SECTION RFD
REAR FINAL DRIVE

CONTENTS

WITHOUT LIMITED SLIP DIFFERENTIAL

WITH LIMITED SLIP DIFFERENTIAL

PRECAUTIONS

PFP:00001

Service Notice or Precautions

GDS0006E

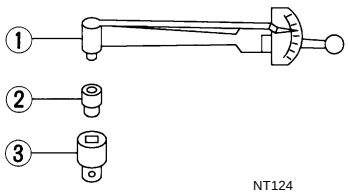
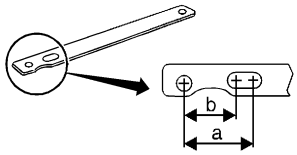
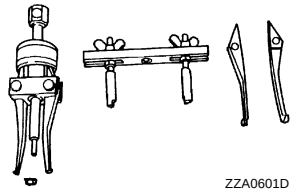
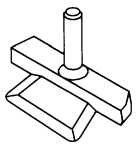
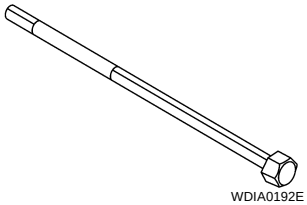
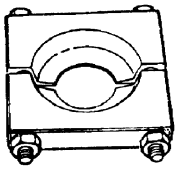
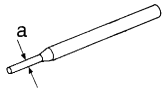
- Check for the correct installation status prior to removal or disassembly. If matching marks are required, be certain they do not interfere with the function of the parts when applied.
- Overhaul should be done in a clean work area, it is preferable to work in dust proof area.
- Before disassembly completely remove sand and mud from the exterior of the unit, preventing them from entering into the unit during disassembly or assembly.
- Check appearance of the disassembled parts for damage, deformation, and unusual wear. Replace them with new ones if necessary.
- Gaskets, seals and O-rings should be replaced any time the unit is disassembled.
- In principle, tighten bolts or nuts gradually in several steps working diagonally from inside to outside. If tightening sequence is specified, observe it.
- Clean and flush the parts sufficiently and blow-dry them.
- Be careful not to damage sliding surfaces and mating surfaces.
- When applying sealant, remove the old sealant from the mounting surface; then remove any moisture, oil, and foreign materials from the application and mounting surfaces.
- Always use shop paper for cleaning the inside of components.
- Avoid using cotton gloves or shop rags to prevent entering of lint.
- During assembly, observe the specified tightening torque, and apply new differential gear oil, petroleum jelly, or multi-purpose grease as specified.

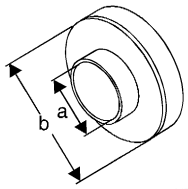
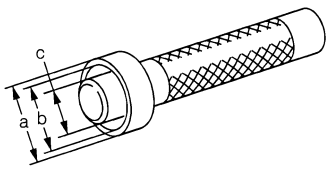
PREPARATION

PFP:00002

Special Service Tools

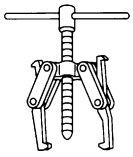
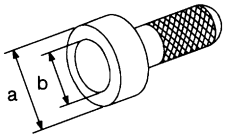
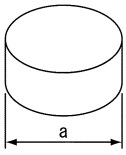
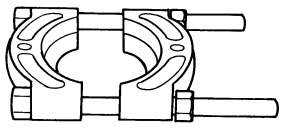
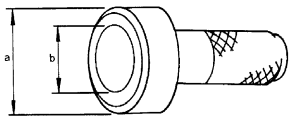
GDS0006F

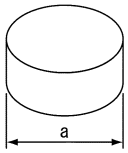
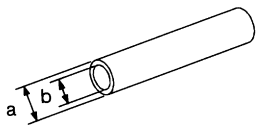
Tool number Tool name		Description
ST3127S000 Preload gauge set 1. GG91030000 Torque wrench 2. HT62940000 (1/2″) Socket adapter 3. HT62900000 (3/8″) Socket adapter	 NT124	Inspecting pinion bearing preload and total preload
KV40104000 Flange wrench a: 85 mm (3.35 in) dia. b: 65 mm (2.56 in) dia.	 NT659	Removing and installing drive pinion lock nut
KV381054S0 Puller	 ZZA0601D	Removing front oil seal
KV10111100 Seal cutter	 S-NT046	Removing carrier cover
KV38108800 Adjuster tool	 WDIA0192E	Removing and installing side bearing adjuster
ST30021000 Puller	 ZZA0700D	Removing drive pinion rear bearing inner race
ST23550000 Pin punch a: 4.5 mm (0.177 in) dia.	 NT410	Removing and installing lock pin

Tool number Tool name		Description
ST30022000 Drift a: 46 mm (1.81 in) dia. b: 110 mm (4.33 in) dia.	 NT660	Installing drive pinion rear bearing outer race
KV38100300 Drift a: 54 mm (2.13 in) dia. b: 46 mm (1.81 in) dia. c: 32mm (1.26 in) dia.	 ZZA1046D	Installing side bearing inner race

Commercial Service Tools

GDS0006G

Tool name		Description
Puller	 NT077	● Removing companion flange ● Removing side bearing inner race
Drift a: 96mm (3.77 in) dia. b: 84 mm (3.30 in) dia.	 NT115	Installing front oil seal
Adapter a: 43 mm (1.69 in) dia.	 PDIA0893E	Removing and installing side bearing inner race
Puller	 ZZB0823D	Removing side bearing inner race
Drift a: 89 mm (3.50 in) dia. b: 79 mm (3.11 in) dia.	 ZZA0811D	Installing drive pinion rear bearing outer race

Tool name	Description
Drift a: 67 mm (2.63 in) dia.  PDIA0893E	Installing drive pinion front bearing outer race
Installer a: 51 mm (2.01 in) dia. b: 41 mm (1.61 in) dia.  NT065	Installing drive pinion rear bearing inner race

NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

GDS0006H

Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page		RFD-23, "INSPECTION AFTER DISASSEMBLY"	RFD-16, "Tooth Contact"	RFD-23, "INSPECTION AFTER DISASSEMBLY"	RFD-17, "Backlash"	RFD-18, "Companion Flange Runout"	RFD-9, "Checking Differential Gear Oil"	PR-2, "NVH Troubleshooting Chart"	RAX-5, "NVH Troubleshooting Chart", RSU-4, "NVH Troubleshooting Chart"	WT-2, "NVH Troubleshooting Chart"		RAX-5, "NVH Troubleshooting Chart"	BR-5, "NVH Troubleshooting Chart"	PS-5, "NVH Troubleshooting Chart"
Possible cause and SUSPECTED PARTS		Gear tooth rough	Gear contact improper	Tooth surfaces worn	Backlash incorrect	Companion flange excessive runout	Gear oil improper	PROPELLER SHAFT	AXLE AND SUSPENSION	TIRES	ROAD WHEEL	AXLE SHAFT	BRAKES	STEERING
Symptom	Noise	×	×	×	×	×	×	×	×	×	×	×	×	×

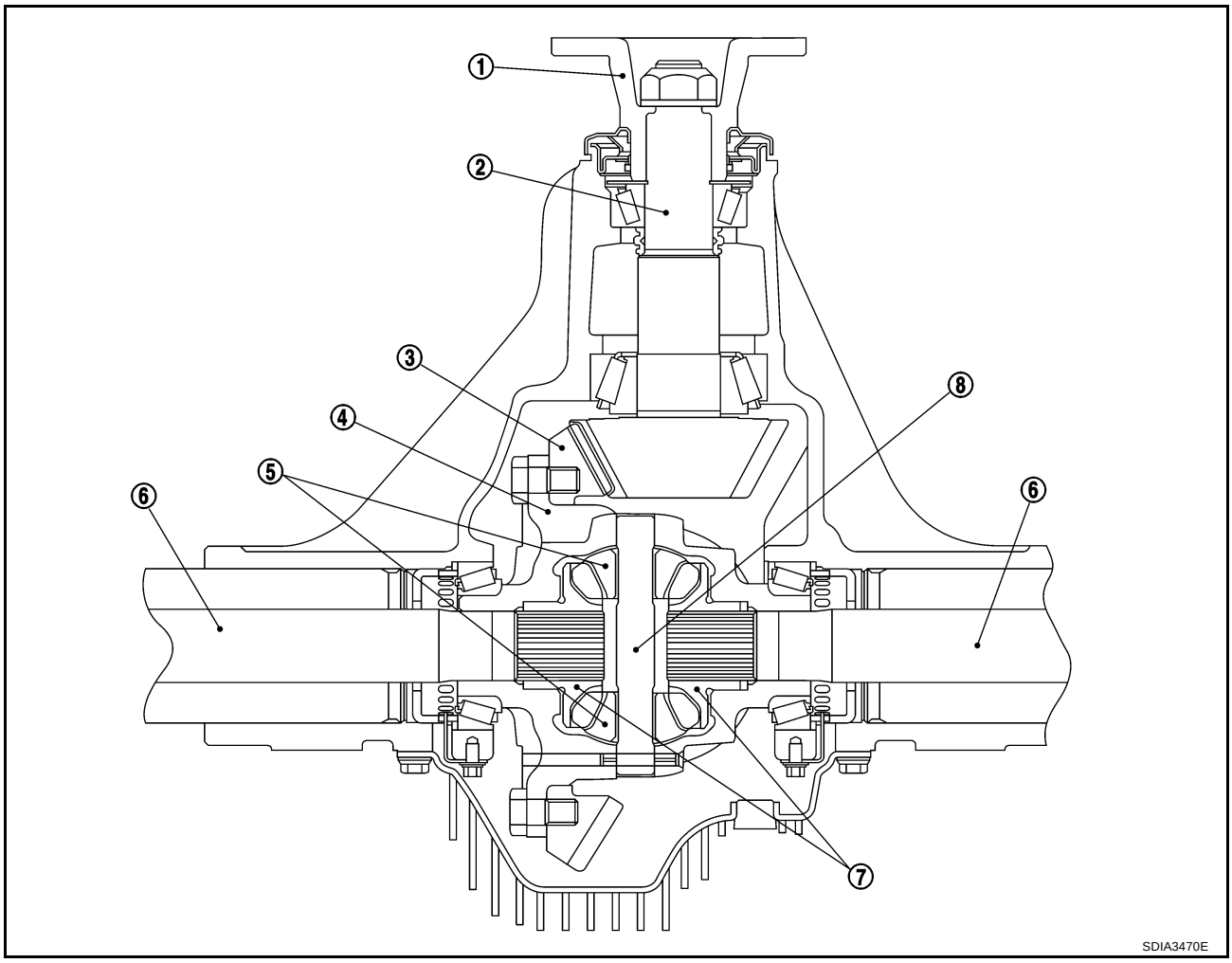
×: Applicable

DESCRIPTION

PFP:00000

Cross-Sectional View

GDS0006I



1. Companion flange
2. Drive pinion
3. Drive gear
4. Differential case
5. Pinion mate gear
6. Axle shaft
7. Side gear
8. Pinion mate shaft

DIFFERENTIAL GEAR OIL

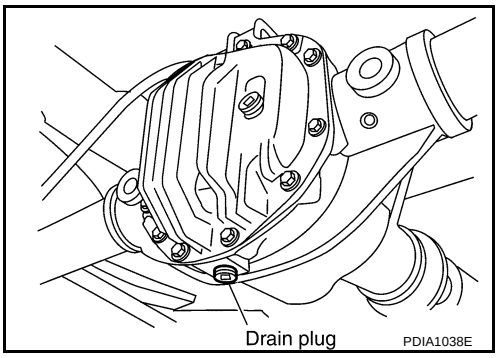
PFP:KLD30

Changing Differential Gear Oil

GDS0006J

DRAINING

1. Stop engine.
2. Remove drain plug and drain gear oil.
3. Apply sealant to drain plug. Install drain plug to final drive assembly and tighten to the specified torque. Refer to RFD-15, "COMPONENTS" .



FILLING

1. Remove filler plug. Fill with new gear oil until oil level reaches the specified limit near filler plug hole.

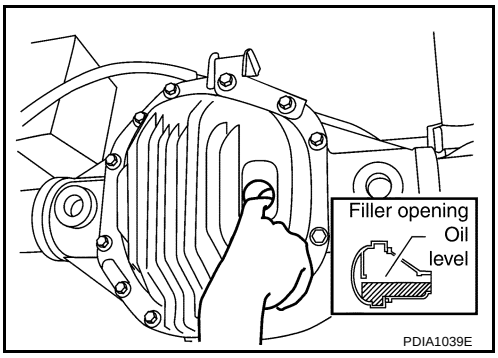
   Oil grade and Viscosity:

   Refer to MA-13, "Fluids and Lubricants" .

   Oil capacity:

   Approx. 2.01 ℓ (3-1/2pt)

2. After refilling oil, check oil level. Apply sealant to filler plug. Install filler plug to final drive assembly and tighten to the specified torque. Refer to RFD-15, "COMPONENTS" .



Checking Differential Gear Oil

GDS0006K

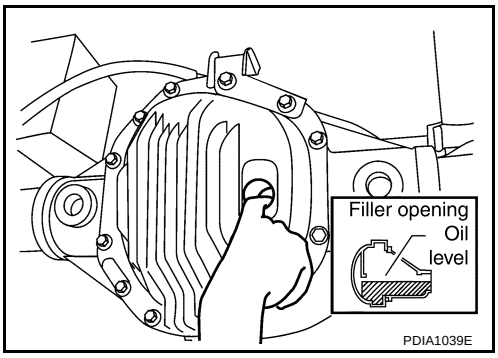
OIL LEAKAGE AND OIL LEVEL

1. Make sure that gear oil is not leaking from final drive assembly or around it.
2. Check oil level from filler plug hole as shown.

   CAUTION:

   Do not start engine while checking oil level.

3. Apply sealant to filler plug. Install filler plug to final drive assembly and tighten to the specified torque. Refer to RFD-15, "COMPONENTS" .



FRONT OIL SEAL

PFP:38189

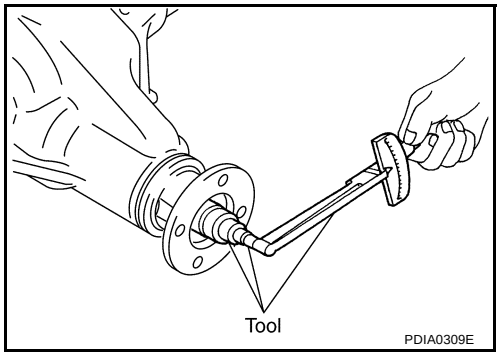
Removal and Installation

GDS0006L

REMOVAL

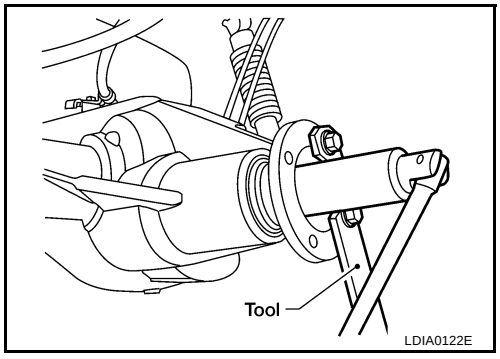
1. Remove the rear propeller shaft. Refer to PR-8, "Removal and Installation" .
2. Remove the rear tires.
3. Remove rear drum brake. Refer to BR-31, "Removal and Installation of Drum Brake Assembly" .
4. Rotate the drive pinion back and forth 2 to 3 times using Tool and record the rotating torque.

   Tool number : ST3127S000



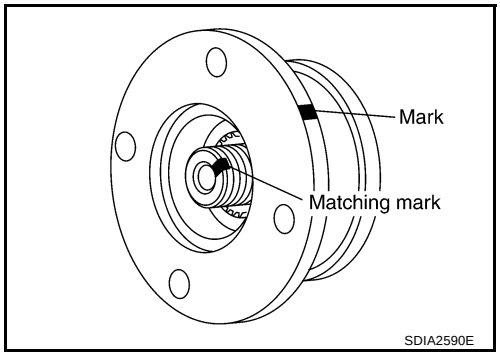
5. Remove the drive pinion lock nut and washer using Tool.

   Tool number : KV40104000

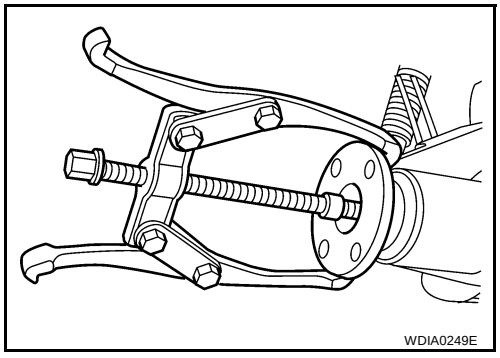


6. Put a matching mark on the thread edge of drive pinion. The mark should be in line with the mark on companion flange.

   CAUTION:
   For matching mark, use paint. Do not damage drive pinion and companion flange.



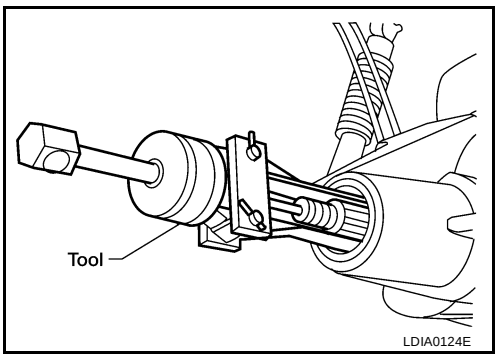
7. Remove the companion flange using suitable tool.



8. Remove the front oil seal using Tool.

Tool number : KV381054S0

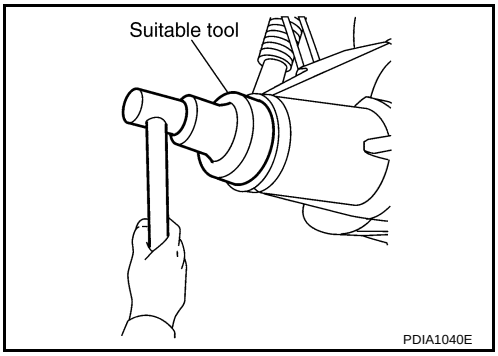
CAUTION:
Do not damage axle housing.



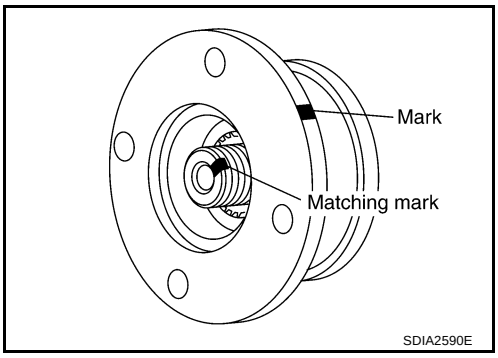
INSTALLATION

1. Install the front oil seal into the axle housing using a suitable tool.

CAUTION:
- **Do not reuse oil seal.**
- **Do not incline oil seal when installing.**
- **Apply multi-purpose grease onto oil seal lip, and gear oil onto the circumference of oil seal.**



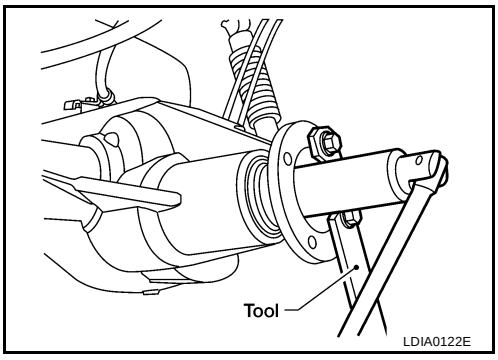
2. Align the matching mark of the drive pinion with the mark of the companion flange, then install the companion flange.



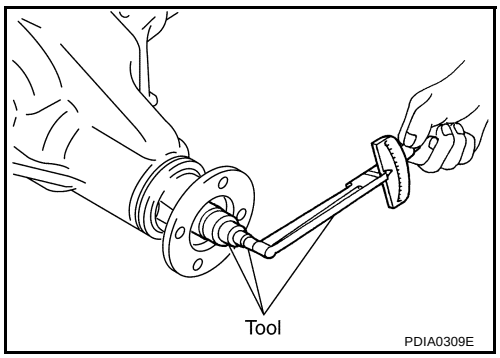
3. Install the washer and drive pinion lock nut. Tighten the nut until there is zero bearing end play using Tool.

Tool number : KV40104000

CAUTION:
Do not reuse drive pinion lock nut and washer.



4. Rotate the drive pinion using Tool. Rotating torque should be equal to the reading recorded in step 4 above during removal plus an additional 0.56 N·m (5 in-lb).



Tool number : ST3127S000

5. If the rotating torque is low, continue to tighten the drive pinion lock nut in 6.8 N·m (5 ft-lb) increments without overtightening. Refer to RFD-15, "COMPONENTS" . Tighten until proper rotating torque is achieved.

CAUTION:

- **Do not loosen the drive pinion lock nut to decrease drive pinion rear bearing rotating torque.**
- **Do not exceed specified rotating preload torque. If preload torque or rotating torque is exceeded a new collapsible spacer must be installed.**
- **Do not exceed maximum tightening torque. If maximum tightening torque is reached prior to reaching the required rotating torque, the collapsible spacer may have been damaged. Replace the collapsible spacer.**

6. Check the gear oil level. Refer to RFD-9, "Checking Differential Gear Oil" .
7. Install the remaining components in the reverse order of removal.

CARRIER COVER

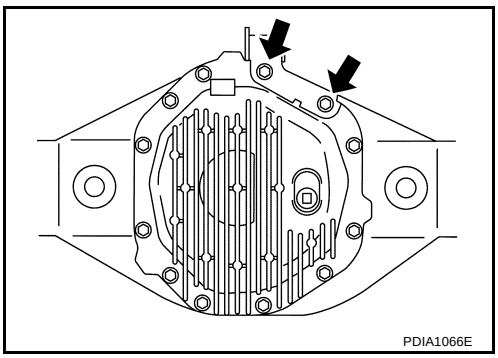
PFP:38351

Removal and Installation

GDS0006M

REMOVAL

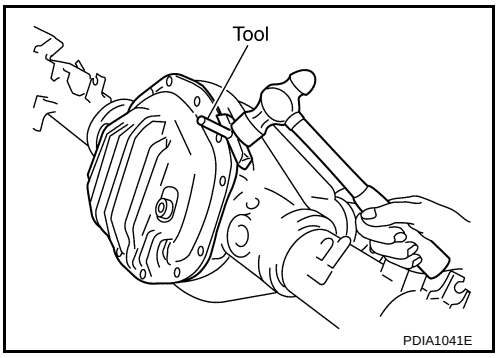
1. Remove the drain plug and drain the gear oil. Refer to RFD-9, "DRAINING" .
2. Disconnect the rear cable (LH) from the carrier cover. Refer to PB-3, "Components" .
3. Remove bracket from the axle housing.



