TOYOTA SERVICE BULLETIN

Group: 06 No.: 05 Date: Mar, 15

Prado 150

Corrections to Repair Manual RM24N1E

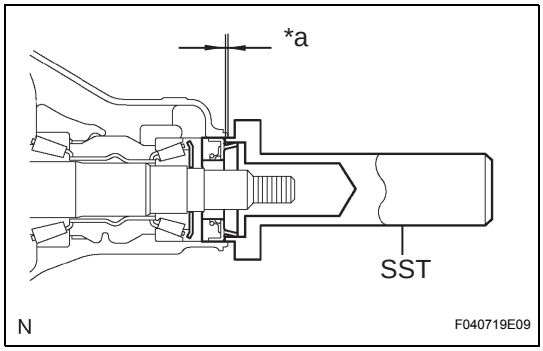
Please ensure these pages are distributed to all relevant staff for their information; and a copy made available for future reference, with the above repair manual.

Section	Title	Paragraph
AXLE AND DIFFERENTIAL	FRONT DIFFERENTIAL CARRIER OIL SEAL	REPLACEMENT
	FRONT DIFFERENTIAL CARRIER ASSEMBLY	REASSEMBLY
	REAR DIFFERENTIAL CARRIER OIL SEAL	REPLACEMENT (2013/08-2014/08)
		REPLACEMENT (2014/08-)
	REAR DIFFERENTIAL CARRIER ASSEMBLY (w/ Differential Lock)	REASSEMBLY (2013/08-2014/08)
		REASSEMBLY (2014/08-)
	REAR DIFFERENTIAL CARRIER ASSEMBLY (w/o Differential Lock)	REASSEMBLY

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. INSTALL FRONT DIFFERENTIAL CARRIER OIL SEAL

(a) Apply MP grease to the lip of a new oil seal.

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

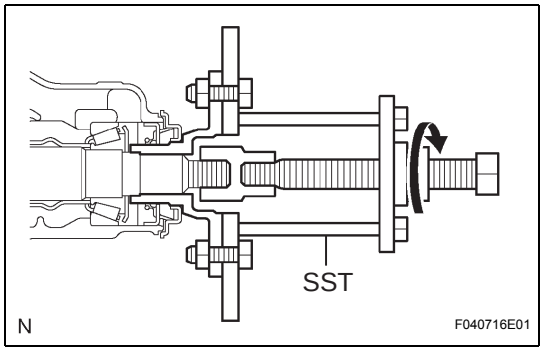
SST 09554-22010

Standard Oil seal depth:

3.9 to 4.8 mm (0.154 to 0.188 in.)

Text in Illustration

*a	Oil Seal Depth



14. 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)

NOTICE:

Before using SST (center bolt), apply hypoid gear oil to its threads and tip.

[Corrected]

(b) Using SST to hold the companion flange in place, then slowly tighten a new nut within the drive pinion preload adjustment range so that it reaches the specified drive pinion preload (at Starting).

SST 09330-00021 (09330-00030)

Limit Torque Value:

370 N*m (3773 kgf*cm, 273 ft.*lbf) or less

15. INSPECT DIFFERENTIAL DRIVE PINION PRELOAD

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

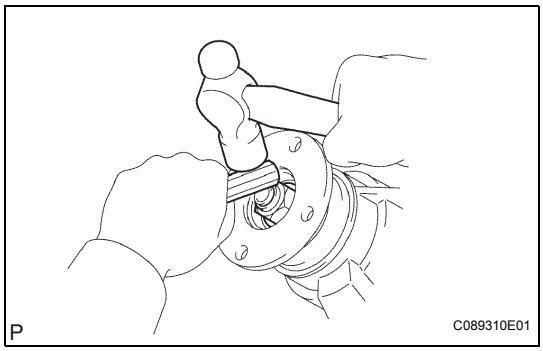
Standard Preload (at Starting)

Item	Specified Condition
New bearing	0.98 to 1.57 N*m (10 to 16 kgf*cm, 8.7 to 13.9 in.*lbf)
Used bearing	0.49 to 0.78 N*m (5 to 8 kgf*cm, 4.3 to 6.9 in.*lbf)

If the result is not as specified, adjust the preload.

Standard Total Preload (at Starting)

Item	Specified Condition
New bearing	1.2 to 2.45 N*m (12 to 25 kgf*cm, 10.6 to 21.7 in.*lbf)
Used bearing	0.71 to 1.66 N*m (7.2 to 17 kgf*cm, 6.3 to 14.7 in.*lbf)



16. STAKE FRONT DRIVE PINION COMPANION FLANGE FRONT NUT

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

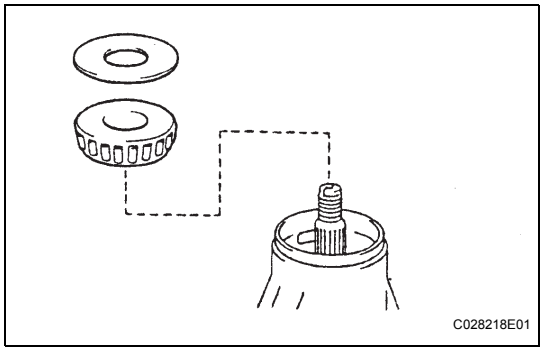
17. INSTALL FRONT DIFFERENTIAL CARRIER ASSEMBLY

(a) Install the front differential carrier assembly (See page AD-67).

AD

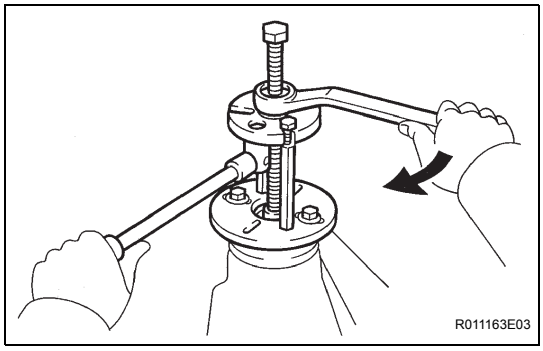
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(b) Using SST and a press, press the front bearing onto the drive pinion.
SST 09506-30012



11. INSPECT DIFFERENTIAL DRIVE PINION PRELOAD

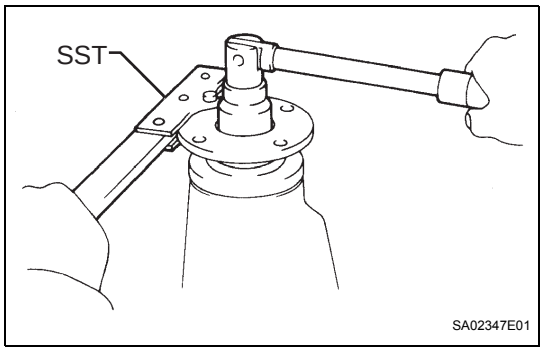
(a) Install the drive pinion, roller bearing and oil slinger to the differential case.
HINT:
Install the spacer, oil storage ring and oil seal after adjusting the gear contact pattern.



