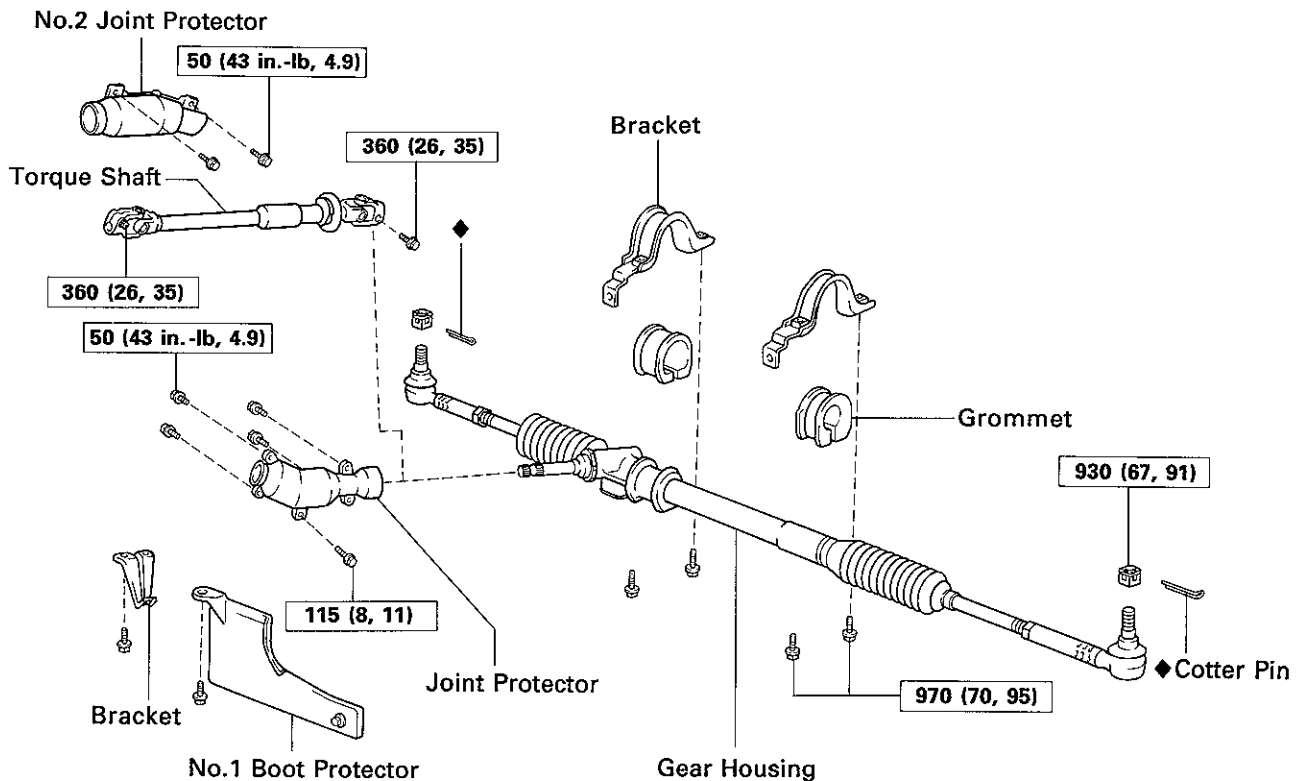


MANUAL GEAR HOUSING

REMOVAL AND INSTALLATION OF MANUAL GEAR HOUSING

Remove and install the parts as shown.

