SECTION RFD
REAR FINAL DRIVE

CONTENTS

PRECAUTIONS

PFP:00001

Caution

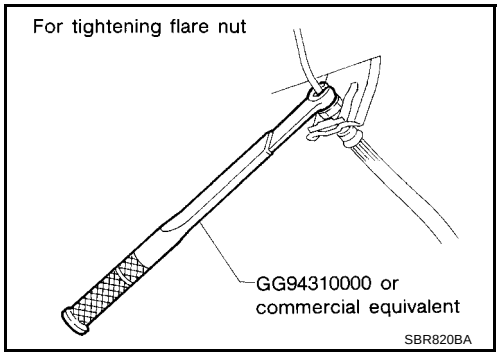
EDS00101

- Before starting diagnosis of the vehicle, understand symptoms well. Perform correct and systematic operations.
- Check for the correct installation status prior to removal or disassembly. When mating marks are required, be sure they do not interfere with the function of the parts they are applied to.
- Carry out an overhaul in a clean work place. Using a dust proof room is recommended.
- Before disassembly, using steam or white gasoline, 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 abnormal wear. If a malfunction is detected, replace it with a new one.
- Normally replace lock pins, oil seals, and bearings with new ones every time they are removed.
- 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 them dry.
- Be careful not to damage the 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 a shop cloth to prevent entering of lint.
- During assembly, observe the specified tightening torque, and apply new differential oil, Vaseline, or Nissan MP Special Grease No. 2, as specified for each vehicle, when necessary.
- Do not reuse drained oil. Discard waste oil after oil changes or part treatment in accordance with local laws and regulations.

Precautions for Brake System

EDS00102

- When installing rubber parts, final tightening must be carried out under unladen condition* with tires on ground.
  *: Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.
- After installing removed suspension parts, check wheel alignment and adjust if necessary.
- Use flare nut wrench when removing or installing brake tubes.
- Always torque brake lines when installing.

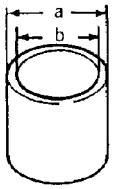
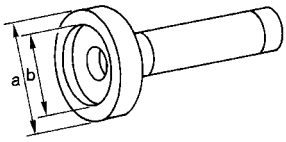
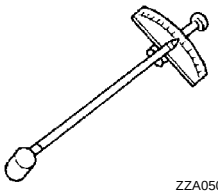
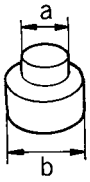
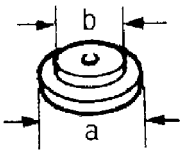
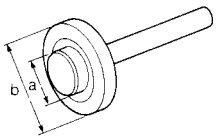


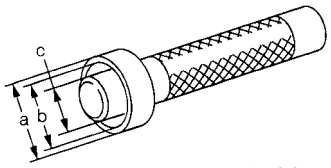
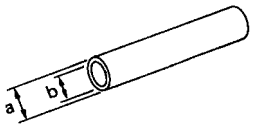
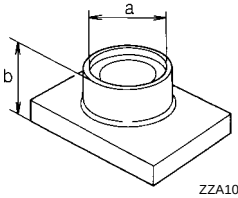
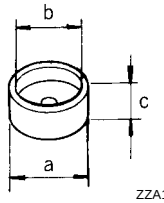
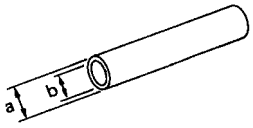
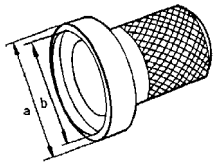
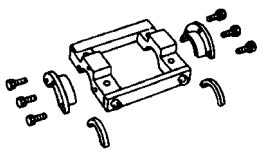
PREPARATION

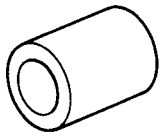
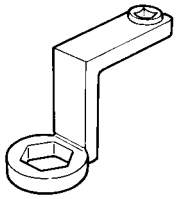
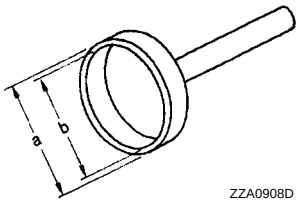
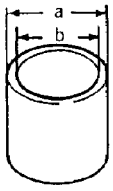
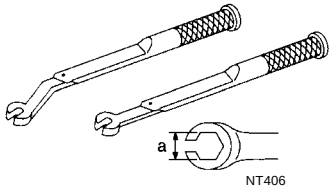
PFP:00002

Special Service Tools

EDS00103

Tool name Tool number		Description
Drift ST27861000 a: 62 mm (2.44 in) dia. b: 52 mm (2.05 in) dia.	 ZZA0832D	Installing final drive front oil seal
Drift KV38100200 a: 65 mm (2.56 in) dia. b: 49 mm (1.93 in) dia.	 ZZA1143D	● Installing final drive front oil seal ● Installing final drive side oil seal
Preload gauge ST3127S000	 ZZA0503D	Measuring preload torque
Drift ST33052000 a: 22 mm (0.87 in) dia. b: 28 mm (1.10 in) dia.	 ZZA1023D	● Removing side bearing inner
Drift KV40100610 a: 63 mm (2.48 in) dia. b: 54.3 mm (2.138 in) dia.	 ZZA0810D	● Removing and installing carrier case and rear cover (2 pieces are used) ● Installing pinion front bearing inner race
Pin punch ST23550000 Tip diameter: 4.5 mm (0.177 in) dia.	 ZZA0815D	Removing and installing lock pin
Drift ST17130000 a: 31.8 mm (1.252 in) dia. b: 58 mm (2.28 in) dia.	 ZZA0836D	Installing pinion rear bearing outer race

Tool name Tool number		Description
Drift ST33230000 a: 51 mm (2.01 in) dia. b: 41 mm (1.61 in) dia. c: 28.5 mm (1.122 in) dia.	 ZZA1046D	Installing pinion front bearing outer race
Drift ST23860000 a: 38 mm (1.50 in) dia. b: 33 mm (1.30 in) dia.	 ZZA0534D	● Installing pinion rear bearing inner race ● Installing pinion front bearing inner race
Press stand ST38220000 a: 63 mm (2.48 in) dia. b: 65 mm (2.56 in)	 ZZA1058D	Installing pinion front bearing inner race
Drift KV40105020 a: 39.7 mm (1.563 in) dia. b: 35 mm (1.38 in) dia. c: 15 mm (0.59 in)	 ZZA1133D	Installing side bearing inner race
Drift ST22350000 a: 34 mm (1.34 in) dia. b: 28 mm (1.10 in) dia.	 ZZA0534D	Installing coupling front bearing
Drift ST33400001 a: 60 mm (2.36 in) dia. b: 47 mm (1.85 in) dia.	 ZZA0814D	Installing coupling cover oil seal
Dummy cover set KV381086S1	 ZZA1204D	● Checking backlash ● Checking drive gear back runout ● Checking tooth contact

Tool name Tool number	Description
drive pinion gear socket KV38108500  ZZA1205D	● Measuring preload torque ● Removing and installing pinion nut
Pinion nut wrench KV38108400  ZZA1206D	Removing and installing pinion nut
Oil seal drift ST15310000 a: 96 mm (3.78 in) dia. b: 84 mm (3.31 in) dia.  ZZA0908D	Center oil seal installation
Support ring KV40104710 a: 76.3 mm (3.004 in) dia. b: 67.9 mm (2.673 in) dia.  ZZA0832D	Center oil seal installation
Flare nut torque wrench GG94310000 a: 10 mm (0.39 in)  NT406	Removing and installing brake piping

OIL

PFP:00024

Inspection

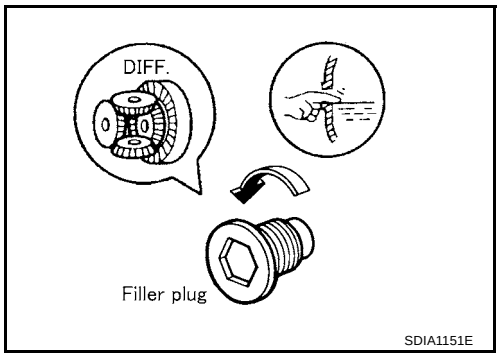
EDS00104

FLUID LEAKAGE AND OIL LEVEL

1. Check for fluid leakage and for proper oil level.
2. Install the filler plug to the final drive, and tighten to the specified torque.

CAUTION:
Do not reuse gasket.

: 30 - 39 N·m (3.0 - 4.0 kg-m,22 - 28 ft-lb)