4. Remove the carrier cover bolts. Then separate carrier cover from the axle housing using Tool.

   Tool number : KV10111100

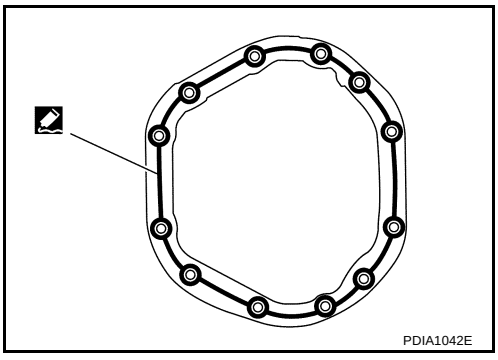
   CAUTION:
   - **Be careful not to damage the mating surface.**
   - **Do not insert flat-bladed screwdriver, this will damage the mating surface.**



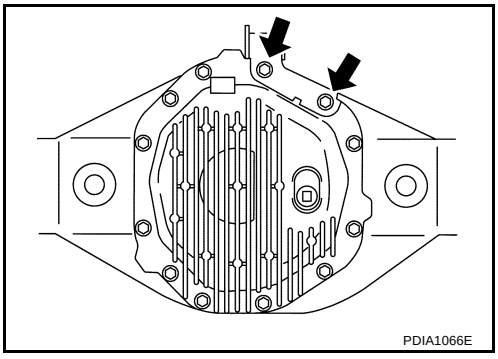
INSTALLATION

1. Apply sealant to mating surface of carrier cover. Refer to RFD-15, "COMPONENTS" .

   CAUTION:
   Remove old sealant adhering to mounting surfaces. Also remove any moisture, oil, or foreign material adhering to application and mounting surfaces.



2. Install carrier cover and bracket on axle housing. Then tighten carrier cover bolts to the specified torque. Refer to RFD-15, "COMPONENTS" .
3. Connect the rear cable (LH) to the carrier cover and tighten to the specified torque. Refer to PB-3, "Components" .
4. Fill with new gear oil until oil level reaches the specified limit near filler plug hole. Refer to RFD-9, "Checking Differential Gear Oil" .



REAR FINAL DRIVE ASSEMBLY

PFP:38300

Removal and Installation

GDS0006N

REMOVAL

1. Remove the rear propeller shaft. Refer to PR-8, "Removal and Installation" .
   - Plug rear end of transmission or transfer.
2. Remove the axle shafts and back plate and torque members. Refer to RAX-7, "Removal and Installation" .
3. Disconnect the following components from the rear final drive.
   - ABS sensor wire harness
   - Rear cable (LH) and rear cable (RH)
   - Brake hoses and brake tube

   CAUTION:
   Position the wire harness, cable and hoses away from the final drive assembly. Failure to do so may result in components being damaged during rear axle assembly removal.
4. Support the rear final drive using a suitable jack.
5. Remove rear shock absorber lower bolts. Refer to RSU-8, "Removal and Installation" .
6. Remove leaf spring U-bolt nuts. Refer to RSU-9, "Removal and Installation" .

   WARNING:
   Support the rear final drive assembly using suitable jack before removing leaf spring U-bolt nuts.
7. Remove rear final drive assembly using suitable jack.

INSTALLATION

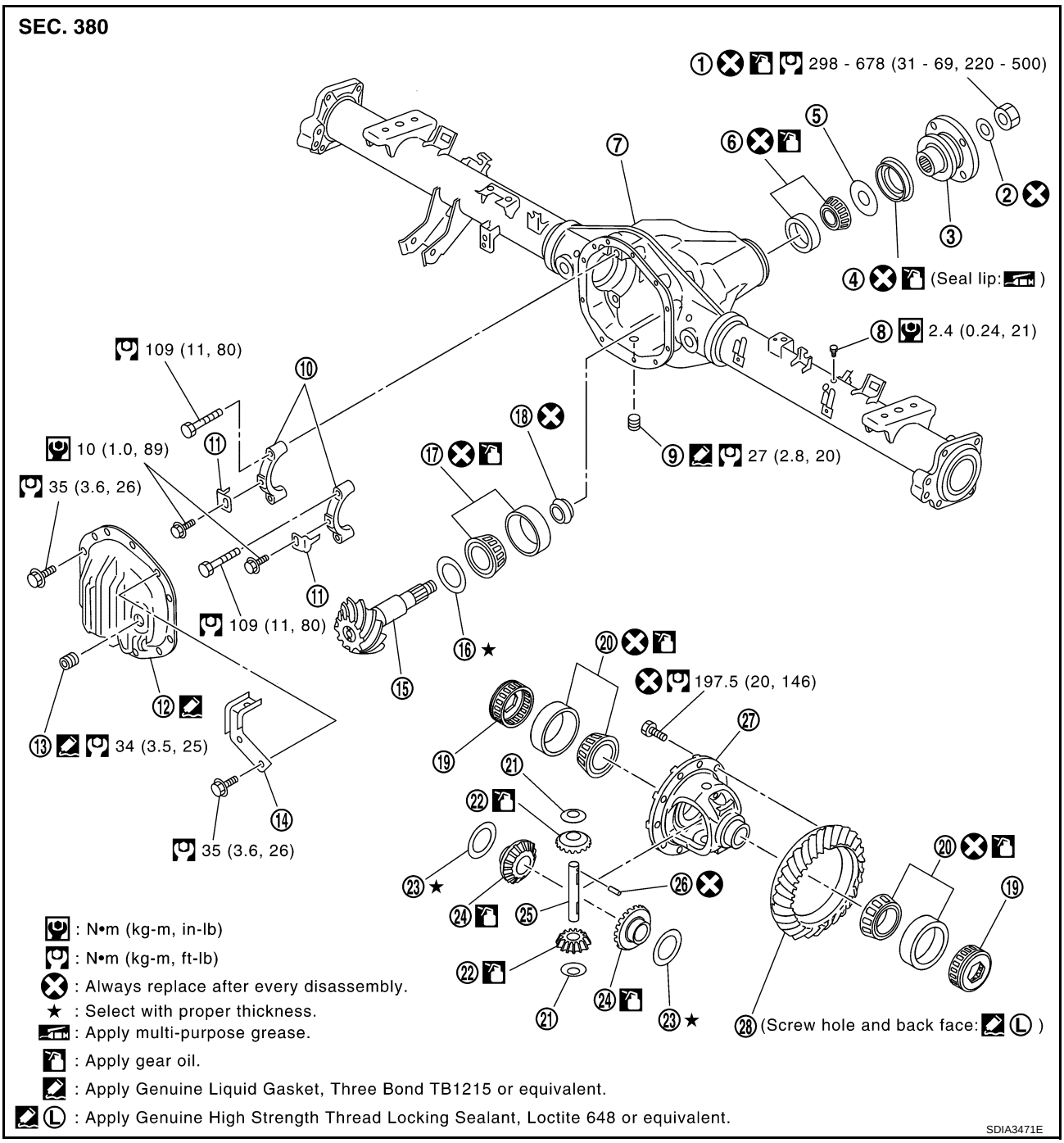
Installation is the reverse order of removal.

- When oil leaks while removing rear final drive assembly, check oil level after the installation. Refer to RFD-9, "Checking Differential Gear Oil" .
- Refill brake fluid and bleed the air from the brake system. Refer to BR-11, "Bleeding Brake System" .

Disassembly and Assembly

GDS0006O

COMPONENTS



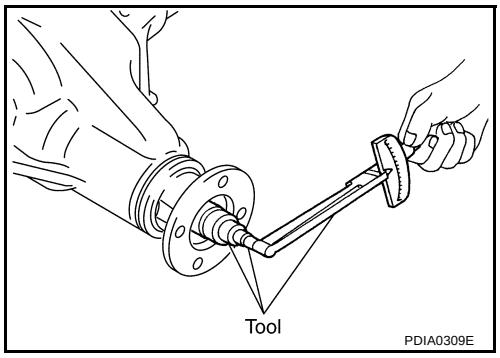
1. Drive pinion lock nut
2. Washer
3. Companion flange
4. Front oil seal
5. Front bearing thrust washer
6. Drive pinion front bearing
7. Axle housing
8. Breather
9. Drain plug
10. Side bearing cap
11. Adjuster lock plate
12. Carrier cover
13. Filler plug
14. Bracket
15. Drive pinion
16. Drive pinion height adjusting washer
17. Drive pinion rear bearing
18. Collapsible spacer
19. Side bearing adjuster
20. Side bearing
21. Pinion mate thrust washer
22. Pinion mate gear
23. Side gear thrust washer
24. Side gear
25. Pinion mate shaft
26. Lock pin
27. Differential case
28. Drive gear

ASSEMBLY INSPECTION AND ADJUSTMENT

- Before inspection and adjustment, drain gear oil.

Total Preload Torque

1. Rotate drive pinion back and forth 2 to 3 times to check for unusual noise and rotation malfunction.
2. Rotate drive pinion at least 20 times to check for smooth operation of the bearing.
3. Turn drive pinion in both directions several times to set bearing rollers.
4. Measure total preload with preload gauge.



Tool number : ST3127S000

Total preload

Gear ratio 3.133 Type:

2.38 - 4.46 N·m (0.25 - 0.45 kg-m, 21- 39 in-lb)

Gear ratio 3.357 Type:

2.38 - 4.46 N·m (0.25 - 0.45 kg-m, 21- 39 in-lb)

Gear ratio 3.538 Type:

2.34 - 4.34 N·m (0.24 - 0.44 kg-m, 21- 38 in-lb)

NOTE:
Total preload torque = Pinion bearing preload torque + Side bearing preload torque

- If measured value is out of the specification, disassemble it to check and adjust each part. Adjust pinion bearing preload and side bearing preload.
  Adjust pinion bearing preload first, then adjust side bearing preload.

When the preload torque is greater than specification

On pinion bearings: Replace collapsible spacer.

On side bearings: Loosen side bearing adjuster.

When the preload torque is less than specification

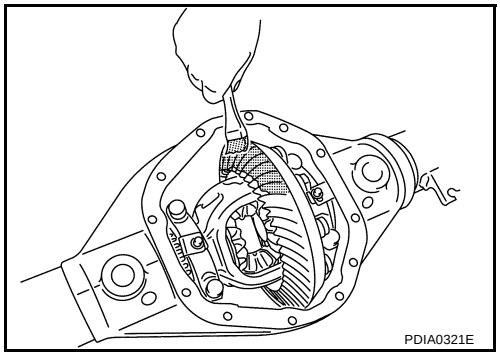
On pinion bearings: Tighten drive pinion lock nut.

On side bearings: Tighten side bearing adjuster.

Tooth Contact

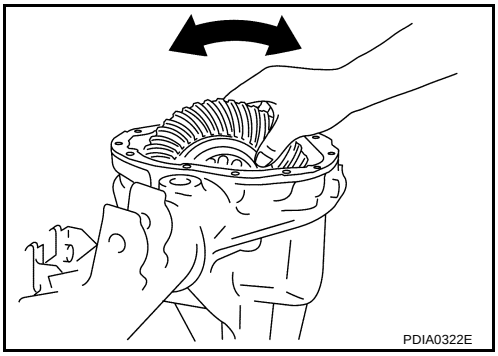
Checking gear tooth contact pattern is necessary to verify correct relationship between drive gear and drive pinion. Gears which are not positioned in proper arrangement may be noisy and/or have a short life. Check gear tooth contact pattern to obtain the best contact for low noise and long life.

1. Remove carrier cover. Refer to RFD-13, "Removal and Installation" .
2. Thoroughly clean drive gear and drive pinion teeth.
3. Apply red lead to drive gear.

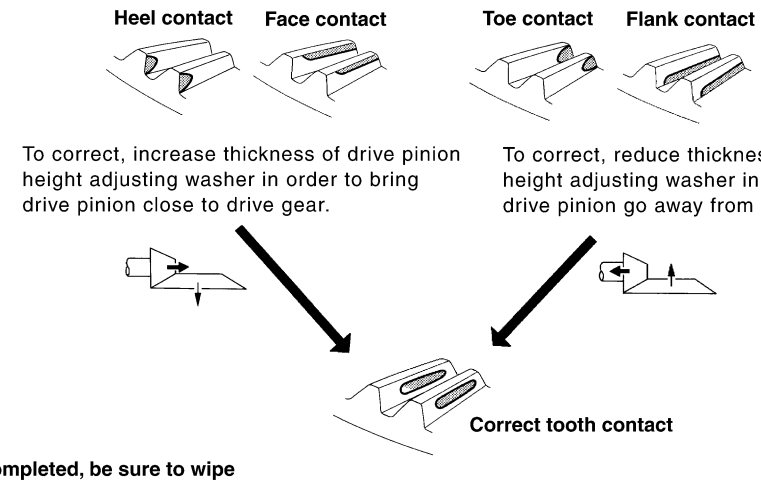


CAUTION:
Apply red lead to both the faces of 3 to 4 gears at 4 locations evenly spaced on drive gear.

4. Hold companion flange steady by hand and rotate drive gear in both directions.



Usually the pattern will be correct if washers are correctly calculated and the backlash is correct.
However, in rare cases, trial and error processes may be employed to obtain a correct pattern.
The tooth pattern is the best indication of how well a differential has been set up.



When adjustment is completed, be sure to wipe off completely the red lead and oil or their equivalent.

SDIA2591E

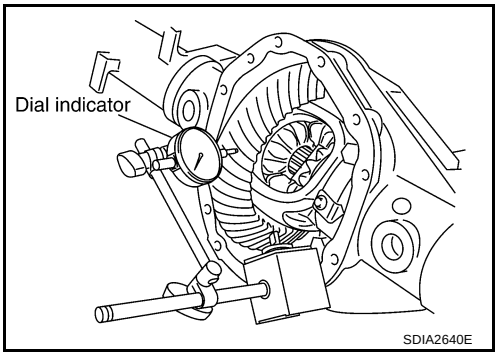
5. If outside the standard, adjust drive pinion height adjusting washer and backlash. Refer to RFD-24, "Drive Pinion Height Adjusting Washer" and RFD-17, "Backlash" .

Backlash

1. Remove carrier cover. Refer to RFD-19, "Differential Assembly" .
2. Check drive gear to drive pinion backlash using a dial indicator at several points.

Drive gear to drive pinion backlash:

0.08 - 0.13 mm (0.0031 - 0.0051 in)



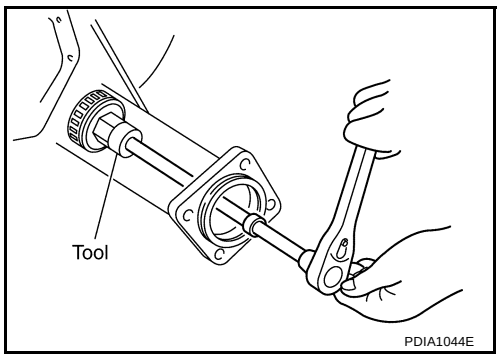
3. If outside the standard, adjust side bearing adjusters.

CAUTION:
Check tooth contact and total preload after adjusting side bearing adjusters. Refer to RFD-16, "Total Preload Torque" , RFD-16, "Tooth Contact" .

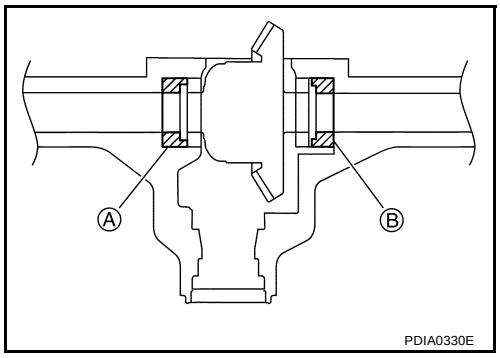
a. Remove adjuster lock plates.
b. Loosen side bearing cap bolts.

c. Tighten or loosen each side bearing adjusters using Tool.

Tool number : KV38108800

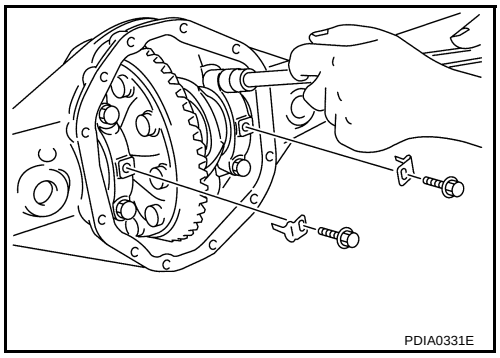


d. In case of excessive backlash, loosen side bearing adjuster A and tighten side bearing adjuster B. In case of insufficient backlash, loosen side bearing adjuster B and tighten side bearing adjuster A.



e. After adjusting backlash, tighten side bearing cap bolts to the specified torque. Refer to RFD-15, "COMPONENTS" .

f. Install adjuster lock plates and tighten to the specified torque. Refer to RFD-15, "COMPONENTS" .



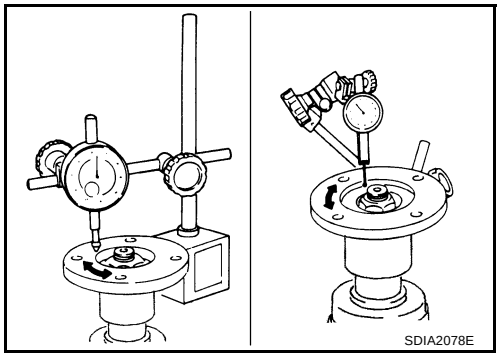
Companion Flange Runout

1. Fit a dial indicator onto companion flange face (inner side of propeller shaft bolt holes).
2. Rotate companion flange to check for runout.

Runout limit : 0.10 mm (0.0039 in) or less

3. Fit a test indicator to the inner side of companion flange (socket diameter).
4. Rotate companion flange to check for runout.

Runout limit : 0.13 mm (0.0051 in) or less



5. If the runout value is outside the repair limit, follow the procedure below to adjust.

a. Check for runout while changing the phase between companion flange and drive pinion by 90°, 180° and 270° and search for the point where the runout is the minimum.

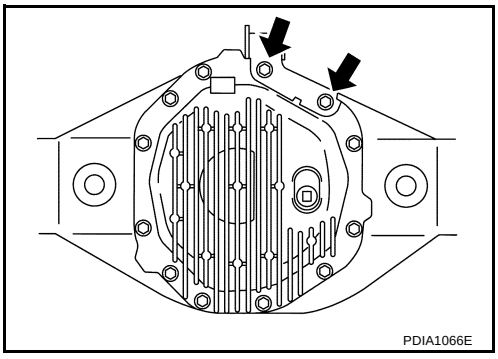
b. If the runout value is still outside of the limit after the phase has been changed, replace companion flange.

c. If the runout value is still outside of the limit after companion flange has been replaced, check drive pinion front bearing, drive pinion rear bearing and drive pinion assembly.

DISASSEMBLY

Differential Assembly

1. Remove carrier cover bolts and bracket.

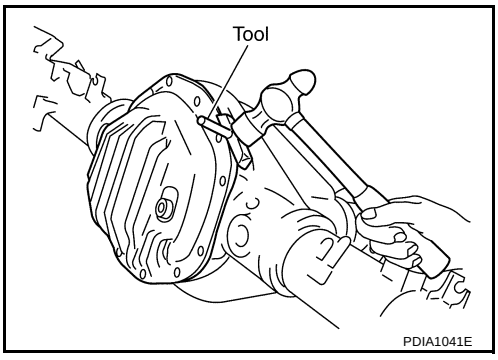

PDIA1066E

2. Separate carrier cover from axle housing using Tool.

Tool number : KV10111100

CAUTION:

- **Be careful not to damage the mating surface.**
- **Do not insert flat-bladed screwdriver, this will damage the mating surface.**



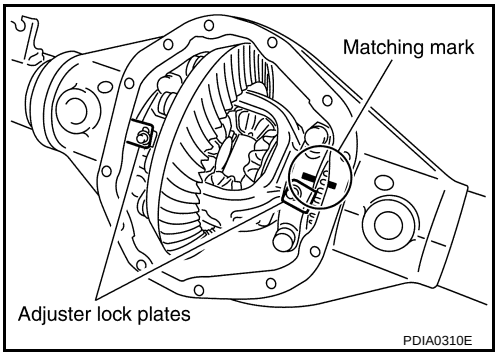
PDIA1041E

3. For proper reinstallation, paint matching mark on one side of side bearing cap and axle housing.

CAUTION:

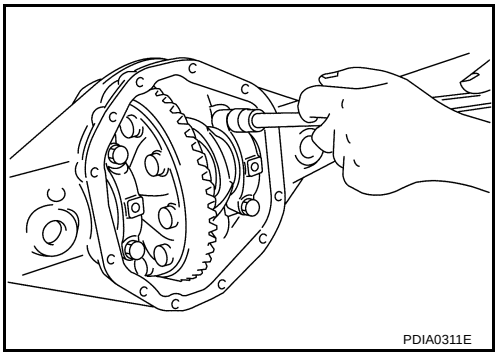
- **Side bearing caps are line-board for initial assembly. The matching marks are used to reinstall them in their original positions.**
- **For matching mark, use paint. Do not damage side bearing cap and axle housing.**

4. Remove adjuster lock plates.



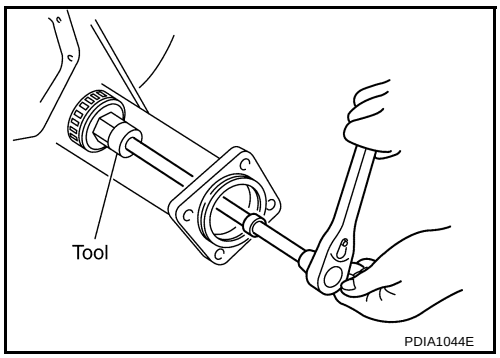
PDIA0310E

5. Remove side bearing caps.

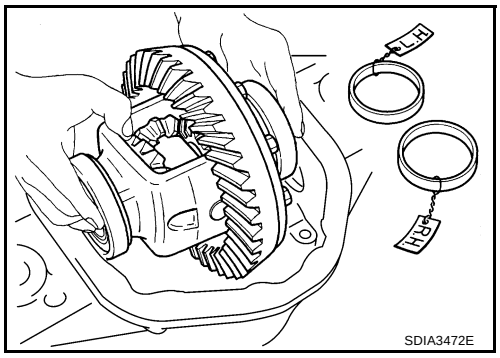

PDIA0311E

6. Loosen side bearing adjusters using Tool.

Tool number : KV38108800

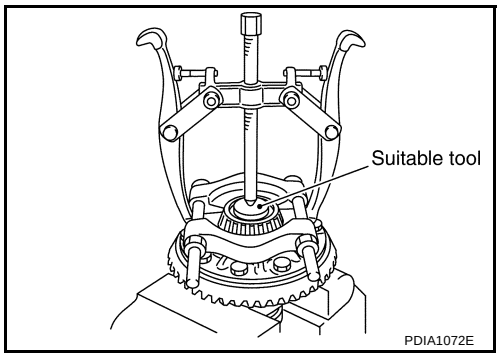


7. Keep side bearing outer races together with inner races. Do not mix them up. Also, keep side bearing adjusters together with bearing.
8. Remove side bearing adjusters from axle housing.



