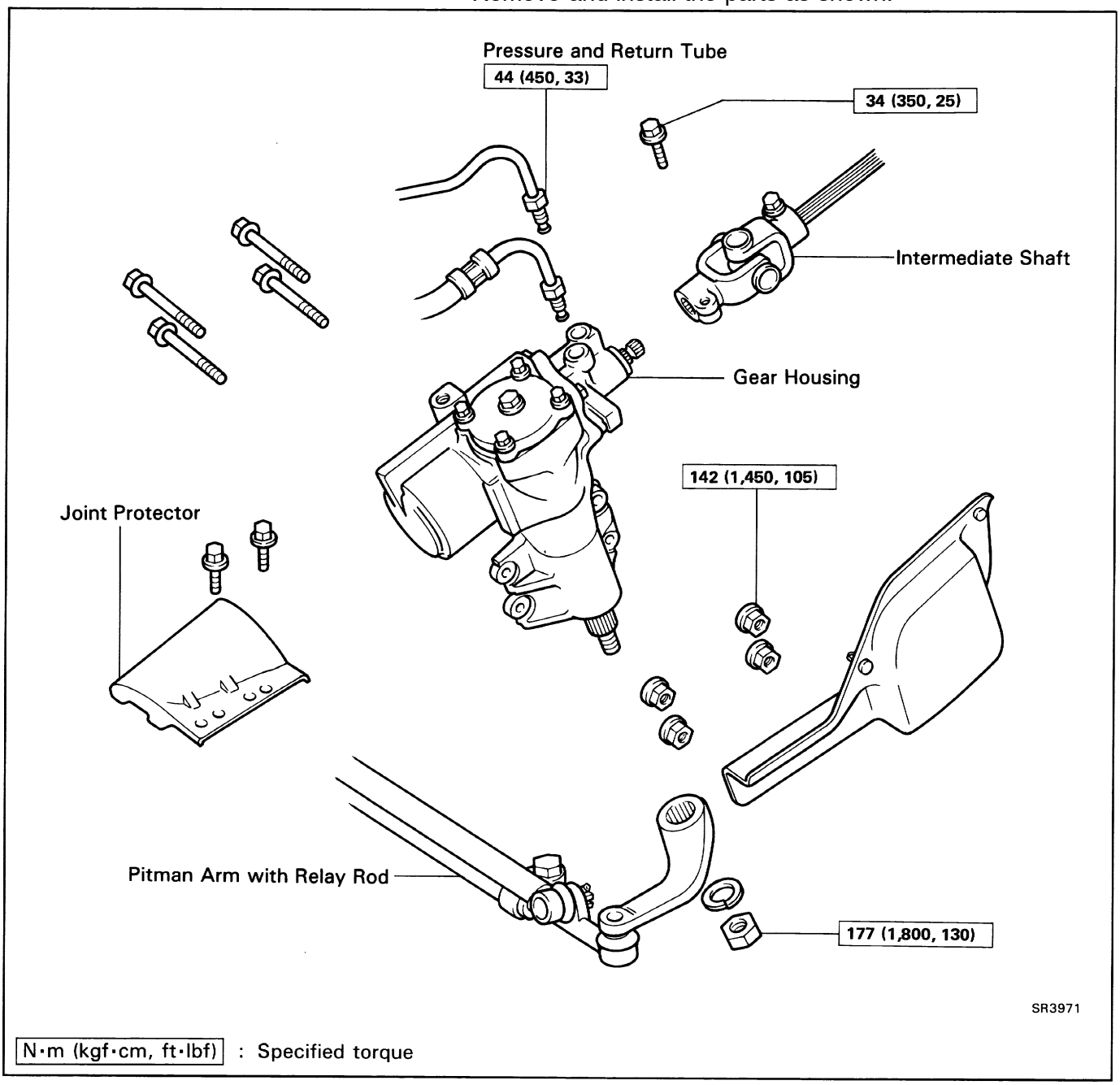
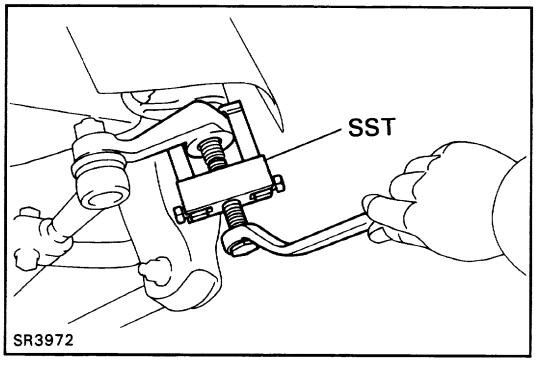
Gear Housing

REMOVAL AND INSTALLATION OF GEAR HOUSING

Remove and install the parts as shown.



