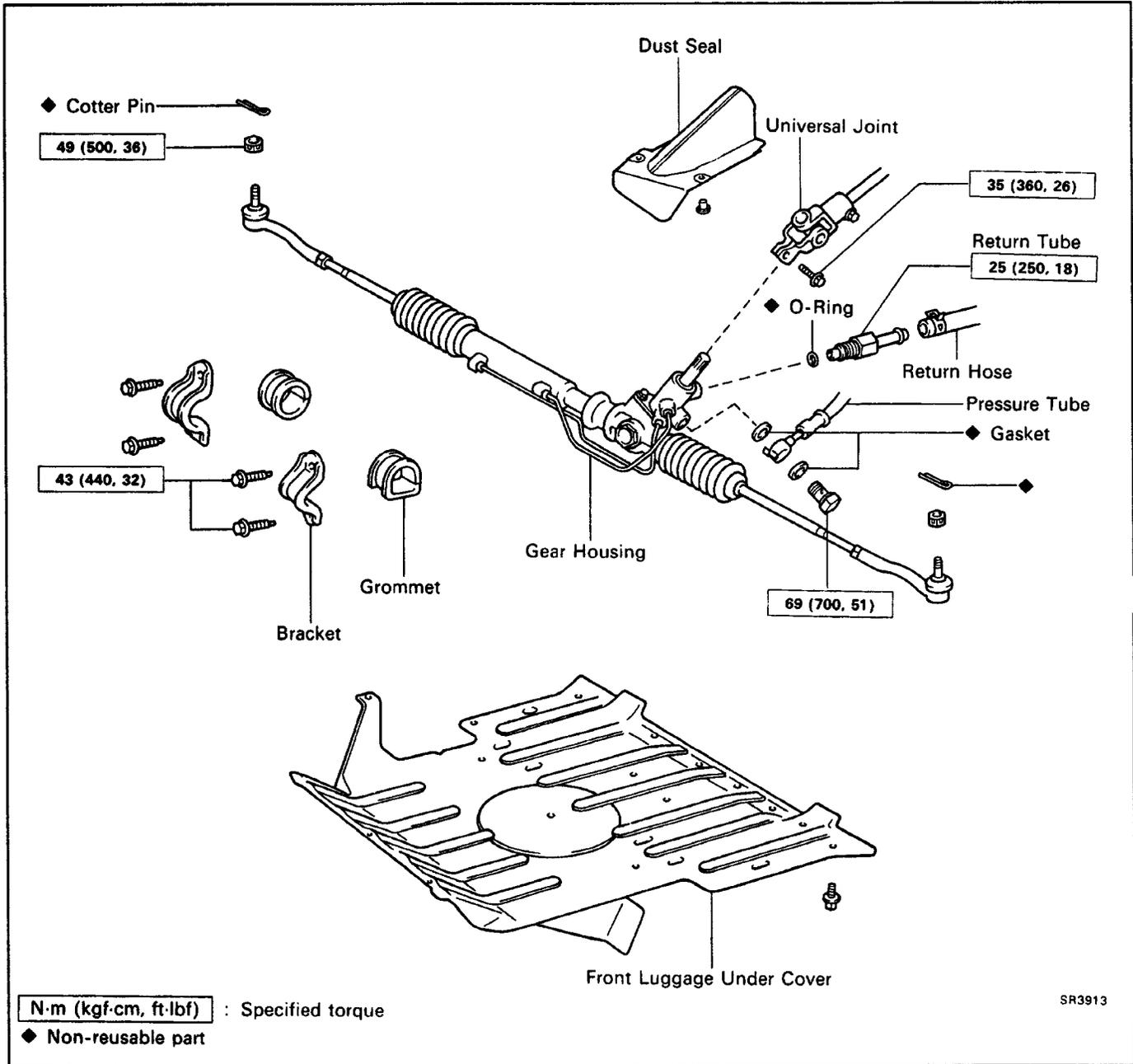


GEAR HOUSING

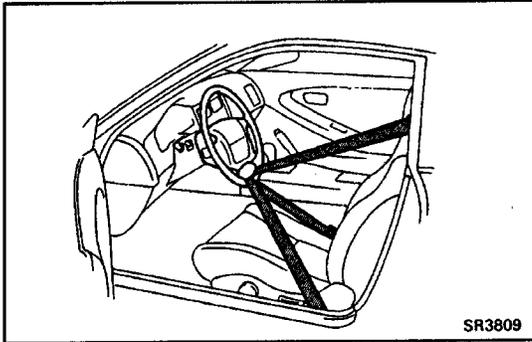
STEERING GEAR HOUSING REMOVAL AND INSTALLATION

Remove and install the parts as shown.



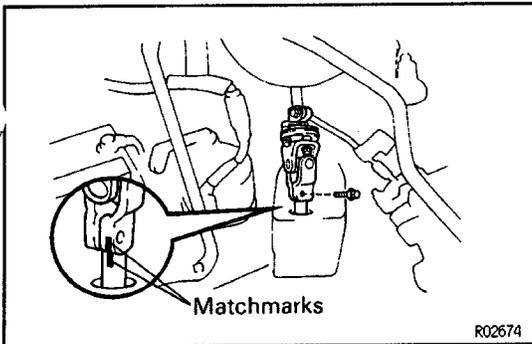
(MAIN POINTS OF REMOVAL AND INSTALLATION)

NOTICE: When disconnecting the universal joint during removal of the gear housing, remove the steering wheel and perform centering of the spiral cable (See page AB-2) If the operation is performed without removing the steering wheel, use the procedure below to make sure the steering wheel is firmly fixed in position and cannot turn.

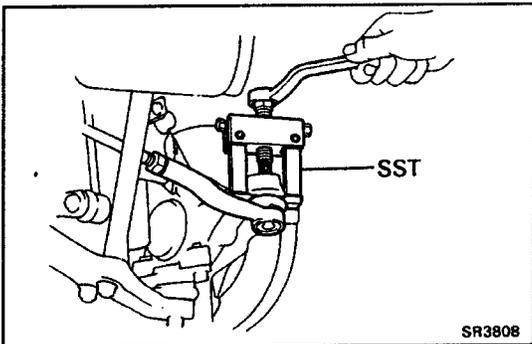


1. DISCONNECT UNIVERSAL JOINT

- (a) Position the front wheels facing straight ahead.
- (b) Using the seat belt of the driver's seat, fix the steering wheel so that it does not turn.



- (c) Place matchmarks on the universal joint and control valve shaft.
- (d) Loosen the bolt on the upper side of the universal joint, remove the bolt on the lower side and disconnect the universal joint.

