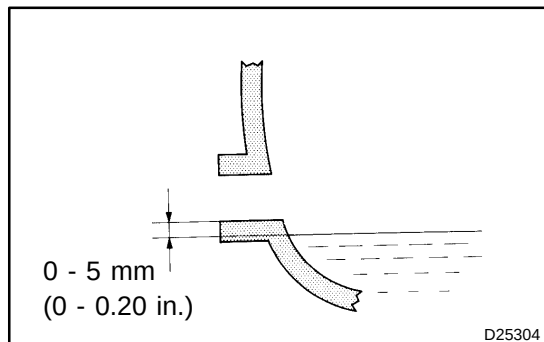


DIFFERENTIAL OIL (4WD) ADJUSTMENT

2900Y-02



1. INSPECT DIFFERENTIAL OIL

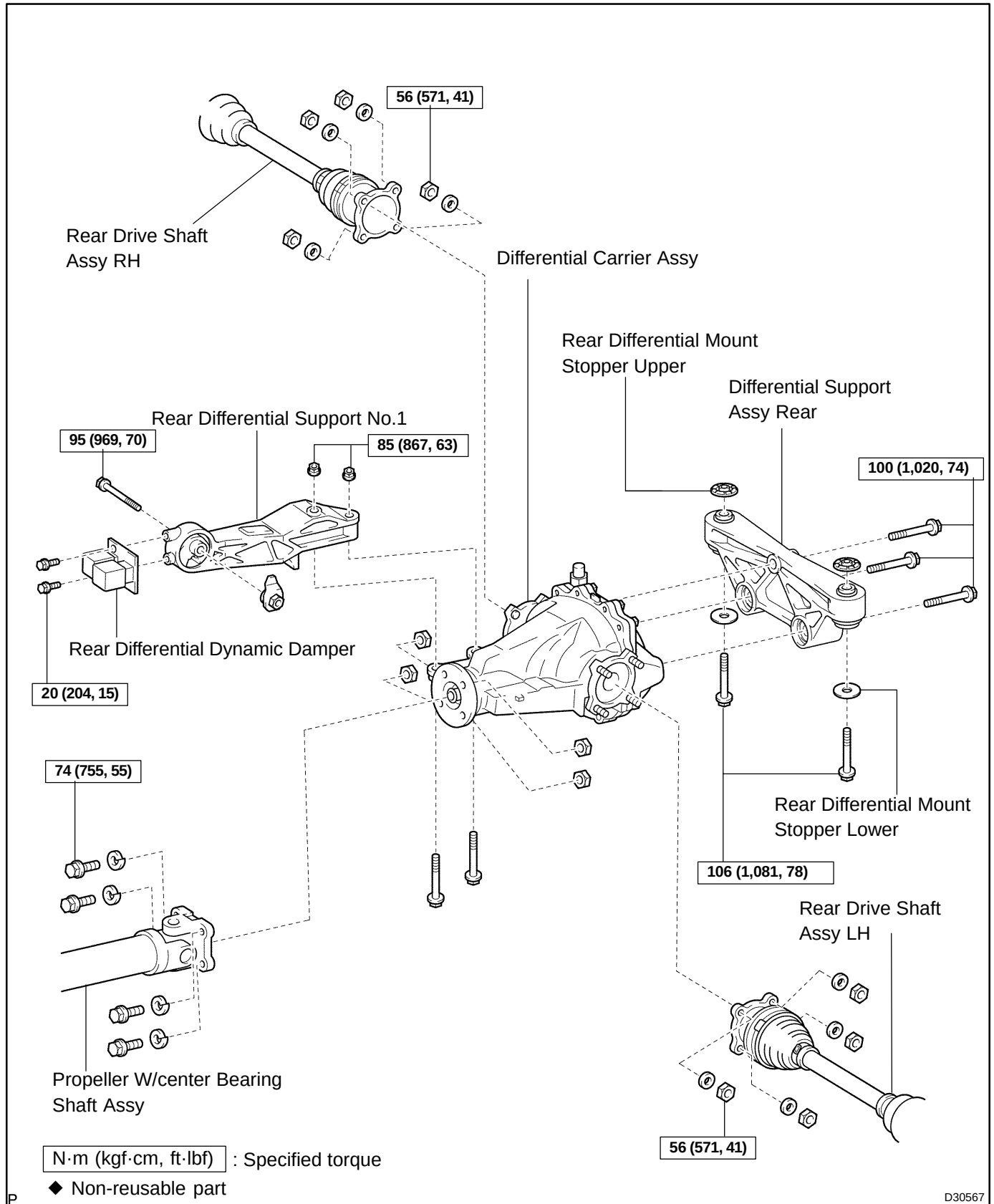
- (a) Stop the vehicle on the level place.
- (b) Remove the differential filler plug and gasket.
- (c) Check that the oil surface is within 5 mm (0.20 in.) from the lowest position of the inner surface of the differential filler plug opening.

NOTICE:

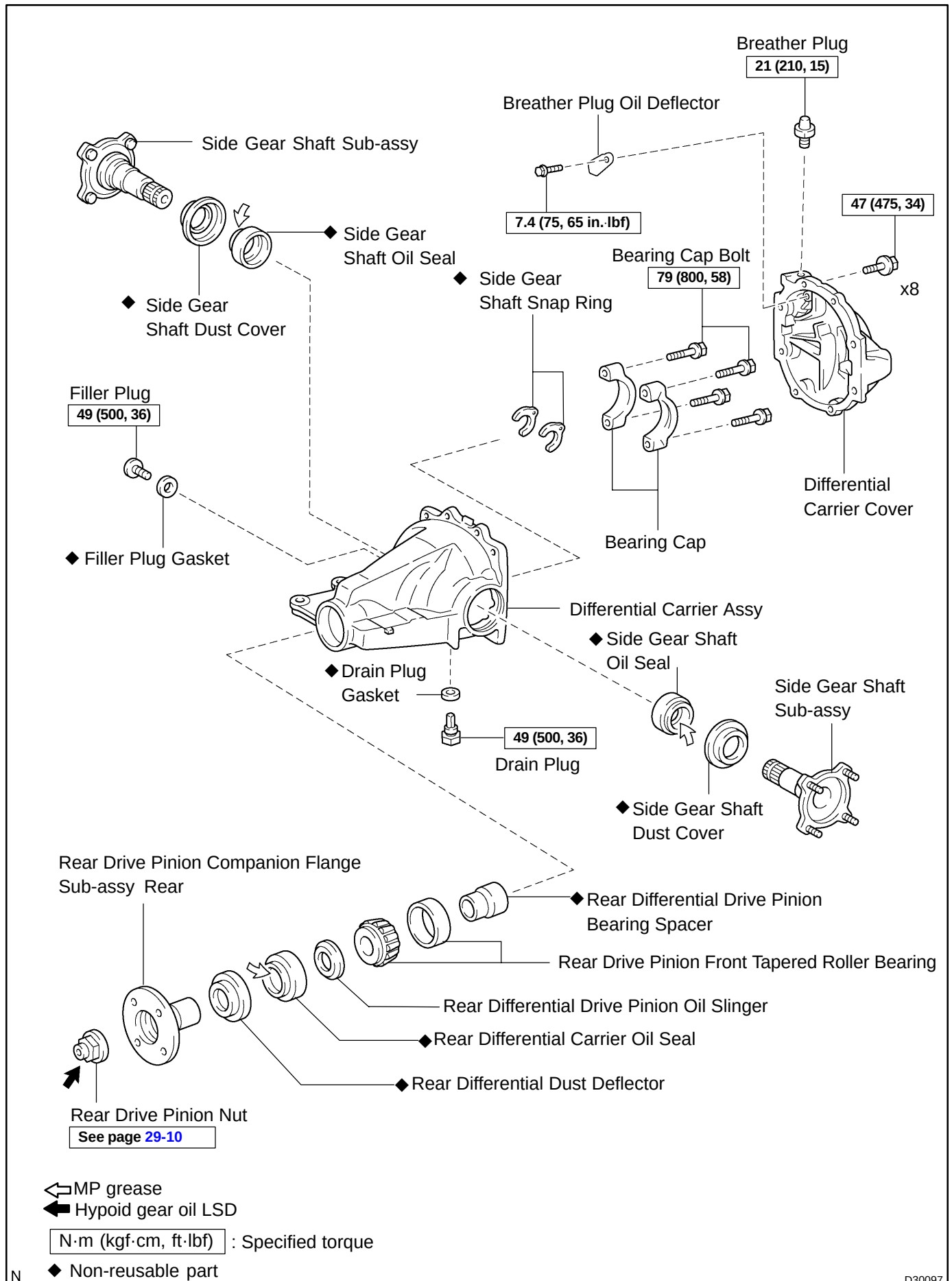
- Excessively large or small amount of oil may cause troubles.
 - After replacing oil, drive the vehicle and check the oil level.
- (d) Check for oil leakage when the oil level is low.
 - (e) Install the differential filler plug and a new gasket.
- Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)**

DIFFERENTIAL (4WD) COMPONENTS

29081-01

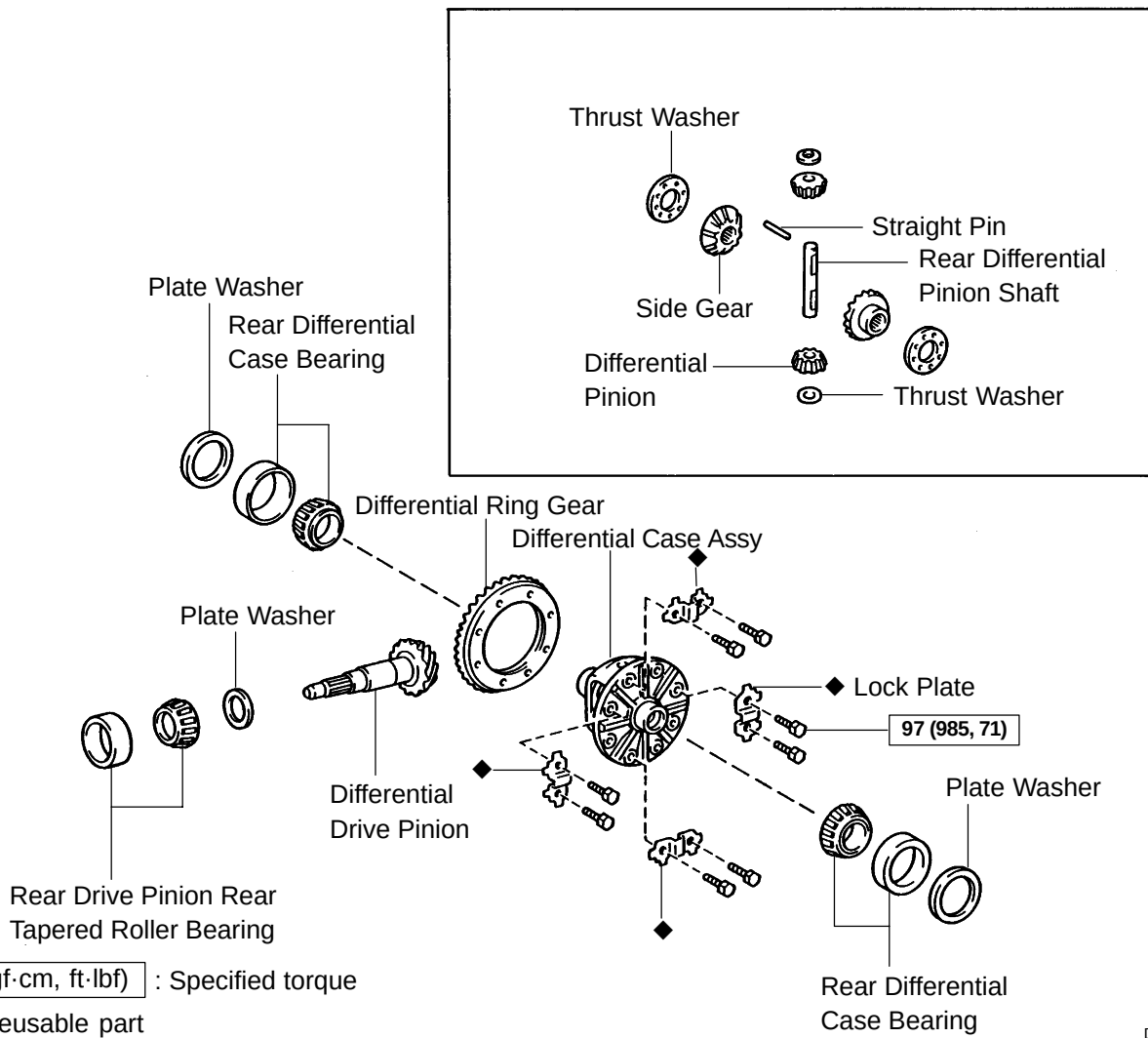


D30567



D30097

F40721



D30563

DIFFERENTIAL SYSTEM (4WD)

2900W-02

PRECAUTION

1. Before disassembly, clean the outside of the rear differential assy and remove any sand or mud to prevent it from entering the inside of the assembly during disassembly and installation.
2. When removing a connected part made of light alloy such as a rear differential carrier cover, tap it off with a plastic hammer. Do not attempt to pry it off with a screwdriver.
3. Always arrange disassembled parts in order and protect them from dust.
4. Before installation, thoroughly clean and dry each part and then apply hypoid gear oil LSD to it. Do not use alkaline cleaner for aluminum or rubber parts and ring gear set bolts. Also, do not clean rubber parts such as O-rings or oil seals with white gasoline.
5. Coat any sliding surface and rotating part with hypoid gear oil LSD.
6. When holding a component part by a vise, be sure to place an aluminum sheet under the part. Do not put it directly on the vise.
7. Be careful not to damage the contact surfaces of the case. Such damage may cause oil leakage.
8. Before applying sealant, remove deposited oil sealant and clean the part to be sealed using white gasoline.
9. Do not supply oil immediately after installing sealed parts. Leave it for at least an hour.
10. Damage on the surface of an oil seal, O-ring or gasket may cause oil leakage. Special attention should be paid.
11. When press-fitting an oil seal, be careful not to damage the oil seal lip and outside periphery.
12. When replacing a bearing, replace the inner and outer races as a set.