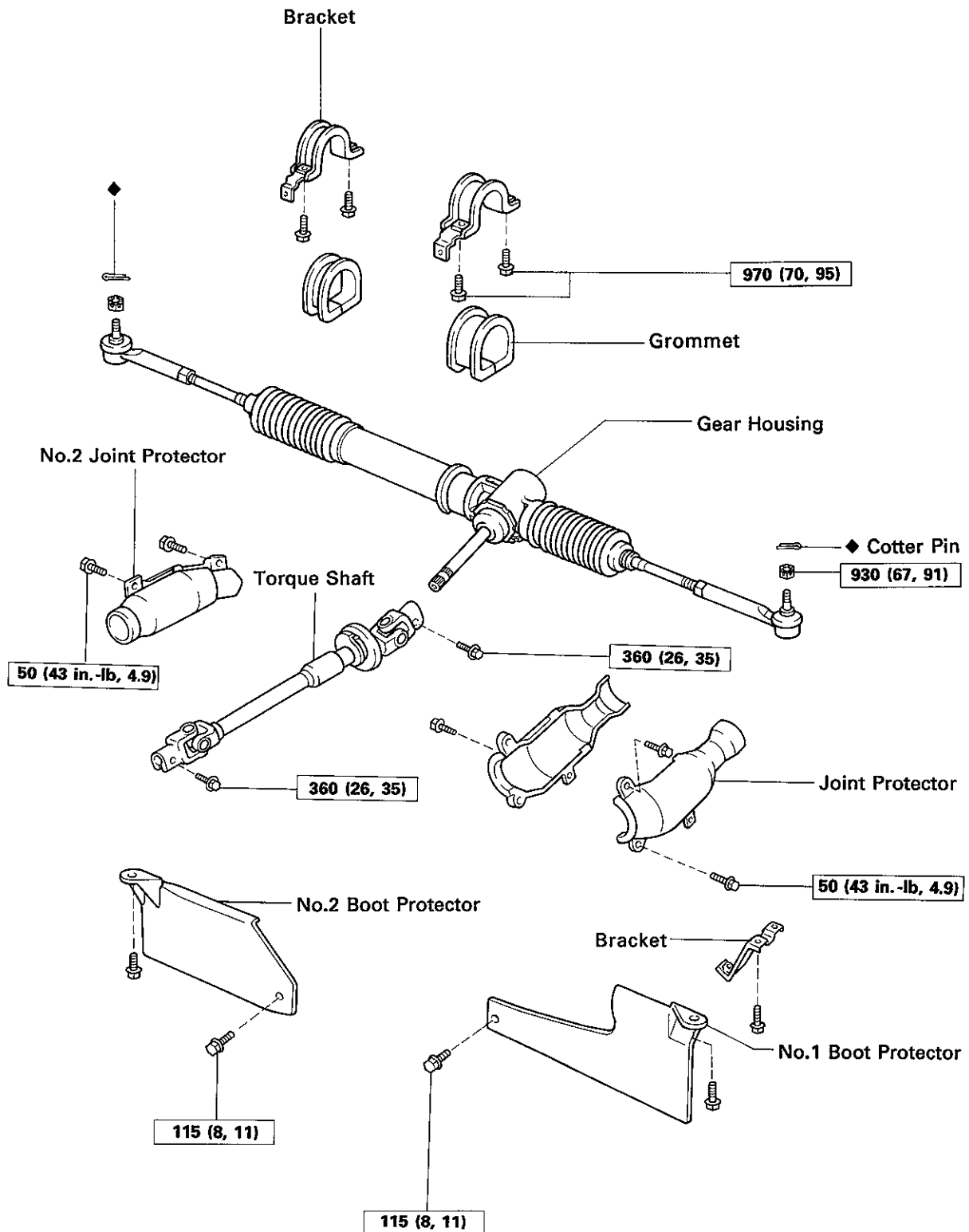
RHD



kg-cm (ft-lb, N-m) : Specified torque

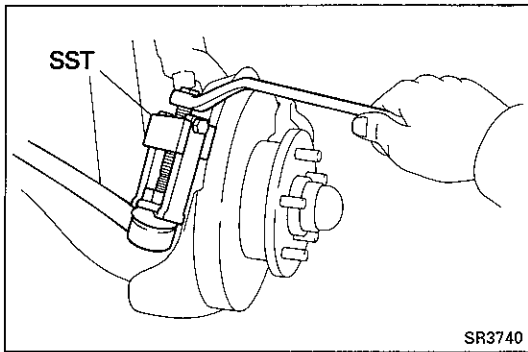
◆ Non-reusable part

LHD



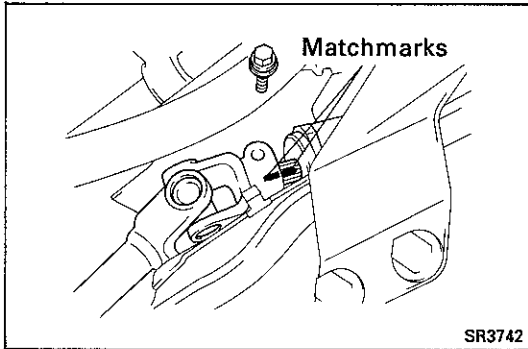
kg-cm (ft-lb, N.m) : Specified torque

◆ Non-reusable part

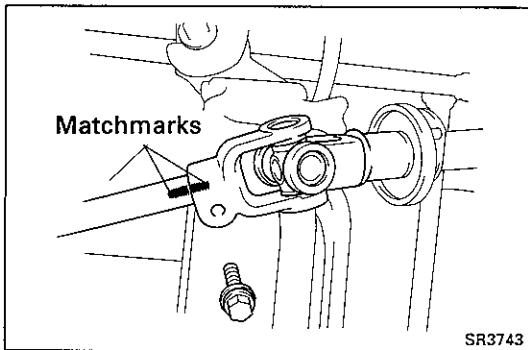
**(MAIN POINTS OF REMOVAL)****1. DISCONNECT TIE ROD ENDS**

- (a) Remove the cotter pins and nuts.
- (b) Using SST, disconnect the tie rod ends from the knuckle arm.