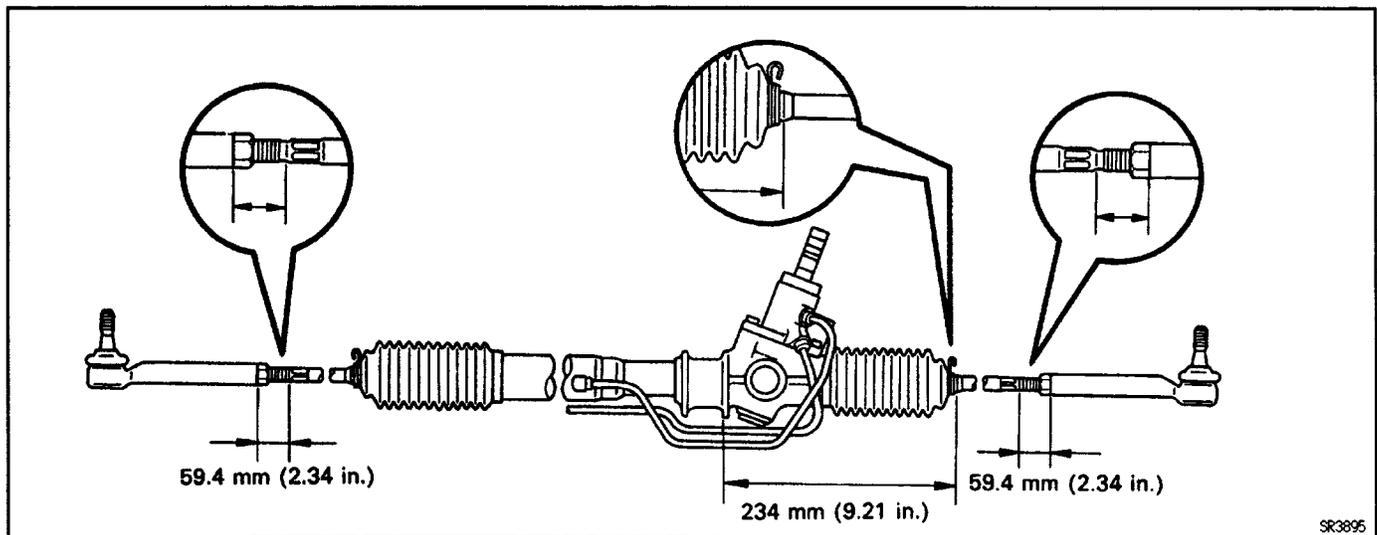


2. DISCONNECT TIE ROD ENDS

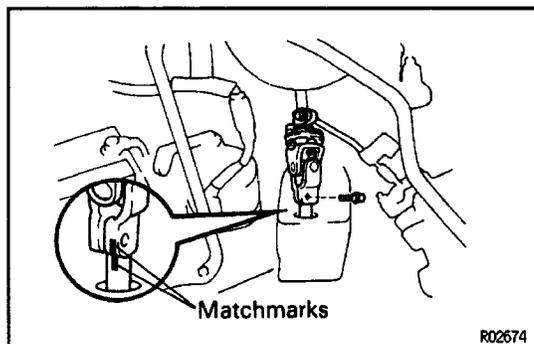
- (a) Remove the cotter pin and nut.
- (b) Using SST, disconnect the tie rod end from the knuckle arm.
SST 09628-62011

3. CONNECT UNIVERSAL JOINT

- (a) Set the gear housing so that it matches the dimensions shown below with the gear housing at the center point.



HINT: The dimension of the tie rod end is a reference value, so always adjust the toe-in before tightening the lock nut.



(b) Align matchmarks on the universal joint and control valve shaft and connect them.

4. CENTER SPIRAL CABLE

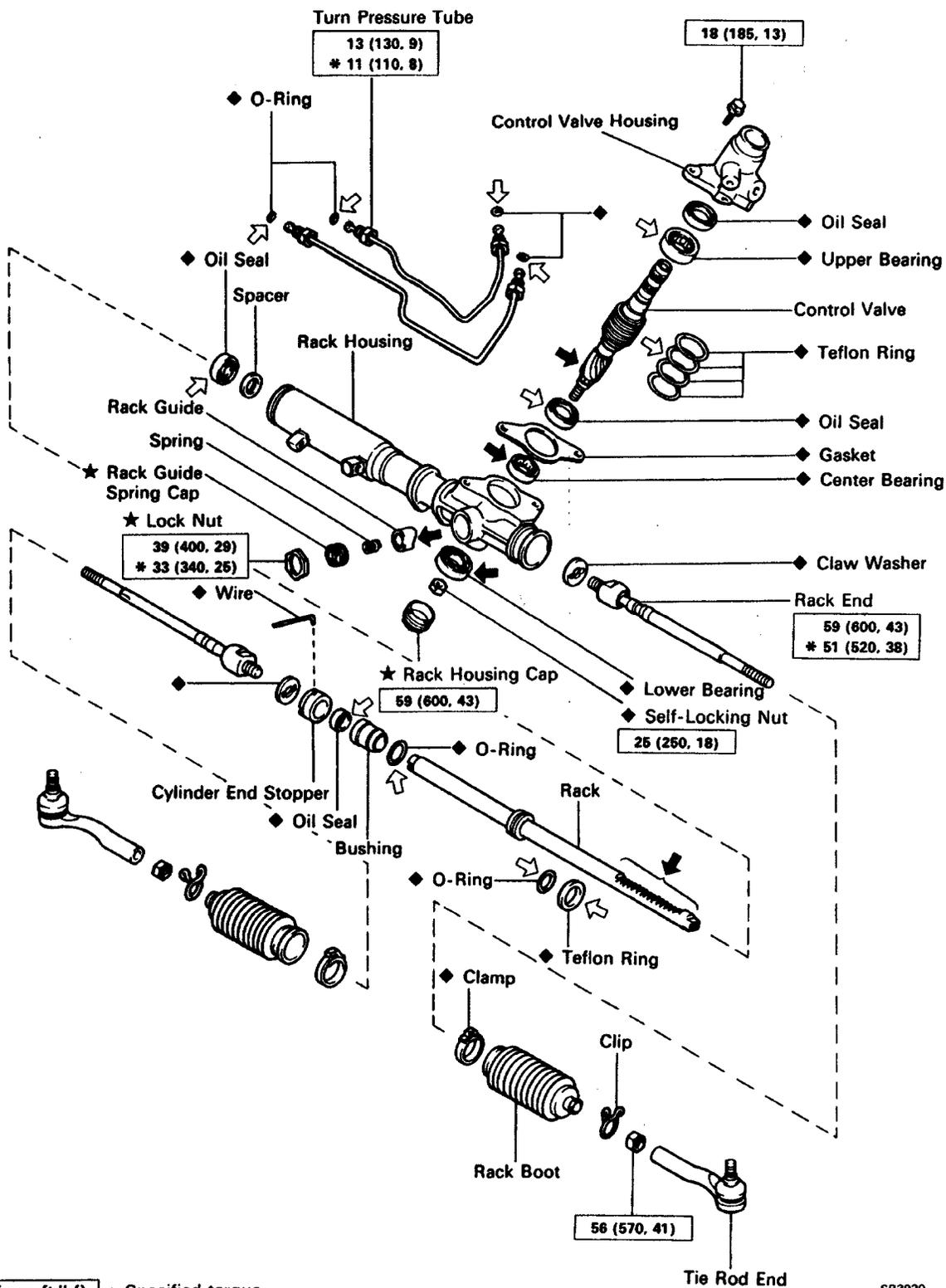
If the steering wheel has been removed, or the steering wheel may have moved during the operation, always perform centering of the spiral cable.

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

5. CHECK STEERING WHEEL CENTER POINT

6. CHECK TOE-IN (See page [SA-4](#))

COMPONENTS

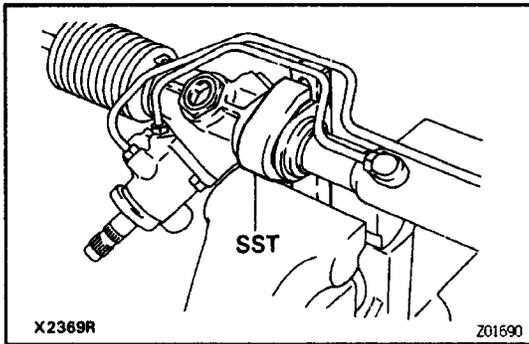


N·m (kgf·cm, ft·lbf) : Specified torque

- ◆ Non-reusable part
- ★ Precoated part
- * For use with SST

- ◀ : Apply Molybdenum Disulphide Lithium Base Grease
- ↶ : Apply Power Steering Fluid EH

