TOYOTA SERVICE BULLETIN
Group: 06 No.: 13 Date: Nov, 13

Rav4

Corrections to Repair Manual RM01N3E

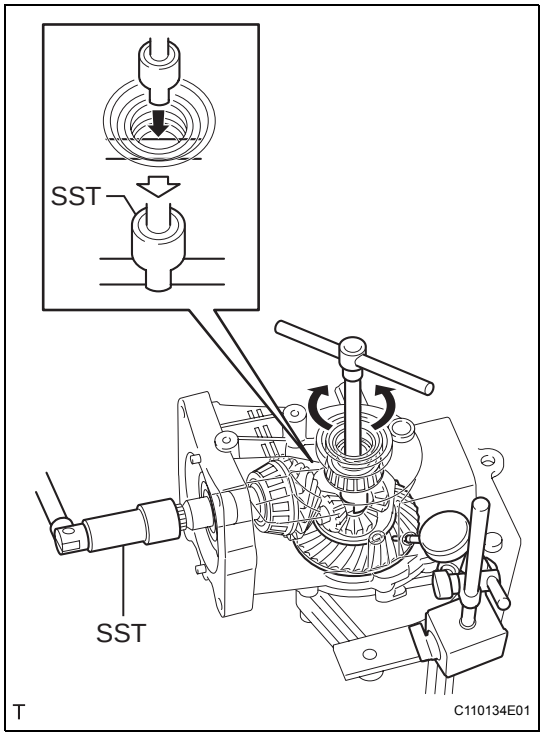
Please ensure these pages are distributed to all relevant staff for their information; and a copy made available for future reference, with the above repair manual.

Section	Title	Paragraph
DIFFERENTIAL	REAR DIFFERENTIAL CARRIER ASSEMBLY	DISASSEMBLY
DIFFERENTIAL	REAR DIFFERENTIAL CARRIER ASSEMBLY	REASSEMBLY
PREPARATION	DIFFERENTIAL	SST

The revised pages listed above are attached.
(The corrected parts are indicated by arrows.)

This Bulletin does not cause the Flat Rate Manual to be changed.

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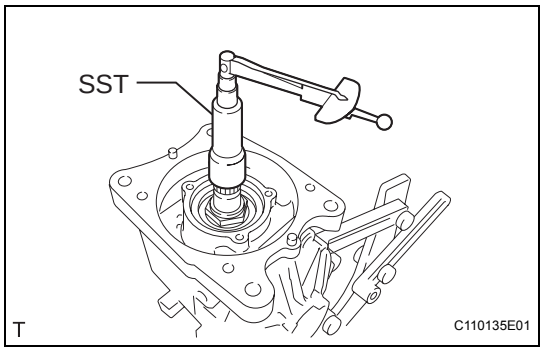


13. INSPECT DIFFERENTIAL RING GEAR BACKLASH

(a) Insert a dial gauge through the rear differential carrier cover plug hole, and set it perpendicular to the ring gear tooth surface's tip.

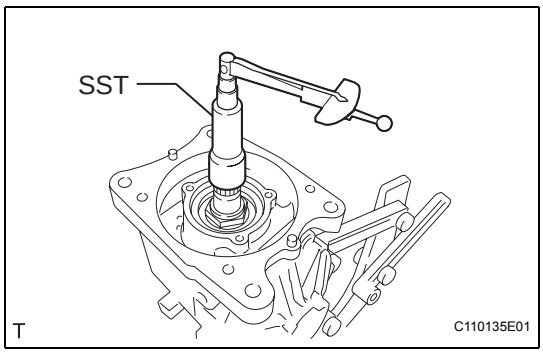
(b) Using SST, fix the drive pinion in place.
SST 09556-52010 [Corrected]

(c) Using SST, rotate the rear differential case forward and backward, and measure the backlash.
SST 09564-32011
Standard backlash:
0.09 to 0.16 mm (0.0034 to 0.0063 in.)
NOTICE:
Measure at 3 or more areas around the circumference of the ring gear.



14. INSPECT DIFFERENTIAL DRIVER PINION PRELOAD

(a) Using SST and a torque wrench, inspect the preload (starting torque) within the differential drive pinion and differential ring gear backlash area.
SST 09556-52010 [Corrected]
Standard drive pinion preload:
0.24 to 0.37 N*m (2 to 4 kgf*cm, 2 to 3 in.*lbf)
NOTICE:
For a more accurate measurement, rotate the case bearing forward and backward before measuring.

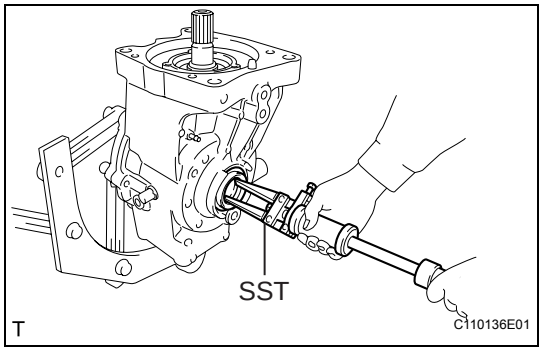


15. INSPECT TOTAL PRELOAD

(a) Using SST and a torque wrench, inspect the preload (starting torque) with the teeth of the differential drive pinion and differential ring gear in contact.
SST 09556-52010 [Corrected]
Standard total preload:
Standard drive pinion preload plus 0.99 to 1.63 N*m (10 to 17 kgf*cm, 9 to 14 in.*lbf)
NOTICE:
For a more accurate measurement, rotate the case bearing forward and backward before measuring.