PROBLEM SYMPTOMS TABLE

Use the table below to help find the cause of the problem. The numbers indicate the likelihood of the cause in the decending order. Check each part in the order shown. Replace these parts as necessary.

Symptom	Suspect Area	See page
Oil leak from rear differential	1. Oil level (Too high or wrong grade)	29-6
	2. Rear differential front oil seal (Worn or damaged)	29-7
	3. Side gear oil seal (Worn or damaged)	29-10
	4. Companion flange (Loose or damaged)	29-10
	5. Side gear shaft (Damaged)	29-10
Oil leak from drive pinion shaft	1. Oil level (Too high or wrong grade)	29-6
	2. Rear differential front oil seal (Worn or damaged)	29-7
	3. Companion flange (Loose or damaged)	29-10
Oil leak from side gear shaft	1. Oil level (Too high or wrong grade)	29-6
	2. Side gear shaft oil seal (Worn or damaged)	29-10
	3. Side gear shaft (Damaged)	29-10

DIFFERENTIAL CARRIER ASSY REAR (4WD)

29082-02

OVERHAUL

HINT:

- Differential components (See page 29-3)
 - Rear drive shaft components (See page 30-31)
1. **REMOVE REAR WHEEL**
 2. **REMOVE EXHAUST PIPE ASSY (See page 15-6)**
 3. **REMOVE PROPELLER W/CENTER BEARING SHAFT ASSY (See page 30-6)**
SST 09325-20010
 4. **REMOVE REAR DIFFERENTIAL FILLER PLUG**
 - (a) Using a hexagon wrench (10 mm), remove the filler plug and gasket.
 5. **REMOVE REAR DIFFERENTIAL DRAIN PLUG**
 - (a) Using a hexagon wrench (10 mm), remove the drain plug and gasket, drain the oil.
 6. **REMOVE SPEED SENSOR REAR LH (See page 30-32)**
 7. **REMOVE SPEED SENSOR REAR RH**

HINT:

Removal procedure of RH side is the same as that of LH side.

8. **REMOVE REAR AXLE SHAFT LH NUT (See page 30-32)**
SST 09930-00010
9. **REMOVE REAR AXLE SHAFT RH NUT**
SST 09930-00010

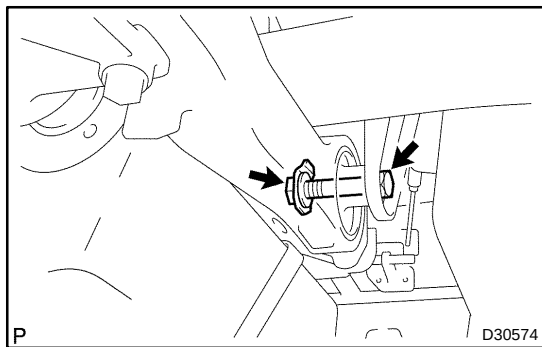
HINT:

Removal procedure of RH side is the same as that of LH side.

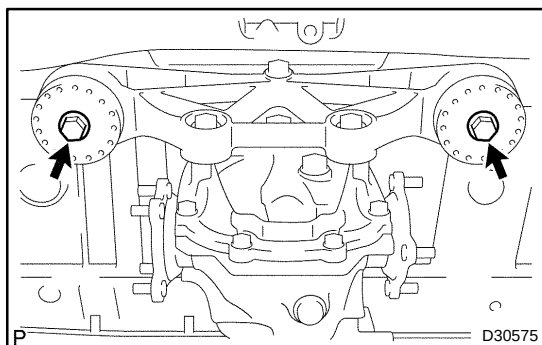
10. **REMOVE REAR DRIVE SHAFT ASSY LH (See page 30-32)**
11. **REMOVE REAR DRIVE SHAFT ASSY RH**

HINT:

Removal procedure of RH side is the same as that of LH side.



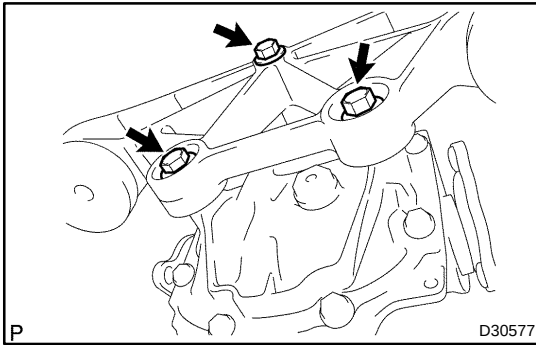
12. **REMOVE DIFFERENTIAL CARRIER ASSY REAR**
 - (a) Support the differential carrier assy rear with a jack.
 - (b) Remove the bolt and nut, separate the rear differential support No.1.



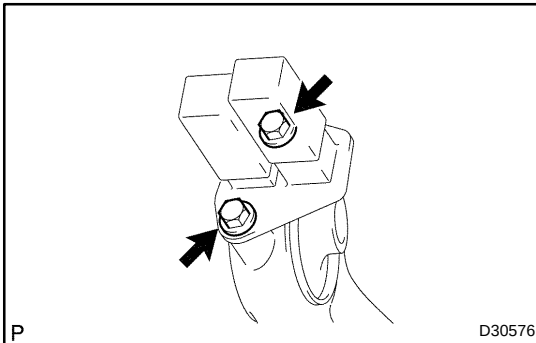
- (c) Remove the 2 bolts, separate the differential support assy rear.

NOTICE:

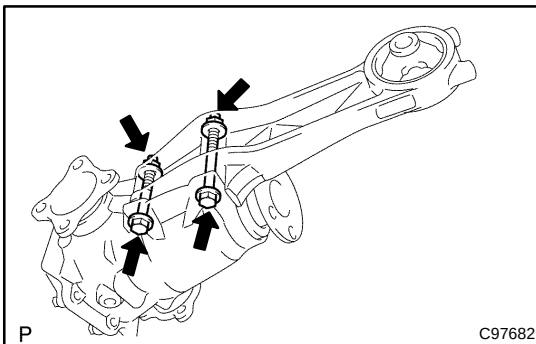
Be careful not to drop the differential carrier assy rear.



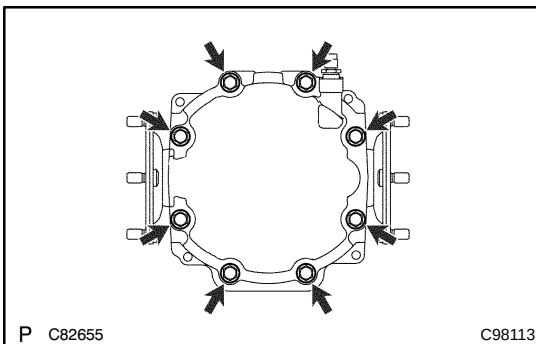
- 13. REMOVE DIFFERENTIAL SUPPORT ASSY REAR**
 (a) Remove the 3 bolts and differential support assy rear.



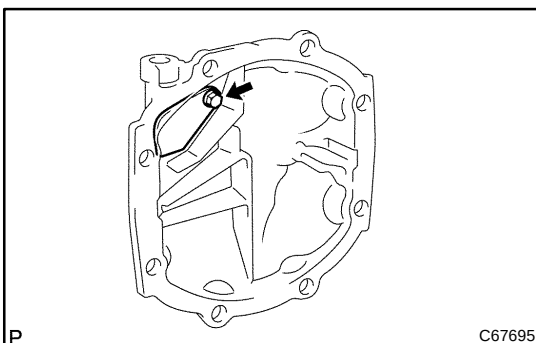
- 14. REMOVE REAR DIFFERENTIAL DYNAMIC DAMPER**
 (a) Remove the 2 bolts and rear differential dynamic damper from the rear differential support No.1.



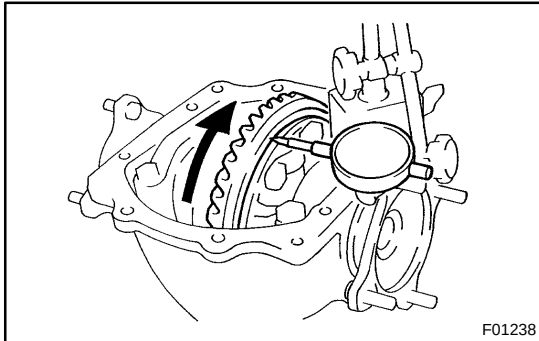
- 15. REMOVE REAR DIFFERENTIAL SUPPORT NO.1**
 (a) Remove the 2 bolts, 2 nuts and rear differential support No.1.



- 16. REMOVE REAR DIFFERENTIAL CARRIER COVER**
 (a) Remove the 8 bolts from the carrier cover.
 (b) Using a brass bar and a hammer, separate the carrier cover from differential carrier assy.
 (c) Remove the breather plug from the differential carrier cover.



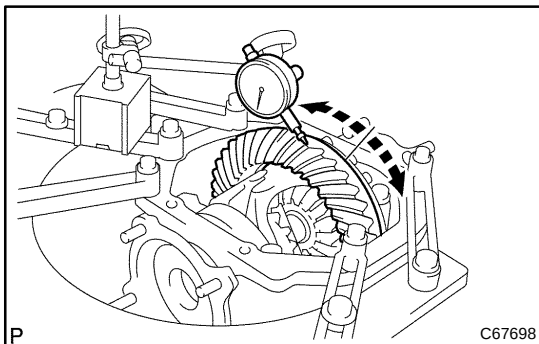
- (d) Remove the bolt and oil deflector from the carrier cover.

17. FIX DIFFERENTIAL CARRIER ASSY REAR**18. INSPECT RUNOUT OF DIFFERENTIAL RING GEAR**

- (a) Using a dial indicator, check the runout of the ring gear.

Maximum runout: 0.07 mm (0.0028 in.)

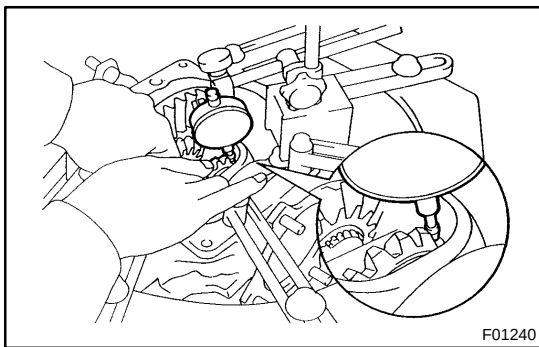
If the runout is greater than the maximum, replace the ring gear with a new one.

**19. INSPECT DIFFERENTIAL RING GEAR BACKLASH**

- (a) Using a dial indicator, check the backlash of the ring gear.

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 as necessary.

20. INSPECT TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION (See step 60)**21. DIFFERENTIAL PINION AND SIDE GEAR BACKLASH**

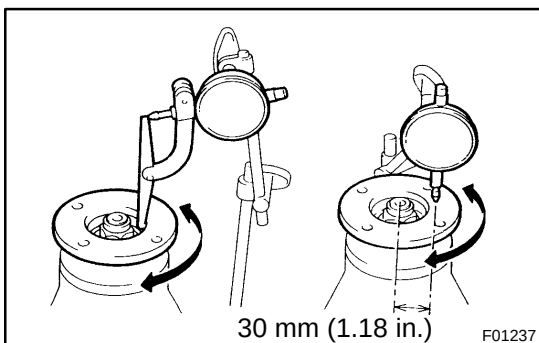
- (a) Using a dial indicator, check the backlash of the side gear while holding 1 pinion gear toward the differential case.

Backlash: 0.05 - 0.20 mm (0.0020 - 0.0079 in.)

If the backlash is not within the specification, install the 2 side gear thrust washers of different thickness (See step 48).

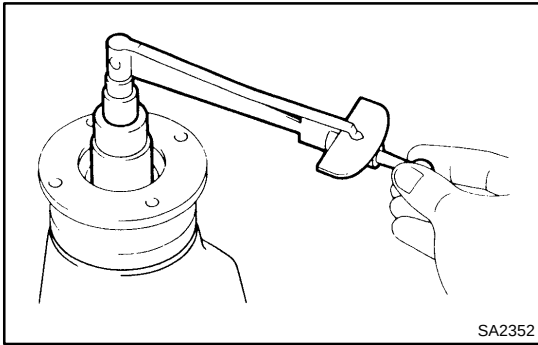
HINT:

Measure the backlash of the side gear with the side gear shaft installed.

**22. INSPECT RUNOUT OF REAR DRIVE PINION COMPANION FLANGE SUB-ASSY REAR**

- (a) Using a dial indicator, measure the runout of the companion flange vertically and horizontally.

