

PROPELLER SHAFT & DIFFERENTIAL CARRIER

SECTION PD

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PROPELLER SHAFT

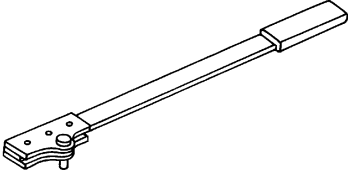
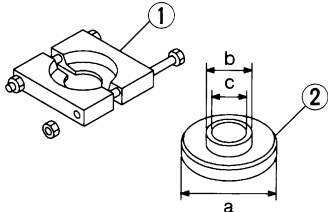
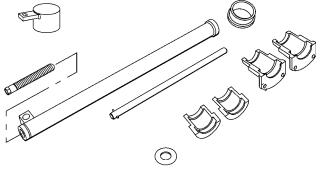
Preparation

Preparation

SPECIAL SERVICE TOOLS

NEPD0001

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

Tool number (Kent-Moore No.) Tool name	Description	GI MA
KV38108300 (J-44195) Companion flange wrench	 NT771	EM LC EC
ST3090S000 (—) Drive pinion rear inner race puller set 1 ST30031000 (J22912-01) Puller 2 ST30901000 (J26010-01) Base	 NT527	FE CL MT
KV40106500 (J-45073) Rear axle shaft bearing puller	 LPD022	AT TF PD

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PROPELLER SHAFT

Noise, Vibration and Harshness (NVH) Troubleshooting

Noise, Vibration and Harshness (NVH) Troubleshooting

=NEPD0049

NVH TROUBLESHOOTING CHART

NEPD0049S01

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

Symptom	PROPELLER SHAFT	Noise	Shake	Vibration	Possible cause and SUSPECTED PARTS	Reference page
					Uneven rotation torque	—
					Center bearing improper installation	PD-6
					Excessive center bearing axial end play	—
					Center bearing mounting (insulator) cracks, damage or deterioration	—
					Excessive joint angle	—
					Rotation imbalance	PD-8
					Excessive runout	PD-8
					Rough gear tooth	PD-26, 51, 75
					Improper gear contact	PD-33, 58, 86
					Tooth surfaces worn	PD-26, 51, 75
					Incorrect backlash	PD-21, 47, 71
					Companion flange excessive runout	—
					Improper gear oil	—
					PROPELLER SHAFT	Refer to PROPELLER SHAFT in this chart.
					DIFFERENTIAL	Refer to DIFFERENTIAL in this chart.
					DRIVE SHAFT	Refer to NVH, AX-4
					AXLE	Refer to NVH, AX-4
					SUSPENSION	Refer to NVH, SU-3
					TIRES	Refer to NVH, SU-3
					ROAD WHEEL	Refer to NVH, SU-3
					BRAKES	Refer to NVH, BR-8
					STEERING	Refer to NVH, ST-5

x: Applicable

PROPELLER SHAFT

Components

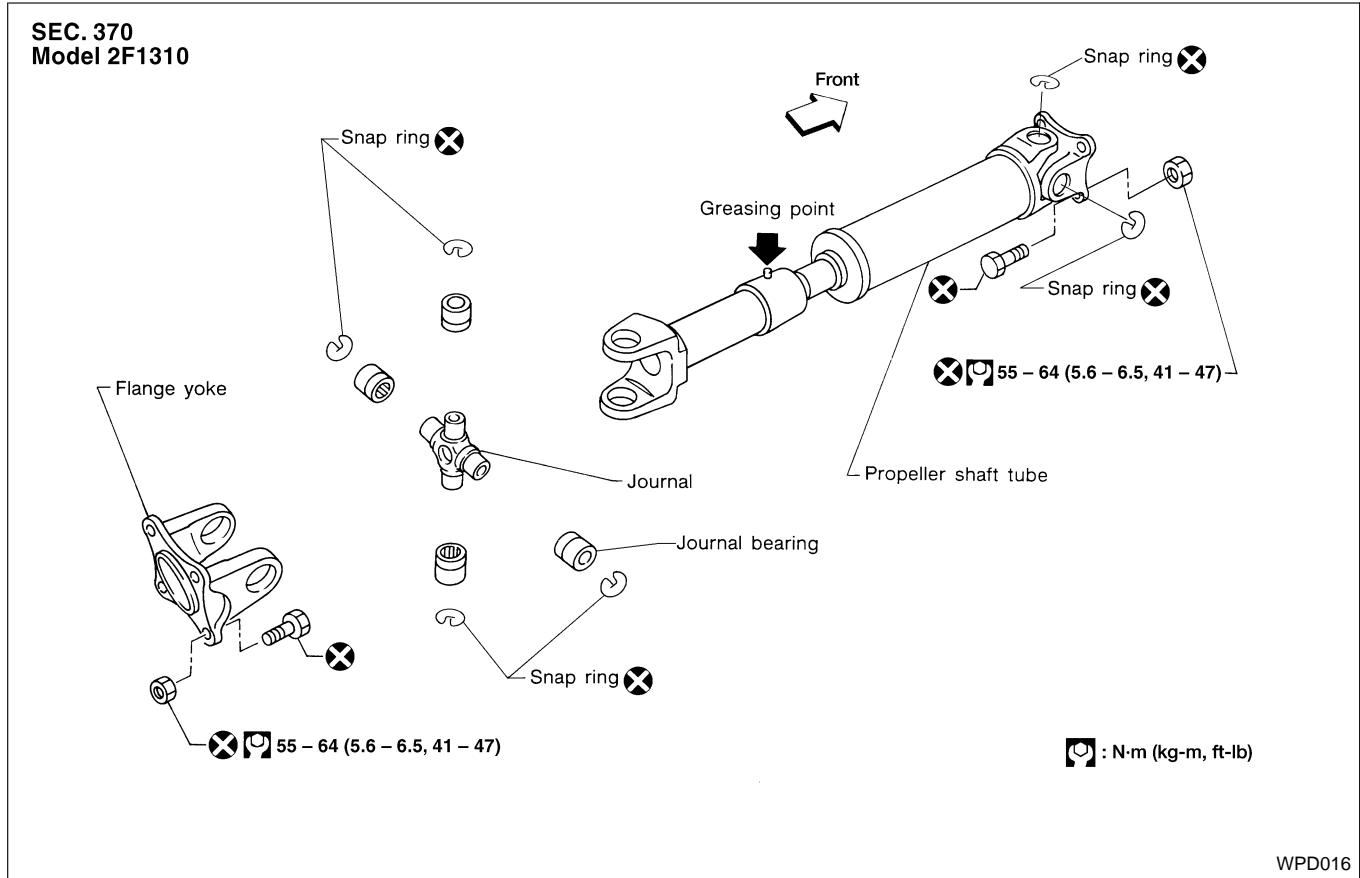
Components

NEPD0002

NEPD0002S01

FRONT PROPELLER SHAFT

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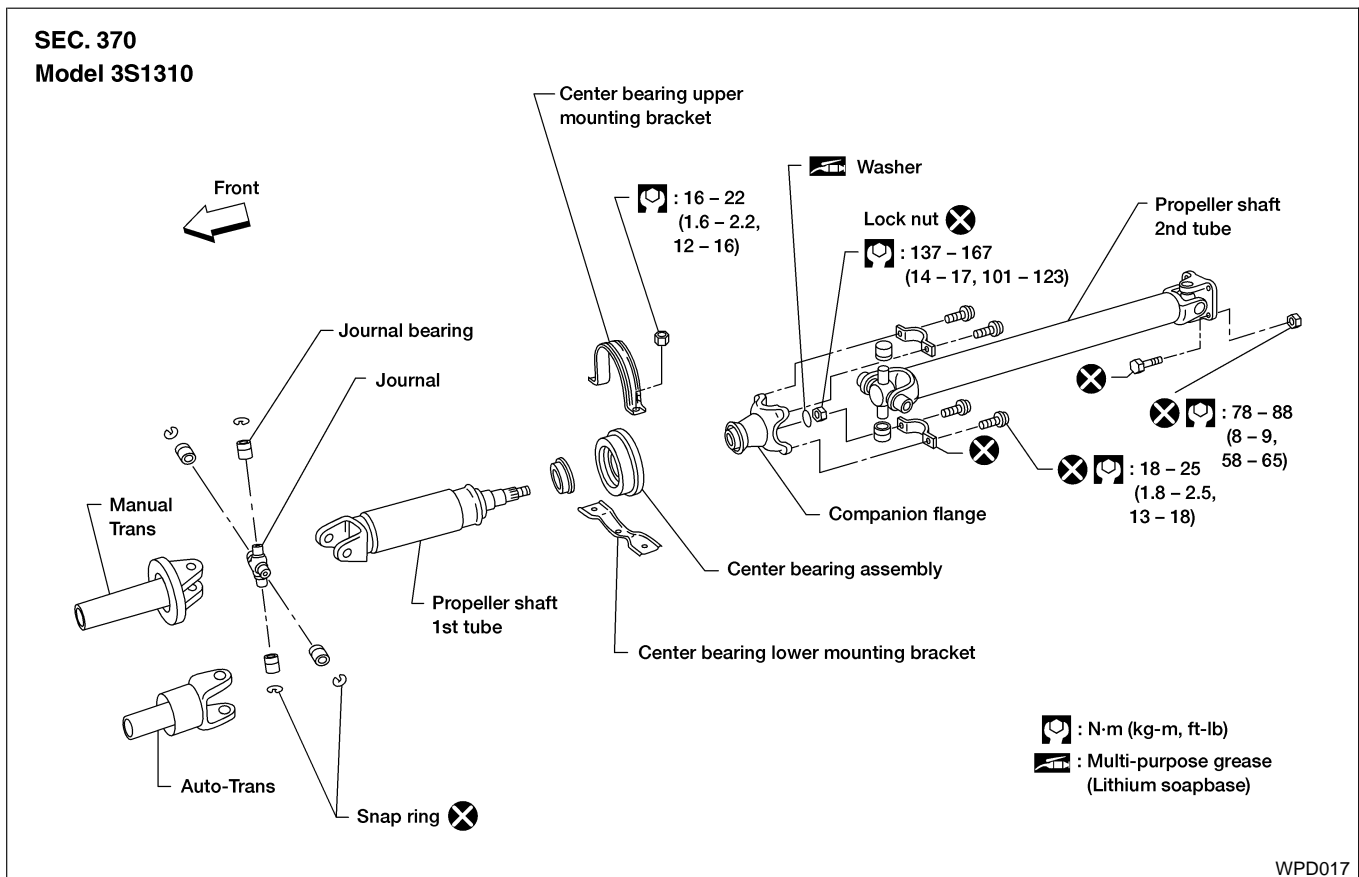
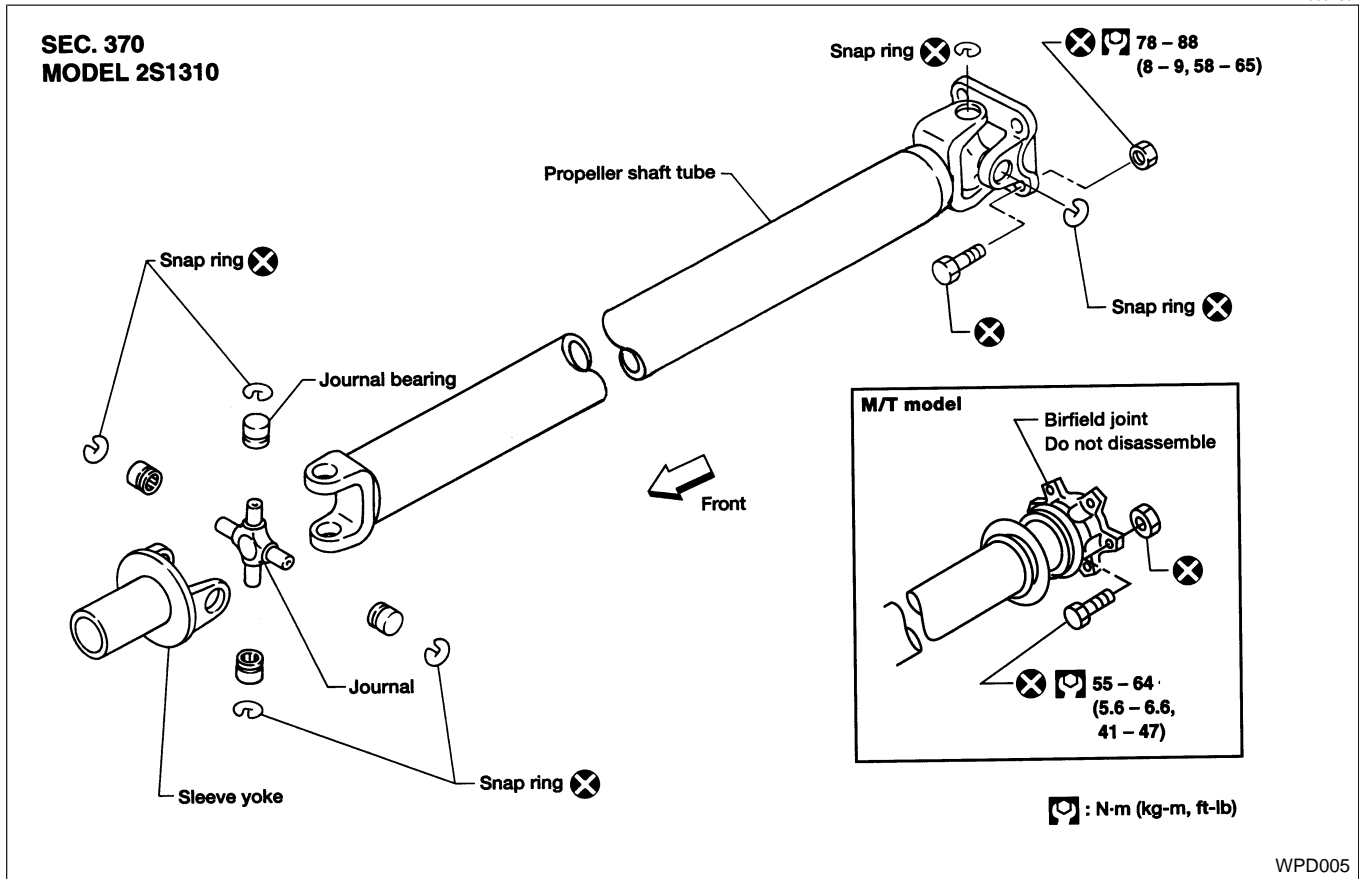


PROPELLER SHAFT

Components (Cont'd)

REAR PROPELLER SHAFT

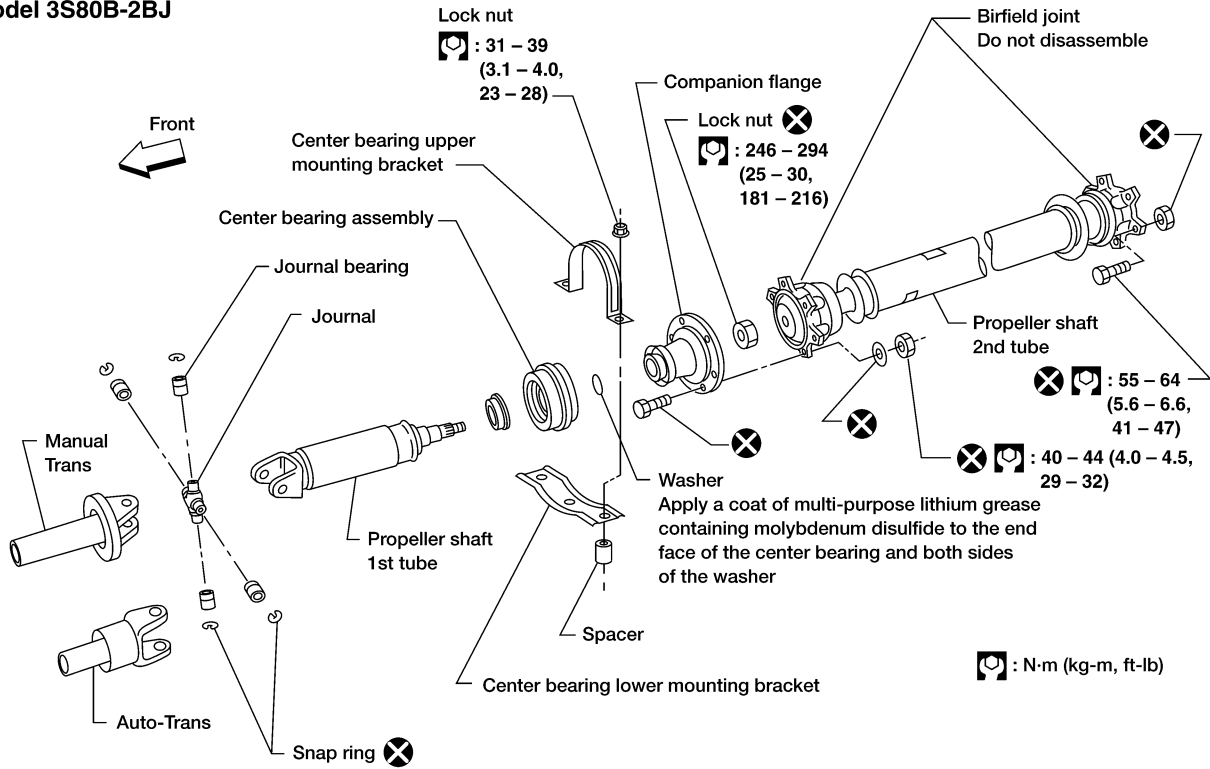
NEPD0002S02



PROPELLER SHAFT

Components (Cont'd)

SEC. 370
Model 3S80B-2BJ

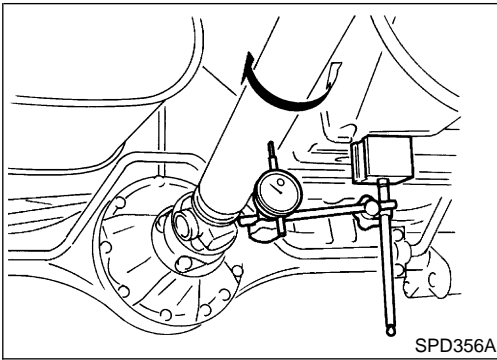


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PROPELLER SHAFT

On-vehicle Service



On-vehicle Service

PROPELLER SHAFT VIBRATION

NEPD0003

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

1. Raise rear end of vehicle until wheels are clear of the ground.
2. Measure propeller shaft runout at several points along propeller shaft by rotating final drive companion flange with hands.

Runout limit: 0.6 mm (0.024 in)

Propeller shaft runout measuring points:

KA24DE engine

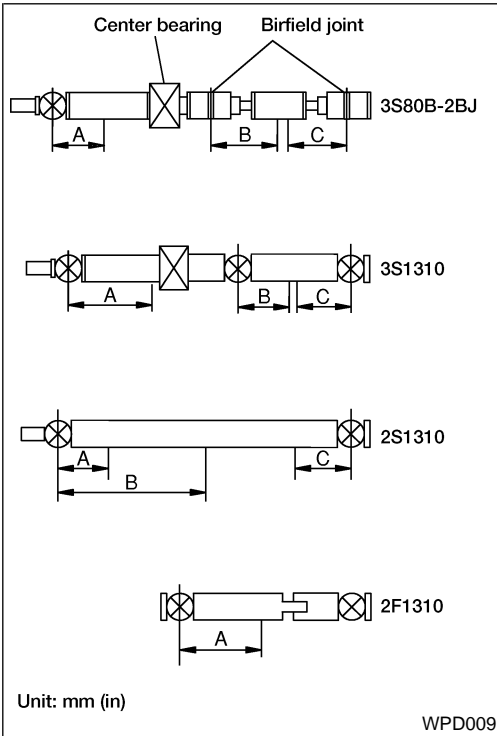
Unit: mm (in)

Distance		A	B	C
3S1310 (King Cab)	A/T	226 (8.90)	485 (19.09)	—
	M/T	274 (10.79)	485 (19.09)	—

VG33E engine

Unit: mm (in)

Distance		A	B	C
3S1310 (2WD)	A/T	241 (9.49)	491 (19.33)	—
	M/T	288 (11.34)	491 (19.33)	—
2S1310 (4WD)	All	237 (9.33)	623.5 (24.55)	237 (9.33)
2F1310 (4WD)	A/T	271 (10.67)	—	—
	M/T	271 (10.67)	—	—



VG33ER engine

Unit: mm (in)

Distance		A	B	C
3S80B-2BJ	All	162 (6.38)	240 (9.45)	240 (9.45)
2S1310 (4WD)	All	237 (9.33)	623.5 (24.55)	237 (9.33)
2F1310 (4WD)	A/T	271 (10.67)	—	—
	M/T	271 (10.67)	—	—

3. If runout exceeds specifications, disconnect propeller shaft at final drive companion flange; then rotate companion flange 180 degrees and reconnect propeller shaft.
4. Check runout again. If runout still exceeds specifications, replace propeller shaft assembly.
5. Perform road test.

APPEARANCE CHECKING

NEPD0004

- Inspect propeller shaft tube surface for dents or cracks.

PROPELLER SHAFT

Removal and Installation

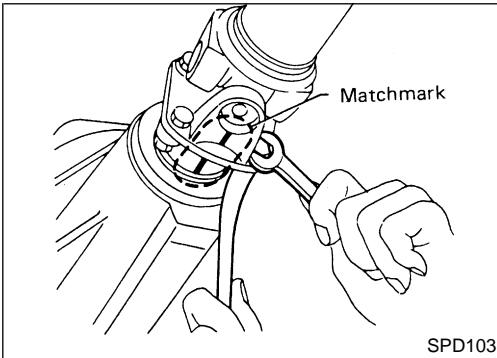
- If damaged, replace propeller shaft assembly.
- If center bearing is noisy or damaged, replace center bearing.

GI

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Removal and Installation

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

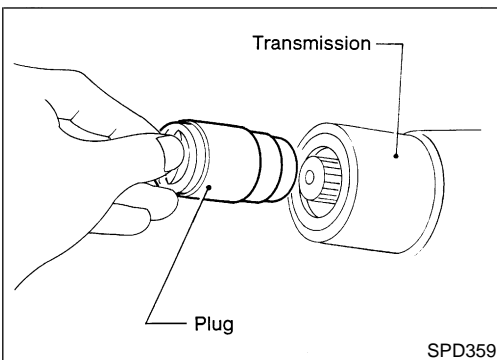
NEPD0005

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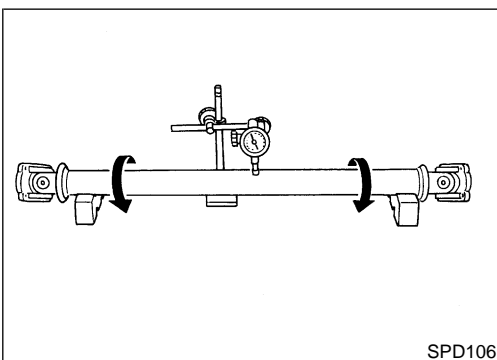
- Remove propeller shaft.
Insert plug into rear oil seal after removing rear propeller shaft.

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AX



Inspection

- Inspect propeller shaft runout. If runout exceeds specifications, replace propeller shaft assembly.

NEPD0006

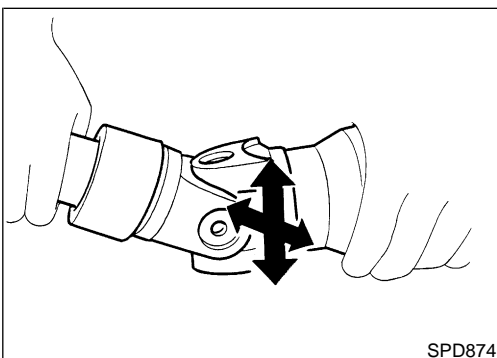
SU

Runout limit: 0.6 mm (0.024 in)

BR

ST

RS



- If the play exceeds specifications, replace propeller shaft assembly.

BT

Journal axial play:

0.02 mm (0.0008 in) or less

HA

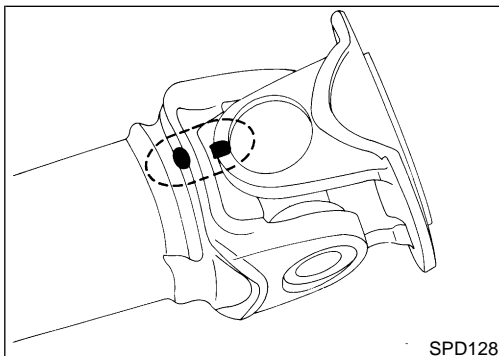
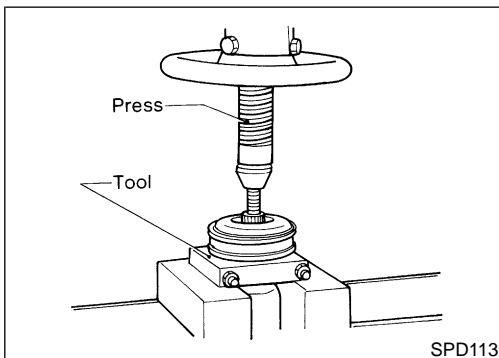
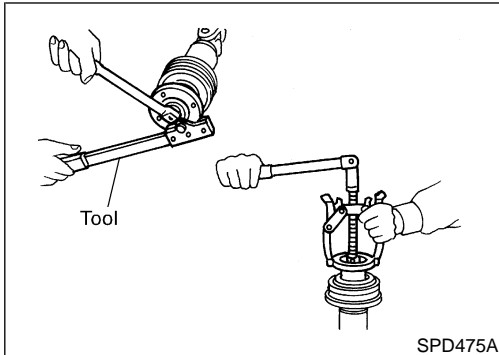
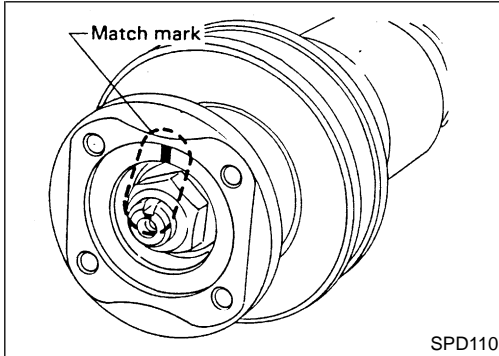
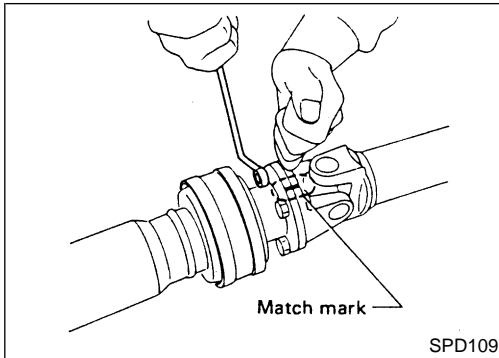
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PROPELLER SHAFT

Disassembly



Disassembly CENTER BEARING

NEPD0007

NEPD0007S01

1. Put match marks on flanges, and separate 2nd tube from 1st tube.

2. Put match marks on the flange and shaft.

3. Remove locking nut with Tool.

Tool number:

KV38108300 (J-44195)

4. Remove companion flange with puller.

5. Remove center bearing with Tool and press.

Tool number: ST30031000 (J22912-01)

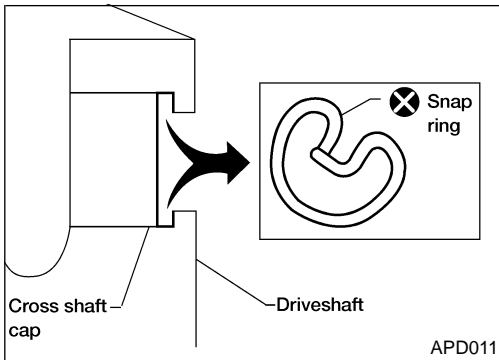
JOURNAL

NEPD0007S02

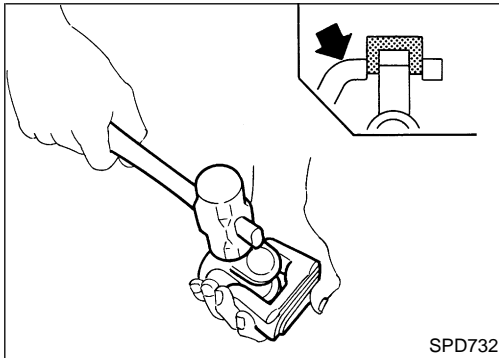
1. Put match marks on shaft and flange or yoke.

PROPELLER SHAFT

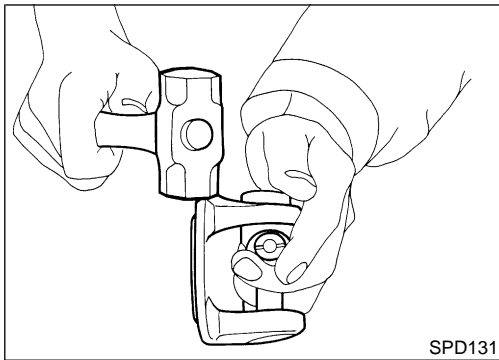
Disassembly (Cont'd)



2. Remove snap ring.

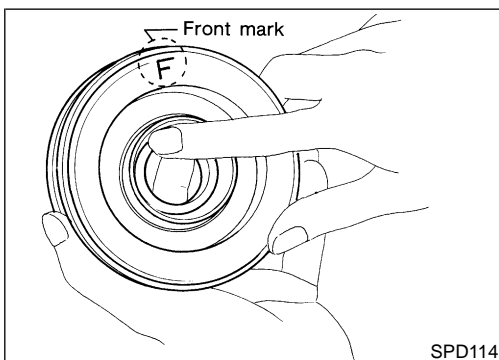


3. Remove pushed out journal bearing by lightly tapping yoke with a hammer, taking care not to damage journal and yoke hole.



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.

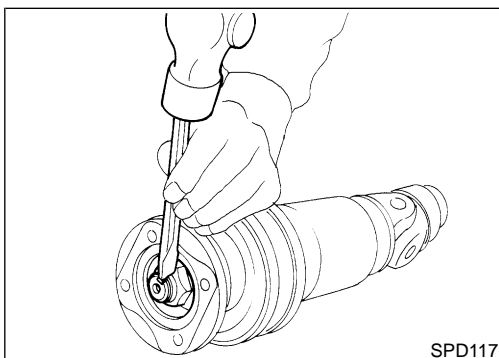


Assembly CENTER BEARING

NEPD0008

NEPD0008S01

- When installing center bearing, position the "F" mark on center bearing toward front of vehicle.
- **Apply a coat of multi-purpose lithium grease containing molybdenum disulfide to the end face of the center bearing and both sides of the washer.**



- Stake the nut. Always use a new one.
- Align match marks when assembling tubes.

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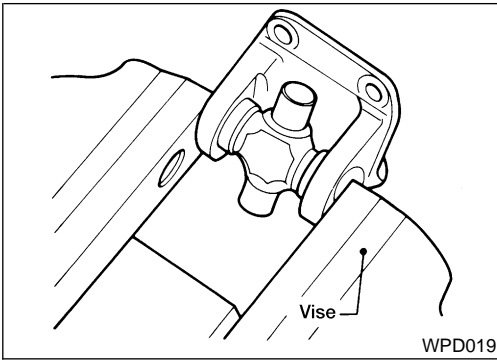
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PROPELLER SHAFT

Assembly (Cont'd)

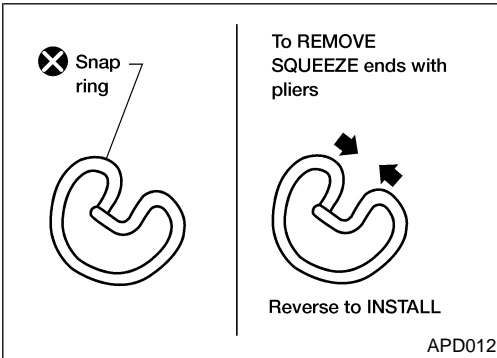


JOURNAL

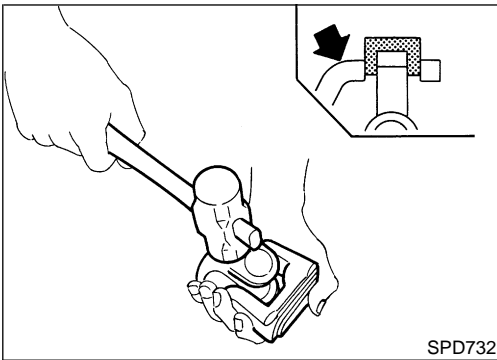
NEPD0008S02

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

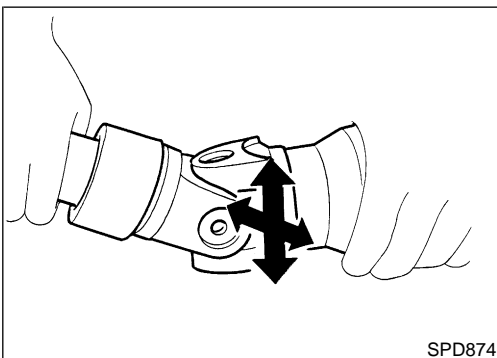
When assembling, be careful that needle bearing does not fall down.



