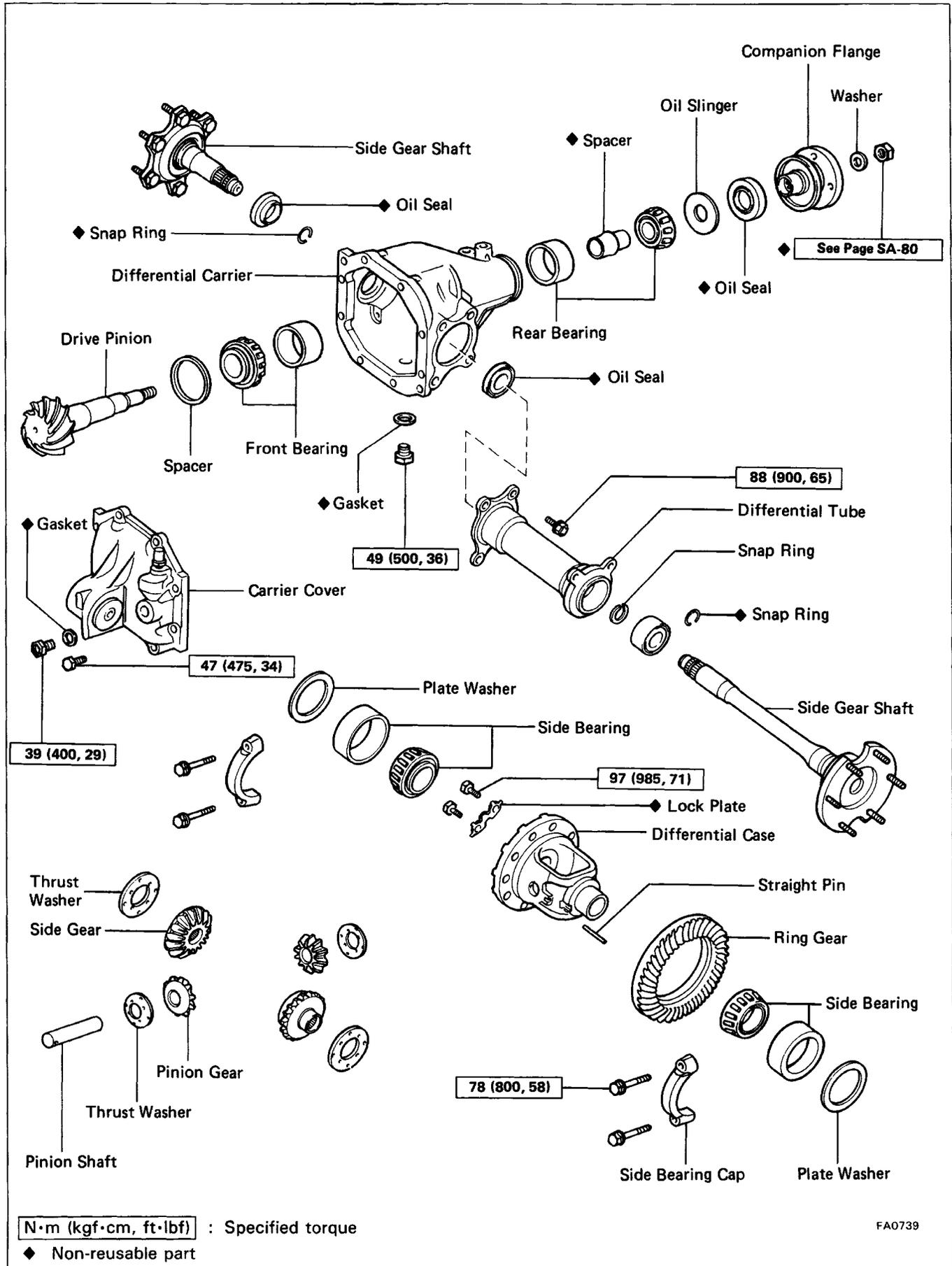
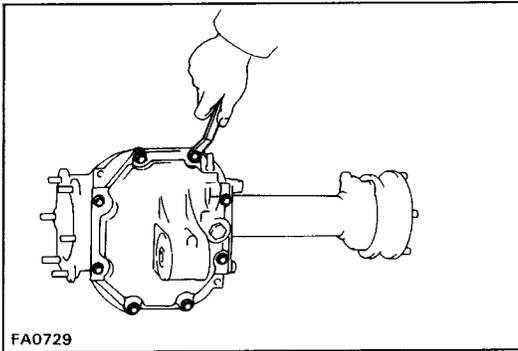


Disassembly and Assembly of Differential (with out A.D.D.)

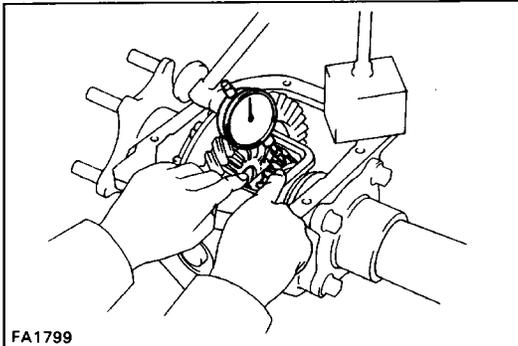




DISASSEMBLY OF DIFFERENTIAL

1. REMOVE DIFFERENTIAL COVER

Remove the eight bolts and tap off the cover with a plastic-faced hammer.



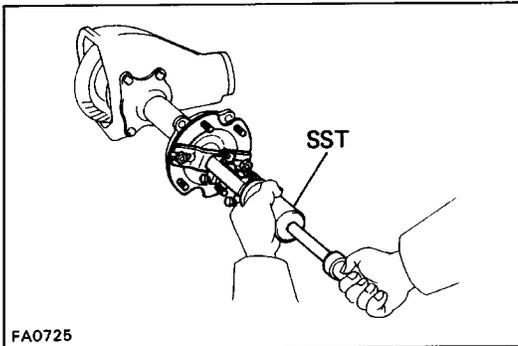
2. CHECK SIDE GEAR BACKLASH

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

Standard backlash: 0.05 – 0.20 mm

(0.0020 – 0.0079 in.)

If the backlash is out of specification, install the correct thrust washers. (See page [SA-71](#))

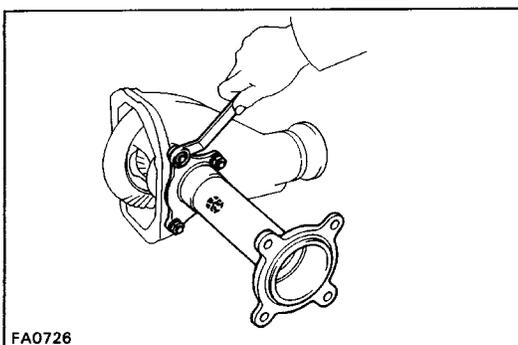


3. REMOVE SIDE GEAR SHAFTS

Using SST, remove the side gear shafts from the differential.

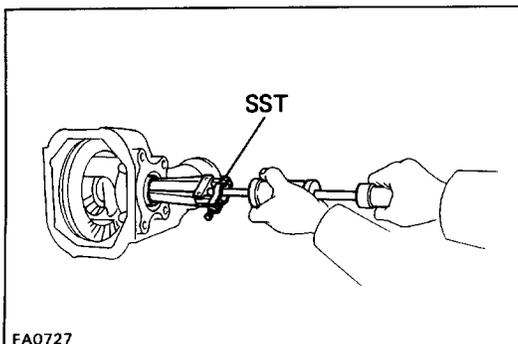
SST 09910-00015 .

(09911-00011, 09912-00010, 09914-00011)



4. REMOVE DIFFERENTIAL TUBE

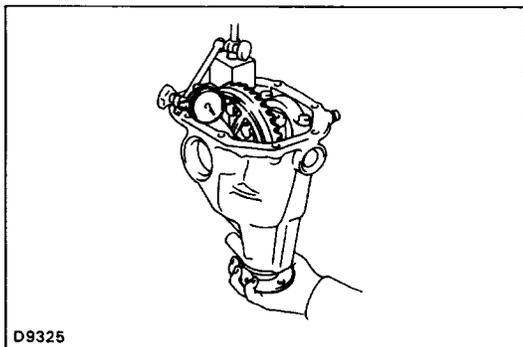
Remove the four bolts and tap off the cover with a plastic-faced hammer.



