

DISASSEMBLY OF DIFFERENTIAL

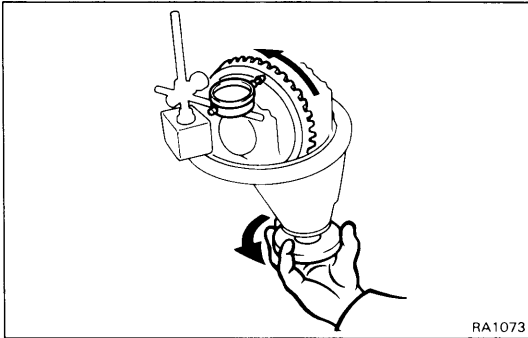
(See page RA-8)

1. CHECK DEVIATION OF COMPANION FLANGE

Using a dial indicator, measure the longitudinal and latitudinal deviation of the companion flange.

Maximum longitudinal deviation: 0.10 mm
(0.0039 in.)

Maximum latitudinal deviation: 0.10 mm
(0.0039 in.)

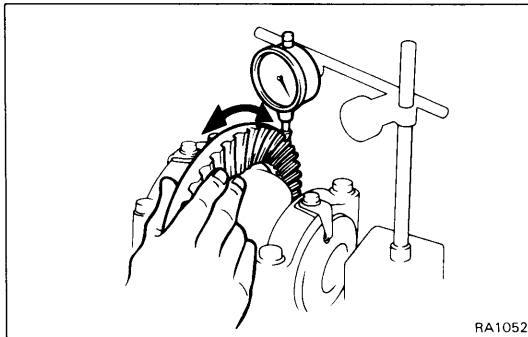


2. CHECK RING GEAR RUNOUT

Using a dial indicator, measure the ring gear runout.

Maximum runout: 0.07 mm (0.0028 in.)

If the runout is greater than maximum, replace the ring gear and drive pinion as a set.



3. CHECK RING GEAR BACKLASH

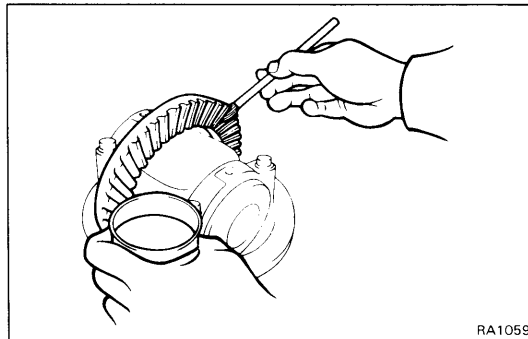
(a) Fix the dial indicator on the tooth surface at a 90° angle.

(b) Holding the drive pinion flange, measure the ring gear backlash.

Ring gear backlash: 0.13 — 0.18 mm
(0.0051 — 0.0071 in.)

If the backlash is not within specification, adjust the ring gear backlash.

NOTE: Measure from three or more places on the circumference of the ring gear.



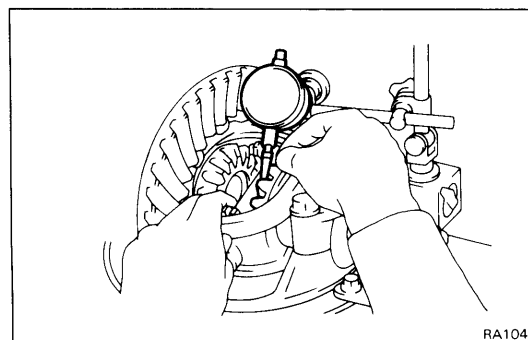
4. INSPECT TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION (See step 7 on page RA-22)

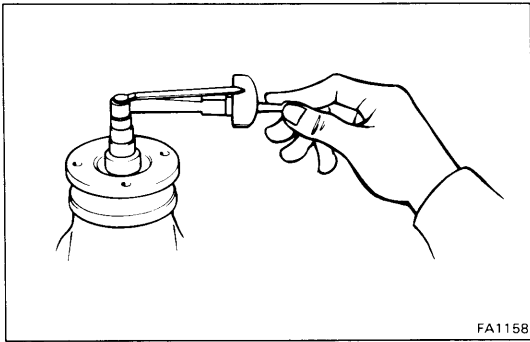
5. CHECK SIDE GEAR BACKLASH

Using a dial indicator, measure the side gear backlash while holding one pinion gear toward the differential case.

Side gear backlash: 0.05 — 0.20 mm
(0.0020 — 0.0079 in.)

If the backlash is not within specification, replace the thrust washers.





6. CHECK DRIVE PINION PRELOAD

Using a torque meter, measure the preload of the backlash between the drive pinion and ring gear.

Preload(starting):

6 — 10 kg-cm (5.2 — 8.7 in.-lb, 0.6 — 1.0 N·m)

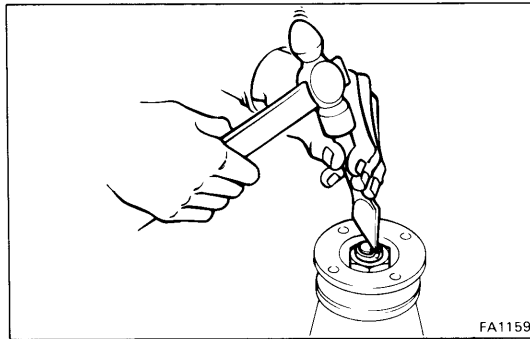
7. CHECK TOTAL PRELOAD

With the drive pinion and ring gear meshed, using a torque meter, measure the total preload.

Total preload(starting):

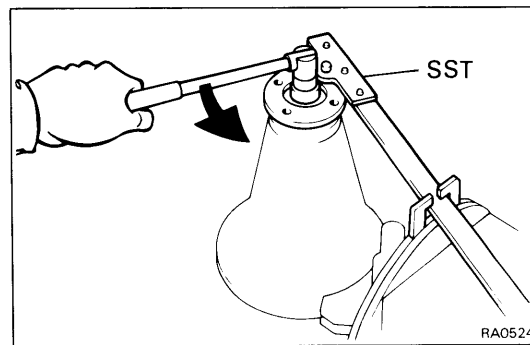
Add drive pinion preload

4 — 6 kg-cm (3.5 — 5.2 in.-lb, 0.4 — 0.6 N·m)



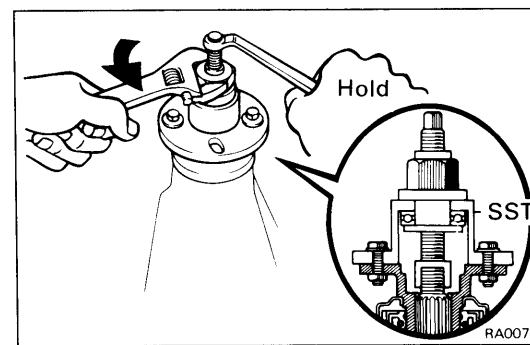
8. REMOVE COMPANION FLANGE

(a) Using a chisel and hammer, unstack the nut.



