MANUAL STEERING GEAR (4WD and PRERUNNER)

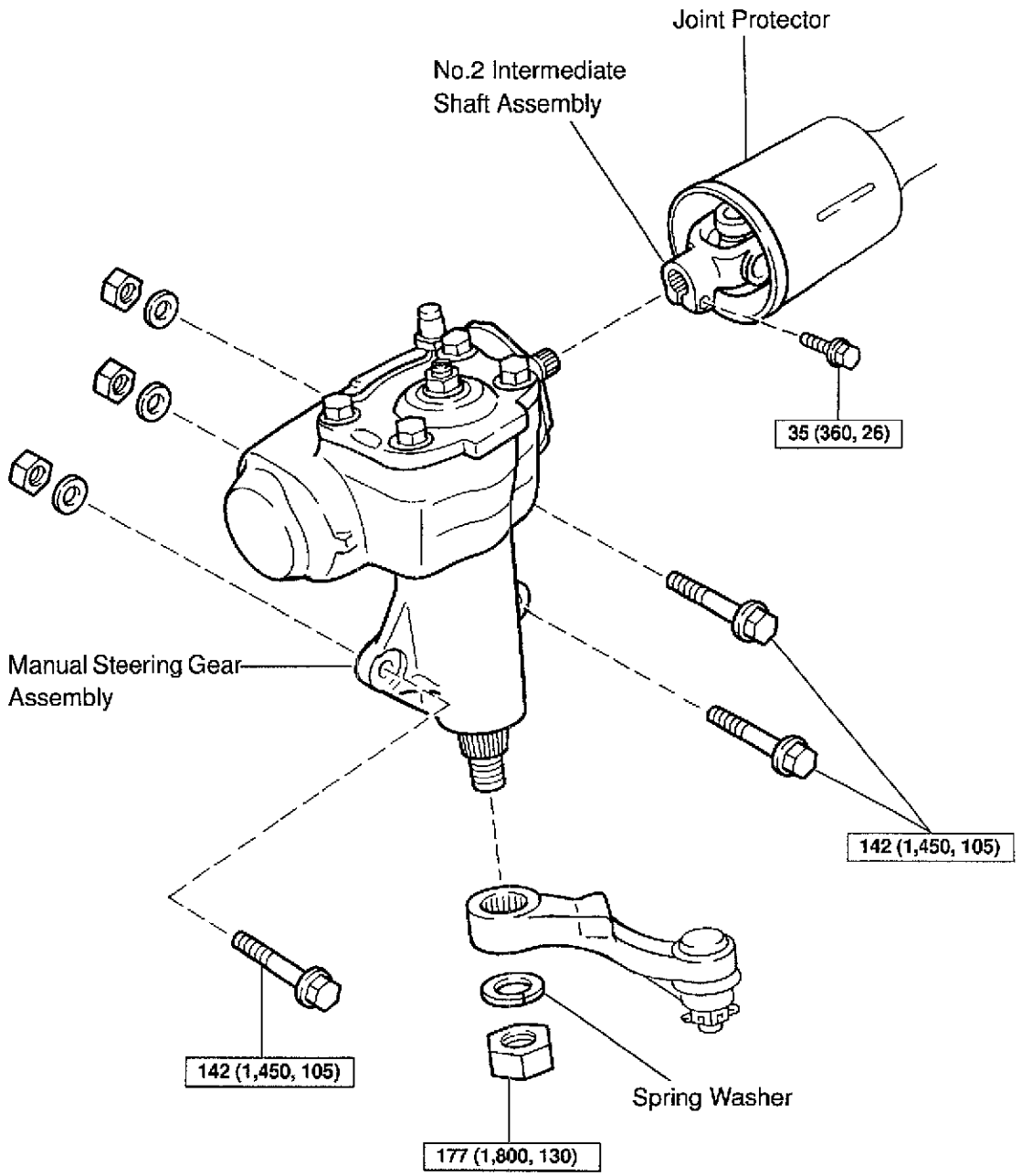
SR0AF-01

COMPONENTS

HINT:

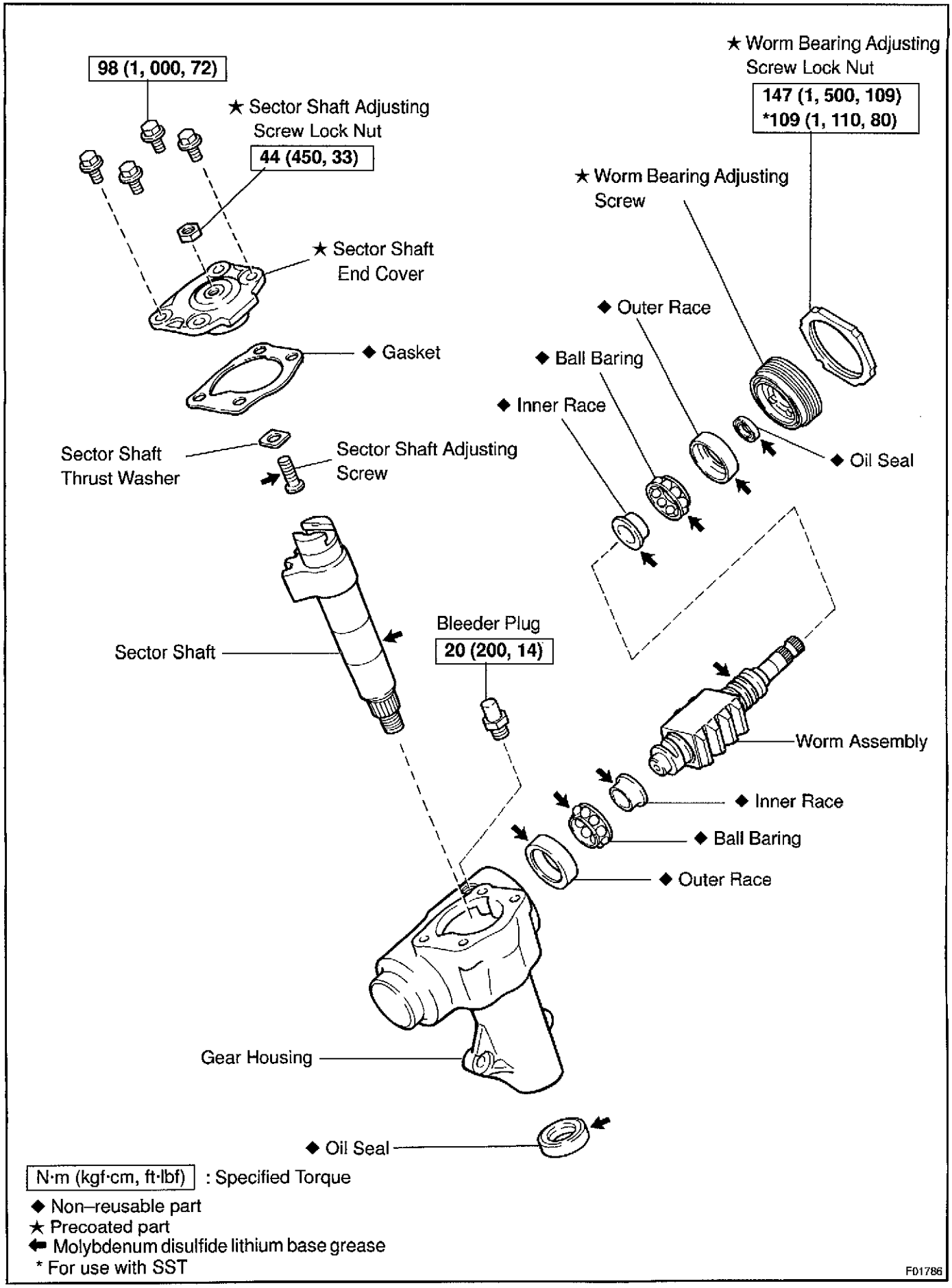
Prerunner is the model described below.

RZN193L – PRMDK, LN191L – PRMDS



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

F01865



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

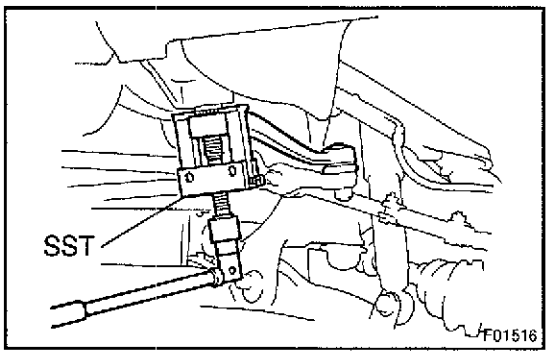
◆ Non–reusable part
★ Precoated part
⬅ Molybdenum disulfide lithium base grease
* For use with SST

F01786

SR0AG-01

REMOVAL

1. **PLACE FRONT WHEELS FACING STRAIGHT AHEAD**
2. **w/ Airbag:**
   REMOVE STEERING WHEEL PAD
   (See page SR–17)
3. **w/ Airbag:**
   REMOVE STEERING WHEEL
   (See page SR–17)



4. **DISCONNECT PITMAN ARM**

(a) Remove the nut and spring washer.