2. Install new snap rings.



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



4. Check to see that journal moves smoothly and check for axial play.

Axial play: 0.02 mm (0.0008 in) or less

PROPELLER SHAFT

Service Data and Specifications (SDS)

Service Data and Specifications (SDS)

GENERAL SPECIFICATIONS

2WD KA24DE Models

=NEPD0009

NEPD0009S01

Propeller shaft model		M/T	A/T
		3S1310	
Number of joints		3	
Coupling method with transmission		Sleeve type	
Type of journal bearings		Solid type (disassembly type)	
Shaft length (Spider to spider) mm (in)	1st tube	644.7 (25.38)	549.6 (21.64)
	2nd tube	970.3 (38.20)	970.3 (38.20)
Shaft diameter mm (in)	1st tube	63.5 (2.50)	63.5 (2.50)
	2nd tube	63.5 (2.50)	63.5 (2.50)

2WD VG33E and VG33ER Models

NEPD0009S03

Grade	XE, SE				SC				
Transmission	M/T		A/T		M/T		A/T		
Model	K/C, C/C	C/C long bed	K/C, C/C	C/C long bed	K/C, C/C	C/C long bed	K/C, C/C	C/C long bed	
Propeller shaft model	3S1310				3S80B-2BJ	3S1310	3S80B-2BJ	3S1310	
Number of joints	3				3				
Coupling method with transmission	Sleeve type								
Type of journal bearings	Solid type (disassembly type)				Solid type (disassembly type without Birfield joint)	Solid type (disassembly type)	Solid type (disassembly type without Birfield joint)	Solid type (disassembly type)	
Distance between yokes mm (in)	80 (3.15)								
Shaft length (Spider to spider) mm (in)	1st tube	661 (26.02)	1043 (41.06)	566 (22.28)	948 (37.32)	681 (26.81)	1043 (41.06)	586 (23.07)	948 (37.32)
	2nd tube	982.3 (38.67)				980 (38.58)	982.3 (38.67)	980 (38.58)	982.3 (38.67)
Shaft outer diameter mm (in)	1st tube	63.5 (2.50)	76.2 (2.99)	63.5 (2.50)	76.2 (2.99)	75 (2.95)	76.2 (2.99)	75 (2.95)	76.2 (2.99)
	2nd tube	63.5 (2.50)				65 (2.56)	63.5 (2.50)	65 (2.56)	63.5 (2.50)

4WD Models

NEPD0009S04

Grade	XE, SE			SC		
Location	Front	Rear		Front	Rear	
Model	All	K/C, C/C	C/C long bed	All	K/C, C/C	C/C long bed
Propeller shaft model	2F1310	2S1310	3S1310	2F1310	2S1310	3S1310
Number of joints	2	2	3	2	2	3
Coupling method with transmission	Flange type	Sleeve type		Flange type	Sleeve type	
Type of journal bearings	Solid type (disassembly type)					
Distance between yokes mm (in)	71 (2.80)	80 (3.15)		71 (2.80)	80 (3.15)	

PROPELLER SHAFT

Service Data and Specifications (SDS) (Cont'd)

Grade		XE, SE			SC		
Shaft length (Spider to spider) mm (in)	1st tube	522 (20.55)	1247 (49.09)	637 (25.07)	522 (20.55)	1247 (49.09)	637 (25.07)
	2nd tube	—	—	989 (38.93)	—	—	989 (38.93)
Shaft outer diameter mm (in)	1st tube	50.8 (2.00)	76.2 (3.00)		50.8 (2.00)	88.9 (3.50)	76.2 (3.00)
	2nd tube	—	—	76.2 (3.00)	—	—	76.2 (3.00)

SERVICE DATA

NEPD0010
Unit: mm (in)

Propeller shaft runout limit	0.6 (0.024)
Journal axial play	0.02 (0.0008) or less

Preparation

SPECIAL SERVICE TOOLS

NEPD0013

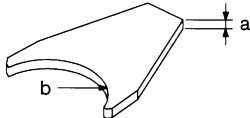
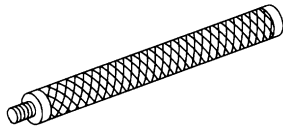
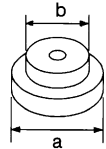
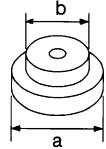
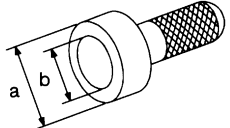
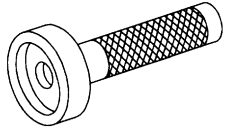
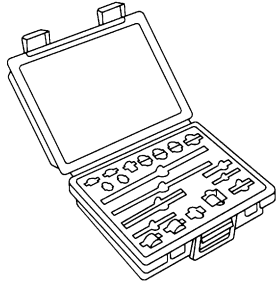
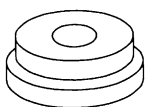
The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

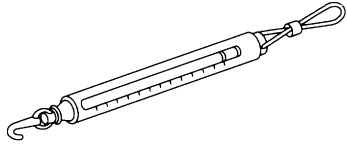
Tool number (Kent-Moore No.) Tool name	Description	
ST3127S000 (See J25765-A) Preload gauge 1 GG91030000 (J25765) Torque wrench 2 HT62940000 (—) Socket adapter 3 HT62900000 (—) Socket adapter	<p>NT124</p>	GI MA EM LC EC FE
KV38100800 (J34310, J25604-01) Differential attachment	<p>NT119</p>	CL MT AT TF
KV38108300 (J-44195) Companion flange wrench	<p>NT771</p>	PD AX SU BR
ST3090S000 (—) Drive pinion rear inner race puller set 1 ST30031000 (J22912-01) Puller 2 ST30901000 (J26010-01) Base	<p>NT527</p>	ST RS BT
ST3306S001 Differential side bearing puller set 1 ST33051001 (J22888-20) Body 2 ST33061000 (J8107-2) Adapter	<p>NT072</p>	HA SC EL
KV38100300 (J25523) Differential side bearing drift	<p>NT085</p>	EL IDX

FRONT FINAL DRIVE

R200A

Preparation (Cont'd)

Tool number (Kent-Moore No.) Tool name	Description	
KV38100600 (J25267) Side bearing spacer drift		Installing side bearing spacer a: 8 mm (0.31 in) b: R42.5 mm (1.673 in)
ST30611000 (J25742-1) Drift		Installing pinion rear bearing outer race (Use with ST30621000 or ST30613000)
ST30621000 (J25742-5) Drift		Installing pinion rear bearing outer race (Use with ST30611000) a: 79 mm (3.11 in) dia. b: 59 mm (2.32 in) dia.
ST30613000 (J25742-3) Drift		Installing pinion front bearing outer race (Use with ST30611000) a: 72 mm (2.83 in) dia. b: 48 mm (1.89 in) dia.
KV38100500 (J25273) Gear carrier front oil seal drift		Installing front oil seal a: 85 mm (3.35 in) dia. b: 60 mm (2.36 in) dia.
KV38100200 (J26233) Gear carrier side oil seal drift		Installing side oil seal
(J34309) Differential shim selec- tor		Adjusting bearing pre-load and gear height
(J25269-4) Side bearing discs (2 Req'd)		Selecting pinion height adjusting washer

Tool number (Kent-Moore No.) Tool name	Description
(J8129) Spring gauge	 <p>Measuring carrier turning torque</p> <p>NT127</p>

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Noise, Vibration and Harshness (NVH) Troubleshooting

Refer to "NVH TROUBLESHOOTING CHART", PD-4.

NEPD0050

On-vehicle Service

FRONT OIL SEAL REPLACEMENT

(Front final drive: Model R200A)

NEPD0014

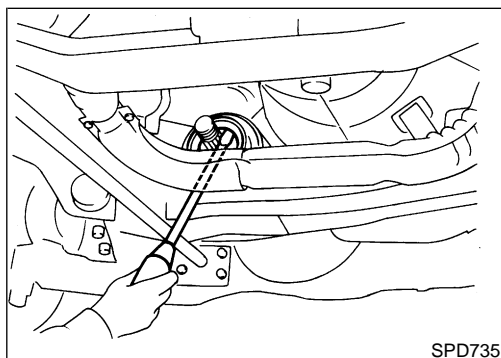
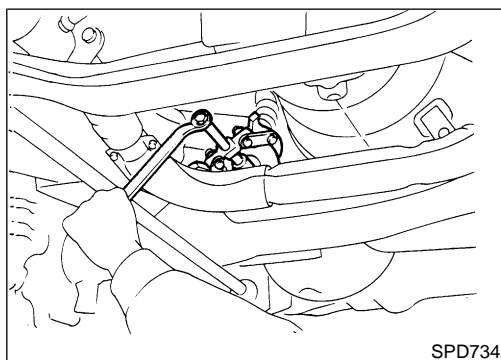
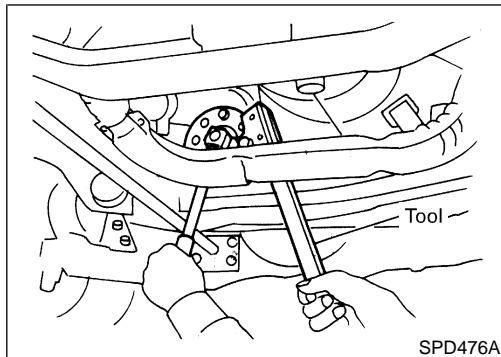
1. Remove front propeller shaft. Refer to "Removal and Installation", PD-9.

2. Loosen drive pinion nut.

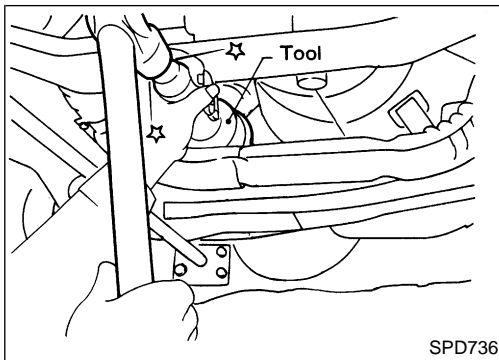
Tool number: KV38108300 (J-44195)

3. Remove companion flange.

4. Remove front oil seal.

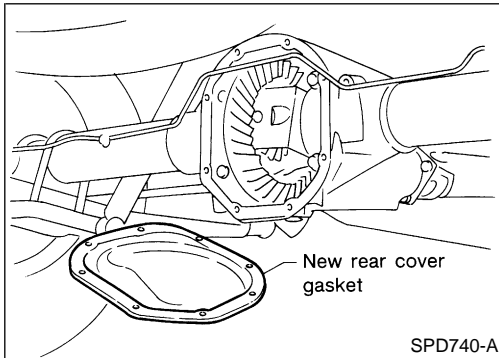


On-vehicle Service (Cont'd)



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:
KV38100500 (J25273)



REAR COVER GASKET REPLACEMENT

NEPD0015

1. Drain gear oil.
2. Remove rear cover and rear cover gasket.
3. Install new rear cover gasket and rear cover.
4. Fill final drive with recommended gear oil.

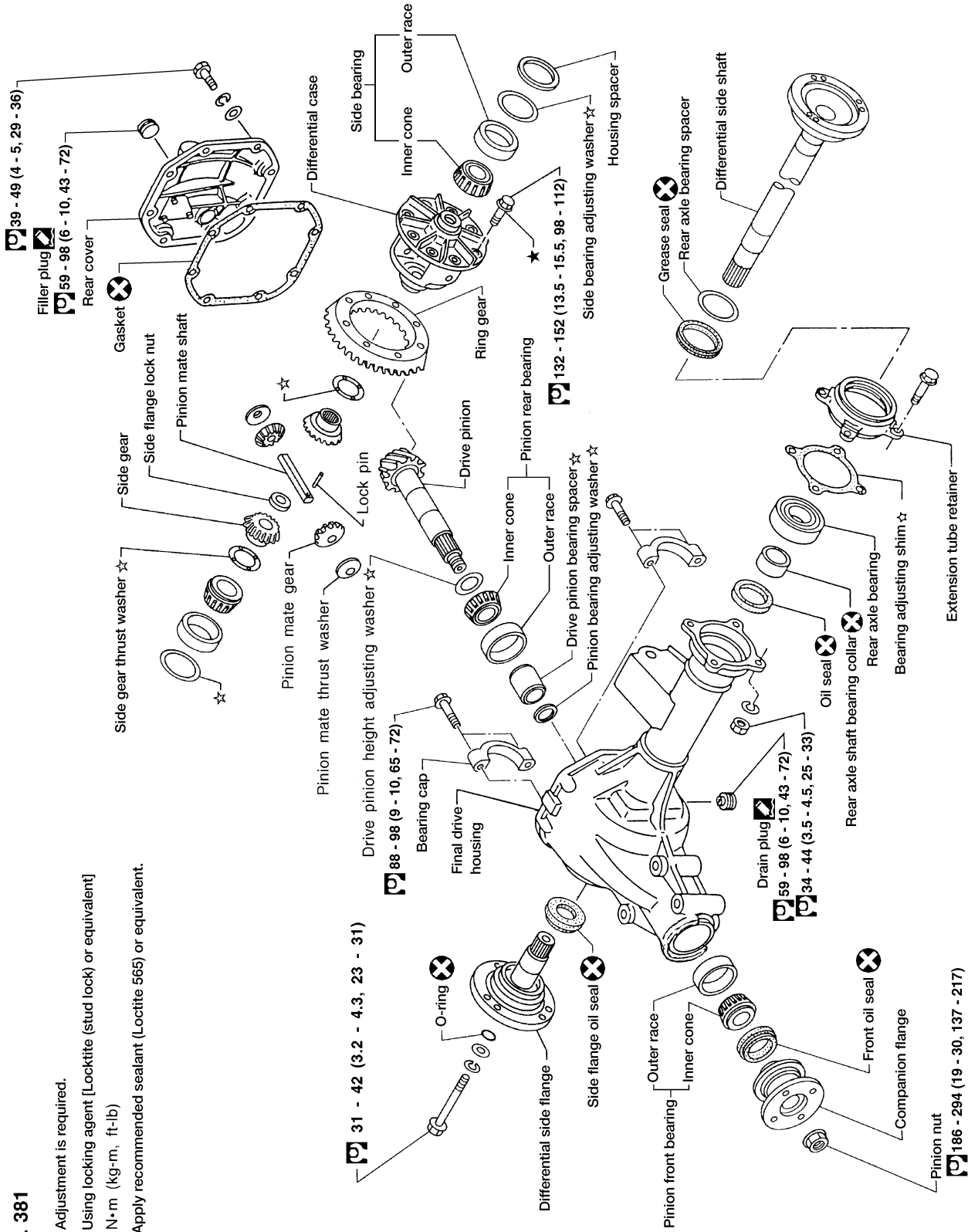
Components

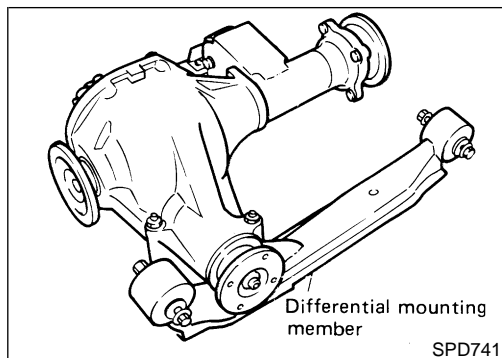
NEPD0016

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SEC. 381

- ☆ : Adjustment is required.
- ★ : Using locking agent [Locktite (stud lock) or equivalent]
- Ⓜ : N·m (kg·m, ft·lb)
- Ⓛ : Apply recommended sealant (Loctite 565) or equivalent.





Removal and Installation

REMOVAL

NEPD0017

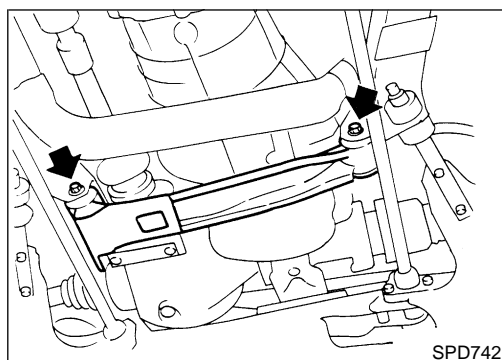
NEPD0017S01

- 1) Remove front propeller shaft. Refer to "Removal and Installation", PD-9.
- 2) Separate drive shaft from front final drive. Refer to **AX-7**, "Drive Shaft".
- 3) Remove engine mounting bolts and raise up engine.
- 4) Remove front final drive together with differential mounting member.

CAUTION:

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

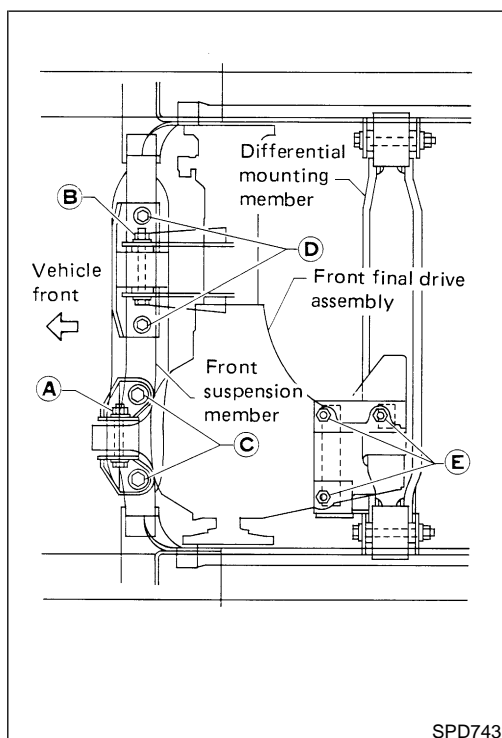
Before removing the final drive assembly or rear axle assembly, disconnect the ABS sensor harness connector from the assembly and move it away from the final drive/rear axle assembly area. Failure to do so may result in the sensor wires being damaged and the sensor becoming inoperative.



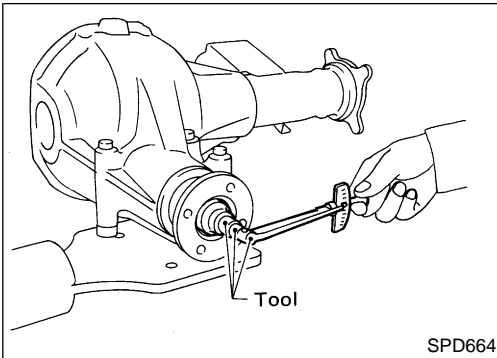
INSTALLATION

NEPD0017S02

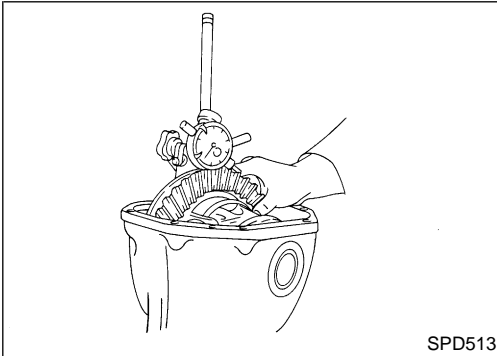
- 1) Install front final drive assembly together with differential mounting member.



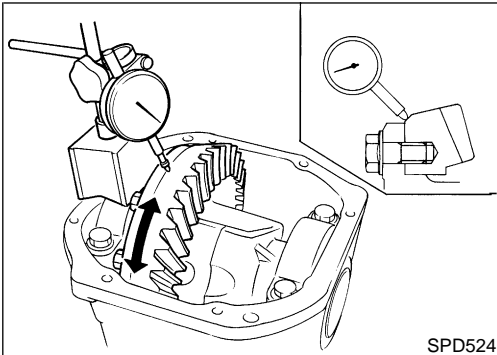
- 2) Tighten front final drive securing bolts and nuts by following the procedure to prevent drive train vibration.
 - a) Temporarily tighten nut **A**.
 - b) Temporarily tighten nut **B**.
 - c) Tighten bolt **C** to the torque of 68 to 87 N·m (6.9 to 8.9 kg-m, 50 to 64 ft-lb).
 - d) Tighten bolt **D** to the torque of 68 to 87 N·m (6.9 to 8.9 kg-m, 50 to 64 ft-lb).
 - e) Tighten nut **A** to the torque of 68 to 87 N·m (6.9 to 8.9 kg-m, 50 to 64 ft-lb).
 - f) Tighten nut **B** to the torque of 68 to 87 N·m (6.9 to 8.9 kg-m, 50 to 64 ft-lb).
 - g) Tighten bolt **E** 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 **AX-7**, "Drive Shaft".
- 4) Install front propeller shaft. Refer to "Removal and Installation", PD-9.



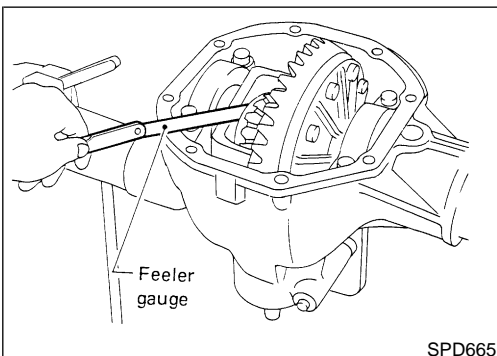
SPD664



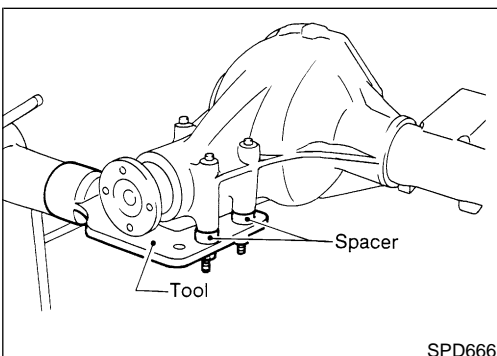
SPD513



SPD524



SPD665



SPD666

Disassembly

PRE-INSPECTION

NEPD0018

NEPD0018S01

Before disassembling final drive, perform the following inspection.

- Total preload
 - a) Turn drive pinion in both directions several times to set bearing rollers.
 - b) Check total preload with Tool.

Tool number: ST3127S000 (J25765-A)

Total preload:

1.4 - 1.7 N-m (14 - 17 kg-cm, 12 - 15 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:

0.10 - 0.15 mm (0.0039 - 0.0059 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 "TOOTH CONTACT", PD-33.

- Side gear to pinion mate gear backlash
Using a feeler gauge, measure clearance between side gear thrust washer and differential case.

Clearance between side gear thrust washer and differential case:

Less than 0.15 mm (0.0059 in)

FINAL DRIVE HOUSING

NEPD0018S02

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

Tool number:

KV38100800 (J34310, J25604-01)

GI

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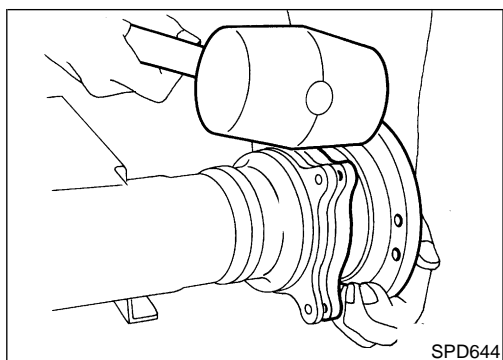
HA

SC

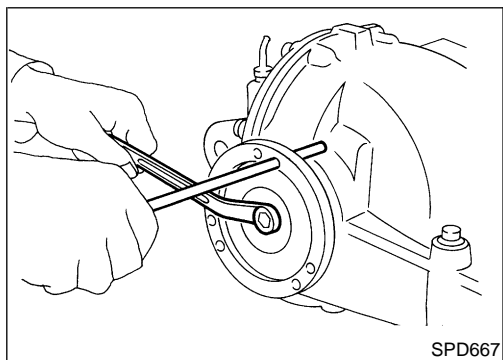
EL

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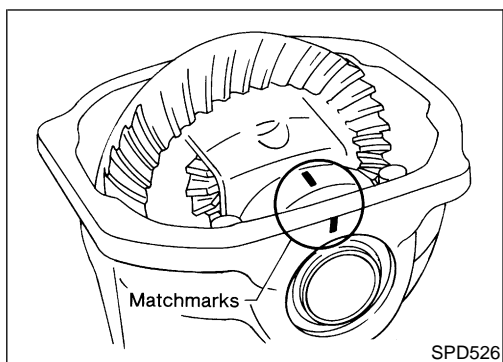
Disassembly (Cont'd)



2. Remove differential side shaft assembly.

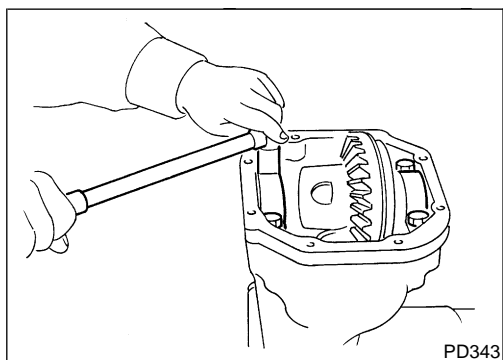


3. Remove differential side flange.

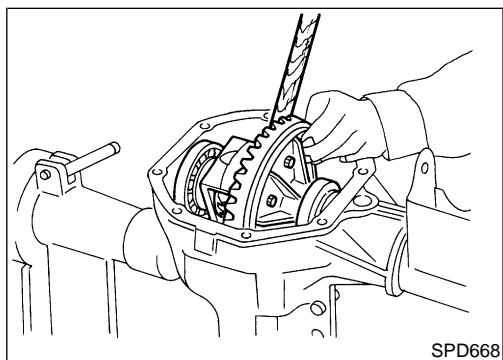


4. Put match marks on one side of side bearing cap with paint or punch to ensure that it is replaced in proper position during reassembly.

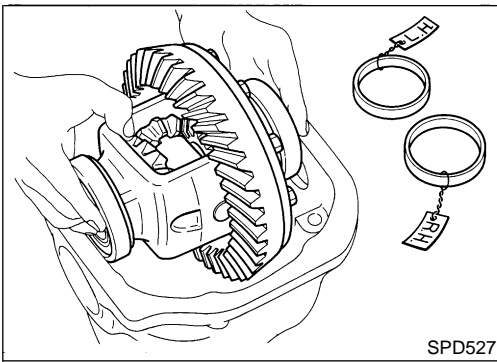
Bearing caps are line-bored during manufacture and should be put back in their original places.



5. Remove side bearing caps.

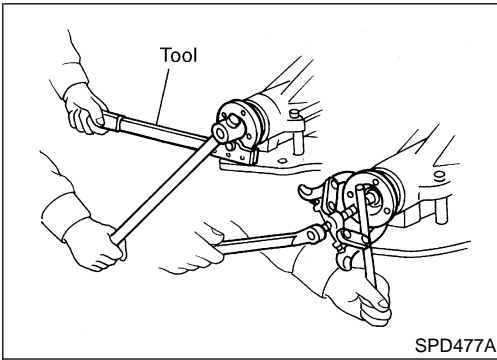


6. Remove differential case assembly with a pry bar.

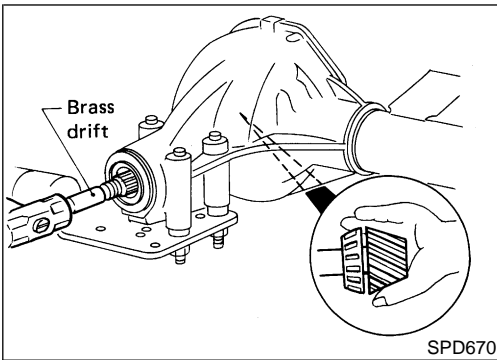


Be careful to keep the side bearing outer races together with their respective inner cones — do not mix them up.

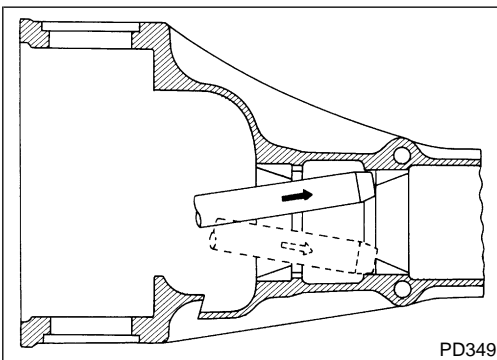
CAUTION:
Side bearing spacer is placed on either the left or right depending upon final drive gear ratio. It should be labeled so that it may be replaced correctly.



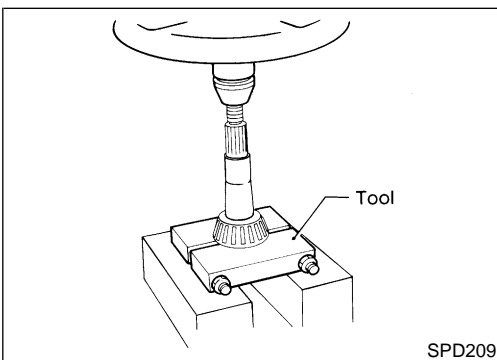
7. Loosen drive pinion nut.
Tool number: KV38108300 (J-44195)
8. Remove companion flange with puller.



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

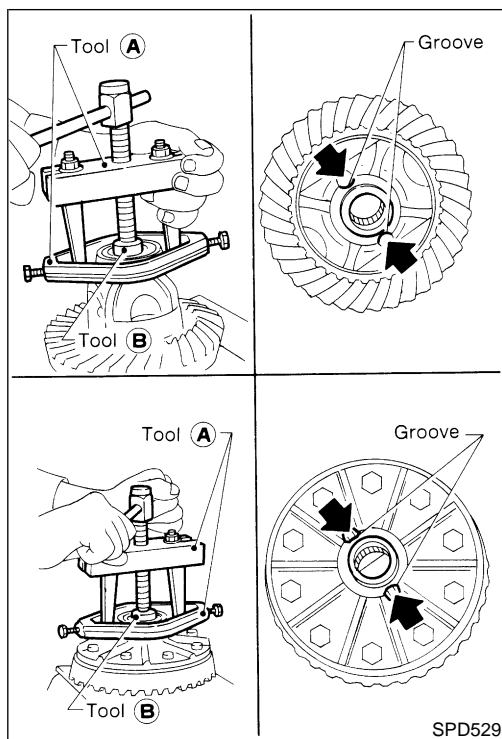


11. Remove pinion bearing outer races with a brass drift.



12. Remove pinion rear bearing inner cone and drive pinion height adjusting washer.
Tool number: ST30031000 (J22912-01)

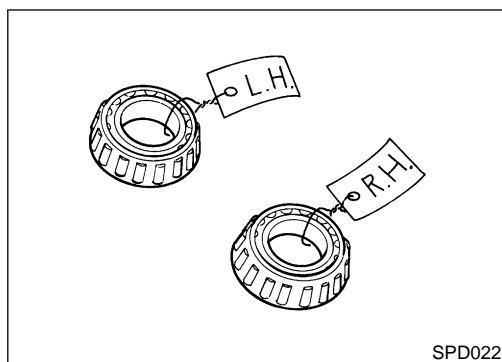
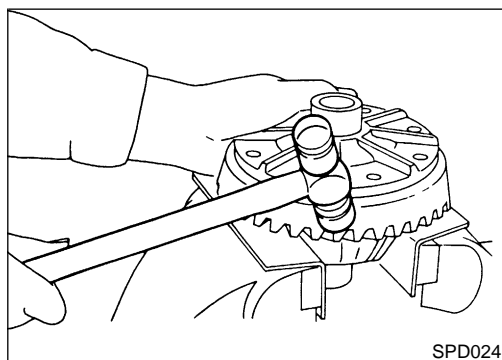
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DIFFERENTIAL CASE

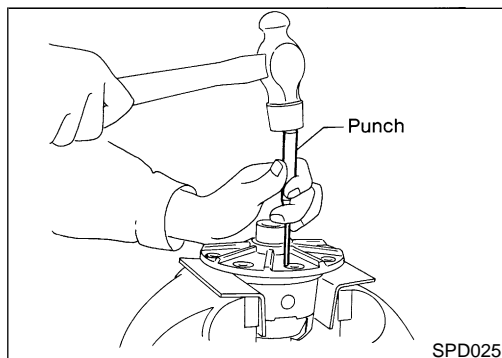
NEPD0018S03

1. Remove side bearing inner cones.

To prevent damage to bearing, engage puller jaws in grooves.
Tool number:
A ST33051001 (J22888-20)
B ST33061000 (J8107-2)

Be careful not to confuse the right-hand and left-hand parts. Keep bearing and bearing race for each side together.