SST 09628-62011

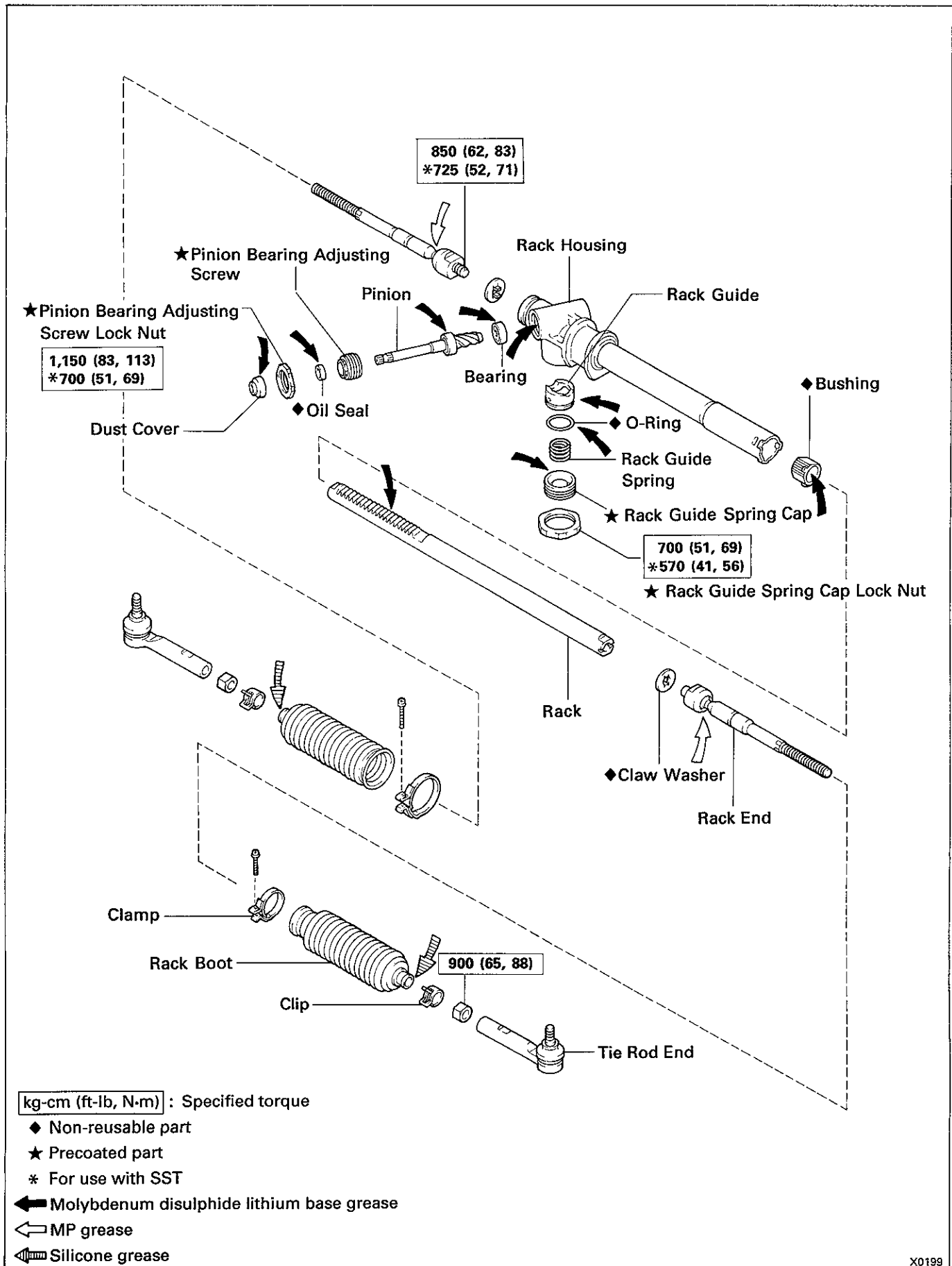
**2. DISCONNECT UNIVERSAL JOINT**

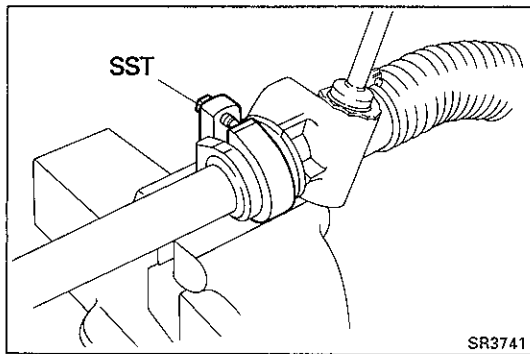
- (a) Place matchmarks on the torque shaft and the bevel gear shaft.
- (b) Loosen the bolt on the torque shaft.



- (c) Place matchmarks on the torque shaft and the control valve shaft.
- (d) Remove the bolt.
- (e) Pull the torque shaft to bevel gear side and disconnect the universal joint.

COMPONENTS



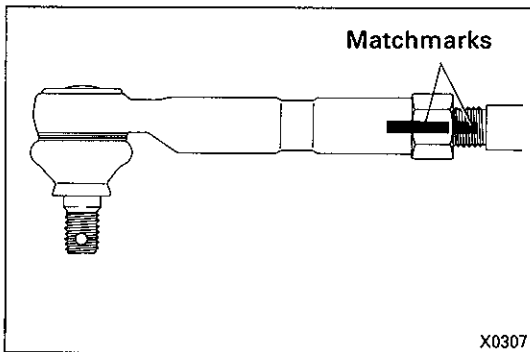


DISASSEMBLY OF MANUAL GEAR HOUSING

1. CLAMP GEAR HOUSING IN VISE

Using SST, secure the steering gear in a vise.

SST 09612-00012



2. REMOVE TIE ROD ENDS

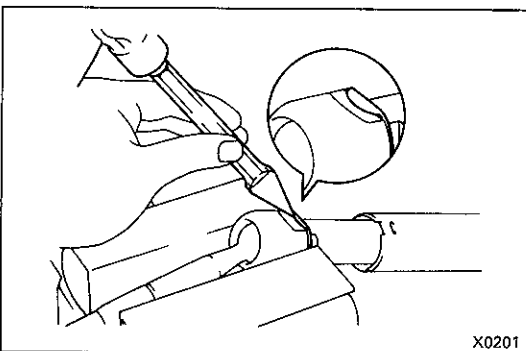
(a) Place the matchmarks on the tie rod and the rack end.

(b) Loosen the lock nut and remove the tie rod end.

3. REMOVE RACK BOOTS

Remove the screws, clamps and the boots.

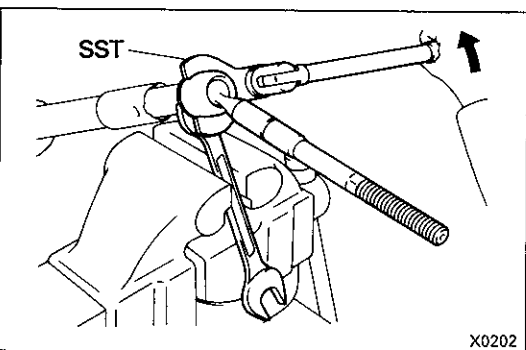
4. REMOVE DUST COVER



5. REMOVE RACK ENDS AND CLAW WASHERS

(a) Unstake the claw washers.

