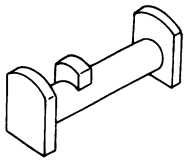
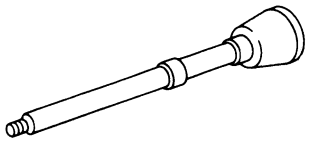
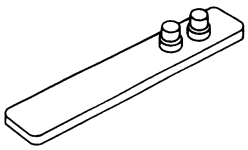
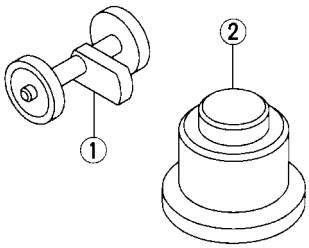
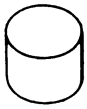
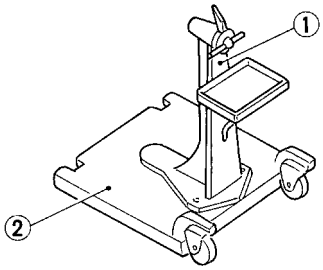
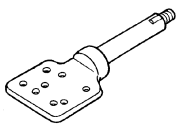
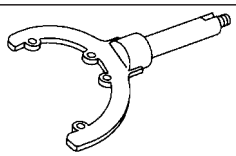
PROPELLER SHAFT & DIFFERENTIAL CARRIER

SECTION PD

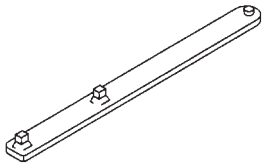
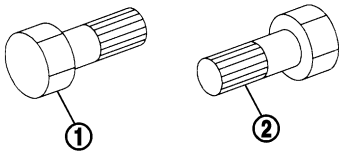
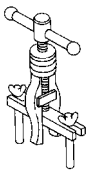
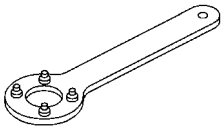
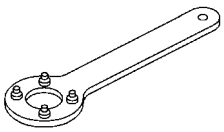
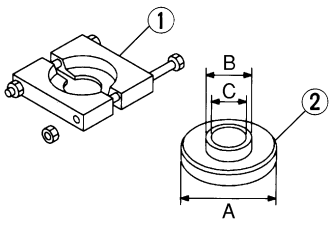
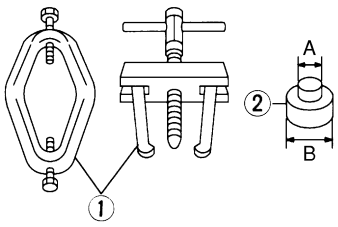
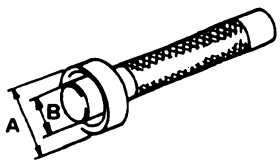
CONTENTS

SPECIAL SERVICE TOOLS

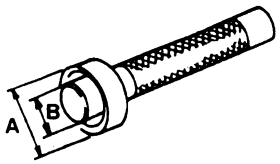
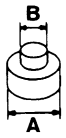
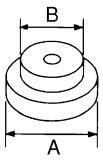
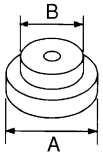
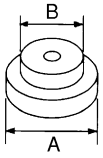
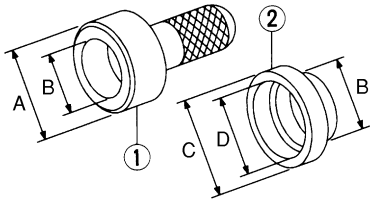
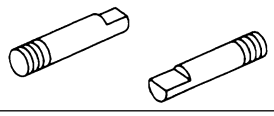
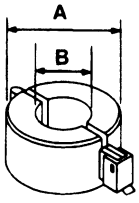
*: Special tool or commercial equivalent

Tool number Tool name	Description		Unit application	
			R180A	H233B
ST31211000 Height gauge		Selecting pinion height adjusting washer	X	—
ST31212000 Dummy shaft		Selecting pinion height adjusting washer	X	—
ST31852000 Stopper		Selecting pinion height adjusting washer	X	—
ST3125S000 Drive pinion height setting gauge set ① ST31251000 Drive pinion height gauge ② ST31181001 Dummy shaft		Selecting pinion height adjusting washer	—	X
ST32501000 Weight block		Selecting side bearing adjusting shim	X	—
KV38101900 Master gauge [20.0 mm (0.787 in)]		Selecting side bearing adjusting shim	X	—
ST0501S000 Engine stand ① ST05011000 Engine stand ② ST05012000 Base		Mounting differential attachment	X	X
KV38100800 Differential attachment		Mounting final drive	X	—
ST06340000 Differential attachment		Mounting final drive	—	X

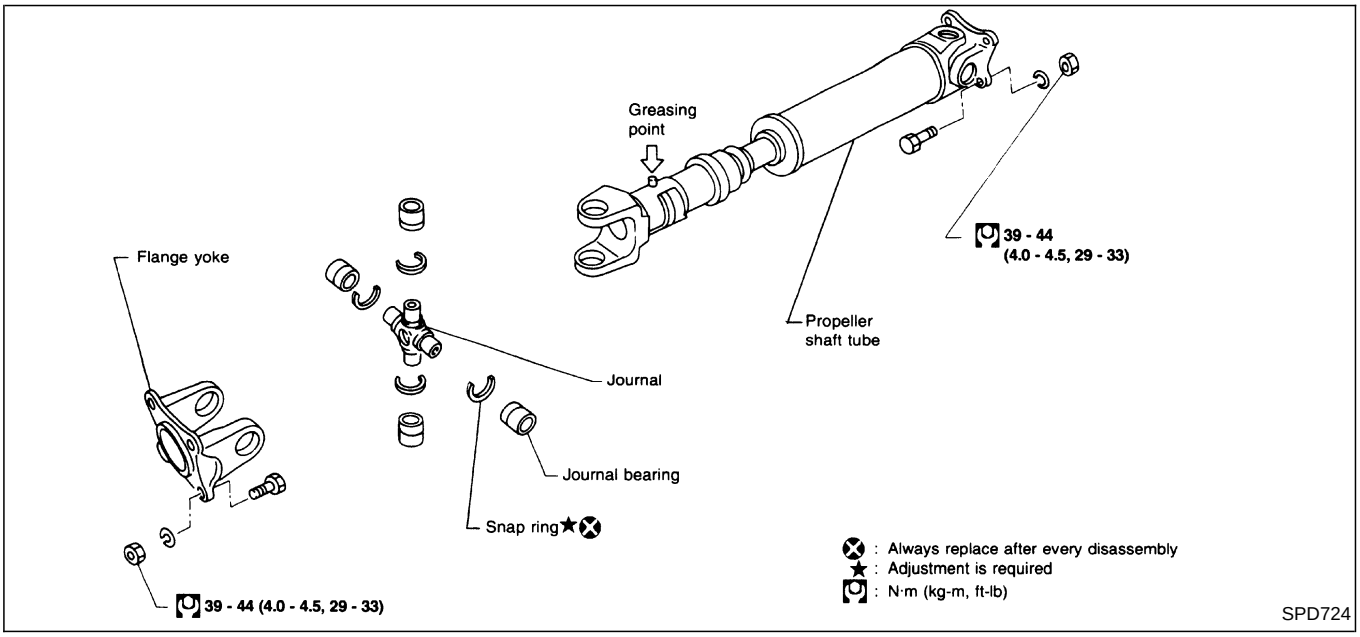
*: Special tool or commercial equivalent

Tool number Tool name	Description		Unit application	
			R180A	H233B
ST32580000 Diff. side bearing adjusting nut wrench		Adjusting side bearing preload and back-lash (ring gear drive pinion)	—	X
KV381052S0 Rear axle shaft dummy ① KV38105210 Torque wrench side ② KV38105220 Vice side		Checking differential torque on limited slip differential	—	X
ST33290001* Side bearing outer race puller		Removing side bearing outer race and side oil seal	X	—
ST38060002* Drive pinion flange wrench		Removing and installing propeller shaft lock nut, and drive pinion lock nut	X	—
KV38104700* Drive pinion flange wrench		Removing and installing propeller shaft lock nut, and drive pinion lock nut	—	X
ST3090S000* Drive pinion rear inner race puller set ① ST30031000 Puller ② ST30901000* Base		Removing and installing drive pinion rear inner cone **A: 79 mm (3.11 in) dia.** **B: 45 mm (1.77 in) dia.** **C: 35 mm (1.38 in) dia.**	X	X
ST3306S001 Diff. side bearing puller set ① ST33051001* Body ② ST33061000* Adapter		Removing and installing differential side bearing inner cone **A: 28.5 mm (1.122 in) dia.** **B: 38 mm (1.50 in) dia.**	X	X
ST33230000* Diff. side bearing drift		Installing side bearing inner cone **A: 51 mm (2.01 in) dia.** **B: 28.5 mm (1.122 in) dia.**	X	—

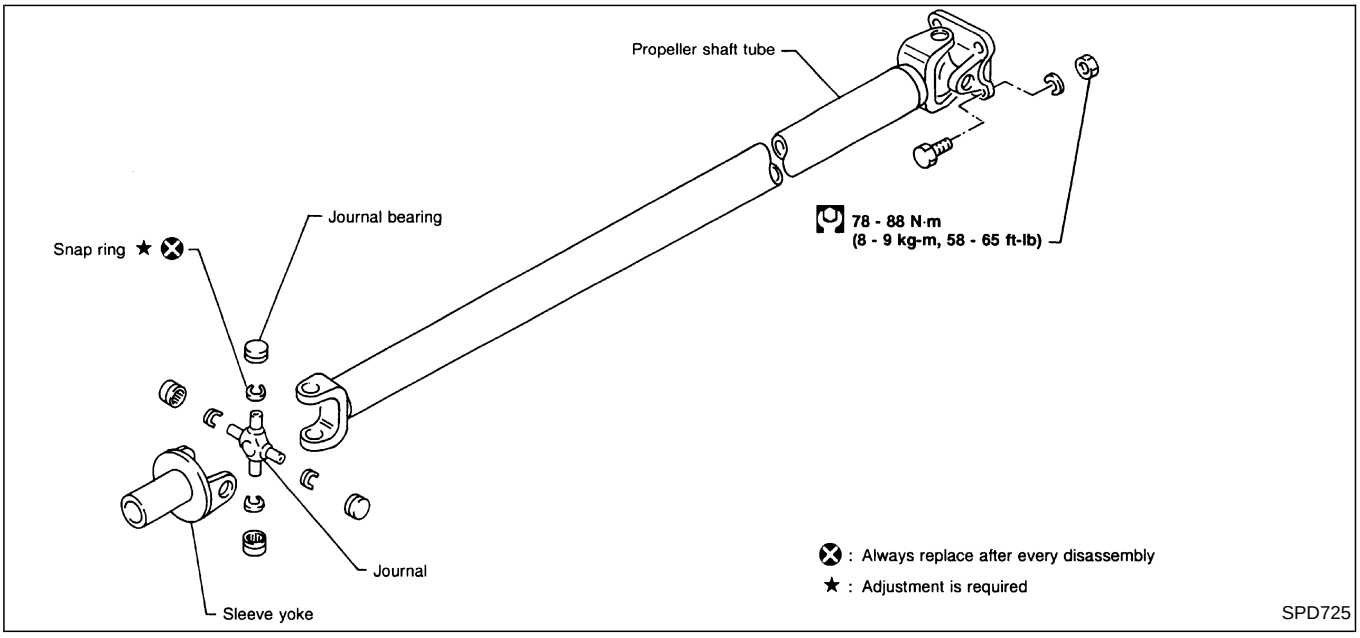
*: Special tool or commercial equivalent

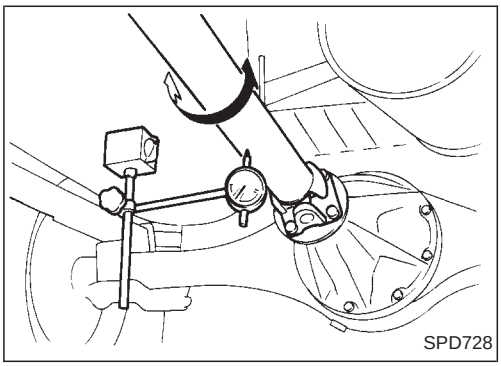
Tool number Tool name	Description		Unit application	
			R180A	H233B
ST33190000* Diff. side bearing drift		Installing side bearing inner cone **A: 52 mm (2.05 in) dia.** **B: 34 mm (1.34 in) dia.**	—	X
ST33081000* Side bearing puller adapter		Installing side bearing inner cone **A: 43 mm (1.69 in) dia.** **B: 33.5 mm (1.319 in) dia.**	—	X
ST30611000* Drift		Installing pinion rear bearing outer race	X	X
ST30621000* Drift		Installing pinion rear bearing outer race **A: 79 mm (3.11 in) dia.** **B: 59 mm (2.32 in) dia.**	X	X
ST30701000* Drift		Installing pinion front bearing outer race **A: 61.5 mm (2.421 in) dia.** **B: 41 mm (1.61 in) dia.**	X	—
ST30613000* Drift		Installing pinion front bearing outer race **A: 71.5 mm (2.815 in) dia.** **B: 47.5 mm (1.870 in) dia.**	—	X
KV381025S0* Oil seal fitting tool ① ST30720000 Drift bar ② KV38102510 Drift		Installing front oil seal **A: 77 mm (3.03 in) dia.** **B: 55 mm (2.17 in) dia.** **C: 71 mm (2.80 in) dia.** **D: 65 mm (2.56 in) dia.**	X	X
ST33720000 Diff. side retainer guide		Installing side retainer	X	—
ST33270000 Side oil seal drift		Installing side oil seal **A: 62 mm (2.44 in) dia.** **B: 28 mm (1.10 in) dia.**	X	—

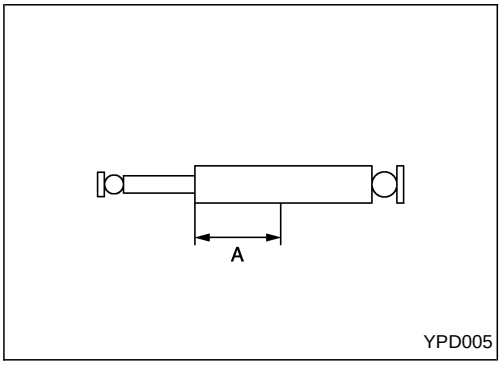
Front propeller shaft (Model 0F71H)



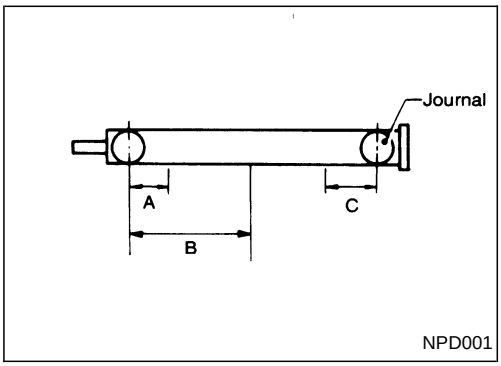
Rear propeller shaft (Model 2S80B)



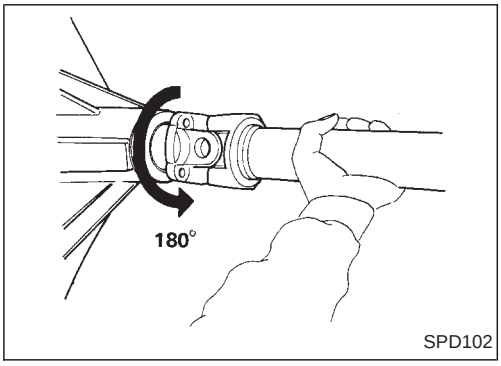

SPD728



YPD005



NPD001



SPD102

On-Vehicle Service

PROPELLER SHAFT VIBRATION

If vibration is present at high speed, inspect propeller shaft runout first.

1. Raise rear wheels.
2. Measure propeller shaft runout at points indicated below by rotating final drive companion flange by hand.

Front propeller shaft

Unit: mm (in)

Propeller shaft model	0F71H
Measuring point A	126 (4.96)

Rear propeller shaft

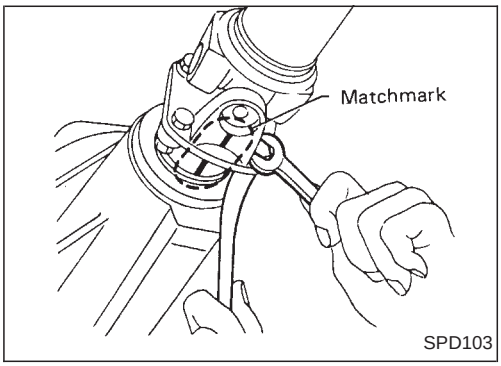
Unit: mm (in)

Propeller shaft model	2S80B
	H233B
Measuring point	
A	280 (11.02)
B	475 (18.70)
C	280 (11.02)

3. If runout exceeds specifications, disconnect propeller shaft at final drive companion flange; then rotate companion flange 180 degrees and reconnect propeller shaft.
   Runout limit: 0.6 mm (0.024 in)
4. Check runout again. If runout still exceeds specifications, replace propeller shaft assembly.
5. Perform road test.

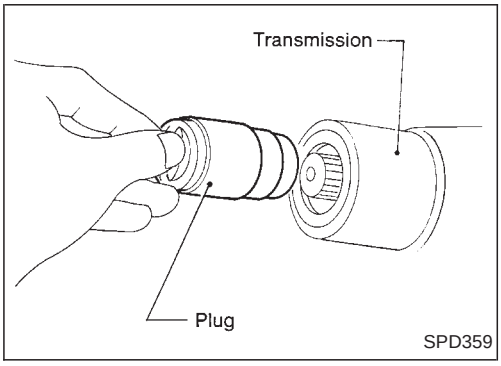
APPEARANCE CHECKING

- Inspect propeller shaft tube surface for dents or cracks. If damaged, replace shaft assembly.
- If center is noisy or damaged, replace center bearing.

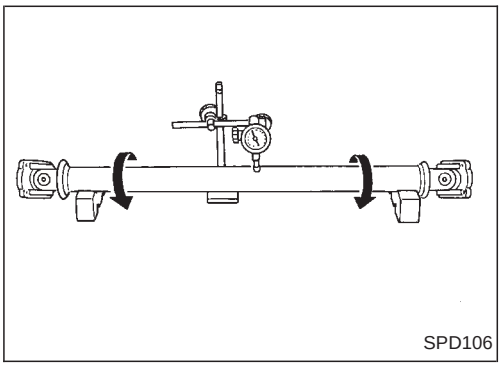


Removal and Installation

- Put match marks on flanges and separate propeller shaft from final drive.

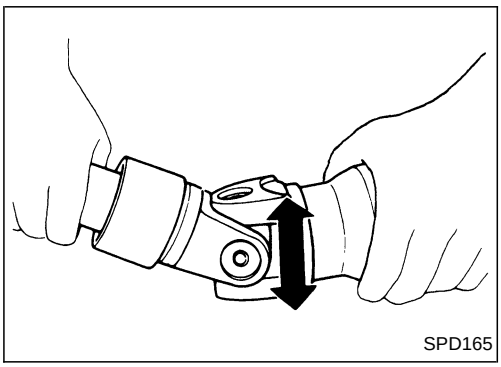


- Draw out propeller shaft from transmission and plug up rear end of transmission rear extension housing.

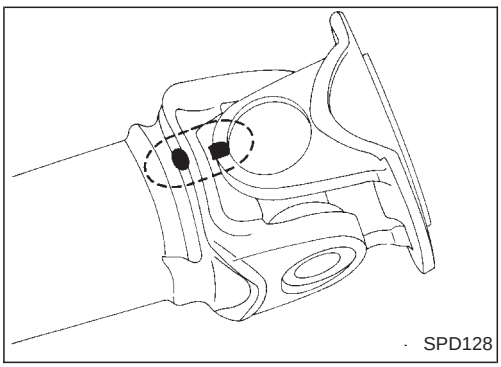


Inspection

- Inspect propeller shaft runout. If runout exceeds specifications, replace propeller shaft assembly.
  Runout limit:
  0.6 mm (0.024 in)



- Inspect journal axial play. If the play exceeds specifications, replace propeller shaft assembly.
  Journal axial play:
  0.2 mm (0.008 in) or less

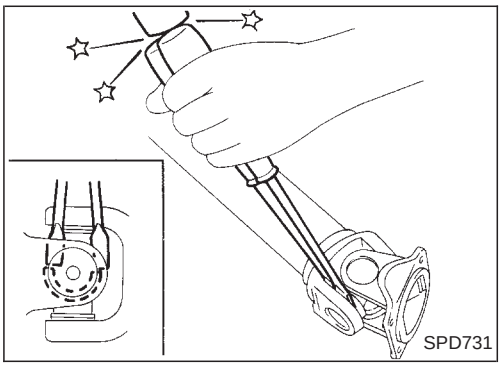


Disassembly

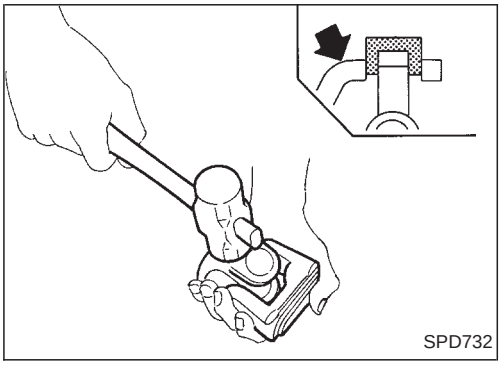
JOURNAL

1. Put match marks on shaft and flange or yoke.

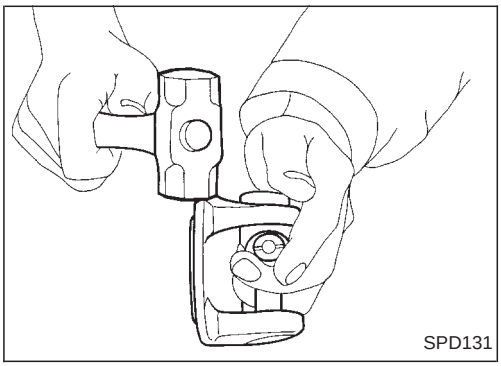
Disassembly (Cont'd)


SPD731

2. Remove snap ring.


SPD732

3. Remove pushed out journal bearing by lightly tapping yoke with a hammer, taking care not to damage journal and yoke hole.