(b) Using SST, disconnect the pitman arm from the gear assembly.
SST 09628–62011

5. **DISCONNECT NO.2 INTERMEDIATE SHAFT ASSEMBLY**
   (See page SR–17)
6. **REMOVE MANUAL STEERING GEAR ASSEMBLY**

Remove the 3 bolts, nuts and washers.

SR2AH-01

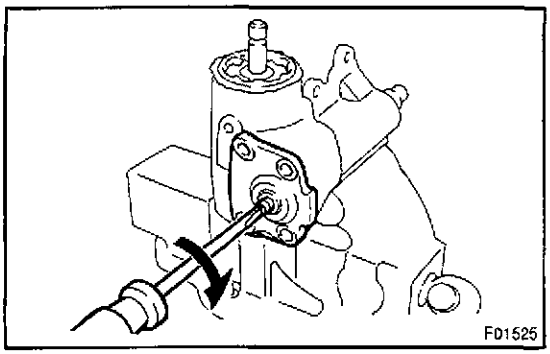
DISASSEMBLY

NOTICE:

When using a vise, do not overtighten it.

1. REMOVE BLEEDER PLUG AND DRAIN GEAR OIL

2. REMOVE SECTOR SHAFT ADJUSTING SCREW LOCK NUT

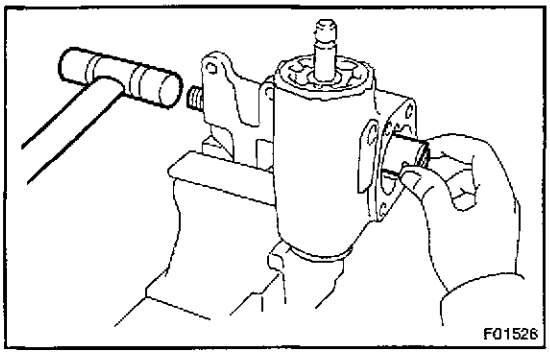


3. REMOVE SECTOR SHAFT END COVER AND GASKET

(a) Remove the 4 bolts.

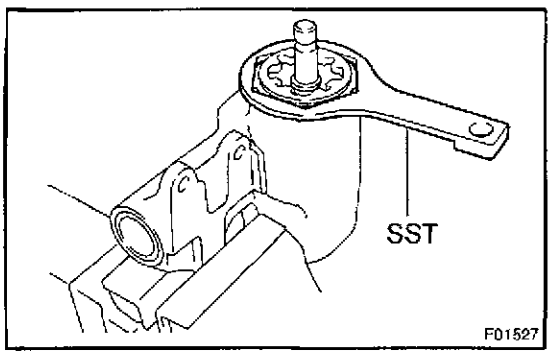
(b) Using a screwdriver, turn the sector shaft adjusting screw clockwise until the cover comes off.

4. REMOVE SECTOR SHAFT ADJUSTING SCREW WITH SECTOR SHAFT THRUST WASHER



5. REMOVE SECTOR SHAFT

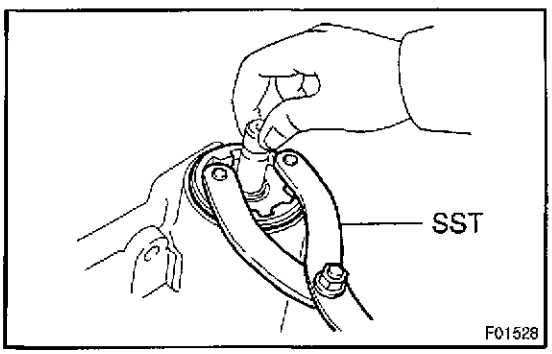
Using a plastic hammer, tap out the sector shaft end and pull out the shaft.



6. REMOVE WORM BEARING ADJUSTING SCREW LOCK NUT

Using SST, remove the lock nut.

SST 09617–60010



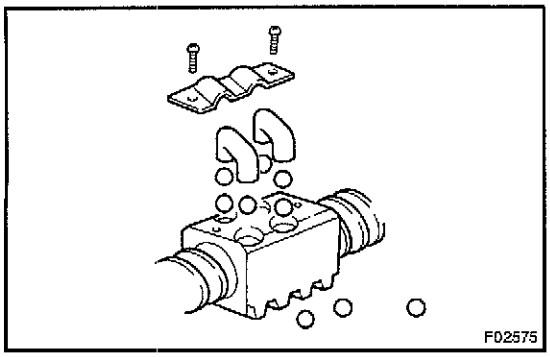
7. REMOVE WORM BEARING ADJUSTING SCREW

Using SST, remove the adjusting screw.

SST 09960–10010 (09962–01000, 09963–00600)

HINT:

Hold the worm shaft while removing the adjusting screw.

