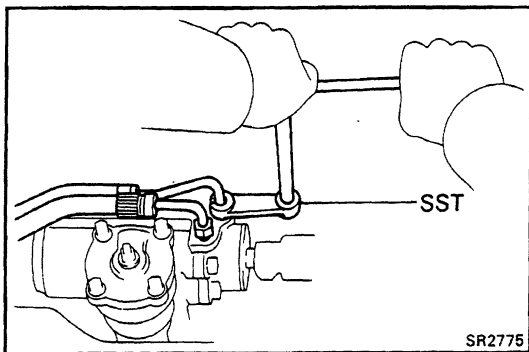
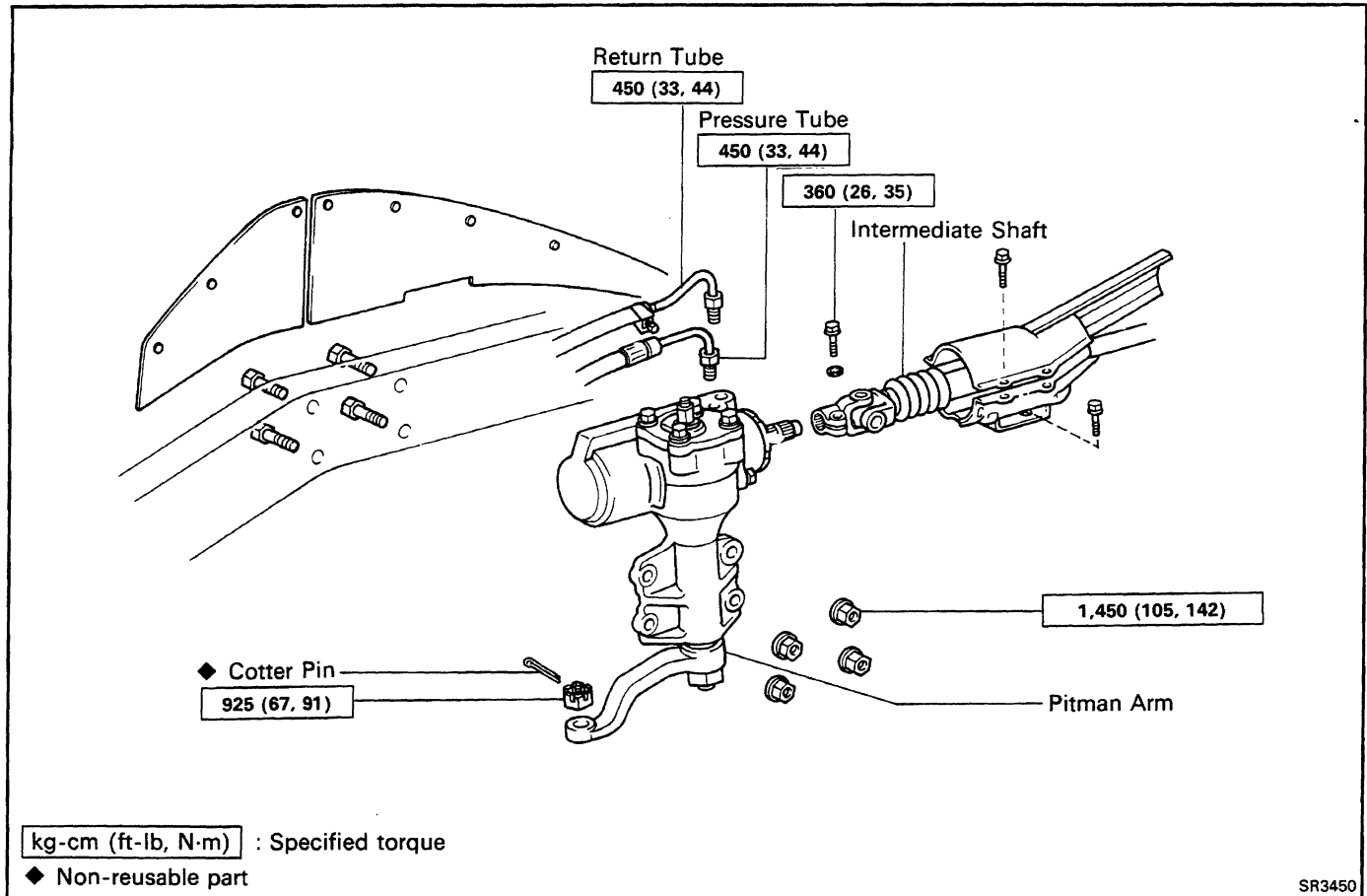


Gear Housing

REMOVAL AND INSTALLATION OF GEAR HOUSING

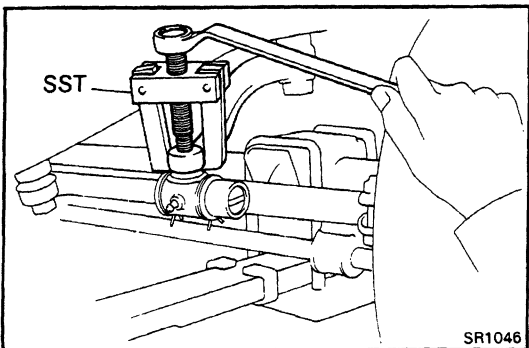
Remove and install the parts as shown.



(MAIN POINT OF REMOVAL AND INSTALLATION)