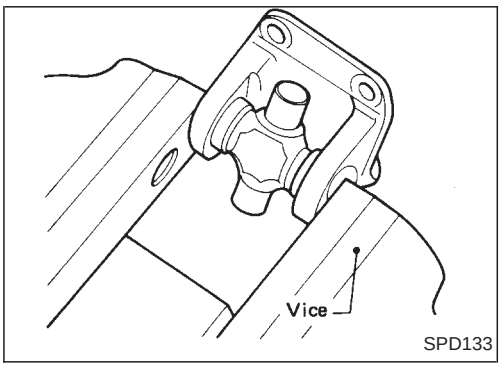

SPD131

4. Remove bearing at opposite side in above operation.

Put marks on disassembled parts so that they can be reinstalled in their original positions from which they were removed.

Assembly

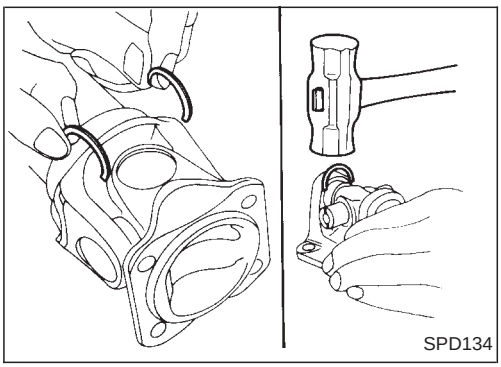
JOURNAL



SPD133

1. Assemble journal bearing. Apply recommended multi-purpose grease on bearing inner surface.

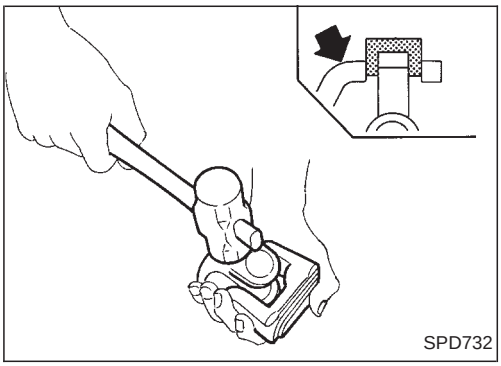
When assembling, be careful that needle bearing does not fall down.


SPD134

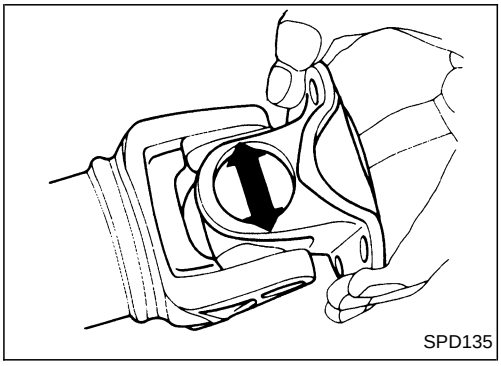
2. Select snap rings that will provide specified play in axial direction of journal, and install them. (Refer to PD-57.)

Select snap rings with a difference in thickness at both sides within 0.06 mm (0.0024 in).

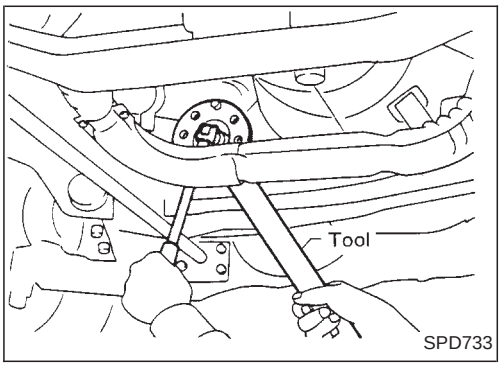
Assembly (Cont'd)


SPD732

3. Adjust thrust clearance between bearing and snap ring to zero by tapping yoke.

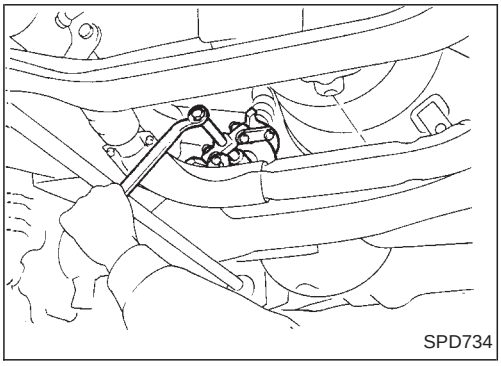

SPD135

4. Check to see that journal moves smoothly and check for axial play.
   Axial play: Less than 0.02 mm (0.0008 in)

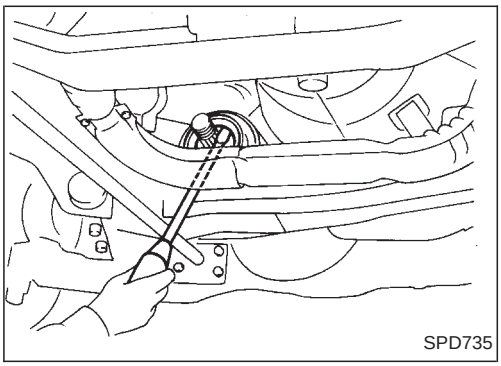


Front Oil Seal Replacement (Front final drive: R180A)

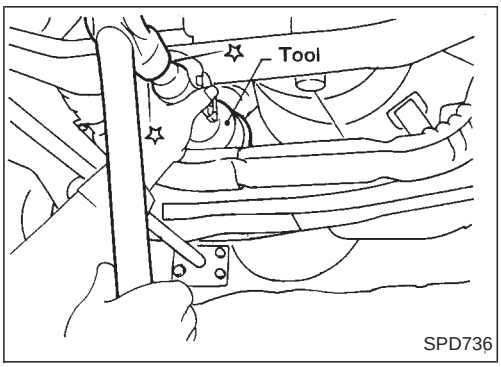
1. Remove front propeller shaft.
2. Loosen drive pinion nut.
   Tool number: ST38060002



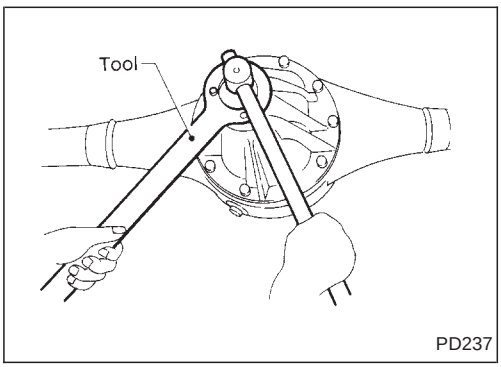
3. Remove companion flange.



4. Remove front oil seal.



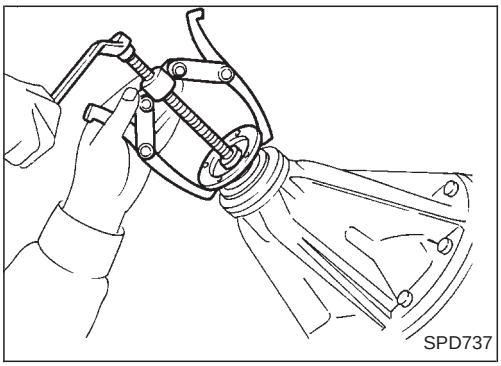
5. Apply multi-purpose grease to cavity at sealing lips of oil seal. Press front oil seal into carrier.
6. Install companion flange and drive pinion nut.
7. Install propeller shaft.
   Tool number:
   ST30720000



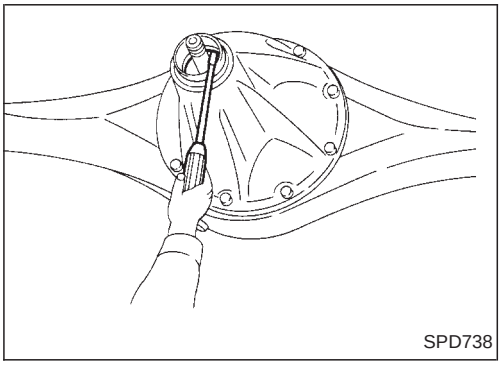
Front Oil Seal Replacement (Rear final drive: H233B)

1. Remove rear propeller shaft.
2. Loosen drive pinion nut.
   Tool number:
   KV38104700

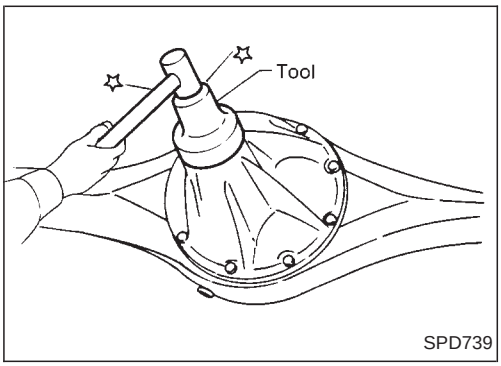
Front Oil Seal Replacement (Rear final drive: H233B) (Cont'd)


SPD737

3. Remove companion flange.


SPD738

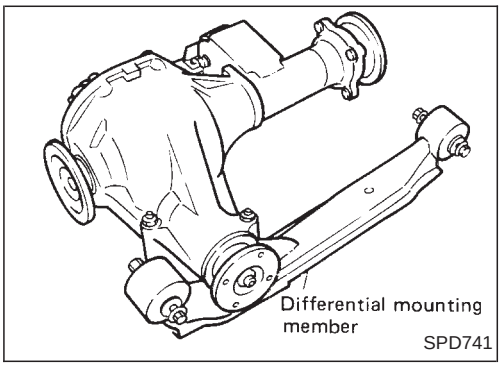
4. Remove front oil seal.



SPD739

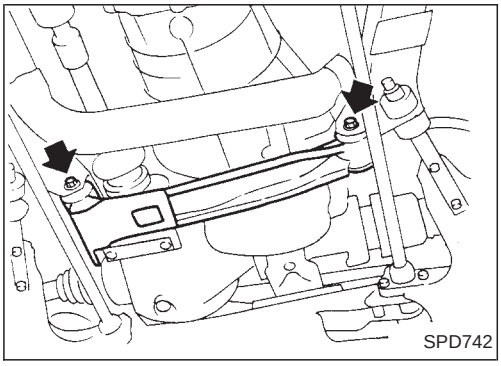
5. Apply multi-purpose grease to cavity at sealing lips of oil seal. Press front oil seal into carrier.
6. Install companion flange and drive pinion nut in.
7. Install rear propeller shaft.

Tool number:
KV381025S0



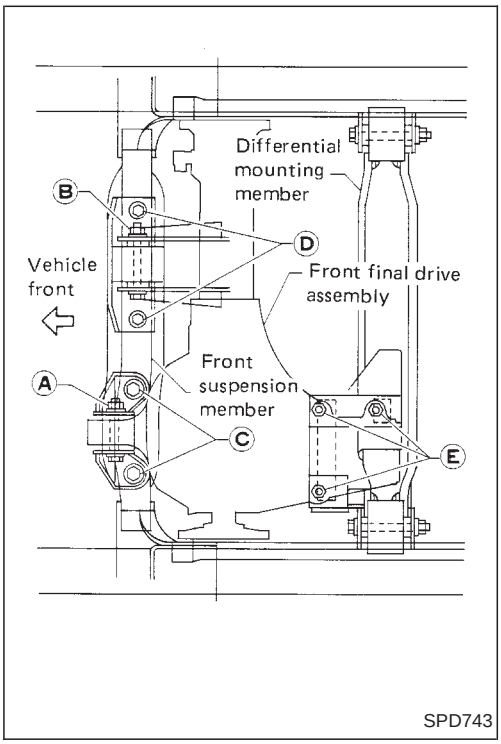
Removal

1. Remove front propeller shaft.
2. Remove drive shaft. Refer to FA section.
3. Remove engine mounting bolts and raise up engine.
4. Remove front final drive together with differential mounting member.



Installation

1. Install front final drive assembly together with differential mounting member.



2. Tighten the front final drive securing bolts and nuts following the procedures below to prevent drive train vibration.
(1) Temporarily tighten nut Ⓐ.
(2) Temporarily tighten nut Ⓑ.
(3) Tighten bolts Ⓒ to the torque of 68 to 87 N·m (6.9 to 8.9 kg-m, 50 to 64 ft-lb).
(4) Tighten bolts Ⓓ to the torque of 68 to 87 N·m (6.9 to 8.9 kg-m, 50 to 64 ft-lb).
(5) Tighten nut Ⓐ to the torque of 68 to 87 N·m (6.9 to 8.9 kg-m, 50 to 64 ft-lb).
(6) Tighten nut Ⓑ to the torque of 68 to 87 N·m (6.9 to 8.9 kg-m, 50 to 64 ft-lb).
(7) Tighten nuts Ⓔ to the torque of 68 to 87 N·m (6.9 to 8.9 kg-m, 50 to 64 ft-lb).

3. Install drive shaft. Refer to FA section.
4. Install front propeller shaft.

Removal

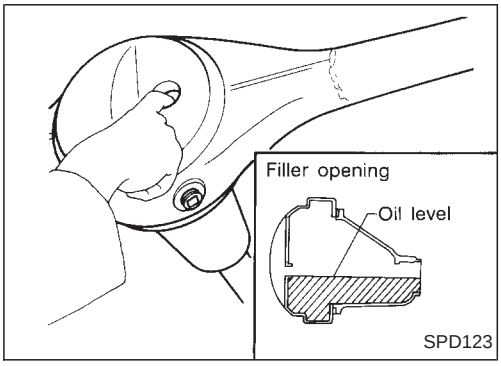
- Remove propeller shaft.

Insert plug into transfer or transmission after removing propeller shaft.

- Remove axle shaft. Refer to RA section.

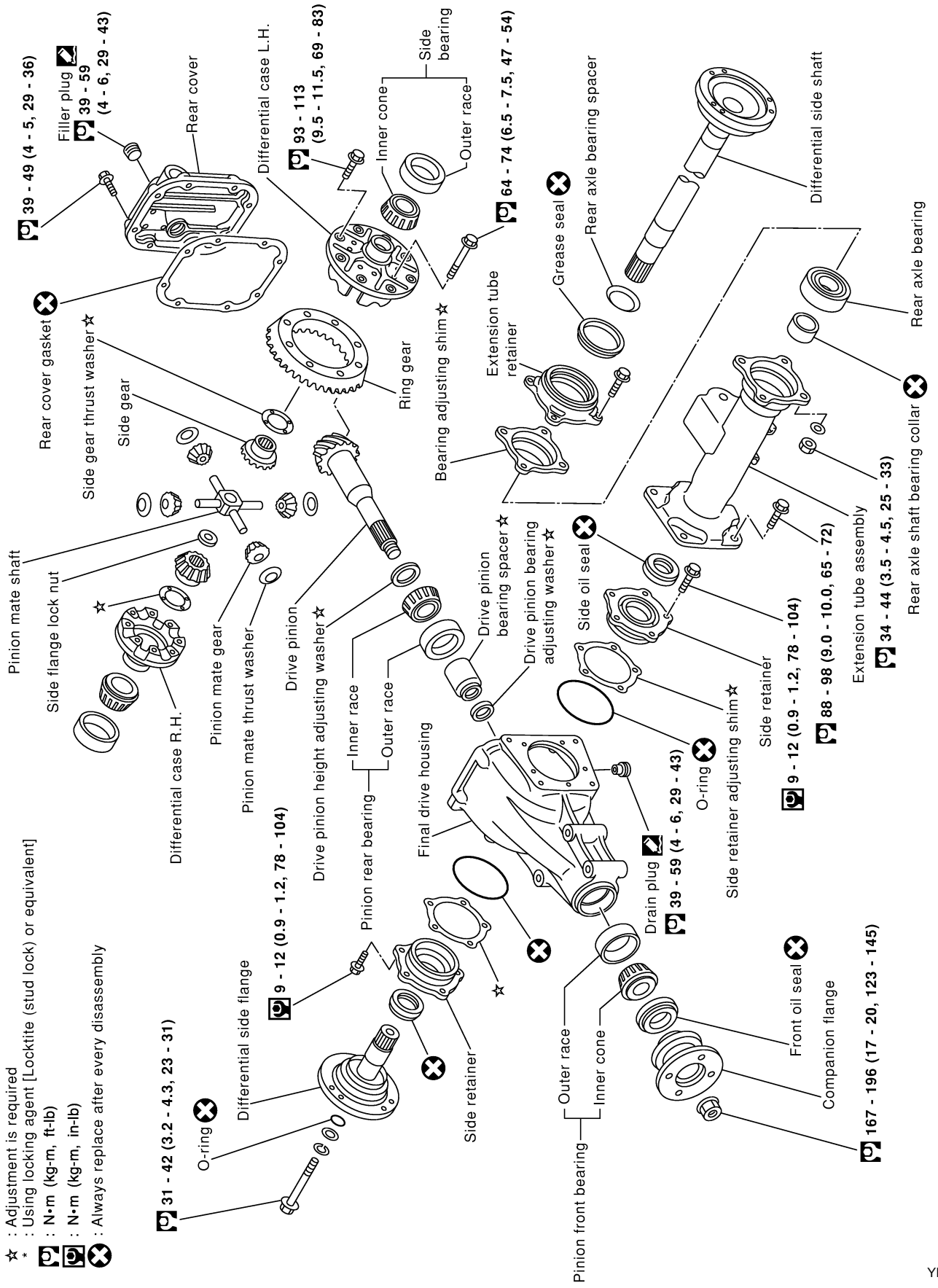
CAUTION:

- **Be careful not to damage spline, sleeve yoke and front oil seal when removing propeller shaft.**

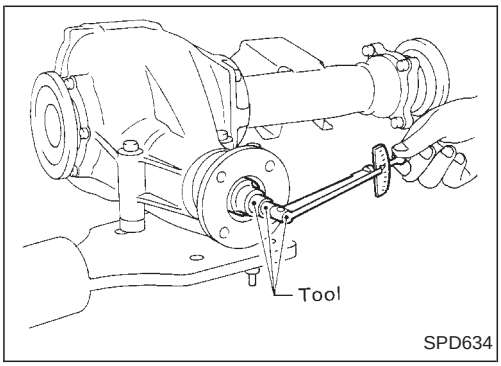


Installation

- Fill final drive with recommended gear oil.


☆ : Adjustment is required
★ : Using locking agent [Locktite (stud lock) or equivalent]
: N•m (kg-m, ft-lb)
: N•m (kg-m, in-lb)
: Always replace after every disassembly
39 - 49 (4 - 5, 29 - 36)
Filler plug
39 - 59 (4 - 6, 29 - 43)
Rear cover
Rear cover gasket
Side gear thrust washer☆
Side gear
Pinion mate shaft
Side flange lock nut
Differential case R.H.
Pinion mate gear
Pinion mate thrust washer
Drive pinion
Drive pinion height adjusting washer☆
Inner race
Outer race
Pinion rear bearing
Final drive housing
Drive pinion bearing spacer☆
Drive pinion bearing adjusting washer☆
Differential case L.H.
93 - 113 (9.5 - 11.5, 69 - 83)
Inner cone
Side bearing
Outer race
Ring gear
Bearing adjusting shim☆
Extension tube retainer
64 - 74 (6.5 - 7.5, 47 - 54)
Grease seal
Rear axle bearing spacer
Side oil seal
Side retainer adjusting shim☆
O-ring
Drain plug
39 - 59 (4 - 6, 29 - 43)
Side retainer
9 - 12 (0.9 - 1.2, 78 - 104)
Differential side shaft
Extension tube assembly
88 - 98 (9.0 - 10.0, 65 - 72)
Rear axle bearing
Rear axle shaft bearing collar
34 - 44 (3.5 - 4.5, 25 - 33)
9 - 12 (0.9 - 1.2, 78 - 104)
Differential side flange
O-ring
31 - 42 (3.2 - 4.3, 23 - 31)
Side retainer
Outer race
Inner cone
Pinion front bearing
Front oil seal
Companion flange
167 - 196 (17 - 20, 123 - 145)

YPD003

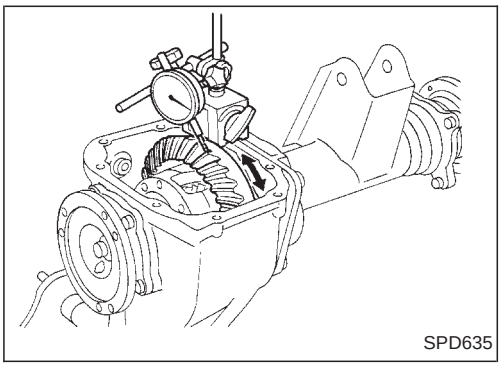


Pre-inspection

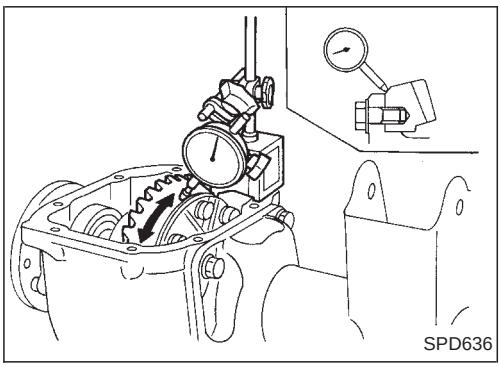
Before disassembling final drive, perform the following inspection.

- Total preload
- Remove the extension tube and the side flange. This measurement must be performed with the extension tube and the differential flange removed.

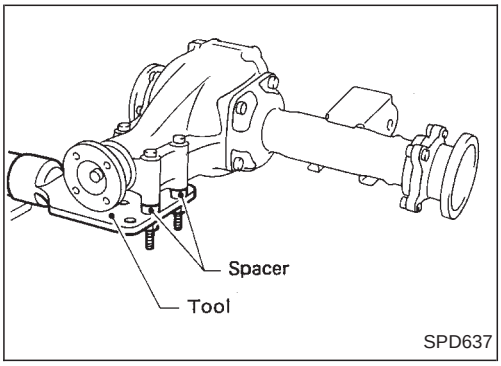
1) Turn drive pinion in both directions several times to set bearing rollers.
2) Check total preload with Tool.
   Tool number:
   ST3127S000
   Total preload:
   1.2 - 2.3 N·m (12 - 23 kg-cm, 8.7 - 20.0 in-lb)



- Ring gear to drive pinion backlash
  Check backlash of ring gear with a dial indicator at several points.
  Ring gear-to-drive pinion backlash:
  0.13 - 0.18 mm (0.0051 - 0.0071 in)



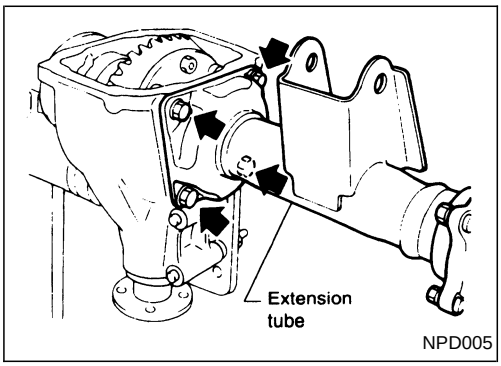
- Ring gear runout
  Check runout of ring gear with a dial indicator.
  Runout limit:
  0.05 mm (0.0020 in)
- Tooth contact
  Check tooth contact (Refer to Adjustment).