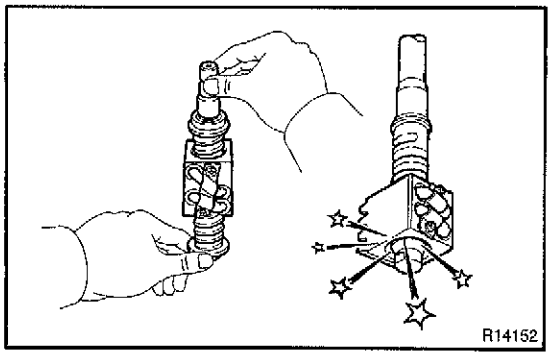


8. REMOVE WORM ASSEMBLY

Remove the worm assembly with 2 ball bearings from the gear housing.

NOTICE:

Do not disassemble the ball nut from the worm assembly.



INSPECTION

SR0AI-01

1. INSPECT WORM ASSEMBLY

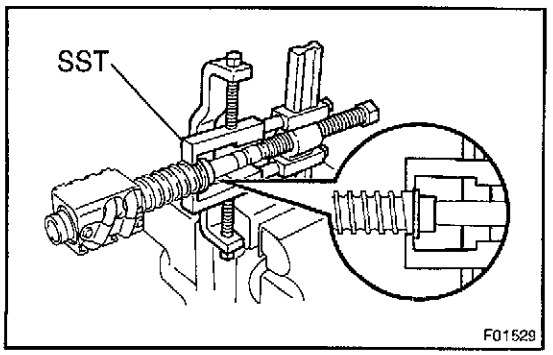
(a) Check the worm assembly and ball nut for wear or damage.

(b) Check that the nut rotates smoothly down the shaft by its own weight.

If a problem is found, replace the worm assembly.

NOTICE:

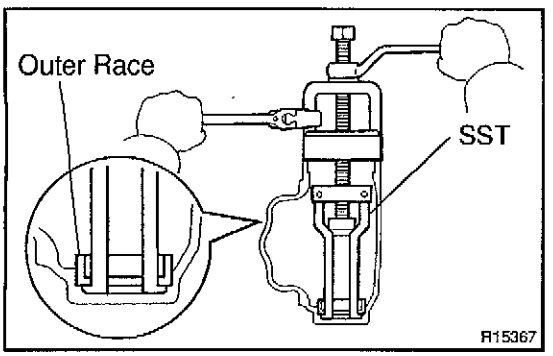
Do not allow the ball nut to hit the end of the shaft..



2. IF NECESSARY, REPLACE 2 BEARINGS

(a) Using SST, remove the 2 inner races from the worm assembly.

SST 09950–40010 (09951–04020, 09952–04010, 09953–04030, 09954–04010, 09955–04050, 09958–04010)

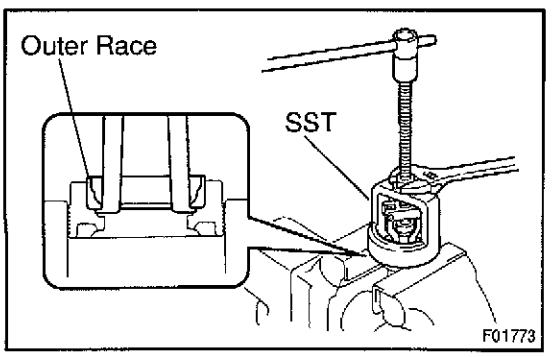


(b) Using SST, remove the outer race from the gear housing.

SST 09612–65014 (09612–01030)

NOTICE:

Be careful not to damage the gear housing.

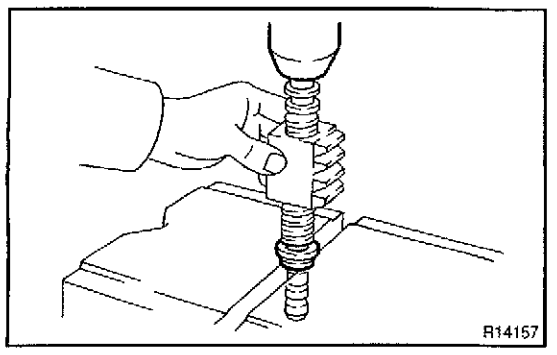


(c) Using SST, remove the outer race from the worm bearing adjusting screw.

SST 09612–65014 (09612–01040)

NOTICE:

Be careful not to damage the adjusting screw.



(d) Using a press, press in 2 new inner races to the worm assembly.

