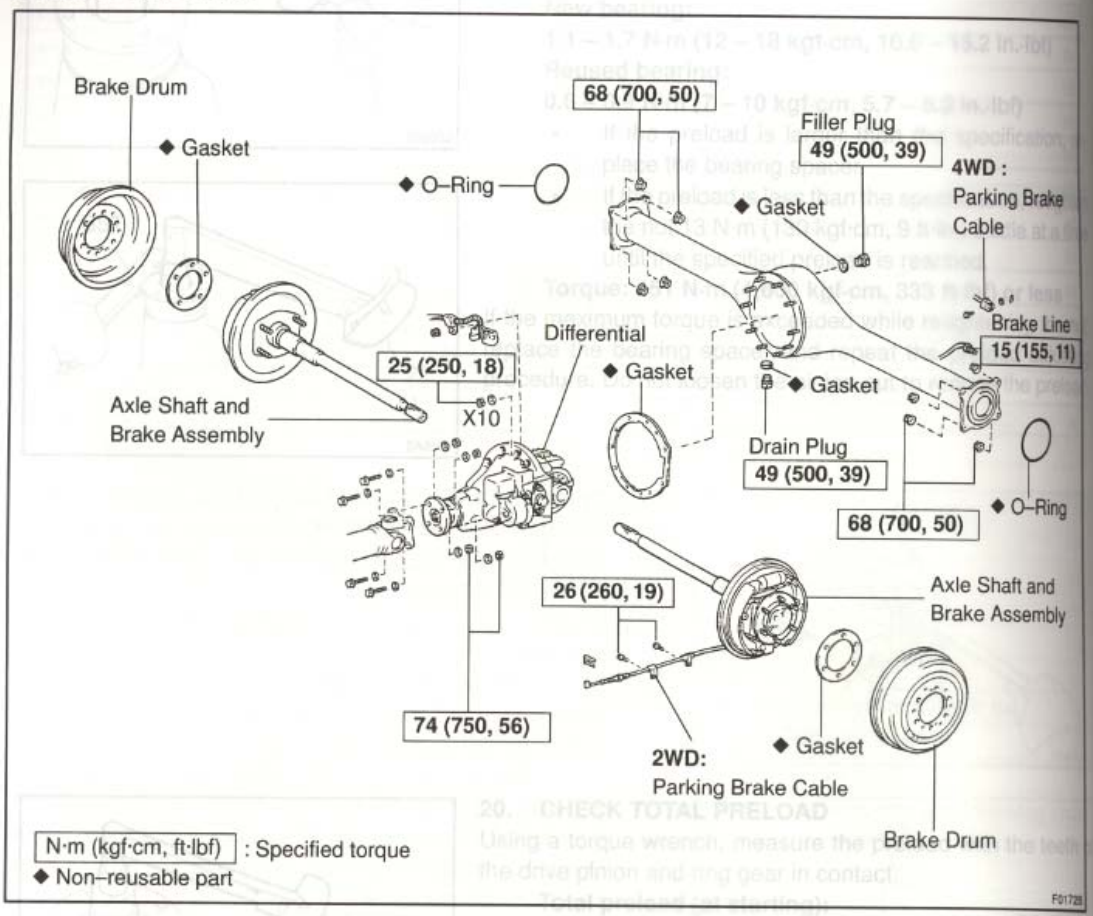
