

SECTION **DLN**
DRIVELINE

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PRECAUTIONS

< PRECAUTION >

[REAR PROPELLER SHAFT: 3S80A-R]

PRECAUTION

PRECAUTIONS

Precautions Concerning On-board Servicing of Hybrid Systems

INFOID:000000008143326

CAUTION:

Be sure to turn the ignition switch OFF before performing inspection and servicing inside the engine compartment or underneath the vehicle. If the ignition switch is ON (vehicle READY state), even if the engine is stopped, the conditions of the vehicle may cause the engine to start automatically. If it is necessary to continually operate the engine during inspection or servicing, use the designated inspection mode. [HBC-89, "Description"](#).

Service Notice or Precautions for Rear Propeller Shaft

INFOID:000000008143327

- Replace the propeller shaft assembly if there is a breakage or deflection on tube.
- Never hit the tube or apply an impact on it during repair service. Never damage the tube as well.
- The joint cannot be disassembled. Never disassemble it.
- If constant velocity joint was bent during propeller shaft assembly removal, installation, or transportation, its boot may be damaged. Wrap boot interference area to metal part with shop cloth or rubber to protect boot from breakage.
- When removing and installing the propeller shaft assembly, the angle, which the third axis rubber coupling forms with the final drive companion flange, must be 4° or less.

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PREPARATION

< PREPARATION >

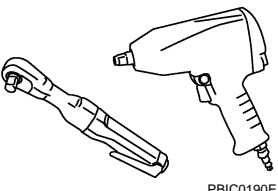
[REAR PROPELLER SHAFT: 3S80A-R]

PREPARATION

PREPARATION

Commercial Service Tools

INFOID:000000008143328

Tool name	Description
Power tool  PBIC0190E	Loosening bolts and nuts

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

< SYMPTOM DIAGNOSIS >

[REAR PROPELLER SHAFT: 3S80A-R]

SYMPTOM DIAGNOSIS

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:000000008143329

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

Symptom		Possible cause and SUSPECTED PARTS													
		DLN-6, "Inspection"	DLN-9, "Inspection"	—	DLN-9, "Inspection"	—	DLN-9, "Inspection"	DLN-9, "Inspection"	NVH of REAR FINAL DRIVE in this section.	NVH in FAX, RAX, FSU and RSU section.	NVH in WT section.	NVH in WT section.	NVH in RAX section.	NVH in BR section.	NVH in ST section.
Reference	Noise	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Shake		x			x				x	x	x	x	x	x
	Vibration	x	x	x	x	x	x	x		x	x	x		x	x
Possible cause and SUSPECTED PARTS		Uneven rotating torque													
		Center bearing improper installation													
		Excessive center bearing axial end play													
		Center bearing mounting (insulator) cracks, damage or deterioration													
		Excessive joint angle													
		Rotation imbalance													
		Excessive runout													
		DIFFERENTIAL													
		AXLE AND SUSPENSION													
		TIRE													
		ROAD WHEEL													
		DRIVE SHAFT													
		BRAKE													
		STEERING													

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REAR PROPELLER SHAFT

< PERIODIC MAINTENANCE >

[REAR PROPELLER SHAFT: 3S80A-R]

PERIODIC MAINTENANCE

REAR PROPELLER SHAFT

Inspection

INFOID:000000008143330

APPEARANCE AND NOISE

- Check the propeller shaft tube surface for dents or cracks. If malfunction is detected, replace propeller shaft assembly.
- If center bearing is noisy or damaged, replace propeller shaft assembly.

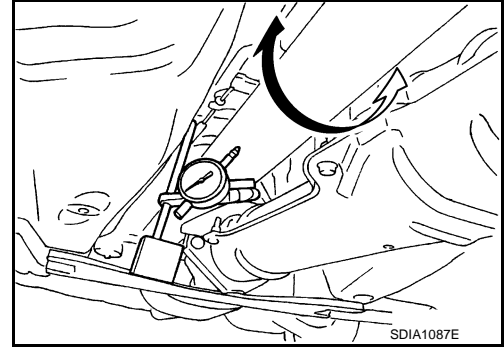
VIBRATION

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

1. With a dial indicator, measure propeller shaft runout at runout measuring points by rotating final drive companion flange with hands.

Propeller shaft runout

: Refer to [DLN-11, "Propeller Shaft Runout"](#).



- Propeller shaft runout measuring point (Point "△").

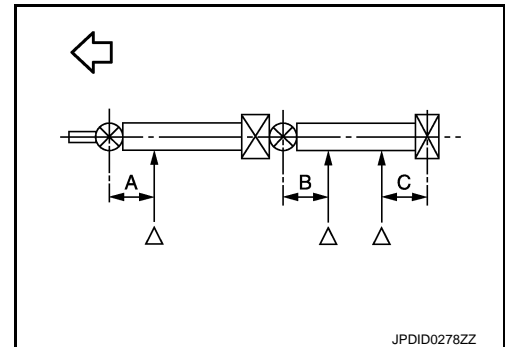
⇐: Vehicle front

Dimension

A : 172 mm (6.77 in)

B : 172 mm (6.77 in)

C : 172 mm (6.77 in)



2. If runout still exceeds specifications, separate propeller shaft at final drive companion flange; then change the phase between companion flange and propeller shaft by the one bolt hole at a time and install propeller shaft.
3. If runout is more than the limit value, remove and check propeller shaft.
4. Check the vibration by driving vehicle.

REAR PROPELLER SHAFT

< REMOVAL AND INSTALLATION >

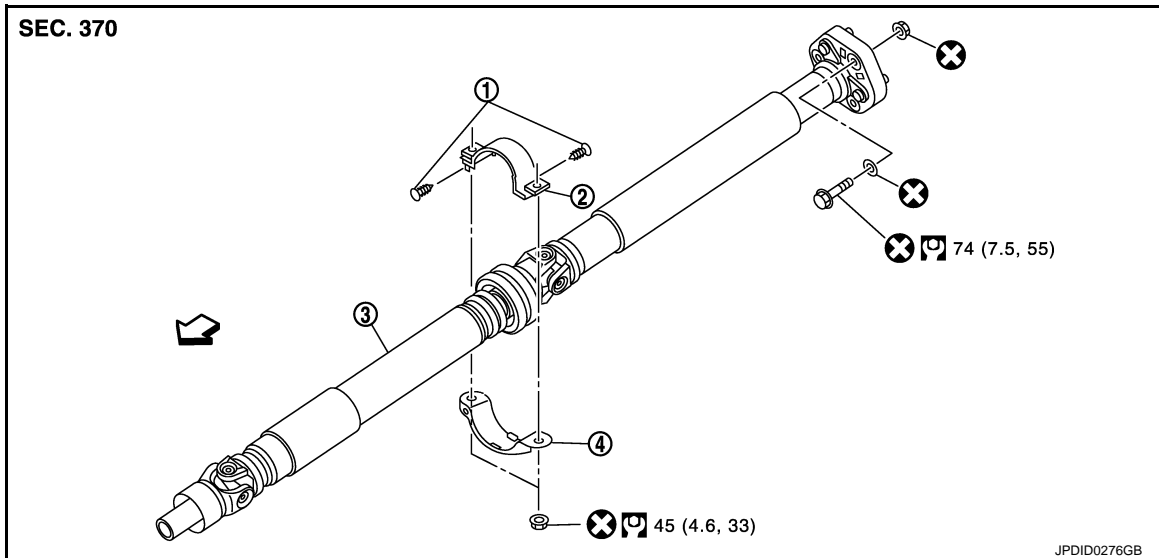
[REAR PROPELLER SHAFT: 3S80A-R]

REMOVAL AND INSTALLATION

REAR PROPELLER SHAFT

Exploded View

INFOID:000000008143331



1. Clip
2. Center bearing mounting bracket (upper)
3. Propeller shaft assembly
4. Center bearing mounting bracket (lower)

←: Vehicle front

: N·m (kg·m, ft·lb)

: Always replace after every disassembly.

Removal and Installation

INFOID:000000008143332

REMOVAL

1. Shift the transmission to the neutral position, and then release the parking brake.
2. Remove the center muffler with power tool. Refer to [EX-6. "Removal and Installation"](#).
3. Remove the heat insulator.
4. Put matching marks (A) on propeller shaft rubber coupling and final drive companion flange.

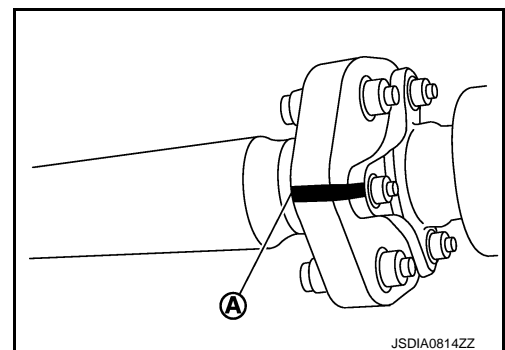
CAUTION:

For matching marks, use paint. Never damage propeller shaft rubber coupling and final drive companion flange.

5. Loosen mounting nuts of center bearing mounting bracket.

NOTE:

Tighten mounting nuts temporarily.



REAR PROPELLER SHAFT

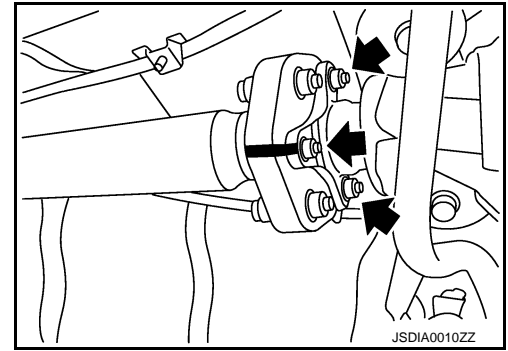
< REMOVAL AND INSTALLATION >

[REAR PROPELLER SHAFT: 3S80A-R]

6. Remove propeller shaft assembly fixing bolts and nuts (←).

CAUTION:

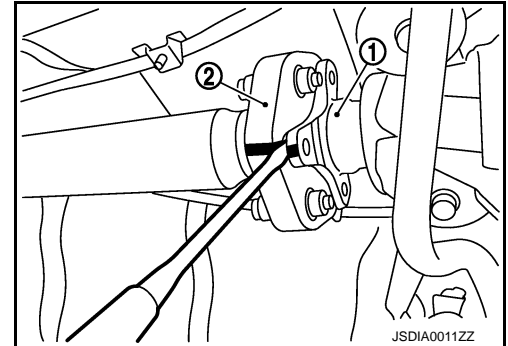
Never remove the rubber coupling from the propeller shaft assembly.



7. Slightly separate the rubber coupling (1) from the final drive companion flange (2).

CAUTION:

Never damage the final drive companion flange and rubber coupling.



8. Remove center bearing mounting bracket fixing nuts.

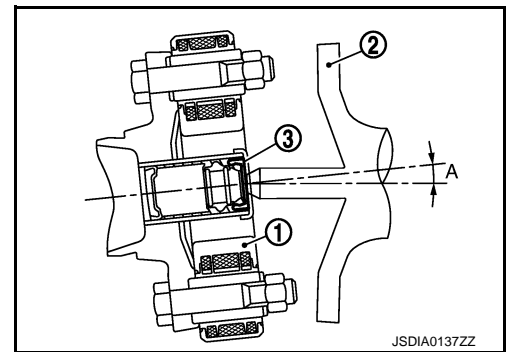
CAUTION:

- The angle (A), which the third axis rubber coupling (1) forms with the final drive companion flange (2), must be 4° or less.
- Never damage the grease seal (3).
- Never damage the rubber coupling.

9. Slide the propeller shaft in the vehicle forward direction slightly. Separate the propeller shaft from the final drive companion flange.

