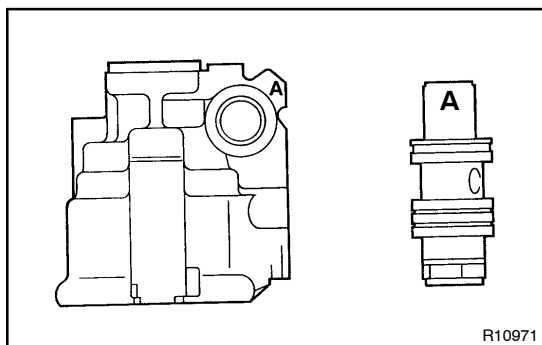
Rotor and cam ring mark	Vane plate part number	Vane plate length mm (in.)
None	44345-12010	14.996-14.998 (0.59039-0.59047)
1	44345-12020	14.994-14.996 (0.59032-0.59039)
2	44345-12030	14.992-14.994 (0.59024-0.59032)
3	44345-12040	14.990-14.992 (0.59016-0.59024)
4	44345-12050	14.988-14.990 (0.59008-0.59016)

**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.

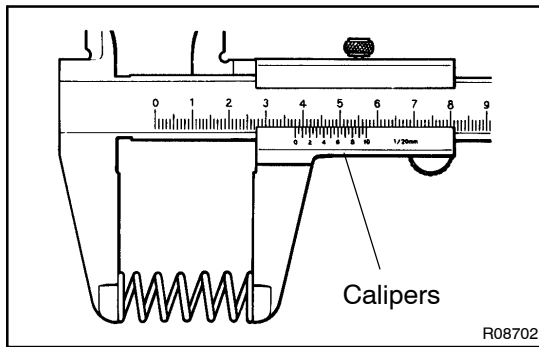


- (b) Check the valve for leakage. Close one of the holes and apply 392-490 kPa (4-5 kgf/cm², 57-71 psi) of compressed air into the opposite side, and confirm that air does not come out from the end hole.



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

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

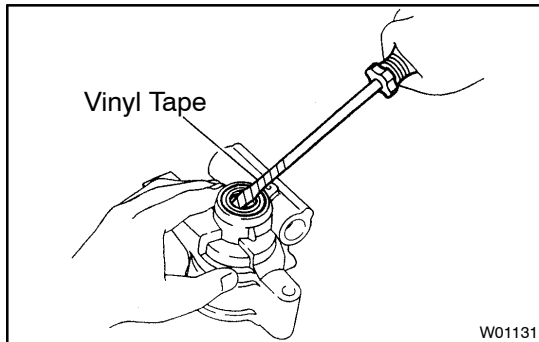


4. INSPECT SPRING

Using calipers, measure the free length of the spring.

Minimum free length: 36.0 mm (1.42 in.)

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

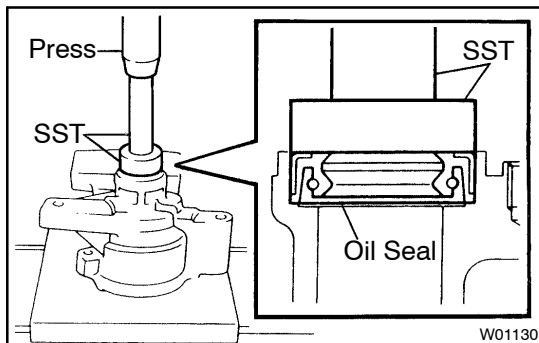


5. IF NECESSARY, REPLACE OIL SEAL

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

NOTICE:

Make sure to install the oil seal facing the correct direction.

REASSEMBLY

NOTICE:

When using a vise, do not overtighten it.

1. **COAT WITH POWER STEERING FLUID**
(See page [SR-31](#))

2. **INSTALL LONGER STRAIGHT PIN**

Using a plastic hammer, tap in a new pin to the front housing.

NOTICE:

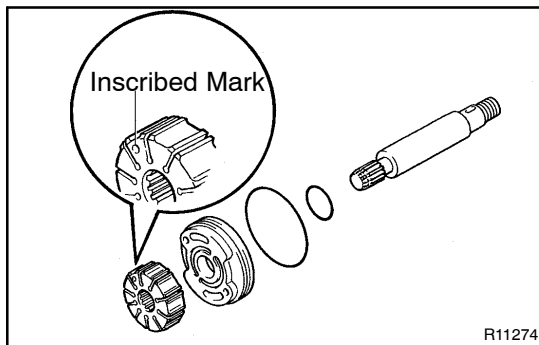
Be careful not to damage the pin.

3. **INSTALL SHORTER STRAIGHT PIN**

Install a new pin to the side front plate.

NOTICE:

Be careful not to damage the pin.



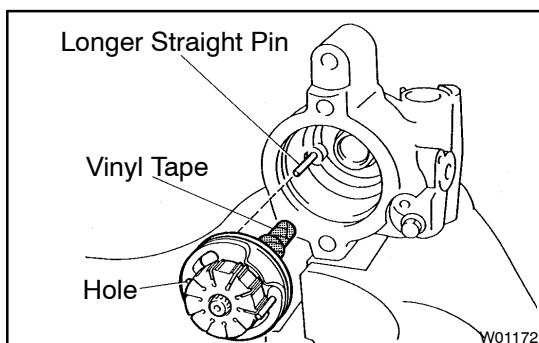
4. **INSTALL SIDE FRONT PLATE AND VANE PUMP ROTOR**

- (a) Coat 2 new O-rings with power steering fluid and install them to the plate.
- (b) Install the plate to the pump shaft.
- (c) Install the rotor to the pump shaft with the inscribed mark facing outward.

NOTICE:

Make sure to install the plate facing the correct direction.

- (d) Using snap ring pliers, install a new snap ring to the vane pump shaft.

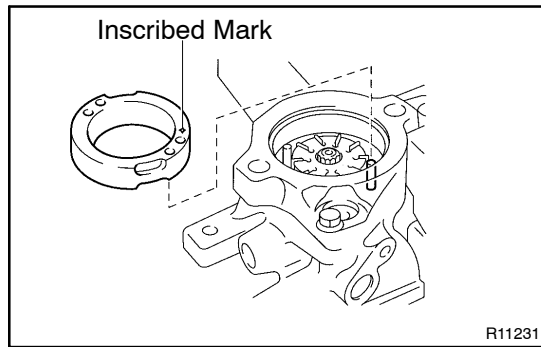


5. **INSTALL VANE PUMP SHAFT WITH VANE PUMP ROTOR AND SIDE FRONT PLATE**

Align the hole of the plate and longer straight pin, and tap in the shaft with a plastic hammer.

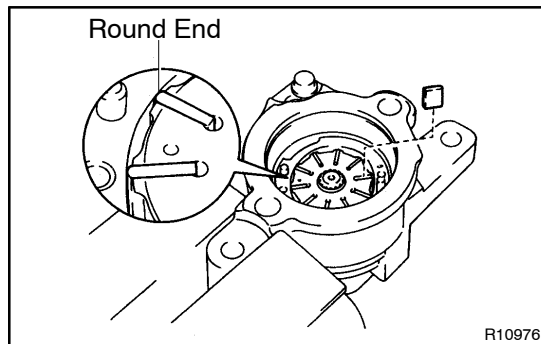
NOTICE:

Be careful not to damage the oil seal and O-rings.



6. INSTALL CAM RING

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

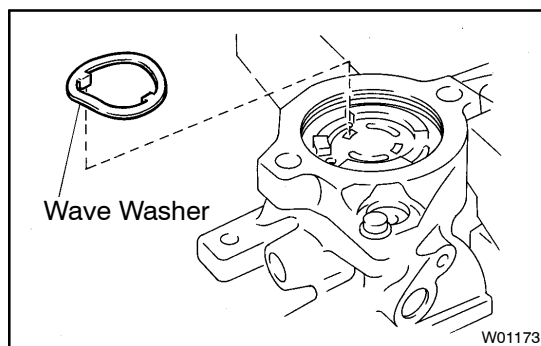


7. INSTALL VANE PLATES

Install the 10 plates with the round end facing outward.

8. INSTALL SIDE REAR PLATE

- Coat a new O-ring with power steering fluid and install it to the plate.
- Align the holes of the plate and 2 straight pins, and install the plate.



9. INSTALL WAVE WASHER

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

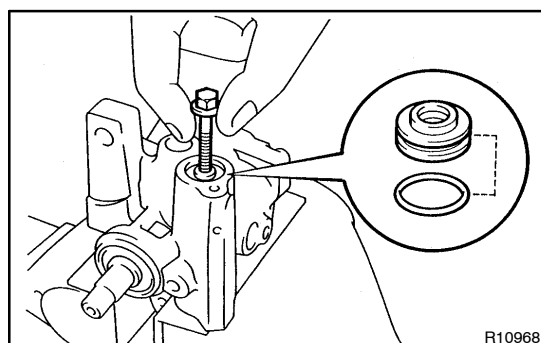
10. INSTALL REAR HOUSING

- Coat a new O-ring with power steering fluid and install it to the housing.
- Using a plastic hammer, tap in the housing to the front housing.

NOTICE:

Be careful not to damage the O-ring.

- Install a new snap ring.



