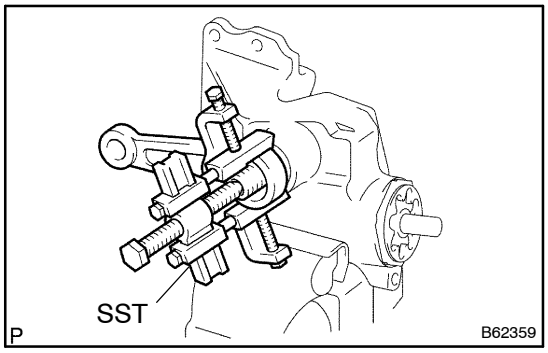
52006–02

OVERHAUL

NOTICE:

When using a vise, do not overtighten it.

1. DRAIN GEAR OIL

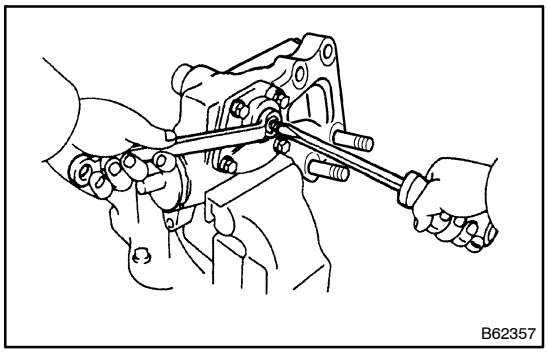


2. REMOVE PITMAN ARM

(a) Remove the nut and spring washer.

(b) Using SST, remove the pitman arm.

SST 09950–40011 (09951–04010, 09952–04010, 09953–04020, 09954–04010, 09955–04031, 09958–04010)



3. REMOVE SECTOR SHAFT END COVER

(a) Remove the shaft adjusting screw lock nut and 4 bolts.

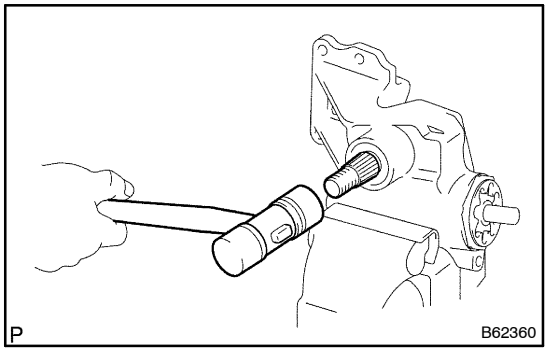
HINT:

Hold the shaft adjusting screw while removing the sector adjusting screw lock nut.

(b) Using a screwdriver, turn the sector shaft adjusting screw clockwise and remove the end cover.

4. REMOVE SECTOR SHAFT ADJUSTING SCREW

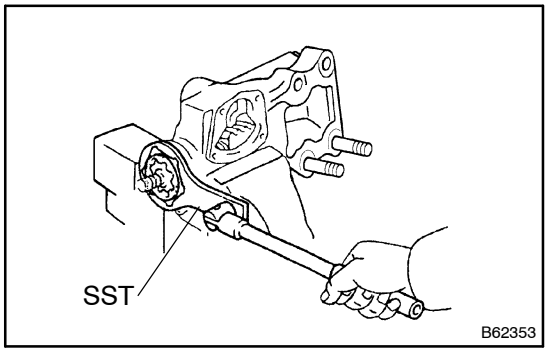
(a) Remove the sector shaft thrust washer.



5. REMOVE SECTOR SHAFT

(a) Using a plastic hammer, tap out the sector shaft as shown in the illustration.