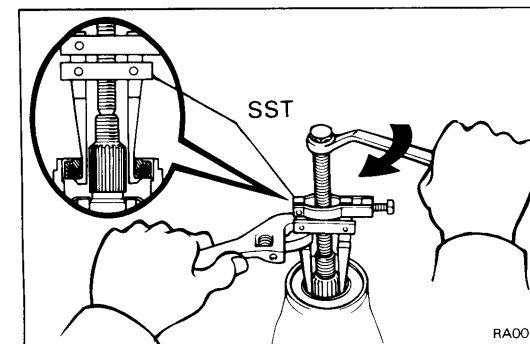
(b) Using SST to hold the flange, remove the nut and plate washer.

SST 09330-00021



(c) Using SST, remove the companion flange.

SST 09557-22022

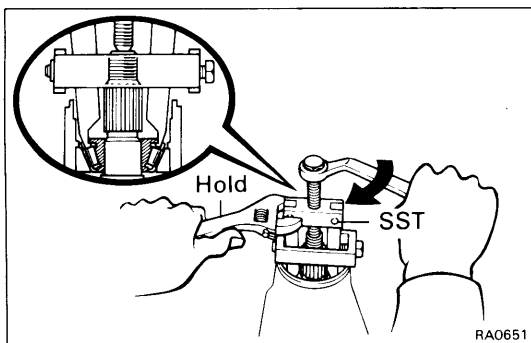


9. REMOVE OIL SEAL AND OIL SLINGER

(a) Using SST, remove the oil seal from the differential carrier.

SST 09308-10010

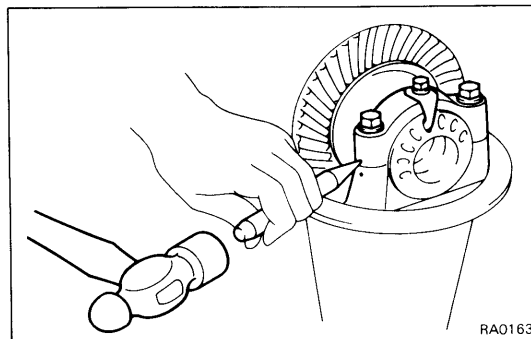
(b) Remove the oil slinger.

**10. REMOVE FRONT BEARING AND BEARING SPACER**

- (a) Using SST, remove the front bearing from the drive pinion.

SST 09556-22010

- (b) Remove the bearing spacer.

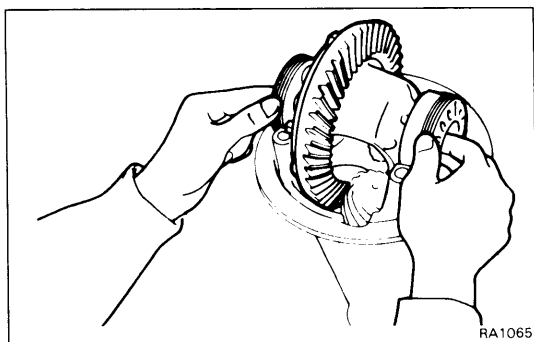
**11. REMOVE DIFFERENTIAL CASE ASSEMBLY AND RING GEAR**

- (a) Place matchmarks on the bearing cap and differential carrier.

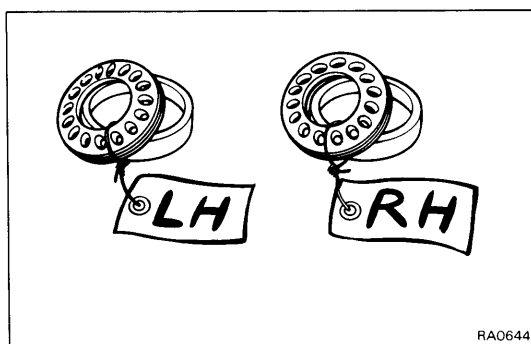
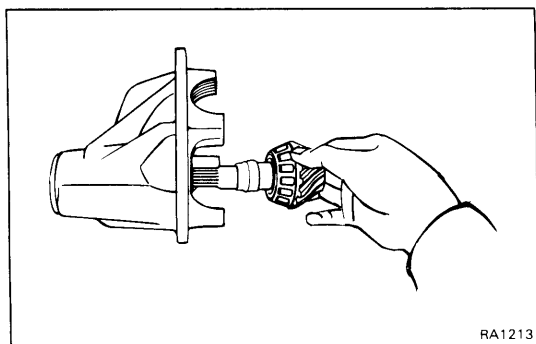
- (b) Remove the two adjusting nut locks.

- (c) Remove the two bearing caps and two adjusting nuts.

- (d) Remove the differential case with bearing outer races from the carrier.



NOTE: Tag the disassembled parts to show the location for reassembly.

**12. REMOVE DRIVE PINION FROM DIFFERENTIAL CARRIER**

INSPECTION AND REPLACEMENT OF DIFFERENTIAL COMPONENTS

1. REPLACE DRIVE PINION REAR BEARING

- (a) Using SST and a press, press out the rear bearing from the drive pinion.

SST 09950-00020

NOTE: If the drive pinion or ring gear are damaged, replace them as a set.

- (b) Install the reused washer on the drive pinion with the chamfered end facing the pinion gear.

- (c) Using SST and a press, press in the rear bearing onto the drive pinion.

SST 09506-30012

2. REPLACE DRIVE PINION FRONT AND REAR BEARING OUTER RACES

- (a) Using a brass bar and hammer, drive out the outer race.

- (b) Using SST and a press, press in a new outer race.