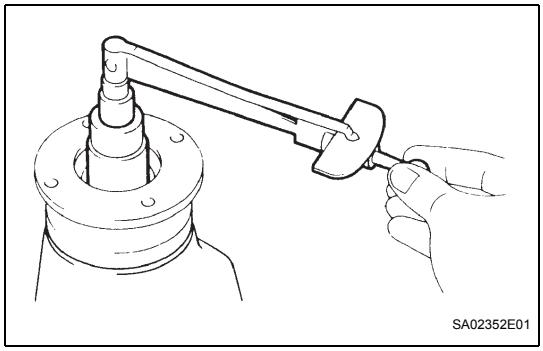
(b) Using SST, install the companion flange.
SST 09950-30012 (09951-03010, 09953-03010, 09954-03010, 09955-03030, 09956-03020)
NOTICE:
Before using SST (center bolt), apply hypoid gear oil to its threads and tip.

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

[Corrected]



(d) Using SST to hold the companion flange in place, then slowly tighten the nut within the drive pinion preload adjustment range so that it reaches the specified drive pinion preload (at Starting).
SST 09330-00021
Limit Torque Value:
370 N*m (3773 kgf*cm, 273 ft.*lbf) or less
NOTICE:
- **As there is no spacer, tighten the nut a little at a time. Be careful not to overtighten it.**
- **Apply hypoid gear oil to the nut.**



(e) Using a torque wrench, measure the preload.
Standard Preload (at Starting)

Item	Specified Condition
New bearing	0.98 to 1.57 N*m (10 to 16 kgf*cm, 8.7 to 14 in.*lbf)
Used bearing	0.49 to 0.78 N*m (5 to 8 kgf*cm, 4.3 to 6.9 in.*lbf)

NOTICE:
For a more accurate measurement, rotate the bearing forward and backward several times before measuring.

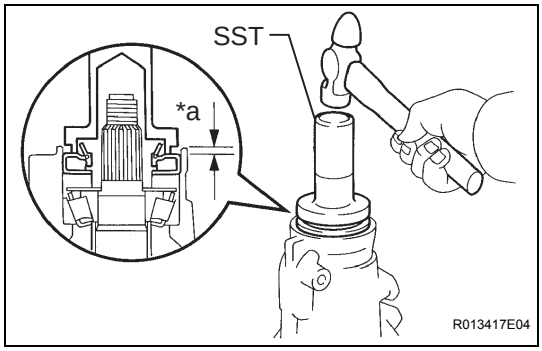
12. INSTALL DIFFERENTIAL CASE ASSEMBLY

13. ADJUST DIFFERENTIAL RING GEAR BACKLASH

(a) Install the side bearing retainer with the 10 bolts.
Torque: 50 N*m (510 kgf*cm, 37 ft.*lbf)

AD

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26. INSTALL FRONT DIFFERENTIAL CARRIER OIL SEAL

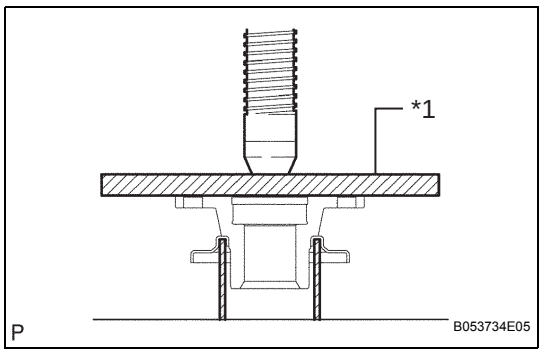
(a) Apply MP grease to the lip of a new oil seal.

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

SST 09554-22010

Standard oil seal depth:

3.9 to 4.8 mm (0.154 to 0.189 in.)



27. INSTALL FRONT DIFFERENTIAL DUST DEFLECTOR

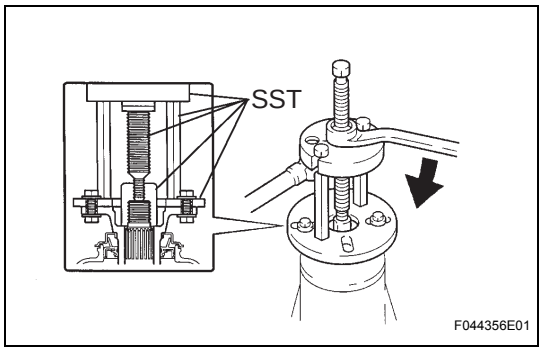
(a) Using a steel plate and press, press in a new dust deflector.

Text in Illustration

*1	Plate

NOTICE:

Do not damage the dust deflector.



28. INSTALL FRONT DRIVE PINION COMPANION FLANGE SUB-ASSEMBLY

(a) Place the companion flange on the drive pinion.

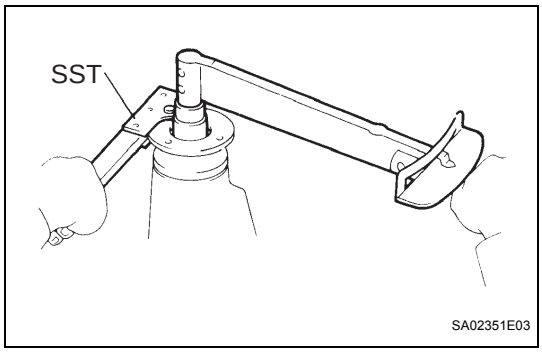
(b) Coat the threads of a new nut with hypoid gear oil.

(c) Using SST, install the companion flange.

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

NOTICE:

Before using SST (center bolt), apply hypoid gear oil to its threads and tip.



(d) Using SST to hold the companion flange in place, then slowly tighten the nut within the drive pinion preload adjustment range so that it reaches the specified drive pinion preload (at Starting).

SST 09330-00021 (09330-00030)

Limit Torque Value:

370 N*m (3773 kgf*cm, 273 ft.*lbf) or less

[Corrected]

29. INSTALL DIFFERENTIAL SIDE BEARING RETAINER

(a) Remove any old FIPG material from the side bearing retainer.