9. Remove side bearing inner races using suitable tools.

CAUTION:
Be careful not to damage differential case assembly.

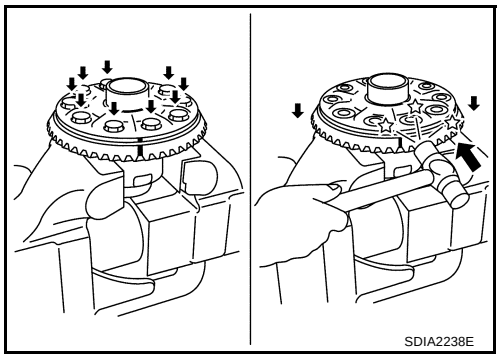


10. For proper reinstallation, paint matching mark on differential case assembly and drive gear.

CAUTION:
For matching mark, use paint. Do not damage differential case assembly and drive gear.

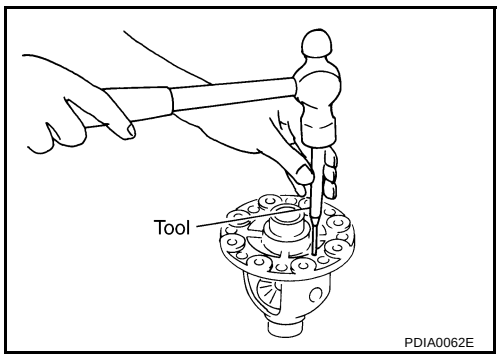
11. Remove drive gear bolts.
12. Tap drive gear off differential case assembly using suitable tool.

CAUTION:
Tap evenly all around to keep drive gear from binding.

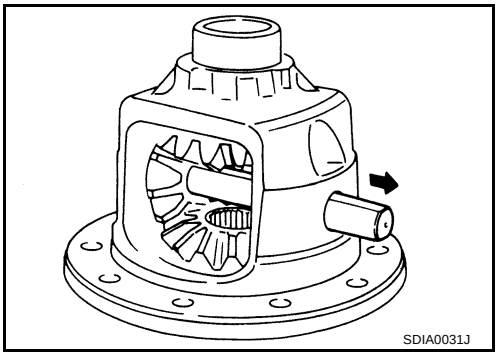


13. Pull lock pin out of pinion mate shaft, using pin punch.

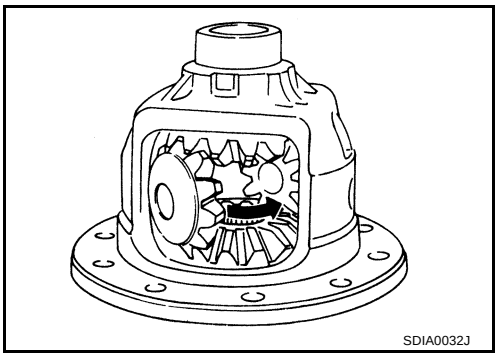
Tool number : ST23550000 (—)



14. Remove pinion mate shaft.


SDIA0031J

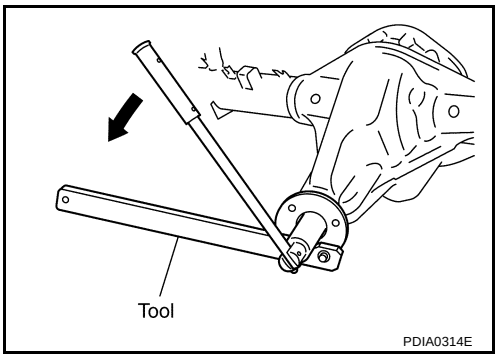
15. Turn pinion mate gear, then remove pinion mate gear, pinion mate thrust washer, side gear and side gear thrust washer from differential case.


SDIA0032J

Drive Pinion Assembly

1. Remove differential case assembly. Refer to RFD-19, "Differential Assembly" .
2. Remove drive pinion lock nut and washer using Tool.

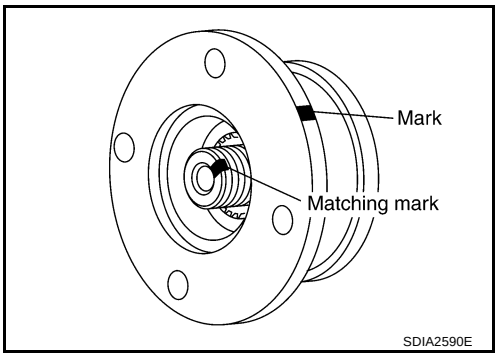
Tool number : KV40104000



PDIA0314E

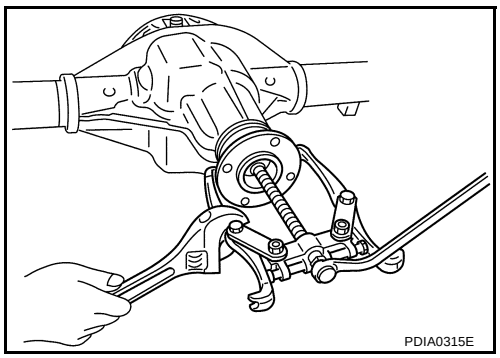
3. Put a matching mark on the thread edge of drive pinion. The mark should be in line with the mark on companion flange.

CAUTION:
For matching mark, use paint. Do not damage drive pinion and companion flange.



SDIA2590E

4. Remove companion flange using suitable tool.

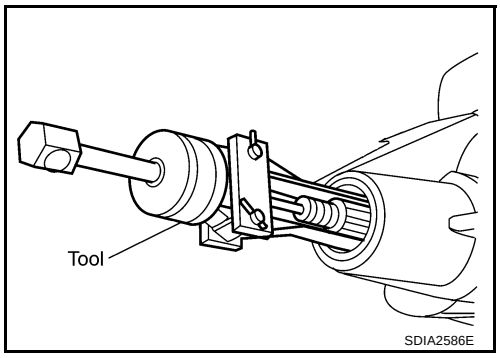


5. Remove front oil seal using Tool.

Tool number : KV381054S0

CAUTION:
Be careful not to damage axle housing.

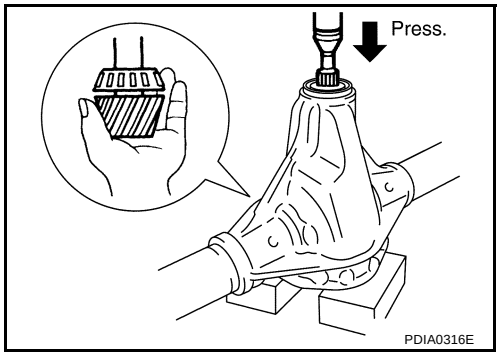
6. Remove front bearing thrust washer.



7. Press the drive pinion assembly and collapsible spacer from axle housing.

CAUTION:
Do not drop drive pinion assembly.

8. Remove drive pinion front bearing inner race from axle housing.

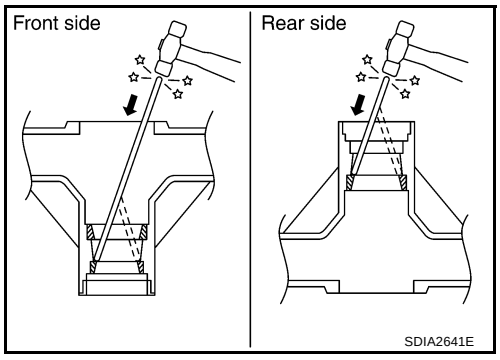


9. Tap drive pinion front bearing outer race uniformly with a brass bar or equivalent to remove.

CAUTION:
Be careful not to damage axle housing.

10. Tap drive pinion rear bearing outer race uniformly with a brass bar or equivalent for removal.

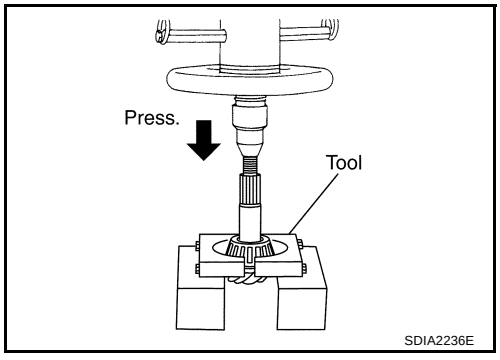
CAUTION:
Be careful not to damage axle housing.



11. Remove drive pinion rear bearing inner race and drive pinion height adjusting washer using Tool.

Tool number : ST30021000

12. Remove the breather.



INSPECTION AFTER DISASSEMBLY

Drive Gear and Drive Pinion

- If the gear teeth do not mesh or line-up correctly, determine the cause and adjust, repair, or replace as necessary.
- If the gears are worn, cracked, damaged, pitted or chipped (by friction) noticeably, replace with new gears.
- Drive gear and drive pinion are supplied in matched sets only. Matching numbers on both drive pinion and drive gear are etched for verification. If a new gear set is being used, verify the numbers of each drive pinion and drive gear before proceeding with assembly.

Bearing

- If bearings are chipped (by friction), pitted, worn, rusted, scratched, or unusual noise is coming from bearing, replace with new bearing assembly (as a new set).
- Bearing must be replaced with a new one whenever disassembled.

Side Gear, Pinion Mate and Pinion Mate Shaft

- Replace with a new one if found any cracks or damage on the surface of the tooth.
- Replace with a new one if found any worn or chipped mark on the contact sides of thrust washer.
- Replace both side gear and pinion mate gear as a set when replacing side gear or pinion mate gear.

Side Gear Thrust Washer and Pinion Mate Thrust Washer

- Replace with a new one if found that it is chipped (by friction), damaged, or unusual worn.

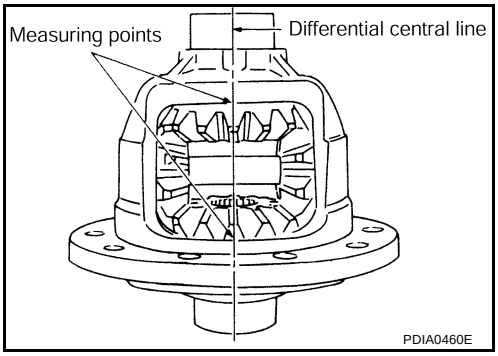
Differential Case Assembly

- If the gears are worn, cracked, damaged, pitted or chipped (by friction) noticeably, replace with new differential case assembly.

SELECTION ADJUSTING WASHERS

Side Gear Thrust Washer

1. Place differential case straight up so that side gear to be measured comes upward.



2. Using a thickness gauge, measure the clearance between side gear back and differential case at 3 different points, while rotating side gear. Average the 3 readings, and then measure the clearance. (Measure the clearance of the other side as well.)

   Side gear back clearance standard:

   0.305 mm (0.0120 in) or less.
   (Each gear should rotate smoothly without excessive resistance during differential motion.)

   CAUTION:
   To prevent side gear from tilting, insert thickness gauges with the same thickness from both sides.

3. If the back clearance is outside the standard, use a thicker/thinner side gear thrust washer to adjust.

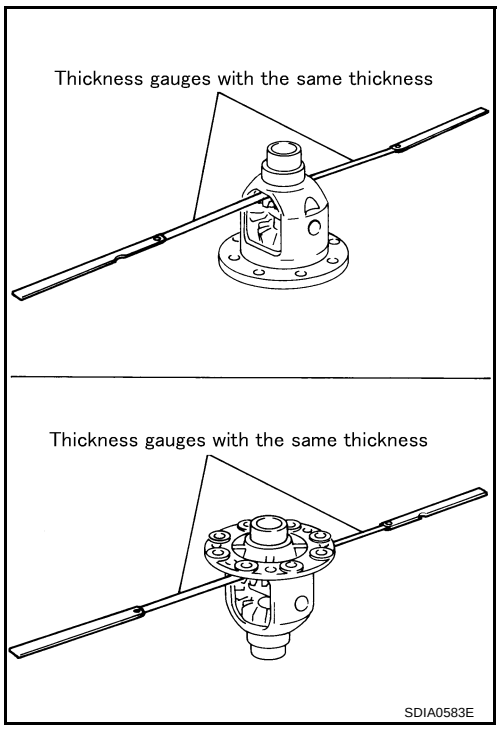
   When the back clearance is greater than specification:

   Use a thicker thrust washer.

   When the back clearance is less than specification:

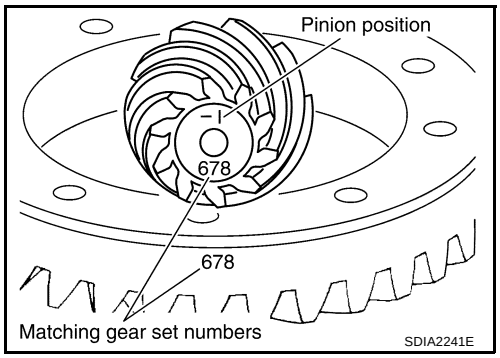
   Use a thinner thrust washer.

   CAUTION:
   Select a side gear thrust washer for right and left individually.



Drive Pinion Height Adjusting Washer

- Drive gear and drive pinion are supplied in matched sets only. Matching numbers on both drive pinion and drive gear are etched for verification. If a new hypoid gear set is being used, verify the numbers of each drive pinion and drive gear before proceeding with assembly.



- The mounting distance from the center line of drive gear to the back face of drive pinion for the M226 final drive is 109.5 mm (4.312 in).
  On the button end of each drive pinion, there is etched a plus (+) number, a minus (-) number, or a zero (0), which indicates the best running position for each particular hypoid gear set. This dimension is controlled by a selective drive pinion height adjusting washer between drive pinion rear bearing inner race and drive pinion.
  For example: If a drive pinion is etched m+8 (+3), it would require 0.08 mm (0.003 in) less drive pinion height adjusting washer than a drive pinion etched “0”. This means decreasing drive pinion height adjusting washer thickness; increases the mounting distance of drive pinion to 109.6 mm (4.315 in). If a drive pinion is etched m-8 (-3), it would require adding 0.08 mm (0.003 in) more to drive pinion height adjusting washer than would be required if drive pinion were etched “0”. By adding 0.08 mm (0.003 in), the mounting distance of drive pinion was decreased to 109.4 mm (4.309 in) which is just what a m-8 (-3) etching indicated.
- To change drive pinion adjustment, use different drive pinion height adjusting washer which come in different thickness.
- Use the following tables as a guide for selecting the correct drive pinion height adjusting washer thickness to add or subtract from the old drive pinion height adjusting washer.

Unit: mm (in)

OLD DRIVE PINION MARKING	NEW DRIVE PINION MARKING								
	-10 (-4)	-8 (-3)	-5 (-2)	-3 (-1)	0	+3 (+1)	+5 (+2)	+8 (+3)	+10 (+4)
+10 (+4)	+0.20 (+0.008)	+0.18 (+0.007)	+0.15 (+0.006)	+0.13 (+0.005)	+0.10 (+0.004)	+0.08 (+0.003)	+0.05 (+0.002)	+0.02 (+0.001)	0 (0)
+8 (+3)	+0.18 (+0.007)	+0.15 (+0.006)	+0.13 (+0.005)	+0.10 (+0.004)	+0.08 (+0.003)	+0.05 (+0.002)	+0.02 (+0.001)	0 (0)	-0.02 (-0.001)
+5 (+2)	+0.15 (+0.006)	+0.13 (+0.005)	+0.10 (+0.004)	+0.08 (+0.003)	+0.05 (+0.002)	+0.02 (+0.001)	0 (0)	-0.02 (-0.001)	-0.05 (-0.002)
+3 (+1)	+0.13 (+0.005)	+0.10 (+0.004)	+0.08 (+0.003)	+0.05 (+0.002)	+0.02 (+0.001)	0 (0)	-0.02 (-0.001)	-0.05 (-0.002)	-0.08 (-0.003)
0	+0.10 (+0.004)	+0.08 (+0.003)	+0.05 (+0.002)	+0.02 (+0.001)	0 (0)	-0.02 (-0.001)	-0.05 (-0.002)	-0.08 (-0.003)	-0.10 (-0.004)
-3 (-1)	+0.08 (+0.003)	+0.05 (+0.002)	+0.02 (+0.001)	0 (0)	-0.02 (-0.001)	-0.05 (-0.002)	-0.08 (-0.003)	-0.10 (-0.004)	-0.13 (-0.005)
-5 (-2)	+0.05 (+0.002)	+0.02 (+0.001)	0 (0)	-0.02 (-0.001)	-0.05 (-0.002)	-0.08 (-0.003)	-0.10 (-0.004)	-0.13 (-0.005)	-0.15 (-0.006)
-8 (-3)	+0.02 (+0.001)	0 (0)	-0.02 (-0.001)	-0.05 (-0.002)	-0.08 (-0.003)	-0.10 (-0.004)	-0.13 (-0.005)	-0.15 (-0.006)	-0.18 (-0.007)
-10 (-4)	0 (0)	-0.02 (-0.001)	-0.05 (-0.002)	-0.08 (-0.003)	-0.10 (-0.004)	-0.13 (-0.005)	-0.15 (-0.006)	-0.18 (-0.007)	-0.20 (-0.008)

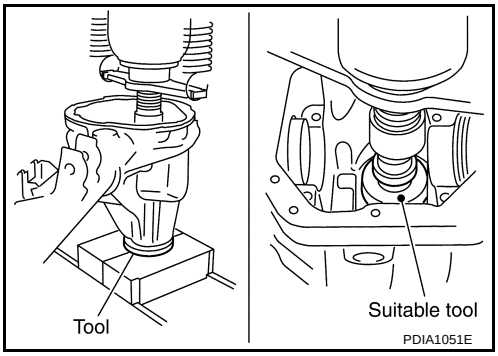
ASSEMBLY

Drive Pinion Assembly

1. Install the breather and then tighten to the specified torque. Refer to RFD-15, "COMPONENTS" .
2. Press a drive pinion rear bearing outer race into axle housing using suitable tool and Tool.

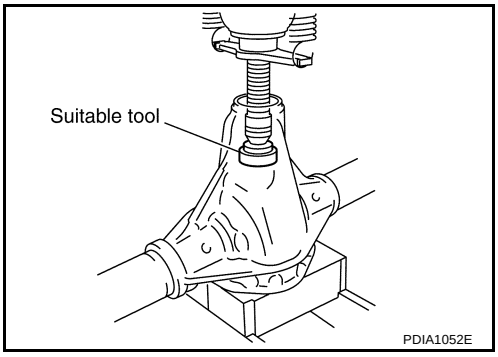
   Tool number : ST30022000

   CAUTION:
   Do not reuse drive pinion rear bearing.



3. Press drive pinion front bearing outer race into axle housing using suitable tool.

   CAUTION:
   Do not reuse drive pinion front bearing.



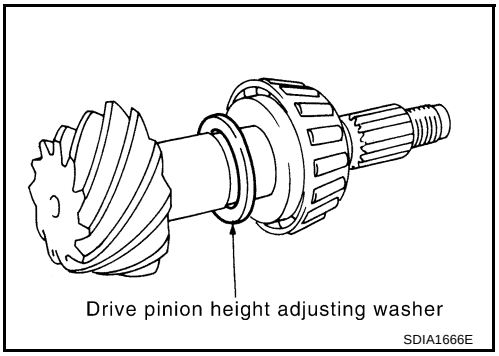
4. Temporarily install drive pinion height adjusting washer.

When hypoid gear set has been replaced

- Select drive pinion height adjusting washer. Refer to RFD-24, "Drive Pinion Height Adjusting Washer" .

When hypoid gear set has been reused

- Temporarily install the removed drive pinion height adjusting washer or same thickness washer to drive pinion.



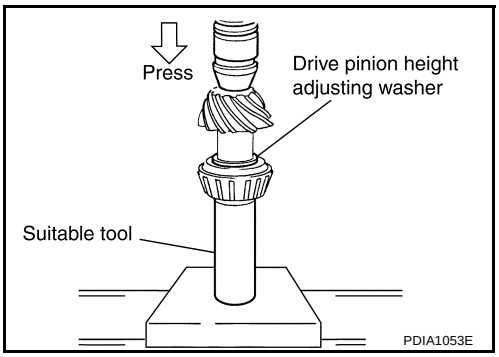
5. Install selected drive pinion height adjusting washer to drive pinion, and press-fit drive pinion rear bearing inner race in it, using a press and suitable tool.

CAUTION:
Do not reuse drive pinion rear bearing.

6. Apply gear oil to drive pinion rear bearing and drive pinion front bearing.
7. Install drive pinion front bearing inner race in axle housing.

CAUTION:
Do not reuse drive pinion front bearing.

8. Install front bearing thrust washer to axle housing.



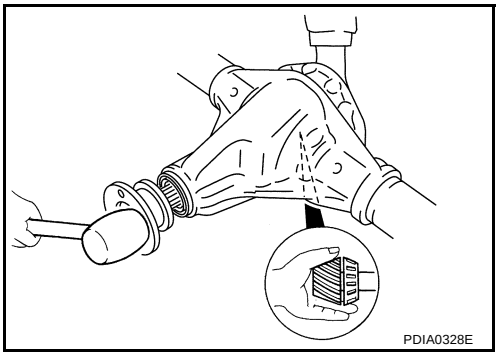
9. Perform checking and adjusting the tooth contact and backlash of the hypoid gear following the procedure below.

a. Assemble the drive pinion assembly to the axle housing.

CAUTION:
Do not assemble a collapsible spacer.

b. Insert companion flange onto drive pinion. Tap the companion flange with a soft hammer until fully seated.

CAUTION:
Do not assemble a front oil seal.

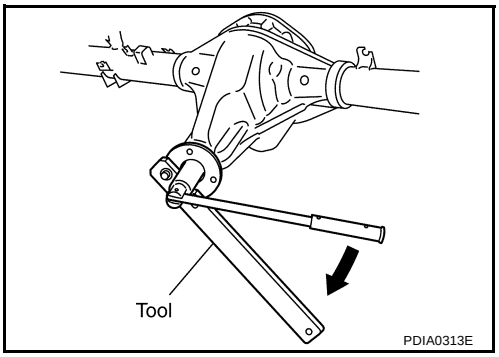


c. Temporarily tighten removed drive pinion lock nut and washer to drive pinion.