11. INSTALL FLOW CONTROL SPRING SEAT

- Coat a new O-ring with power steering fluid and install it to the flow control spring seat.
- Install the 2-3 threads of the bolt to the spring seat.
- Using pliers, install the spring seat to the front housing.

NOTICE:

- Be careful not to damage the O-ring.**
- Make sure to install the seat facing the correct direction.**

- (d) Using snap ring pliers, install a new snap ring.

12. INSTALL SPRING AND FLOW CONTROL VALVE

Install the valve facing the correct direction

(See page [SR-31](#)).

13. INSTALL PRESSURE PORT UNION

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

- (b) Torque the union.

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

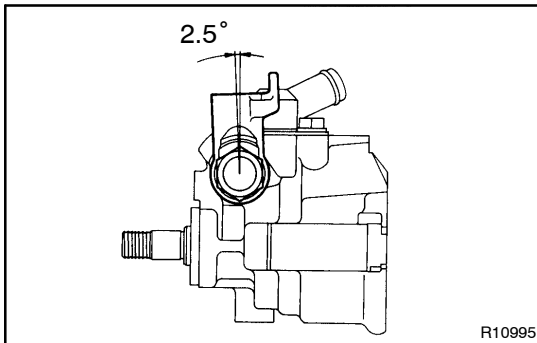
14. INSTALL SUCTION PORT UNION

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

- (b) Install the O-ring to the union.

- (c) Install the union with the bolt.

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)



15. INSTALL PRESSURE FEED NO.2 TUBE

Torque the union bolt with a new gasket on each side of the tube.

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

HINT:

Pressure feed No.2 tube installation angle is 2.5°.

16. INSTALL AIR CONTROL VALVE

- (a) Install a new union seat.

- (b) Torque the valve.

Torque: 36 N·m (370 kgf·cm, 27 ft·lbf)

17. INSTALL VANE PUMP PULLEY

- (a) Install the woodruff key to the vane pump shaft.

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

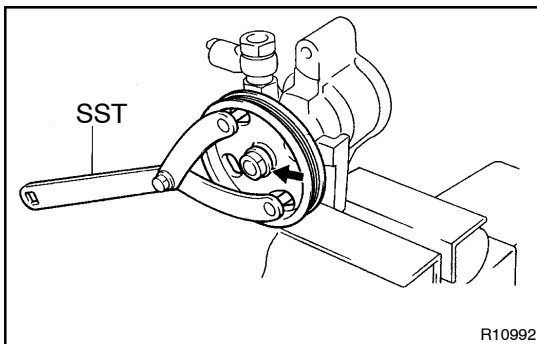
Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)

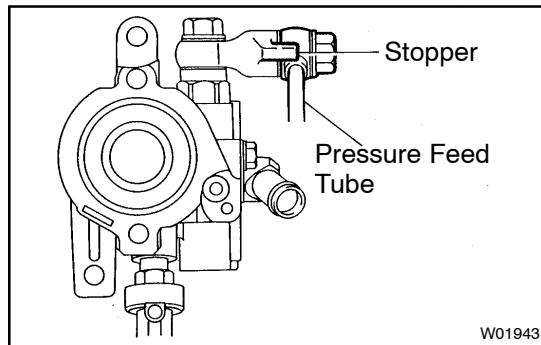
18. INSTALL PUMP BRACKET AND PUMP FRONT BRACKET

Temporarily tighten the 2 bolts.

19. MEASURE PS VANE PUMP ROTATING TORQUE

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





INSTALLATION

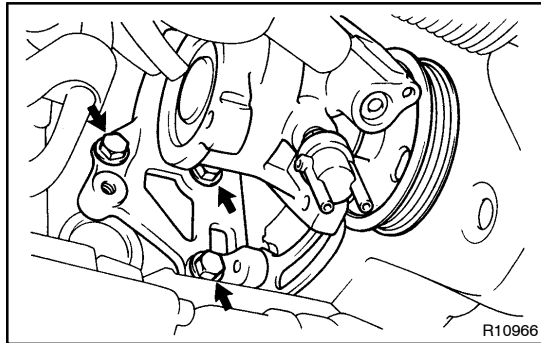
1. INSTALL PRESSURE FEED TUBE

Torque the union bolt over a new gasket.

Torque: 52 N·m (525 kgf·cm, 38 ft·lbf)

HINT:

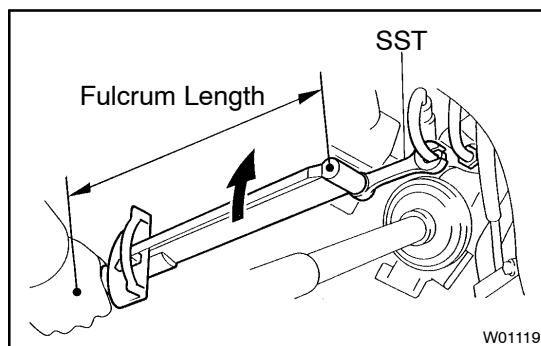
Make sure the tube is touching the stopper of the pressure feed No.2 tube, as shown, then torque the union bolt.



2. INSTALL PS VANE PUMP ASSEMBLY WITH PUMP BRACKET

Torque the 3 bolts.

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



3. CONNECT PRESSURE FEED TUBE

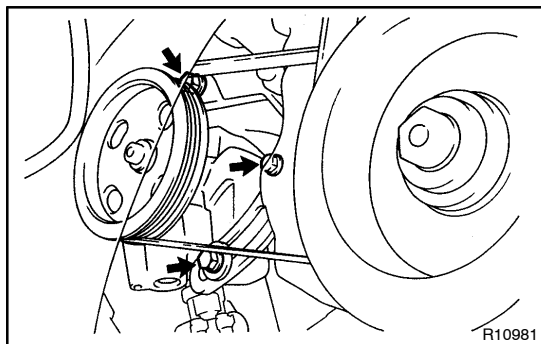
Using SST, connect the tube.

SST 09631-22020

Torque: 36 N·m (365 kgf·cm, 26 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. INSTALL DRIVE BELT

(a) Adjust drive belt tension (See page [SR-3](#))

(b) Torque the 3 bolts.

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

5. CONNECT RETURN HOSE

6. CONNECT 2 VACUUM HOSES

7. CONNECT 2 TUBE CLAMPS

Torque the bolt.

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

8. INSTALL FRONT SUSPENSION CROSSMEMBER ASSEMBLY (See page [SA-42](#))

9. TORQUE 2 PS GEAR ASSEMBLY SET BOLTS AND NUTS

Torque: 113 N·m (1,150 kgf·cm, 83 ft·lbf)

10. CONNECT RH AND LH LOWER SUSPENSION ARMS (See page [SA-42](#))

11. INSTALL STABILIZER BAR WITH LINK (See page [SA-42](#))

12. INSTALL FRONT EXHAUST PIPE

- (a) Torque the 2 bolts with a new gasket.

Torque: 48 N·m (490 kgf·cm, 35 ft·lbf)

- (b) Torque 3 new nuts with a new gasket.

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

13. INSTALL RH AND LH ENGINE UNDER COVERS

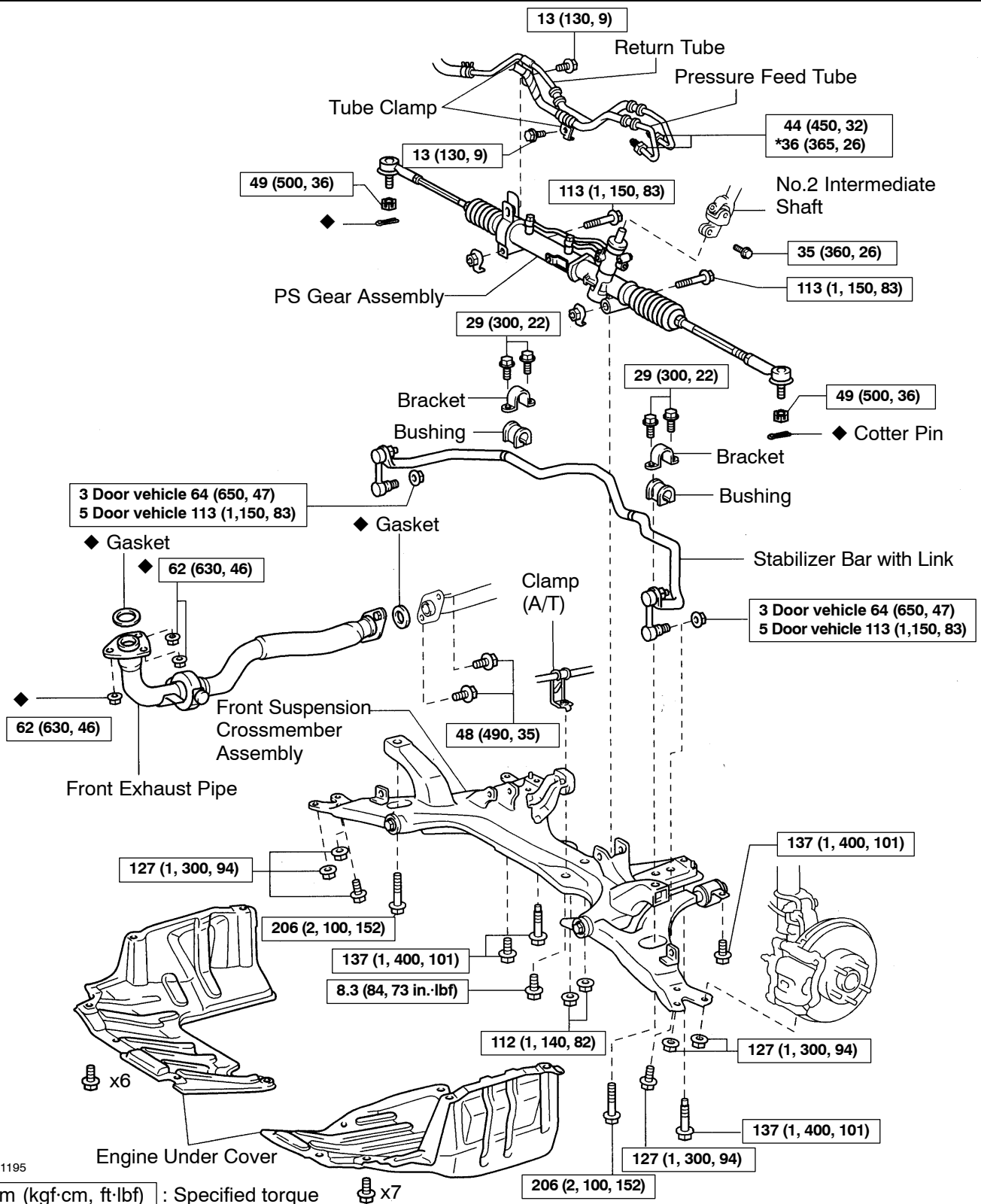
Tighten the 13 bolts.