CAUTION:

- The angle, which the third axis rubber coupling forms with the final drive companion flange, must be 4° or less.
- Never damage the grease seal.
- Never damage the rubber coupling.



10. Remove the propeller shaft assembly from the vehicle.

CAUTION:

Never damage the rear oil seal of transmission.

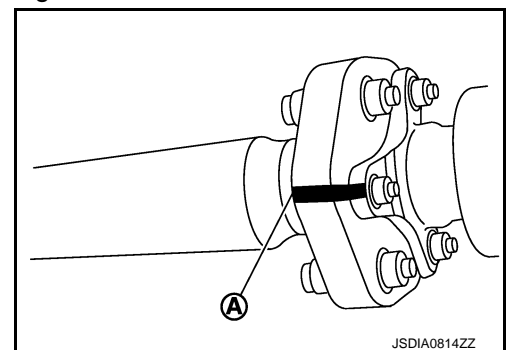
11. Remove clip and center bearing mounting bracket (upper/lower).

12. Perform inspection after removal. Refer to [DLN-9. "Inspection"](#).

INSTALLATION

Note the following, and install in the reverse order of removal.

- When installing propeller shaft assembly to transmission, never damage the rear oil seal of transmission.
- Align matching marks (A) to install propeller shaft rubber coupling to final drive companion flange.



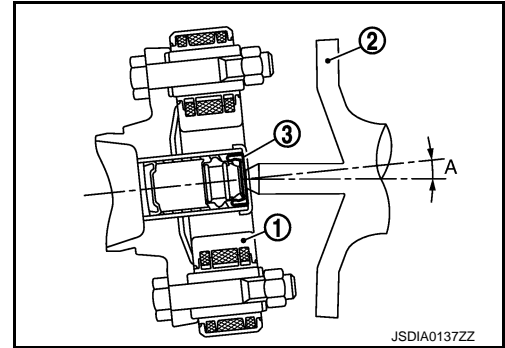
REAR PROPELLER SHAFT

< REMOVAL AND INSTALLATION >

[REAR PROPELLER SHAFT: 3S80A-R]

CAUTION:

- The angle (A), which the third axis rubber coupling (1) forms with the final drive companion flange (2), must be 4° or less.
- Never damage the grease seal (3).
- Never damage the rubber coupling.



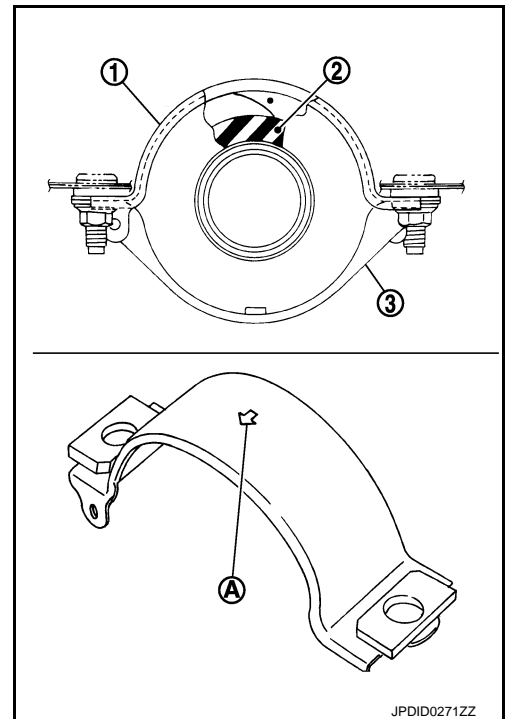
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- Install center bearing mounting bracket (upper) (1) with its arrow mark (A) facing forward.
- Adjust position of center bearing mounting bracket (upper), center bearing mounting bracket (lower) (2) sliding back and forth to prevent play in thrust direction of center bearing insulator (3). Install center bearing mounting bracket (upper/lower) to vehicle.



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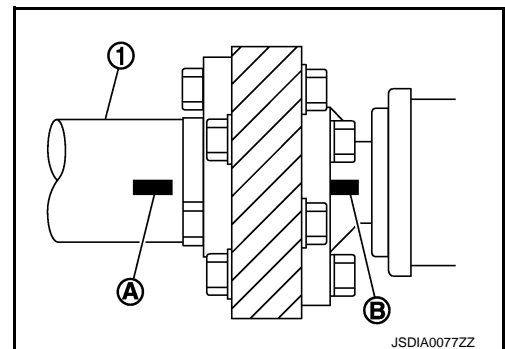
- If propeller shaft or final drive has been replaced, connect them as follows:

- Install the propeller shaft (1) while aligning its matching mark (A) with the matching mark (B) on the joint as close as possible.

CAUTION:

Never damage rubber coupling.

- Perform inspection after installation. Refer to [DLN-9, "Inspection"](#).



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Inspection

INFOID:000000008143333

INSPECTION AFTER REMOVAL

Appearance

- Check propeller shaft for bend and damage. If malfunction is detected, replace propeller shaft assembly.
- Check rubber coupling for wear, cracks and damage. If malfunction is detected, replace propeller shaft assembly.

Propeller Shaft Runout

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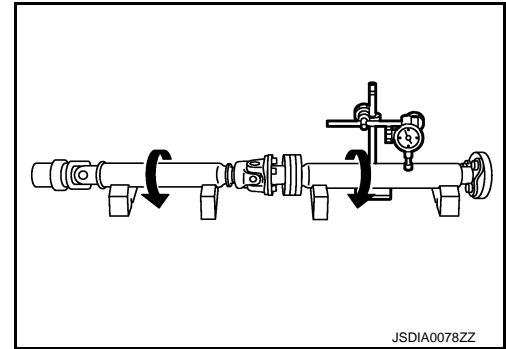
REAR PROPELLER SHAFT

< REMOVAL AND INSTALLATION >

[REAR PROPELLER SHAFT: 3S80A-R]

Check propeller shaft runout at measuring points with a dial indicator. If runout exceeds specifications, replace propeller shaft assembly.

Propeller shaft runout : Refer to [DLN-11, "Propeller Shaft Runout"](#).



- Propeller shaft runout measuring point (Point "△").

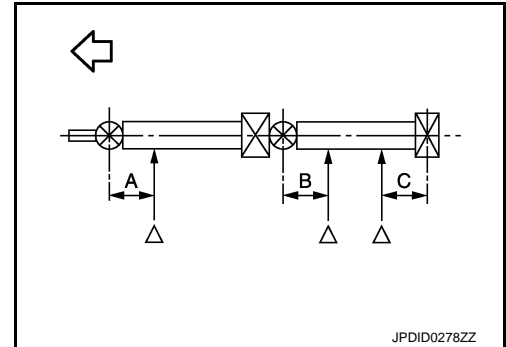
←: Vehicle front

Dimension

A : 172 mm (6.77 in)

B : 172 mm (6.77 in)

C : 172 mm (6.77 in)

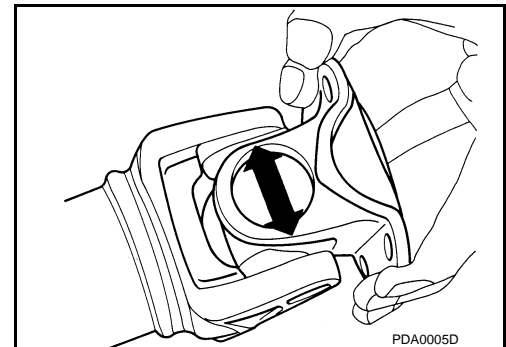


Journal Axial Play

As shown in the figure, while fixing yoke on one side, check axial play of joint. If it is outside the standard, replace propeller shaft assembly.

Journal axial play : Refer to [DLN-11, "Journal Axial Play"](#).

CAUTION:
Never disassemble joints.



Center Bearing

Check center bearing for noise and damage. If malfunction is detected, replace propeller shaft assembly.

CAUTION:
Never disassemble center bearing.

INSPECTION AFTER INSTALLATION

After assembly, perform a driving test to check propeller shaft vibration. If vibration occurred, separate propeller shaft from final drive. Reinstall companion flange by changing the phase between companion flange and propeller shaft by the one bolt hole at a time. Then perform driving test and check propeller shaft vibration again at each point.

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[REAR PROPELLER SHAFT: 3S80A-R]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specifications

INFOID:0000000008143334

Applied model	Engine type	VQ35HR
	Motor type	HM34
	Transmission type	A/T
Propeller shaft model		3S80A-R
Number of joints		3
Type of journal bearings (Non-disassembly type)	1st joint	Shell type
	2nd joint	Shell type
	3rd joint	Rubber coupling type
Coupling method with transmission		Sleeve type
Coupling method with rear final drive		Rubber coupling type
Shaft length	1st (Spider to spider)	720 mm (28.35 in)
	2nd (Spider to rubber coupling center)	745 mm (29.33 in)
Shaft outer diameter	1st	75.0 mm (2.953 in)
	2nd	65.0 mm (2.559 in)

Propeller Shaft Runout

INFOID:0000000008143335

Unit: mm (in)

Item	Limit
Propeller shaft runout	0.8 (0.031)

Journal Axial Play

INFOID:0000000008143336

Unit: mm (in)

Item	Standard
Journal axial play	0 (0)

PRECAUTION

PRECAUTIONS

Precautions Concerning On-board Servicing of Hybrid Systems

INFOID:000000008143337

CAUTION:

Be sure to turn the ignition switch OFF before performing inspection and servicing inside the engine compartment or underneath the vehicle. If the ignition switch is ON (vehicle READY state), even if the engine is stopped, the conditions of the vehicle may cause the engine to start automatically.

If it is necessary to continually operate the engine during inspection or servicing, use the designated inspection mode. [HBC-89, "Description"](#).

Service Notice or Precautions for Rear Final Drive

INFOID:000000008143338

- Check for the correct installation status prior to removal or disassembly. If matching marks are required, be certain they never interfere with the function of the parts when applied.
- Overhaul should be done in a clean work area, it is preferable to work in dustproof area.
- Before disassembly, using steam or white gasoline, completely remove sand and mud from the exterior of the unit, preventing them from entering into the unit during disassembly or assembly.
- Check appearance of the disassembled parts for damage, deformation, and unusual wear. Replace them with a new ones if necessary.
- Gaskets, seals and O-rings should be replaced any time when the unit is disassembled.
- When replacing the parts, use the genuine parts.
- In principle, tighten bolts or nuts gradually in several steps working diagonally from inside to outside. If tightening sequence is specified, observe it.
- Clean and flush the parts sufficiently and blow-dry them.
- Be careful not to damage sliding surfaces and mating surfaces.
- When applying sealant, remove the old sealant from the mounting surface; then remove any moisture, oil, and foreign materials from the application and mounting surfaces.
- Always use shop paper for cleaning the inside of components.
- Never use cotton gloves or shop rags to prevent entering of lint.
- During assembly, observe the specified tightening torque, and apply new gear oil, petroleum jelly, or multi-purpose grease as specified for each vehicle, if necessary.
- Dispose of the waste oil using the methods prescribed law, ordinance, etc., after replacing gear oil.