1. DISCONNECT RETURN LINE AND PRESSURE LINE

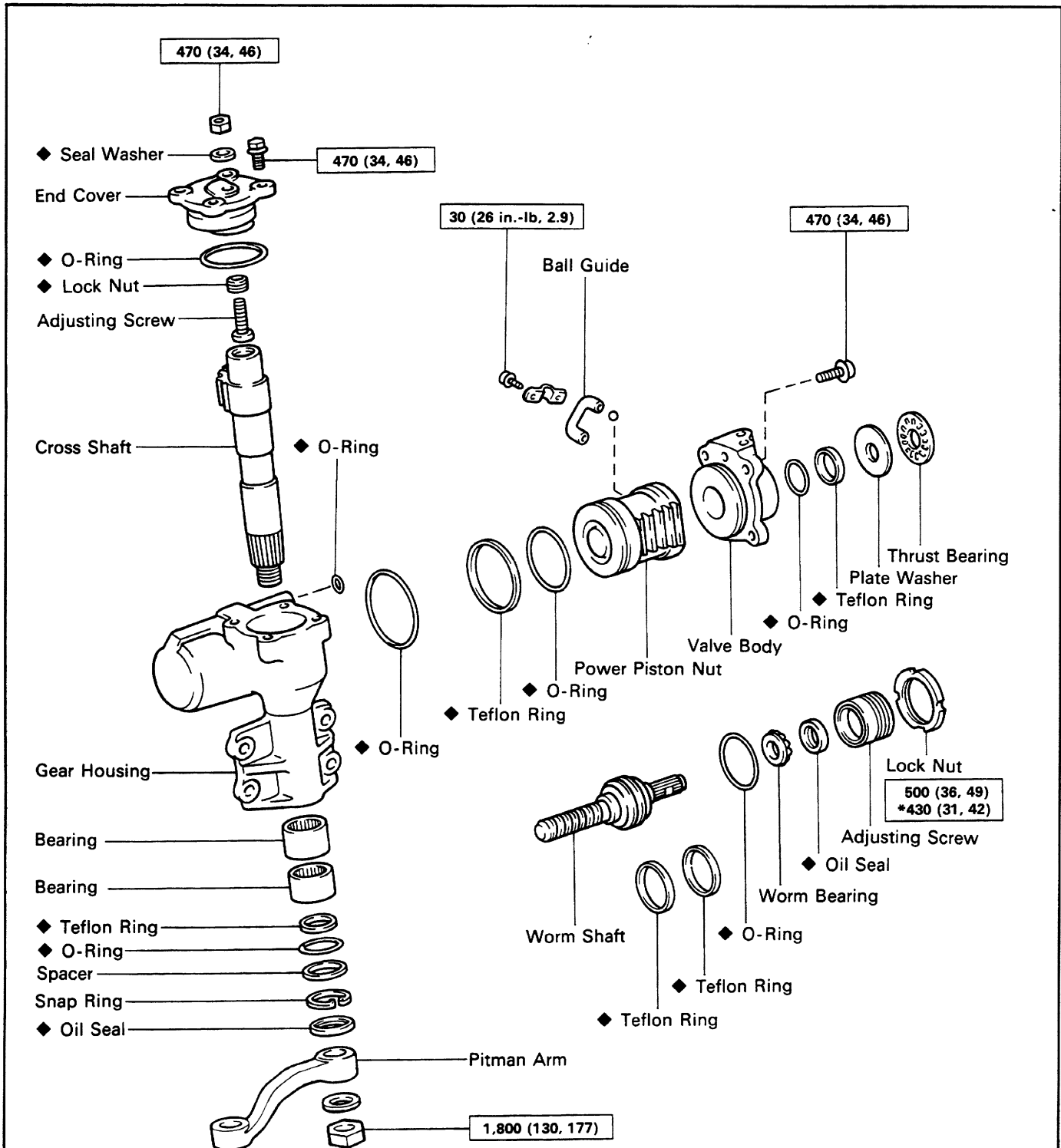
Using SST, disconnect the return and pressure line.
SST 09631-22020



2. DISCONNECT RELAY ROD FROM PITMAN ARM

- Remove the cotter pin.
- Remove the set nut.
- Using SST, disconnect the relay rod from the pitman arm.
SST 09628-62011

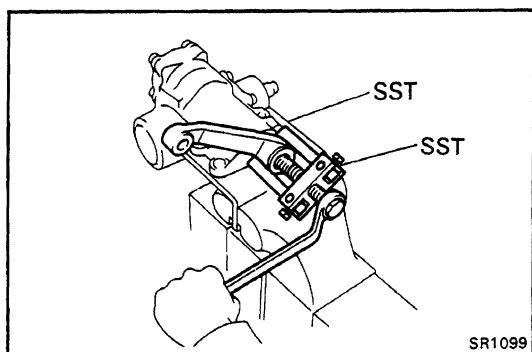
COMPONENTS



kg-cm (ft-lb, N·m) : Specified torque

◆ Non-reusable part

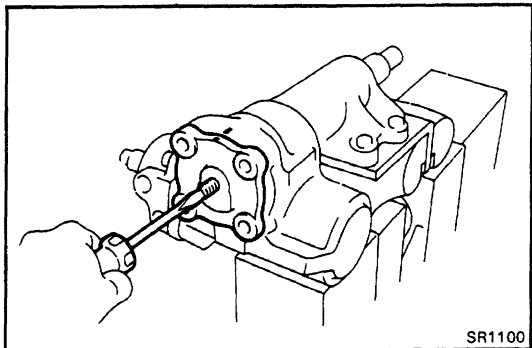
* For use with SST



DISASSEMBLY OF GEAR HOUSING

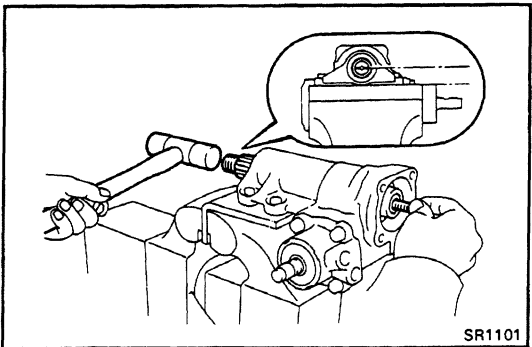
1. REMOVE PITMAN ARM

- (a) Mount the gear housing on SST and clamp SST in vise.
SST 09630-00012 (09631-00140)
- (b) Using SST, remove the pitman arm.
SST 09628-62011



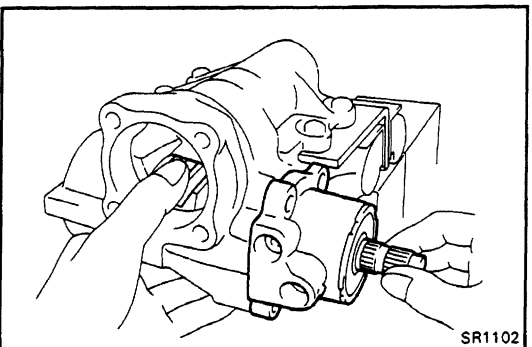
2. REMOVE END COVER

- (a) Remove the adjusting screw lock nut and seal washer.
- (b) Remove the four bolts.
- (c) Screw in the adjusting screw until the cover is removed.
- (d) Remove O-ring.