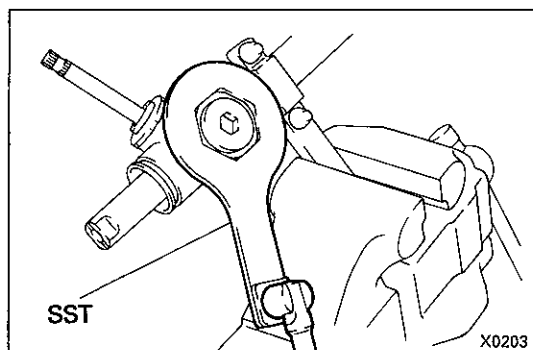
NOTICE: Avoid any impact to the rack.



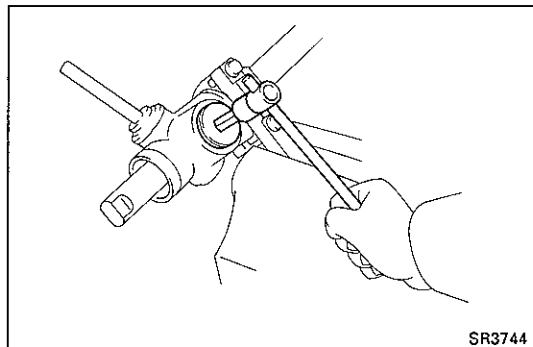
(b) Using SST and 24 mm wrench, remove the rack ends.

SST 09612-24014 (09617-24030)

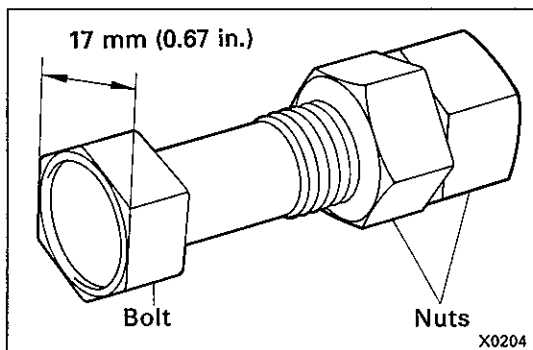
(c) Remove the claw washers.

**6. REMOVE RACK GUIDE SPRING CAP LOCK NUT**

Using SST, remove the rack guide spring cap lock nut.
SST 09617-26010

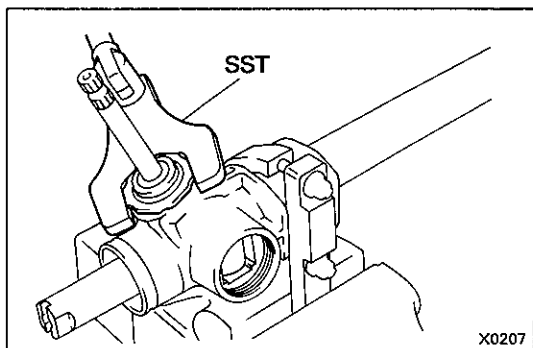
**7. REMOVE RACK GUIDE SPRING CAP AND RACK GUIDE SPRING**

(a) Using the 17 mm hexagon socket, remove the spring cap.

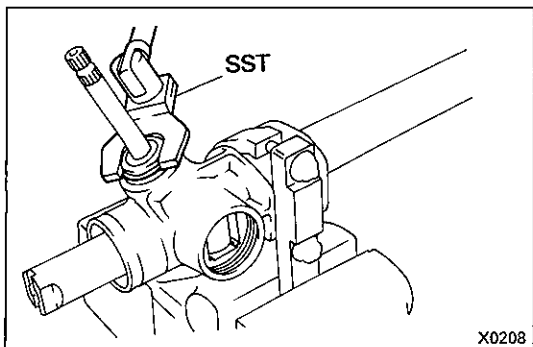


HINT: The hexagon socket can be replaced by this tool as shown.

(b) Remove the spring.

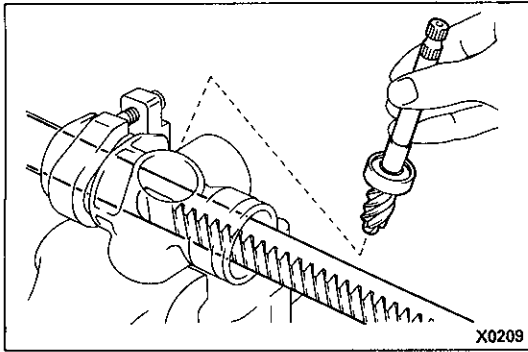
**8. REMOVE PINION BEARING ADJUSTING SCREW LOCK NUT**

Using SST, remove the lock nut.
SST 09612-10093 (09617-10010)

**9. REMOVE PINION BEARING ADJUSTING SCREW**

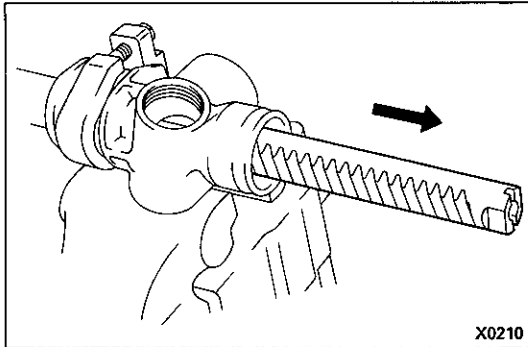
Using SST, remove the adjusting screw.
SST 09612-10093 (09628-10020)

HINT: Do not damage the oil seal lip in the adjusting screw.