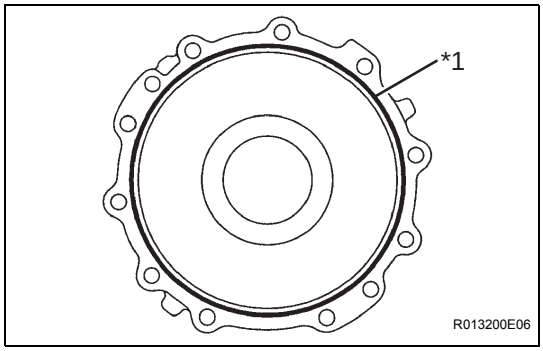
NOTICE:

Do not drop oil on the contact surfaces of the differential carrier and side bearing retainer.

(b) Wipe off any residual FIPG material on the contact surface using gasoline or alcohol.

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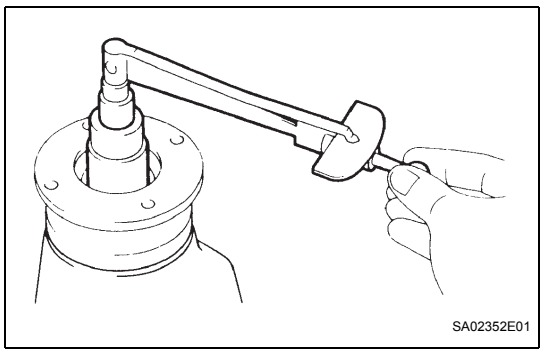


(c) Apply seal packing to the side bearing retainer as shown in the illustration.
Seal packing:
Toyota Genuine Seal Packing 1281, Three Bond 1281 or equivalent
Text in Illustration

*1	Seal Packing

HINT:
Install the side bearing retainer within 10 minutes of applying seal packing.

(d) Install the side bearing retainer with the 10 bolts.
Torque: 50 N*m (510 kgf*cm, 37 ft.*lbf)



30. INSPECT DRIVE PINION PRELOAD

(a) Using a torque wrench, measure the preload of the backlash between the drive pinion and ring gear.
Standard Preload (at Starting)

Item	Specified Condition
New bearing	0.98 to 1.57 N*m (10 to 16 kgf*cm, 8.7 to 14 in.*lbf)
Used bearing	0.49 to 0.78 N*m (5 to 8 kgf*cm, 4.3 to 6.9 in.*lbf)

If the result not as specified, replace the bearing spacer.
If the preload is less than the minimum, retighten the nut with 13 N*m (130 kgf*cm, 9 ft.*lbf) of torque at a time until the specified preload is reached.

[Corrected] **Limit Torque Value:**
370 N*m (3773 kgf*cm, 273 ft.*lbf) or less

If the maximum torque is exceeded while retightening the nut, replace the bearing spacer and repeat the preload adjusting procedure.
HINT:
Do not loosen the pinion nut to reduce the preload.

31. INSPECT TOTAL PRELOAD

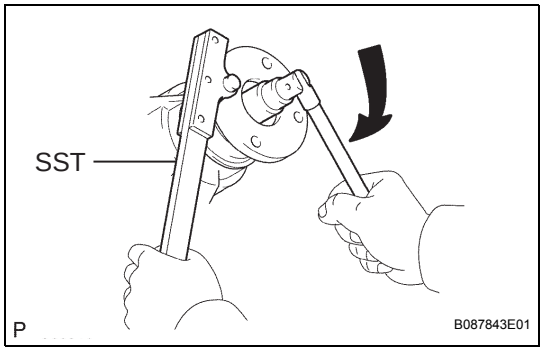
(a) Using a torque wrench, measure the preload with the teeth of the drive pinion and ring gear in contact.
Standard Total Preload (at Starting)

Item	Specified Condition
New bearing	1.2 to 2.45 N*m (12 to 25 kgf*cm, 10.6 to 21.7 in.*lbf)
Used bearing	0.71 to 1.66 N*m (7.2 to 17 kgf*cm, 6.3 to 14.7 in.*lbf)

If necessary, disassemble and inspect the differential.

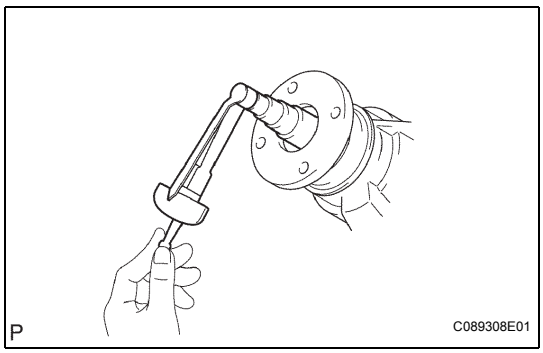
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(b) Using SST to hold the companion flange in place, then slowly tighten a new nut within the drive pinion preload adjustment range so that it reaches the specified drive pinion preload (at Starting).
SST 09330-00021 (09330-00030)
Limit Torque Value:
457 N*m (4660 kgf*cm, 337ft.*lbf) or less

[Corrected]

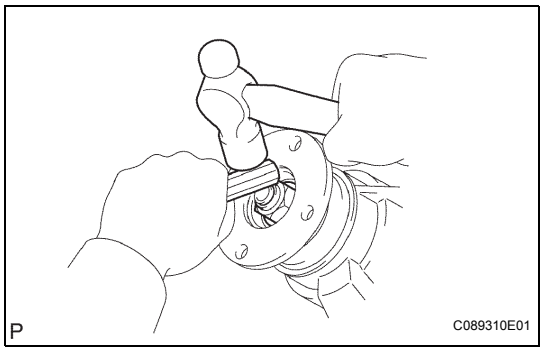


15. INSPECT DIFFERENTIAL DRIVE PINION PRELOAD

(a) Using a torque wrench, measure the preload.
Standard Preload (at Starting)

Item	Specified Condition
New bearing	0.83 to 2.18 N*m (8.64 to 22.2 kgf*cm, 7.35 to 19.3 in.*lbf)
Used bearing	0.88 to 1.98 N*m (8.97 to 20.2 kgf*cm, 7.79 to 17.5 in.*lbf)

If the result is not as specified, adjust the preload.
Total preload (at starting):
1.08 to 2.38 N*m (11.0 to 24.3 kgf*cm, 9.6 to 21.0 in.*lbf)



16. STAKE REAR DRIVE PINION NUT

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

17. INSTALL REAR PROPELLER SHAFT ASSEMBLY

(a) Install the rear propeller shaft assembly (See page ○○-○○).