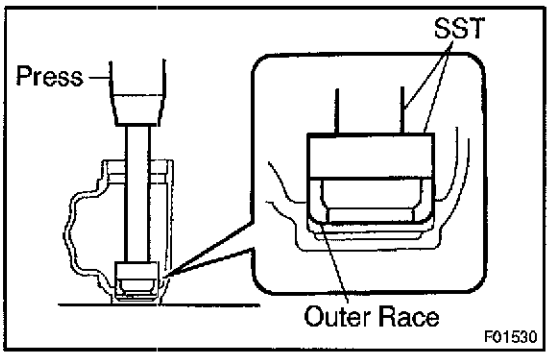
NOTICE:

Be careful not to damage the inner races.

HINT:

Install the inner race while holding the ball nut.

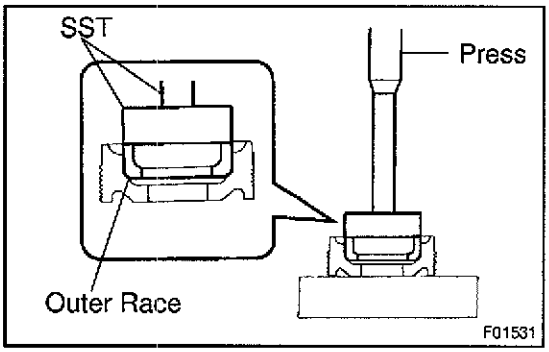
(e) Coat 2 races with molybdenum disulfide lithium base grease.



(f) Coat new outer race with molybdenum disulfide lithium base grease.

(g) Using SST, press in the outer race to the gear housing.
SST 09950–60010 (09951–00540),
09950–70010 (09951–07200)

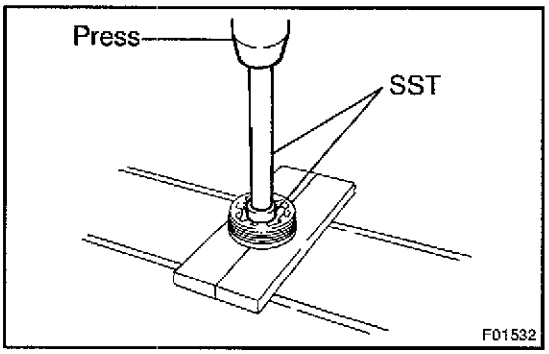
NOTICE:
Be careful not to damage the outer race.



(h) Coat new outer race with molybdenum disulfide lithium base grease.

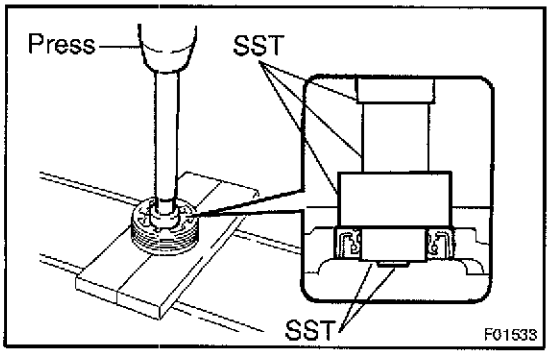
(i) Using SST, press in the outer race to the worm bearing adjusting screw.
SST 09950–60010 (09951–00540),
09950–70010 (09951–07200)

NOTICE:
Be careful not to damage the outer race.



3. IF NECESSARY, REPLACE OIL SEAL

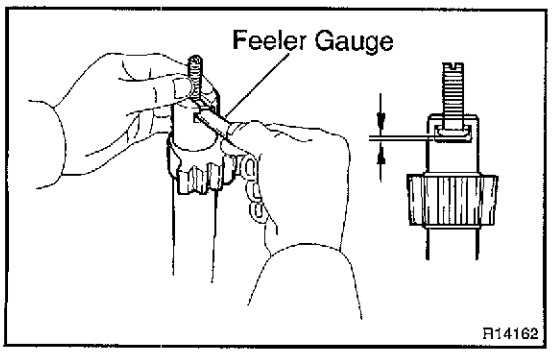
(a) Using SST, press out the oil seal from the worm bearing adjusting screw.
SST 09950–60010 (09951–00280),
09950–70010 (09951–07200)



(b) Coat new oil seal lip with molybdenum disulfide lithium base grease.

(c) Using SST, press in the oil seal until its surface is flush with the worm bearing adjusting screw.
SST 09950–60010 (09951–00180, 09951–00310, 09952–06010), 09950–70010 (09951–07200)

NOTICE:
Make sure to install the oil seal facing the correct direction.

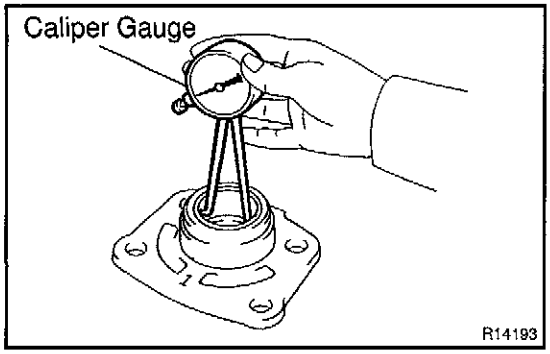


4. INSPECT SECTOR SHAFT THRUST CLEARANCE

Measure the thrust clearance with a feeler gauge.
Maximum clearance: 0.05 mm (0.0020 in.)