5. REMOVE SIDE GEAR SHAFT OIL SEALS

Using SST, remove the oil seals.

SST 09308-00010



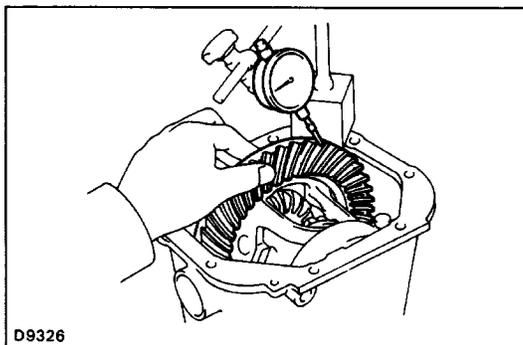
D9325

6. 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.



D9326

7. CHECK RING GEAR BACKLASH

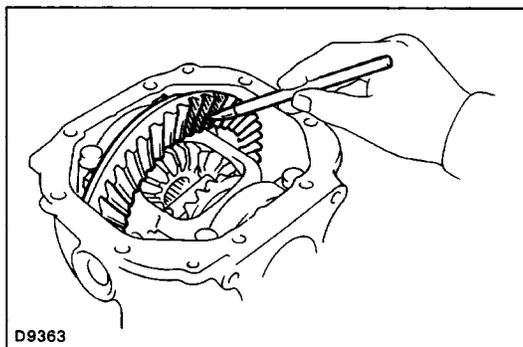
- (a) Fix the dial indicator on the tooth surface at a 90° angle.
- (b) Holding the drive pinion flange, measure the ring gear backlash.

Ring gear backlash: 0.13 – 0.18 mm

(0.0051 – 0.0071 in.)

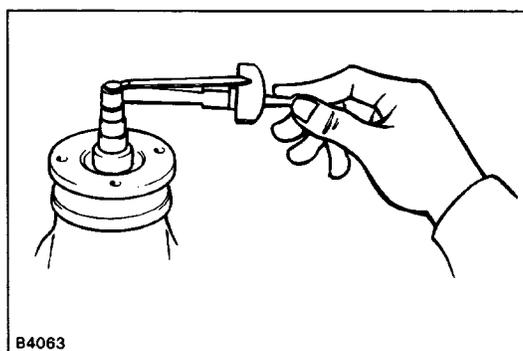
If the backlash is not within specification, adjust the ring gear backlash.

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



D9363

8. INSPECT TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION (SEE STEP 7 ON PAGE SA-78)



B4063

9. MEASURE DRIVE PINION PRELOAD

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

Preload (starting):

0.6 – 1.0 N-m (6 – 10 kgf-cm, 5.2 – 8.7 in.-lbf)

10. CHECK TOTAL PRELOAD

Using a torque gauge, measure the total preload.

Total preload (starting):

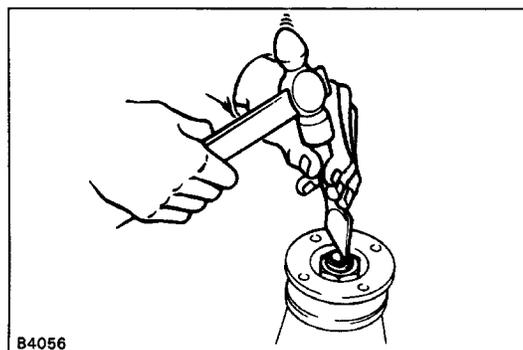
Add drive pinion preload

0.4 – 0.6 N-m

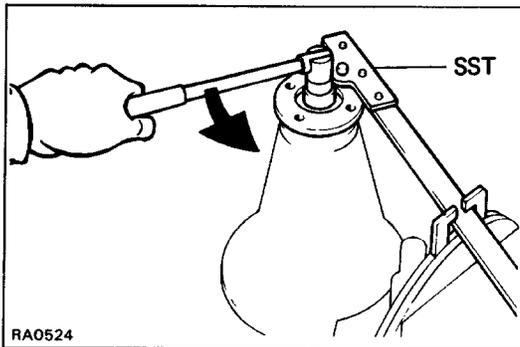
(4 – 6 kgf -cm, 3.5 – 5.2 in.-lbf)

11. REMOVE COMPANION FLANGE

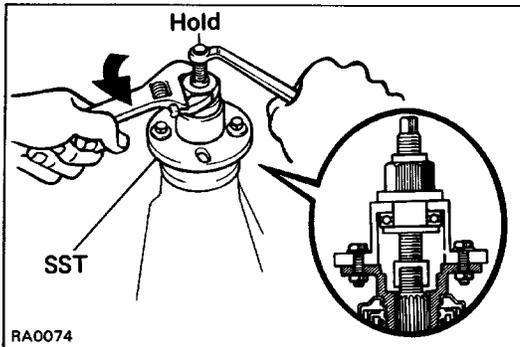
- (a) Using a hammer and chisel, loosen the staked part of the nut.



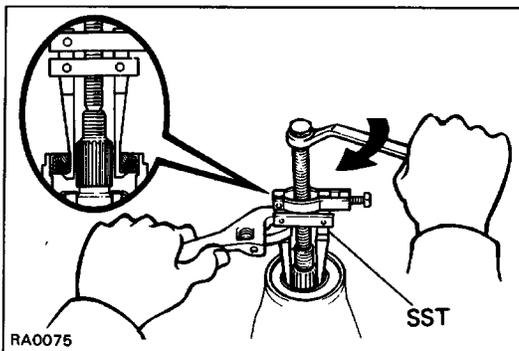
B4056



- (b) Using SST to hold the flange, remove the nut.
SST 09330-00021

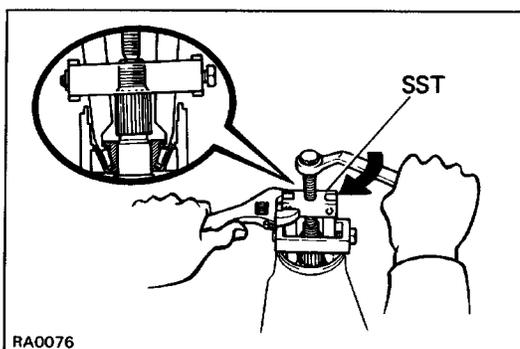


- (c) Using SST, remove the companion flange.
SST 09557-22022 (09557-22030)



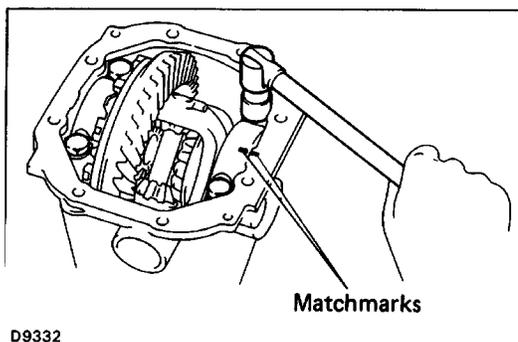
12. REMOVE OIL SEAL AND OIL SLINGER

- (a) Using SST, remove the oil seal from the housing.
SST 09308-10010
(b) Remove the oil slinger.



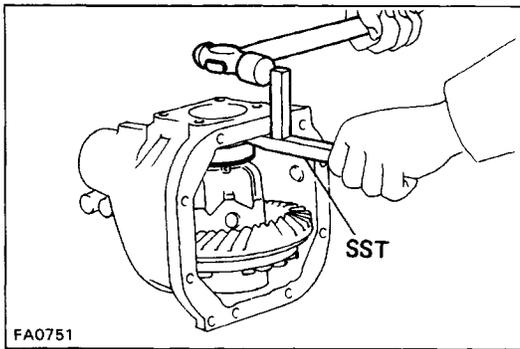
13. REMOVE REAR BEARING AND BEARING SPACER

- (a) Using SST, remove the rear bearing from drive pinion.
SST 09556-30010
(b) Remove the bearing spacer.
If the rear bearing is damaged or worn, replace the bearing.



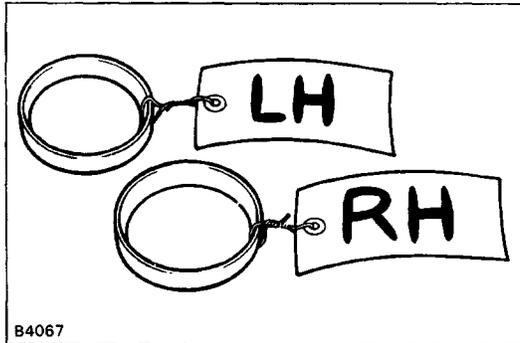
14. REMOVE DIFFERENTIAL CASE AND RING GEAR

- (a) Place matchmarks on the bearing cap and differential carrier.
(b) Remove the two bearing caps.



