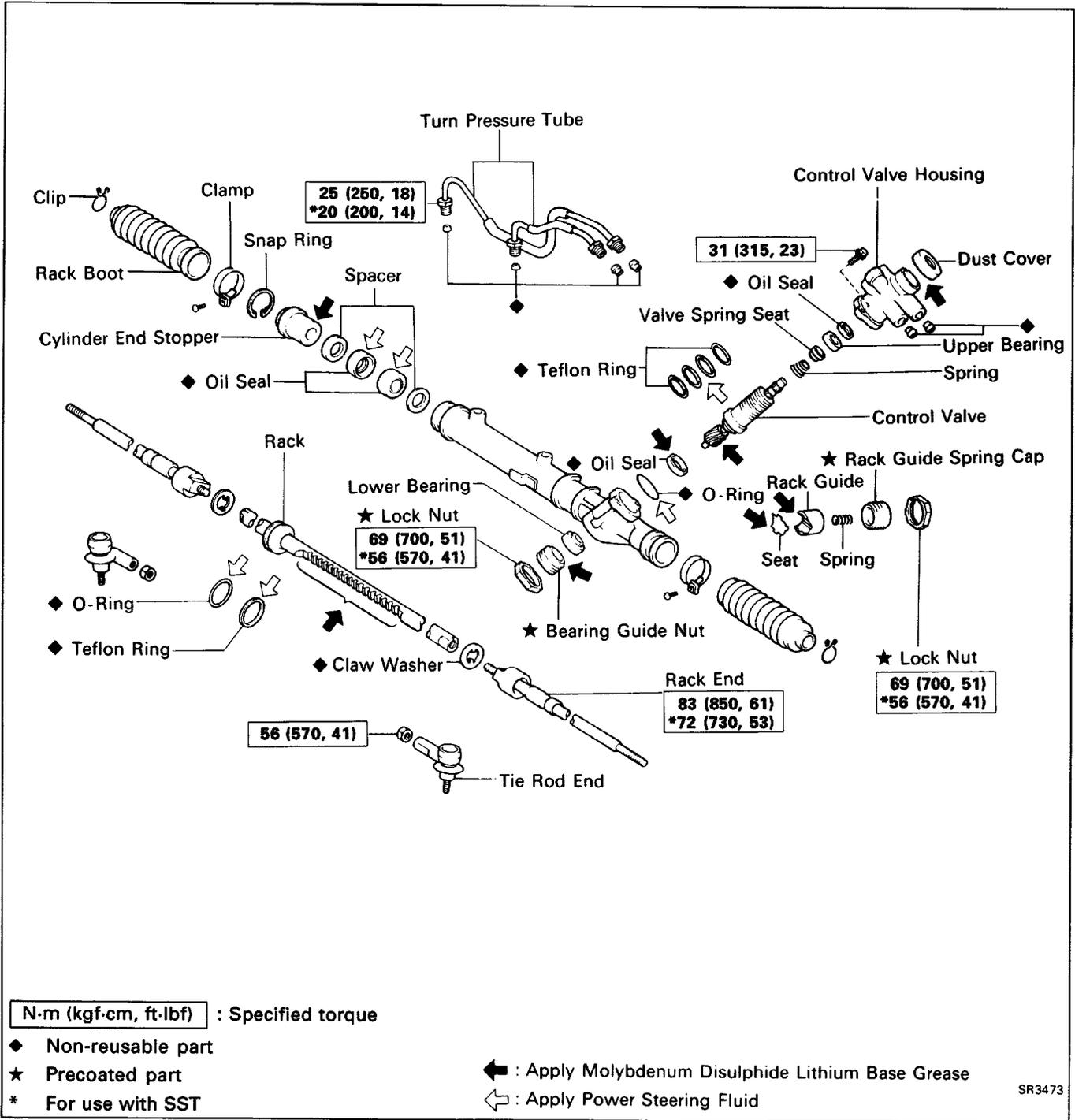
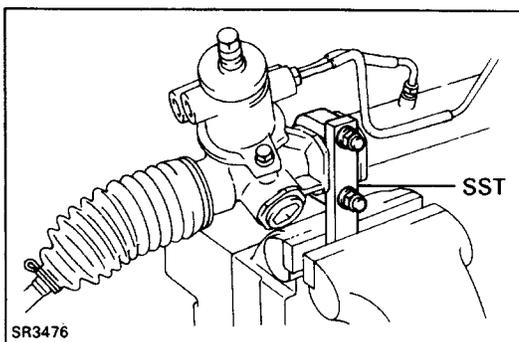


GEAR HOUSING COMPONENTS



SR3473

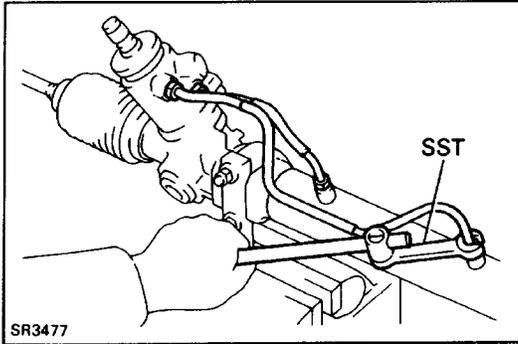


SR3476

DISASSEMBLY OF GEAR HOUSING

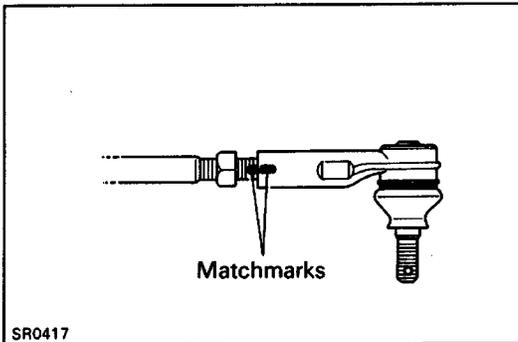
1. CLAMP GEAR HOUSING IN VISE

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



2. REMOVE RIGHT AND LEFT TURN PRESSURE TUBES

Using SST, remove the pressure tubes.
SST 09633-00020

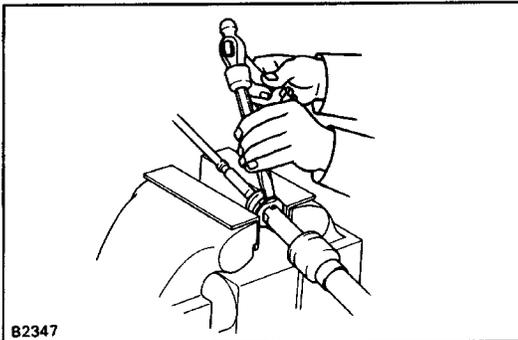


3. REMOVE TIE ROD ENDS

- (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.

