

SECTION RFD

REAR FINAL DRIVE

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RFD

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PREPARATION

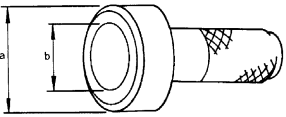
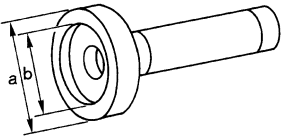
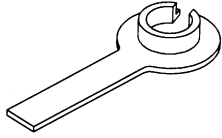
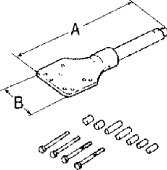
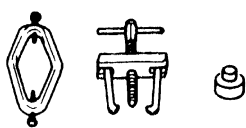
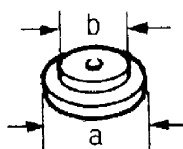
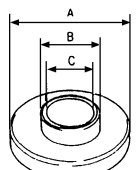
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PREPARATION

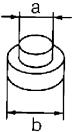
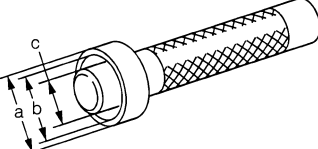
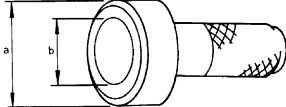
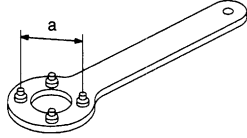

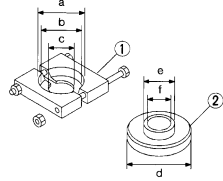
Special Service Tools

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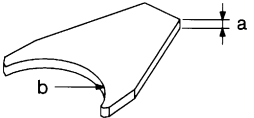
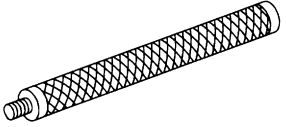
The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool name Tool number (Kent-moore No.)	Description
Drift ST30720000 (J25405) a: 77 mm (3.03 in) dia. b: 55 mm (2.17 in) dia.	 <p style="text-align: center;">ZZA0811D</p> Final drive oil seal installation
Drift KV38100200 (-) a: 65 mm (2.56 in) dia. b: 49 mm (1.93 in) dia.	 <p style="text-align: center;">ZZA1143D</p> Final drive oil seal installation
Protector KV38107900 (J39352)	 <p style="text-align: center;">S-NT129</p> Final drive side flange installation
Attachment KV38100800 (J25604-01) a: 541 mm (21.30 in) b: 200 mm (7.87 in)	 <p style="text-align: center;">SDIA0267E</p> Unit assembly fixing
Puller set ST3306S001 (-)	 <p style="text-align: center;">SDIA0215J</p> Side bearing removal
Drift ST30613000 (J25742-3) a: 72 mm (2.83 in) dia. b: 48 mm (1.89 in) dia. ST30621000 (J25742-5) a: 79 mm (3.11 in) dia. b: 59 mm (2.32 in) dia.	 <p style="text-align: center;">ZZA0810D</p> Drive pinion bearing outer race installation
Drift ST30901000 (J26010-01) a: 80 mm (3.15 in) dia. b: 45 mm (1.77 in) dia. c: 35 mm (1.38 in) dia.	 <p style="text-align: center;">SDIA0217J</p> Drive pinion rear bearing installation

PREPARATION

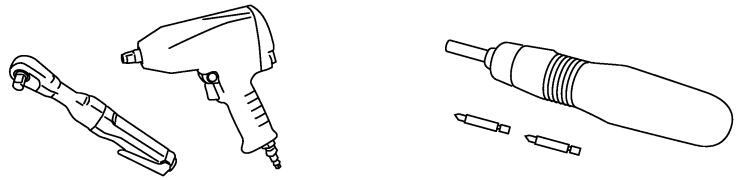
Tool name Tool number (Kent-moore No.)	Description	
Drift ST33061000 (J8107-2) a: 38 mm (1.50 in) dia. b: 28.5 mm (1.122 in) dia.	 ZZA0969D	A B C
Drift KV38100300 (J2553) a: 54 mm (2.13 in) dia. b: 46 mm (1.81 in) dia. c: 32 mm (1.26 in) dia.	 ZZA1046D	RFD E
Drift KV38100500 (-) a: 77 mm (3.03 in) dia. b: 55 mm (2.17 in) dia. c: 32 mm (1.26 in) dia.	 ZZA0811D	F G H
Drift pinion flange wrench KV38104700 (J34311) a : 95mm (3.74in) dia.	 S-NT355	I J
Slide hammer HT72400000 (-)	 S-NT125	K L
Drift pinion rear inner race puller set 1. ST30031000 (J22912-01) Puller 2. ST30901000 (-) Equivalent tool (J26010-01) Base a : 90mm (3.54in) dia. b : 80mm (3.15in) dia. c : 50mm (1.97in) dia. d : 79mm (3.11in) dia. e : 45mm (1.77in) dia. f : 35mm (1.38in) dia.	 S-NT640	M

PREPARATION

Tool name Tool number (Kent-moore No.)	Description
Slide bearing spacer drift KV38100600 (J25267) a : 8mm (0.31in) b : R42.5mm (1.673in)	 Installing side bearing spacer S-NT528
Drift ST30611000 (J25742-1)	 Installing pinion rear bearing outer race (Use with ST30613000) S-NT090

Commercial Service Tools

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Power tool	 PBIC0190E PBIC0191E
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NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

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NVH Troubleshooting Chart

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

Symptom			Possible cause and SUSPECTED PARTS												
DIFFERENTIAL		Noise	Rough gear tooth	Improper gear contact	Tooth surfaces worn	Incorrect backlash	Companion flange excessive runout	Improper gear oil	PROPELLER SHAFT	AXLE AND SUSPENSION	TIRES	ROAD WHEEL	DRIVE SHAFT	BRAKES	STEERING
			x	x	x	x	x	x	x	x	x	x	x	x	x
Reference page			Refer to RFD-15	Refer to RFD-21	Refer to RFD-15	Refer to RFD-11	—	Refer to MA section.	NVH in PR section.	NVH in FAX, RAX, FSU and RSU sections.	NVH in WT section.	NVH in WT section.	NVH in RAX section.	NVH in BR section.	NVH in PS section.

x: Applicable

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FRONT OIL SEAL

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FRONT OIL SEAL

Removal and Installation

REMOVAL

1. Remove the propeller shaft. Refer to [PR-4, "REAR PROPELLER SHAFT"](#) .
2. Put a mark on the end of the drive pinion corresponding to the B position mark on the final drive companion flange.

NOTE:

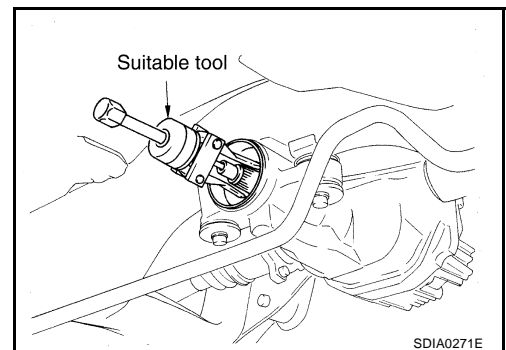
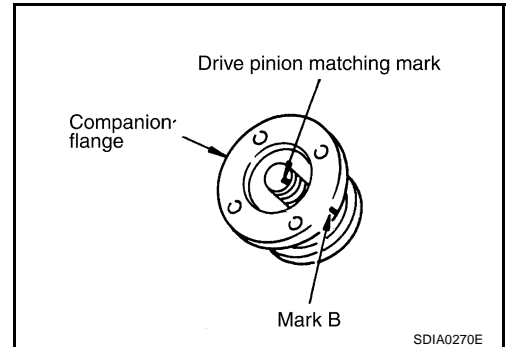
- For matching mark, use paint. Never damage drive pinion.
- The mark B on the final drive companion flange indicates the maximum vertical runout position.

3. Loosen drive pinion nut with tool.

Tool number : KV38104700 (J34311)

4. Using the puller, remove the companion flange.

5. Using the oil seal puller, remove oil seal.



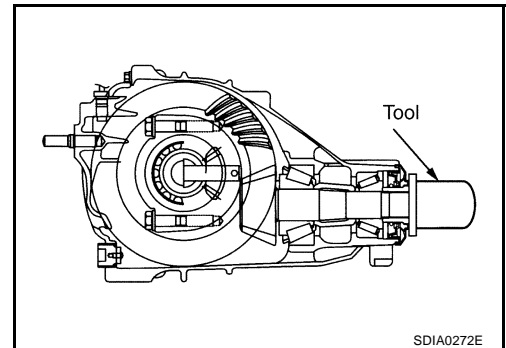
INSTALLATION

1. Apply multi-purpose grease to sealing lips of oil seal. Press front oil seal into carrier with tool.

Tool number : ST30720000 (J25405)

NOTE:

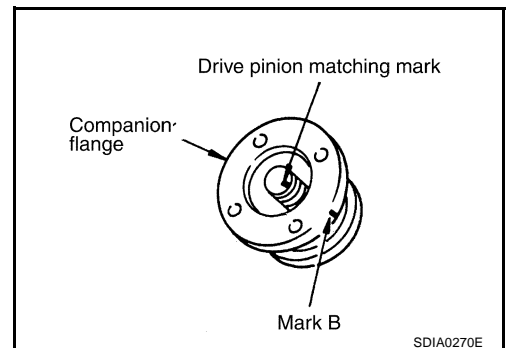
- When installing the oil seal, be careful not to get it inclined.
- Discard the old oil seal. Always replace with new one.



2. Align the matching mark of drive pinion with the matching mark B of companion flange, then install the companion flange.
3. Apply oil or grease on the screw part of drive pinion and the seating surface of drive pinion nut. Install drive pinion nut with tool.

⊗ : 187 - 294N-m (19.0 - 30.0 kg-m, 138 - 216 ft-lb)

4. Install propeller shaft. Refer to [PR-4, "REAR PROPELLER SHAFT"](#) .



SIDE OIL SEAL

SIDE OIL SEAL

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Removal and Installation

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REMOVAL

1. Remove side flange with the following procedure for press-fitting.
 - a. Remove rear wheel rotation sensor.
 - b. Remove driving shaft.
 - c. Install suitable attachment to both side flange, LH and RH, and using a sliding hammer, pull out the side flange.
 - d. Check that circular clip is installed at correct position.