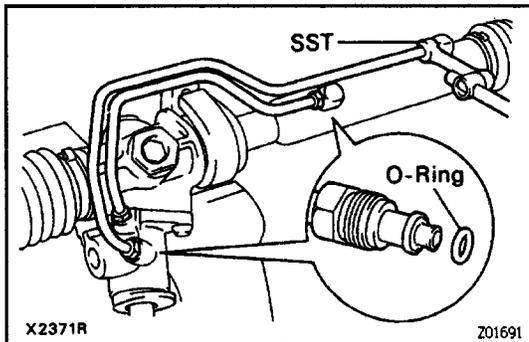
SR3920



GEAR HOUSING DISASSEMBLY

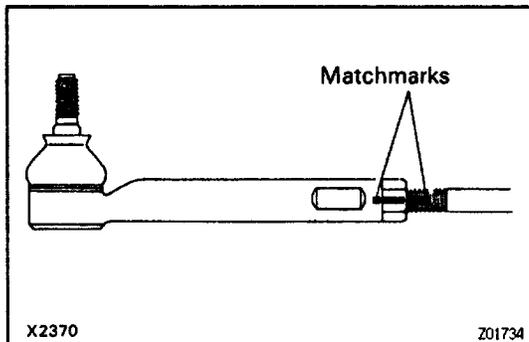
1. CLAMP GEAR HOUSING IN VISE

Using SST, secure the steering gear housing in a vise.
SST 09612-00012



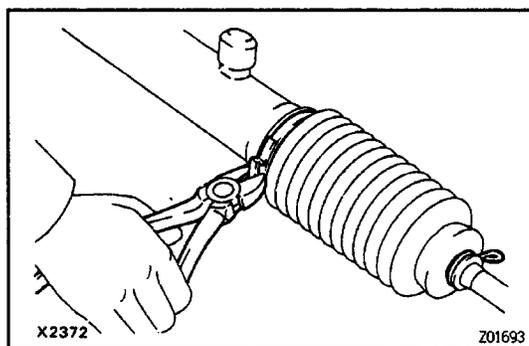
2. REMOVE RIGHT AND LEFT TURN PRESSURE TUBES

- (a) Using SST, remove the pressure tubes.
SST 09633-00020
- (b) Remove the O-rings from the tubes.



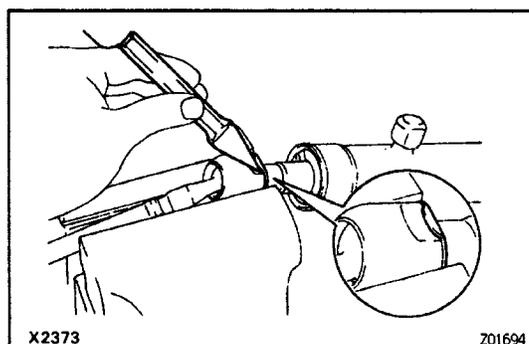
3. REMOVE TIE ROD ENDS

- (a) Loosen the lock nuts and place matchmarks on the tie rod ends and rack ends.
- (b) Remove the tie rod ends and lock nuts.



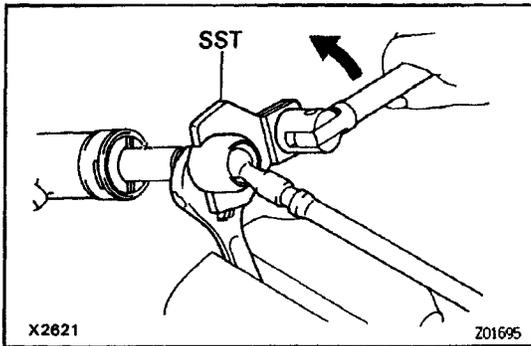
4. REMOVE RACK BOOTS

- (a) Remove the clips and clamps.
- (b) Remove the rack boots.



5. REMOVE RACK ENDS AND CLAW WASHERS

- (a) Unstake the claw washers.
- NOTICE:** Avoid any impact to the rack.

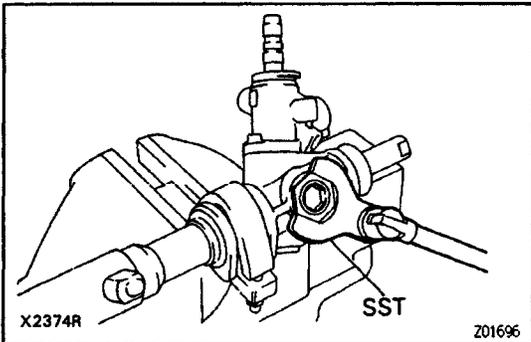


(b) Using SST, remove the rack ends.

SST 09617-10020

(c) Mark the left and right rack ends accordingly.

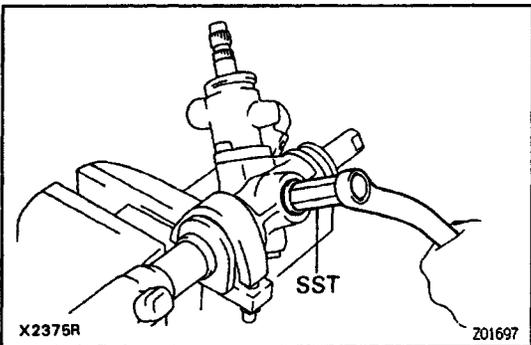
(d) Remove the claw washers.



6. REMOVE RACK GUIDE SPRING CAP LOCK NUT

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

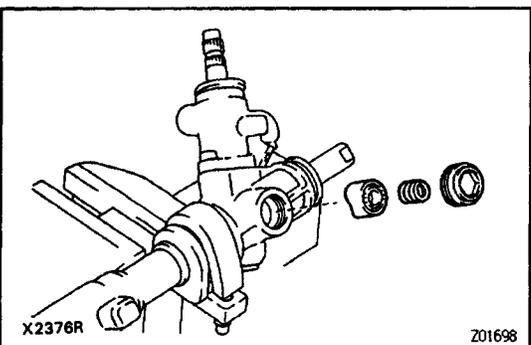
SST 09612-24014 (09617-22030)



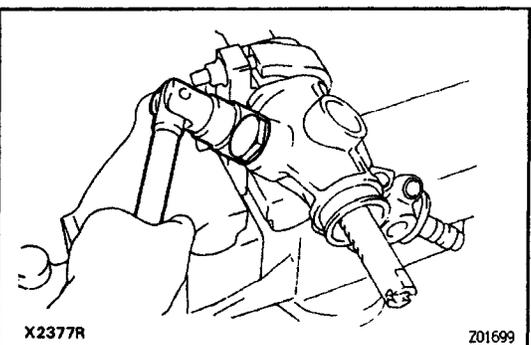
7. REMOVE RACK GUIDE SPRING

Using SST, remove the rack guide spring cap.

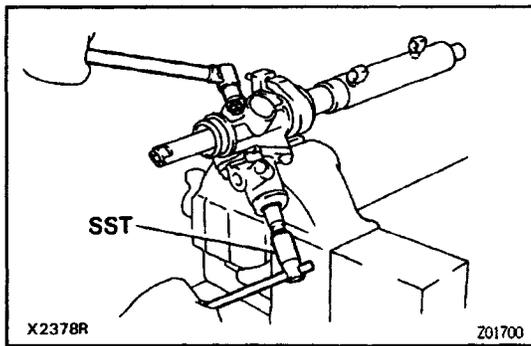
SST 09612-10131



8. REMOVE RACK GUIDE SPRING AND RACK GUIDE

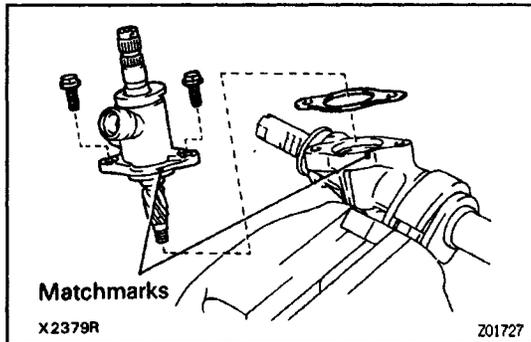


9. REMOVE RACK HOUSING CAP

**10. REMOVE SELF-LOCKING NUT**

Using SST to hold the control valve, remove the self-locking nut.