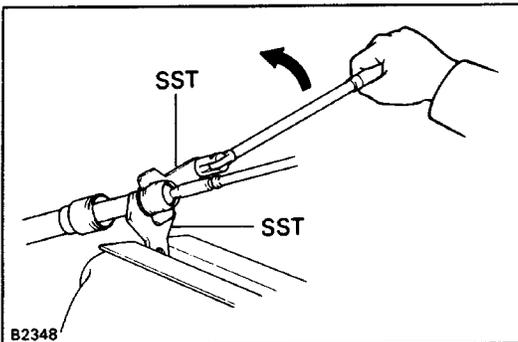
4. REMOVE RACK BOOTS

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

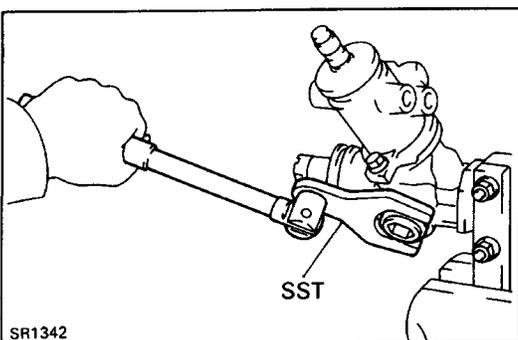


5. REMOVE RACK ENDS AND CLAW WASHERS

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

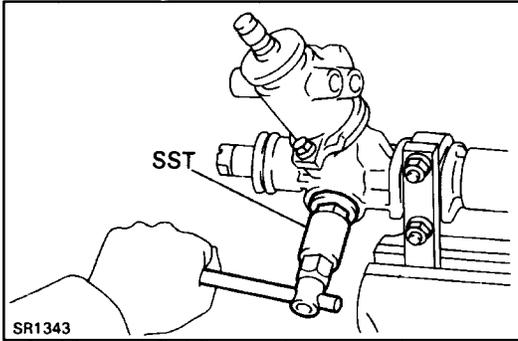


- (b) Using SST, remove the rack ends.
SST 09612-10093 (09628-10020) and
09612-24014 (09617-24011)
- (c) Mark the left and right rack ends accordingly.
- (d) Remove the claw washers.

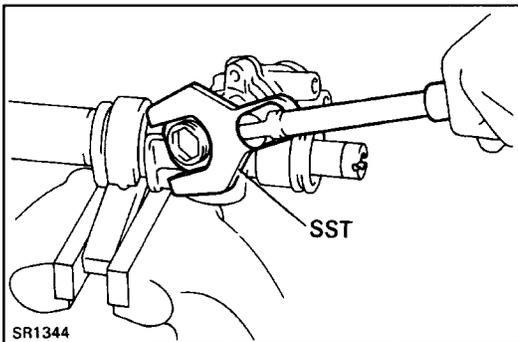


6. REMOVE RACK GUIDE SPRING CAP LOCK NUT

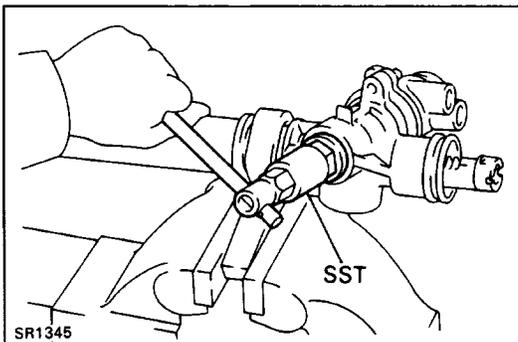
Using SST, remove the rack guide spring cap lock nut.
SST 09612-24014 (09617-24020)

**7. REMOVE RACK GUIDE SPRING CAP**

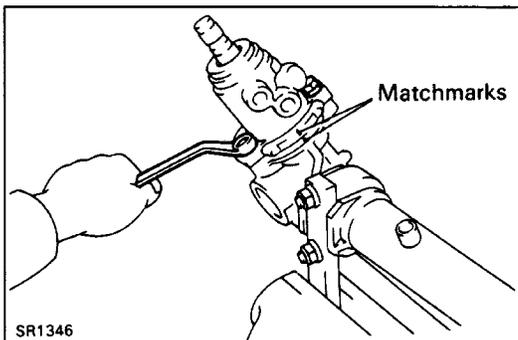
Using SST, remove the rack guide spring cap.
SST 09612-24014 (09612-10022)

8. REMOVE RACK GUIDE SPRING, RACK GUIDE AND SEAT**9. REMOVE BEARING GUIDE LOCK NUT**

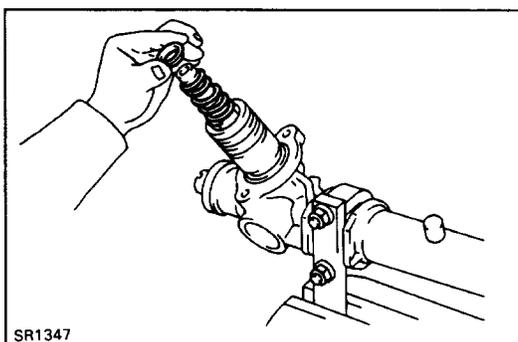
Using SST, remove the lock nut.
SST 09612-24014 (09617-24020)