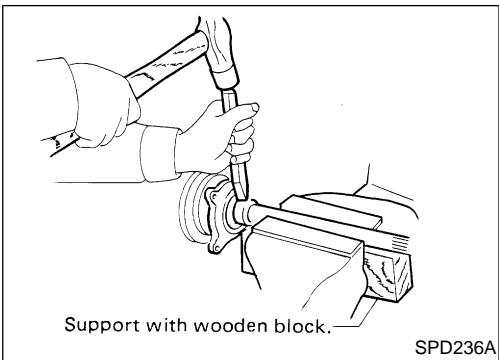
2. Loosen ring gear bolts in a crisscross pattern.

3. Tap ring gear off the differential case with a soft hammer.

Tap evenly all around to keep ring gear from binding.


4. Punch off pinion mate shaft lock pin from ring gear side.

Lock pin is caulked at pin hole mouth on differential case.



DIFFERENTIAL SIDE SHAFT

NEPD0018S04

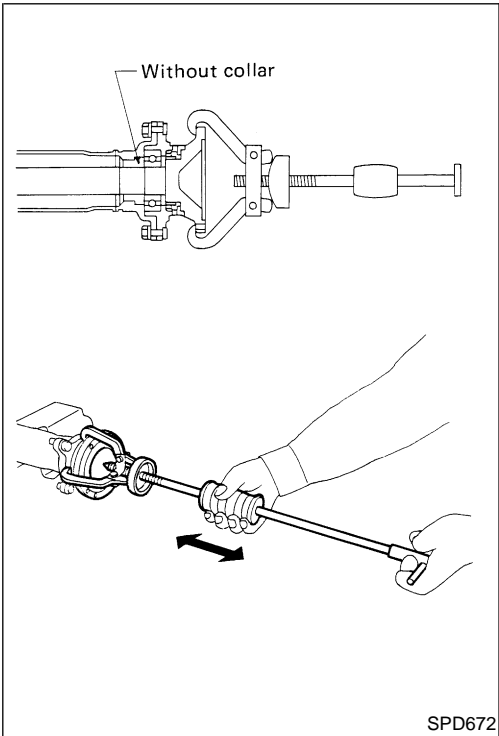
1. Cut collar with cold chisel. Be careful not to damage differential side shaft.

GI

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LC



2. Reinstall differential side shaft into extension tube and secure with bolts. Remove rear axle bearing by drawing out differential side shaft from rear axle bearing with puller.

EC

FE

CL

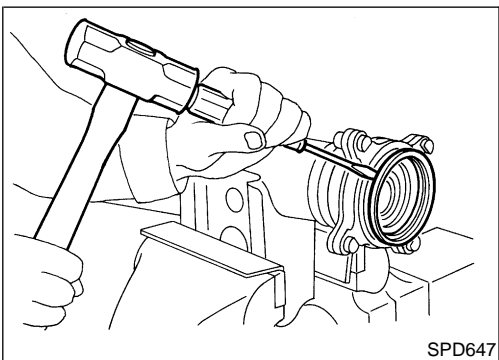
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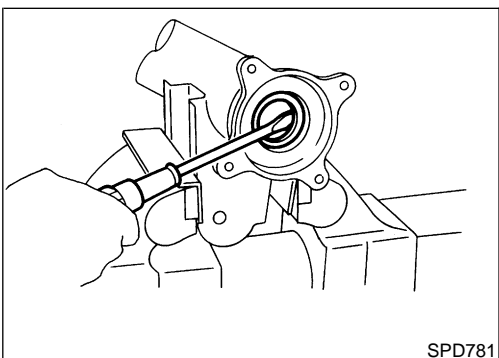
3. Remove grease seal and oil seal.

SU

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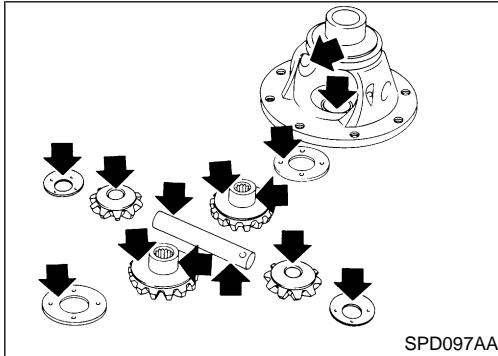
IDX

Inspection**RING GEAR AND DRIVE PINION**

NEPD0019

NEPD0019S01

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).

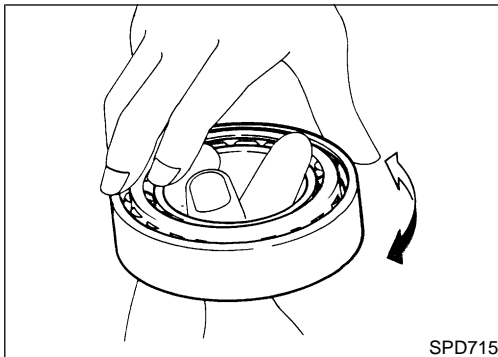


SPD097AA

DIFFERENTIAL CASE ASSEMBLY

NEPD0019S02

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



SPD715

BEARING

NEPD0019S03

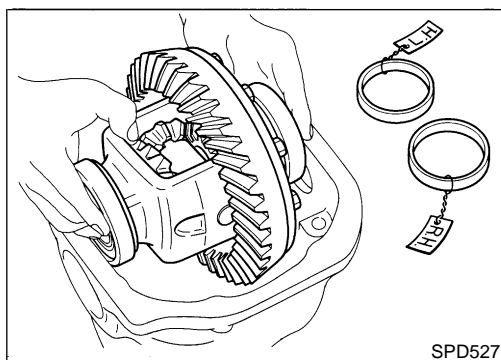
1. Thoroughly clean bearing.
2. Check bearing for wear, scratches, pitting or flaking. Check tapered roller bearing for smooth rotation. If damaged, replace outer race and inner cone as a set.

Adjustment

NEPD0020

For quiet and reliable final drive operation, the following five adjustments must be made correctly:

1. Side bearing preload. Refer to "SIDE BEARING PRELOAD", PD-27.
2. Pinion gear height. Refer to "PINION GEAR HEIGHT AND PINION BEARING PRELOAD", PD-28.
3. Pinion bearing preload. Refer to "PINION GEAR HEIGHT AND PINION BEARING PRELOAD", PD-28.
4. Ring gear-to-pinion backlash. Refer to "Total Preload Adjustment", PD-40.
5. Ring and pinion gear tooth contact pattern. Refer to "TOOTH CONTACT", PD-33.



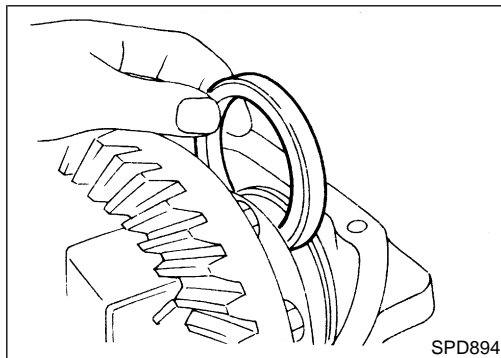
SPD527

SIDE BEARING PRELOAD

NEPD0020S01

A selection of carrier side bearing adjusting washers are required for successful completion of this procedure.

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

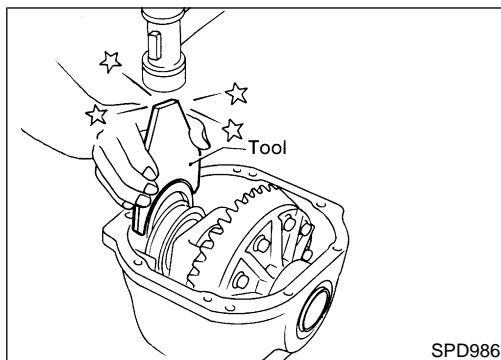


SPD894

3. Put the side bearing spacer in place.

CAUTION:

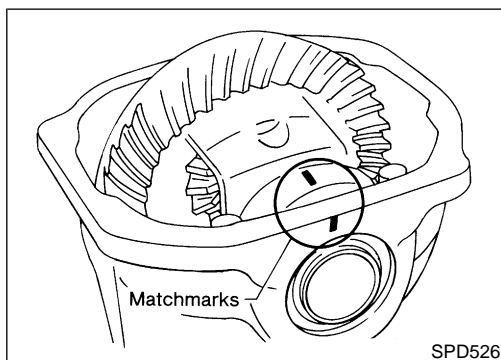
Side bearing spacer is placed on either the right or left depending upon final drive gear ratio. Be sure to replace it on the correct side.



SPD986

4. Using Tool, install original carrier side bearing preload shims on the carrier end, opposite the ring gear.

Tool number: KV38100600 (J25267)



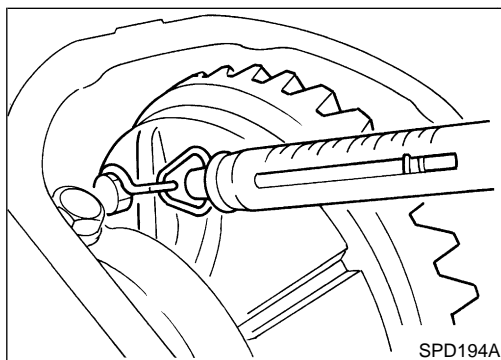
SPD526

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

Specification:

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

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



SPD194A

7. Measure the turning torque of the carrier at the ring gear retaining bolts with a spring gauge, J8129.

Specification:

34.3 - 39.2 N (3.5 - 4.0 kg, 7.7 - 8.8 lb) of pulling force at the ring gear bolt

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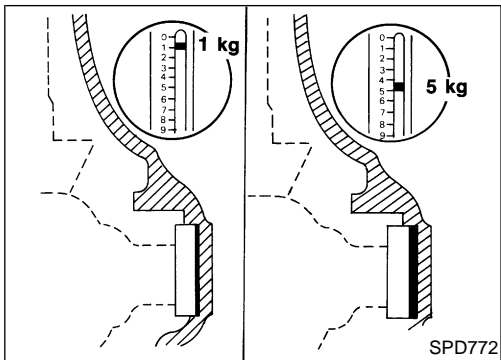
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Adjustment (Cont'd)

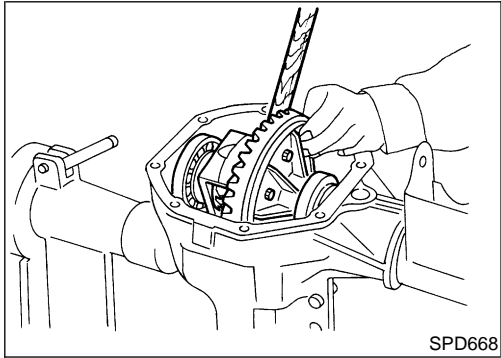


SPD772

8. If the carrier turning torque is not within the specification range, increase or decrease the total thickness of the side bearing adjusting washers until the turning torque is correct. If the turning torque is less than the specified range, install washers of greater thickness; if the turning torque is greater than the specification, install thinner washers.

Refer to "Side Bearing Adjustment", PD-40 .

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



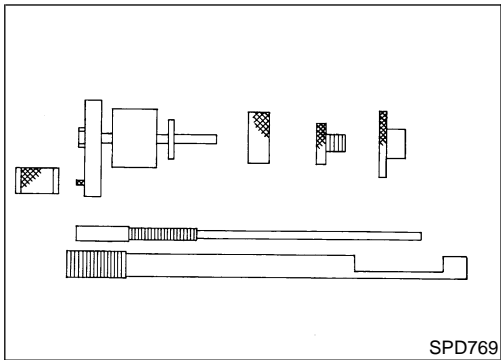
SPD668

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

PINION GEAR HEIGHT AND PINION BEARING PRELOAD

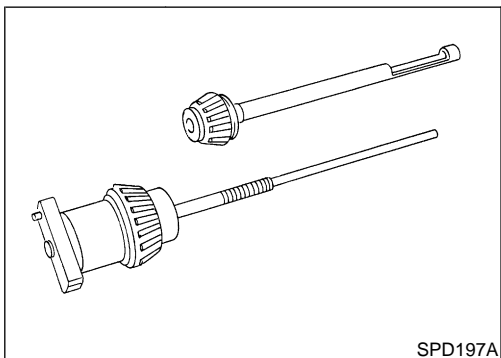
NEPD0020S02

1. Make sure all parts are clean and that the bearings are well lubricated.
2. Assemble the pinion gear bearings into the pinion preload shim selector Tool, J34309.



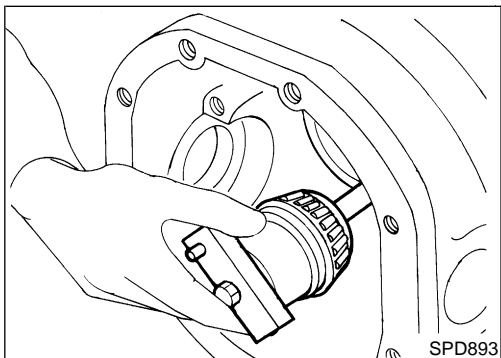
SPD769

- **Front Pinion Bearing** — make sure the J34309-3 front pinion bearing seat is secured tightly against the J34309-2 gauge anvil. Then turn the front pinion bearing pilot, J34309-5, to secure the bearing in its proper position.
- **Rear Pinion Bearing** — the rear pinion bearing pilot, J34309-15, is used to center the rear pinion bearing only. The rear pinion bearing locking seat, J34309-4, is used to lock the bearing to the assembly.

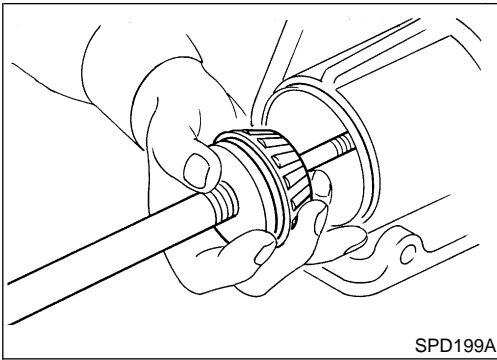


SPD197A

3. Place the pinion preload shim selector Tool, J34309-1, gauge screw assembly with the pinion rear bearing inner cone installed into the final drive housing.



SPD893



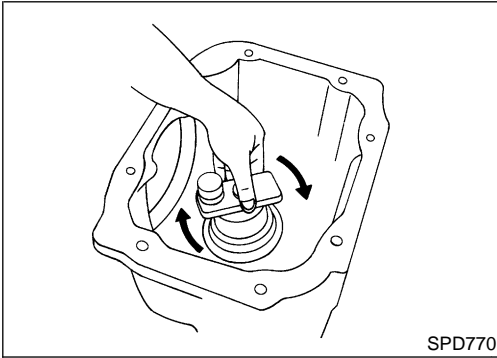
- Assemble the front pinion bearing inner cone and the J34309-2 gauge anvil together with the J34309-1 gauge screw in the final drive housing. Make sure that the pinion height gauge plate, J34309-16, will turn a full 360 degrees, and tighten the two sections together by hand.

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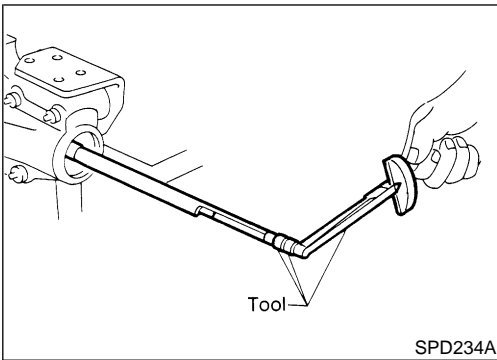
- Turn the assembly several times to seat the bearings.

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- Measure the turning torque at the end of the J34309-2 gauge anvil using torque wrench J25765A.

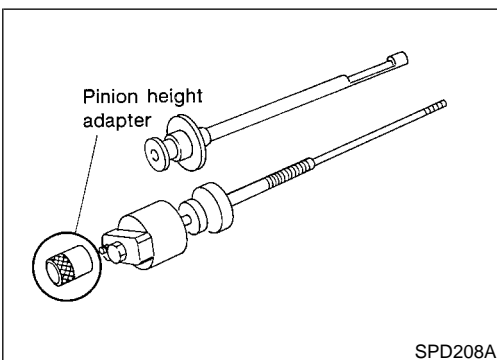
Turning torque specification:

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

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- Place the J34309-1 "R200A" pinion height adapter onto the gauge plate and tighten it by hand.

CAUTION:

Make sure all machined surfaces are clean.

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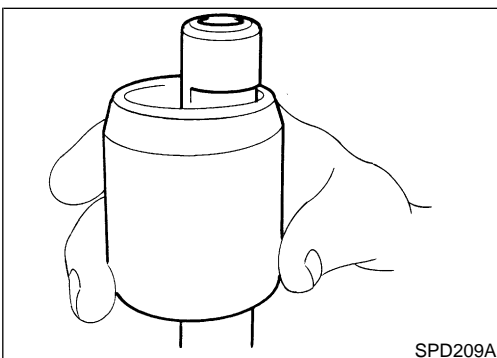
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PINION BEARING PRELOAD WASHER SELECTION



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

BT

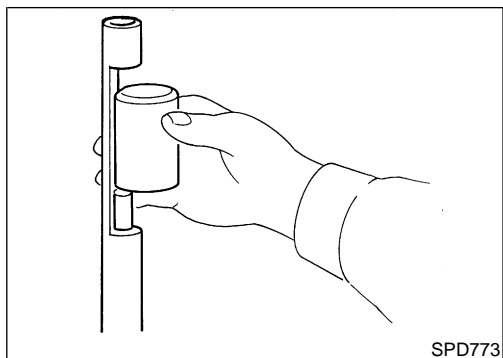
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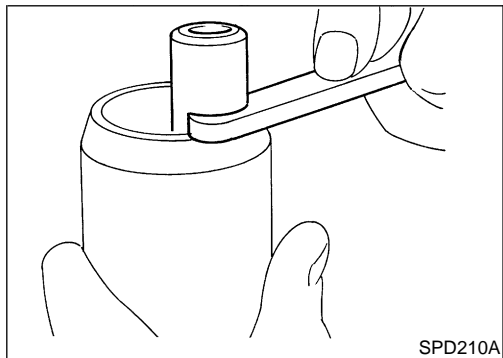
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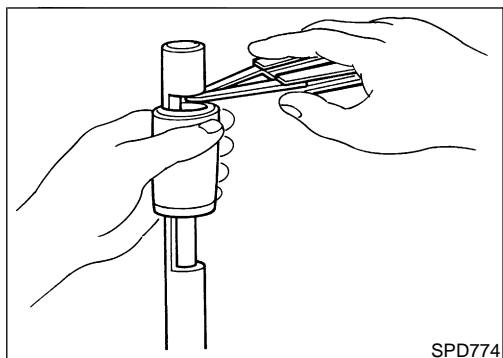
Adjustment (Cont'd)



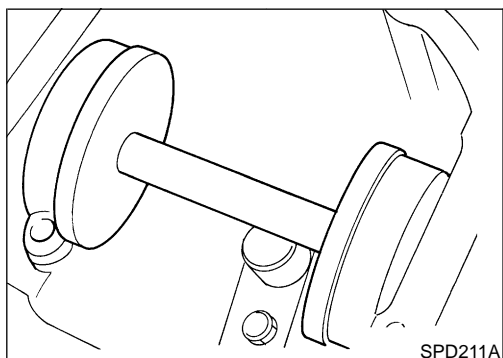
SPD773



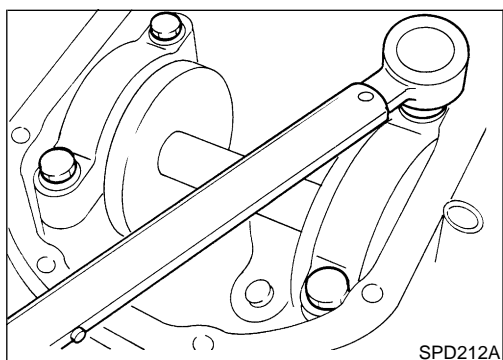
SPD210A



SPD774



SPD211A



SPD212A

9. Select the correct thickness of pinion bearing preload adjusting washer using a standard gauge of 3.5 mm (0.138 in) and J34309-101 feeler gauge. The exact measure is the thickness of the adjusting washer required. Select the correct washer.

Drive pinion bearing preload adjusting washer:

Refer to "Drive Pinion Preload Adjustment", PD-41.

10. Set the selected, correct pinion bearing preload adjusting washer aside for use when assembling the pinion gear and bearings into the final drive.

PINION HEIGHT ADJUSTING WASHER SELECTION

11. Position the side bearing discs, J25269-4, and arbor firmly into the side bearing bores.

12. Install the side bearing caps and tighten the cap bolts.

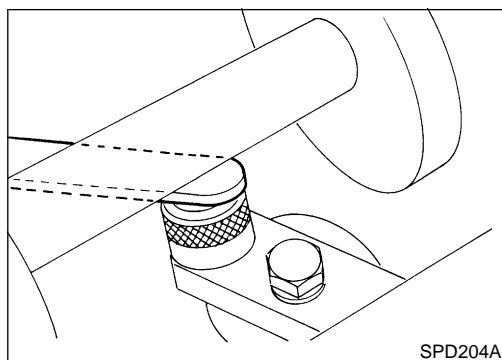
Specification:

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

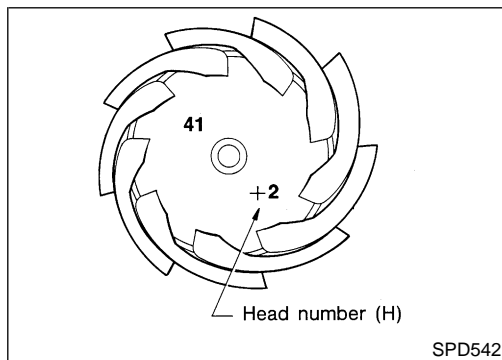
FRONT FINAL DRIVE

R200A

Adjustment (Cont'd)



13. Select the correct standard pinion height adjusting washer thickness by using a standard gauge of 3.0 mm (0.118 in) and J34309-101 feeler gauge. Measure the gap between the J34309-11 "R200A" pinion height adapter and the arbor.
14. Write down the exact total measurement.



15. Correct the pinion height washer size by referring to the "pinion head number".

There are two numbers painted on the pinion gear. The first one refers to the pinion and ring gear as a matched set and should be the same as the number on the ring gear. The second number is the "pinion head height number", and it refers to the ideal pinion height from standard for quietest operation. Use the following chart to determine the correct pinion height washer. Refer to "Drive Pinion Height Adjustment", PD-41.

Pinion Head Height Number	Add or Remove from the Standard Pinion Height Washer Thickness Measurement
-6	Add 0.06 mm (0.0024 in)
-5	Add 0.05 mm (0.0020 in)
-4	Add 0.04 mm (0.0016 in)
-3	Add 0.03 mm (0.0012 in)
-2	Add 0.02 mm (0.0008 in)
-1	Add 0.01 mm (0.0004 in)
0	Use the selected washer thickness
+1	Subtract 0.01 mm (0.0004 in)
+2	Subtract 0.02 mm (0.0008 in)
+3	Subtract 0.03 mm (0.0012 in)
+4	Subtract 0.04 mm (0.0016 in)
+5	Subtract 0.05 mm (0.0020 in)
+6	Subtract 0.06 mm (0.0024 in)

16. Select the correct drive pinion height washer.

Drive pinion height adjusting washer:

Refer to "Drive Pinion Height Adjustment", PD-41.

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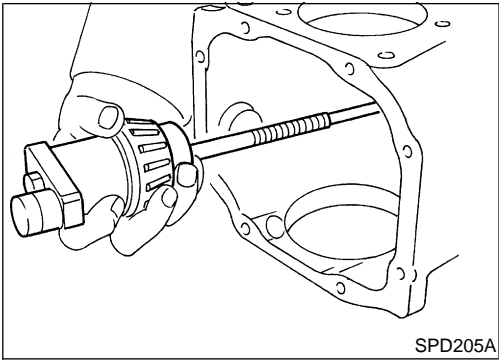
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FRONT FINAL DRIVE

R200A

Adjustment (Cont'd)



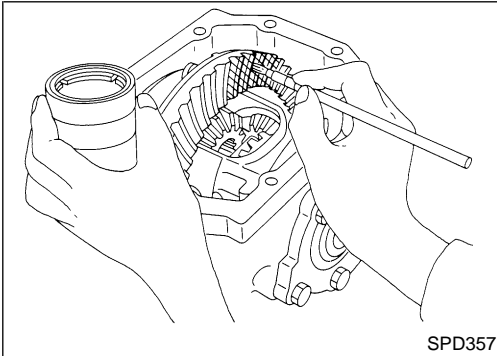
17. Remove the J34309 pinion preload shim selector tool from the final drive housing and disassemble to retrieve the pinion bearings.

TOOTH CONTACT

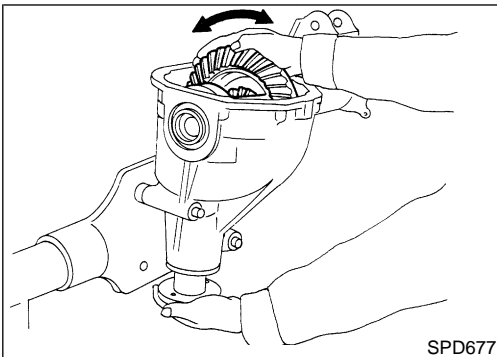
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Gear tooth contact pattern check is necessary to verify correct relationship between ring gear and drive pinion.

Hypoid gear sets which are not positioned properly in relation to one another may be noisy, or have short life, or both. With a pattern check, the most desirable contact for low noise level and long life can be assured.

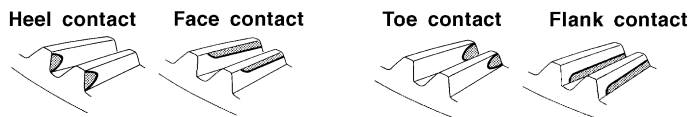


1. Thoroughly clean ring gear and drive pinion teeth.
2. Sparingly apply a mixture of powdered ferric oxide and oil or equivalent to 3 or 4 teeth of ring gear drive side.



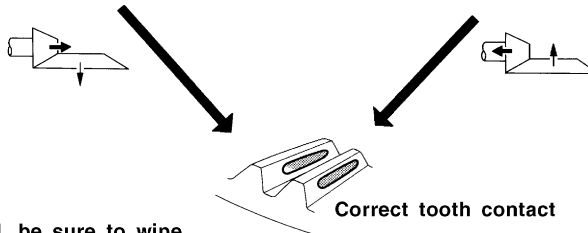
3. Hold companion flange steady by hand and rotate the ring gear in both directions.

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



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

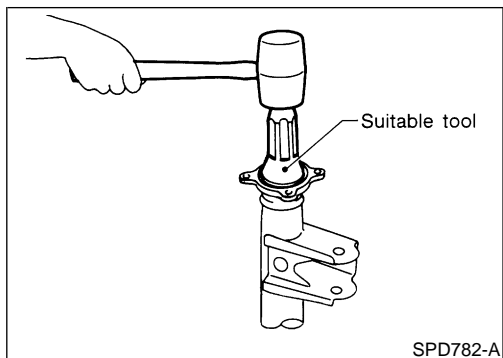
To correct, reduce thickness of pinion height adjusting washer in order to make drive pinion go away from ring gear.



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

SPD007-B

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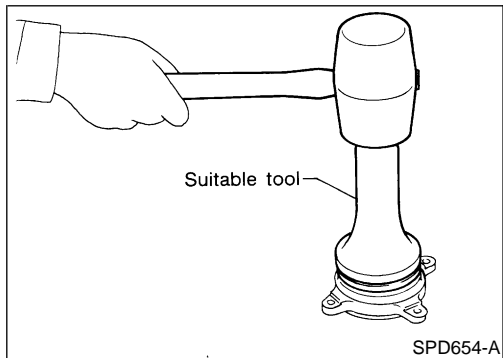


Assembly DIFFERENTIAL SIDE SHAFT

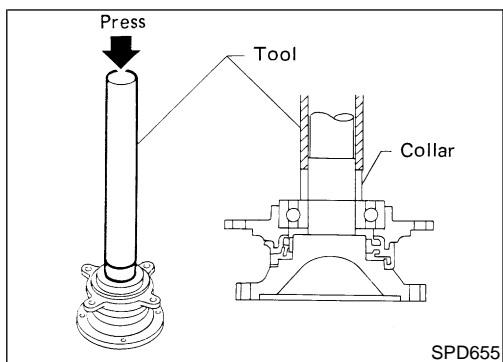
NEPD0021

NEPD0021S01

1. Install oil seal and grease seal.
Tool number: KV38100200 (J26233).



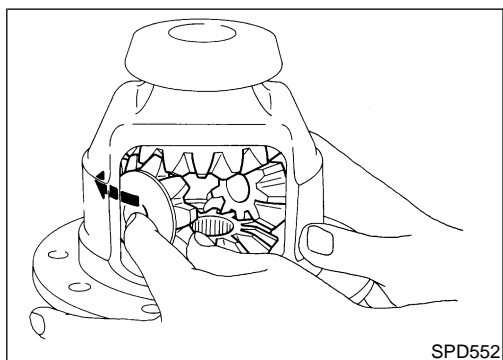
2. Install extension tube retainer, rear axle bearing and rear axle shaft bearing collar on differential side shaft.



DIFFERENTIAL CASE

NEPD0021S02

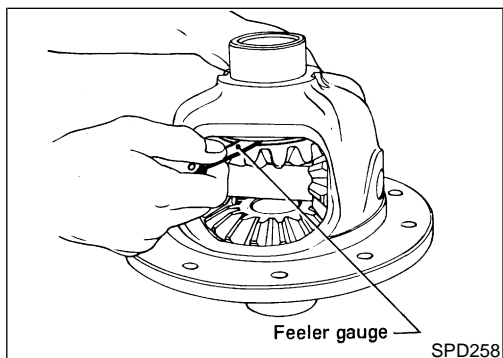
1. Install side gears, pinion mate gears and thrust washers into differential case.

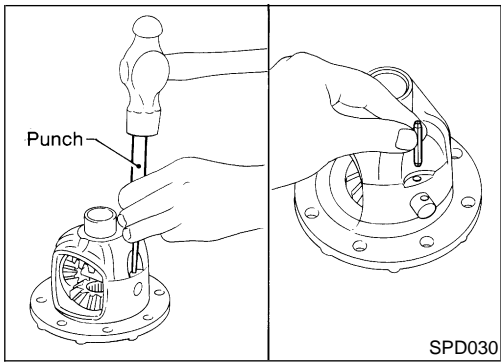


2. Fit pinion mate shaft to differential case so that it meets lock pin holes.
3. Adjust backlash between side gear and pinion mate gear by selecting side gear thrust washer.
Refer to "Side Gear Adjustment", PD-40.

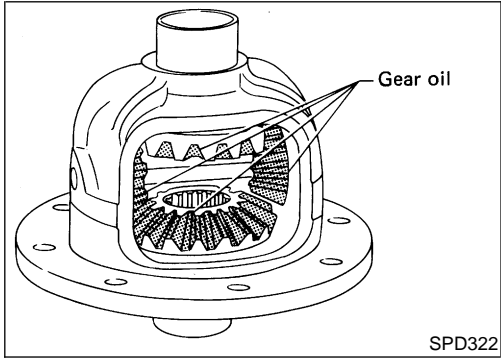
Backlash between side gear and pinion mate gear (Clearance between side gear thrust washer and differential case):

Less than 0.15 mm (0.0059 in)

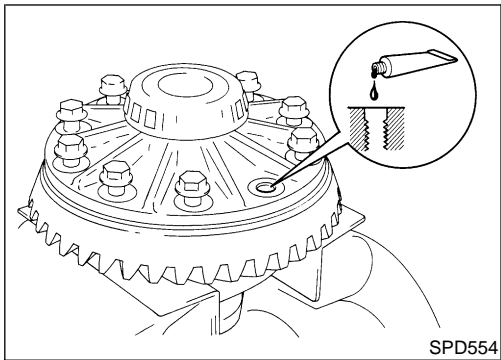




4. Install pinion mate shaft lock pin with a punch.
Make sure lock pin is flush with case.

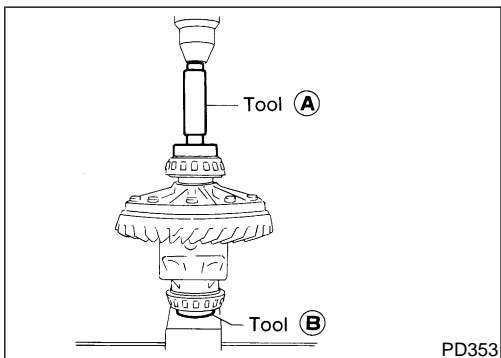


5. Apply gear oil to gear tooth surfaces and thrust surfaces and check to see they turn properly.



6. Install differential case assembly on ring gear.
7. Apply locking agent [Loctite (stud lock) or equivalent] to ring gear bolts, and install them.