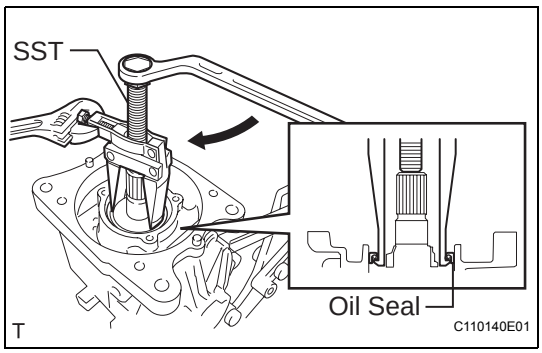
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16. REMOVE DIFFERENTIAL SIDE GEAR SHAFT OIL SEAL

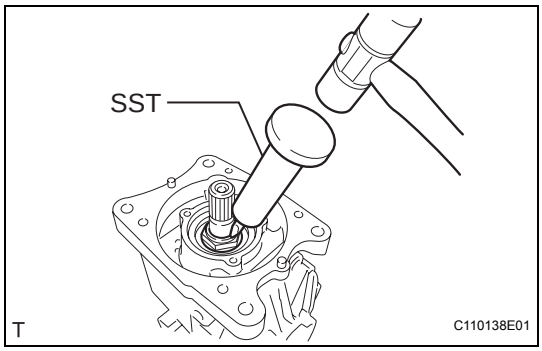
(a) Using SST, tap out the 2 rear differential side shaft gear oil seals from the rear differential carrier.
SST 09308-00010



17. REMOVE DIAPHRAGM OIL SEAL

(a) Using SST, remove the diaphragm oil seal from the rear differential carrier.
SST 09308-10010

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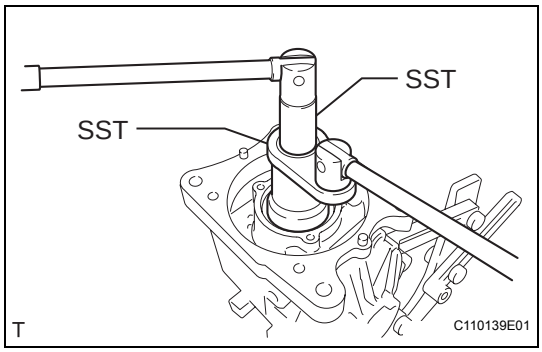


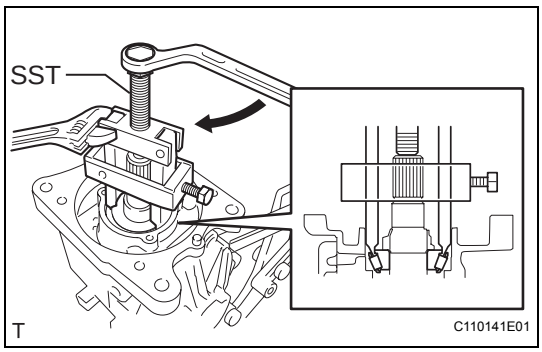
18. REMOVE DRIVE PINION NUT

(a) Using SST and a hammer, unstake the rear drive pinion nut.
SST 09930-00010
NOTICE:
- **Use SST with the tapered part against the shaft side.**
- **Do not modify the SST tip with a grinder or equivalent.**
- **Fully unstake the rear drive pinion nut.**

(b) Using SST, fix the differential drive pinion in place and remove the rear drive pinion nut from the differential drive pinion.
SST 09556-52010, 09564-16020

[Corrected]

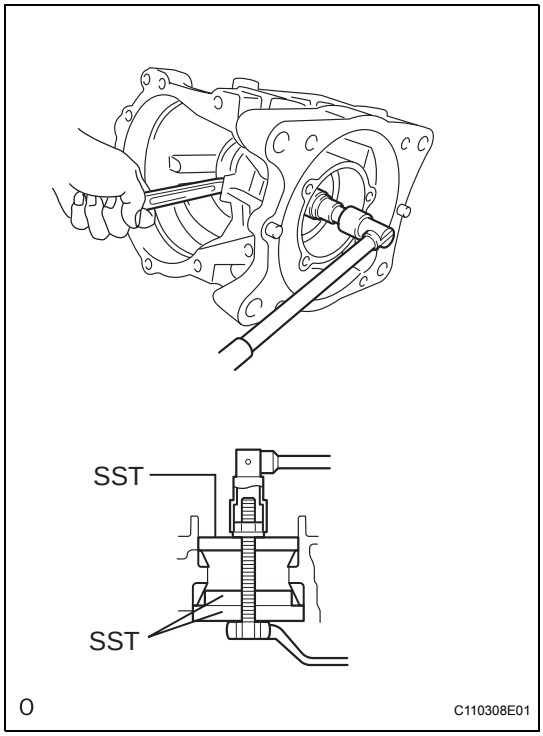




19. REMOVE REAR DRIVE PINION FRONT TAPERED ROLLER BEARING

(a) Using SST, remove the rear driver pinion tapered roller bearing front (inner race) from the rear differential carrier.
SST 09556-30010

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9. INSTALL REAR DRIVE PINION REAR TAPERED ROLLER BEARING

(a) Using SST, bolts, nuts and washers, install the rear drive pinion tapered roller bearing rear (outer race) to the rear differential carrier.

SST 09950-60010 (09951-00600), 09950-60020 (09951-00680, 09951-00750)

HINT:

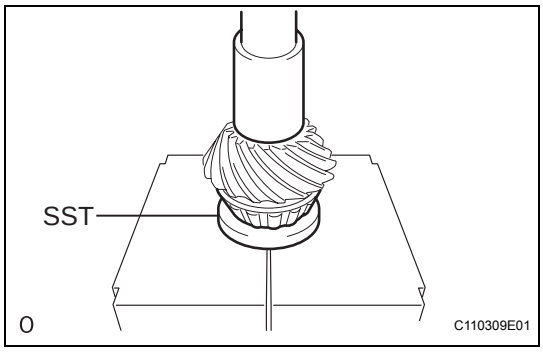
Use M12 x P1.25 bolts with shaft lengths of 186 mm (part No. 90101-12159) and M12 x p1.25 nuts (part No. 90179-12051) for the installation.