- (c) Using SST and a hammer, remove the two side bearing preload adjusting plate washers.
SST 09504-22011

HINT: Measure the adjusting plate washer and note the thickness.



- (d) Remove the differential case with bearing outer race from the carrier.
HINT: Tag the bearing outer races to show the location for reassembly.

15. REMOVE DRIVE PINION FROM DIFFERENTIAL CARRIER

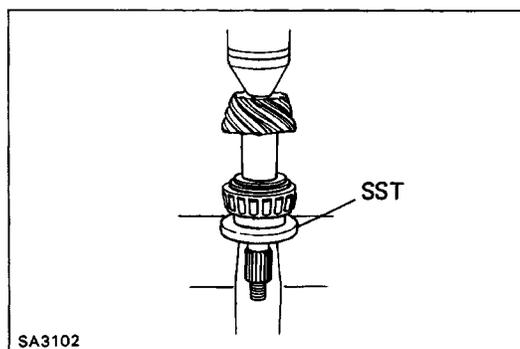
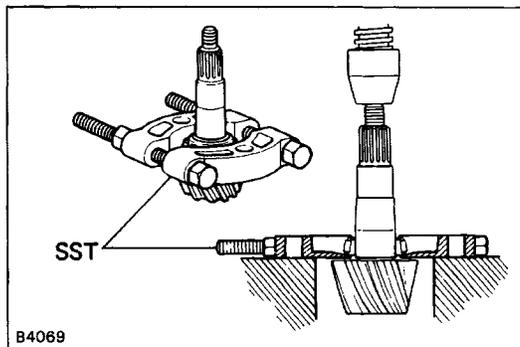
INSPECTION AND REPLACEMENT OF DIFFERENTIAL

1. REPLACE DRIVE PINION FRONT BEARING

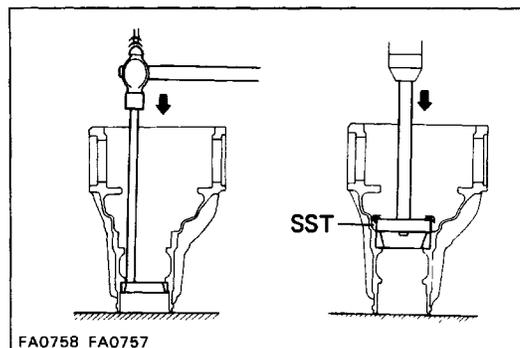
4ay Using SST, press out the front bearing from the drive pinion.

SST 09950-00020

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



- (b) Install the washer on the drive pinion.
(c) Using SST, press in the front bearing onto the drive pinion.
SST 09506-30012



2. REPLACE DRIVE PINION FRONT AND REAR BEARING OUTER RACES

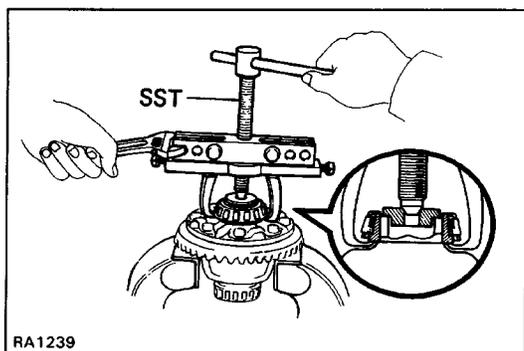
(a) Using a brass bar and hammer, drive out the outer race.

(b) Using SST, drive in a new outer race.

SST 09608-35014

Front outer race (09608-06020, 09608-06120)

Rear outer race (09608-06020, 09608-06110)

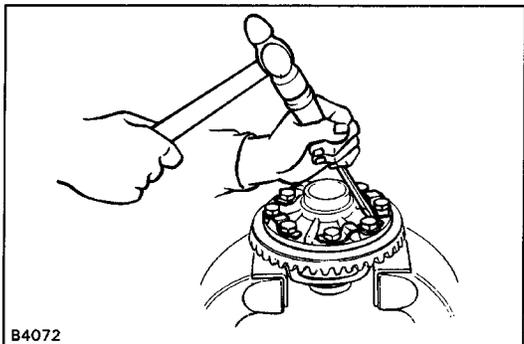


3. REMOVE SIDE BEARING FROM DIFFERENTIAL CASE

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

SST 09950-20017

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

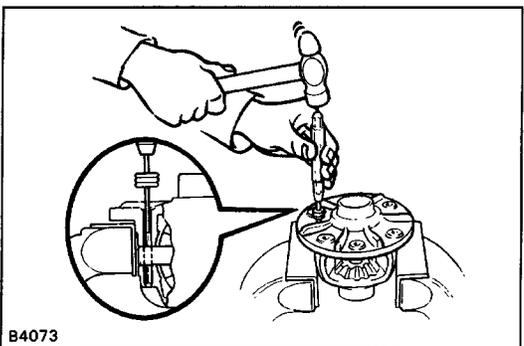


4. REMOVE RING GEAR

(a) Remove the ring gear set bolts and lock plates.

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

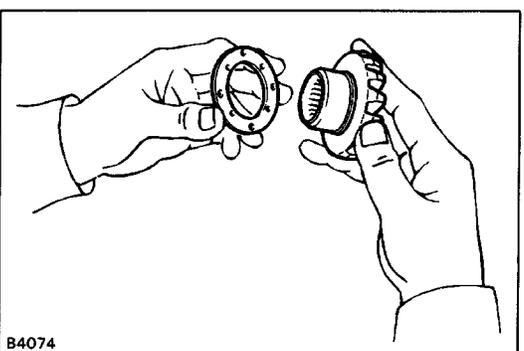
(c) Using a plastic-faced hammer, tap on the ring gear to separate it from the differential case.



5. DISASSEMBLE DIFFERENTIAL CASE

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

Remove the pinion shaft, two pinion gears, two side gears and four thrust washers.



6. ASSEMBLE DIFFERENTIAL CASE

(a) Install the correct thrust washers and side gears.

From the table below select thrust washers that will ensure the backlash is within specification. Try to select washers of the same thickness for both sides.

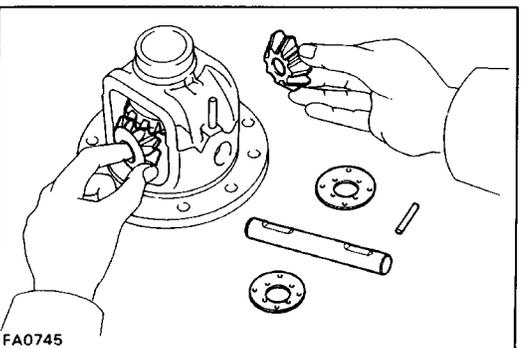
Standard backlash: 0.05 – 0.20 mm

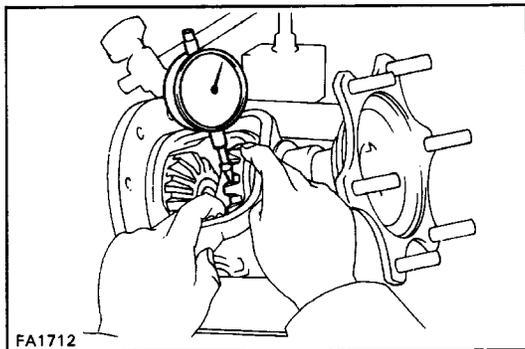
(0.0020 – 0.0079 in.)

Thrust washer thickness

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)

Install the thrust washers and side gears in the differential case.



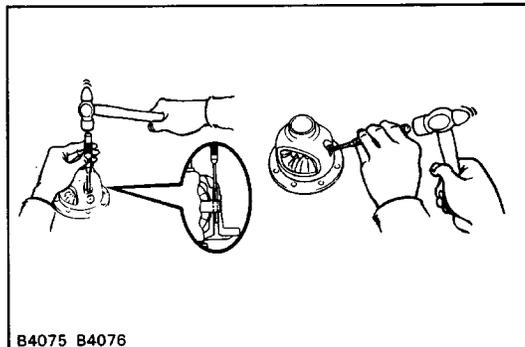


- (b) Check the side gear backlash.
- Temporarily install the side gear shaft.
 - Measure the side gear backlash while holding one pinion gear toward the case.