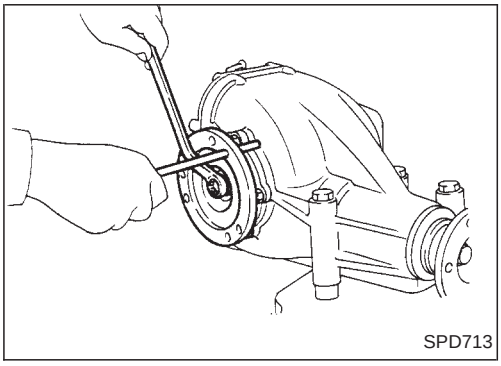
Final Drive Housing

1. Using three spacers [20 mm (0.79 in)], mount final drive assembly on Tool.
   Tool number:
   KV38100800

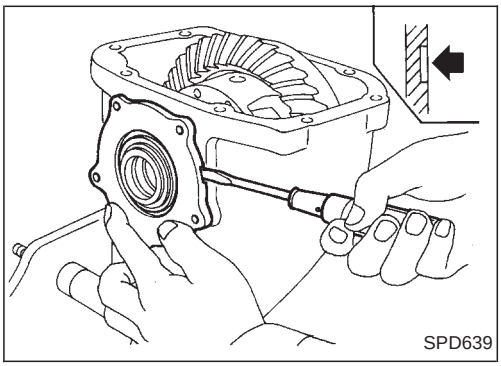
Final Drive Housing (Cont'd)



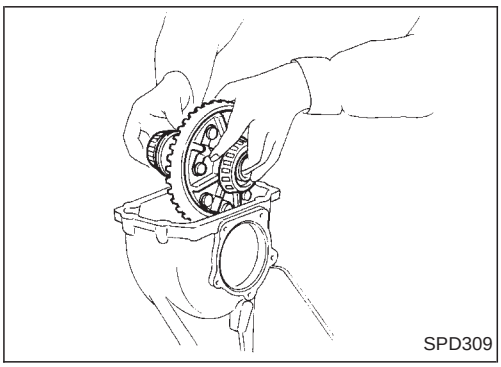
2. Remove extension tube and differential side shaft assembly.



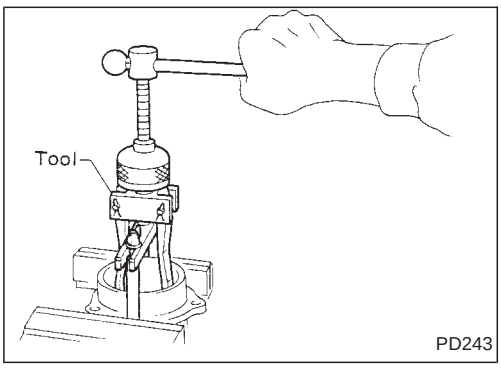
3. Remove differential side flange.



4. Mark side retainers for identification. Remove side retainers.
Be careful not to confuse right and left side retainers and shims.

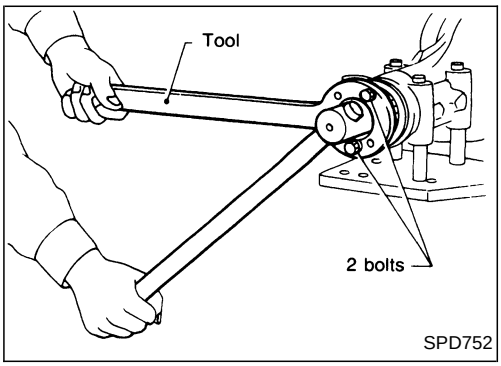


5. Extract differential case from final drive housing.

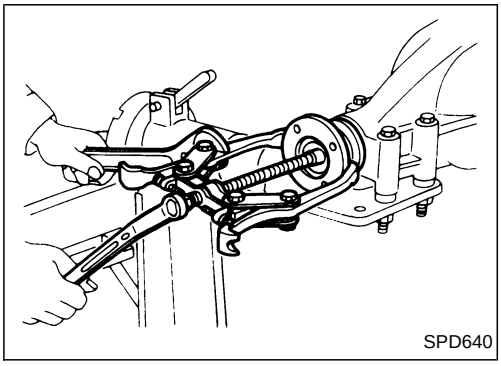


6. Remove side outer races.
Tool number:
ST33290001
Be careful to keep the side bearing outer races together with their respective inner cones — do not mix them up.
7. Remove side oil seal.

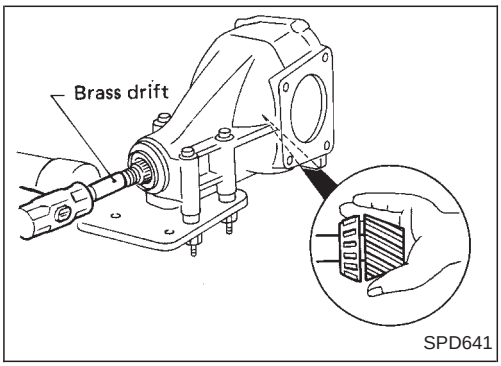
Final Drive Housing (Cont'd)



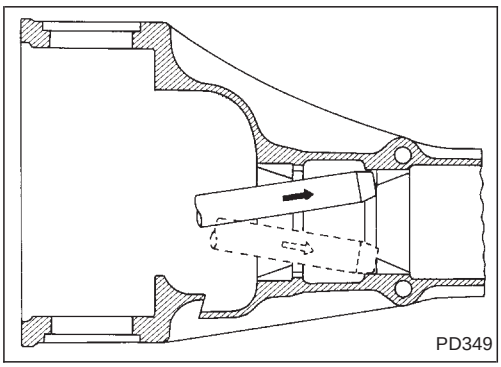
8. Loosen drive pinion nut.
   Tool number:
   ST38060002



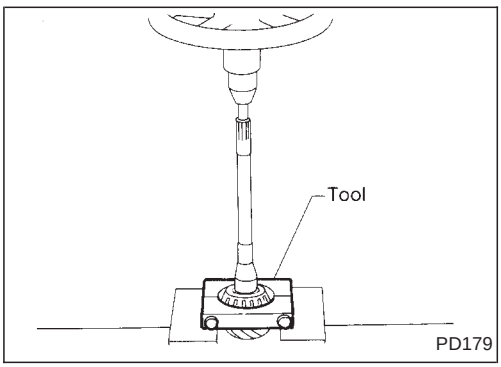
9. Remove companion flange with puller.



10. Take out drive pinion together with pinion rear bearing inner cone, drive pinion bearing spacer and pinion bearing adjusting washer.
11. Remove front oil seal and pinion front bearing inner cone.

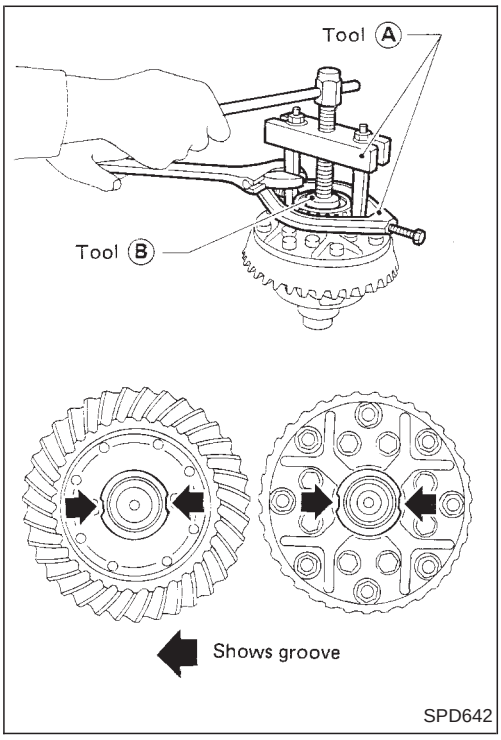


12. Remove pinion front and rear bearing outer races with brass drift.



13. Remove pinion rear bearing inner cone and drive pinion adjusting washer.
    Assembly:
    ST30905000
    Tool number:
    ST30031000

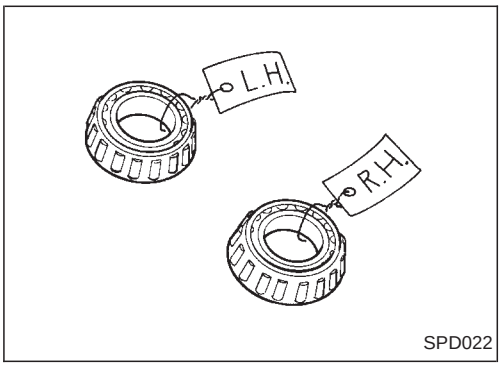
Differential Case



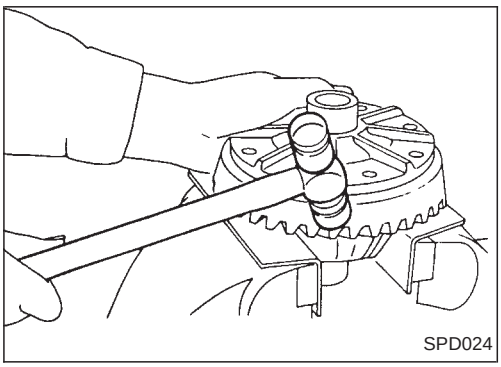
1. Remove side bearing inner cones.

To prevent damage to bearing, engage puller jaws in grooves.

Assembly:
ST33065001
Tool number:
Ⓐ ST33051001
Ⓑ ST33061000

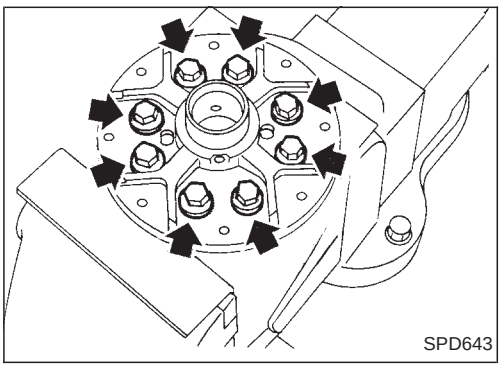


Be careful not to confuse the right and left hand parts.



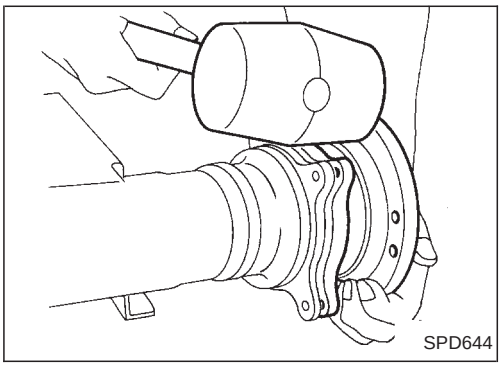
2. Loosen ring gear bolts in a criss-cross fashion.
3. Tap ring gear off differential case with a soft hammer.

Tap evenly all around to keep ring gear from binding.



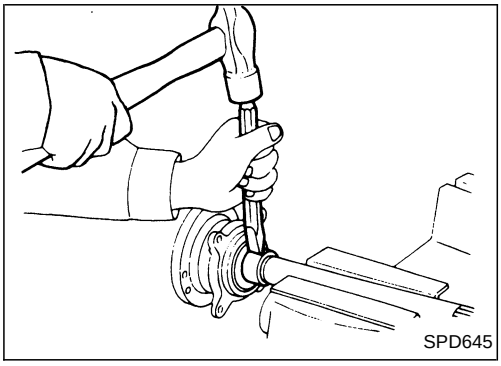
4. Separate L.H. and R.H. differential cases.

Put match marks on both L.H. and R.H. differential cases.

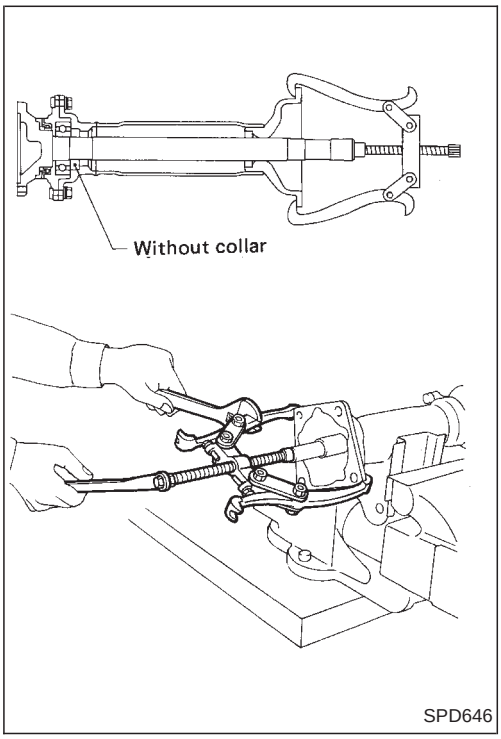

SPD644

Extension Tube and Differential Side Shaft

1. Remove differential side shaft assembly from extension tube.

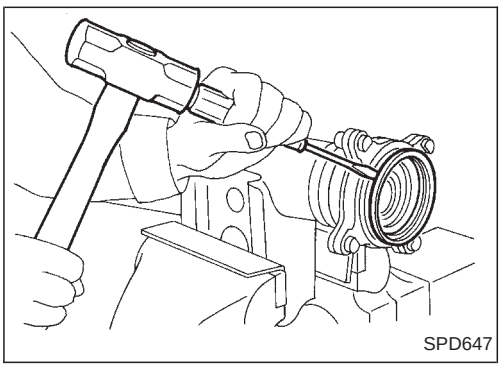

SPD645

2. Cut rear axle bearing collar with cold chisel. Be careful not to damage differential side shaft.



SPD646

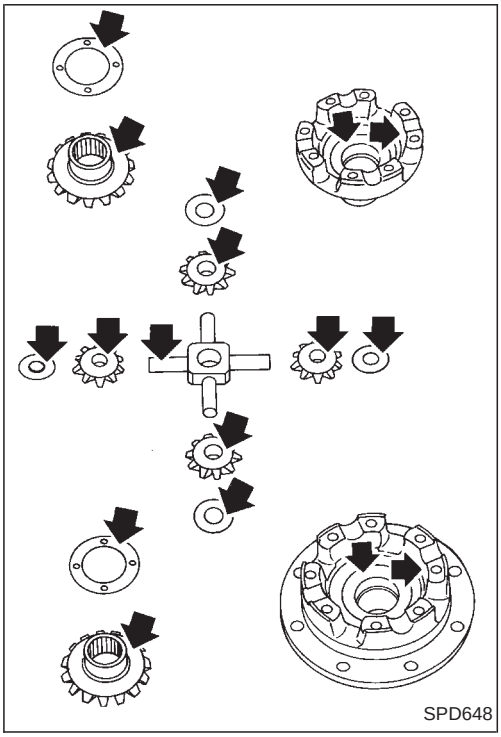
3. Install differential side shaft into extension tube and secure with bolts. Remove extension tube retainer from differential side shaft.


SPD647

4. Remove grease seal.

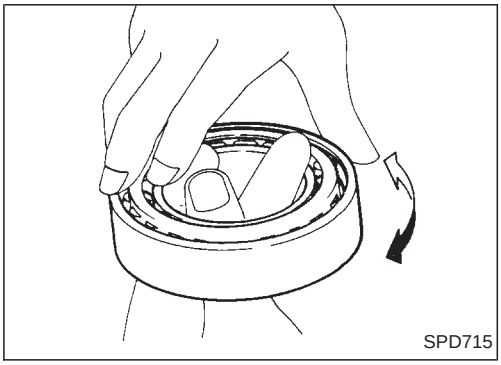
Ring Gear and Drive Pinion

Check gear teeth for scoring, cracking or chipping.
If any damaged part is evident, replace ring gear and drive pinion as a set (hypoid gear set).


SPD648

Differential Case Assembly

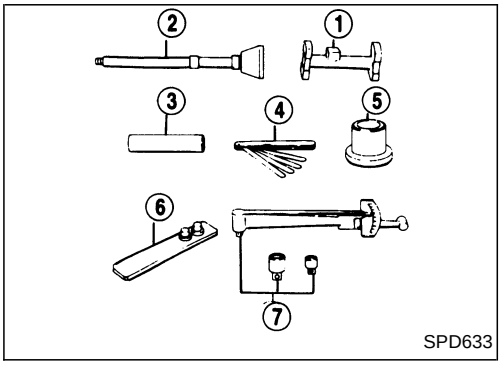
Check mating surfaces of differential case, side gears, pinion mate gears, pinion mate shaft and thrust washers.


SPD715

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.

To avoid confusion while calculating bearing shims, it is absolutely necessary to stay with the metric system. If you measure anything in inches, the results MUST be converted to the metric system.

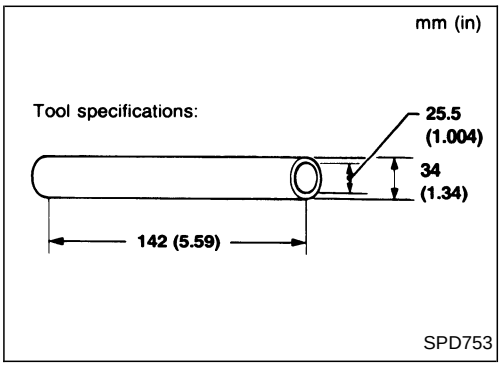


SPD633

Drive Pinion Height

1. First prepare Tools for pinion height adjustment.

① Height gauge (ST31211000)
② Dummy shaft (ST31212000)
③ Collar
④ Feeler gauge
⑤ Dummy shaft spacer (ST31851000)
⑥ Stopper (ST31852000)
⑦ Preload gauge (ST3127S000)

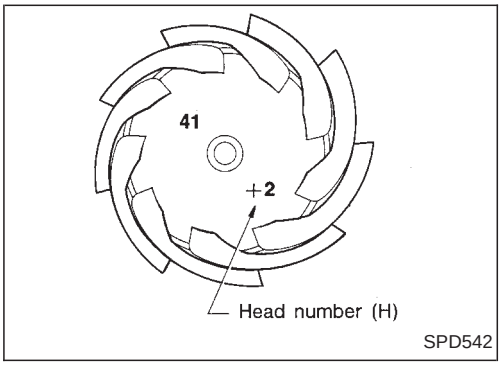


SPD753

- Use a collar which has the specifications shown at left.

2. To simplify the job, make a chart, like the one below, to organize your calculations.

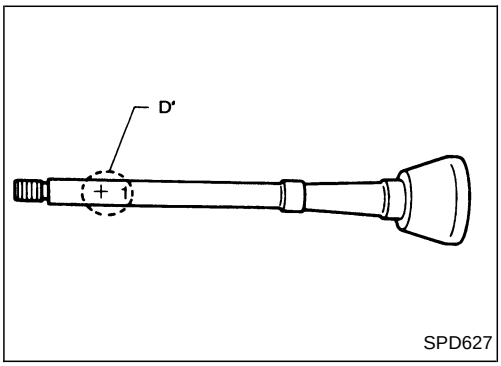
LETTERS	HUNDREDTHS OF A MILLIMETER
H: Head number	
D′: Figure marked on dummy shaft	
S: Figure marked on height gauge	
N: Measuring clearance	



SPD542

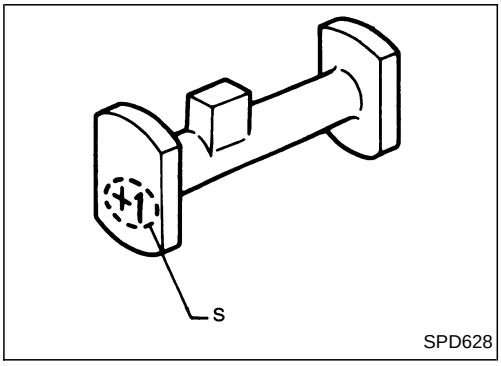
3. Write the following numbers down in the chart.
H: Head number

Drive Pinion Height (Cont'd)



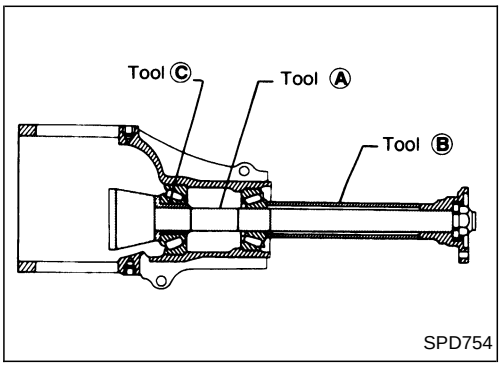
SPD627

D′: Figure marked on dummy shaft.



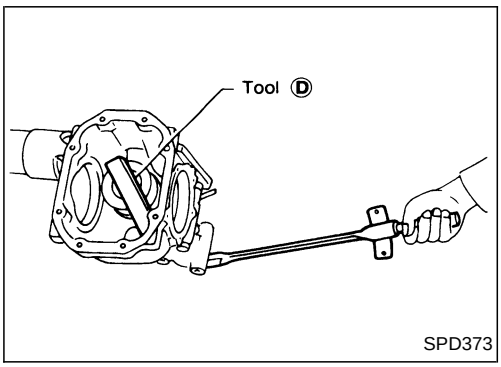
SPD628

S: Figure marked on height gauge.
W: Thickness of drive pinion height adjusting washer which is 3.09 mm (0.1217 in).