18. INSTALL DIFFERENTIAL OIL (See page AD-36)

19. CHECK FOR DIFFERENTIAL OIL LEAKAGE

REPLACEMENT

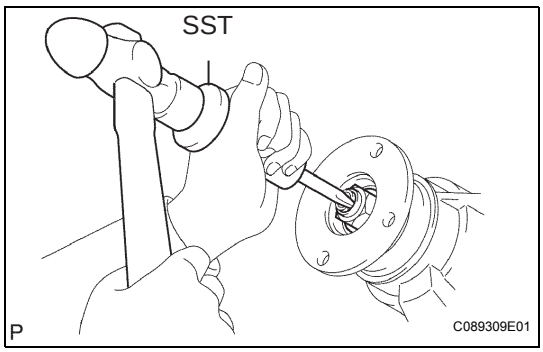
(2014/08-)

1. REMOVE REAR PROPELLER SHAFT ASSEMBLY

(a) Remove the rear propeller shaft assembly (See page ○○-○○).

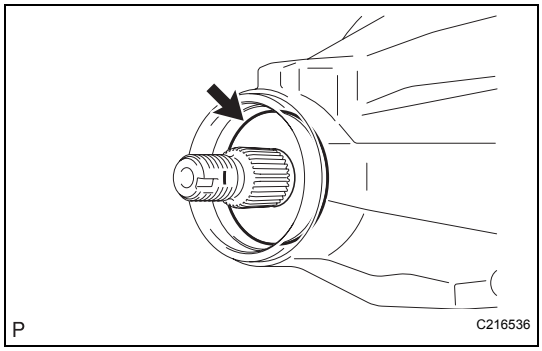
2. REMOVE REAR DRIVE PINION NUT

(a) Using SST and a hammer, loosen the staked part of the rear drive pinion nut.
SST 09930-00010



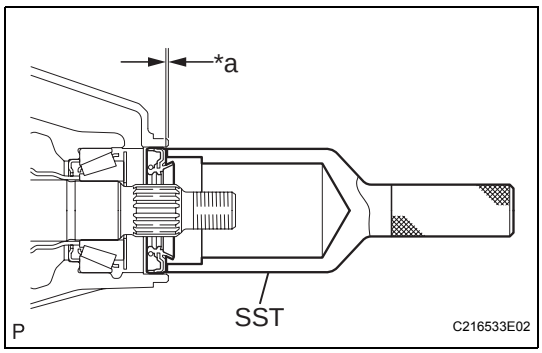
AD

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12. INSTALL REAR DIFFERENTIAL DRIVE PINION OIL SLINGER

(a) Install the rear differential drive pinion oil slinger.



13. INSTALL REAR DIFFERENTIAL CARRIER OIL SEAL

(a) Apply MP grease to the lip of a new oil seal.

(b) Using SST and a hammer, tap in the rear differential carrier oil seal.

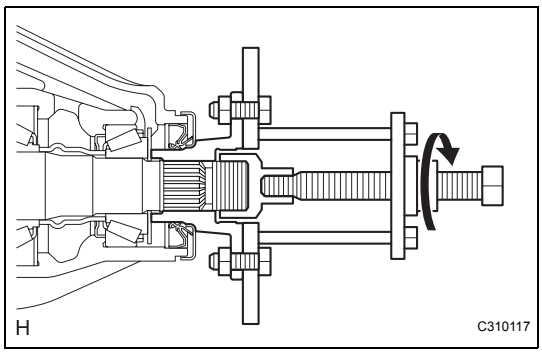
SST 09214-76011

Standard oil seal depth:

-0.30 to 0.30 mm (-0.0118 to 0.0118 in.)

Text in Illustration

*a	Oil Seal Depth



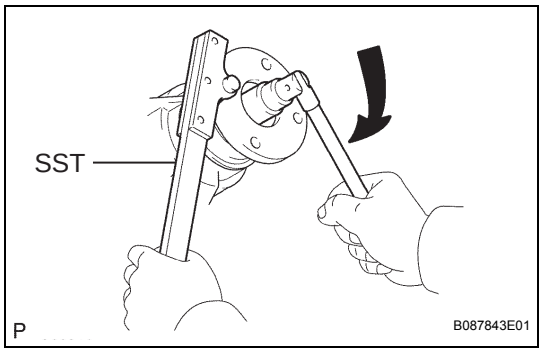
14. INSTALL REAR DRIVE PINION COMPANION FLANGE SUB-ASSEMBLY

(a) Using SST, install the rear drive pinion companion flange sub-assembly.

SST 09950-30012 (09951-03010, 09953-03010, 09954-03010, 09955-03030, 09956-03040)

NOTICE:

Before using SST (center bolt), apply hypoid gear oil to its threads and tip.



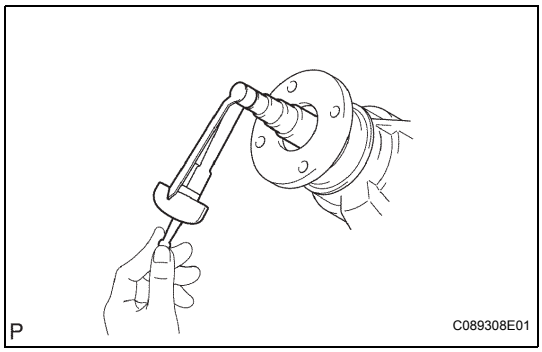
(b) Using SST to hold the companion flange in place, then slowly tighten a new nut within the drive pinion preload adjustment range so that it reaches the specified drive pinion preload (at Starting).

SST 09330-00021 (09330-00030)

Limit Torque Value:

457 N*m (4660 kgf*cm, 337ft.*lbf) or less

[Corrected]



15. INSPECT DIFFERENTIAL DRIVE PINION PRELOAD

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

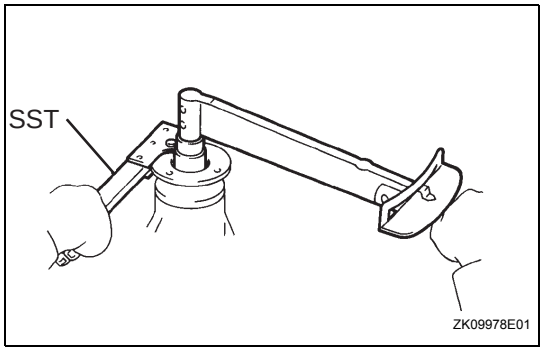
Standard Preload (at Starting)

Item	Specified Condition
New bearing	0.83 to 2.18 N*m (9 to 22 kgf*cm, 8 to 19 in.*lbf)
Used bearing	0.88 to 1.98 N*m (9 to 20 kgf*cm, 8 to 17 in.*lbf)

If the result is not as specified, adjust the preload.