10. INSTALL REAR DRIVE PINION REAR TAPERED ROLLER BEARING

(a) Install the rear differential drive pinion washer to the differential drive pinion.

NOTICE:

Install each rear differential drive pinion washer to the place it was removed from.



(b) Using SST and a press, press-fit the tapered roller rear (inner race) to the differential drive pinion.

SST 09506-30012

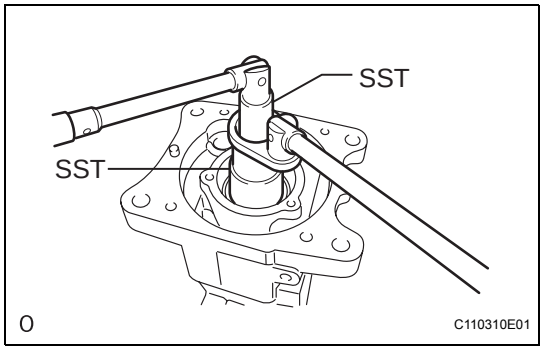
11. ADJUST DIFFERENTIAL DRIVE PINION PRELOAD

(a) Install the differential drive pinion (with rear drive pinion tapered roller bearing rear inner race) to the rear differential carrier.

(b) Install the rear drive pinion tapered roller bearing front inner race and a new rear drive pinion nut to the differential drive pinion.

NOTICE:

- **New bearings are coated with anti-rust oil. If using new bearings, do not wash it off.**
- **If reusing a bearing, coat it with hypoid gear oil.**



(c) Using SST, tighten a new rear drive pinion nut a little at a time until the specified preload is reached. Do not exceed the torque limit shown below.

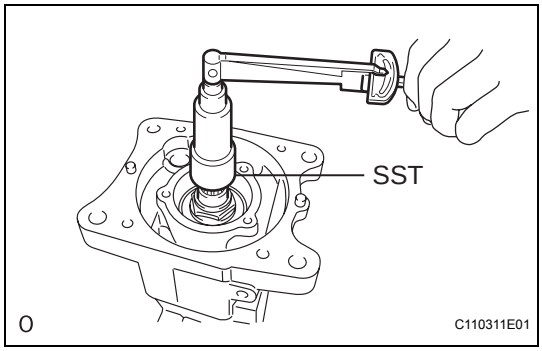
SST 09556-52010, 09564-16020

Torque: 245 N*m (2,500 kgf*cm, 181 ft.*lbf)
223 N*m (2,273 kgf*cm, 164 in.*lbf)
(When using torque wrench 2800 FL)

[Corrected]

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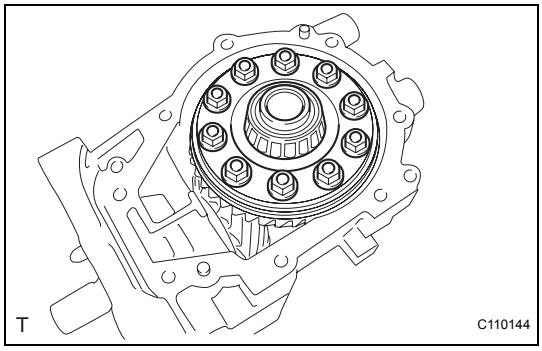
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(d) Using SST and a torque wrench, measure the starting torque of the differential drive pinion.
SST 09556-52010 [Corrected]
Standard drive pinion preload (start torque)

Bearing	Preload
New bearing	1.31 to 2.18 N*m (13 to 22 kgf*cm, 12 to 19 in.*lbf)
Reused bearing	0.24 to 0.37 N*m (2 to 4 kgf*cm, 2 to 3 in.*lbf)

NOTICE:
- **For a more accurate measurement, rotate the bearing forward and backward before inspecting.**
- **Record the preload measurement for use with the total preload inspection.**

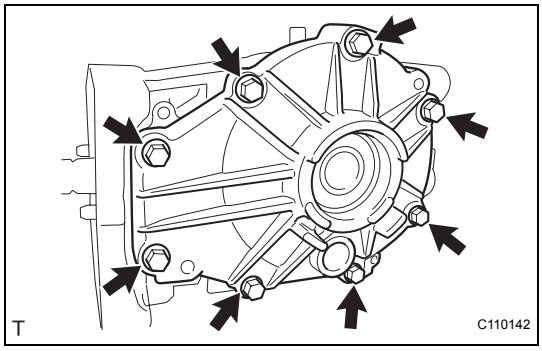


12. INSTALL DIFFERENTIAL CASE

(a) Install the rear differential case to the rear differential carrier.

13. INSTALL DIFFERENTIAL SIDE BEARING RETAINER

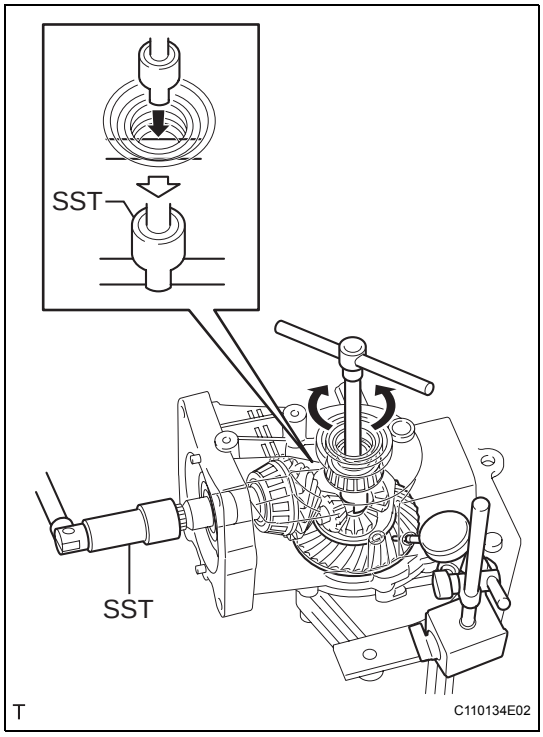
(a) Using a scraper and wire brush, clean the seal packing from the rear differential carrier and differential side bearing retainer.
NOTICE:
Do not scratch the installation area.