SST 09616 - 00010

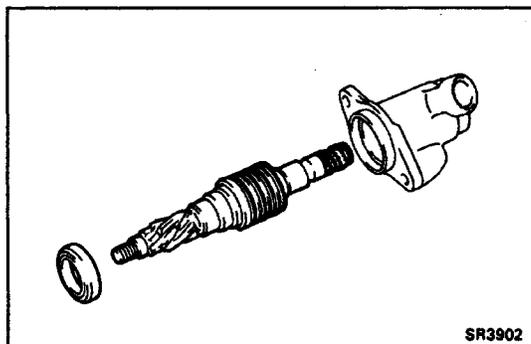
**11. REMOVE CONTROL VALVE HOUSING**

(a) Place matchmarks on the valve housing and rack housing.

(b) Remove the two bolts.

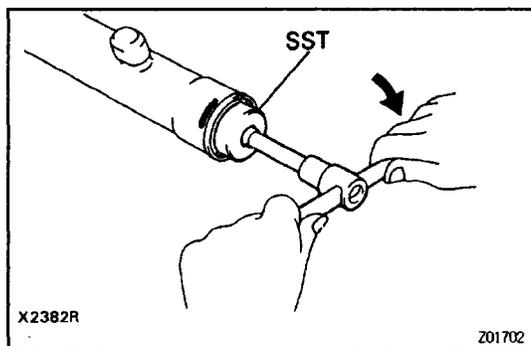
(c) Pull out the valve housing with the control valve.

(d) Remove the gasket.

**12. REMOVE CONTROL VALVE FROM HOUSING**

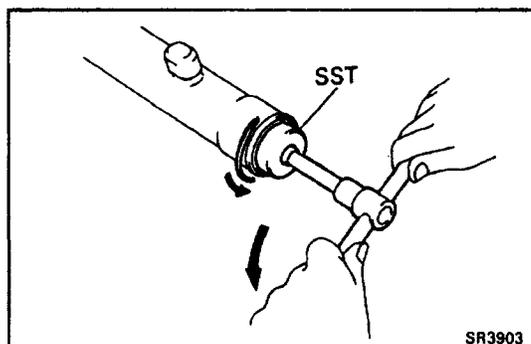
(a) Tap out the control valve with the oil seal.

(b) Remove the oil seal from the control valve.

**13. REMOVE CYLINDER END STOPPER WIRE**

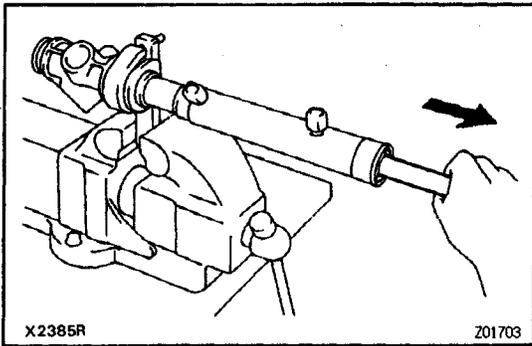
(a) Using SST, turn the cylinder end stopper clockwise until the wire end comes out.

SST 09631 -10021

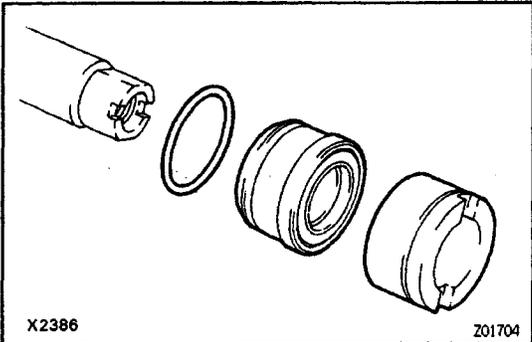


(b) Using SST, turn the cylinder end stopper counter-clockwise, and remove the wire.

SST 09631 -10021

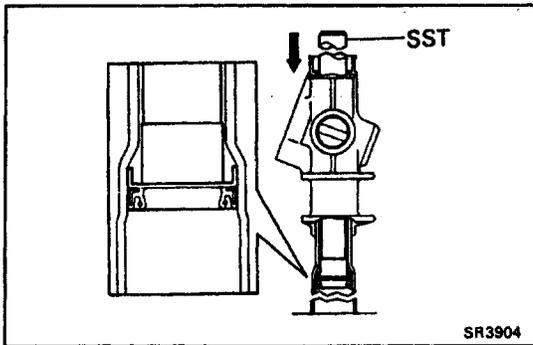
**14. REMOVE STEERING RACK**

(a) Pull out the steering rack.



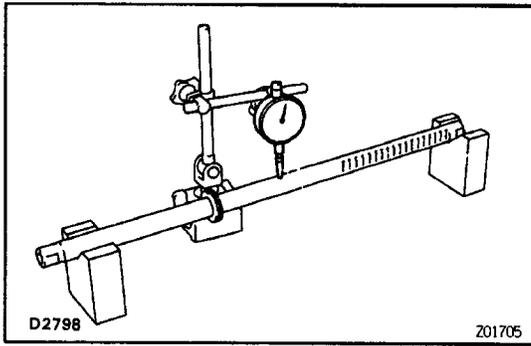
(b) Remove the cylinder end stopper and rack bushing from the rack.

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

**15. REMOVE RACK HOUSING OIL SEAL AND SPACER**

Using SST, drive out the spacer and oil seal.

SST 09631 -12020



GEAR HOUSING COMPONENTS

INSPECTION AND REPAIR

NOTICE: When coating the gear housing components with power steering fluid, use **TOYOTA POWER STEERING FLUID EH** or equivalent which is exclusively for EHPS use.

1. INSPECT RACK

- (a) Check the rack for runout and for tooth wear or damage.

Maximum thrust clearance:

0.3 mm (0.012 in.)

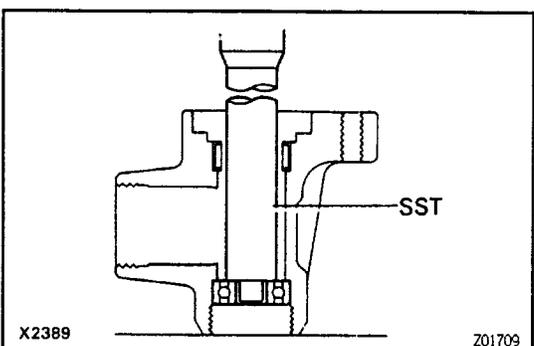
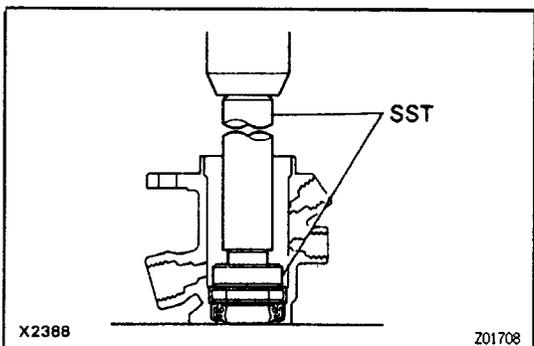
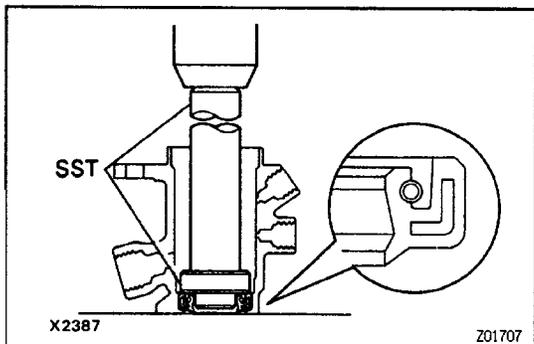
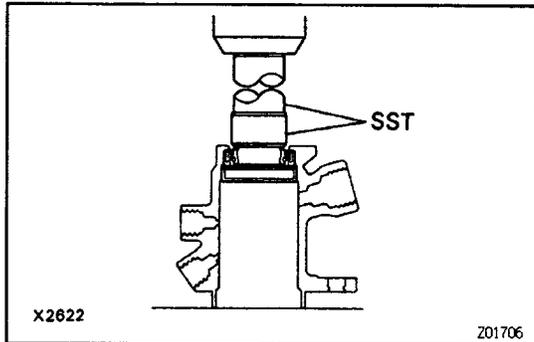
- (b) Check the rack surface for wear or damage. If faulty, replace it.