Side gear backlash: 0.05 – 0.20 mm

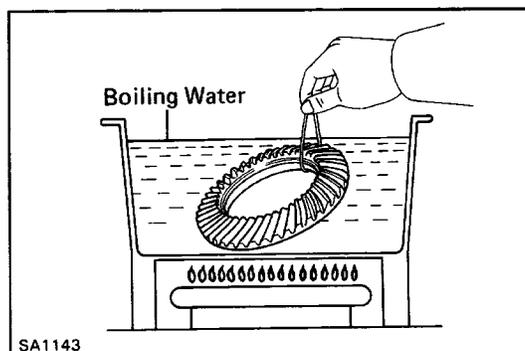
(0.0020 – 0.0079 in.)

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



- (c) Install straight pin.

- Using a hammer and punch, drive the straight pin through the case and hole in the pinion shaft.
- Stake the pin and differential case.

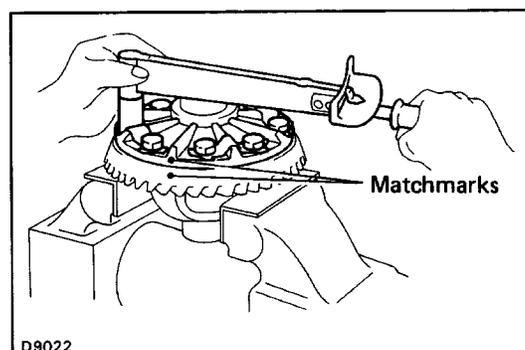


7. INSTALL RING GEAR ON DIFFERENTIAL CASE

- (a) Clean the contact surfaces of the differential case and ring gear.

- (b) Heat the ring gear in boiling water.

- (c) After the moisture on the ring gear has completely evaporated, quickly install the ring gear to the differential case.



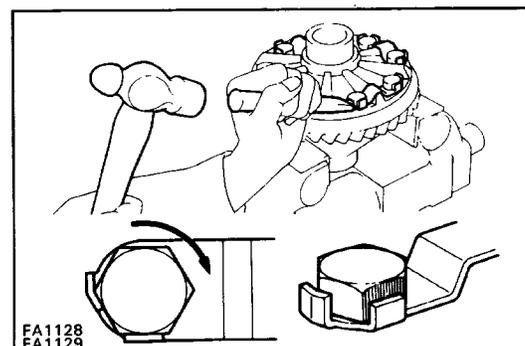
- (d) Align the matchmarks on the ring gear and differential case.

- (e) Coat the ring gear set bolts with gear oil.

- (f) Temporarily install the lock plates and set bolts.

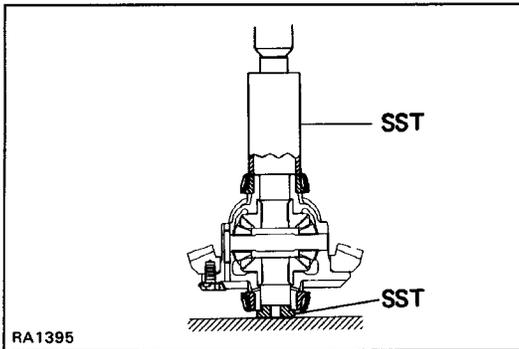
- (g) After the ring gear cools down enough, tighten the set bolts uniformly and a little at a time.

Torque: 97 N-m (985 kgf-cm, 71 ft-lbf)



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

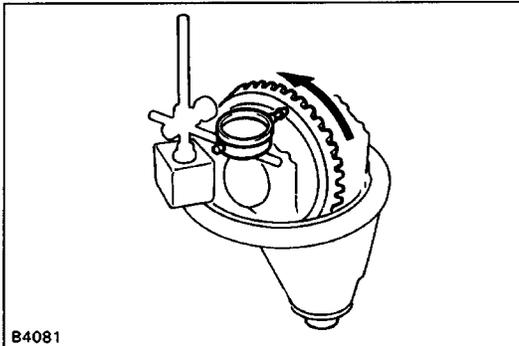
HINT: Stake one claw flush with the flat surface of the nut. For the claw contacting the protruding portion of the nut, stake only the half on the tightening side.



8. INSTALL SIDE BEARINGS

Using a press and SST, drive in the side bearings into the differential case.

SST 09226-10010, 09950-20017



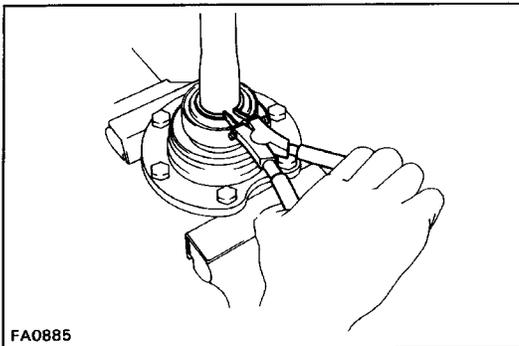
9. CHECK RING GEAR RUNOUT

(a) Install the differential case onto the carrier and install the plate washers to where there is no play in the bearing. (See page SA-75)

(b) Install bearing caps. (See page SA-77)

(e) Using a dial indicator, measure the runout of ring gear.

Maximum runout: 0.07 mm (0.0028 in.)

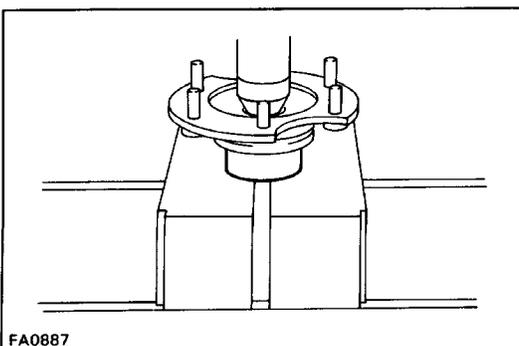
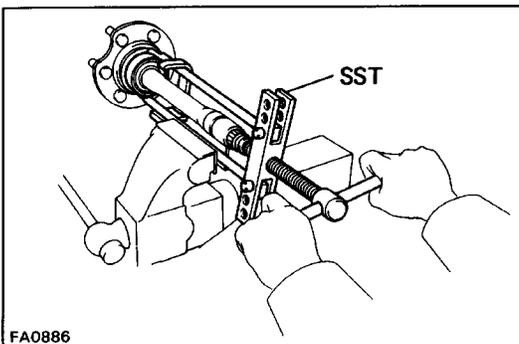


10. REPLACE LH SIDE GEAR SHAFT BEARING

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

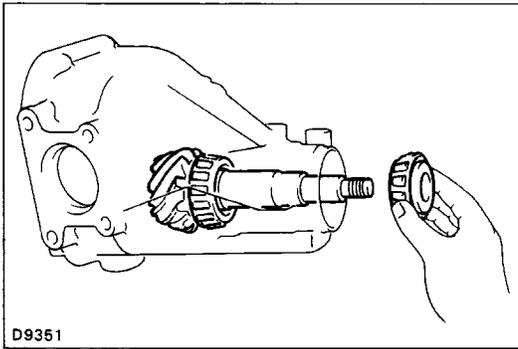
(b) Using SST, remove the bearing from the LH side gear shaft.

SST 09950-20017



(c) Install a new bearing to the LH side gear shaft.

(d) Using a snap ring expander, install the snap ring.



ASSEMBLY OF DIFFERENTIAL

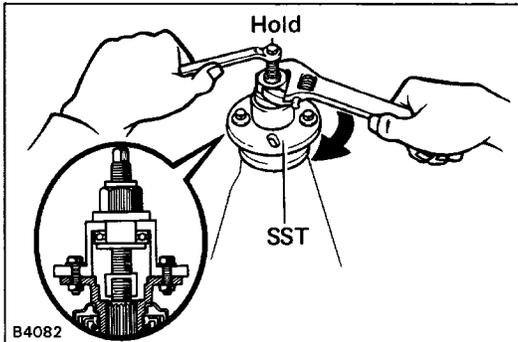
(See page SA-67)

1. TEMPORARILY ADJUST DRIVE PINION PRELOAD

(a) Install the following parts.