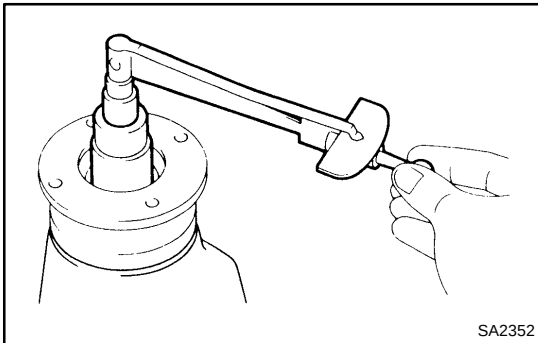
Maximum runout: 0.10 mm (0.0039 in.)

**23. INSPECT DIFFERENTIAL DRIVE PINION PRELOAD**

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

Preload (at starting):

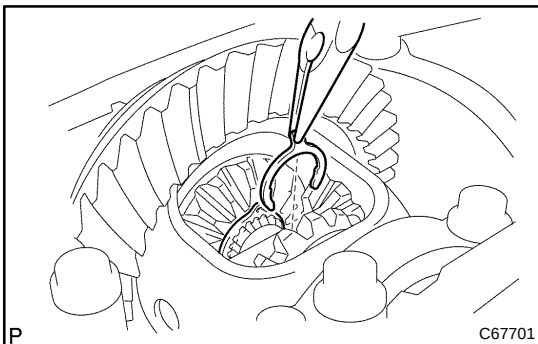
0.6 - 0.9 N·m (6 - 9 kgf·cm, 5.2 - 7.8 in.·lbf)

**24. INSPECT TOTAL PRELOAD**

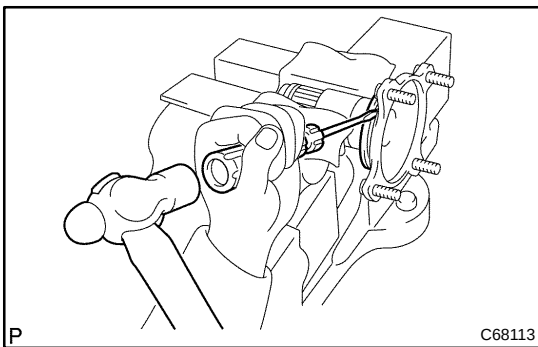
- (a) Using a torque wrench, measure the total preload.

**Total preload (at starting): Drive pinion preload plus
0.3 - 0.5 N·m (3 - 5 kgf·cm, 2.6 - 4.3 in.·lbf)**

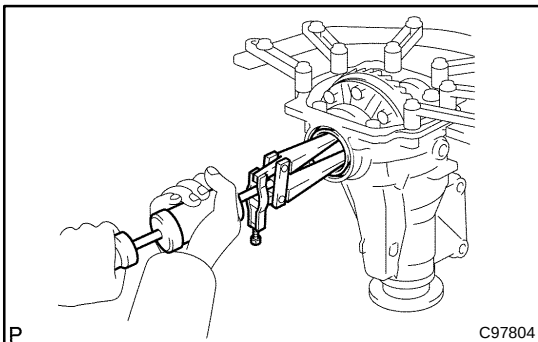
Disassemble and inspect the differential as necessary.

**25. REMOVE REAR DIFFERENTIAL SIDE GEAR SHAFT SUB-ASSY**

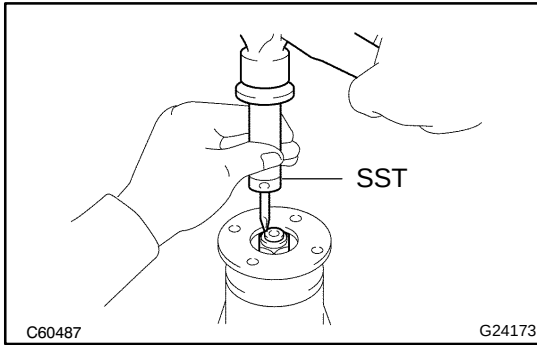
- (a) Using needle nose pliers, remove the 2 snap rings from the 2 side gear shafts.
(b) Remove the 2 side gear shafts.

**26. REMOVE REAR DIFFERENTIAL SIDE GEAR SHAFT DUST COVER**

- (a) Using a screwdriver and a hammer, remove the side gear shaft dust cover.

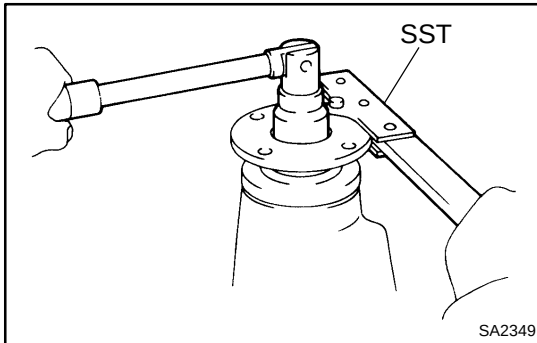
**27. REMOVE REAR DIFFERENTIAL SIDE GEAR SHAFT SEAL OIL**

- (a) Using SST, remove the 2 oil seals from the housing.
SST 09308-00010

**28. REMOVE REAR DRIVE PINION NUT**

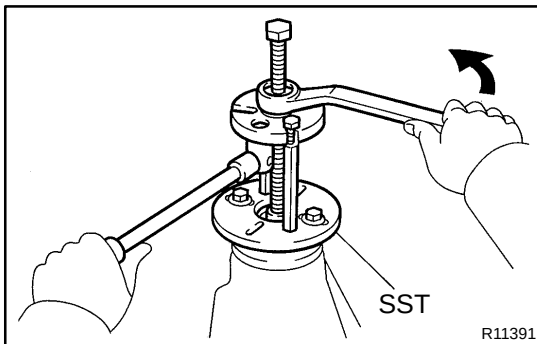
- (a) Using a chisel and a hammer, unstake the staked part of the nut.

SST 09930-00010



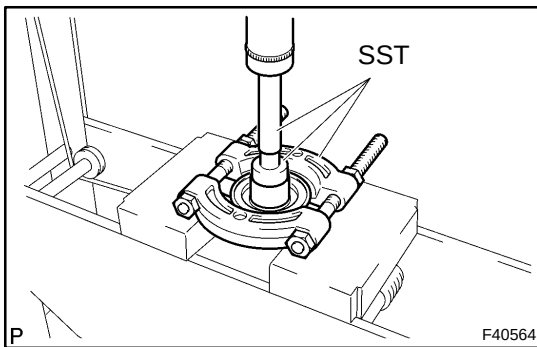
- (b) Using SST to hold the flange, remove the nut.

SST 09330-00021

**29. REMOVE REAR DRIVE PINION COMPANION FLANGE SUB-ASSYREAR**

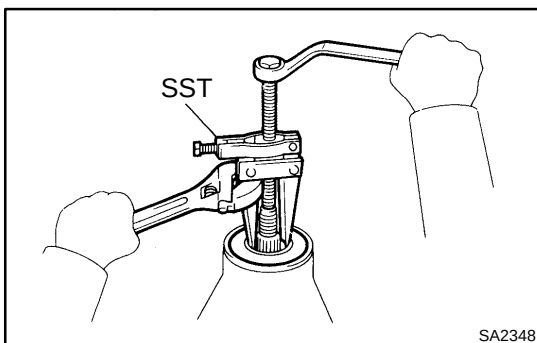
- (a) Using SST, remove the companion flange.

SST 09950-30012 (09951-03010, 09953-03010, 09954-03010, 09955-03030, 09956-03020)

**30. REMOVE REAR DIFFERENTIAL DUST DEFLECTOR**

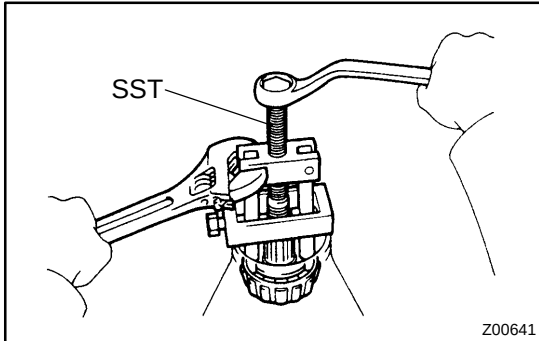
- (a) Using SST and a press, remove the dust deflector.

SST 09950-60010 (09951-00360), 09950-70010 (09951-07150), 09950-00020

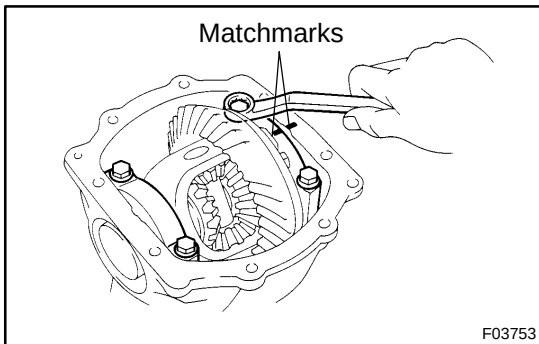
**31. REMOVE REAR DIFFERENTIAL CARRIER OIL SEAL**

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

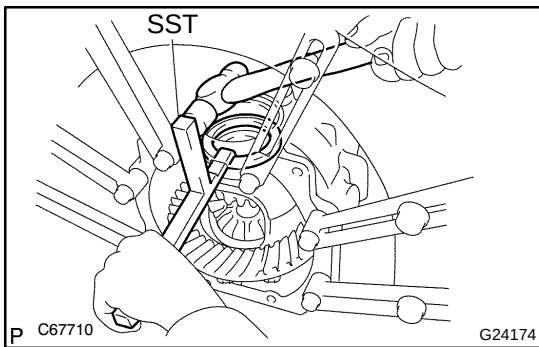
SST 09308-10010

32. REMOVE REAR DIFFERENTIAL DRIVE PINION OIL SLINGER**33. REMOVE REAR DRIVE PINION FRONT TAPERED ROLLER BEARING**

- (a) Using SST, remove the front bearing from the drive pinion.
SST 09556-22010

34. REMOVE REAR DIFFERENTIAL DRIVE PINION BEARING SPACER**35. REMOVE DIFFERENTIAL CASE ASSY**

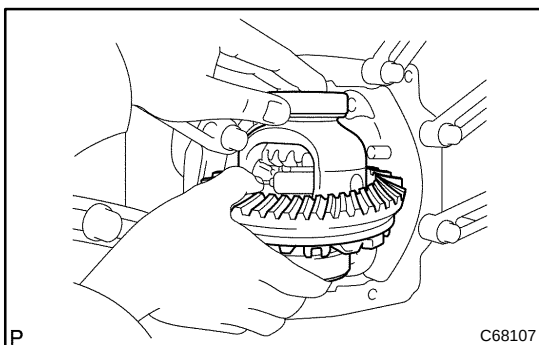
- (a) Align matchmarks on the bearing cap and differential carrier.
(b) Remove the 4 bolts and 2 bearing caps.



- (c) Using SST and a hammer, remove the 2 plate washers.
SST 09504-2201 1

HINT:

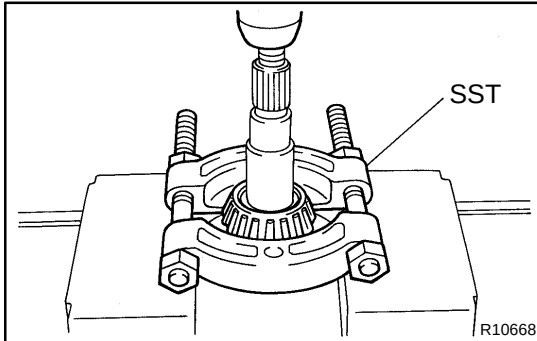
Measure the plate washer and note down the thickness.



- (d) Remove the differential case assy and the 2 bearing outer races from the differential carrier.

HINT:

Tag the 2 bearing outer races to show the location for reassembling.

36. REMOVE DIFFERENTIAL DRIVE PINION**37. REMOVE REAR DRIVE PINION REAR TAPERED ROLLER BEARING**

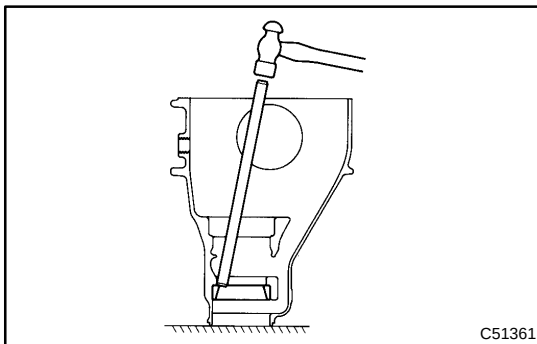
- (a) Using SST and a press, remove the rear bearing from the drive pinion.

SST 09950-00020

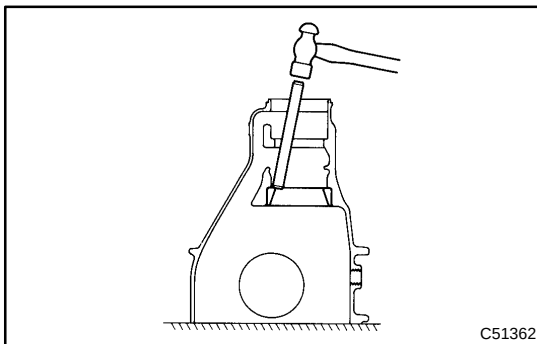
HINT:

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

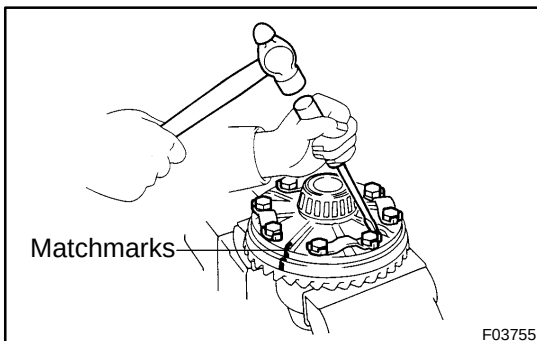
- (b) Remove the plate washer.