3. REMOVE CROSS SHAFT

Using a plastic hammer, tap on the cross shaft end and pull out the shaft.



4. REMOVE WORM GEAR VALVE BODY ASSEMBLY

- (a) Remove the four cap bolts from the valve body.
- (b) Hold the power piston nut with your thumb so it cannot move and turn the worm shaft counterclockwise. Then withdraw the valve body and power piston assembly.

NOTICE: Ensure that the power piston nut does not come off the worm shaft.

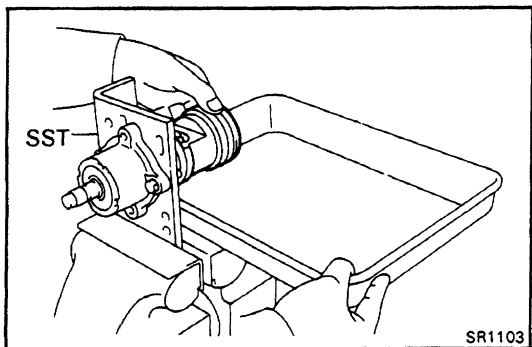
- (c) Remove the two O-rings from the gear housing and valve body.

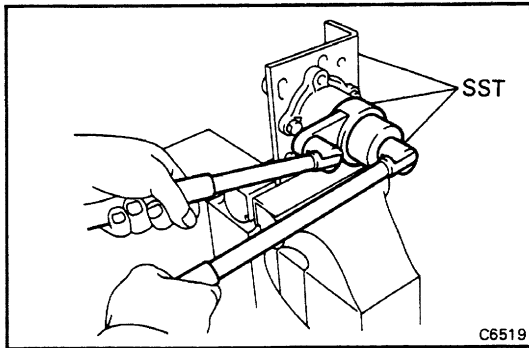
5. REMOVE POWER PISTON NUT

- (a) Mount the valve body on SST and clamp SST in vise.
SST 09630-00012 (09631-00140)

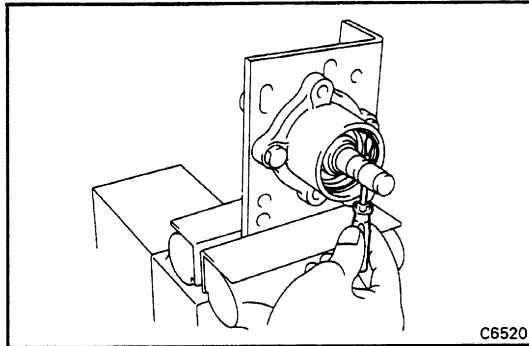
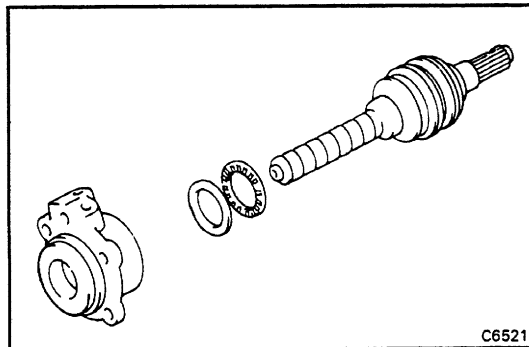
- (b) Pull out the power piston nut.

NOTICE: Do not lose the ball.

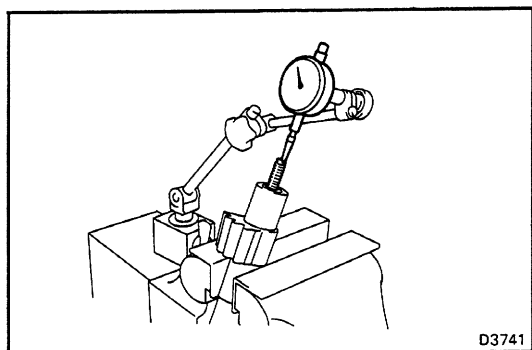


**6. REMOVE LOCK NUT**

- (a) Using SST, hold the adjusting screw and remove the lock nut with SST.
SST 09630-00012 (09631-00030, 09631-00040)
- (b) Using SST, remove the adjusting screw.
SST 09630-00012 (09631-00030)
- (c) Remove the bearing.

**7. REMOVE O-RING****8. REMOVE FOLLOWING PARTS:**

- (a) Worm shaft
- (b) Thrust bearing
- (c) Plate washer
- (d) Teflon ring
- (e) O-ring



D3741

INSPECTION AND REPAIR OF STEERING GEAR HOUSING

1. INSPECT CROSS SHAFT ADJUSTING SCREW THRUST CLEARANCE

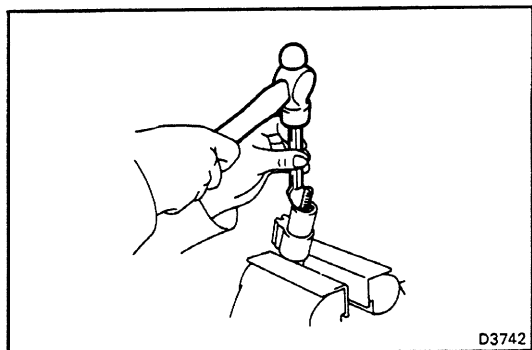
- (a) Clamp the cross shaft in a vise.
- (b) Using a dial indicator, measure the thrust clearance.

**Thrust clearance: 0.03 – 0.05 mm
(0.0012 – 0.0020 in.)**

If thrust clearance is not correct, adjust the thrust clearance.

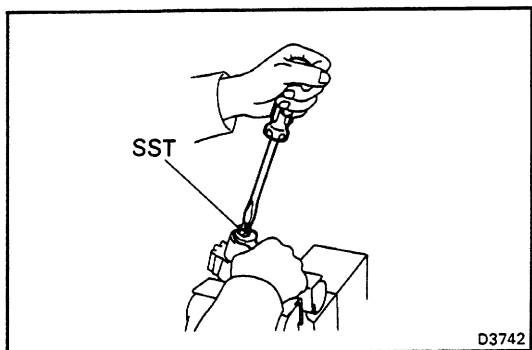
2. IF NECESSARY, ADJUST THRUST CLEARANCE

- (a) Using a chisel and hammer, remove the lock nut stake.