- Drive pinion
- Front bearing

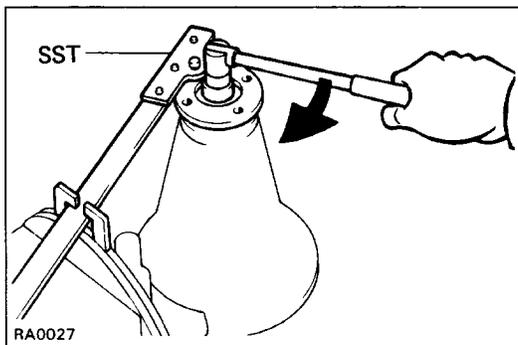
HINT: Assemble the spacer and oil seal after adjusting the gear contact pattern.



(b) Install the companion flange with SST.

Coat the threads of the nut with MP grease.

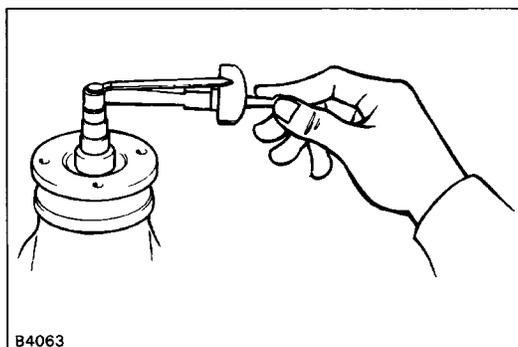
SST 09557-22022 (09557-22030)



(e) Adjust the drive pinion preload by tightening the companion flange nut.

Using SST to hold the flange, tighten the nut.

SST 09330-00021



(d) Using a torque meter, measure the preload.

Preload (starting):

New bearing

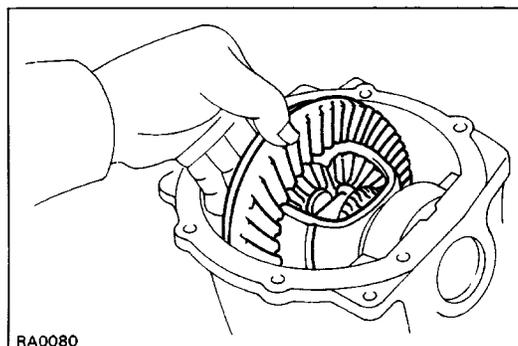
1.2 – 1.9 N-m

(12 – 19 kgf-cm, 10.4 – 16.5 in.-lbf)

Reused bearing

0.6 – 1.0 N-m

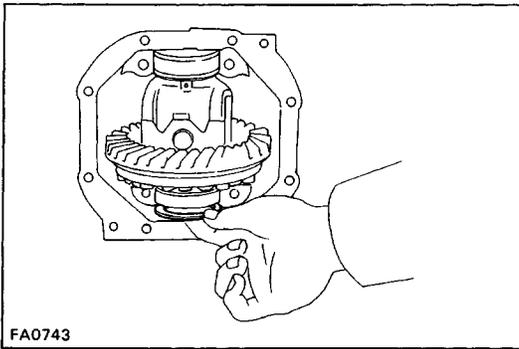
(6 – 10 kgf-cm, 5.2 – 8.7 in.-lbf)



2. INSTALL DIFFERENTIAL CASE IN CARRIER

(a) Place the bearing outer races on their respective bearings. Make sure the left and right outer races are not interchanged.

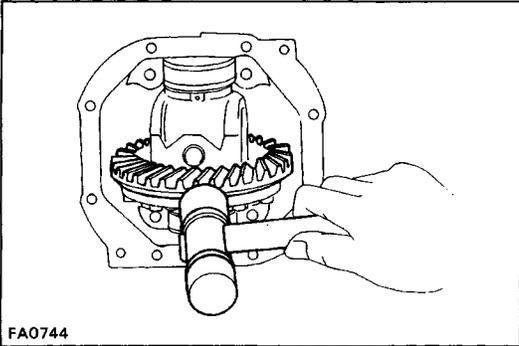
(b) Install the differential case in the carrier.



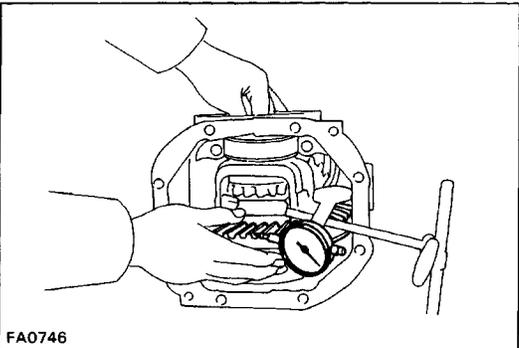
3. ADJUST RING GEAR BACKLASH

- (a) Install only the plate washer on the ring gear back side.

HINT: Insure that the ring gear has backlash.

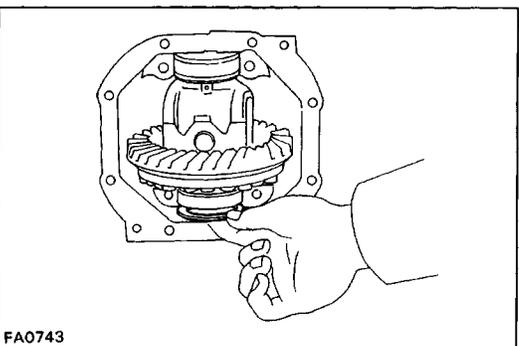


- (b) Snug down the washer and bearing by tapping on the ring gear with a plastic-faced hammer.

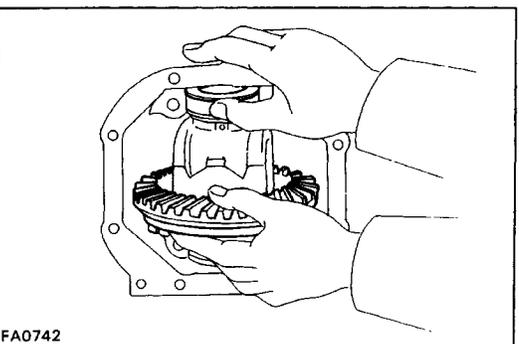


- (c) Hold the side bearing boss on the teeth surface of the ring gear and measure the backlash.

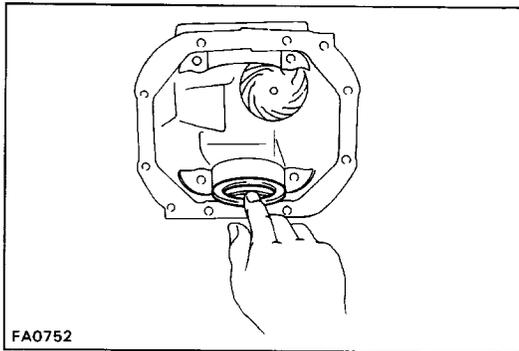
Backlash (reference): 0.13 mm (0.0051 in.)



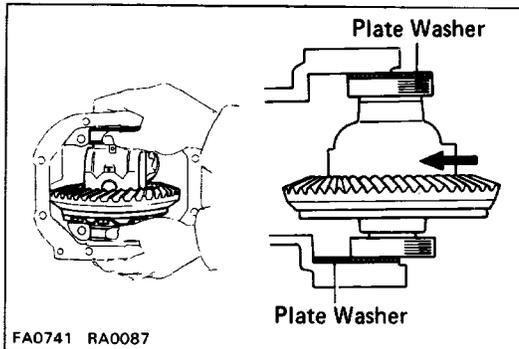
- (d) Select a ring gear back plate washer, using the backlash as reference. (See page [SA-77](#))



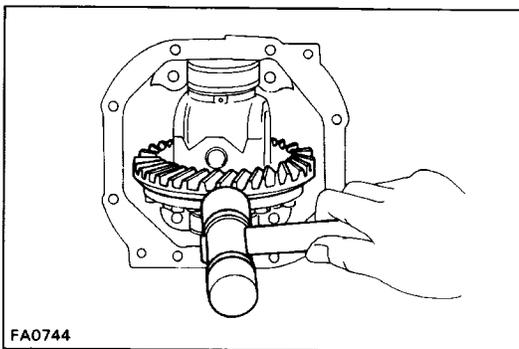
- (e) Select a ring gear teeth side washer with a thickness which eliminates any clearance between the outer race and case.