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



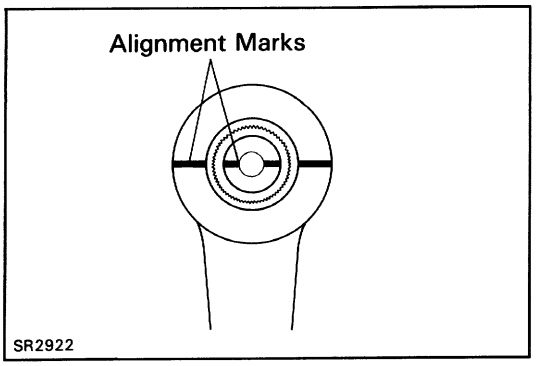
(MAIN POINTS OF REMOVAL AND INSTALLATION)

1. DISCONNECT PITMAN ARM

(a) Loosen the pitman arm nut.

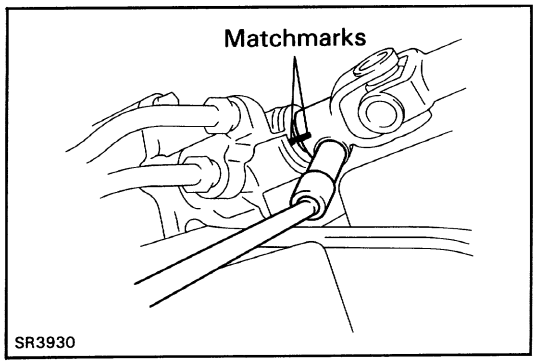
(b) Using SST, disconnect the pitman arm from the sector shaft.
SST 09628–62011

(c) Remove the nut, the spring washer and the arm.



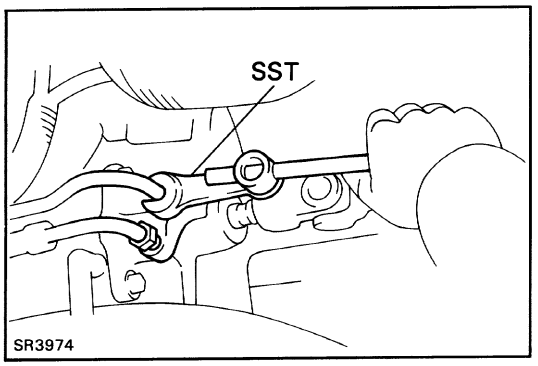
(d) When connecting the pitman arm, align alignment marks on the pitman arm and the sector shaft, and install the spring washer and nut.

Torque: 177 N–m (1,800 kgf–cm, 130 ft–lbf)



2. DISCONNECT UNIVERSAL JOINT FROM GEAR HOUSING

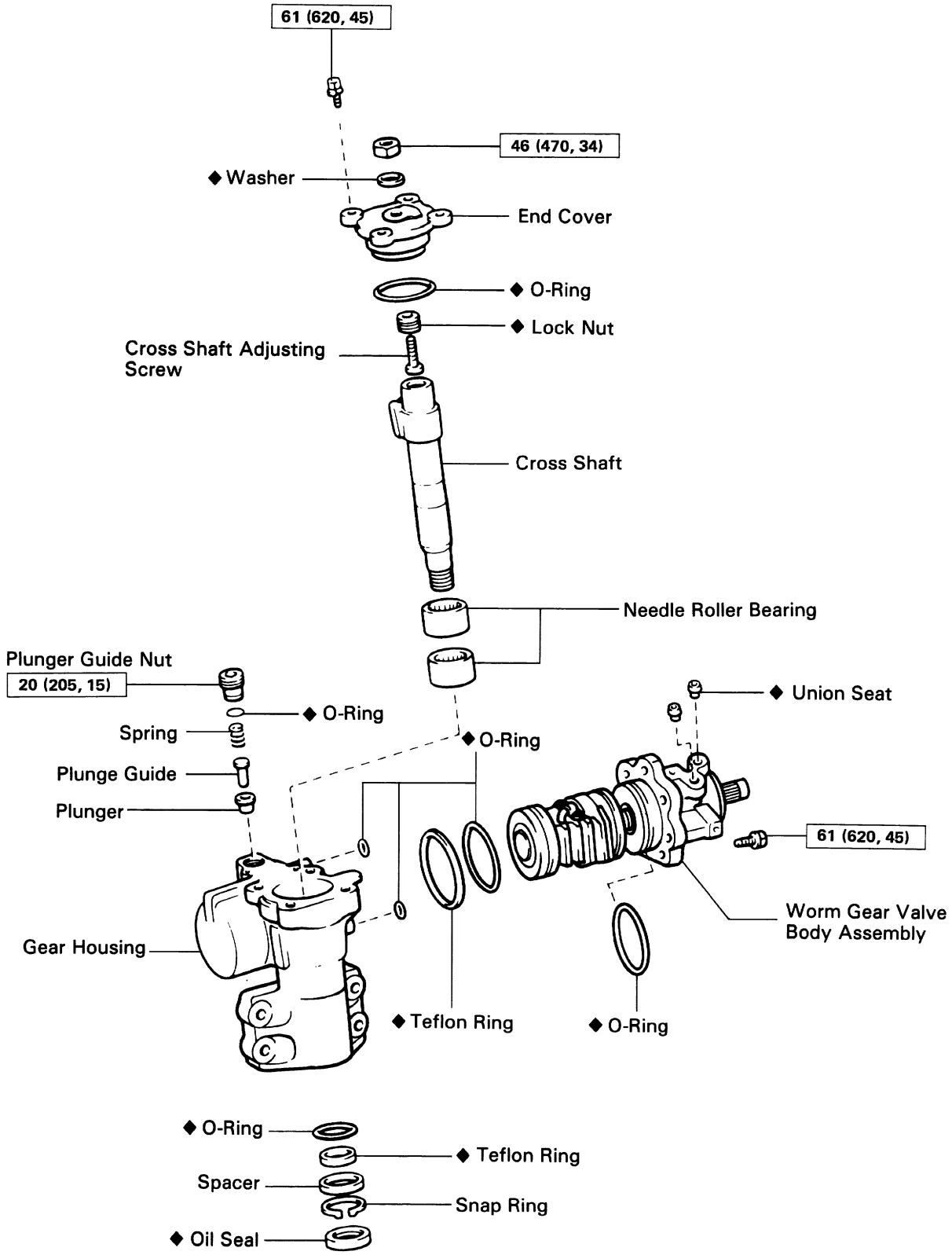
(a) Loosen the universal joint upper bolt.
(b) Remove the universal joint lower bolt.
(c) Slide the joint backward to disconnect the joint from the worm shaft.