Tighten bolts in a crisscross pattern.



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

Tool number:

A KV38100300 (J25523)

B ST33061000 (J8107-2)

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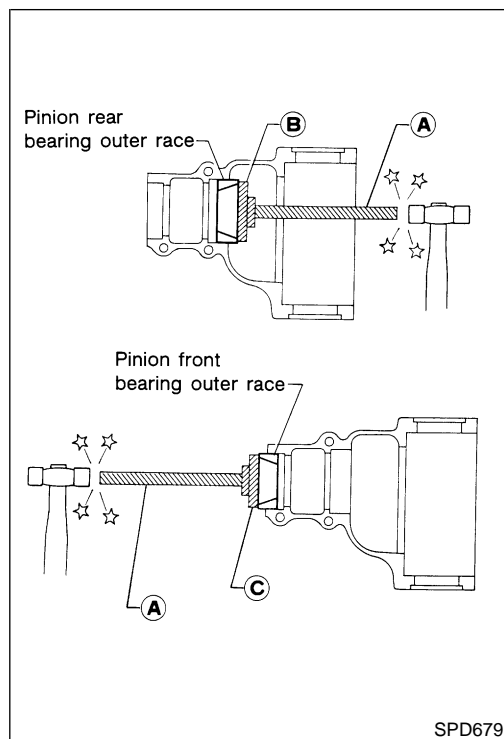
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FINAL DRIVE HOUSING

NEPD0021S03

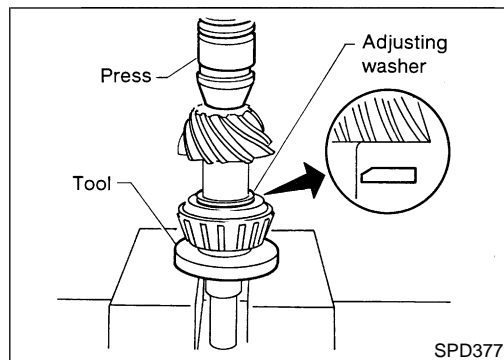
1. Press-fit front and rear bearing outer races with Tools.

Tool number:

A ST30611000 (J25742-1)

B ST30621000 (J25742-5)

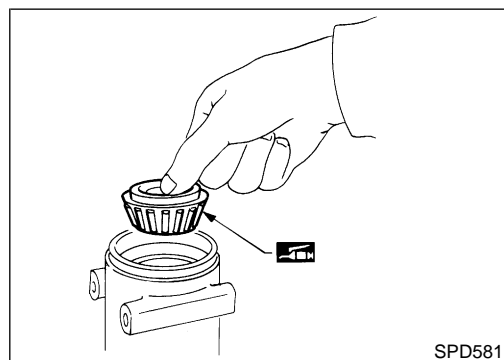
C ST30613000 (J25742-3)



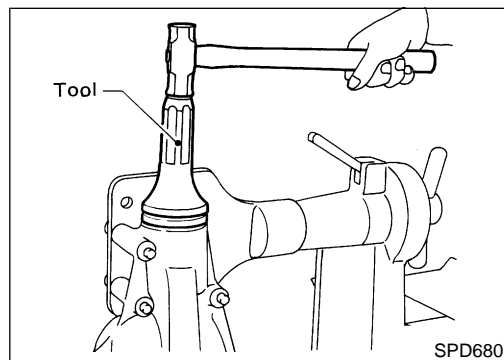
2. Select drive pinion height adjusting washer and pinion bearing adjusting washer. Refer to "PINION GEAR HEIGHT AND PINION BEARING PRELOAD", PD-28.
3. Install drive pinion height adjusting washer in drive pinion, and press-fit pinion rear bearing inner cone in it, using press and Tool.

Tool number:

ST30901000 (J26010-01)



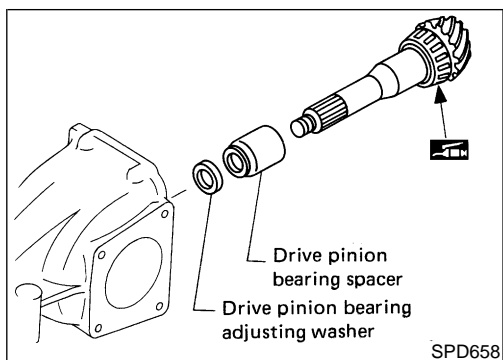
4. Place pinion front bearing inner cone in final drive housing.



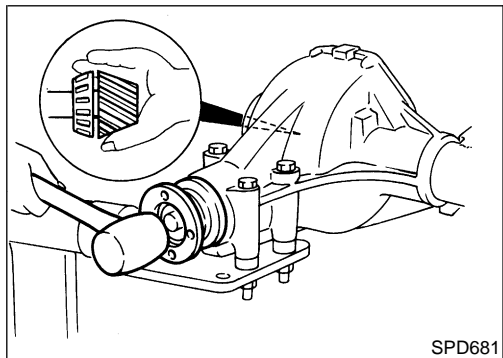
5. Apply multi-purpose grease to cavity at sealing lips of oil seal. Install front oil seal.

Tool number:

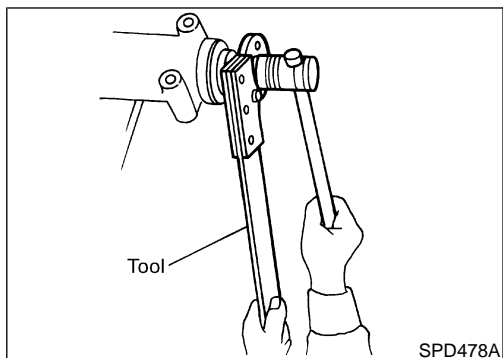
KV38100500 (J25273)



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

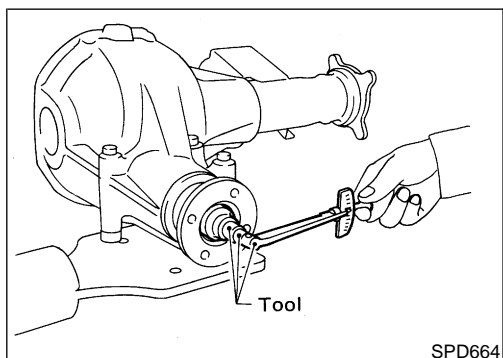


- Insert companion flange into drive pinion by tapping the companion flange with a soft hammer.



- 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: KV38108300 (J-44195)



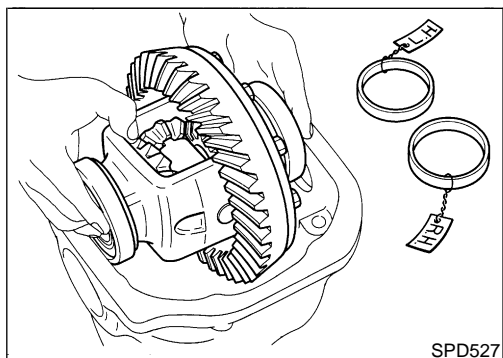
- Turn drive pinion in both directions several revolutions, and measure pinion bearing preload.

Tool number: ST3127S000 (J25765-A)

Pinion bearing preload:

1.1 - 1.4 N·m (11 - 14 kg-cm, 9.5 - 12.2 in-lb)

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



- Select side bearing adjusting washer. Refer to "SIDE BEARING PRELOAD", PD-27.
- Install differential case assembly with side bearing outer races into final drive housing.

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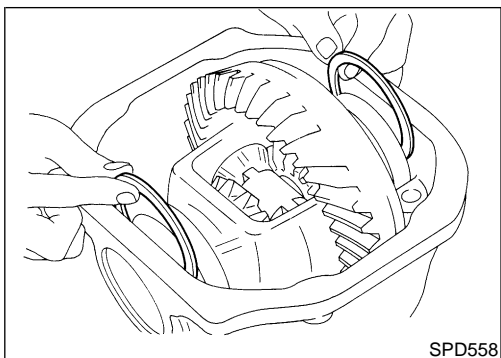
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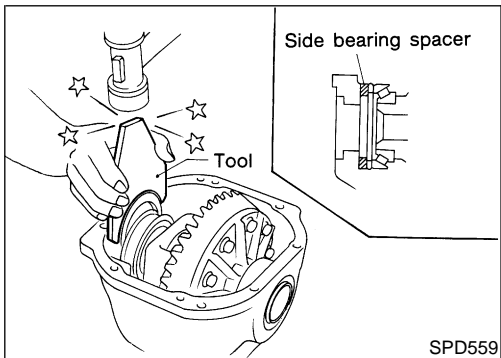
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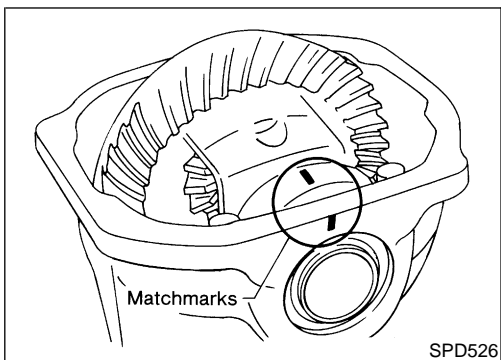
Assembly (Cont'd)



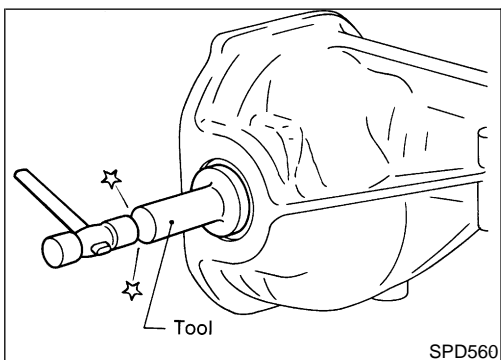
12. Insert left and right side bearing adjusting washers in place between side bearings and final drive housing.



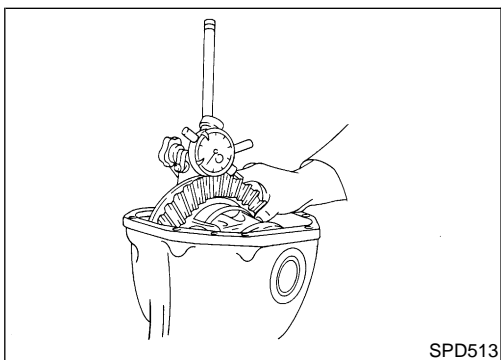
13. Drive in side bearing spacer with Tool.
Tool number: KV38100600 (J25267)



14. Align mark on bearing cap with that on final drive housing and install bearing cap on final drive housing.



15. Apply multi-purpose grease to cavity at sealing lips of oil seal. Install side oil seal.
Tool number: KV38100200 (J26233)

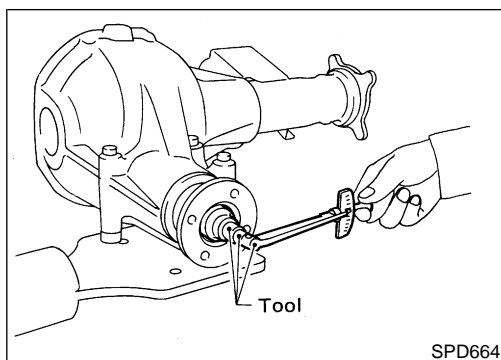


16. Measure ring gear to drive pinion backlash with a dial indicator.

Ring gear-to-drive pinion backlash:
0.10 - 0.15 mm (0.0039 - 0.0059 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.



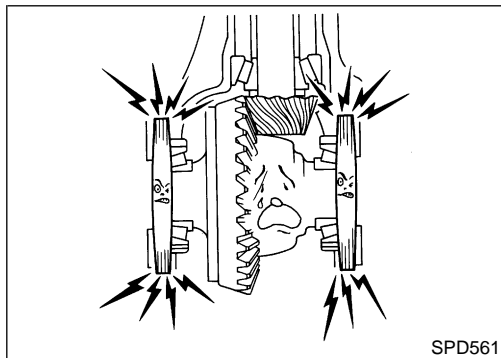
SPD664

17. Check total preload with Tool.
When checking preload, turn drive pinion in both directions several times to set bearing rollers.

Tool number: ST3127S000 (J25765-A)

Total preload:

1.4 - 1.7 N·m (14 - 17 kg·cm, 12 - 15 in·lb)

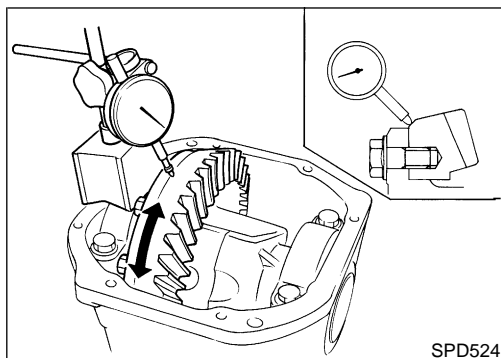


SPD561

- 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.

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



SPD524

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

Runout limit:

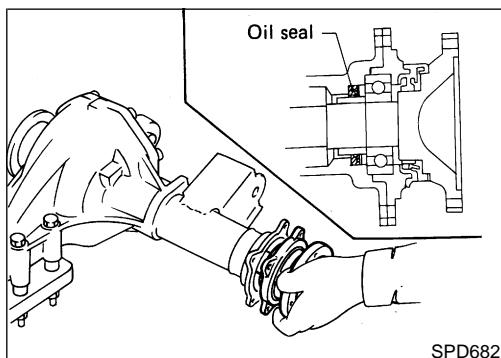
0.05 mm (0.0020 in)

- 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.

20. Check tooth contact. Refer to "TOOTH CONTACT", PD-33.

21. Install rear cover and gasket.

22. Install differential side shaft assembly.



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Service Data and Specifications (SDS)

R200A General Specifications

=NEPD0022

Engine	VG33E		VG33ER
Vehicle grade	XE	SE	SC
Front final drive	R200A		
	2-pinion		
Gear ratio	4.636	4.900	4.636
Number of teeth (Ring gear/drive pinion)	51/11	49/10	51/11
Oil capacity (Approx.) ℓ (US pt, Imp pt)	1.75 (3-3/4, 3-1/8)		

Ring Gear Runout

NEPD0023

Ring gear runout limit mm (in)	0.05 (0.0020)
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Side Gear Adjustment

NEPD0024

Side gear backlash (Clearance between side gear and differential case) mm (in)	Less than 0.15 (0.0059)	
Available side gear thrust washers	Thickness mm (in)	Part number*
	0.75 (0.0295)	38424-N3110
	0.78 (0.0307)	38424-N3111
	0.81 (0.0319)	38424-N3112
	0.84 (0.0331)	38424-N3113
	0.87 (0.0343)	38424-N3114
	0.90 (0.0354)	38424-N3115
0.93 (0.0366)	38424-N3116	

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

Side Bearing Adjustment

NEPD0025

Differential carrier assembly turning resistance N (kg, lb)	34.3 - 39.2 (3.5 - 4.0, 7.7 - 8.8)	
Available side bearing adjusting washers	Thickness mm (in)	Part number*
	2.00 (0.0787)	38453-N3100
	2.05 (0.0807)	38453-N3101
	2.10 (0.0827)	38453-N3102
	2.15 (0.0846)	38453-N3103
	2.20 (0.0866)	38453-N3104
	2.25 (0.0886)	38453-N3105
	2.30 (0.0906)	38453-N3106
	2.35 (0.0925)	38453-N3107
	2.40 (0.0945)	38453-N3108
	2.45 (0.0965)	38453-N3109
	2.50 (0.0984)	38453-N3110
2.55 (0.1004)	38453-N3111	
2.60 (0.1024)	38453-N3112	

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

Total Preload Adjustment

NEPD0026

Total preload N·m (kg·cm, in·lb)	1.4 - 1.7 (14 - 17, 12 - 15)
Ring gear to pinion backlash mm (in)	0.10 - 0.15 (0.0039 - 0.0059)

FRONT FINAL DRIVE

R200A

Service Data and Specifications (SDS) (Cont'd)

Drive Pinion Height Adjustment

NEPD0027

	Thickness mm (in)	Part number*
Available pinion height adjusting washers	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	

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

Drive Pinion Preload Adjustment

NEPD0028

Drive pinion bearing preload adjusting method	Adjusting washer and spacer	
Drive pinion preload with front oil seal N-m (kg-cm, in-lb)	1.1 - 1.4 (11 - 14, 9.5 - 12.2)	
	Thickness mm (in)	Part number*
Available drive pinion bearing preload adjusting washers	3.81 (0.1500)	38125-61001
	3.83 (0.1508)	38126-61001
	3.85 (0.1516)	38127-61001
	3.87 (0.1524)	38128-61001
	3.89 (0.1531)	38129-61001
	3.91 (0.1539)	38130-61001
	3.93 (0.1547)	38131-61001
	3.95 (0.1555)	38132-61001
	3.97 (0.1563)	38133-61001
	3.99 (0.1571)	38134-61001
	4.01 (0.1579)	38135-61001
	4.03 (0.1587)	38136-61001
	4.05 (0.1594)	38137-61001
	4.07 (0.1602)	38138-61001
	4.09 (0.1610)	38139-61001
	Length mm (in)	Part number*
Available drive pinion bearing preload adjusting spacers	54.50 (2.1457)	38165-B4000
	54.80 (2.1575)	38165-B4001
	55.10 (2.1693)	38165-B4002
	55.40 (2.1811)	38165-B4003
	55.70 (2.1929)	38165-B4004
56.00 (2.2047)	38165-61001	

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

Preparation

SPECIAL SERVICE TOOLS

NEPD0114

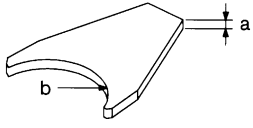
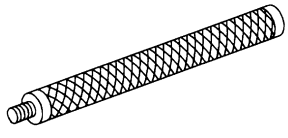
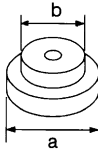
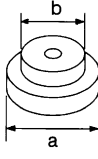
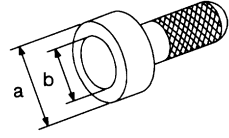
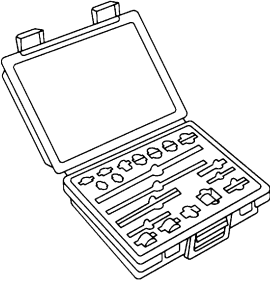
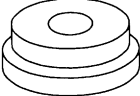
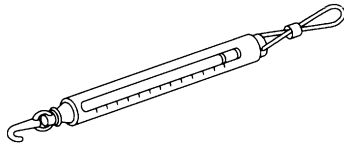
The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description	
ST3127S000 (See J25765-A) Preload gauge 1 GG91030000 (J25765) Torque wrench 2 HT62940000 (—) Socket adapter 3 HT62900000 (—) Socket adapter	<p>NT124</p>	Measuring pinion bearing preload and total preload
KV38108300 (J44195) Companion flange wrench	<p>NT771</p>	Removing and installing propeller shaft lock nut and drive pinion lock nut
ST3090S000 (—) Drive pinion rear inner race puller set 1 ST30031000 (J22912-01) Puller 2 ST30901000 (J26010-01) Base	<p>NT527</p>	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.
ST3306S001 Differential side bearing puller set 1 ST33051001 (J22888-20) Body 2 ST33061000 (J8107-2) Adapter	<p>NT072</p>	Removing and installing differential side bearing inner cone a: 28.5 mm (1.122 in) dia. b: 38 mm (1.50 in) dia.
ST33230000 (J25805-01) Differential side bearing drift	<p>NT085</p>	Installing side bearing inner cone a: 51 mm (2.01 in) dia. b: 41 mm (1.61 in) dia. c: 28.5 mm (1.122 in) dia.
ST33081000 (—) Side bearing puller adapter	<p>NT431</p>	Installing side bearing inner cone a: 43 mm (1.69 in) dia. b: 33.5 mm (1.319 in) dia.

REAR FINAL DRIVE

C200

Preparation (Cont'd)

Tool number (Kent-Moore No.) Tool name	Description	
KV38100600 (J25267) Side bearing spacer drift		Installing side bearing spacer a: 8 mm (0.31 in) b: R42.5 mm (1.673 in)
ST30611000 (J25742-1) Drift		Installing pinion rear bearing outer race
ST30621000 (J25742-5) Drift		Installing pinion rear bearing outer race a: 79 mm (3.11 in) dia. b: 59 mm (2.32 in) dia.
ST30613000 (J25742-3) Drift		Installing pinion front bearing outer race a: 72 mm (2.83 in) dia. b: 48 mm (1.89 in) dia.
KV38100500 (J25273) Gear carrier front oil seal drift		Installing front oil seal a: 85 mm (3.35 in) dia. b: 60 mm (2.36 in) dia.
(J34309) Differential shim selector		Adjusting bearing pre-load and gear height
(J25269-4) Side bearing discs (2 Req'd)		Selecting pinion height adjusting washer
(J8129) Spring gauge		Measuring carrier turning torque

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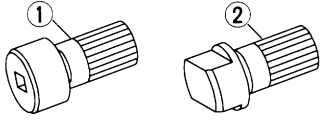
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REAR FINAL DRIVE

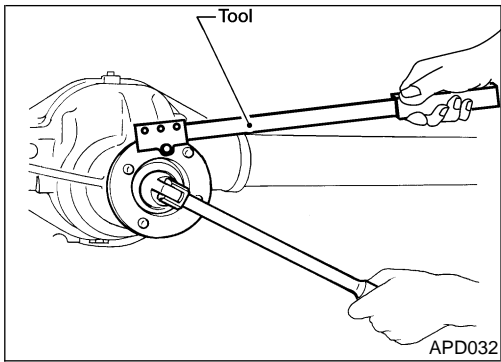
C200

Preparation (Cont'd)

Tool number (Kent-Moore No.) Tool name	Description
KV381051S0 (—) Rear axle shaft dummy 1 KV38105110 (—) Torque wrench side 2 KV38105120 (—) Vise side	 <p>NT142</p> <p>Checking differential torque on limited slip differential</p>

Noise, Vibration and Harshness (NVH) Troubleshooting

Refer to “NVH TROUBLESHOOTING CHART”, ^{NEPD0115} PD-4.



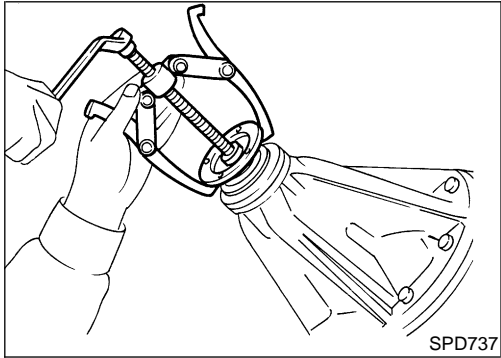
On-vehicle Service

FRONT OIL SEAL REPLACEMENT

1. Remove propeller shaft. Refer to "Removal and Installation", PD-9. =NEPD0124

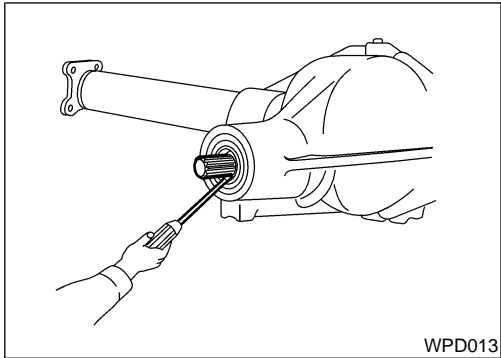
2. Loosen drive pinion nut.

Tool number: KV38108300 (J-44195)

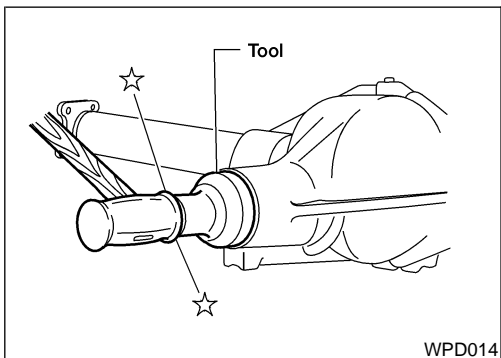


3. Remove companion flange.

4. Remove ABS sensor and sensor rotor.



5. Remove front oil seal.



6. Apply multi-purpose grease to cavity at sealing lips of oil seal. Press front oil seal into carrier.

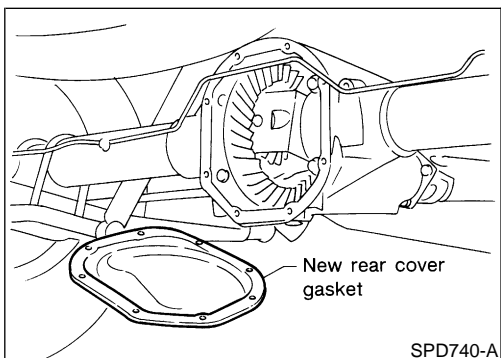
Tool number:

KV38100500 (J25273)

7. Install ABS sensor and sensor rotor.

8. Install companion flange and drive pinion nut.

9. Install rear propeller shaft.



REAR COVER GASKET REPLACEMENT

(Rear final drive: Model C200)

1. Drain gear oil.

2. Remove rear cover and rear cover gasket.

3. Install new rear cover gasket and rear cover.

4. Fill final drive with recommended gear oil.

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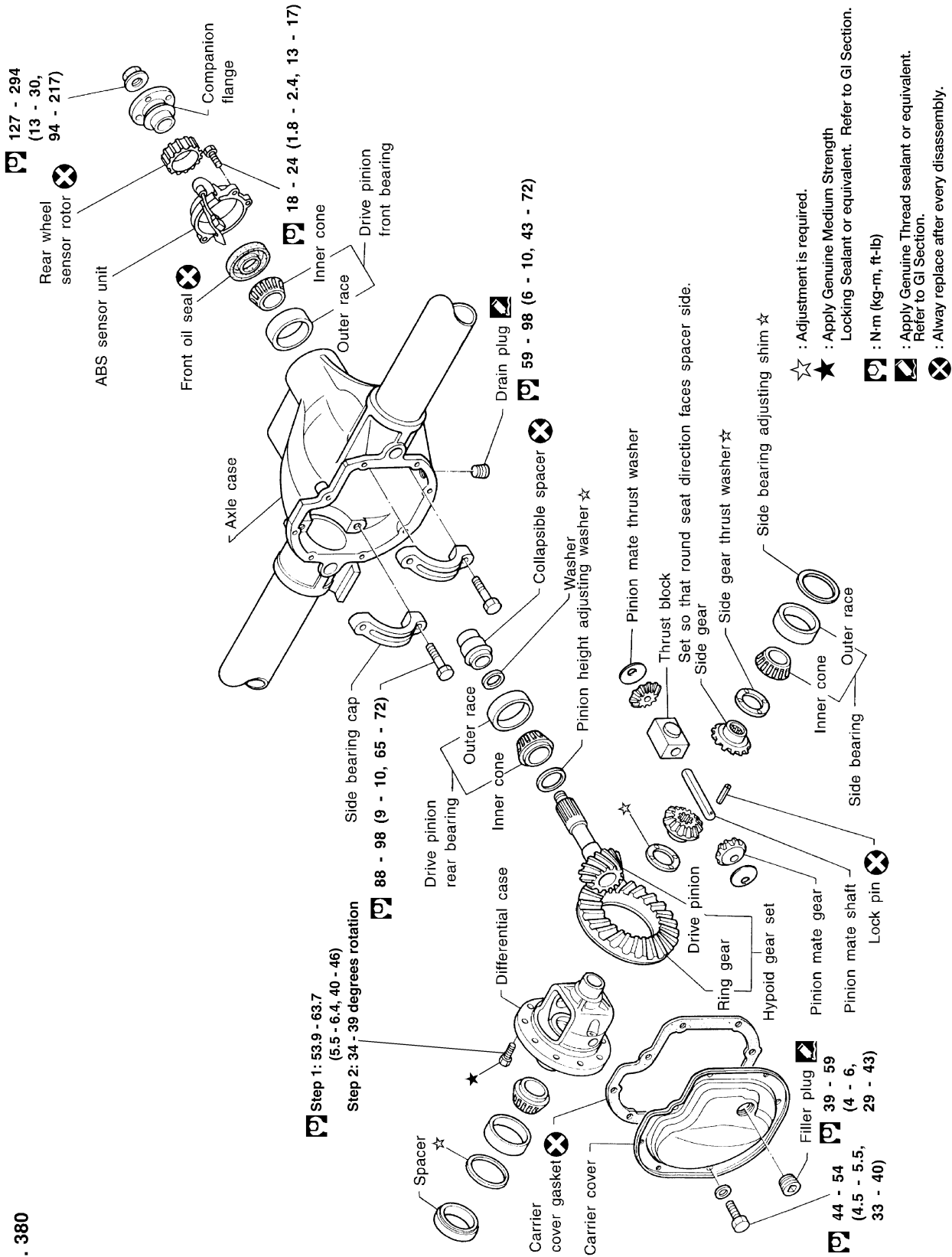
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Components

NEPD0117



- ☆ : Adjustment is required.
- ★ : Apply Genuine Medium Strength Locking Sealant or equivalent. Refer to GI Section.
- ⊗ : N/m (kg-m, ft-lb)
- ⊕ : Apply Genuine Thread sealant or equivalent. Refer to GI Section.
- ⊗ : Always replace after every disassembly.

SEC. 380

Removal and Installation

REMOVAL

NEPD0118

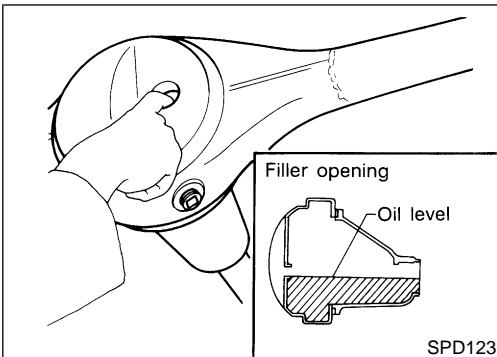
- Remove propeller shaft. Refer to "Removal and Installation", PD-9.

Plug front end of transfer.

- Remove axle shaft. Refer **AX-30**, "Removal".

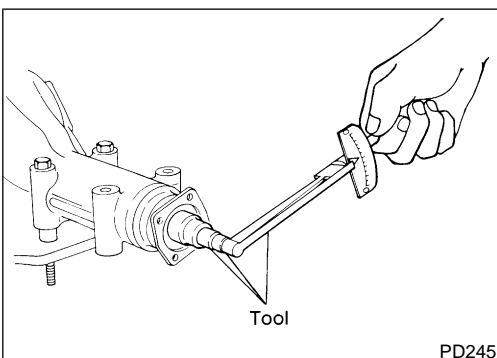
CAUTION:

- Be careful not to damage spline, sleeve yoke and front oil seal when removing propeller shaft.
- Before removing the final drive assembly or rear axle assembly, disconnect the ABS sensor harness connector from the assembly and move it away from the final drive/rear axle assembly area. Failure to do so may result in the sensor wires being damaged and the sensor becoming inoperative.



INSTALLATION

- Fill final drive with recommended gear oil.

NEPD0118S02


Disassembly

PRE-INSPECTION

NEPD0119

Before disassembling final drive, perform the following inspection.

- Total preload
 - a) Turn drive pinion in both directions several times to set bearing rollers.
 - b) Check total preload with Tool.