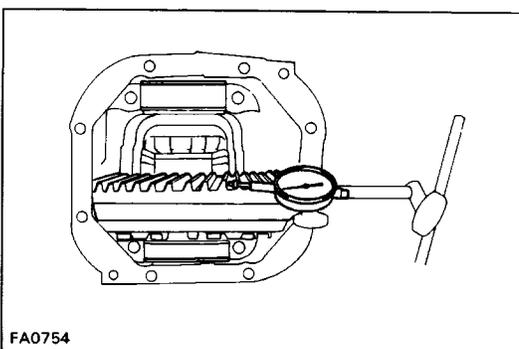
- (f) Remove the plate washers and differential case.
- (g) Install the plate washer into the lower part of the carrier.



- (h) Place the other plate washer onto the differential case together with the outer race, and install the differential case with the outer race into the carrier.

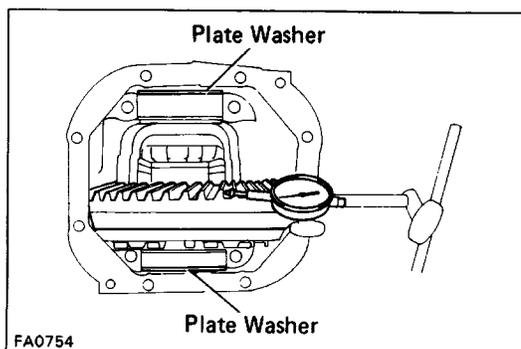


- (i) Using a plastic-faced hammer, snug down the washer and bearing by tapping the ring gear.



- (j) Using a dial indicator, measure the ring gear backlash.

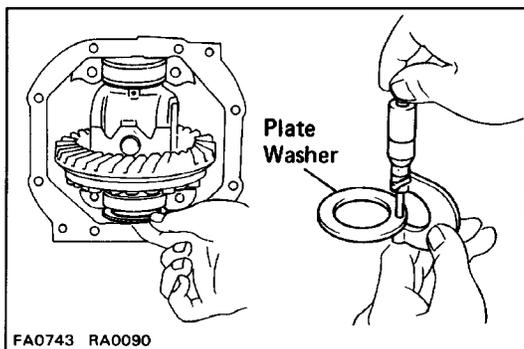
Backlash: 0.13 – 0.18 mm (0.0051 – 0.0071 in.)



- (k) If not within specification, adjust by either increasing or decreasing the number of washers on both sides by an equal amount.

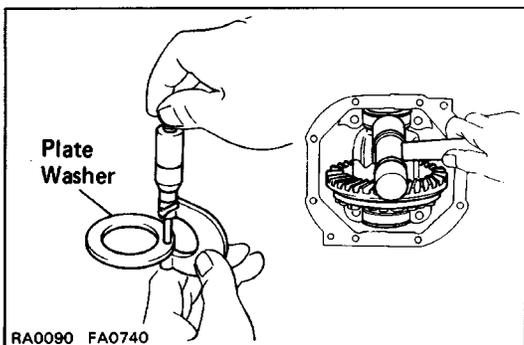
HINT: There should be no clearance between the plate washer and case.

Insure that there is ring gear backlash.



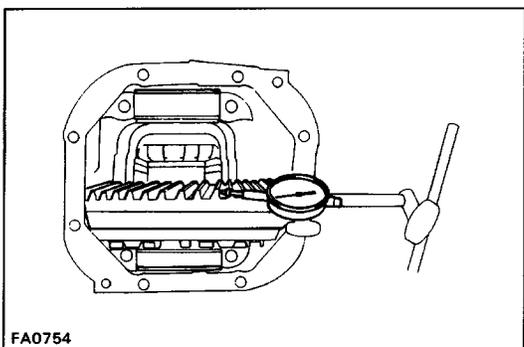
4. ADJUST SIDE BEARING PRELOAD

- (a) Remove the ring gear teeth plate washer and measure the thickness.



- (b) Using the backlash as a reference, install a new washer of 0.06 – 0.09 mm (0.0024 – 0.0035 in.) thicker than the washer removed.
HINT: Select a washer which can be pressed in 2/3 of the way with your finger.

- (c) Using a plastic-faced hammer, tap in the side washer.

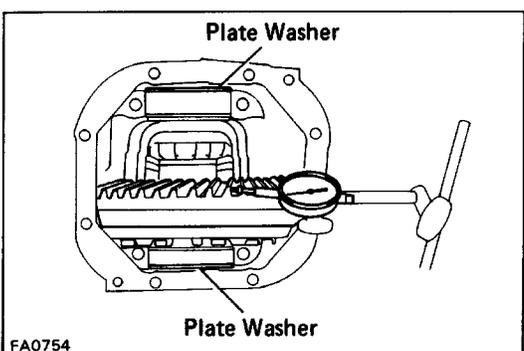


- (d) Recheck the ring gear backlash.

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

- (e) If not within standard, adjust by either increasing or decreasing the washers on both sides by an equal amount.

HINT: The backlash will change about 0.02 mm (0.0008 in.) with 0.03 mm (0.0012 in.) alteration of the side washer.



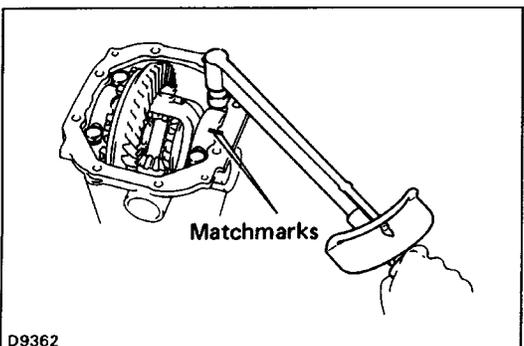
Washer thickness

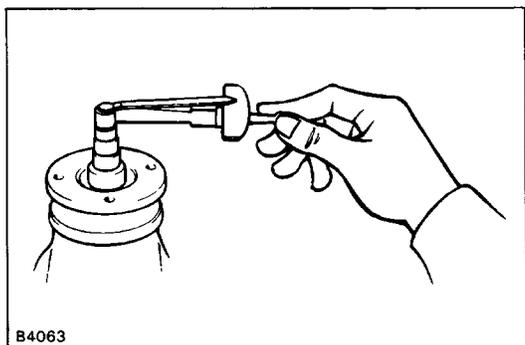
Thickness mm (in.)	
2.57 – 2.59 (0.1012 – 0.1020)	2.93 – 2.95 (0.1154 – 0.1161)
2.60 – 2.62 (0.1024 – 0.1031)	2.96 – 2.98 (0.1165 – 0.1173)
2.63 – 2.65 (0.1035 – 0.1043)	2.99 – 3.01 (0.1177 – 0.1185)
2.66 – 2.68 (0.1047 – 0.1055)	3.02 – 3.04 (0.1189 – 0.1197)
2.69 – 2.71 (0.1059 – 0.1067)	3.05 – 3.07 (0.1201 – 0.1209)
2.72 – 2.74 (0.1071 – 0.1079)	3.08 – 3.10 (0.1213 – 0.1220)
2.75 – 2.77 (0.1083 – 0.1091)	3.11 – 3.13 (0.1224 – 0.1232)
2.78 – 2.80 (0.1094 – 0.1102)	3.14 – 3.16 (0.1236 – 0.1244)
2.81 – 2.83 (0.1106 – 0.1114)	3.17 – 3.19 (0.1248 – 0.1256)
2.84 – 2.86 (0.1118 – 0.1126)	3.20 – 3.22 (0.1260 – 0.1268)
2.87 – 2.89 (0.1130 – 0.1138)	3.23 – 3.25 (0.1272 – 0.1280)
2.90 – 2.92 (0.1142 – 0.1150)	

5. INSTALL SIDE BEARING CAPS

Align the matchmarks on the cap and carrier.

Torque: 78 N-m (800 kgf-cm, 58 ft-lbf)





B4063

6. MEASURE TOTAL PRELOAD

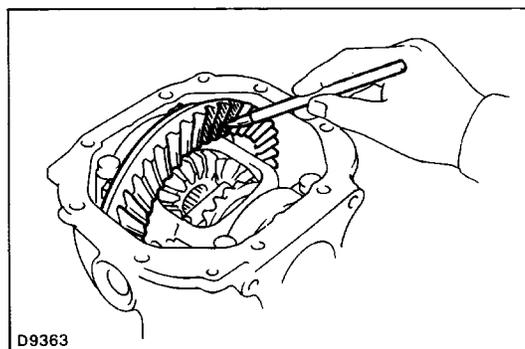
Using a torque wrench, measure the total preload.