3. DISCONNECT PRESSURE AND RETURN TUBES

Using SST, disconnect the pressure and return tubes from the gear housing.
SST 09631–22022

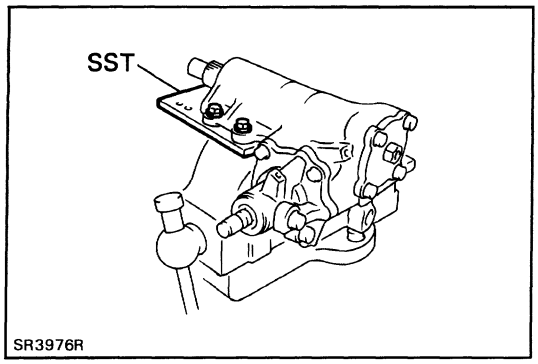
COMPONENTS



SR3975

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

◆ Non-reusable part

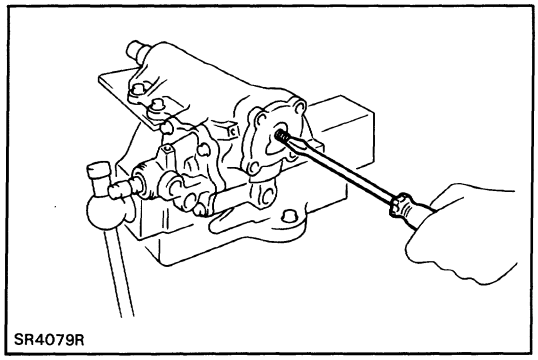


DISASSEMBLY OF GEAR HOUSING

(See page SR–34)

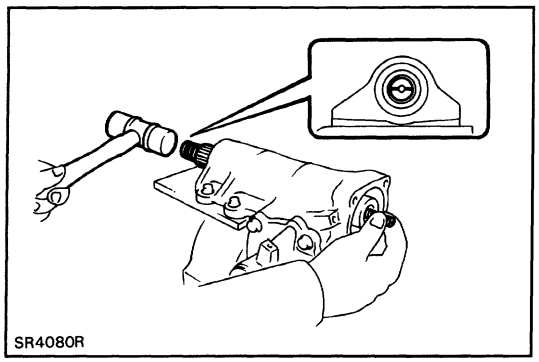
1. MOUNT HOUSING ON STAND

Mount the gear housing on SST and clamp SST in a vise.
SST 09630–00012 (09631–00140)



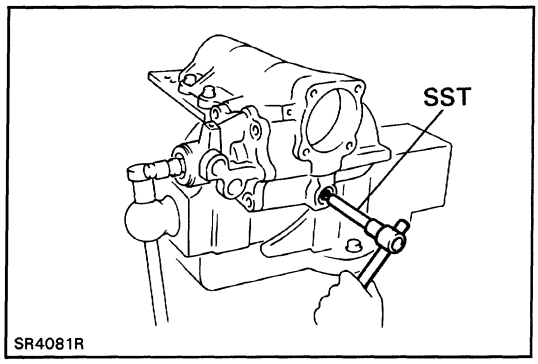
2. REMOVE END COVER

(a) Remove the adjusting screw lock nut.
(b) Remove the four bolts.
(c) Screw in the adjusting screw until the cover comes off .