**38. REMOVE REAR DRIVE PINION FRONT TAPERED ROLLER BEARING**

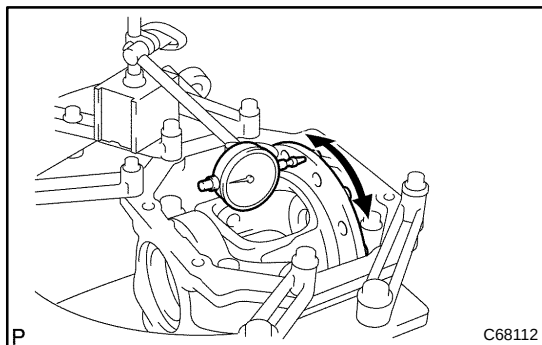
- (a) Using a brass bar and a hammer, remove the front bearing (outer race) from the carrier.

**39. REMOVE REAR DRIVE PINION REAR TAPERED ROLLER BEARING**

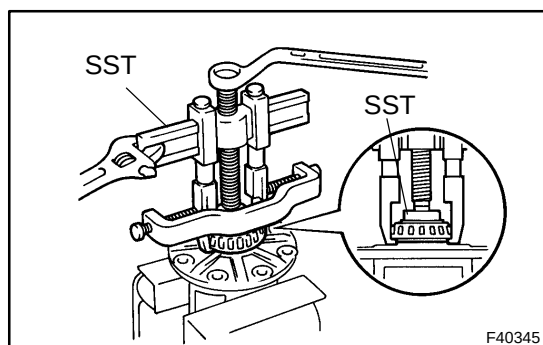
- (a) Using a brass bar and a hammer, remove the rear bearing (outer race) from the carrier.

**40. REMOVE DIFFERENTIAL RING GEAR**

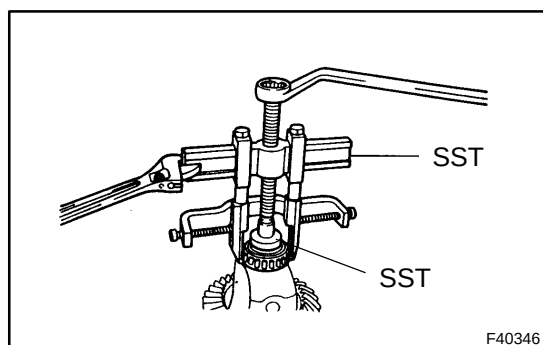
- (a) Align matchmarks on the ring gear and differential case.
- (b) Using a screwdriver and a hammer, unstake the 4 lock plates.
- (c) Remove the 8 ring gear set bolts and 4 lock plates.
- (d) Using a plastic hammer, tap on the ring gear to separate it from the differential case.

**41. INSPECT RUNOUT OF DIFFERENTIAL CASE ASSY**

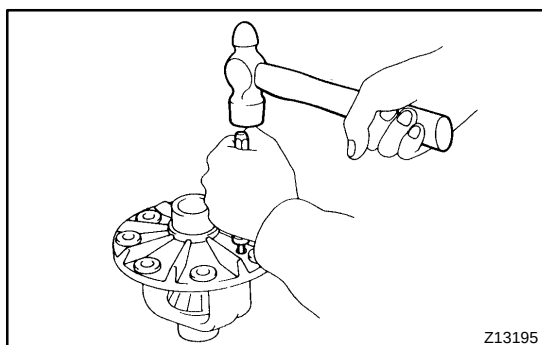
- (a) Install the differential case in the differential carrier.
- (b) Install the right and left bearing caps with the 4 bolts.
Torque: 79 N·m (800 kgf·cm, 58 ft·lbf)
- (c) Using a dial indicator, measure the differential case run-out.
Maximum case runout: 0.07 mm (0.0028 in.)
- (d) Remove the differential case.

**42. REMOVE REAR DIFFERENTIAL CASE BEARING**

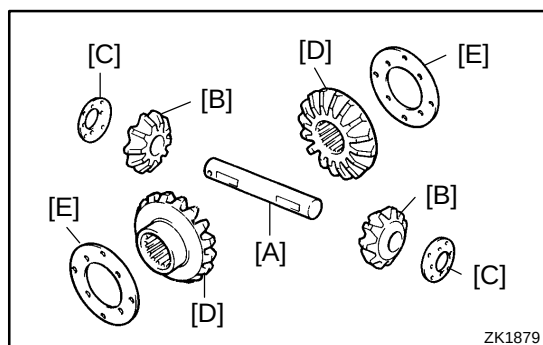
- (a) Using SST, remove the case bearing (LH) from the differential case.
SST 09950-40011 (09951-04020, 09952-04010, 09953-04030, 09954-04010, 09955-04061, 09957-04010, 09958-04011), 09950-60010 (09951-00360)

**43. REMOVE REAR DIFFERENTIAL CASE BEARING**

- (a) Using SST, remove the case bearing (RH) from the differential case.
SST 09950-40011 (09951-04020, 09952-04010, 09953-04030, 09954-04010, 09955-04061, 09957-04010, 09958-04011), 09950-60010 (09951-00360)

**44. REMOVE REAR DIFFERENTIAL PINION SHAFT**

- (a) Using a pin punch (5 mm) and a hammer, remove the straight pin.



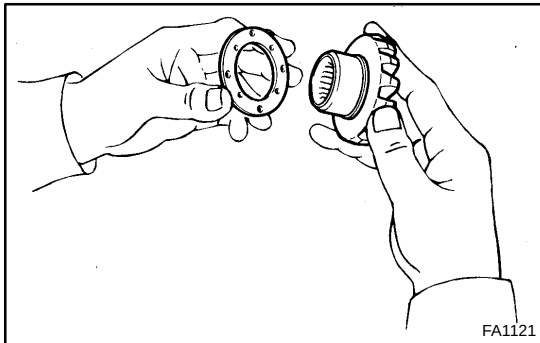
- (b) Remove the differential pinion shaft. [A]
- (c) Remove the 2 differential pinions. [B]
- (d) Remove the 2 differential pinion thrust washers. [C]
- (e) Remove the 2 side gears. [D]
- (f) Remove the 2 side gear thrust washers. [E]

45. INSPECT DIFFERENTIAL PINION AND SIDE GEAR

- (a) Check that no damage is identified on the differential pinion and side gear.
If the differential pinion and/or side gear is damaged, replace them with new ones.

46. INSPECT DIFFERENTIAL CASE

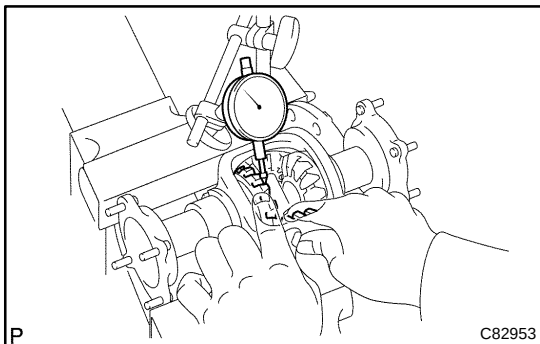
- (a) Check that no damage is identified in the differential case.
If the differential case is damaged, replace the differential case.

**47. INSTALL REAR DIFFERENTIAL PINION SHAFT**

- (a) Install the 2 thrust washers on the 2 side gears.
(b) Install the 2 side gears, 2 differential pinions, 2 differential pinion thrust washers and differential pinion shaft in the differential case.

HINT:

Align the holes of the differential case and differential pinion shaft.

**48. ADJUST DIFFERENTIAL PINION GEAR BACKLASH**

- (a) Install the side gear shaft.
(b) Measure the side gear backlash while holding 1 pinion gear toward the differential case.

Backlash: 0.05 - 0.20 mm (0.0020 - 0.0079 in.)

If the backlash is not within the specification, install the 2 side gear thrust washers with different thicknesses.

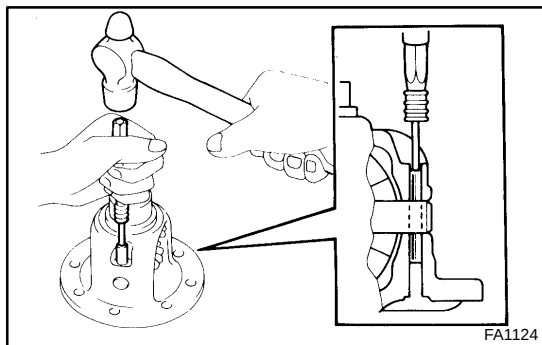
HINT:

- Measure the backlash of the side gear with the side gear shaft installed.
- Refer to the following table to select 2 thrust washers which ensures that the backlash is within the specification.

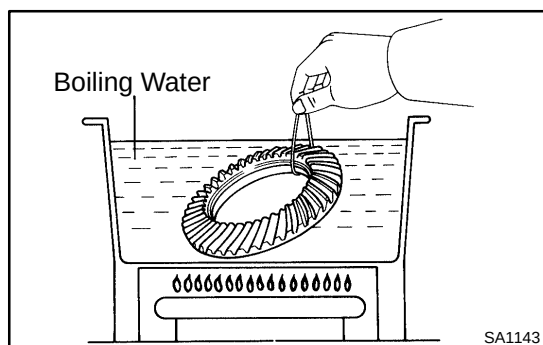
Thrust washer thickness:

Thickness mm (in.)	Thickness mm (in.)
0.93 - 0.97 (0.0366 - 0.0382)	1.18 - 1.22 (0.0465 - 0.0480)
0.98 - 1.02 (0.0386 - 0.0402)	1.23 - 1.27 (0.0484 - 0.0500)
1.03 - 1.07 (0.0406 - 0.0421)	1.28 - 1.32 (0.0504 - 0.0520)
1.08 - 1.12 (0.0425 - 0.0441)	1.33 - 1.37 (0.0524 - 0.0539)
1.13 - 1.17 (0.0445 - 0.0461)	1.38 - 1.42 (0.0543 - 0.0559)

- (c) Remove the side gear shaft.

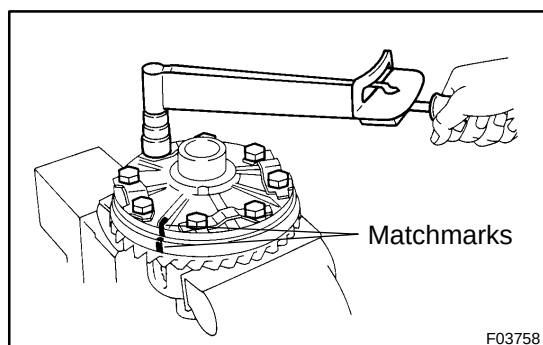


- (d) Using a pin punch (5 mm) and a hammer, install the straight pin through the differential case and hole of the pinion shaft.
- (e) Using a chisel and a hammer, stake the outside of the differential case pin hole.



49. INSTALL DIFFERENTIAL RING GEAR

- (a) Clean the contact surfaces of the differential case and ring gear.
- (b) Heat the ring gear to approx. 100 °C (212 °F) in the boiling water.
- (c) Carefully take the ring gear out of the boiling water.
- (d) After the moisture on the ring gear has completely evaporated, quickly install the ring gear to the differential case.

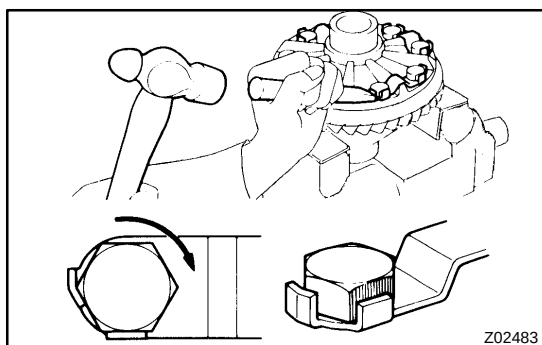


- (e) Align the matchmarks on the ring gear and differential case.
- (f) Temporarily install 4 new lock plates and 8 bolts.
- (g) After the ring gear cools down enough, torque the 8 bolts uniformly at a time.

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

HINT:

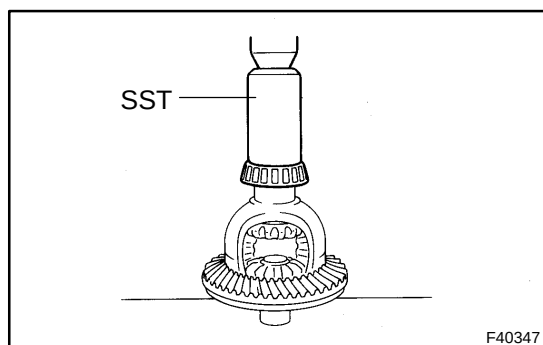
Tighten the bolts in diagonal order little by little over several times.



- (h) Using a chisel and a hammer, stake the 4 lock plates.