SST 09608-30012

Front outer race (09608-04020,09608-04100)

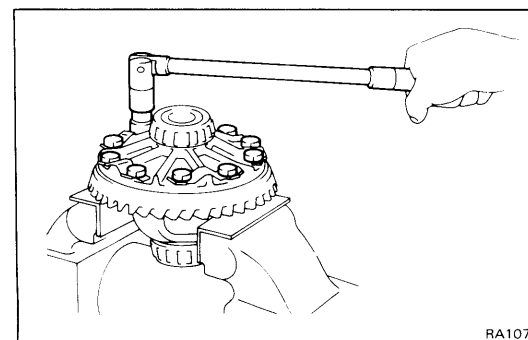
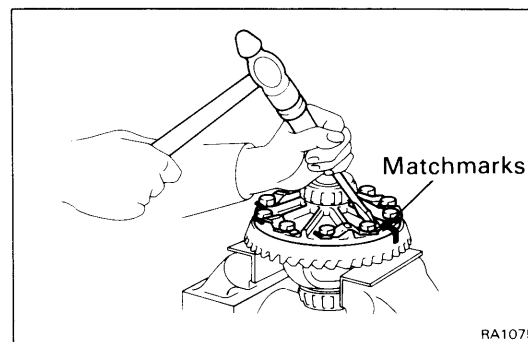
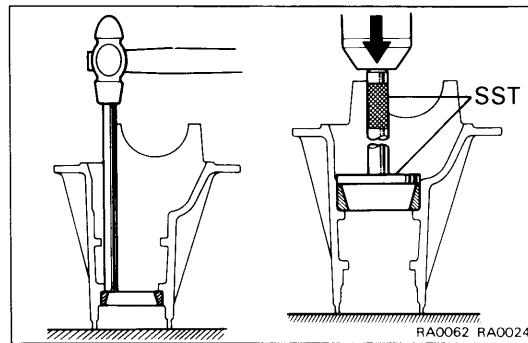
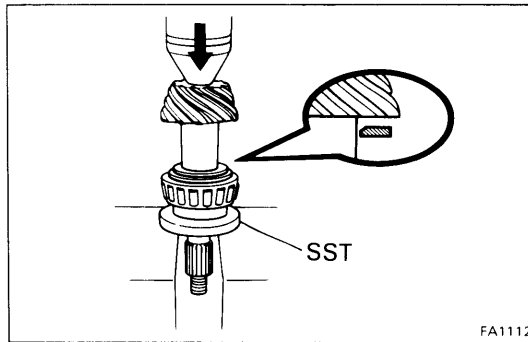
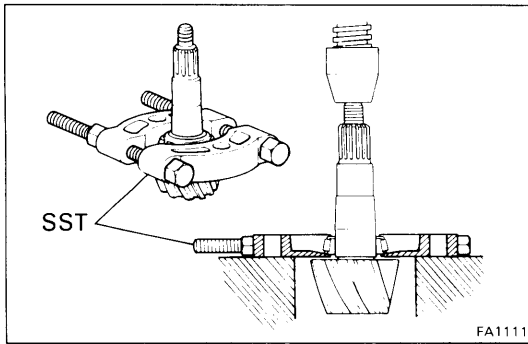
Rear outer race (09608-04020,09608-04110)

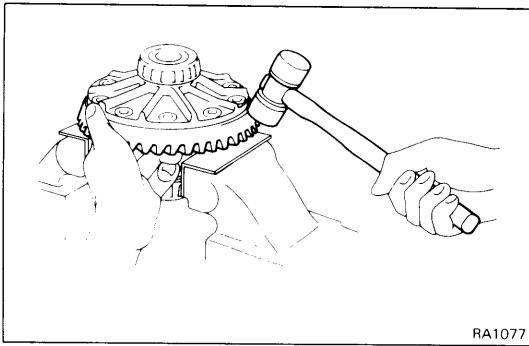
3. REMOVE RING GEAR

- (a) Place matchmarks on the ring gear and differential case.

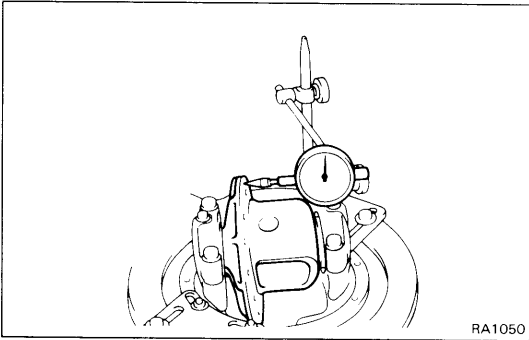
- (b) Using a screwdriver, unstake the lock plates.

- (c) Remove the ten bolts and five lock plates.





- (d) Using a plastic-faced hammer, tap on the ring gear to separate it from the differential case.

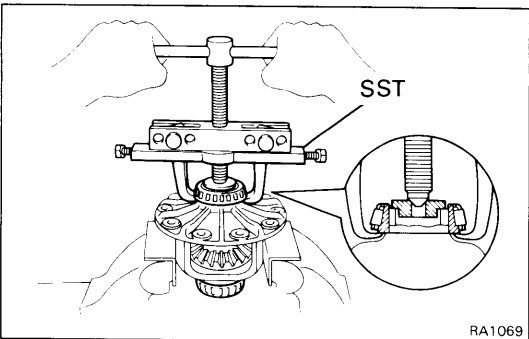


4. CHECK DIFFERENTIAL CASE RUNOUT

- (a) Install the differential case in the differential carrier and tighten the adjusting nut just to where there is no play in the bearing. (See page RA-20)
- (b) Using a dial indicator, measure the differential case runout.

Maximum runout: 0.07 mm (0.0028 in.)

- (c) Remove the differential case.
(See procedure step 11 on page RA-14)

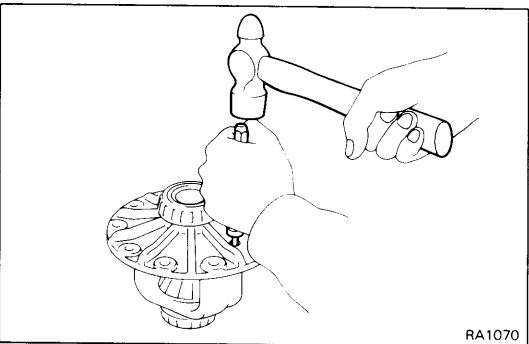


5. REMOVE SIDE BEARINGS

Using SST, remove the side bearing from the differential case.