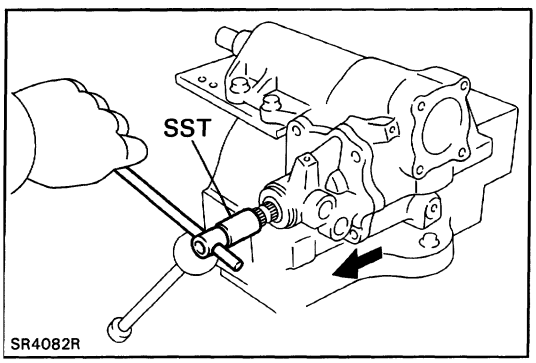
3. REMOVE CROSS SHAFT

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



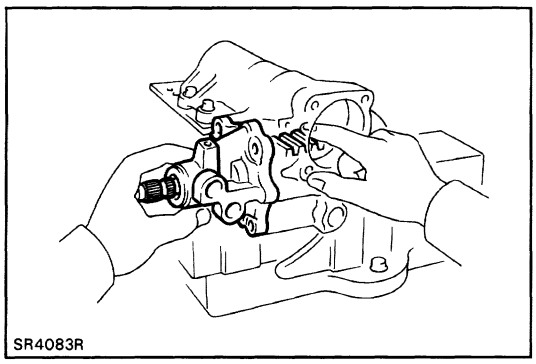
4. REMOVE PLUNGER GUIDE NUT

(a) Using SST, remove the plunger guide nut.
SST 09043–38100
(b) Remove the spring, plunger and plunger guide.
(c) Remove the O–ring.



5. REMOVE WORM GEAR VALVE BODY ASSEMBLY

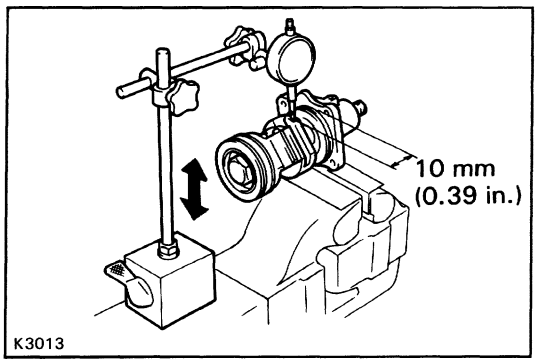
(a) Remove the four cap bolts from the housing.
(b) Using SST, turn the shaft clockwise to disconnect the worm gear valve body assembly from gear housing.
SST 09616–00010



(c) Hold the power piston nut with your thumb so it cannot move, then withdraw the valve body and power piston assembly.

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

(d) Remove the O–ring.



INSPECTION AND REPLACEMENT OF GEAR HOUSING

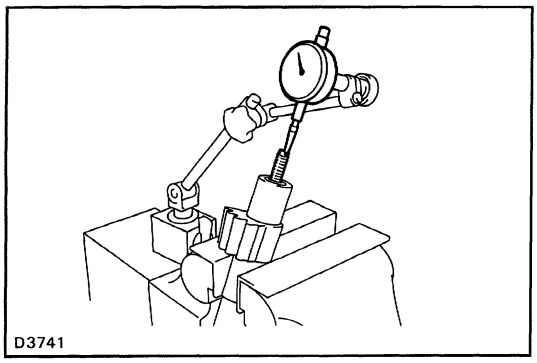
1. CHECK BALL CLEARANCE

(a) Mount the valve body in a vise.

(b) Using a dial indicator, check the ball clearance.
Move the worm gear up and down.

Maximum ball clearance: 0.15 mm (0.0059 in.)

If clearance is excessive, the power control valve assembly must be replaced.



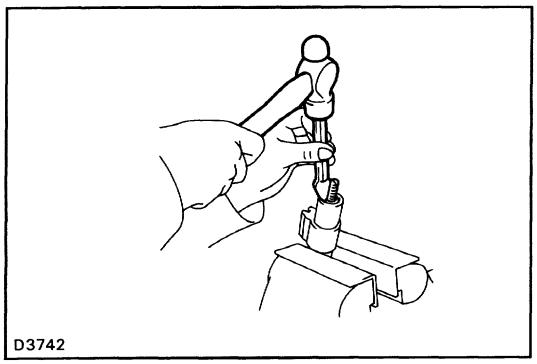
2. INSPECT CROSS SHAFT ADJUSTING SCREW THRUST CLEARANCE

(a) Clamp the cross shaft in a vise.

(b) Using a dial indicator, measure the thrust clearance.