14. BLEED POWER STEERING SYSTEM

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

POWER STEERING GEAR COMPONENTS

SR0G1-03



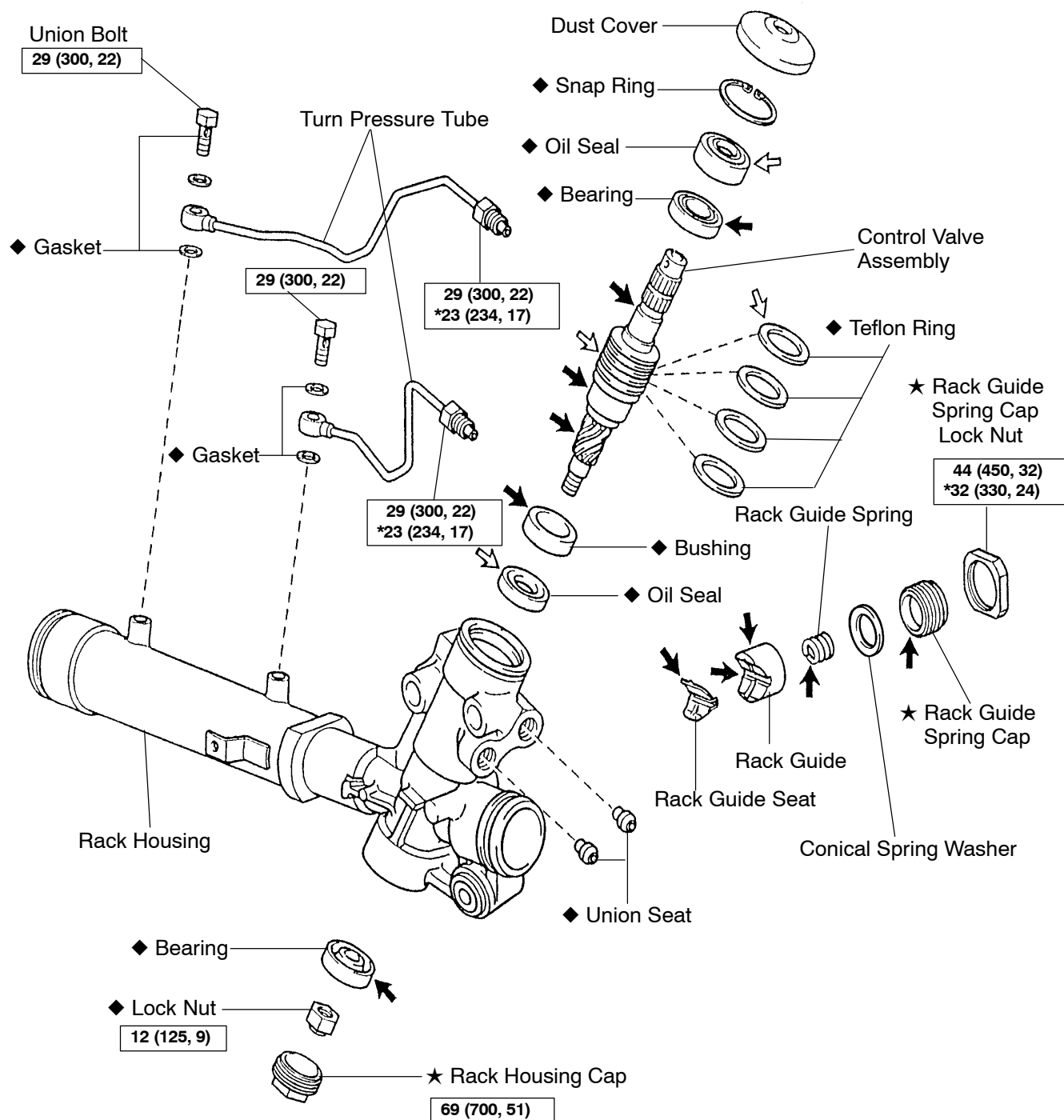
W01195

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

◆ Non-reusable part

* For use with SST

Z19807



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

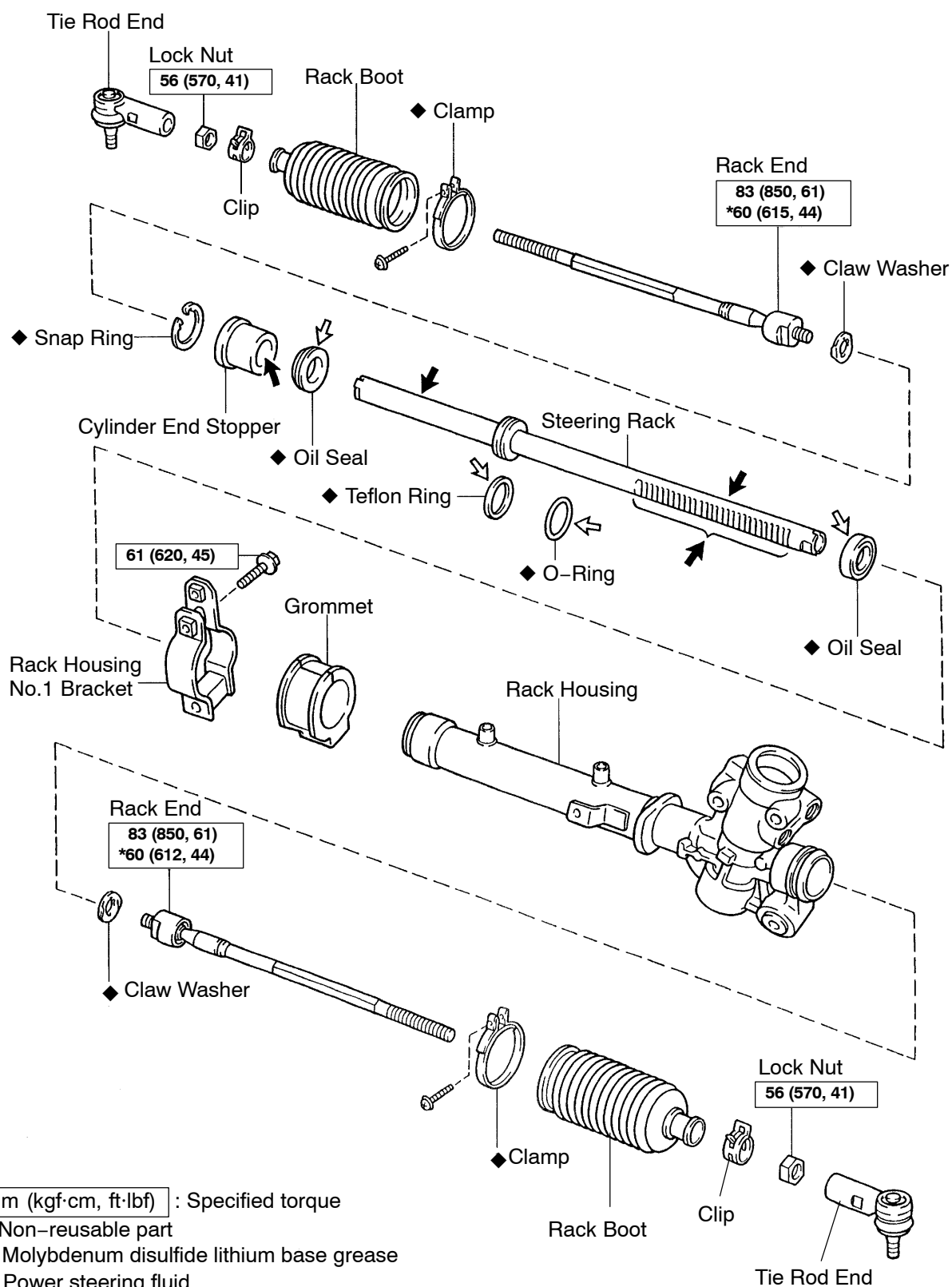
◆ Non-reusable part

★ Precoated part

↙ Molybdenum disulfide lithium base grease

↖ Power steering fluid

* For use with SST



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

◆ Non-reusable part

◀ Molybdenum disulfide lithium base grease

↔ Power steering fluid

* For use with SST

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-12](#))
3. REMOVE STEERING WHEEL (See page [SR-12](#))
4. REMOVE RH AND LH ENGINE UNDER COVERS