D3742

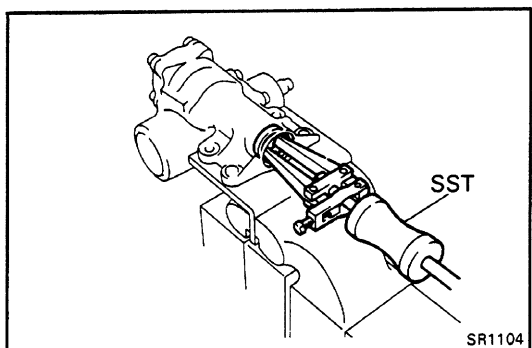
- (b) Using SST, loosen the lock nut.
SST 09630-00012 (09631-00050)
- (c) Adjust the adjusting screw for correct thrust clearance and tighten the lock nut.
- (d) Stake the lock nut.



D3742

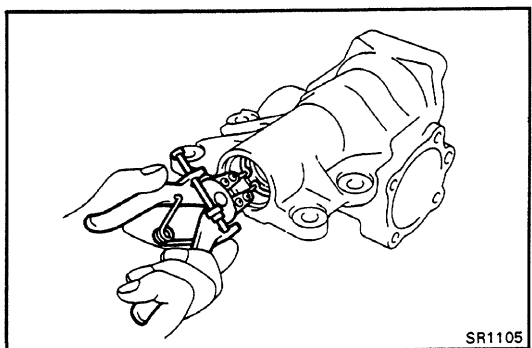
3. REPLACE NEEDLE ROLLER BEARINGS

- (a) Using SST, remove the oil seal.
SST 09308-00010

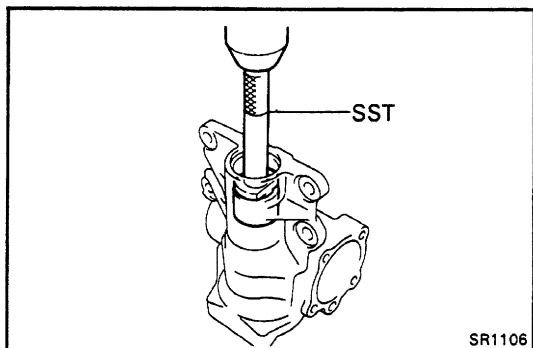


SR1104

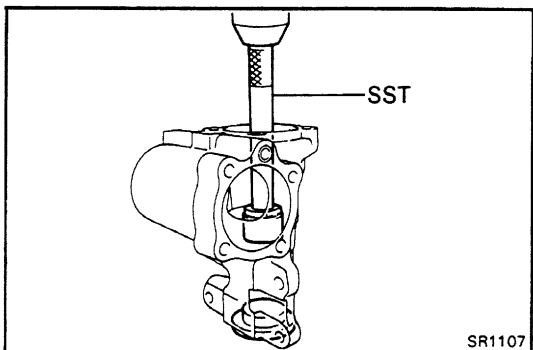
- (b) Using snap ring pliers, remove the snap ring.
- (c) Remove the metal spacer, O-ring and teflon ring.



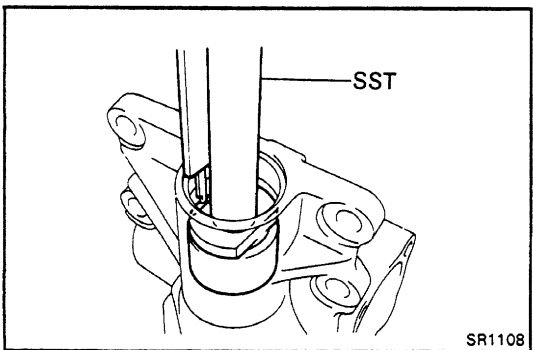
SR1105



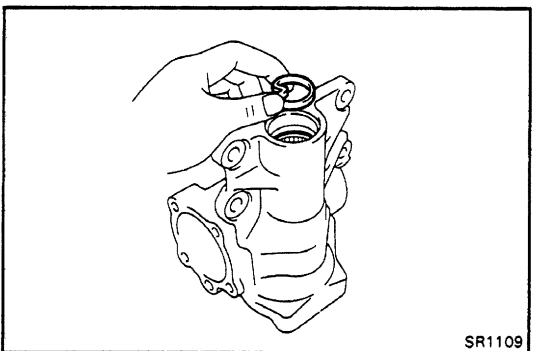
- (d) Using SST, press out the bearing.
SST 09630-00012 (09631-00020, 09631-00070)



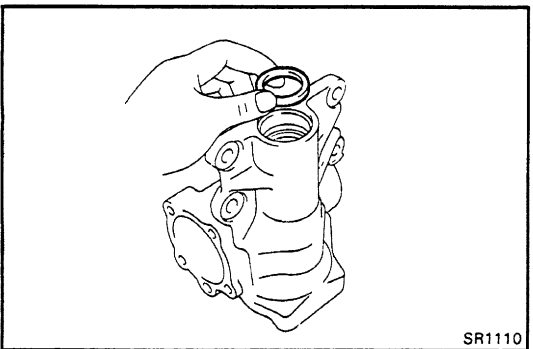
- (e) Using SST, press in a new upper bearing.
SST 09630-00012 (09631-00020, 09631-00070)
HINT: The bearing top end should be installed so that it aligns with upper end of the housing hole.



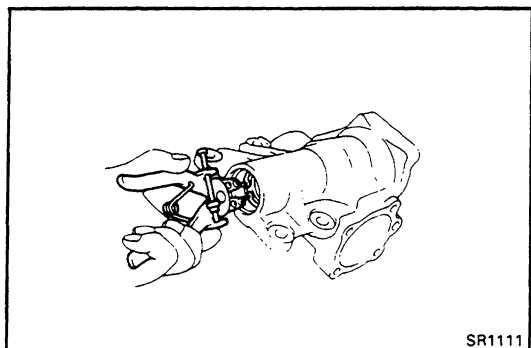
- (f) Using SST, install a new lower bearing so that it is positioned 23.1 mm (0.909 in.) away from the lower end of the housing hole.
SST 09630-00012 (09631-00020, 09631-00070)
(g) Install a new O-ring.