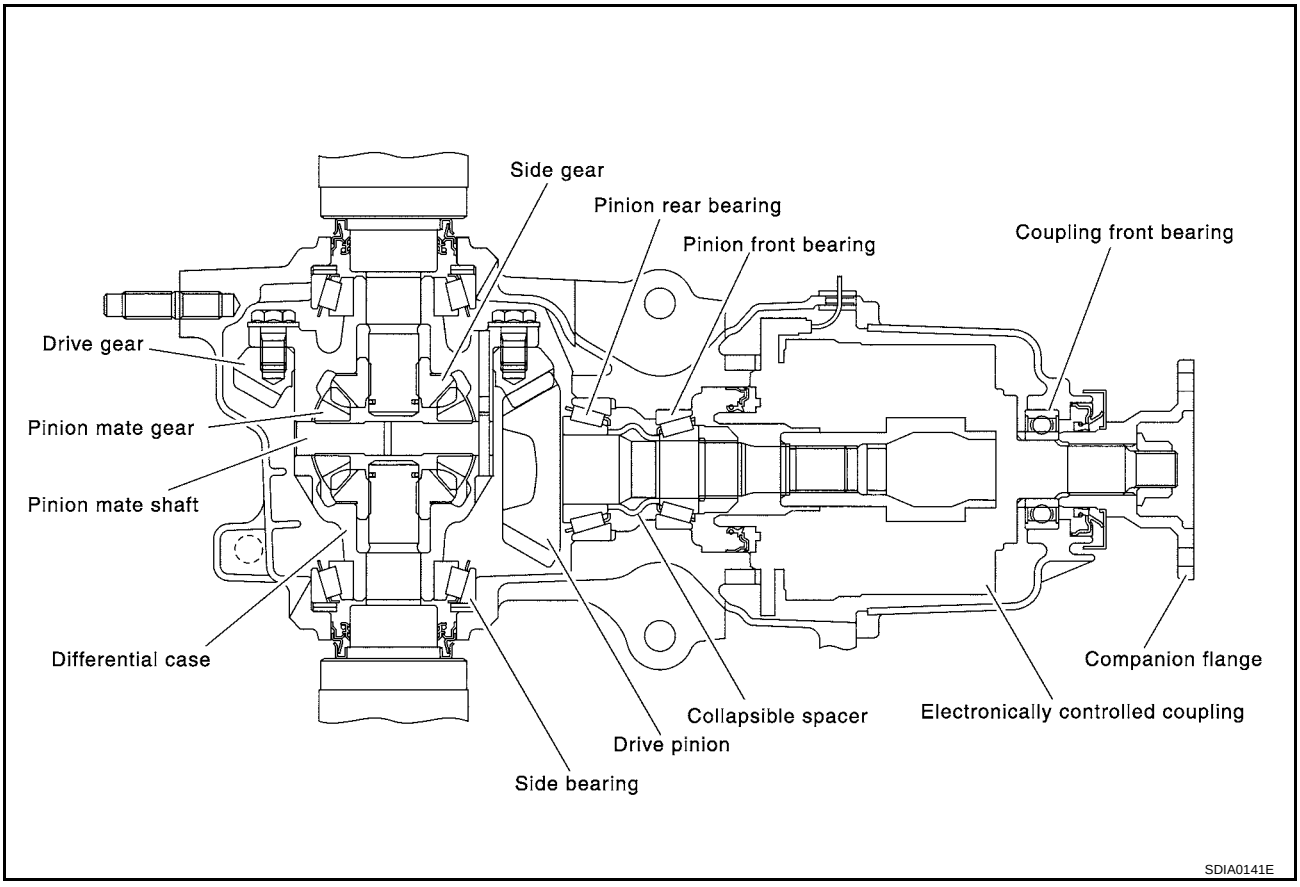


REAR FINAL DRIVE SYSTEM

PFP:38300

Sectional View

EDS00105



FRONT OIL SEAL

PFP:38189

Removal and Installation

EDS00106

REMOVAL

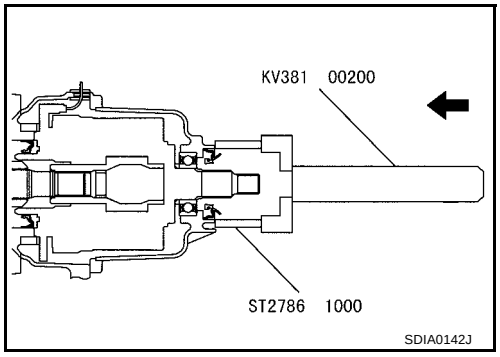
1. Remove propeller shaft. Refer to PR-3, "REMOVAL" .
2. Paint mating marks on the final drive companion flange and the thread edge of the electronically controlled coupling.

   CAUTION:
   Use paint to avoid scratching the surface.
3. Using a differential flange tool, remove companion flange nut to remove companion flange.
4. Using a screwdriver or similar tool, remove oil seal.

INSTALLATION

1. Apply multi-purpose grease to oil seal lips. Using a drift as shown, install oil seal. It should become flush with case end surface.

   CAUTION:
   - **When installing, do not incline the oil seal.**
   - **Oil seals are not reusable. Never reuse them.**



2. Align the mating marks on the companion flange and on the electronically controlled coupling, and install the companion flange.
3. Install a companion flange nut. Using a differential flange tool, tighten the nut to the specified torque.

   : 100 - 122 N·m (11 - 12 kg-m,74 - 89 ft-lb)

   CAUTION:
   Do not reuse the companion flange nut.
4. Connect propeller shaft. Refer toPR-3, "Removal and Installation" .

SIDE OIL SEAL

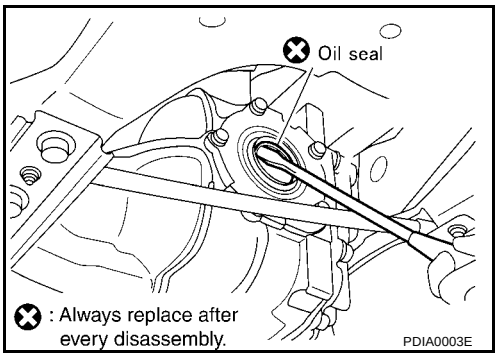
PFP:38343

Removal and Installation

EDS00107

REMOVAL

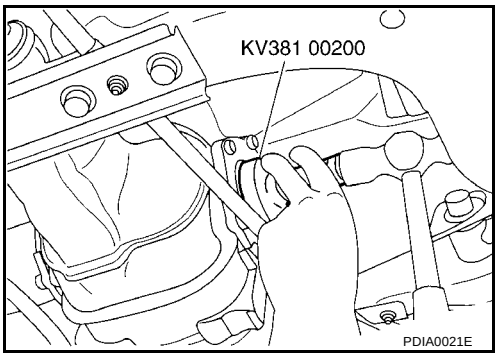
1. Remove drive shaft. Refer to RAX-9, "Removal" .
2. Using flat tip screwdriver as shown in the figure, remove oil seal.



INSTALLATION

1. Apply multi-purpose grease.to oil seal lips. Using a drift as shown, install oil seal. It should become flush with case end surface.

   CAUTION:
   - **When installing, do not incline the oil seal.**
   - **Oil seals are not reusable. Never reuse them.**
2. Install drive shaft. Refer to RAX-9, "Installation" .



REAR COVER GASKET

PFP:38320

Replacement

EDS00108

- Apply a continuous bead of sealant (Three bond 1217 or equivalent) around the gear carrier mating surface on the coupling cover as shown in the figure. Overlap both ends of the bead for at least 3 mm.

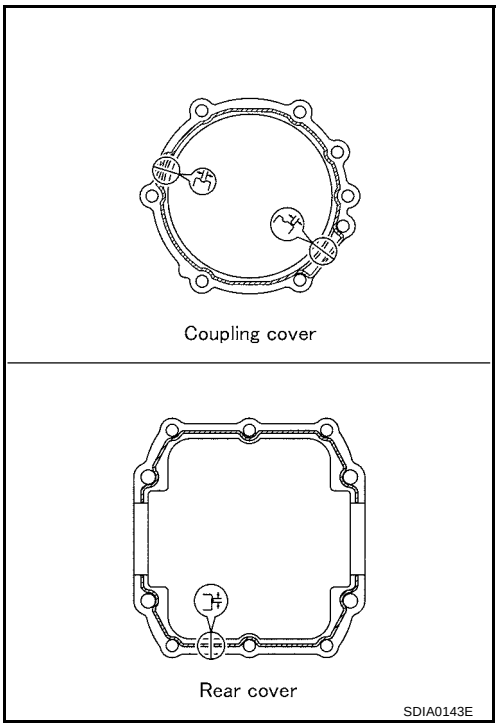
CAUTION:

Remove old sealant on the mounting surface, then remove any moisture, oil, and foreign material from the application and mounting surfaces.

- Apply sealant (Three bond 1217 or the equivalent) around the carrier case of rear cover as shown.

CAUTION:

Remove old sealant on the mounting surface, then remove any moisture, oil, and foreign material from the application and mounting surfaces.

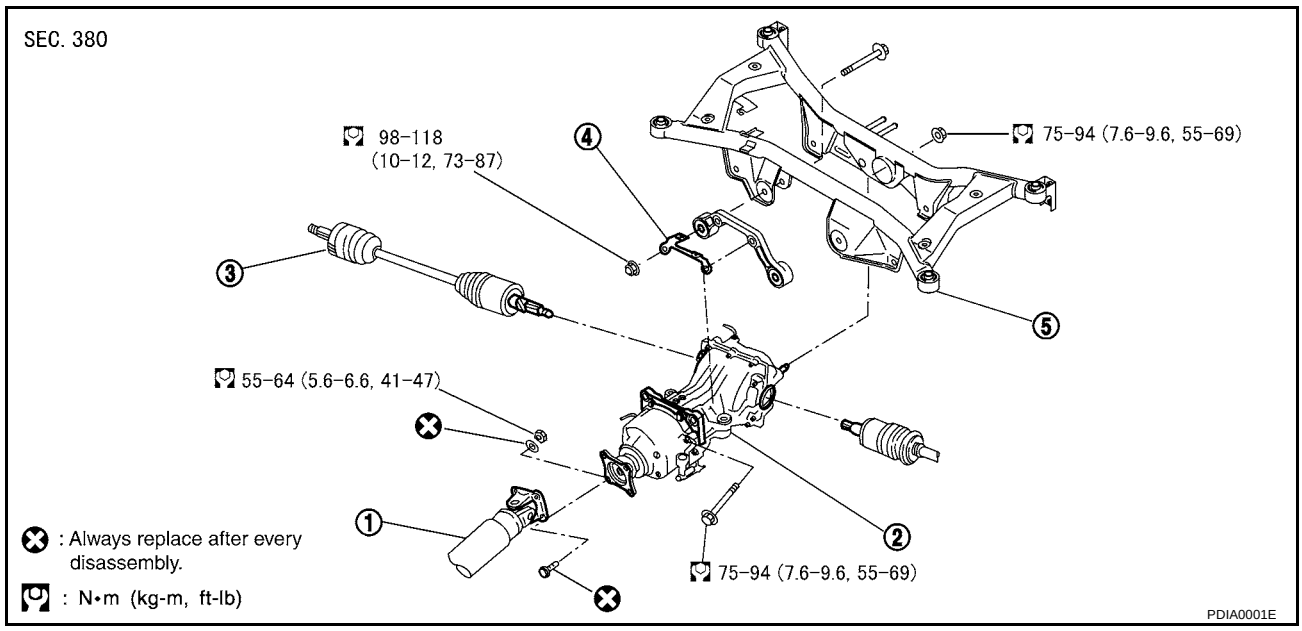


REAR FINAL DRIVE ASSEMBLY

PFP:38300

Removal and Installation

EDS00109



1. Propeller shaft
2. Final drive assembly
3. Drive shaft
4. Final drive mounting bracket
5. Suspension member

REMOVAL

1. Remove exhaust center tube.Refer to EX-2, "EXHAUST SYSTEM" .
2. Remove propeller shaft. Refer to PR-3, "Removal and Installation" .
3. Remove drive shaft. Refer to RAX-9, "Removal and Installation" .
4. Remove rear suspension member. Refer to RSU-5, "Components" .
5. Remove air breather hose (for electronically controlled coupling and for rear final drive). Refer to RFD-12, "Electronically Controlled Coupling Breather Hose" ,RFD-13, "Rear Final Drive Breather Hose" .
6. Remove the mounting bolt and nuts connecting to the suspension member, and remove the rear final drive