Model	Circular clip installation position
R200	Final drive side

2. Remove dust shield using a flat-bladed screwdriver.
3. Remove oil seal using a flat-bladed screwdriver.

INSTALLATION

NOTE:

Be sure to install the side flange from the right side. If installed from the left side, the fitting of the left side flange comes out sometimes from the shock of installing the right side.

1. Apply multi-purpose grease to sealing lips of oil seal.
2. Using the drift, press-fit oil seal so that its surface comes face to face with the end surface of the case.

Tool number : KV38100200 (-)

NOTE:

- When installing the oil seal be careful not to get it inclined.
- Discard the old oil seal. Always replace with new one.

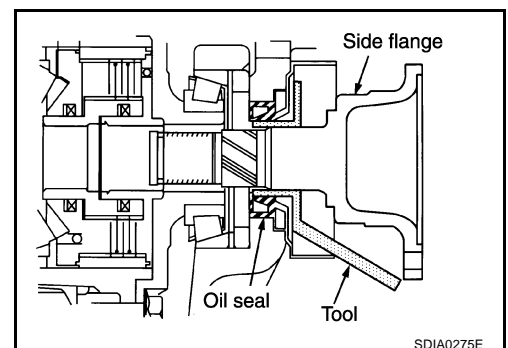
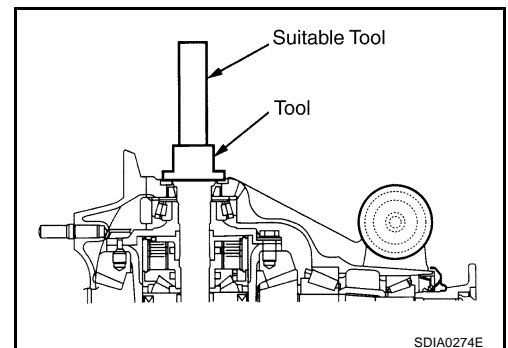
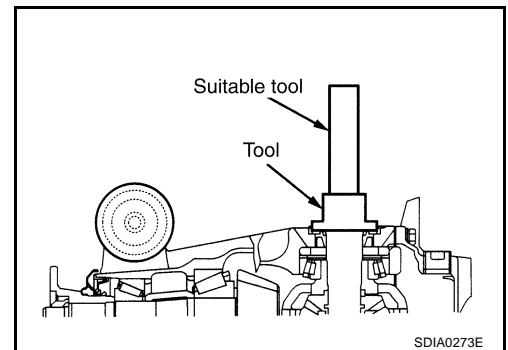
3. Align the installing position of the wheel revolution sensor with the notched part of the dust shield. Then, attach the dust shield using a drift.

Tool number : ST30720000 (J25405)

4. Install the side flange with the following procedure.
 - a. Attach the protector to side oil seal.

Tool number : KV38107900 (J39352)

- b. After the side flange is inserted and the serrated part of side gear has engaged the serrated part of flange, remove the protector.



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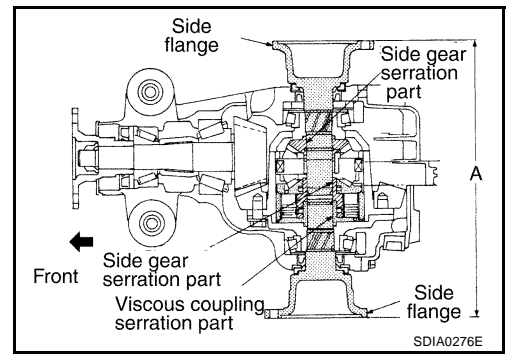
SIDE OIL SEAL

- c. Put suitable drift on the center of side flange, then drive it until sound changes.

NOTE:

- Apply multi-purpose grease on the circular clip of the flange serration part, and eliminate any inclination of circular clip.
 - When installation is completed, driving sound of the side flange turns into a sound which seems to affect the whole final drive.
5. Confirm that the dimension of the side flange installation (Measurement A) in the illustration comes into the following, then install the drive shaft.

Measurement A : Approx. 326-328mm (12.83-12.91 in)



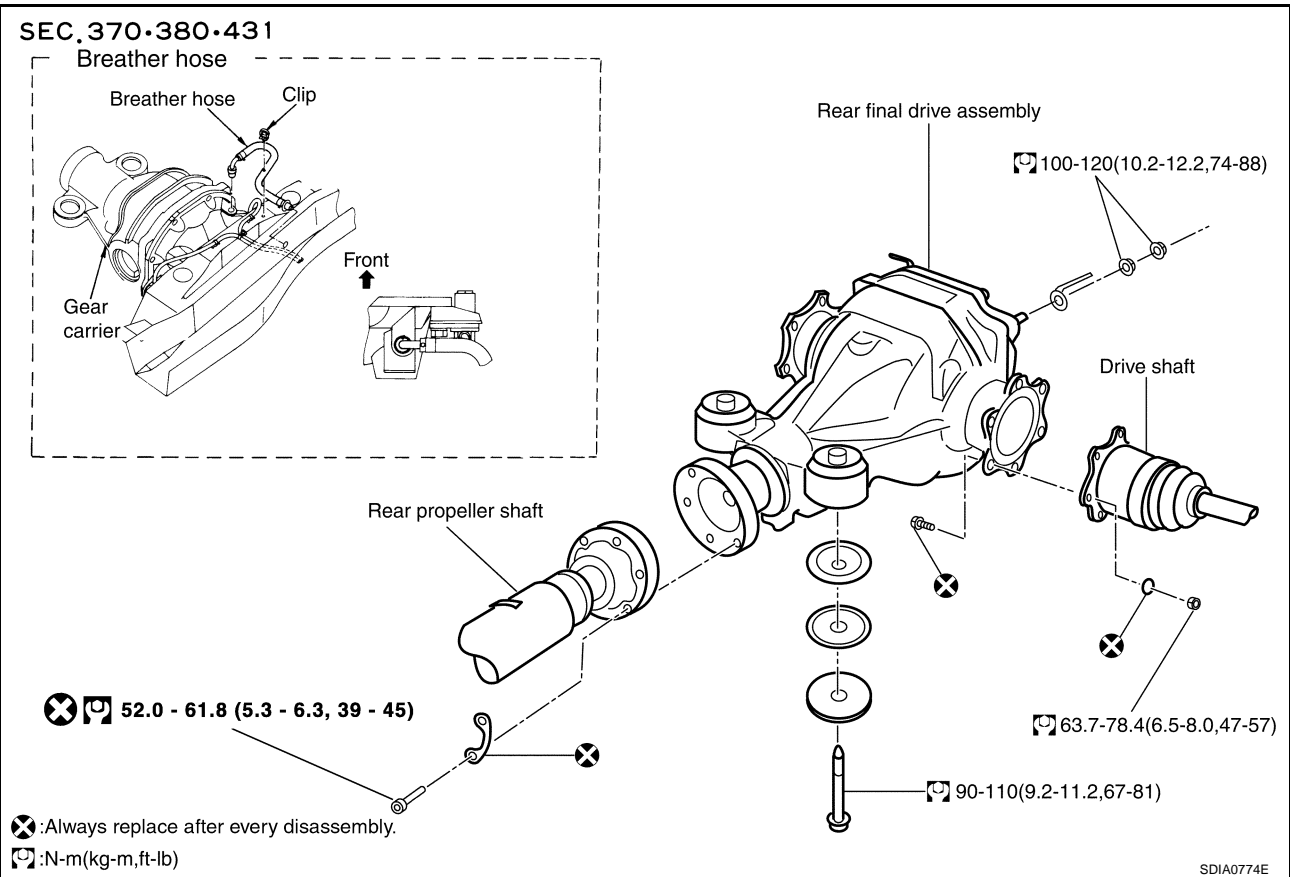
REAR FINAL DRIVE ASSEMBLY

REAR FINAL DRIVE ASSEMBLY

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Removal and Installation

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REMOVAL

1. Remove exhaust center tube.
2. Remove rear stabilizer bar.
3. Remove rear propeller shaft.
4. Remove rear drive shaft.
5. Remove air bleeding hose from the Final Drive.
6. Remove ABS wheel sensor
7. Place a transmission jack on the final drive.

NOTE:

Do not place a transmission jack on the rear cover (aluminum case).

8. Remove the mounting bolts and nuts connecting to the suspension member, and remove the rear final drive.

INSTALLATION

Install in the reverse order of removal.

