

Last Modified: 12-21-2017	6.8:8.0.48	Doc ID: RM100000000T32H
Model Year Start: 2016	Model: LX570	Prod Date Range: [09/2015 -]
Title: AXLE AND DIFFERENTIAL: FRONT DIFFERENTIAL CARRIER ASSEMBLY: REASSEMBLY; 2016 - 2018 MY LX570 [09/2015 -]		

REASSEMBLY

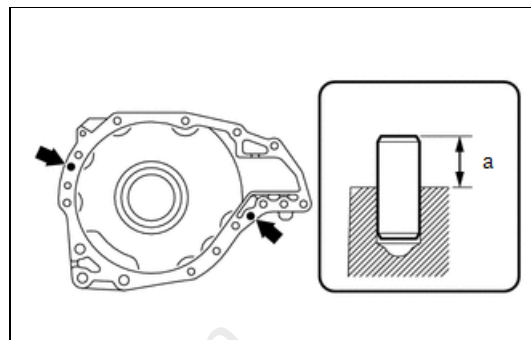
PROCEDURE

1. INSTALL FRONT DIFFERENTIAL CARRIER STRAIGHT PIN

- (a) Using a plastic-faced hammer, tap in the straight pins until the protrusion height shown in the illustration is within the specification.

Standard depth (a):

9.5 to 10.0 mm (0.374 to 0.394 in.)

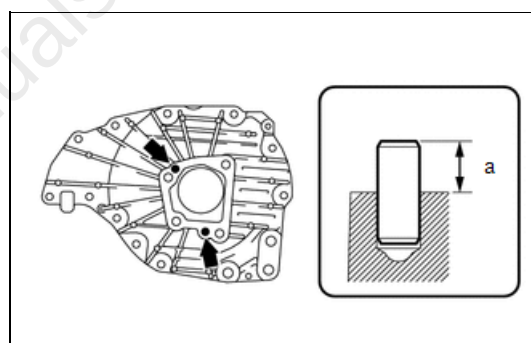


2. INSTALL FRONT DIFFERENTIAL TUBE STRAIGHT PIN

- (a) Using a plastic-faced hammer, tap in the straight pins until the protrusion height shown in the illustration is within the specification.

Standard depth (a):

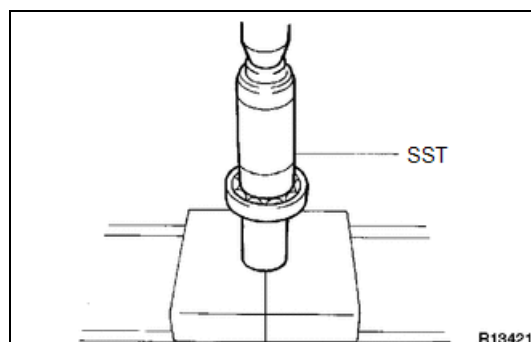
9.5 to 10.0 mm (0.374 to 0.394 in.)



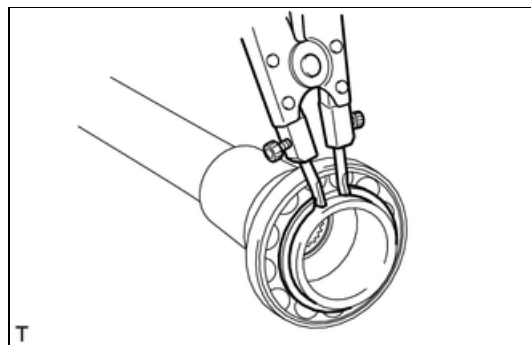
3. INSTALL FRONT DIFFERENTIAL SIDE GEAR SHAFT RH BEARING

- (a) Using SST and a press, press in the bearing.

SST: 09223-00010

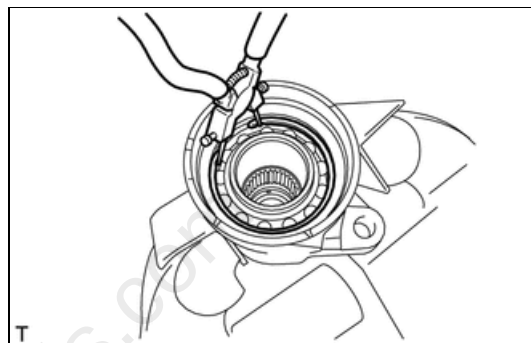


(b) Using a snap ring expander, install a new snap ring.



4. INSTALL DIFFERENTIAL SIDE GEAR SHAFT SUB-ASSEMBLY RH

(a) Install the side gear shaft into the differential tube.



(b) Using snap ring pliers, install a new snap ring.

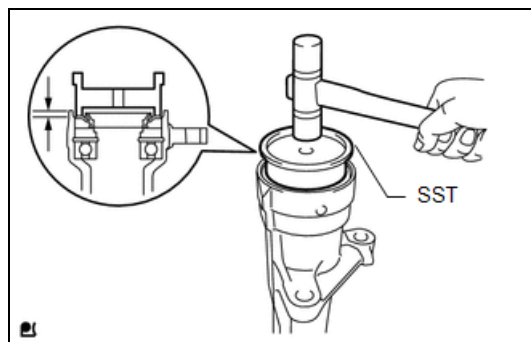
5. INSTALL DIFFERENTIAL SIDE GEAR SHAFT OIL SEAL

(a) Using SST and a plastic-faced hammer, tap in a new oil seal.

SST: 09608-32010

Standard oil seal depth:

4.8 to 5.8 mm (0.189 to 0.228 in.)



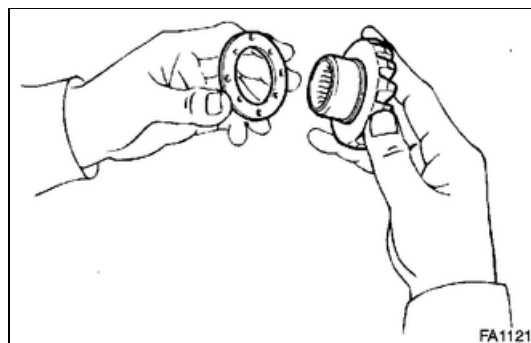
(b) Coat the lip of the oil seal with MP grease.

6. INSTALL FRONT NO. 1 DIFFERENTIAL CASE SUB-ASSEMBLY

(a) Install the 2 side gear thrust washers onto the 2 side gears.

HINT:

Using the table below, select 2 thrust washers which will ensure that the backlash is within the specifications.



(b) Install the 2 side gears (with thrust washers), 2 pinion gears, 2 pinion gear thrust washers and pinion shaft into the differential case assembly.

HINT:

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

- Align the noles of the differential case assembly and pinion shaft.
- Apply hypoid gear oil to each sliding surface and rotating part.