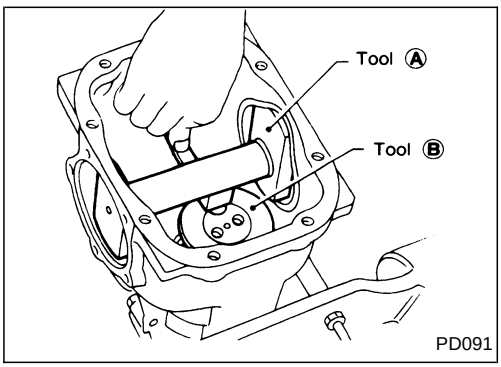


SPD754

4. Set Tool (dummy shaft) as shown at left and tighten drive pinion nut carefully to correct preload of 1.0 to 1.3 N·m (10 to 13 kg-cm, 8.7 to 11.3 in-lb).
   Tool number:
   - Ⓐ **Dummy shaft (ST31212000)**
   - Ⓑ **Collar**
   - Ⓒ **Dummy shaft spacer (ST31851000)**
   - Ⓓ **Stopper (ST31852000)**



SPD373



PD091

5. Attach Tool (height gauge) to gear carrier, and measure the clearance between the height gauge and the dummy shaft face.
   Tool number
   - Ⓐ **Height gauge (ST31211000)**
   - Ⓑ **Dummy shaft (ST31212000)**

Drive Pinion Height (Cont'd)

6. Substitute these values into the equation to calculate the thickness of the washer.

If values signifying H, D′ and S are not given, regard them as zero and calculate.

T (Thickness of washer)
= W + N − [(H − D′ − S) x 0.01] − 0.20

Example:

W = 3.09
N = 0.33
H = +2
D′ = −1
S = 0

T = W + N − [(H − D′ − S) x 0.01] − 0.20

(1)	H	2
	−D′	−(−1)
		+3
(2)	−S	−0
		+3
(3)		+3
		x0.01
		+0.03
(4)	W	3.09
	+N	+0.33
		3.42
(5)		−[+0.03]
		3.39
(6)		−0.20
		3.19

7. Select the proper washer. (Refer to PD-57.)

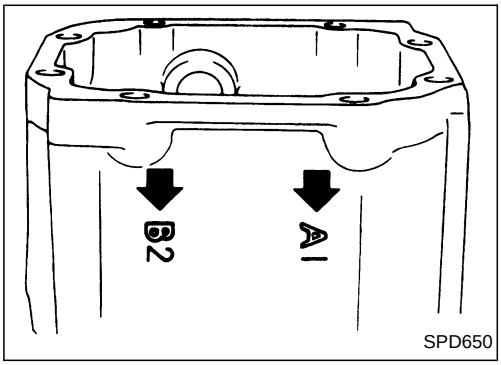
If you cannot find the desired thickness of washer, use washer with thickness closest to the calculated value.

Example:
Calculated value ... T = 3.19 mm
Used washer ... T = 3.18 mm

Side Bearing Preload

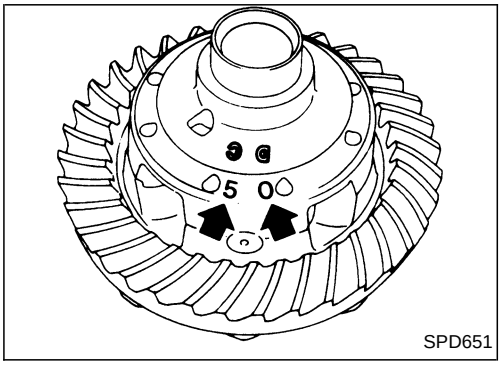
1. To simplify the job, make a chart like the one below to organize your calculations.

LETTERS	HUNDREDTHS OF A MILLIMETER
A − Left housing	
B − Right housing	
C − Differential case	
D − Differential case	
E − Left side bearing	
F − Right side bearing	
G_1 − Left side retainer	
G_2 − Right side retainer	



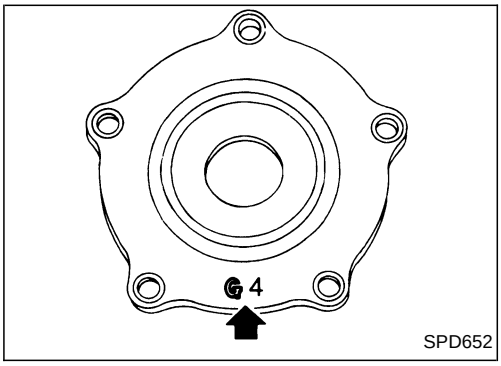
SPD650

2. Write the following numbers down in the chart.
   A & B: Figures marked on final drive housing.



SPD651

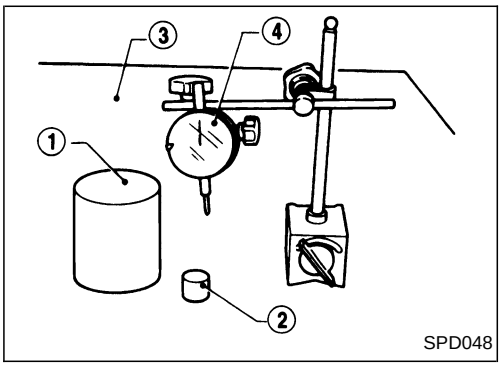
C & D: Figures marked on differential case.



SPD652

G_1 & G_2: Figures marked on side retainer.

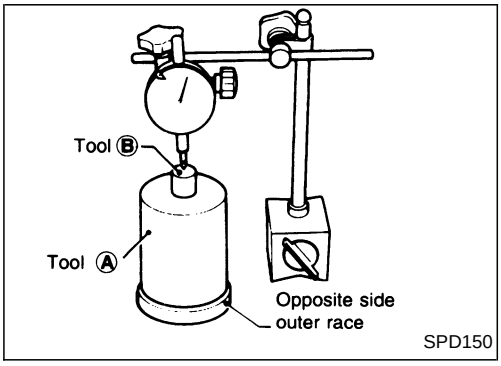
Side Bearing Preload (Cont'd)



SPD048

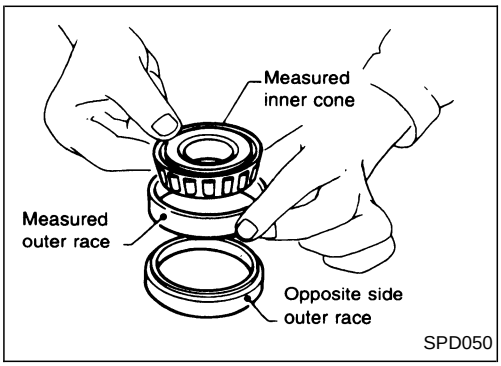
3. Measure how far under the standard thickness [20 mm (0.79 in)] the side bearings are.
   It will require tools shown below.

① Weight Block (ST32501000)
② Master Gauge (KV38101900)
③ Base Plate
④ Dial Indicator



SPD150

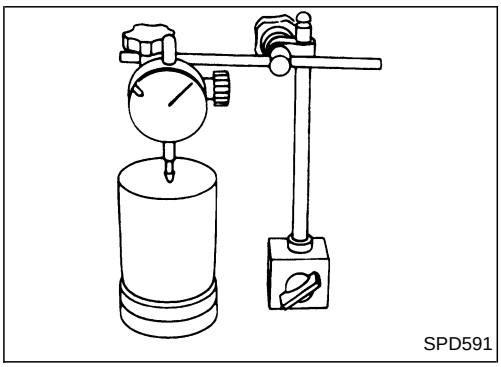
4. Place the outer race of the opposite side bearing to the measured.
5. Place a weight block on the outer race, and a master gauge on the block.
   Tool number:
   Ⓐ ST32501000
   Ⓑ KV38101900



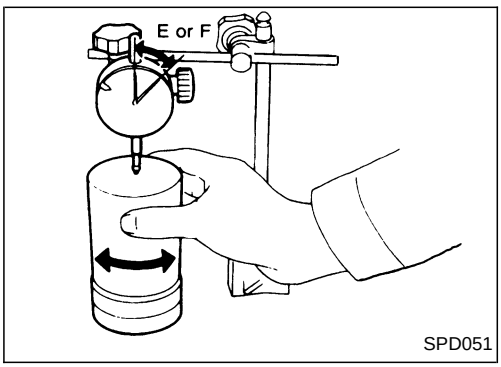
SPD050

6. Adjust dial indicator scale to zero.
7. Carefully slide master gauge and weight block out from under dial indicator.
8. Lubricate side bearing and place the bearing outer race and inner cone to be measured on the opposite side outer race.

If the bearing assembly is placed on the base plate, the bearing width cannot be accurately determined due to its cage being in contact with the base plate.


SPD591

9. Place weight block (ST32501000) on side bearing.
10. Slide dial indicator on weight block.



SPD051

11. Turn weight block a few times to ensure that bearing is properly seated.
12. Read dial indicator.

- Normal indication:
  0.10 - 0.30 mm (0.0039 - 0.0118 in)
- If the needle fluctuates erratically then bearing is either dirty or defective and should be cleaned or replaced.

Side Bearing Preload (Cont'd)

13. Measure both bearing in the same way and write the left side bearing measurement next to "E" and the right side bearing measurement next to "F".
14. Substitute these values into the equation to calculate the thickness of the shim.

If values signifying A, B, C, D, G_1 and G_2 are not given, regard them as zero and calculate.

Left side:

$$T_1 = (A + C + G_1 - D) \times 0.01 + 0.76 - E$$

Right side:

$$T_2 = (B + D + G_2) \times 0.01 + 0.76 - F$$

Example

A = 5	E = 0.11
B = 5	F = 0.15
C = 3	G_1 = 4
D = 3	G_2 = 1

Left side:

T_1 = (A + C + G_1 − D) x 0.01 + 0.76 − E
= (5 + 3 + 4 − 3) x 0.01 + 0.76 − 0.11

(1)	A	5
	+ C	+3
		8
	+ G_1	+4
		12
	− D	−3
		9
(2)		9
		x0.01
		0.09
(3)		0.09
		+0.76
		0.85
(4)		0.85
	− E	−0.11
		0.74

$\therefore T_1$ = 0.74 mm

Right side:

T_2 = (B + D + G_2) x 0.01 + 0.76 − F
= (5 + 3 + 1) x 0.01 + 0.76 − 0.15

(1)	B	5
	+ D	+3
		8
	+ G_2	+1
		9
(2)		9
		x0.01
		0.09
(3)		0.09
		+0.76
		0.85
(4)		0.85
		−0.15
		0.70

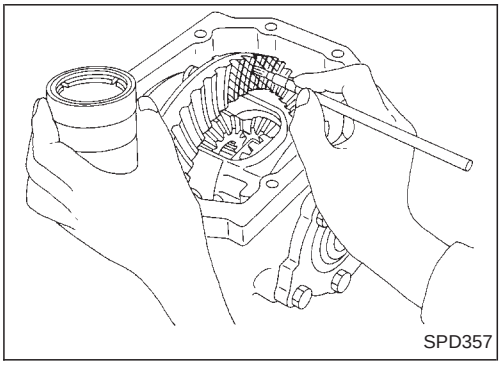
$\therefore T_2$ = 0.70 mm

15. Select the proper shims. (Refer to PD-57.)

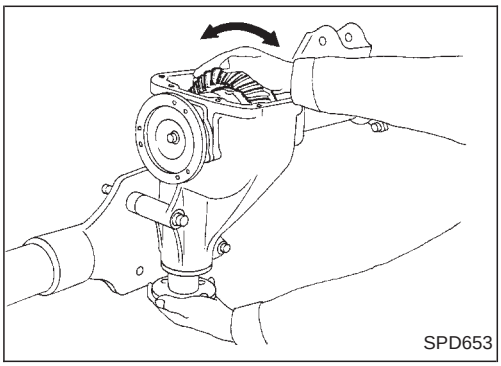
If you cannot find the desired thickness of shims, use shims with the total thickness closest to the calculated value.

Tooth Contact

Gear tooth contact pattern check is necessary to verify correct relationship between ring gear and drive pinion.
Hypoid gear sets which are not positioned properly in relation to one another may be noisy, or have short life span or both. With a pattern check, the most desirable contact for low noise level and long life can be assured.

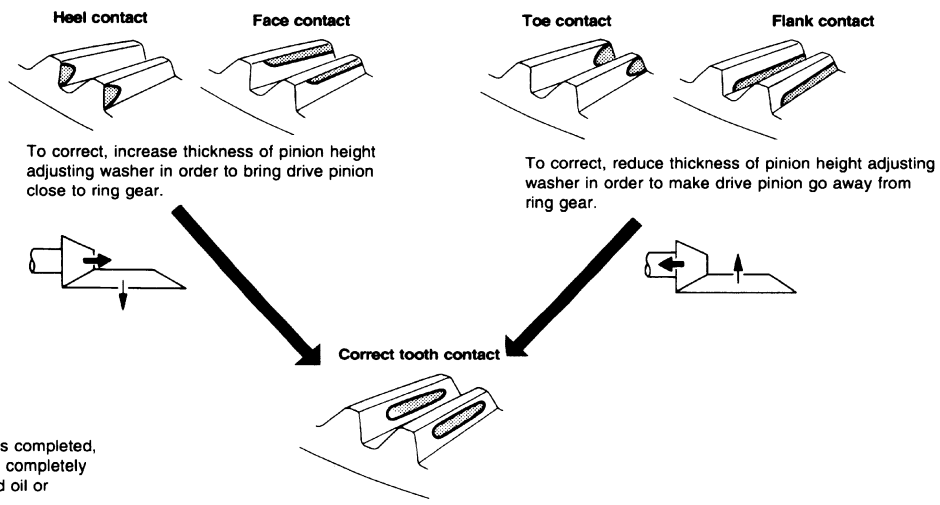

SPD357

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


SPD653

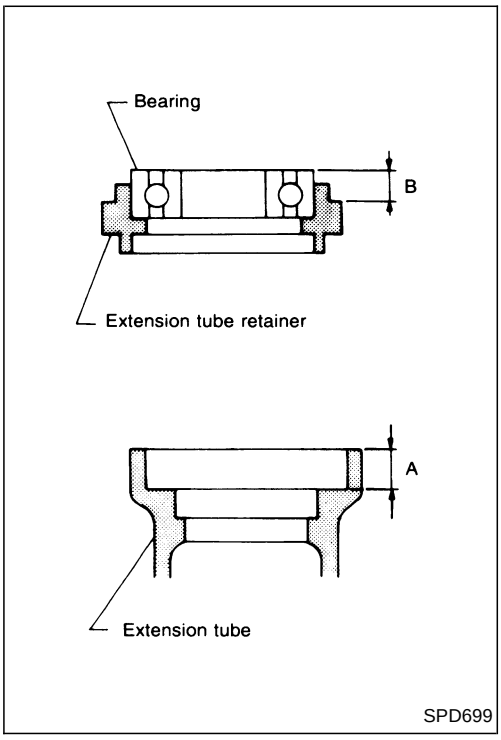
3. Hold companion flange steady by hand and rotate the ring gear in both directions.

Usually the pattern will be correct if you have calculated the shims correctly and the backlash is correct.
However, in rare cases you may have to use trial-and-error processes until you get a good tooth contact pattern.
Tho tooth pattern is the best indication of how well a differential has been set up.



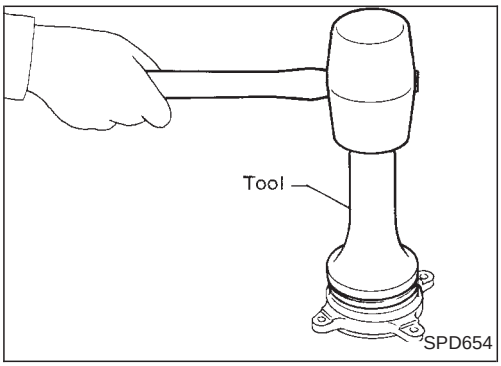
When adjustment is completed, be sure to wipe off completely the ferric oxide and oil or their equivalent.

NPD003

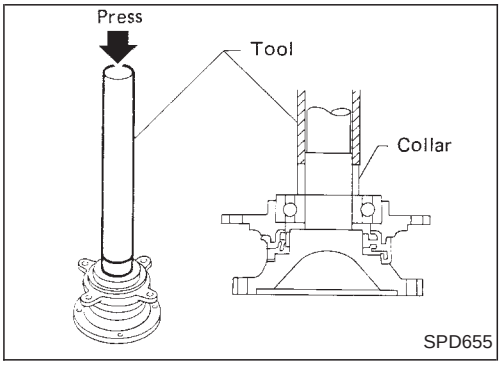


Extension Tube and Differential Side Shaft

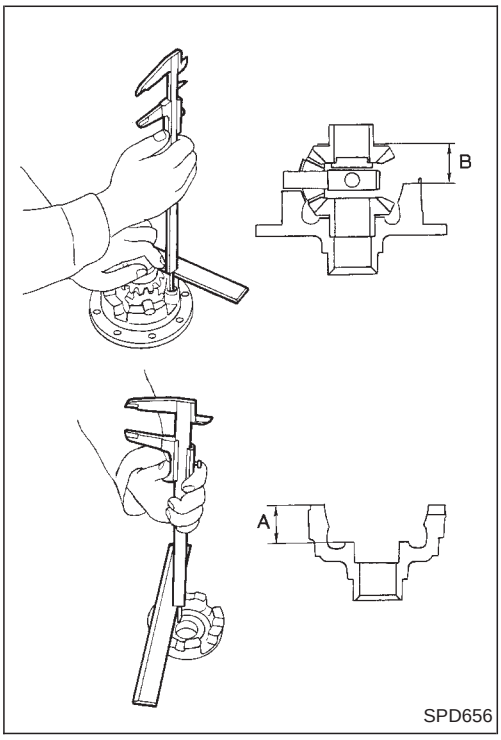
1. Measure rear axle bearing end play.
   Rear axle bearing end play (A − B):
   0.1 mm (0.0039 in) or less
   The end play can be adjusted with bearing adjusting shim. (Refer to PD-57.)



2. Install oil seal.

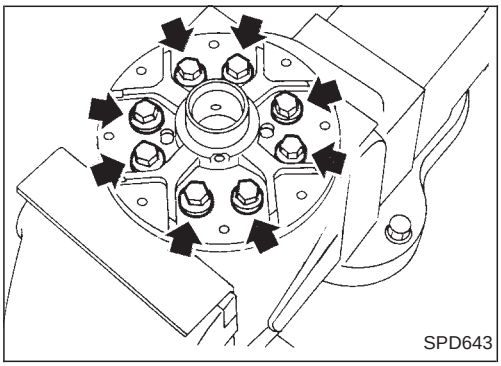


3. Install the spacer, grease seal, extension tube retainer, adjusting shim, shim and shim collar onto the differential side shaft.
4. Install differential side shaft assembly into extension tube.

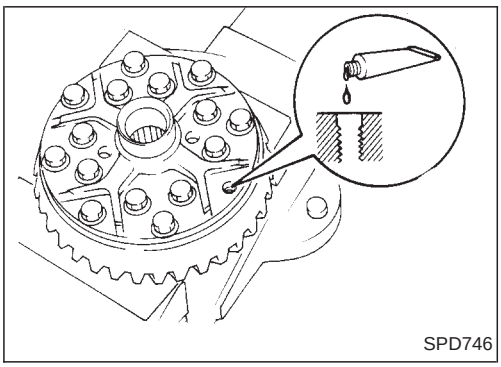


Differential Case

1. Measure clearance between side gear thrust washer and differential case.
   Clearance between side gear thrust washer and differential case (A − B):
   0.10 - 0.20 mm (0.0039 - 0.0079 in)
   The clearance can be adjusted with side gear thrust washer. (Refer to PD-57.)
2. Apply gear oil to gear tooth surfaces and thrust surfaces and check to see the turn properly.

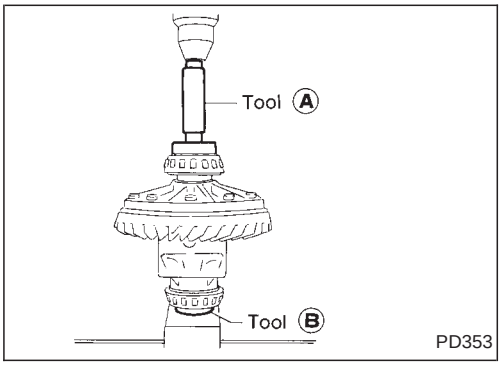


3. Install L.H. and R.H. differential cases.

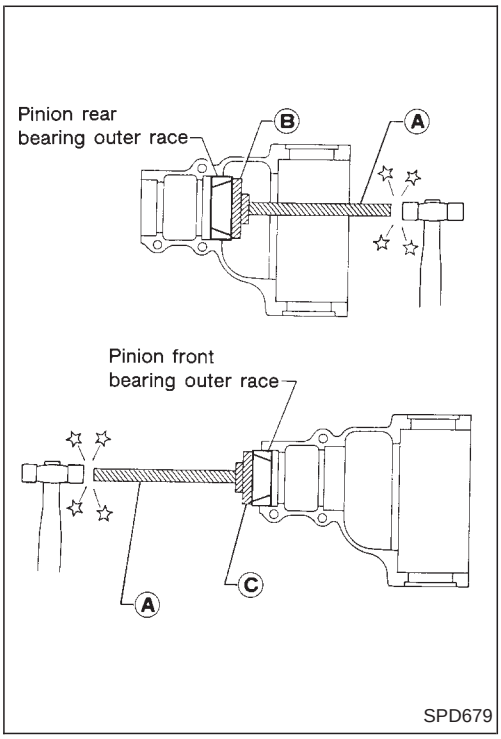


4. Place differential case on ring gear.
5. Apply locking agent [Locktite (stud lock) or equivalent] to ring gear bolts, and install them.

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

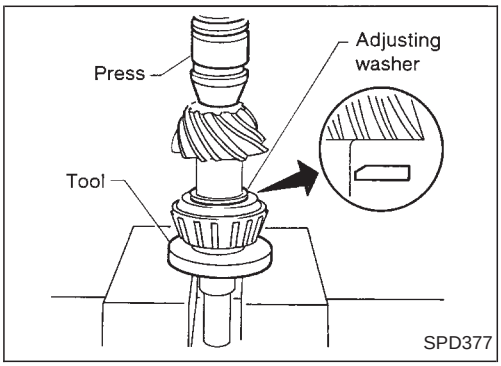


6. Press-fit side bearing inner cones on differential case with Tool.
   Tool number:
   (A) ST33230000
   (B) ST33061000

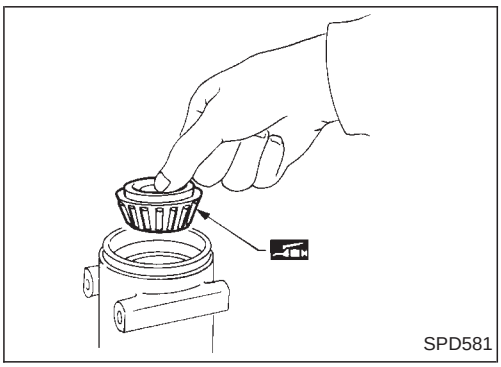


Final Drive Housing

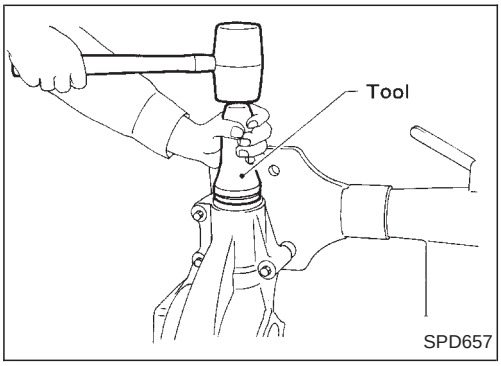
1. Press-fit front and rear bearing outer races with Tools.
   Tool number:
   - Ⓐ **ST30611000**
   - Ⓑ **ST30621000**
   - Ⓒ **ST30701000**
2. Select pinion bearing adjusting washer and drive pinion bearing spacer, referring to Adjustment.