(b) Install the differential side bearing retainer to the rear differential carrier with the 8 bolts.
Torque: 34 N*m (350 kgf*cm, 25 ft.*lbf)

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14. ADJUST DIFFERENTIAL RING GEAR BACKLASH

(a) Insert a dial gauge through the rear differential carrier cover plug hole, and set it perpendicular to the ring gear tooth surface's tip.

(b) Using SST, fix the drive pinion in place.
SST **09556-52010** [Corrected]

(c) Using SST, rotate the rear differential case forward and backward, and measure the backlash.
SST **09564-32011** [Corrected]
NOTICE:
Measure at 3 or more areas around the circumstance of the ring gear.

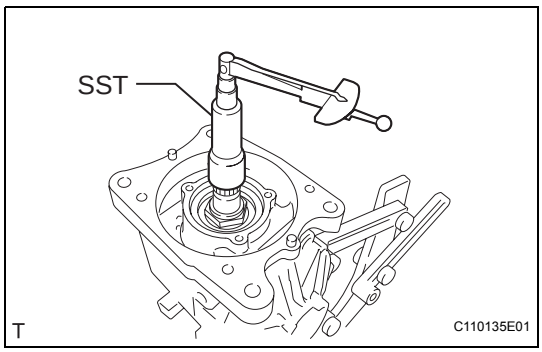
(d) If the result is not within the specified range, select washers that are thicker or thinner ad necessary, where the thickness for the left and right side is the same. Then perform the rear differential case bearing outer race installation.
HINT:
- If the backlash is small, select a thick washer for the RH side and a thin washer for the LH side.
- If the backlash is large, select a thin washer for the RH side and a thick washer for the LH side.

Rear differential side gear shaft washer type

Part No.	Thickness mm (in.)	Identifying Mark	Part No.	Thickness mm (in.)	Identifying Mark
90564-37022	1.59 to 1.61 (0.0625 to 0.0633)	A0	90564-37040	2.13 to 2.15 (0.0839 to 0.0846)	B8
90564-37023	1.62 to 1.64 (0.0637 to 0.0649)	A1	90564-37041	2.16 to 2.18 (0.0850 to 0.0858)	B9
90564-37024	1.65 to 1.67 (0.0650 to 0.0657)	A2	90564-37042	2.19 to 2.21 (0.0862 to 0.0870)	C0
90564-37025	1.68 to 1.70 (0.0661 to 0.0669)	A3	90564-37043	2.22 to 2.24 (0.0874 to 0.0882)	C1
90564-37026	1.71 to 1.73 (0.0673 to 0.0681)	A4	90564-37044	2.25 to 2.27 (0.0886 to 0.0894)	C2
90564-37027	1.74 to 1.76 (0.0685 to 0.0693)	A5	90564-37045	2.28 to 2.30 (0.0898 to 0.0906)	C3
90564-37028	1.77 to 1.79 (0.0697 to 0.0705)	A6	90564-37046	2.31 to 2.33 (0.0909 to 0.0917)	C4
90564-37029	1.80 to 1.82 (0.0709 to 0.0717)	A7	90564-37047	2.34 to 2.36 (0.0921 to 0.0929)	C5
90564-37030	1.83 to 1.85 (0.0720 to 0.0728)	A8	90564-37048	2.37 to 2.39 (0.0930 to 0.0941)	C6
90564-37031	1.86 to 1.88 (0.0732 to 0.0740)	A9	90564-37049	2.40 to 2.42 (0.0945 to 0.0953)	C7
90564-37032	1.89 to 1.91 (0.0744 to 0.0752)	B0	90564-37050	2.43 to 2.45 (0.0957 to 0.0965)	C8
90564-37033	1.92 to 1.94 (0.0756 to 0.0764)	B1	90564-37051	2.46 to 2.48 (0.0969 to 0.0976)	C9
90564-37034	1.95 to 1.97 (0.0768 to 0.0776)	B2	90564-37052	2.49 to 2.51 (0.0980 to 0.0988)	D0
90564-37035	1.98 to 2.00 (0.0780 to 0.0787)	B3	90564-37053	2.52 to 2.54 (0.0992 to 0.1000)	D1
90564-37036	2.02 to 2.04 (0.0795 to 0.0803)	B4	90564-37054	2.55 to 2.57 (0.1004 to 0.1012)	D2
90564-37037	2.04 to 2.06 (0.0803 to 0.0811)	B5	90564-37055	2.58 to 2.60 (0.1016 to 0.1024)	D3