If necessary, replace the sector shaft thrust washer which will provide the minimum clearance between the sector shaft and the sector shaft adjusting screw.

Thickness thrust washer: 1.95 mm (0.0768 in.)
Thickness thrust washer: 2.00 mm (0.0787 in.)
Thickness thrust washer: 2.05 mm (0.0807 in.)



5. INSPECT SECTOR SHAFT END COVER

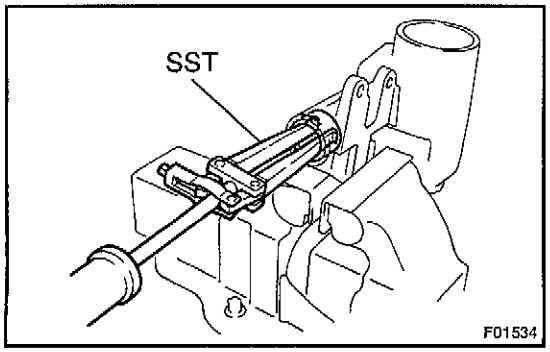
(a) Check the bushing of the sector shaft end cover for wear or damage.

(b) Using caliper gauge, measure the bushing inner diameter.

Standard inner diameter:

36.025 – 36.065 mm (1.4183 – 1.4199 in.)

If necessary, replace the sector shaft end cover.



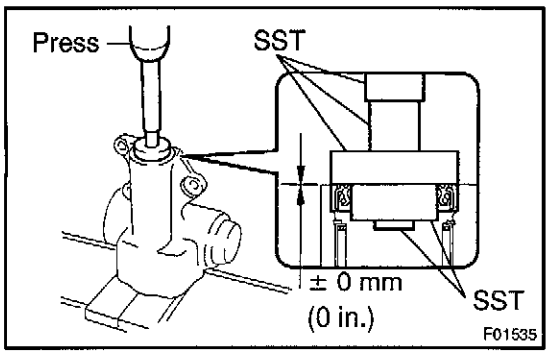
6. IF NECESSARY, REPLACE OIL SEAL

(a) Using SST, remove the oil seal from the gear housing.

SST 09308–00010

NOTICE:

Be careful not to damage the gear housing.



(b) Coat new oil seal lip with molybdenum disulfide lithium base grease.

(c) Using SST, press in the oil seal to the gear housing.

SST 09950–60010 (09951–00350, 09951–00470, 09952–06010), 09950–70010 (09951–07100)

NOTICE:

Make sure to install the oil seal facing the correct direction.

SR0AJ-01

REASSEMBLY

NOTICE:

When using a vise, do not overtighten it.

1. COAT WITH MOLYBDENUM DISULFIDE LITHIUM BASE GREASE

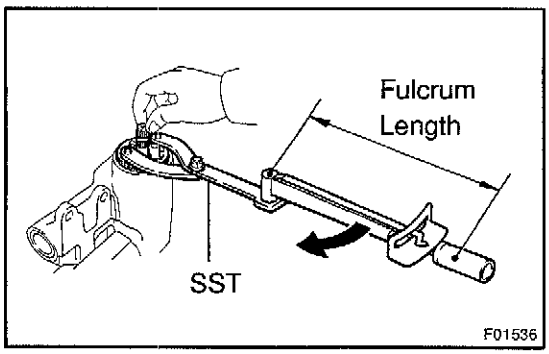
(See page SR–89)

2. INSTALL WORM ASSEMBLY

(a) Coat 2 new ball bearings with molybdenum disulfide lithium base grease.

(b) Put out ball bearing into the gear housing and place the other bearing on the worm assembly.

(c) Install the worm assembly into the gear housing.



3. INSTALL WORM BEARING ADJUSTING SCREW

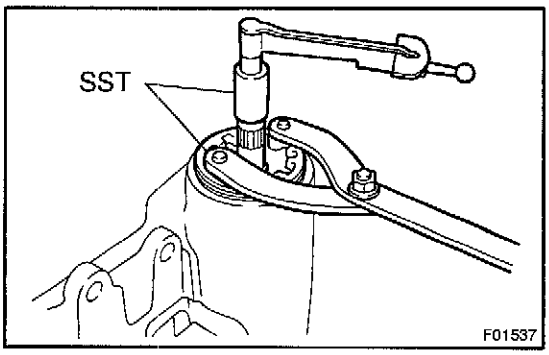
(a) Apply sealant to 2 or 3 threads of the screw.