(c) Measure the side gear backlash.

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

Standard backlash:

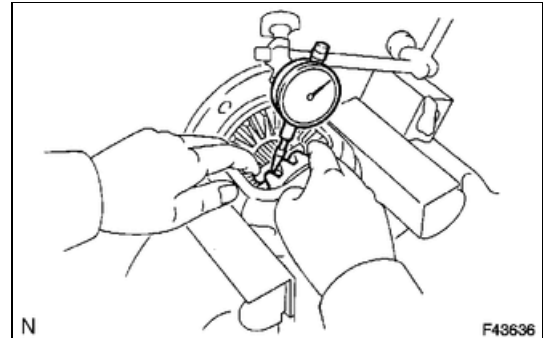
0.1 to 0.25 mm (0.00394 to 0.00984 in.)

If the backlash is not within the specification, replace the 2 side gear thrust washers.

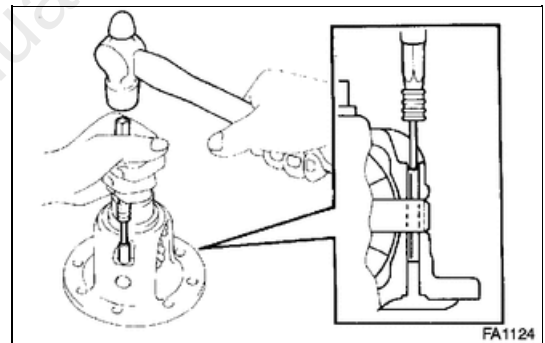
Use the table below to select 2 thrust washers of the same thickness which will ensure that the backlash is within the specification.

Standard Thrust Washer Thickness:

PART NO.	SPECIFIED CONDITION	PART NO.	SPECIFIED CONDITION
41361-34100	1.43 to 1.47 mm (0.0563 to 0.0579 in.)	41361-34150	1.68 to 1.72 mm (0.0661 to 0.0677 in.)
41361-34110	1.48 to 1.52 mm (0.0583 to 0.0598 in.)	41361-34160	1.73 to 1.77 mm (0.0681 to 0.0697 in.)
41361-34110	1.53 to 1.57 mm (0.0602 to 0.0618 in.)	41361-34170	1.78 to 1.82 mm (0.0701 to 0.0717 in.)
41361-34130	1.58 to 1.62 mm (0.0622 to 0.0638 in.)	41361-34180	1.83 to 1.87 mm (0.0720 to 0.0736 in.)
41361-34140	1.63 to 1.67 mm (0.0642 to 0.0657 in.)	-	-



- (d) Using a pin punch and hammer, tap in the straight pin through the differential case and hole of the pinion shaft.



- (e) Stake the differential case.

7. INSTALL DIFFERENTIAL RING GEAR

- Clean the contact surfaces of the differential case and ring gear.
- Heat the ring gear to about 100°C (212°F) in boiling water.
- Carefully take the ring gear out of the boiling water.
- After the moisture on the ring gear has completely evaporated, quickly align the matchmarks on the ring gear and differential case and set the ring gear onto the differential case. Then temporarily install the 12 bolts so that the bolt holes in the ring gear and differential case are aligned.
- After the ring gear cools down sufficiently, remove the 12 bolts. Then apply adhesive to the 12 bolts and install them.

Torque:

137 N·m {1397 kgf·cm, 101 ft·lbf}

Adhesive:

Toyota Genuine Adhesive 1360K, Three Bond 1360K or equivalent

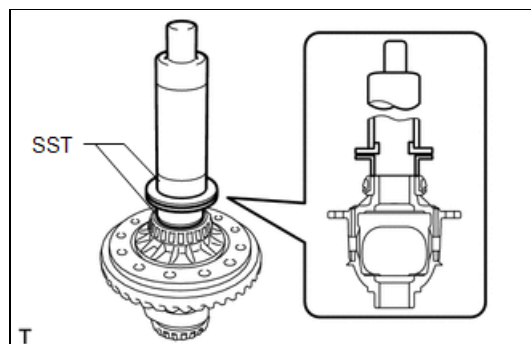
8. INSTALL FRONT DIFFERENTIAL CASE BEARING

(a) Using SST and a press, press in the 2 bearings (inner race).

SST: 09316-20011

SST: 09316-60011

09316-00041



9. INSTALL FRONT DIFFERENTIAL CASE BEARING

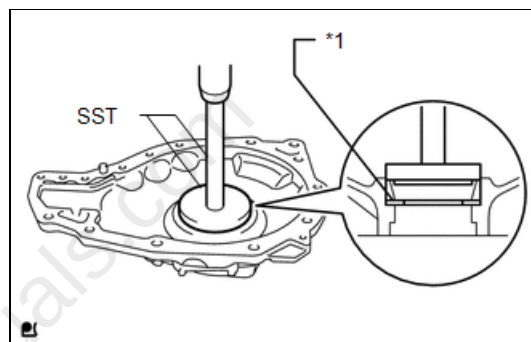
HINT:

When replacing the 2 differential case bearings, fit the thinnest washer to each bearing. When reusing the bearings, fit a washer of the same thickness as the one removed to each bearing.

(a) Install a new plate washer to the shaft bearing retainer.

Text in Illustration

*1	Plate Washer
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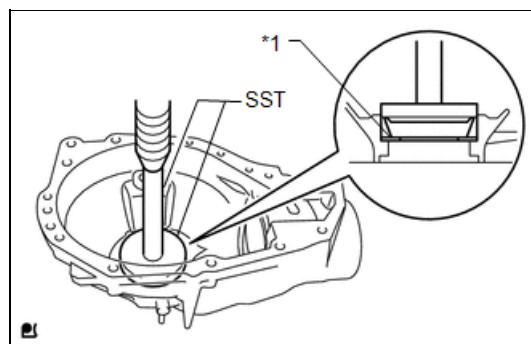
(b) Using SST and a press, press the bearing (outer race) into the differential case bearing retainer.

SST: 09950-60020

09951-00890

SST: 09950-70010

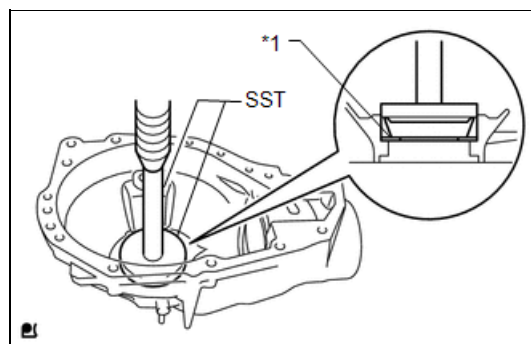
09951-07150



(c) Install a new plate washer onto the differential carrier.