Tool number: ST3127S000 (J25765-A)

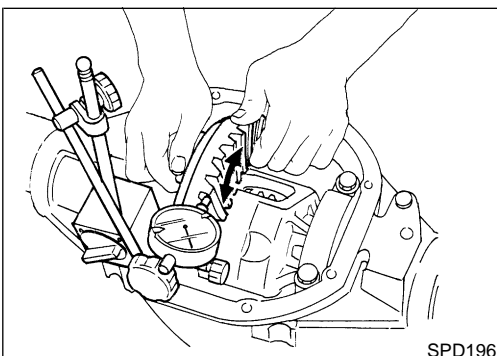
Total preload:

1.2 - 2.3 N·m (12 - 23 kg·cm, 10 - 20 in·lb)

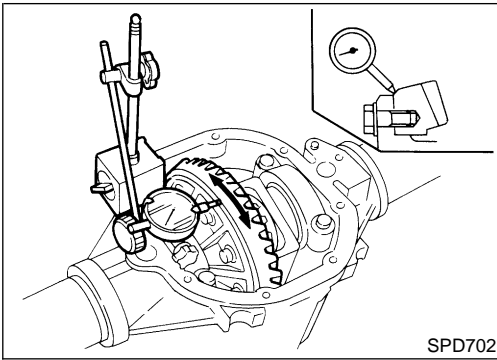
- Ring gear-to-drive pinion backlash. Check backlash of ring gear with a dial indicator at several points.

Ring gear-to-drive pinion backlash:

0.13 - 0.18 mm (0.0051 - 0.0071 in)

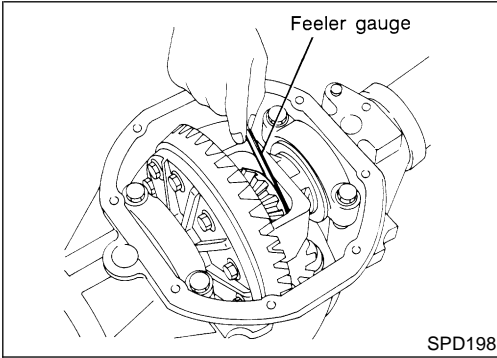


Disassembly (Cont'd)



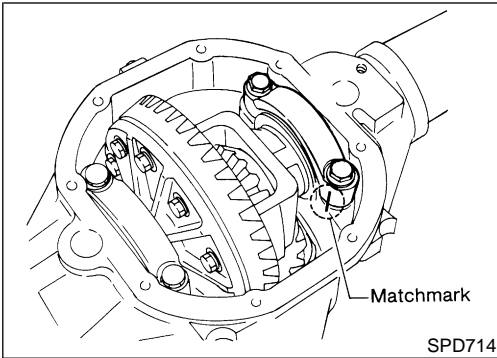
SPD702

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



SPD198

- Tooth contact
Check tooth contact. Refer to "TOOTH CONTACT", PD-58.
- 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:
Less than 0.15 mm (0.0059 in)**



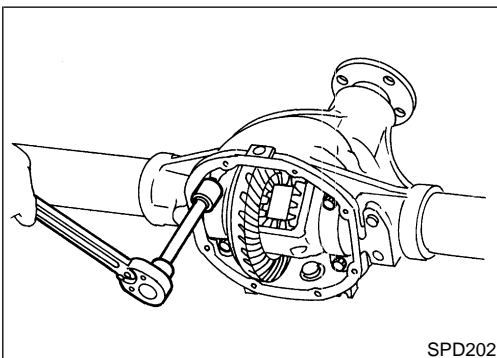
SPD714

DIFFERENTIAL CARRIER

NEPD0119S02

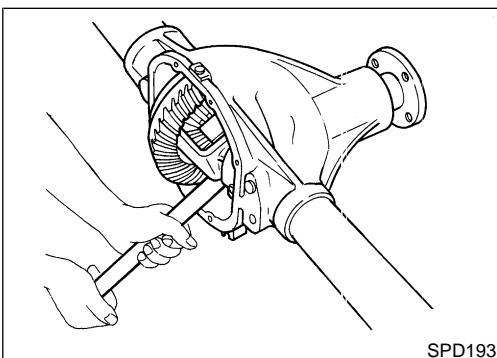
1. Remove rear cover and rear cover gasket.
2. Put match marks on one side of side bearing cap with paint or punch to ensure that it is replaced in proper position during reassembly.

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



SPD202

3. Remove side bearing caps.



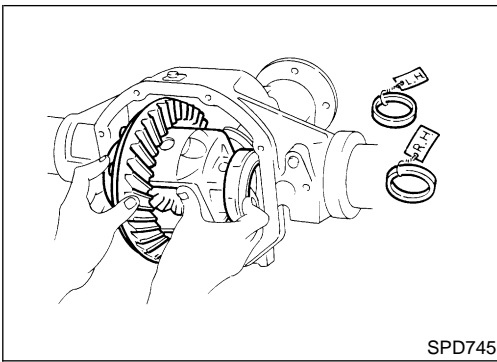
SPD193

4. Remove differential case assembly with pry bar.

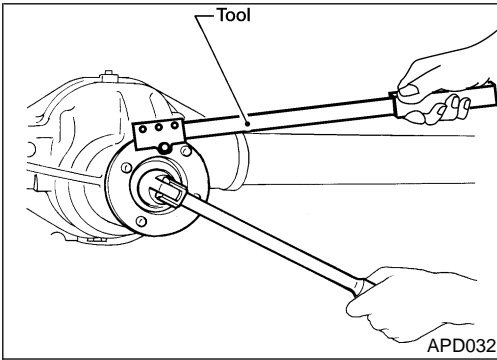
REAR FINAL DRIVE

C200

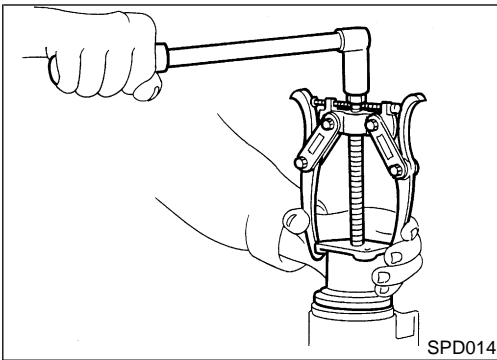
Disassembly (Cont'd)



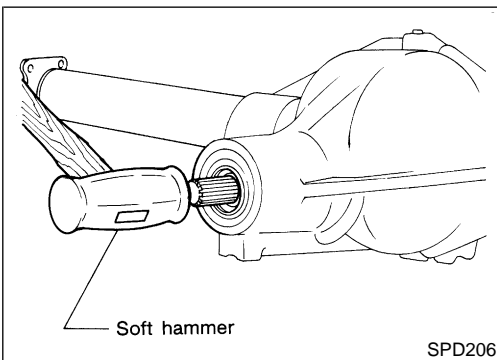
Keep the side bearing outer races together with their respective inner cones — do not mix them up.



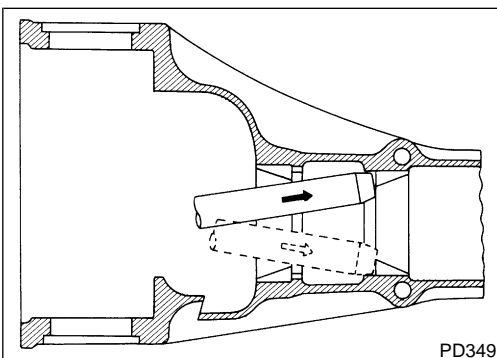
5. Remove pinion nut with Tool.
Tool number: KV38108300 (J44195)



6. Remove companion flange with puller.
7. Remove ABS sensor and sensor rotor.



8. Remove drive pinion with soft hammer.
9. Remove front oil seal and pinion front bearing inner cone.



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

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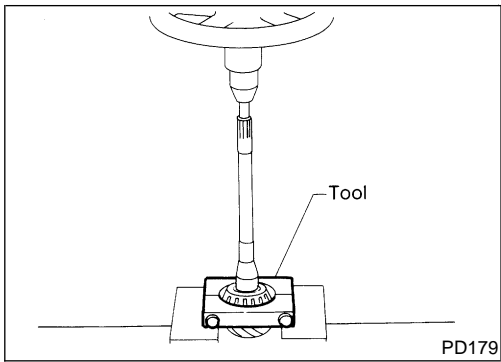
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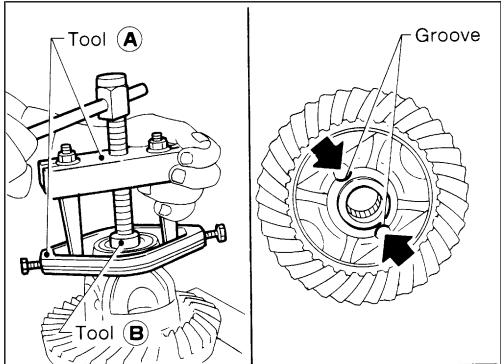
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Disassembly (Cont'd)



11. Remove pinion rear bearing inner cone and pinion height adjusting washer.

Tool number: ST30031000 (J22912-01)



DIFFERENTIAL CASE

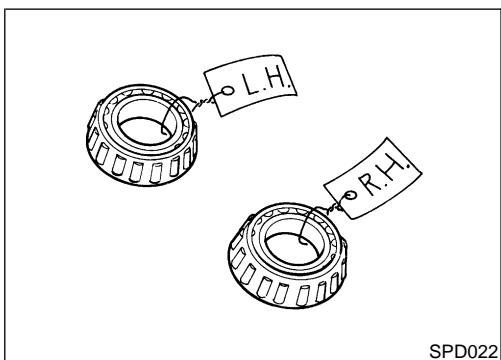
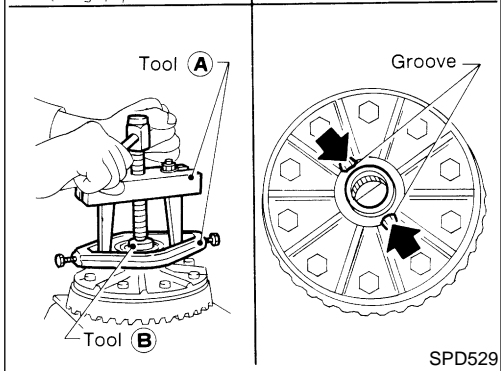
NEPD0119S03

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

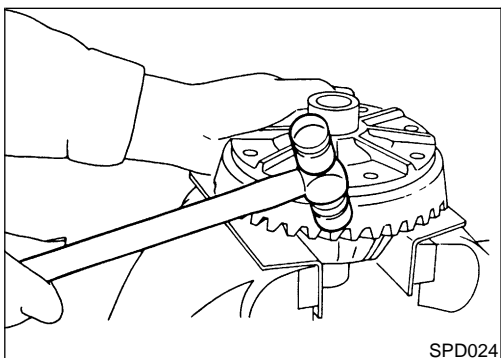
Tool numbers:

A ST33051001 (J22888-20)

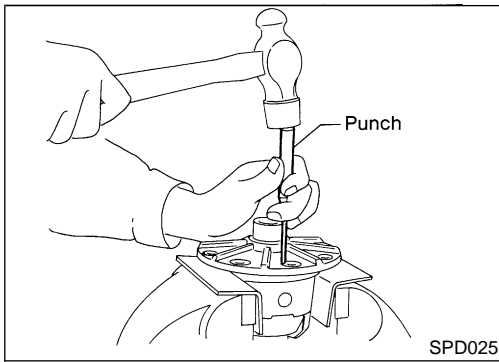
B ST33061000 (J8107-2)



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



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



- Punch off pinion mate shaft lock pin from ring gear side.
Lock pin is caulked at pinhole mouth on differential case.

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Inspection

RING GEAR AND DRIVE PINION

NEPD0120

NEPD0120S01

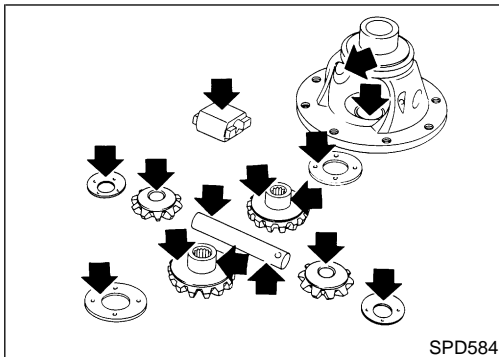
Check gear teeth for scoring, cracking or chipping. If any damaged part is evident, replace ring gear and drive pinion as a set (hypoid gear set).

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DIFFERENTIAL CASE ASSEMBLY

NEPD0120S02

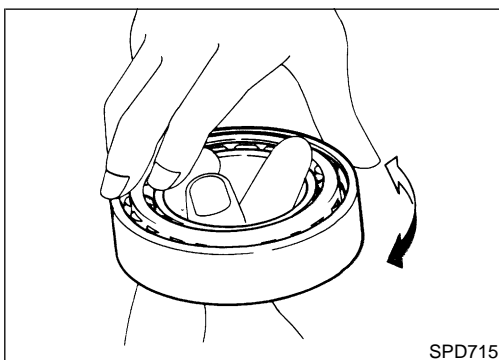
Check mating surfaces of differential case, side gears, pinion mate gears, pinion mate shaft, thrust block and thrust washers.

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BEARING

NEPD0120S03

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

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Adjustment

NEPD0121

For quiet and reliable final drive operation, the following five adjustments must be made correctly.

- Side bearing preload. Refer to "SIDE BEARING PRELOAD", PD-52.
- Pinion gear height. Refer to "PINION GEAR HEIGHT AND PINION BEARING PRELOAD", PD-53.
- Pinion bearing preload. Refer to "PINION GEAR HEIGHT AND PINION BEARING PRELOAD", PD-53.
- Ring gear-to-pinion backlash. Refer to "Total Preload Adjustment", PD-64.

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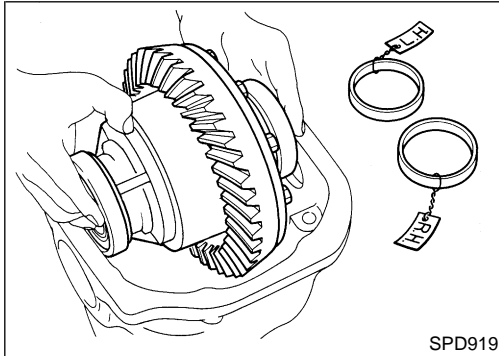
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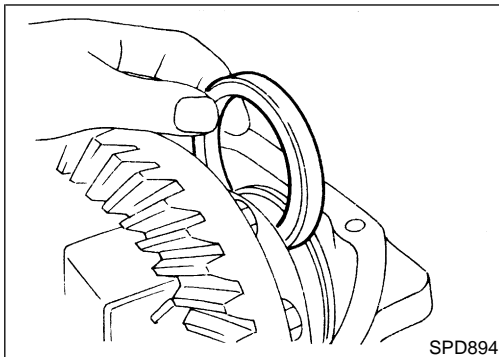
5. Ring and pinion gear tooth contact pattern. Refer to "TOOTH CONTACT", PD-58.

SIDE BEARING PRELOAD

A selection of carrier side bearing preload shims is required for successful completion of this procedure. NEPD0121S01

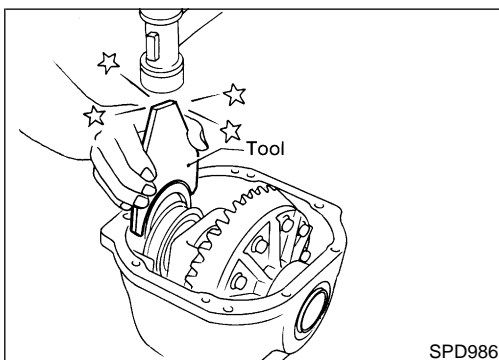


1. Make sure all parts are clean. Make sure, also, the bearings are well lubricated with light oil or "DEXRON™" automatic transmission fluid.
2. Place the differential carrier, with side bearings and bearing races installed, into the final drive housing.



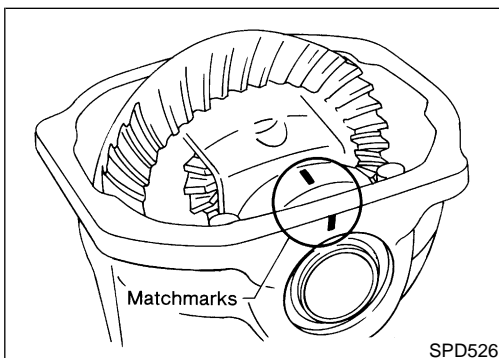
3. Put the side bearing spacer in place.

CAUTION:
Side bearing spacer is placed on either the right or left depending upon final drive gear ratio. Be sure to replace it on the correct side.



4. Use Tool to place original carrier side bearing preload shims on the carrier end, opposite the ring gear.

Tool number: KV38100600 (J25267)

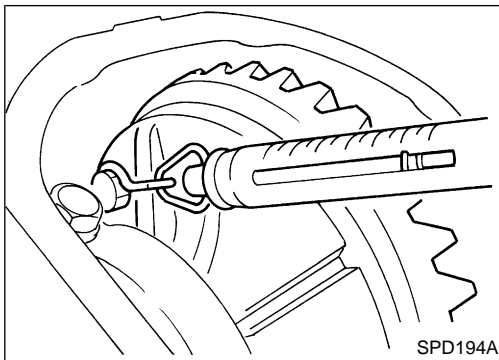


5. Install the side bearing caps in their correct locations and torque the bearing cap retaining bolts.

Specification:

88 - 98 N-m (9.0 - 10.0 kg-m, 65 - 72 ft-lb)

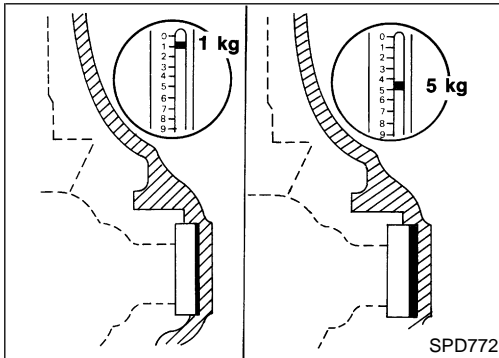
6. Turn the carrier several times to seat the bearings.



7. Measure the turning torque of the carrier at the ring gear retaining bolts with a spring gauge, J8129.

Specification:

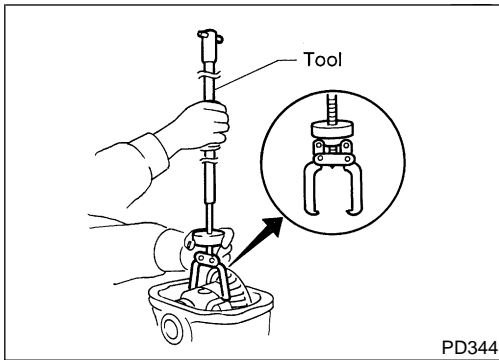
34.3 - 39.2 N (3.5 - 4.0 kg, 7.7 - 8.8 lb) of pulling force at the ring gear bolt



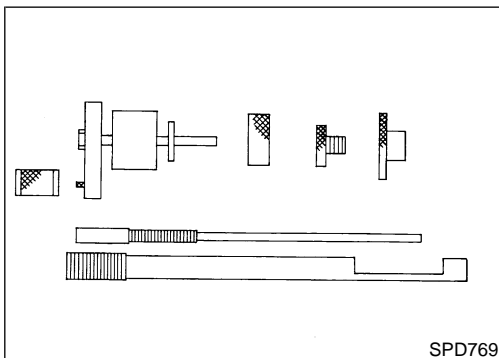
8. If the turning torque is not within the specifications, correct the torque as follows:
 - If the turning torque is less than the specified range, install washers of greater thickness.
 - If the turning torque is greater than the specification, install thinner washers.

Refer to "Side Bearing Adjustment", PD-64.

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



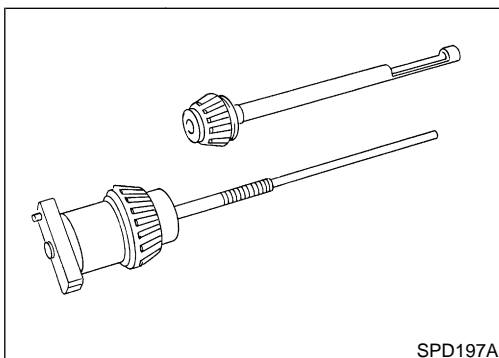
10. Remove the carrier from the final drive housing. Save the selected preload washers for later use during the assembly of the final drive unit.



PINION GEAR HEIGHT AND PINION BEARING PRELOAD

NEPD0121S02

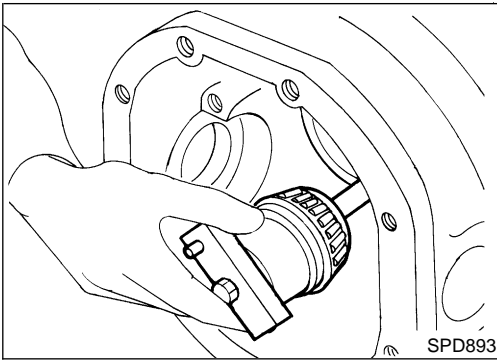
1. Make sure all parts are clean and that the bearings are well lubricated.
2. Assemble the pinion gear bearings into the pinion preload shim selector Tool, J34309.



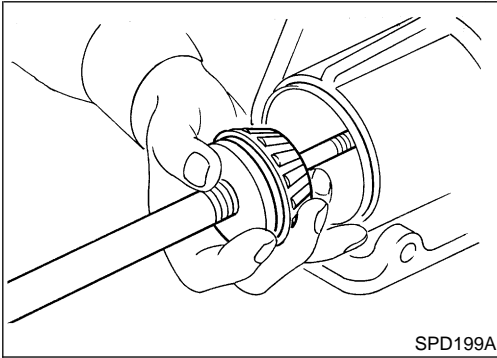
- **Front pinion bearing** — make sure the J34309-3 front pinion bearing seat is secured tightly against the J34309-2 gauge anvil. Then turn the front pinion bearing pilot, J34309-5, to secure the bearing in its proper position.
- **Rear pinion bearing** — the rear pinion bearing pilot, J34309-8, is used to center the rear pinion bearing only. The rear pinion bearing locking seat, J34309-4, is used to lock the bearing to the assembly.

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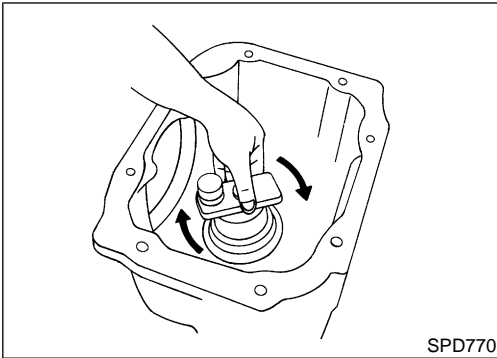
Adjustment (Cont'd)



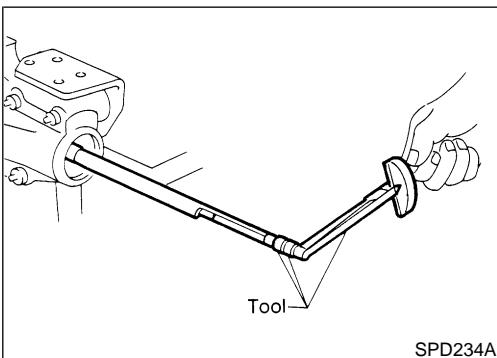
3. Install the pinion rear bearing inner cone into the final drive housing. Then place the pinion preload shim selector Tool, J34309-1, on gauge screw assembly.



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



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

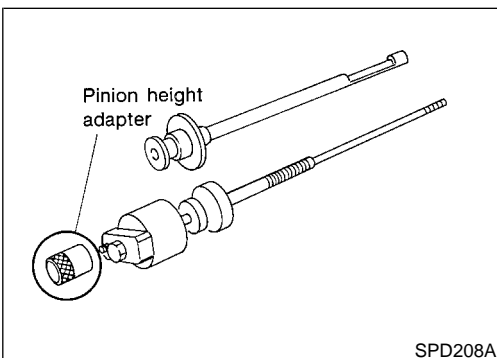


6. Measure the turning torque at the end of the J34309-2 gauge anvil using Tool.

Tool number: ST3127S000 (J25765-A)

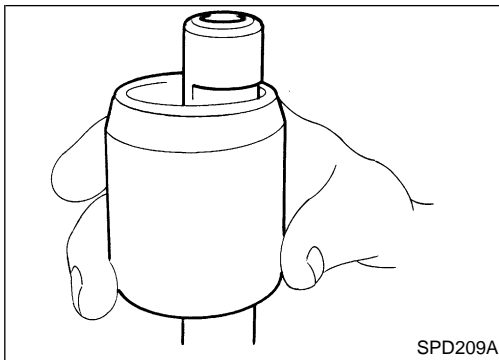
Turning torque specification:

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



7. Place the J34309-11 pinion height adapter onto the gauge plate and tighten it by hand.

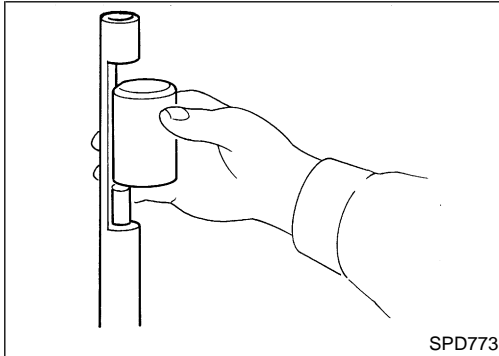
CAUTION:
Make sure all machined surfaces are clean.



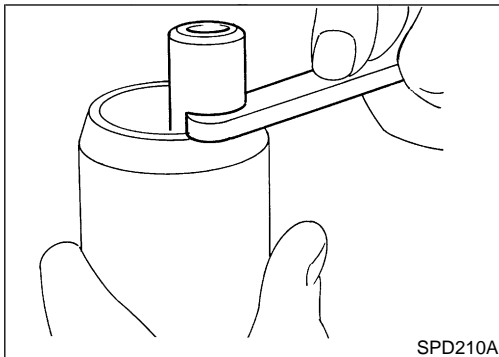
SPD209A

PINION BEARING PRELOAD WASHER SELECTION

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



SPD773



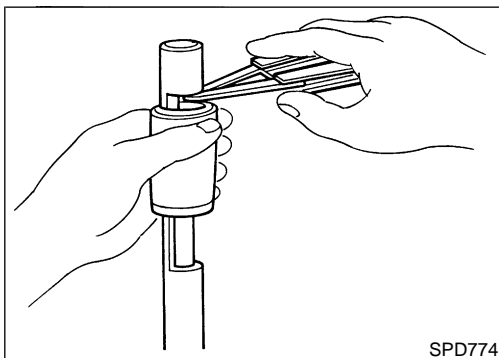
SPD210A

- Select the correct thickness of pinion bearing preload adjusting washer using a standard gauge of 3.5 mm (0.138 in) and J34309-101 feeler gauge. The exact measure is the thickness of the adjusting washer required. Select the correct washer.

Drive pinion bearing preload adjusting washer:

Refer to "Drive Pinion Preload Adjustment", PD-65.

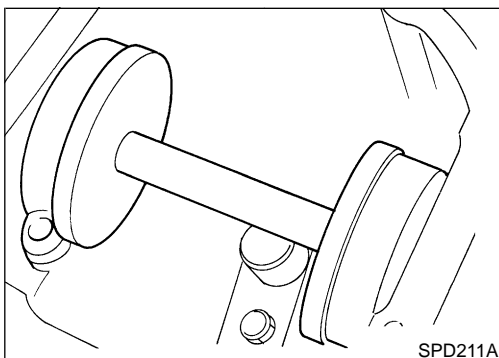
- Set the selected, correct pinion bearing preload adjusting washer aside for use when assembling the pinion gear and bearings into the final drive.



SPD774

PINION HEIGHT ADJUSTING WASHER SELECTION

- Now, position the side bearing discs, J25269-4, and arbor firmly into the side bearing bores. Install the side bearing caps and tighten the cap bolts to proper torque.



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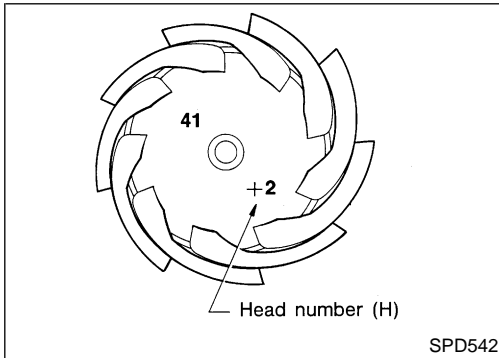
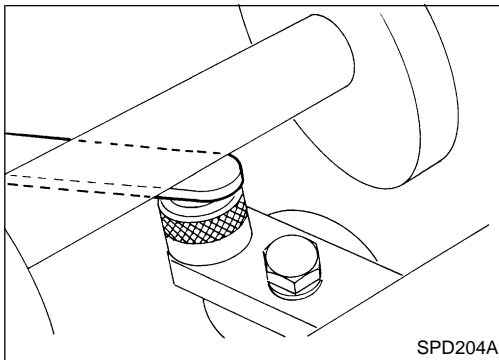
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Adjustment (Cont'd)



12. Select the correct standard pinion height adjusting washer thickness. Select by using a standard gauge of 3 mm (0.12 in) and J34309-101 feeler gauge. Measure the distance between the J34309-11 pinion height adapter including the standard gauge and the arbor.
13. Write down the exact measurement (the value of feeler gauge).

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

Use the following chart to determine the correct pinion height washer:

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

15. Select the correct pinion height washer.

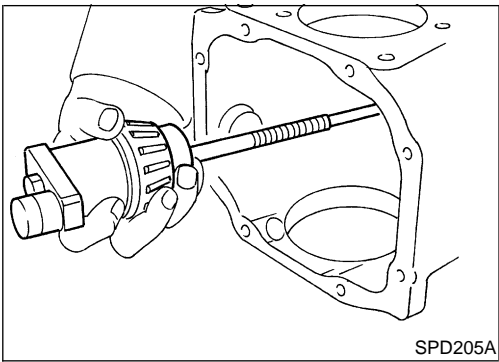
Drive pinion height adjusting washer:

Refer to “Drive Pinion Height Adjustment”, PD-65.

REAR FINAL DRIVE

C200

Adjustment (Cont'd)



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

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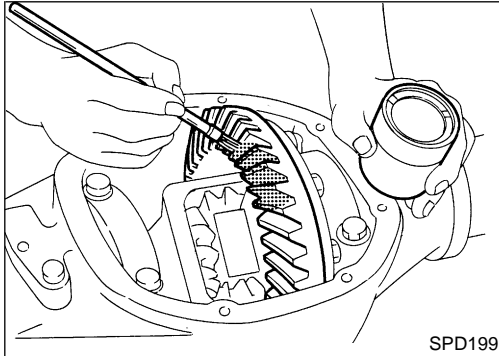
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TOOTH CONTACT

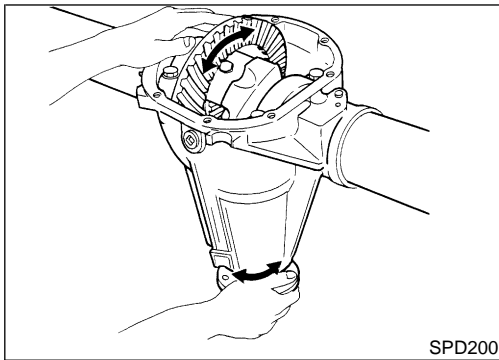
=NEPD0121S03

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

Hypoid gear set which is not positioned properly may be noisy, or have short life or both. With the checking of gear tooth contact pattern, the most desirable contact for low noise level and long life can be assured.

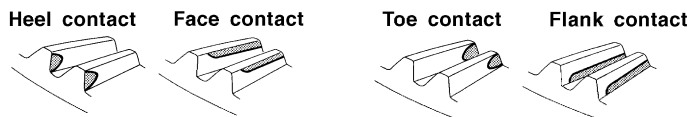


1. Thoroughly clean ring gear and drive pinion teeth.
2. Sparingly apply a mixture of powdered ferric oxide and oil or equivalent to 3 or 4 teeth of ring gear drive side.



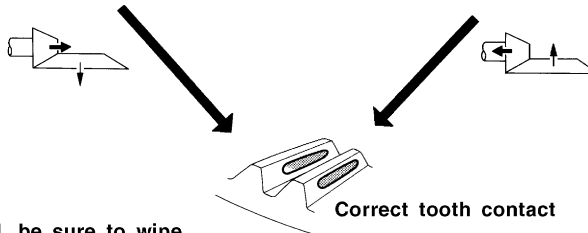
3. Hold companion flange steady and rotate the ring gear in both directions.