**10. REMOVE BEARING GUIDE NUT**

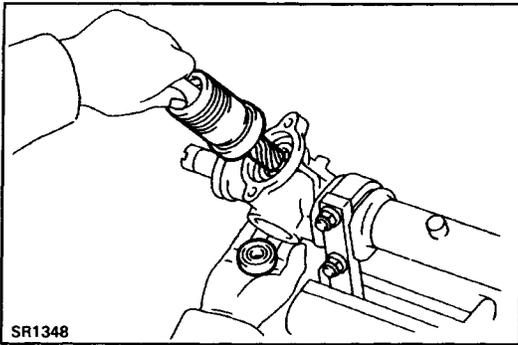
Using SST, remove the bearing guide nut.
SST 09612-24014 (09612-10022)

11. REMOVE DUST COVER**12. REMOVE CONTROL VALVE HOUSING**

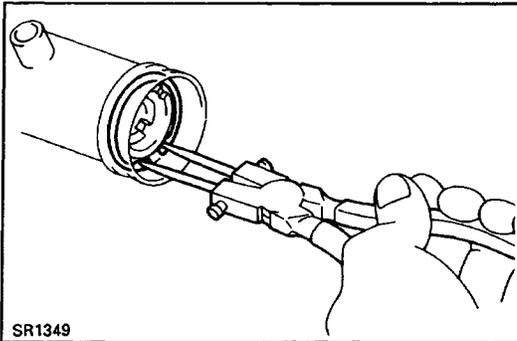
- (a) Place matchmarks on the valve housing and rack housing.
- (b) Remove the two bolts.
- (c) Pull out the valve housing.
- (d) Remove the O-ring from the rack housing.

**13. REMOVE CONTROL VALVE**

- (a) Remove the valve spring seat and spring.

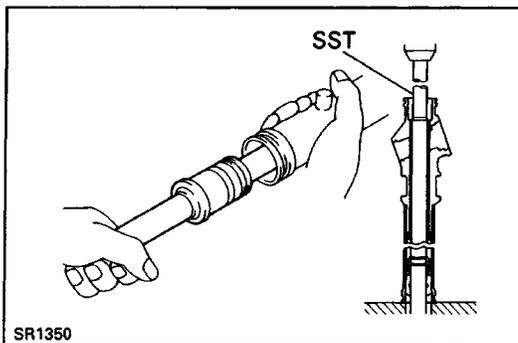


(b) Remove the control valve and bearing.



14. REMOVE CYLINDER END STOPPER, SPACER, OIL SEAL AND RACK

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

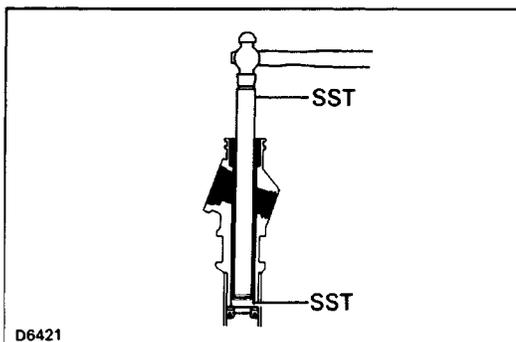


(b) Using SST, press the rack until the end stopper slightly touches the press block.

SST 09612-24014 (09612-10061)

(c) Pull out the rack with the cylinder end stopper, spacer and oil seal.

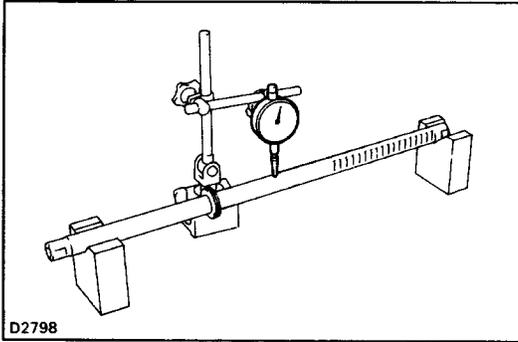
HINT: If necessary, slightly tap the rack end with a brass bar and hammer.



15. REMOVE RACK HOUSING OIL SEAL AND SPACER

Using SST, drive out the spacer and oil seal.

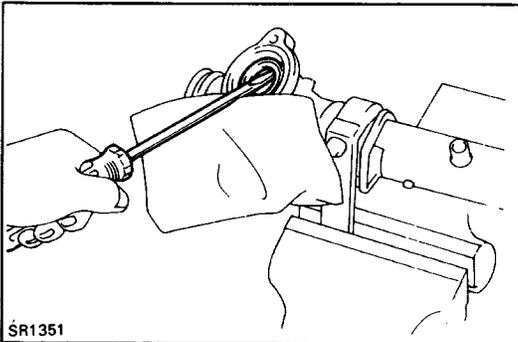
SST 09631-12020 and 09631-20031



INSPECTION AND REPAIR OF GEAR HOUSING COMPONENTS

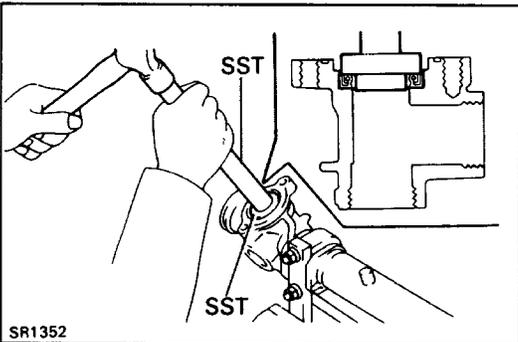
1. INSPECT RACK

- (a) Check the rack for runout and for tooth wear or damage.
- (b) Check the back surface for wear or damage.
If faulty, replace it.
Maximum runout: 0.3 mm (0.012 in.)