INSTALLATION

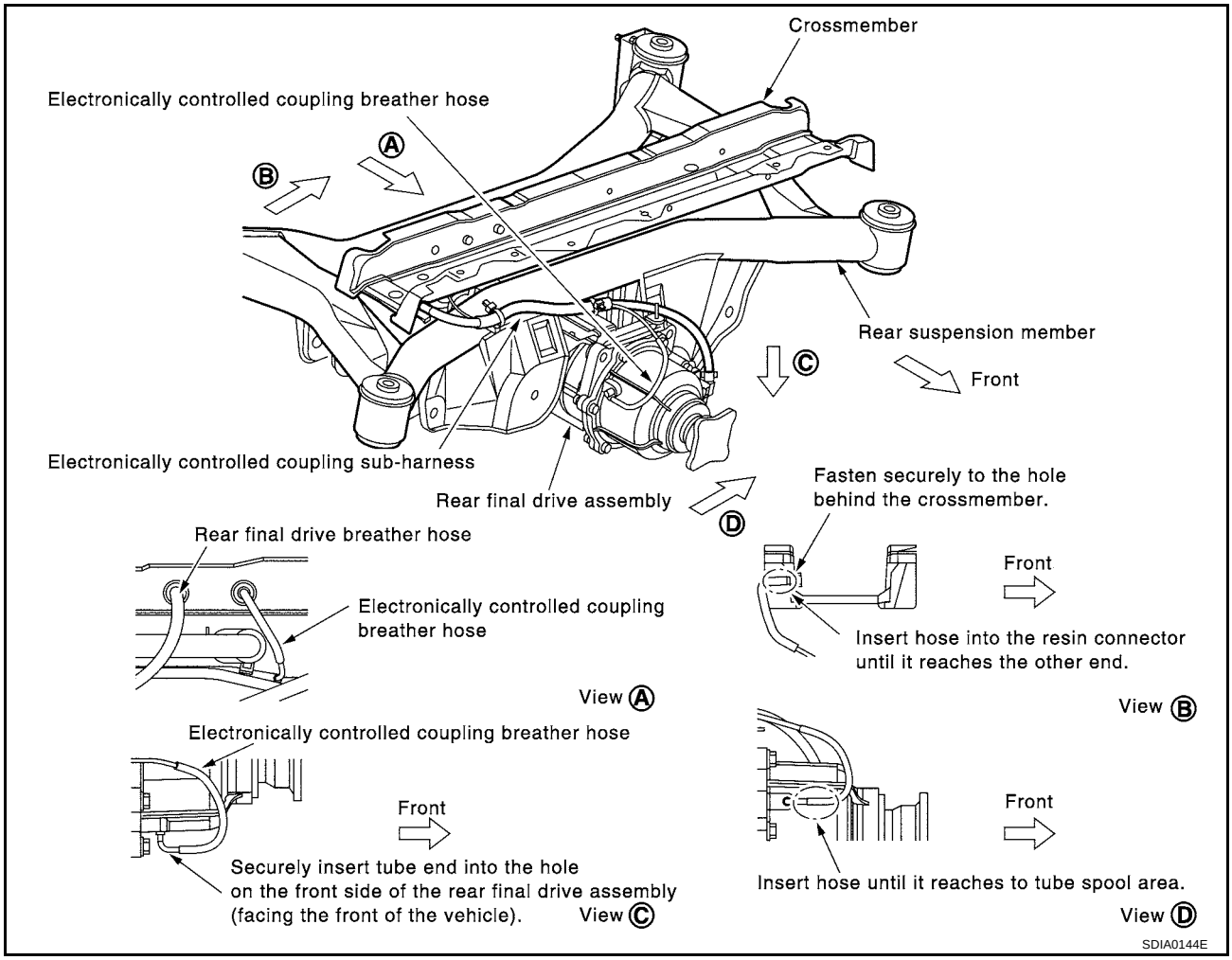
Install in the reverse order of the removal.

CAUTION:

- **Keep the air breather hose to exhaust tube clearance for at least 40 mm (1.57 in).**

Electronically Controlled Coupling Breather Hose

EDS0010A

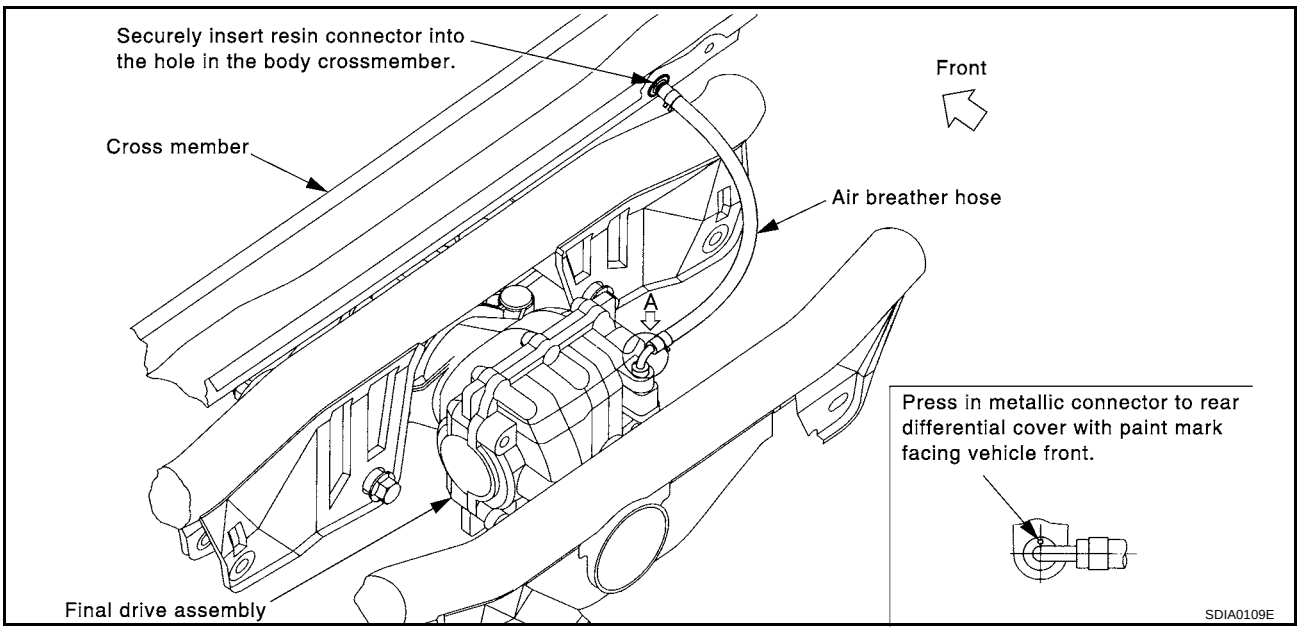


CAUTION:

- **Refer to the figure for removal and installation procedure of the electronically controlled coupling breather hose.**
- **When installing the electronically controlled coupling breather hose, be careful not to damage or sharply bend the hose. Otherwise, the hose may be pinched or restricted.**

Rear Final Drive Breather Hose

EDS0010B

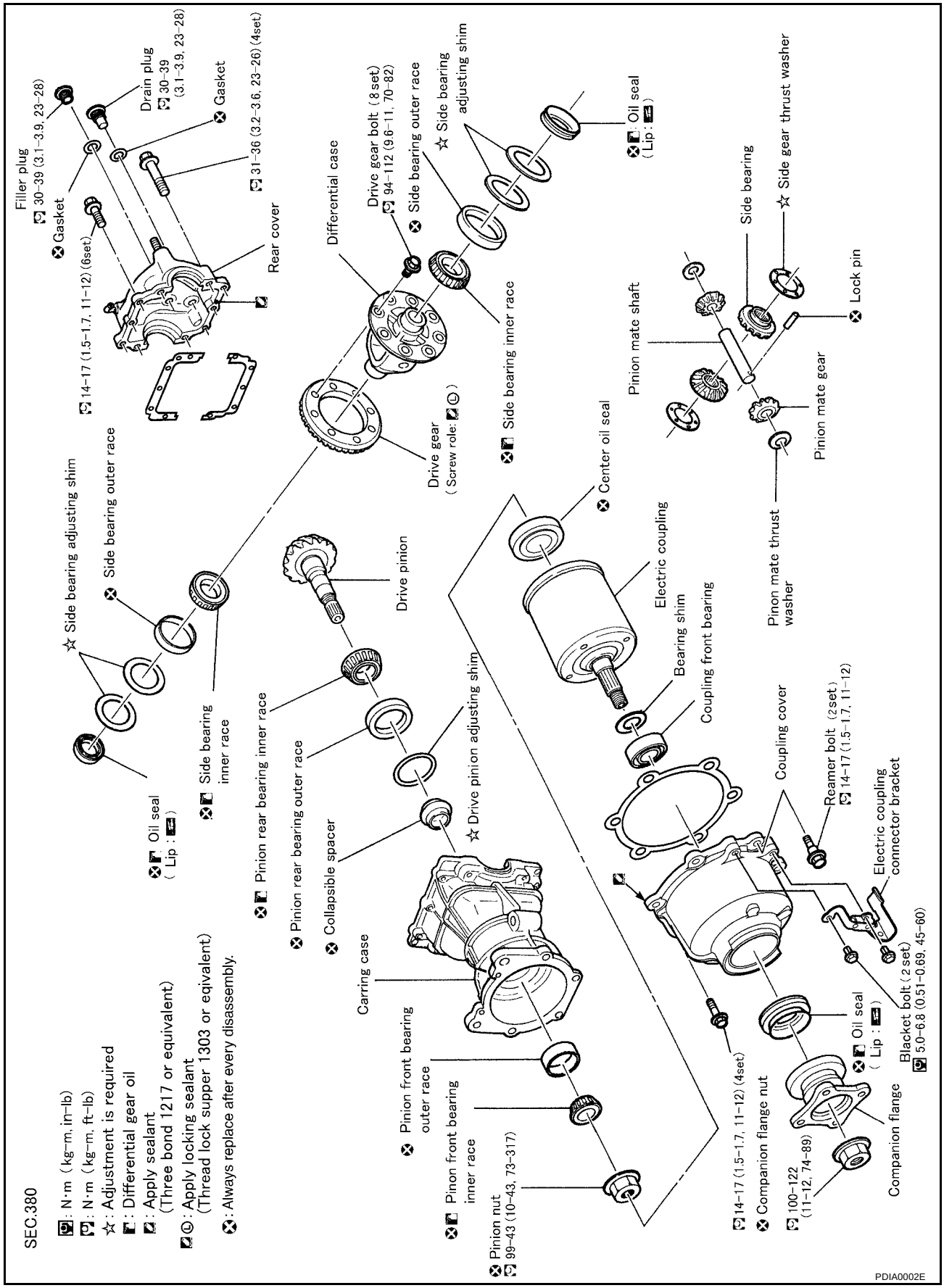


CAUTION:

- **Refer to the figure for removal and installation of rear final drive breather hose.**
- **When installing the air breather hose, be careful not to damage or sharply bend the hose. Otherwise, the hose may be pinched or restricted.**

Components

EDS0010C

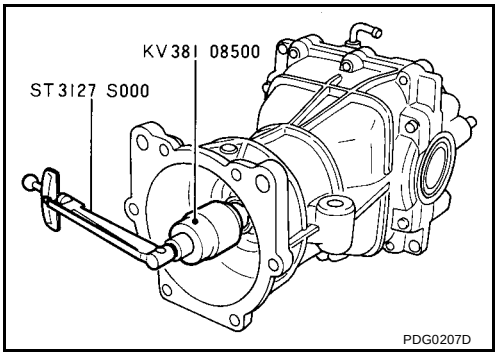


Inspection Before Disassembly

EDS0010D

OVERALL PRELOAD TORQUE

1. Drain the oil.
2. Remove electronically controlled coupling assembly.
   Refer to “Electronically Controlled Coupling Assembly”.
3. Rotate the drive pinion gear back and forth in 2 - 3 times to check for abnormal noise and rotation malfunction.
4. Rotate the drive pinion gear at least 20 times to check for smooth operation of the bearing.
5. Fit the drive pinion gear socket onto the drive pinion gear spline. Using a preload gauge, measure the overall preload torque.



Overall preload torque:

:1.33 - 2.15 N·m (0.14 - 0.21 kg-m,12 - 19 in-lb)

- If outside the standard, disassemble, check, and adjust each part. Adjust the pinion bearing and side bearing preload.
  Adjust the pinion bearing preload first, then adjust the side bearing preload.

When the preload torque is large

On pinion bearings : Replace the collapsible spacer.

On side bearings : Use thinner side bearing adjusting shims.

When the preload is small

On pinion bearings : Tighten the pinion nut.

On side bearings : Use thicker side bearing adjusting shims.

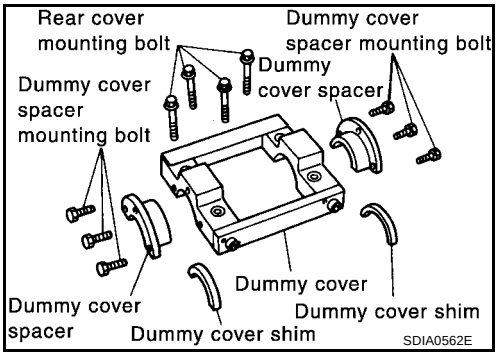
Side bearing adjusting shims

Thickness	Part No.	Thickness	Part No.	Thickness	Part No.
1.85 mm (0.0728 in)	38453 4N200	2.05 mm (0.807 in)	38453 4N204	2.25 mm (0.0866 in)	38453 4N208
1.90 mm (0.0748 in)	38453 4N201	2.10 mm (0.0827 in)	38453 4N205	2.30 mm (0.0906 in)	38453 4N209
1.95 mm (0.0768 in)	38453 4N202	2.15 mm (0.0854 in)	38453 4N206	2.35 mm(0.0925 in)	38453 4N210
2.00 mm (0.0787 in)	38453 4N203	2.20 mm (0.0866 in)	38453 4N207		

HYPOID GEAR BACKLASH

1. Drain the oil.
2. Remove the rear cover. Refer to RFD-20, "Removal of Differential Assembly" .
3. Following the procedure below, install a dummy cover set to the gear carrier.

a. Fit dummy cover shims to the right and left side bearing adjusting shims.

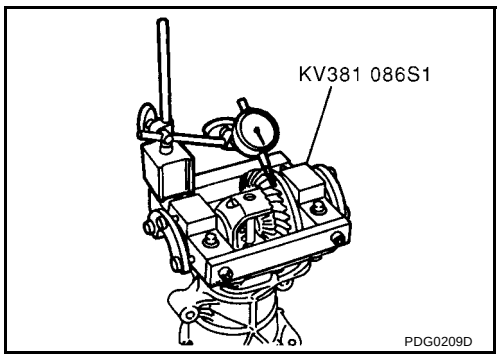


b. Temporarily tighten a dummy cover to the carrier case.
c. Position a dummy cover spacer to the dummy cover.
d. Tighten rear cover mounting bolts to the specified torque.

: 31 - 36 N·m (3.2 - 3.6 kg-m, 23 - 26 ft-lb)

e. Tighten dummy cover spacer mounting bolts evenly to the specified torque.

: 5.9 N·m (0.6 kg-m, 52 in-lb)



4. Fit a dial gauge to the drive gear face to measure the backlash.

Backlash : 0.10 - 0.15 mm (0.0039 - 0.0059 in)

- If outside the standard, change the thickness of the side bearing adjusting shims.

When the backlash is large:

Make the drive gear back adjusting shims thicker, and the drive gear front adjusting shims thinner.

When the backlash is small:

Make the drive gear back adjusting shims thinner, and the drive gear front adjusting shims thicker.

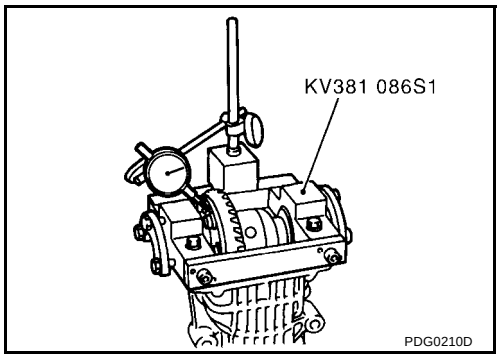
Side bearing adjusting shims

Thickness	Part No.	Thickness	Part No.	Thickness	Part No.
1.85 mm (0.0728 in)	38453 4N200	2.05 mm (0.0807 in)	38453 4N204	2.25 mm (0.0886 in)	38453 4N208
1.90 mm (0.0748 in)	38453 4N201	2.10 mm (0.0827 in)	38453 4N205	2.30 mm (0.0906 in)	38453 4N209
1.95 mm (0.0768 in)	38453 4N202	2.15 mm (0.0854 in)	38453 4N206	2.35 mm (0.0925 in)	38453 4N210
2.00 mm (0.0787 in)	38453 4N203	2.20 mm (0.0866 in)	38453 4N207		

DRIVE GEAR BACK RUNOUT

1. Drain the oil.
2. Remove the rear cover.Refer to RFD-20, "Removal of Differential Assembly" .
3. Attach dummy cover set. Refer to RFD-15, "HYPOID GEAR BACKLASH" .
4. Fit a dial gauge to the drive gear back face.
5. Rotate the drive gear to measure runout.

Runout limit : 0.05 mm (0.0020 in)



- If outside the repair limit, check drive gear assembly condition; foreign material may be caught between drive gear and differential case, or differential case or drive gear may be deformed, etc.

CAUTION:
Replace the drive gear and drive pinion gear as a set.

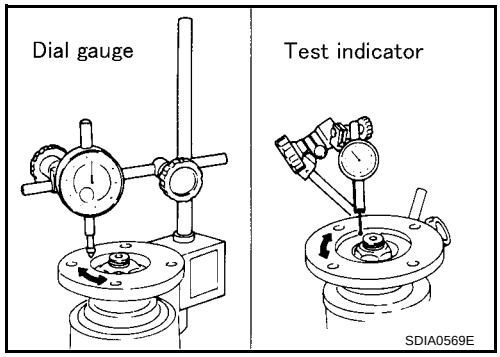
COMPANION FLANGE RUNOUT

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

Runout limit : 0.13 mm (0.0051 in)

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

Runout limit : 0.19 mm (0.0075 in)



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 gear by 90° step, and search for the point where the runout is the minimum.

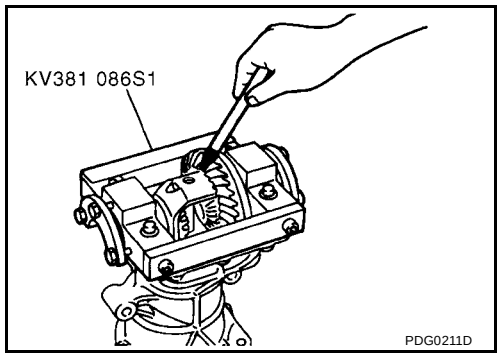
b. If the runout value is still outside of the limit after the phase has been changed, replace the companion flange.

c. If the runout value is still outside of the limit after the companion flange has been replaced, possible cause will be an assembly malfunction of the drive pinion gear and the electronically controlled coupling, malfunctioning coupling bearing, or malfunctioning electronically controlled coupling.

TOOTH CONTACT

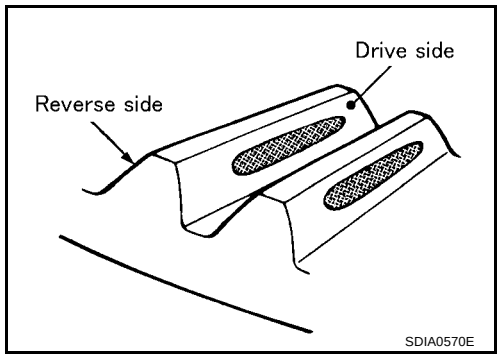
1. Drain the oil.
2. Remove the rear cover. Refer to RFD-20, "Removal of Differential Assembly"
3. Attach dummy cover set. Refer to RFD-15, "HYPOID GEAR BACKLASH" .
4. Apply red lead to drive gear face.