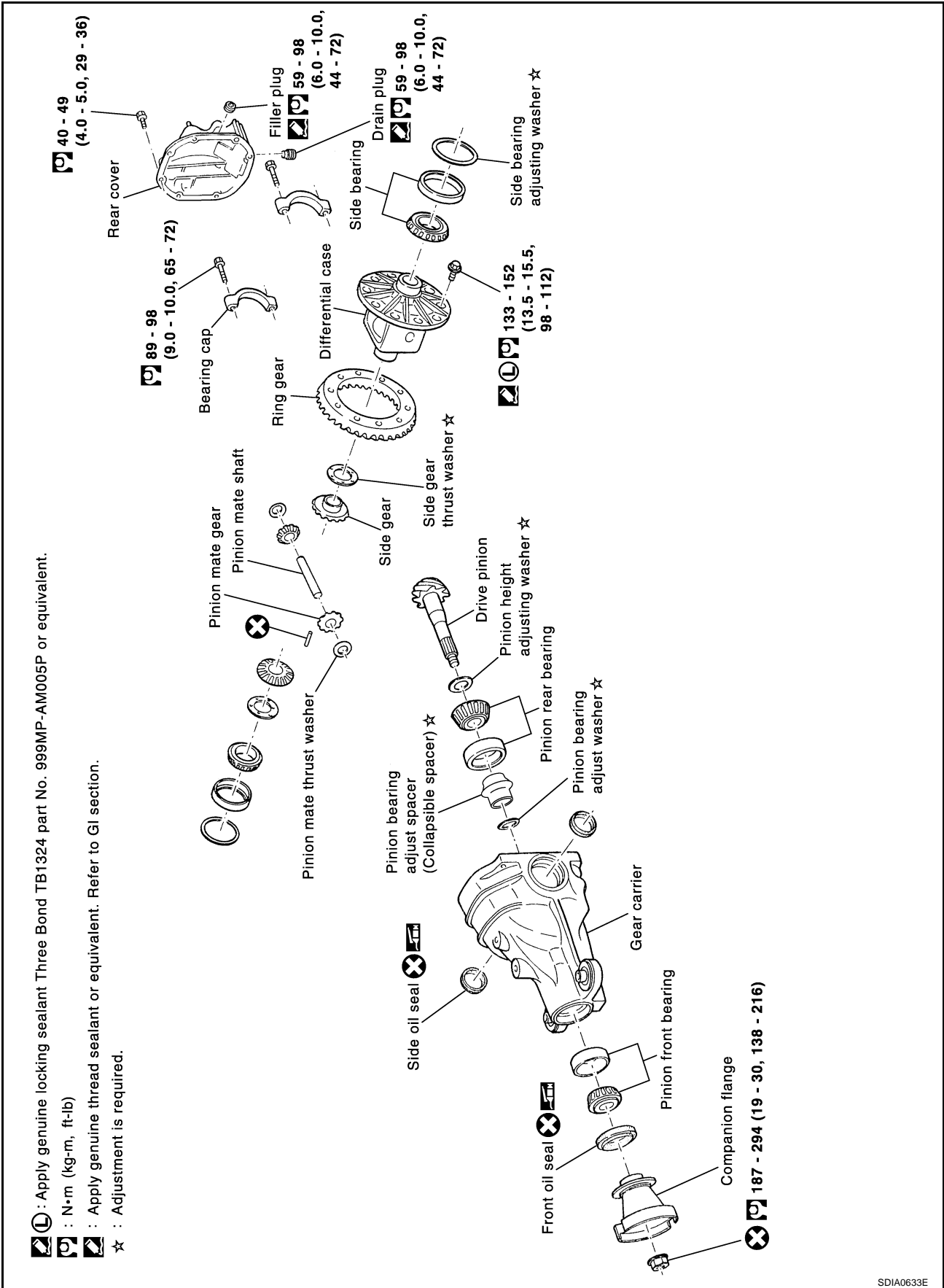
CAUTION:

After installation, adjust the parking brake and check the final drive oil level.

REAR FINAL DRIVE ASSEMBLY

EDS000AD

Components R200



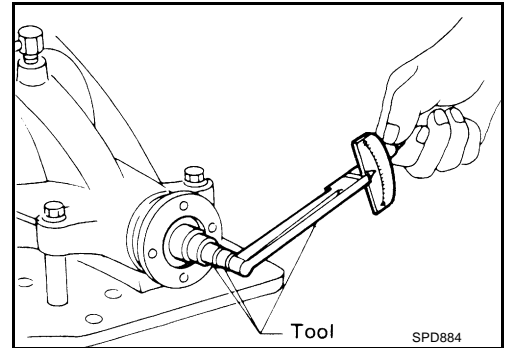
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REAR FINAL DRIVE ASSEMBLY

Disassembly PRE-INSPECTION

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Before disassembling final drive, perform the following inspection.



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Total Preload

1. Turn drive pinion in both directions several times to set bearing rollers.
2. Check total preload with Tool.

Tool number :ST3127S000 (J25765-A)

Total preload : 2.0 - 2.8 N-m (0.20 - 0.29 kg-m, 18 - 25 in-lb)

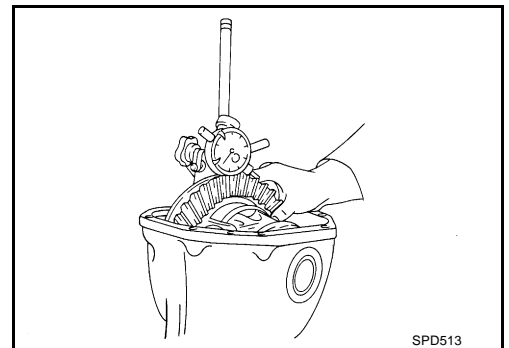
Ring Gear to Drive Pinion Backlash

Ring gear to drive pinion backlash

Check ring gear-to-drive pinion backlash with a dial indicator at several points.

Ring gear backlash:

0.10 - 0.15 mm (0.0039 - 0.0059 in)



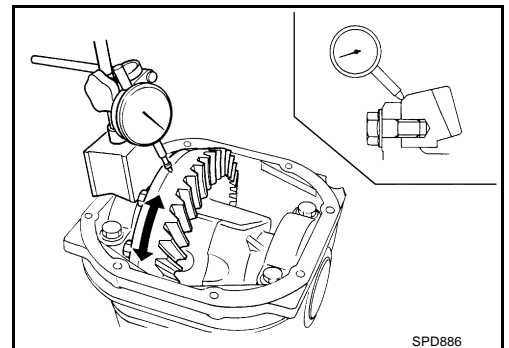
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Ring Gear Runout

Check runout of ring gear with a dial indicator.

Runout limit:

0.05 mm (0.0020 in)



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Tooth Contact

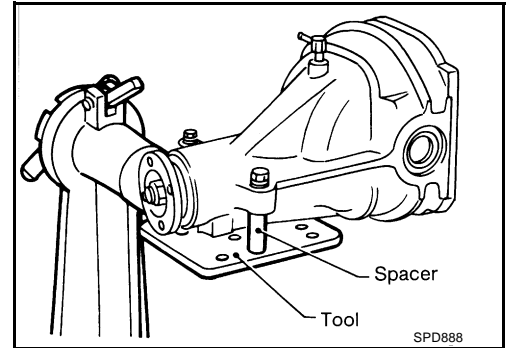
Check tooth contact. Refer to [RFD-15, "Adjustment"](#) .

REAR FINAL DRIVE ASSEMBLY

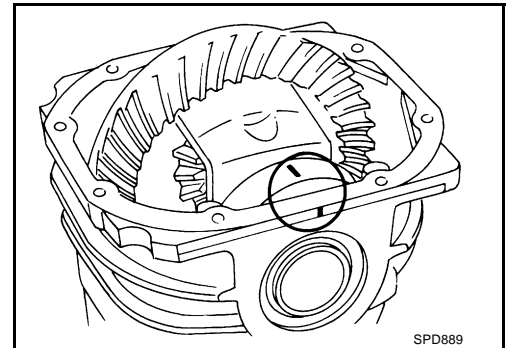
DIFFERENTIAL CARRIER

1. Using two 45 mm (1.77 in) spacers, mount carrier on Tool.

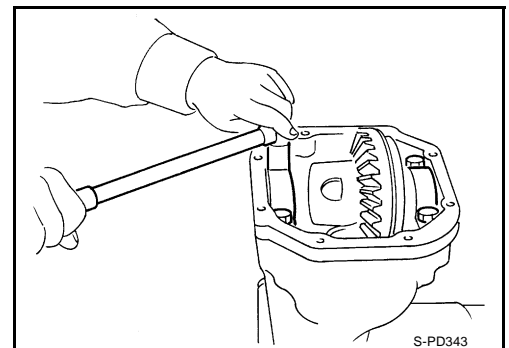
Tool number: KV38100800 (-)



2. For proper reinstallation, paint or punch match marks on one side of the side bearing cap. Bearing caps are line-board during manufacture. Replace them in their proper positions.

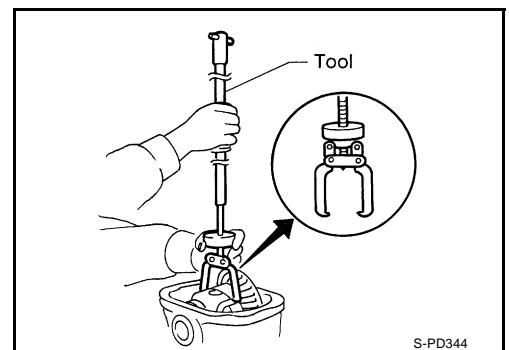


3. Remove side bearing caps.



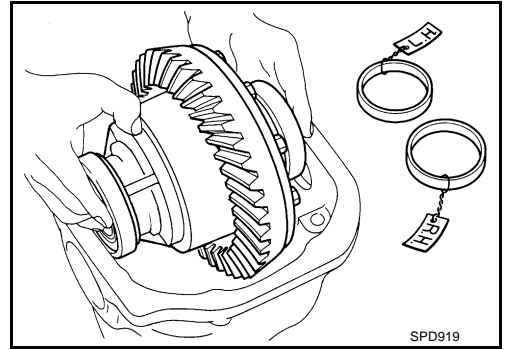
4. Lift differential case assembly out with Tool.

Tool number: HT72400000 (-)



REAR FINAL DRIVE ASSEMBLY

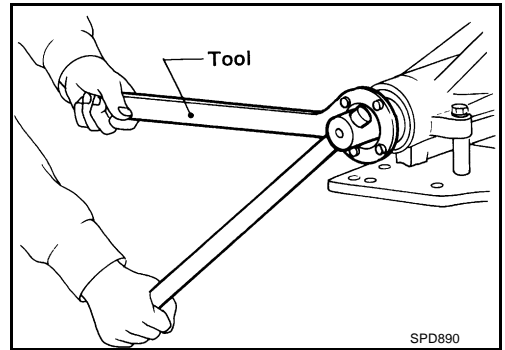
- Keep the side bearing outer races together with inner cone. Do not mix them up. Also, keep side bearing spacer and adjusting shims together with bearings.



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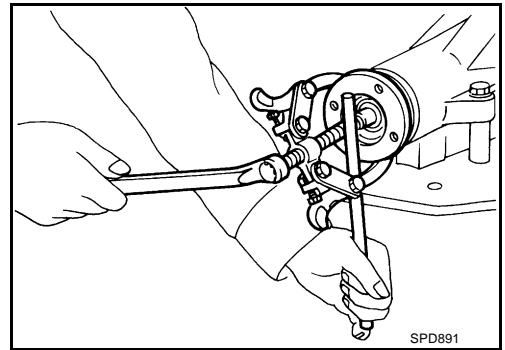
5. Loosen drive pinion nut and pull off companion flange.