2. IF NECESSARY, REPLACE CONTROL VALVE HOUSING OIL SEAL AND UPPER BEARING

- (a) Using SST, press out the oil seal with the bearing.
SST 09620-30010 (09631-00020),
09630-24013 (09620-24010)

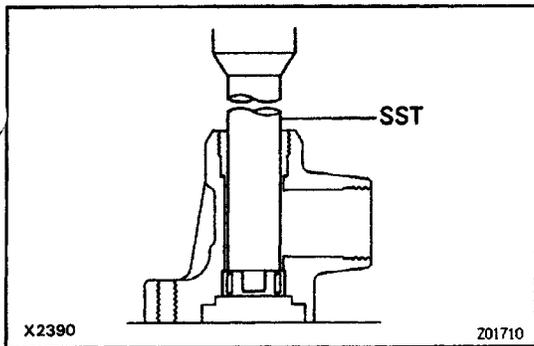
- (b) Using SST, press in a new oil seal.
SST 09620-30010 (09631-00020),
09630-24013 (09620-24013)

- (c) Using SST, press in a new bearing.
SST 09620-30010 (09631-00020),
09630-24013 (09620-24020)

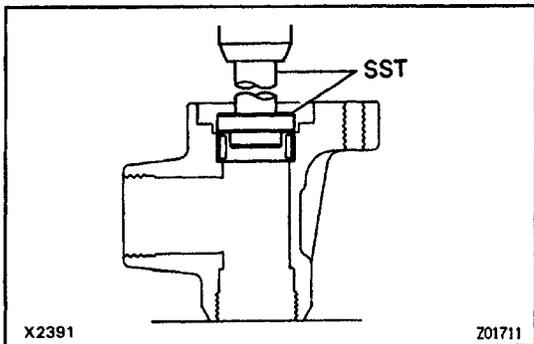


3. IF NECESSARY, REPLACE CONTROL VALVE LOWER BEARING AND CENTER BEARING

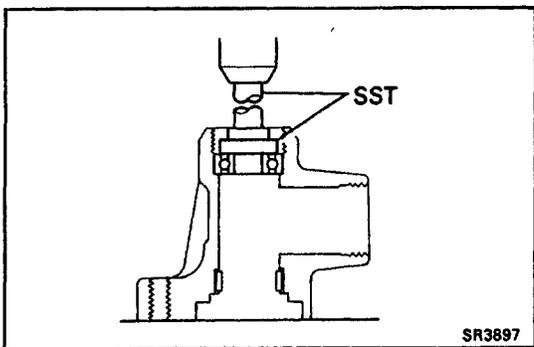
- (a) Using SST, press out the lower bearing.
SST 09620-30010 (09631-00020)



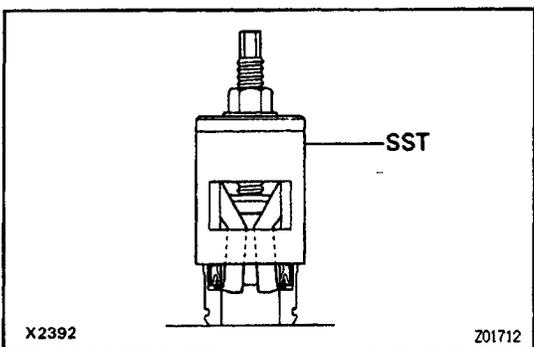
- (b) Using SST, press out the center bearing.
SST 09631-12020



- (c) Using SST, press in a new center bearing.
SST 09620-30010 (09631-00020),
09630-24013 (09620-24020)

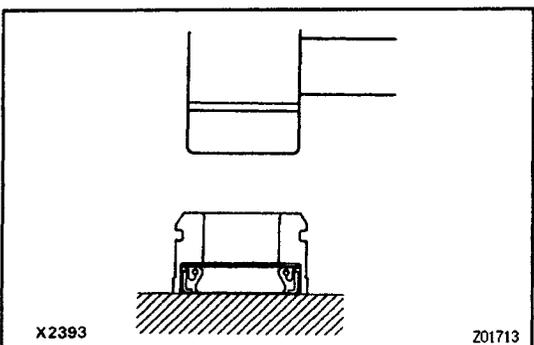


- (d) Using SST, press in a new lower bearing.
SST 09620-30010 (09631-00020),
09631-20031

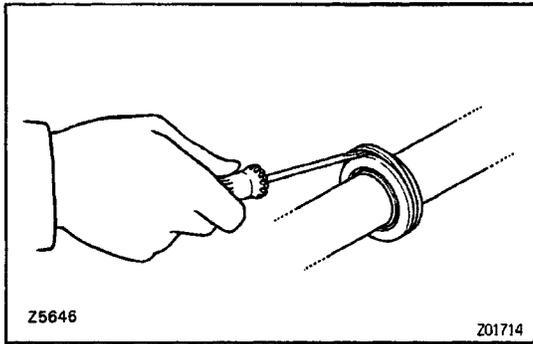


4. IF NECESSARY, REPLACE RACK BUSHING OIL SEAL

- (a) Using SST, remove the oil seal.
SST 09612-24014 (09613-22011)



- (b) Using a plastic hammer, tap in a new oil seal as shown.



5. IF NECESSARY, REPLACE STEERING RACK TEFLON RING AND O-RING

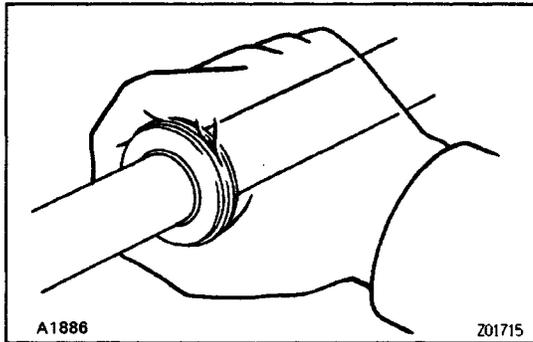
(a) Remove the teflon ring and O-ring.

NOTICE: Be careful not to damage the steering rack.

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

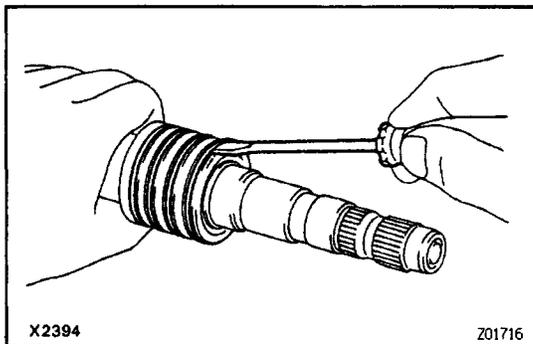
(c) Expand a new teflon ring with your fingers.

NOTICE: Be careful not to over-expand the teflon ring.



(d) Install the new teflon ring to the steering rack.