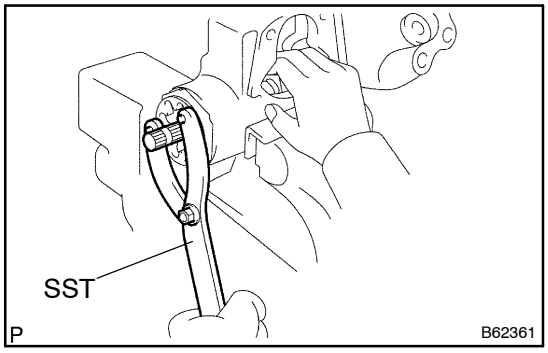
6. REMOVE SECTOR SHAFT DUST COVER



7. REMOVE WORM BEARING ADJUSTING SCREW LOCK NUT

(a) Using SST, remove the nut.

SST 09617–60010



8. REMOVE WORM BEARING ADJUSTING SCREW

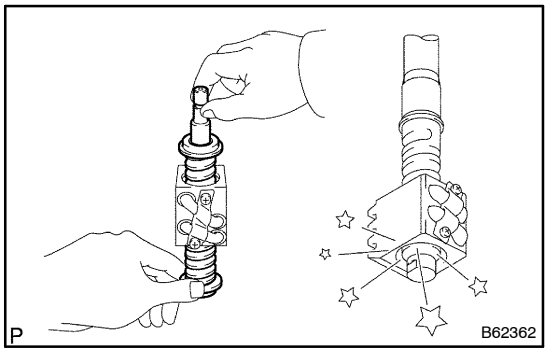
(a) Using SST, remove the adjusting screw.
SST 09960–10010 (09962–01000, 09963–00600)

HINT:
Hold the worm shaft while removing the screw.

9. REMOVE WORM ASSY

(a) Remove the worm assy together with the the 2 ball bearings from the gear housing.

NOTICE:
Do not remove the ball nut from the worm assy.



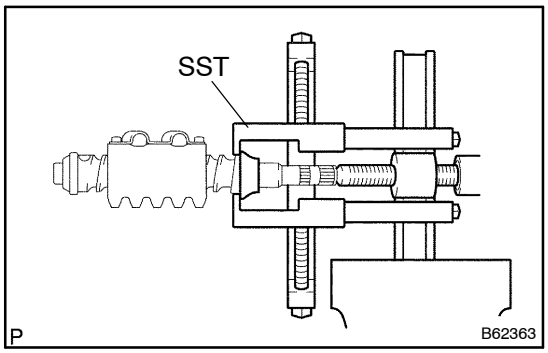
10. INSPECT WORM ASSY

NOTICE:
When using a vise, do not overtighten it.

(a) Check the worm assy and ball nut for wear or damage.
(b) Check that the nut rotates down smoothly the shaft by its own weight.

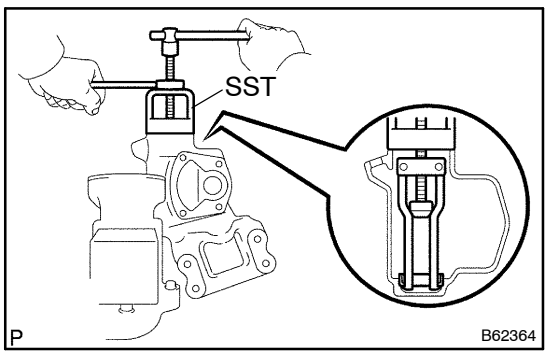
If a problem is found, replace the worm assy.

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



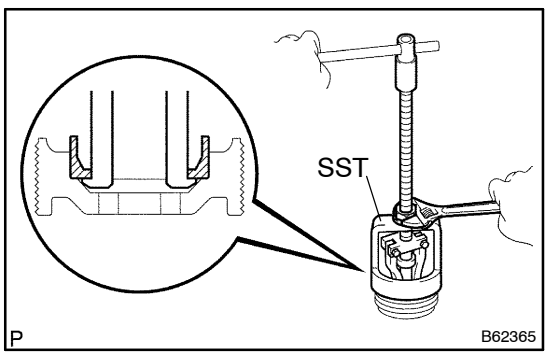
11. REMOVE WORM BEARING

(a) Using SST, remove the 2 inner races from the worm assy.
SST 09950–40011 (09951–04020, 09952–04010, 09953–04020, 09954–04010, 09955–04051, 09958–04011)