Tool number: KV38104700 (J34311)



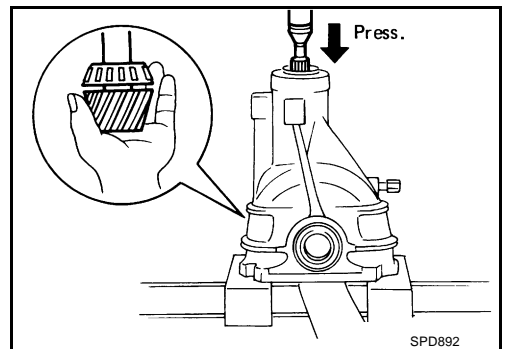
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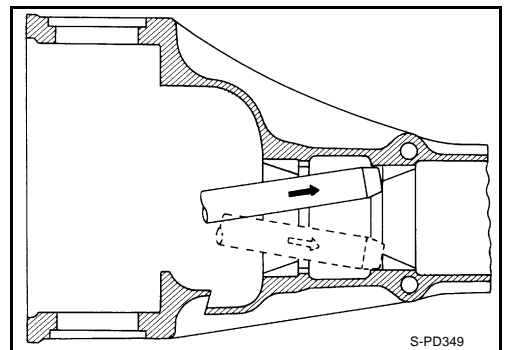
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6. Take out drive pinion (together with rear bearing inner race, bearing spacer and adjusting washer).
7. Remove oil seal.
8. Remove front bearing inner race.
9. Remove side oil seal.



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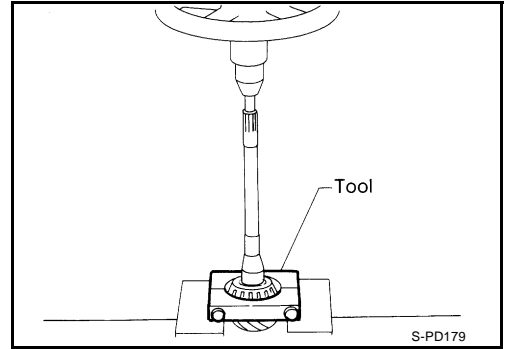
10. Remove pinion bearing outer races with a brass drift.



REAR FINAL DRIVE ASSEMBLY

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

Tool number: ST30031000 (J22912-01)



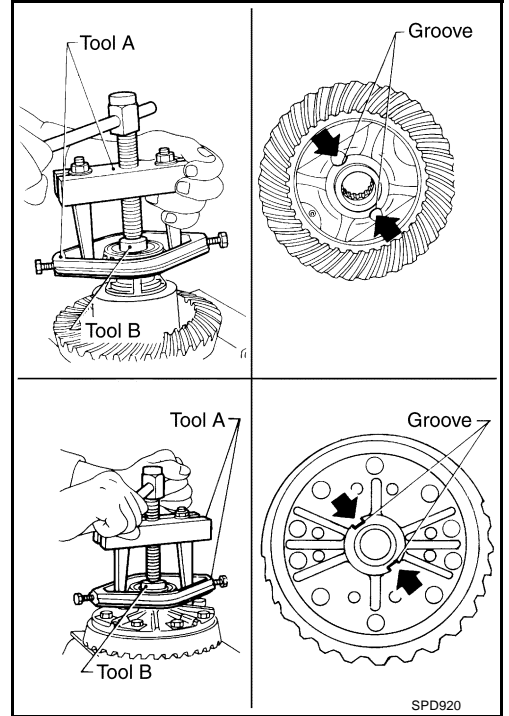
DIFFERENTIAL CASE

1. Remove side bearing inner cones.
To prevent damage to bearing, engage puller jaws in groove.

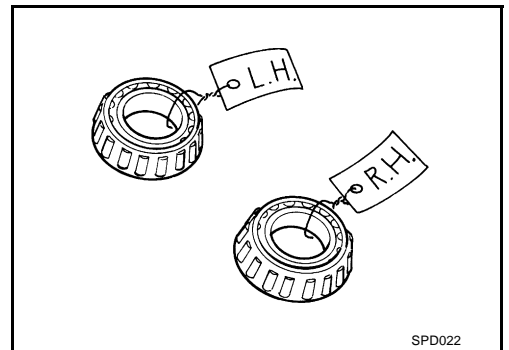
Tool number:

A ST3305S001 (-)

B ST33061000 (J8107-2)

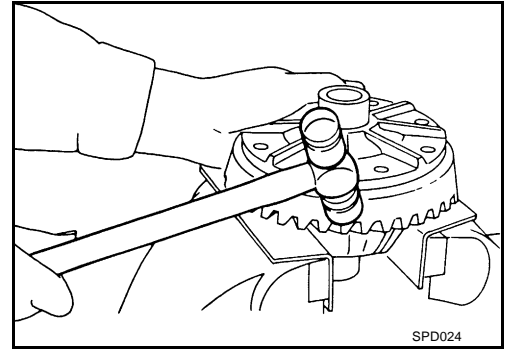


- Be careful not to confuse left- and right-hand parts.



REAR FINAL DRIVE ASSEMBLY

2. Loosen ring gear bolts in a criss-cross fashion.
3. Tap ring gear off the differential case with a soft hammer.
 - Tap evenly all around to keep ring gear from binding.



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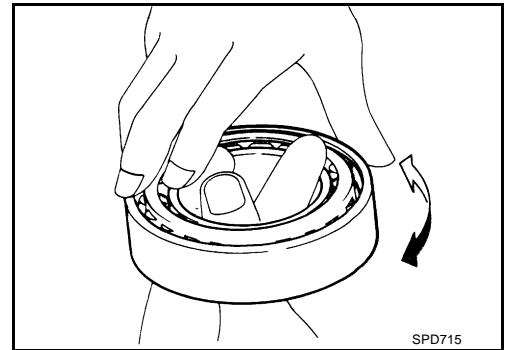
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Inspection CONTACT SURFACES

1. Clean the disassembled parts in suitable solvent and blow dry with compressed air.
2. If following surfaces are found to be burred or scratched, smooth with oil stone.
 - Differential case
 - Side gear
 - Pinion mate gear
 - Pinion mate shaft

BEARING

1. Thoroughly clean bearing.
2. Check bearings for wear, scratches, pitting or flaking. Check tapered roller bearing for smooth rotation. If damaged, replace outer race and inner cone as a set.



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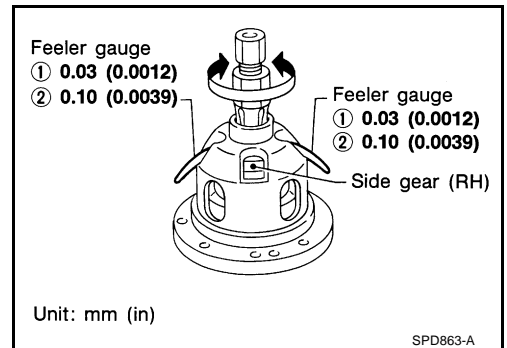
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Adjustment DIFFERENTIAL CASE

Thrust Washer Selection

Whenever side gears or pinion mate gears are replaced, select suitable thrust washers as follows:

1. Clean side gears and pinion mate gears using white gasoline.
2. Before assembling gears, apply hypoid gear oil to frictional surfaces.
3. Install the previously removed thrust washer on right side gear. On left side gear, install a suitable thrust washer. Temporarily tighten differential cases using two screws.
4. Position differential assembly so that right side gear is on the upper side. Place two feeler gauges of 0.03 mm (0.0012 in) thickness between right side gear and thrust washer as shown.
 - Do not place feeler gauge at groove side of differential case.
5. Also place a 0.03 mm (0.0012 in) additional feeler gauge between right side gear and thrust washer so that it is positioned diagonal to (180° apart from) the feeler gauge described previously.
6. Rotate right side gear with a suitable tool attached to splines. If hard to rotate, replace thrust washer on left side gear with a thinner one.
7. Replace both 0.03 mm (0.0012 in) feeler gauges with 0.10 mm (0.0039 in) gauges. At this point, make sure right side gear does not rotate. If it rotates, replace thrust washer on left side gear with a thicker one to prevent rotation.
8. As explained in above example, select suitable thrust washers to ensure that:



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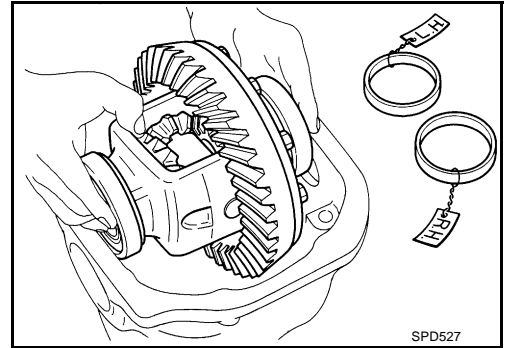
REAR FINAL DRIVE ASSEMBLY

- a. Both side gears rotate. [0.03 mm (0.0012 in) feeler gauges are used in this case.]
 - b. Side gear is held stationary. [0.10 mm (0.0039 in) gauges are used in this case.]
- For quiet and reliable final drive operation, the following five adjustments must be made correctly.
 1. Side bearing preload
 2. Pinion gear height
 3. Pinion bearing preload
 4. Ring gear to pinion backlash. Refer to [RFD-22, "Assembly"](#) .
 5. Ring and pinion gear tooth contact pattern

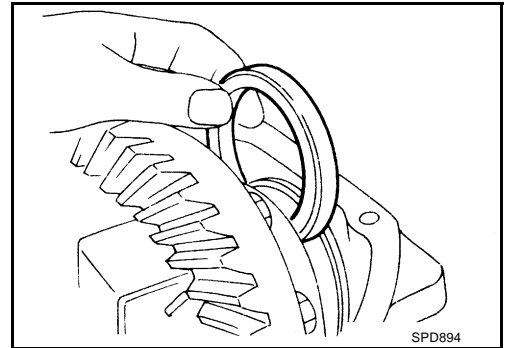
SIDE BEARING PRELOAD

- A selection of carrier side bearing preload shims is required for successful completion of this procedure.