3. Install drive pinion height adjusting washer in drive pinion, and press-fit rear bearing inner cone in it, using press and Tool.
   Assembly:
   ST30905000
   Tool number:
   ST30901000

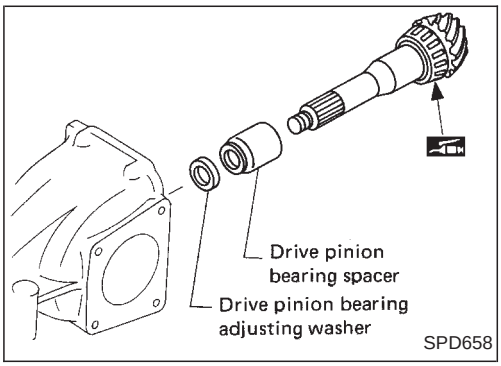


4. Place pinion front bearing inner cone in final drive housing.

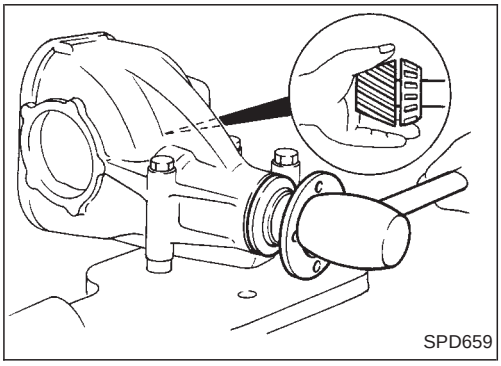


5. Apply multi-purpose grease to cavity at sealing lips of oil seal. Install front oil seal.
   Tool number:
   ST30720000

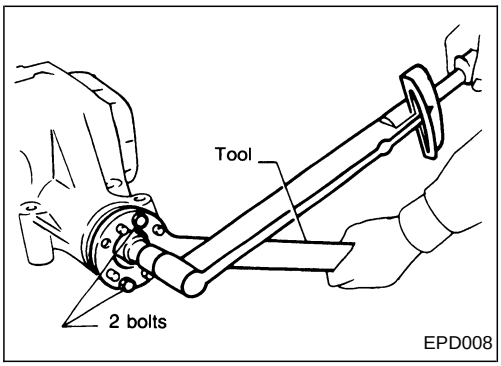
Final Drive Housing (Cont'd)



6. Place drive pinion bearing spacer, pinion bearing adjusting washer and drive in final drive housing.



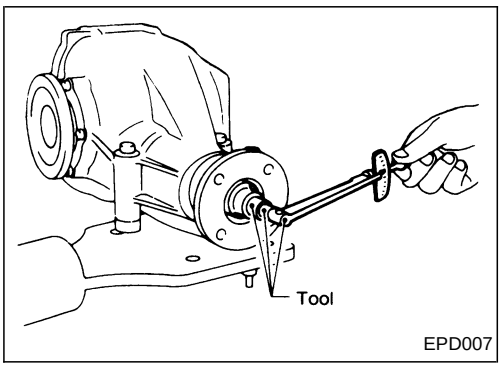
7. Insert companion flange into drive pinion by tapping the companion flange with a soft hammer.



8. Tighten pinion nut to the specified torque.

The threaded portion of drive pinion and pinion nut should be free from oil or grease.

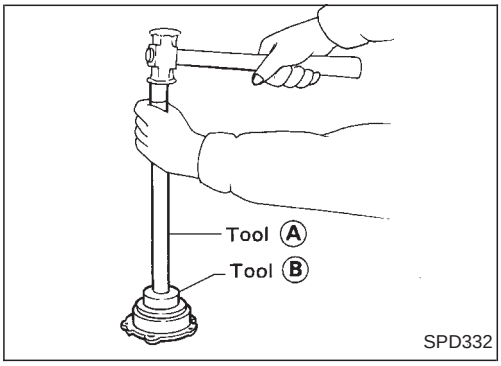
Tool number:
ST38060002



9. Turn drive pinion in both directions several revolutions, and measure pinion bearing preload.

Tool number:
ST3127S000
Pinion bearing preload:
1.1 - 1.7 N·m (11 - 17 kg-cm, 9.5 - 14.8 in-lb)

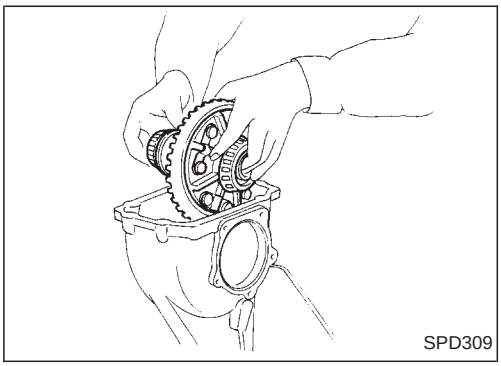
When pinion bearing preload is outside the specifications, replace pinion bearing adjusting washer and spacer with a different thickness.



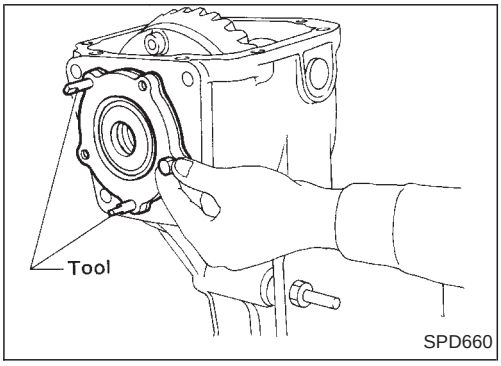
10. Select side retainer adjusting washer.
    Refer to Adjustment.
11. Press-fit side bearing outer race into side retainer.

Tool number:
Ⓐ ST30611000
Ⓑ ST30621000

Final Drive Housing (Cont'd)


SPD309

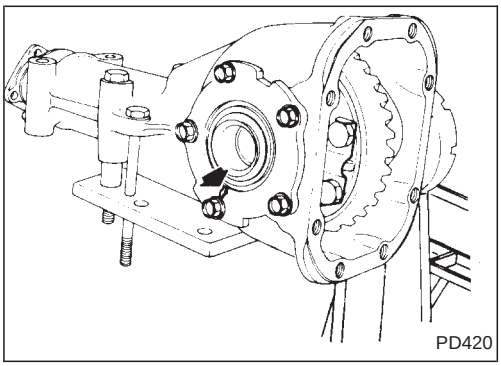
12. Place the differential case assembly in its housing.



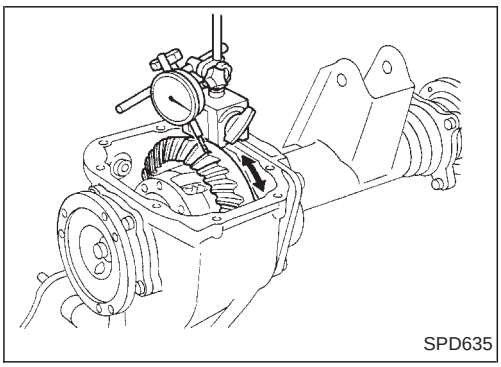
SPD660

13. Install side oil seal.
14. Place side retainer adjusting shims and O-ring on side retainer, and install them in final drive housing.

Tool number:
ST33720000


PD420

- Align arrows stamped on side retainer and final drive housing.


SPD635

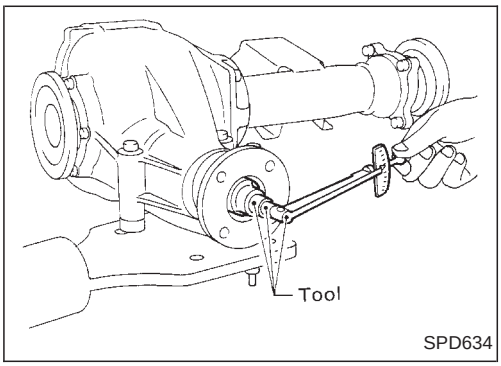
15. Measure ring gear-to-drive pinion backlash with a dial indicator.

Ring gear-to-drive pinion backlash:
0.13 - 0.18 mm (0.0051 - 0.0071 in)

- If backlash is too small, decrease thickness of right shim and increase thickness of left 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.

Final Drive Housing (Cont'd)



SPD634

16. Check total preload with Tool.

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

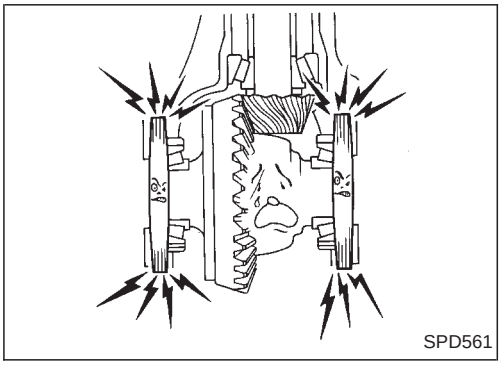
The total pinion bearing preload value with the differential case assembly should be in accordance with the same value measured without the differential case assembly. (See point 9.)

The relationship between both is:

Pinion bearing preload

With differential case assembly		Without differential case assembly	
kg-cm	N·m	kg-cm	N·m
11	1.1	12 - 17	1.2 - 1.7
12	1.2	13 - 18	1.3 - 1.8
13	1.3	14 - 19	1.4 - 1.9
14	1.4	15 - 20	1.5 - 2.0
15	1.5	16 - 21	1.6 - 2.1
16	1.6	17 - 22	1.7 - 2.2
17	1.7	18 - 23	1.8 - 2.3

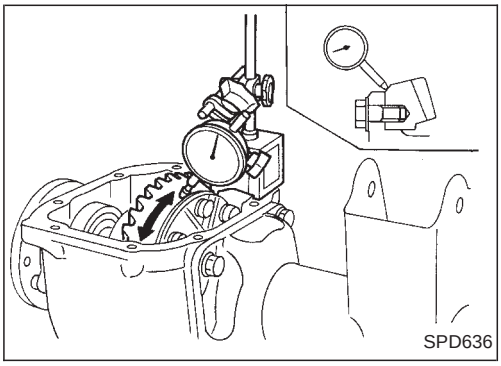
Tool number:
ST3127S000
Total preload:
1.0 - 2.3 N·m (10 - 23 kg-cm, 8.7 - 20.0 in-lb)


SPD561

- If preload is too great, remove the same amount of shim from 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 as it will change ring gear-to-drive pinion backlash.

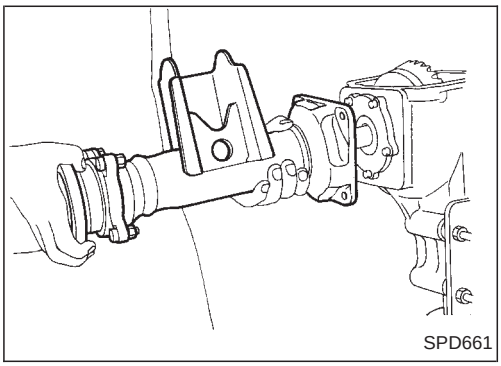
17. Recheck ring gear-to-drive pinion backlash because increase or decrease in thickness of shims will cause change of ring gear-to-pinion backlash.


SPD636

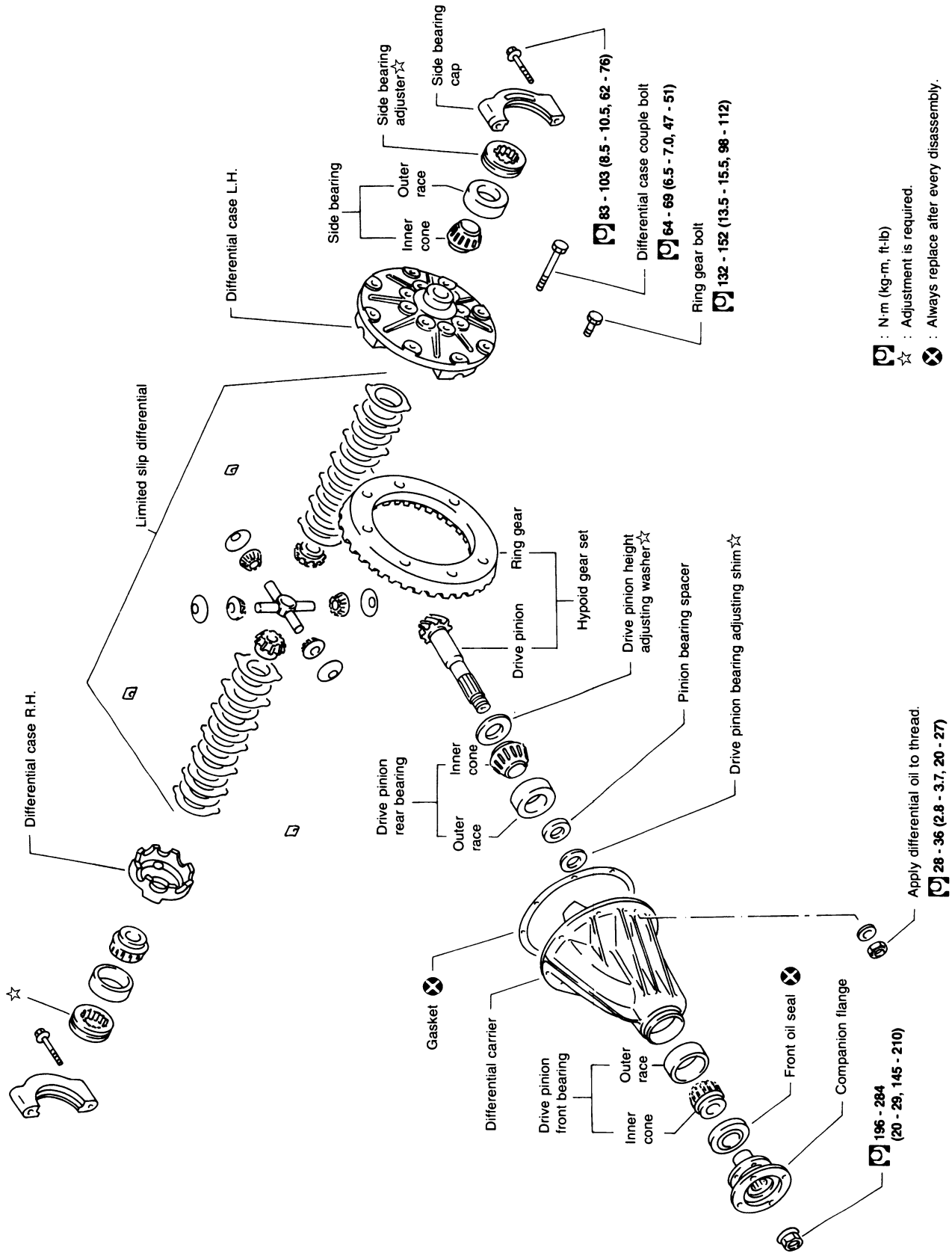
18. Check runout of ring gear with a dial indicator.
    Runout limit:
    0.05 mm (0.0020 in)

- If backlash varies excessively in different places, the variance may have resulted from foreign matter caught between the ring gear and the differential case.
- If the backlash varies greatly when the runout of the ring gear is within a specified range, the hypoid gear set or differential case should be replaced.

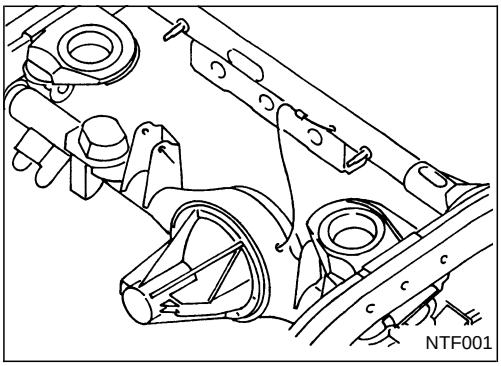
Final Drive Housing (Cont'd)


SPD661

19. Check tooth contact.
    Refer to Adjustment.
20. Install rear cover and gasket.
21. Install extension tube and differential side shaft assembly.

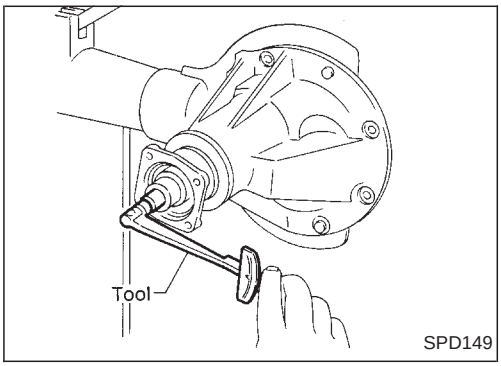

Side bearing adjuster☆
Side bearing cap
Side bearing
Outer race
Inner cone
Differential case L.H.
83 - 103 (8.5 - 10.5, 62 - 76)
Differential case couple bolt
64 - 69 (6.5 - 7.0, 47 - 51)
Ring gear bolt
132 - 152 (13.5 - 15.5, 98 - 112)
: N·m (kg-m, ft-lb)
☆ : Adjustment is required.
⊗ : Always replace after every disassembly.
Limited slip differential
Ring gear
Hypoid gear set
Drive pinion
Drive pinion height adjusting washer☆
Pinion bearing spacer
Drive pinion bearing adjusting shim☆
Differential case R.H.
Drive pinion rear bearing
Inner cone
Outer race
Apply differential oil to thread.
28 - 36 (2.8 - 3.7, 20 - 27)
Gasket
Differential carrier
Drive pinion front bearing
Outer race
Inner cone
Front oil seal
Companion flange
196 - 284 (20 - 29, 145 - 210)

EPD004



Air Breather

Make sure air breather hose is situated as shown in the illustration.



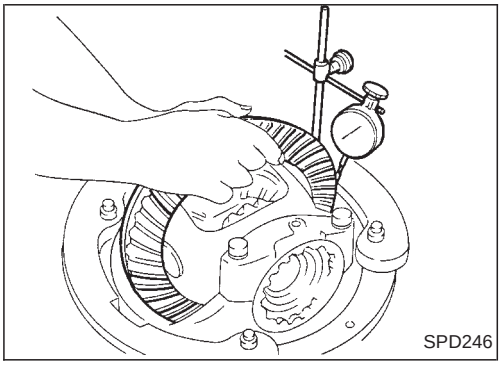
Pre-inspection

Before disassembling final drive, perform the following inspection.

- Total preload

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

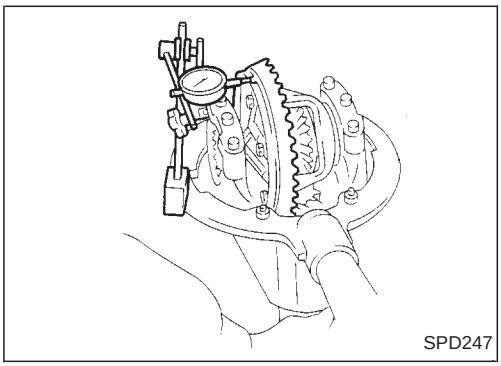
Total preload:
1.7 - 2.5 N·m (17 - 25 kg-cm, 15 - 22 in-lb)
Tool number:
ST3127S000



- Ring gear to drive pinion backlash

Check backlash of ring gear with a dial indicator at several points.

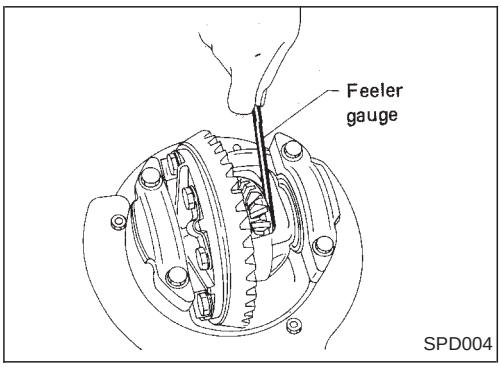
Ring gear-to-drive pinion backlash:
0.15 - 0.20 mm (0.0059 - 0.0079 in)



- Ring gear runout

Check runout of ring gear with a dial indicator.

Runout limit:
0.08 mm (0.0031 in)



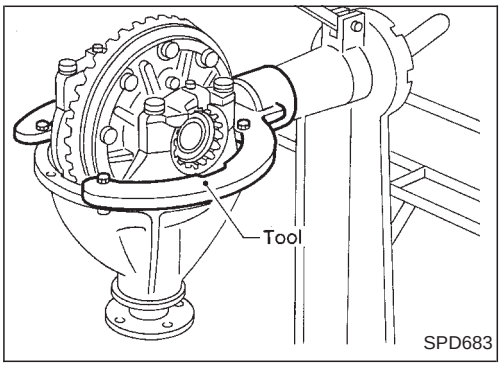
- Tooth contact

Check tooth contact, referring to Adjustment.

- Side gear to pinion mate gear backlash

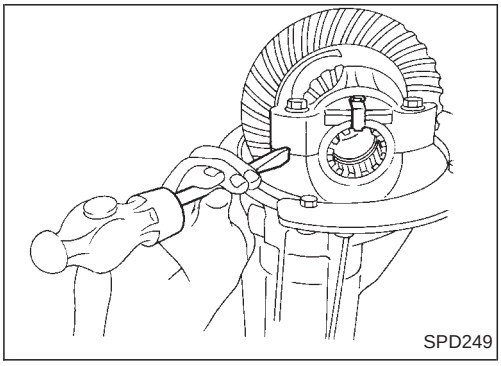
Measure clearance between side gear thrust washer and differential case with a feeler gauge.