Text in Illustration

*1	Plate Washer
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(d) Using SST and a press, press the bearing (outer race) into the differential carrier assembly.

SST: 09950-60020

09951-00890

SST: 09950-70010

09951-07150

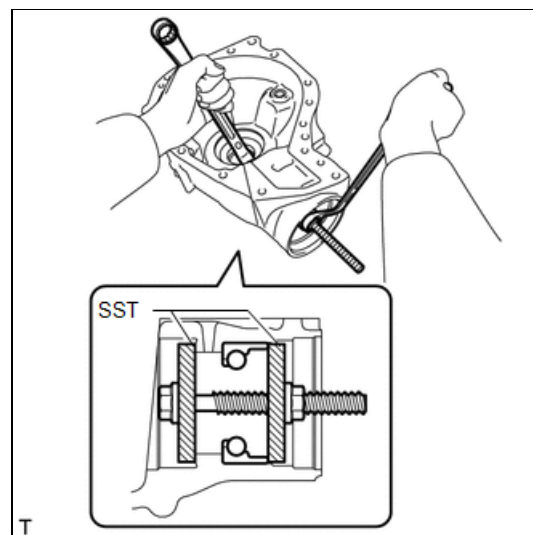
10. INSTALL FRONT DRIVE PINION FRONT RADIAL BALL BEARING

(a) Using SST, install the bearing (outer race).

SST: 09950-60020

09951-00810

09951-00890



11. INSTALL FRONT DRIVE PINION REAR TAPERED ROLLER BEARING

(a) Using SST, install the washer and bearing (outer race).

SST: 09950-60020

09951-00890

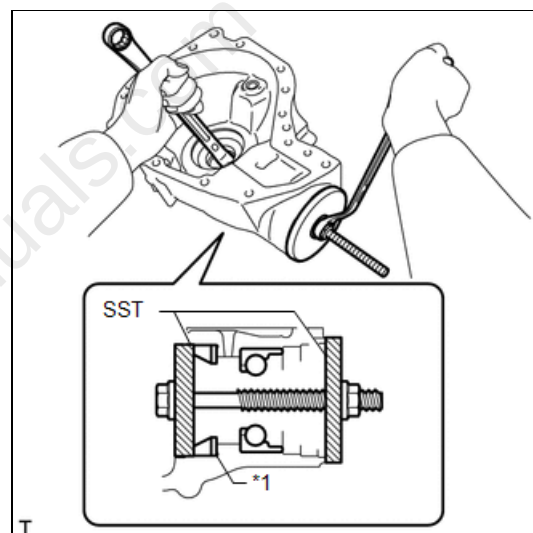
09951-01030

Text in Illustration

*1	Plate Washer
----	--------------

HINT:

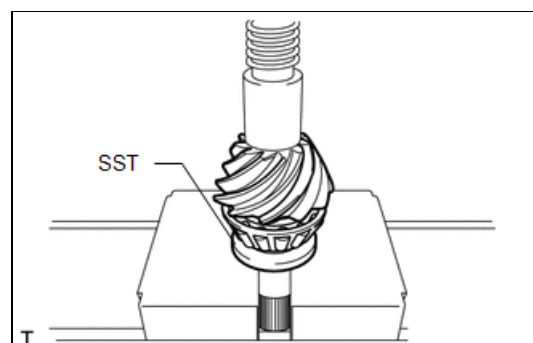
After installing the washer, check the tooth contact pattern. If necessary, replace the washer with one of a different thickness.



12. INSTALL FRONT DRIVE PINION REAR TAPERED ROLLER BEARING

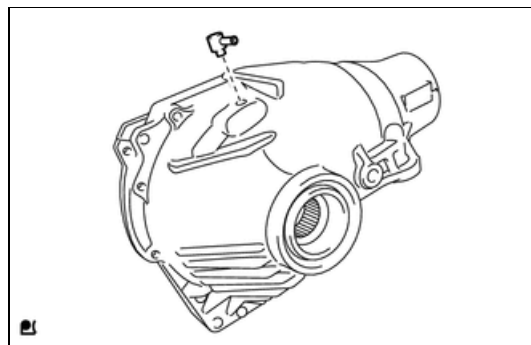
(a) Using SST and a press, press in the bearing (inner race).

SST: 09506-35010



13. INSTALL FRONT DIFFERENTIAL UNION

(a) Install the front differential union to the differential carrier.

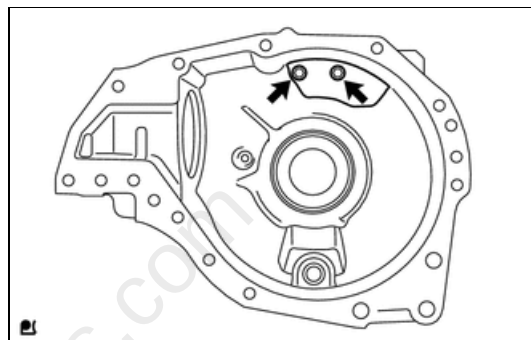


14. INSTALL FRONT DIFFERENTIAL BREATHER PLUG OIL DEFLECTOR

(a) Install the 2 bolts and oil deflector.

Torque:

6.0 N·m {61 kgf·cm, 53 in·lbf}



15. TEMPORARILY INSTALL DIFFERENTIAL DRIVE PINION

16. INSTALL FRONT NO. 1 DIFFERENTIAL CASE SUB-ASSEMBLY

17. INSTALL FRONT DIFFERENTIAL CROSS SHAFT BEARING RETAINER

(a) Install the differential cross shaft bearing retainer and differential support with the 14 bolts.

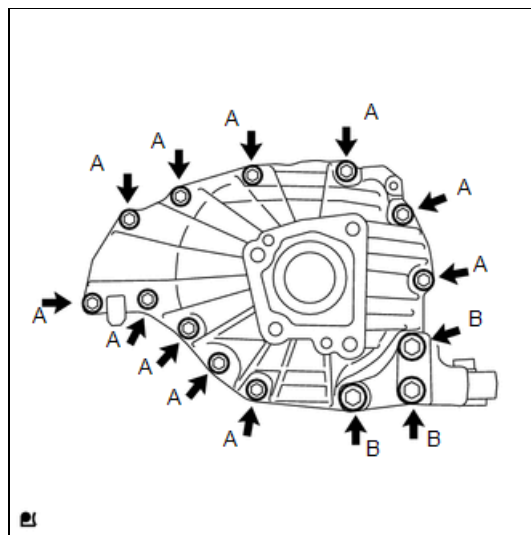
Torque:

for bolt A :

65 N·m {663 kgf·cm, 48 ft·lbf}

for bolt B :

155 N·m {1581 kgf·cm, 114 ft·lbf}

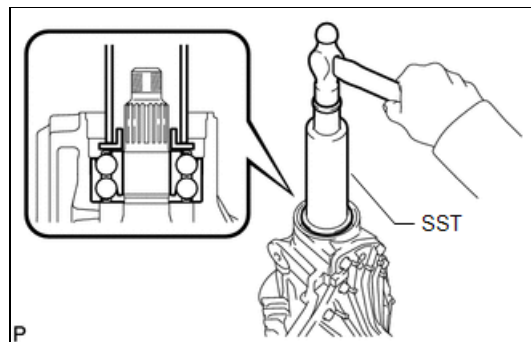


18. INSTALL FRONT DRIVE PINION FRONT RADIAL BALL BEARING

(a) Using SST and a hammer, lightly tap in the bearing (inner race) to install it.