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



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

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

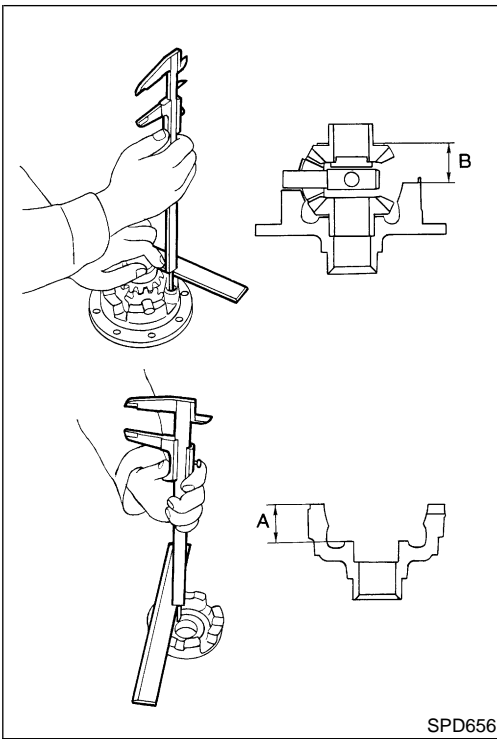


When adjustment is completed, be sure to wipe off completely the ferric oxide and oil or their equivalent.

SPD007-B

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Assembly DIFFERENTIAL CASE

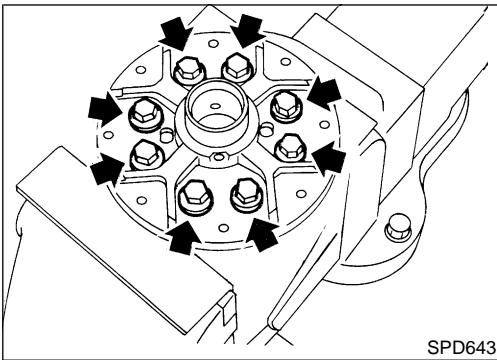
1. Measure clearance between side gear thrust washer and differential case.

Clearance between side gear thrust washer and differential case (A – B):

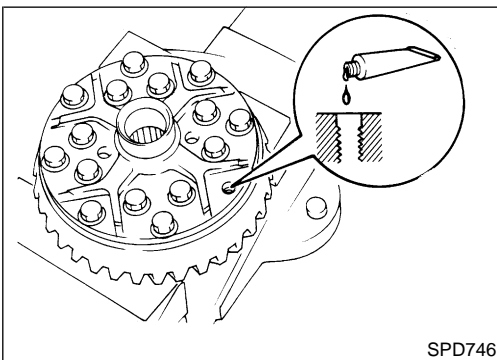
Less than 0.15 mm (0.0059 in)

The clearance can be adjusted with side gear thrust washer. Refer to "Side Gear Adjustment", PD-64.

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

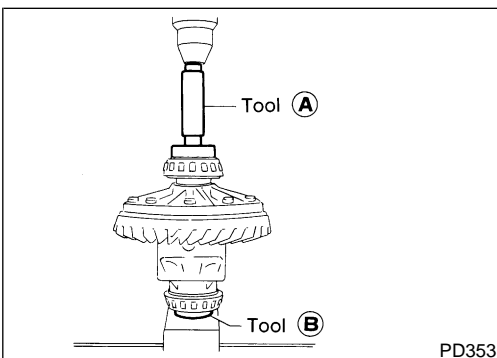


3. Install differential case LH and RH.



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 crisscross pattern.



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

Tool numbers:

A ST33230000 (J25805-01)

B ST33061000 (J8107-2)

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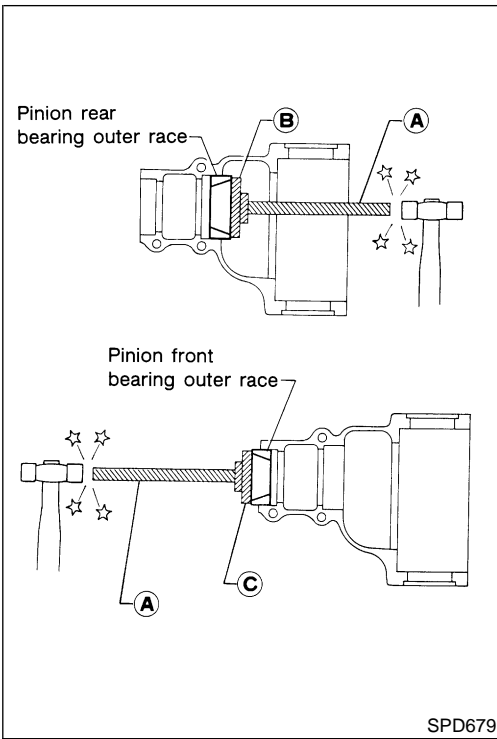
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DIFFERENTIAL CARRIER

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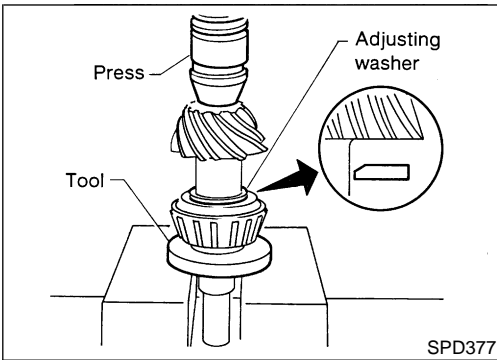
1. Press-fit front and rear bearing outer races with Tools.

Tool numbers:

A ST30611000 (J25742-1)

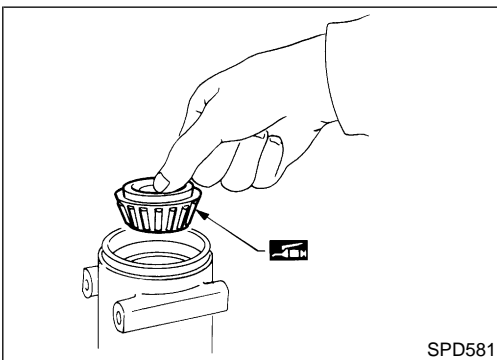
B ST30621000 (J25742-5)

C ST30613000 (J25742-3)

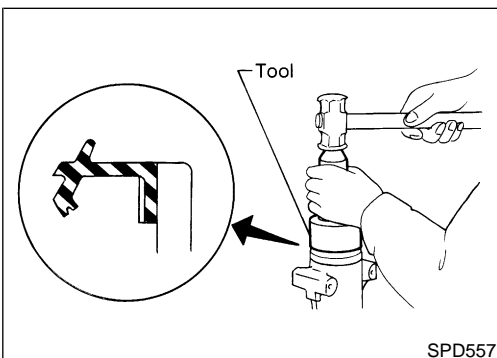


2. Select pinion height adjusting washer. Refer to "PINION GEAR HEIGHT AND PINION BEARING PRELOAD", PD-53.
3. Install pinion height adjusting washer in drive pinion, and press-fit rear bearing inner cone in it, with press and Tool.

Tool number: ST30901000 (J26010-01)

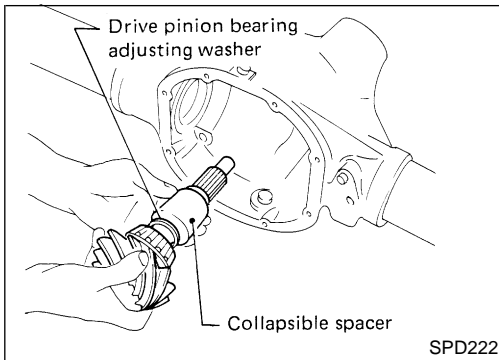


4. Place pinion front bearing inner cone in gear carrier.

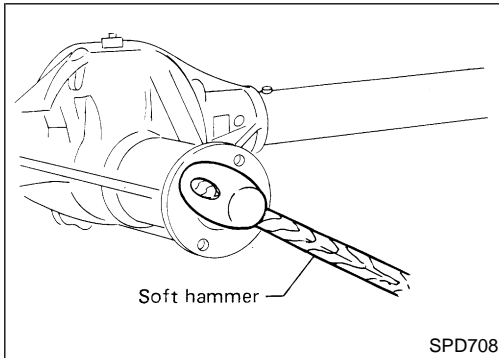


5. Apply multi-purpose grease to cavity at sealing lips of oil seal. Install front oil seal.

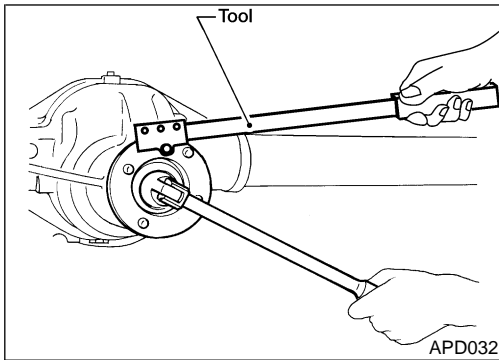
Tool number: KV38100500 (J25273)



- Place drive pinion bearing spacer, drive pinion bearing adjusting washer and drive pinion in gear carrier.

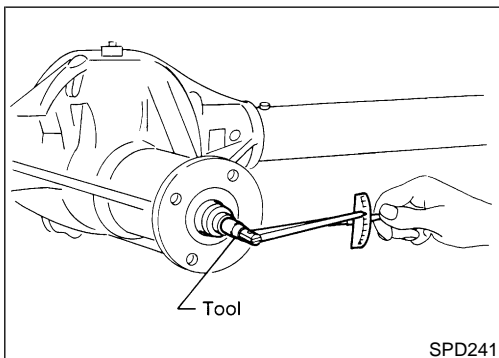


- Install ABS sensor and sensor rotor.
- Insert companion flange onto drive pinion by tapping the companion flange with a soft hammer until fully seated.



- Tighten pinion nut to 127–294 N·m (13–30 kg·m, 94–217 ft·lb). **The threaded portion of drive pinion and pinion nut should be free from oil or grease.**

Tool number: KV38108300 (J44195)



- Tighten the pinion nut by very small degrees until the specified preload is achieved. When checking the preload, turn the drive pinion in both directions several times to set the bearing rollers.

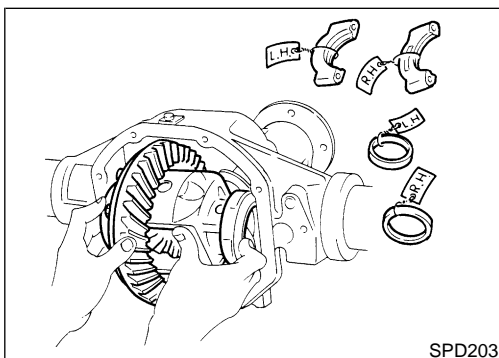
Tool number: ST3127S000 (J25765-A)

Pinion bearing preload:

1.1 - 1.7 N·m (11 - 17 kg·cm, 9.5 - 14.8 in·lb)

This procedure will have to be repeated if:

- Maximum preload is achieved before the minimum pinion nut torque is reached.**
- Minimum preload is not achieved before maximum pinion nut torque is reached.**



- Select side bearing adjusting washer. Refer to "SIDE BEARING PRELOAD", PD-52.
- Install differential case assembly with side bearing outer races into gear carrier.

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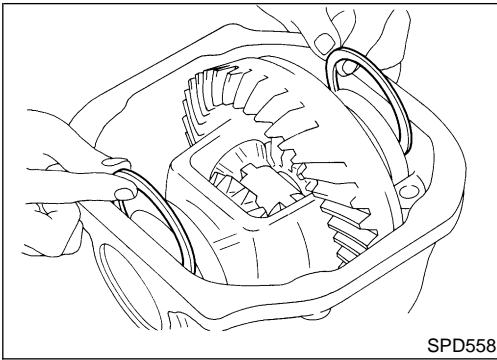
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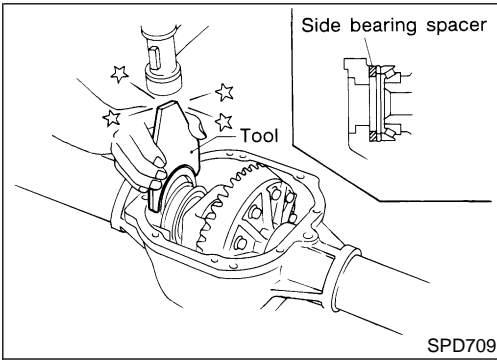
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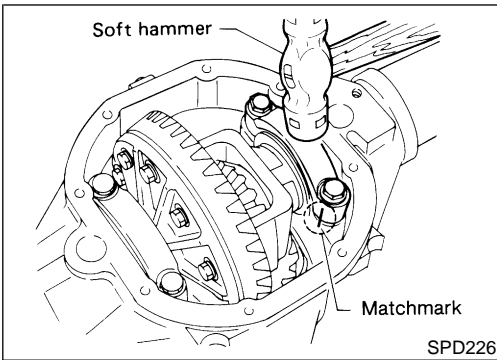
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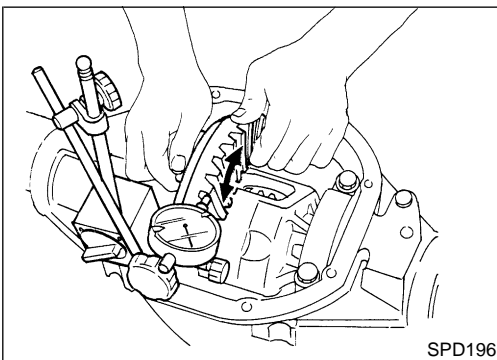
13. Insert left and right side bearing adjusting washers in place between side bearing and carrier.



14. Drive in side bearing spacer with Tool.
Tool number: KV38100600 (J25267)



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

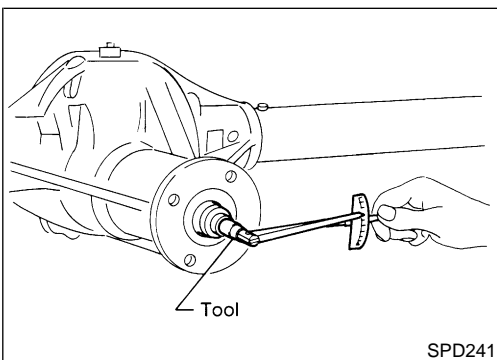


16. Measure ring gear-to-drive pinion backlash with a dial indicator.

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.



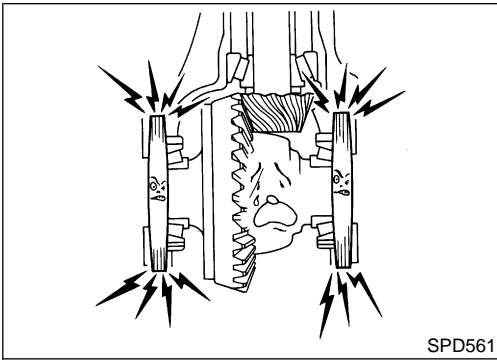
17. Check total preload with Tool.
When checking preload, turn drive pinion in both directions several times to seat bearing rollers correctly.

Total preload:
1.2 - 2.3 N·m (12 - 23 kg-cm, 10 - 20 in-lb)
Tool number: ST3127S000 (J25765-A)

REAR FINAL DRIVE

C200

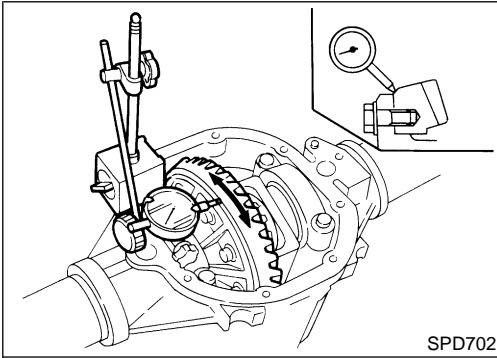
Assembly (Cont'd)



- 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.

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



19. 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.
20. Check tooth contact.
Refer to "TOOTH CONTACT", PD-58.
21. Install rear cover and gasket.

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REAR FINAL DRIVE

C200

Service Data and Specifications (SDS)

Service Data and Specifications (SDS)

C200

General Specifications

=NEPD0123

NEPD0123S01

Engine	KA24DE	
Vehicle Grade	XE	
Transmission	A/T	M/T
Rear final drive	Standard	
	C200	
	2-pinion	
Gear ratio	4.625	3.900
Number of teeth (Ring gear/drive pinion)	37/8	39/10
Oil capacity (Approx.) ℓ (US pt, Imp pt)	1.3 (2-3/4, 2-1/4)	

Ring Gear Runout

NEPD0123S02

Ring gear runout limit mm (in)	0.05 (0.0020)
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Side Gear Adjustment

NEPD0123S03

Side gear backlash (Clearance between side gear and differential case) mm (in)	Less than 0.15 (0.0059)	
Available side gear thrust washers	Thickness mm (in)	Part number*
	0.75 (0.0295)	38424-N3110
	0.78 (0.0307)	38424-N3111
	0.81 (0.0319)	38424-N3112
	0.84 (0.0331)	38424-N3113
	0.87 (0.0343)	38424-N3114
	0.90 (0.0354)	38424-N3115
	0.93 (0.0366)	38424-N3116

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

Side Bearing Adjustment

NEPD0123S04

Differential carrier assembly turning resistance N (kg, lb)	34.3 - 39.2 (3.5 - 4.0, 7.7 - 8.8)	
Available side bearing adjusting washers	Thickness mm (in)	Part number*
	2.00 (0.0787)	38453-N3100
	2.05 (0.0807)	38453-N3101
	2.10 (0.0827)	38453-N3102
	2.15 (0.0846)	38453-N3103
	2.20 (0.0866)	38453-N3104
	2.25 (0.0886)	38453-N3105
	2.30 (0.0906)	38453-N3106
	2.35 (0.0925)	38453-N3107
	2.40 (0.0945)	38453-N3108
	2.45 (0.0965)	38453-N3109
	2.50 (0.0984)	38453-N3110
	2.55 (0.1004)	38453-N3111
2.60 (0.1024)	38453-N3112	

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

Total Preload Adjustment

NEPD0123S05

Total preload N·m (kg-cm, in-lb)	1.2 - 2.3 (12 - 23, 10 - 20)
Ring gear-to-pinion backlash mm (in)	0.13 - 0.18 (0.0051 - 0.0071)

REAR FINAL DRIVE

C200

Service Data and Specifications (SDS) (Cont'd)

Drive Pinion Height Adjustment

NEPD0123S06

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	

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

Drive Pinion Preload Adjustment

NEPD0123S07

Drive pinion bearing preload adjusting method	Collapsible spacer
Drive pinion preload with front oil seal N·m (kg-cm, in-lb)	1.1 - 1.7 (11 - 17, 9.5 - 15)
Drive pinion preload without front oil seal N·m (kg-cm, in-lb)	1.0 - 1.6 (10 - 16, 8.7 - 14)

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Preparation

SPECIAL SERVICE TOOLS

NEPD0029

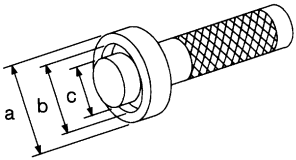
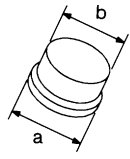
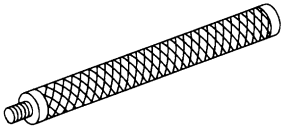
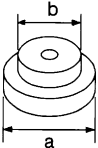
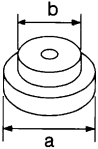
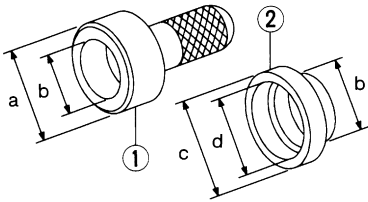

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description	
ST3127S000 (See J25765-A) Preload gauge 1 GG91030000 (J25765) Torque wrench 2 HT62940000 (—) Socket adapter 3 HT62900000 (—) Socket adapter		Measuring pinion bearing preload and total preload
ST06340000 (J24310, J34310) Differential attachment		Mounting final drive
ST32580000 (J34312) Differential side bearing adjusting nut wrench		Adjusting side bearing preload and backlash (ring gear-drive pinion)
KV38108300 (J-44195) Companion flange wrench		Removing and installing propeller shaft lock nut, and drive pinion lock nut
ST3090S000 (—) Drive pinion rear inner race puller set 1 ST30031000 (J22912-01) Puller 2 ST30901000 (J26010-01) 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.
ST3306S001 Differential side bearing puller set 1 ST33051001 (J22888-20) Body 2 ST33061000 (J8107-2) Adapter		Removing and installing differential side bearing inner cone a: 28.5 mm (1.122 in) dia. b: 38 mm (1.50 in) dia.

REAR FINAL DRIVE

H233B

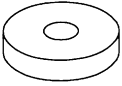
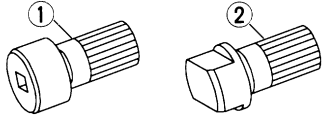
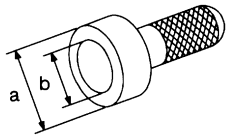
Preparation (Cont'd)

Tool number (Kent-Moore No.) Tool name	Description	
ST33190000 (J25523) Differential side bearing drift		Installing side bearing inner cone a: 52 mm (2.05 in) dia. b: 45.5 mm (1.791 in) dia. c: 34 mm (1.34 in) dia.
NT085		GI MA EM
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.
NT431		LC EC FE
ST30611000 (J25742-1) Drift		Installing pinion rear bearing outer race (Use with ST30621000 or ST30613000)
NT090		CL MT
ST30621000 (J25742-5) Drift		Installing pinion rear bearing outer race a: 79 mm (3.11 in) dia. b: 59 mm (2.32 in) dia.
NT073		AT TF
ST30613000 (J25742-3) Drift		Installing pinion front bearing outer race (Use with ST30611000) a: 72 mm (2.83 in) dia. b: 48 mm (1.89 in) dia.
NT073		PD
KV381025S0 (—) Oil seal fitting tool 1 ST30720000 (J25405) 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.
NT525		BR ST RS
(J34309) Differential shim selector		Adjusting bearing pre-load and gear height
NT134		BT HA SC EL

REAR FINAL DRIVE

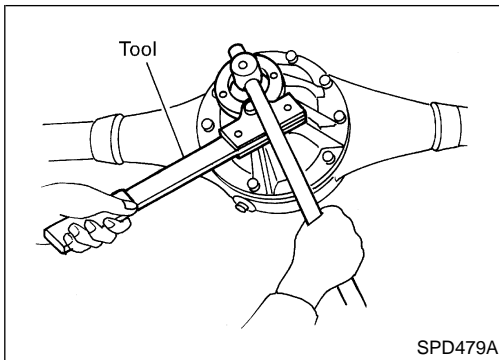
H233B

Preparation (Cont'd)

Tool number (Kent-Moore No.) Tool name	Description	
(J25269-18) Side bearing discs (2 Req'd)		Selecting pinion height adjusting washer NT135
KV381052S0 (—) Rear axle shaft dummy 1 KV38105210 (—) Torque wrench side 2 KV38105220 (—) Vise side		Checking differential torque on limited slip differential NT142
KV38100500 (J25273) Gear carrier front oil seal drift		Installing front oil seal a: 85 mm (3.35 in) dia. b: 60 mm (2.36 in) dia. NT115

Noise, Vibration and Harshness (NVH) Troubleshooting

Refer to "NVH TROUBLESHOOTING CHART", ^{NEPD0051} PD-4.



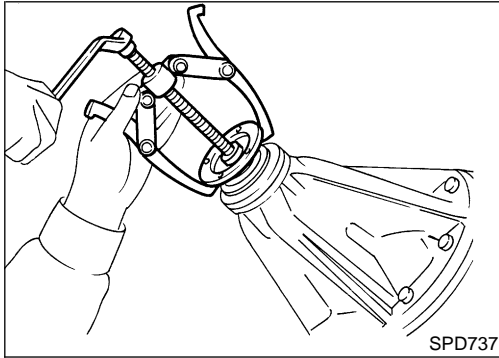
On-vehicle Service

FRONT OIL SEAL REPLACEMENT

1. Remove propeller shaft. Refer to "Removal and Installation", PD-9. =NEPD0030

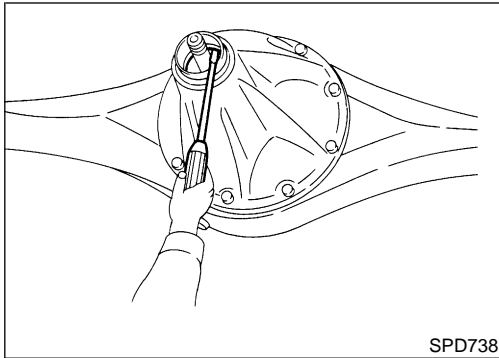
2. Loosen drive pinion nut.

Tool number: KV38108300 (J-44195)

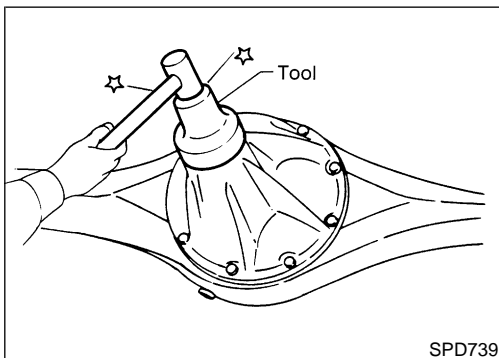


3. Remove companion flange.

4. Remove ABS sensor and sensor rotor (2WD models).



5. Remove front oil seal.



6. Apply multi-purpose grease to cavity at sealing lips of oil seal. Press front oil seal into carrier.

Tool number:

KV38100500 (J25273)

NOTE:

Always install a new sensor rotor.

7. Install ABS sensor and sensor rotor (2WD models).

8. Install companion flange and drive pinion nut.

9. Install rear propeller shaft.

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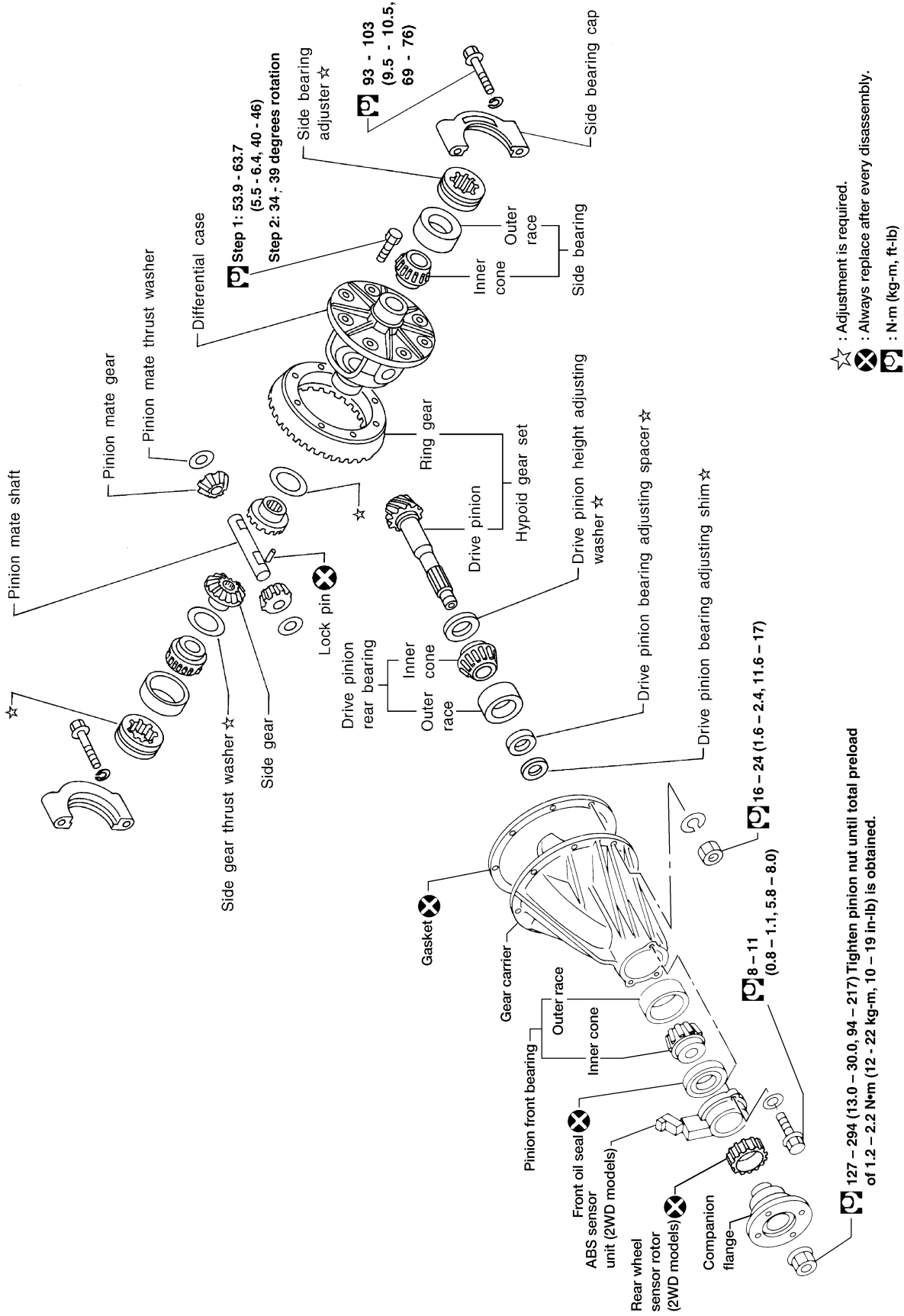
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Components



\star : Adjustment is required.
 \otimes : Always replace after every disassembly.
 \square : N·m (kg·m, ft·lb)

Removal and Installation

REMOVAL

NEPD0032

- Remove rear propeller shaft. Refer to "Removal and Installation", PD-9.

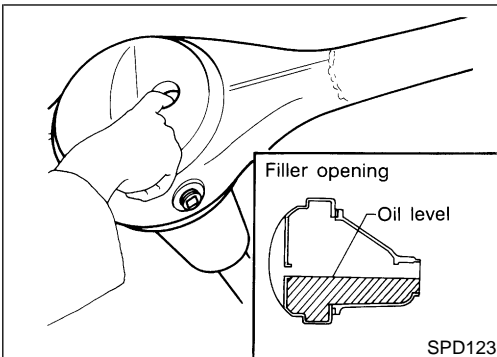
Plug front end of transfer.

- Remove axle shaft. Refer to **AX-30**, "Removal".
- Remove rear final drive mounting bolts.

CAUTION:

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

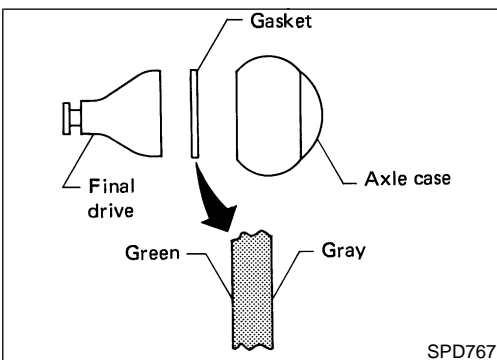
Before removing the final drive assembly or rear axle assembly, disconnect the ABS sensor harness connector from the assembly and move it away from the final drive/rear axle assembly area. Failure to do so may result in the sensor wires being damaged and the sensor becoming inoperative.



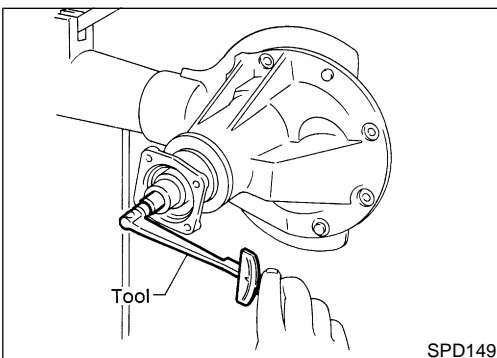
INSTALLATION

NEPD0032S02

- Fill final drive with recommended gear oil.



- Pay attention to the direction of gasket.



Disassembly

NEPD0033

PRE-INSPECTION

NEPD0033S01

Before disassembling final drive, perform the following inspection.

- Total preload
 - Turn drive pinion in both directions several times to seat bearing rollers correctly.
 - Check total preload with Tool.