**10. REMOVE PINION WITH UPPER BEARING**

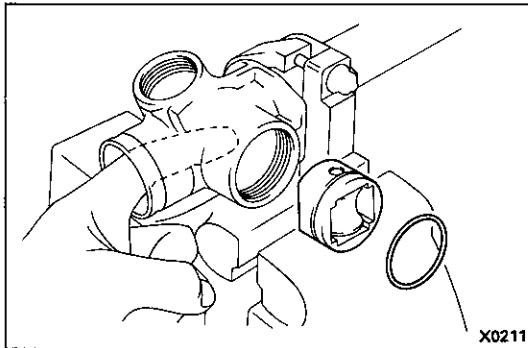
HINT: Be careful not to damage the serrations.

- (a) Fully pull the rack from the housing side and align the rack notched portion with the pinion.
- (b) Remove the pinion together with the upper bearing.

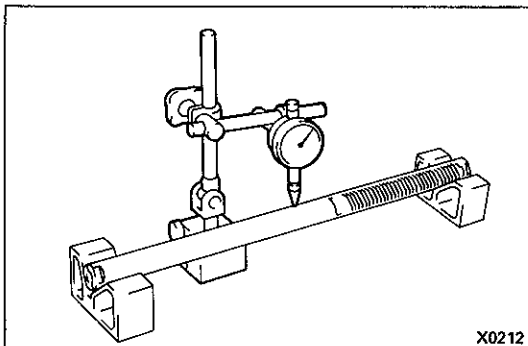
**11. REMOVE RACK**

Remove the rack from the housing side without revolving it.

HINT: If the rack is pulled from the tube side, there is a possibility of damaging the bushing with the rack teeth surface.

**12. REMOVE RACK GUIDE**

- (a) Remove the rack guide.
- (b) Remove the O-ring from the guide.

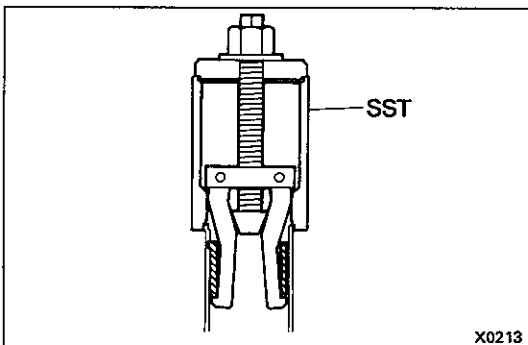
**INSPECTION AND REPLACEMENT OF GEAR HOUSING COMPONENTS****1. INSPECT RACK**

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

Maximum runout: 0.3 mm (0.012 in.)

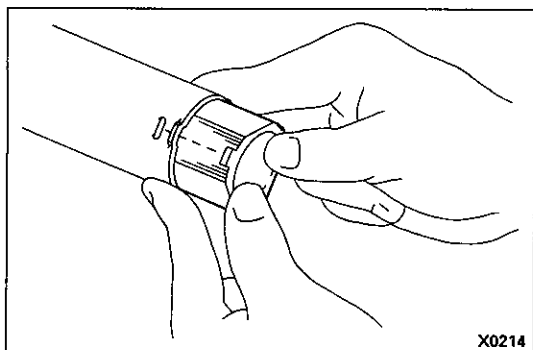
- (b) Check the back surface for wear or damage.

If faulty, replace it.

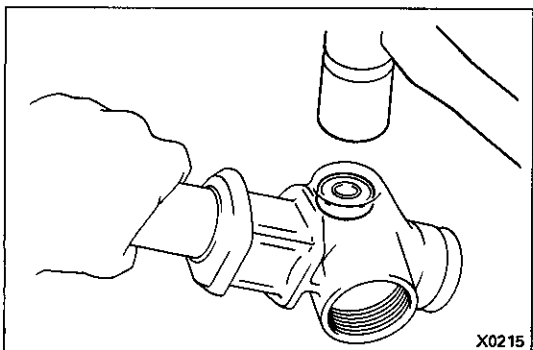
**2. IF NECESSARY, REPLACE RACK BUSHING**

- (a) Using SST, remove the rack bushing.

SST 09612-10093 (09613-22011)

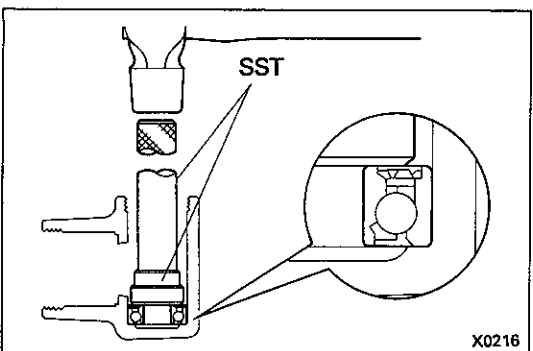


- (b) Apply molybdenum disulphide lithium base grease to the inside of a new bushing.
- (c) Install the bushing into the rack housing, making sure to align into the three holes.

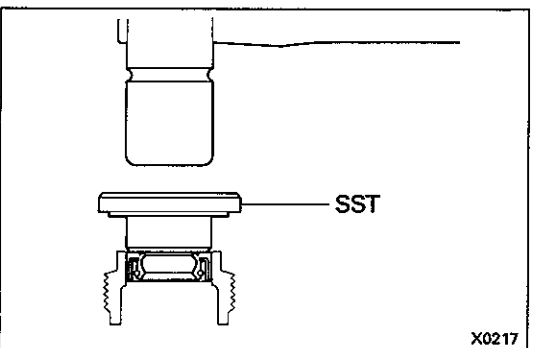


3. IF NECESSARY, REPLACE LOWER BEARING

- (a) Heat the rack housing to above 80°C (176°F).
- (b) Tap the rack housing with a plastic hammer to remove the lower bearing by recoil.