SST: 09316-60011

09316-00041



19. INSTALL FRONT DIFFERENTIAL DRIVE PINION OIL SLINGER

20. INSPECT DIFFERENTIAL DRIVE PINION PRELOAD

(a) Using SST, install the companion flange.

SST: 09950-30012

09951-03010

09953-03010

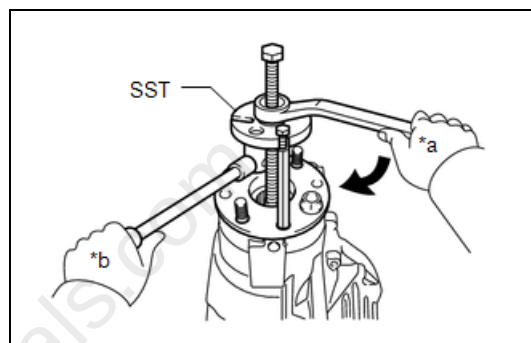
09954-03010

09955-03030

09956-03020

Text in Illustration

*a	Turn
*b	Hold

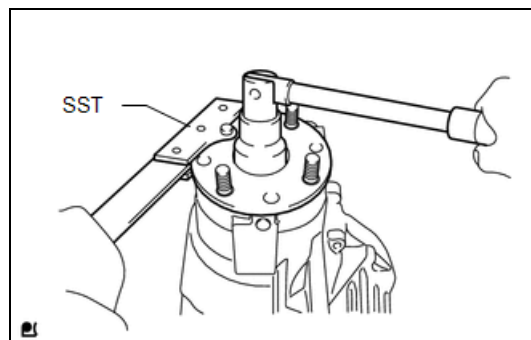


(b) Coat the threads of the nut with hypoid gear oil.

(c) Using SST, hold the companion flange.

SST: 09330-00021

09330-00030



(d) Tighten the nut until the standard preload is reached.

Torque:

451 N·m {4599 kgf·cm, 332 ft·lbf}

or less

NOTICE:

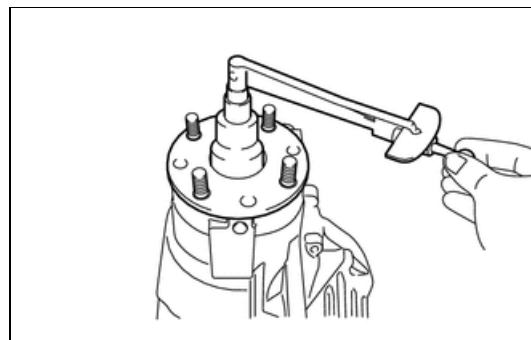
As there is no spacer, tighten the nut a little at a time, being careful not to overtighten it.

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

Standard Preload (at Starting):

BEARING	SPECIFIED CONDITION
New	2.69 to 3.19 N·m (28 to 32 kgf·cm, 24 to 28 in.*lbf)
Reused	1.86 to 2.17 N·m (19 to 22 kgf·cm, 17 to 19 in.*lbf)

If necessary, disassemble and inspect the differential assembly.



21. ADJUST BACKLASH BETWEEN DIFFERENTIAL RING GEAR AND DIFFERENTIAL DRIVE PINION

(a) Using SST and a dial indicator, measure the ring gear backlash.

SST: 09564-33010

Standard backlash:

0.17 to 0.27 mm (0.00670 to 0.0106 in.)

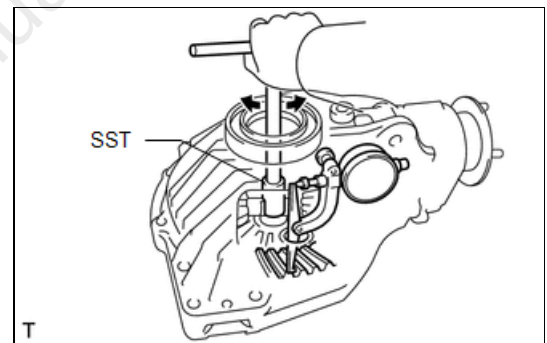
If the backlash is not within the specification, adjust it by either increasing or decreasing the thickness of the washers on both sides by an equal amount.

HINT:

- There should be no clearance between the plate washer and differential case.
- Make sure that there is ring gear backlash.

Standard Plate Washer Thickness:

PART NO.	SPECIFIED CONDITION	PART NO.	SPECIFIED CONDITION
90564-50238	1.49 to 1.51 mm (0.0587 to 0.0594 in.)	90564-50260	1.93 to 1.95 mm (0.0760 to 0.0768 in.)
90564-50239	1.51 to 1.53 mm (0.0594 to 0.0602 in.)	90564-50261	1.95 to 1.97 mm (0.0768 to 0.0776 in.)
90564-50240	1.53 to 1.55 mm (0.0602 to 0.0610 in.)	90564-50262	1.97 to 1.99 mm (0.0776 to 0.0783 in.)
90564-50241	1.55 to 1.57 mm (0.0610 to 0.0618 in.)	90564-50263	1.99 to 2.01 mm (0.0783 to 0.0791 in.)
90564-50242	1.57 to 1.59 mm (0.0618 to 0.0626 in.)	90564-50264	2.01 to 2.03 mm (0.0791 to 0.0799 in.)
90564-50243	1.59 to 1.61 mm (0.0626 to 0.0634 in.)	90564-50265	2.03 to 2.05 mm (0.0799 to 0.0807 in.)
90564-50244	1.61 to 1.63 mm (0.0634 to 0.0642 in.)	90564-50266	2.05 to 2.07 mm (0.0807 to 0.0815 in.)
90564-50245	1.63 to 1.65 mm (0.0642 to 0.0650 in.)	90564-50267	2.07 to 2.09 mm (0.0815 to 0.0823 in.)
90564-50246	1.65 to 1.67 mm (0.0650 to 0.0657 in.)	90564-50268	2.09 to 2.11 mm (0.0823 to 0.0831 in.)
90564-50247	1.67 to 1.69 mm (0.0657 to 0.0665 in.)	90564-50269	2.11 to 2.13 mm (0.0831 to 0.0839 in.)
90564-50248	1.69 to 1.71 mm (0.0665 to 0.0673 in.)	90564-50270	2.13 to 2.15 mm (0.0839 to 0.0846 in.)
90564-50249	1.71 to 1.73 mm (0.0673 to 0.0681 in.)	90564-50271	2.15 to 2.17 mm (0.0846 to 0.0854 in.)
90564-50250	1.73 to 1.75 mm (0.0681 to 0.0689 in.)	90564-50272	2.17 to 2.19 mm (0.0854 to 0.0862 in.)
90564-50251	1.75 to 1.77 mm (0.0689 to 0.0697 in.)	90564-50273	2.19 to 2.21 mm (0.0862 to 0.0870 in.)
90564-50252	1.77 to 1.79 mm (0.0697 to 0.0705 in.)	90564-50274	2.21 to 2.23 mm (0.0870 to 0.0878 in.)
90564-50253	1.79 to 1.81 mm (0.0705 to 0.0713 in.)	90564-50275	2.23 to 2.25 mm (0.0878 to 0.0886 in.)
90564-50254	1.81 to 1.83 mm (0.0713 to 0.0720 in.)	90564-50276	2.25 to 2.27 mm (0.0886 to 0.0894 in.)
90564-50255	1.83 to 1.85 mm (0.0720 to 0.0728 in.)	90564-50277	2.27 to 2.29 mm (0.0894 to 0.0902 in.)
90564-50256	1.85 to 1.87 mm (0.0728 to 0.0736 in.)	90564-50278	2.29 to 2.31 mm (0.0902 to 0.0909 in.)
90564-50257	1.87 to 1.89 mm (0.0736 to 0.0744 in.)	90564-50279	2.31 to 2.33 mm (0.0909 to 0.0917 in.)
90564-50258	1.89 to 1.91 mm (0.0744 to 0.0752 in.)	90564-50280	2.33 to 2.35 mm (0.0917 to 0.0925 in.)
90564-50259	1.91 to 1.93 mm (0.0752 to 0.0760 in.)	-	-



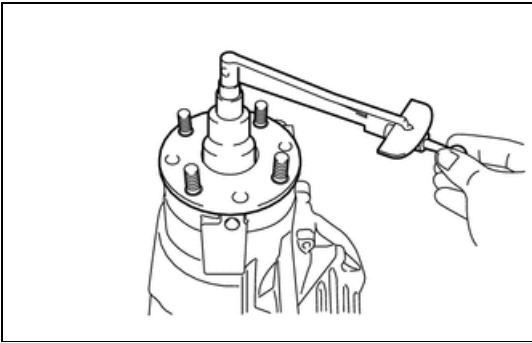
22. INSPECT TOTAL PRELOAD

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

Standard Total Preload (at starting):

BEARING	SPECIFIED CONDITION
New	4.30 to 5.60 N*m (44 to 57 kgf*cm, 39 to 49 in.*lbf)
Reused	3.19 to 4.30 N*m (33 to 43 kgf*cm, 29 to 38 in.*lbf)

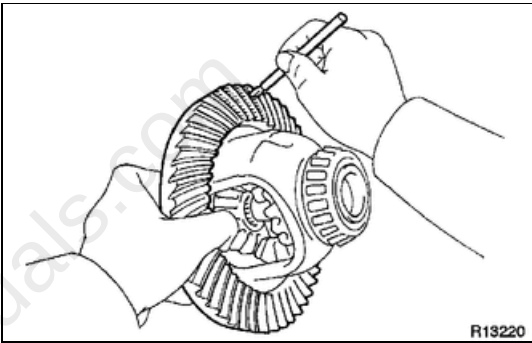
If necessary, disassemble and inspect the differential.



23. INSPECT TOOTH CONTACT BETWEEN RING GEAR AND DRIVE PINION

- (a) Remove the bearing retainer and differential case.

- (b) Coat 3 or 4 teeth at 3 different positions on the ring gear with Prussian blue.

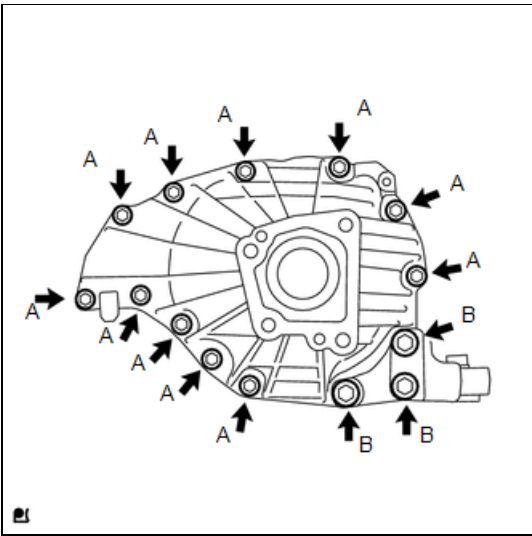


- (c) Install the differential case to the differential carrier.

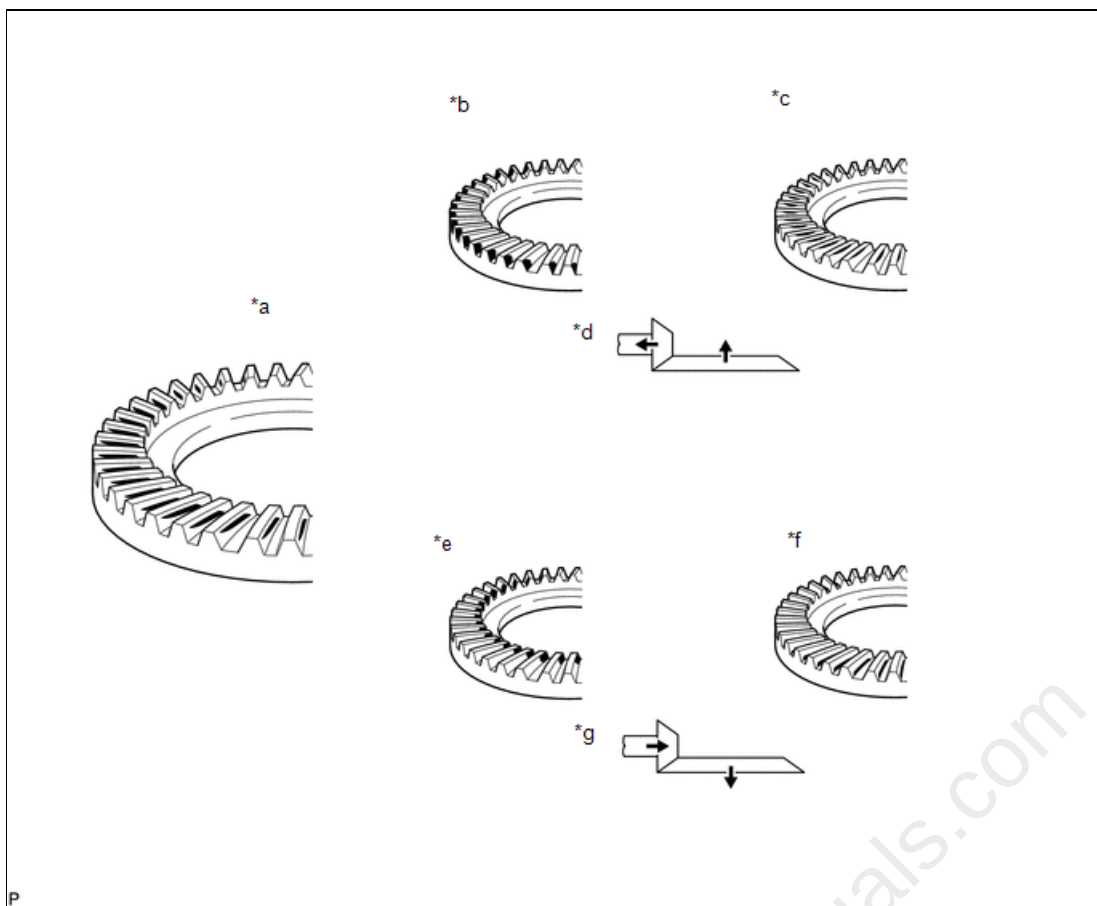
- (d) Install the differential cross shaft bearing retainer and front differential front support assembly LH with the 14 bolts.