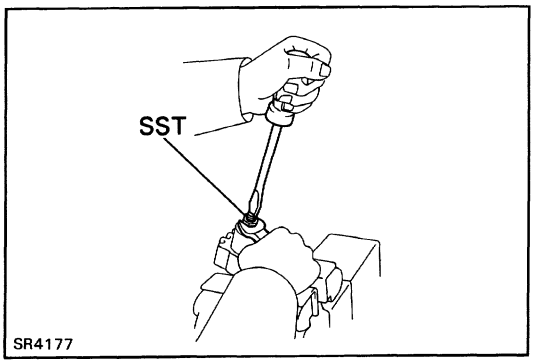
Thrust clearance: 0.03 – 0.05 mm
(0.0012 – 0.0020 in.)

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



3. IF NECESSARY, ADJUST THRUST CLEARANCE

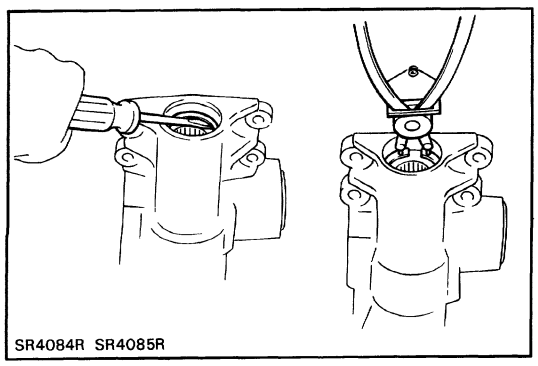
(a) Using a chisel and hammer, remove the lock nut stake.



(b) Using SST, remove the lock nut.
SST 09630–00012 (09631–00050)

(c) Adjust the adjusting screw for correct thrust clearance and tighten a new lock nut.

(d) Stake the lock nut.

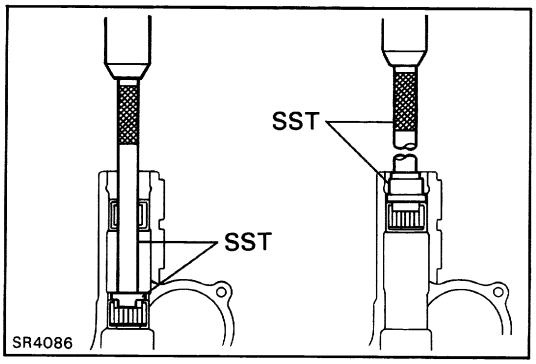


4. IF NECESSARY, REPLACE NEEDLE ROLLER BEARING

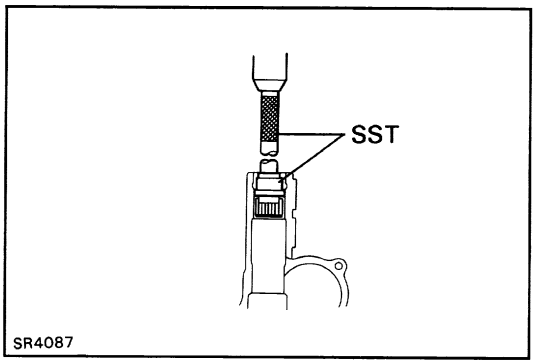
(a) Using a screwdriver, pry out the oil seal.

(b) Using snap ring pliers, remove the snap ring.

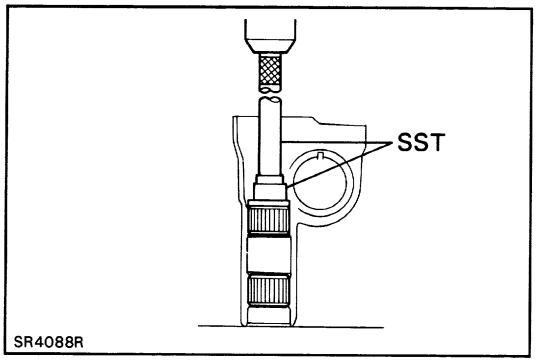
(c) Remove the metal spacer, teflon ring and O–ring.



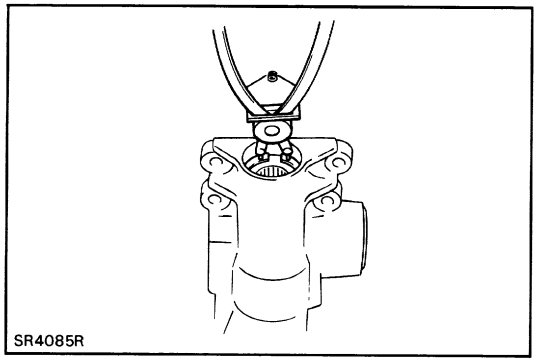
(d) Using SST, press out the upper bearing.
SST 09630–00012 (09631–00020, 09631–00070)
(e) Using SST, press out the lower bearing.
SST 09630–00012 (09631–00020, 09631–00090)



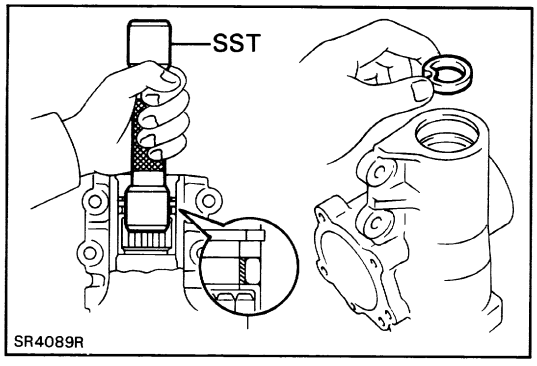
(f) Using SST, press in a new lower bearing.
SST 09630–00012 (09631–00020, 09631–00090)
HINT: Install the lower bearing so that it is positioned 23.1 mm (0.909 in.) away from the housing inner end surface.