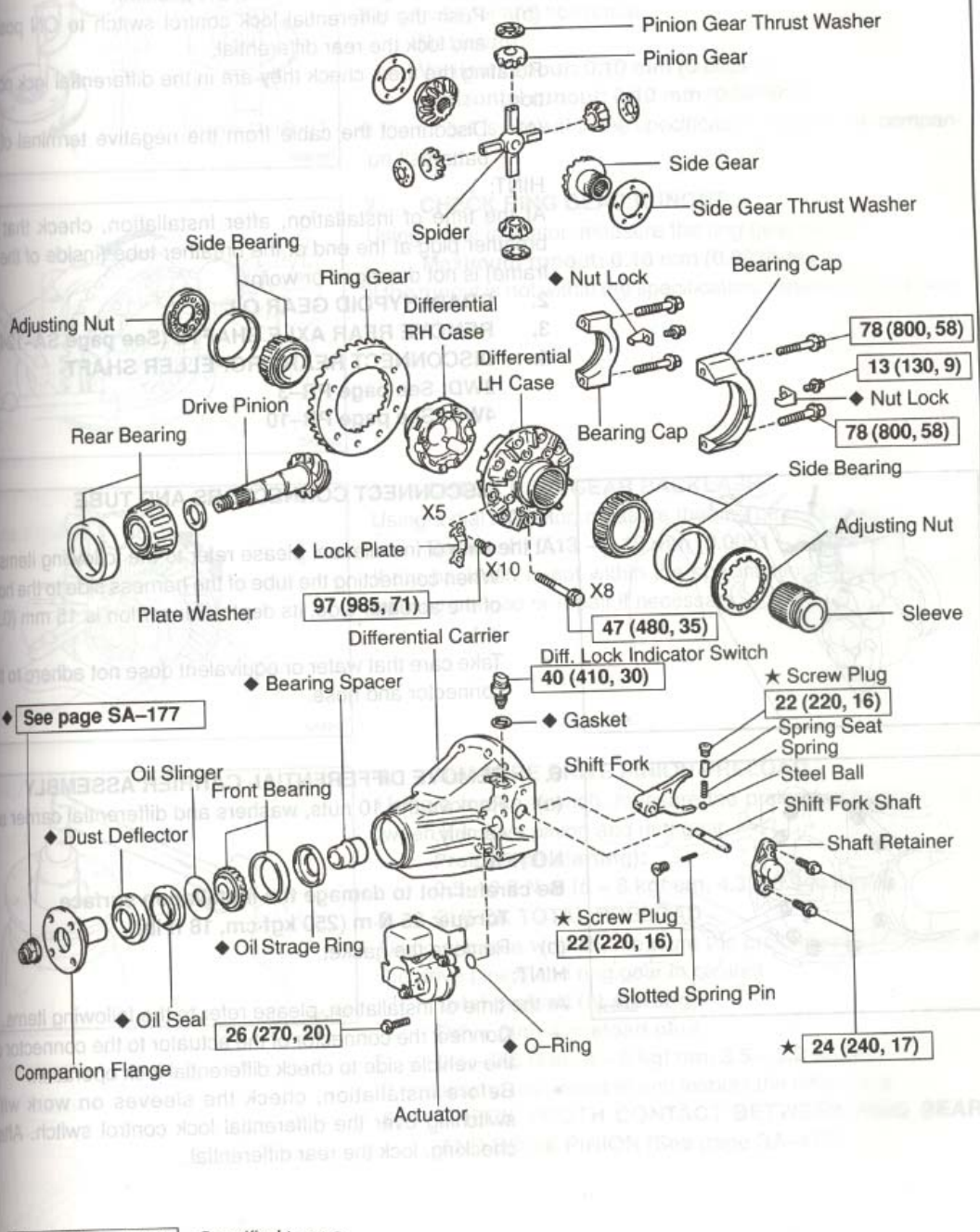
4 Runner Diff rebuild