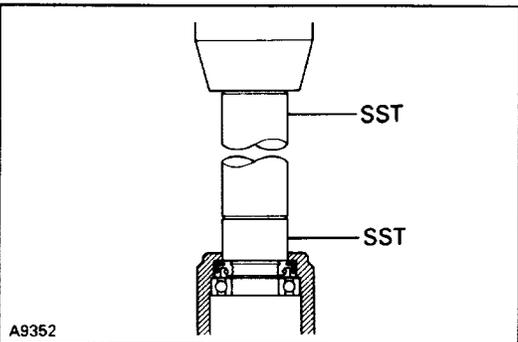


2. IF NECESSARY, REPLACE RACK HOUSING OIL SEAL

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

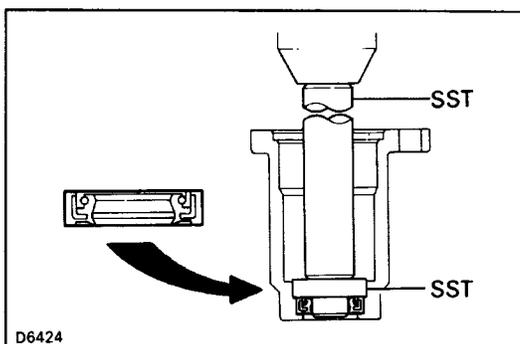


- (b) Using SST, drive in a new oil seal.
SST 09630-24013 (09631-24070) and 09631-12020

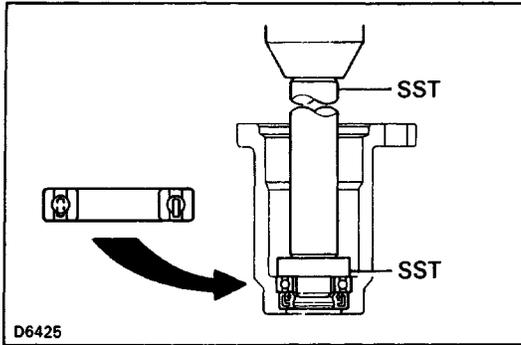


3. IF NECESSARY, REPLACE CONTROL VALVE HOUSING OIL SEAL

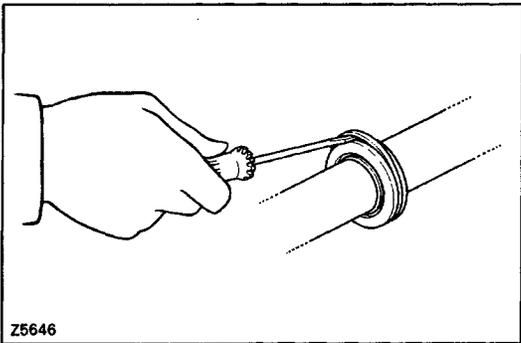
- (a) Using SST, press out the oil seal with the bearing.
SST 09630-24013 (09620-24010) and 09631-2020



- (b) Using SST, press in a new oil seal.
SST 09630-24013 (09620-24020) and 09631-12020

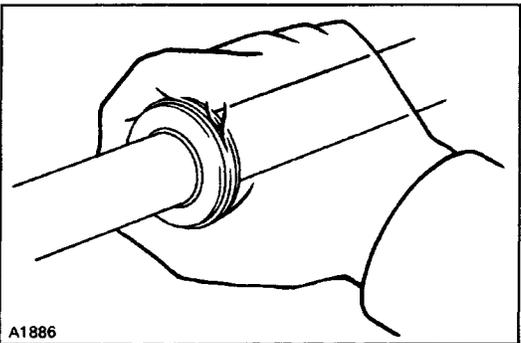


- (c) Using SST, press in a new bearing.
SST 09630-24013 (09620-24030) and 09631-12020

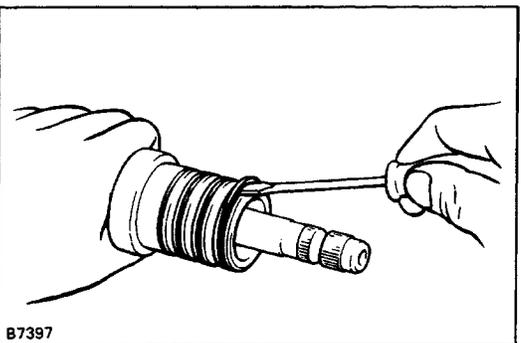


4. IF NECESSARY, REPLACE STEERING RACK TEFLON RING AND O-RING

- (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.

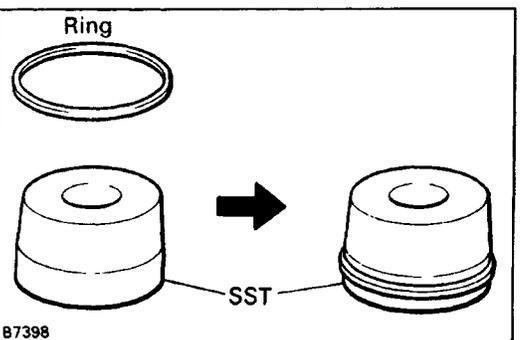


- (d) Install the new teflon ring to the steering rack.
(e) Coat the teflon ring with power steering fluid and snug it down with your fingers.