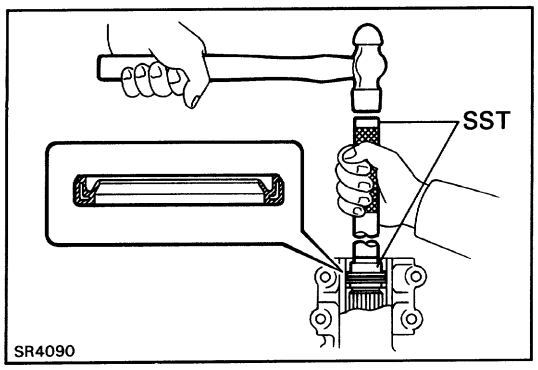
(g) Using SST, press in a new upper bearing.
SST 09630–00012 (09631–00020, 09631–00090)
HINT: The bearing's top end should be installed so that it aligns with the housing end surface.
(h) Install a new O–ring and metal spacer.



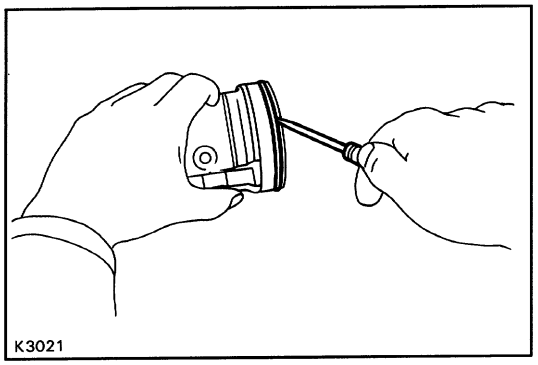
(i) Using snap ring pliers, install the snap ring.



(j) Form a teflon ring into a heart shape and install it with hand.
(k) Using SST, form the teflon ring.
NOTICE: The teflon ring must be squeezed before inserting the sector shaft or damage will result.
SST 09630–00012 (09631–00120)



(l) Using SST, drive a new oil seal into the gear housing.
SST 09630–00012 (09631–00020, 09631–00090)



5. IF NECESSARY, REPLACE CONTROL VALVE TEFLON RING

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

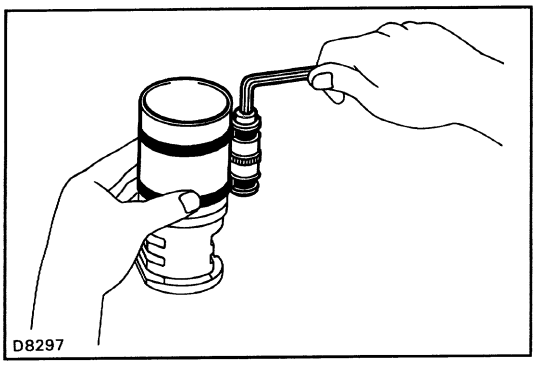
NOTICE: Be careful not to damage the control valve.

(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.

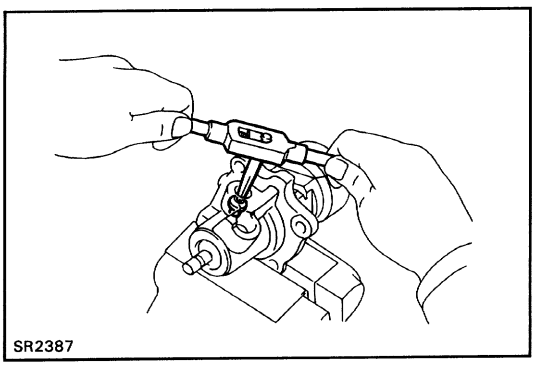
(d) Install a new teflon ring.

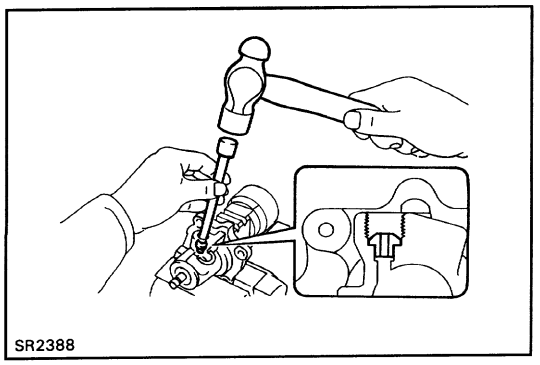


(e) Coat the teflon ring with power steering fluid and snug it down with piston ring compressor for 5 – 7 minutes.