REAR DIFFERENTIAL CARRIER (3RZ–FE, 5VZ–FE w/ Diff. Lock)

COMPONENTS





N·m (kgf·cm, ft·lbf) : Specified torque
◆ Non–reusable part
★ Precoated part

Z19301

REMOVAL

1. SHIFTING DIFF. LOCK POSITION

(a) Turn the ignition switch to ON position.

(b) Push the differential lock control switch to ON position and lock the rear differential.

Rotating the tires, check they are in the differential lock condition.

(c) Disconnect the cable from the negative terminal of the battery.

HINT:

At the time of installation, after installation, check that the breather plug at the end of the breather tube (inside of the LH frame) is not damaged or worn.

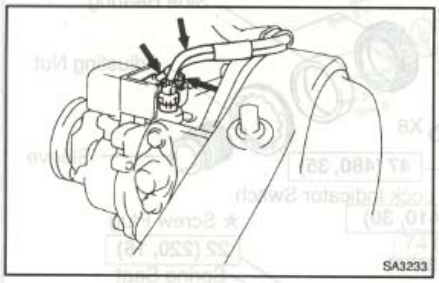
2. DRAIN HYPOID GEAR OIL

3. REMOVE REAR AXLE SHAFTS (See page SA–124)

4. DISCONNECT REAR PROPELLER SHAFT

2WD: See page PR–3

4WD: See page PR–10

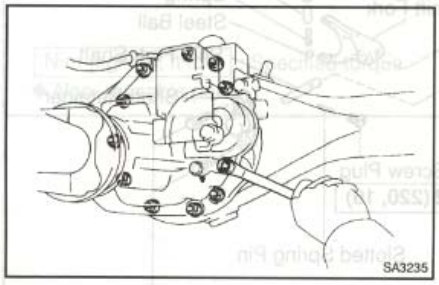

SA3233

5. DISCONNECT CONNECTORS AND TUBE

HINT:

At the time of installation, please refer to the following items.

- When connecting the tube of the harness side to the hose of the actuator side, its depth of insertion is 15 mm (0.59 in.).
- Take care that water or equivalent dose not adhere to the connector and hose.


SA3235

6. REMOVE DIFFERENTIAL CARRIER ASSEMBLY

(a) Remove the 10 nuts, washers and differential carrier assembly.

NOTICE:

Be careful not to damage the installation surface.

Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

(b) Remove the gasket.

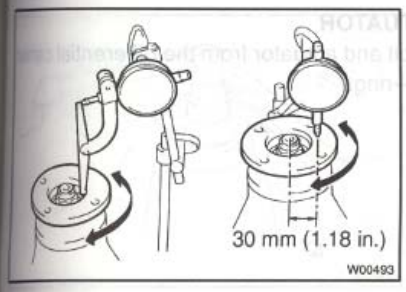
HINT:

At the time of installation, please refer to the following items.

- Connect the connector of the actuator to the connector of the vehicle side to check differential lock operation.
- Before installation, check the sleeves on work with switching over the differential lock control switch. After checking, lock the rear differential.

SA09V-01

DISASSEMBLY

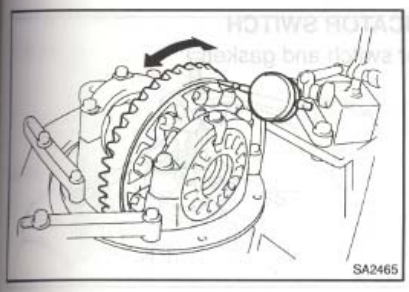


1. CHECK RUNOUT OF COMPANION FLANGE

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

Maximum:
Vertical runout: 0.10 mm (0.0039 in.)
Horizontal runout: 0.10 mm (0.0039 in.)

If the runout is not within the specification, replace the companion flange.

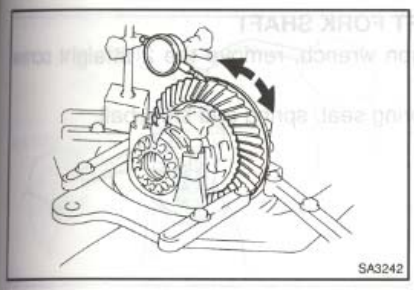


2. CHECK RING GEAR RUNOUT

Using a dial indicator, measure the ring gear runout.

Maximum runout: 0.10 mm (0.0039 in.)

If the runout is not within the specification, replace the ring gear.

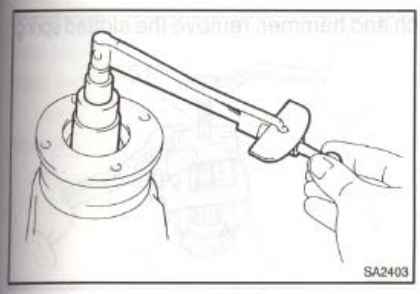


3. CHECK RING GEAR BACKLASH

Using a dial indicator, measure the ring gear backlash.

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

If the backlash is not within the specification, adjust the side bearing preload or repair if necessary.