Clearance between side gear thrust washer and differential case:
0.10 - 0.20 mm (0.0039 - 0.0079 in)



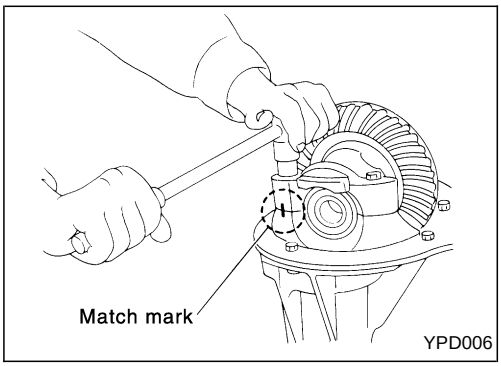
Differential Carrier

1. Mount final drive assembly on Tool.
   Tool number:
   ST06340000

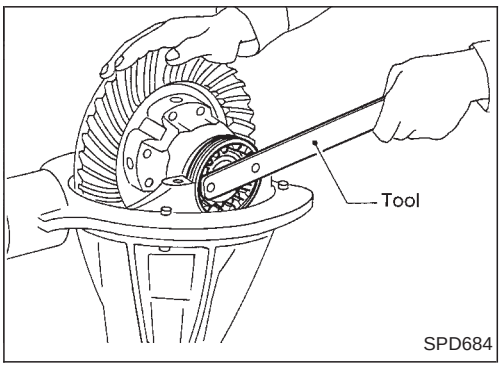


2. Put match marks on one side bearing cap with paint or punch to ensure that it is replaced in proper position during reassembly.

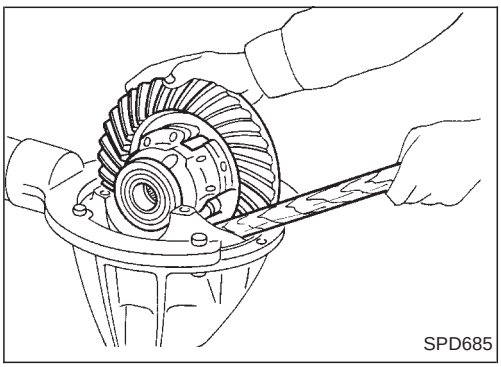
Bearing caps are line-bored during manufacture and should be put back in their original places.



3. Remove side lock fingers and side bearing caps.

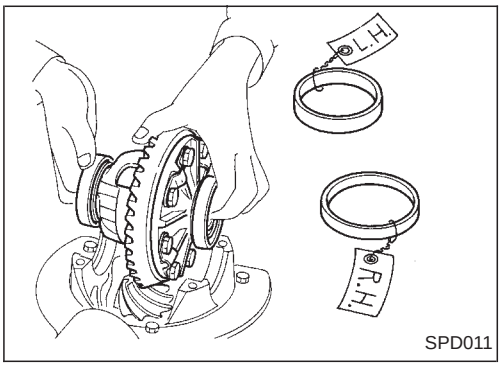


4. Remove side bearing adjuster with Tool.
   Tool number:
   ST32580000



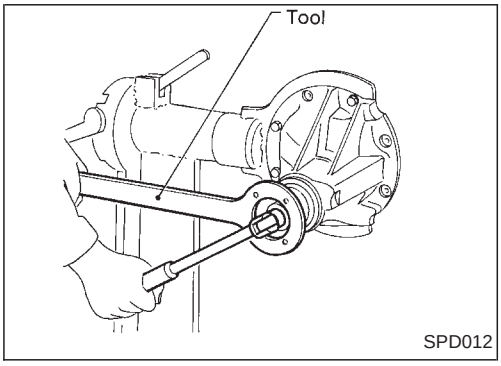
5. Remove differential case assembly with a pry bar.

Differential Carrier (Cont'd)



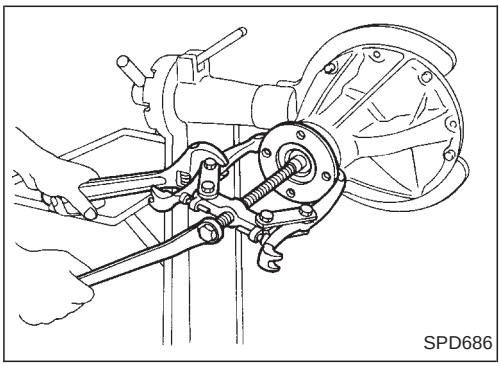
SPD011

Be careful to keep the side bearing outer races together with their respective inner cones — do not mix them up.

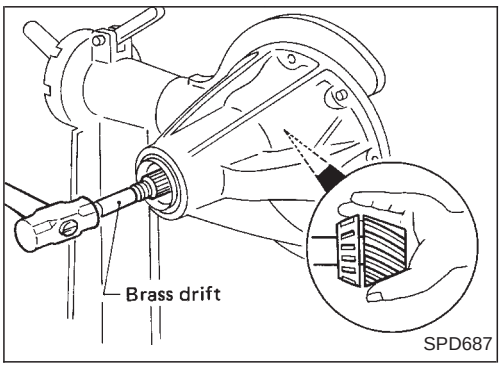


SPD012

6. Remove drive pinion nut with Tool.
   Tool number: KV38104700

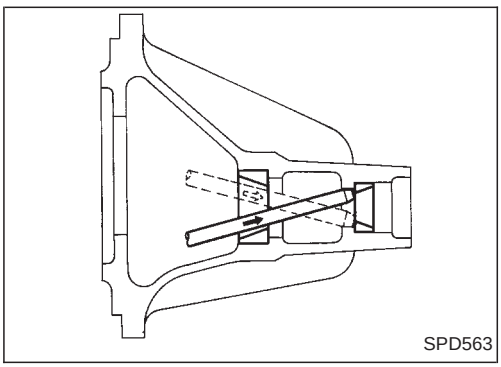

SPD686

7. Remove companion flange with puller.



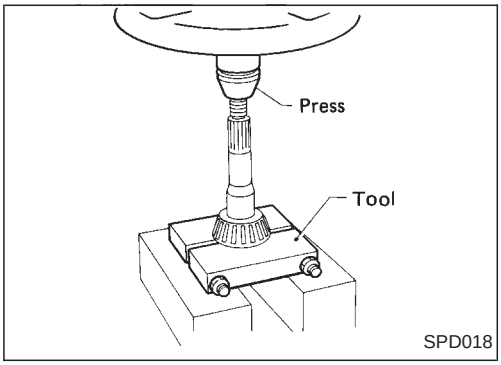
SPD687

8. Take out drive pinion together with pinion rear bearing inner cone, drive pinion bearing spacer and pinion bearing adjusting shim.


SPD563

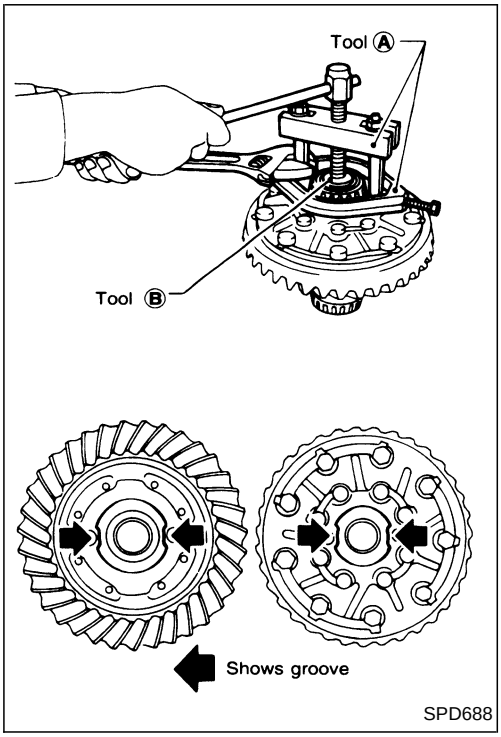
9. Remove front oil seal and pinion front bearing inner cone.
10. Remove pinion bearing outer races with a brass drift.

Differential Carrier (Cont'd)



11. Remove pinion rear bearing inner cone and drive pinion adjusting washer.
    Tool number:
    ST30031000

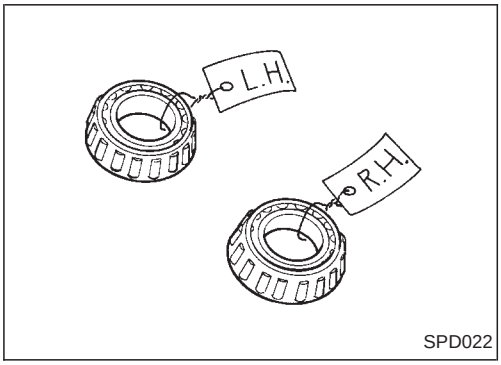
Differential Case



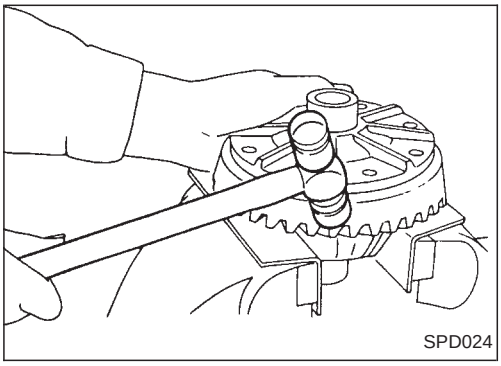
1. Remove side bearing inner cones.

To prevent damage to bearing, engage puller jaws in groove.

Tool number:
Ⓐ **ST33051001**
Ⓑ **ST33061000**



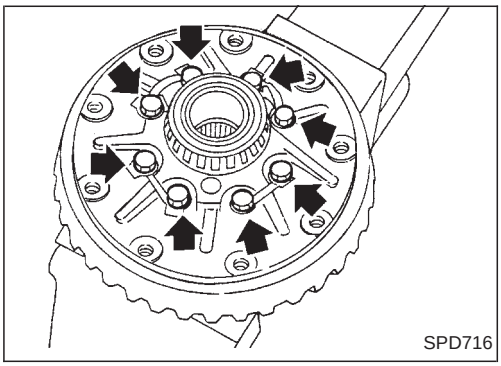
Be careful not to confuse left and right hand parts.



2. Loosen ring gear bolts in a criss-cross fashion.
3. Tap ring gear off differential case with a soft hammer.

Tap evenly all around to keep ring gear from binding.

Differential Case (Cont'd)

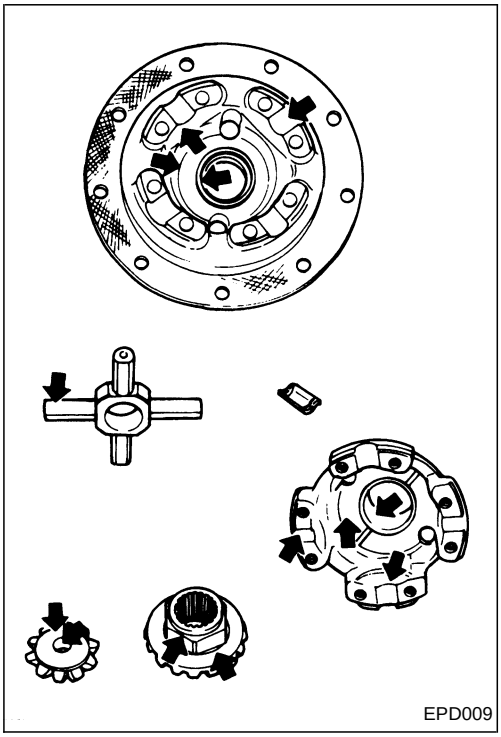

SPD716

4. Separate differential case.

Put match marks on both L.H. and R.H. differential cases.

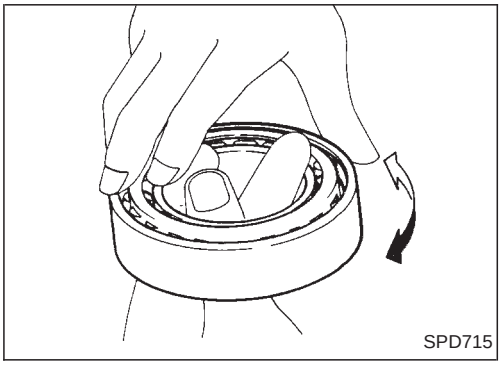
Ring Gear and Drive Pinion

Check gear teeth for scoring, cracking or chipping.
If any damaged part is evident, replace ring gear and drive pinion as a set (hypoid gear set).


EPD009

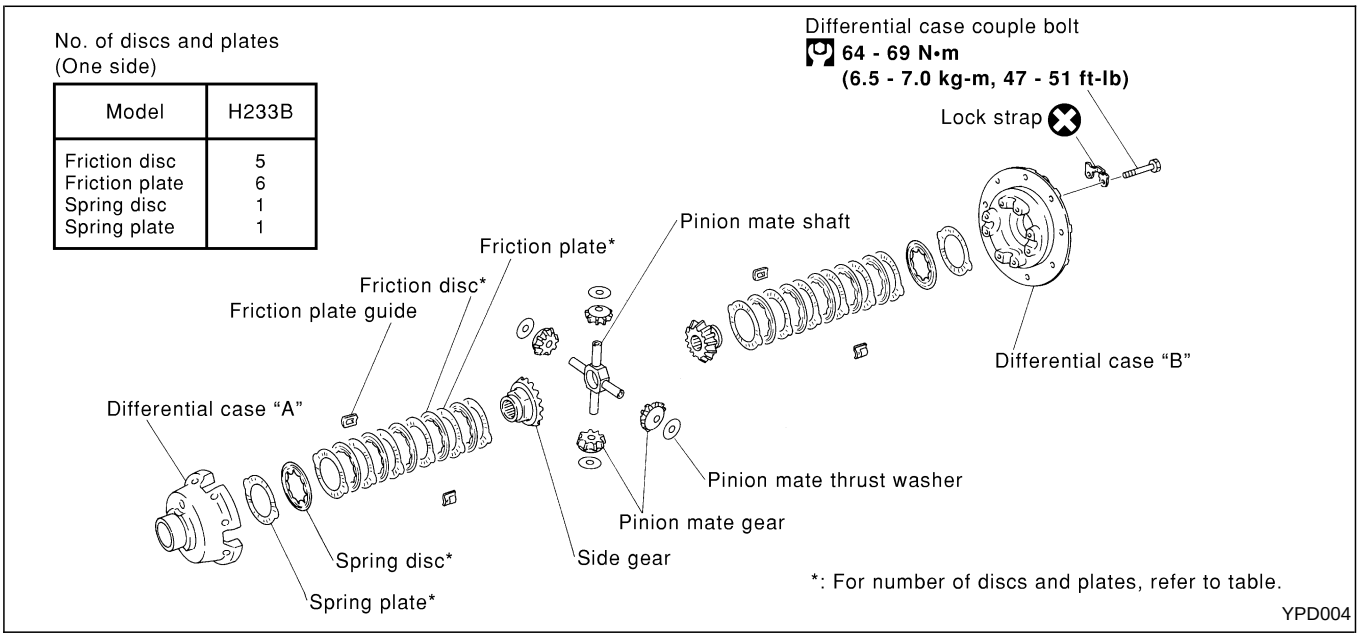
Differential Case Assembly

Check mating surfaces of differential case, side gears, pinion mate gears, pinion mate shaft, and thrust washers.

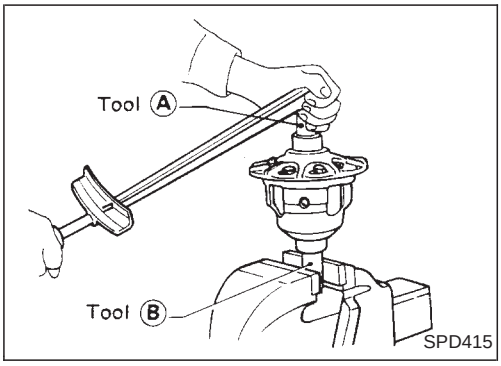

SPD715

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.



CAUTION:
Do not run engine when one rear wheel is off the ground.

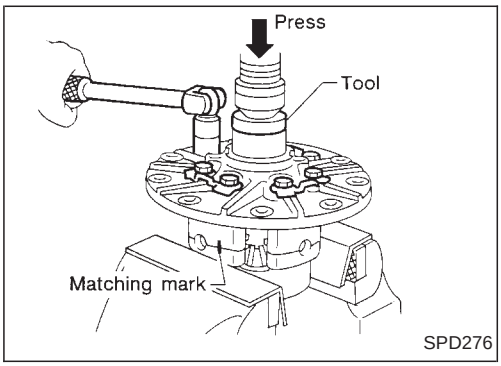


Preparation for Disassembly

CHECKING DIFFERENTIAL TORQUE

Measure differential torque with Tool.
If it is not within the specifications, inspect components of limited slip differential.

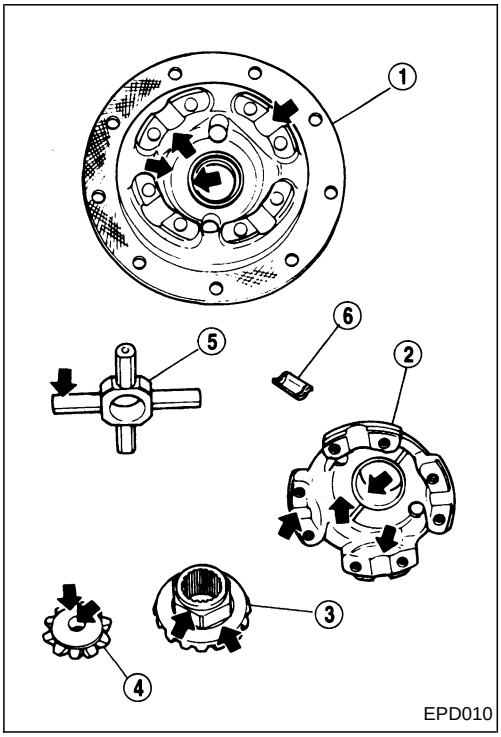
Differential torque:
353 - 392 N·m (36 - 40 kg-m, 260 - 289 ft-lb)
Assembly:
KV38105250
Tool number:
Ⓐ KV38105210
Ⓑ KV38105220



Disassembly

1. Spread out lock straps.
2. Remove couple bolts using a press.
   Tool number: ST33081000
3. Separate differential case A and B.
   Draw out component parts (discs and plates, etc.)

Put marks on gears and pressure rings so that they can be reinstalled in their original positions from which they were removed.



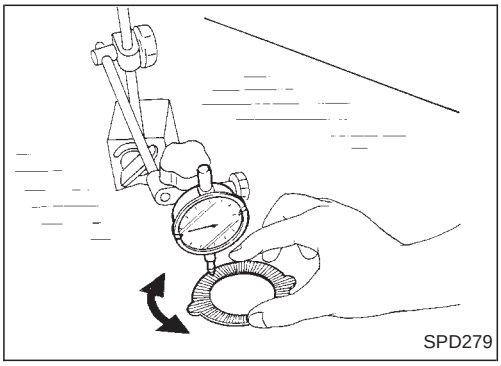
Inspection

CONTACT SURFACES

1. Clean the disassembled parts in suitable solvent and blow dry with compressed air.
2. If following surfaces are found with burrs or scratches, smooth with oil stone.
   ① Differential case B
   ② Differential case A
   ③ Side gear
   ④ Pinion mate gear
   ⑤ Pinion mate shaft
   ⑥ Friction plate guide

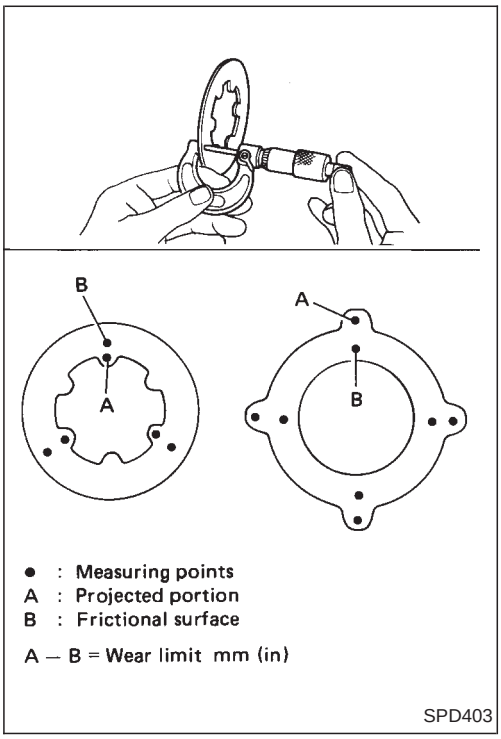
DISC AND PLATE

1. Clean the discs and plates in suitable solvent and blow dry with compressed air.
2. Inspect discs and plates for wear, nicks and burrs.



3. To make sure that friction disc or plate is not distorted, place it on a surface plate and rotate it by hand with indicating finger of dial gauge resting against disc or plate surface. Check the warpage.
   Allowable warpage:
   0.05 - 0.15 mm (0.0020 - 0.0059 in)
   If it exceeds limit, replace with a new plate to eliminate possibility of clutch slippage or sticking.

Inspection (Cont'd)

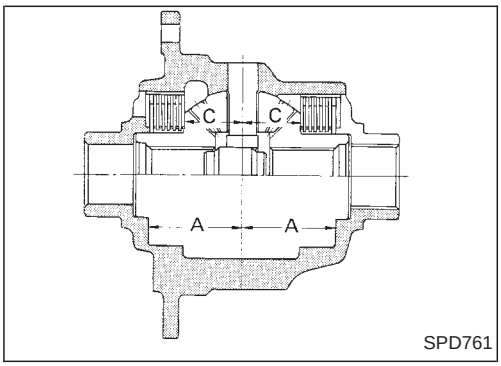


4. Measure frictional surfaces and projected portions of friction disc, friction plate and spring plate.

If any part has worn beyond the wear limit, replace it with a new one that is the same thickness as the projected portion.

Wear limit:

0.1 mm (0.004 in) or less



Adjustment

FRICTION DISC AND FRICTION PLATE END PLAY

End play of friction disc and friction plate can be calculated by using the following equation and should be adjusted within the following range.

Adjustment can be made by selecting friction disc having two different thicknesses.