PREPARATION

< PREPARATION >

[REAR FINAL DRIVE: R208]

PREPARATION

PREPARATION

Special Service Tools

INFOID:000000008143339

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

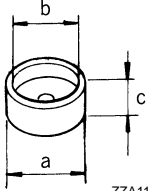
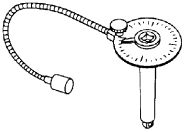
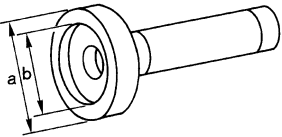
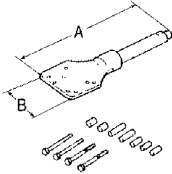
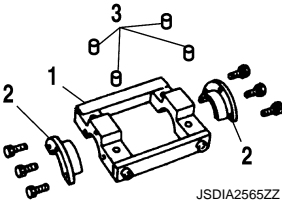
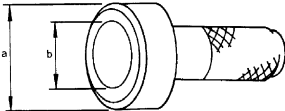
Tool number (Kent-Moore No.) Tool name	Description
ST3127S000 (J-25765-A) Preload gauge	Measuring pinion bearing preload and total preload
KV381054S0 (J-34286) Puller	Removing front oil seal
KV40104710 (—) Drift a: 57 mm (2.24 in) dia. b: 47 mm (1.85 in) dia.	<ul style="list-style-type: none"> • Installing front oil seal • Installing side oil seal
KV38109220 (—) Drift a: 77.9 mm (3.067 in) dia.	<ul style="list-style-type: none"> • Removing and Installing rear cover • Removing and Installing differential case
KV38109210 (—) Base tube a: 77.9 mm (3.067 in) dia. b: 58 mm (2.28 in) dia.	<ul style="list-style-type: none"> • Removing and Installing rear cover • Removing and Installing differential case
ST33051001 (J-22888-20) Puller	Removing side bearing inner race

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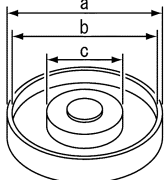
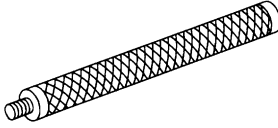
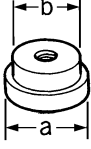
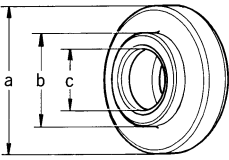
[REAR FINAL DRIVE: R208]

Tool number (Kent-Moore No.) Tool name	Description
KV40104840 (—) Adaptor A: 49 mm (1.93 in) dia. B: 42 mm (1.65 in) dia. C: 25 mm (0.98 in)	Removing and installing side bearing inner race  <p style="text-align: center; font-size: small;">ZZA1133D</p>
KV10112100 (BT-8653-A) Angle wrench	Tightening the drive gear mounting bolt  <p style="text-align: center; font-size: small;">ZZA0120D</p>
KV38100200 (J-26233) Drift a: 65 mm (2.56 in) dia. b: 49 mm (1.93 in) dia.	Installing side bearing inner race  <p style="text-align: center; font-size: small;">ZZA1143D</p>
KV38100800 (J-25604-01) Attachment A: 541 mm (21.30 in) B: 200 mm (7.87 in)	Fixing unit assembly  <p style="text-align: center; font-size: small;">SDIA0267E</p>
KV381091S0 (—) Dummy cover set 1. KV38109110 (—) Dummy cover 2. KV38109120 (—) Dummy cover spacer 3. KV38109140 (—) Color	<ul style="list-style-type: none"> Checking backlash Checking drive gear runout Checking tooth contact  <p style="text-align: center; font-size: small;">JSDIA2565ZZ</p>
ST30720000 (J-25405) Drift a: 77 mm (3.03 in) dia. b: 55.5 mm (2.185 in) dia.	Installing pinion rear bearing outer race  <p style="text-align: center; font-size: small;">ZZA0811D</p>

PREPARATION

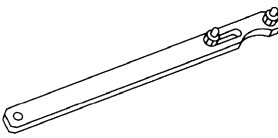
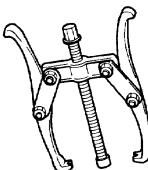
< PREPARATION >

[REAR FINAL DRIVE: R208]

Tool number (Kent-Moore No.) Tool name	Description	
KV40105230 (—) Drift a: 92 mm (3.62 in) dia. b: 86 mm (3.39 in) dia. c: 45 mm (1.77 in) dia.	 <p style="text-align: center; font-size: small;">PDIA0591E</p>	A B C
ST30611000 (J-25742-1) Drift bar	 <p style="text-align: center; font-size: small;">S-NT090</p>	DLN E F
ST30621000 (J-25742-5) Drift a: 79 mm (3.11 in) dia. b: 59 mm (2.32 in) dia.	 <p style="text-align: center; font-size: small;">ZZA1000D</p>	G H
ST30901000 (J-26010-01) Drift a: 79 mm (3.11 in) dia. b: 45 mm (1.77 in) dia. c: 35.2 mm (1.386 in) dia.	 <p style="text-align: center; font-size: small;">ZZA0978D</p>	I J K

Commercial Service Tools

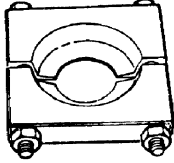
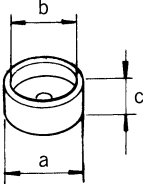
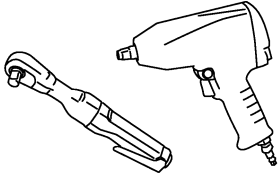
INFOID:000000008143340

Tool name	Description	
Flange wrench	 <p style="text-align: center; font-size: small;">NT035</p>	L M N
Puller	 <p style="text-align: center; font-size: small;">ZZA0119D</p>	O P

PREPARATION

< PREPARATION >

[REAR FINAL DRIVE: R208]

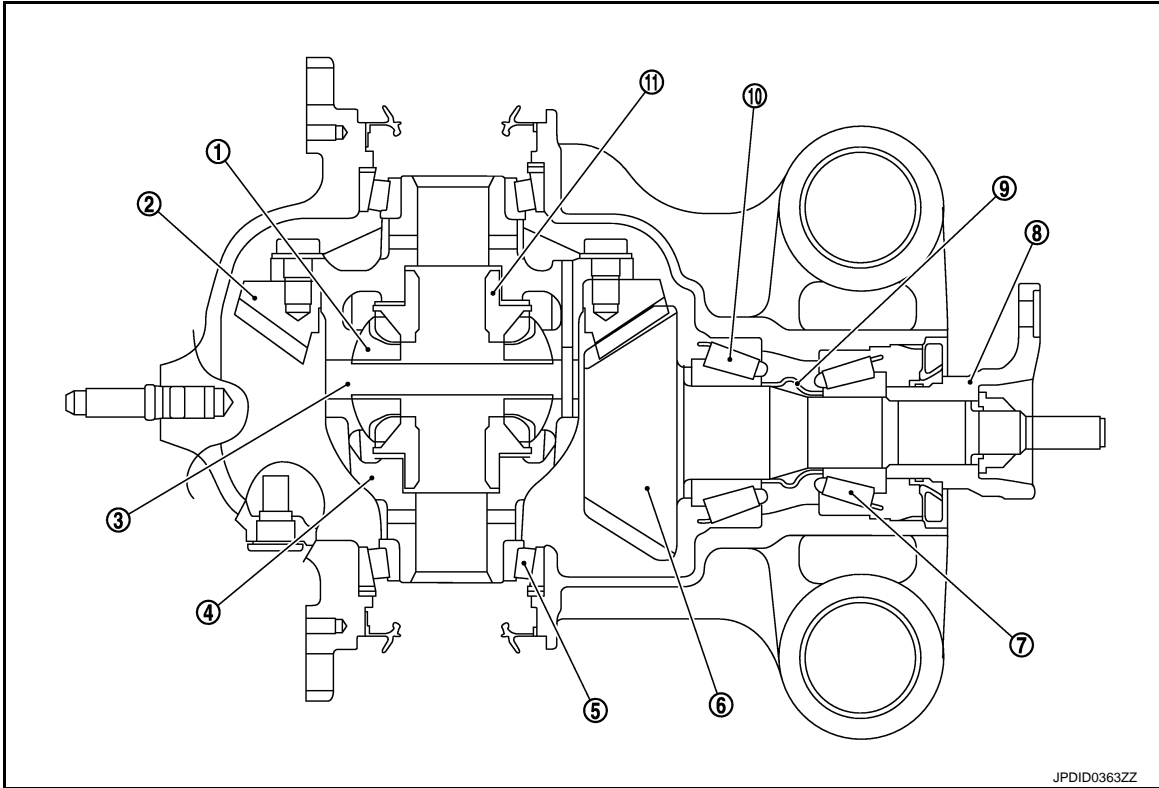
Tool name	Description
<p>Replacer</p>  <p style="text-align: right; margin-right: 50px;">ZZA0700D</p>	<p>Removing pinion rear bearing inner race</p>
<p>Spacer</p> <p>a: 60 mm (2.36 in) dia. b: 36 mm (1.42 in) dia. c: 30 mm (1.18 in)</p>  <p style="text-align: right; margin-right: 50px;">ZZA1133D</p>	<p>Installing pinion front bearing inner race</p>
<p>Power tool</p>  <p style="text-align: right; margin-right: 50px;">PBIC0190E</p>	<p>Loosening bolts and nuts</p>

SYSTEM DESCRIPTION

STRUCTURE AND OPERATION

Sectional View

INFOID:000000008143341



- | | | |
|-------------------------|---------------------|-----------------------|
| 1. Pinion mate gear | 2. Drive gear | 3. Pinion mate shaft |
| 4. Differential case | 5. Side bearing | 6. Drive pinion |
| 7. Pinion front bearing | 8. Companion flange | 9. Collapsible spacer |
| 10. Pinion rear bearing | 11. Side gear | |

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NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

< SYMPTOM DIAGNOSIS >

[REAR FINAL DRIVE: R208]

SYMPTOM DIAGNOSIS

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:000000008143342

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

Reference		DLN-37, "Inspection"	DLN-33, "Adjustment"	DLN-37, "Inspection"	DLN-33, "Adjustment"	DLN-33, "Adjustment"	DLN-19, "Inspection"	NVH of REAR PROPELLER SHAFT in this section.	NVH in FAX, RAX, FSU and RSU sections.	NVH in WT section.	NVH in WT section.	NVH in RAX section.	NVH in BR section.	NVH in ST section.	
Possible cause and SUSPECTED PARTS		Gear tooth rough	Gear contact improper	Tooth surfaces worn	Backlash incorrect	Companion flange excessive runout	Gear oil improper	PROPELLER SHAFT	AXLE AND SUSPENSION	TIRE	ROAD WHEEL	DRIVE SHAFT	BRAKE	STEERING	
Symptom	Noise	×	×	×	×	×	×	×	×	×	×	×	×	×	

×: Applicable

PERIODIC MAINTENANCE

REAR DIFFERENTIAL GEAR OIL

Inspection

INFOID:000000008143343

OIL LEAKAGE

- Make sure that oil is not leaking from final drive assembly or around it.

OIL LEVEL

- Remove filler plug (1) and check oil level from filler plug mounting hole as shown in the figure.

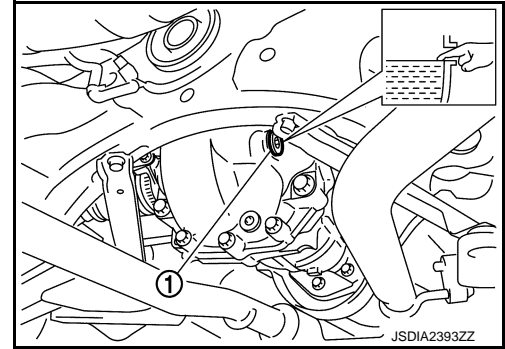
CAUTION:

Turn the ignition switch OFF while checking oil level.

- Set a gasket on filler plug and install it on final drive assembly. Refer to [DLN-27, "Exploded View"](#).

CAUTION:

Never reuse gasket.



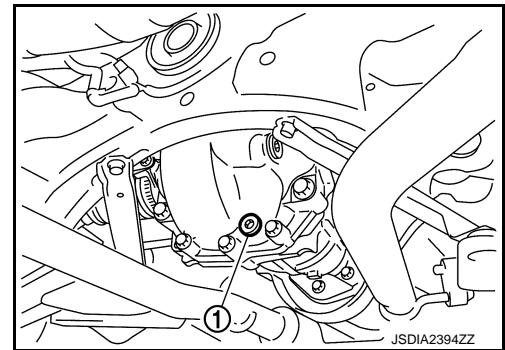
Draining

INFOID:000000008143344

1. Turn the ignition switch OFF.
2. Remove drain plug (1) and drain gear oil.
3. Set a gasket on drain plug and install it to final drive assembly and tighten to the specified torque. Refer to [DLN-27, "Exploded View"](#).