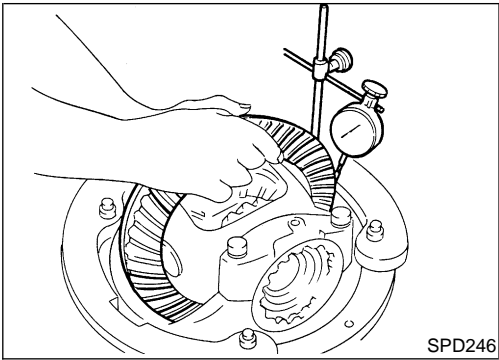
Tool number: ST3127S000 (J25765-A)

Total preload:

1.7 - 2.5 N·m (17 - 25 kg·cm, 15 - 22 in·lb)

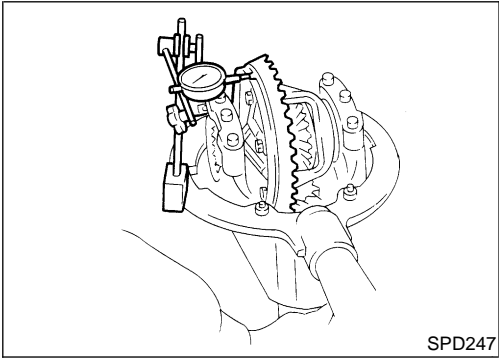
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Disassembly (Cont'd)



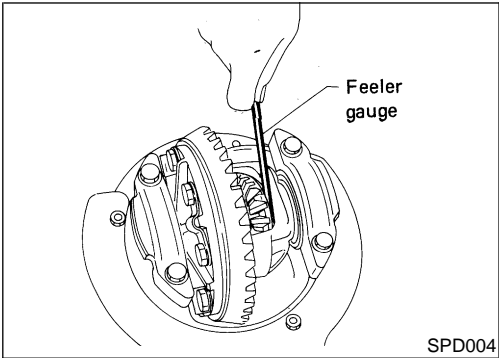
- Ring gear to drive pinion backlash
Check backlash of ring gear with a dial indicator at several points.

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



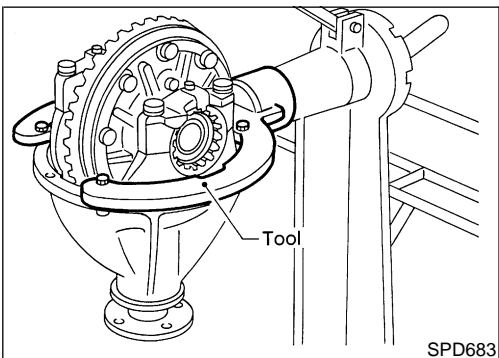
- Ring gear runout
Check runout of ring gear with a dial indicator.

Runout limit:
0.08 mm (0.0031 in)



- Tooth contact
Check tooth contact. Refer to "TOOTH CONTACT", PD-86.
- 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)

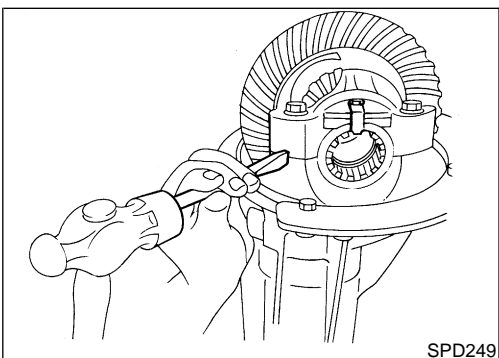


DIFFERENTIAL CARRIER

NEPD0033S02

1. Mount final drive assembly on Tool.

Tool number:
ST06340000 (J24310, J34310)



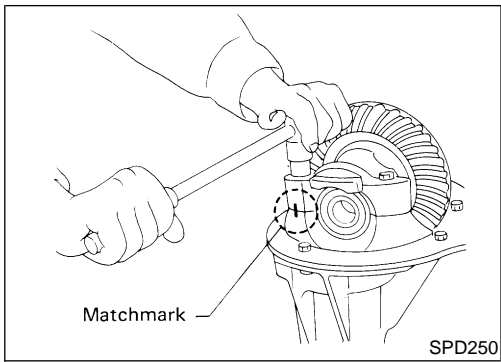
2. Put match marks on one side of side bearing cap with paint or punch to ensure that it is replaced in proper position during reassembly.

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

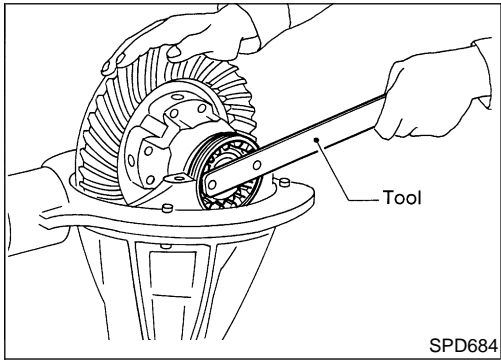
REAR FINAL DRIVE

H233B

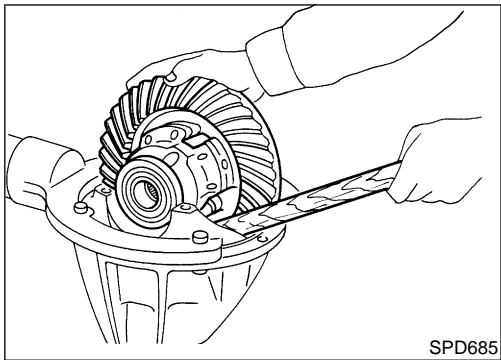
Disassembly (Cont'd)



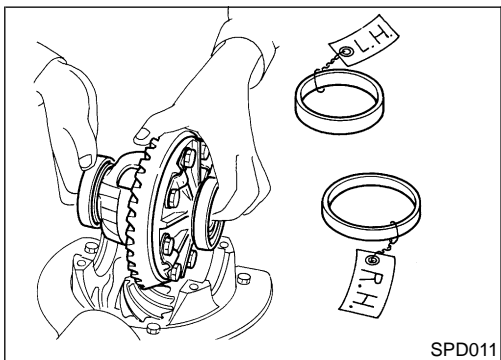
3. Remove side lock fingers and side bearing caps.



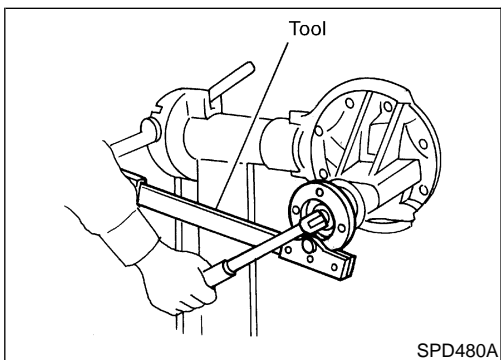
4. Remove side bearing adjuster with Tool.
Tool number: ST32580000 (J34312)



5. Remove differential case assembly with a pry bar.



Keep the side bearing outer races together with their respective inner cones — do not mix them up.



6. Remove drive pinion nut with Tool.
Tool number: KV38108300 (J-44195)
7. Remove companion flange with puller.
8. Remove ABS sensor and sensor rotor (2WD models).

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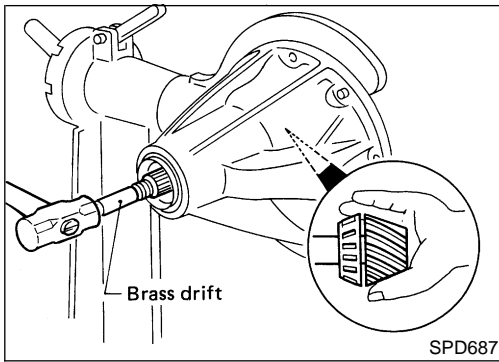
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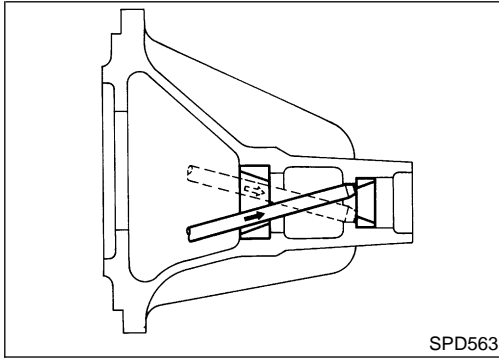
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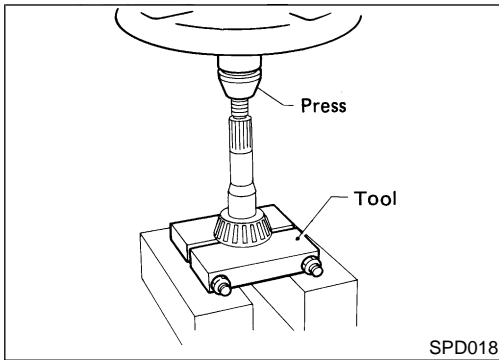
Disassembly (Cont'd)



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

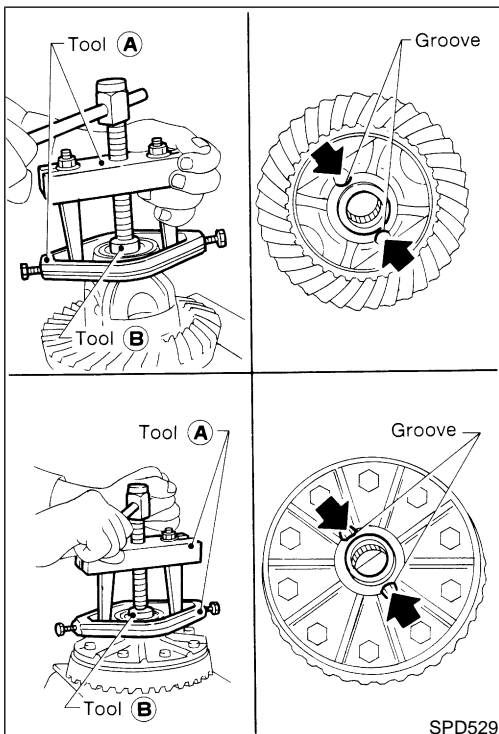


10. Remove front oil seal and pinion front bearing inner cone.
11. Remove pinion bearing outer races with a brass drift.



12. Remove pinion rear bearing inner cone and drive pinion adjusting washer.

Tool number: ST30031000 (J22912-01)



DIFFERENTIAL CASE

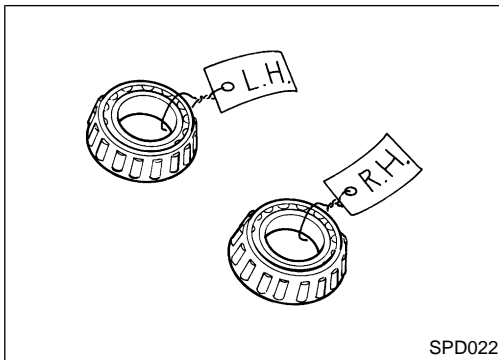
NEPD0033S03

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

Tool number:

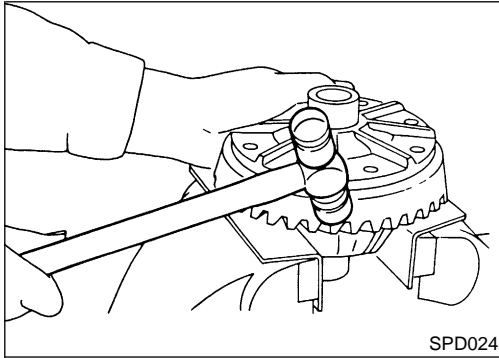
A ST33051001 (J22888-20)

B ST33061000 (J8107-2)

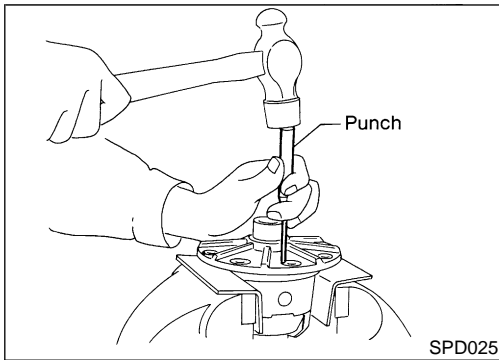


Be careful not to confuse the left-hand and right-hand parts. Keep bearing and bearing race for each side together.

2. Loosen ring gear bolts in a crisscross pattern.



3. Tap ring gear off differential case with a soft hammer. **Tap evenly all around to keep ring gear from binding.**



4. Drive out pinion mate shaft lock pin, with punch from ring gear side.

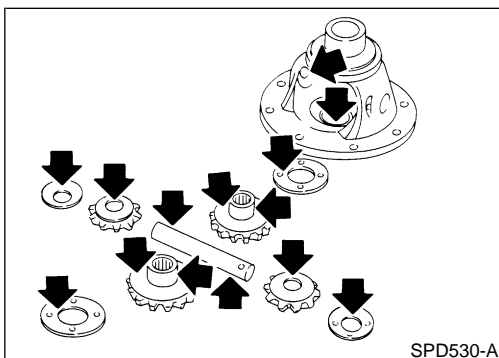
Lock pin is caulked at pinhole mouth on differential case.

Inspection

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).



DIFFERENTIAL CASE ASSEMBLY

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

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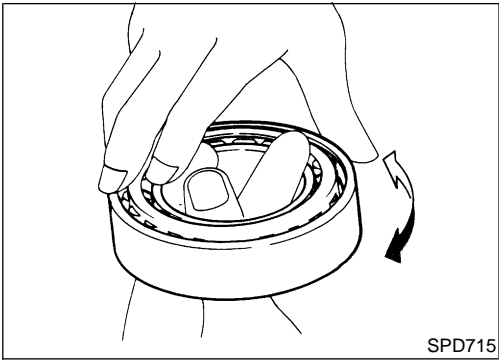
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Inspection (Cont'd)



SPD715

BEARING

NEPD0034S03

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.

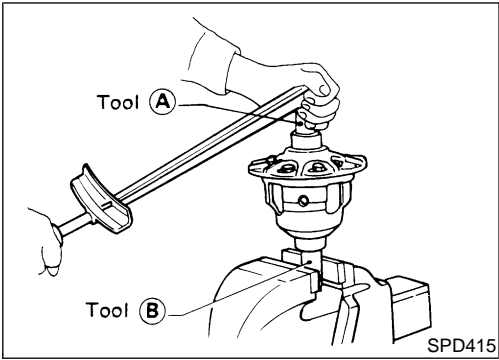
Limited Slip Differential

PREPARATION FOR DISASSEMBLY

NEPD0035

CAUTION:

Do not run engine when only one wheel (rear) is off the ground.



SPD415

Checking Differential Torque

NEPD0035S01

Measure differential torque with Tool.

If it is not within the specifications, inspect components of limited slip differential.

Differential torque:

187 - 245N·m (19 - 25 kg·m, 138 - 180 ft·lb)

Tool number: A KV38105210 (—)

Tool number: B KV38105220 (—)

DISASSEMBLY

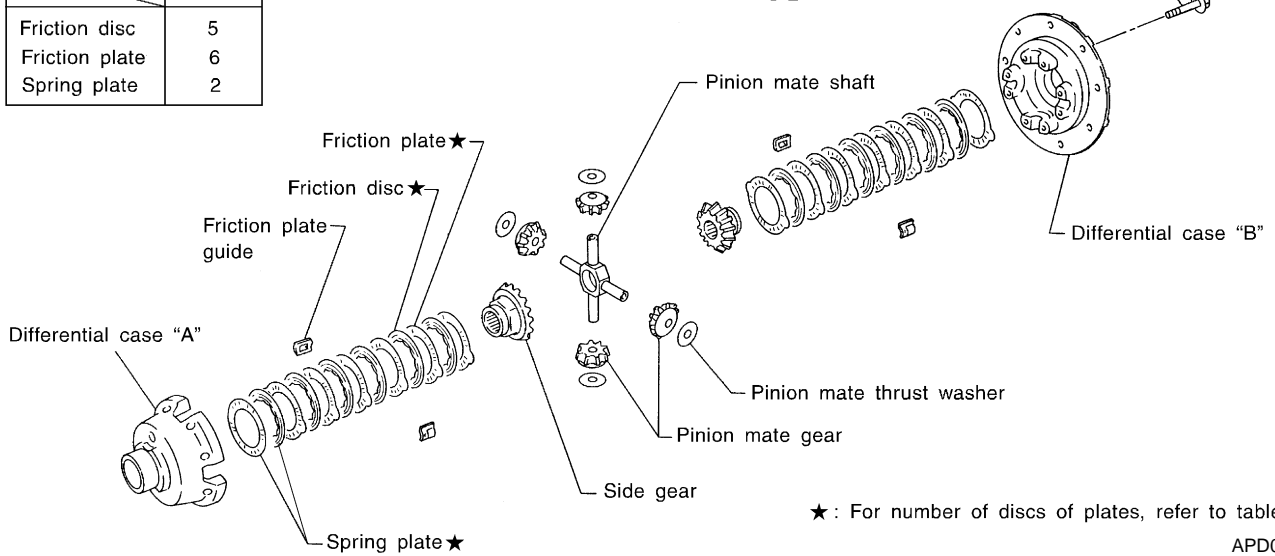
NEPD0036

No. of discs and plates (One side)

Model	H233B
Friction disc	5
Friction plate	6
Spring plate	2

Differential case couple bolt

64 - 74 N·m (6.5 - 7.5 kg·m, 47 - 54 ft·lb)

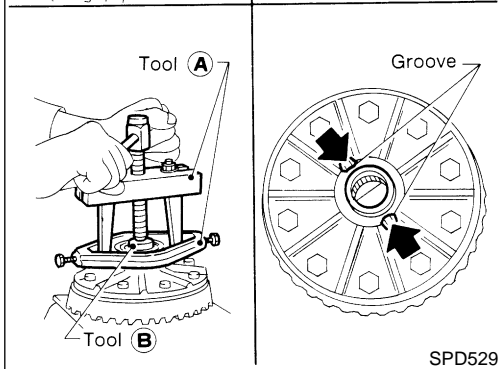
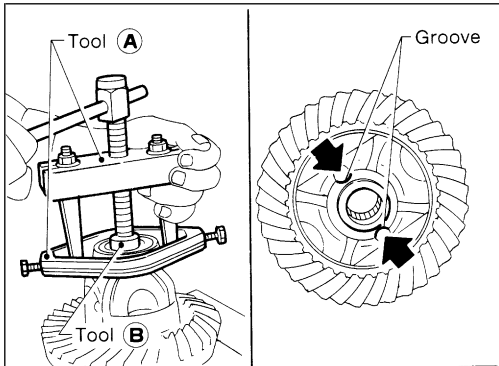


★ : For number of discs of plates, refer to table.

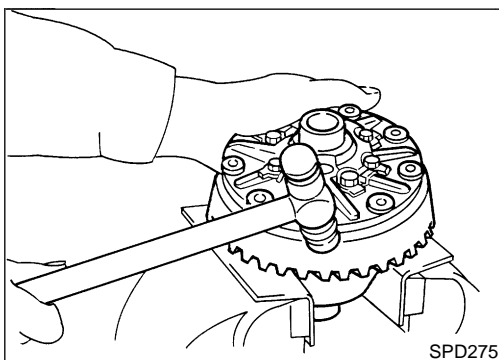
APD027

CAUTION:

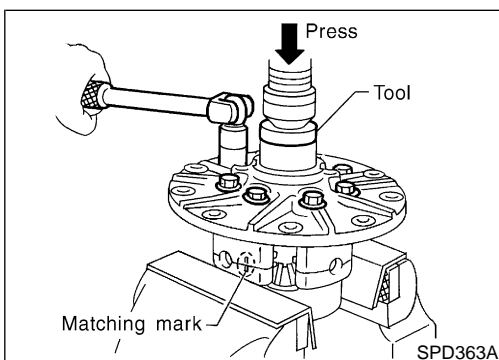
Do not run engine when one wheel (rear) is off the ground.



SPD529



SPD275



SPD363A

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

Tool number:

A ST33051001 (J22888-20)

B ST33061000 (J8107-2)

2. Loosen ring gear bolts in a crisscross pattern.

3. Tap ring gear off gear case with a soft hammer.
Tap evenly all around to keep ring gear from binding.

4. Remove couple bolts on differential cases A and B with a press.

Tool number: ST33081000 (—)

5. 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.

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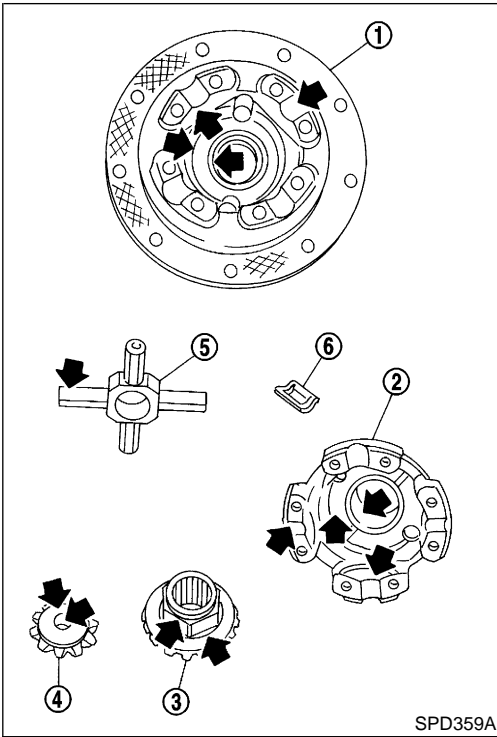
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INSPECTION

Contact Surfaces

NEPD0037

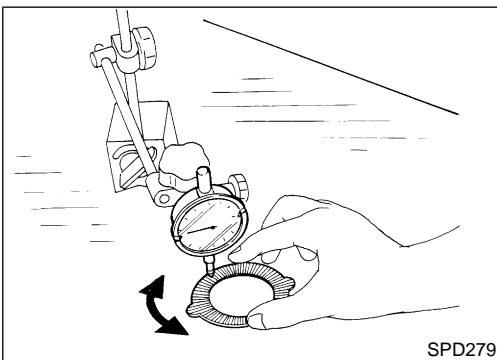
NEPD0037S01

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

NEPD0037S02

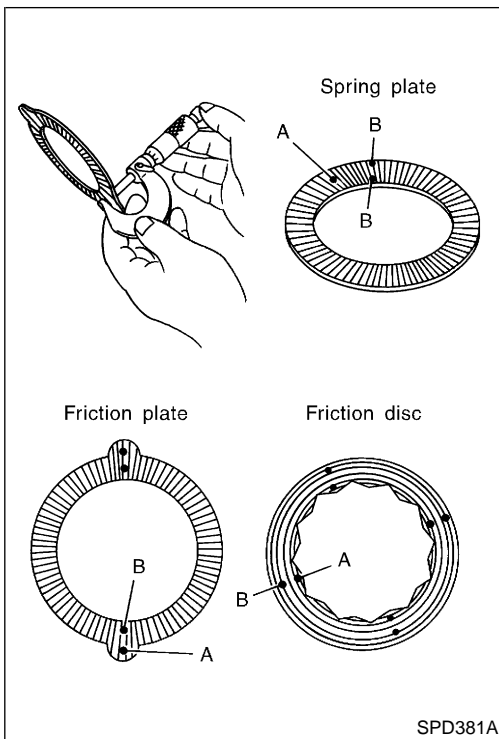
1. Clean the discs and plates in suitable solvent and blow dry with compressed air.
2. Inspect discs and plates for wear, nicks and burrs.



3. Check friction discs or plates for warpage.

Allowable warpage:
0.08 mm (0.0031 in)

If it exceeds limits, replace with a new plate to eliminate possibility of clutch slippage or sticking.



4. Measure frictional surfaces and projected portions of friction disc, friction plate, spring plate, and determine each part's differences to see if the specified wear limit has been exceeded. If any part has worn beyond the wear limit, and deformed or fatigued, replace it with a new one that is the same thickness as the projected portion.

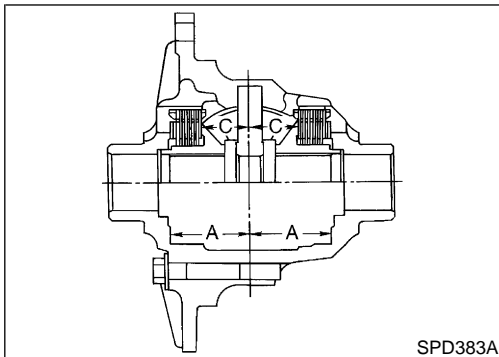
Wear limit:

0.1 mm (0.004 in) or less

$A - B = \text{Wear limit mm (in)}$

● Measuring points:

- A: Projected portion
- B: Frictional surface



ADJUSTMENT

Friction Disc and Friction Plate End Play

NEPD0038

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NEPD0038S01

TF

End play of friction disc and friction plate can be calculated by using following equation and should be adjusted within following range. Adjustment can be made by selecting friction disc having two different thicknesses.

End play E:

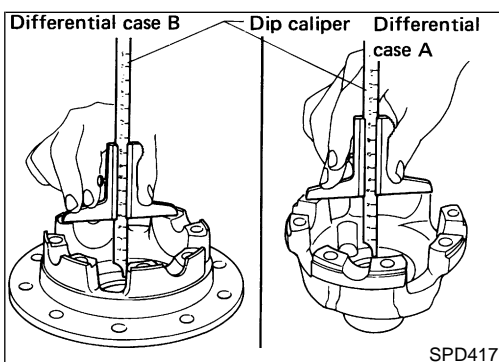
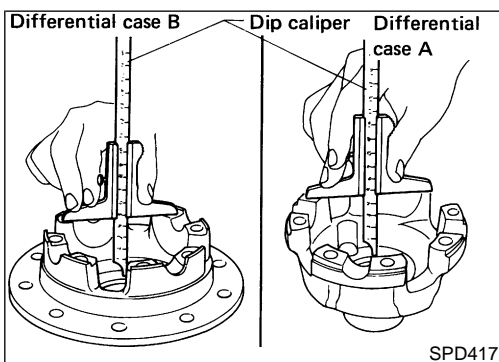
0.05 - 0.15 mm (0.0020 - 0.0059 in)

$E = A - (B + C)$

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)

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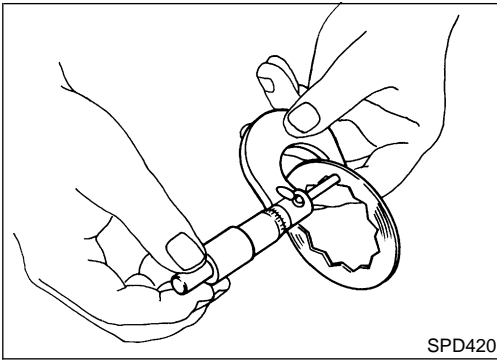
HA

SC

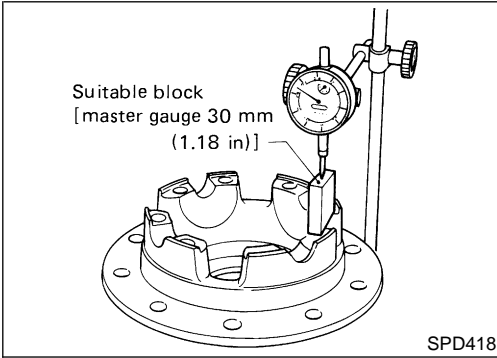
EL

IDX

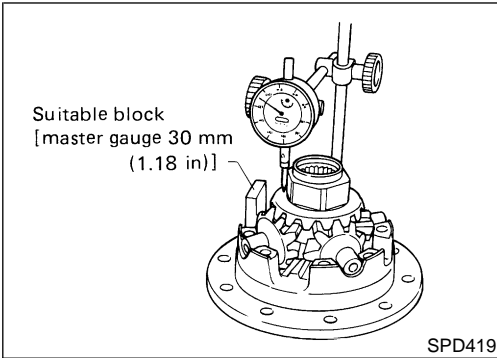
Limited Slip Differential (Cont'd)



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 plate 2



3. Measure values of "C".
 - a. Attach a dial indicator to the base plate.
 - b. 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.



- c. Install pinion mate gears, side gears and pinion mate shaft in differential case B.
- d. Set dial indicator tip on the side gear, and read the indication.

Example:

$$E = A - D = A - (B + C) = 0.05 \text{ to } 0.15 \text{ mm}$$

$$A = 49.52 \text{ mm}$$

$$B = 19.45 \text{ mm}$$

$$C = 29.7 \text{ mm}$$

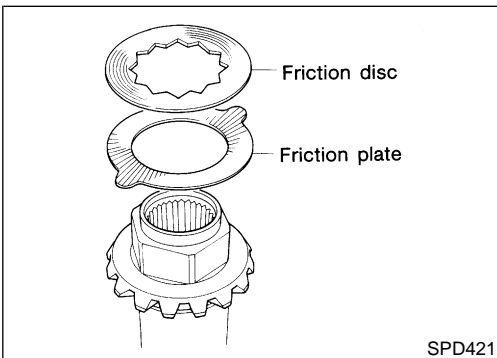
$$D = B + C$$

$$49.15 (D) = 19.45 (B) + 29.7 (C)$$

$$E = A - D$$

$$0.37 (E) = 49.52 (A) - 49.15 (D)$$

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.



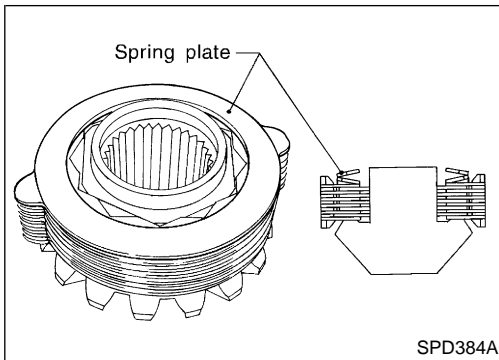
ASSEMBLY

NEPD0039

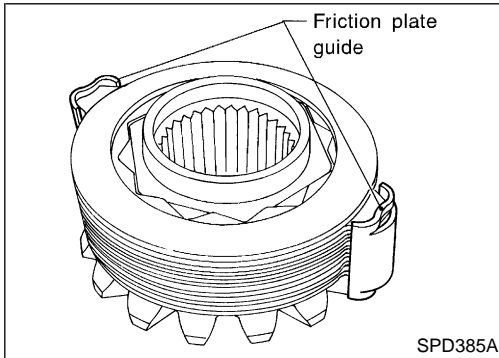
Prior to assembling discs and plates, properly lubricate them by dipping them in limited slip differential oil. Refer to **MA-13**, "RECOMMENDED FLUIDS AND LUBRICANTS".

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.

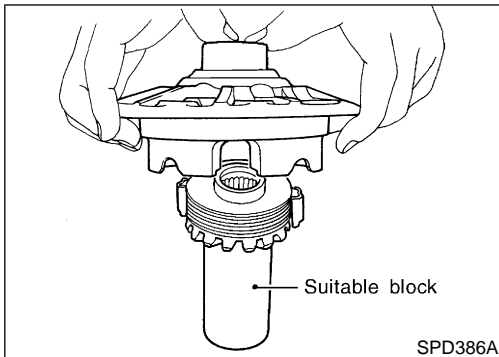


2. Install spring plate.



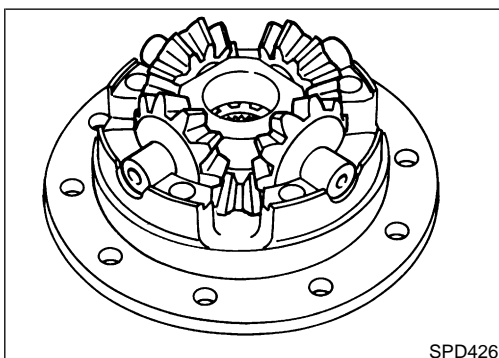
3. Install friction plate guides.

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

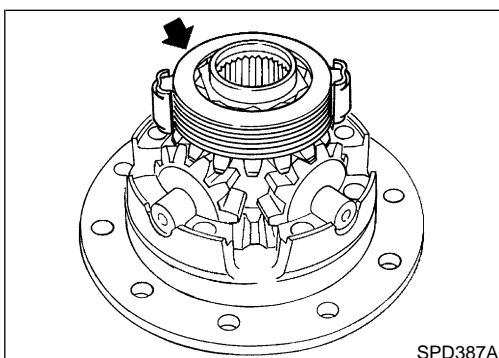


4. Install differential case B over side gear, discs, plates and friction plate guide assembly.

- **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.**



5. Install pinion mate gears and pinion mate thrust washers on pinion mate shaft, then install pinion mate shaft in differential case B.



6. Install side gear to pinion mate gears.

7. Install each disc and plate.

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

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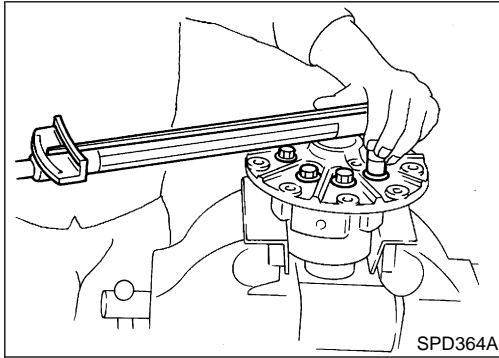
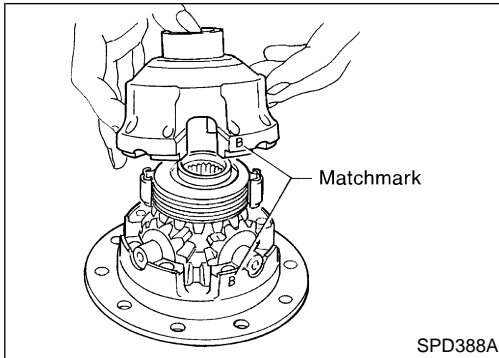
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8. Install differential case A.