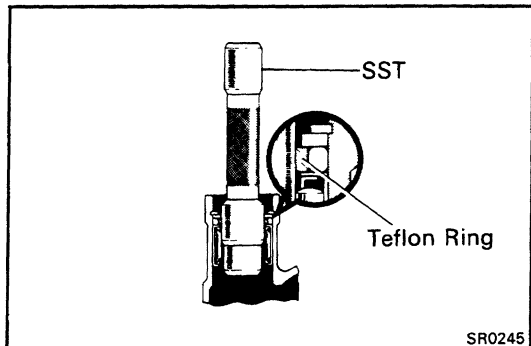
- (h) Form a new teflon ring into a heart shape and install it with your fingers.



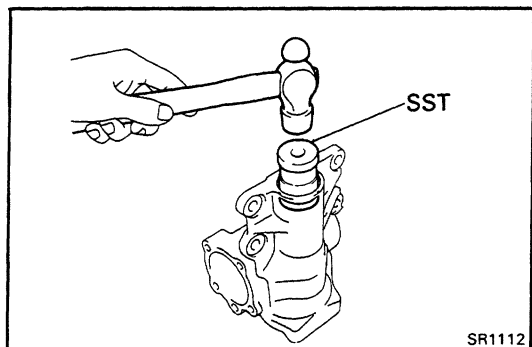
- (i) Install the metal spacer.



(j) Using snap ring pliers, install the snap ring.



(k) Using SST, form the teflon ring.
SST 09630-00012 (09631-00120)

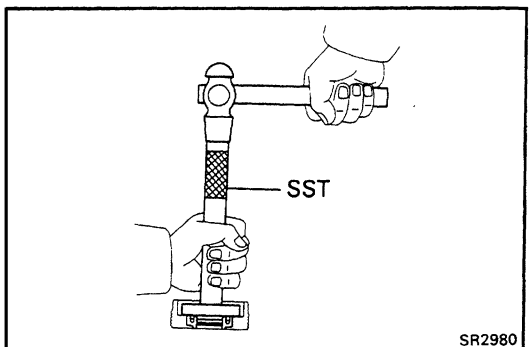
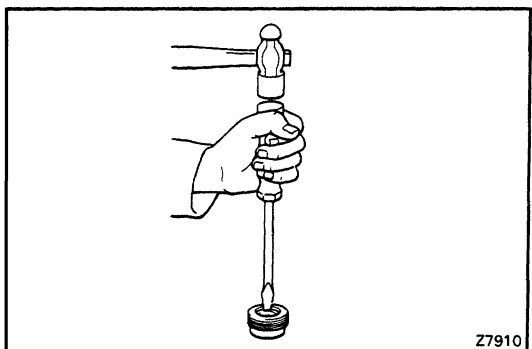


(l) Using SST, drive in a new oil seal.
SST 09630-00012 (09631-00020, 09631-00090)

(m) Apply Mp grease to the oil seal lip.

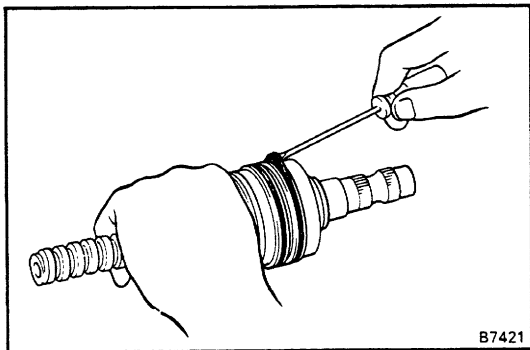
4. IF NECESSARY, REPLACE ADJUSTING SCREW OIL SEAL

(a) Using a screwdriver, drive out the oil seal.



(b) Using SST, install a new oil seal.
SST 09630-00012 (09631-00020, 09631-00080)

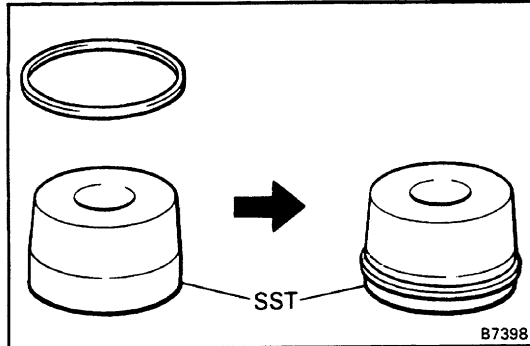
(c) Apply MP grease to the oil seal lip.



5. IF NECESSARY, REPLACE CONTROL VALVE TEFLON RINGS

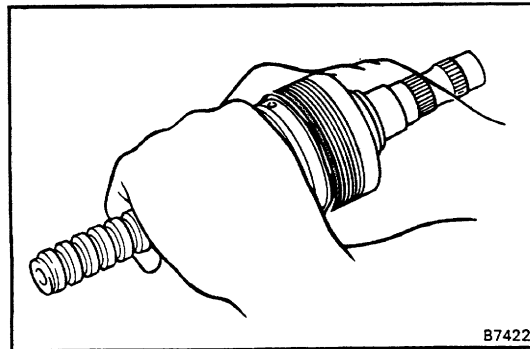
(a) Using a screwdriver, remove the two teflon rings.

NOTICE: Be careful not to damage the control valve.



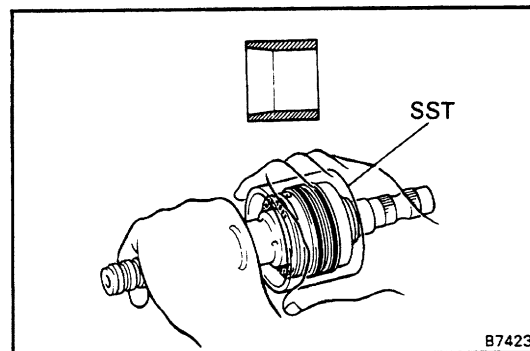
(b) Install new teflon rings to SST and expand them.

SST 09630-00012 (09631-00150)



(c) Install the expanded teflon rings to the control valve and set them with hand.

NOTICE: Be careful not to damage the teflon rings.



(d) Coat the teflon rings with power steering fluid and fit them with SST.