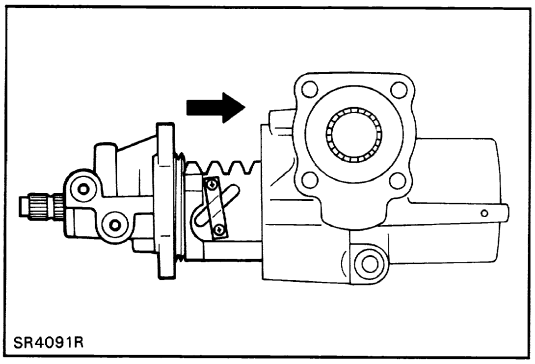
6. IF NECESSARY, REPLACE UNION SEAT

(a) Using a screw extractor, remove the union seat.





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


SR4091R

ASSEMBLY OF GEAR HOUSING

(See page SR–34)

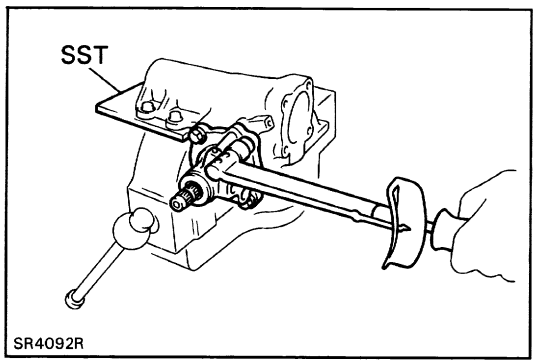
1. INSTALL WORM GEAR VALVE BODY ASSEMBLY

(a) Install the three O–rings to the gear housing and valve body.

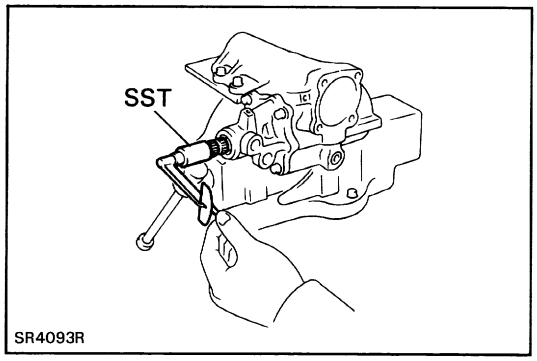
(b) Mount the gear housing on SST and clamp SST in vise.
SST 09630–00012 (09631–00140)

(c) Install the worm gear valve body assembly to the gear housing as shown.

(d) Install and torque the four bolts.
Torque: 61 N–m (620 kgf–cm, 45 ft–lbf)
NOTICE: Be careful not to damage the teflon ring.



SR4092R

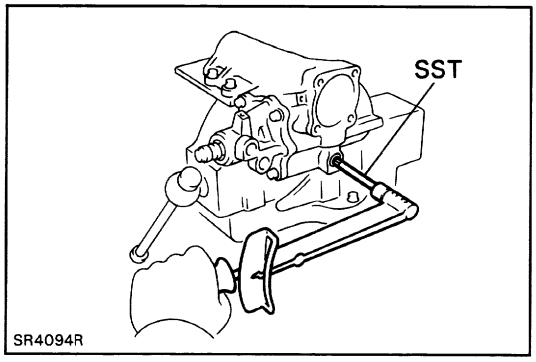


SR4093R

(e) Using SST, check the worm gear preload.
SST 09616–00010
Preload: (at starting)
0.3 – 0.5 N–m (3 – 5.5 kgf–cm, 2.6 – 4.8–lbf)

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

If preload is not correct, replace the worm gear assembly.

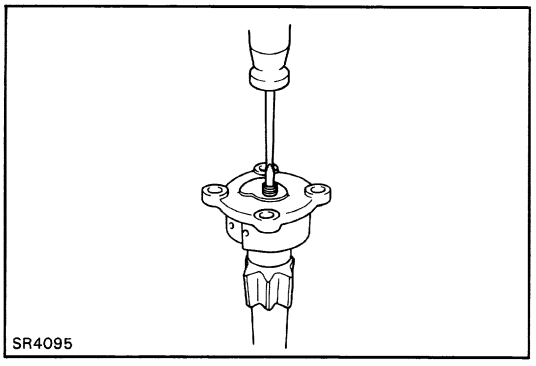


SR4094R

2. INSTALL PLUNGER GUIDE NUT

(a) Install the plunger, plunger guide and spring.