Tool number : KV40104000

NOTE:
Use removed drive pinion lock nut and washer only for the preload measurement.

d. Rotate drive pinion at least 20 times to check for smooth operation of the bearing.



e. Tighten to drive pinion lock nut, while adjust pinion bearing preload torque.

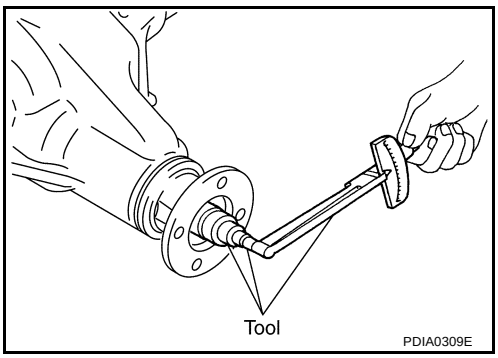
Tool number : ST3127S000

Drive pinion lock nut tightening torque:

298 - 678 N·m (31 - 69 kg-m, 220 - 500 ft-lb)

Pinion bearing preload:

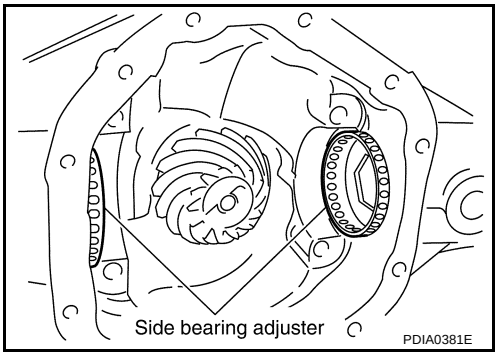
1.7 - 3.1 N·m (0.18 - 0.31 kg-m, 15 - 27 in-lb)



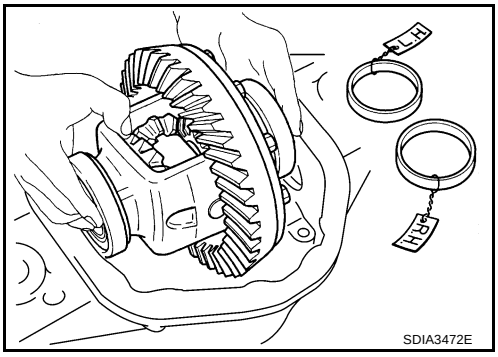
CAUTION:

- **Adjust to the lower limit of the drive pinion lock nut tightening torque first.**
- **Drive pinion lock nut is tightened with no collapsible spacer. Be careful not to overtighten it. While measuring the preload, tighten it by 5° to 10°.**
- **After adjustment, rotate drive pinion back and forth 2 to 3 times to check for unusual noise, rotation malfunction and other malfunctions.**

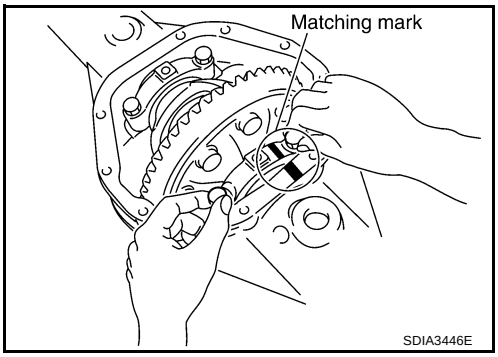
f. Install side bearing adjusters into axle housing.



g. Apply gear oil to side bearings. Install differential case assembly with side bearing outer races into axle housing.



h. Align paint matching mark on side bearing cap with that on axle housing and install side bearing caps on axle housing.
   - Do not tighten at this point. This allows further tightening of side bearing adjusters.



i. Check and adjust the backlash and tooth contact. Refer to RFD-17, "Backlash" and RFD-16, "Tooth Contact" .

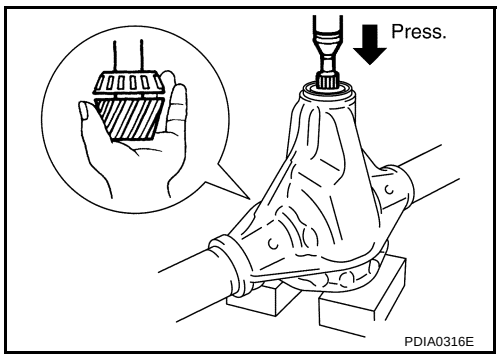
j. Remove side bearing caps.

k. Remove differential case assembly.

l. Remove companion flange.

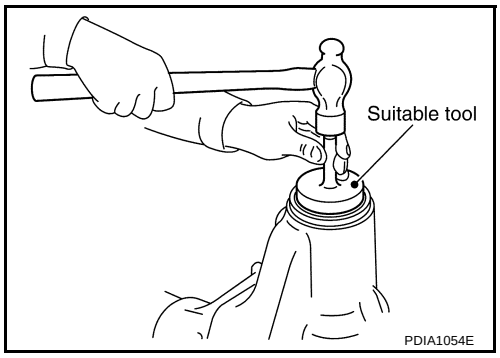
m. Press the drive pinion assembly from axle housing.

CAUTION:
Do not drop drive pinion assembly.



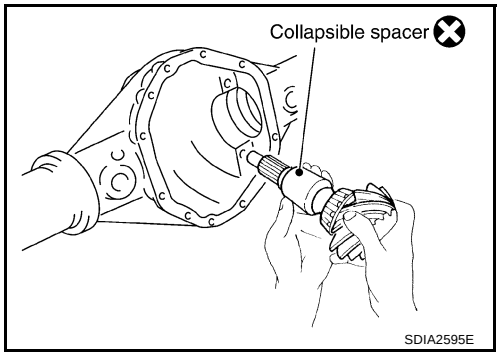
10. Install front oil seal into axle housing using suitable tool.

CAUTION:
- **Do not reuse oil seal.**
- **Do not incline oil seal when installing.**
- **Apply multi-purpose grease onto oil seal lip, and gear oil onto the circumference of oil seal.**

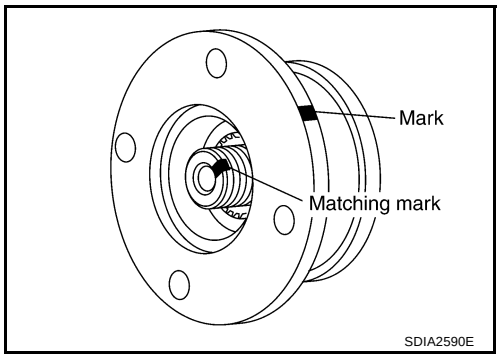


11. Install collapsible spacer to drive pinion. And then install drive pinion assembly in axle housing.

CAUTION:
- **Do not reuse collapsible spacer.**
- **Be careful not to damage front oil seal.**

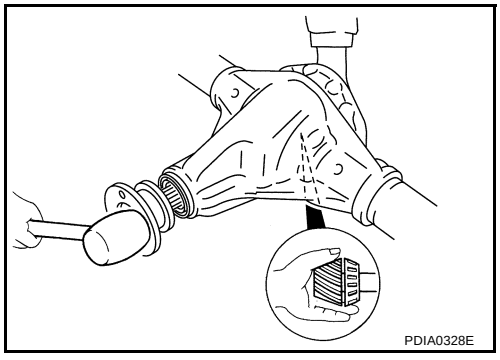


12. Align the matching mark of the drive pinion with the mark of the companion flange, then install the companion flange.



13. Insert companion flange onto drive pinion. Tap the companion flange with a soft hammer until fully seated.

CAUTION:
Be careful not to damage companion flange and front oil seal.

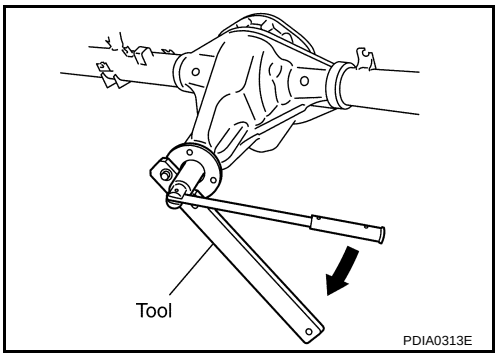


14. Apply anti-corrosive oil to the thread and seat of drive pinion lock nut, and temporarily tighten drive pinion lock nut and washer to drive pinion.

    Tool number : KV40104000

    CAUTION:
    Do not reuse drive pinion lock nut and washer.

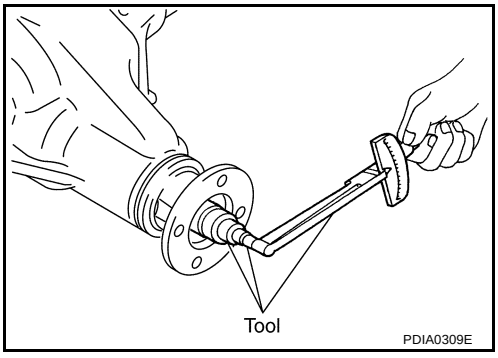
15. Rotate drive pinion at least 20 times to check for smooth operation of the bearing.



16. Tighten to drive pinion lock nut, while adjust pinion bearing preload torque.

    Tool number : ST3127S000

    Drive pinion lock nut tightening torque:
    298 - 678 N·m (31 - 69 kg-m, 220 - 500 ft-lb)
    Pinion bearing preload:
    1.7 - 3.1 N·m (0.18 - 0.31 kg-m, 15 - 27 in-lb)



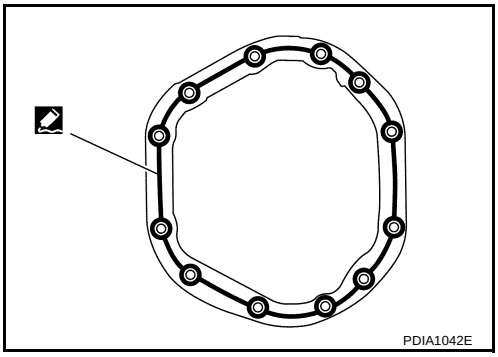
    CAUTION:
    - **Adjust the lower limit of the drive pinion lock nut tightening torque first.**
    - **If the preload torque exceeds the specified value, replace collapsible spacer and tighten it again to adjust. Never loosen drive pinion lock nut to adjust the preload torque.**
    - **After adjustment, rotate drive pinion back and forth 2 to 3 times to check for unusual noise, rotation malfunction, and other malfunctions.**

17. Install differential case assembly. Refer to RFD-30, "Differential Assembly" .

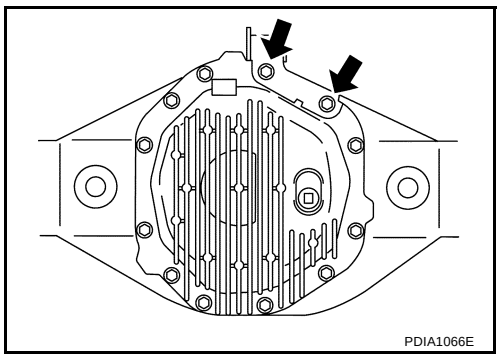
    CAUTION:
    Do not install carrier cover yet.

18. Check and adjust backlash, tooth contact and companion flange runout. Refer to RFD-17, "Backlash" , RFD-16, "Tooth Contact" and RFD-18, "Companion Flange Runout" . Recheck above items. Readjust the above description, if necessary.
19. Check total preload torque. Refer to RFD-16, "Total Preload Torque" .
20. Apply sealant to mating surface of carrier cover. Refer to RFD-15, "COMPONENTS" .

    CAUTION:
    Remove old sealant adhering to mounting surfaces. Also remove any moisture, oil, or foreign material adhering to application and mounting surfaces.

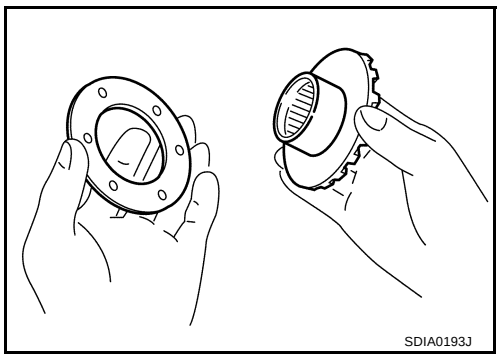


21. Install carrier cover and bracket on axle housing. Then tighten carrier cover bolts to the specified torque. Refer to RFD-15, "COMPONENTS" .

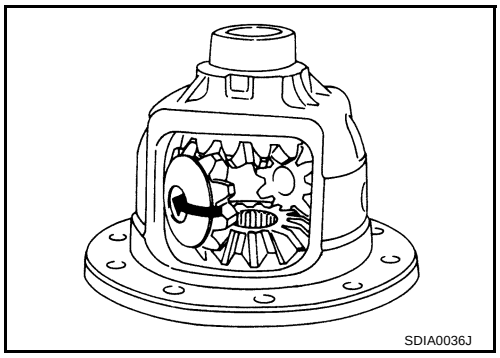

PDIA1066E

Differential Assembly

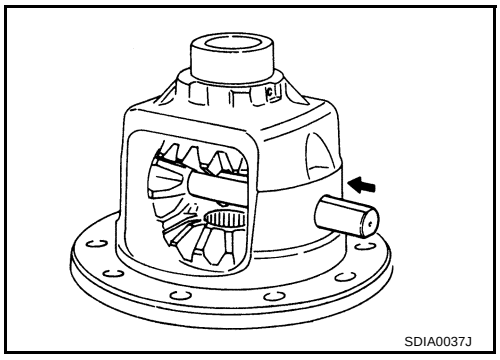
1. Assemble side gear thrust washers with the same thickness as the ones installed prior to disassembly or reinstall the old ones on side gears.
2. Assemble side gear and side gear thrust washer into differential case.


SDIA0193J

3. Align 2 pinion mate gears in diagonally opposite positions, then rotate and assemble them into differential case after assembling pinion mate thrust washer to pinion mate gear.


SDIA0036J

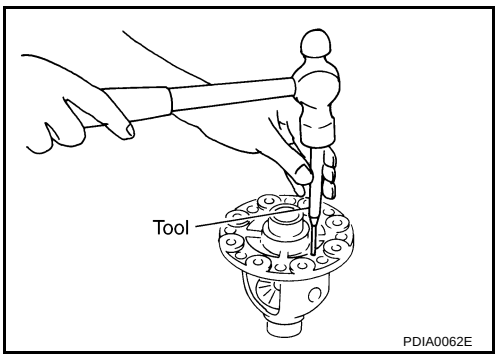
4. Align lock pin holes on differential case and shaft, and assemble pinion mate shaft.
5. Measure side gear end play. If necessary, select the appropriate side gear thrust washers. Refer to RFD-23, "Side Gear Thrust Washer" .


SDIA0037J

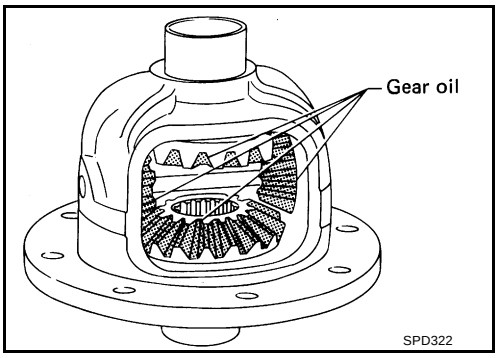
6. Drive a lock pin into pinion mate shaft, using pin punch.

Tool number : ST23550000 (—)

CAUTION:
Do not reuse lock pin.

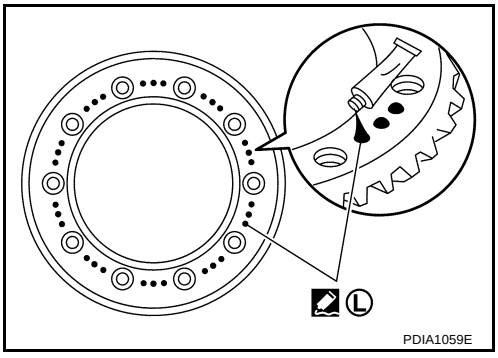


7. Apply gear oil to gear tooth surfaces and thrust surfaces and check to see they turn properly.

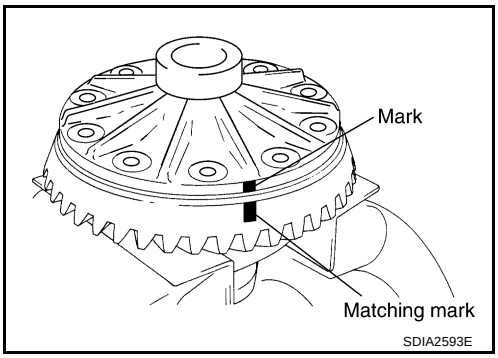


8. Apply sealant to back face of drive gear. Refer to RFD-15, "COMPONENTS" .

CAUTION:
Remove old sealant adhering to mounting surfaces. Also remove any moisture, oil, or foreign material adhering to application and mounting surfaces.

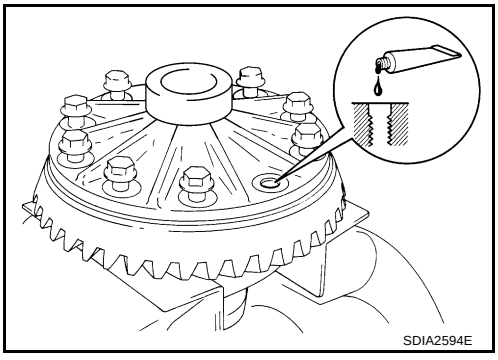


9. Align the matching mark of differential case assembly with the mark of drive gear, then install drive gear.



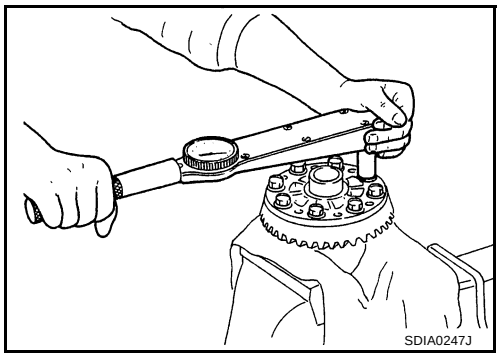
10. Apply thread locking sealant into the thread hole of drive gear. Refer to RFD-15, "COMPONENTS" .

CAUTION:
Make sure threaded holes are clean.



11. Install the drive gear bolts, and then tighten to the specified torque. Refer to RFD-15, "COMPONENTS" .

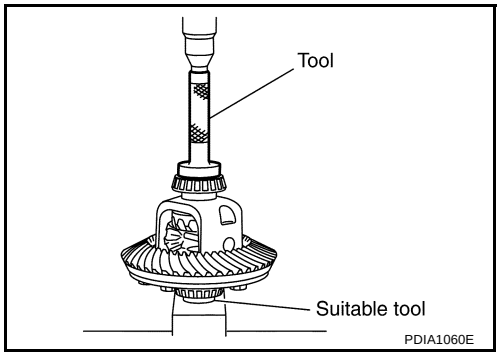
CAUTION:
- **Do not reuse the bolts.**
- **Tighten bolts in a crisscross fashion.**



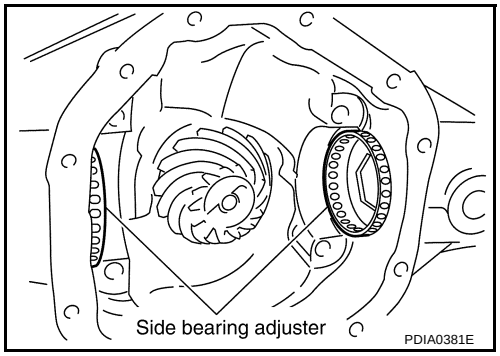
12. Press side bearing inner races to differential case assembly using suitable tool and Tool.

Tool number : KV38100300

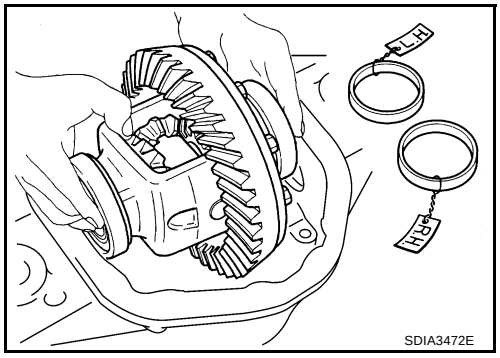
CAUTION:
Do not reuse side bearings.



13. Install side bearing adjusters into axle housing.

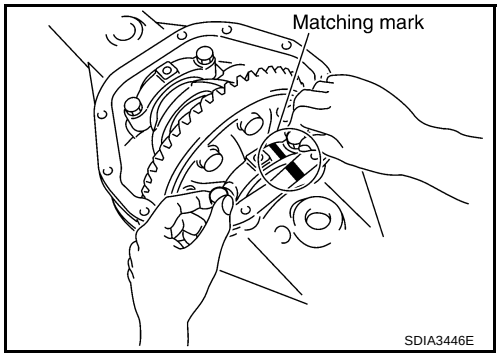


14. Apply gear oil to side bearings. Install differential case assembly with side bearing outer races into axle housing.



15. Align paint matching mark on side bearing cap with that on axle housing and install side bearing caps on axle housing.

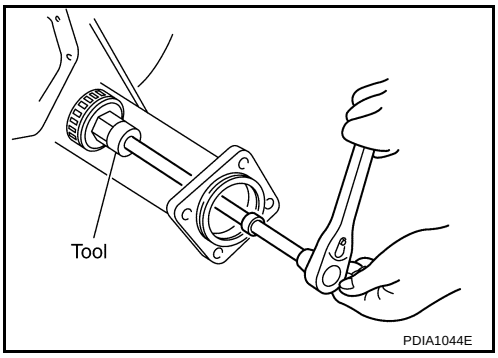
CAUTION:
Do not tighten at this point. This allows further tightening of side bearing adjusters.



16. Tighten each side bearing adjusters using Tool.

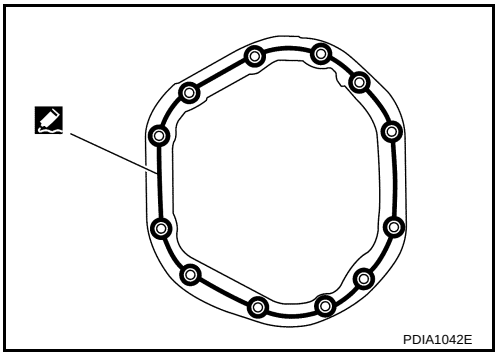
Tool number : KV38108800

17. Adjust backlash of drive gear and drive pinion. Refer to RFD-17, "Backlash" .
18. Check tooth contact. Refer to RFD-16, "Tooth Contact" .
19. Check total preload. Refer to RFD-16, "Total Preload Torque" .