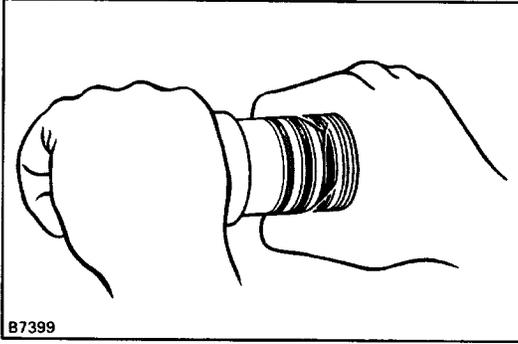


5. IF NECESSARY, REPLACE CONTROL VALVE TEFLON RINGS

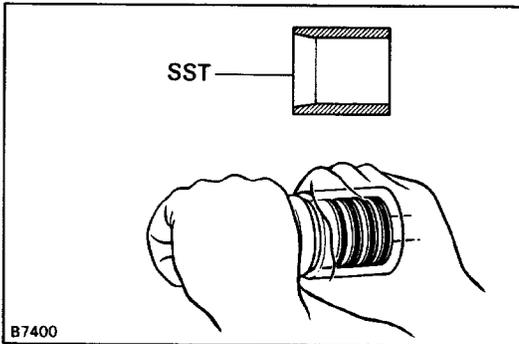
- (a) Using a screwdriver, remove the teflon rings.
NOTICE: Be careful not to damage the control valve.



- (b) Install new teflon rings to SST and expand them.
SST 09630-24013 (09620-24040)

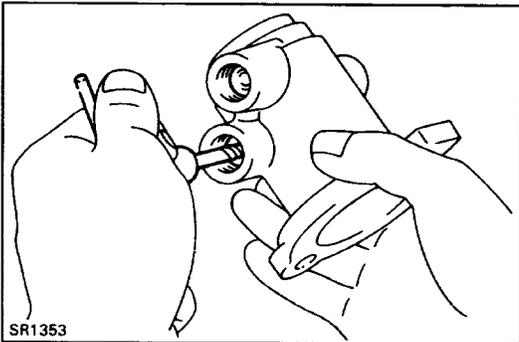


- (c) Install the expanded teflon rings to the control valve and snug them down with your fingers.



- (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.

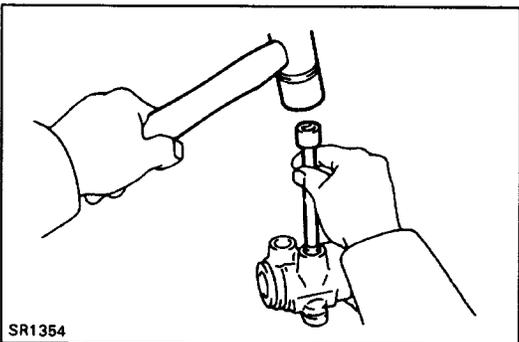
SST 09630-24013 (09620-24050)



6. IF NECESSARY, REPLACE UNION SEATS

HINT: Replace the union seats with new ones only when they are damaged.

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

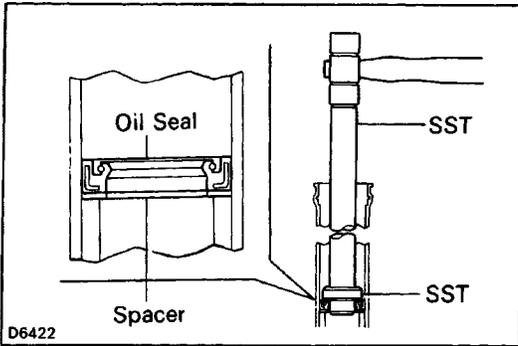


- (b) Using a plastic hammer and extension bar, lightly tap in new union seats.

ASSEMBLY OF GEAR HOUSING

(See page [SR-74](#))

1. COAT WITH POWER STEERING FLUID OR MOLYBDENUM DISULPHIDE LITHIUM BASE GREASE
(See page [SR-74](#))



2. INSTALL RACK HOUSING OIL SEAL AND SPACER

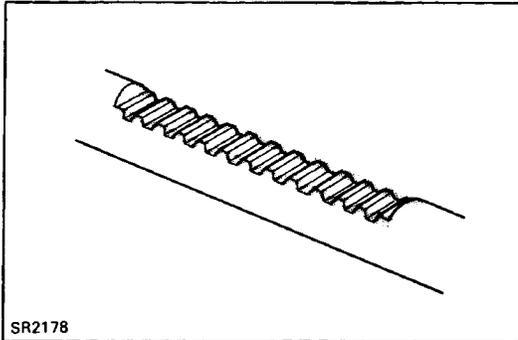
Install a new oil seal and spacer to SST, and drive them in with a plastic hammer.

SST [5S-FE, 3S-GTE Engine]

09631-12020 and 09631-32010

[4A-FE Engine]

09631-12020 and 09631-22070

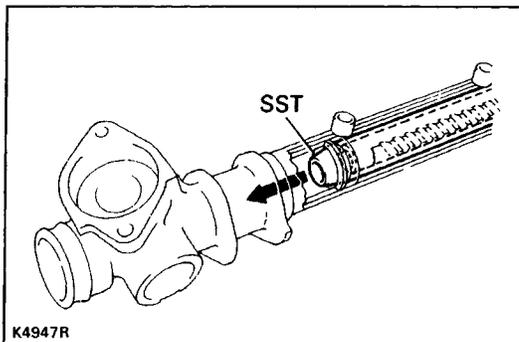


3. INSTALL RACK

(a) Install SST to the rack.

HINT: If necessary, scrape the burrs off the rack teeth end and burnish.

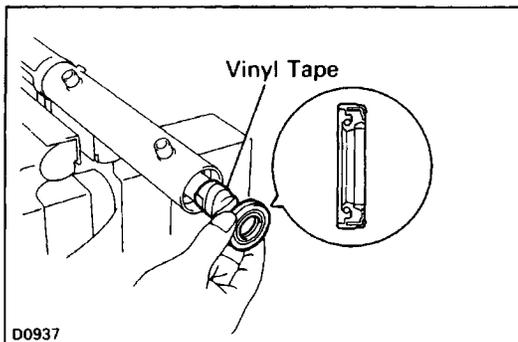
SST 09631-20102



(b) Coat SST with power steering fluid.

(c) Install the rack into the cylinder.