AD

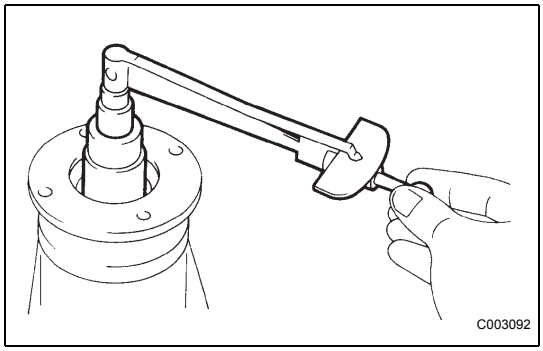
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(d) Using SST to hold the companion flange in place, then slowly tighten the nut within the drive pinion preload adjustment range so that it reaches the specified drive pinion preload (at Starting).
SST 09330-00021
Limit Torque Value:
457 N*m (4660 kgf*cm, 337ft.*lbf) or less

[Corrected]

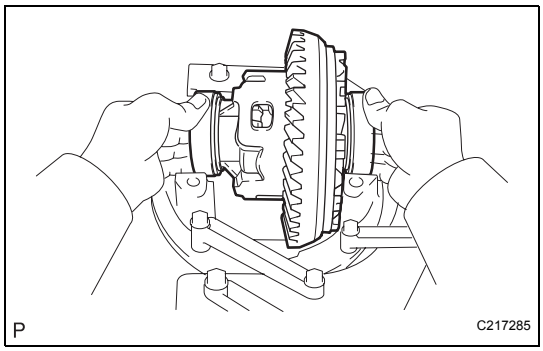
NOTICE:
- **As there is no spacer, tighten the nut a little at a time, being careful not to overtighten it.**
- **Apply hypoid gear oil LSD to drive pinion thread and seat face.**



(e) Using a torque wrench, measure the preload.
Standard Preload (at Starting)

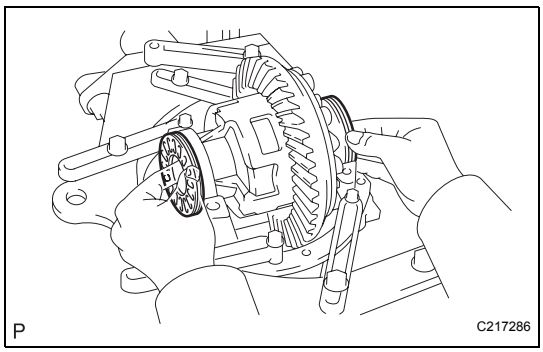
Item	Specified Condition
New bearing	0.68 to 2.03 N*m (6.94 to 20.7 kgf*cm, 6.02 to 17.9 in.*lbf)
Used bearing	0.73 to 1.83 N*m (7.45 to 18.6 kgf*cm, 6.46 to 16.1 in.*lbf)

NOTICE:
For a more accurate measurement, rotate the bearing forward and backward several times before measuring.



9. INSTALL DIFFERENTIAL CASE ASSEMBLY

(a) Place the 2 bearing outer races on their respective bearings.
HINT:
Do not interchange the right and left races.

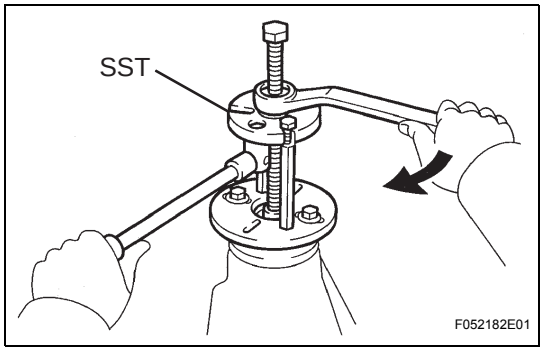


10. INSTALL REAR DIFFERENTIAL BEARING ADJUSTING NUT

(a) Install the 2 adjusting nuts to the carrier, making sure the nuts are threaded properly.

AD

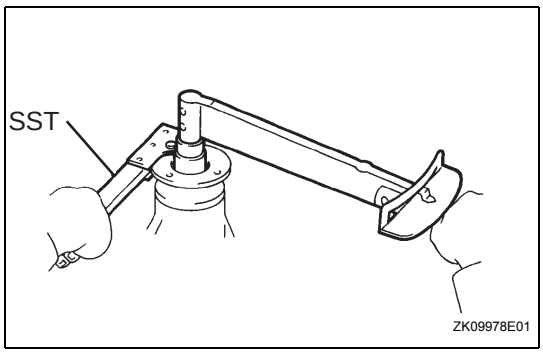
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23. INSTALL REAR DRIVE PINION COMPANION FLANGE SUB-ASSEMBLY REAR

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

SST 09950-30012 (09951-03010, 09953-03010, 09954-03010, 09955-03030, 09956-03040)



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

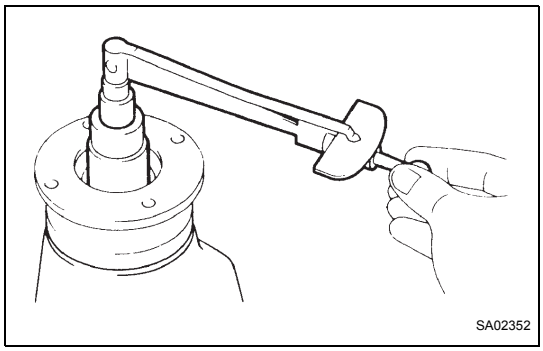
(c) Using SST to hold the companion flange in place, then slowly tighten the nut within the drive pinion preload adjustment range so that it reaches the specified drive pinion preload (at Starting).

SST 09330-00021

Limit Torque Value:

457 N*m (4660 kgf*cm, 337ft.*lbf) or less

[Corrected]



24. INSPECT DRIVE PINION PRELOAD

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

If the result not as specified, replace the bearing spacer.

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

Limit Torque Value:

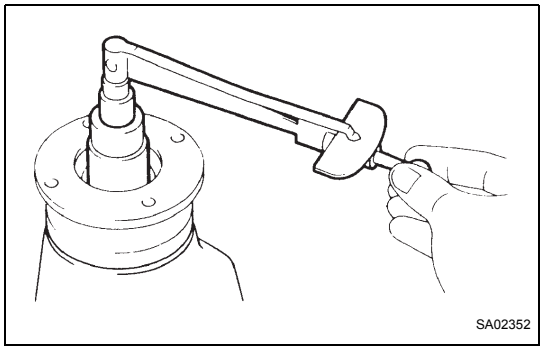
457 N*m (4660 kgf*cm, 337ft.*lbf) or less

[Corrected]

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

HINT:

Do not loosen the pinion nut to reduce the preload.