Sealant:

Part No.08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

(b) Using SST, tighten the screw taking care that worm shaft still moves by hand torque.

SST 09960–10010 (09962–01000, 09963–00600)

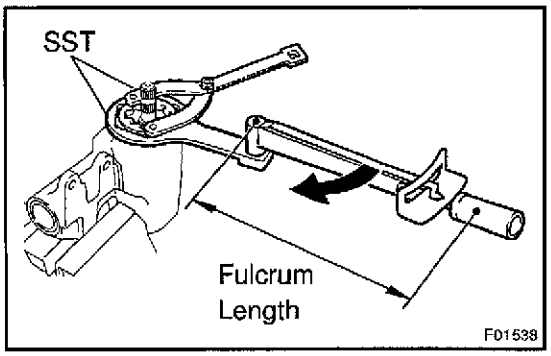


(c) Using SST and a torque wrench, measure the bearing preload in both directions. Using SST, turn the adjusting screw until the preload is correct.

SST 09616–00010, 09960–10010 (09962–01000, 09963–00600)

Preload (Starting):

0.3 – 0.5 N·m (3.5 – 5.0 kgf·cm, 3.0 – 4.3 in.·lbf)



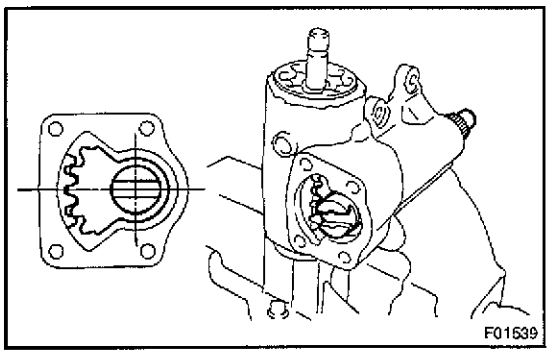
4. INSTALL WORM BEARING ADJUSTING SCREW LOCK NUT

(a) Apply sealant to 2 or 3 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 torque the nut with SST.
SST 09617–60010, 09960–10010 (09962–01000, 09963–00600)
Torque: 109 N·m (1,110 kgf·cm, 80 ft·lbf)

HINT:
Use a torque wrench with a fulcrum length of 425 mm (16.73 in.).

(c) Recheck the bearing preload.
Preload (Starting):
0.3 – 0.5 N·m (3.5 – 5.0 kgf·cm, 3.0 – 4.3 in.·lbf)



5. INSTALL SECTOR SHAFT

(a) Set the ball nut at the center of the worm assembly.

(b) Install the sector shaft into the gear housing so that the center teeth mesh together.

(c) Install the sector shaft adjusting screw and sector shaft thrust washer to the sector shaft.

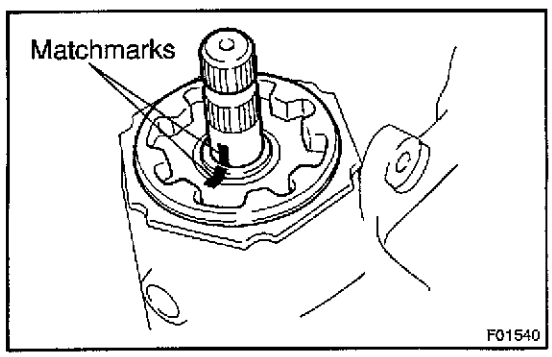
6. INSTALL SECTOR SHAFT END COVER AND GASKET

(a) Place a new gasket on the gear housing.

(b) Using a screwdriver, loosen the sector shaft adjusting screw as far as possible.

(c) Apply sealant to 2 or 3 threads of the 4 bolts and end cover.
Sealant:
Part No.08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

(d) Torque the 4 bolts.
Torque: 98 N·m (1,000 kgf·cm, 72 ft·lbf)

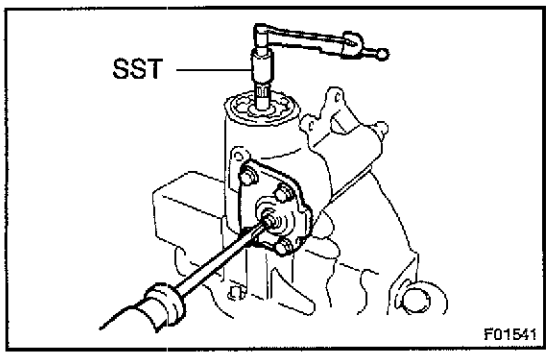


7. PLACE WORM ASSEMBLY IN NEUTRAL POSITION

(a) Count the total shaft rotations and turn the shaft back half of that number.