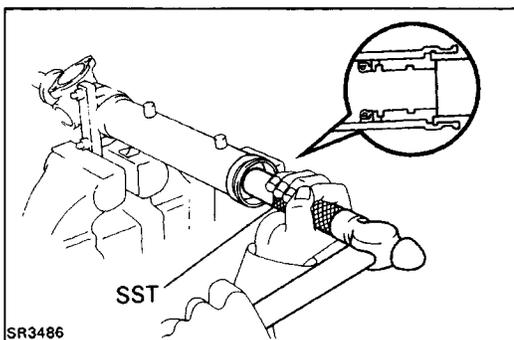
(d) Remove SST.



4. INSTALL CYLINDER END STOPPER, OIL SEAL AND SPACER

(a) To prevent oil seal lip damage, wind vinyl tape on the steering rack end, and apply power steering fluid.

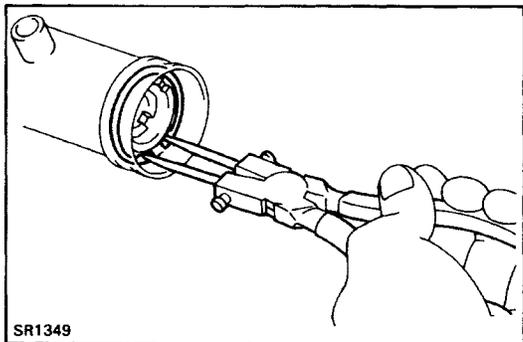
(b) Install the oil seal by pushing it into the cylinder in the direction shown in drawing, without tilting.



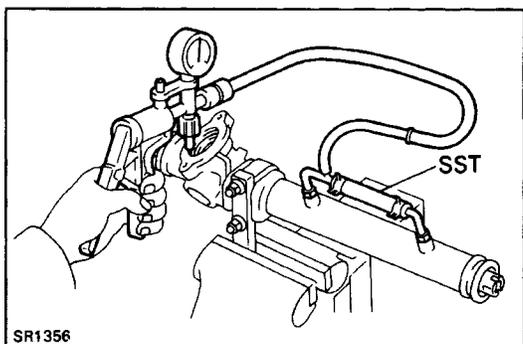
(c) Install the spacer and cylinder end stopper.

(d) Using SST, drive in the cylinder end stopper.

SST 09612-22011

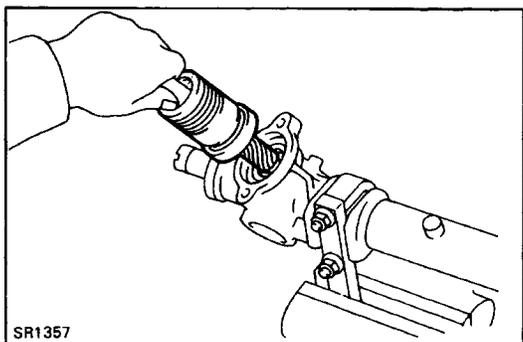


(e) Using snap ring pliers, install the snap ring.



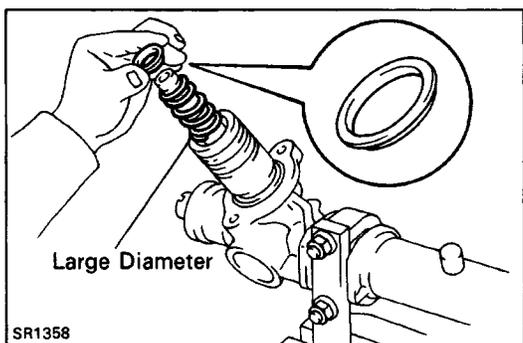
5. AIR TIGHTNESS TEST

- Install SST to the unions of the cylinder housing.
SST 09631-12070
- 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.

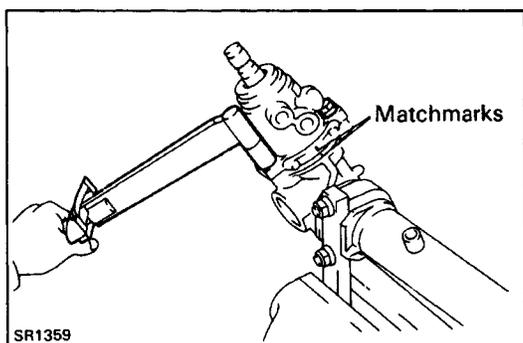


6. INSTALL CONTROL VALVE

- Coat the teflon ring with power steering fluid.
- Push the control valve into the rack housing.
- Coat a new O-ring with power steering fluid, and install it.



7. INSTALL SPRING AND VALVE SPRING SEAT

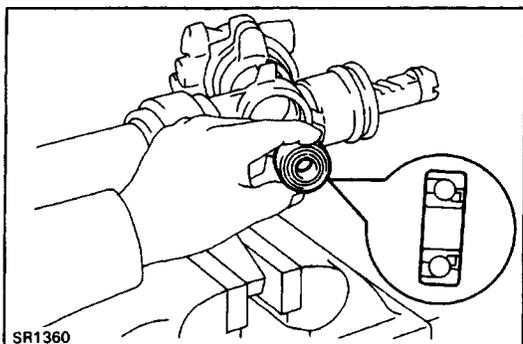


8. INSTALL CONTROL VALVE HOUSING

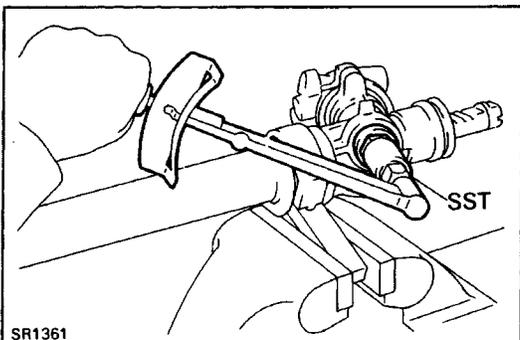
- Align the matchmarks on the valve housing and rack housing.