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

9. Tighten differential case couple bolts.

10. Place ring gear on differential case and tighten ring gear bolts.

Tighten bolts in a crisscross pattern.

Then bend up lock straps to lock the bolts in place.

11. Install side bearing inner cone.

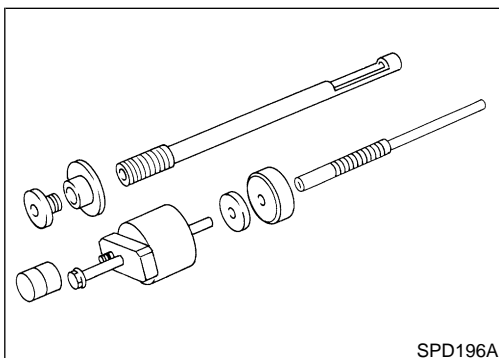
12. Check differential torque.

Adjustment

For quiet and reliable final drive operation, the following five adjustments must be made correctly:

1. Side bearing preload. Refer to "Total Preload Adjustment", PD-92.
2. Pinion gear height. Refer to "PINION GEAR HEIGHT", PD-82.
3. Pinion bearing preload. Refer to "Drive Pinion Preload Adjustment", PD-93.
4. Ring gear-to-pinion backlash. Refer to "Total Preload Adjustment", PD-92.
5. Ring and pinion gear tooth contact pattern. Refer to "TOOTH CONTACT", PD-86.

NEPD0040



PINION GEAR HEIGHT

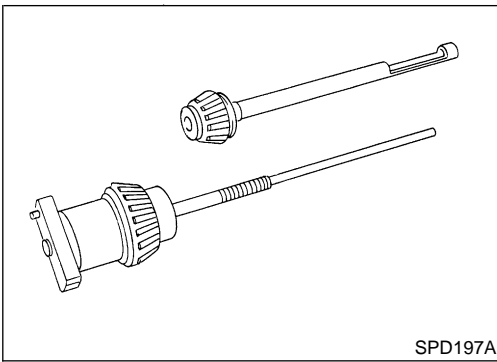
1. Make sure all parts are clean and that the bearings are well lubricated.
2. Assemble the pinion gear bearings into the pinion pre-load shim selector tool, J34309.

NEPD0040S01

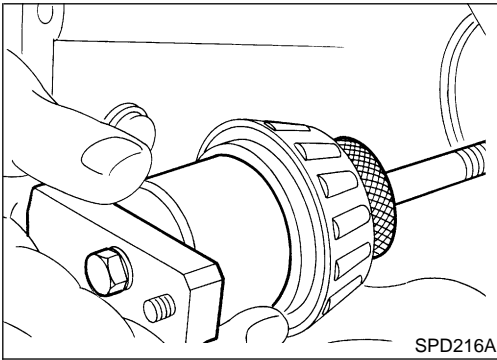
REAR FINAL DRIVE

H233B

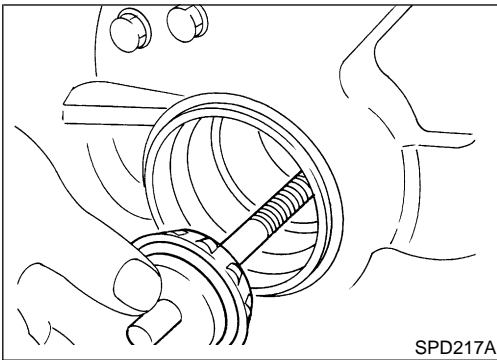
Adjustment (Cont'd)



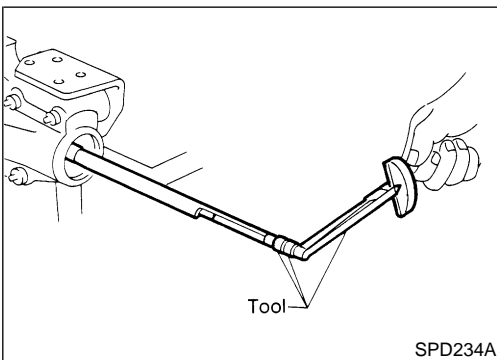
- **Rear Pinion Bearing** — the rear pinion bearing pilot, J34309-8, is used to center the rear pinion bearing only. The rear pinion bearing locking seat, J34309-4, is used to lock the bearing to the assembly.
- **Front Pinion Bearing** — make sure the J34309-3, front pinion bearing seat is secured tightly against the J34309-2 gauge anvil. Then turn the front pinion bearing pilot, J34309-5, to secure the bearing in its proper position.



3. Place the pinion preload shim selector tool gauge screw assembly, J34309-1, with the pinion rear bearing inner cone installed, into the final drive housing.



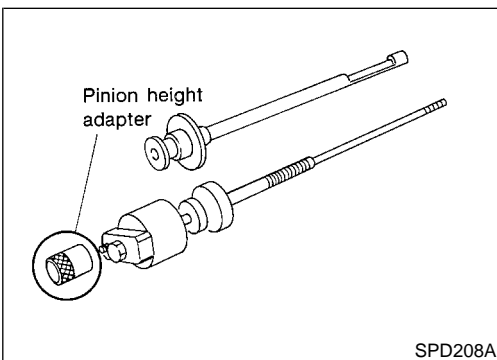
4. Install the J34309-2 gauge anvil with the front pinion bearing into the final drive housing and assemble it to the J34309-1 gauge screw. Make sure that the J34309-16 gauge plate will turn a full 360 degrees, and tighten the two sections by hand to set bearing preload.
5. Turn the assembly several times to seat the bearings.



6. Measure the turning torque at the end of the J34309-2 gauge anvil using torque wrench J25765.

Turning torque specification:

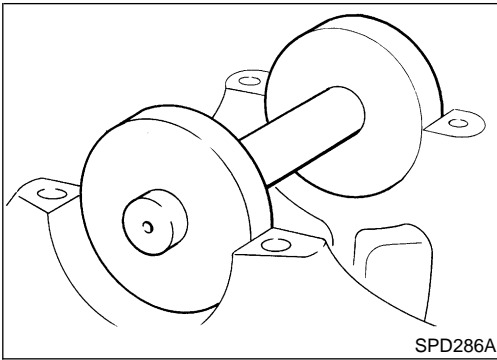
0.4 - 0.9 N·m (4 - 9 kg·cm, 3.5 - 7.8 in·lb)



7. Place the J34309-12 "H233B" pinion height adapter onto the gauge plate and tighten it by hand.

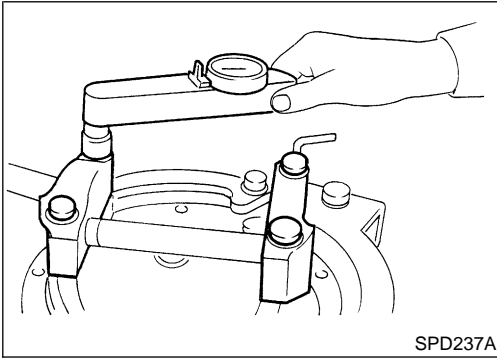
CAUTION:
Make sure all machined surfaces are clean.

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PINION HEIGHT ADJUSTING WASHER SELECTION

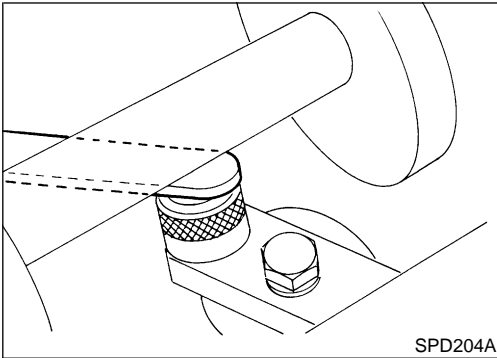
- Position the J25269-18 side bearing discs and the arbor into the side bearing bores.



- Install the bearing caps and torque the bolts.

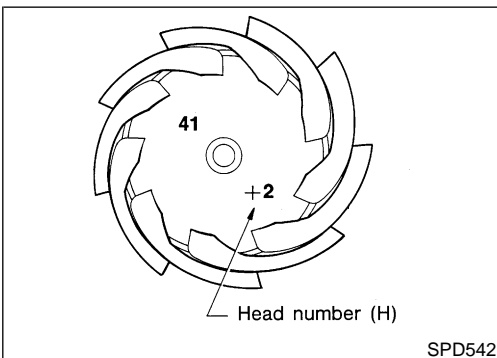
Specification:

93 - 103 N-m (9.5 - 10.5 kg-m, 69 - 76 ft-lb)



- Select the correct standard pinion height adjusting washer thickness using a standard gauge of 2.5, 3.0, or 3.5 mm (0.098, 0.118, or 0.138 in) and the J34309-101 feeler gauge. Measure the distance between the J34309-12 "H233B" pinion height adapter and the arbor.

- Write down the exact total measurement.



- Correct the pinion height washer size by referring to the "pinion head height number".

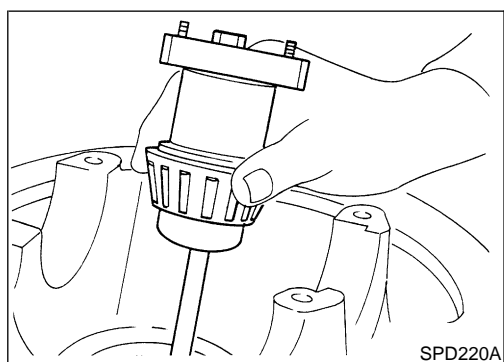
There are two numbers painted on the pinion gear. The first one refers to the pinion and ring gear as a matched set and should be the same as the number on the ring gear. The second number is the "pinion head height number", and it refers to the ideal pinion height from standard for the quietest operation. Use the following chart to determine the correct pinion height washer. Refer to "Drive Pinion Height Adjustment", PD-92.

Pinion Head Height Number	Add or Remove from the Selected Standard Pinion Height Washer Thickness Measurement	
-6	Add 0.06 mm (0.0024 in)	GI
-5	Add 0.05 mm (0.0020 in)	MA
-4	Add 0.04 mm (0.0016 in)	EM
-3	Add 0.03 mm (0.0012 in)	LC
-2	Add 0.02 mm (0.0008 in)	EC
-1	Add 0.01 mm (0.0004 in)	FE
0	Use the selected washer thickness	CL
+1	Subtract 0.01 mm (0.0004 in)	MT
+2	Subtract 0.02 mm (0.0008 in)	
+3	Subtract 0.03 mm (0.0012 in)	
+4	Subtract 0.04 mm (0.0016 in)	
+5	Subtract 0.05 mm (0.0020 in)	
+6	Subtract 0.06 mm (0.0024 in)	

13. Select the correct pinion height washer.

Drive pinion height adjustment:

Refer to “Drive Pinion Height Adjustment”, PD-92.



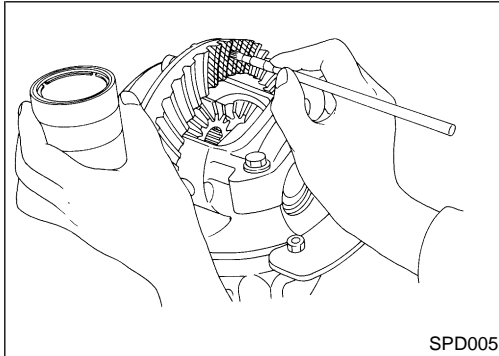
14. Remove the J34309 pinion preload shim selector tool from the final drive housing and disassemble to retrieve the pinion bearings.

TOOTH CONTACT

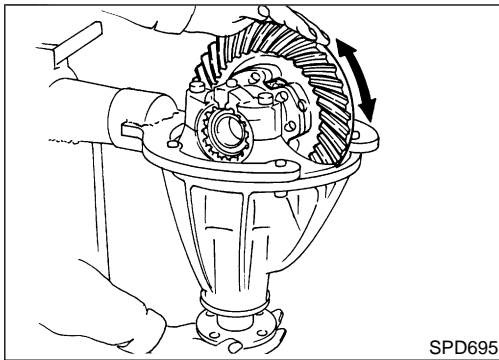
=NEPD0040S02

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, or both. With a pattern check, the most desirable contact for low noise level and long life can be assured.

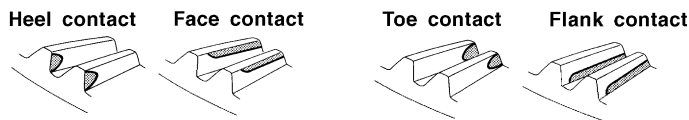


1. Thoroughly clean ring gear and drive pinion teeth.
2. Sparingly apply a mixture of powdered ferric oxide and oil or equivalent to 3 or 4 teeth of ring gear drive side.



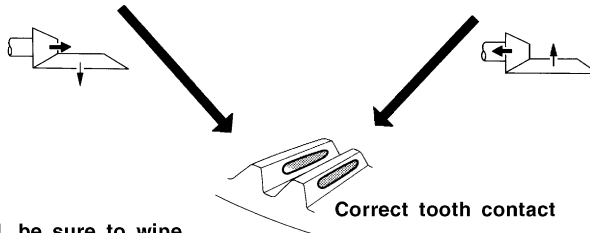
3. Hold companion flange steady by hand and rotate the ring gear in both directions.

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



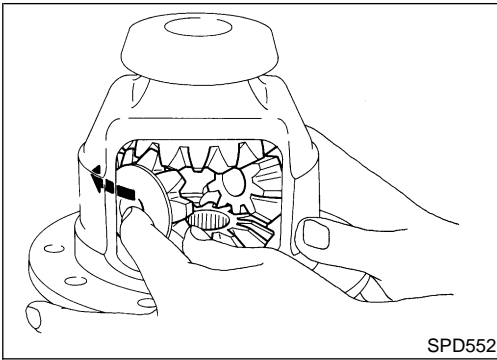
To correct, increase thickness of pinion height adjusting washer in order to bring drive pinion close to ring gear.

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



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

SPD007-B

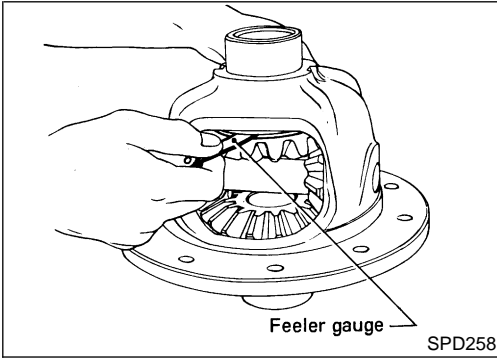


Assembly DIFFERENTIAL CASE

NEPD0041

NEPD0041S01

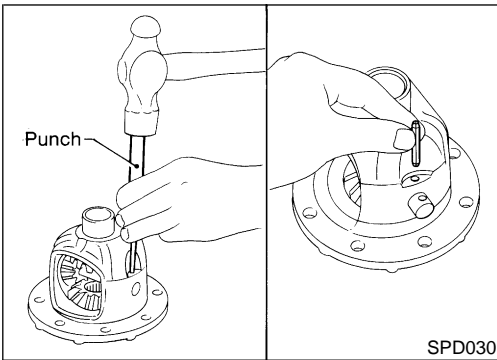
1. Install side gears, pinion mate gears and thrust washers into differential case.
The clearance can be adjusted with side gear thrust washer. Refer to "Side Gear Adjustment", PD-91.



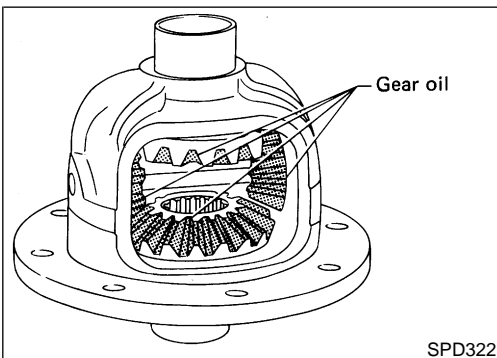
2. Fit pinion mate shaft to differential case so that it meets lock pinholes.
3. Adjust backlash between side gear and pinion mate gear by selecting side gear thrust washer.

**Backlash between side gear and pinion mate gear
(Clearance between side gear thrust washer and differential case:**

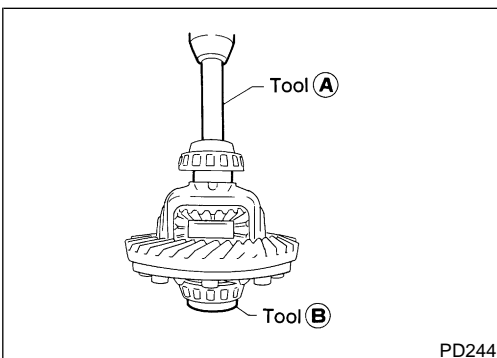
0.10 – 0.20 mm (0.0039 – 0.0079 in)



4. Install pinion mate shaft lock pin with a punch.
Make sure lock pin is flush with case.

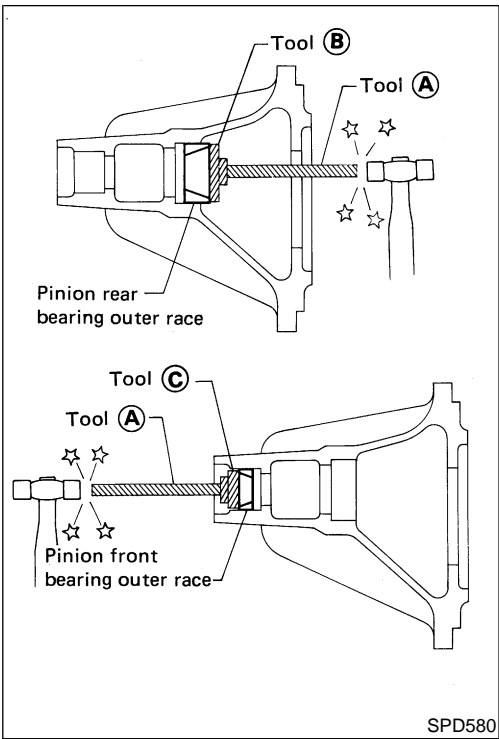


5. Apply gear oil to gear tooth surfaces and thrust surfaces and check to see that they turn properly.
6. Install differential case assembly on ring gear.
Tighten bolts in a crisscross pattern.



7. Press-fit side bearing inner cones on differential case with Tool.
Tool number:
A ST33190000 (J25523)
B ST33081000 (—)

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DIFFERENTIAL CARRIER

NEPD0041S02

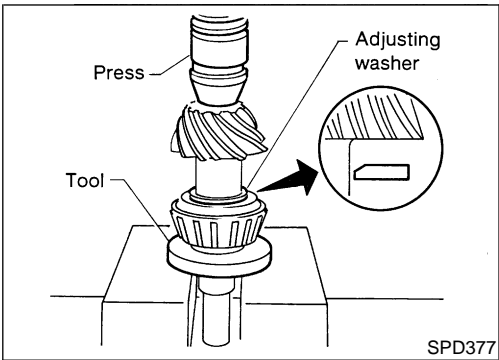
1. Press-fit front and rear bearing outer races with Tools.

Tool number:

A ST30611000 (J25742-1)

B ST30621000 (J25742-5)

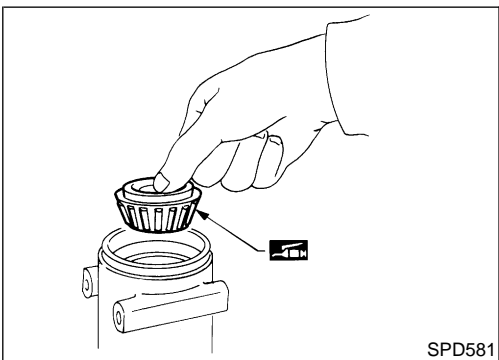
C ST30613000 (J25742-3)



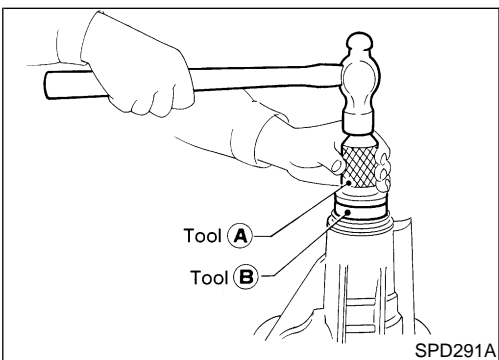
2. Select drive pinion height adjusting washer. Refer to "Drive Pinion Height Adjustment", PD-92.
3. Install drive pinion adjusting washer in drive pinion, and press-fit pinion rear bearing inner cone in it, with press and Tool.

Tool number:

ST30901000 (J26010-01)



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:

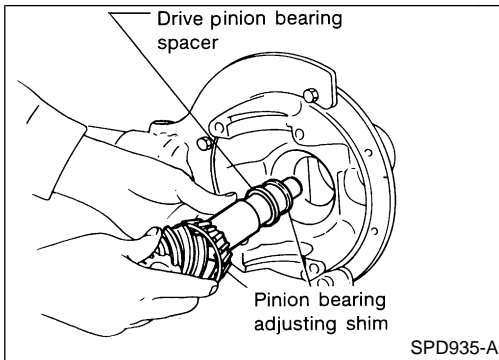
A ST30720000 (J25405)

B KV38102510 (—)

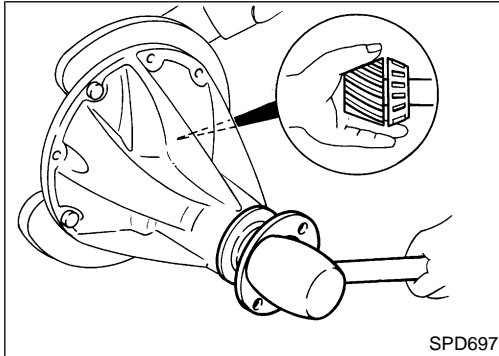
REAR FINAL DRIVE

H233B

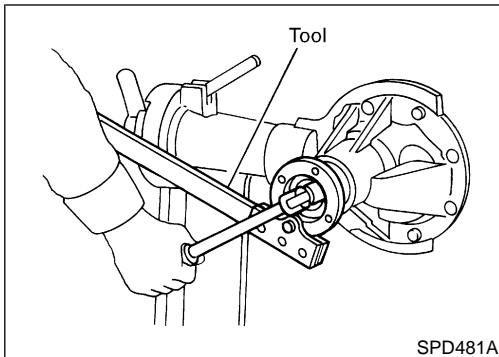
Assembly (Cont'd)



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



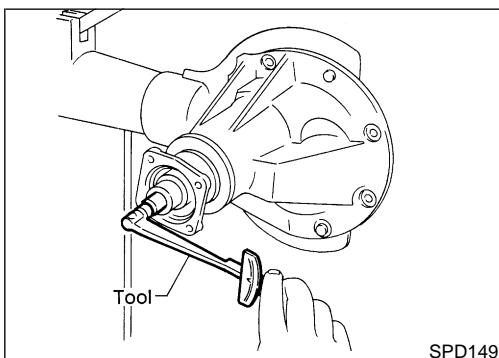
7. Install ABS sensor and sensor rotor (2WD models).
8. Insert companion flange onto drive pinion. Tap the companion flange with a soft hammer until fully seated



9. Tighten pinion nut 127 – 294 N·m (13.0 – 30.0 kg·m, 94 – 217 ft·lb) until total preload of 1.2–2.2 N·m (12 – 22 kg·m, 10 – 19 in·lb) is obtained.

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

Tool number: KV38108300 (J-44195)



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

Tool number: ST3127S000 (J25765-A)

Pinion bearing preload (With front oil seal):

1.4 - 1.7 N·m (14 - 17 kg·cm, 12 - 15 in·lb)

Pinion bearing preload (Without front oil seal):

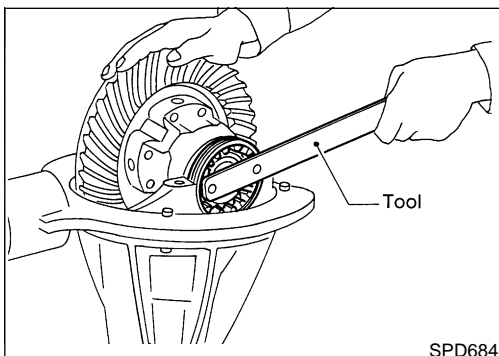
1.2 - 1.5 N·m (12 - 15 kg·cm, 10 - 13 in·lb)

If preload is out of specification, adjust the thickness of spacer and shim combination by replacing shim and spacer with thinner one.

- Start from the combination of thickest spacer and shim.
- Combine each spacer and shim thickness one by one until the correct specification are achieved.

Drive pinion bearing preload adjusting spacer and shim:

Refer to “Drive Pinion Preload Adjustment”, PD-93.

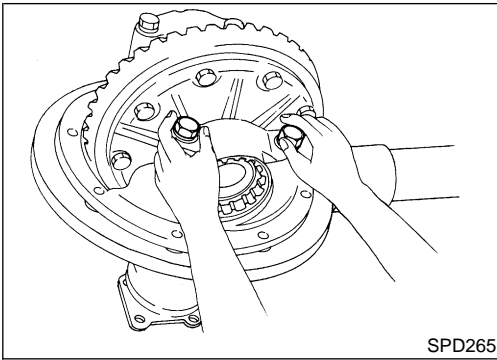


11. Install differential case assembly with side bearing outer races into gear carrier.
12. Position side bearing adjusters on gear carrier with threads properly engaged; screw in adjusters lightly at this stage of assembly.

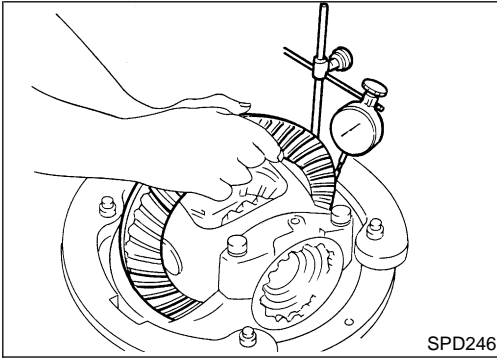
Tool number: ST32580000 (J34312)

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Assembly (Cont'd)

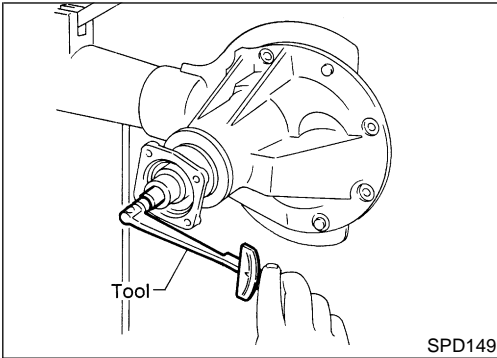


13. Align mark on bearing cap with that on gear carrier and install bearing cap on gear carrier.
 - Do not tighten at this point. This allows further tightening of side bearing adjusters.



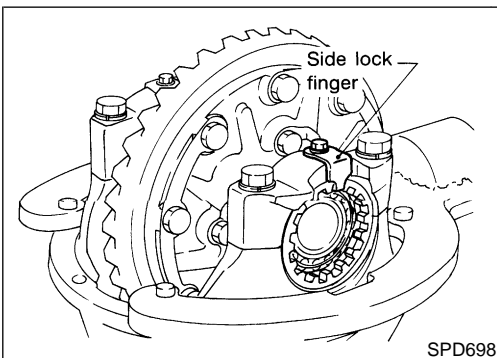
14. Tighten both right and left side bearing adjusters alternately and measure ring gear backlash and total preload at the same time. Adjust right and left side bearing adjusters by tightening them alternately so that proper ring gear backlash and total preload can be obtained.

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

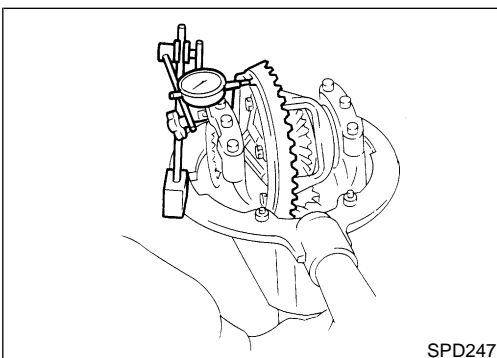


- When checking preload, turn drive pinion in both directions several times to set bearing rollers.

Tool number: ST3127S000 (J25765-A)
Total preload:
1.7 - 2.5 N·m (17 - 25 kg·cm, 15 - 22 in·lb)



15. Tighten side bearing cap bolts.
16. Install side lock finger in place to prevent rotation during operation.



17. 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.
18. Check tooth contact. Refer to "TOOTH CONTACT", PD-86.

REAR FINAL DRIVE

H233B

Service Data and Specifications (SDS)

Service Data and Specifications (SDS)

H233B General Specifications 2WD Model

=NEPD0042

NEPD0042S02

Engine	VG33E				VG33ER	
Vehicle grade	XE		SE		SC	
Rear final drive	Standard	Optional*	Standard	Optional	Standard	Optional
	H233B					
	2-pinion	LSD	2-pinion	LSD	2-pinion	LSD
Gear ratio	4.636		4.636		4.363	
Number of teeth (Ring gear/drive pinion)	51/11		51/11		48/11	
Oil capacity (Approx.) ℓ (US pt, Imp pt)	2.8 (5-7/8, 4-7/8)					

*: Standard on Canada models.

4WD Model

NEPD0042S03

Engine	VG33E				VG33ER	
Vehicle grade	XE		SE		SC	
Rear final drive	Standard	Optional	Standard	Optional	Standard	Optional
	H233B					
	2-pinion	LSD	2-pinion	LSD	2-pinion	LSD
Gear ratio	4.636		4.900		4.636	
Number of teeth (Ring gear/drive pinion)	51/11		49/10		51/11	
Oil capacity (Approx.) ℓ (US pt, Imp pt)	2.8 (5-7/8, 4-7/8)					

*: Standard on Canada models.

Ring Gear Runout

NEPD0043

Ring gear runout limit mm (in)	0.08 (0.0031)
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Side Gear Adjustment

NEPD0044

Side gear backlash (Clearance between side gear and differential case) mm (in)	0.10 - 0.20 (0.0039 - 0.0079)	
Available side gear thrust washers	Thickness mm (in)	Part number*
	1.75 (0.0689)	38424-T5000
	1.80 (0.0709)	38424-T5001
	1.85 (0.0728)	38424-T5002

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

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REAR FINAL DRIVE

H233B

Service Data and Specifications (SDS) (Cont'd)

Differential Torque Adjustment (LSD Models)

NEPD0045

Differential torque N-m (kg-m, ft-lb)		187 - 245 (19 - 25, 138 - 180)	
Number of discs and plates (One side)	Friction disc	5	
	Friction plate	6	
	Spring plate	2	
Wear limit of plate and disc mm (in)		0.1 (0.004)	
Allowable warpage of friction disc and plate mm (in)		0.08 (0.0031)	
Available discs and plates	Plate name	Thickness mm (in)	Part number*
	Friction disc	1.48 - 1.52 (0.0583 - 0.0598)	38433-C6002 (Standard type)
		1.38 - 1.42 (0.0543 - 0.0559)	38433-C6004 (Adjusting type)
		1.58 - 1.62 (0.0622 - 0.0638)	38433-C6003 (Adjusting type)
Friction plate	1.48 - 1.52 (0.0583 - 0.0598)	38432-C6001	
Spring plate	1.48 - 1.52 (0.0583 - 0.0598)	38435-S9200	

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

Total Preload Adjustment

NEPD0046

Total preload N-m (kg-cm, in-lb)	1.7 - 2.5 (17 - 25, 15 - 22)
Ring gear to pinion backlash mm (in)	0.13 - 0.18 (0.0051 - 0.0071)
Side bearing adjusting method	Side adjuster

Drive Pinion Height Adjustment

NEPD0047

	Thickness mm (in)	Part number*
Available pinion height adjust washers	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	

REAR FINAL DRIVE

H233B

Service Data and Specifications (SDS) (Cont'd)

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

Drive Pinion Preload Adjustment

NEPD0048

Drive pinion bearing preload adjusting method		Adjusting shim and spacer
Drive pinion preload without front oil seal N-m (kg-cm, in-lb)		1.4 - 1.7 (14 - 17, 12 - 15)
Available front drive pinion bearing 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 bearing adjusting spacers	Thickness 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

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