CAUTION:

Never reuse gasket.



Refilling

INFOID:000000008143345

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

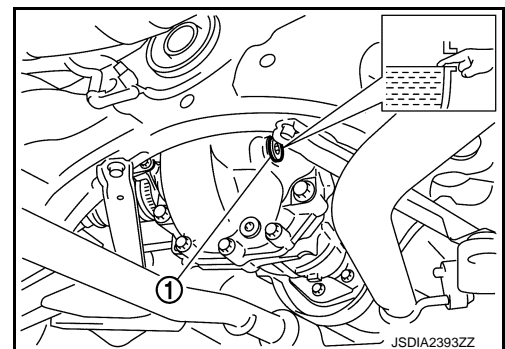
Oil grade and viscosity : Refer to [MA-10, "Fluids and Lubricants"](#).

Oil capacity : Refer to [DLN-45, "General Specifications"](#).

2. After refilling oil, check oil level. Set a gasket to filler plug, then install it to final drive assembly. Refer to [DLN-27, "Exploded View"](#).

CAUTION:

Never reuse gasket.



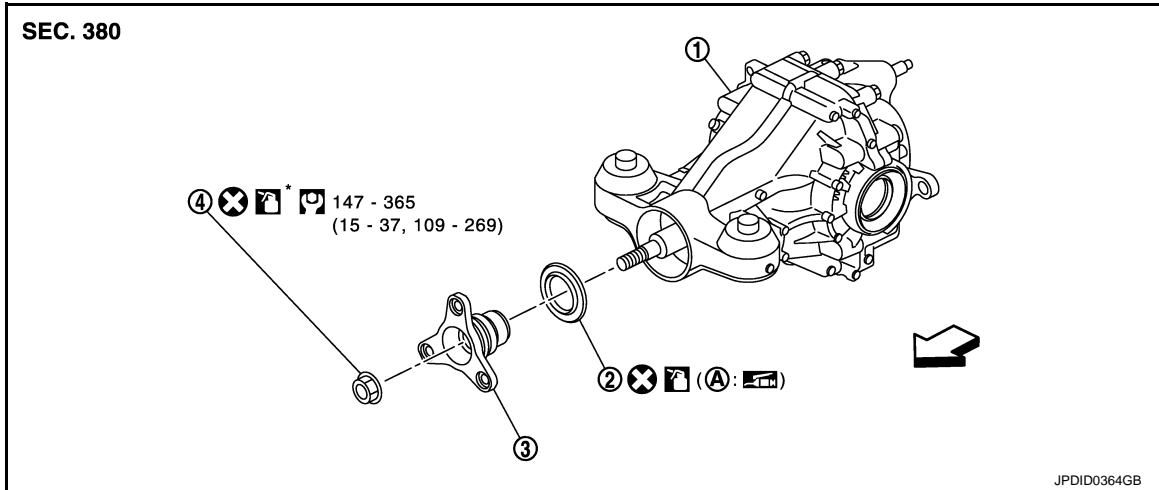
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REMOVAL AND INSTALLATION

FRONT OIL SEAL

Exploded View

INFOID:000000008143346



- 1. Final drive assembly
- 2. Front oil seal
- 3. Companion flange
- 4. Drive pinion lock nut
- A. Oil seal lip

←: Vehicle front

⊗: Always replace after every disassembly

⊞: N·m (kg·m, ft·lb)

⊞: Apply multi purpose grease

⊞: Apply gear oil.

⊞*: Apply anti-corrosion oil.

Removal and Installation

INFOID:000000008143347

REMOVAL

CAUTION:

Verify identification stamp of replacement frequency put in the lower part of gear carrier to determine replacement for collapsible spacer when replacing front oil seal. Refer to “Identification stamp of replacement frequency of front oil seal”. If collapsible spacer replacement is necessary, remove final drive assembly and disassemble it to replace front oil seal and collapsible spacer. Refer to [DLN-25, "Removal and Installation"](#) and [DLN-39, "Disassembly"](#).

NOTE:

The reuse of collapsible spacer is prohibited in principle. However, it is reusable on a one-time basis only in cases when replacing front oil seal.

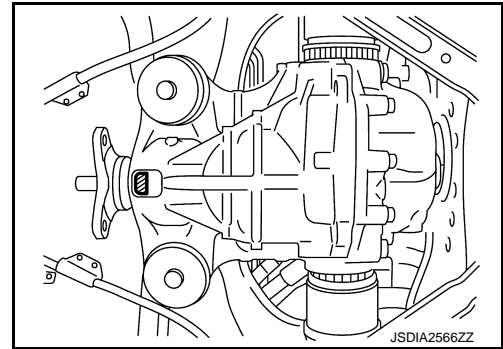
Identification stamp of replacement frequency of front oil seal

FRONT OIL SEAL

[REAR FINAL DRIVE: R208]

< REMOVAL AND INSTALLATION >

- The diagonally shaded area in the figure shows stamping point for replacement frequency of front oil seal.
- The following table shows if collapsible spacer replacement is needed before replacing front oil seal. When collapsible spacer replacement is required, disassemble final drive assembly to replace collapsible spacer and front oil seal. Refer to [DLN-39, "Disassembly"](#).



Stamp	collapsible spacer replacement
No stamp	Not required
"0" or "0" on the far right of stamp	Required
"01" or "1" on the far right of stamp	Not required

CAUTION:

Make a stamping after replacing front oil seal.

- After replacing front oil seal, make a stamping on the stamping point in accordance with the table below in order to identify replacement frequency.

CAUTION:

Make a stamping from left to right.

Stamp before stamping	Stamping on the far right	Stamping
No stamp	0	0
"0" (Front oil seal was replaced once.)	1	01
"01" (Collapsible spacer and front oil seal were replaced last time.)	0	010
"0" is on the far right. (Only front oil seal was replaced last time.)	1	...01
"1" is on the far right. (Collapsible spacer and front oil seal were replaced last time.)	0	...010

1. Make a judgment if a collapsible spacer replacement is required.
2. Drain gear oil. Refer to [DLN-19, "Draining"](#).
3. Remove final drive assembly. Refer to [DLN-25, "Removal and Installation"](#).

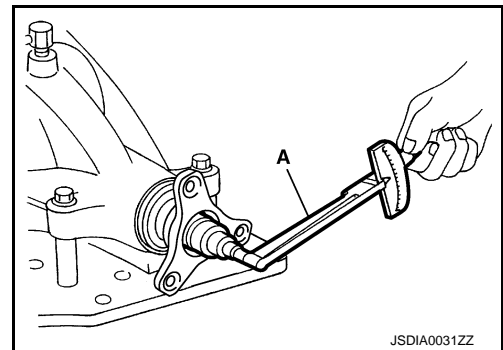
NOTE:

- It is necessary to separate the rear drive shaft from final drive to measure the total preload.
- It is necessary to remove final drive assembly to separate the rear drive shaft from final drive.

4. Measure the total preload with the preload gauge (A) [SST: ST3127S000 (J-25765-A)].

NOTE:

Record the preload measurement.



FRONT OIL SEAL

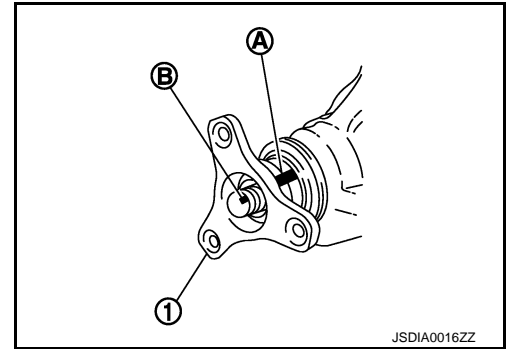
< REMOVAL AND INSTALLATION >

[REAR FINAL DRIVE: R208]

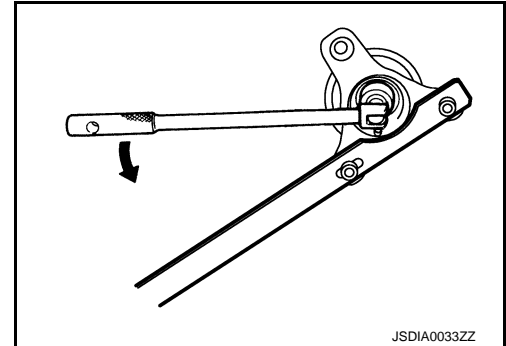
- Put matching mark (B) on the end of the drive pinion. The matching mark should be in line with the matching mark (A) on companion flange (1).

CAUTION:

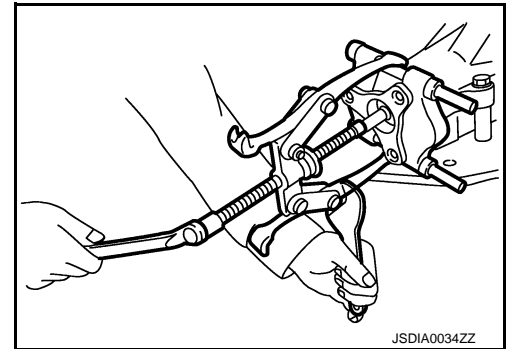
For matching mark, use paint. Never damage companion flange and drive pinion.



- Remove drive pinion lock nut using the flange wrench. (commercial service tool)



- Remove companion flange using puller (commercial service tool).
- Remove front oil seal using the puller [SST: KV381054S0 (J-34286)].

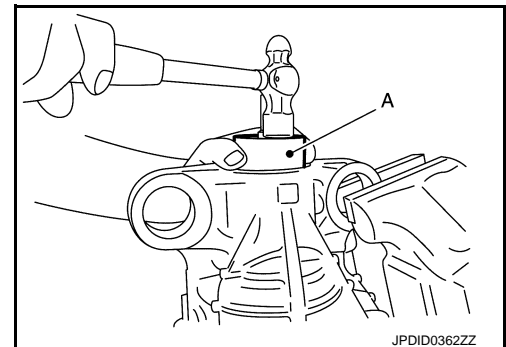


INSTALLATION

- Apply multi-purpose grease to front oil seal lips.
- Install front oil seal until it becomes flush with the carrier end, using the drift (A) [SST: KV40104710 (—)] as shown in figure.

CAUTION:

- Never reuse oil seal.
- Never incline oil seal when installing.

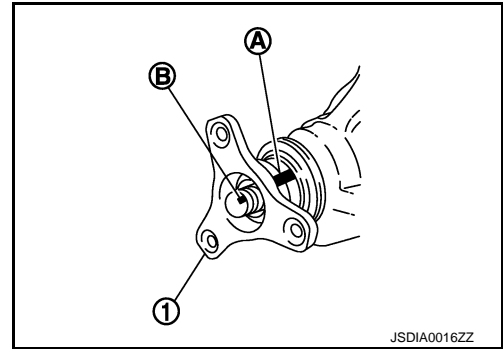


FRONT OIL SEAL

< REMOVAL AND INSTALLATION >

[REAR FINAL DRIVE: R208]

- Align the matching mark (B) of drive pinion with the matching mark (A) of companion flange (1), and then install the companion flange.



- Apply anti-corrosion oil to the thread and seat of new drive pinion lock nut, and temporarily tighten drive pinion lock nut to drive pinion, using flange wrench (commercial service tool).

A : Preload gauge [SST: ST3127S000 (J-25765-A)]

CAUTION:

Never reuse drive pinion lock nut.