4. MEASURE DRIVE PINION PRELOAD

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

Preload (at starting):
0.5 – 0.8 N·m (5 – 8 kgf·cm, 4.3 – 6.9 in.·lbf)

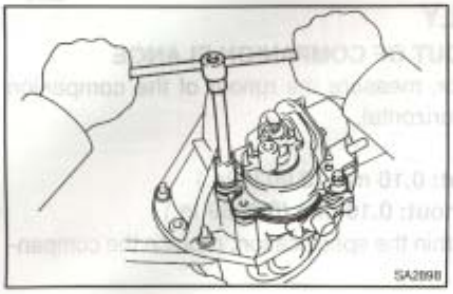
5. CHECK TOTAL PRELOAD

Using a torque wrench, measure the preload with the teeth of the drive pinion and ring gear in contact.

Total preload (at starting):
Drive pinion preload plus
0.4 – 0.6 N·m (4 – 6 kgf·cm, 3.5 – 5.2 in.·lbf)

If necessary, disassemble and inspect the differential.

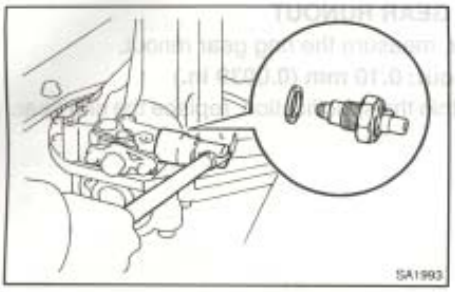
6. CHECK TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION (See page SA–177)



7. REMOVE ACTUATOR

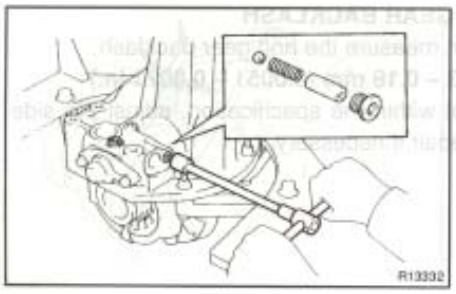
(a) Remove the bolt and actuator from the differential case.

(b) Remove the O–ring.



8. REMOVE INDICATOR SWITCH

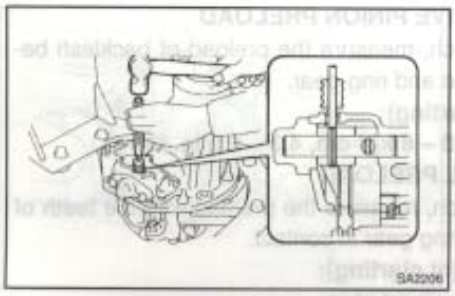
Remove the indicator switch and gasket.



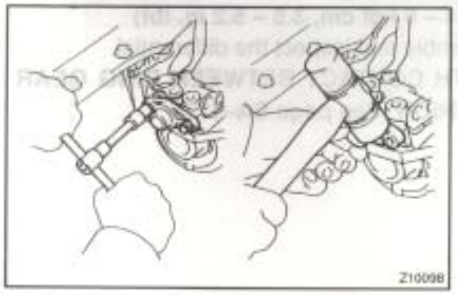
9. REMOVE SHIFT FORK SHAFT

(a) Using a hexagon wrench, remove the 2 straight screw plugs.

(b) Remove the spring seat, spring and steel ball.



(c) Using a pin punch and hammer, remove the slotted spring pin.



(d) Remove the 2 bolts from the shaft retainer.

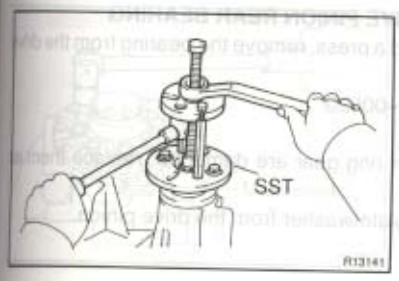
(e) Using a plastic hammer, remove the shaft retainer.

(f) Remove the shift fork shaft.