1. Make sure all parts are clean. Also, make sure the bearings are well lubricated with light oil or DEXRON™ type automatic transmission fluid.
2. Place the differential carrier, with side bearings and bearing races installed, into the final drive housing.

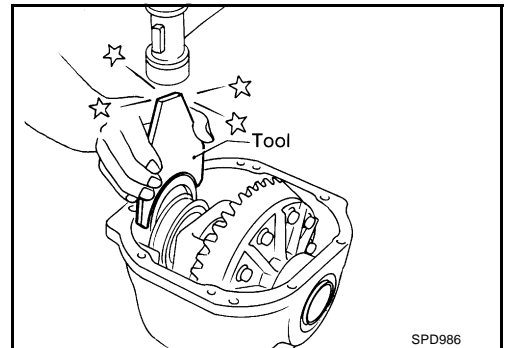


3. Put the side bearing spacer in place on the ring gear end of the carrier.



4. Use the J25267 side bearing spacer drift. Place original carrier side bearing preload shims on the carrier end, opposite the ring gear.

Tool number: KV38100600 (J25267)



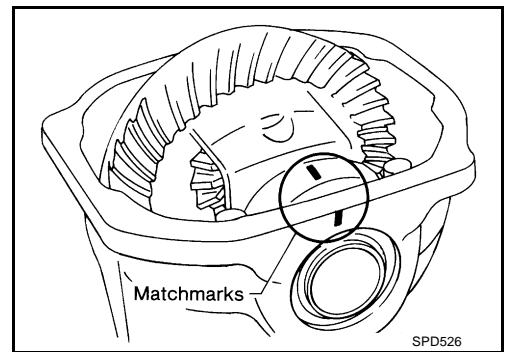
REAR FINAL DRIVE ASSEMBLY

5. Install the side bearing caps in their correct locations and torque the bearing cap retaining bolts.

Specification:

88-98 N-m (9-10 kg-m, 65-72 ft-lb)

6. Turn the carrier several times to seat the bearings.



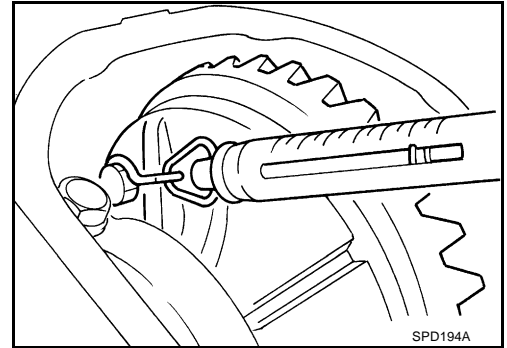
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RFD

7. Measure the turning torque of the carrier at the ring gear retaining bolts with a spring gauge, J-8129.

Specification:

**34.2-39.2 N (3.5-4 kg, 7.7-8.8 lb)
of pulling force at the ring gear bolt**

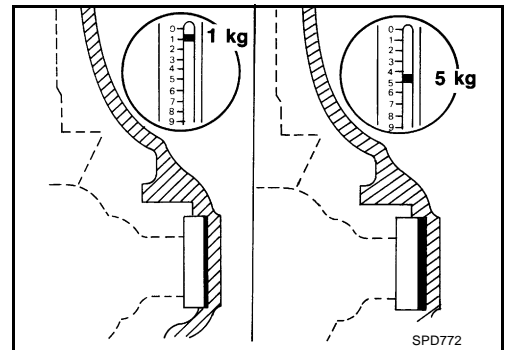


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8. If the turning torque is not within the specifications, correct the torque as follows:

- If the turning torque is less than the specified range, install washers of greater thickness.
- If the turning torque is greater than the specification, install thinner washers.
- See the SDS section for washer dimensions and part numbers.

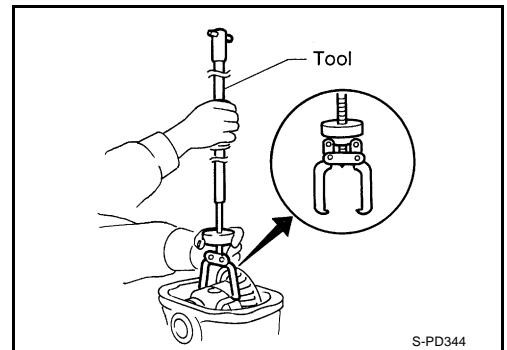
9. Record the total amount of washer thickness required for the correct carrier side bearing preload.



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10. Remove the carrier from the final drive housing. Save the selected preload washers for later use during the assembly of the final drive unit.

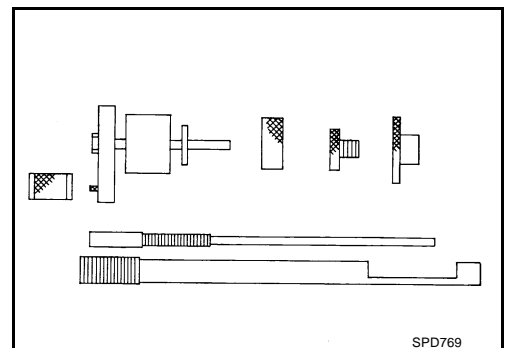
Tool number: HT72400000 (-)



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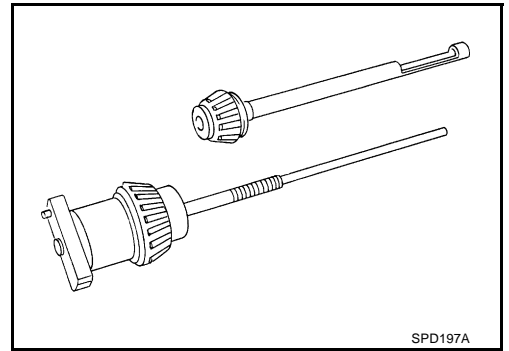
PINION GEAR HEIGHT AND PINION BEARING PRELOAD

1. Make sure all parts are clean and that the bearings are well lubricated.
2. Assemble the pinion gear bearings into the pinion preload shim selector Tool, J-34309.

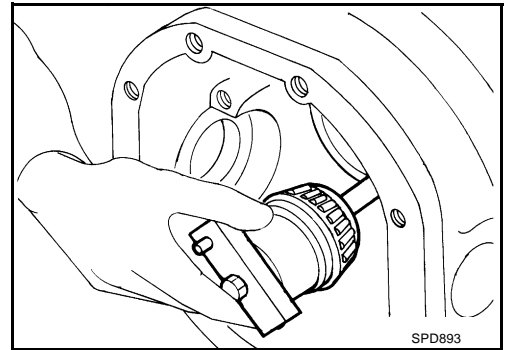


REAR FINAL DRIVE ASSEMBLY

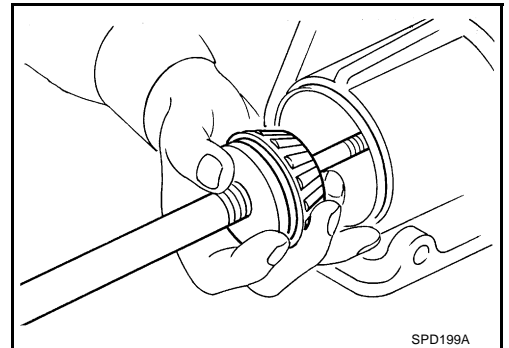
- Front pinion bearing; make sure the J-34309-3 front pinion bearing seat is secured tightly against the J-34309-2 gauge anvil. Then turn the front pinion bearing pilot, J-34309-5, to secure the bearing in its proper position.
- Rear pinion bearing; the rear pinion bearing pilot, J-34309-8, is used to center the rear pinion bearing only. The rear pinion bearing locking seat, J-34309-4, is used to lock the bearing to the assembly.
- Installation of J-34309-9 and J-34309-16; place a suitable 2.5 mm (0.098 in) thick plain washer between J-34309-9 and J-34309-16. Both surfaces of J-34309-9 and J-34309-16 must be parallel with a clearance of 2.5 mm (0.098 in).



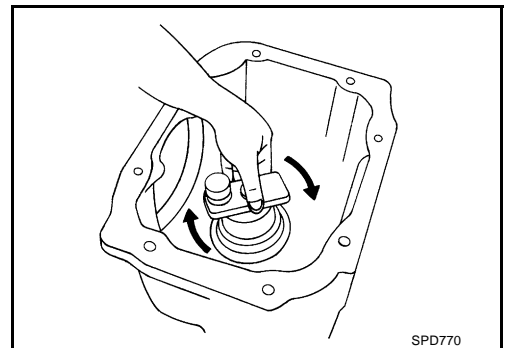
3. Install the pinion rear bearing inner cone into the final drive housing. Then place the pinion preload shim selector Tool, J34309-1, gauge screw assembly.



4. Assemble the front pinion bearing inner cone and the J34309-2 gauge anvil. Assemble them together with the J34309-1 gauge screw in the final drive housing. Make sure that the pinion height gauge plate, J34309-16, will turn a full 360 degrees. Tighten the two sections together by hand.