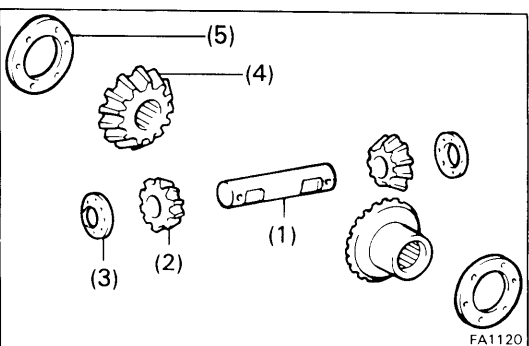
SST 09950-20017

NOTE: Fix the claws of SST to the notches in the differential case.



6. DISASSEMBLE DIFFERENTIAL CASE ASSEMBLY

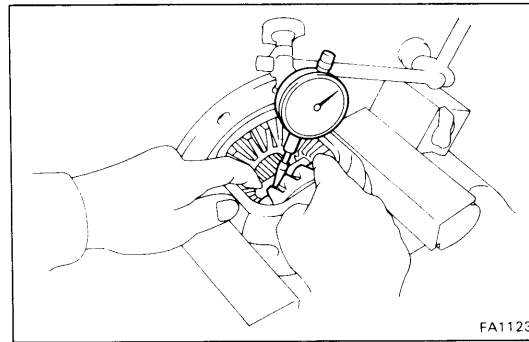
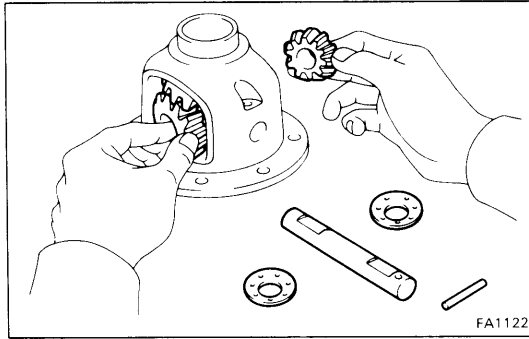
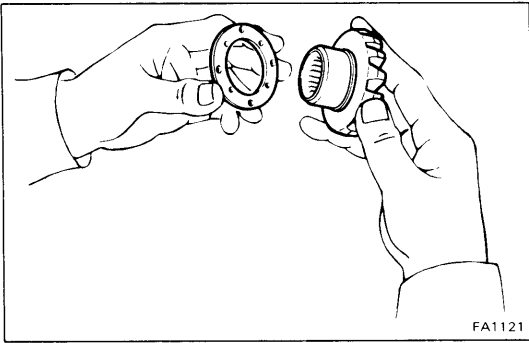
- (a) Using a pin punch and hammer, drive out the straight pin.



- (b) Remove the following parts:

- (1) Pinion shaft
- (2) Pinion gears
- (3) Pinion gear thrust washers
- (4) Side gears
- (5) Side gear thrust washers

7. ASSEMBLE DIFFERENTIAL CASE



(a) Install the side gear thrust washers to the side gears.

(b) Install the side gears with the thrust washers, pinion gears, pinion gear thrust washers and pinion shaft.

(c) Check the side gear backlash.

- Measure the side gear backlash while holding one pinion gear toward the case.

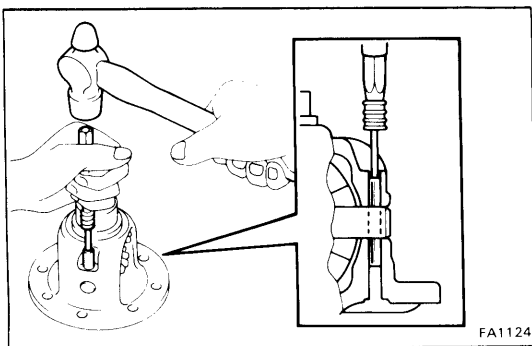
**Side gear backlash: 0.05 — 0.20 mm
(0.0020 — 0.0079 in.)**

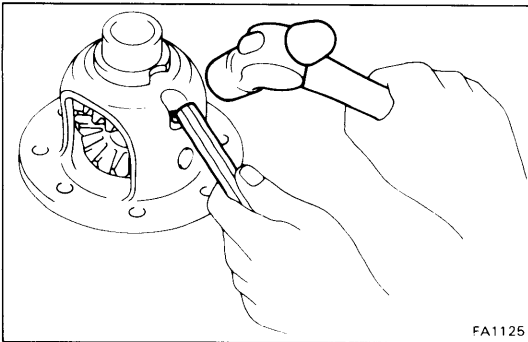
If the backlash is not within specification, replace the thrust washers.

Thrust washer thickness	mm (in.)
0.96 — 1.04	(0.0378 — 0.0409)
1.06 — 1.14	(0.0417 — 0.0449)
1.16 — 1.24	(0.0457 — 0.0488)
1.26 — 1.34	(0.0496 — 0.0528)

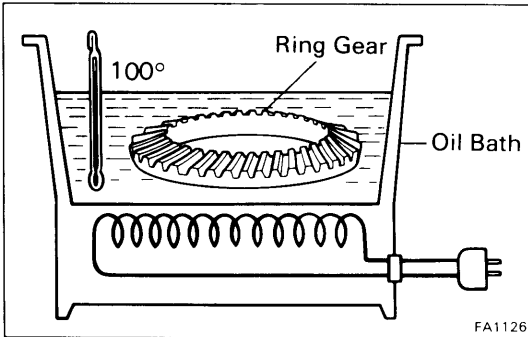
NOTE: Select the same sized thrust washers for both the left and right sides.

(d) Using a pin punch and hammer, drive the straight pin through the holes in the differential case and pinion shaft.





- (e) Using a chisel and hammer, stake the outside of the differential case pin hole.

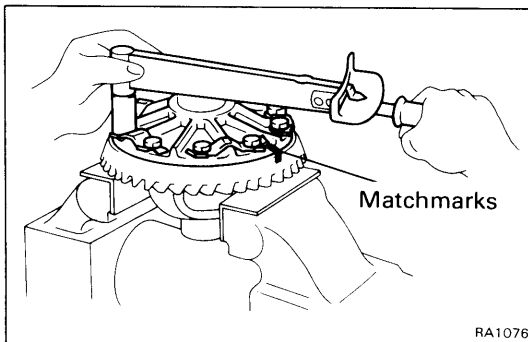


8. INSTALL RING GEAR

- (a) Heat the ring gear to about 100°C (212°F) in an oil bath.