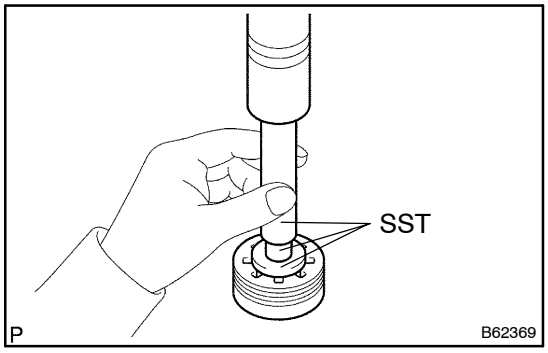
(b) Using SST, remove the outer race from the gear housing.
SST 09612–65014 (09612–01030)

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)

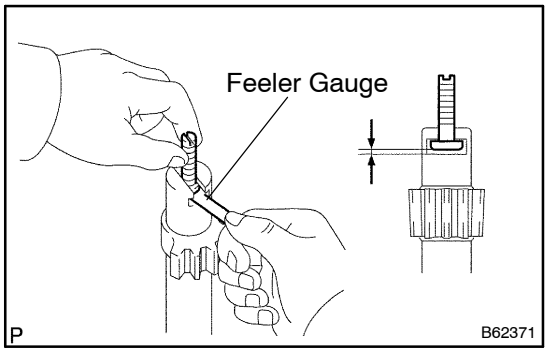
NOTICE:
Be careful not to damage the worm bearing adjusting screw.



12. REMOVE WORM BEARING ADJUSTING SCREW OIL SEAL

(a) Using SST and a press, press out the oil seal from the worm bearing adjusting screw.

SST 09950–60010 (09951–00180, 09951–00310, 09952–06010), 09950–70010 (09951–07100)



13. INSPECT SECTOR SHAFT

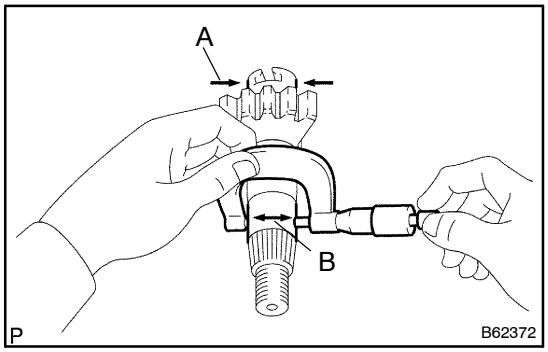
(a) Using a feeler gauge, measure the thrust clearance with a feeler gauge.

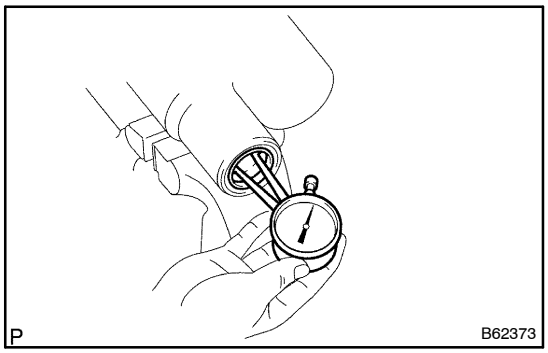
Maximum thrust clearance: 0.10 mm (0.0039 in.)

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

Thrust washer thickness:

1.95 mm (0.0768 in.)	2.05 mm (0.0807 in.)
2.00 mm (0.0787 in.)	–





(b) Inspect the sector shaft oil clearance.

(1) Using a micrometer, measure the sector shaft diameter the A and B.

Standard shaft diameter:

37.966 – 37.991 mm (1.4947 – 1.4957 in.)

Minimum shaft diameter: 37.94 mm (1.4937 in.)

If the shaft diameter is less than the minimum, replace the sector shaft.

(2) Check the bush of the gear housing for wear or damage.

(3) Using a caliper gauge, measure the bush inside diameter of the gear housing.