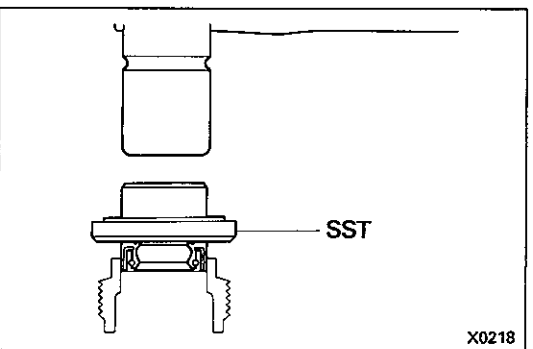


- (c) Heat the rack housing to above 80°C (176°F).
 - (d) Using SST, install a new bearing.
- SST 09620-30010 (09627-30010, 09631-00020)



4. IF NECESSARY, PINION BEARING ADJUSTING SCREW OIL SEAL

- (a) Using SST, remove the oil seal.
- SST 09612-24014 (09612-10050)



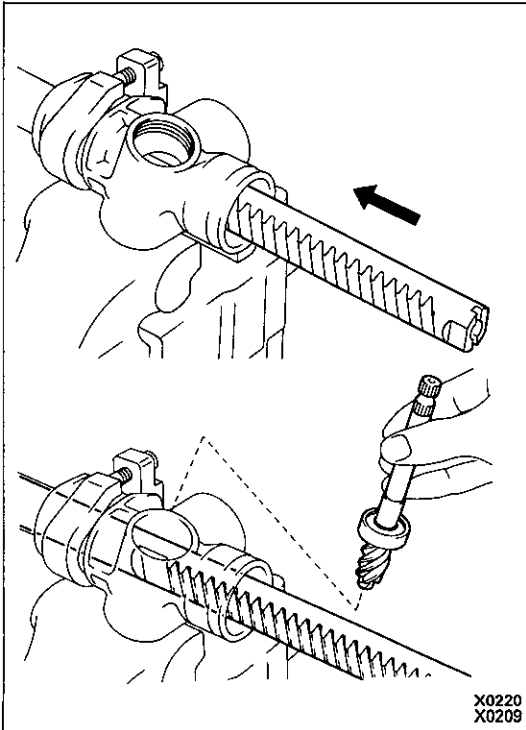
- (b) Using SST, drive in a new oil seal.
- SST 09612-24014 (09612-10050)

HINT: The oil seal's top end should be installed so that it aligns with the screw end surface.

ASSEMBLY OF STEERING GEAR HOUSING

(See page SR-20)

1. **COAT PARTS WITH MP GREASE OR MOLYBDENUM DISULPHIDE LITHIUM BASE GREASE**
(See page SR-20)



2. **INSTALL RACK INTO RACK HOUSING**

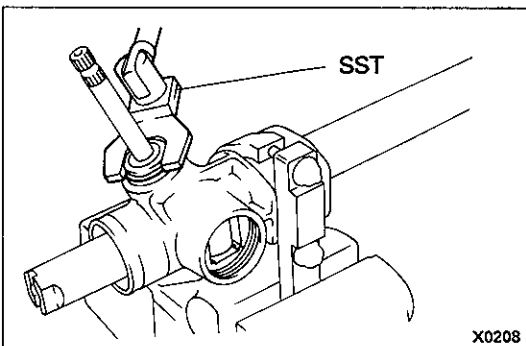
- (a) Install the rack into the rack housing from the pinion side.

HINT:

- Do not turn the rack.
 - Do not damage the steering rack bushing.
- (b) Set the rack notched side so that the pinion can be positioned inside.

3. **INSTALL PINION INTO RACK HOUSING**

Insure that the pinion end is securely in the lower bearing.



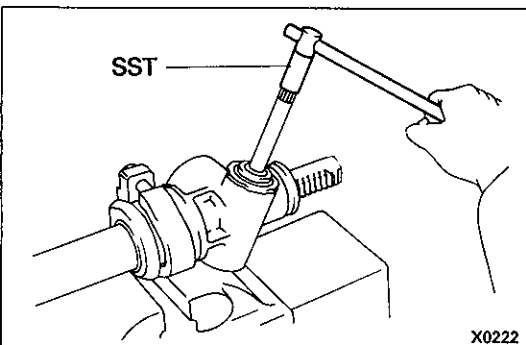
4. **INSTALL AND ADJUST PINION BEARING ADJUSTING SCREW**

- (a) Apply sealant to the threads of the screw.

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

- (b) Using SST, gradually tighten the adjusting screw until it is snug.

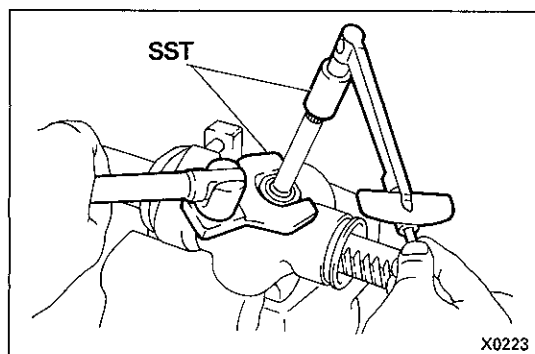
SST 09612-10093 (09628-10020)



- (c) Temporarily install the rack ends to the rack.

- (d) Using SST, turn the pinion shaft from lock to lock.