(b) Install a new O–ring to the plunger guide nut and install the plunger guide nut with SST.
SST 09043–38100
Torque: 20 N–m (205 kgf–cm, 15 ft–lbf)

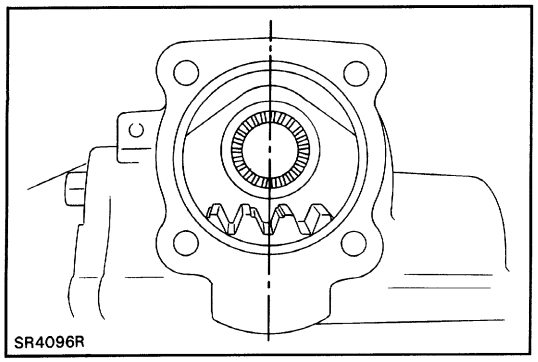

SR4095

3. INSTALL CROSS SHAFT AND END COVER

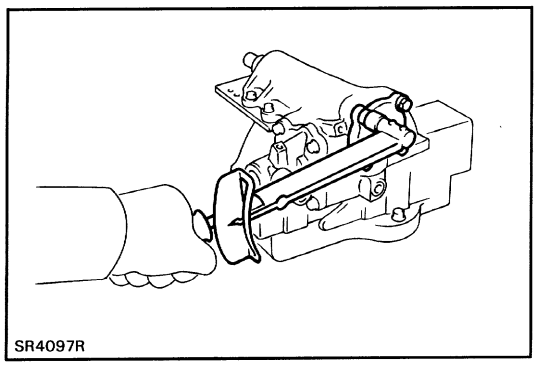
(a) Install a new O–ring on the end cover.

(b) Using a screwdriver, assemble the cross shaft to the end cover.

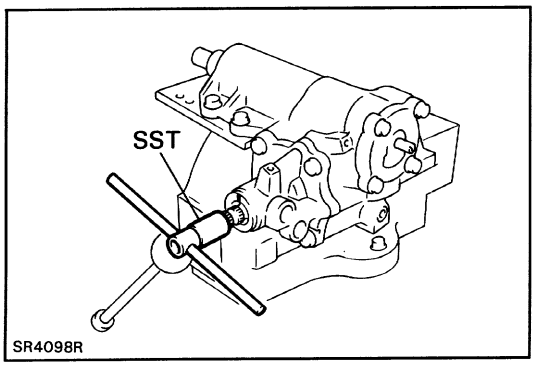
HINT: Fully loosen the adjusting screw.


SR4096R

(c) Set the worm gear at the center of the gear housing.
(d) Install and push the cross shaft into the gear housing so that the center teeth mesh together.

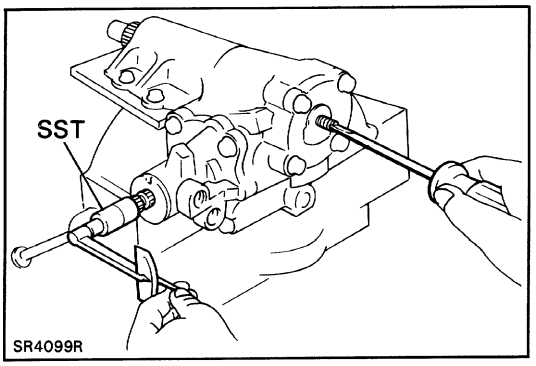

SR4097R

(e) Install the four cap bolts. Torque the bolts in a diagonal pattern.
Torque: 61 N–m (620 kgf–cm, 45 ft–lbf)



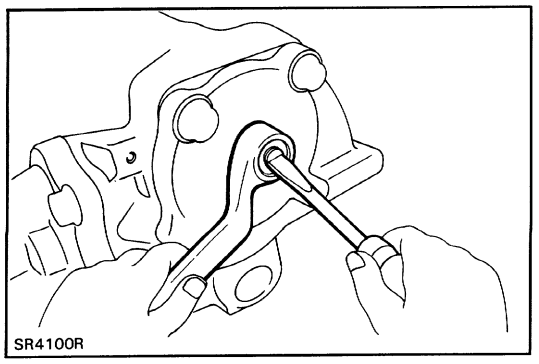
SR4098R

4. DETERMINE CENTER POSITION OF GEAR HOUSING
(a) Using SST, turn the worm shaft so full lock in both directions and determine the exact center.
SST 09616–00010
(b) Place matchmarks on the worm shaft and housing to show neutral position.



SR4099R

5. ADJUST CROSS SHAFT ADJUSTING SCREW
(a) Install SST with a torque meter on the worm shaft.
SST 09616–00010
(b) Turn the adjusting screw while measuring the preload until it is correct.
Total preload: (at starting)
0.74 – 1.08 N–m
(7.5 – 11 kgf –cm, 6.5 – 9.6 in.–lbf)


SR4100R

6. INSTALL NEW WASHER
7. INSTALL AND TIGHTEN LOCK NUT
Torque the lock nut while holding the adjusting screw.
Torque: 46 N–m (470 kgf–cm, 34 ft–lbf)
8. CHECK TOTAL PRELOAD