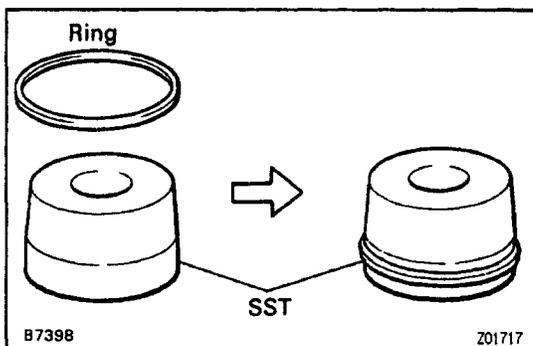
(e) Coat the teflon ring with power steering fluid and snug it down with your fingers.



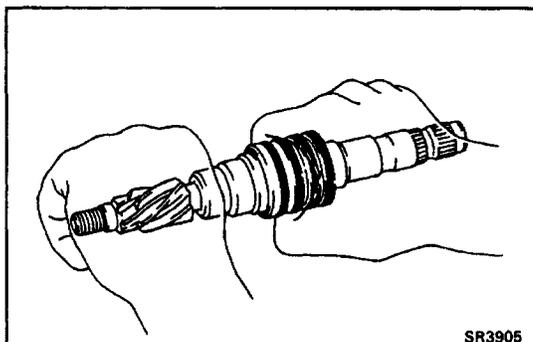
6. IF NECESSARY, REPLACE CONTROL VALVE TEFLON RINGS

(a) Using a screwdriver, remove the teflon rings.

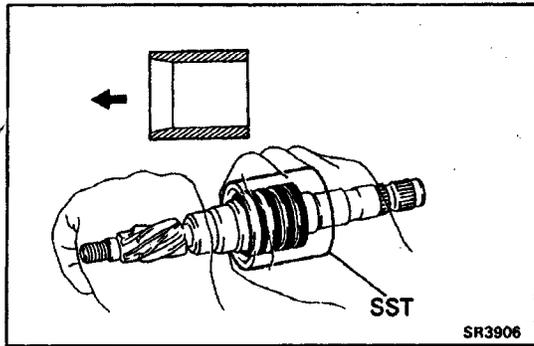
NOTICE: Be careful not to damage the control valve.



(b) install new teflon rings to SST and expand them.
SST 09631 - 20070



(c) Install the expanded teflon rings to the control valve and snug them with your fingers.



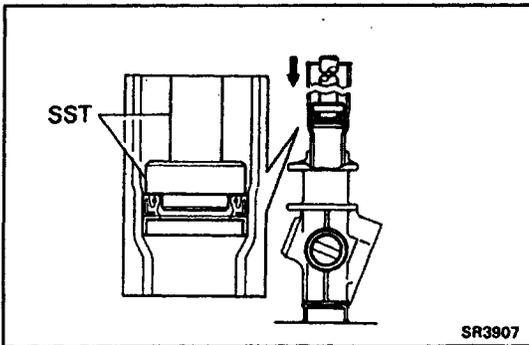
- (d) Coat the teflon rings with power steering fluid, and carefully slide the tapered end of SST over the teflon rings to seat the rings.
SST 09631-20081

GEAR HOUSING ASSEMBLY

SR07Y-01

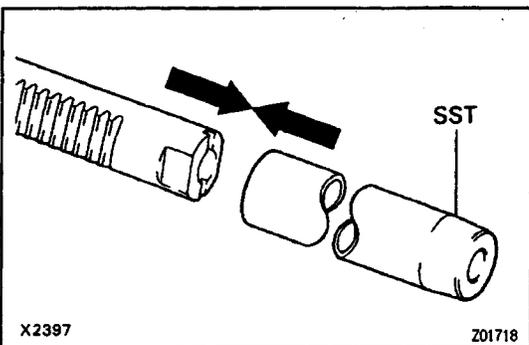
NOTICE: When coating the gear housing components with power steering fluid use TOYOTA POWER STEERING FLUID EH or equivalent which is exclusively for EHPS use.

1. COAT WITH POWER STEERING FLUID OR MOLYBDENUM DISULPHIDE LITHIUM BASE GREASE



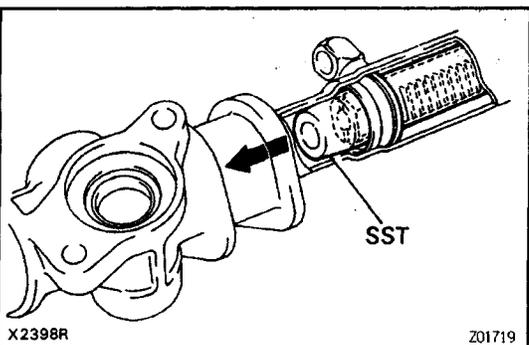
2. INSTALL RACK HOUSING OIL SEAL AND SPACER

- (a) Install the spacer into the rack housing.
(b) Using SST, drive in a new oil seal.
SST 09630-24013(09620-24030),
09631-12020

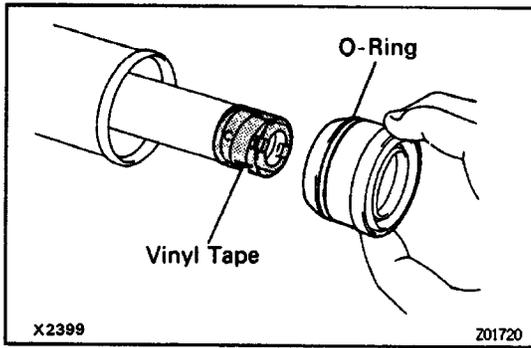


3. INSTALL RACK

- (a) Install SST to the rack.
HINT: If necessary, scrape the burrs off the rack teeth end and burnish.
SST 09631-10040

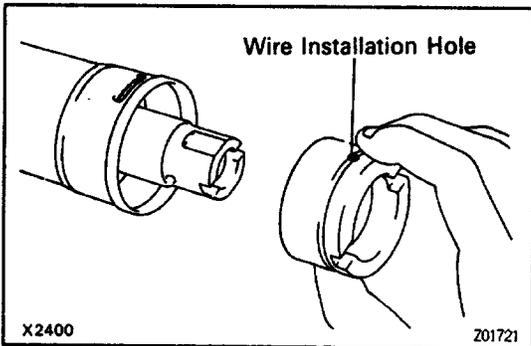


- (b) Coat SST with power steering fluid.
(c) Install the rack into the cylinder.
(d) Remove SST.



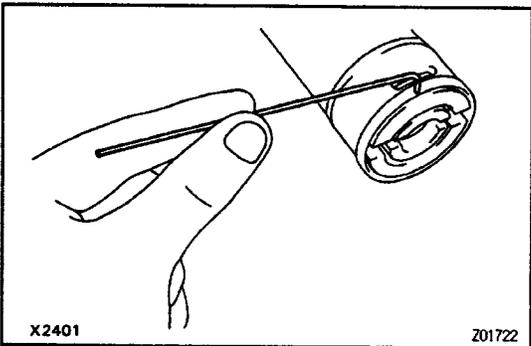
4. INSTALL RACK BUSHING

- Coat a new O-ring with power steering fluid and install it to the bushing.
- To prevent oil seal lip damage, wind vinyl tape on the steering rack end, and apply power steering fluid.
- Install the bushing by pushing it into the cylinder in the direction shown in drawing, without tilting.

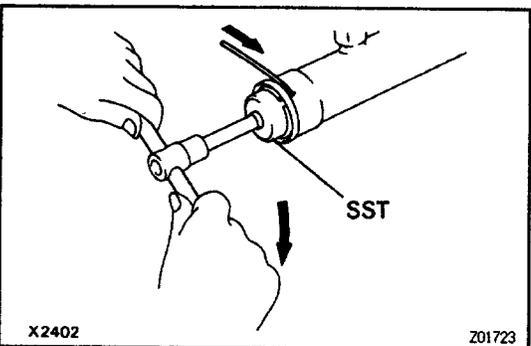


5. INSTALL CYLINDER END STOPPER

- Push in the cylinder end stopper until the wire installation hole appears.