- Tighten drive pinion lock nut within the limits of specified torque so as to keep the pinion bearing preload within a standard values, using preload gauge [SST: ST3127S000 (J-25765-A)].

Total preload torque : A value that add 0.1 – 0.4 N-m (0.01 – 0.04 kg-m, 0.1 – 0.3 in-lb) to the measured value before removing.

CAUTION:

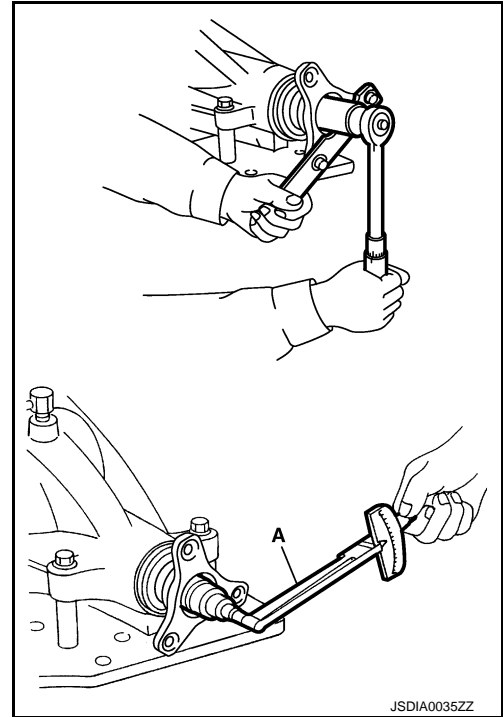
- Adjust to the lower limit of the drive pinion lock nut tightening torque first.
- If the preload torque exceeds the specified value, replace collapsible spacer and tighten it again to adjust. Never loosen drive pinion lock nut to adjust the preload torque.

- Make a stamping for identification of front oil seal replacement frequency. Refer to "Identification stamp of replacement frequency of front oil seal".

CAUTION:

Make a stamping after replacing front oil seal.

- Install final drive assembly. Refer to [DLN-25, "Removal and Installation"](#).
- Refill gear oil to the final drive and check oil level. Refer to [DLN-19, "Refilling"](#).
- Check the final drive for oil leakage. Refer to [DLN-19, "Inspection"](#).



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SIDE OIL SEAL

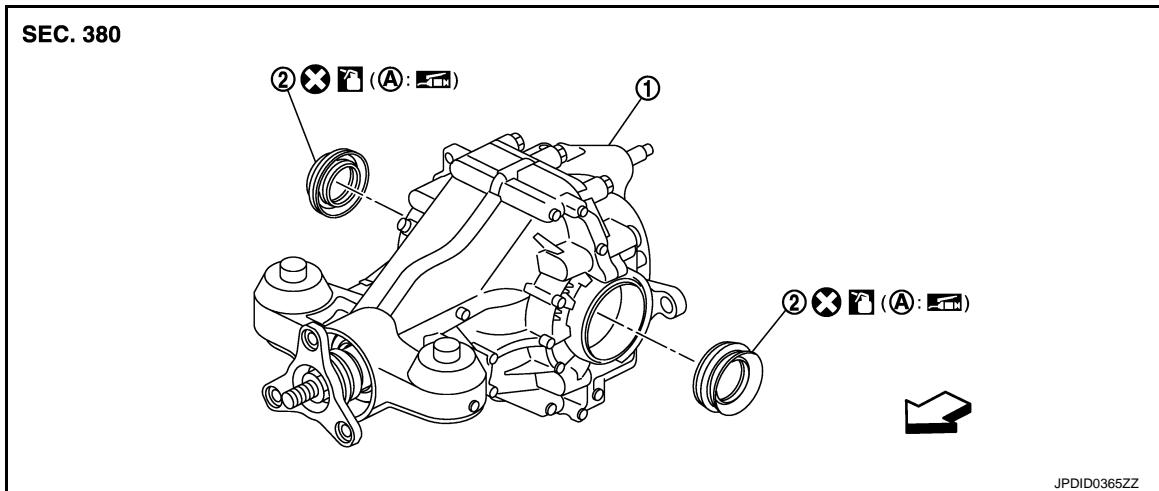
< REMOVAL AND INSTALLATION >

[REAR FINAL DRIVE: R208]

SIDE OIL SEAL

Exploded View

INFOID:000000008143348



1. Final drive assembly
2. Side oil seal
- A. Oil seal lip

←: Vehicle front

⊗: Always replace after every disassembly

▣: Apply multi purpose grease

◻: Apply gear oil.

Removal and Installation

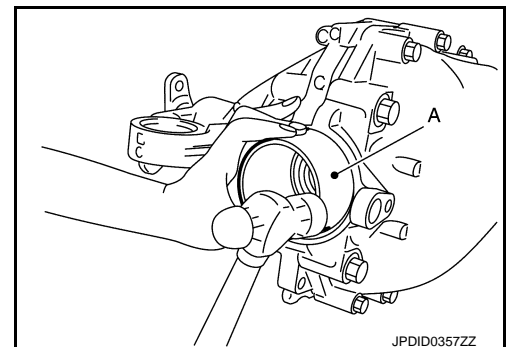
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REMOVAL

1. Remove final drive assembly. Refer to [DLN-25. "Removal and Installation"](#).
NOTE:
It is necessary to remove final drive assembly to remove the rear drive shaft.
2. Remove side oil seal, using oil seal remover.
CAUTION:
Never damage gear carrier.

INSTALLATION

1. Apply multi-purpose grease to side oil seal lips.
2. Install side oil seal until it becomes flush with the carrier end, using the drift (A) [SST: KV40104710 (—)].
CAUTION:
 - **Never reuse oil seal.**
 - **When installing, never incline oil seal.**
3. Install final drive assembly. Refer to [DLN-25. "Removal and Installation"](#).
4. When oil leaks while removing, check oil level after the installation. Refer to [DLN-19. "Inspection"](#).



REAR FINAL DRIVE ASSEMBLY

< UNIT REMOVAL AND INSTALLATION >

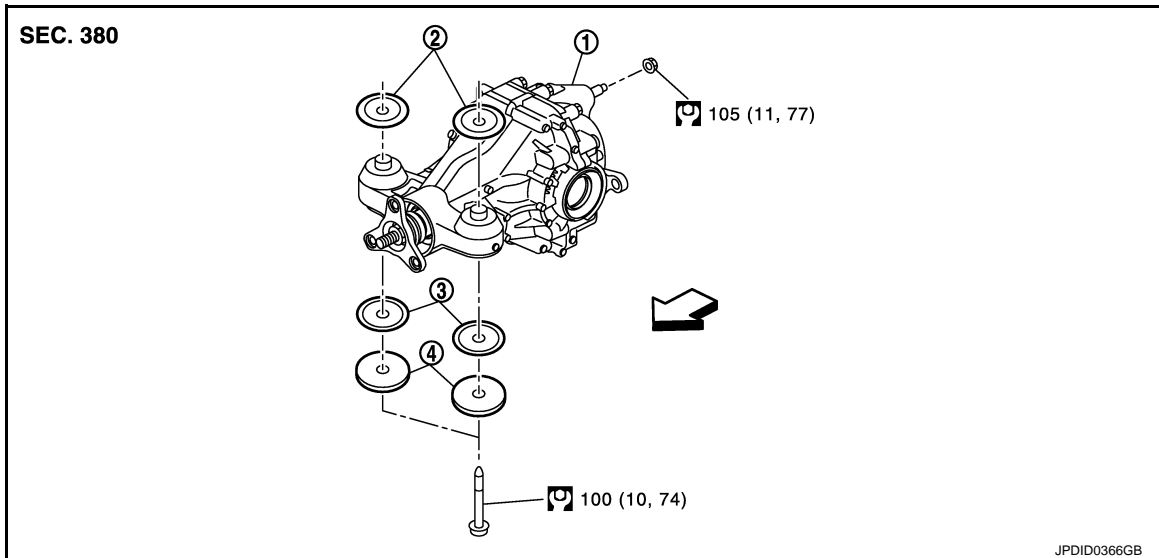
[REAR FINAL DRIVE: R208]

UNIT REMOVAL AND INSTALLATION

REAR FINAL DRIVE ASSEMBLY

Exploded View

INFOID:000000008143350



1. Rear final drive assembly
2. Upper stopper
3. Lower stopper
4. Washer

↔: Vehicle front

: N·m (kg-m, ft-lb)

Removal and Installation

INFOID:000000008143351

REMOVAL

1. Remove center muffler with a power tool. Refer to [EX-6, "Removal and Installation"](#).
2. Remove stabilizer bar with a power tool. Refer to [RSU-20, "Removal and Installation"](#).
3. Remove rear propeller shaft from the final drive. Refer to [DLN-7, "Removal and Installation"](#).
4. Remove rear suspension member stay. Refer to [RSU-21, "Removal and Installation"](#).
5. Separate drive shaft from final drive. Refer to [RAX-12, "Removal and Installation"](#).
6. Remove breather hose from the final drive.
7. Set a suitable jack to rear final drive assembly.

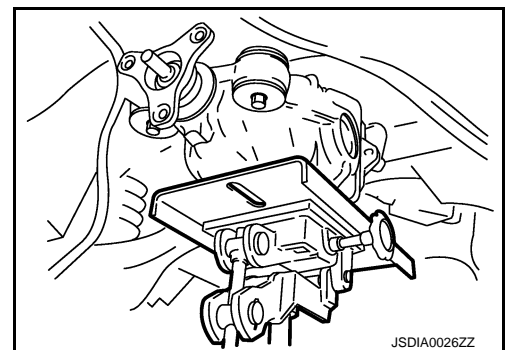
CAUTION:

Never place a jack on the rear cover (aluminum case).

8. Remove rear wheel sensor. Refer to [BRC-160, "REAR WHEEL SENSOR : Removal and Installation"](#).
9. Remove the mounting bolts and nuts connecting to the suspension member with a power tool. And then, remove rear final drive assembly.

CAUTION:

Secure rear final drive assembly to suitable jack while removing it.



INSTALLATION

Note the following, and installation is in the reverse order of removal.

- If install the drive shaft to final drive, remove wheel hub rock nut. Refer to [RAX-12, "Removal and Installation"](#).

REAR FINAL DRIVE ASSEMBLY

< UNIT REMOVAL AND INSTALLATION >

[REAR FINAL DRIVE: R208]

- Check that there are no pinched or restricted areas on the breather hose caused by bending or winding when installing it.
- Install the breather hose (1) to breather connector until dimension (A) shown as follows.

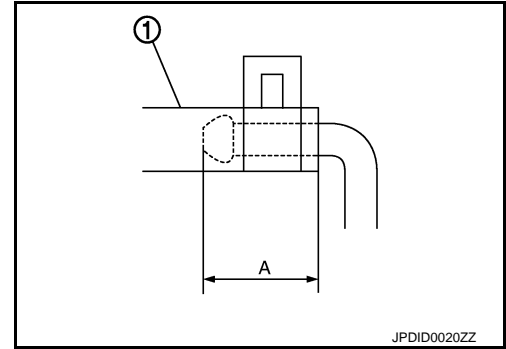
A:

Final drive side : 20 mm (0.79 in)

**Suspension member : 20 mm (0.79 in)
side**

CAUTION:

- **Never reuse hose clamp.**
- **Install the hose clamp at the final drive side, with the tab facing downward.**
- **Install the hose clamp at the position 5 mm (0.2 in) from breather hose end and never reach tube bulge.**
- If remove breather connector, install breather hose (1) as shown in the figure.