End play E:

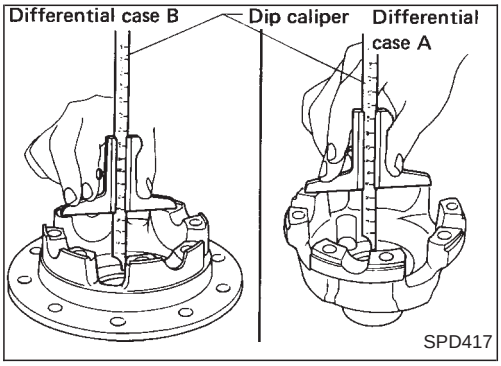
0.05 - 0.15 mm (0.0020 - 0.0059 in)

E = A − (B + C)

A: Length of differential case contact surface to differential case inner bottom.

B: Total thickness of friction discs, friction plates, spring disc and spring plate in differential case on one side.

C: Length of differential case contact surface to back side of side gear.

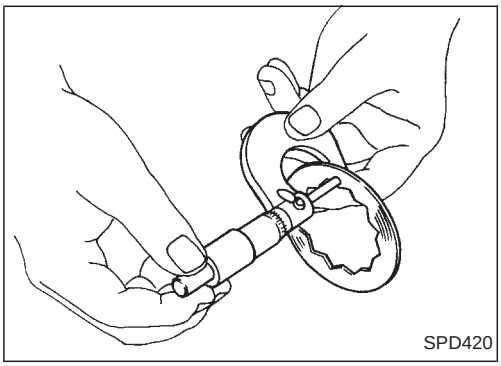


1. Measure values of "A".

Standard length A:

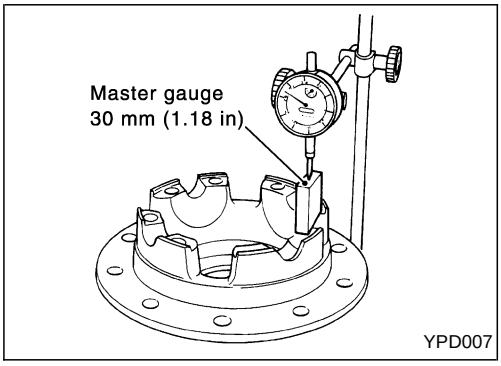
49.50 - 49.55 mm (1.9488 - 1.9508 in)

Adjustment (Cont'd)


SPD420

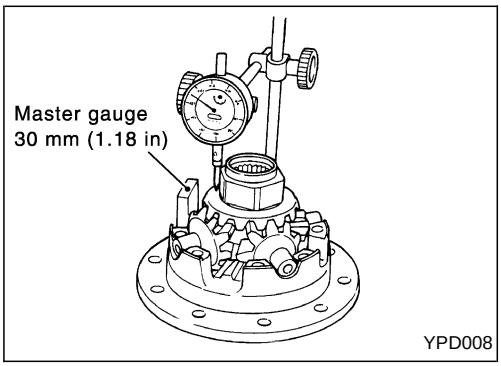
2. Measure thickness of each disc and plate.
   Total thickness "B":
   19.24 - 20.26 mm (0.7575 - 0.7976 in)
   No. of discs and plates (One side):

Friction disc	**5**
Friction plate	**6**
Spring disc	**1**
Spring plate	**1**



YPD007

3. Measure values of "C".
(1) Attach a dial indicator to the base plate.
(2) Place differential case B on the base plate, and install a master gauge on case B.
Then adjust the dial indicator scale to zero with its tip on the master gauge.



YPD008

(3) Install pinion mate gears, side gears and pinion mate shaft in differential case B.
(4) Set dial indicator's tip on the side gear, and read the indication.

Example:

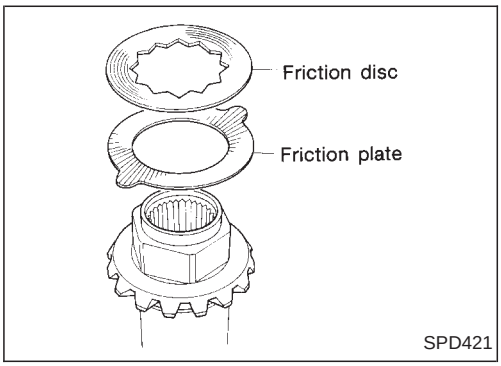
E = A − D
= A − (B + C)
= 0.05 to 0.15 mm → Specified range
A = 49.52 mm
B = 19.45 mm
C = 29.7 mm
D = B + C

B	19.45
+ C	29.7
	49.15

E = A − D

A	49.52
− D	49.15
	0.37

From the above equation, end play of 0.37 mm exceeds the specified range of 0.05 to 0.15 mm.
Select suitable discs and plates to adjust correctly. (Refer to PD-57.)

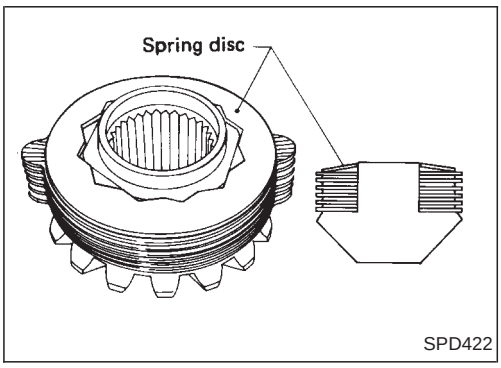


Assembly

Prior to assembling discs and plates, properly lubricate them by dipping them in limited slip differential oil.

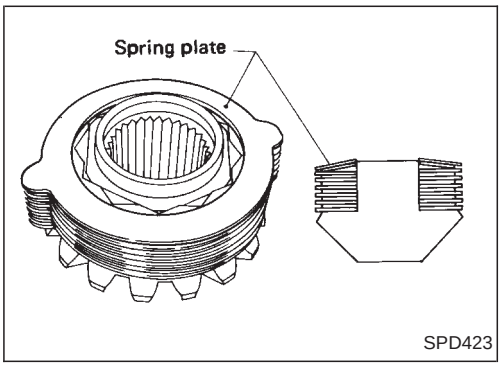
1. Alternately position specified number of friction plates and friction discs on rear of side gear.

Always position a friction plate first on rear of side gear.

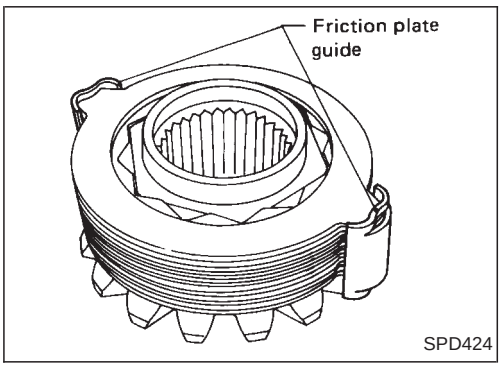


2. Install spring disc.

Align the twelve angular holes in spring disc with the hexagonal area of the side gear.

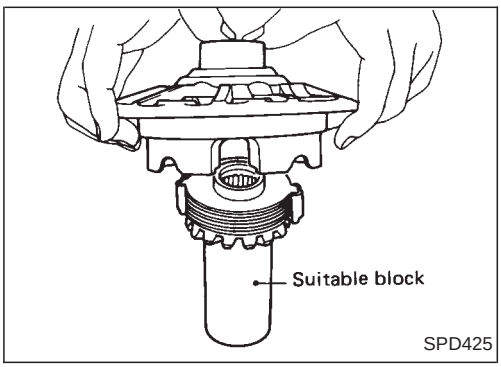


3. Install spring plate.



4. Install friction plate guides.

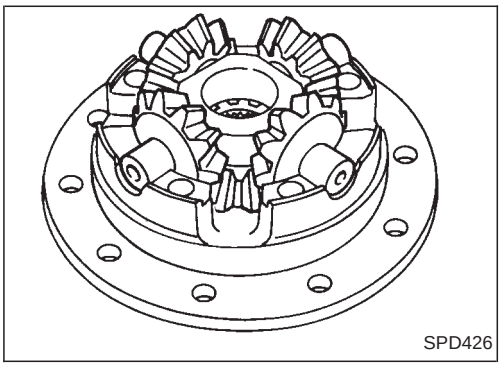
Correctly align the raised portions of friction plates, and apply grease to inner surfaces of friction plate guides to prevent them from falling.



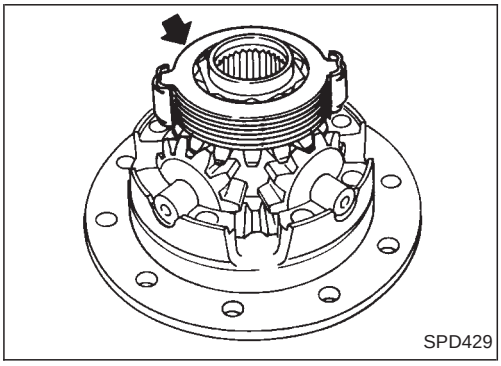
5. Install differential case B over side gear, discs, plates and friction plate guide assembly.

- **Install differential case B while supporting friction plate guides with your middle finger inserted through oil hole in differential case.**
- **Be careful not to detach spring disc from the hexagonal part of the side gear.**

Assembly (Cont'd)

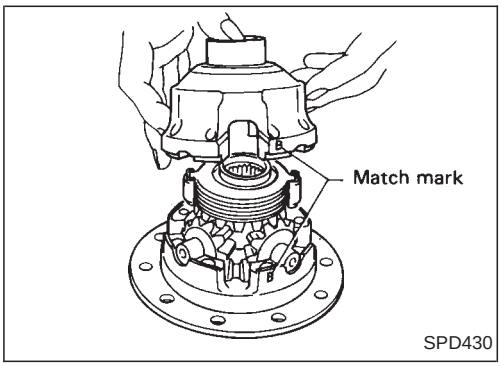

SPD426

6. Install pinion mate gears and pinion shaft to differential case B.


SPD429

7. Install side gear to pinion mate gears.
8. Install each disc and plate.

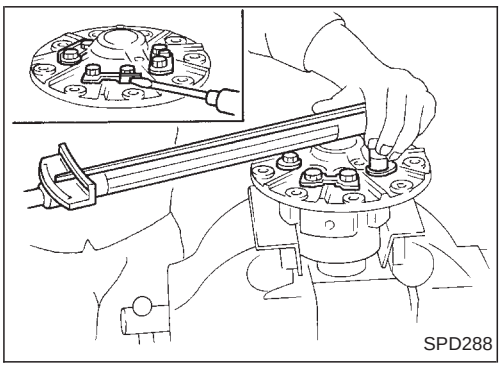
Use same procedures as outlined in steps 1. through 4. above.



SPD430

9. Install differential case A.

Position differential cases A and B by correctly aligning marks stamped on cases.

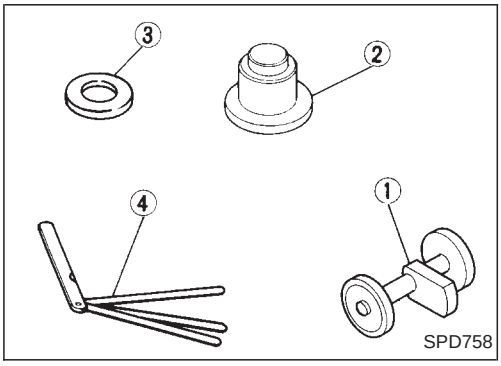

SPD288

10. Tighten differential case bolts.
    : 64 - 69 N·m (6.5 - 7.0 kg-m, 47 - 51 ft-lb)
11. Place ring gear on differential case and install new lock straps and bolts.

Tighten bolts in a criss-cross fashion, lightly tapping bolt head with a hammer.
Then bend up lock straps to lock the bolts in place.

12. Install side bearing inner cone.
13. Check differential torque.

To avoid confusion while calculating bearing shims, it is absolutely necessary to stay with the metric system. If you measure anything in inches, the results MUST be converted to the metric system.

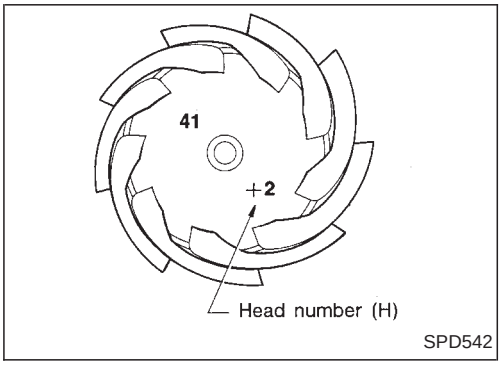


SPD758

Drive Pinion Height

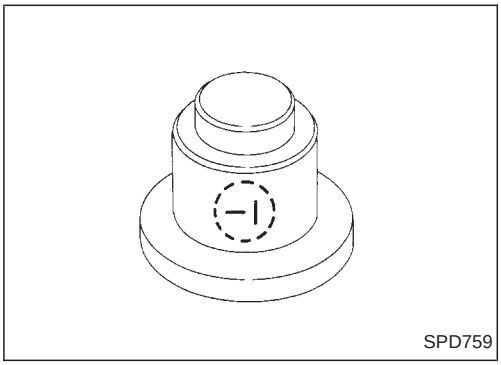
1. First prepare Tools for pinion height adjustment.
   Assembly ① ② :
   ST3125500
   ① Height Gauge (ST31251000)
   ② Dummy Shaft (ST31181001)
   ③ Spacer [thickness: 2.50 mm (0.0984 in)]
   ④ Feeler Gauge
2. To simplify the job, make a chart, like the one below, to organize your calculations.

LETTERS	HUNDREDTHS OF A MILLIMETER
H: Head number	
D′: Figure marked on dummy shaft	
S: Figure marked on height gauge	
N: Measuring clearance	



SPD542

3. Write the following numbers down in the chart.
   H: Head number

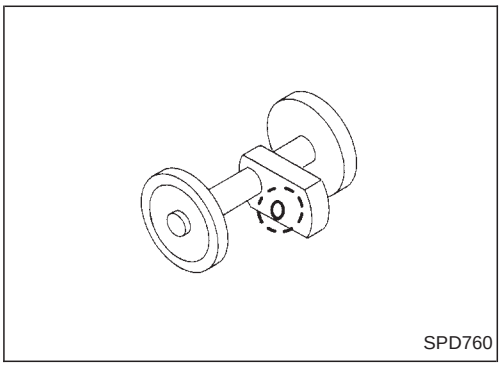


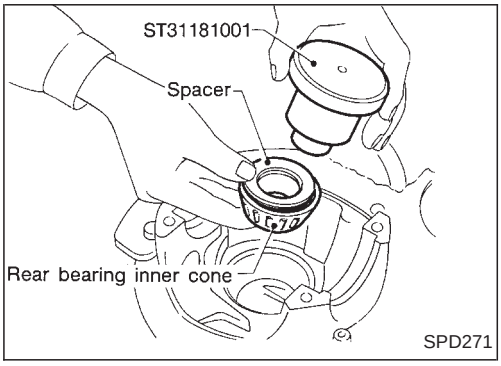
SPD759

D′: Figure marked on dummy shaft

Drive Pinion Height (Cont'd)

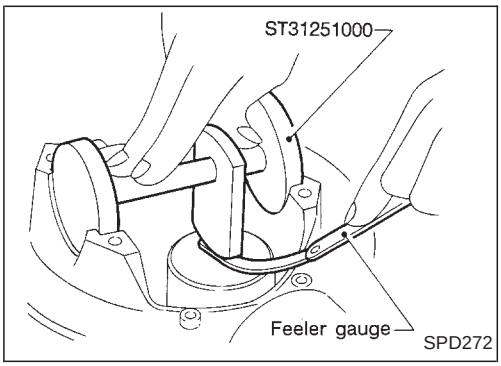
S: Figure marked on height gauge


SPD760



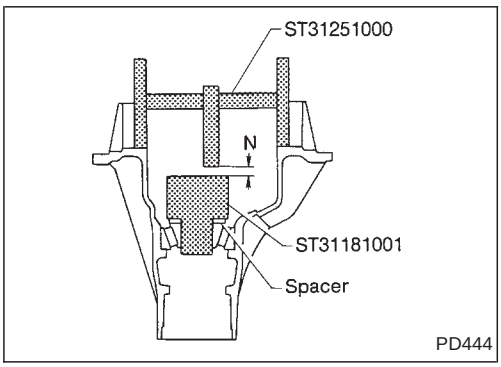
SPD271

4. Place pinion rear bearing inner race and Tools on gear carrier.



SPD272

5. Attach Tool (Height gauge) to gear carrier, and measure the clearance between the height gauge tip and the dummy shaft face.



PD444

Drive Pinion Height (Cont'd)

6. Substitute these values into the equation to calculate the thickness of the washer.

If values signifying H, D′ and S are not given, regard them as zero and calculate.

T (Thickness of washer) = N − [(H − D′− S) x 0.01] + 3.05

Example:

N = 0.30

H = 2

D′ = −1

S = 0

T=N − [(H − D′ − S) x 0.01] + 3.05
= 0.30 − [{2 − (−1) − 0} x 0.01] + 3.05

(1) H.....2
− D′.....−(−1)
3

− S.....−0
3

(2) 3
x 0.01
0.03

(3) N.....0.30
−0.03
0.27

(4) 0.27
+3.05
3.32

∴T = 3.32

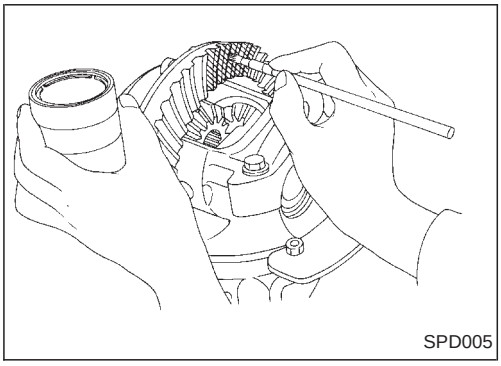
7. Select the proper washer. (Refer to PD-57.)

If you cannot find the desired thickness of washer, use washer with thickness closest to the calculated value.

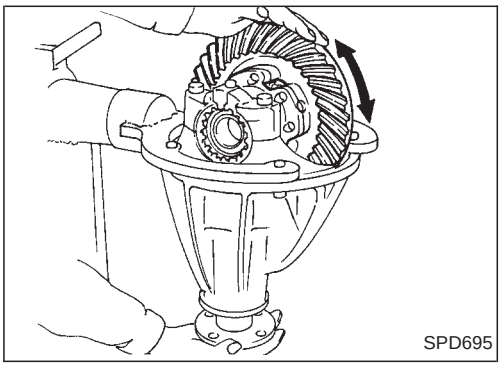
Example:
Calculated value ... T = 3.32 mm
Used washer ... T = 3.33 mm

Tooth Contact

Gear tooth contact pattern check is necessary to verify correct relationship between ring gear and drive pinion.
Hypoid gear sets which are not positioned properly in relation to one another may be noisy, or have short life span or both. With a pattern check, the most desirable contact for low noise level and long life can be assured.

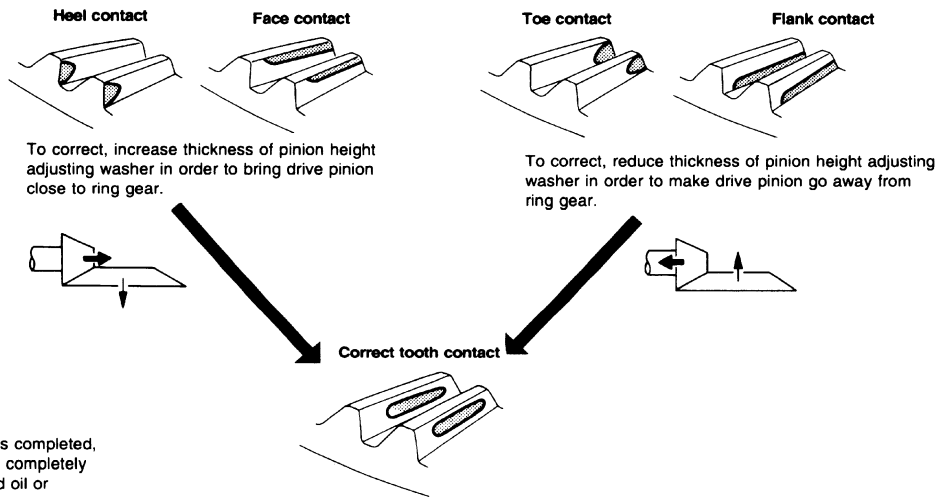

SPD005

1. Thoroughly clear ring gear and dive pinion teeth.
2. Sparingly apply a mixture of powdered ferric oxide and oil or equivalent to 3 or 4 teeth of ring gear drive side.


SPD695

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

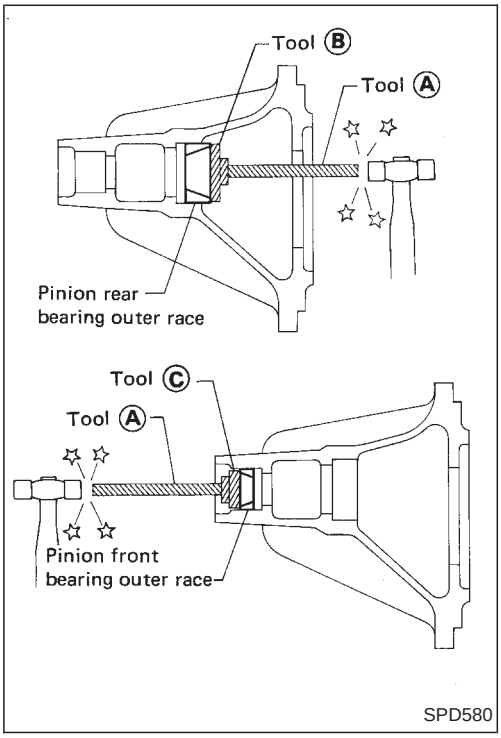
Usually the pattern will be correct if you have calculated the shims correctly and the backlash is correct.
However, in rare cases you may have to use trial-and-error processes until you get a good tooth contact pattern.
Tho tooth pattern is the best indication of how well a differential has been set up.



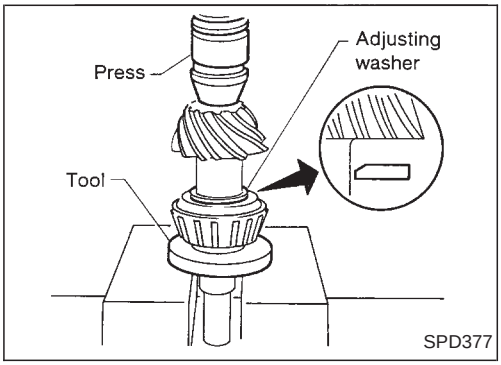
When adjustment is completed, be sure to wipe off completely the ferric oxide and oil or their equivalent.