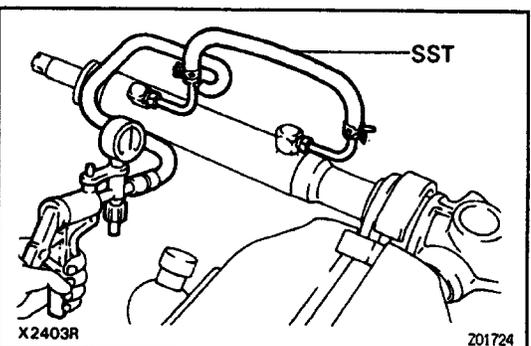


- Install a new wire end into the hole.



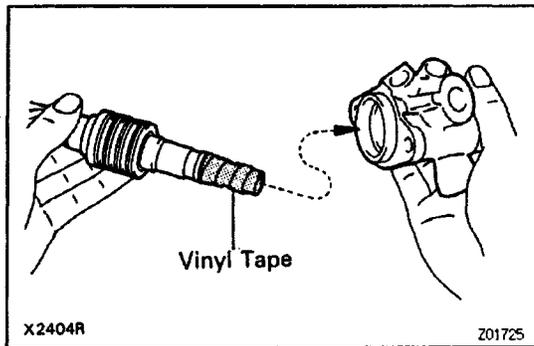
- Using SST, turn the cylinder end stopper clockwise until the wire end disappears.

SST 09631 -10021



6. AIR TIGHTNESS TEST

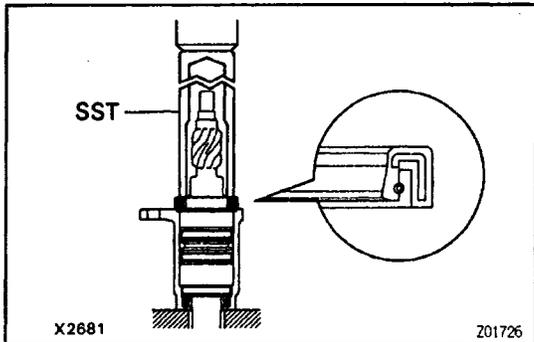
- Install SST to the unions of the cylinder housing.
SST 09631-12071
- Apply 53 kPa (400 mmHg, 15.75 in.-Hg) of vacuum for about 30 seconds.
- Check that there is no change in the vacuum.
If there is change in the vacuum, check the installation of the rack housing oil seals.



7. INSTALL CONTROL VALVE

- Coat the teflon rings with power steering fluid.
- Install the control valve into the housing.

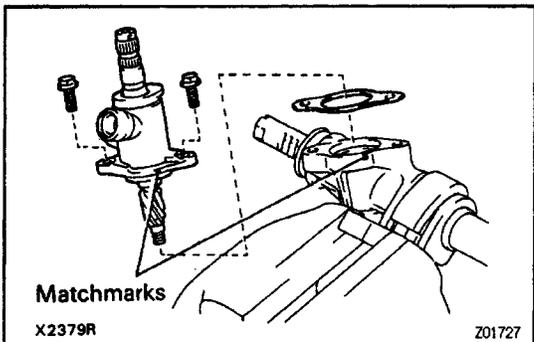
NOTICE: To prevent oil seal damage, wind vinyl tape on the serration part of the control valve shaft.



8. INSTALL OIL SEAL

- Coat a new oil seal with power steering fluid.
- Using SST, install the oil seal as shown.

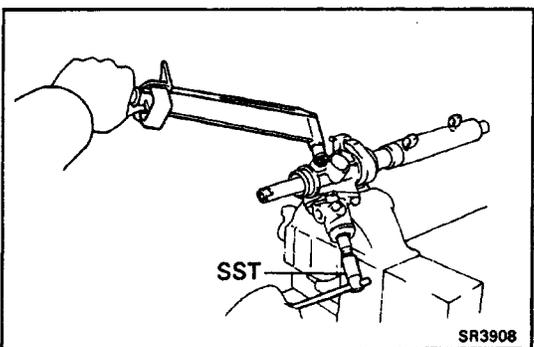
SST 09612-22011



9. INSTALL CONTROL VALVE HOUSING

- Place a new gasket on the rack housing.
- Align the matchmarks on the valve housing and rack housing.
- Torque the two bolts.

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

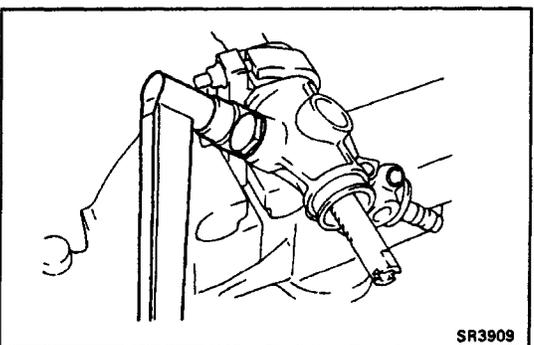


10. INSTALL SELF-LOCKING NUT

Using SST to hold the control valve, install a new self-locking nut.

SST 09616 - 00010

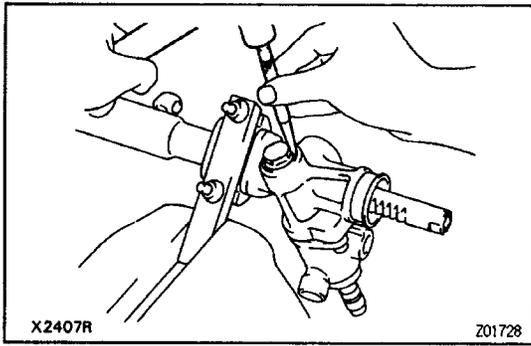
Torque: 25 N-m (250 kgf-cm, 18 ft.lbf)



11. INSTALL RACK HOUSING CAP

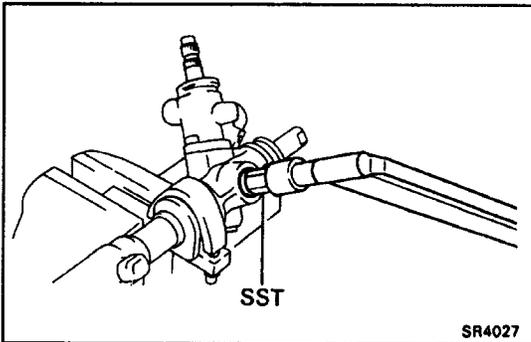
- Apply sealant to 2 or 3 threads of the housing cap.
Sealant: Part No. 08833-00080, THREE BOND 1344, LOCTITE 242 or equivalent
- Install the rack housing cap.

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



(c) Using a centering punch, stake the cap at two places.

12. INSTALL RACK GUIDE AND RACK GUIDE SPRING



13. ADJUST TOTAL PRELOAD

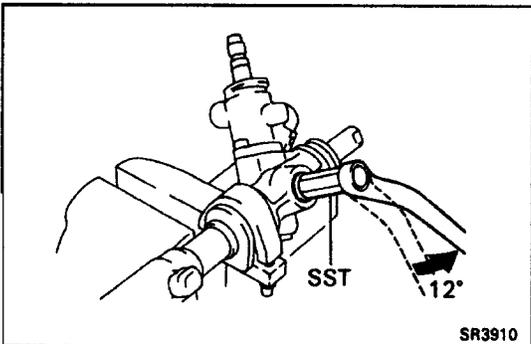
(a) Apply sealant to 2 or 3 threads of the rack guide spring cap.

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

(b) Using SST, install and torque the spring cap.