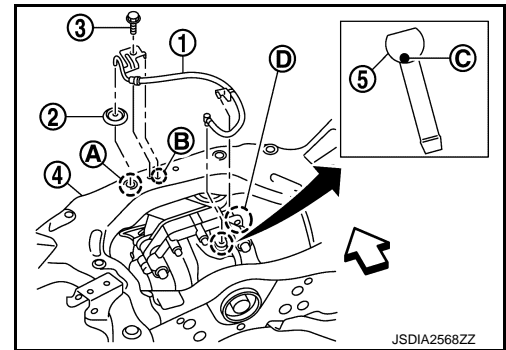
↔: Vehicle front

Suspension member side

- Insert the plug (2) to the (A) position in suspension member (4).
- Insert the tube end to center hole of the plug.
- Insert the projection to (B) position in suspension member.
- Be sure to fix the breather hose by the trim clip (3).

Final drive side

- Install metal connector (5) to rear cover with paint mark (C) facing vehicle rear.
- Be sure to fix the breather hose in (D) position by the clip.



CAUTION:

Never reuse the plug, trim clip, metal connector and clip.

- When oil leaks while removing final drive assembly, check oil level after the installation. Refer to [DLN-19, "Inspection"](#).

DIFFERENTIAL ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

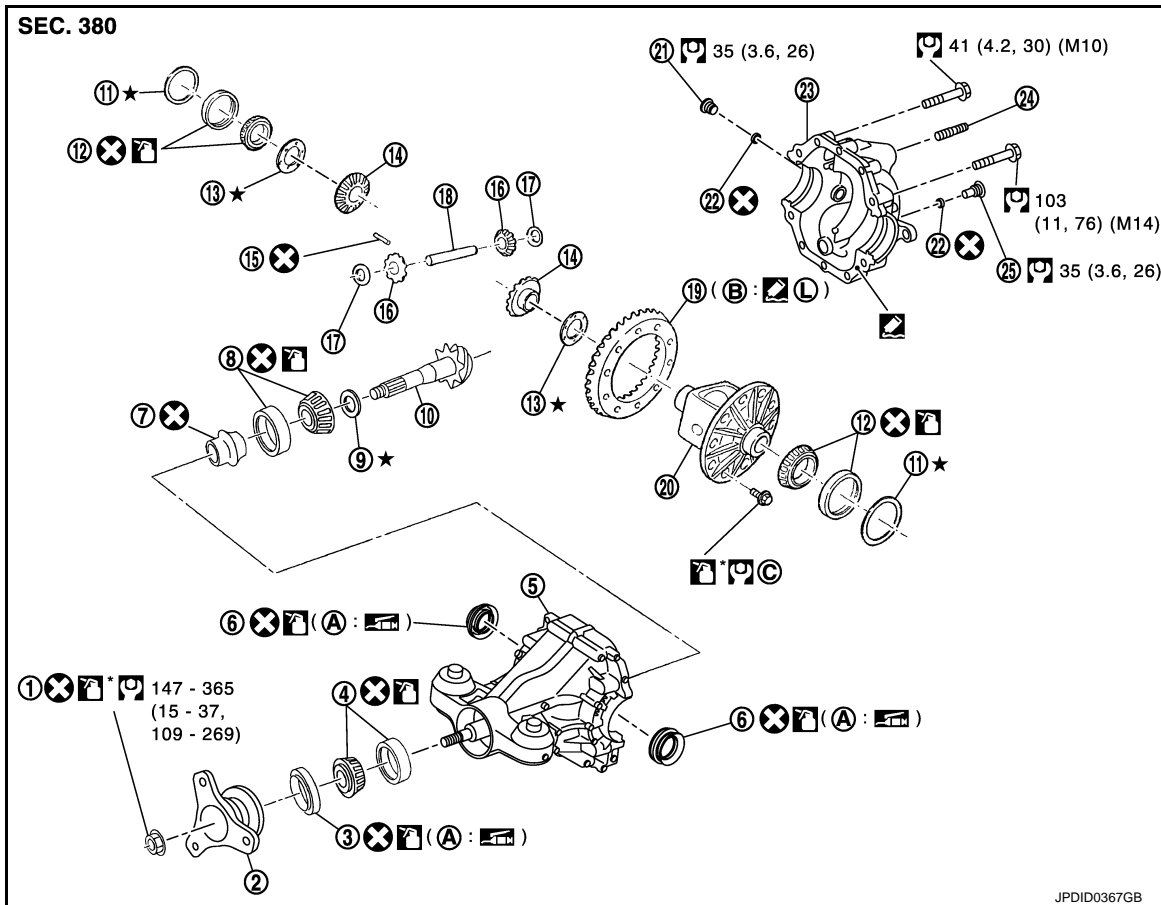
[REAR FINAL DRIVE: R208]

UNIT DISASSEMBLY AND ASSEMBLY

DIFFERENTIAL ASSEMBLY

Exploded View

INFOID:000000008143352



- | | | |
|-----------------------------|-----------------------------------|-----------------------------------|
| 1. Drive pinion lock nut | 2. Companion flange | 3. Front oil seal |
| 4. Pinion front bearing | 5. Gear carrier | 6. Side oil seal |
| 7. Collapsible spacer | 8. Pinion rear bearing | 9. Pinion height adjusting washer |
| 10. Drive pinion | 11. Side bearing adjusting washer | 12. Side bearing |
| 13. Side gear thrust washer | 14. Side gear | 15. Lock pin |
| 16. Pinion mate gear | 17. Pinion mate thrust washer | 18. Pinion mate shaft |
| 19. Drive gear | 20. Differential case | 21. Filler plug |
| 22. Gasket | 23. Rear cover | 24. Stud bolt |
| 25. Drain plug | | |
- A. Oil seal lip
B. Screw hole
C. Comply with the assembly procedure when tightening. Refer to [DLN-30, "Assembly"](#).

⊗: Always replace after every disassembly

Ⓜ: N·m (kg·m, ft·lb)

🛢️: Apply multi purpose grease

🛢️: Apply gear oil.


🛢️*: Apply anti-corrosion oil.

DIFFERENTIAL ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R208]

: Apply Genuine Silicone RTV or equivalent. Refer to [GI-23. "Recommended Chemical Products and Sealants"](#).

: Apply Genuine High Strength Thread Locking Sealant or equivalent. Refer to [GI-23. "Recommended Chemical Products and Sealants"](#).

Disassembly

INFOID:000000008143353

1. Drain gear oil, if necessary.
2. Remove the side oil seal, using oil seal remover.
CAUTION:
Never damage gear carrier and rear cover.
3. Remove rear cover mounting bolts.
4. Set drift (A) and base tube (B) to the right and left side bearing adjusting washers individually. Press differential case assembly with side bearing to remove gear carrier assembly and rear cover assembly.

A : Drift [SST: KV38109220 (—)]

B : Base tube [SST: KV38109210 (—)]

CAUTION:

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

NOTE:

Differential case assembly, side bearings, and adjusting washers are compressed and integrated in gear carrier and rear cover.

5. Remove side bearing adjusting washers and side bearing outer races.

CAUTION:

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

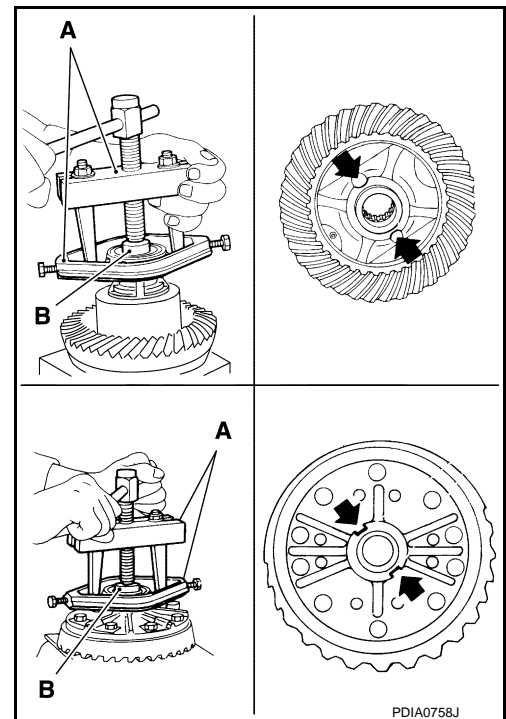
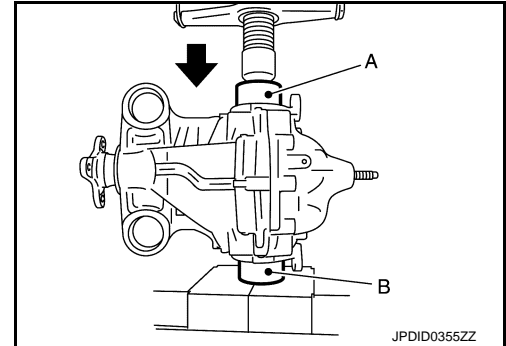
6. Remove side bearing inner races, using puller (A) and the adaptor (B).

A : Puller [SST: ST33051001 (J-22888-20)]

B : Adaptor [SST: KV40104840 (—)]

CAUTION:

- To prevent damage to the side bearing and drive gear, place copper plates between these parts and vise.
- To prevent damage to bearing, engage puller jaws in groove (←).
- It is not necessary to remove side bearing inner race except when it is replaced.



DIFFERENTIAL ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R208]

7. For proper reinstallation, paint matching marks on one differential case assembly.

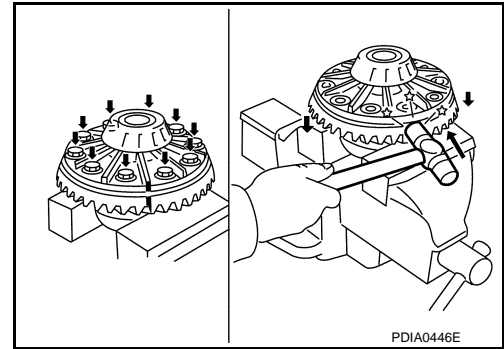
CAUTION:

For matching marks, use paint. Never damage differential case and drive gear.

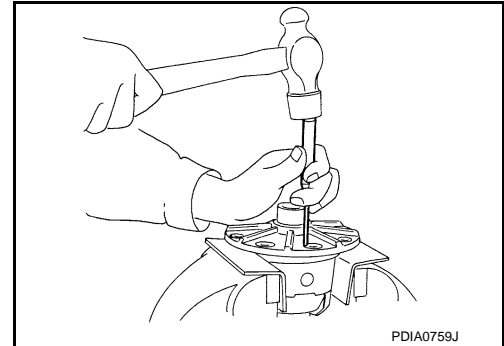
8. Remove drive gear mounting bolts.
9. Tap drive gear off differential case assembly with a soft hammer.

CAUTION:

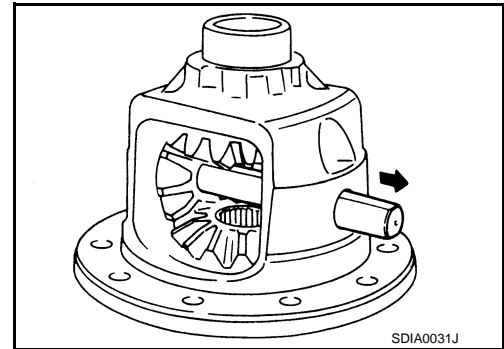
Tap evenly all around to keep drive gear from bending.