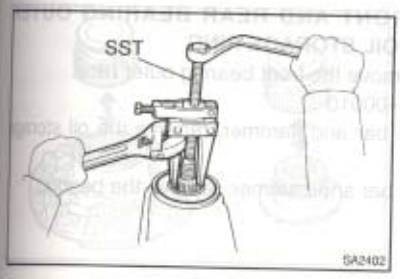
10. REMOVE COMPANION FLANGE

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

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



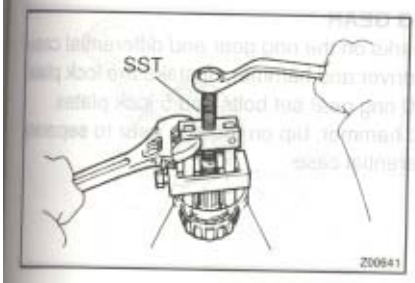
(c) Using SST, remove the companion flange.
SST 09950–30010 (09951–03010, 09953–03010, 09954–03010, 09955–03030, 09956–03020)



11. REMOVE OIL SEAL AND OIL SLINGER

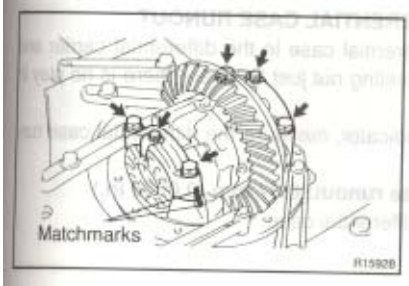
(a) Using SST, remove the oil seal from the differential carrier.
SST 09350–32014 (09308–10010)

(b) Remove the oil slinger.



12. REMOVE FRONT BEARING

Using SST, remove the front bearing from the drive pinion.
SST 09556–22010

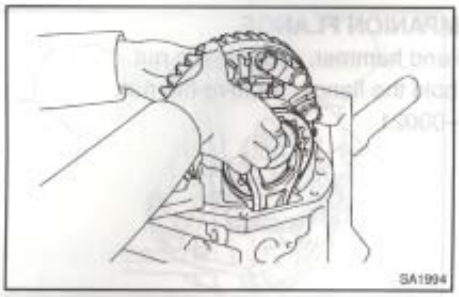


13. REMOVE DIFFERENTIAL CASE

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

(b) Remove the 2 adjusting nut locks.

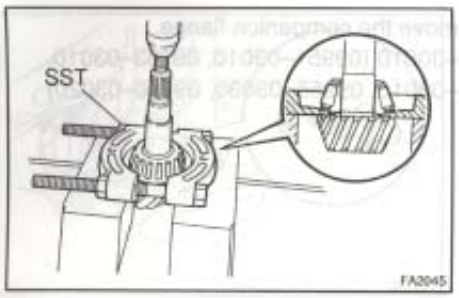
(c) Remove the 4 bolts and 2 bearing caps.



(d) Remove the differential case with side bearing outer race, adjusting nuts and sleeve from the differential carrier.
(e) Remove the shift fork.

14. REMOVE DRIVE PINION AND BEARING SPACER

(a) Remove the drive pinion with the rear bearing.
(b) Remove the bearing spacer.

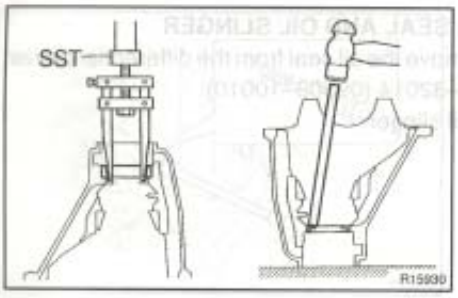


15. REMOVE DRIVE PINION REAR BEARING

(a) Using SST and a press, remove the bearing from the drive pinion.
SST 09950–00020

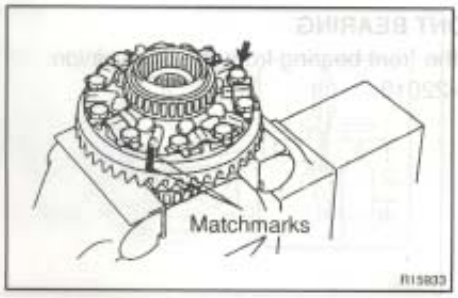
HINT:
If the drive pinion or ring gear are damaged, replace them as a set.