SST 09630-00012 (09631-00160)

6. IF NECESSARY, REPLACE POWER PISTON NUT TEFLON RING

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

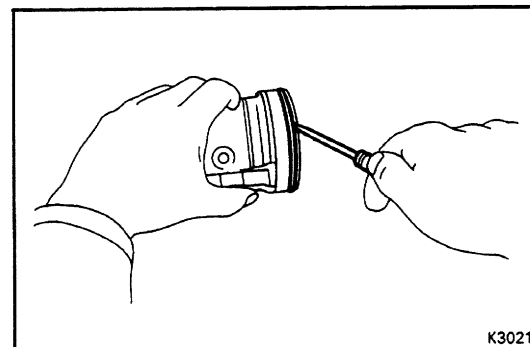
NOTICE: Be careful not to damage the power piston nut.

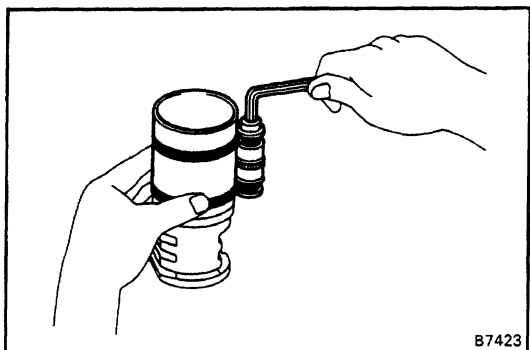
(b) Install a new O-ring.

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

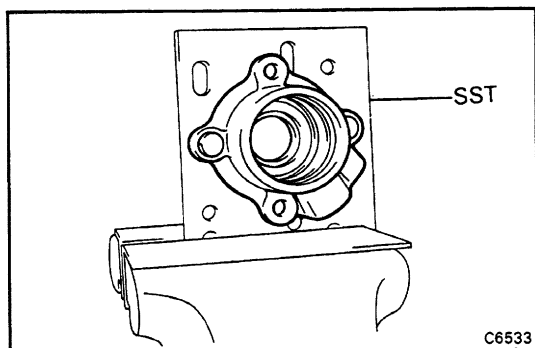
NOTICE: Be careful not to over-expand the Teflon ring.

(d) Install the teflon ring.





- (e) Coat the teflon ring with power steering fluid and snug it down with piston ring compressor for 5 – 7 minutes.



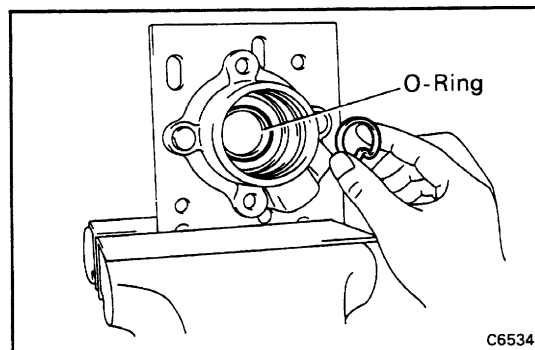
ASSEMBLY OF GEAR HOUSING

(See page [SR-36](#))

1. COAT ALL PARTS WITH POWER STEERING FLUID

2. MOUNT VALVE BODY IN VISE

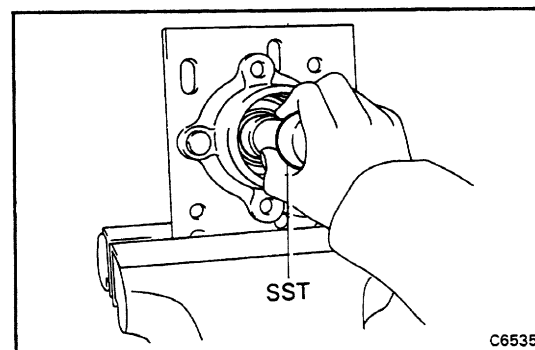
Mount the valve body on SST and clamp SST in vise.
SST 09630-00012 (09631-00140)



3. INSTALL O-RING AND TEFLON RING

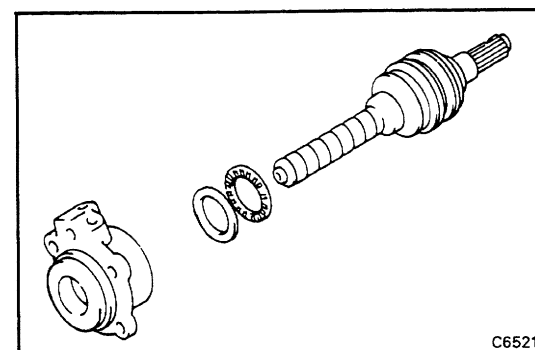
(a) Install a new O-ring.

(b) Form a new teflon ring into a heart shape and install it with your fingers.



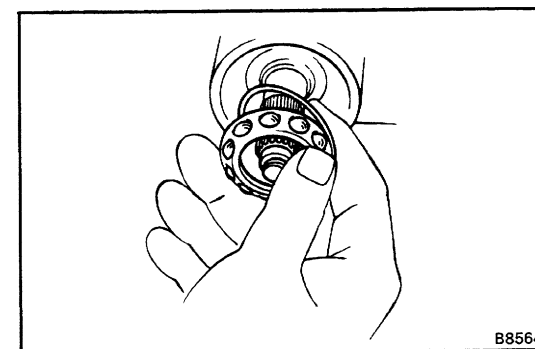
(c) Using SST, form the teflon ring.

SST 09630-00012 (09631-00120)

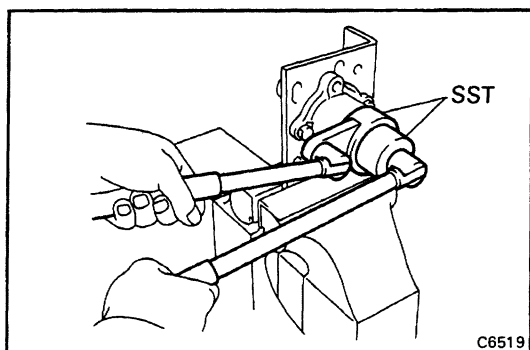


4. INSTALL WORM SHAFT

Install the worm shaft with the thrust bearing and the plate washer to the valve body.