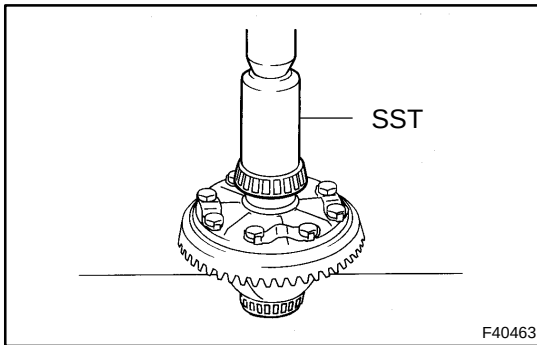
HINT:

Stake one claw so that it is flush with the flat surface of the bolt. For the claw contacting the protruding portion of the bolt, stake only the half on the tightening side.



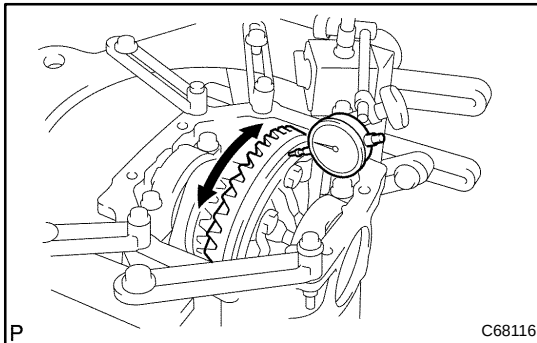
50. INSTALL REAR DIFFERENTIAL CASE BEARING

- (a) Using SST and a press, install the case bearing (RH) into the differential case.
SST 09636-20010

**51. INSTALL REAR DIFFERENTIAL CASE BEARING**

- (a) Using SST and a press, install the case bearing (LH) into the differential case.

SST 09636-20010

**52. INSPECT RUNOUT OF DIFFERENTIAL RING GEAR**

- (a) Install the differential case on the carrier, and install the 2 plate washers so that there is no play in the bearing.

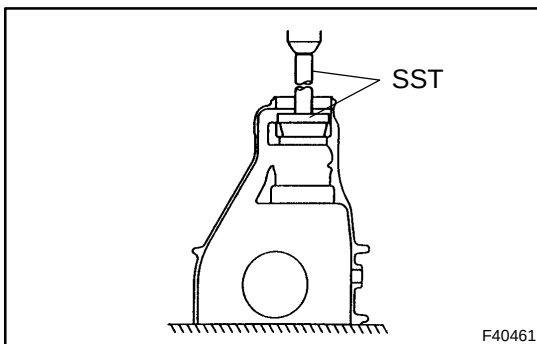
- (b) Install the 2 bearing caps with the 4 bolts.

Torque: 79 N·m (800 kgf·cm, 58 ft·lbf)

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

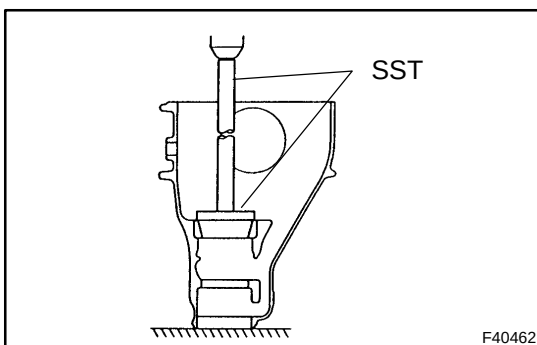
Maximum runout: 0.07 mm (0.0028 in.)

- (d) Remove the 2 bearing caps, 2 plate washers and differential carrier.

**53. INSTALL REAR DRIVE PINION FRONT TAPERED ROLLER BEARING**

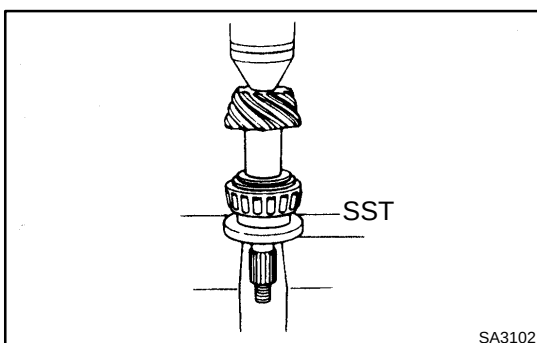
- (a) Using SST and a press, install the front bearing (outer race) to the carrier.

SST 09950-60010 (09951-00620), 09950-70010 (09951-07150)

**54. INSTALL REAR DRIVE PINION REAR TAPERED ROLLER BEARING**

- (a) Using SST and a press, install the rear bearing (outer race) to the carrier.

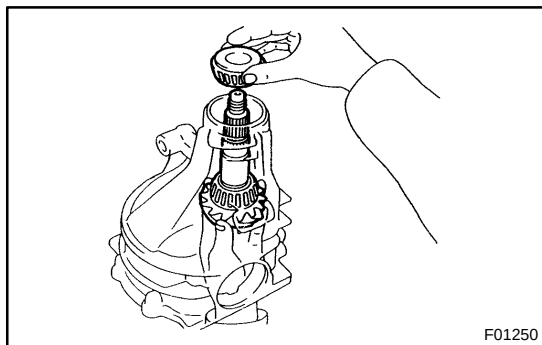
SST 09950-60020 (09951-00710), 09950-70010 (09951-07150)

**55. INSTALL REAR DRIVE PINION REAR TAPERED ROLLER BEARING**

- (a) Install the removed plate washer on the drive pinion.

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

SST 09506-30012

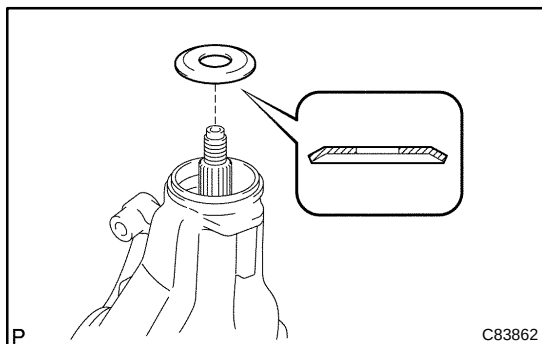


56. ADJUST DIFFERENTIAL DRIVE PINION PRELOAD

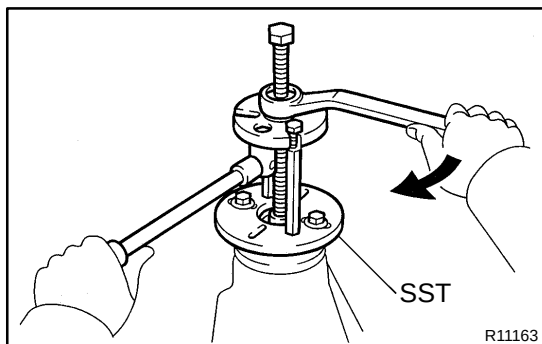
(a) Install the drive pinion and front bearing.

HINT:

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



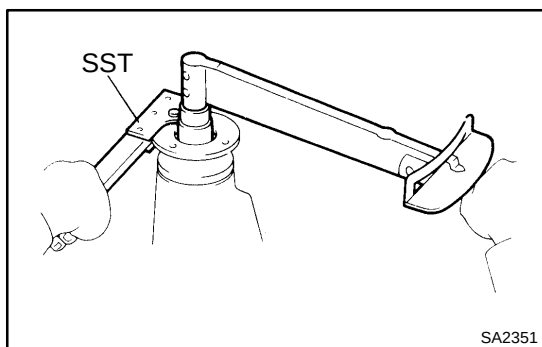
(b) Install the oil slinger, as shown in the illustration.



(c) Using SST, install the companion flange.

SST 09950-30012 (09951-03010, 09953-03010, 09954-03010, 09955-03030, 09956-03020)

(d) Coat the threads of the nut with hypoid gear oil LSD.



(e) Using SST to hold the flange, torque the nut.

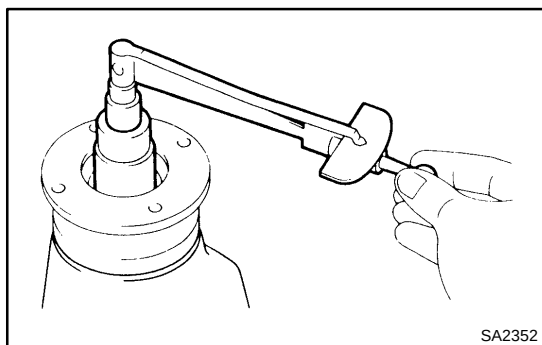
SST 09330-00021

Torque:

108 N·m (1,100 kgf·cm, 80 ft·lbf)

NOTICE:

- As there is no spacer, torque a little at a time, being careful not to overtighten it.
- Apply hypoid gear oil LSD to the nut.



(f) Using a torque wrench, measure the preload.

Preload (at starting):

New bearing:

1.1 - 1.7 N·m (11 - 17 kgf·cm, 9.6 - 14.8 in·lbf)

Reused bearing:

0.6 - 0.9 N·m (6 - 9 kgf·cm, 5.2 - 7.8 in·lbf)

57. INSTALL DIFFERENTIAL CASE ASSY

- (a) Place the 2 bearing outer races on their respective bearings. Make sure the right and left races are not interchanged.

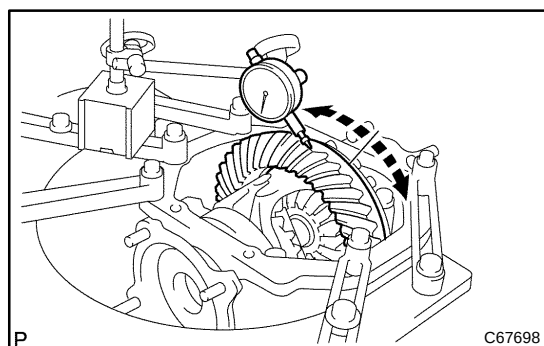
58. ADJUST DIFFERENTIAL RING GEAR BACKLASH

- (a) Install the right and left bearing caps with the 4 bolts.

Torque: 79 N·m (800 kgf·cm, 58 ft·lbf)

HINT:

- If the side bearing is new, select a thrust shim of proper thickness from the thinner ones.
 - If the side bearing is reused, select a thrust shim of the same thickness as the one installed before disassembly.
- (b) Snug down the differential case bearing and thrust shim by tapping on the ring gear with a plastic hammer.



- (c) Set the dial indicator perpendicular to the end of the ring gear face.

- (d) While holding the rear drive pinion companion flange rear, rotate the ring gear and measure the backlash.

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

NOTICE:

Measure it at 3 points or more on the ring gear periphery.

If the measured value is out of the specified value, select a proper thrust shim so that the backlash of the differential ring gear is within the value, and install it to the ring gear back side.

Washer thickness:

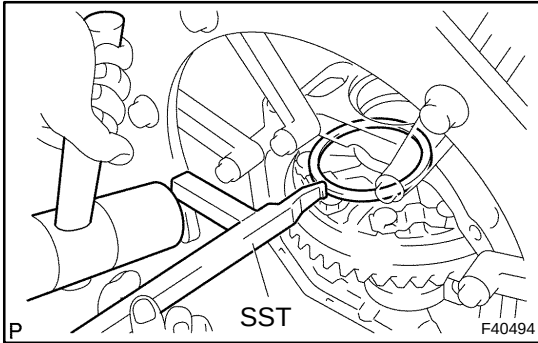
Thickness mm (in.)	Thickness mm (in.)	Thickness mm (in.)
2.21 - 2.23 (0.0870 - 0.0878)	2.57 - 2.59 (0.1012 - 0.1020)	2.93 - 2.95 (0.1154 - 0.1161)
2.24 - 2.26 (0.0882 - 0.0890)	2.60 - 2.62 (0.1024 - 0.1031)	2.96 - 2.98 (0.1165 - 0.1173)
2.27 - 2.29 (0.0894 - 0.0902)	2.63 - 2.65 (0.1035 - 0.1043)	2.99 - 3.01 (0.1177 - 0.1185)
2.30 - 2.32 (0.0906 - 0.0913)	2.66 - 2.68 (0.1047 - 0.1055)	3.02 - 3.04 (0.1189 - 0.1197)
2.33 - 2.35 (0.0917 - 0.0925)	2.69 - 2.71 (0.1059 - 0.1067)	3.05 - 3.07 (0.1201 - 0.1209)
2.36 - 2.38 (0.0929 - 0.0937)	2.72 - 2.74 (0.1071 - 0.1079)	3.08 - 3.10 (0.1213 - 0.1220)
2.39 - 2.41 (0.0941 - 0.0949)	2.75 - 2.77 (0.1083 - 0.1091)	3.11 - 3.13 (0.1224 - 0.1232)
2.42 - 2.44 (0.0953 - 0.0961)	2.78 - 2.80 (0.1094 - 0.1102)	3.14 - 3.16 (0.1236 - 0.1244)
2.45 - 2.47 (0.0965 - 0.0972)	2.81 - 2.83 (0.1106 - 0.1114)	3.17 - 3.19 (0.1248 - 0.1256)
2.48 - 2.50 (0.0976 - 0.0984)	2.84 - 2.86 (0.1118 - 0.1126)	3.20 - 3.22 (0.1260 - 0.1268)
2.51 - 2.53 (0.0988 - 0.0996)	2.87 - 2.89 (0.1130 - 0.1138)	-
2.54 - 2.56 (0.1000 - 0.1008)	2.90 - 2.92 (0.1142 - 0.1150)	-

59. ADJUST TOTAL PRELOAD

- (a) After adjusting the backlash of the differential ring gear, remove the teeth side thrust shim.
- (b) Using a micrometer, measure the thickness of the removed thrust shim.
- (c) Select a new thrust shim 0.06 - 0.09 mm (0.0024 - 0.0035 in.) thicker than the removed one.