Standard inside diameter:

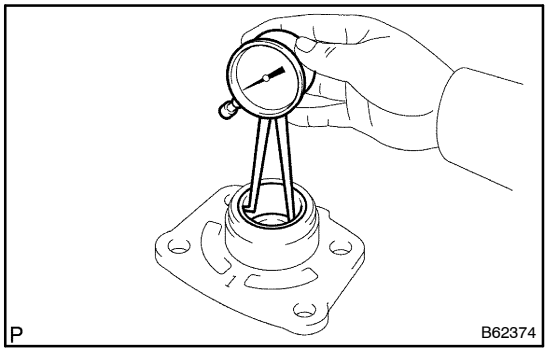
38.000 – 38.025 mm (1.4961 – 1.4970 in.)

(4) Calculate the oil clearance between the B and bush.

Maximum oil clearance: 0.20 mm (0.0079 in.)

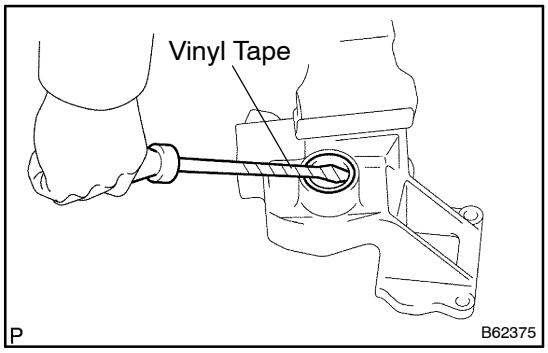
If the oil clearance is greater than the maximum, replace the sector shaft and/or gear housing.

(c) Check the bush of the sector shaft end cover for wear or damage.



(d) Using a caliper gauge, measure the bush inside diameter of the sector shaft end cover.
Standard inside diameter:
38.000 – 38.025 mm (1.4961 – 1.4970 in.)
(e) Calculate the oil clearance between the A and bushing.
Maximum oil clearance: 0.20 mm (0.0079 in.)

If the oil clearance is greater than the maximum, replace the sector shaft and/or sector shaft end cover.

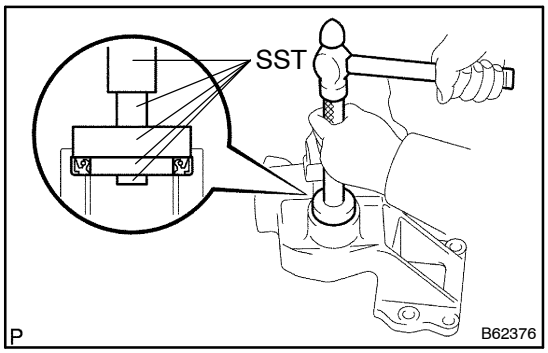


14. REMOVE WORM BEARING ADJUSTING SCREW OIL SEAL

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

HINT:
Tape a screwdriver tip before use.

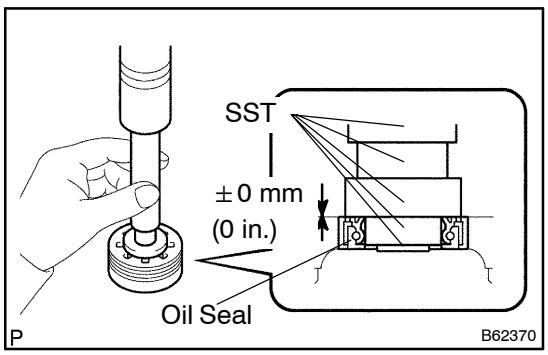
NOTICE:
Be careful not to damage the gear housing.