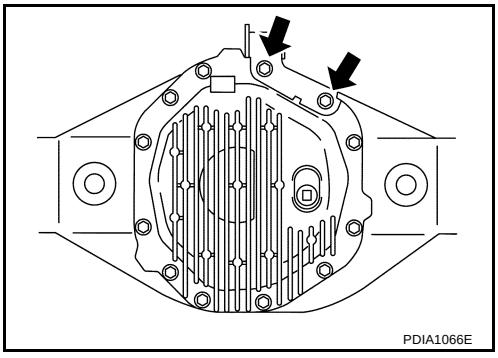


20. Apply sealant to mating surface of carrier cover. Refer to RFD-15, "COMPONENTS" .

CAUTION:
Remove old sealant adhering to mounting surfaces. Also remove any moisture, oil, or foreign material adhering to application and mounting surfaces.



21. Install carrier cover and bracket on axle housing. Then tighten carrier cover bolts to the specified torque. Refer to RFD-15, "COMPONENTS" .



SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications

GDS0006P

Applied model	VQ40DE		YD25DDTi	
	2WD			
	6M/T	5A/T	6M/T	5A/T
Grade	SE			
Final drive model	M226			
Gear ratio	3.538	3.133	3.538	3.357
Number of pinion gears	2			
Number of teeth (Drive gear / drive pinion)	46/13	47/15	46/13	47/14
Oil capacity (Approx.) ℓ (lmp pt)	2.01 (3-1/2)			
Drive pinion adjustment spacer type	Collapsible			

Inspection and Adjustment

GDS0006Q

PRELOAD TORQUE

Unit: N·m (kg-m, in-lb)

Item	Specification			
	Gear ratio 3.133 type	Gear ratio 3.357 type	Gear ratio 3.538 type	Gear ratio 3.692 type
Total preload	2.38 - 4.46 (0.25 - 0.45, 21 - 39)		2.34 - 4.34 (0.24 - 0.44, 21 - 38)	2.32 - 4.34 (0.24 - 0.44, 21 - 38)
Pinion bearing preload	1.7 - 3.1 (0.18 - 0.31, 15 - 27)			

BACKLASH

Unit: mm (in)

Item	Standard
Drive gear to drive pinion gear	0.08 - 0.13 (0.0031 - 0.0051)

COMPANION FLANGE RUNOUT

Unit: mm (in)

Item	Runout limit
Companion flange face	0.10 (0.0039) or less
Inner side of companion flange	0.13 (0.0051) or less

SELECTIVE PARTS

Drive Pinion Height Adjusting Washer

Unit: mm (in)

Thickness	Package part number*
0.076 (0.030) 0.079 (0.031) 0.081 (0.032) 0.084 (0.033) 0.086 (0.034)	38151 8S101
0.089 (0.035) 0.091 (0.036) 0.094 (0.037) 0.097 (0.038) 0.099 (0.039)	38151 8S102
0.102 (0.040) 0.104 (0.041) 0.107 (0.042) 0.109 (0.043) 0.112 (0.044)	38151 8S103
0.114 (0.045) 0.117 (0.046) 0.119 (0.047) 0.122 (0.048) 0.124 (0.049)	38151 8S104
0.127 (0.050) 0.130 (0.051) 0.132 (0.052) 0.135 (0.053) 0.137 (0.054)	38151 8S105

*Always check with the Parts Department for the latest parts information.

PRECAUTIONS

PFP:00001

Limited Slip Differential (LSD) Performance Judgement

GDS00028

- Inspection is required when detecting any noise or malfunction while driving or turning. Improper condition of oil or differential case assembly is suspected. Refer to RFD-36, "METHOD FOR TROUBLESHOOTING" .

METHOD FOR TROUBLESHOOTING

1. Check differential gear oil level and differential gear oil leakage. Refer to RFD-42, "Checking Differential Gear Oil" .
2. Changing differential gear oil. Refer to RFD-42, "Changing Differential Gear Oil" .
3. Start engine. Drive for 10 min.
4. Again changing differential gear oil. Refer to RFD-42, "Changing Differential Gear Oil" .
5. Start engine. Drive for 10 min. Check if any noise or improper oil condition is detected.
   - If OK, check differential gear oil level and differential gear oil leakage. Refer to RFD-42, "Checking Differential Gear Oil" .
   - If NG, replace differential case assembly after checking each part of final drive. Refer to RFD-48, "Disassembly and Assembly" .

Service Notice or Precautions

GDS00029

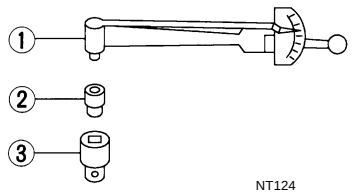
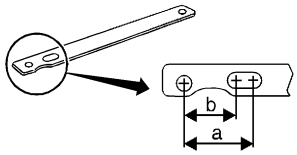
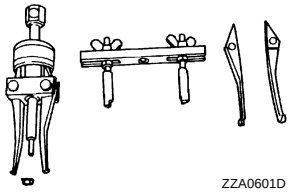
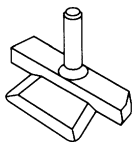
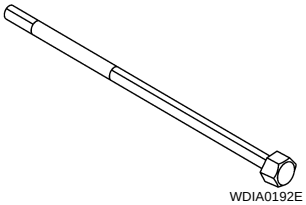
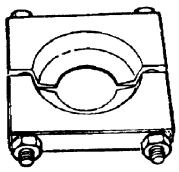
- Check for the correct installation status prior to removal or disassembly. If matching marks are required, be certain they do not interfere with the function of the parts when applied.
- Overhaul should be done in a clean work area, it is preferable to work in dust proof area.
- Before disassembly completely remove sand and mud from the exterior of the unit, preventing them from entering into the unit during disassembly or assembly.
- Check appearance of the disassembled parts for damage, deformation, and unusual wear. Replace them with new ones if necessary.
- Gaskets, seals and O-rings should be replaced any time the unit is disassembled.
- In principle, tighten bolts or nuts gradually in several steps working diagonally from inside to outside. If tightening sequence is specified, observe it.
- Clean and flush the parts sufficiently and blow-dry them.
- Be careful not to damage sliding surfaces and mating surfaces.
- When applying sealant, remove the old sealant from the mounting surface; then remove any moisture, oil, and foreign materials from the application and mounting surfaces.
- Always use shop paper for cleaning the inside of components.
- Avoid using cotton gloves or shop rags to prevent entering of lint.
- During assembly, observe the specified tightening torque, and apply new differential gear oil, petroleum jelly, or multi-purpose grease as specified.

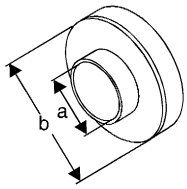
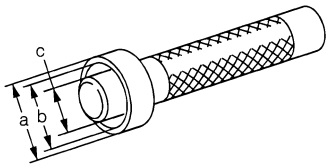
PREPARATION

PFP:00002

Special Service Tools

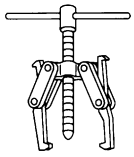
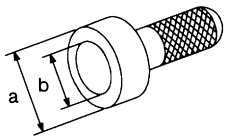
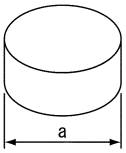
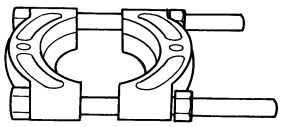
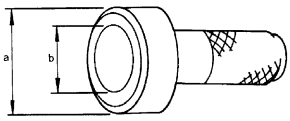
GDS0002A

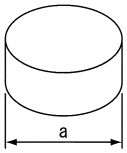
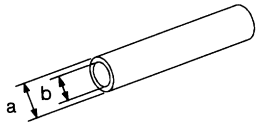
Tool number Tool name		Description
ST3127S000 Preload gauge set 1. GG91030000 Torque wrench 2. HT62940000 (1/2″) Socket adapter 3. HT62900000 (3/8″) Socket adapter	 NT124	Inspecting pinion bearing preload and total preload
KV40104000 Flange wrench a: 85 mm (3.35 in) dia. b: 65 mm (2.56 in) dia.	 NT659	Removing and installing drive pinion lock nut
KV381054S0 Puller	 ZZA0601D	Removing front oil seal
KV10111100 Seal cutter	 S-NT046	Removing carrier cover
KV38108800 Adjuster tool	 WDIA0192E	Removing and installing side bearing adjuster
ST30021000 Puller	 ZZA0700D	Removing drive pinion rear bearing inner race

Tool number Tool name		Description
ST30022000 Drift a: 46 mm (1.81 in) dia. b: 110 mm (4.33 in) dia.	 NT660	Installing drive pinion rear bearing outer race
KV38100300 Drift a: 54 mm (2.13 in) dia. b: 46 mm (1.81 in) dia. c: 32mm (1.26 in) dia.	 ZZA1046D	Installing side bearing inner race

Commercial Service Tools

GDS0002B

Tool name		Description
Puller	 NT077	● Removing companion flange ● Removing side bearing inner race
Drift a: 96mm (3.77 in) dia. b: 84 mm (3.30 in) dia.	 NT115	Installing front oil seal
Adapter a: 43 mm (1.69 in) dia.	 PDIA0893E	Removing and installing side bearing inner race
Puller	 ZZB0823D	Removing side bearing inner race
Drift a: 89 mm (3.50 in) dia. b: 79 mm (3.11 in) dia.	 ZZA0811D	Installing drive pinion rear bearing outer race

Tool name	Description
Drift a: 67 mm (2.63 in) dia.  PDIA0893E	Installing drive pinion front bearing outer race
Installer a: 51 mm (2.01 in) dia. b: 41 mm (1.61 in) dia.  NT065	Installing drive pinion rear bearing inner race

NOISE, VIBRATION, AND HARSHNESS (NVH) TROUBLESHOOTING

PFP:00003

NVH Troubleshooting Chart

GDS0002C

Use the chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page		RFD-55, "INSPECTION AFTER DISASSEMBLY"	RFD-49, "Tooth Contact"	RFD-55, "INSPECTION AFTER DISASSEMBLY"	RFD-50, "Backlash"	RFD-51, "Companion Flange Runout"	RFD-42, "Checking Differential Gear Oil"	PR-2, "NVH Troubleshooting Chart"	RAX-5, "NVH Troubleshooting Chart", RSU-4, "NVH Troubleshooting Chart"	WT-2, "NVH Troubleshooting Chart"		RAX-5, "NVH Troubleshooting Chart"	BR-5, "NVH Troubleshooting Chart"	PS-5, "NVH Troubleshooting Chart"
Possible cause and SUSPECTED PARTS		Gear tooth rough	Gear contact improper	Tooth surfaces worn	Backlash incorrect	Companion flange excessive runout	Gear oil improper	PROPELLER SHAFT	AXLE AND SUSPENSION	TIRES	ROAD WHEEL	AXLE SHAFT	BRAKES	STEERING
Symptom	Noise	×	×	×	×	×	×	×	×	×	×	×	×	×

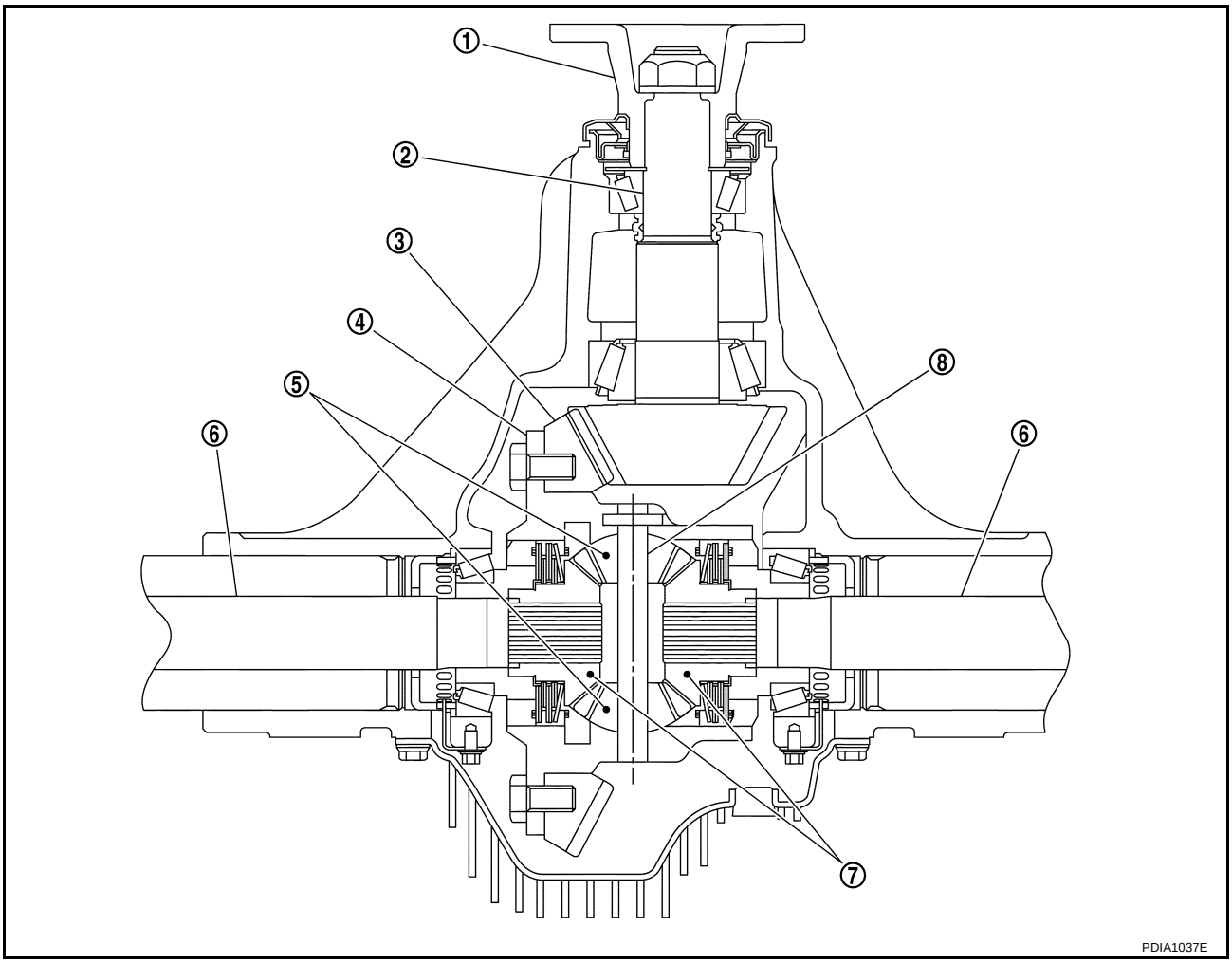
×: Applicable

DESCRIPTION

PFP:00000

Cross-Sectional View

GDS0002D



1. Companion flange
2. Drive pinion
3. Drive gear
4. Differential case
5. Pinion mate gear
6. Axle shaft
7. Side gear
8. Pinion mate shaft

DIFFERENTIAL GEAR OIL

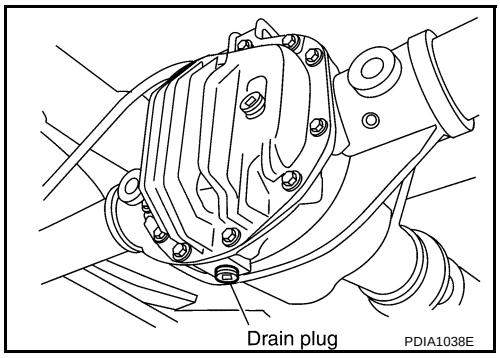
PFP:KLD30

Changing Differential Gear Oil

GDS0002E

DRAINING

1. Stop engine.
2. Remove drain plug and drain gear oil.
3. Apply sealant to drain plug. Install drain plug to final drive assembly and tighten to the specified torque. Refer to RFD-48, "COMPONENTS" .



FILLING

1. Remove filler plug. Fill with new gear oil until oil level reaches the specified limit near filler plug hole.

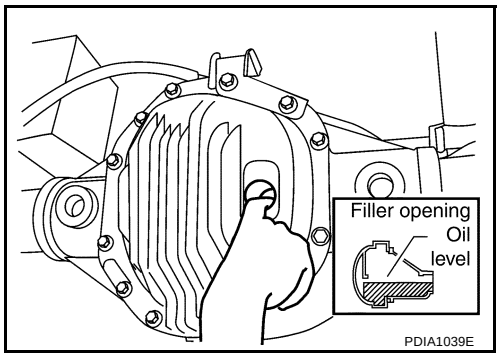
   Oil grade and Viscosity:

   Refer to MA-13, "Fluids and Lubricants" .

   Oil capacity:

   Approx. 2.01 ℓ (3-1/2pt)

2. After refilling oil, check oil level. Apply sealant to filler plug. Install filler plug to final drive assembly and tighten to the specified torque. Refer to RFD-48, "COMPONENTS" .



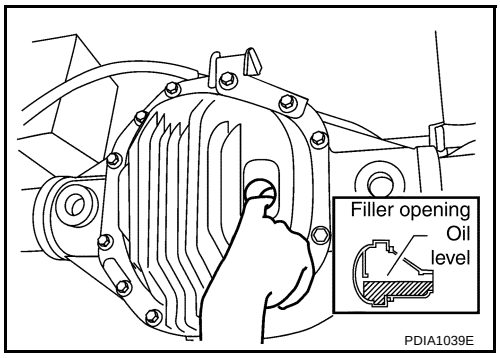
Checking Differential Gear Oil

GDS0002F

OIL LEAKAGE AND OIL LEVEL

1. Make sure that gear oil is not leaking from final drive assembly or around it.
2. Check oil level from filler plug hole as shown.

   CAUTION:
   Do not start engine while checking oil level.
3. Apply sealant to filler plug. Install filler plug to final drive assembly and tighten to the specified torque. Refer to RFD-48, "COMPONENTS" .



FRONT OIL SEAL

PFP:38189

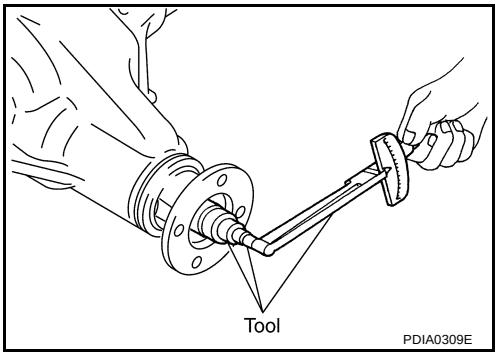
Removal and Installation

GDS0002G

REMOVAL

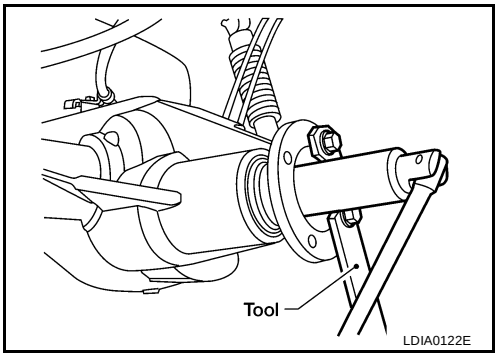
1. Remove the rear propeller shaft. Refer to PR-8, "Removal and Installation" .
2. Remove the rear tires.
3. Remove rear drum brake. Refer to BR-31, "Removal and Installation of Drum Brake Assembly" .
4. Rotate the drive pinion back and forth 2 to 3 times using Tool and record the rotating torque.

   Tool number : ST3127S000



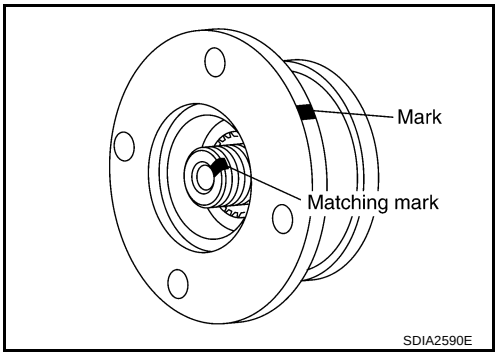
5. Remove the drive pinion lock nut and washer using Tool.

   Tool number : KV40104000

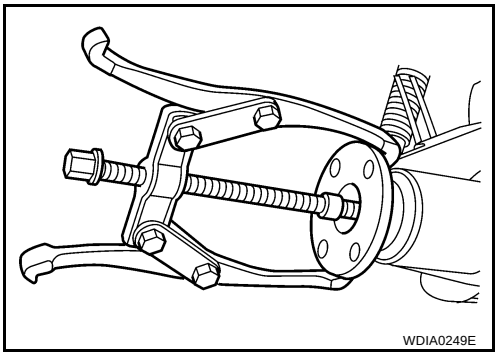


6. Put a matching mark on the thread edge of drive pinion. The mark should be in line with the mark on companion flange.

   CAUTION:
   For matching mark, use paint. Do not damage drive pinion and companion flange.



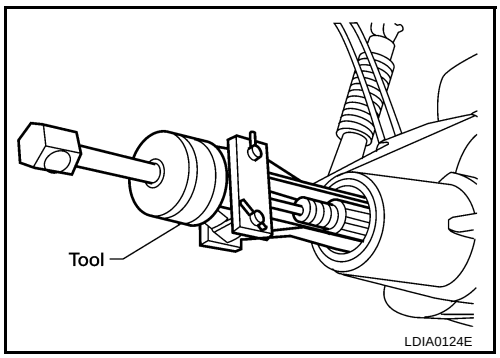
7. Remove the companion flange using suitable tool.



8. Remove the front oil seal using Tool.

Tool number : KV381054S0

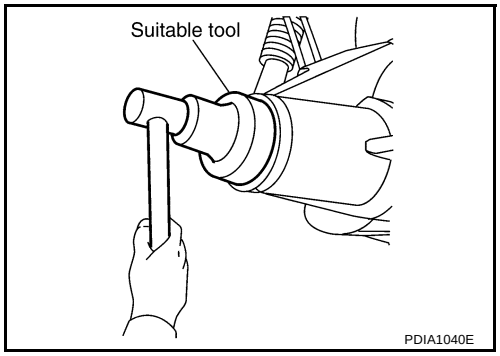
CAUTION:
Do not damage axle housing.



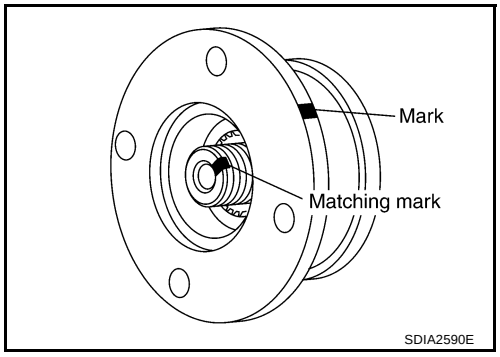
INSTALLATION

1. Install the front oil seal into the axle housing using a suitable tool.

CAUTION:
- **Do not reuse oil seal.**
- **Do not incline oil seal when installing.**
- **Apply multi-purpose grease onto oil seal lip, and gear oil onto the circumference of oil seal.**



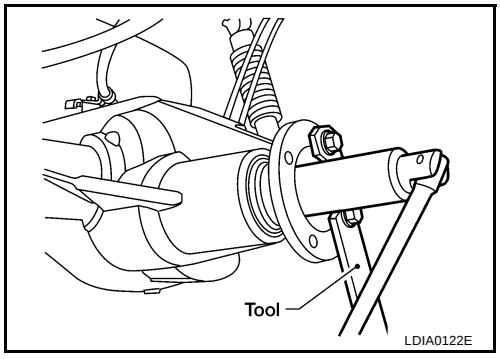
2. Align the matching mark of the drive pinion with the mark of the companion flange, then install the companion flange.