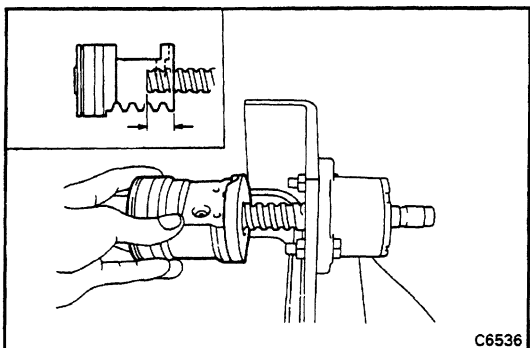
5. INSTALL NEW O-RING AND BEARING TO CONTROL VALVE



6. INSTALL ADJUSTING SCREW AND LOCK NUT

Using SST, temporarily tighten the adjusting screw and lock nut.

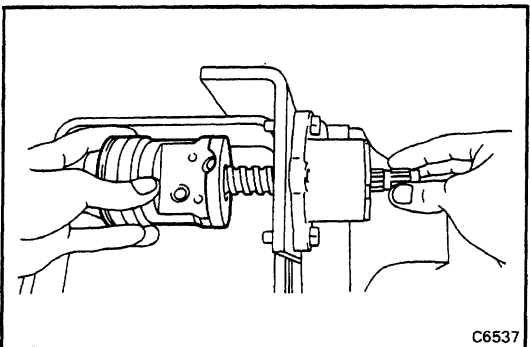
SST 09630-00012 (09631-00030, 09631-00040)



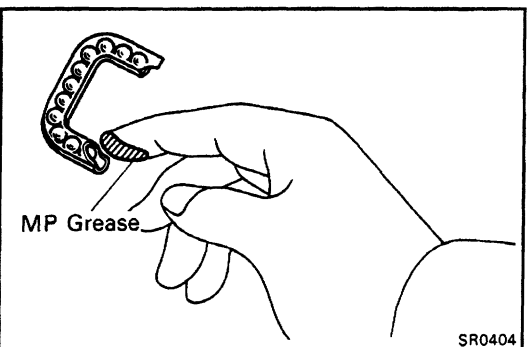
7. INSTALL POWER PISTON NUT AND BALLS

(a) Clean all parts with power steering fluid.

(b) Insert the power piston nut approx. 15 mm (0.59 in.) from the worm shaft end, and align the ball transfer surface with the bail hole.



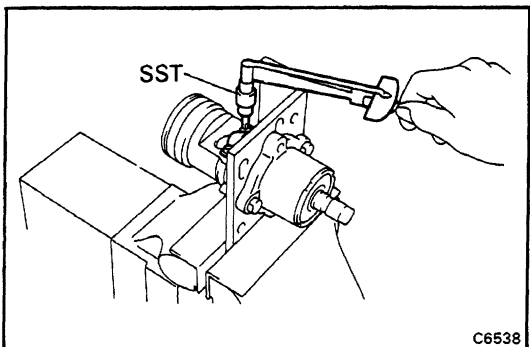
(c) Insert the balls one at a time into the hole, and turn the worm shaft a little with each insertion. Then, securely insert the 33 balls into the piston.



(d) Install the eleven balls to the ball guide, and apply M P grease to the ball guide lips so the balls do not fall out.

(e) Install the ball guide to the power piston nut.

HINT: Be careful not to damage the ball guide.



(f) Using SST, install the ball guide clamp.

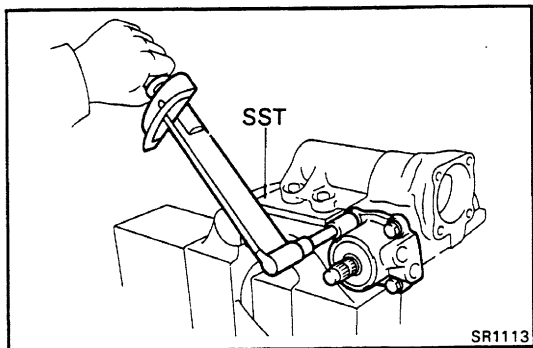
SST 09060-20010

Torque: 30 kg-cm (26 in.-lb, 2.9 N-m)

(g) Check that the power piston nut rotates smoothly.

(h) Turn the power piston nut, and ensure that it is adhered to the tip surface of the valve body.

HINT: If a ball has fallen out, there will be a gap.



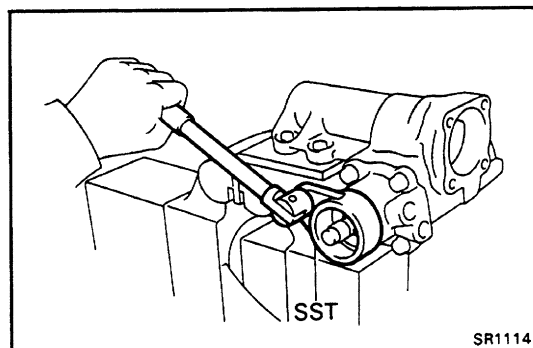
8. INSTALL WORM GEAR VALVE BODY ASSEMBLY

- (a) Install two new O-rings to the gear housing and valve body.
- (b) Mount the gear housing on SST and clamp SST in vise.

SST 09630-00012 (09631-00140)

- (c) Install and torque the four bolts.

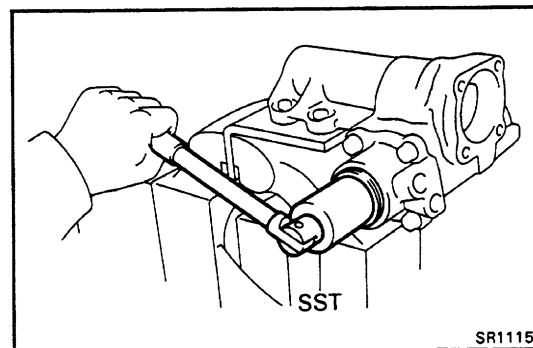
Torque: 470 kg-cm (34 ft-lb, 46 N-m)



9. ADJUST WORM BEARING PRELOAD

- (a) Using SST, remove the lock nut.