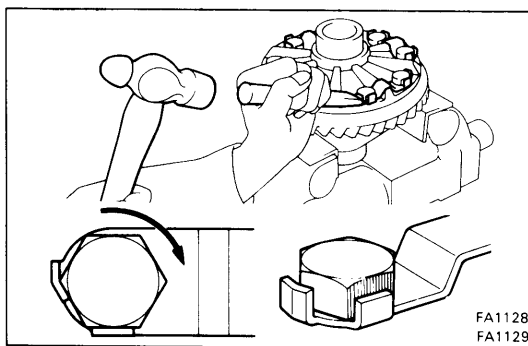
CAUTION: Do not heat the ring gear above 110°C (230°F).

- (b) Clean the contact surface of the differential case.
 (c) Clean the contact surface of the ring gear with cleaning solvent.



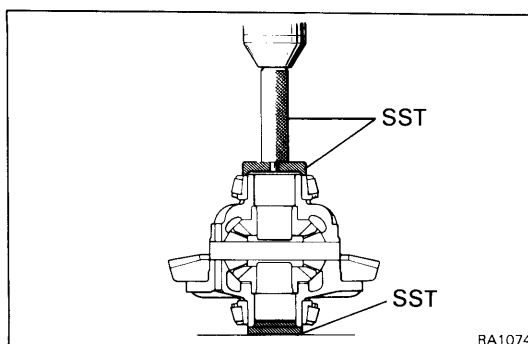
- (d) Align the matchmarks on the ring gear and differential case.
 (e) Then quickly install the ring gear on the differential case.
 (f) Place the five lock plates on the differential case.
 (g) Install and uniformly tighten the ten bolts in several passes.

Torque: 985 kg-cm (71 ft-lb, 97 N·m)



- (h) Using a chisel and hammer, stake the lock plates.

NOTE: Stake one claw flush with the flat surface of the nut. For the claw contacting the protruding portion of the nut, stake only the half on the tightening side.

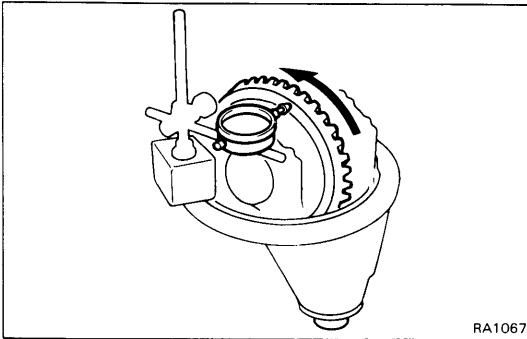


9. INSTALL SIDE BEARINGS

Using SST and a press, press the bearing into the differential case.

SST 09550-10012

(09252-10010, 09557-10010, 09558-10010)



RA1067

10. CHECK RING GEAR RUNOUT

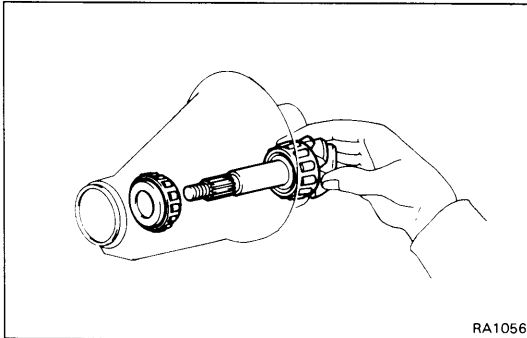
- (a) Install the differential case in the differential carrier and tighten the adjusting nut just to where there is no play in the bearing. (See page RA-20)
- (b) Using a dial indicator, measure the ring gear runout.
Maximum runout: 0.07 mm (0.0028 in.)
- (c) Remove the differential case.
(See procedure step 11 on page RA-14)

ASSEMBLY OF DIFFERENTIAL

(See page RA-8)

1. TEMPORARILY ADJUST DRIVE PINION PRELOAD

- (a) Install the drive pinion, front bearing and oil slinger.
NOTE: After adjusting the gear tooth contact, assemble the spacer and oil seal.

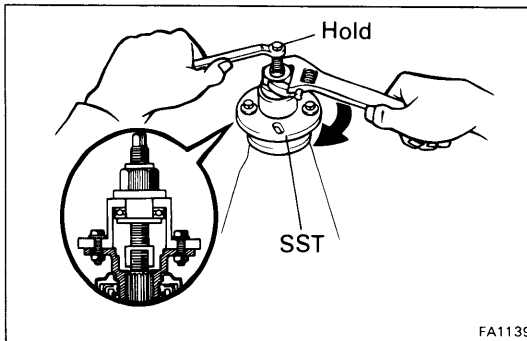


RA1056

- (b) As the spacer is not installed, using SST, install the companion flange until a small clearance remains on the drive pinion.

SST 09557-22022

- (c) Place the plate washer on the companion flange.



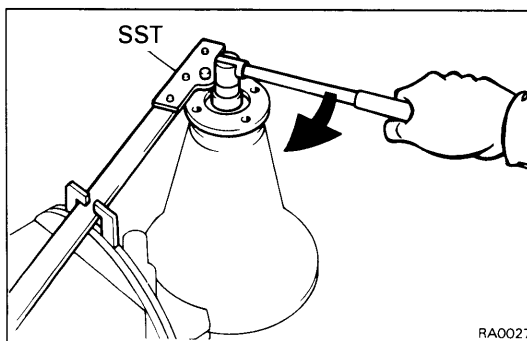
FA1139

- (d) Apply a light coat of gear oil on the threads of the companion flange nut and drive pinion.

- (e) Using SST to hold the flange, adjust the drive pinion preload by tightening the companion flange.

SST 09330-00021

CAUTION: As there is no spacer, tighten a little at a time, being careful not to overtighten.



RA0027

- (f) Rotate the flange left and right to seat the bearings.

- (g) Using a torque meter, measure the preload.