HINT:

Select a thrust shim which can be pressed in 2/3 of the way by finger.



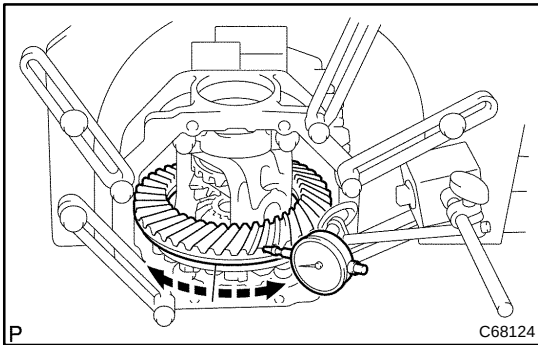
- (d) Using SST and a plastic hammer, drive in the thrust shim.
SST 09504-2201 1
- (e) Align matchmarks on the bearing cap and differential carrier, install the 2 bearing caps.

NOTICE:

Make sure the right and left bearing caps are not interchanged.

- (f) Tighten the both bearing caps with the 4 bolts.

Torque: 79 N·m (800 kgf·cm, 58 ft·lbf)



- (g) Set the dial indicator to the end of the differential ring gear face.
- (h) While holding the rear drive pinion companion flange rear, rotate the differential ring gear and measure the backlash.

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

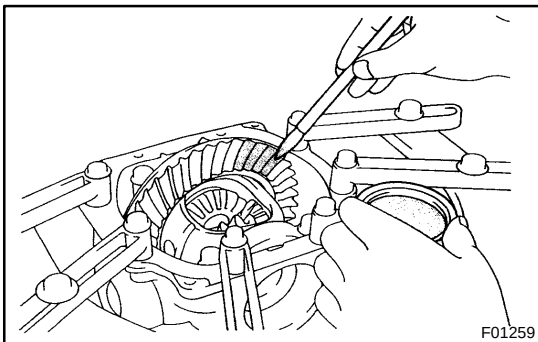
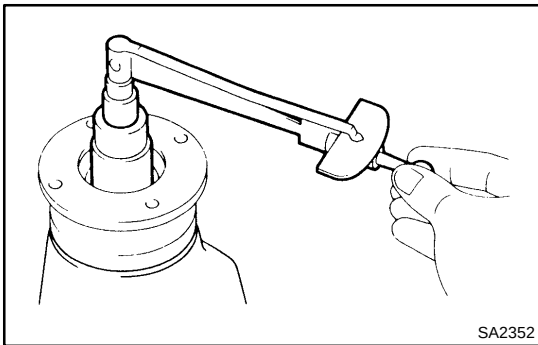
- (i) If the measured value is out of the specified value, adjust it by increasing or decreasing the thickness of both right and left thrust shims equally.

SST 09504-2201 1

- (j) Using a torque wrench, measure the preload.

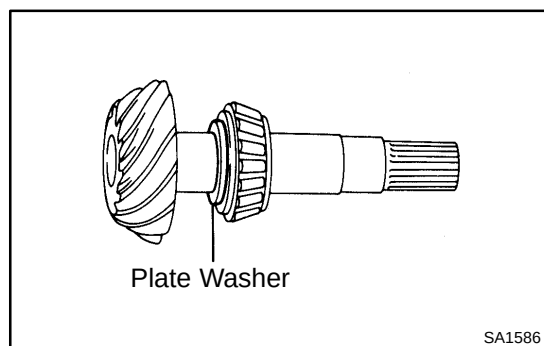
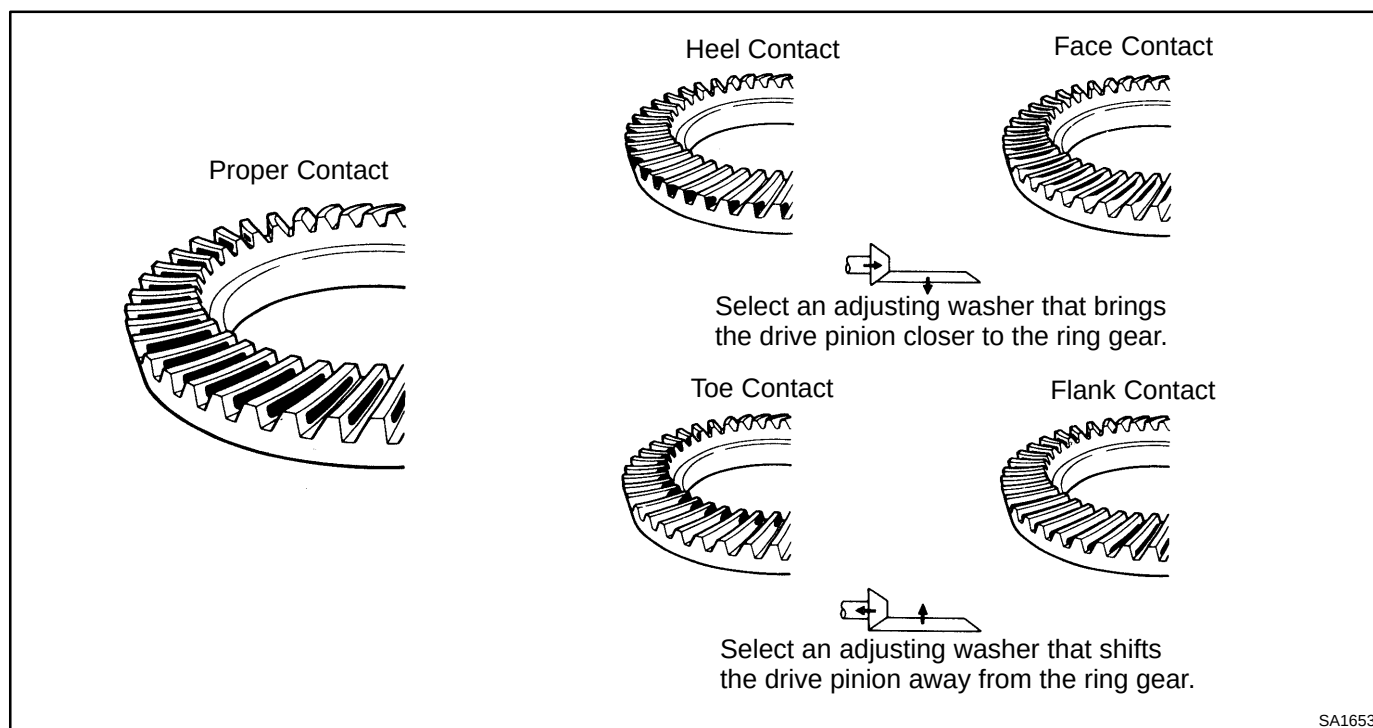
Total preload (at starting):

Drive pinion preload plus 0.3 - 0.5 N·m (3 - 5 kgf·cm, 2.6 - 4.3 in·lbf)

**60. INSPECT TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION**

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

(c) Inspect the tooth contact pattern.



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

Washer thickness:

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

61. REMOVE REAR DRIVE PINION NUT (See step 28)

SST 09330-00021

62. REMOVE REAR DRIVE PINION COMPANION FLANGE SUB-ASSY REAR (See step 29)

SST 09950-30012 (09951-03010, 09953-03010, 09954-03010, 09955-03030, 09956-03020)

63. REMOVE REAR DIFFERENTIAL DRIVE PINION OIL SLINGER

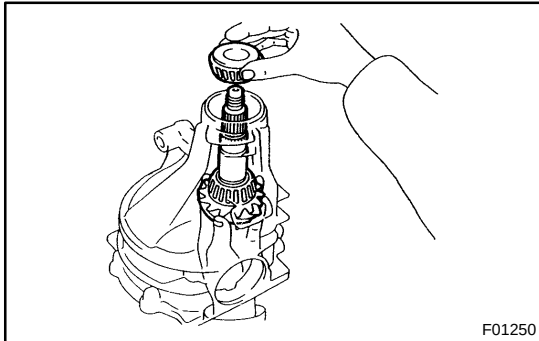
2005 SIENNA REPAIR MANUAL (RM1163U)

64. REMOVE REAR DRIVE PINION FRONT TAPERED ROLLER BEARING (See step 33)

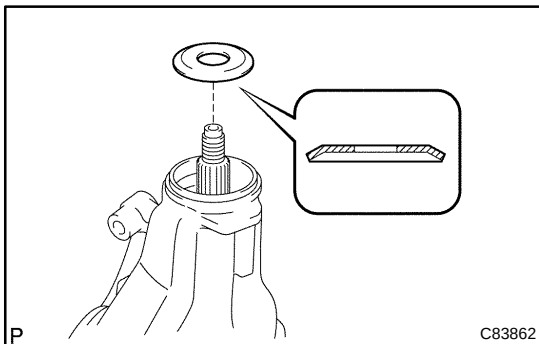
SST 09556-22010

65. INSTALL REAR DIFFERENTIAL DRIVE PINION BEARING SPACER

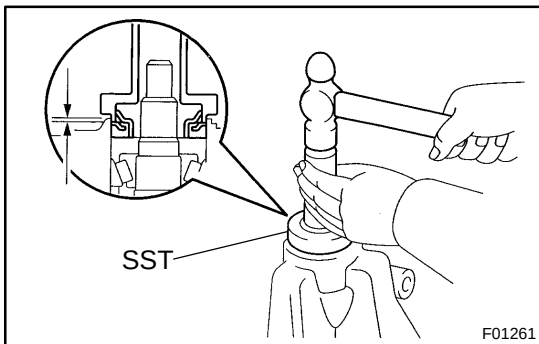
- (a) Install a new bearing spacer.

**66. INSTALL REAR DRIVE PINION FRONT TAPERED ROLLER BEARING**

- (a) Install the rear drive pinion front tapered roller bearing on the drive pinion.

**67. INSTALL REAR DIFFERENTIAL DRIVE PINION OIL SLINGER**

- (a) Install the oil slinger, as shown in the illustration.

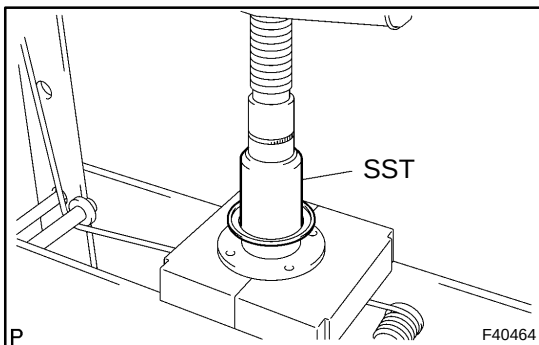
**68. INSTALL REAR DIFFERENTIAL CARRIER OIL SEAL**

- (a) Using SST and a hammer, install a new oil seal.

SST 09554-22010

Oil seal drive in depth:**2.0 ± 0.3 mm (0.079 ± 0.012 in.)**

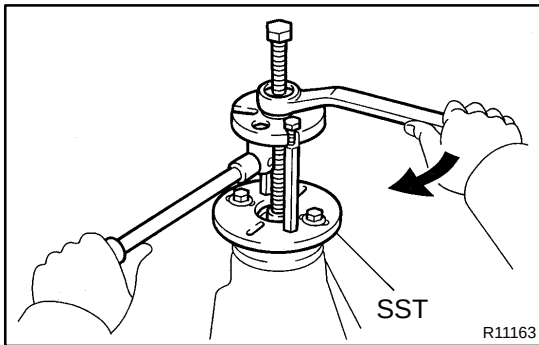
- (b) Apply MP grease to the oil seal lip.

**69. INSTALL REAR DIFFERENTIAL DUST DEFLECTOR**

- (a) Using SST and a press, install a new dust deflector.

SST 09223-00010

NOTICE:**Be careful not to damage the dust deflector.**

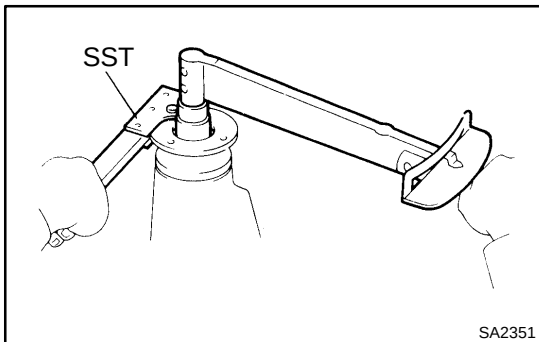


70. INSTALL REAR DRIVE PINION COMPANION FLANGE SUB-ASSY REAR

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

SST 09950-30012 (09951-03010, 09953-03010, 09954-03010, 09955-03030, 09956-03020)

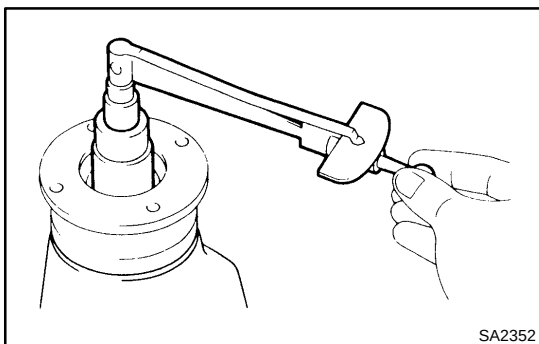
- (b) Coat the threads of a new nut with hypoid gear oil LSD.



- (c) Using SST to hold the flange, torque the nut.