Total preload (starting):

Add drive pinion preload

0.4 – 0.6 N-m

(4 – 6 kgf-cm, 3.5 – 5.2 in.-lbf)



D9363

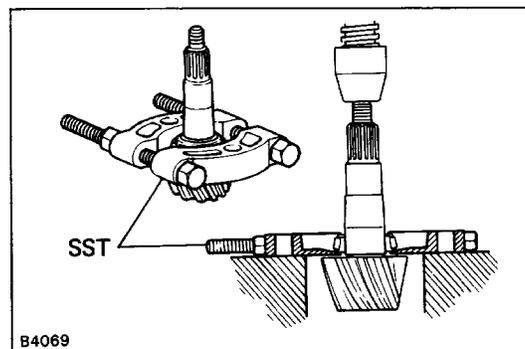
7. INSPECT TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION

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

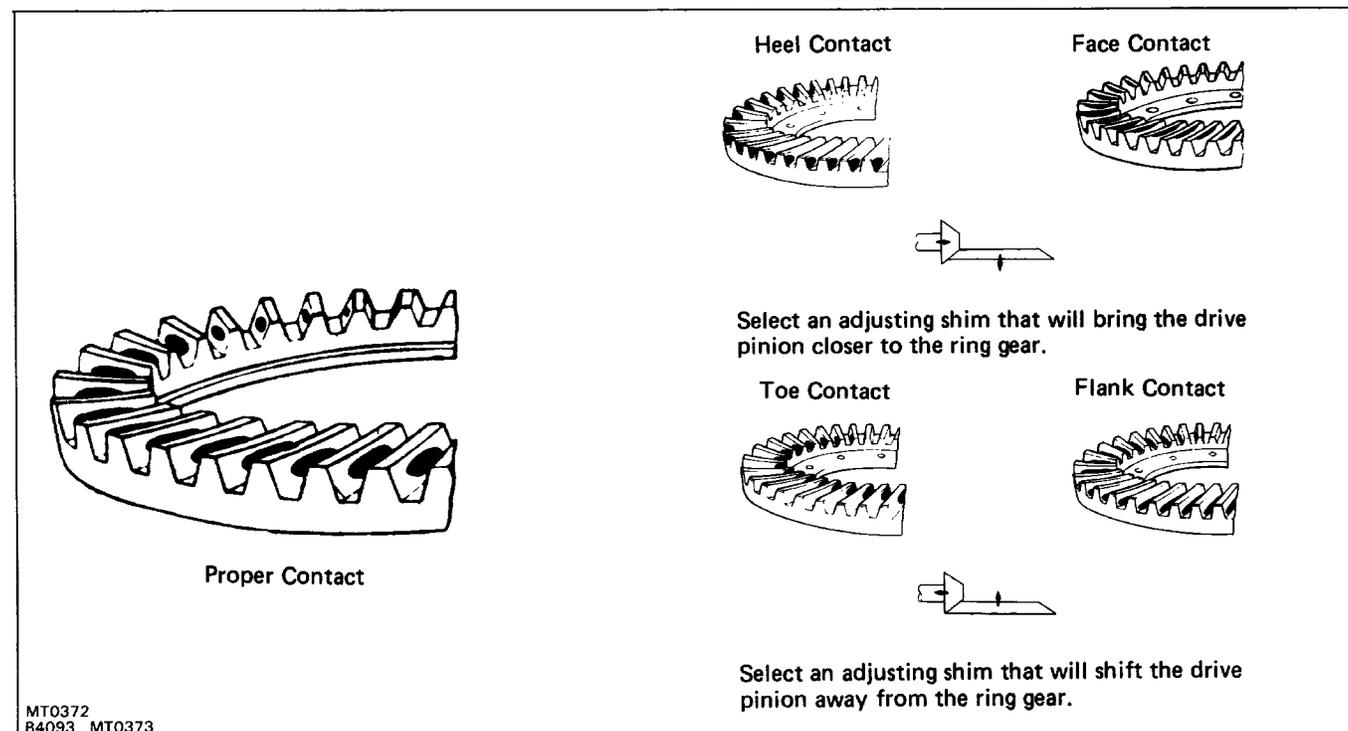
If the teeth are not contacting properly, use the following chart to select a proper washer for correction.

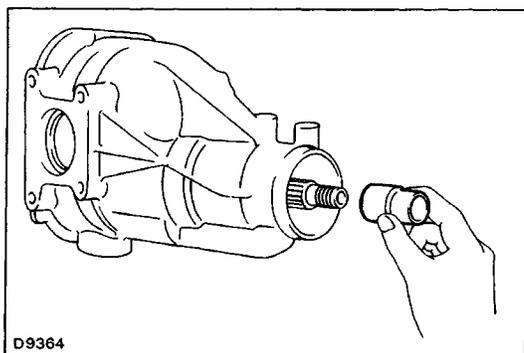
Washer thickness

Thickness mm (in.)	
2.24 (0.0882)	2.51 (0.0988)
2.27 (0.0894)	2.54 (0.1000)
2.30 (0.0906)	2.57 (0.1012)
2.33 (0.0917)	2.60 (0.1024)
2.36 (0.0929)	2.63 (0.1035)
2.39 (0.0941)	2.66 (0.1047)
2.42 (0.0953)	2.69 (0.1059)
2.45 (0.0965)	2.72 (0.1071)
2.48 (0.0976)	



B4069



**8. REMOVE COMPANION FLANGE**

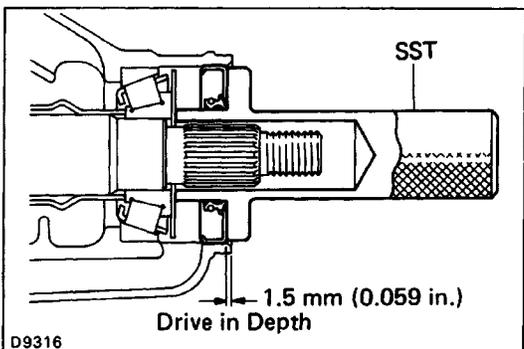
(See step 11 on page SA-68)

9. REMOVE FRONT BEARING

(See step 12 on page SA-69)

10. INSTALL NEW BEARING SPACER AND FRONT BEARING

- Install a new bearing spacer on the drive pinion.
- Install the front bearing on the drive pinion.

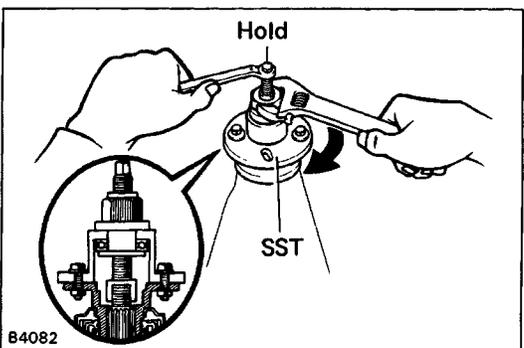
**11. INSTALL OIL SLINGER AND NEW OIL SEAL**

- Install the oil slinger.
- Using SST, drive in a new oil seal.

SST 09554-3001 1

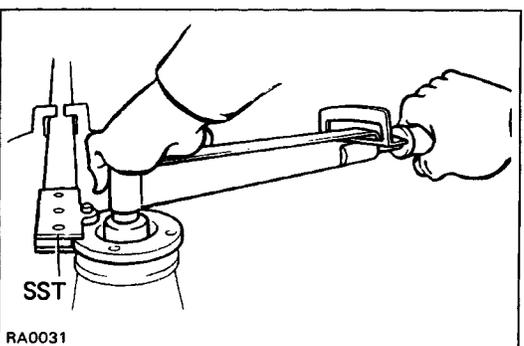
Oil seal drive in depth: 1.5 mm (0.059 in.)

- Apply MP grease to the oil seal lip.

**12. INSTALL COMPANION FLANGE**

- Using SST, install the companion flange on the shaft.

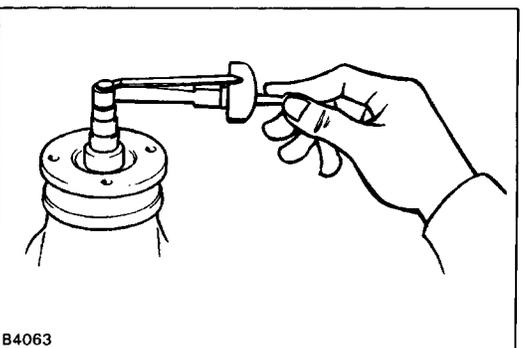
SST 09557-22022 (09557-22030)



- Coat the threads of a new nut with MP grease.
- Using SST to hold the flange, tighten the nut.