5. Turn the assembly several times to seat the bearings.

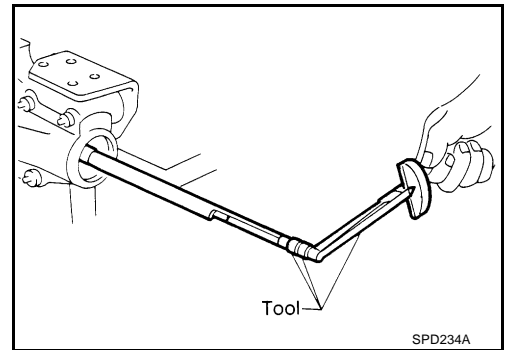


REAR FINAL DRIVE ASSEMBLY

6. Measure the turning torque at the end of the J-34309-2 gauge anvil using torque wrench J-25765A.

Turning torque specification:

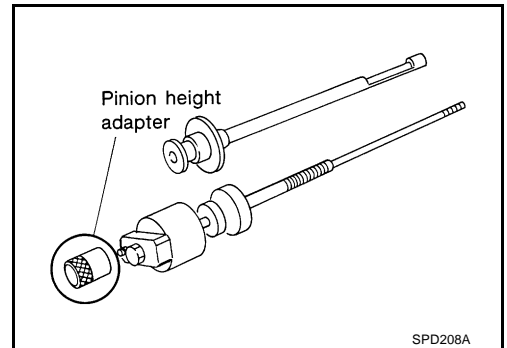
1.0-1.3 N-m(10-13 kg-cm, 8.7-11.3 in-lb)



7. Place the J-34309-11 "R200A" pinion height adapter onto the gauge plate and tighten it by hand.

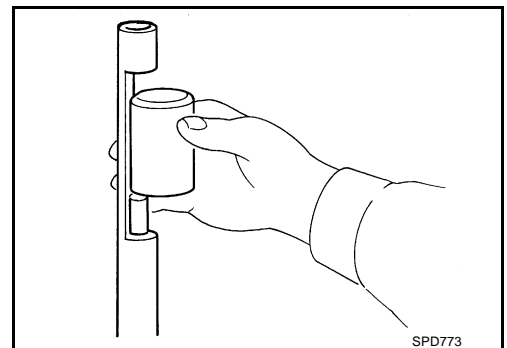
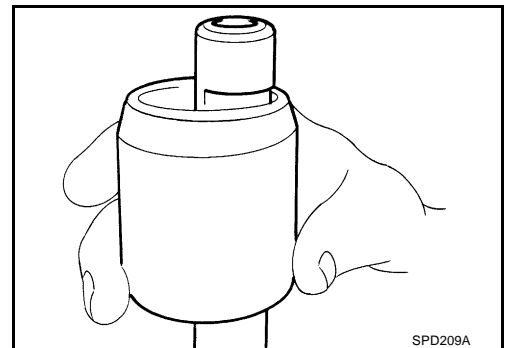
CAUTION:

Make sure all machined surfaces are clean.



Pinion Bearing Preload Washer Selection

1. Place the solid pinion bearing spacer, small end first, over the J34309-2 gauge anvil. Seat the small end squarely against the tip of the J34309-1 gauge screw in the tool recessed portion.



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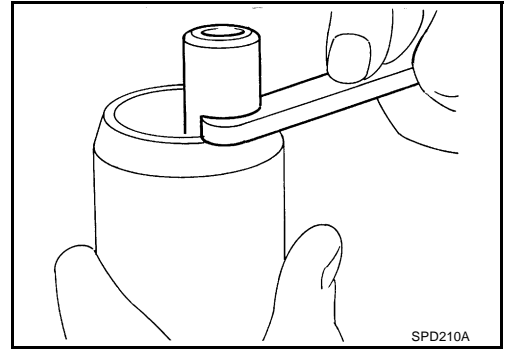
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REAR FINAL DRIVE ASSEMBLY

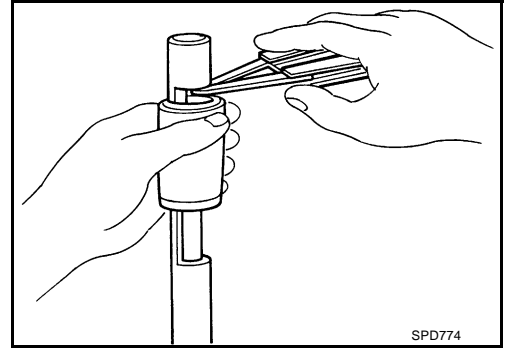
2. Select the correct thickness of pinion bearing preload adjusting washer. Select by using a standard gauge of 3.5 mm (0.138 in) and your J34309-101 feeler gauge. The exact measure you get with your gauges is the thickness of the adjusting washer required. Select the correct washer as follows.

Drive pinion bearing preload adjusting washer:

Refer to [RFD-27, "SERVICE DATA"](#).

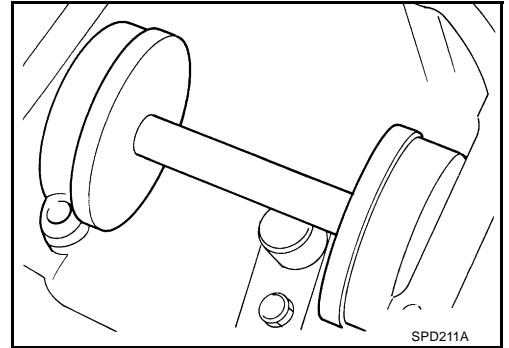


3. Set aside the selected correct pinion bearing preload adjusting washer. Use it when assembling the pinion gear and bearings into the final drive.

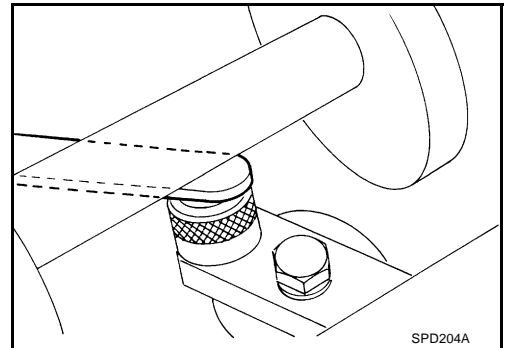


Pinion Height Adjusting Washer Selection

1. Now, position the side bearing discs, J-25269-4, and arbor firmly into the side bearing bores. Install the side bearing caps and tighten the cap bolts to proper torque.

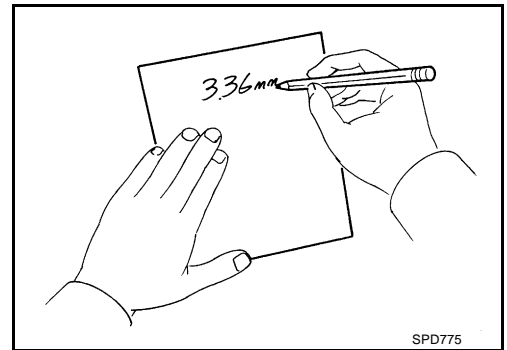


2. Select the correct standard pinion height adjusting washer thickness. Select by using a standard gauge of 3 mm (0.12 in) and your J34309-101 feeler gauge. Measure the distance between the J-34309-11 pinion height adapter including the standard gauge and the arbor.



REAR FINAL DRIVE ASSEMBLY

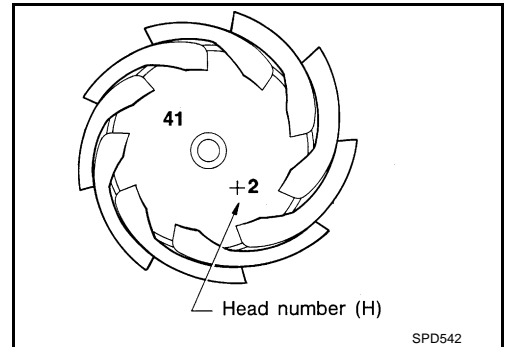
3. Write down your exact measurement (the value of feeler gauge).



4. Correct the pinion height washer size by referring to the “pinion head number”.

There are two numbers painted on the pinion gear. The first one refers to the pinion and ring gear as a matched set. This number should be the same as the number on the ring gear. The second number is the “pinion head height number”. It refers to the ideal pinion height from standard for quietest operation. Use the following chart to determine the correct pinion height washer.

Pinion head height number	Add or remove from the standard pinion height washer thickness measurement
- 6	Add 0.06 mm (0.0024 in)
- 5	Add 0.05 mm (0.0020 in)
- 4	Add 0.04 mm (0.0016 in)
- 3	Add 0.03 mm (0.0012 in)
- 2	Add 0.02 mm (0.0008 in)
- 1	Add 0.01 mm (0.0004 in)
0	Use the selected washer thickness
+1	Subtract 0.01 mm (0.0004 in)
+2	Subtract 0.02 mm (0.0008 in)
+3	Subtract 0.03 mm (0.0012 in)
+4	Subtract 0.04 mm (0.0016 in)
+5	Subtract 0.05 mm (0.0020 in)
+6	Subtract 0.06 mm (0.0024 in)

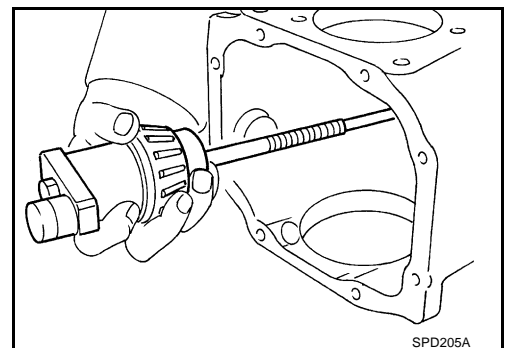


5. Select the correct pinion height washer as follows.

Drive pinion height adjusting washer:

Refer to [RFD-27, "SERVICE DATA"](#) .

6. Remove the J34309 pinion preload shim selector Tool from the final drive housing. Then disassemble to retrieve the pinion bearings.



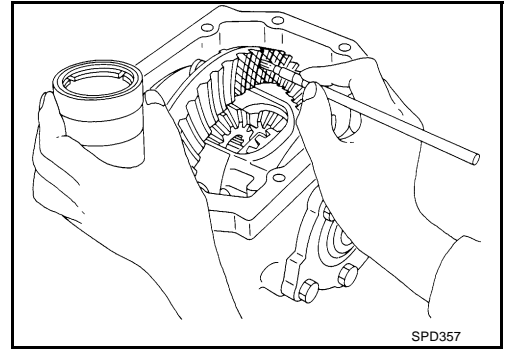
TOOTH CONTACT

Checking gear tooth contact pattern is necessary to verify correct relationship between ring gear and drive pinion.

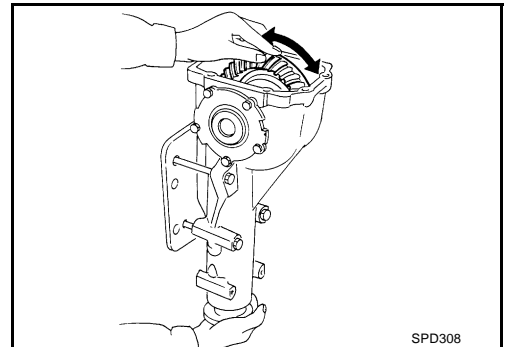
Hypoid gears which are not positioned in proper arrangement may be noisy and/or have a short life. Check gear tooth contact pattern to obtain the best contact for low noise and long life.