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

- Torque the two bolts.
Torque: 31 N-m (315 kgf-cm, 23 ft-lbf)



9. INSTALL CONTROL VALVE LOWER BEARING



10. INSTALL BEARING GUIDE NUT

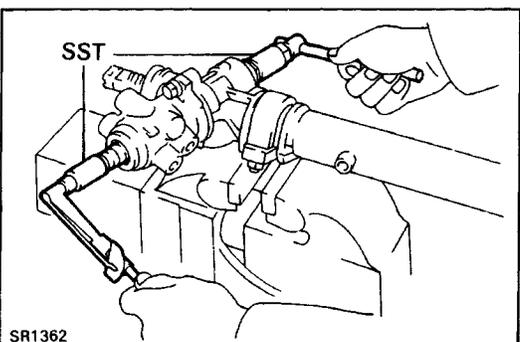
(a) Apply sealant to 2 or 3 threads of the guide nut.

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

(b) Using SST, torque the bearing guide nut.

SST 09612-24014 (09612-10022)

Torque: 15 N-m (150 kgf-cm, 11 ft-lbf)

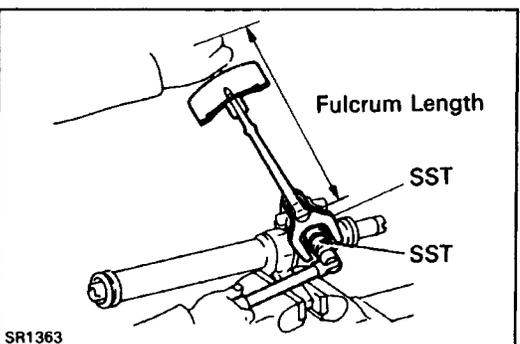


(c) Using SST and torque meter, loosen the bearing guide nut until the preload is within specification.

SST 09612-24014 (09612-10022) and 09616-00010

Preload (turning): 0.4 - 0.6 N-m

(4.5 - 6.5 kgf-cm, 3.9 - 5.6 in.-lbf)



11. INSTALL BEARING GUIDE 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 09612-24014 (09612-10022, 09617-24020)

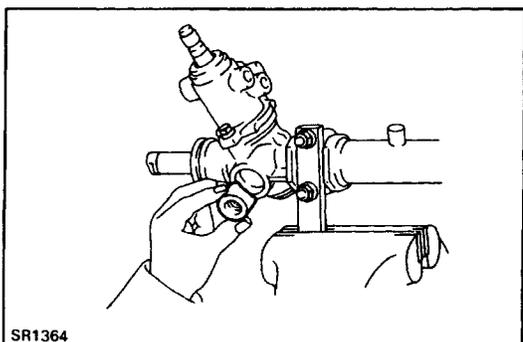
Torque: 56 N-m (570 kgf-cm, 41 ft-lbf)

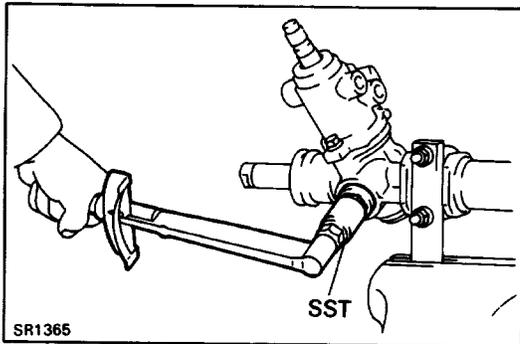
HINT: Use a torque wrench with a fulcrum length of 340 mm (13.39 in.).

(c) Recheck the preload.

12. INSTALL RACK GUIDE SEAT, RACK GUIDE AND RACK GUIDE SPRING

Install the rack guide with the seat and spring.



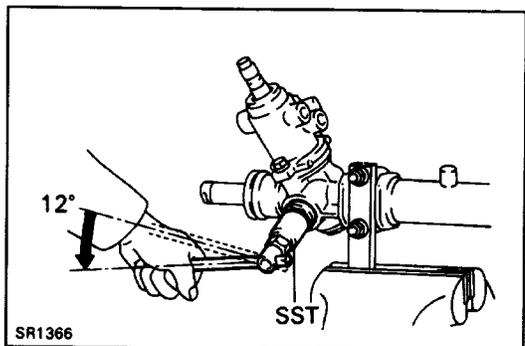
**13. ADJUST TOTAL PRELOAD**

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

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

(b) Using SST, install and torque the spring cap.
SST 09612-24014 (09612-10022)

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

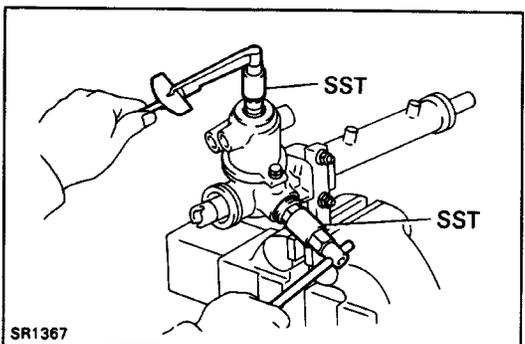


(c) Using SST, return the rack guide spring cap 12°.

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

NOTICE: If the rack overstrokes, the oil seal will be damaged by the teeth of the rack, so temporarily install the rack end so that it does not overstroke.

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

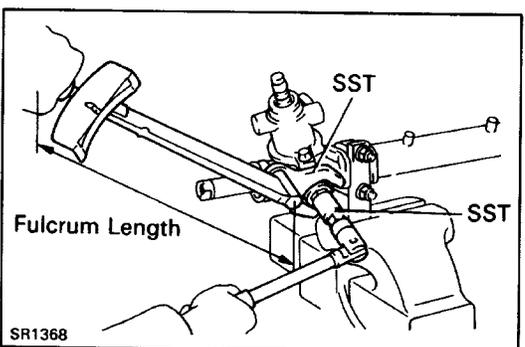


(f) Using SST and a torque meter, tighten the rack guide spring cap until the preload is within specification.