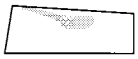
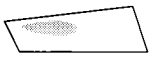
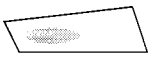
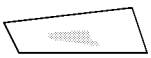
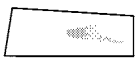
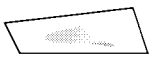
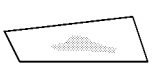
CAUTION:
Apply red lead to the both faces of 3 to 4 gears at 4 locations evenly spaced on the drive gear.



5. Rotate the drive gear back and forth in several times, check drive pinion gear to drive gear tooth contact.

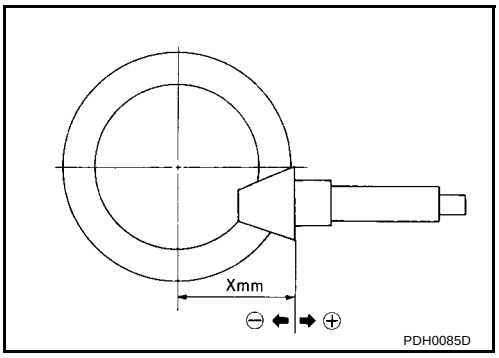
CAUTION:
Check tooth contact on drive side (acceleration) and reverse side (deceleration).



Tooth contact condition		Drive pinion adjusting shim selection value (mm)		Adjustment (Yes/No)	Possible cause
Drive side	Back side				
Heel side Toe side 	Toe side Heel side 	Thicker ↑	+0.09	Yes	Occurrence of noise and scoring sound in all speed ranges.
			+0.06		Occurrence of noise when accelerating.
			+0.03	No	–
			0		
		Thinner ↓	−0.03		
			−0.06	Yes	Occurrence of noise at constant speed and decreasing speed.
			−0.09		Occurrence of noise and scoring sound in all speed ranges.

SDIA0563E

6. If the tooth contact is improperly adjusted, follow the procedure below to adjust the pinion height (dimension X in the figure).

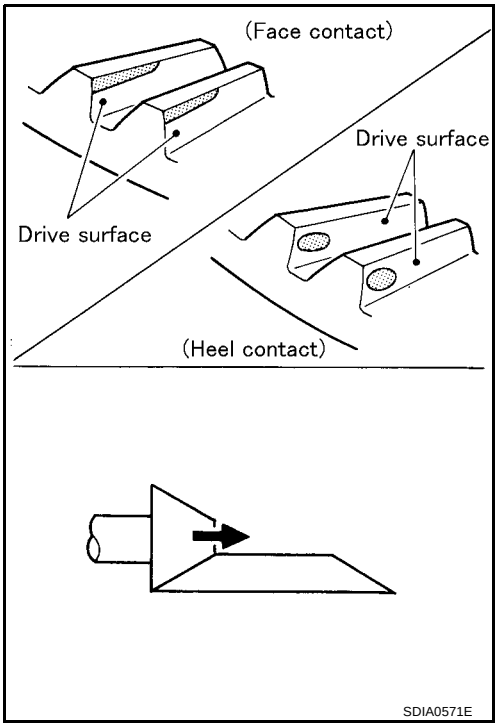


PDH0085D

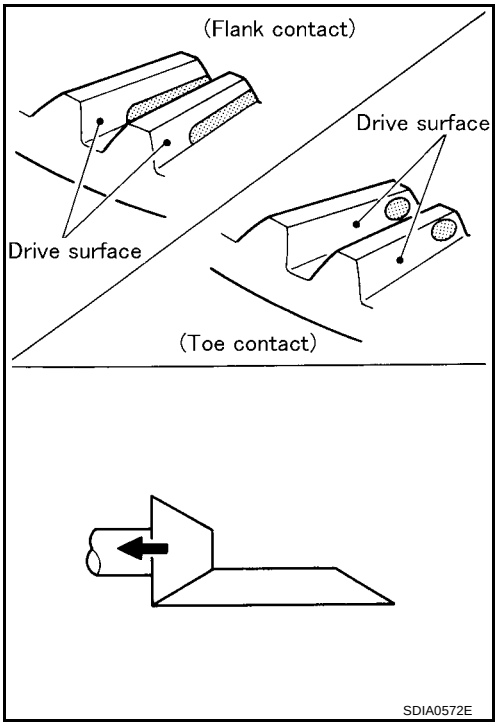
Drive pinion gear adjusting shim

Thickness	Part No.	Thickness	Part No.
1.70 mm (0.0669 in)	381544N200	2.00 mm (0.0787 in)	381544N210
1.73 mm (0.0681 in)	381544N201	2.03 mm (0.0799 in)	381544N211
1.76 mm (0.0693 in)	381544N202	2.06 mm (0.0811 in)	381544N212
1.79 mm (0.0705 in)	381544N203	2.09 mm (0.0823 in)	381544N213
1.82 mm (0.0717 in)	381544N204	2.12 mm (0.0835 in)	381544N214
1.85 mm (0.0728 in)	381544N205	2.15 mm (0.0846 in)	381544N215
1.88 mm (0.0740 in)	381544N206	2.18 mm (0.0858 in)	381544N216
1.91 mm (0.0752 in)	381544N207	2.21 mm (0.0870 in)	381544N217
1.94 mm (0.0764 in)	381544N208	2.24 mm (0.0882 in)	381544N218
1.97 mm (0.0776 in)	381544N209		

- In case of face contact or heel contact, thicken the drive pinion gear adjusting shims to move the drive pinion gear closer to the drive gear.



- In case of flank contact or toe contact, thin the drive pinion gear adjusting shims to move the drive pinion gear farther from the drive gear.



Disassembly and Assembly

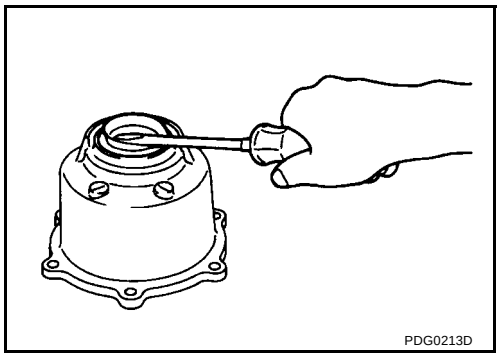
EDS0010E

DISASSEMBLY

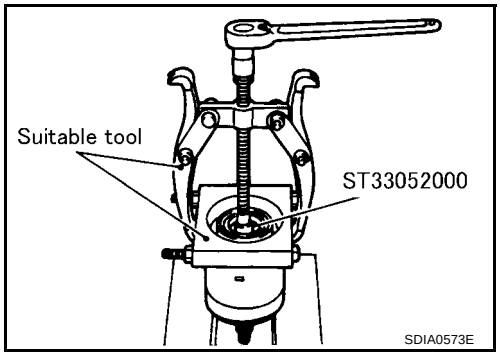
Removal of Electronically Controlled Coupling Assembly

1. Using a flange wrench, remove companion flange nut.
2. Remove companion flange.
3. Remove coupling cover.
4. Using flat tip screwdriver, remove oil seal from the coupling cover.

   CAUTION:
   Be careful not to damage the coupling cover.

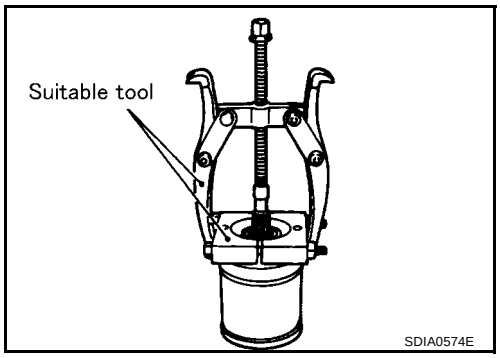


5. Remove electronically controlled coupling assembly from the drive pinion gear.



6. Using a puller, remove coupling front bearing from the electronically controlled coupling.

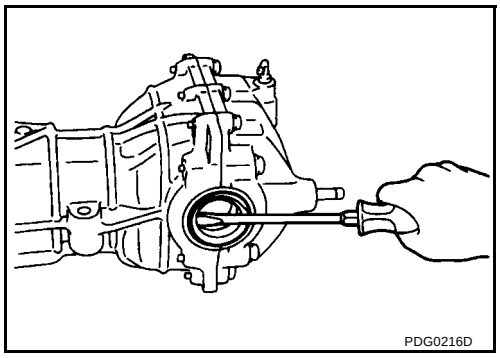
   CAUTION:
   When the bearing is replaced with new one, reassemble the shim between bearing and the coupling.



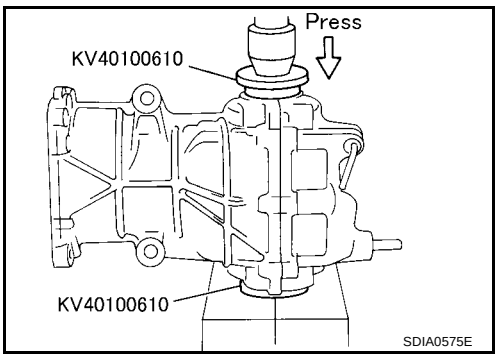
Removal of Differential Assembly

1. Using flat tip screwdriver, remove side oil seal from the carrier case assembly.

   CAUTION:
   Be careful not to damage the carrier case and rear cover.
2. Remove rear cover mounting bolts.



3. Fit a drift to the right and left side bearing adjusting shims individually. Compress differential case assembly and side bearing to remove carrier case assembly and rear cover.



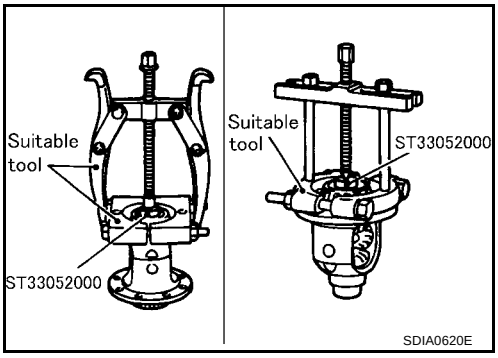
CAUTION:
The pressure shall be as low as possible to remove carrier case assembly and rear cover. The maximum pressure shall be 10kN (1 ton, 1.1 US ton, 1.0 Imp ton).

NOTE:
The differential case assembly, side bearings, and adjusting shims are compressed and integrated in the carrier case and rear cover.