Torque:

- for bolt A :
65 N-m {663 kgf.cm, 48 ft.lbf}
for bolt B :
155 N-m {1581 kgf.cm, 114 ft.lbf}



- (e) Hold the companion flange firmly and rotate it in both directions.
(f) Remove the 14 bolts, differential case, shaft bearing retainer and front support.
(g) Inspect the tooth contact pattern.



Text in Illustration

*a	Proper Contact	*b	Heel Contact
*c	Face Contact	*d	Select an adjusting washer that will shift the drive pinion closer to the ring gear (*b, *c)
*e	Toe Contact	*f	Flank Contact
*g	Select an adjusting washer that will shift the drive pinion away from the ring gear (*e, *f)	-	-

If the teeth are not engaged properly, use the following chart to select the appropriate drive pinion washer for correction.

Standard Drive Pinion Washer Thickness:

PART NO.	SPECIFIED CONDITION	PART NO.	SPECIFIED CONDITION
90564-63065	1.815 to 1.835 mm (0.0715 to 0.0722 in.)	90564-63076	2.065 to 2.085 mm (0.0813 to 0.0820 in.)
90564-63066	1.840 to 1.860 mm (0.0725 to 0.0732 in.)	90564-63077	2.090 to 2.110 mm (0.0823 to 0.0830 in.)
90564-63067	1.865 to 1.885 mm (0.0735 to 0.0742 in.)	90564-63078	2.115 to 2.135 mm (0.0833 to 0.0840 in.)
90564-63068	1.890 to 1.910 mm (0.0744 to 0.0752 in.)	90564-63079	2.140 to 2.160 mm (0.0843 to 0.0850 in.)
90564-63069	1.915 to 1.935 mm (0.0754 to 0.0762 in.)	90564-63080	2.165 to 2.185 mm (0.0853 to 0.0860 in.)
90564-63070	1.940 to 1.960 mm (0.0764 to 0.0772 in.)	90564-63081	2.190 to 2.210 mm (0.0863 to 0.0870 in.)
90564-63071	1.965 to 1.985 mm (0.0774 to 0.0781 in.)	90564-63082	2.215 to 2.235 mm (0.0872 to 0.0879 in.)
90564-63072	1.990 to 2.010 mm (0.0784 to 0.0791 in.)	90564-63083	2.240 to 2.260 mm (0.0882 to 0.0889 in.)
90564-63074	2.015 to 2.035 mm (0.0794 to 0.0801 in.)	90564-63084	2.265 to 2.285 mm (0.0892 to 0.0899 in.)
90564-63075	2.040 to 2.060 mm (0.0804 to 0.0811 in.)	-	-

24. REMOVE FRONT DRIVE PINION COMPANION FLANGE SUB-ASSEMBLY

INFO

25. REMOVE FRONT DIFFERENTIAL DRIVE PINION OIL SLINGER

26. REMOVE FRONT DIFFERENTIAL CROSS SHAFT BEARING RETAINER

INFO

27. REMOVE FRONT NO. 1 DIFFERENTIAL CASE SUB-ASSEMBLY

28. REMOVE DIFFERENTIAL DRIVE PINION

29. REMOVE FRONT DRIVE PINION FRONT RADIAL BALL BEARING

30. INSTALL FRONT DIFFERENTIAL DRIVE PINION BEARING SPACER

- (a) Install a new bearing spacer.

31. TEMPORARILY INSTALL DIFFERENTIAL DRIVE PINION

32. INSTALL FRONT NO. 1 DIFFERENTIAL CASE SUB-ASSEMBLY

33. INSTALL FRONT DIFFERENTIAL CROSS SHAFT BEARING RETAINER

- (a) Remove any old FIPG material and be careful not to drop oil on the contact surfaces of the differential carrier and shaft bearing retainer.
(b) Wipe off any residual FIPG material on the contact surface using gasoline or alcohol.

- (c) Apply seal packing to the differential carrier as shown in the illustration.

Text in Illustration

*a	Seal Packing
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Seal packing:

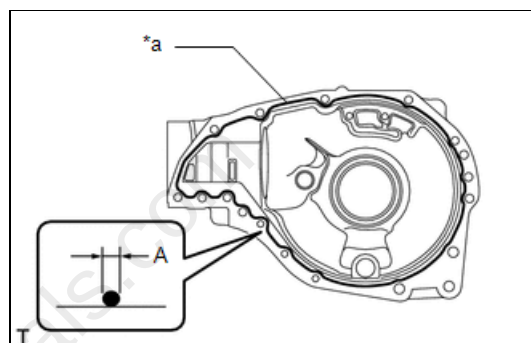
Toyota Genuine Seal Packing 1281, Three Bond 1281 or equivalent

Standard Seal Diameter (A):

2.0 to 3.0 mm (0.0788 to 0.118 in.)

HINT:

Install the shaft bearing retainer within 10 minutes of applying seal packing.



- (d) Install the front differential cross shaft bearing retainer and front differential front support assembly LH with the 11 bolts (A), and 3 new bolts (B).