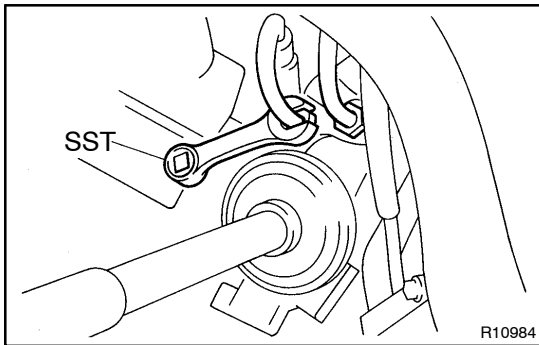
Remove the 13 bolts.

5. DISCONNECT RH AND LH TIE ROD ENDS
(See page [SA-10](#))

6. REMOVE FRONT EXHAUST PIPE

Remove the 2 bolts, 3 nuts and 2 gaskets.

7. REMOVE STABILIZER BAR WITH LINK
(See page [SA-48](#))
8. DISCONNECT NO.2 INTERMEDIATE SHAFT
(See page [SR-12](#))



9. DISCONNECT PRESSURE FEED AND RETURN TUBES

Using SST, disconnect the tube.

SST 09631-22020

10. DISCONNECT PRESSURE FEED AND RETURN TUBE CLAMPS

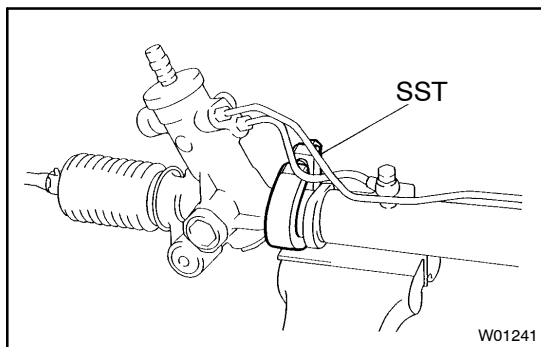
Remove the bolt.

11. DISCONNECT RH AND LH LOWER SUSPENSION ARMS (See page [SA-40](#))
12. REMOVE 2 PS GEAR ASSEMBLY SET BOLTS AND NUTS

HINT:

Securely suspend the steering gear assembly.

13. REMOVE FRONT SUSPENSION CROSSMEMBER ASSEMBLY (See page [SA-40](#))



DISASSEMBLY

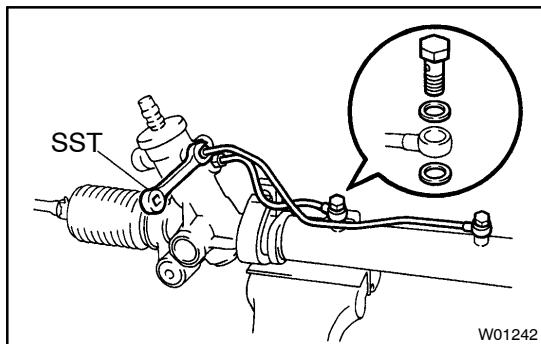
NOTICE:

When using a vise, do not overtighten it.

1. SECURE PS GEAR ASSEMBLY IN VISE

Using SST, secure the gear assembly in a vise.

SST 09612-00012

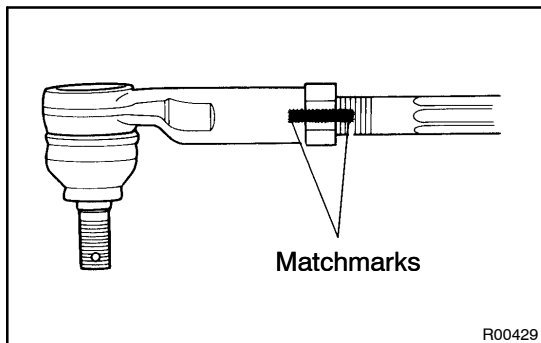


2. REMOVE 2 TURN PRESSURE TUBES

(a) Remove the union bolt and 2 gaskets.

(b) Using SST, remove the tube.

SST 09633-00020



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

(a) Place matchmarks on the tie rod end and rack end.

(b) Loosen the lock nut.

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

Remove the screw and loosen the clamp.

NOTICE:

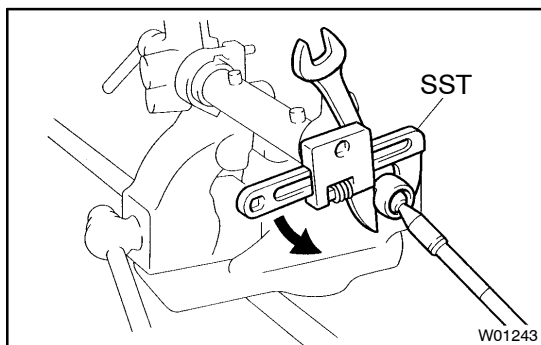
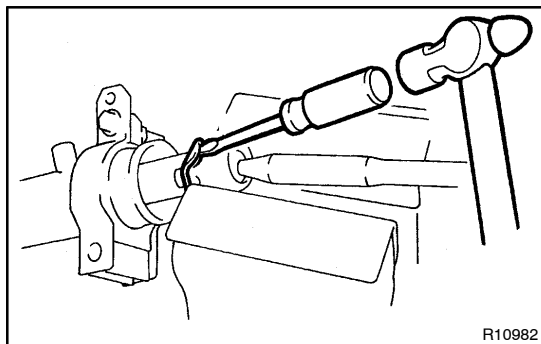
- Be careful not to damage the boot.
- Mark the RH and LH boots.

5. REMOVE RH AND LH RACK ENDS AND CLAW WASHERS

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

NOTICE:

Avoid any impact to the steering rack.

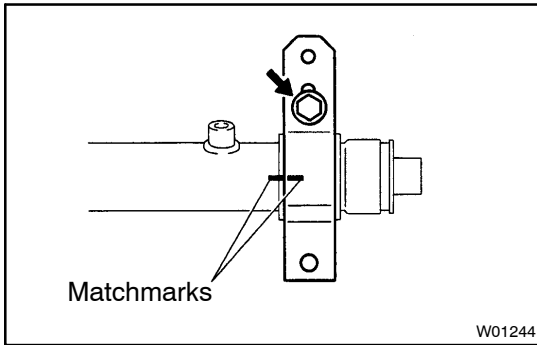


(b) Using a spanner to hold the steering rack steady and using SST, remove the rack end.

SST 09922-10010

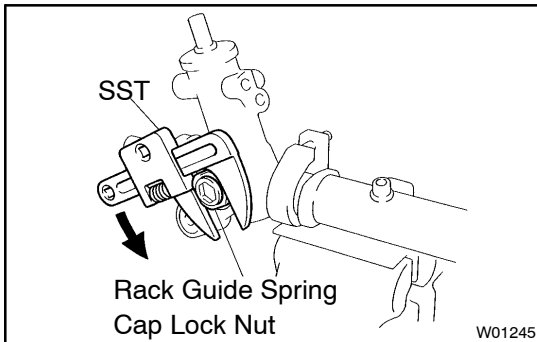
NOTICE:

- Use SST 09922-10010 in the direction shown in the illustration.
- Mark the RH and LH rack ends.



6. REMOVE RACK HOUSING NO.1 BRACKET AND GROMMET

- Place matchmarks on the bracket and rack housing.
- Remove the bolt.
- Remove the grommet from the rack housing No.1 bracket.



7. REMOVE RACK GUIDE SPRING CAP LOCK NUT

Using SST, remove the nut.

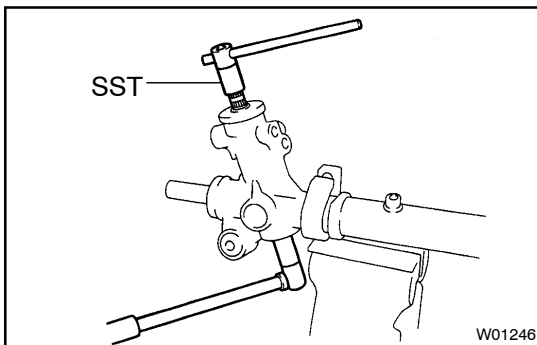
SST 09922-10010

NOTICE:

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

8. REMOVE RACK GUIDE SPRING CAP, RACK GUIDE SPRING, RACK GUIDE AND RACK GUIDE SEAT

- Using a hexagon wrench (21 mm), remove the cap.
- Remove the seat from the guide.