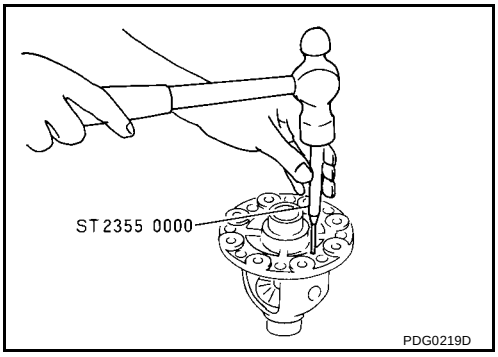
4. Remove side bearing adjusting shims and side bearing outer race.

CAUTION:
Mark the side bearing adjusting shims so that the original mounting positions (right/left) can be identified later.

5. Remove drive gear mounting bolts, and remove drive gear from the differential case.
6. Using a puller and a drift, remove side bearing inner race.

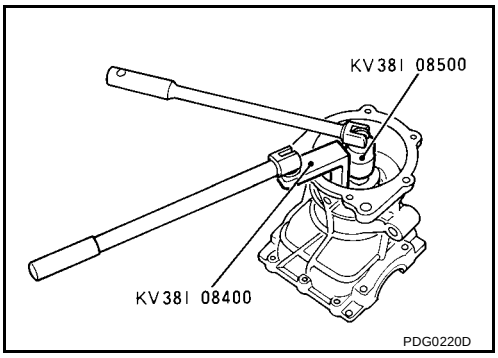


7. Using a pin punch, pull the lock pin out of the pinion mate shaft.
8. Remove pinion mate shaft, pinion mate gears, pinion mate thrust washers, side gears, side gear thrust washers from the differential case.

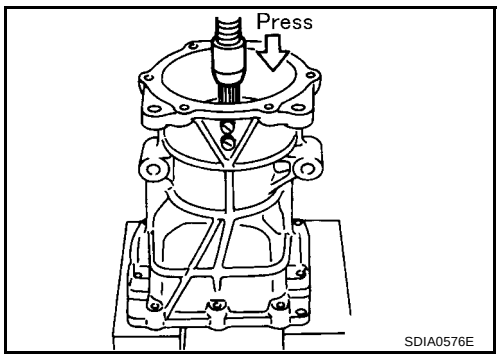


Removing Drive Pinion Assembly

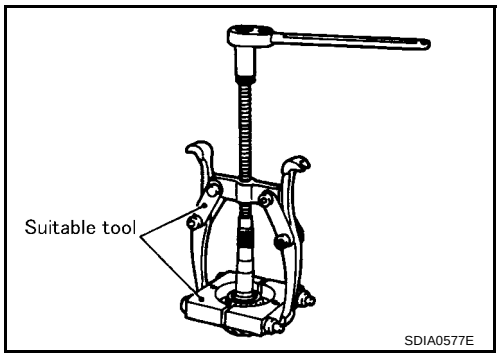
1. Remove electronically controlled coupling assembly. Refer to RFD-20, "Removal of Electronically Controlled Coupling Assembly" .
2. Remove differential case assembly. Refer to RFD-20, "Removal of Differential Assembly" .
3. Fit a drive pinion socket onto the drive pinion spline. Using a pinion nut wrench, remove pinion nut.
4. Remove center oil seal.



5. Press the drive pinion gear assembly out of the carrier case.
6. Remove pinion front bearing inner race.
7. Remove collapsible spacer.



8. Using a puller, remove pinion rear bearing inner race from the drive pinion.



9. Using a brass rod, tap the pinion front bearing outer race evenly from the 2 cutouts on the carrier case, and remove pinion front bearing outer race.

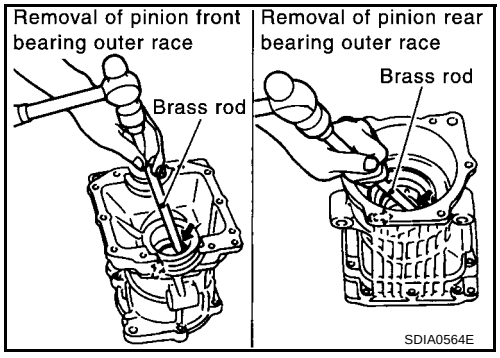
   CAUTION:

   Be careful not to damage the carrier case.

10. Using a brass rod, tap the drive pinion adjusting shim evenly from the 2 cutouts on the carrier case, and remove drive pinion adjusting shims and pinion rear bearing outer race.

    CAUTION:

    Be careful not to damage the carrier case.



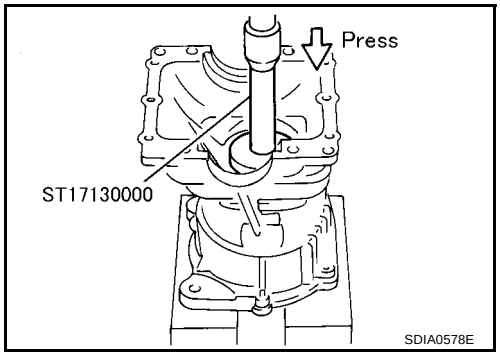
ASSEMBLY

Assembly of Drive Pinion Assembly

1. Assemble with a drive pinion adjusting shim of the same thickness as was installed prior to disassembly. Using a drift, press a pinion rear bearing outer race into the carrier case.

   CAUTION:

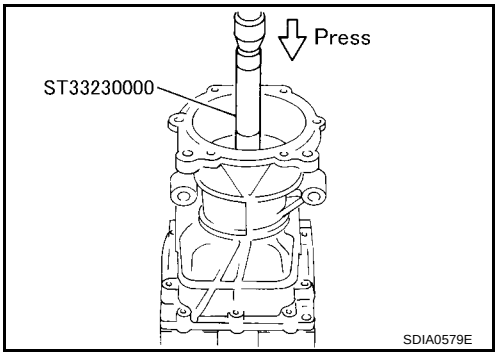
   - **At first, using a hammer, tap the bearing outer race until it becomes square to the carrier case.**
   - **Do not reuse the pinion rear bearing outer race.**



2. Using a drift, press a pinion front bearing outer race into the carrier case.

CAUTION:

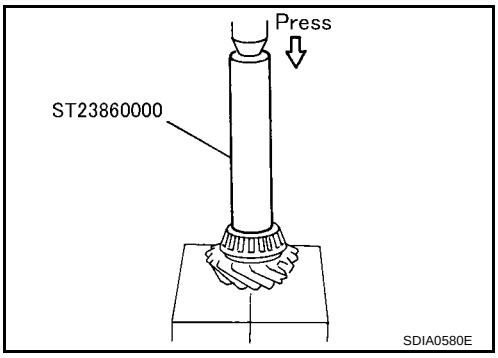
- **At first, using a hammer, tap the bearing outer race until it becomes square to the carrier case.**
- **Do not reuse the pinion front bearing outer race.**



3. Using a drift, press a pinion rear bearing inner race into the drive pinion.

CAUTION:

Do not reuse the pinion rear bearing inner race.



4. After checking and adjusting the tooth contact and backlash of the hypoid gear following the procedure below, assemble a collapsible spacer to the drive pinion.

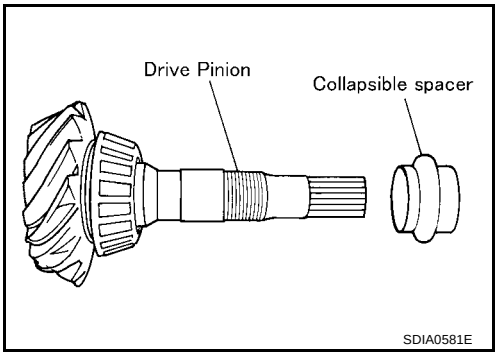
CAUTION:

- **Be careful of the mounting orientation of the collapsible spacer.**
- **Do not reuse the collapsible spacer.**

a. Apply differential oil to the pinion bearing, and assemble the drive pinion to the carrier case.

CAUTION:

Do not assemble a collapsible spacer.

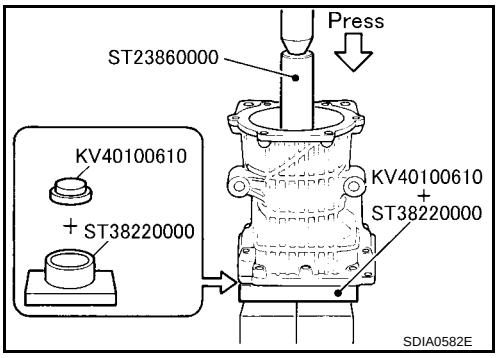


b. Assemble a pinion front bearing inner race to the drive pinion. Using a drift and press stand, press the pinion nut as far as it can be tightened.

c. Temporarily tighten the removed pinion nut to the drive pinion.

NOTE:

Use the removed pinion nut only for the preload torque measurement.



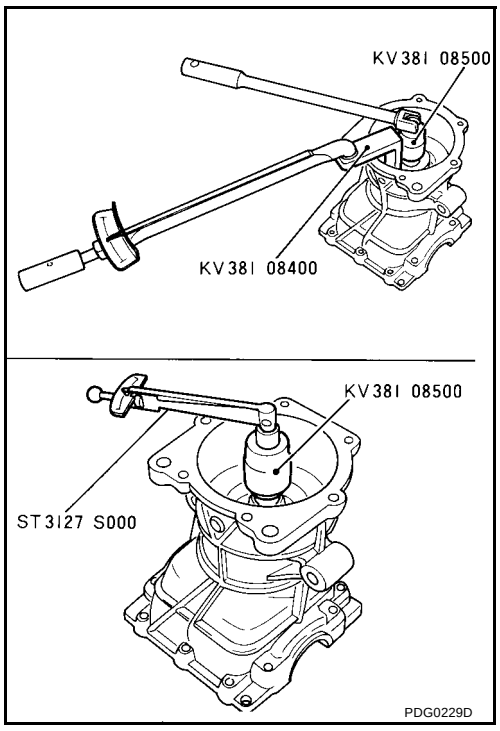
d. Fit the drive pinion socket onto the drive pinion spline. Using a pinion nut wrench, tighten the pinion nut to the specified preload torque.