Preload(starting):

New bearing

12 — 19 kg-cm

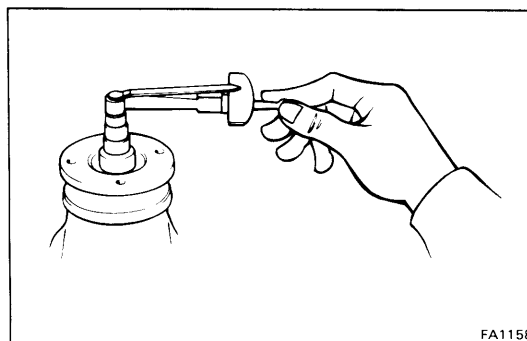
(10.4 — 16.5 in.-lb, 1.2 — 1.9 N·m)

Reused bearing

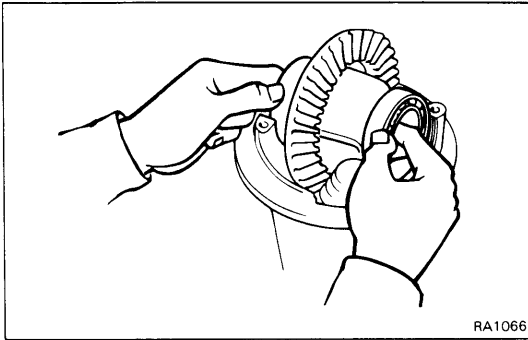
6 — 10 kg-cm

(5.2 — 8.7 in.-lb, 0.6 — 1.0 N·m)

NOTE: In order to measure the total preload, record the preload reading.



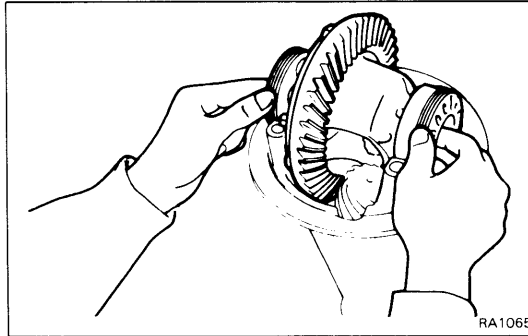
FA1158



RA1066

2. INSTALL DIFFERENTIAL CASE IN DIFFERENTIAL CARRIER

- (a) Place the bearing outer races on their respective bearings. Check that the left and right outer races are not interchanged.
- (b) Install the differential case in the differential carrier.

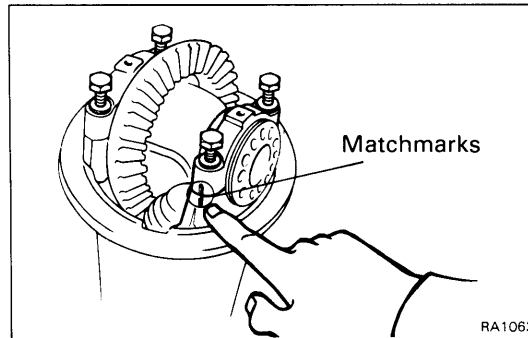


RA1065

3. INSTALL ADJUSTING NUTS

Install the adjusting nuts on their respective carrier, making sure the nuts are threaded properly.

NOTE: Check that there is backlash between the ring gear and drive pinion.

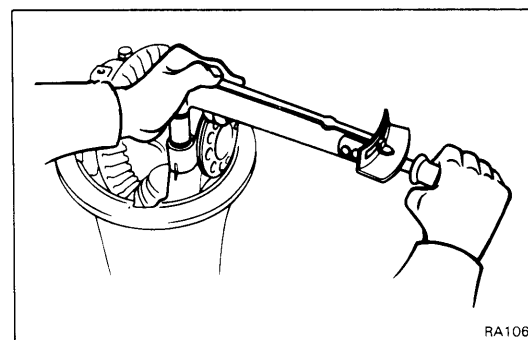


RA1063

4. INSTALL BEARING CAPS

Align the matchmarks on the cap and carrier. Screw in the two bearing cap bolts two or three turns and press down the bearing cap by hand.

NOTE: If the bearing cap does not fit tightly on the carrier, the adjusting nut threads are not threaded properly. Reinstall the adjusting nuts if necessary.



RA1060

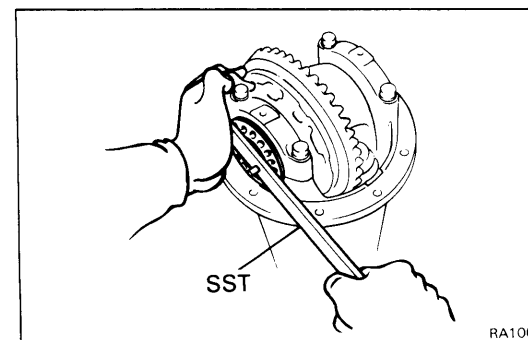
5. ADJUST SIDE BEARING PRELOAD AND RING GEAR BACKLASH

- (a) Torque the bearing cap bolts.

Torque: 800 kg-cm (58 ft-lb, 78 N·m)

- (b) Loosen the bearing cap bolts until the adjusting nuts can be turned with SST.

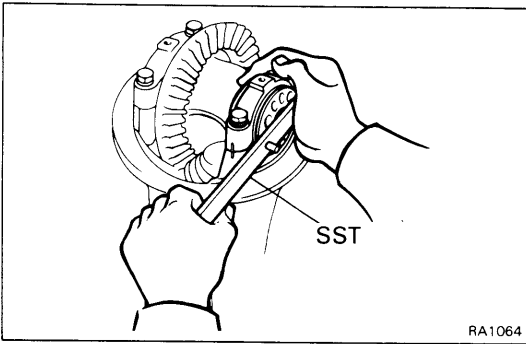
SST 09504-00011



RA1062

- (c) Using SST, tighten the adjusting nut on the ring gear side until the ring gear has a backlash of about 0.2 mm (0.008 in.).

SST 09504-00011

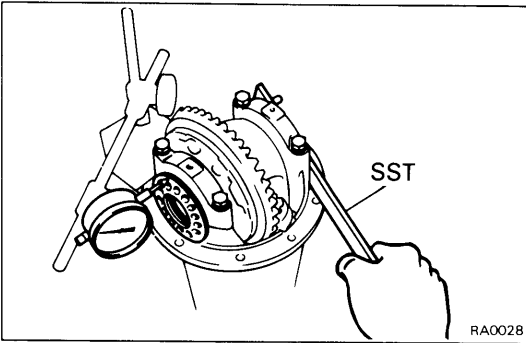


- (d) Using SST, firmly tighten the adjusting nut on the drive pinion side.

SST 09504-00011

- (e) Check that the ring gear has backlash.