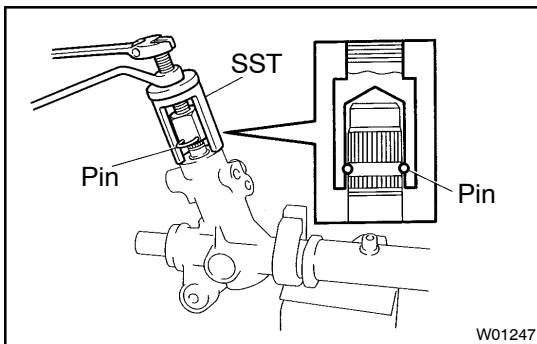
9. REMOVE RACK HOUSING CAP

10. REMOVE LOCK NUT

Using SST to stop the control valve shaft rotating, remove the nut.

SST 09616-00010

11. REMOVE DUST COVER



12. REMOVE CONTROL VALVE ASSEMBLY, OIL SEAL AND BEARING

- Using snap ring pliers, remove the snap ring from the rack housing.
- Using SST, remove the control valve with the oil seal and bearing.

SST 09613-12010

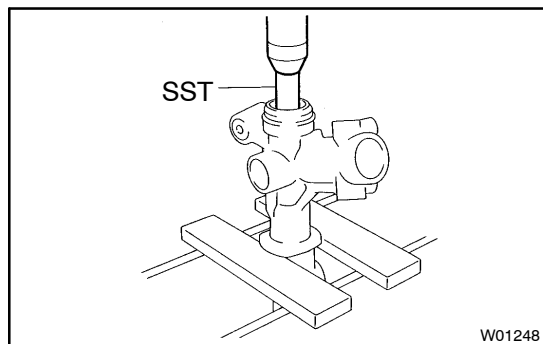
NOTICE:

Never attempt to tap out the control valve as this would damage it.

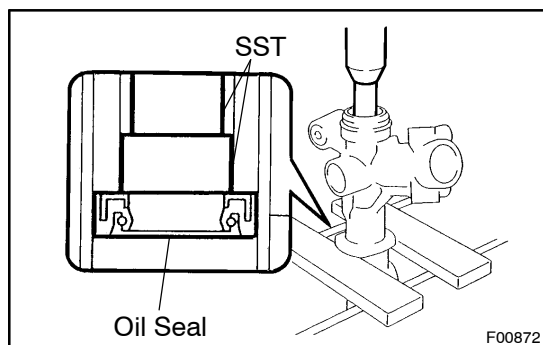
- Remove the oil seal and bearing from the control valve.

13. REMOVE BEARING

Remove the bearing and spacer from the rack housing.

**14. REMOVE CYLINDER END STOPPER AND STEERING RACK**

- (a) Using snap ring pliers, remove the snap ring from the rack housing.
- (b) Using SST, press out the steering rack and end stopper.
SST 09612-10093 (09612-10061)
- (c) Remove the oil seal from the steering rack.

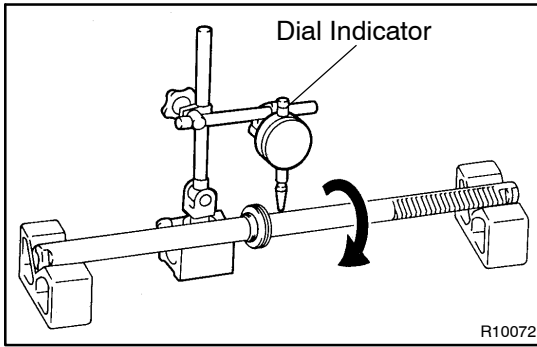
**15. REMOVE OIL SEAL**

Using SST, press out the oil seal.

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

NOTICE:

Be careful not to damage the rack housing.



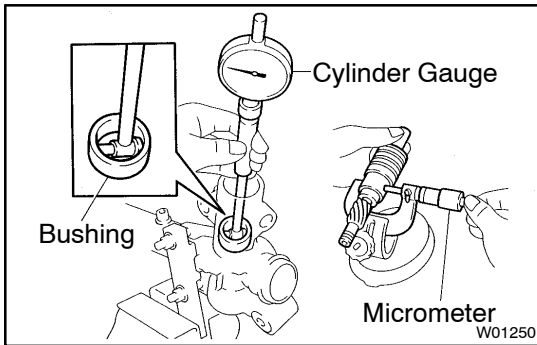
INSPECTION

NOTICE:

When using a vise, do not overtighten it.

1. INSPECT STEERING RACK

- Using a dial indicator, check the rack for runout.
Maximum runout: 0.30 mm (0.0118 in.)
- Check the rack for teeth wear and damage.
- Check the back surface for wear and damage.

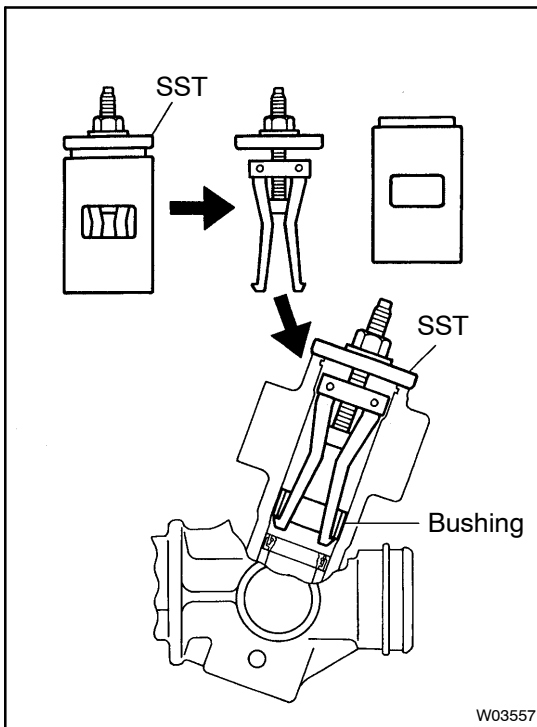


2. CHECK CONTROL VALVE ASSEMBLY AND BUSHING

Using a cylinder gauge and a micrometer, measure the inside diameter of the bushing and outside diameter of the valve assembly.

Maximum inside diameter: 28.20 mm (1.1102 in.)

Minimum outside diameter: 27.75 mm (1.0925 in.)



3. IF NECESSARY, REPLACE BUSHING AND OIL SEAL

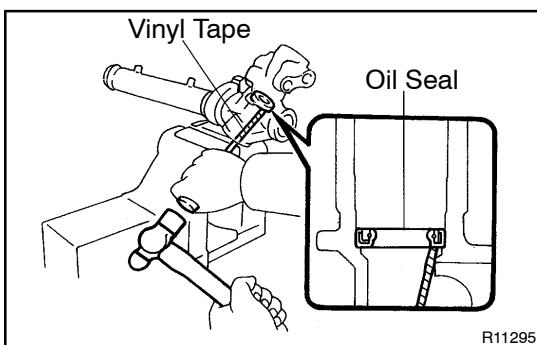
- Using SST, remove the bushing from the rack housing.
SST 09612-24014 (09613-22011)

NOTICE:

Be careful not to damage the rack housing.

HINT:

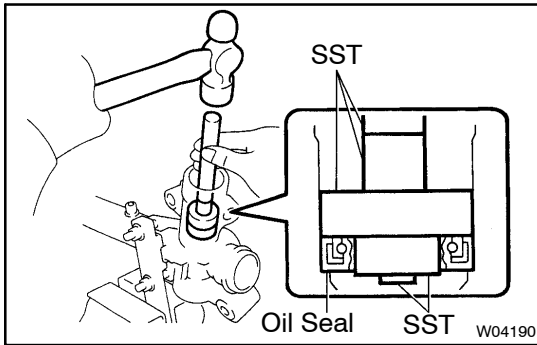
- Separate the SST as shown in the illustration to use it.
- As shown, from the opposite side of SST confirm that its claw is firmly caught on the bushing.



- Using a screwdriver, tap out the oil seal.

NOTICE:

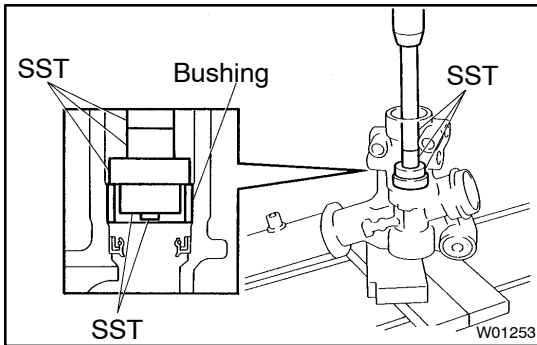
To prevent rack housing damage, wind vinyl tape on the screwdriver.



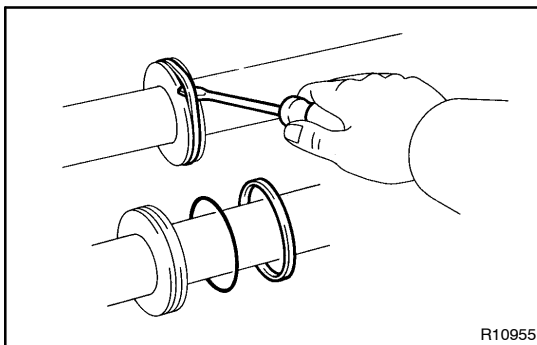
- (c) Coat a new oil seal lip with power steering fluid.
- (d) Using SST, carefully tap in the oil seal.
SST 09950-60010 (09951-00230, 09951-00330, 09952-06010), 09950-70010 (09951-07150)

NOTICE:

Make sure to install the oil seal facing the correct direction.