SST 09616-00010

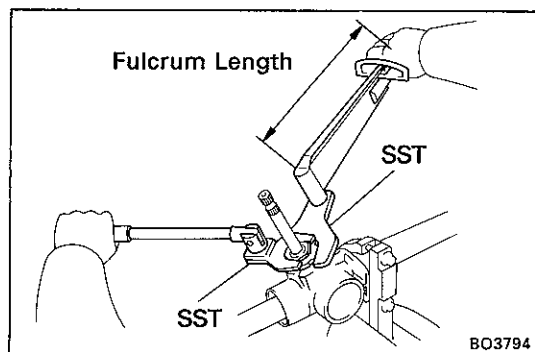


- (e) Using a torque meter and SST, measure the bearing preload in both directions. Turn the adjusting screw with SST until the preload is correct.

SST 09612-10093 (09628-10020), 09616-00010

Preload (at turning):

1.5 – 2.5 kg-cm (1.3 – 2.2 in.-lb, 0.1 – 0.2 N-m)



5. INSTALL PINION BEARING ADJUSTING SCREW LOCK NUT

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

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

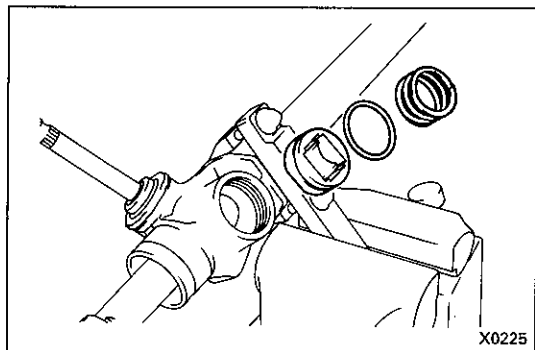
- (b) Hold the adjusting screw in position with SST and tighten the lock nut with SST.

SST 09612-10093 (09617-10010, 09628-10020)

Torque: 900 kg-cm (65 ft-lb, 88 N-m)

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

- (c) Recheck the pinion preload.



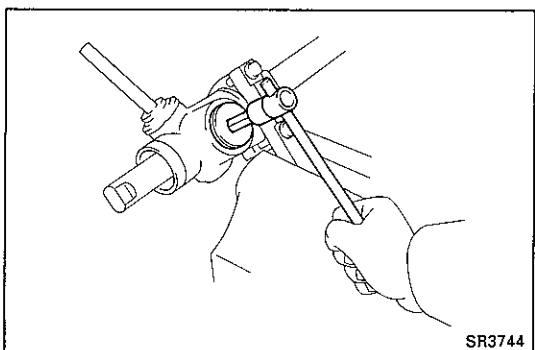
6. INSTALL RACK GUIDE, AND RACK GUIDE SPRING

- (a) Apply molybdenum disulphide lithium base grease to new O-ring.

- (b) Install the O-ring to the rack guide.

- (c) Apply molybdenum disulphide lithium base grease to the rack guide.

- (d) Install the rack guide and the rack guide spring.

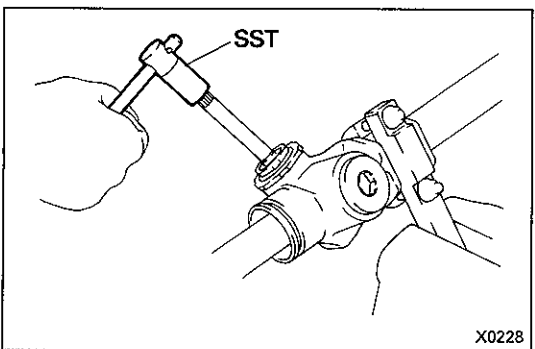


7. INSTALL RACK GUIDE SPRING CAP

- (a) Apply sealant to the thread of the spring cap.

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

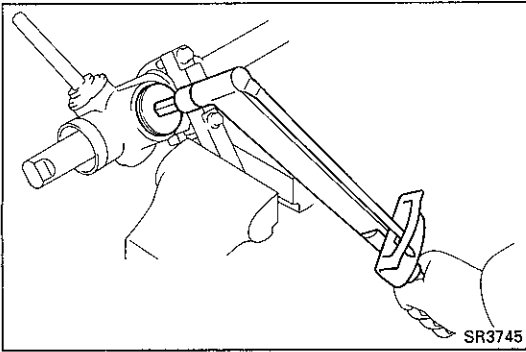
- (b) Using the 17 mm hexagon socket, temporarily install the spring cap.



8. ADJUST TOTAL PRELOAD

- (a) Using SST, count the total pinion rotations and turn the pinion back half of that number.

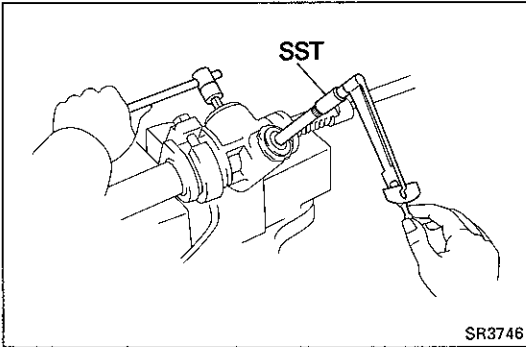
SST 09616-00010



- (b) Using the 17 mm hexagon socket, torque the rack guide spring cap.

Torque: 250 kg-cm (18 ft-lb, 25 N·m)

- (c) Return the rack guide spring cap 25°.



- (d) Using SST and torque meter, measure the total preload within one rotation from the neutral position in both directions.

SST 09616-00010

Preload (turning):

7 – 17 kg-cm (6.1 – 14.8 in.-lb, 0.7 – 1.7 N·m)

9. INSTALL RACK GUIDE SPRING CAP LOCK NUT

- (a) Apply sealant to the lock nut.