CAUTION:
The pinion nut is tightened with no collapsible spacer. Be careful not to overtighten it. While measuring the preload, tighten it by 5° to 10°.

e. Apply differential oil to the side bearings, and install new side bearing adjusting shims with the same thickness or re-install the old ones to the same mounting position they were in prior to disassembly. Install the differential case assembly to the carrier case. Refer to RFD-25, "Installation of Differential Assembly" .

f. Install a dummy cover set to check and adjust the tooth contact. Refer to RFD-17, "TOOTH CONTACT" .

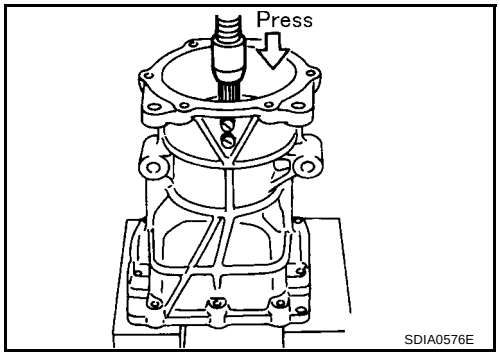
g. Check and adjust the backlash. Refer to RFD-15, "HYPOID GEAR BACKLASH" .



h. Remove dummy cover set, and remove differential case assembly.

i. Remove pinion nut, pinion front bearing inner race, and remove drive pinion gear.

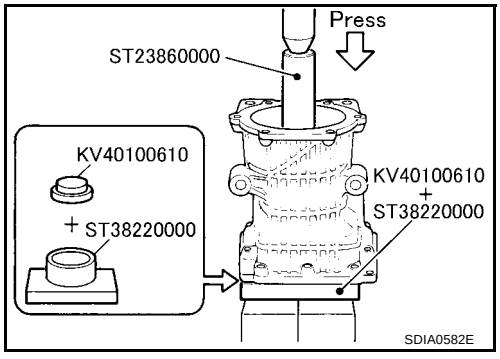
5. Install the drive pinion gear with a collapsible spacer to the carrier case.



6. Using a drift and press stand, press the pinion front bearing inner race to the drive pinion as far as a pinion nut can be tightened.

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

CAUTION:
Do not reuse the pinion nut.



8. Fit a drive pinion socket onto the drive pinion gear spline. Using a pinion nut wrench, adjust the pinion nut tightening torque and pinion bearing preload torque.

Pinion nut tightening torque:

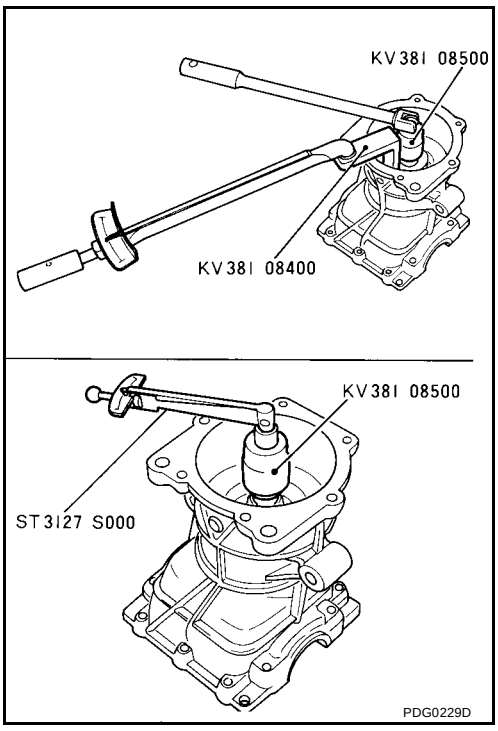
99 - 431 N·m (10 - 43 kg-m, 73 - 317 ft-lb)

Pinion bearing preload torque:

0.69 - 1.17 N·m (0.07 - 0.11 kg-m, 7 - 10 in-lb)

CAUTION:

- **Do not reuse the pinion nut.**
- **Adjust the lower limit of the pinion nut tightening torque first.**
- **If the preload torque exceeds the specified value, replace the collapsible spacer and tighten it again to adjust. Never loosen the pinion nut to adjust the preload torque.**
- **After adjustment, rotate the drive pinion gear back and forth 2 - 3 times to check for abnormal noise, rotation malfunction, and other malfunctions.**

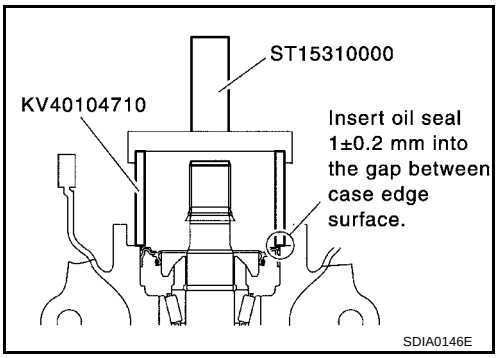


9. Install center oil seal.
10. Install the differential case assembly. Refer to RFD-25, "Installation of Differential Assembly" .

CAUTION:

Do not install the rear cover.

11. Install a dummy cover set, and check backlash, drive gear back runout, and tooth contact. Refer to RFD-17, "TOOTH CONTACT" .
12. Remove dummy cover, then install the rear cover, and drive in the oil seal.RFD-25, "Installation of Differential Assembly" Refer to



13. Check overall preload torque. Refer to RFD-15, "OVERALL PRELOAD TORQUE" .
14. Connect electronically controlled coupling assembly. Refer to RFD-28, "Installation of Electronically Controlled Coupling Assembly" .
15. Check companion flange runout. Refer to RFD-17, "COMPANION FLANGE RUNOUT" .

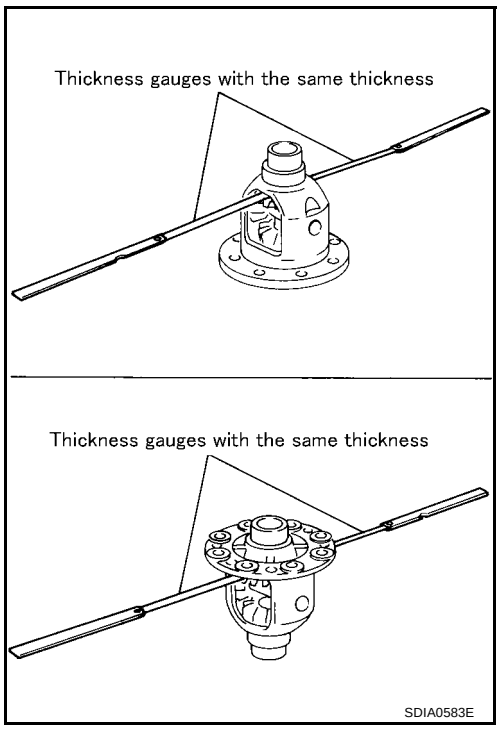
Installation of Differential Assembly

1. Assemble new side gear thrust washers with the same thickness as the ones installed prior to disassembly or reinstall the old ones on the side gears.
2. Assemble the side gears, side gear thrust washers, pinion mate gears, and pinion mate thrust washers to the differential case, and temporarily assemble the pinion mate shaft.

3. Measure the side gear endplay following the procedure below, and select the appropriate side gear thrust washers.
   - Using a thickness gauge, measure the clearance between side gear back and the differential case at 3 different points, while rotating the side gear. Average the 3 readings, and select the appropriate side gear thrust washer so that the mean value is within specifications below. (Measure the clearance of the other side as well.)

   Side gear endplay standard:

   0.2 mm (0.008 in) or less. Every gear shall rotate smoothly with no abnormal feeling of drag.

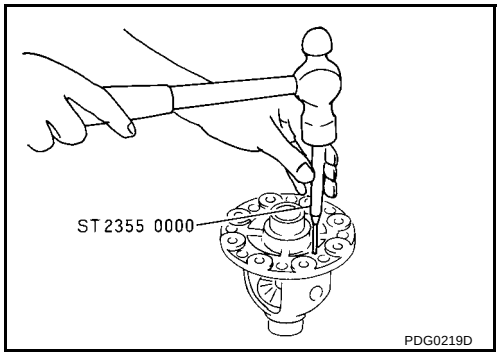


Thickness	Part No.	Thickness	Part No.
0.74 mm (0.0291 in)	38424 4N200	0.83 mm (0.0327 in)	38424 4N203
0.77 mm (0.0303 in)	38424 4N201	0.86 mm (0.0339 in)	38424 4N204
0.80 mm (0.0315 in)	38424 4N202		

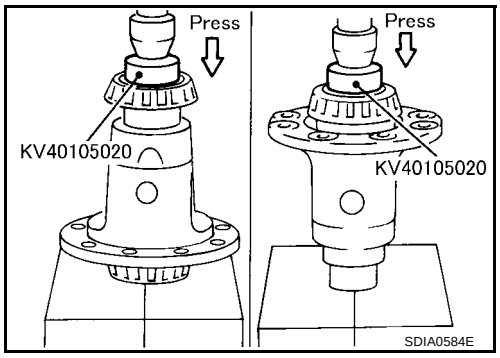
CAUTION:
- **Before measurement, place differential case straight up so that side gear to be measured comes upward. To prevent the side gear from tilting, insert thickness gauges with the same thickness from both sides.**
- **Select a side gear thrust washer for right and left individually.**

4. Assemble the selected side gear thrust washer to the differential case.
5. Using a pin punch, drive a lock pin into the pinion mating shaft.

   CAUTION:
   Do not reuse the lock pin.



6. Using a drift, press a side bearing inner race into the differential case.

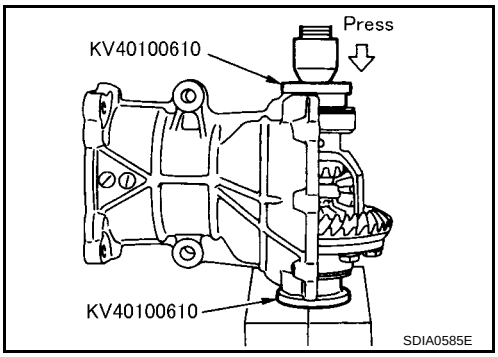


7. Apply locking sealant (Thread lock super 1303 or equivalent) onto the thread of the drive gear.

   CAUTION:
   The drive gear back, threaded holes, and drive gear bolts shall be cleaned and decreased sufficiently.
8. Assemble the drive gear to the differential case, and tighten it with drive gear bolt.