(b) Remove the plate washer from the drive pinion.



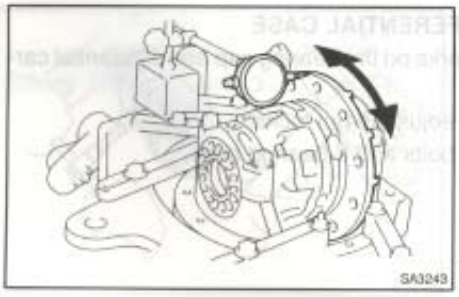
16. REMOVE FRONT AND REAR BEARING OUTER RACES AND OIL STORAGE RING

(a) Using SST, remove the front bearing outer race.
SST 09308–00010
(b) Using a brass bar and hammer, remove the oil storage ring.
(c) Using a brass bar and hammer, remove the bearing.



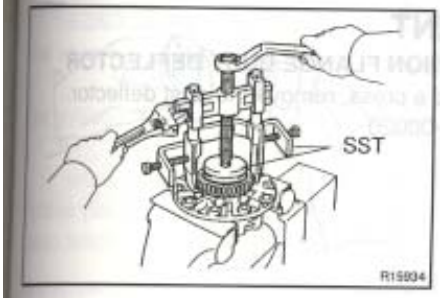
17. REMOVE RING GEAR

(a) Place matchmarks on the ring gear and differential case.
(b) Using a screwdriver and hammer, unstake the lock plate.
(c) Remove the 10 ring gear set bolts and 5 lock plates.
(d) Using a plastic hammer, tap on the ring gear to separate it from the differential case.



18. 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.
(b) Using a dial indicator, measure the differential case runout.
Maximum case runout: 0.07 mm (0.0028 in.)
(c) Remove the differential case.



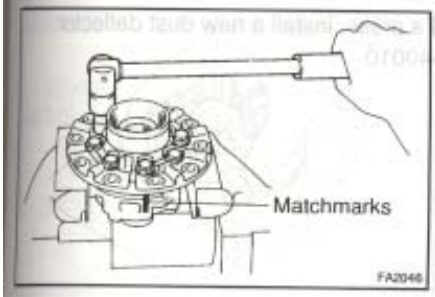
19. REMOVE SIDE BEARING FROM DIFFERENTIAL CASE

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

SST 09950–40010 (09951–04010, 09952–04010, 09953–04020, 09954–04010, 09955–04060, 09957–04010, 09958–04010), 09950–60010 (09951–00480), 09950–60020 (09951–00730)

HINT:

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



20. DISASSEMBLE DIFFERENTIAL CASE

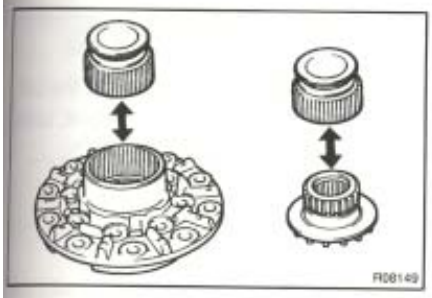
(a) Place matchmarks on the LH and RH cases.

(b) Remove the 8 bolts uniformly, a little at a time.

(c) Using a plastic hammer, separate the LH and RH cases.

(d) Remove these parts from the differential case:

- 2 side gears
- 2 side gear thrust washers
- Spider
- 4 pinion gears
- 4 pinion gear thrust washers



21. INSPECT SLEEVE

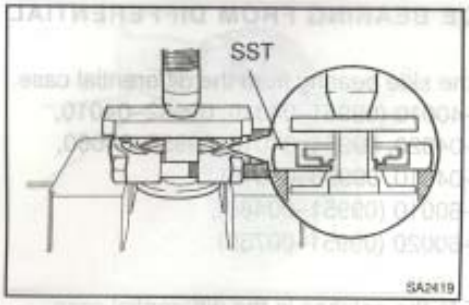
(a) Install the sleeve to the differential case (LH) and check it moves smoothly.