NPD003

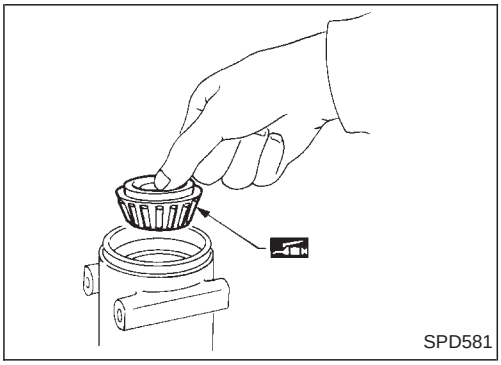
Differential Carrier



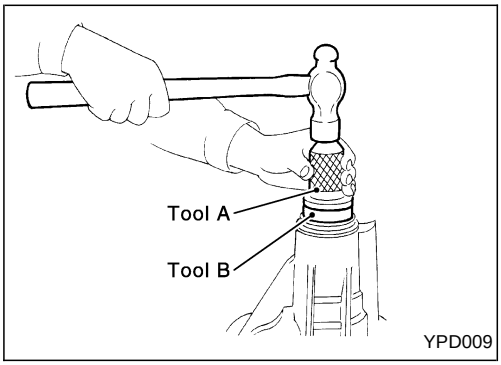
1. Press-fit front and rear bearing outer races with Tools.
   Tool number:
   - Ⓐ **ST30611000**
   - Ⓑ **ST30621000**
   - Ⓒ **ST30613000**



2. Select drive pinion height adjusting washer, referring to Adjustment.
3. Install drive pinion adjusting washer in drive pinion, and press-fit pinion rear bearing inner cone in it with press and Tool.
   Tool number:
   ST30901000

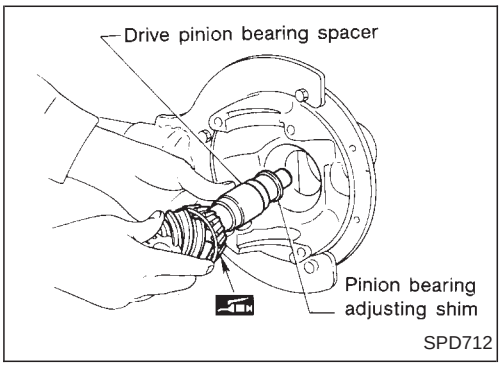


4. Place pinion front bearing inner cone in gear carrier.

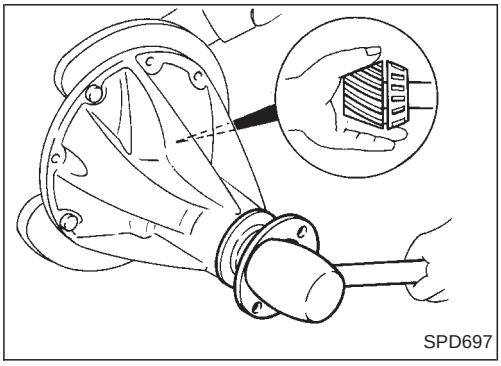


5. Apply multi-purpose grease to cavity at sealing lips of oil seal. Install front oil seal.
   Tool number:
   - Ⓐ **ST30720000**
   - Ⓑ **KV38102510**

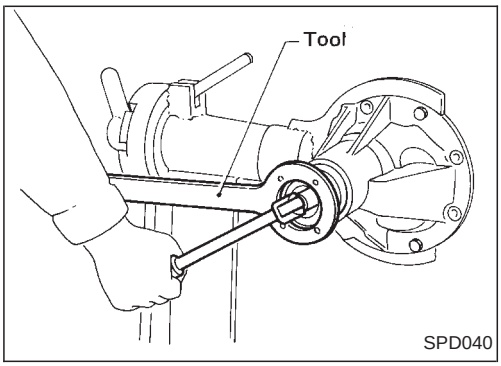
Differential Carrier (Cont'd)



6. Install drive pinion bearing spacer, pinion bearing adjusting shim and drive pinion in gear carrier.



7. Insert companion flange into drive pinion by tapping the companion flange with a soft hammer.

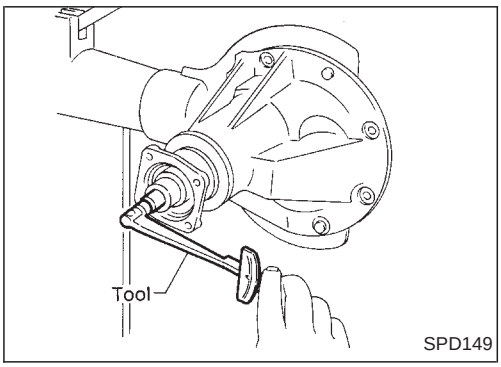


8. Tighten pinion nut to specified torque.

The threaded portion of drive pinion and pinion nut should be free from oil or grease.

Tool number:

KV38104700



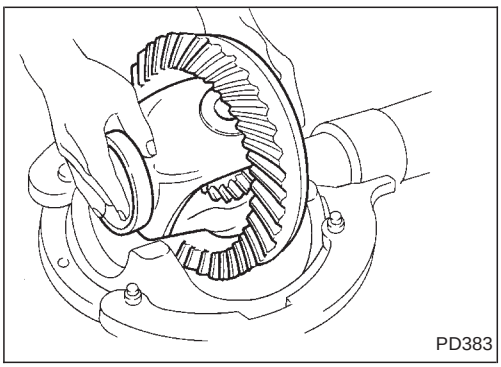
9. Turn drive pinion in both directions several times, and measure pinion bearing preload.

Tool number:

ST3127S000

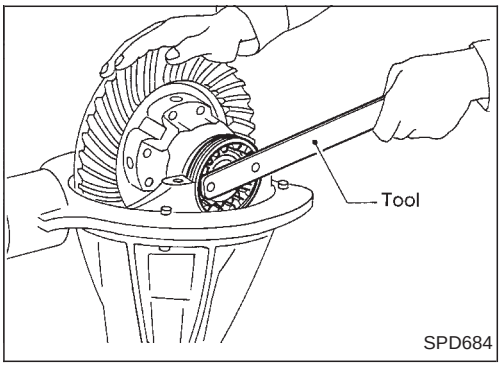
Pinion bearing preload:

1.7 - 2.5 N·m (17 - 26 kg-cm, 15 - 23 in-lb)

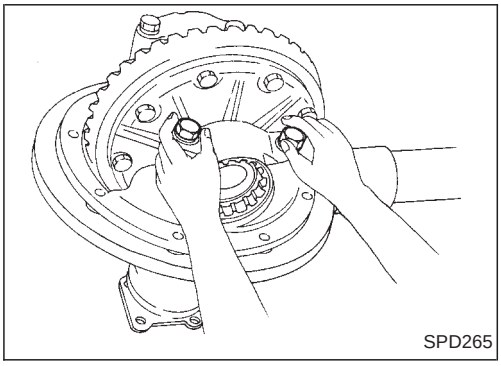


10. Install differential case assembly with side bearing outer races into gear carrier.

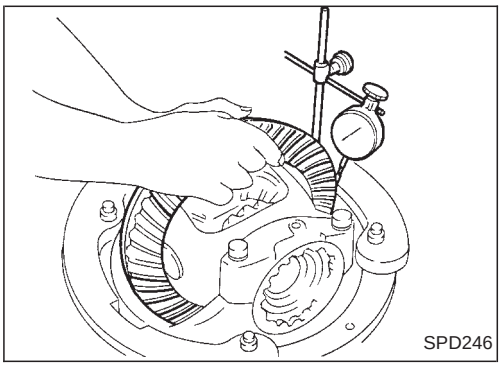
Differential Carrier (Cont'd)



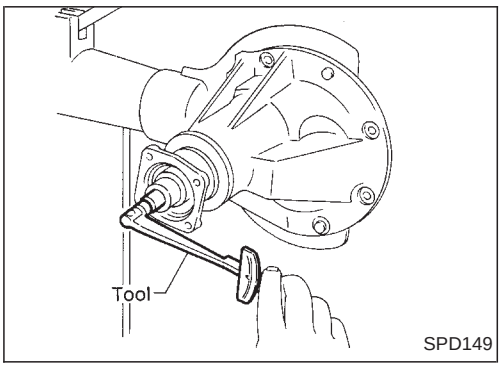
11. Position side bearing on gear carrier with threads properly engaged; screw in adjusters lightly at this stage of assembly.
    Tool number:
    ST32580000



12. Align mark on bearing cap with that on gear carrier and install bearing cap on gear carrier.
- Do not tighten at this point to allow further tightening of side bearing adjusters.



13. Tighten both right and left side bearing adjusters alternately and measure ring gear backlash and total preload at the same time. Adjust right and left side bearing adjusters by tightening them alternately so that proper ring gear backlash and total preload can be obtained.
    Ring gear-to-drive pinion backlash:
    0.15 - 0.20 mm (0.0059 - 0.0079 in)



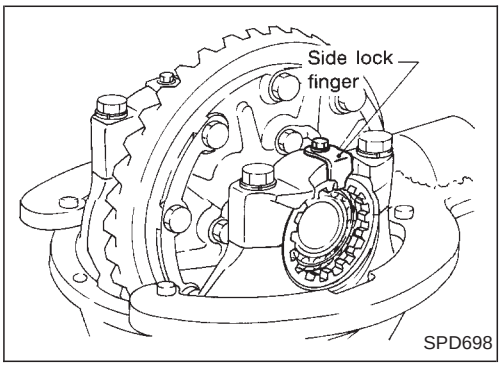
- **When checking preload, turn drive pinion in both directions several times to set bearing rollers.**
  Tool number:
  ST3127S000

The total pinion bearing preload value with the differential case assembly should be in accordance with the same value measured without the differential case assembly. (See point 9.)
The relationship between both is:

Pinion bearing preload

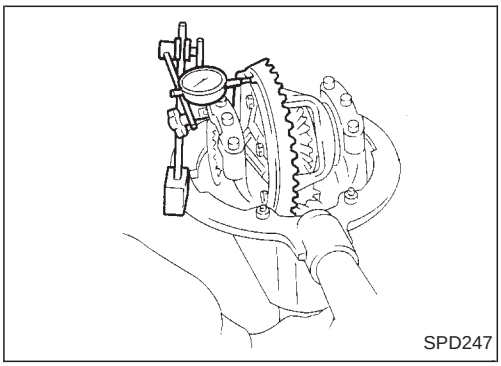
With differential case assembly		Without differential case assembly	
kg-cm	N·m	kg-cm	N·m
14	1.4	17 - 23	1.7 - 2.3
15	1.5	18 - 24	1.8 - 2.4
16	1.6	19 - 25	1.9 - 2.5
17	1.7	20 - 26	2.0 - 2.6

Differential Carrier (Cont'd)



14. Tighten side bearing cap bolts.
    : 83 - 103 N·m (8.5 - 10.5 kg-m, 62 - 76 ft-lb)

15. Install side lock finger in place to prevent rotation during operation.



16. Check runout of ring gear with a dial indicator.
    Runout limit:
    0.08 mm (0.0031 in)
- If backlash varies excessively in different places, the variance may have resulted from foreign matter caught between the ring gear and the differential case.
- If the backlash varies greatly when the runout of the ring gear is within a specified range, the hypoid gear set or differential case should be replaced.

17. Check tooth contact. (Refer to PD-49.)

Propeller Shaft

GENERAL SPECIFICATIONS

Unit: mm (in)

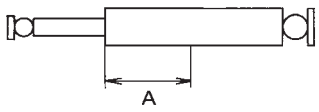
MODEL	ALL	H/T	WAGON
Portion	Front	Rear	
Propeller shaft model	0F71H	2S80B	
Number of joints	2		
Coupling method with transmission	Flange type	Sleeve type	
Types of journal bearings	Solid type (disassembly type)	Solid type	
Shaft length (Spider to spider) mm (in)	542 (21.34)	725 (28.54)	925 (36.42)
Shaft outer diameter mm (in)	65 (2.56)	65 (2.56)	

INSPECTION AND ADJUSTMENT

Front propeller shaft

Unit: mm (in)

Propeller shaft model	0F71H
Journal axial play limit	0.02 (0.0008)
Propeller shaft runout limit	0.6 (0.024)
Measuring point A	126 (4.96)

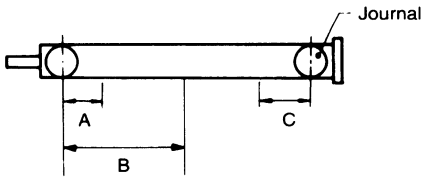


SPD996

Rear propeller shaft

Unit: mm (in)

Propeller shaft model	2S80B
Journal axial play limit	0.02 (0.0008)
Propeller shaft runout limit	0.6 (0.024)
Measuring point	
A	280 (11.02)
B	475 (18.70)
C	280 (11.02)



NPD004

Available snap rings

0F71H models

Unit: mm (in)

Thickness mm (in)	ID color	Part number
1.99 (0.0783)	White	37146-01G00
2.02 (0.0795)	Yellow	37147-01G00
2.05 (0.0807)	Red	37148-01G00
2.08 (0.0819)	Green	37149-01G00
2.11 (0.0831)	Blue	37150-01G00
2.14 (0.0843)	Light brown	37151-01G00
2.17 (0.0854)	Pink	37152-01G00
2.20 (0.0866)	No paint	37153-01G00

2S80B models

Thickness mm (in)	ID color	Part number
1.99 (0.0783)	White	37146-C9400
2.02 (0.0795)	Yellow	37147-C9400
2.05 (0.0807)	Red	37148-C9400
2.08 (0.0819)	Green	37149-C9400
2.11 (0.0831)	Blue	37150-C9400
2.14 (0.0843)	Light Brown	37151-C9400
2.17 (0.0854)	Pink	37152-C9400
2.20 (0.0866)	No paint	37153-C9400

Final Drive

GENERAL SPECIFICATIONS

Front final drive	R180A
	4-pinion
Oil capacity (Approx.) ℓ (Imp pt)	1.3 (2-1/4)
Rear final drive	H233B
	LSD* 4-pinion
Oil capacity (Approx.) ℓ (Imp pt)	2.8 (4-7/8)
Gear ratio	4.375
Number of teeth	
Ring gear	35
Drive pinion	8

* Limited Slip Differential

INSPECTION AND ADJUSTMENT (R180A)

Ring gear runout

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

Axle bearing adjustment

Axle bearing end play mm (in)	0 - 0.1 (0 - 0.004)

Available axle bearing adjusting shims

Thickness mm (in)	Part number
0.10 (0.0039)	38233-01G11
0.20 (0.0079)	38233-01G12
0.30 (0.0118)	38233-01G13
0.40 (0.0157)	38233-01G14

Side gear adjustment

Side gear backlash (Clearance between side gear to differential case) mm (in)	0.10 - 0.20 (0.0039 - 0.0079)

Available side gear thrust washers

Thickness mm (in)	Part number
0.75 (0.0295)	38424-W2010
0.78 (0.0307)	38424-W2011
0.81 (0.0319)	38424-W2012
0.84 (0.0331)	38424-W2013
0.87 (0.0343)	38424-W2014
0.90 (0.0354)	38424-W2015
0.93 (0.0366)	38424-W2016
0.96 (0.0378)	38424-W2017

Drive pinion height adjustment

Available pinion height adjusting washers

Thickness mm (in)	Part number
3.09 (0.1217)	38154-P6017
3.12 (0.1228)	38154-P6018
3.15 (0.1240)	38154-P6019
3.18 (0.1252)	38154-P6020
3.21 (0.1264)	38154-P6021
3.24 (0.1276)	38154-P6022
3.27 (0.1287)	38154-P6023
3.30 (0.1299)	38154-P6024
3.33 (0.1311)	38154-P6025
3.36 (0.1323)	38154-P6026
3.39 (0.1335)	38154-P6027
3.42 (0.1346)	38154-P6028
3.45 (0.1358)	38154-P6029
3.48 (0.1370)	38154-P6030
3.51 (0.1382)	38154-P6031
3.54 (0.1394)	38154-P6032
3.57 (0.1406)	38154-P6033
3.60 (0.1417)	38154-P6034
3.63 (0.1429)	38154-P6035
3.66 (0.1441)	38154-P6036

Drive pinion preload adjustment

Drive pinion bearing preload adjusting method	Adjusting washer and spacer
Drive pinion preload N·m (kg-cm, in-lb)	
With front oil seal	1.1 - 1.7 (11 - 17, 9.5 - 14.8)

Available drive pinion preload adjusting washers

Thickness mm (in)	Part number
6.59 (0.2594)	38127-01G00
6.57 (0.2587)	38127-01G01
6.55 (0.2579)	38127-01G02
6.53 (0.2571)	38127-01G03
6.51 (0.2563)	38127-01G04
6.49 (0.2555)	38127-01G05
6.47 (0.2547)	38127-01G06
6.45 (0.2539)	38127-01G07
6.43 (0.2531)	38127-01G08
6.41 (0.2524)	38127-01G09
6.39 (0.2516)	38127-01G10
6.37 (0.2508)	38127-01G11
6.35 (0.2500)	38127-01G12
6.33 (0.2492)	38127-01G13
6.31 (0.2484)	38127-01G14

Available drive pinion preload adjusting spacers

Length mm (in)	Part number
52.20 (2.0551)	38130-G2300
52.40 (2.0630)	38131-G2301
52.60 (2.0709)	38132-G2302
52.80 (2.0787)	38133-G2303
53.00 (2.0866)	38134-G2304
53.20 (2.0945)	38135-G2305

Final Drive (Cont'd)

Side bearing adjustment

Differential carrier assembly turning resistance N (kg, lb)	34.3 - 39.2 (3.5 - 4.0, 7.7 - 8.8)
Side bearing adjusting method	Adjusting shim

Available side retainer adjusting shims

Thickness mm (in)	Part number
0.20 (0.0079)	38453-01G00
0.25 (0.0098)	38453-01G01
0.30 (0.0118)	38453-01G02
0.40 (0.0157)	38453-01G03
0.50 (0.0197)	38453-01G04

Total preload adjustment

Total preload N·m (kg-cm, in-lb)	1.2 - 2.3 (12 - 23, 8.7 - 20.0)
Ring gear backlash mm (in)	0.13 - 0.18 (0.0051 - 0.0071)

INSPECTION AND ADJUSTMENT (H233B)

Ring gear runout

Ring gear runout limit mm (in)	0.08 (0.0031)

Differential torque adjustment

Differential torque N·m (kg-m, ft-lb)	353 - 392 (36 - 40, 260 - 289)
Number of discs and plates	
Friction disc	5
Friction plate	6
Spring disc	1
Spring plate	1
Wear limit of plate and disc mm (in)	0.1 (0.004)
Allowable warpage of friction disc and plate mm (in)	0.05 - 0.15 (0.0020 - 0.0059)

Available discs and plates

Part name	Thickness mm (in)	Part number
Friction disc	1.48 - 1.52 (0.0583 - 0.0598)	38433-C6000
	1.58 - 1.62 (0.0622 - 0.0638)	38433-C6001
Friction plate	1.48 - 1.52 (0.0583 - 0.0598)	38432-C6000
Spring disc	1.48 - 1.52 (0.0583 - 0.0598)	38436-C6000
Spring plate	1.48 - 1.52 (0.0583 - 0.0598)	38435-C6010

Drive pinion height adjustment

Available pinion height adjusting washers

Thickness mm (in)	Part number
2.58 (0.1016)	38151-01J00
2.61 (0.1028)	38151-01J01
2.64 (0.1039)	38151-01J02
2.67 (0.1051)	38151-01J03
2.70 (0.1063)	38151-01J04
2.73 (0.1075)	38151-01J05
2.76 (0.1087)	38151-01J06
2.79 (0.1098)	38151-01J07
2.82 (0.1110)	38151-01J08
2.85 (0.1122)	38151-01J09
2.88 (0.1134)	38151-01J10
2.91 (0.1146)	38151-01J11
2.94 (0.1157)	38151-01J12
2.97 (0.1169)	38151-01J13
3.00 (0.1181)	38151-01J14
3.03 (0.1193)	38151-01J15
3.06 (0.1205)	38151-01J16
3.09 (0.1217)	38151-01J17
3.12 (0.1228)	38151-01J18
3.15 (0.1240)	38151-01J19
3.18 (0.1252)	38151-01J60
3.21 (0.1264)	38151-01J61
3.24 (0.1276)	38151-01J62
3.27 (0.1287)	38151-01J63
3.30 (0.1299)	38151-01J64
3.33 (0.1311)	38151-01J65
3.36 (0.1323)	38151-01J66
3.39 (0.1335)	38151-01J67
3.42 (0.1346)	38151-01J68
3.45 (0.1358)	38151-01J69
3.48 (0.1370)	38151-01J70
3.51 (0.1382)	38151-01J71
3.54 (0.1394)	38151-01J72
3.57 (0.1406)	38151-01J73
3.60 (0.1417)	38151-01J74
3.63 (0.1429)	38151-01J75
3.66 (0.1441)	38151-01J76

Final Drive (Cont'd)

Drive pinion preload adjustment

Drive pinion bearing preload adjusting method	Adjusting shim and spacer
Drive pinion preload N·m (kg-cm, in-lb)	1.4 - 1.7 (14 - 17, 12 - 15)
Without front oil seal	1.2 - 1.5 (12 - 15, 10 - 13)

Available drive pinion preload adjusting shims

Thickness mm (in)	Part number
2.31 (0.0909)	38125-82100
2.33 (0.0917)	38126-82100
2.35 (0.0925)	38127-82100
2.37 (0.0933)	38128-82100
2.39 (0.0941)	38129-82100
2.41 (0.0949)	38130-82100
2.43 (0.0957)	38131-82100
2.45 (0.0965)	38132-82100
2.47 (0.0972)	38133-82100
2.49 (0.0980)	38134-82100
2.51 (0.0988)	38135-82100
2.53 (0.0996)	38136-82100
2.55 (0.1004)	38137-82100
2.57 (0.1012)	38138-82100
2.59 (0.1020)	38139-82100

Available drive pinion preload adjusting spacers

Length mm (in)	Part number
4.50 (0.1772)	38165-76000
4.75 (0.1870)	38166-76000
5.00 (0.1969)	38167-76000
5.25 (0.2067)	38166-01J00
5.50 (0.2165)	38166-01J10

Total preload adjustment

Total preload N·m (kg-cm, in-lb)	1.7 - 2.5 (17 - 25, 15 - 22)
Ring gear backlash mm (in)	0.15 - 0.20 (0.0059 - 0.0079)
Side bearing adjusting method	Side adjuster