SST 09330-00021

Torque: 108 N·m (1,100 kgf·cm, 80 ft·lbf)



71. INSPECT DIFFERENTIAL DRIVE PINION PRELOAD

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

Preload (at starting):

New bearing:

1.1 - 1.7 N·m (11 - 17 kgf·cm, 9.6 - 14.8 in·lbf)

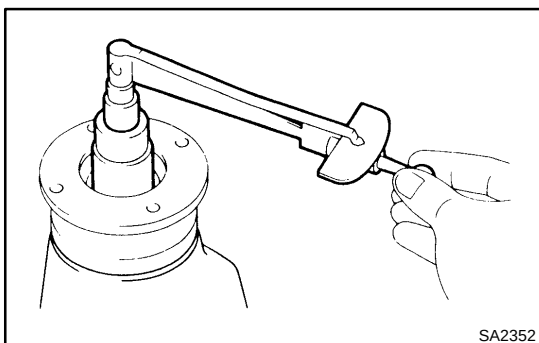
Reused bearing:

0.6 - 0.9 N·m (6 - 9 kgf·cm, 5.2 - 7.8 in·lbf)

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

Torque: 235 N·m (2,400 kgf·cm, 174 ft·lbf) or less

- If the torque exceeds the maximum while retightening the nut, replace the bearing spacer and repeat the preload adjusting procedure. Do not loosen the pinion nut to reduce the preload.



72. INSPECT TOTAL PRELOAD

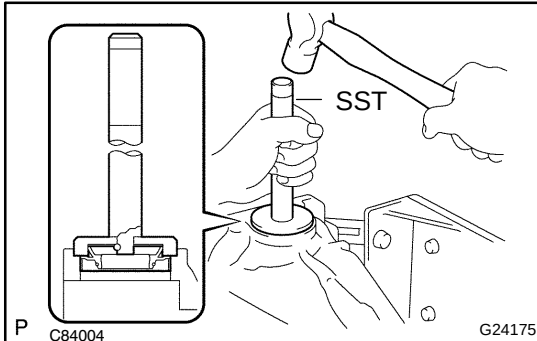
- (a) Using a torque wrench, measure the preload.

Total preload (at starting):

Drive pinion preload plus 0.3 - 0.5 N·m (3 - 5 kgf·cm, 2.6 - 4.3 in·lbf)

73. INSPECT DIFFERENTIAL RING GEAR BACKLASH (See step 19)**74. INSPECT RUNOUT OF REAR DRIVE PINION COMPANION FLANGE SUB-ASSY REAR (See step 22)****75. INSTALL REAR DRIVE PINION NUT**

- (a) Using a chisel and a hammer, stake the drive pinion nut.

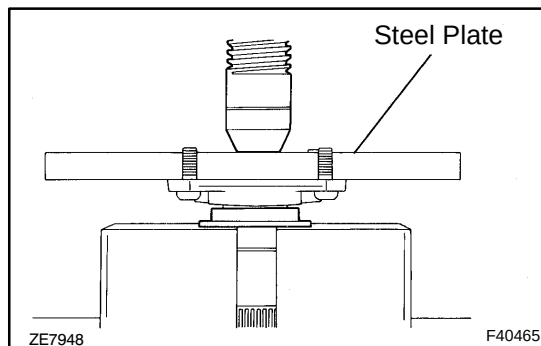
**76. INSTALL REAR DIFFERENTIAL SIDE GEAR SHAFT SEAL OIL**

- (a) Using SST and a hammer, install 2 new oil seals.
SST 09550-00032, 09950-70010 (09951-07200)

Oil seal drive in depth:

0 ± 0.5 mm (0 ± 0.019 in.)

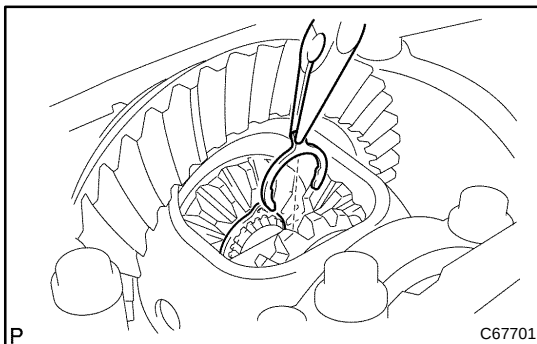
- (b) Apply MP grease to the oil seal lip.

**77. INSTALL REAR DIFFERENTIAL SIDE GEAR SHAFT DUST COVER**

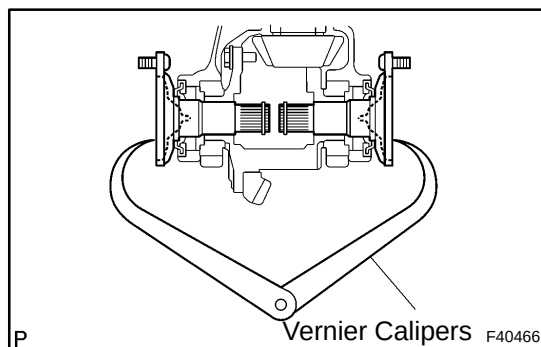
- (a) Using a steel plate and a press, install a new dust cover.

NOTICE:

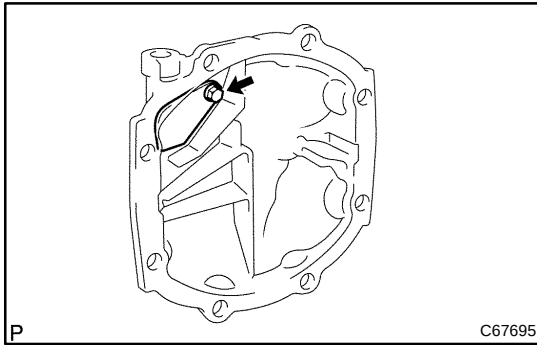
Be careful not to damage the dust cover.

**78. INSTALL REAR DIFFERENTIAL SIDE GEAR SHAFT SUB-ASSY**

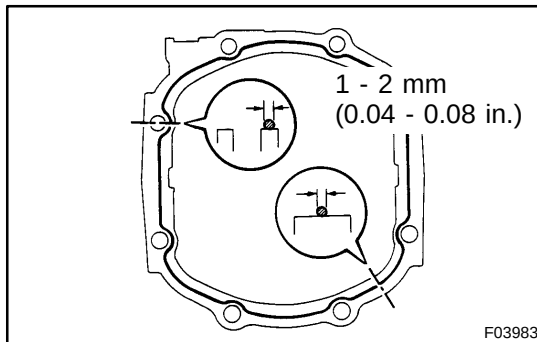
- (a) Install the 2 side gear shafts to the differential case.
(b) Using needle nose pliers, install 2 new snap rings to the 2 side gear shafts.



- (c) Using vernier calipers, measure the distance between the right and left side gear shafts, as shown in the illustration.
Standard distance: 242 mm (9.528 in.)

**79. INSTALL REAR DIFFERENTIAL CARRIER COVER**

- (a) Install the oil deflector and bolt to the carrier cover.
Torque: 7.4 N·m (75 kgf·cm, 65 in.-lbf)
- (b) Install the breather plug to the carrier cover.
Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)
- (c) Clean contacting surfaces of any residual FIPG material using gasoline or alcohol.



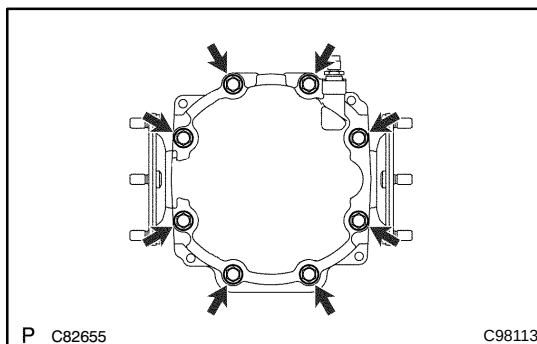
- (d) Apply FIPG to the carrier.

FIPG:

08826-00090, THREE BOND 1281 or equivalent

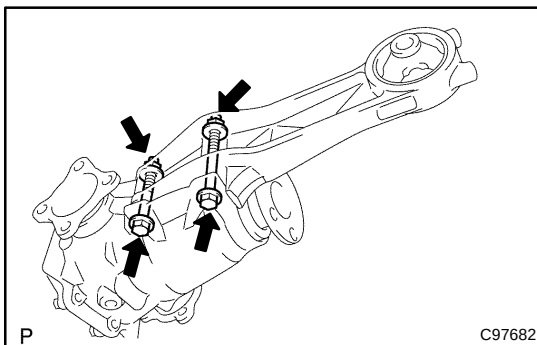
HINT:

- FIPG should be applied 2 to 3 mm in diameter with no break.
- Allow for overlap of 10 mm (0.37 in.) or more between the start and end of FIPG application.
- Install the carrier cover within 3 minutes after applying FIPG.
- Do not add oil or drive the vehicle immediately after installing the cover, and leave it as it is for an hour or more. Also, for 12 hours or more, avoid rapid acceleration/deceleration.



- (e) Install the carrier cover with the 8 bolts.

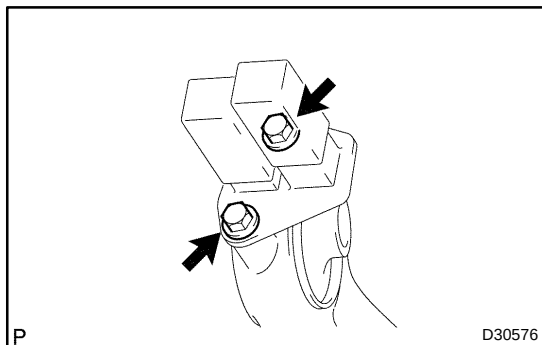
Torque: 47 N·m (475 kgf·cm, 34 ft·lbf)

**80. INSTALL REAR DIFFERENTIAL SUPPORT NO.1**

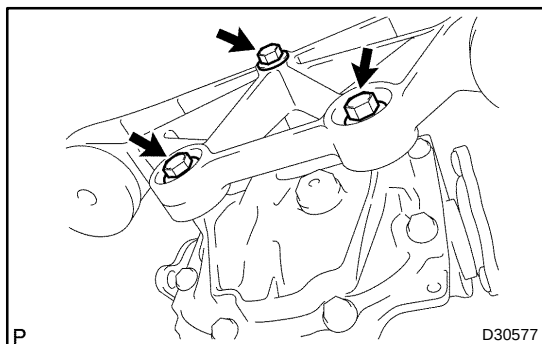
- (a) Install the rear differential support No. 1 to the differential carrier assy rear with 2 bolts and 2 nuts.
Torque: 85 N·m (867 kgf·cm, 63 ft·lbf)

HINT:

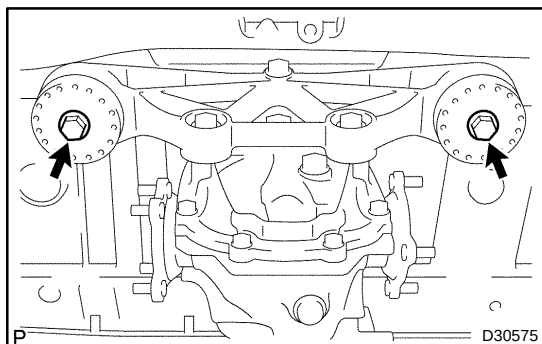
Hold the bolt and tighten the nut.



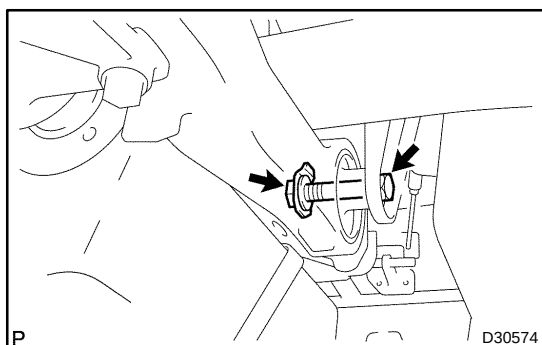
- 81. INSTALL REAR DIFFERENTIAL DYNAMIC DAMPER**
 (a) Install the rear differential dynamic damper to the rear differential support No.1 with the 2 bolts.
Torque: 20 N·m (204 kgf·cm, 15 ft·lbf)



- 82. INSTALL DIFFERENTIAL SUPPORT ASSY REAR**
 (a) Install the differential support assy rear to differential carrier assy rear with the 3 bolts.
Torque: 100 N·m (1,020 kgf·cm, 74 ft·lbf)



- 83. INSTALL DIFFERENTIAL CARRIER ASSY REAR**
 (a) Jack up the differential carrier assy rear.
 (b) Install the differential carrier assy rear with the 2 bolts.
Torque: 106 N·m (1,081 kgf·cm, 78 ft·lbf)



- (c) Connect the rear differential support assy No.1 with the bolt and nut.
Torque: 95 N·m (969 kgf·cm, 70 ft·lbf)

HINT:
 Tighten the bolt.

84. INSTALL REAR DRIVE SHAFT ASSY LH (See page 30-32)

85. INSTALL REAR DRIVE SHAFT ASSY RH

HINT:

Install procedue of RH side is the same as that of LH side.

86. INSTALL REAR AXLE SHAFT LH NUT (See page 30-32)

SST 09930-00010

87. INSTALL REAR AXLE SHAFT RH NUT

SST 09930-00010

HINT:

Install procedue of RH side is the same as that of LH side.

2005 SIENNA REPAIR MANUAL (RM1163U)

88. INSTALL SPEED SENSOR REAR LH (See page 30-32)

89. INSTALL SPEED SENSOR REAR RH

HINT:

Install procedure of RH side is the same as that of LH side.