REAR FINAL DRIVE ASSEMBLY

1. Thoroughly clean ring gear and drive pinion teeth.
2. Lightly apply a mixture of powdered ferric oxide and oil or the equivalent. Apply it to 3 or 4 teeth of ring gear drive side.

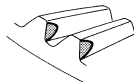


3. Hold companion flange steady by hand and rotate the ring gear in both directions.

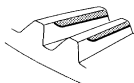


Usually the pattern will be correct if shims are correctly calculated and the backlash is correct. However, in rare cases, trial and error processes may be employed to obtain a correct pattern. The tooth pattern is the best indication of how well a differential has been set up.

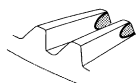
Heel contact



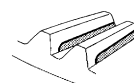
Face contact



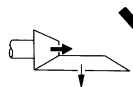
Toe contact



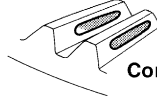
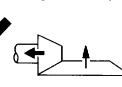
Flank contact



To correct, increase thickness of pinion height adjusting washer in order to bring drive pinion close to ring gear.



To correct, reduce thickness of pinion height adjusting washer in order to make drive pinion go away from ring gear.



Correct tooth contact

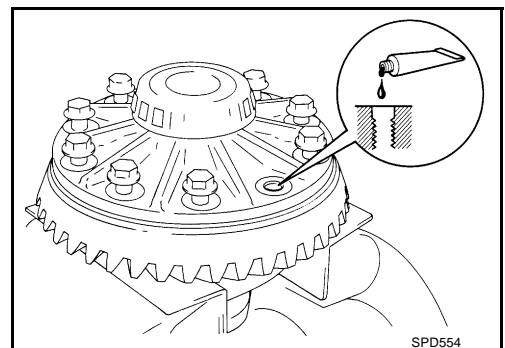
When adjustment is completed, be sure to wipe off completely the ferric oxide and oil or their equivalent.

SPD007-B

Assembly

1. Place differential case on ring gear.
2. Apply locking sealant (Three Bond TB1324 Part No.999 - AM005P or equivalent) to ring gear bolts, and install them.

Tighten bolts in a criss-cross fashion, lightly tapping bolt head with a hammer.



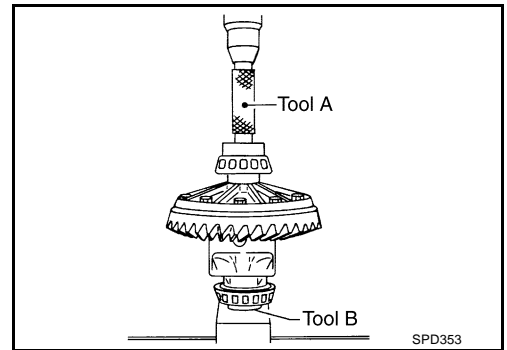
REAR FINAL DRIVE ASSEMBLY

3. Press-fit side bearing inner cones on differential case with Tool.

Tool number:

A KV38100300 (J25523)

B ST33061000 (J8107-2)



4. Press-fit front and rear bearing outer races with Tools.

Tool number:

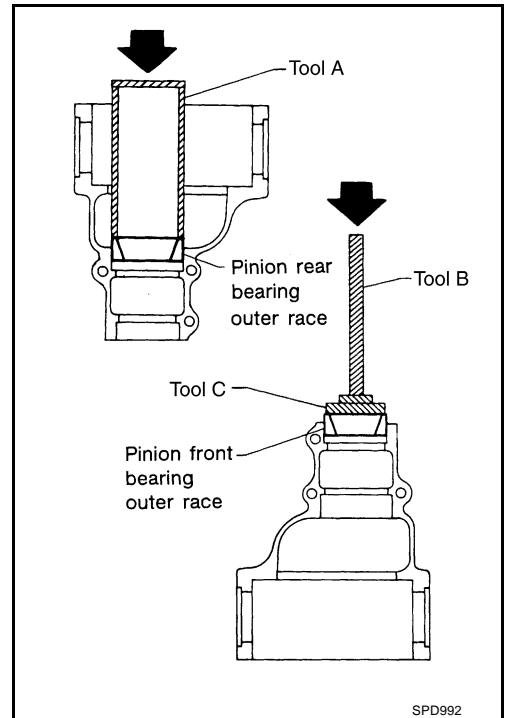
A Suitable tool

B ST30611000 (J25742-1)

C ST30613000 (J25742-3)

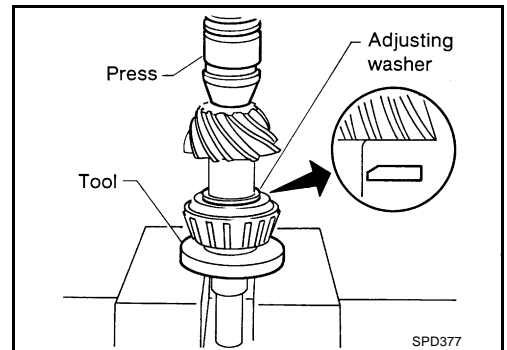
5. Select pinion bearing adjusting washer and drive pinion bearing spacer.

Refer to [RFD-15, "Adjustment"](#) .

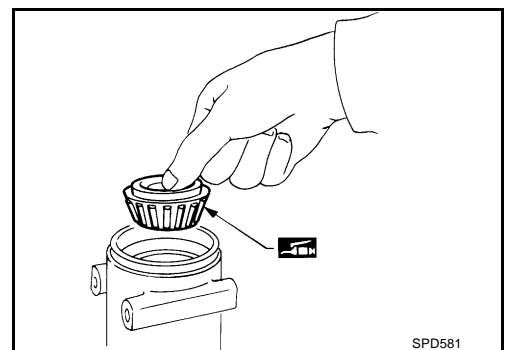


6. Install selected drive pinion height adjusting washer in drive pinion. Using press and Tool, press-fit pinion rear bearing inner cone into it.

Tool number: ST30901000 (-)



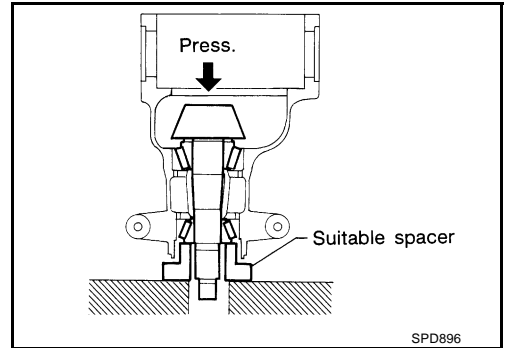
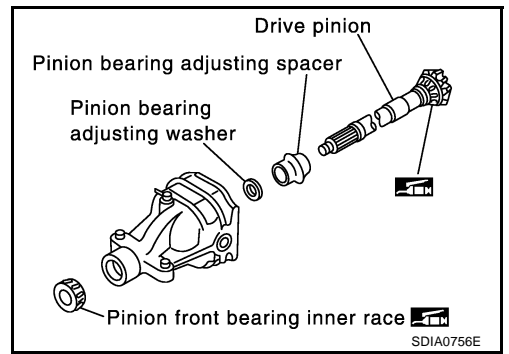
7. Place pinion front bearing inner cone in final drive housing.



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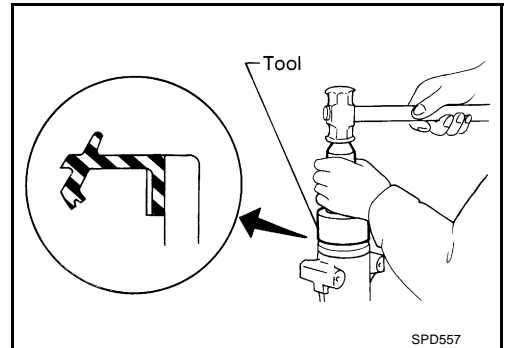
REAR FINAL DRIVE ASSEMBLY

8. Set drive pinion assembly (as shown in figure) in differential carrier and install drive pinion, with press and suitable tool. Stop when drive pinion touches bearing. Apply multi-purpose grease to pinion rear bearing inner race and pinion front bearing inner race.



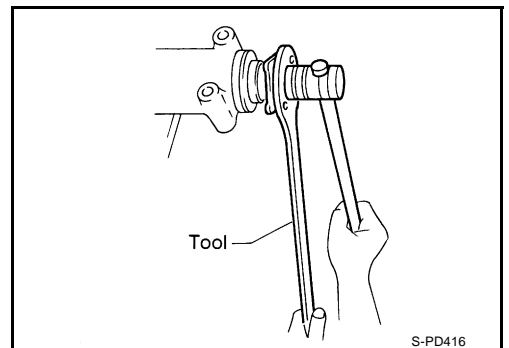
9. Install front oil seal with Tool.

Tool number: KV38100500 (-)



10. Install companion flange, and tighten pinion nut to specified torque with Tool. Ascertain that threaded portion of drive pinion and pinion nut are free from oil or grease.

Tool number: KV38104700 (J34311)



REAR FINAL DRIVE ASSEMBLY

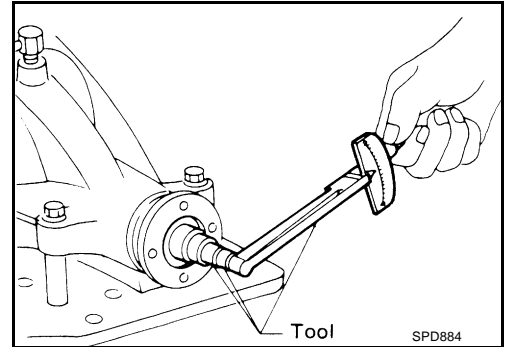
- Turn drive pinion in both directions several times, and measure pinion bearing preload.