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Part No.	Thickness mm (in.)	Identifying Mark	Part No.	Thickness mm (in.)	Identifying Mark
90564-35060	1.885 to 1.895 (0.0742 to 0.0746)	60	90564-35090	2.145 to 2.155 (0.0844 to 0.0848)	90
90564-35061	1.895 to 1.905 (0.0746 to 0.0750)	61	90564-35091	2.155 to 2.165 (0.0848 to 0.0852)	91
90564-35062	1.905 to 1.915 (0.0750 to 0.0754)	62	90564-35092	2.165 to 2.175 (0.0852 to 0.0856)	92
90564-35063	1.915 to 1.925 (0.0754 to 0.0758)	63	90564-35093	2.175 to 2.185 (0.0856 to 0.0860)	93
90564-35064	1.925 to 1.935 (0.0758 to 0.0762)	64	90564-35094	2.185 to 2.195 (0.0860 to 0.0864)	94
90564-35065	1.935 to 1.945 (0.0762 to 0.0766)	65	90564-35095	2.195 to 2.205 (0.0864 to 0.0868)	95
90564-35070	1.945 to 1.955 (0.0766 to 0.0770)	70	-	-	-



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16. INSPECT TOTAL PRELOAD

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

SST 09556-52010 [Corrected]

Standard total preload:

Standard drive pinion preload plus

Bearing	Preload
New bearing	1.18 to 1.63 N*m (12 to 17 kgf*cm, 10 to 14 in.*lbf)
Reused bearing	0.99 to 1.63 N*m (10 to 17 kgf*cm, 9 to 14 in.*lbf)

NOTICE:

For a more accurate measurement, rotate the case bearing forward and backward before measuring.

(b) If the results are not within the specification, perform the procedures below.

(1) Select a side gear shaft washer for the RH side again, and then perform the rear differential case bearing outer race installation (RH side only).

(2) Repeat the total preload inspection.

(3) Repeat the ring gear backlash inspection.

(4) Repeat the differential ring gear and drive pinion tooth contact pattern inspection.

17. REMOVE DIFFERENTIAL SIDE BEARING RETAINER

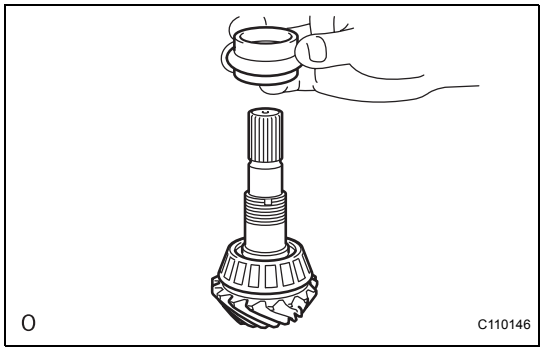
(a) Remove the 8 bolts and differential side bearing retainer from the rear differential carrier.

18. REMOVE DIFFERENTIAL CASE

(a) Remove the rear differential case from the rear differential carrier.

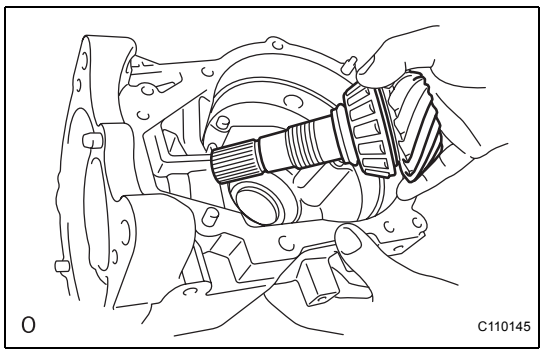
19. REMOVE DIFFERENTIAL DRIVE PINION

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20. INSTALL DIFFERENTIAL DRIVE PINION BEARING SPACER

(a) Install a new rear differential drive pinion bearing spacer to the differential drive pinion.

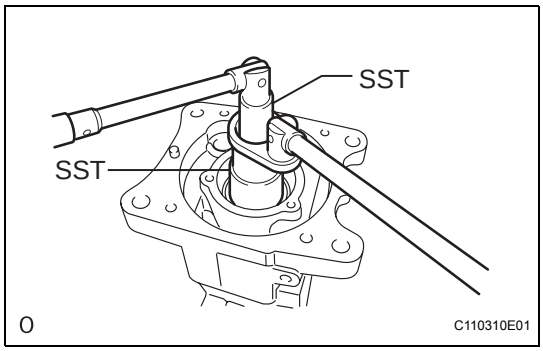


21. INSTALL DIFFERENTIAL DRIVE PINION

(a) Install the differential drive pinion to the rear differential carrier.

22. INSTALL REAR DRIVE PINION NUT

(a) Apply hypoid gear oil LSD to the threads of the rear drive pinion nut.



(b) Install a new rear drive pinion nut to the differential drive pinion. Using SST, tighten the nut while confirming the preload.

SST 09556-52010, 09564-16020

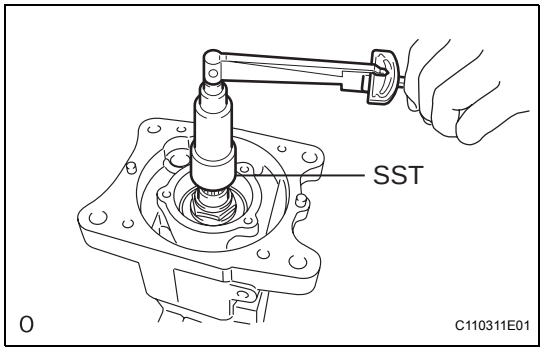
Torque: 245 N*m (2,500 kgf*cm, 181 ft.*lbf) for use without SST

223 N*m (2,273 kgf*cm, 164 ft.*lbf) for use with SST

[Corrected]

HINT:

Use a torque wrench with a fulcrum length of 30 cm (11.81 in.)



23. ADJUST DIFFERENTIAL DRIVE PINION PRELOAD

(a) Using SST and a torque wrench, inspect the starting torque.