90. INSTALL PROPELLER W/CENTER BEARING SHAFT ASSY (See page 30-6)

91. FULLY TIGHTEN PROPELLER W/CENTER BEARING SHAFT ASSY (See page 30-6)

SST 09370-50010

92. INSTALL REAR DIFFERENTIAL DRAIN PLUG

(a) Using a hexagon wrench (10 mm), install the drain plug with a new gasket.

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

93. ADD DIFFERENTIAL OIL

(a) Fill the rear differential carrier assy with hypoid gear oil.

Oil grade: Hypoid gear oil API GL-5

Recommended oil viscosity:

Above -18 °C (0 °F) SAE 90

Below -18 °C (0 °F) SAE 80W-90

Capacity: 0.9 ± 0.05 liters (0.95 ± 0.05 US qts, 0.79 ± 0.04 Imp. qts)

94. INSPECT DIFFERENTIAL OIL (See page 29-6)

95. INSTALL REAR DIFFERENTIAL FILLER PLUG

(a) Using a hexagon wrench (10 mm), install the filler plug with a new gasket.

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

96. INSTALL REAR WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

97. INSTALL EXHAUST PIPE ASSY (See page 15-6)

98. CHECK FOR EXHAUST GAS LEAKS

99. INSPECT AND ADJUST REAR WHEEL ALIGNMENT (See page 27-4)

100. CHECK ABS SPEED SENSOR SIGNAL

(a) ABS WITH EBD & BA & TRAC & VSC SYSTEM (See page 05-435)

REAR DIFFERENTIAL CARRIER OIL SEAL (4WD)

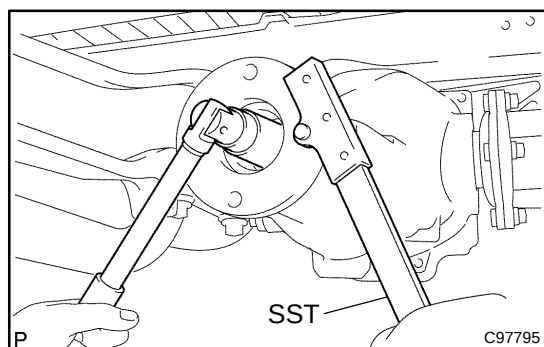
REPLACEMENT

29010-05

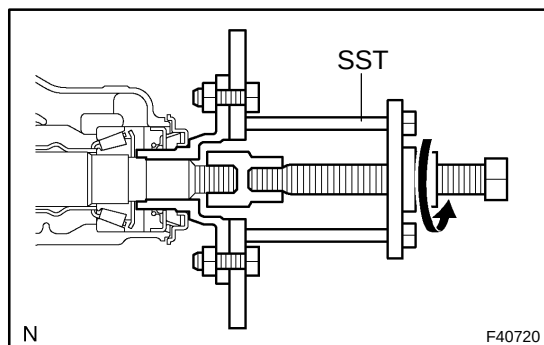
HINT:

Differential components (See page 29-3)

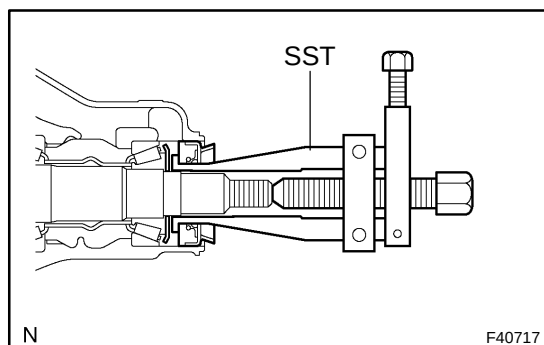
1. **REMOVE EXHAUST PIPE ASSY** (See page 15-6)
2. **REMOVE PROPELLER W/CENTER BEARING SHAFT ASSY** (See page 30-6)
SST 09325-20010
3. **REMOVE REAR DIFFERENTIAL FILLER PLUG**
 - (a) Using a hexagon wrench (10 mm), remove the filler plug and gasket.
4. **REMOVE REAR DIFFERENTIAL DRAIN PLUG**
 - (a) Using a hexagon wrench (10 mm), remove the drain plug, drain the oil.



5. **REMOVE REAR DRIVE PINION NUT**
 - (a) Using a chisel and a hammer, unstack the staked part of the nut.
 - (b) Using SST to hold the flange, remove the nut.
SST 09330-00021

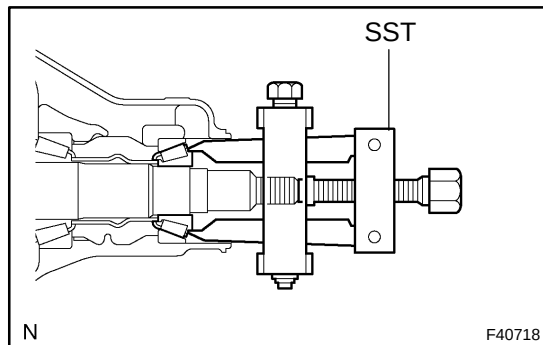


6. **REMOVE REAR DRIVE PINION COMPANION FLANGE SUB-ASSY REAR**
 - (a) Using SST, remove the companion flange.
SST 09950-30012 (09951-03010, 09953-03010, 09954-03010, 09955-03030, 09956-03020)



7. **REMOVE REAR DIFFERENTIAL CARRIER OIL SEAL**
 - (a) Using SST, remove the oil seal.
SST 09308-10010

8. **REMOVE REAR DIFFERENTIAL DRIVE PINION OIL SLINGER**



9. REMOVE REAR DRIVE PINION FRONT TAPERED ROLLER BEARING

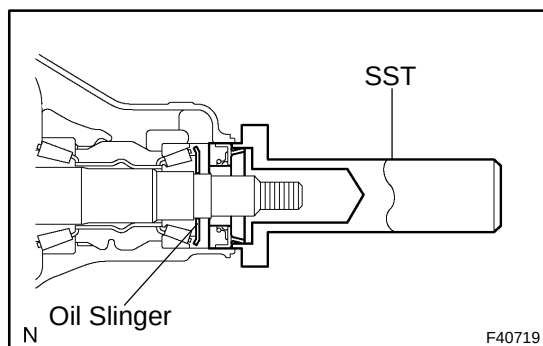
- (a) Using SST, remove the front bearing.
SST 09556-22010

10. REMOVE REAR DIFFERENTIAL DRIVE PINION BEARING SPACER

11. INSTALL REAR DIFFERENTIAL DRIVE PINION BEARING SPACER

- (a) Install a new bearing spacer.

12. INSTALL REAR DRIVE PINION FRONT TAPERED ROLLER BEARING



13. INSTALL REAR DIFFERENTIAL DRIVE PINION OIL SLINGER

- (a) Install the oil slinger, as shown in the illustration.

14. INSTALL REAR DIFFERENTIAL CARRIER OIL SEAL

- (a) Using SST and a hammer, install a new oil seal.

Oil seal drive in depth:

2.0 ± 0.3 mm (0.079 ± 0.012 in.)

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

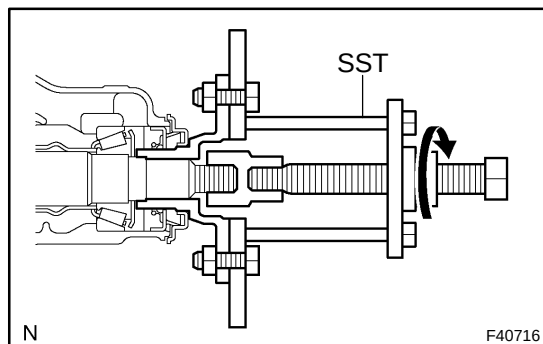
09554-22010

SST 09554-22010

15. INSTALL REAR DRIVE PINION COMPANION FLANGE SUB-ASSY REAR

- (a) Using SST, install the companion flange on the shaft.
(b) Coat the threads of a new nut with hypoid gear oil LSD.

SST 09950-30012 (09951-03010, 09953-03010, 09954-03010, 09955-03030, 09956-03020)

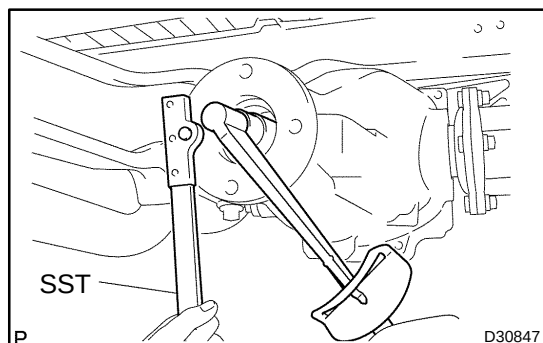


16. INSTALL REAR DRIVE PINION NUT

- (a) Coat the threads of a new nut with hypoid gear oil LSD.
(b) Using SST to hold the flange, torque the nut.

SST 09330-00021

Torque: 108 N·m (1,100 kgf·cm, 80 ft·lbf)



17. INSPECT DIFFERENTIAL DRIVE PINION PRELOAD (See page 29-10)

18. INSTALL REAR DRIVE PINION NUT

- (a) Using a chisel and a hammer, stake the drive pinion nut.

19. INSTALL REAR DIFFERENTIAL DRAIN PLUG

- (a) Using a hexagon wrench (10 mm), install the drain plug and a new gasket.

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

20. ADD DIFFERENTIAL OIL

- (a) Fill the rear differential carrier assy with hypoid gear oil.

Oil grade: Hypoid gear oil API GL-5

Recommended oil viscosity:

Above -18 °C (0 °F) SAE 90

Below -18 °C (0 °F) SAE 80W-90

Capacity: 0.9 ± 0.05 liters (0.95 ± 0.05 US qts, 0.79 ± 0.04 Imp. qts)

21. INSPECT DIFFERENTIAL OIL (See page 29-6)**22. INSTALL REAR DIFFERENTIAL FILLER PLUG**

- (a) Using a hexagon wrench (10 mm), install the filler plug with a new gasket.

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

23. INSTALL PROPELLER W/CENTER BEARING SHAFT ASSY (See page 30-6)**24. FULLY TIGHTEN PROPELLER W/CENTER BEARING SHAFT ASSY (See page 30-6)**

SST 09370-50010

25. INSTALL EXHAUST PIPE ASSY (See page 15-6)**26. CHECK FOR EXHAUST GAS LEAKS**

REAR DIFFERENTIAL SIDE GEAR SHAFT BOLT (4WD) REPLACEMENT

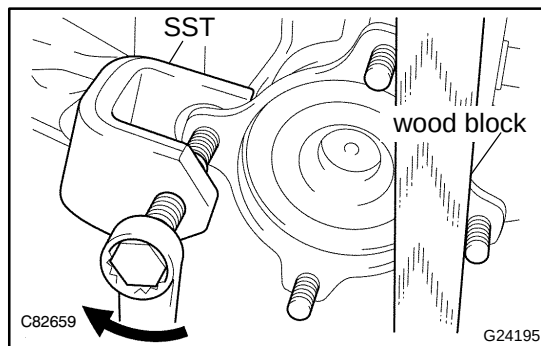
29012-02

1. REMOVE REAR WHEEL
2. REMOVE EXHAUST PIPE ASSY (See page 15-6)

HINT:

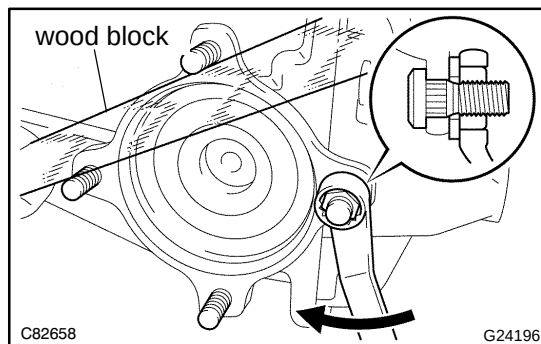
Perform this procedure only when removing the RH side.

3. REMOVE SPEED SENSOR REAR LH (See page 30-32)
4. REMOVE REAR AXLE SHAFT LH NUT (See page 30-32)
SST 09930-00010
5. REMOVE REAR DRIVE SHAFT ASSY LH (See page 30-32)



6. REMOVE REAR DIFFERENTIAL SIDE GEAR SHAFT BOLT

- (a) Using SST and wood block, remove the rear differential side gear shaft bolt.
SST 09611-12010



7. INSTALL REAR DIFFERENTIAL SIDE GEAR SHAFT BOLT

- (a) Install the bolt tightening the nut through the plate washer.

8. INSTALL REAR DRIVE SHAFT ASSY LH (See page 30-32)
9. INSTALL REAR AXLE SHAFT LH NUT (See page 30-32)
SST 09930-00010
10. INSTALL SPEED SENSOR REAR LH (See page 30-32)
11. INSTALL EXHAUST PIPE ASSY (See page 15-6)

HINT:

Perform this procedure only when installing the RH side.

12. INSTALL REAR WHEEL
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

13. CHECK FOR EXHAUST GAS LEAKS

HINT:

Perform this procedure only when installing the RH side.

14. INSPECT AND ADJUST REAR WHEEL ALIGNMENT (See page 27-4)
15. CHECK ABS SPEED SENSOR SIGNAL

- (a) ABS WITH EBD & BA & TRAC & VSC SYSTEM (See page 05-435)

2005 SIENNA REPAIR MANUAL (RM1163U)