Tool number: ST3127S000 (See J25765-A)

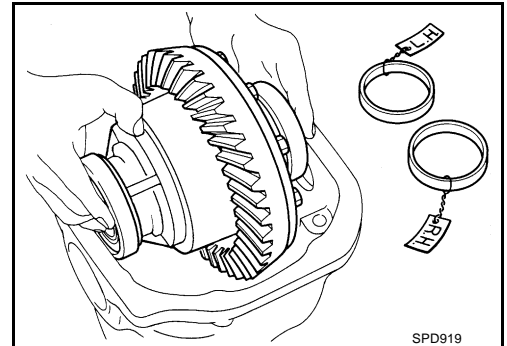
Pinion bearing preload:

1.8 - 2.3 N-m (18 - 24 kg-cm, 16 - 20 in-lb)

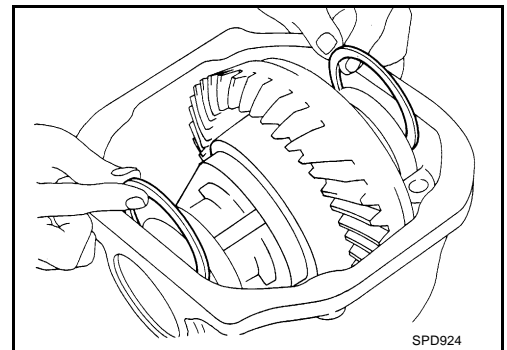
When pinion bearing preload is outside specifications, replacement is required for pinion bearing adjusting washer and spacer. Replace with those of different thickness.



- Select side bearing adjusting washer. Refer to [RFD-15, "Adjustment"](#).
- Install differential case assembly with side bearing outer races into gear carrier.

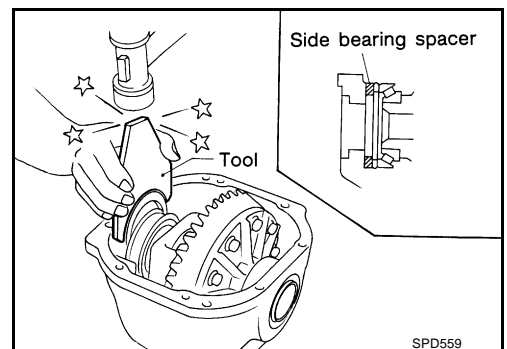


- Insert left and right side bearing adjusting washers in place between side bearings and carrier.

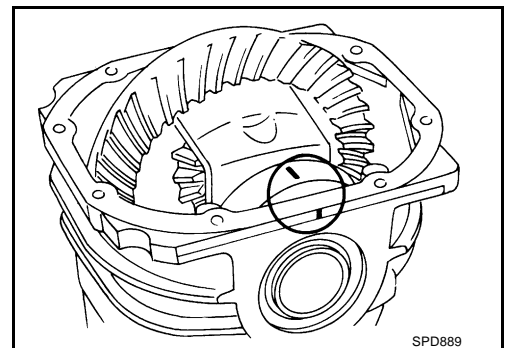


- Drive in side bearing spacer with Tool.

Tool number: KV38100600 (J25267)



- Align mark on bearing cap with that on gear carrier and install bearing cap on gear carrier.



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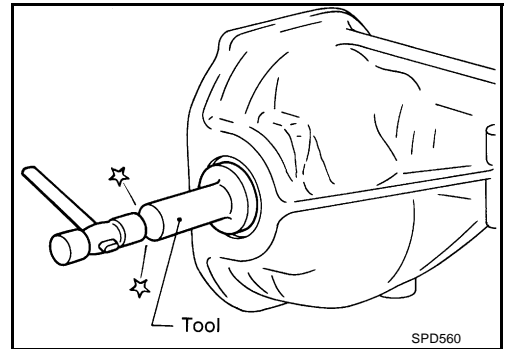
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REAR FINAL DRIVE ASSEMBLY

17. Install side oil seal.

Tool number: KV38100200 (J26233)

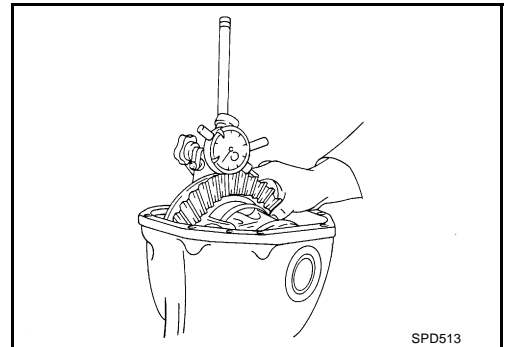


18. Measure ring gear-to-drive pinion backlash with a dial indicator.

Ring gear backlash:
0.10-0.15 mm (0.0039-0.0059 in)

- If backlash is too small, adjustment of shim thickness is required. Decrease thickness of left shim and increase thickness of right shim by the same amount. If backlash is too great, reverse the above procedure.

Never change the total amount of shims as it will change the bearing preload.



19. Check total preload with Tool.

Tool number: ST3127S000 (See J25765-A)

When checking preload, turn drive pinion in both directions several times to seat bearing rollers correctly.

Total preload:
2.0-2.8 N-m (20-29 kg-cm, 18-25 in-lb)

- If preload is too great, remove the same amount of shim to each side.
- If preload is too small, add the same amount of shim to each side.

Never add or remove a different number of shims for each side. Difference in number of shims will change ring gear to drive pinion backlash.

20. Recheck ring gear to drive pinion backlash. Increase or decrease in thickness of shims will cause change to ring gear to pinion backlash.

- Check whether the backlash varies excessively in different places. Foreign matter may be caught between the ring gear and the differential case causing the trouble.
- The backlash can vary greatly even when the ring gear runout is within a specified range. In that case, replace the hypoid gear set or differential case.

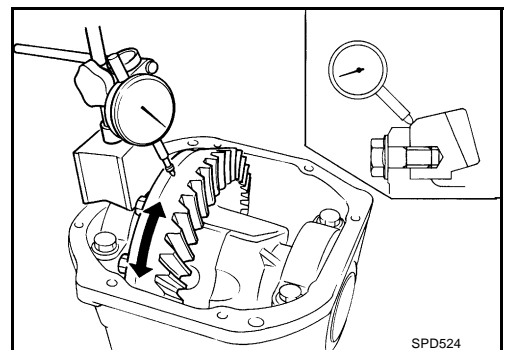
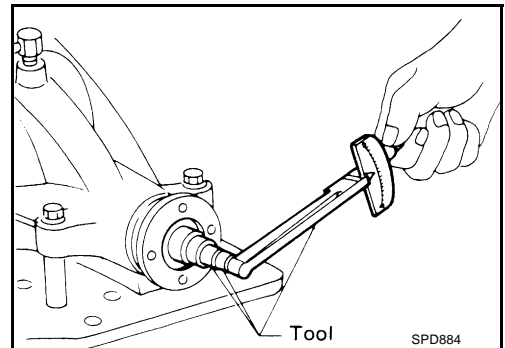
21. Check runout of ring gear with a dial indicator.

Runout limit: 0.05 mm (0.0020 in)

22. Check tooth contact.

Refer to [RFD-15, "Adjustment"](#)

23. Install rear cover and gasket.



SERVICE DATA

SERVICE DATA

PFP:00030

Ring Gear Runout

EDS000BA

Type	R200
Ring gear runout limit mm(in)	0.05 (0.0020)

Side Gear Adjustment

EDS000BB

Type	R200
Clearance limit between side gear and differential case mm(in)	0.15 (0.0059)

AVAILABLE SIDE GEAR THRUST WASHERS

Unit: mm (in)

Type	R200	
	Thickness	Part number
Thrust washer	0.75 (0.0295)	38424 0C000
	0.78 (0.0307)	38424 0C001
	0.81 (0.0319)	38424 0C002
	0.84 (0.0331)	38424 0C003
	0.87 (0.0343)	38424 0C004
	0.90 (0.0350)	38424 0C005
	0.93 (0.0366)	38424 0C006

Drive Pinion Height Adjustment

EDS000BD

AVAILABLE PINION HEIGHT ADJUSTING WASHERS

Unit: mm (in)

Type	R200			
	Thickness	Part number	Thickness	Part number
Adjusting washer	3.05 (0.1201)	38154 0C000	3.35 (0.1319)	38154 0C010
	3.08 (0.1213)	38154 0C001	3.38 (0.1331)	38154 0C011
	3.11 (0.1224)	38154 0C002	3.41 (0.1343)	38154 0C012
	3.14 (0.1236)	38154 0C003	3.44 (0.1354)	38154 0C013
	3.17 (0.1248)	38154 0C004	3.47 (0.1366)	38154 0C014
	3.20 (0.1260)	38154 0C005	3.50 (0.1378)	38154 0C015
	3.23 (0.1272)	38154 0C006		
	3.26 (0.1283)	38154 0C007		
	3.29 (0.1295)	38154 0C008		
	3.32 (0.1307)	38154 0C009		

Drive Pinion Preload Adjustment

EDS000BE

Type	R200
Drive pinion preload	2.6 - 3.1N-m (0.26 - 0.32 kg-m, 23 - 27 in-lb)

Side Bearing Preload Adjustment

EDS000BF

Type	R200
Side bearing preload	0.20 - 0.52 N-m (0.02 - 0.05 kg-m, 2 - 4 in-lb)

SERVICE DATA

SIDE BEARING PRELOAD ADJUSTING WASHERS

Unit: mm (in)

Type	R200			
Adjusting washer	Thickness	Part number	Thickness	Part number
	2.00 (0.0787)	38453 N3100	2.35 (0.0925)	38453 N3107
	2.05 (0.0807)	38453 N3101	2.40 (0.0945)	38453 N3108
	2.10 (0.0827)	38453 N3102	2.45 (0.0965)	38453 N3109
	2.15 (0.0846)	38453 N3103	2.50 (0.0984)	38453 N3110
	2.20 (0.0866)	38453 N3104	2.55 (0.1004)	38453 N3111
	2.25 (0.0886)	38453 N3105	2.60 (0.1024)	38453 N3112
	2.30 (0.0906)	38453 N3106	2.65 (0.1043)	38453 N3113

Total Preload Adjustment

EDS000BG

Type	R200
Total preload with front oil seal	2.0 - 2.8 N-m (0.20 - 0.29 kg-m, 18 - 25 in-lb)
Drive pinion to ring gear backlash	0.10 - 0.15 mm (0.0040 - 0.0059 in)