SST 09556-52010 [Corrected]

Standard drive pinion preload (start torque)

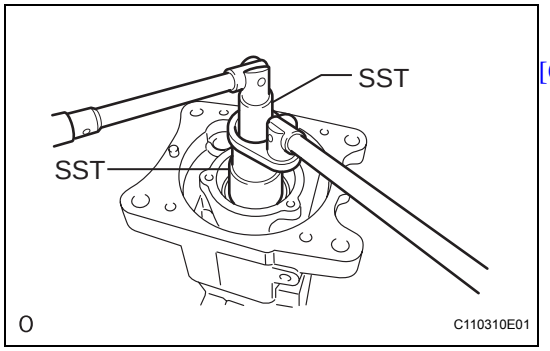
Bearing	Preload
New bearing	1.31 to 2.18 N*m (13 to 22 kgf*cm, 12 to 19 in.*lbf)
Reused bearing	0.24 to 0.37 N*m (2 to 4 kgf*cm, 2 to 3 in.*lbf)

NOTICE:

- **For a more accurate measurement, rotate the bearing forward and backward before adjusting.**
- **Adjust it so that it matches the drive pinion temporary adjustment starting torque.**

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(b) If the preload is insufficient, use SST to tighten the drive pinion nut 5 to 10° at a time. Measure the starting torque and repeat the adjustment as necessary until the preload matches the specified torque. [Corrected]

SST 09556-52010 09564-16020

(c) If the tightening torque of the rear drive pinion nut exceeds 245 N*m {2500 kgf*cm} but the preload is still insufficient, loosen the rear drive pinion nut. Then check if the rear drive pinion nut and differential drive pinion screw threads are damaged.

(d) If there is no defect, replace the rear drive differential drive pinion bearing spacer, apply hypoid gear oil LSD to its threads and repeat the procedure above.

24. INSTALL DIFFERENTIAL CASE

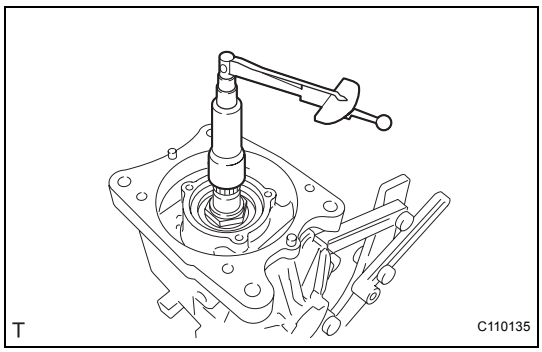
25. INSTALL DIFFERENTIAL SIDE BEARING RETAINER

(a) Install the differential side bearing retainer to the rear differential carrier with the 8 bolts.

Torque: 34 N*m (350 kgf*cm, 25 ft.*lbf)

26. INSPECT DIFFERENTIAL RING GEAR BACKLASH

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27. INSPECT TOTAL PRELOAD

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

SST 09556-52010 [Corrected]

Standard total preload:

Standard drive pinion preload plus

Bearing	Preload
New bearing	1.18 to 1.90 N*m (12 to 19 kgf*cm, 10 to 17 in.*lbf)
Reused bearing	0.99 to 1.63 N*m (10 to 17 kgf*cm, 9 to 14 in.*lbf)

NOTICE:

For a more accurate measurement, rotate the case bearing forward and backward before measuring.

(b) If the results are not within the specified range, select a rear differential side gear shaft washer for the RH side again, and then perform the rear differential case bearing outer race installation (RH side only).

NOTICE:

If using a different rear differential side gear shaft washer, adjust the ring gear backlash. Then adjust the total preload.

28. REMOVE DIFFERENTIAL SIDE BEARING RETAINER

(a) Remove the 8 bolts and side bearing retainer from the rear differential carrier.

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29. INSTALL DIFFERENTIAL SIDE BEARING RETAINER

(a) Using white gasoline, remove grease and oil from the alignment surfaces of the rear differential carrier and differential side bearing retainer.

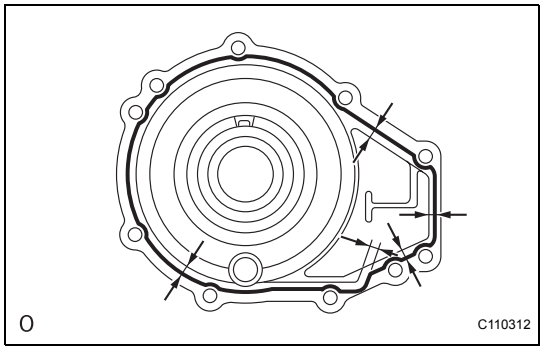
(b) Apply seal packing to the areas indicated in the illustration of the differential side bearing retainer.

Seal Packing:

Toyota Genuine Seal Packing 1281, Three Bond 1281 or equivalent

NOTICE:

- **Apply seal packing in a continuous line 2 to 3 mm (0.08 to 0.12 in.) in diameter.**
- **Perform the installation with 3 minutes of applying seal packing 1281.**

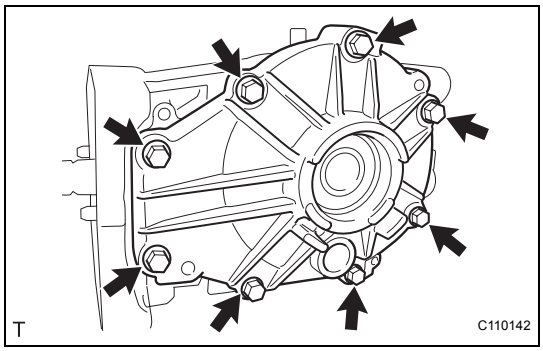


(c) Install the differential side bearing retainer to the rear differential carrier with the 8 bolts.

Torque: 34 N*m (350 kgf*cm, 25 ft.*lbf)

NOTICE:

After installing the cover, do not add oil or drive the vehicle, and leave it alone for 1 hour or more. Also, avoid sudden acceleration and deceleration for 12 hours or more.