SST 09630-00011 (09631-00040)

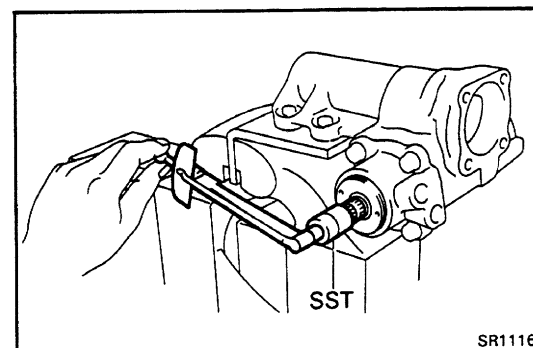


- (b) Using SST, tighten the adjusting screw.

SST 09630-00012 (09631-00030)

- (c) Turn the worm shaft to the right and left and fit it the bearing.

- (d) Slightly loosen the adjusting screw.



- (e) Using SST, slightly tighten the adjusting screw until the preload is correct.

SST 09630-00012 (09631-00030)

- (f) Using SST and a torque meter, check the preload of the bearing.

SST 09616-00010

Preload: 4.0 – 6.5 kg-cm

(3.5 – 5.6 in.-lb, 0.4 – 0.6 N-m)

HINT: Hold the power piston nut to prevent it from turning.

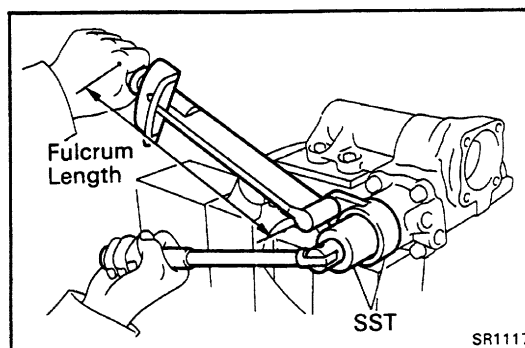
- (g) Using SST, torque the lock nut while holding the adjusting screw with SST.

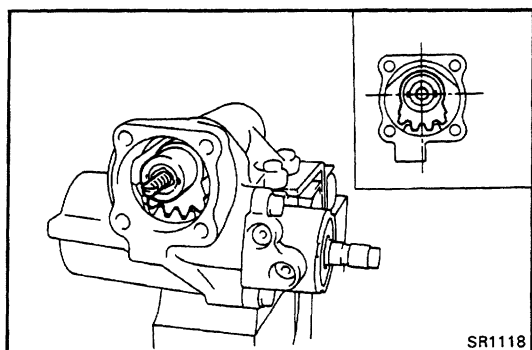
SST 09630-00012 (09631-00030, 09631-00040)

Torque: 430 kg-cm (31 ft-lb, 42 N-m)

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

- (h) Recheck the preload.



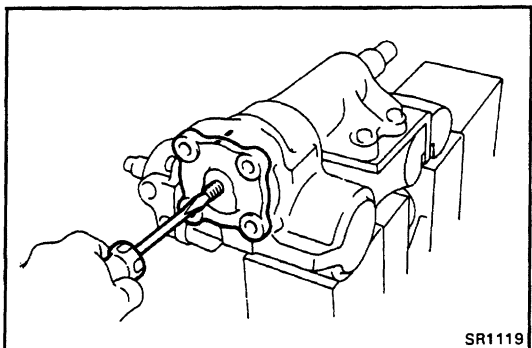


10. INSTALL CROSS SHAFT AND END COVER

- Install a new O-ring on the end cover.
- Wrap the tape to the serrated part of the cross shaft.
- Set the piston nut at the center of the gear housing.
- Insert and push the cross shaft into the gear housing so that the center tooth meshes.

- Fully loosen the adjusting screw and install the end cover with the four bolts.

Torque: 470 kg-cm (34 ft-lb, 46 N-m)



11. ADJUST TOTAL PRELOAD

- Turn the worm shaft to full lock in both directions and determine the exact center.
- Install SST with a torque meter on the worm shaft.
SST 09616-00010
- Turn the adjusting screw while measuring the preload until it is correct.

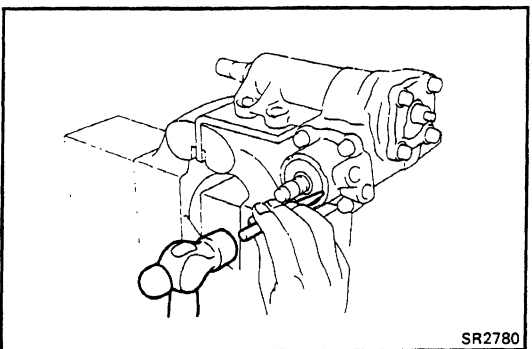
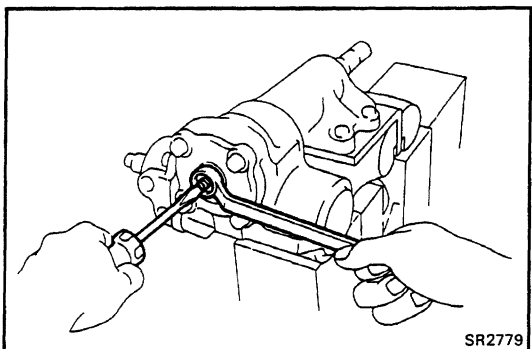
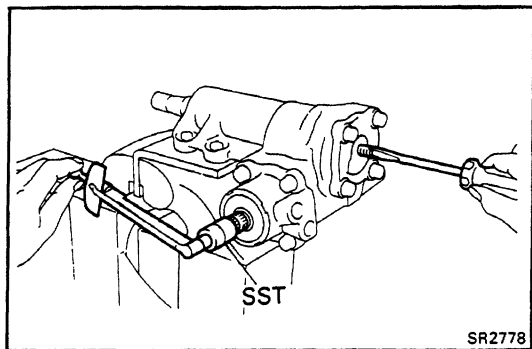
Total preload: 7.5 - 11.0 kg-cm

(6.5 - 9.5 in.-lb, 0.7 - 1.1 N-m)

- Install a new seal washer.
- Install and torque the lock nut while holding the adjusting screw.

Torque: 470 kg-cm (34 ft-lb, 46 N-m)

- Recheck the total preload.



12. STAKE LOCK NUT

Using a punch and hammer, stake the lock nut.