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

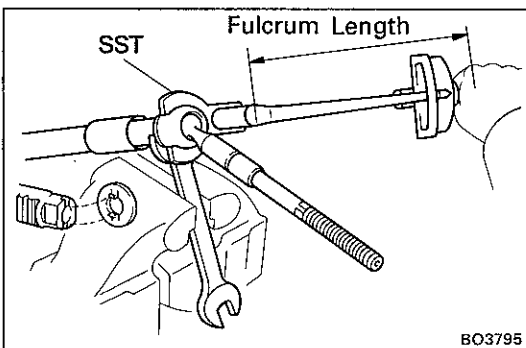
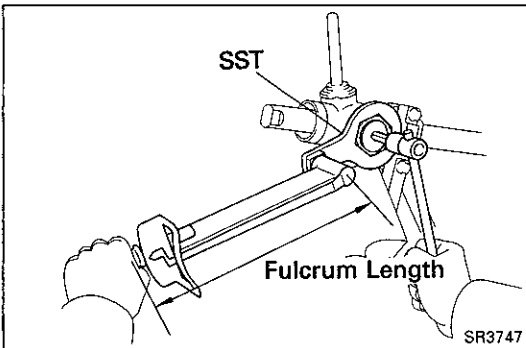
- (b) While holding the screw with hexagon wrench, torque the lock nut with SST.

SST 09617-26010

Torque: 700 kg-cm (51 ft-lb, 69 N·m)

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

- (c) Recheck the total preload.



10. INSTALL RACK ENDS AND CLAW WASHERS

- (a) Apply molybdenum disulphide lithium base grease to the ball joint.

- (b) Install new claw washers.

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

- (c) Using SST and 24 mm wrench, install rack ends.

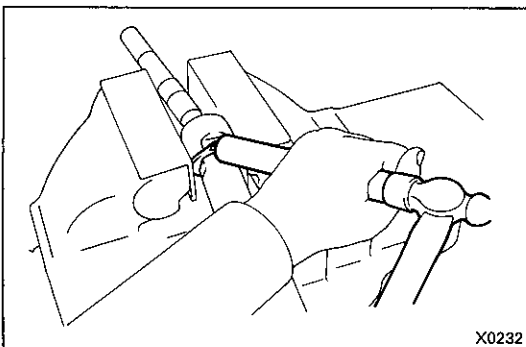
SST 09612-24014 (09617-24030)

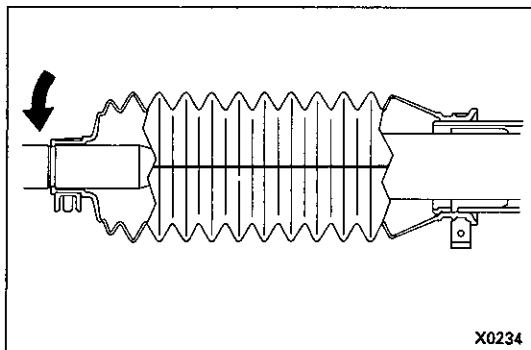
Torque: 725 kg-cm (52 ft-lb, 71 N·m)

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

- (d) Stake the claw washer.

NOTICE: Do not damage the rack.

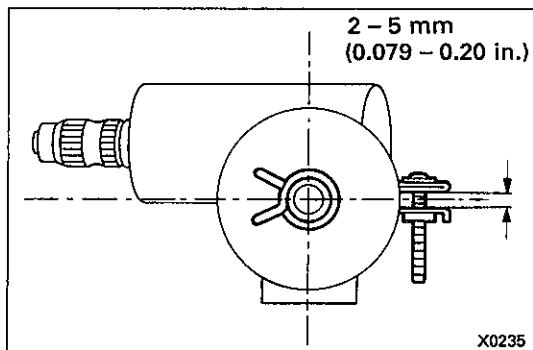




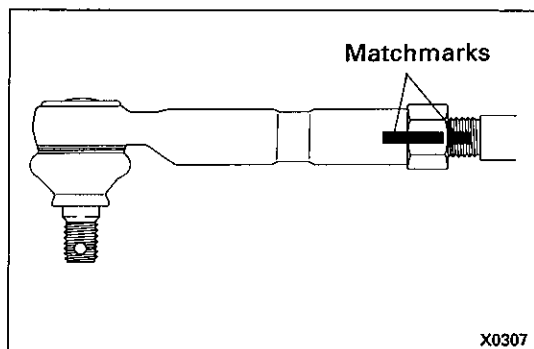
11. INSTALL RACK BOOT

- (a) Apply silicone grease to the lip of the boot.
- (b) Install the rack boot.

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



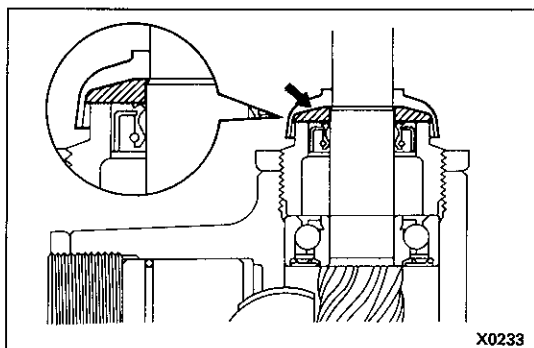
- (c) Install the clamp and clip.



12. INSTALL TIE ROD ENDS

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

Torque: 900 kg-cm (65 ft-lb, 88 N-m)



13. INSTALL DUST COVER

- (a) Apply molybdenum disulphide lithium base grease to the cover.
- (b) Install the cover.