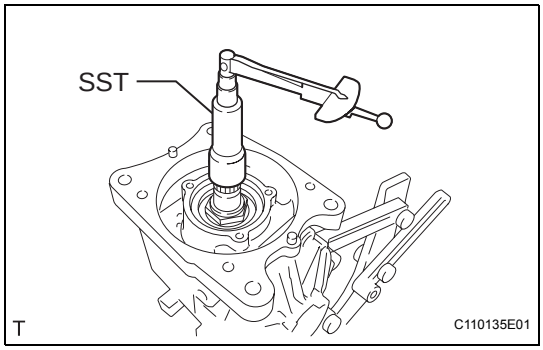
30. INSPECT TOTAL PRELOAD

(a) Using SST and a torque wrench, inspect the starting torque with the teeth of the differential drive pinion and differential ring gear in contact.

SST 09556-52010 [Corrected]

Standard total preload:

Standard drive pinion preload plus



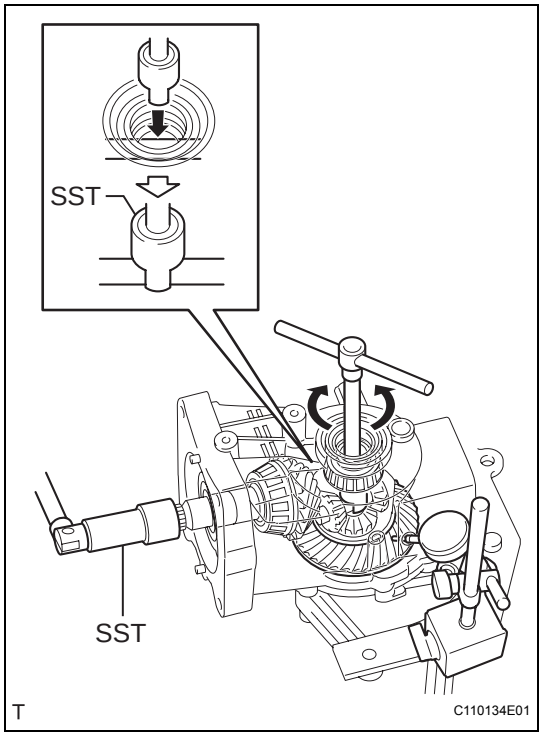
Bearing	Preload
New bearing	1.18 to 1.90 N*m (12 to 19 kgf*cm, 10 to 17 in.*lbf)
Reused bearing	0.99 to 1.63 N*m (10 to 17 kgf*cm, 9 to 14 in.*lbf)

NOTICE:

For a more accurate measurement, rotate the case bearing forward and backward before inspecting.

DF

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31. INSPECT DIFFERENTIAL RING GEAR BACKLASH

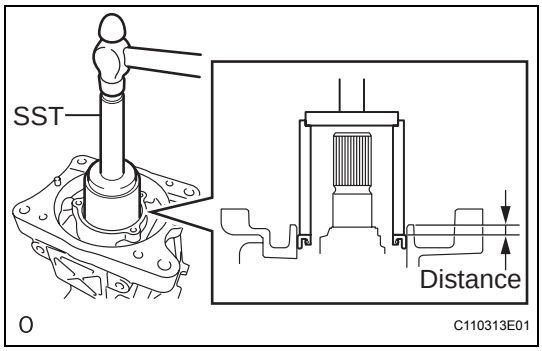
(a) Insert a dial gauge through the rear differential carrier cover plug hole, and set it perpendicular to the ring gear tooth surface's tip.

(b) Using SST, fix the drive pinion in place.
SST 09556-52010 [Corrected]

(c) Using SST, rotate the rear differential case forward and backward, and inspect the backlash.
SST 09564-32011 [Corrected]
Standard backlash:
0.09 to 0.16 mm (0.0004 to 0.006 in.)
NOTICE:
Inspect at 3 or more areas around the circumference of the ring gear.

32. INSTALL REAR DRIVE PINION NUT

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



33. INSTALL DIAPHRAGM OIL SEAL

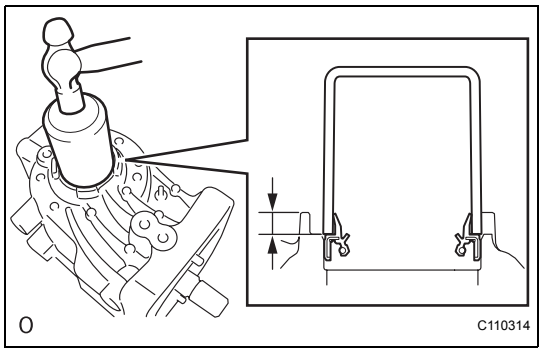
(a) Apply a light coat of MP grease No. 2 to the lip of a new diaphragm oil seal.

(b) Using SST and a hammer, tap the diaphragm oil seal into the rear differential carrier according to the specification.
SST 09710-30021 (09710-03121), 09950-60010 (09951-00570), 09950-70010 (09951-07100)
Standard distance:
7.0 +-0.5 mm (0.28 +-0.02 in.)