   : 94 - 112 N·m (9.6 - 11 kg-m, 70 - 82 ft-lb)

9. Apply differential oil to the side bearings, and assemble new side bearing adjusting shims (2 pieces for one side) with the same thickness as the ones installed prior to disassembly or re-install the old ones, with a side bearing outer race to the differential case.
   If the side bearing adjusting shims have been already selected, use them.
10. Fit a drift to the right and left side bearing adjusting shims individually. Compress differential case assembly and side bearing to install the carrier case assembly to differential case assembly.

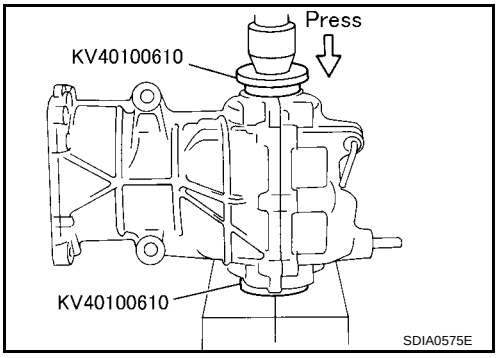


CAUTION:
- **A drift shall be placed on the center of the adjusting shims.**
- **The pressure shall be as low as possible to install the carrier case assembly into the differential assembly. The maximum pressure shall be 1 ton.**
- **If the adjusting shims are installed by tapping, the carrier case may be damaged. Avoid tapping.**

11. Install a dummy cover set, check and adjust the backlash, drive gear back runout, tooth contact, and overall preload torque. Refer to RFD-15, "Inspection Before Disassembly" .
12. Remove dummy cover set.
13. Apply sealant (Three bond 1217 or the equivalent) around the carrier case mounting surface on the rear cover.Refer to

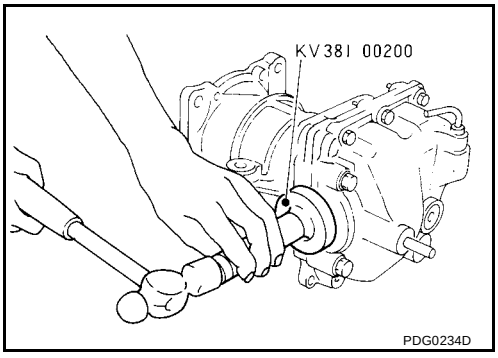
CAUTION:
Remove old sealant on the mounting surface, then remove any moisture, oil, and foreign material on the application and mounting surfaces.

14. Fit a drift to the right and left side bearing adjusting shims individually. Compress differential case assembly and side bearing to install the rear cover.



CAUTION:
- **A drift shall be placed on the center of the adjusting shims.**
- **The pressure shall be as low as possible to install the rear cover. The maximum pressure shall be 10kN (1 ton, 1.1US ton, 1.0 Imp ton)**
- **If the rear cover is forced in by tapping, the rear cover may be damaged by the adjusting shims. Avoid tapping.**

15. Tighten rear cover mounting bolts to the specified torque.



Tightening torque

M8-bolt		**: 14 - 17 N·m (1.5 - 1.7 kg-m, 11 - 12 ft-lb)**
M10-bolt		**: 31 - 36 N·m (3.2 - 3.6kg·m, 23 - 26 ft-lb)**

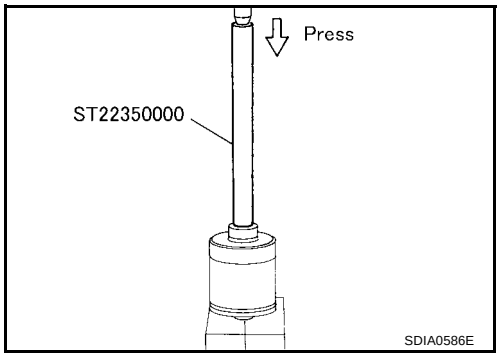
16. Using a drift, drive the oil seal until it becomes flush with the case end.

CAUTION:
- **Oil seals are not reusable. Never reuse them.**
- **Apply multi-purpose grease onto the oil seal lips, and differential oil onto the circumference of the oil seal.**

17. Check overall preload torque. Refer to RFD-15, "OVERALL PRELOAD TORQUE" .

Installation of Electronically Controlled Coupling Assembly

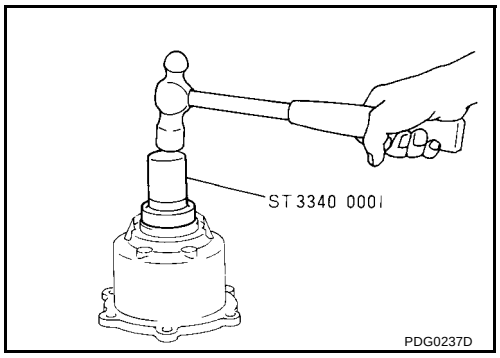
1. Using a drift, install the coupling front bearing to the electronically controlled coupling.



CAUTION:
At disassembly, be sure to install shim between electronically-controlled coupling and bearing. Chamfering side of shim should be coupled to install.

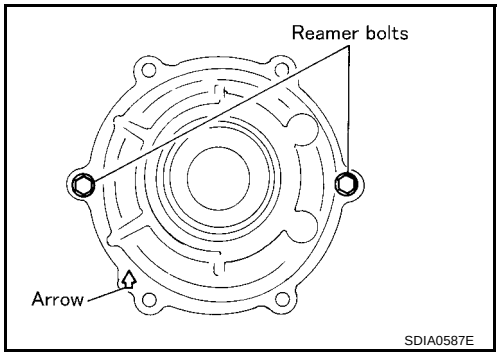
2. Assemble the electronically controlled coupling assembly to the drive pinion.

3. Using a drift, drive an oil seal until it becomes flush with the case end.



CAUTION:
- **Oil seals are not reusable. Never reuse them.**
- **Apply multi-purpose grease onto the oil seal lips, and differential oil onto the circumference of the oil seal.**

4. Apply sealant (Three bond 1217 or the equivalent) around the carrier case mounting surface on the coupling cover.Refer to RFD-10, "REAR COVER GASKET" .



CAUTION:
Remove old sealant on the mounting surface, then remove any moisture, oil, and foreign material from the application and mounting surfaces.

5. Assemble the coupling cover to the carrier case assembly with the arrow facing upward, temporarily tighten reamer bolts to the positions shown in the figure.
6. Tighten the reamer bolts and coupling cover mounting bolts to the specified torque.
7. Assemble the companion flange.
8. Using a flange wrench, tighten the companion flange nut to the specified torque.

CAUTION:
Do not reuse the companion flange nut.

9. Check companion flange runout. Refer to RFD-17, "COMPANION FLANGE RUNOUT" .

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specification

EDS0010F

Applied model	QR20DE, QR25DE, YD22DDTi
Final drive model	R145
Ring gear pitch diameter	145
Gear ratio	2.466
Number of teeth (Ring gear/Drive pinion)	37/15
Oil capacity (approx.)	0.55 ℓ (1 lamp pt.)
Number of pinion gears	2
Drive pinion adjustment spacer type	Collapsible

Ring Gear Vibration

EDS0010G

Type	R145
Vibration limit at drive gear back	0.05 mm (0.0020 in) or less

Side Gear Clearance Adjustment

EDS0010H

Type	R145
Side gear back clearance	0.2 mm (0.008 in) or less. Every gear shall rotate smoothly with no abnormal feeling of drag.

THRUST WASHER FOR ADJUSTMENT OF SIDE GEAR BACK CLEARANCE

	Thickness	Part No.	Thickness	Part No.
Thrust washer	0.74 mm (0.0291 in) 0.77 mm (0.0303 in) 0.80 mm (0.0315 in)	38424 4N200 38424 4N201 38424 4N202	0.83 mm (0.0327 in) 0.86 mm (0.0339 in)	38424 4N203 38424 4N204

Drive Pinion Gear Preload Adjustment

EDS0010I

Adjustment of drive pinion gear	Collapsible spacer
Drive pinion gear preload	0.69 - 1.17 N·m (0.07 - 0.11 kg-m,7 - 10 in-lb)

DRIVE PINION GEAR PRELOAD ADJUSTING SHIM

	Thickness	Part No.	Thickness	Part No.
Adjusting shim	1.70 mm (0.0669 in) 1.73 mm (0.0681 in) 1.76 mm (0.0693 in) 1.79 mm (0.0705 in) 1.82 mm (0.0717 in) 1.85 mm (0.0728 in) 1.88 mm (0.0740 in) 1.91 mm (0.0752 in) 1.94 mm (0.0764 in) 1.97 mm (0.0776 in)	38154 4N200 38154 4N201 38154 4N202 38154 4N203 38154 4N204 38154 4N205 38154 4N206 38154 4N207 38154 4N208 38154 4N209	2.00 mm (0.0787 in) 2.03 mm (0.0799 in) 2.06 mm (0.0811 in) 2.09 mm (0.0823 in) 2.12 mm (0.0835 in) 2.15 mm (0.0846 in) 2.18 mm (0.0858 in) 2.21 mm (0.0870 in) 2.24 mm (0.0882 in)	38154 4N210 38154 4N211 38154 4N212 38154 4N213 38154 4N214 38154 4N215 38154 4N216 38154 4N217 38154 4N218

Side Bearing Preload Adjustment

EDS0010J

Adjustment of side bearing	Adjusting shim
Side bearing preload	0.64 - 0.98 N·m (0.07 - 0.09 kg-m,6 - 8 in-lb)

ADJUSTING SHIM FOR SIDE BEARING PRELOAD

	Thickness	Part No.	Thickness	Part No.
Adjusting shim	1.85 mm (0.0728 in) 1.90 mm (0.0748 in) 1.95 mm (0.0768 in) 2.00 mm (0.0787 in) 2.05 mm (0.0807 in) 2.10 mm (0.0827 in)	38154 4N200 38154 4N201 38154 4N202 38154 4N203 38154 4N204 38154 4N205	2.15 mm (0.0854 in) 2.20 mm (0.0866 in) 2.25 mm (0.0886 in) 2.30 mm (0.0906 in) 2.35 mm (0.0925 in)	38154 4N206 38154 4N207 38154 4N208 38154 4N209 38154 4N210

Overall Preload

EDS0010K

Overall preload with oil seal installed	1.33 - 2.15 N·m (0.14 - 0.21 kg-m,12 - 19 in-lb)
Ring gear backlash	0.10 - 0.15 mm (0.0039 - 0.0059 in)