Torque:

for bolt A :

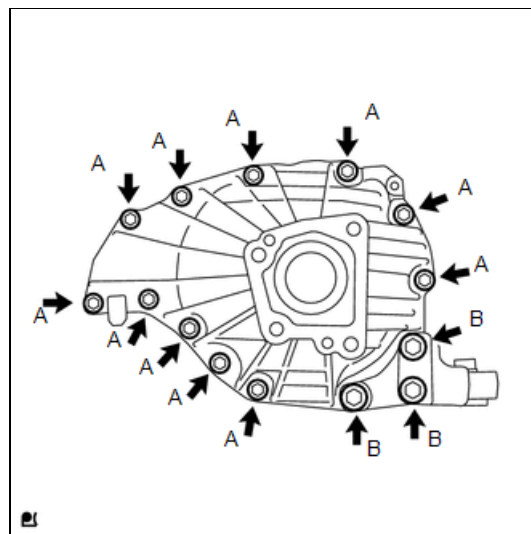
65 N·m {663 kgf·cm, 48 ft·lbf}

for bolt B :

155 N·m {1581 kgf·cm, 114 ft·lbf}

NOTICE:

Do not add oil or drive the vehicle immediately after installing the cover, and leave it as is for at least an hour. Also, for 12 hours or less, avoid rapid acceleration/deceleration.

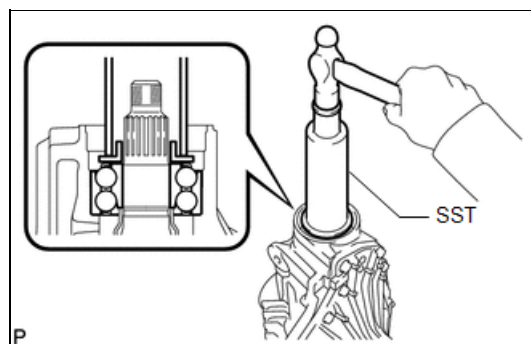


34. INSTALL FRONT DRIVE PINION FRONT RADIAL BALL BEARING

- (a) Using SST and a hammer, lightly tap in the bearing (inner race) to install it.

SST: 09316-60011

09316-00041

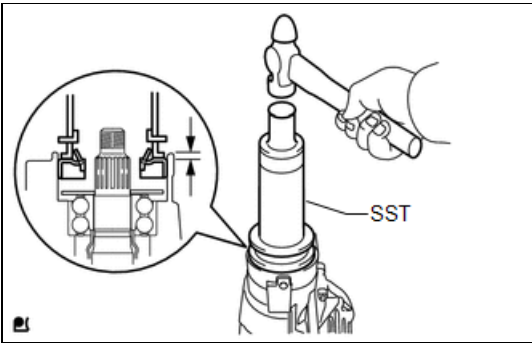


35. INSTALL FRONT DIFFERENTIAL DRIVE PINION OIL SLINGER

36. INSTALL FRONT DIFFERENTIAL CARRIER OIL SEAL

(a) Using SST and a hammer, tap in a new oil seal.

SST: 09502-12010
SST: 09316-60011
09316-00041
Standard oil seal depth:
5.6 to 6.6 mm (0.221 to 0.260 in.)



(b) Coat the lip of the oil seal with MP grease.

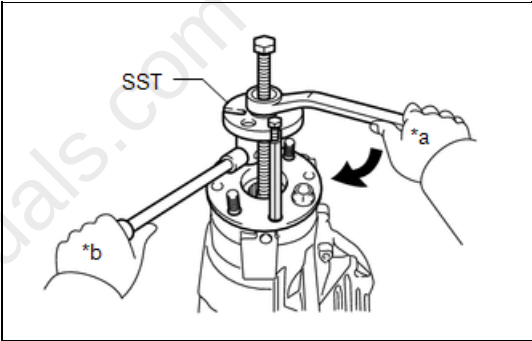
37. INSTALL FRONT DRIVE PINION COMPANION FLANGE SUB-ASSEMBLY

(a) Using SST, install the companion flange.

SST: 09950-30012
09951-03010
09953-03010
09954-03010
09955-03030
09956-03020

Text in Illustration

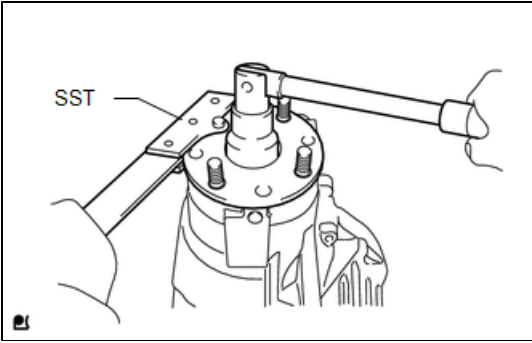
*a	Turn
*b	Hold



38. INSPECT DIFFERENTIAL DRIVE PINION PRELOAD

(a) Using SST, hold the companion flange.

SST: 09330-00021
09330-00030



(b) Coat the threads of a new nut with hypoid gear oil.
(c) Install the nut by tightening it until the standard preload is reached.

Torque:
451 N·m {4599 kgf·cm, 332 ft·lbf}
or less

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

Standard Preload (at Starting):

BEARING	SPECIFIED CONDITION
New	3.05 to 3.55 N·m (32 to 36 kgf·cm, 27 to 31 in.·lbf)
Reused	2.22 to 2.53 N·m (23 to 25 kgf·cm, 20 to 22 in.·lbf)

If the preload is more than the specification, replace the bearing spacer.

If the preload is less than the specification, tighten the nut with 13 N*m (130 kgf*cm, 9 ft.*lbf) of torque at a time until the specified preload is reached.

Torque:

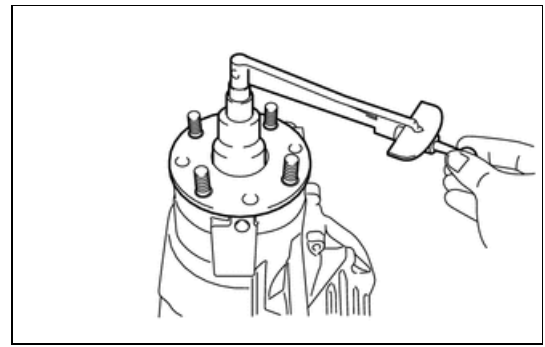
451 N·m {4599 kgf·cm, 333 ft·lbf}

or less

If the maximum torque is exceeded while tightening the nut, replace the bearing spacer and repeat the preload procedure.

HINT:

Do not loosen the nut to reduce the preload.