(b) Install the sleeve to the side gear and check it moves smoothly.

22. MEASURE CLEARANCE OF SHIFT FORK AND SLEEVE

Using a feeler gauge, measure the clearance between the shift fork and sleeve.

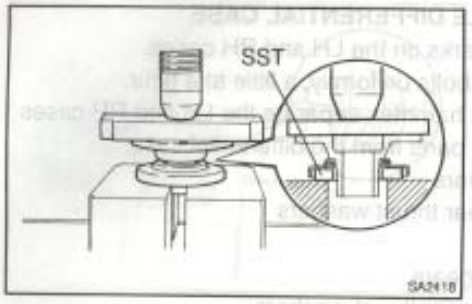
Clearance (Reference):
0.15 – 0.35 mm (0.006 – 0.014 in.)



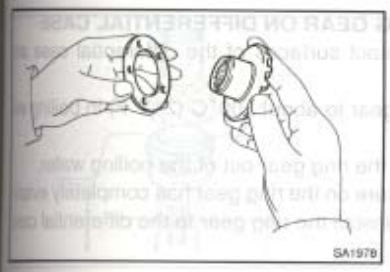
REPLACEMENT

REPLACE COMPANION FLANGE DUST DEFLECTOR

(a) Using SST and a press, remove the dust deflector.
SST 09950–00020



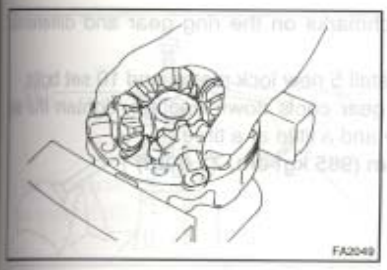
(b) Using SST and a press, install a new dust deflector.
SST 09726–40010



REASSEMBLY

1. ASSEMBLE DIFFERENTIAL CASE

(a) Apply all of the sliding and rotating surfaces with gear oil.
(b) Install the side gear thrust washer to the side gear.
(c) Install the side gear to the RH case.



(d) Install the 4 pinion gears and pinion gear thrust washers to the spider.
(e) Install the pinion gear with spider to the RH case.
(f) Using a dial indicator, measure the side gear backlash with holding the side gear and spider.
Backlash: 0.05 – 0.20 mm (0.0020 – 0.0079 in.)

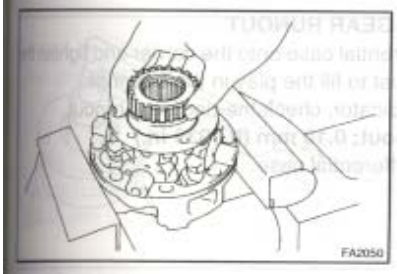
HINT:

- Measure at all 4 locations.
- Measure the backlash at the RH case and the LH case.

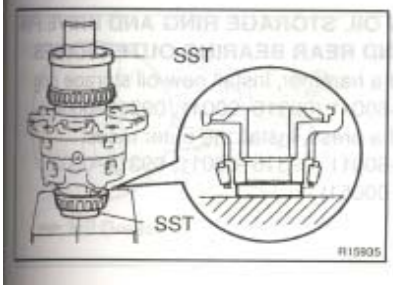
If the backlash is not within the specification, install a thrust washer of a different thickness.

Thrust washer thickness

Thickness mm (in.)	Thickness mm (in.)
0.9 (0.035)	1.2 (0.047)
1.0 (0.039)	1.3 (0.051)
1.1 (0.043)	–



(g) Install the side gear and side gear thrust washer to the RH case.
(h) Install the pinion gears and spider to the RH case.
(i) Install the side gear and side gear thrust washer to the RH case.
(j) Align the matchmarks on the LH and RH cases.
(k) Torque the 8 bolts uniformly, a little at a time.
Torque: 47 N·m (480 kgf·cm, 35 ft·lbf)



2. INSTALL SIDE BEARINGS

Using SST and a press, install the side bearings on the differential case.

SST 09950–60010 (09951–00480, 09951–00550), 09950–60020 (09951–00730)