10. Remove lock pin of pinion mate shaft with a punch from drive gear side.

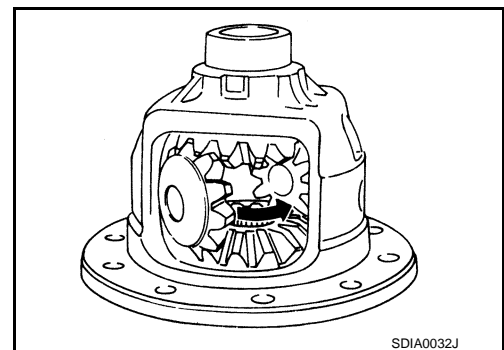


11. Remove pinion mate shaft.



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

13. Perform inspection after disassembly. Refer to [DLN-37, "Inspection"](#).



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DIFFERENTIAL ASSEMBLY

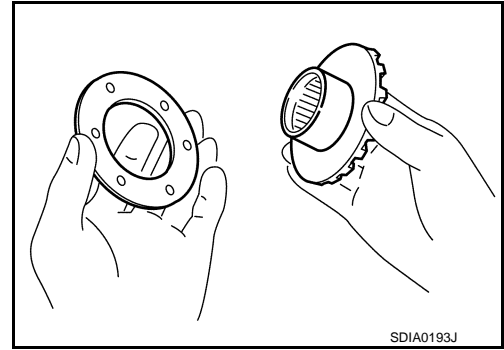
< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R208]

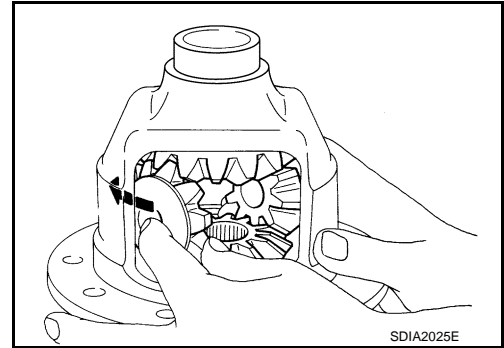
Assembly

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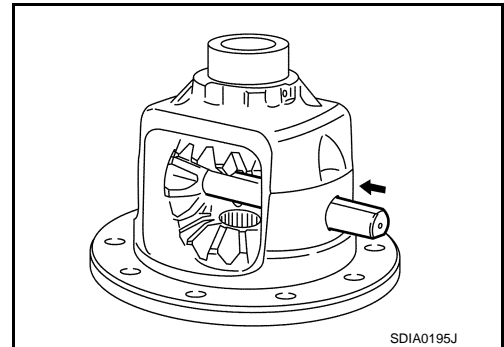
1. Install side gear thrust washers with the same thickness as the ones installed prior to disassembly or reinstall the old ones on the side gears.



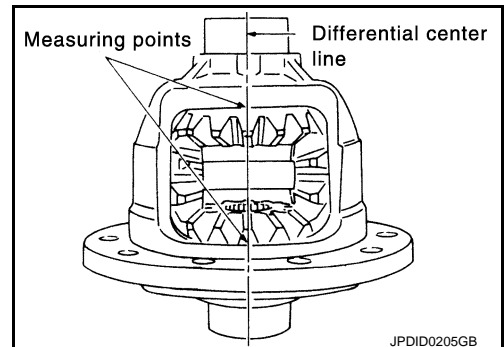
2. Install side gears and thrust washers into differential case.
3. Align 2 pinion mate gears in diagonally opposite positions, then rotate and install them into differential case after installing thrust washer to pinion mate gear.



4. Align the lock pin holes on differential case with shaft, and install pinion mate shaft.



5. Measure side gear end play. If necessary, select the appropriate side gear thrust washers.
 - a. Place differential case straight up so that side gear to be measured comes upward.



DIFFERENTIAL ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R208]

- b. Using feeler gauge, measure the clearance between side gear back and differential case at 3 different points, while rotating side gear. Average the 3 readings, and then measure the clearance of the other side as well.

Side gear back clearance : Refer to [DLN-45, "Differential Side Gear Clearance"](#).

CAUTION:

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

- If the back clearance is outside the specification, use a thicker/thinner side gear thrust washer to adjust. For selecting thrust washer, refer to the latest parts information.

When the back clearance is large: Use a thicker thrust washer.

When the back clearance is small: Use a thinner thrust washer.

CAUTION:

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

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

CAUTION:

Never reuse lock pin.

7. Apply thread locking sealant into the thread hole of drive gear. Use Genuine High Strength Thread Locking Sealant or equivalent. Refer to [GI-23, "Recommended Chemical Products and Sealants"](#).

CAUTION:

Clean and degrease drive gear back and threaded holes sufficiently.

8. Install the drive gear to differential case.

CAUTION:

Align the matching mark of differential case and drive gear.

9. Tighten the mounting bolts with the following procedure.

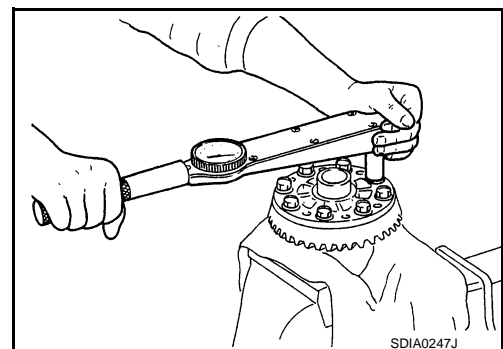
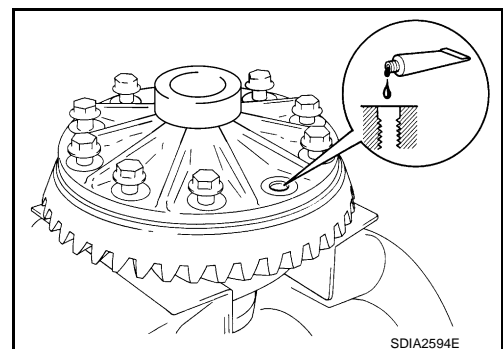
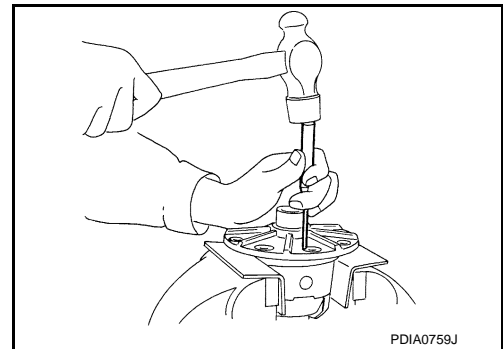
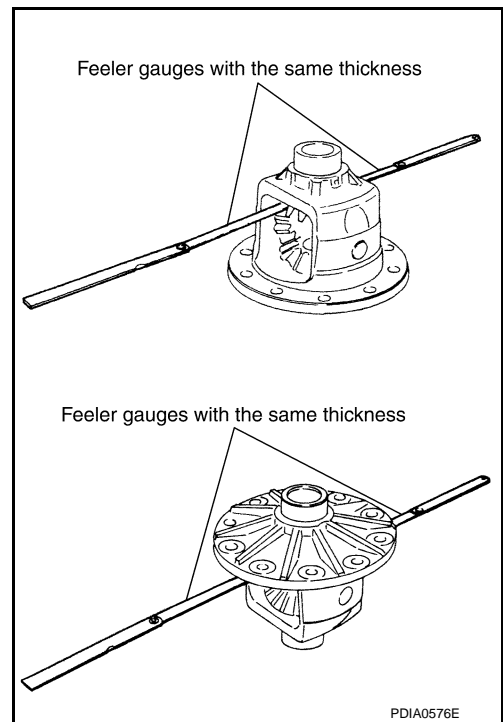
CAUTION:

Apply anti-corrosion oil to the thread and seat of mounting bolts.

- a. Tighten the bolts in a crisscross fashion to the specified torque.

Drive gear mounting bolts tightening torque : 78.5 N•m (8.0 kg-m, 58 ft-lb)

- b. Tighten the bolts additionally to the specified angle.



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DIFFERENTIAL ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R208]

Drive gear mounting bolts tightening angle : 31 to 36 degree

CAUTION:

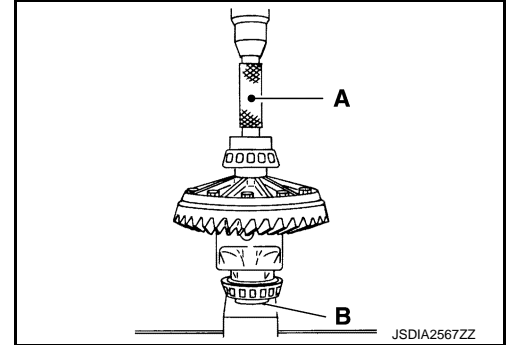
Check the tightening angle using the angle wrench [SST: KV10112100 (BT-8653-A)]. Never make judgment by visual inspection.

10. Press side bearing inner races to differential case, using the drift (A) and the adaptor (B).

A : Drift [SST: KV38100200 (J-26233)]
B : Adaptor [SST: KV40104840 (—)]

CAUTION:

Never reuse side bearing inner race.

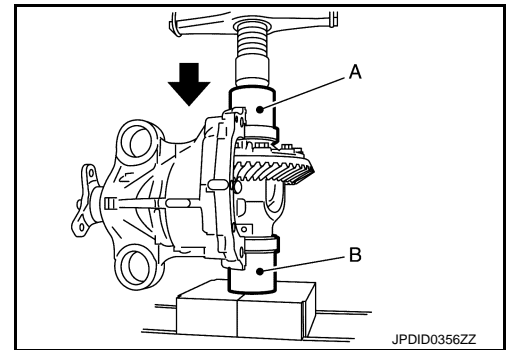


11. Set the drifts (A) and base tube (B) to the right and left side bearing adjusting washers individually. Compress differential case assembly and side bearing to install gear carrier assembly to differential case assembly.

A : Drift [SST: KV38109220 (—)]
B : Base tube [SST: KV38109210 (—)]

CAUTION:

- The drift shall be placed on the center of the adjusting washers.
- The pressure shall be as low as possible to install differential assembly into gear carrier assembly. The maximum pressure shall be 10 kN (1 ton, 1.1 US ton, 1.0 Imp ton).
- If the adjusting washers are installed by tapping, the gear carrier may be damaged. Avoid tapping.



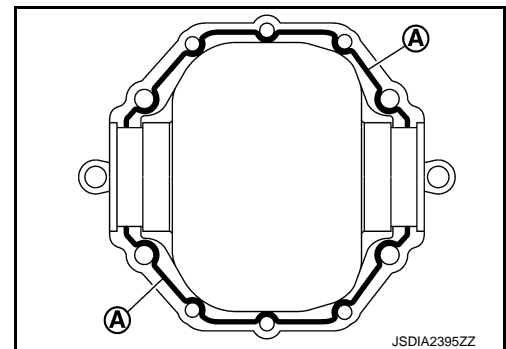
12. Install dummy cover set [SST: KV381091S0 (—)], check and adjust drive gear runout, tooth contact, backlash, and total preload torque. Refer to [DLN-33, "Adjustment"](#).

13. Remove dummy cover set.

14. Apply liquid gasket (A) to mating surface of rear cover. Use Genuine Silicone RTV or equivalent. Refer to [GI-23, "Recommended Chemical Products and Sealants"](#).

CAUTION:

- Remove old gasket adhering to the mounting surfaces. Also remove any moisture, oil, or foreign material adhering to the mounting surfaces.
- The width of sealant bead is approximately 3 mm (0.12 in). Apply sealant evenly.



DIFFERENTIAL ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

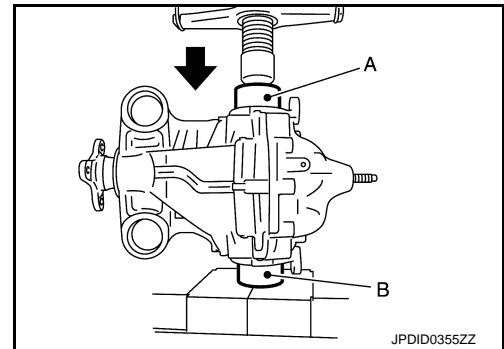
[REAR FINAL DRIVE: R208]

15. Set the drift (A) and base tube (B) to the right and left side bearing adjusting washers individually. Compress differential case assembly and side bearing to install rear cover.