SST 09612-24014 (09612-10022) and 09616-00010

Preload (turning): 0.9 - 1.2 N-m

(9 - 12 kgf-cm, 7.8 - 10.4 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 09612-24014 (09612-10022, 09617-24020)

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

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

(c) Recheck the total preload.

15. INSTALL DUST COVER**16. INSTALL CLAW WASHERS AND RACK ENDS**

(a) Install new claw washers.

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

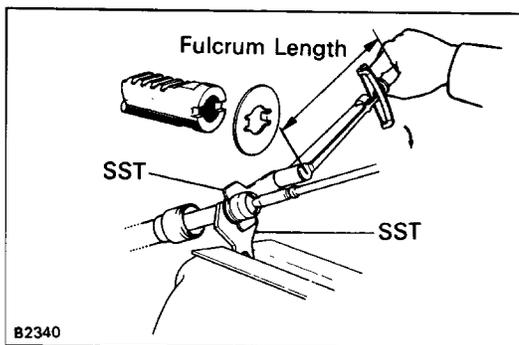
(b) Using SST, install and torque the rack ends.

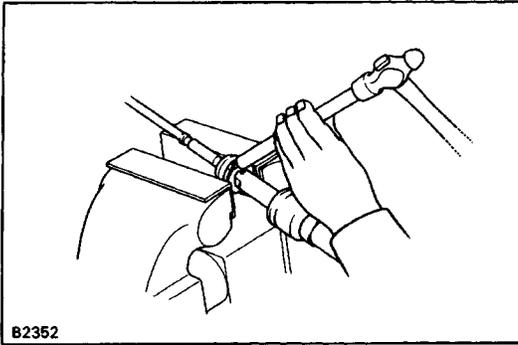
SST 09612-10093 (09628-10020) and

09612-24014 (09617-24011)

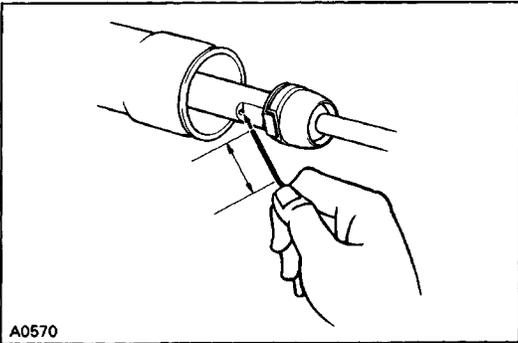
Torque: 72 N-m (730 kgf-cm, 53 ft-lbf)

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



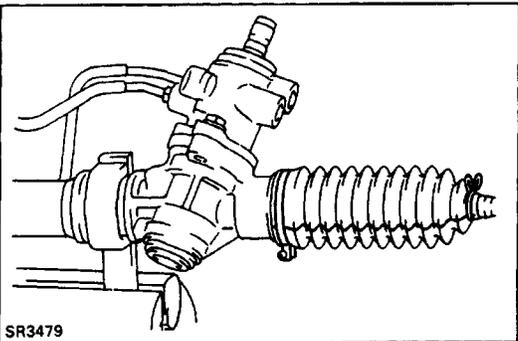


(c) Using a brass bar and hammer, stake the claw washers.



17. INSTALL RACK BOOTS, CLAMPS AND CLIPS

(a) Insure that the tube hole is not clogged with grease.
 HINT: If the tube hole is clogged, the pressure inside the boot will change after it is assembled and the steering wheel turned.

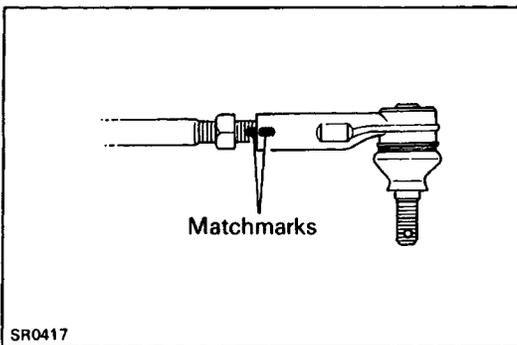


(b) Install the boots.

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

(c) Install the clamps.

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

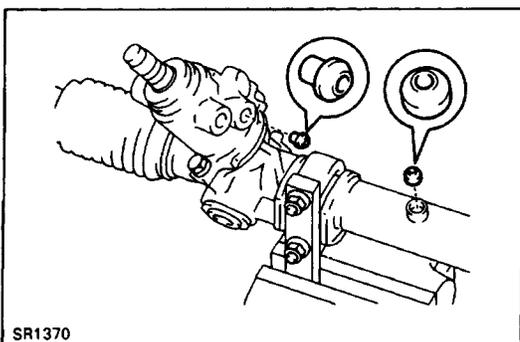


18. INSTALL TIE ROD ENDS

(a) Screw the lock nuts and tie rod ends onto the rack ends until the matchmarks are aligned.

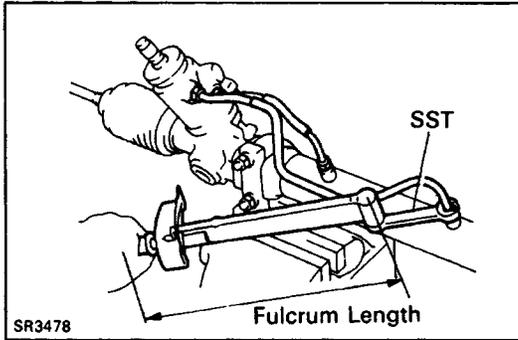
(b) After adjusting toe-in, torque the lock nuts.

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



19. INSTALL RIGHT AND LEFT TURN PRESSURE TUBES

(a) Install new union seats as shown.



(b) Using SST, install and torque the tubes.

SST 09633-00020

Torque: 20 N-m (200 kgf-cm, 14 ft-lbf)

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