- (e) Coat a new bushing with molybdenum disulfide lithium base grease.
- (f) Using SST, press in the bushing.
SST 09950-60010 (09951-00270, 09951-00340, 09952-06010), 09950-70010 (09951-07150)



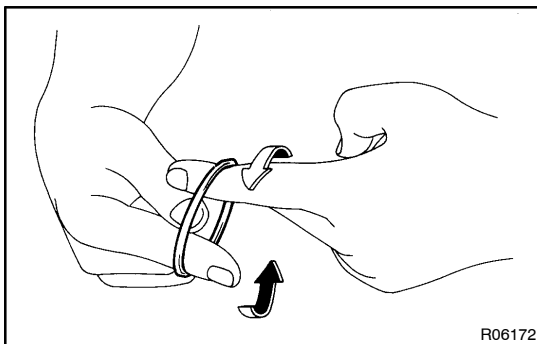
4. IF NECESSARY, REPLACE TEFLON RING AND O-RING

- (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.

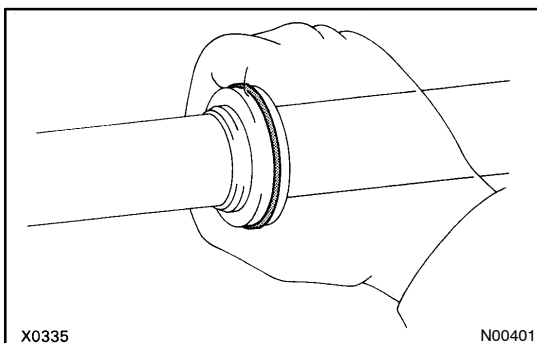
- (b) Coat a new O-ring with power steering fluid and install it.



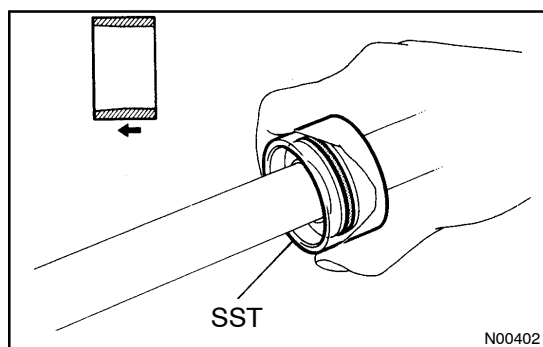
- (c) Expand a new teflon ring with your fingers.

NOTICE:

Be careful not to overexpand the ring.



- (d) Coat the ring with power steering fluid.
- (e) Install the ring to the steering rack and snug it down with your fingers.

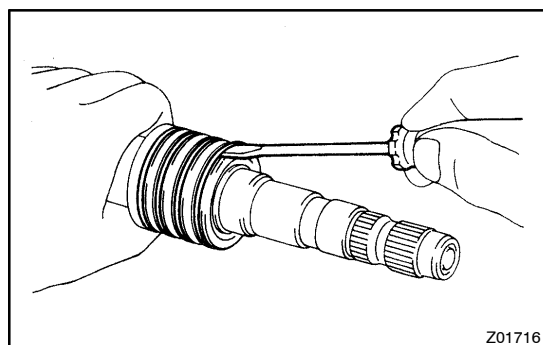


- (f) Carefully slide the tapered end of SST over the ring to seat it.

SST 09630-24014 (09631-24031)

NOTICE:

Be careful not to damage the ring.



5. IF NECESSARY, REPLACE TEFLON RINGS

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

NOTICE:

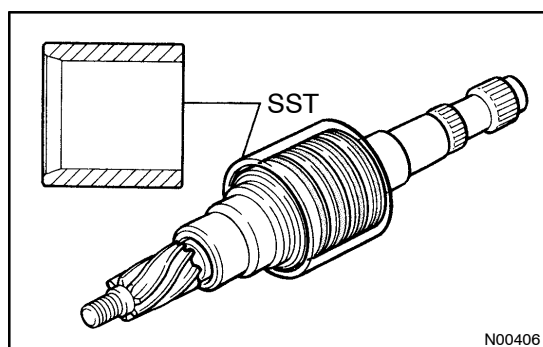
Be careful not to damage the grooves for the ring.

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

NOTICE:

Be careful not to overexpand the ring.

- (c) Coat the rings with power steering fluid.
(d) Install the rings to the control valve assembly, and snug them down with your fingers.

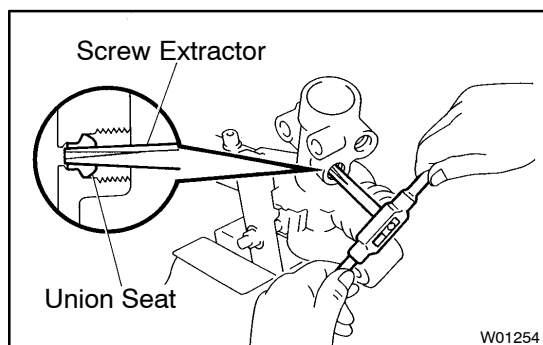


- (e) Carefully slide the tapered end of SST over the rings to seat them.

SST 09631-20081

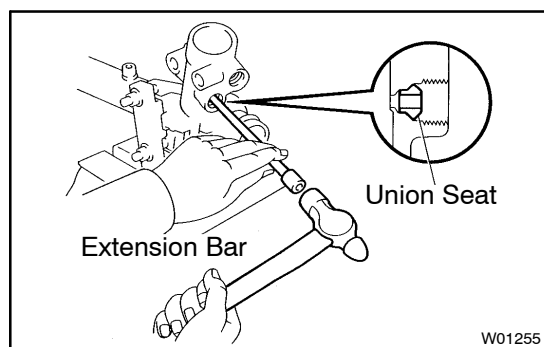
NOTICE:

Be careful not to damage the rings.



6. IF NECESSARY, REPLACE 2 UNION SEATS

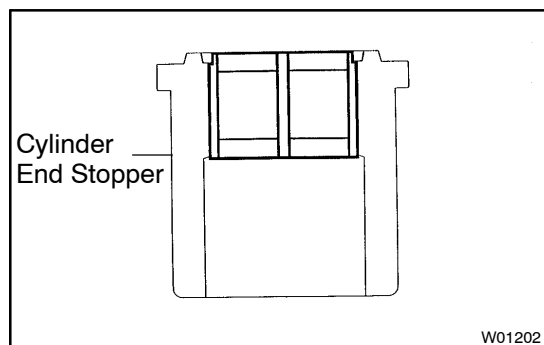
- (a) Using a screw extractor, remove the union seats.



- (b) Using an extension bar and a hammer, tap in 2 new union seats.

NOTICE:

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



7. INSPECT BUSHING

- (a) Check for wear and damage on the inside of the bushing of the cylinder end stopper.

If the bushing is worn or damaged, replace the cylinder end stopper.

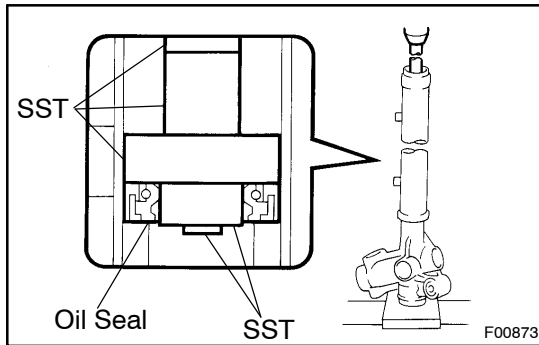
- (b) Coat inside of the bushing with molybdenum disulfide lithium base grease.

REASSEMBLY

NOTICE:

When using a vise, do not overtighten it.