NOTICE:
Be sure that the worm shaft is in the neutral position.

(b) Place matchmarks on the worm shaft and worm bearing adjusting screw to show neutral position.



8. ADJUST TOTAL PRELOAD

Using SST, a torque wrench and screwdriver, turn the sector shaft adjusting screw while measuring the preload until the preload is correct.

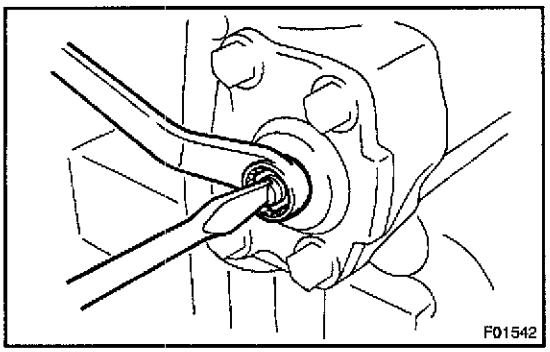
SST 09616–00010

NOTICE:

Be sure that the worm assembly is in the neutral position.

Preload (Starting):

0.8 – 1.1 N·m (8 – 11 kgf·cm, 6.9 – 9.5 in.·lbf)



9. INSTALL SECTOR SHAFT ADJUSTING SCREW LOCK NUT

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

Sealant:

Part No.08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

(b) Torque the lock nut while holding the sector shaft adjusting screw.

Torque: 44 N·m (450 kgf·cm, 33 ft·lbf)

(c) Recheck the total preload.

Preload (Starting):

0.8 – 1.1 N·m (8 – 11 kgf·cm, 6.9 – 9.5 in.·lbf)

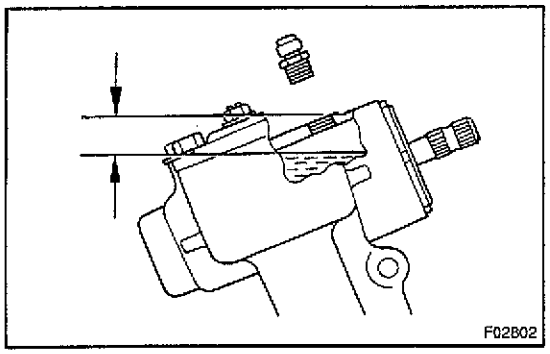
SR0AK-01

INSTALLATION

1. INSTALL MANUAL STEERING GEAR ASSEMBLY

Install the 3 bolts, washers and nuts.

Torque: 142 N·m (1,450 kgf·cm, 105 ft·lbf)



2. REPLENISH WITH GEAR OIL

Oil type: API GL–4, SAE 90

Capacity: 0.4 liters (0.4 US qts, 0.4 Imp.qts)

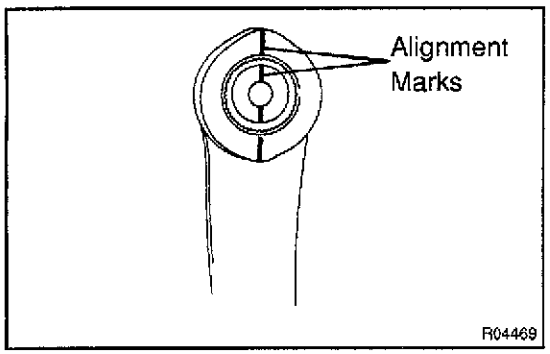
Oil level (at installation): 14 – 17 mm (0.55 – 0.67 in.)

3. INSTALL BLEEDER PLUG

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

4. CONNECT NO.2 INTERMEDIATE SHAFT ASSEMBLY

(See page SR–25)



5. CONNECT PITMAN ARM

(a) Align the alignment marks on the pitman arm and sector shaft.

(b) Install the spring washer and nut.

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

6. w/ Airbag:

PLACE FRONT WHEEL FACING STRAIGHT AHEAD

HINT:

Do it with the front of the vehicle jacked up.

7. w/ Airbag:

CENTER SPIRAL CABLE

(See page SR–25)

8. w/ Airbag:

INSTALL STEERING WHEEL

(a) Align the matchmarks on the wheel and steering column main shaft.

(b) Temporarily tighten the wheel set nut.

(c) Connect the connector.

9. CHECK STEERING WHEEL CENTER POINT

10. w/ Airbag:

TORQUE STEERING WHEEL SET NUT

Torque: 34 N·m (350 kgf·cm, 25 ft·lbf)

11. w/ Airbag:

INSTALL STEERING WHEEL PAD

(See page SR–25)

12. CHECK FRONT WHEEL ALIGNMENT

(See page SA–12)