25. INSPECT TOTAL PRELOAD

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

Standard total preload (at starting)

Item	Specified Condition
New bearing	0.83 to 2.18 N*m (8.47 to 22.2 kgf*cm, 7.35 to 19.2 in.*lbf) + ring gear preload
Reused bearing	0.88 to 1.98 N*m (8.98 to 20.1 kgf*cm, 7.79 to 17.5 in.*lbf) + ring gear preload

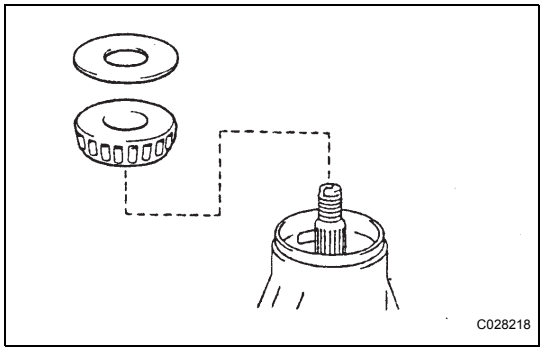
Standard total preload (at starting):

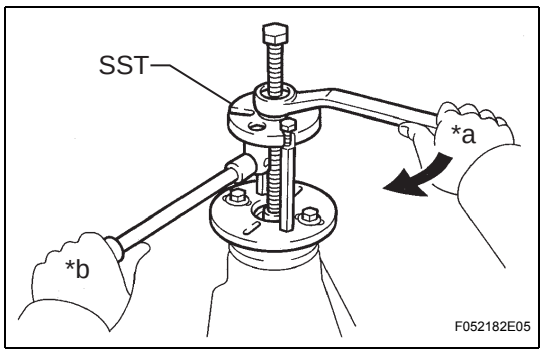
Drive pinion preload plus 0.20 to 0.40 N*m (2.0 to 4.1 kgf*cm, 1.8 to 3.5 in.*lbf)

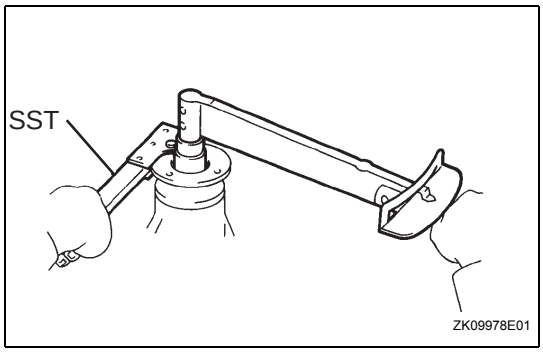
If necessary, disassemble and inspect the differential.

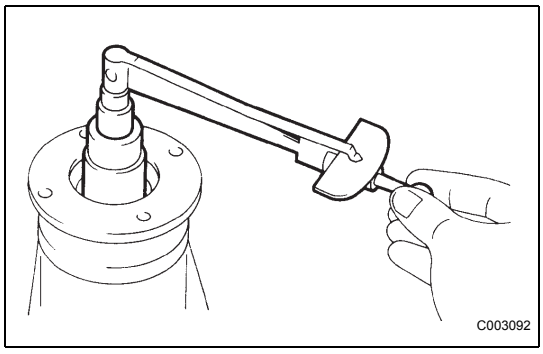
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8. ADJUST DIFFERENTIAL DRIVE PINION PRELOAD

(a) Install the drive pinion, rear drive pinion tapered roller bearing and rear differential drive pinion oil slinger.
HINT:
Install the spacer and oil seal after adjusting the gear contact pattern.

(b) Using SST, install the drive pinion companion flange.
SST 09950-30012 (09951-03010, 09953-03010, 09954-03010, 09955-03030, 09956-03040)
Text in Illustration

*a	Turn
*b	Hold

NOTICE:
Before using SST (center bolt), apply hypoid gear oil to its threads and tip.

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

(d) Using SST to hold the companion flange in place, then slowly tighten the nut within the drive pinion preload adjustment range so that it reaches the specified drive pinion preload (at Starting).
SST 09330-00021
Limit Torque Value:
457 N*m (4660 kgf*cm, 337ft.*lbf) or less

[Corrected]

NOTICE:
- **As there is no spacer, tighten the nut a little at a time, being careful not to overtighten it.**
- **Apply hypoid gear oil LSD to drive pinion thread and seat face.**

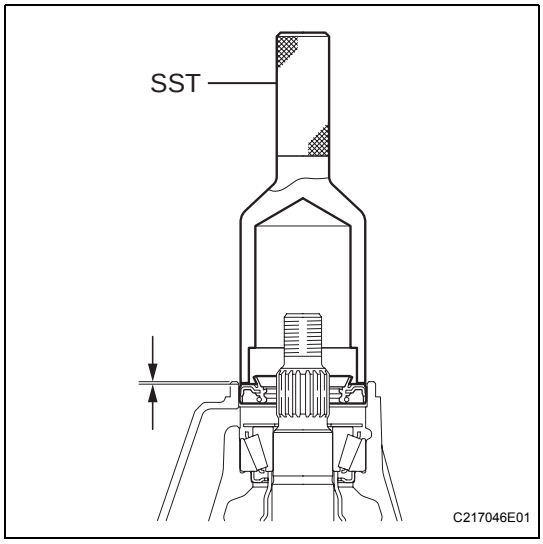
(e) Using a torque wrench, measure the preload.
Standard Preload (at Starting)

Item	Specified Condition
New bearing	0.68 to 2.03 N*m (7 to 20 kgf*cm, 7 to 17 in.*lbf)
Used bearing	0.73 to 1.83 N*m (8 to 18 kgf*cm, 7 to 16 in.*lbf)

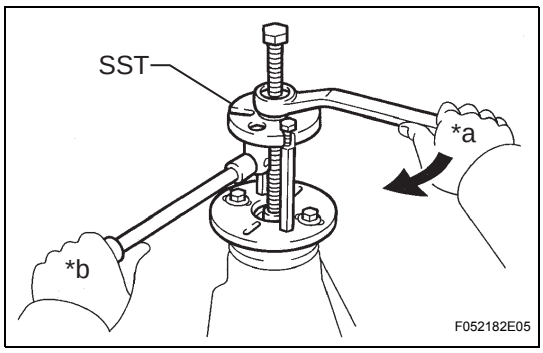
NOTICE:
For a more accurate measurement, rotate the bearing forward and backward several times before measuring.