15. INSTALL WORM BEARING ADJUSTING SCREW OIL SEAL

(a) Coat a new oil seal with molybdenum disulfide lithium base grease.
(b) Using SST and a hammer, tap in the oil seal to the gear housing.
SST 09950–60010 (09951–00520, 09952–06010, 09952–06010), 09950–70010 (09951–07100)

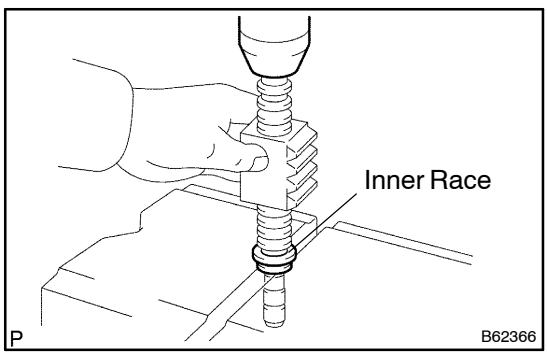
NOTICE:
Make sure that the oil seal faces the correct direction.



16. INSTALL OIL SEAL

(a) Coat a new oil seal with molybdenum disulfide lithium base grease.
(b) Using SST and a press, 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 (09951–07100)

NOTICE:
Make sure that the oil seal faces the correct direction.

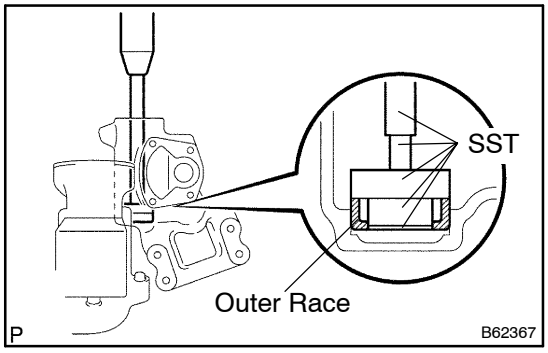


17. INSTALL WORM BEARING

(a) A press, press in 2 new inner races to the worm assy.

NOTICE:
Be careful not to damage the inner race.

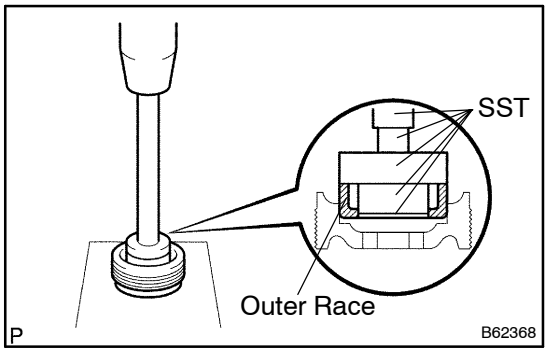
(b) Coat 2 inner races with molybdenum disulfide lithium base grease.



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

(d) Using SST and a press, press in the outer race to the gear housing.
SST 09950–60010 (09951–00520, 09951–00550, 09952–06010), 09950–70010 (09951–07200),

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



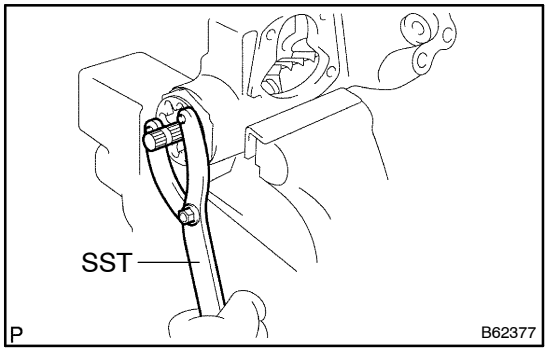
(f) Using SST and a press, press in the outer race to the worm bearing adjusting screw.
SST 09950–60010 (09951–00520, 09951–00550, 09952–06010), 09950–70010 (09951–07100)

18. INSTALL WORM ASSY

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

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

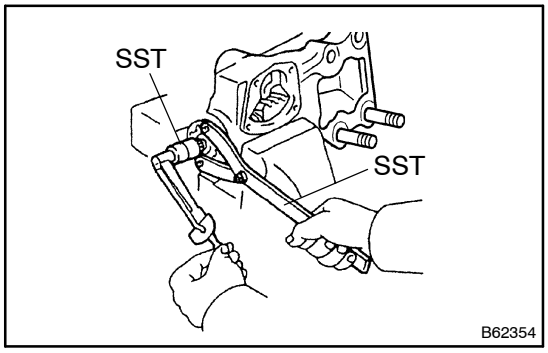
(c) Install the worm assy into the gear housing.