1. **COAT WITH POWER STEERING FLUID OR MOLYBDENUM DISULFIDE LITHIUM BASE GREASE**
(See page [SR-44](#))



2. INSTALL OIL SEAL

- (a) Coat a new oil seal lip with power steering fluid.
- (b) Using SST, press in the oil seal.
SST 09950-60010 (09951-00230, 09951-00400, 09952-06010), 09950-70010 (09951-07360)

NOTICE:

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

3. INSTALL STEERING RACK

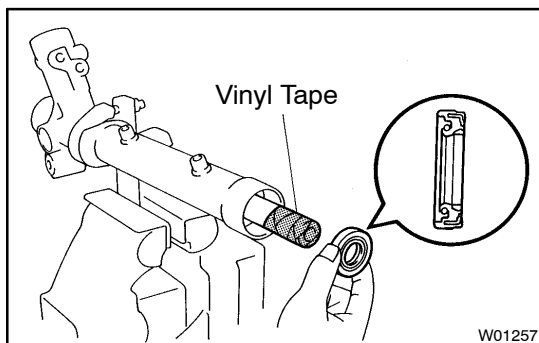
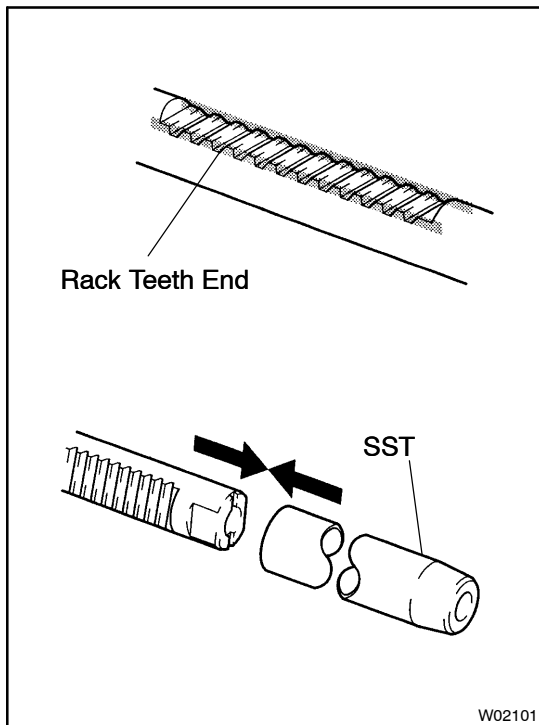
- (a) Install SST to the rack.

HINT:

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

SST 09631-16020

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



4. INSTALL OIL SEAL

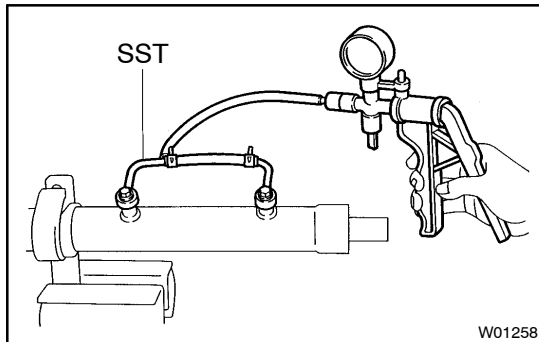
- (a) Coat a new oil seal lip with power steering fluid.
- (b) To prevent oil seal lip damage, wind vinyl tape on the steering rack end, and apply power steering fluid.
- (c) Install the oil seal by pushing it into the rack housing, without tilting.

NOTICE:

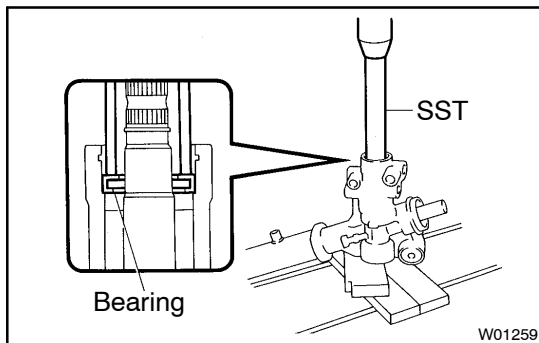
Make sure to install the oil seal facing the correct direction.

5. INSTALL CYLINDER END STOPPER

- (a) Install the stopper into the rack housing.
- (b) Using snap ring pliers, install a new snap ring to the rack housing.

**6. AIR TIGHTNESS TEST**

- (a) Install SST to the union of the rack housing.
SST 09631-22030
 - (b) Apply 53 kPa (400 mmHg, 15.75 in.Hg) of vacuum for about 30 seconds.
 - (c) 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**

- (a) Coat the teflon rings with power steering fluid.
- (b) Install the control valve assembly into the rack housing.

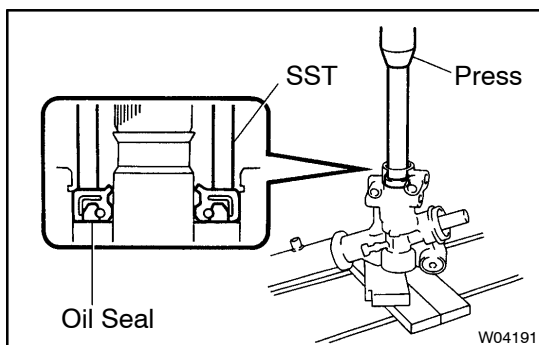
NOTICE:

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

8. INSTALL BEARING

Using SST, press in a new bearing.

SST 09612-22011

**9. INSTALL OIL SEAL**

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

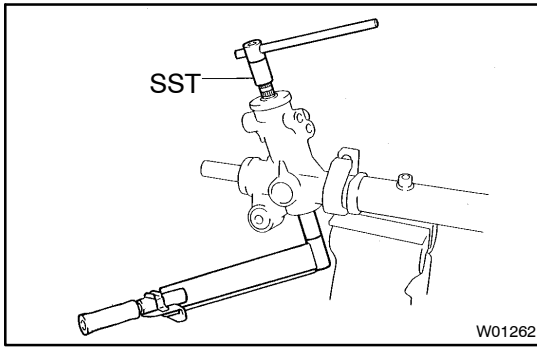
NOTICE:

Make sure to install the oil seal facing the correct direction.

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

10. INSTALL DUST COVER**11. INSTALL BEARING**

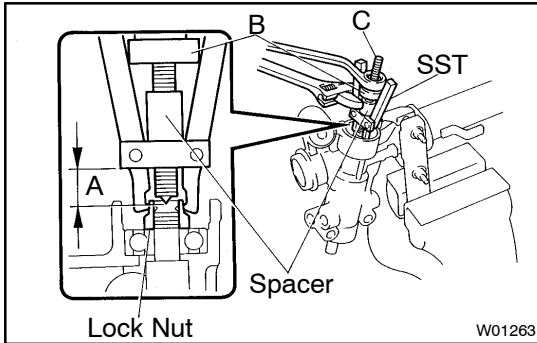
Install the spacer and a new bearing into the rack housing.

**12. INSTALL LOCK NUT**

- (a) Using SST to stop the control valve shaft rotating, torque a new nut.

SST 09616-00010

Torque: 12 N·m (125 kgf·cm, 9 ft·lbf)



- (b) Turn C of SST to obtain dimension A, then set SST, as shown.

SST 09613-12020

Dimension A: 16.5 - 17.0 mm (0.65 - 0.67 in.)

- (c) Stake the nut by turning B of SST until it touches the spacer of SST.

13. INSTALL RACK HOUSING CAP

- (a) Apply sealant to 2 or 3 threads of the cap.

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

- (b) Torque the cap.

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

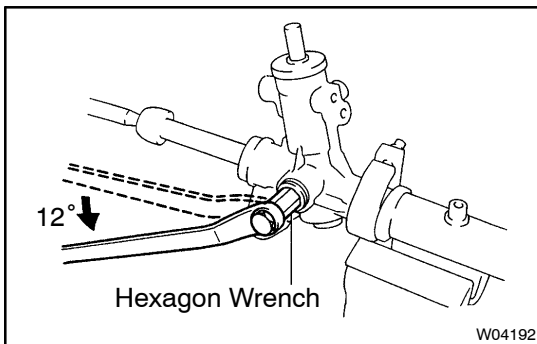
14. INSTALL RACK GUIDE SEAT, RACK GUIDE, RACK GUIDE SPRING AND RACK GUIDE SPRING CAP

- (a) Install the seat to the guide.

- (b) Apply sealant to 2 or 3 threads of the cap.

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

- (c) Temporarily install the cap.

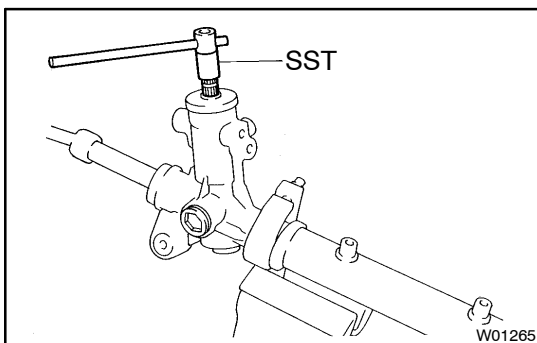
**15. ADJUST TOTAL PRELOAD**

- (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 (21 mm), torque the rack guide spring cap.

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

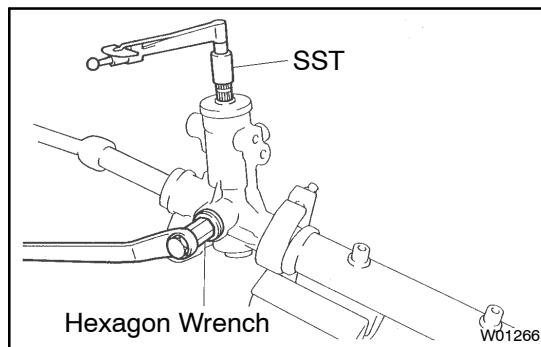
- (c) Using a hexagon wrench (21 mm), return the cap 12°.



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

SST 09616-00010

- (e) Using a hexagon wrench (21 mm), loosen the cap until the rack guide spring is not functioning.