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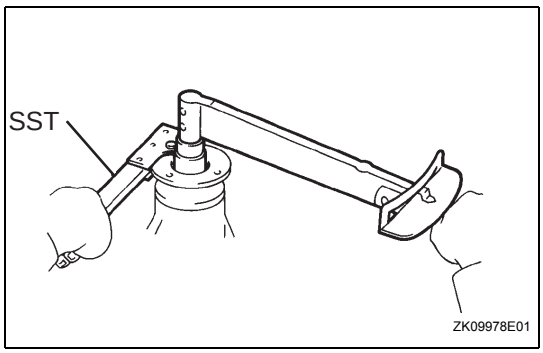
(b) Using SST and a hammer, install a new carrier oil seal.
SST 09214-76011
Standard oil seal drive in depth:
-0.3 to 0.3 mm (-0.0118 to 0.0118 in.)



23. INSTALL REAR DRIVE PINION COMPANION FLANGE SUB-ASSEMBLY REAR

(a) Using SST, install the drive pinion companion flange to the drive pinion.
SST 09950-30012 (09951-03010, 09953-03010, 09954-03010, 09955-03030, 09956-03040)
Text in Illustration

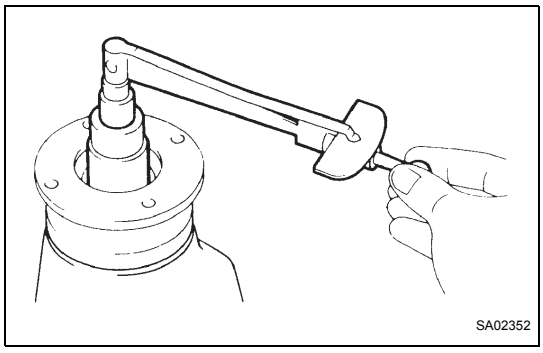
*a	Turn
*b	Hold



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

(c) Using SST to hold the companion flange in place, then slowly tighten the nut within the drive pinion preload adjustment range so that it reaches the specified drive pinion preload (at Starting).
SST 09330-00021
Limit Torque Value:
457 N*m (4660 kgf*cm, 337ft.*lbf) or less

[Corrected]



24. INSPECT DRIVE PINION PRELOAD

(a) Using a torque wrench, measure the preload of the backlash between the drive pinion and ring gear.
Standard Preload (at Starting)

Item	Specified Condition
New bearing	0.83 to 2.18 N*m (9 to 22 kgf*cm, 8 to 19 in.*lbf)
Reused bearing	0.88 to 1.98 N*m (9 to 20 kgf*cm, 8 to 17 in.*lbf)

If the result not as specified, replace the bearing spacer.
If the preload is less than the minimum, retighten the nut with 13 N*m (130 kgf*cm, 9 ft.*lbf) of torque at a time until the specified preload is reached.

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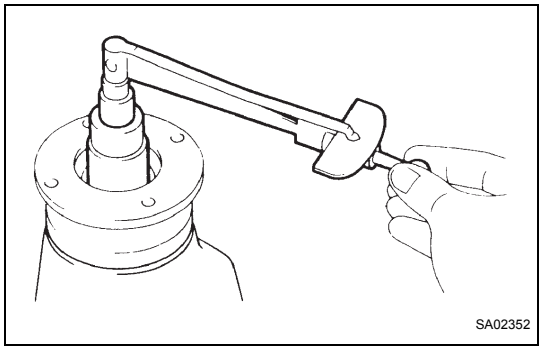
[Corrected]

Limit Torque Value:
457 N*m (4660 kgf*cm, 337ft.*lbf) or less

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

HINT:

Do not loosen the pinion nut to reduce the preload.



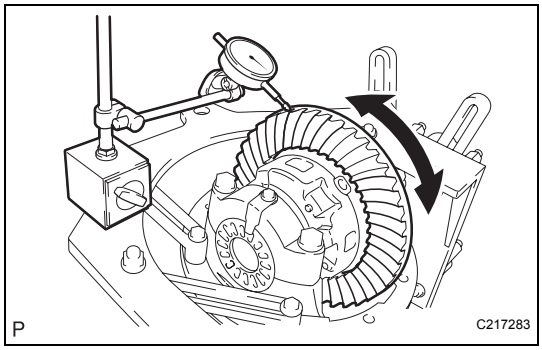
25. INSPECT TOTAL PRELOAD

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

Standard total preload (at starting)

Item	Specified Condition
New bearing	1.03 to 2.58 N*m (11 to 26 kgf*cm, 10 to 22 in.*lbf)
Reused bearing	1.08 to 2.38 N*m (12 to 24 kgf*cm, 10 to 21 in.*lbf)

If necessary, disassemble and inspect the differential.



26. INSPECT DIFFERENTIAL RING GEAR BACKLASH

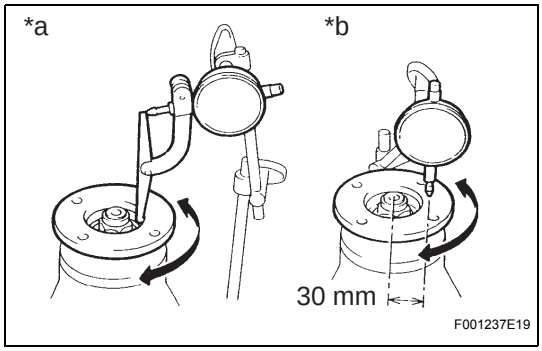
(a) Using a dial indicator, check the backlash of the ring gear.

Standard Backlash:
0.10 to 0.20 mm (0.00394 to 0.00787 in.)

If the backlash is not within the specification, adjust the side bearing preload or perform repairs as necessary.

HINT:

Perform the measurement at 3 or more positions around the circumference of the ring gear.



27. INSPECT RUNOUT OF REAR DRIVE PINION COMPANION FLANGE SUB-ASSEMBLY REAR

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

Distance from center to runout measurement point:
30 mm (1.18 in.)

Maximum Runout

Item	Specified Condition
Vertical runout	0.10 mm (0.00394 in.)
Lateral runout	0.10 mm (0.00394 in.)

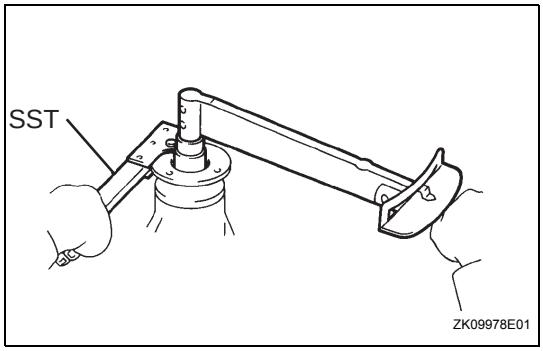
Text in Illustration

*a	Vertical Runout
*b	Lateral Runout

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

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(c) Using a 30 mm socket wrench, adjust the drive pinion preload by tightening the companion flange nut.

(d) Using SST to hold the companion flange in place, then slowly tighten the nut within the drive pinion preload adjustment range so that it reaches the specified drive pinion preload (at Starting).