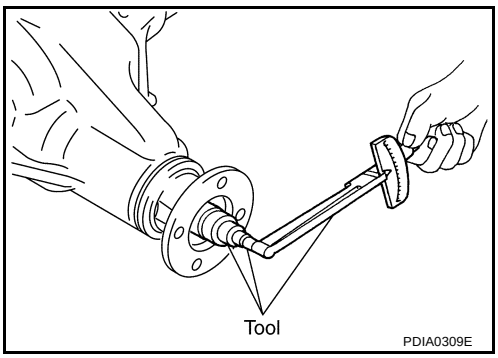
3. Install the washer and drive pinion lock nut. Tighten the nut until there is zero bearing end play using Tool.

Tool number : KV40104000

CAUTION:
Do not reuse drive pinion lock nut and washer.



4. Rotate the drive pinion using Tool. Rotating torque should be equal to the reading recorded in step 4 above during removal plus an additional 0.56 N·m (5 in-lb).



Tool number : ST3127S000

5. If the rotating torque is low, continue to tighten the drive pinion lock nut in 6.8 N·m (5 ft-lb) increments without overtightening. Refer to RFD-48, "COMPONENTS" . Tighten until proper rotating torque is achieved.

CAUTION:

- **Do not loosen the drive pinion lock nut to decrease drive pinion rear bearing rotating torque.**
- **Do not exceed specified rotating preload torque. If preload torque or rotating torque is exceeded a new collapsible spacer must be installed.**
- **Do not exceed maximum tightening torque. If maximum tightening torque is reached prior to reaching the required rotating torque, the collapsible spacer may have been damaged. Replace the collapsible spacer.**

6. Check the gear oil level. Refer to RFD-42, "Checking Differential Gear Oil" .
7. Install the remaining components in the reverse order of removal.

CARRIER COVER

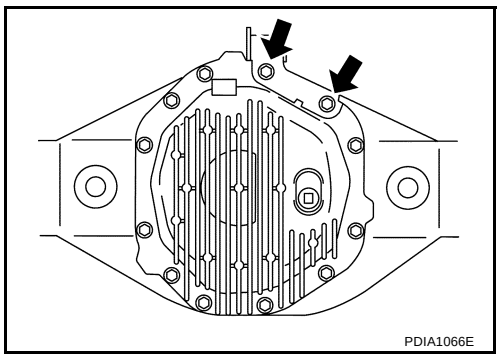
PFP:38351

Removal and Installation

GDS0002H

REMOVAL

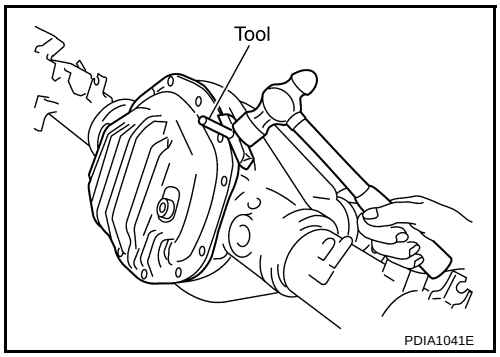
1. Remove the drain plug and drain the gear oil. Refer to RFD-42, "DRAINING" .
2. Disconnect the rear cable (LH) from the carrier cover. Refer to PB-3, "Components" .
3. Remove bracket from the axle housing.



4. Remove the carrier cover bolts. Then separate carrier cover from the axle housing using Tool.

   Tool number : KV10111100

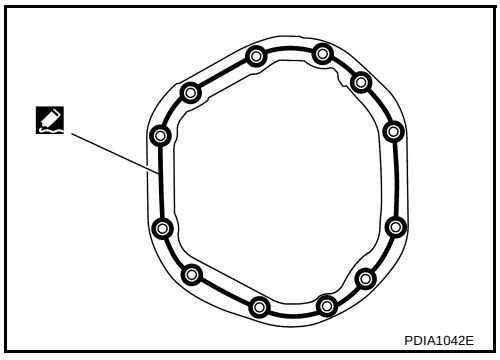
   CAUTION:
   - **Be careful not to damage the mating surface.**
   - **Do not insert flat-bladed screwdriver, this will damage the mating surface.**



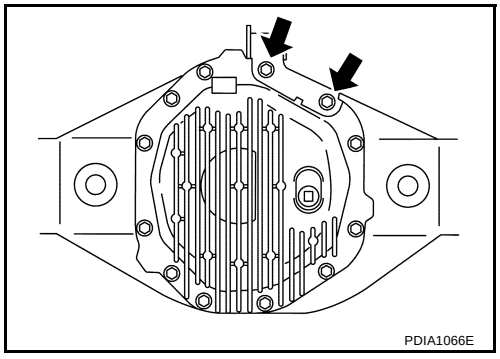
INSTALLATION

1. Apply sealant to mating surface of carrier cover. Refer to RFD-48, "COMPONENTS" .

   CAUTION:
   Remove old sealant adhering to mounting surfaces. Also remove any moisture, oil, or foreign material adhering to application and mounting surfaces.



2. Install carrier cover and bracket on axle housing. Then tighten carrier cover bolts to the specified torque. Refer to RFD-48, "COMPONENTS" .
3. Connect the rear cable (LH) to the carrier cover and tighten to the specified torque. Refer to PB-3, "Components" .
4. Fill with new gear oil until oil level reaches the specified limit near filler plug hole. Refer to RFD-42, "Checking Differential Gear Oil" .



REAR FINAL DRIVE ASSEMBLY

PFP:38300

Removal and Installation

GDS0002I

REMOVAL

1. Remove the rear propeller shaft. Refer to PR-8, "Removal and Installation" .
   - Plug rear end of transmission or transfer.
2. Remove the axle shafts and back plate and torque members. Refer to RAX-7, "Removal and Installation" .
3. Disconnect the following components from the rear final drive.
   - ABS sensor wire harness
   - Rear cable (LH) and rear cable (RH)
   - Brake hoses and brake tube

   CAUTION:
   Position the wire harness, cable and hoses away from the final drive assembly. Failure to do so may result in components being damaged during rear axle assembly removal.
4. Support the rear final drive using a suitable jack.
5. Remove rear shock absorber lower bolts. Refer to RSU-8, "Removal and Installation" .
6. Remove leaf spring U-bolt nuts. Refer to RSU-9, "Removal and Installation" .

   WARNING:
   Support the rear final drive assembly using suitable jack before removing leaf spring U-bolt nuts.
7. Remove rear final drive assembly using suitable jack.

INSTALLATION

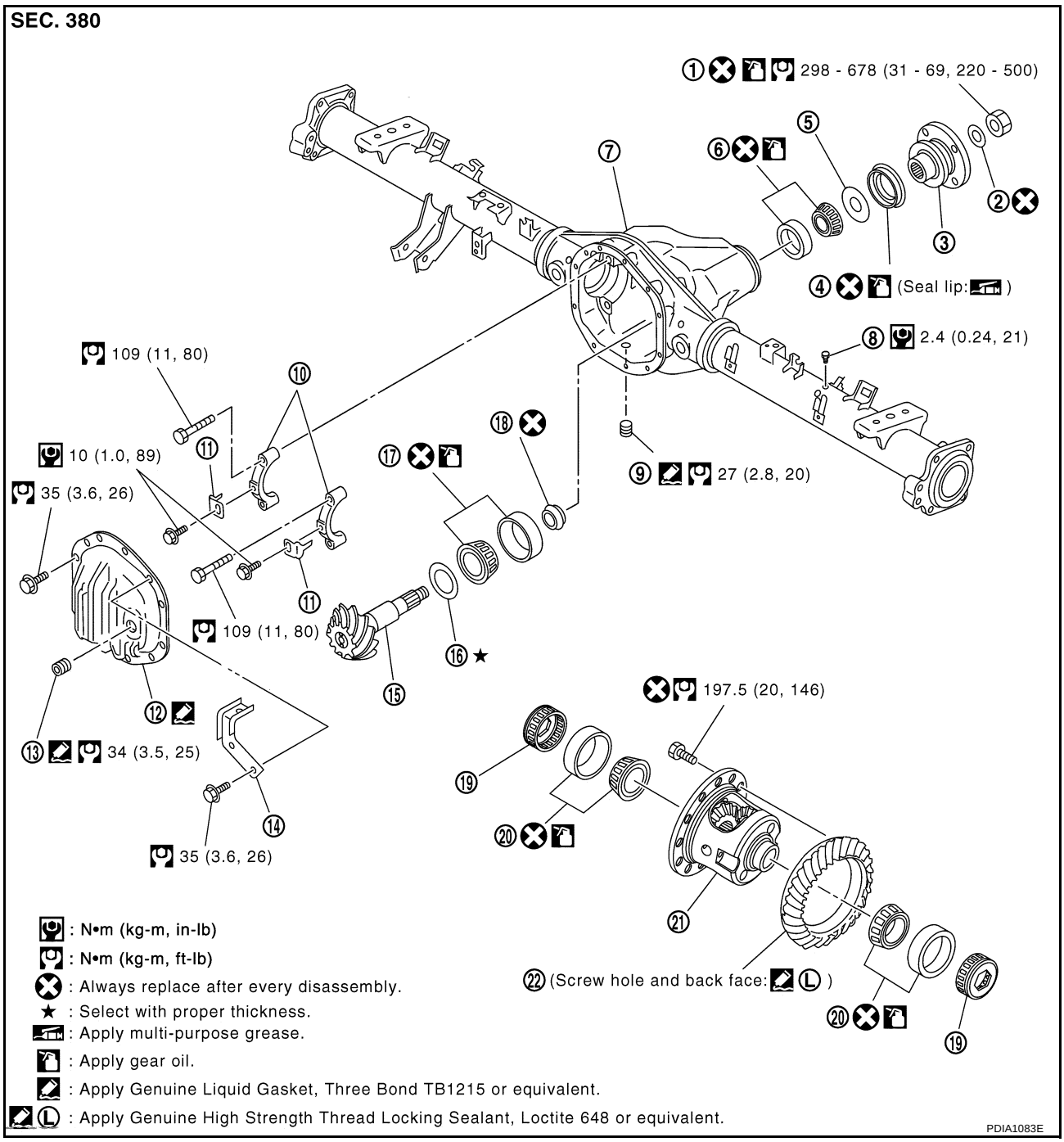
Installation is the reverse order of removal.

- When oil leaks while removing rear final drive assembly, check oil level after the installation. Refer to RFD-42, "Checking Differential Gear Oil" .
- Refill brake fluid and bleed the air from the brake system. Refer to BR-11, "Bleeding Brake System" .

Disassembly and Assembly

GDS0002J

COMPONENTS



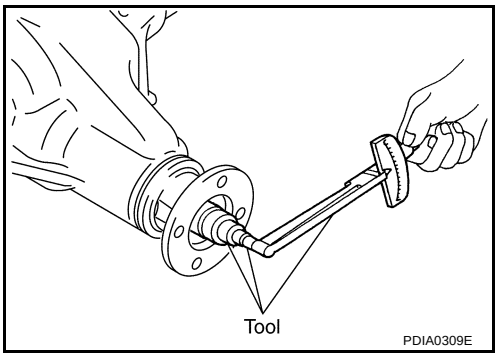
1. Drive pinion lock nut	2. Washer	3. Companion flange
4. Front oil seal	5. Front bearing thrust washer	6. Drive pinion front bearing
7. Axle housing	8. Breather	9. Drain plug
10. Side bearing cap	11. Adjuster lock plate	12. Carrier cover
13. Filler plug	14. Bracket	15. Drive pinion
16. Drive pinion height adjusting washer	17. Drive pinion rear bearing	18. Collapsible spacer
19. Side bearing adjuster	20. Side bearing	21. Differential case assembly
22. Drive gear		

ASSEMBLY INSPECTION AND ADJUSTMENT

- Before inspection and adjustment, drain gear oil.

Total Preload Torque

1. Rotate drive pinion back and forth 2 to 3 times to check for unusual noise and rotation malfunction.
2. Rotate drive pinion at least 20 times to check for smooth operation of the bearing.
3. Turn drive pinion in both directions several times to set bearing rollers.
4. Measure total preload with preload gauge.



Tool number : ST3127S000

Total preload

Gear ratio 3.133 Type:
2.38 - 4.46 N·m (0.25 - 0.45 kg-m, 21- 39 in-lb)
Gear ratio 3.357 Type:
2.38 - 4.46 N·m (0.25 - 0.45 kg-m, 21- 39 in-lb)
Gear ratio 3.538 Type:
2.34 - 4.34 N·m (0.24 - 0.44 kg-m, 21- 38 in-lb)
Gear ratio 3.692 Type:
2.32 - 4.34 N·m (0.24 - 0.44 kg-m, 21 - 38 in-lb)

NOTE:
Total preload torque = Pinion bearing preload torque + Side bearing preload torque

- If measured value is out of the specification, disassemble it to check and adjust each part. Adjust pinion bearing preload and side bearing preload.
  Adjust pinion bearing preload first, then adjust side bearing preload.

When the preload torque is greater than specification
On pinion bearings: Replace collapsible spacer.
On side bearings: Loosen side bearing adjuster.

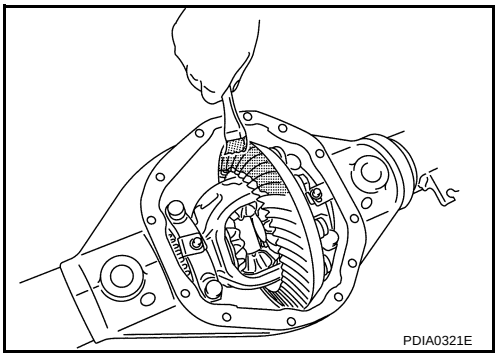
When the preload torque is less than specification
On pinion bearings: Tighten drive pinion lock nut.
On side bearings: Tighten side bearing adjuster.

Tooth Contact

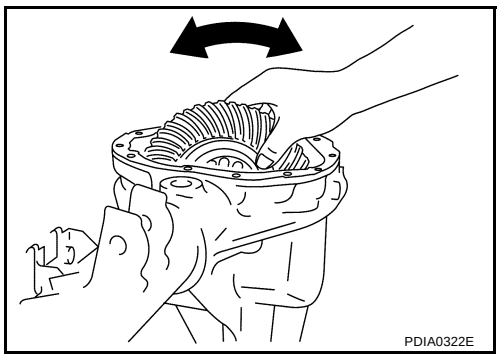
Checking gear tooth contact pattern is necessary to verify correct relationship between drive gear and drive pinion. Gears which are not positioned in proper arrangement may be noisy and/or have a short life. Check gear tooth contact pattern to obtain the best contact for low noise and long life.

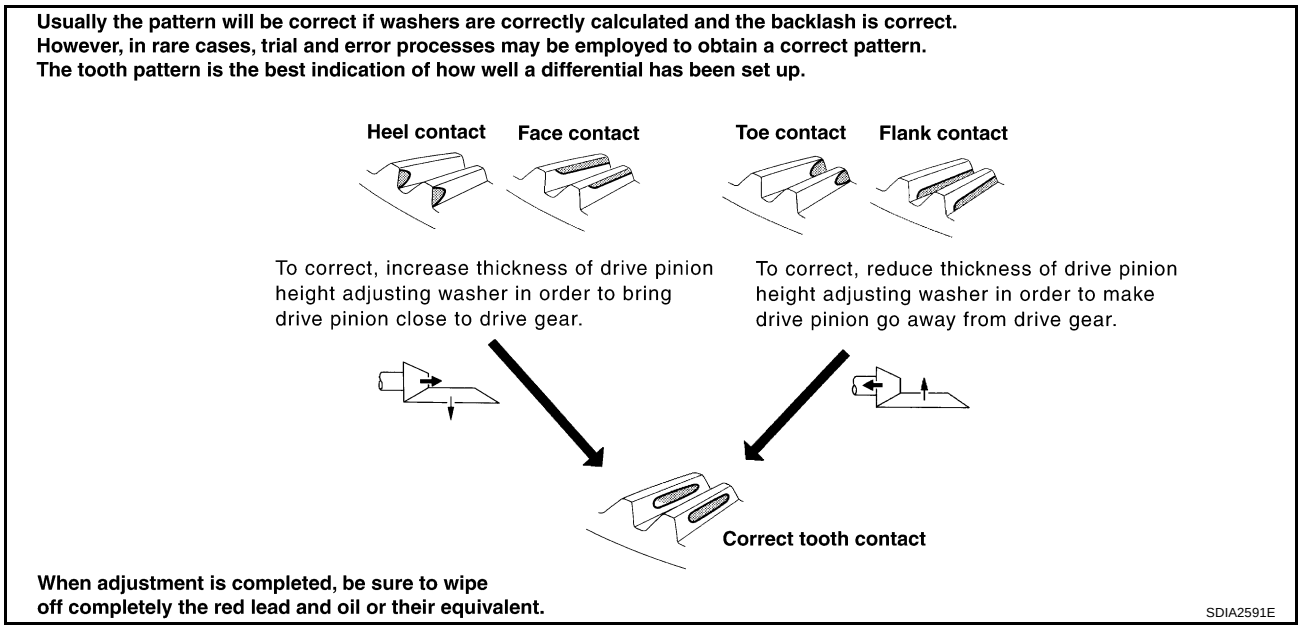
1. Remove carrier cover. Refer to RFD-46, "Removal and Installation" .
2. Thoroughly clean drive gear and drive pinion teeth.
3. Apply red lead to drive gear.

CAUTION:
Apply red lead to both the faces of 3 to 4 gears at 4 locations evenly spaced on drive gear.



4. Hold companion flange steady by hand and rotate drive gear in both directions.





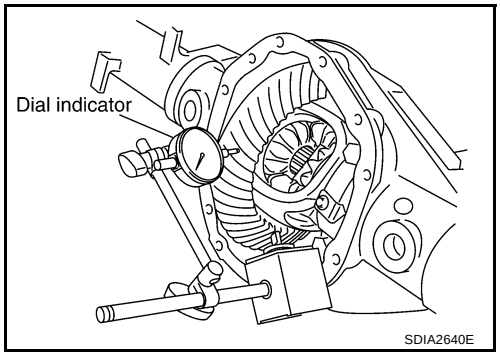
5. If outside the standard, adjust drive pinion height adjusting washer and backlash. Refer to RFD-56, "Drive Pinion Height Adjusting Washer" and RFD-50, "Backlash" .

Backlash

1. Remove carrier cover. Refer to RFD-52, "Differential Assembly" .
2. Check drive gear to drive pinion backlash using a dial indicator at several points.

Drive gear to drive pinion backlash:

0.08 - 0.13 mm (0.0031 - 0.0051 in)



3. If outside the standard, adjust side bearing adjusters.

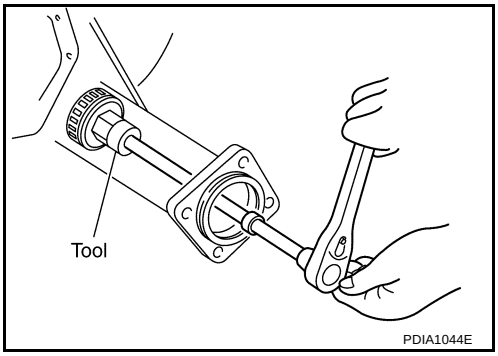
CAUTION:

Check tooth contact and total preload after adjusting side bearing adjusters. Refer to RFD-49, "Total Preload Torque" , RFD-49, "Tooth Contact" .

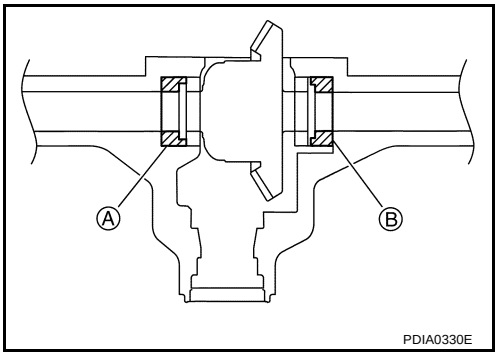
a. Remove adjuster lock plates.
b. Loosen side bearing cap bolts.

c. Tighten or loosen each side bearing adjusters using Tool.

Tool number : KV38108800

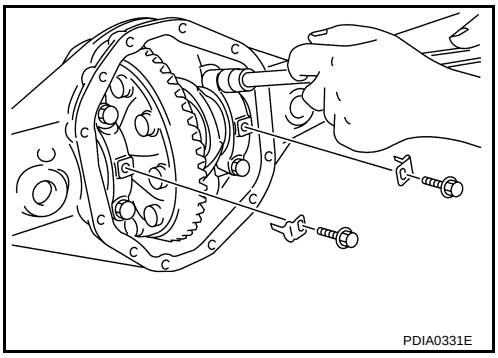


d. In case of excessive backlash, loosen side bearing adjuster A and tighten side bearing adjuster B. In case of insufficient backlash, loosen side bearing adjuster B and tighten side bearing adjuster A.



e. After adjusting backlash, tighten side bearing cap bolts to the specified torque. Refer to RFD-48, "COMPONENTS" .

f. Install adjuster lock plates and tighten to the specified torque. Refer to RFD-48, "COMPONENTS" .



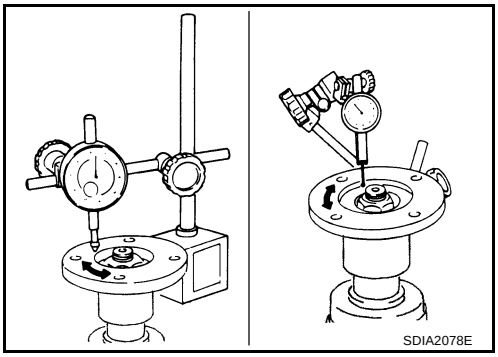
Companion Flange Runout

1. Fit a dial indicator onto companion flange face (inner side of propeller shaft bolt holes).
2. Rotate companion flange to check for runout.

Runout limit : 0.10 mm (0.0039 in) or less

3. Fit a test indicator to the inner side of companion flange (socket diameter).
4. Rotate companion flange to check for runout.