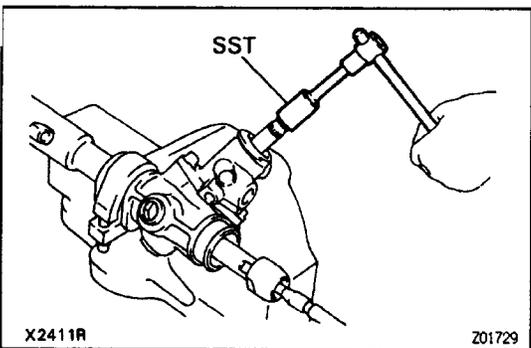
SST 09612-10131

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



(c) Using SST, return the rack guide spring cap 12°.

SST 09612-10131

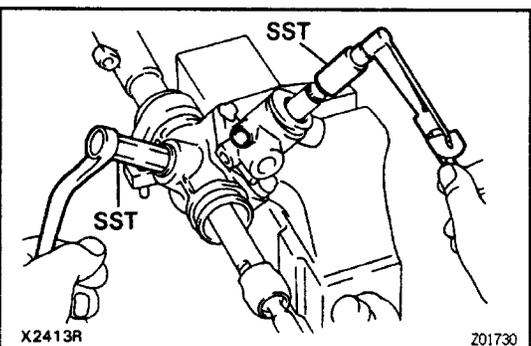


(d) Turn the control valve shaft right and left one or two times.

SST 09616 - 00010

NOTICE: If the rack over strokes, the oil seal will be damaged by the teeth of the rack, so temporarily in stall the rack end so that it does not over stroke.

(e) Loosen the spring cap until the rack guide compression spring is not functioning.



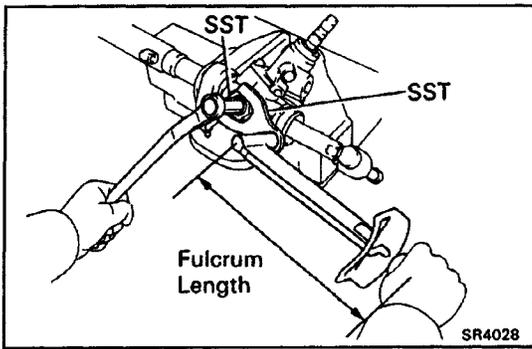
(f) Using SST and a torque meter, tighten the rack guide spring cap until the preload is within specification.

SST 09612-10131 and 09616-00010

Preload (turning):

0.9-1.3 N-m

(9-13 kgf-cm, 7.8-11.3 in.-lbf)

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

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

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

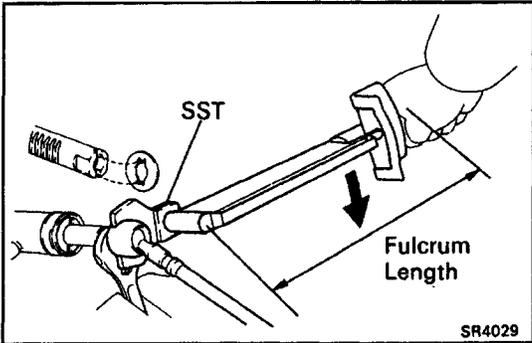
- (b) Using SST, install and torque the lock nut.

SST 09612-10131, 09612-24014 (09617-22030)

Torque: 33 N-m (340 kgf-cm, 25 ft-lbf)

HINT: Use a torque wrench with a fulcrum length of 340 mm (13.39 in.).

- (c) Recheck the total preload.

**15. INSTALL CLAW WASHERS AND RACK ENDS**

- (a) Install new claw washers.

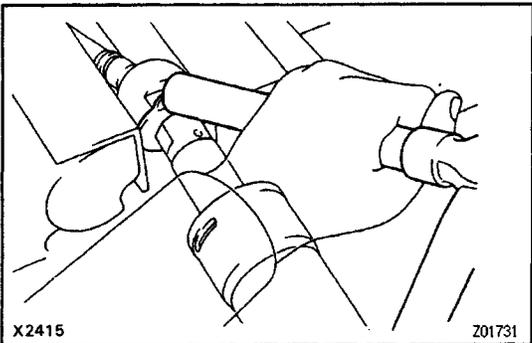
HINT: Align the claws of the claw washer with the rack grooves.

- (b) Using SST, install and torque the rack ends.

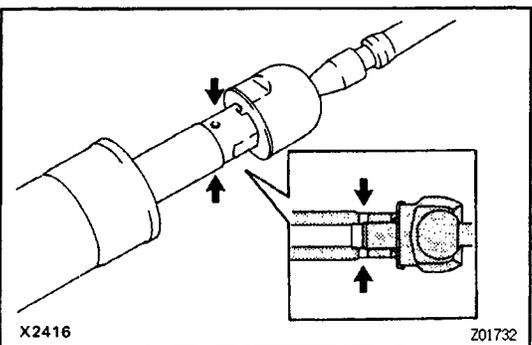
SST 09617-10020

Torque: 51 N-m (520 kgf-cm, 38 ft-lbf)

HINT: Use a torque wrench with a fulcrum length of 340 mm (13.39 in.).

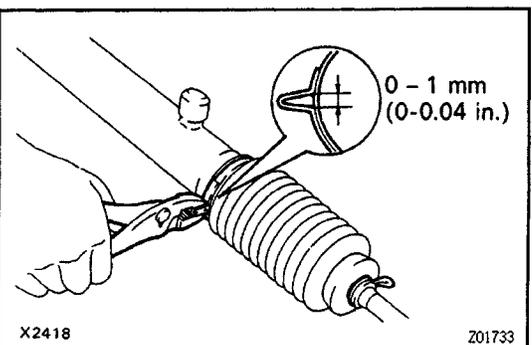


- (c) Using a brass bar and hammer, stake the claw washers.

**16. INSTALL RACK BOOTS, CLAMPS AND CLIPS**

- (a) Insure that the rack hole is not clogged with grease.

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

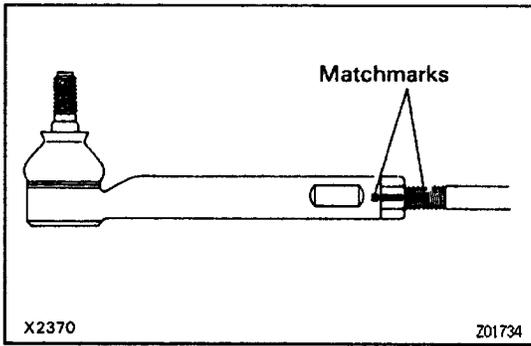


- (b) Install the boots.

NOTICE: Be careful not to damage or twist the boots.

- (c) Install new clamps.

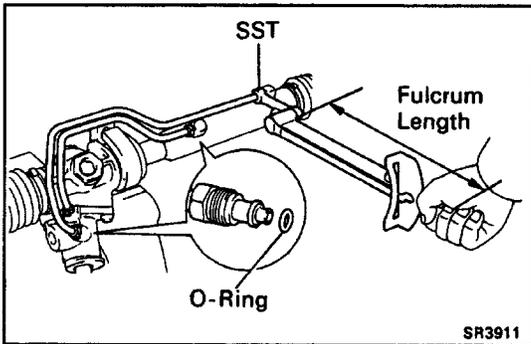
- (d) Install the clips with the ends facing outward.



17. INSTALL TIE ROD ENDS

- (a) Screw the lock nuts and tie rod ends onto the rack ends until the matchmarks are aligned.
- (b) After adjusting toe-in, torque the lock nuts.

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



18. INSTALL RIGHT AND LEFT TURN PRESSURE TUBES

- (a) Install four new O-rings to the tubes.
- (b) Using SST, install the tubes.

SST 09633-00020

Torque: 11 N-m (110 kgf-cm, 8 ft-lbf)

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