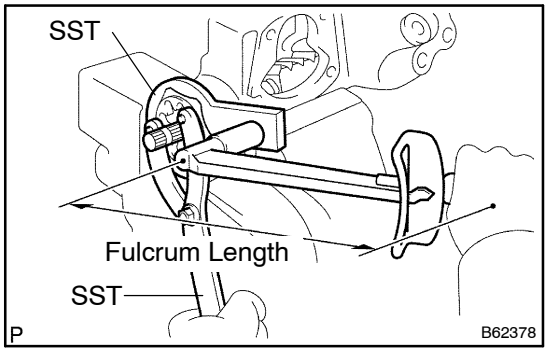
19. INSTALL WORM BEARING ADJUSTING SCREW

(a) Apply adhesive 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.
SST 09960–10010 (09962–01000, 09963–01000)



(c) Using SST and a torque wrench, turn the adjusting screw until the bearing preload is correct.
SST 09616–00011, 09960–10010 (09962–01000, 09963–01000)
Preload (Starting):
0.4 – 0.6 N·m (4 – 6 kgf·cm, 3.5 – 5.2 in.·lbf)



20. INSTALL WORM BEARING ADJUSTING SCREW LOCK NUT

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

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

(b) Using SST, hold the adjusting screw in position and torque the nut.

SST 09617–60010, 09960–10010 (09962–01000, 09963–00600)

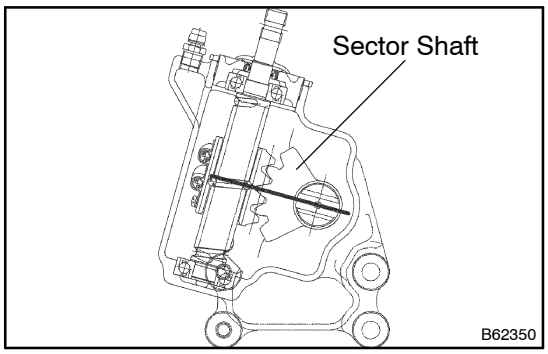
Torque: 109 N·m (1,111 kgf·cm, 80 ft·lbf)

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

(c) Recheck the bearing preload.

Preload (Starting):
0.4 – 0.6 N·m (4 – 6 kgf·cm, 3.5 – 5.2 in.·lbf)

21. INSTALL SECTOR SHAFT DUST COVER



22. INSTALL SECTOR SHAFT

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

(b) Set the ball nut at the center of the worm assy.

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

23. INSTALL SECTOR SHAFT END COVER

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

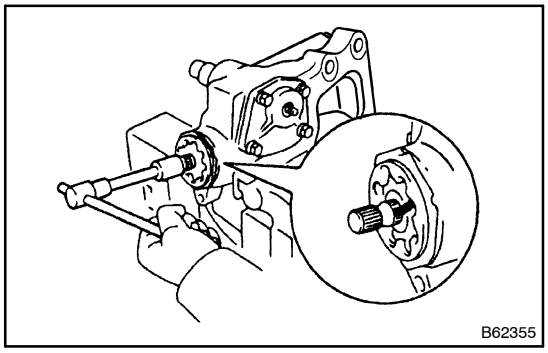
(b) Using a screwdriver, loosen the sector shaft adjusting screw as far as possible.

(c) Apply adhesive to the 2 or 3 threads of the 4 bolts and end cover.

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

(d) Install the end cover with the 4 bolts.

Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)



24. ADJUST TOTAL PRELOAD

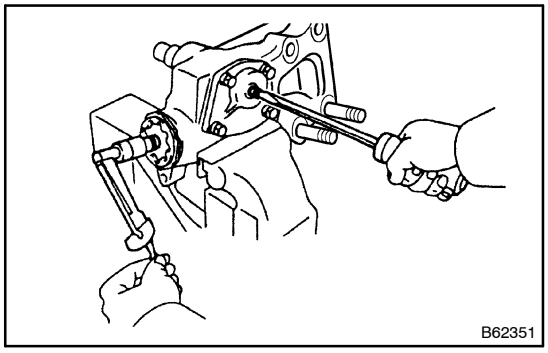
(a) Place the worm assy in neutral position.

(1) Using SST, count the total worm shaft rotations and turn the shaft back half of that number.

SST 09616–00011

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

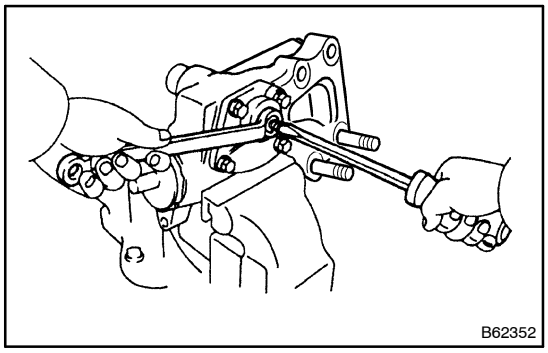
(2) Place match marks on the worm shaft and worm bearing adjusting screw to show neutral position.



(b) Using SST, torque wrench and a screwdriver, turn the sector shaft adjusting screw while measuring the preload until the preload is correct.
SST 09616–00011

HINT:
Be sure that the worm assy is in the neutral position.

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



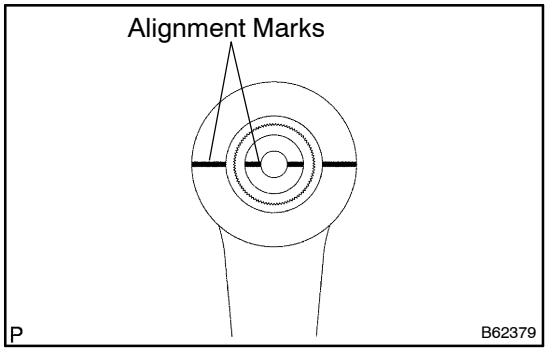
25. INSTALL SECTOR SHAFT ADJUSTING SCREW LOCK NUT

(a) Apply adhesive to 2 or 3 threads of the nut.
Adhesive:
Part No. 08833–00080, THREE BOND 1344, LOCTITE 242 or equivalent

(b) Install the nut.
Torque: 44 N·m (450 kgf·cm, 33 ft·lbf)

HINT:
Hold the sector shaft adjusting screw while torquing the sector shaft adjusting screw lock nut.

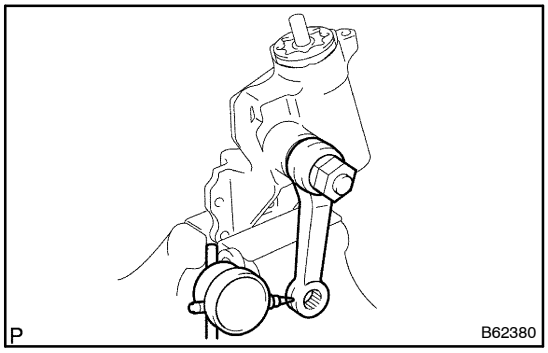
(c) Recheck the total preload.
Preload (Starting):
0.8 – 1.1 N·m (8 – 11 kgf·cm, 6.9 – 9.5 in.·lbf)



26. INSTALL PITMAN ARM

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

(b) Install the spring washer and nut.
Torque: 245 N·m (2,500 kgf·cm, 180 ft·lbf)



27. INSPECT SECTOR SHAFT BACKLASH

(a) Set a dial indicator as shown.

(b) Check that the sector shaft has a backlash of 0 mm (0 in.).

28. INSTALL MANUAL STEERING GEAR