Runout limit : 0.13 mm (0.0051 in) or less



5. If the runout value is outside the repair limit, follow the procedure below to adjust.

a. Check for runout while changing the phase between companion flange and drive pinion by 90°, 180° and 270° and search for the point where the runout is the minimum.

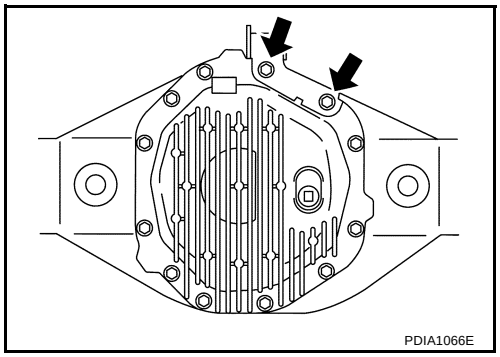
b. If the runout value is still outside of the limit after the phase has been changed, replace companion flange.

c. If the runout value is still outside of the limit after companion flange has been replaced, check drive pinion front bearing, drive pinion rear bearing and drive pinion assembly.

DISASSEMBLY

Differential Assembly

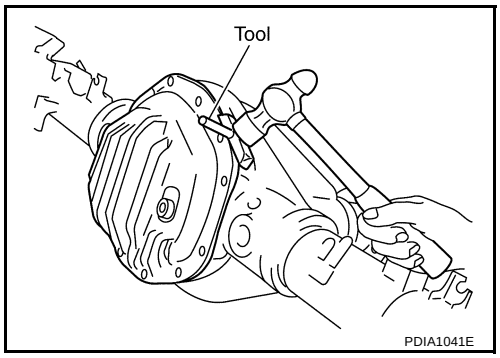
1. Remove carrier cover bolts and bracket.



2. Separate carrier cover from axle housing using Tool.

   Tool number : KV10111100

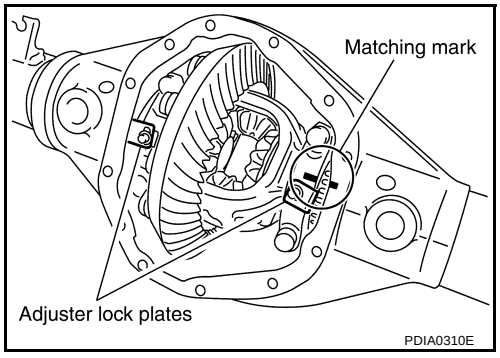
   CAUTION:
   - **Be careful not to damage the mating surface.**
   - **Do not insert flat-bladed screwdriver, this will damage the mating surface.**



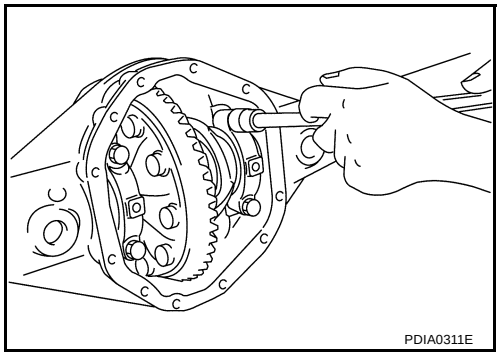
3. For proper reinstallation, paint matching mark on one side of side bearing cap and axle housing.

   CAUTION:
   - **Side bearing caps are line-board for initial assembly. The matching marks are used to reinstall them in their original positions.**
   - **For matching mark, use paint. Do not damage side bearing cap and axle housing.**

4. Remove adjuster lock plates.

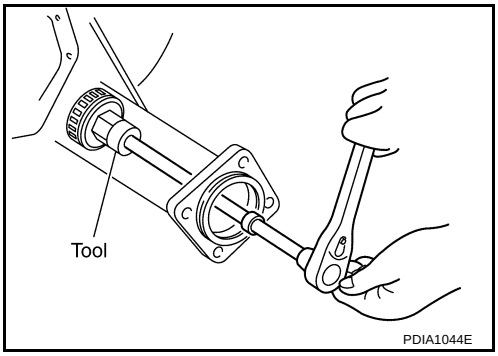


5. Remove side bearing caps.

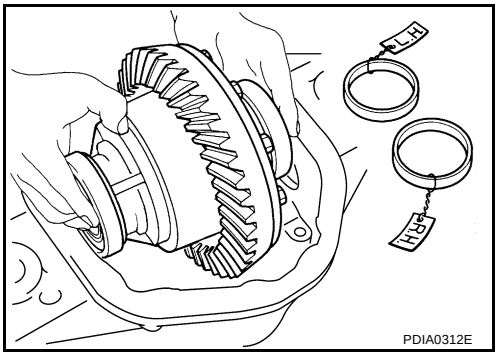


6. Loosen side bearing adjusters using Tool.

Tool number : KV38108800

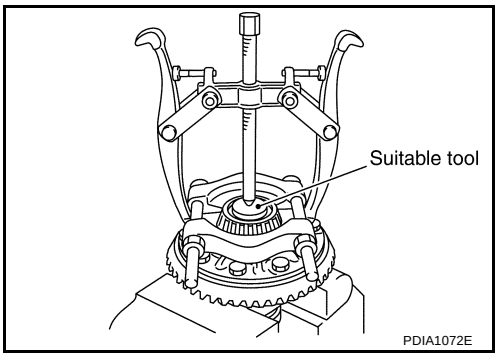


7. Keep side bearing outer races together with inner races. Do not mix them up. Also, keep side bearing adjusters together with bearing.
8. Remove side bearing adjusters from axle housing.



9. Remove side bearing inner races using suitable tools.

CAUTION:
Be careful not to damage differential case assembly.

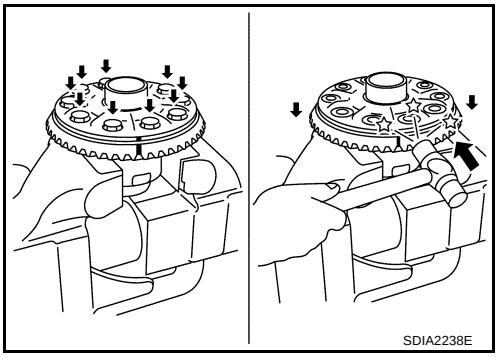


10. For proper reinstallation, paint matching mark on differential case assembly and drive gear.

CAUTION:
For matching mark, use paint. Do not damage differential case assembly and drive gear.

11. Remove drive gear bolts.
12. Tap drive gear off differential case assembly using suitable tool.

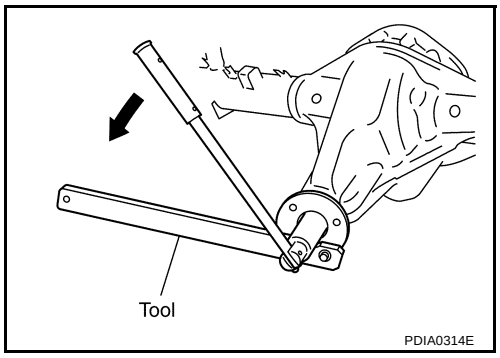
CAUTION:
Tap evenly all around to keep drive gear from binding.



Drive Pinion Assembly

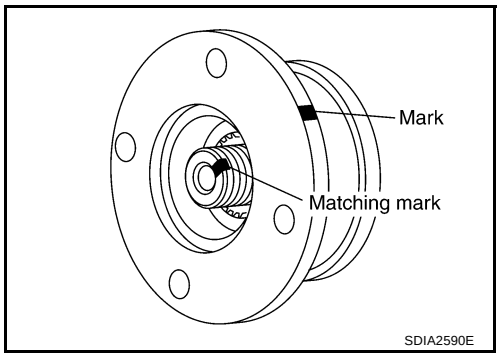
1. Remove differential case assembly. Refer to RFD-52, "Differential Assembly" .
2. Remove drive pinion lock nut and washer using Tool.

   Tool number : KV40104000

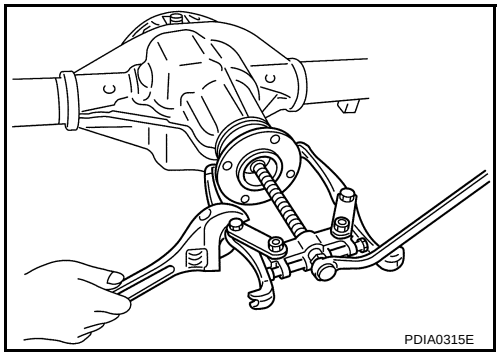


3. Put a matching mark on the thread edge of drive pinion. The mark should be in line with the mark on companion flange.

   CAUTION:
   For matching mark, use paint. Do not damage drive pinion and companion flange.



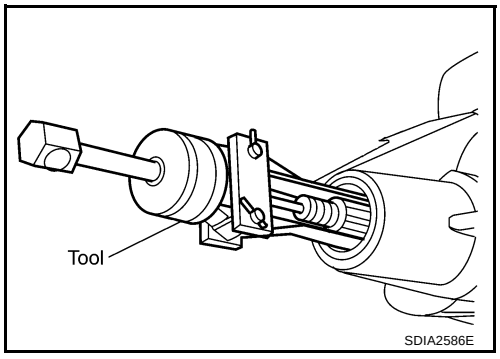
4. Remove companion flange using suitable tool.



5. Remove front oil seal using Tool.

   Tool number : KV381054S0

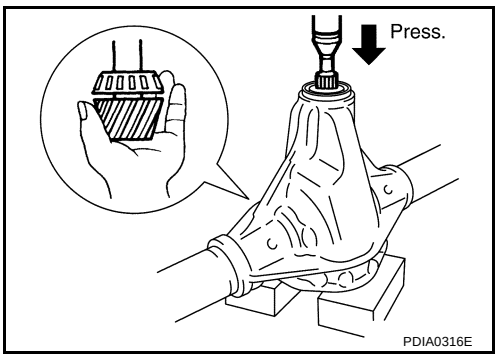
   CAUTION:
   Be careful not to damage axle housing.
6. Remove front bearing thrust washer.



7. Press the drive pinion assembly and collapsible spacer from axle housing.

CAUTION:
Do not drop drive pinion assembly.

8. Remove drive pinion front bearing inner race from axle housing.

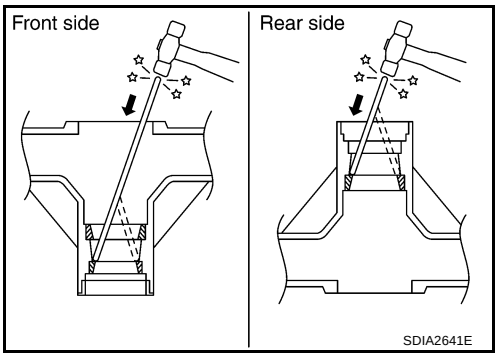


9. Tap drive pinion front bearing outer race uniformly with a brass bar or equivalent to remove.

CAUTION:
Be careful not to damage axle housing.

10. Tap drive pinion rear bearing outer race uniformly with a brass bar or equivalent for removal.

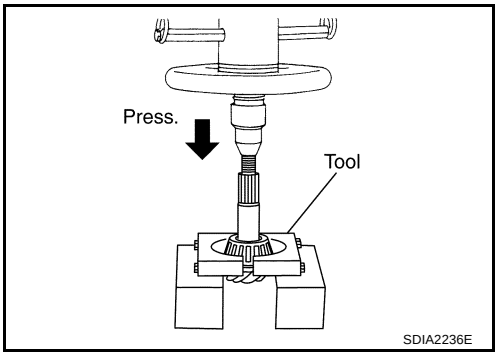
CAUTION:
Be careful not to damage axle housing.



11. Remove drive pinion rear bearing inner race and drive pinion height adjusting washer using Tool.

Tool number : ST30021000

12. Remove the breather.



INSPECTION AFTER DISASSEMBLY

Drive Gear and Drive Pinion

- If the gear teeth do not mesh or line-up correctly, determine the cause and adjust, repair, or replace as necessary.
- If the gears are worn, cracked, damaged, pitted or chipped (by friction) noticeably, replace with new gears.
- Drive gear and drive pinion are supplied in matched sets only. Matching numbers on both drive pinion and drive gear are etched for verification. If a new gear set is being used, verify the numbers of each drive pinion and drive gear before proceeding with assembly.

Bearing

- If bearings are chipped (by friction), pitted, worn, rusted, scratched, or unusual noise is coming from bearing, replace with new bearing assembly (as a new set).
- Bearing must be replaced with a new one whenever disassembled.

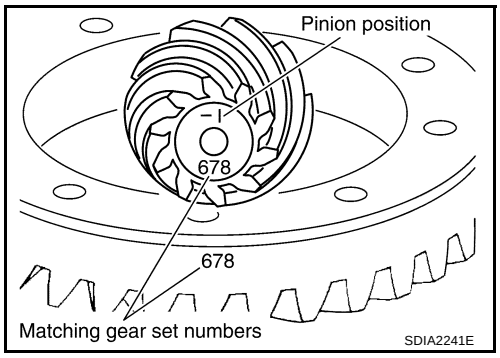
Differential Case Assembly

- If the gears are worn, cracked, damaged, pitted or chipped (by friction) noticeably, replace with new differential case assembly.

SELECTION ADJUSTING WASHERS

Drive Pinion Height Adjusting Washer

- Drive gear and drive pinion are supplied in matched sets only. Matching numbers on both drive pinion and drive gear are etched for verification. If a new hypoid gear set is being used, verify the numbers of each drive pinion and drive gear before proceeding with assembly.



- The mounting distance from the center line of drive gear to the back face of drive pinion for the M226 final drive is 109.5 mm (4.312 in).
  On the button end of each drive pinion, there is etched a plus (+) number, a minus (-) number, or a zero (0), which indicates the best running position for each particular hypoid gear set. This dimension is controlled by a selective drive pinion height adjusting washer between drive pinion rear bearing inner race and drive pinion.
  For example: If a drive pinion is etched m+8 (+3), it would require 0.08 mm (0.003 in) less drive pinion height adjusting washer than a drive pinion etched “0”. This means decreasing drive pinion height adjusting washer thickness; increases the mounting distance of drive pinion to 109.6 mm (4.315 in). If a drive pinion is etched m-8 (-3), it would require adding 0.08 mm (0.003 in) more to drive pinion height adjusting washer than would be required if drive pinion were etched “0”. By adding 0.08 mm (0.003 in), the mounting distance of drive pinion was decreased to 109.4 mm (4.309 in) which is just what a m-8 (-3) etching indicated.
- To change drive pinion adjustment, use different drive pinion height adjusting washer which come in different thickness.
- Use the following tables as a guide for selecting the correct drive pinion height adjusting washer thickness to add or subtract from the old drive pinion height adjusting washer.

Unit: mm (in)

OLD DRIVE PINION MARKING	NEW DRIVE PINION MARKING								
	-10 (-4)	-8 (-3)	-5 (-2)	-3 (-1)	0	+3 (+1)	+5 (+2)	+8 (+3)	+10 (+4)
+10 (+4)	+0.20 (+0.008)	+0.18 (+0.007)	+0.15 (+0.006)	+0.13 (+0.005)	+0.10 (+0.004)	+0.08 (+0.003)	+0.05 (+0.002)	+0.02 (+0.001)	0 (0)
+8 (+3)	+0.18 (+0.007)	+0.15 (+0.006)	+0.13 (+0.005)	+0.10 (+0.004)	+0.08 (+0.003)	+0.05 (+0.002)	+0.02 (+0.001)	0 (0)	-0.02 (-0.001)
+5 (+2)	+0.15 (+0.006)	+0.13 (+0.005)	+0.10 (+0.004)	+0.08 (+0.003)	+0.05 (+0.002)	+0.02 (+0.001)	0 (0)	-0.02 (-0.001)	-0.05 (-0.002)
+3 (+1)	+0.13 (+0.005)	+0.10 (+0.004)	+0.08 (+0.003)	+0.05 (+0.002)	+0.02 (+0.001)	0 (0)	-0.02 (-0.001)	-0.05 (-0.002)	-0.08 (-0.003)
0	+0.10 (+0.004)	+0.08 (+0.003)	+0.05 (+0.002)	+0.02 (+0.001)	0 (0)	-0.02 (-0.001)	-0.05 (-0.002)	-0.08 (-0.003)	-0.10 (-0.004)
-3 (-1)	+0.08 (+0.003)	+0.05 (+0.002)	+0.02 (+0.001)	0 (0)	-0.02 (-0.001)	-0.05 (-0.002)	-0.08 (-0.003)	-0.10 (-0.004)	-0.13 (-0.005)
-5 (-2)	+0.05 (+0.002)	+0.02 (+0.001)	0 (0)	-0.02 (-0.001)	-0.05 (-0.002)	-0.08 (-0.003)	-0.10 (-0.004)	-0.13 (-0.005)	-0.15 (-0.006)
-8 (-3)	+0.02 (+0.001)	0 (0)	-0.02 (-0.001)	-0.05 (-0.002)	-0.08 (-0.003)	-0.10 (-0.004)	-0.13 (-0.005)	-0.15 (-0.006)	-0.18 (-0.007)
-10 (-4)	0 (0)	-0.02 (-0.001)	-0.05 (-0.002)	-0.08 (-0.003)	-0.10 (-0.004)	-0.13 (-0.005)	-0.15 (-0.006)	-0.18 (-0.007)	-0.20 (-0.008)

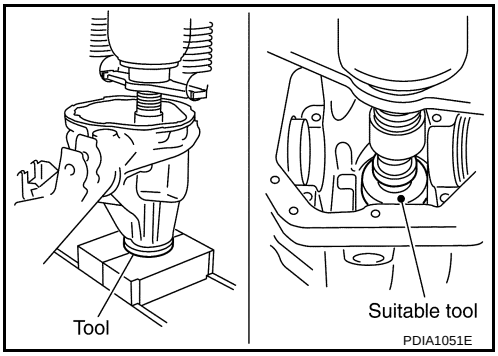
ASSEMBLY

Drive Pinion Assembly

1. Install the breather and then tighten to the specified torque. Refer to RFD-48, "COMPONENTS" .
2. Press a drive pinion rear bearing outer race into axle housing using suitable tool and Tool.

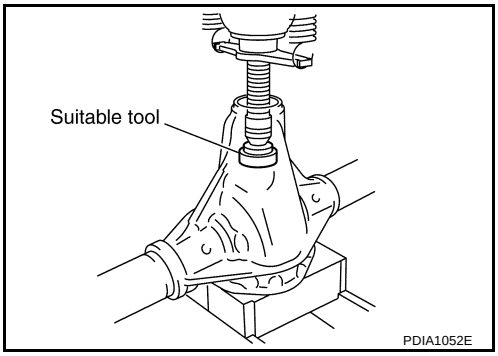
   Tool number : ST30022000

   CAUTION:
   Do not reuse drive pinion rear bearing.



3. Press drive pinion front bearing outer race into axle housing using suitable tool.

   CAUTION:
   Do not reuse drive pinion front bearing.



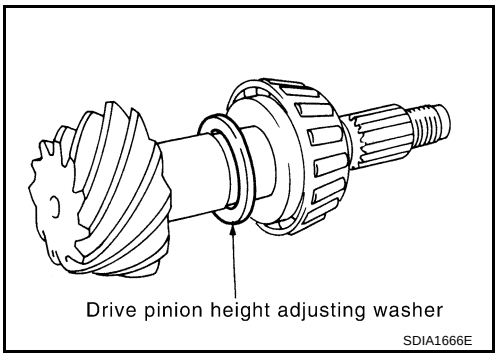
4. Temporarily install drive pinion height adjusting washer.

   When hypoid gear set has been replaced

   - Select drive pinion height adjusting washer. Refer to RFD-56, "Drive Pinion Height Adjusting Washer" .

   When hypoid gear set has been reused

   - Temporarily install the removed drive pinion height adjusting washer or same thickness washer to drive pinion.



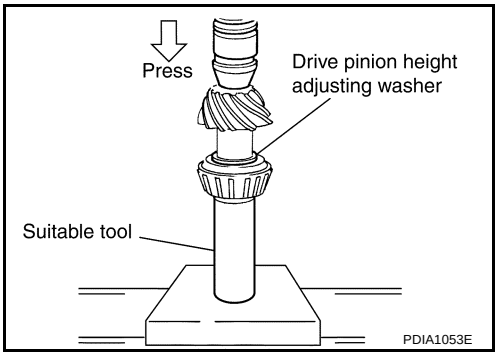
5. Install selected drive pinion height adjusting washer to drive pinion, and press-fit drive pinion rear bearing inner race in it, using a press and suitable tool.

   CAUTION:
   Do not reuse drive pinion rear bearing.

6. Apply gear oil to drive pinion rear bearing and drive pinion front bearing.
7. Install drive pinion front bearing inner race in axle housing.

   CAUTION:
   Do not reuse drive pinion front bearing.

8. Install front bearing thrust washer to axle housing.



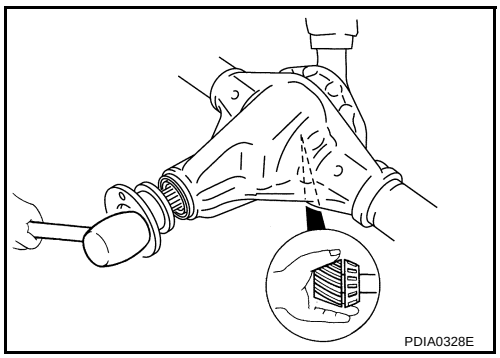
9. Perform checking and adjusting the tooth contact and backlash of the hypoid gear following the procedure below.

a. Assemble the drive pinion assembly to the axle housing.

   CAUTION:
   Do not assemble a collapsible spacer.

b. Insert companion flange onto drive pinion. Tap the companion flange with a soft hammer until fully seated.

CAUTION:
Do not assemble a front oil seal.

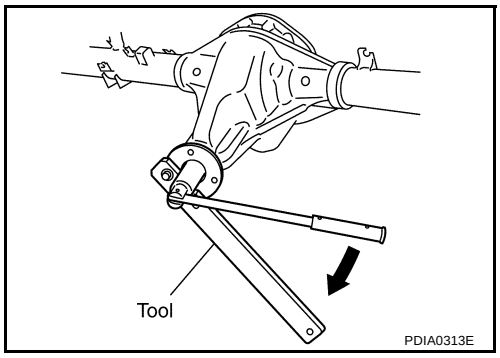

PDIA0328E

c. Temporarily tighten removed drive pinion lock nut and washer to drive pinion.

Tool number : KV40104000

NOTE:
Use removed drive pinion lock nut and washer only for the preload measurement.

d. Rotate drive pinion at least 20 times to check for smooth operation of the bearing.