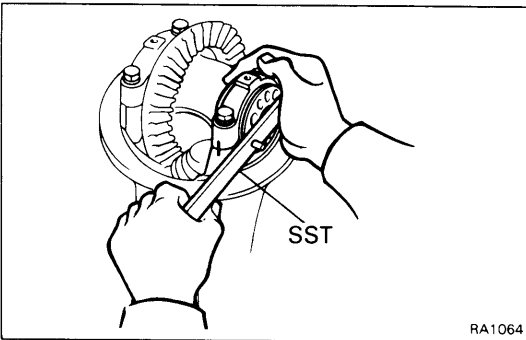
If tightening the adjusting nut creates ring gear backlash, loosen the nut so that backlash is eliminated.



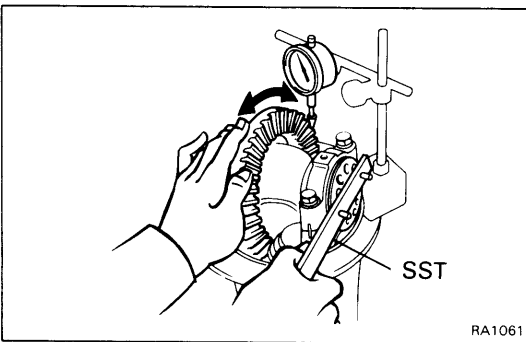
- (f) Place a dial indicator on the top of the adjusting nut on the ring gear side.

- (g) Loosen the adjusting nut on the drive pinion side.

- (h) Adjust the side bearing for zero preload by tightening the other adjusting nut until the pointer on the indicator begins to move.



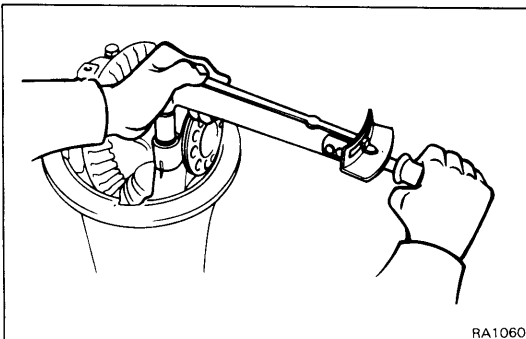
- (i) Tighten the adjusting nut 1 — 1 1/2 notches from the zero preload position



- (j) Using a dial indicator, adjust the ring gear backlash until it is within specification.

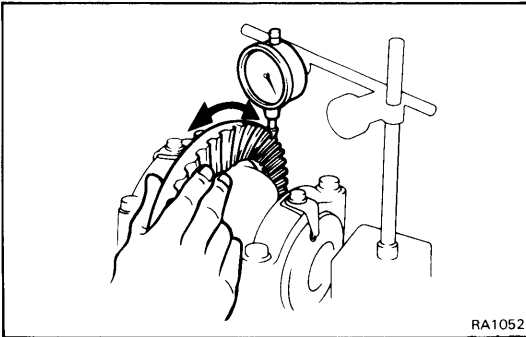
Backlash: 0.13 — 0.18 mm (0.0051 — 0.0071 in.)

NOTE: The backlash is adjusted by turning the left and right adjusting nuts equal amounts. For example, loosen the nut on the left side one notch and tighten the nut on the right side one notch.



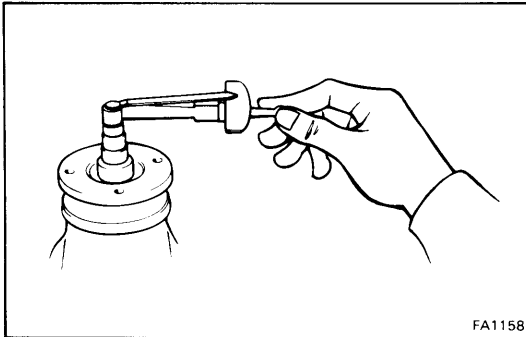
- (k) Torque the bearing cap bolts.

Torque: 800 kg-cm (58 ft-lb, 78 N·m)



(l) Recheck the ring gear backlash.

Backlash: 0.13 — 0.18 mm (0.0051 — 0.0071 in.)



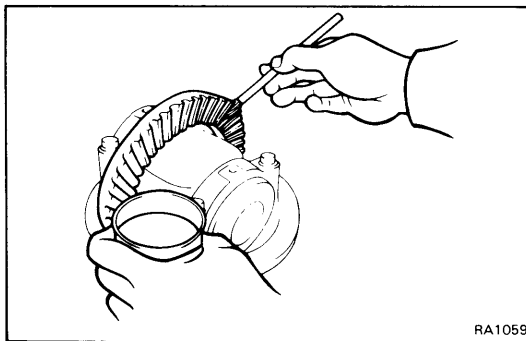
6. CHECK TOTAL PRELOAD

Using a torque meter, with the drive pinion and ring gear meshed, measure the total preload.

Total preload (starting):