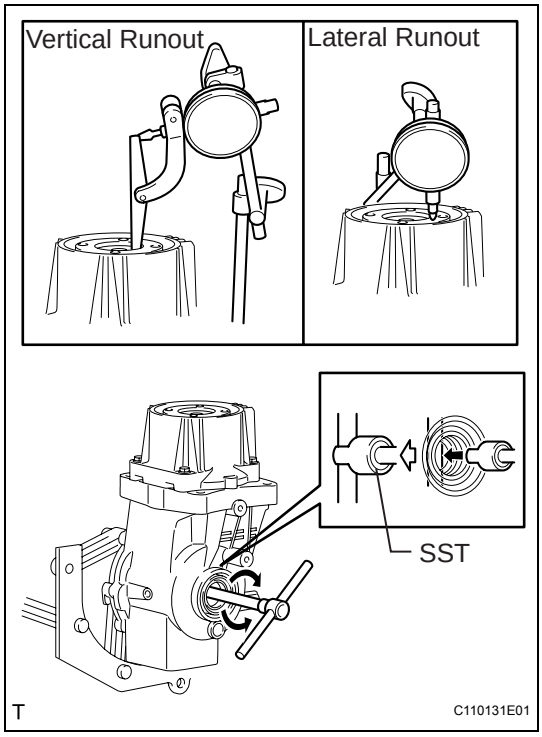
34. INSTALL DIFFERENTIAL SIDE GEAR SHAFT OIL SEAL

(a) Apply a light coat of MP grease No. 2 to the lip of a new rear differential side gear shaft oil seal.

(b) Using SST and a hammer, tap the 2 rear differential side gear shaft oil seals into the rear differential carrier and differential side bearing retainer according to the specification.
SST 09223-00010
Standard distance:
7.2 +-0.5 mm (0.28 +-0.02 in.)



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44. INSPECT RUNOUT OF TRANSMISSION COUPLING ASSEMBLY

(a) Install a dial gauge so that it is perpendicular to the inner side of the transmission coupling.

(b) Using SST, rotate the transmission coupling forward and backward and measure the vertical runout.

SST 09564-32011 [Corrected]

Maximum vertical runout:
0.06 mm (0.0023 in.)

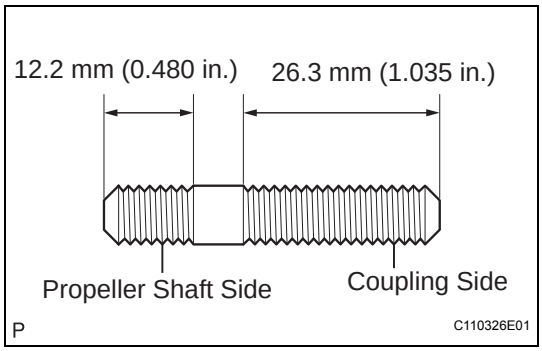
(c) Install a dial gauge perpendicularly onto the transmission coupling, as shown in the illustration.

(d) Using SST, rotate the transmission coupling forward and backward and measure the lateral runout.

SST 09564-32011 [Corrected]

Maximum lateral runout:
0.07 mm (0.0028 in.)

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45. INSTALL STUD BOLT

(a) Install the differential support assembly rear with the 4 bolts.

Torque: 8.0 N*m (82 kgf*cm, 71 in.*lbf)

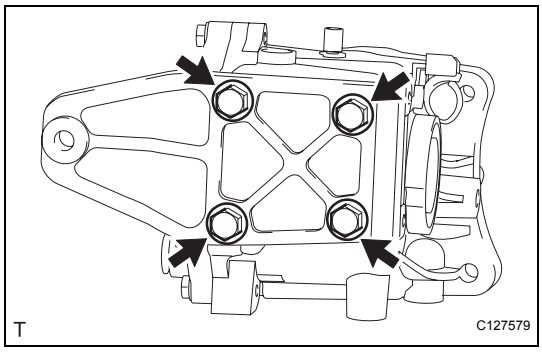
INSTALLATION

(2005/11-2007/01)

1. INSTALL REAR DIFFERENTIAL SUPPORT

(a) Install the differential support to the differential carrier with the 4 bolts.

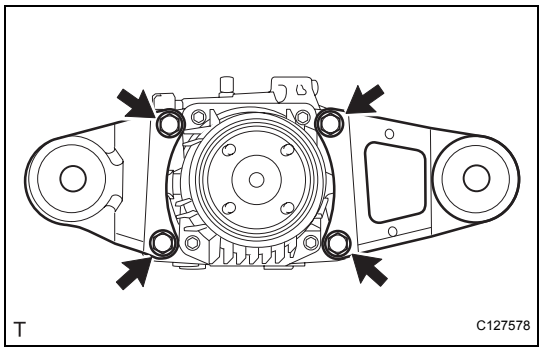
Torque: 98 N*m (999 kgf*cm, 72 ft.*lbf)



2. INSTALL REAR DIFFERENTIAL NO. 1 AND NO. 2 SUPPORT

(a) Install the differential No. 1 and No. 2 supports with the 4 bolts to the differential carrier.

Torque: 55 N*m (561 kgf*cm, 41 ft.*lbf)



3. INSTALL REAR DIFFERENTIAL DYNAMIC DAMPER

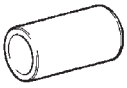
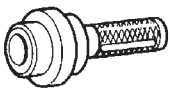
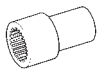
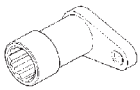
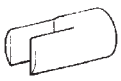
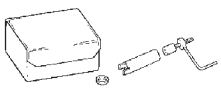
(a) Install the damper front side with the 2 bolts to the No. 1 support.

Torque: 33 N*m (337 kgf*cm, 24 ft.*lbf)

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DIFFERENTIAL

SST

	09223-00010	Cover & Seal Replacer	-
	09223-50010	Crankshaft Front Oil Seal Replacer	-
	09308-00010	Oil Seal Puller	-
	09308-10010	Oil Seal Puller	-
	09506-30012	Differential Drive Pinion Rear Bearing Cone Replacer	-
	09556-30010	Drive Pinion Front Bearing Remover	-
	09556-52010	Differential Drive Pinion Holding Tool [Corrected]	-
	09564-16020	Drive Pinion Lock Nut Wrench	-
	09564-32011	Differential Preload Adaptor	-
	09612-07010	Main Shaft Retaining Ring Remover & Replacer	-
	(09612-10061)	Steering Pinion Bearing Replacer	-

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