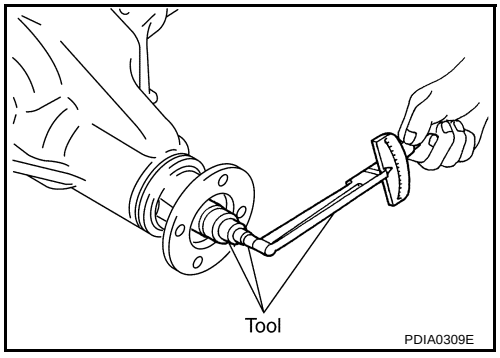
PDIA0313E

e. Tighten to drive pinion lock nut, while adjust pinion bearing preload torque.

Tool number : ST3127S000

Drive pinion lock nut tightening torque:
298 - 678 N·m (31 - 69 kg-m, 220 - 500 ft-lb)

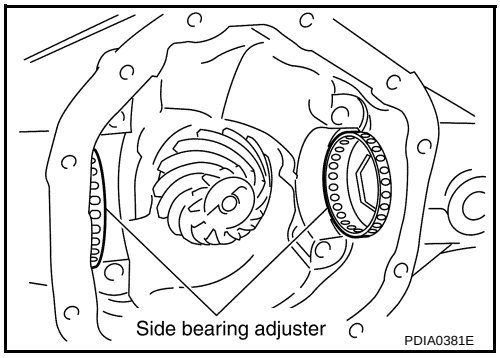
Pinion bearing preload:
1.7 - 3.1 N·m (0.18 - 0.31 kg-m, 15 - 27 in-lb)



PDIA0309E

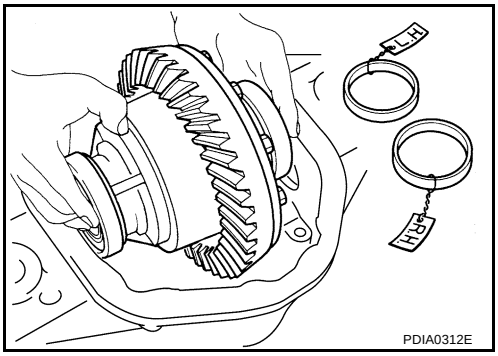
CAUTION:
- **Adjust to the lower limit of the drive pinion lock nut tightening torque first.**
- **Drive pinion lock nut is tightened with no collapsible spacer. Be careful not to overtighten it. While measuring the preload, tighten it by 5° to 10°.**
- **After adjustment, rotate drive pinion back and forth 2 to 3 times to check for unusual noise, rotation malfunction and other malfunctions.**

f. Install side bearing adjusters into axle housing.



PDIA0381E

g. Apply gear oil to side bearings. Install differential case assembly with side bearing outer races into axle housing.



PDIA0312E

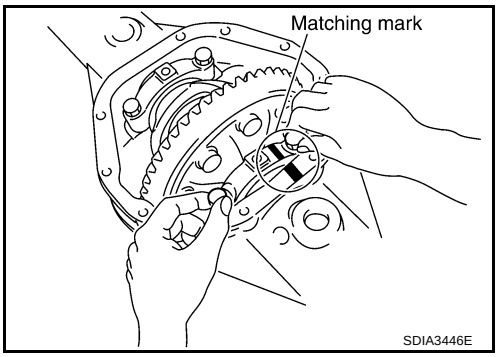
h. Align paint matching mark on side bearing cap with that on axle housing and install side bearing caps on axle housing.
   - Do not tighten at this point. This allows further tightening of side bearing adjusters.

i. Check and adjust the backlash and tooth contact. Refer to RFD-50, "Backlash" and RFD-49, "Tooth Contact" .

j. Remove side bearing caps.

k. Remove differential case assembly.

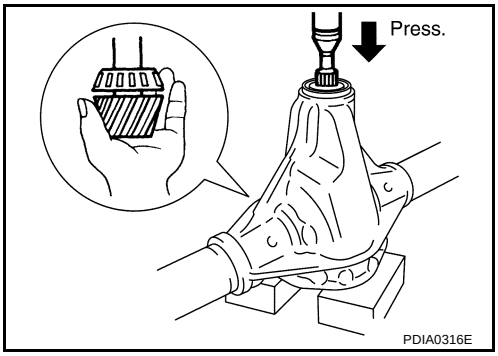
l. Remove companion flange.



SDIA3446E

m. Press the drive pinion assembly from axle housing.

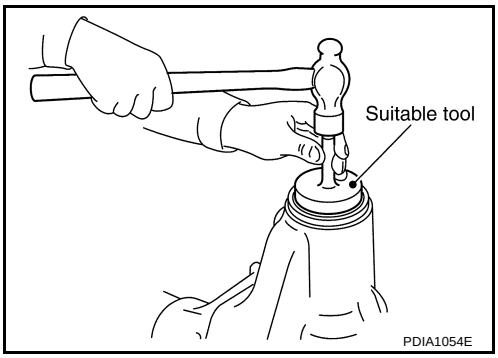
CAUTION:
Do not drop drive pinion assembly.



PDIA0316E

10. Install front oil seal into axle housing using suitable tool.

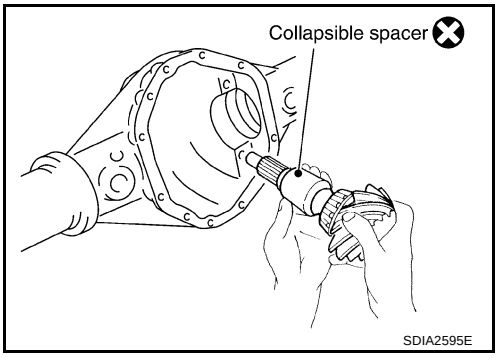
CAUTION:
- **Do not reuse oil seal.**
- **Do not incline oil seal when installing.**
- **Apply multi-purpose grease onto oil seal lip, and gear oil onto the circumference of oil seal.**



PDIA1054E

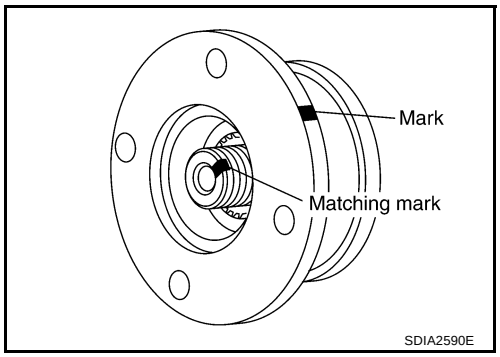
11. Install collapsible spacer to drive pinion. And then install drive pinion assembly in axle housing.

CAUTION:
- **Do not reuse collapsible spacer.**
- **Be careful not to damage front oil seal.**



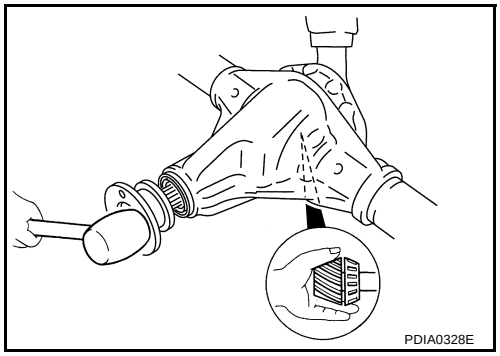
SDIA2595E

12. Align the matching mark of the drive pinion with the mark of the companion flange, then install the companion flange.



13. Insert companion flange onto drive pinion. Tap the companion flange with a soft hammer until fully seated.

CAUTION:
Be careful not to damage companion flange and front oil seal.

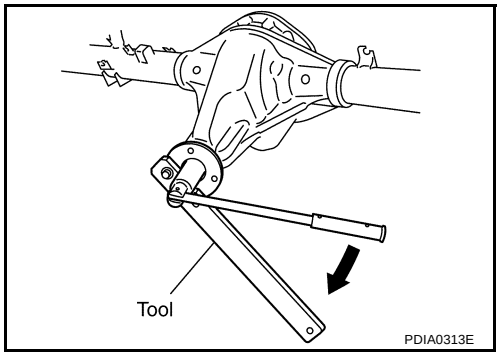


14. Apply anti-corrosive oil to the thread and seat of drive pinion lock nut, and temporarily tighten drive pinion lock nut and washer to drive pinion.

Tool number : KV40104000

CAUTION:
Do not reuse drive pinion lock nut and washer.

15. Rotate drive pinion at least 20 times to check for smooth operation of the bearing.

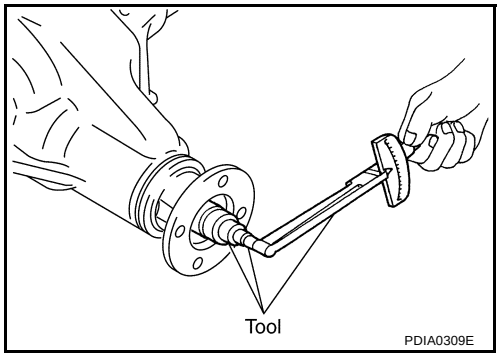


16. Tighten to drive pinion lock nut, while adjust pinion bearing preload torque.

Tool number : ST3127S000

Drive pinion lock nut tightening torque:
298 - 678 N·m (31 - 69 kg-m, 220 - 500 ft-lb)

Pinion bearing preload:
1.7 - 3.1 N·m (0.18 - 0.31 kg-m, 15 - 27 in-lb)



CAUTION:
- **Adjust the lower limit of the drive pinion lock nut tightening torque first.**
- **If the preload torque exceeds the specified value, replace collapsible spacer and tighten it again to adjust. Never loosen drive pinion lock nut to adjust the preload torque.**
- **After adjustment, rotate drive pinion back and forth 2 to 3 times to check for unusual noise, rotation malfunction, and other malfunctions.**

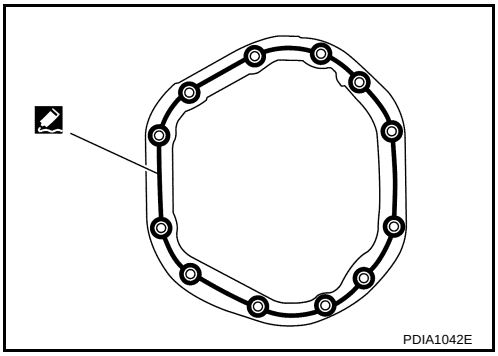
17. Install differential case assembly. Refer to RFD-61, "Differential Assembly" .

CAUTION:
Do not install carrier cover yet.

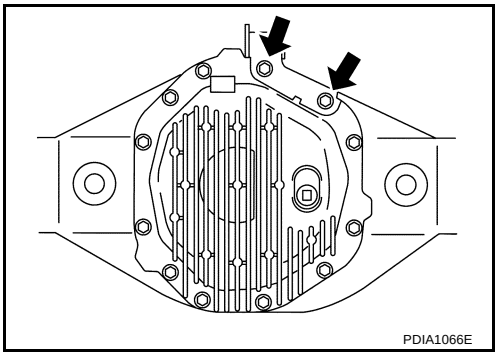
18. Check and adjust backlash, tooth contact and companion flange runout. Refer to RFD-50, "Backlash" , RFD-49, "Tooth Contact" and RFD-51, "Companion Flange Runout" . Recheck above items. Readjust the above description, if necessary.

19. Check total preload torque. Refer to RFD-49, "Total Preload Torque" .
20. Apply sealant to mating surface of carrier cover. Refer to RFD-48, "COMPONENTS" .

CAUTION:
Remove old sealant adhering to mounting surfaces. Also remove any moisture, oil, or foreign material adhering to application and mounting surfaces.


PDIA1042E

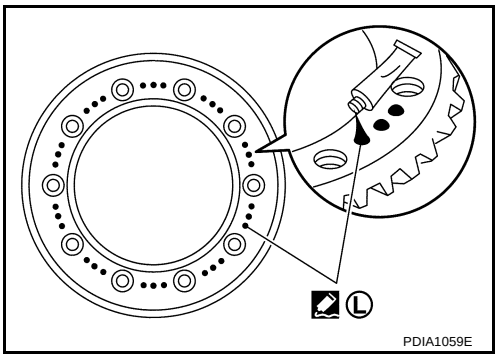
21. Install carrier cover and bracket on axle housing. Then tighten carrier cover bolts to the specified torque. Refer to RFD-48, "COMPONENTS" .


PDIA1066E

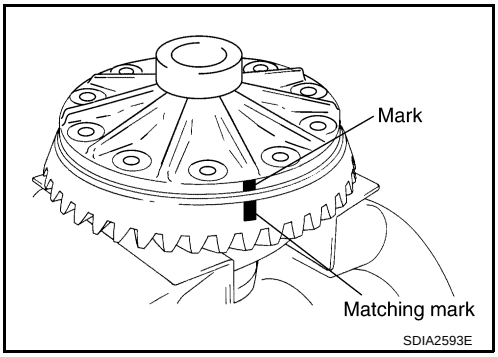
Differential Assembly

1. Apply sealant to back face of drive gear. Refer to RFD-48, "COMPONENTS" .

CAUTION:
Remove old sealant adhering to mounting surfaces. Also remove any moisture, oil, or foreign material adhering to application and mounting surfaces.


PDIA1059E

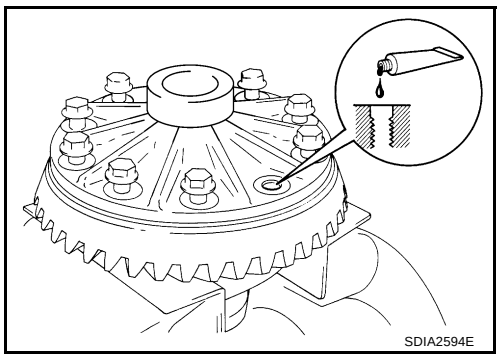
2. Align the matching mark of differential case assembly with the mark of drive gear, then install drive gear.



SDIA2593E

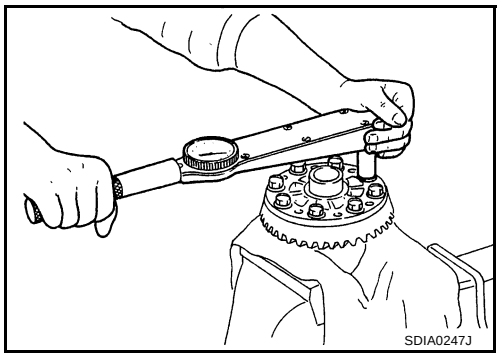
3. Apply thread locking sealant into the thread hole of drive gear. Refer to RFD-48, "COMPONENTS" .

CAUTION:
Make sure threaded holes are clean.


SDIA2594E

4. Install the drive gear bolts, and then tighten to the specified torque. Refer to RFD-48, "COMPONENTS" .

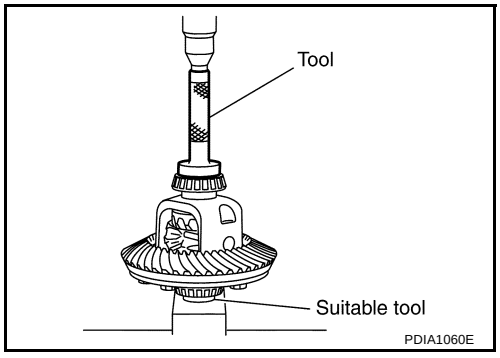
CAUTION:
- **Do not reuse the bolts.**
- **Tighten bolts in a crisscross fashion.**


SDIA0247J

5. Press side bearing inner races to differential case assembly using suitable tool and Tool.

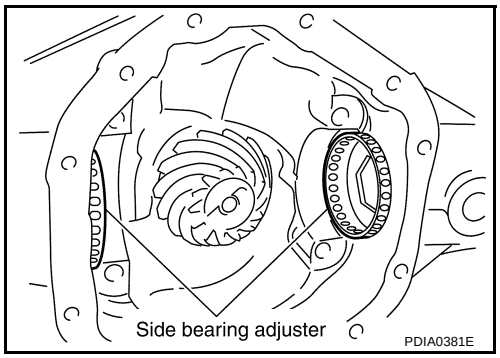
Tool number : KV38100300

CAUTION:
Do not reuse side bearings.



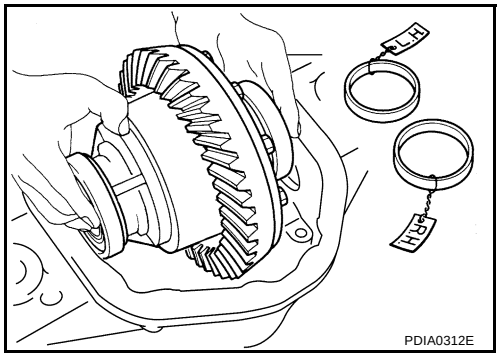
PDIA1060E

6. Install side bearing adjusters into axle housing.



PDIA0381E

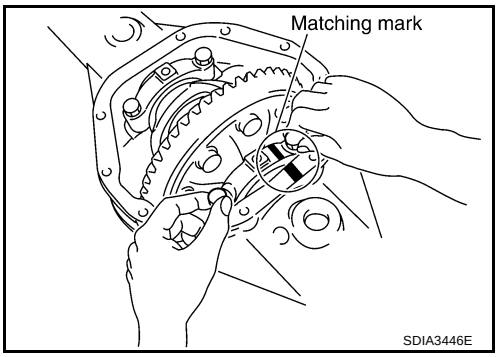
7. Apply gear oil to side bearings. Install differential case assembly with side bearing outer races into axle housing.



PDIA0312E

8. Align paint matching mark on side bearing cap with that on axle housing and install side bearing caps on axle housing.

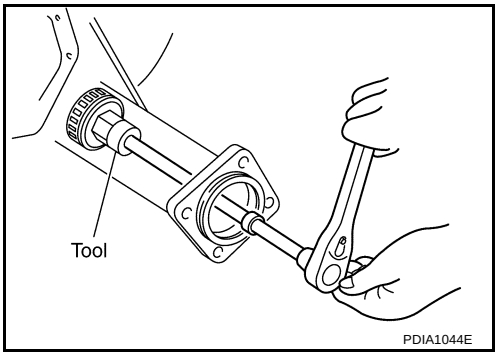
CAUTION:
Do not tighten at this point. This allows further tightening of side bearing adjusters.



9. Tighten each side bearing adjusters using Tool.

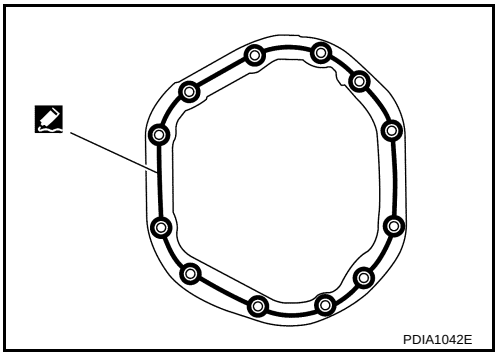
Tool number : KV38108800

10. Adjust backlash of drive gear and drive pinion. Refer to RFD-50, "Backlash" .
11. Check tooth contact. Refer to RFD-49, "Tooth Contact" .
12. Check total preload. Refer to RFD-49, "Total Preload Torque" .

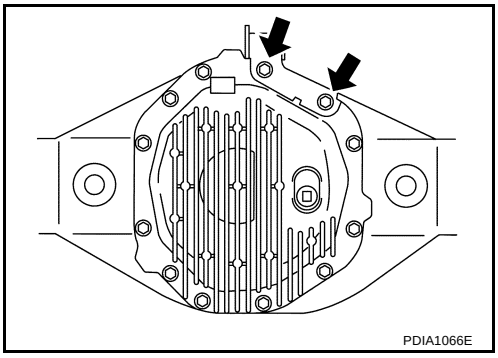


13. Apply sealant to mating surface of carrier cover. Refer to RFD-48, "COMPONENTS" .

CAUTION:
Remove old sealant adhering to mounting surfaces. Also remove any moisture, oil, or foreign material adhering to application and mounting surfaces.



14. Install carrier cover and bracket on axle housing. Then tighten carrier cover bolts to the specified torque. Refer to RFD-48, "COMPONENTS" .



SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications

GDS0002K

VQ40DE engine models

Applied model	2WD*		4WD	
	6M/T	5A/T	6M/T	5A/T
Grade	SE		SE, XE	
Final drive model	M226			
Gear ratio	3.538	3.133	3.692	3.357
Number of pinion gears	2			
Number of teeth (Drive gear / drive pinion)	46/13	47/15	48/13	47/14
Oil capacity (Approx.) ℓ (Imp pt)	2.01 (3-1/2)			
Drive pinion adjustment spacer type	Collapsible			

*: Option

YD25DDTi engine models

Applied model	2WD*		4WD		
	6M/T	5A/T	6M/T		5A/T
Grade	SE		XE*	XE	SE, XE
Final drive model	M226				
Gear ratio	3.538	3.357	3.692		3.538
Number of pinion gears	2				
Number of teeth (Drive gear / drive pinion)	46/13	47/14	48/13		46/13
Oil capacity (Approx.) ℓ (Imp pt)	2.01 (3-1/2)				
Drive pinion adjustment spacer type	Collapsible				

*: Option

Inspection and Adjustment

GDS0002L

PRELOAD TORQUE

Unit: N·m (kg-m, in-lb)

Item	Specification			
	Gear ratio 3.133 type	Gear ratio 3.357 type	Gear ratio 3.538 type	Gear ratio 3.692 type
Total preload	2.38 - 4.46 (0.25 - 0.45, 21 - 39)		2.34 - 4.34 (0.24 - 0.44, 21 - 38)	2.32 - 4.34 (0.24 - 0.44, 21 - 38)
Pinion bearing preload	1.7 - 3.1 (0.18 - 0.31, 15 - 27)			

BACKLASH

Unit: mm (in)

Item	Standard
Drive gear to drive pinion gear	0.08 - 0.13 (0.0031 - 0.0051)

COMPANION FLANGE RUNOUT

Unit: mm (in)

Item	Runout limit
Companion flange face	0.10 (0.0039) or less
Inner side of companion flange	0.13 (0.0051) or less

SELECTIVE PARTS

Drive Pinion Height Adjusting Washer

Unit: mm (in)

Thickness	Package part number*
0.076 (0.030) 0.079 (0.031) 0.081 (0.032) 0.084 (0.033) 0.086 (0.034)	38151 8S101
0.089 (0.035) 0.091 (0.036) 0.094 (0.037) 0.097 (0.038) 0.099 (0.039)	38151 8S102
0.102 (0.040) 0.104 (0.041) 0.107 (0.042) 0.109 (0.043) 0.112 (0.044)	38151 8S103
0.114 (0.045) 0.117 (0.046) 0.119 (0.047) 0.122 (0.048) 0.124 (0.049)	38151 8S104
0.127 (0.050) 0.130 (0.051) 0.132 (0.052) 0.135 (0.053) 0.137 (0.054)	38151 8S105

*Always check with the Parts Department for the latest parts information.