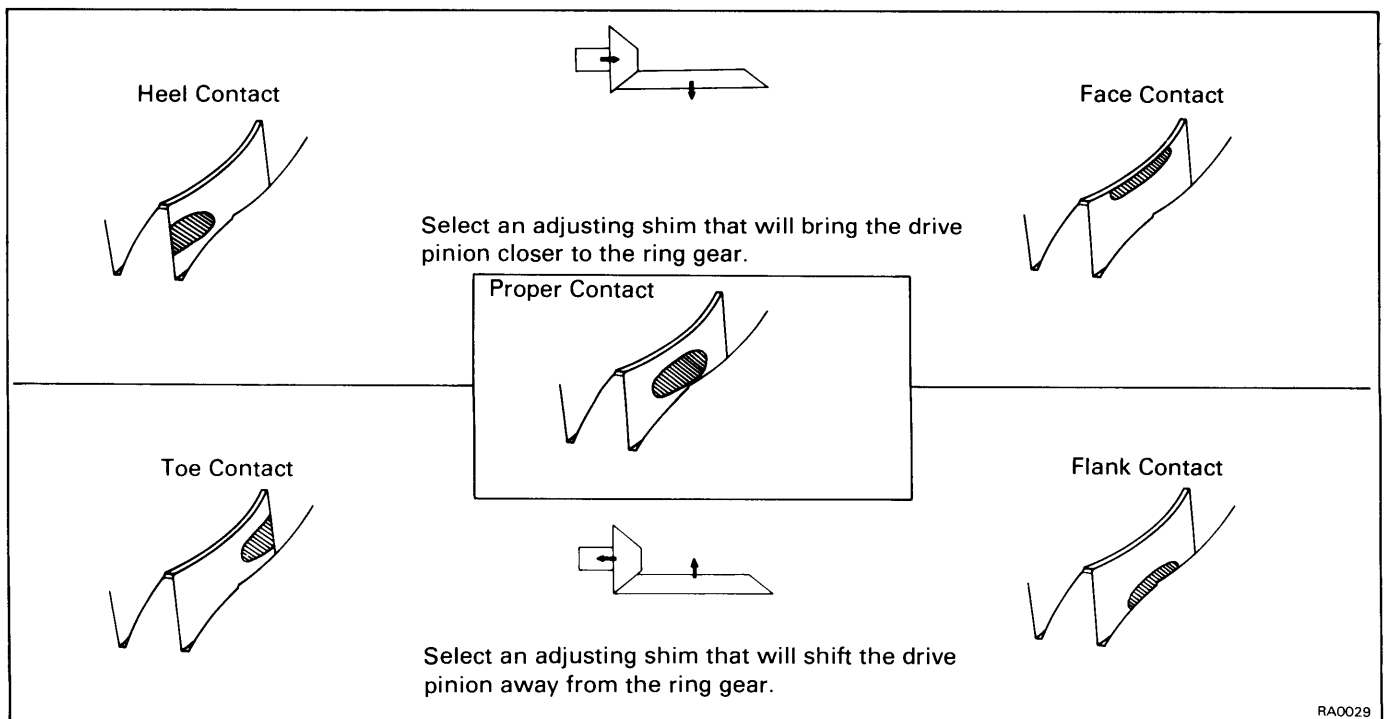
Add drive pinion preload

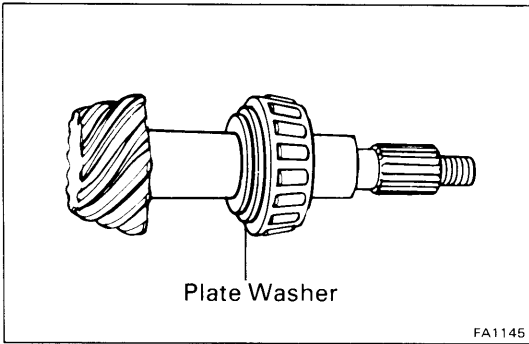
4 — 6 kg-cm (3.4 — 5.2 in.-lb, 0.4 — 0.6 N·m)



7. INSPECT TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION

- (a) Coat 3 or 4 teeth at three different positions on the ring gear with red lead.
- (b) Hold the companion flange firmly and rotate the ring gear in both directions.
- (c) Inspect the tooth pattern.



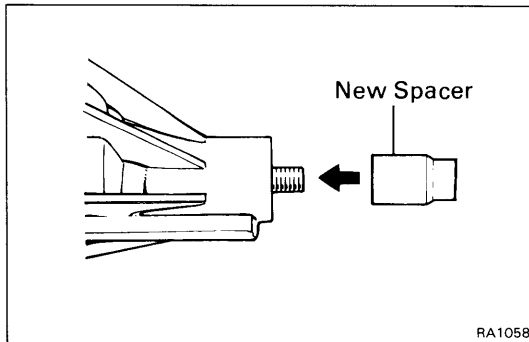


If the tooth pattern is not proper, replace the drive pinion plate washer.

Plate washer thickness		mm (in.)
2.23 — 2.25 (0.0878 — 0.0886)	2.50 — 2.52 (0.0984 — 0.0992)	
2.26 — 2.28 (0.0890 — 0.0898)	2.53 — 2.55 (0.0996 — 0.1004)	
2.29 — 2.31 (0.0902 — 0.0909)	2.56 — 2.58 (0.1008 — 0.1016)	
2.32 — 2.34 (0.0913 — 0.0921)	2.59 — 2.61 (0.1020 — 0.1028)	
2.35 — 2.37 (0.0925 — 0.0933)	2.62 — 2.64 (0.1031 — 0.1039)	
2.38 — 2.40 (0.0937 — 0.0945)	2.65 — 2.67 (0.1043 — 0.1051)	
2.41 — 2.43 (0.0949 — 0.0957)	2.68 — 2.70 (0.1055 — 0.1063)	
2.44 — 2.46 (0.0961 — 0.0969)	2.71 — 2.73 (0.1067 — 0.1075)	
2.47 — 2.49 (0.0972 — 0.0980)		

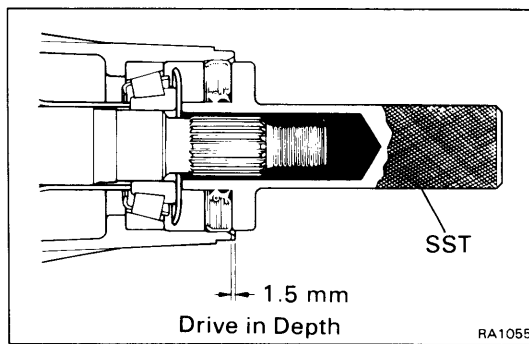
8. REMOVE COMPANION FLANGE AND OIL SLINGER
(See step 8 on page RA-13)

9. REMOVE FRONT BEARING
(See step 10 on page RA-14)



10. INSTALL NEW BEARING SPACER AND FRONT BEARING

- (a) Install a new bearing spacer on the drive pinion with the large end toward the differential carrier.
- (b) Install the front bearing on the drive pinion.



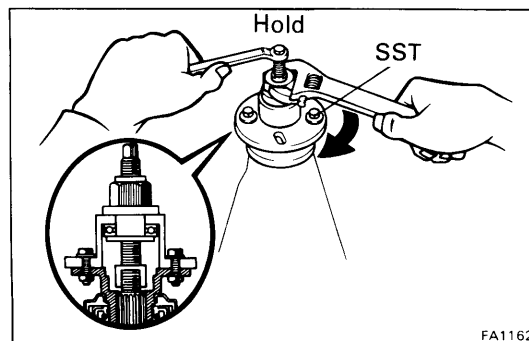
11. INSTALL OIL SLINGER AND NEW OIL SEAL

- (a) Install the oil slinger facing as shown.
- (b) Using SST and a hammer, tap in a new oil seal.

SST 09554-30011

Oil seal drive in depth: 1.5 mm (0.059 in.)

- (c) Apply MP grease to the oil seal lip.



12. INSTALL COMPANION FLANGE

- (a) Using SST, install the companion flange on the drive pinion.

SST 09557-22022

- (b) Place the plate washer on the companion flange.