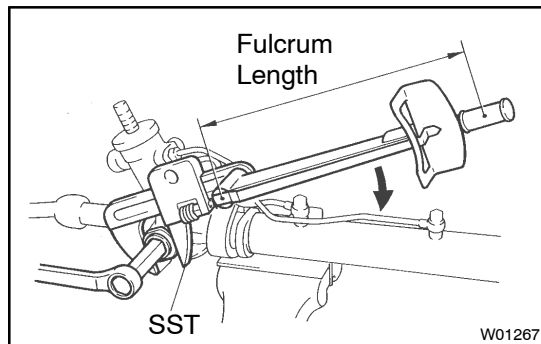


- (f) Using SST, a torque wrench and hexagon wrench (21 mm), tighten the cap until the preload is within the specification.

SST 09616-00010

Preload (turning):

0.8 – 1.3 N·m (8 – 13 kgf·cm, 6.9 – 11.3 in·lbf)



16. INSTALL RACK GUIDE SPRING CAP LOCK NUT

- (a) Apply sealant to 2 or 3 threads of the nut.

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

- (b) Using a hexagon wrench (21 mm) to stop the rack guide spring cap rotating, and using SST, torque the nut.

SST 09922-10010

Torque: 32 N·m (330 kgf·cm, 24 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) Recheck the total preload.

SST 09616-00010

Preload (turning):

0.8 – 1.3 N·m (8 – 13 kgf·cm, 6.9 – 11.3 in·lbf)

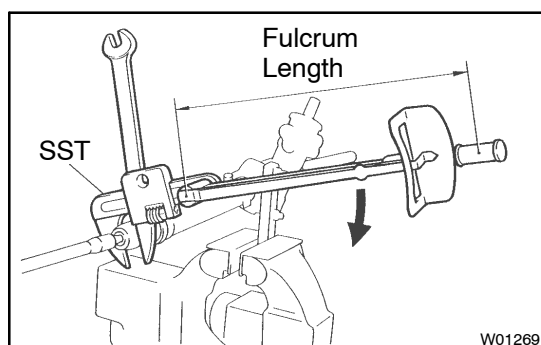
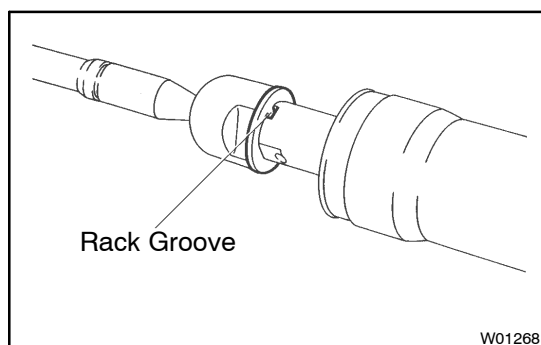
- (d) Remove the RH and LH rack ends.

17. INSTALL RH AND LH CLAW WASHERS AND RACK ENDS

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

HINT:

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



- (b) Using a spanner (22 mm) to hold the steering rack steady, and using SST, torque the rack end.

SST 09922-10010

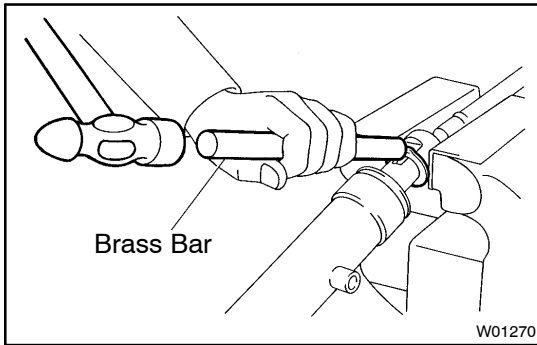
Torque: 60 N·m (615 kgf·cm, 44 ft·lbf)

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 to the rack.

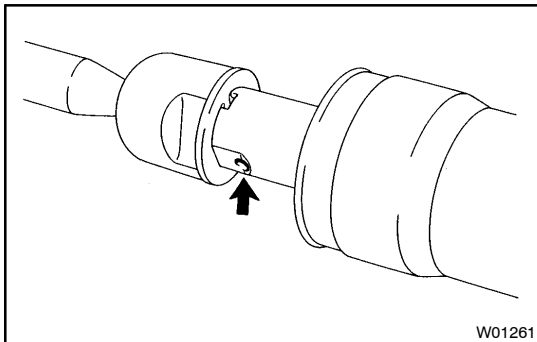
18. INSTALL GROMMET

Install the grommet to the rack housing No.1 bracket.

19. INSTALL RACK HOUSING NO.1 BRACKET

- Align the matchmarks on the bracket and housing.
- Torque the bolt.

Torque: 61 N·m (620 kgf·cm, 45 ft·lbf)



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

- Make sure 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 turned.

- Install the boot.

NOTICE:

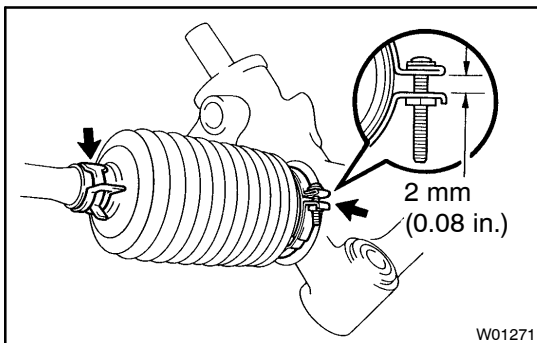
Be careful not to damage or twist the boot.

- Tighten the clamp, as shown in the illustration.

21. INSTALL RH AND LH TIE ROD ENDS AND LOCK NUTS

- Screw the lock nut and tie rod end onto the rack end until the matchmarks are aligned.
- After adjusting toe-in, torque the nut
(See page [SA-4](#)).

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



22. INSTALL 2 TURN PRESSURE TUBES

- Using SST, install the tube.

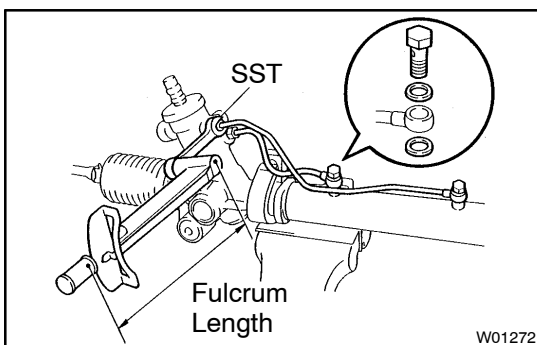
SST 09633-00020

Torque: 23 N·m (234 kgf·cm, 17 ft·lbf)

HINT:

- Use a torque wrench with a fulcrum length of 250 mm (9.84 in.).
 - This torque value is effective in case that SST is parallel to a torque wrench.
- Torque the union bolt with a new gasket on each side of the tube.

Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)



INSTALLATION

1. CONNECT PRESSURE FEED AND RETURN TUBE CLAMPS

Torque the bolt.

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

2. INSTALL FRONT SUSPENSION CROSSMEMBER ASSEMBLY (See page [SA-42](#))

3. TORQUE 2 PS GEAR ASSEMBLY SET BOLTS AND NUTS

Torque: 113 N·m (1,150 kgf·cm, 83 ft·lbf)

4. CONNECT RH AND LH LOWER SUSPENSION ARMS (See page [SA-42](#))

5. INSTALL STABILIZER BAR WITH LINK (See page [SA-50](#))

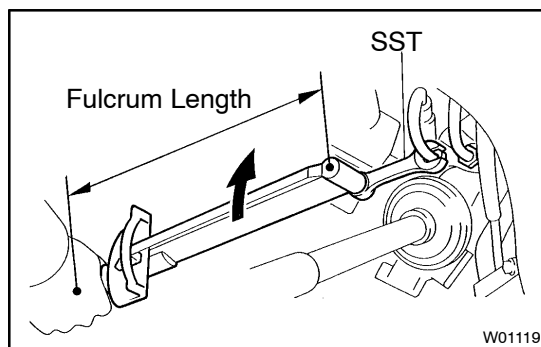
6. INSTALL FRONT EXHAUST PIPE

(a) Torque the 2 bolts with a new gasket.

Torque: 48 N·m (490 kgf·cm, 35 ft·lbf)

(b) Torque 3 new nuts with a new gasket.

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



7. CONNECT PRESSURE FEED AND RETURN TUBES

Using SST, connect the tube.

SST 09631-22020

Torque: 36 N·m (365 kgf·cm, 26 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.
- Securely suspend the steering gear assembly.

8. CONNECT NO.2 INTERMEDIATE SHAFT (See page [SR-19](#))

9. CONNECT RH AND LH TIE ROD ENDS (See page [SA-16](#))

10. INSTALL RH AND LH ENGINE UNDER COVERS

Tighten the 13 bolts.

11. POSITION FRONT WHEELS FACING STRAIGHT AHEAD

HINT:

Do it with the front of the vehicle jacked up.

12. **CENTER SPIRAL CABLE (See page [SR-19](#))**
13. **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.
14. **BLEED POWER STEERING SYSTEM**
(See page [SR-4](#))
15. **CHECK STEERING WHEEL CENTER POINT**
16. **TORQUE STEERING WHEEL SET NUT**
Torque: 34 N·m (350 kgf·cm, 25 ft·lbf)
17. **INSTALL STEERING WHEEL PAD (See page [SR-19](#))**
18. **CHECK FRONT WHEEL ALIGNMENT**
(See page [SA-4](#))