SST 09330-00021

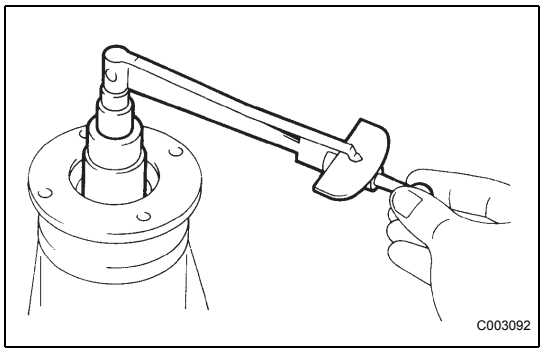
Limit Torque Value:

457 N*m (4660 kgf*cm, 337ft.*lbf) or less

[Corrected]

NOTICE:

- **As there is no spacer, tighten the nut a little at a time. Be careful not to overtighten the nut.**
- **Apply hypoid gear oil LSD to drive pinion thread and seat face.**



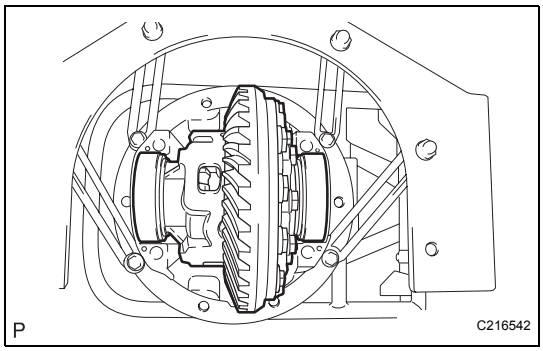
(e) Using a torque wrench, measure the preload.

Standard Preload (at Starting)

Item	Specified Condition
New bearing	0.68 to 2.03 N*m (6.94 to 20.7 kgf*cm, 6.02 to 17.9 in.*lbf)
Used bearing	0.73 to 1.83 N*m (7.45 to 18.6 kgf*cm, 6.46 to 16.1 in.*lbf)

NOTICE:

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

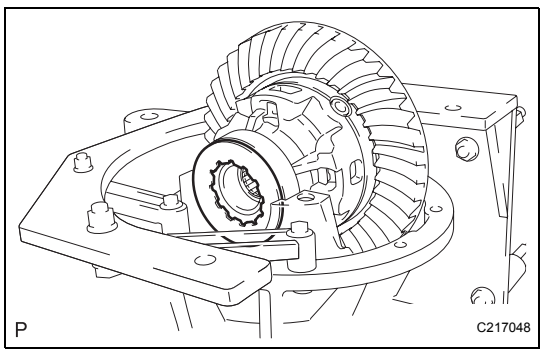


9. INSTALL DIFFERENTIAL CASE ASSEMBLY

(a) Place the 2 bearing outer races on their respective bearings.

HINT:

Do not interchange the right and left races.



10. ADJUST RING GEAR BACKLASH

(a) Install the plate washer on the side without the ring gear teeth.

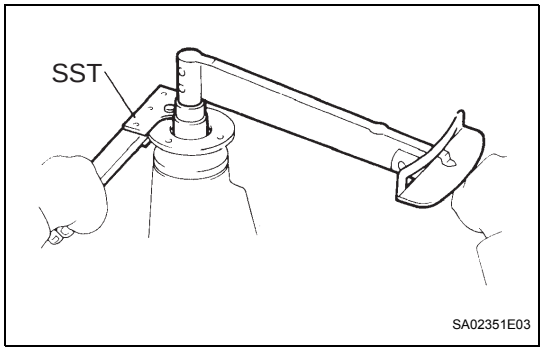
NOTICE:

Make sure that the ring gear has backlash.

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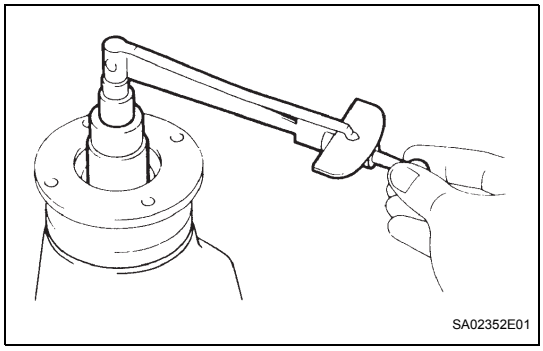
NOTICE:
Before using SST (center bolt), apply hypoid gear oil to its threads and tip.



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

(c) Using SST to hold the companion flange in place, then slowly tighten the nut within the drive pinion preload adjustment range so that it reaches the specified drive pinion preload (at Starting).
SST 09330-00021
Limit Torque Value:
457 N*m (4660 kgf*cm, 337ft.*lbf) or less

[Corrected]



28. INSPECT DRIVE PINION PRELOAD

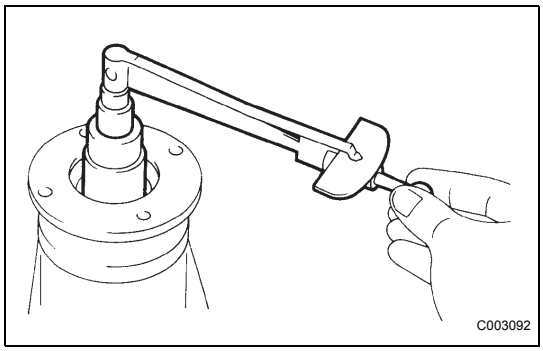
(a) Using a torque wrench, measure the preload of the backlash between the drive pinion and ring gear.
Standard Preload (at Starting)

Item	Specified Condition
New bearing	0.83 to 2.18 N*m (8.64 to 22.2 kgf*cm, 7.35 to 19.3 in.*lbf)
Used bearing	0.88 to 1.98 N*m (8.97 to 20.2 kgf*cm, 7.79 to 17.5 in.*lbf)

If the result not as specified, replace the bearing spacer.
If the preload is less than the minimum, retighten the nut with 13 N*m (130 kgf*cm, 9 ft.*lbf) of torque at a time until the specified preload is reached.

[Corrected]
Limit Torque Value:
457 N*m (4660 kgf*cm, 337ft.*lbf) or less

If the maximum torque is exceeded while retightening the nut, replace the bearing spacer and repeat the preload adjusting procedure.
HINT:
Do not loosen the pinion nut to reduce the preload.



29. 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):
Drive pinion preload plus 0.20 to 0.40 N*m (2.0 to 4.1 kgf*cm, 1.8 to 3.5 in.*lbf)
If necessary, disassemble and inspect the differential.

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