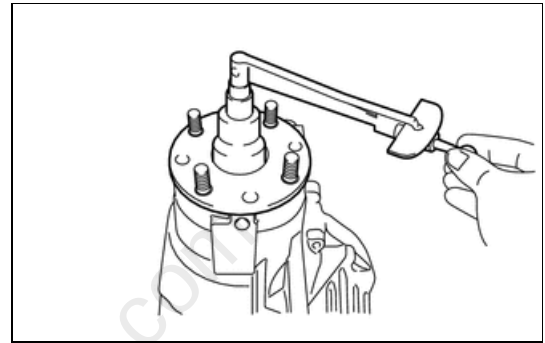


39. INSPECT TOTAL PRELOAD

- (a) With the drive pinion contacting the tooth side of the ring gear, use a torque wrench to measure the total preload.

Standard Total Preload (at starting):

BEARING	SPECIFIED CONDITION
New	4.66 to 5.96 N*m (48 to 60 kgf*cm, 42 to 52 in.*lbf)
Reused	3.55 to 4.66 N*m (37 to 47 kgf*cm, 32 to 41 in.*lbf)



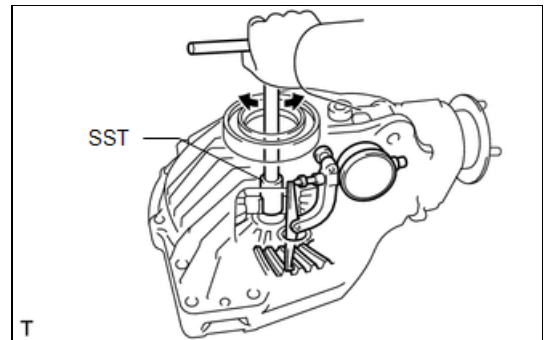
40. INSPECT BACKLASH BETWEEN DIFFERENTIAL RING GEAR AND DIFFERENTIAL DRIVE PINION

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

SST: 09564-33010

Standard backlash:

0.17 to 0.27 mm (0.00670 to 0.0106 in.)



41. INSPECT RUNOUT OF FRONT DRIVE PINION COMPANION FLANGE SUB-ASSEMBLY

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

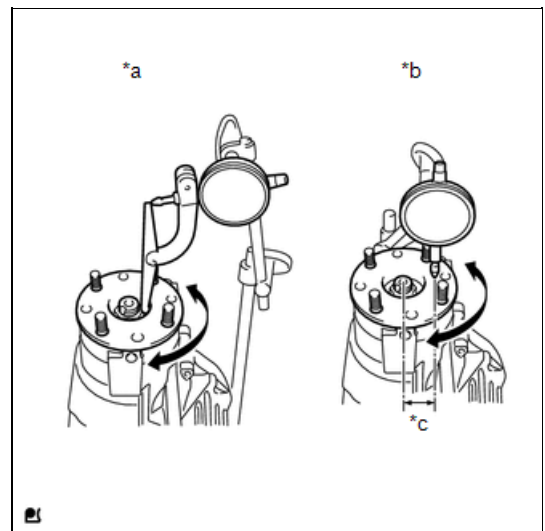
Maximum Runout:

RUNOUT	SPECIFIED CONDITION
Vertical runout	0.10 mm (0.00394 in.)
Lateral runout	0.10 mm (0.00394 in.)

Text in Illustration

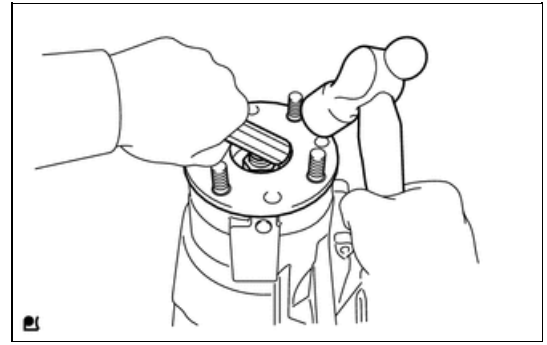
*a	Vertical Runout
*b	Lateral Runout
*c	55 mm (2.17 in.)

If the runout is more than the maximum, replace the companion flange.



42. STAKE FRONT DRIVE PINION COMPANION FLANGE FRONT NUT

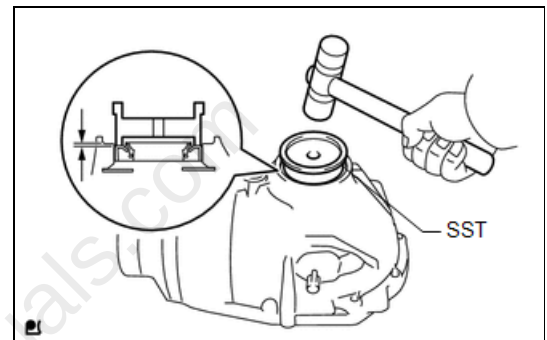
- (a) Using a chisel and hammer, stake the nut.



43. INSTALL DIFFERENTIAL SIDE GEAR SHAFT OIL SEAL

- (a) Using SST and a plastic-faced hammer, tap in a new oil seal until its surface is flush with the differential carrier end.

SST: 09608-32010



- (b) Coat the lip of the oil seal with MP grease.

Standard oil seal depth:

-0.45 to 0.45 mm (-0.0177 to 0.0177 in.)

44. INSTALL DIFFERENTIAL EXTENSION FLANGE TUBE

- (a) Remove any old FIPG material and be careful not to drop oil on the contact surfaces of the differential tube and bearing retainer.
(b) Wipe off any residual FIPG material on the contact surface using gasoline or alcohol.

- (c) Apply seal packing to the bearing retainer as shown in the illustration.

Text in Illustration

*a	Seal Packing
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Seal packing:

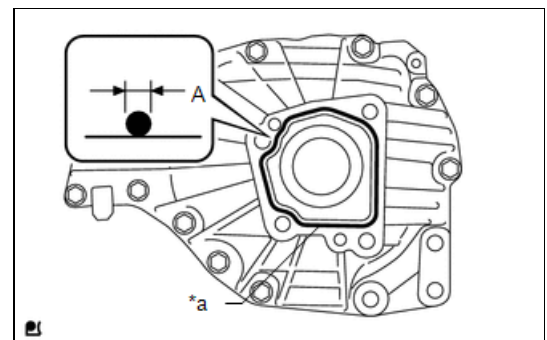
Toyota Genuine Seal Packing 1281, Three Bond 1281 or equivalent

Standard Seal Diameter (A):

2.0 to 3.0 mm (0.0788 to 0.118 in.)

HINT:

Install the differential tube within 10 minutes of applying seal packing.



- (d) Install the differential tube onto the bearing retainer.

- (e) Install 4 new bolts.

Torque:

65 N·m {663 kgf·cm, 48 ft·lbf}

or less

NOTICE:

Do not add oil or drive the vehicle immediately after installing the cover, and leave it as is for at least an hour. Also, for 12 hours or less, avoid rapid acceleration/deceleration.