Torque the nut.

SST 09330-00021

Torque: 120 N-m (1,225 kgf-cm, 89 ft-lbf)**13. CHECK FRONT BEARING PRELOAD**

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

Preload (starting):**New bearing**

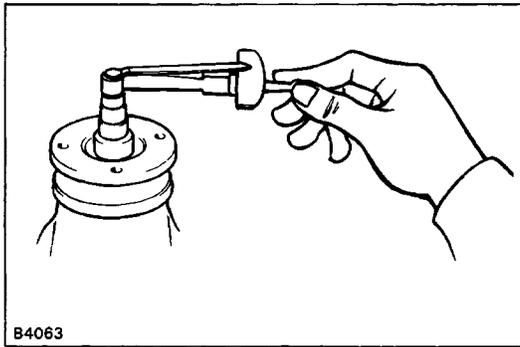
1.2 – 1.9 N-m

(12 – 19 kgf-cm, 10.4 – 16.5 in.-lbf)

Reused bearing

0.6 – 1.0 N-m

(6 – 10 kgf-cm, 5.2 – 8.7 in.-lbf)



- (a) If the preload is greater than specification, replace the bearing spacer.
- (b) If the preload is less than specification, retighten the nut 13 N-m (130 kgf-cm, 9 ft-lbf) a little at a time until the specified preload is reached.

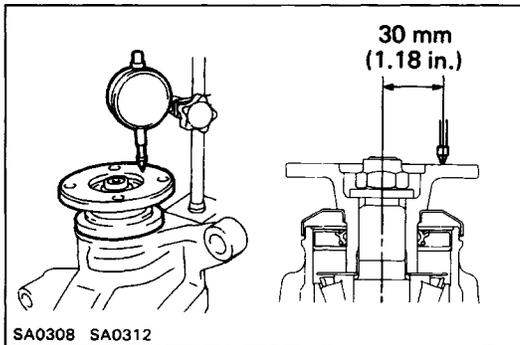
Maximum torque: 223 N-m (2,275 kgf-cm, 165 ft-lbf)

If the maximum torque is exceeded while retightening the nut, replace the bearing spacer and repeat the preload procedure. Do not back off the pinion nut to reduce the preload.

14. CHECK RUNOUT OF COMPANION FLANGE

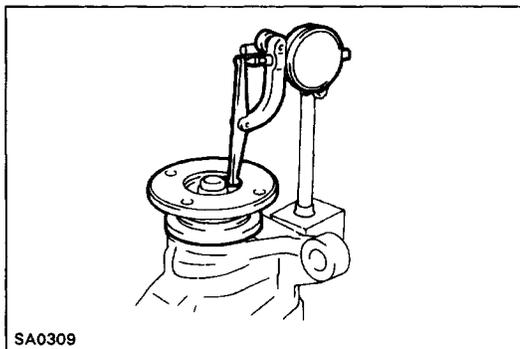
Using a dial indicator, measure the vertical and lateral runout of the companion flange.

Maximum vertical runout: 0.10 mm (0.0039 in.)

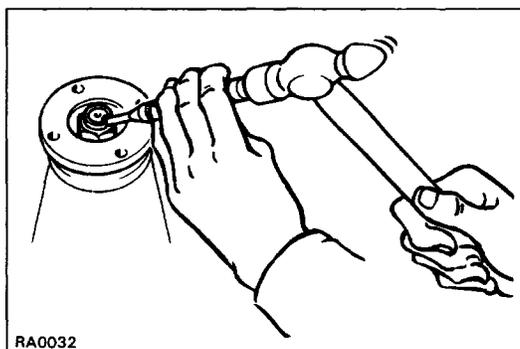


Maximum lateral runout: 0.10 mm (0.0039 in.)

If the runout is greater than maximum, inspect the bearings.



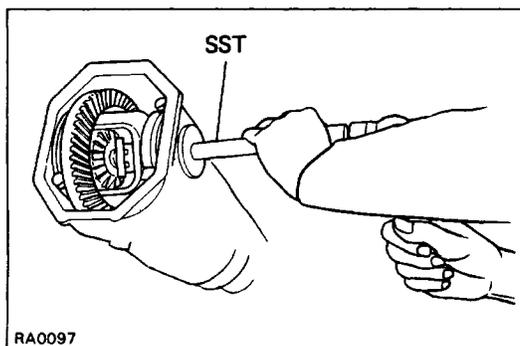
15. STAKE DRIVE PINION NUT

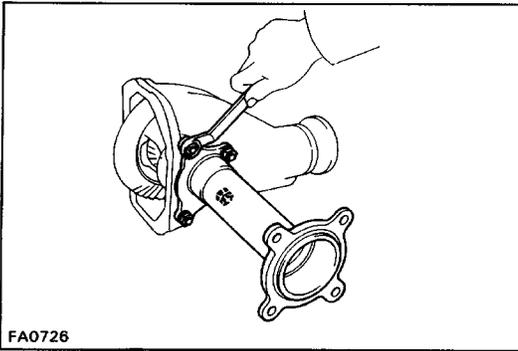


16. INSTALL NEW SIDE GEAR SHAFT OIL SEAL

- (a) Coat the oil seal lip with MP grease.
- (b) Using SST, drive in the oil seal until it is flush with the carrier end surface.

SST 09550-22011 (09550-00020, 09550-00031)

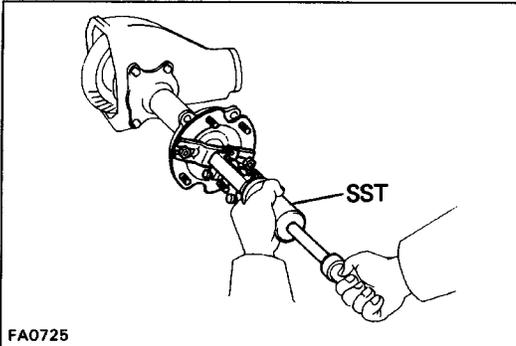




17. INSTALL DIFFERENTIAL TUBE

Install the differential tube to the differential carrier with the four bolts.

Torque: 88 N-m (900 kgf-cm, 65 ft-lbf)

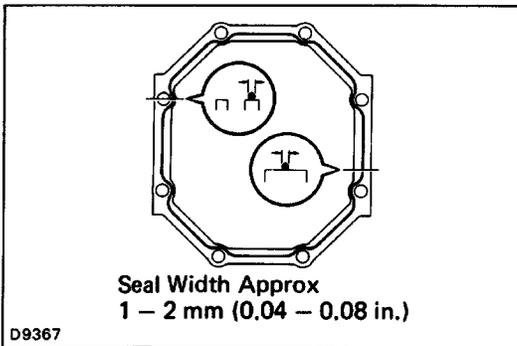


18. INSTALL SIDE GEAR SHAFTS

- (a) Before installing the shafts, replace the snap ring.
- (b) Using SST, install the side gear shafts to the differential carrier.

SST 09910-00015

(09911-00011, 09912-00010, 09914-00011)

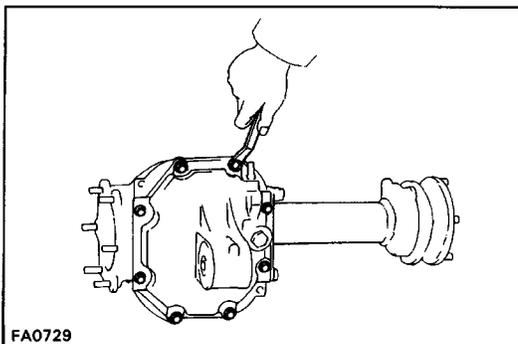


19. INSTALL DIFFERENTIAL CARRIER COVER

- (a) Remove any packing material and be careful not to drop oil on the contacting surface of the differential carrier or carrier cover.
- (b) Apply seal packing to the carrier cover.

Seal packing: Part No. 08826-00090, THREE BOND 1281 or equivalent

HINT: Install the carrier cover within ten minutes after applying seal packing.



- (c) Install and torque the bolts.

Torque: 47 N-m (475 kgf-cm, 34 ft-lbf)