A : Drift [SST: KV38109220 (—)]
B : Base tube [SST: KV38109210 (—)]

CAUTION:

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

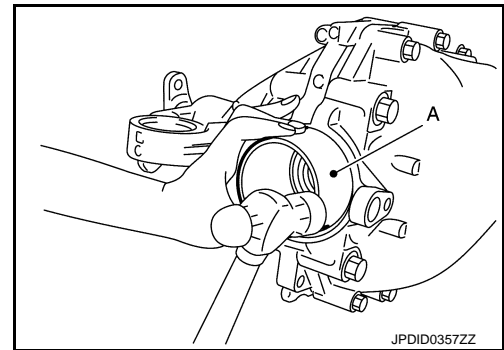


16. Tighten rear cover mounting bolts to the specified torque.
17. Using the drift (A) [SST: KV40104710 (—)], drive side oil seals until it becomes flush with the carrier end.

CAUTION:

- Never reuse oil seals.
- When installing, do not incline oil seals.
- Apply multi-purpose grease onto oil seal lips, and gear oil onto the circumference of oil seal.

18. Check total preload torque. Refer to [DLN-33, "Adjustment"](#).



Adjustment

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TOTAL PRELOAD TORQUE

Before inspection and adjustment, drain gear oil.

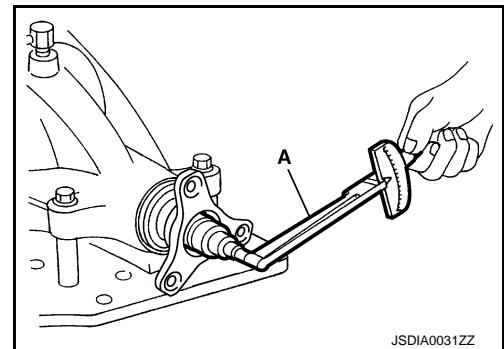
1. Secure final drive assembly onto an attachment [SST: KV38100800 (J-25604-01)].
2. Rotate drive pinion back and forth 2 to 3 times to check for unusual noise and rotation malfunction.
3. Rotate drive pinion at least 20 times to check for smooth operation of the bearing.
4. Measure total preload with the preload gauge (A) [SST: ST3127S000 (J-25765-A)].

Total preload torque : Refer to [DLN-45, "Preload Torque"](#).

NOTE:

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

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



When the preload torque is large

On pinion bearings: Replace the collapsible spacer.

On side bearings: Use thinner side bearing adjusting washers by the same amount to each side. For selecting adjusting washer, refer to the latest parts information.

DIFFERENTIAL ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R208]

When the preload is small

On pinion bearings: Tighten the drive pinion lock nut.

On side bearings: Use thicker side bearing adjusting washers by the same amount to each side. For selecting adjusting washer, refer to the latest parts information.

DRIVE GEAR RUNOUT

1. Remove rear cover. Refer to [DLN-28, "Disassembly"](#).
2. Following the procedure below, install a dummy cover set [SST: KV381091S0 (—)] to gear carrier.
 - a. Using rear cover mounting bolt, temporarily install color [SST: KV38109140 (—)] and dummy cover [SST: KV38109110 (—)] to gear carrier.
 - b. Position colors and dummy cover spacers [SST: KV38109120 (—)] to dummy cover.
 - c. Using dummy cover mounting bolt (rear cover mounting bolt), tighten bolts to the specified torque with colors. Refer to [DLN-27, "Exploded View"](#).
 - d. Tighten dummy cover spacer mounting bolts evenly to the specified torque.

Tightening torque : 5.9 N·m (0.6 kg·m)

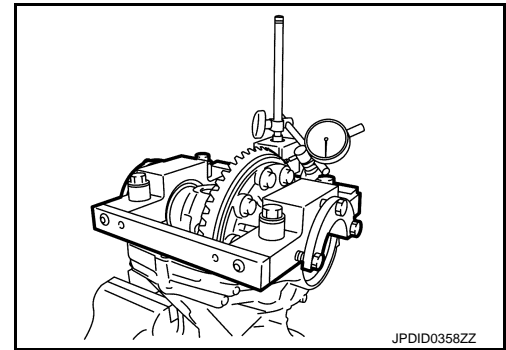
3. Fit a dial indicator to the drive gear back face.
4. Rotate the drive gear to measure runout.

Drive gear back face runout : Refer to [DLN-45, "Drive Gear Runout"](#).

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

CAUTION:

Replace drive gear and drive pinion as a set.



TOOTH CONTACT

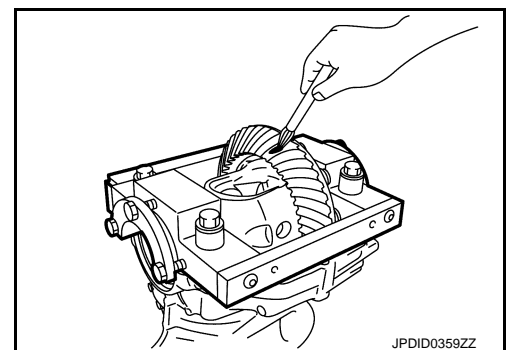
1. Remove rear cover. Refer to [DLN-28, "Disassembly"](#).
2. Following the procedure below, install a dummy cover set [SST: KV381091S0 (—)] to gear carrier.
 - a. Using rear cover mounting bolt, temporarily install color [SST: KV38109140 (—)] and dummy cover [SST: KV38109110 (—)] to gear carrier.
 - b. Position colors and dummy cover spacers [SST: KV38109120 (—)] to dummy cover.
 - c. Using dummy cover mounting bolt (rear cover mounting bolt), tighten bolts to the specified torque with colors. Refer to [DLN-27, "Exploded View"](#).
 - d. Tighten dummy cover spacer mounting bolts evenly to the specified torque.

Tightening torque : 5.9 N·m (0.6 kg·m)

3. Apply red lead to drive gear.

CAUTION:

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



DIFFERENTIAL ASSEMBLY

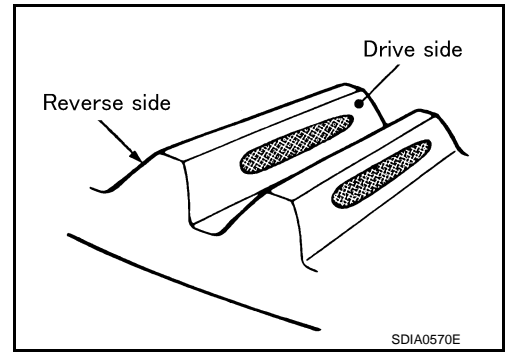
< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R208]

- Rotate drive gear back and forth several times, check drive pinion gear to drive gear tooth contact.

CAUTION:

Check tooth contact on drive side and reverse side.

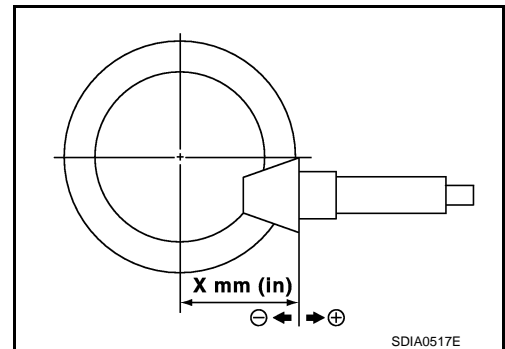


Tooth Contact Judgment Guide

Tooth contact condition				Pinion height adjusting washer selection valve [mm (in)]	Adjustment (Yes/No)	Possible cause			
Drive side		Back side							
Heel side	Toe side	Toe side	Heel side	Thicker ↑	Yes	Occurrence of noise and scoring sound in all speed ranges.			
							+0.09 (+0.0035)	Yes	Occurrence of noise when accelerating.
							+0.06 (+0.0024)		
					+0.03 (+0.0012)	No	-		
					0				
					-0.03 (-0.0012)				
					-0.06 (-0.0024)			Yes	Occurrence of noise at constant speed and decreasing speed.
				-0.09 (-0.0035)	Yes	Occurrence of noise and scoring sound in all speed ranges.			

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

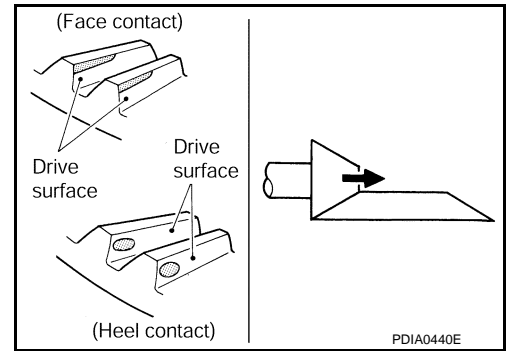


DIFFERENTIAL ASSEMBLY

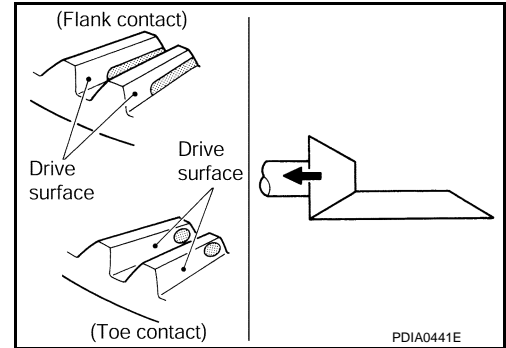
< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R208]

- If the tooth contact is near the face (face contact), or near the heel (heel contact), thicken drive pinion height adjusting washer to move drive pinion closer to drive gear.
For selecting adjusting washer, refer to the latest parts information.



- If the tooth contact is near the flank (flank contact), or near the toe (toe contact), thin drive pinion height adjusting washer to move drive pinion farther from drive gear.
For selecting adjusting washer, refer to the latest parts information.



BACKLASH

1. Remove rear cover. Refer to [DLN-28, "Disassembly"](#).
2. Following the procedure below, install a dummy cover set [SST: KV381091S0 (—)] to gear carrier.
 - a. Using rear cover mounting bolt, temporarily install color [SST: KV38109140 (—)] and dummy cover [SST: KV38109110 (—)] to gear carrier.
 - b. Position colors and dummy cover spacers [SST: KV38109120 (—)] to dummy cover.
 - c. Using dummy cover mounting bolt (rear cover mounting bolt), tighten bolts to the specified torque with colors. Refer to [DLN-27, "Exploded View"](#).
 - d. Tighten dummy cover spacer mounting bolts evenly to the specified torque.

Tightening torque : 5.9 N·m (0.6 kg·m)

3. Fit a dial indicator to the drive gear face to measure the backlash.

Backlash : Refer to [DLN-45, "Backlash"](#).

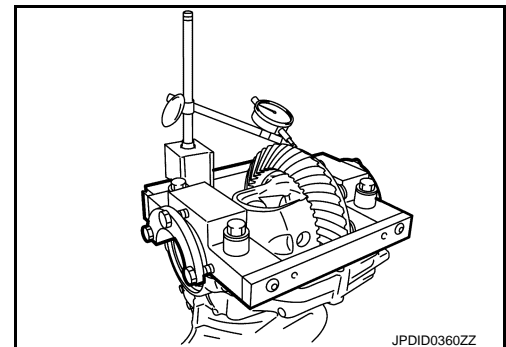
- If the backlash is outside of the specified value, change the thickness of side bearing adjusting washers.

When the backlash is large:

Make drive gear back side adjusting washer thicker, and drive gear tooth side adjusting washer thinner by the same amount. For selecting adjusting washer, refer to the latest parts information.

When the backlash is small:

Make drive gear back side adjusting washer thinner, and drive gear tooth side adjusting washer thicker by the same amount. For selecting adjusting washer, refer to the latest parts information.



CAUTION:

DIFFERENTIAL ASSEMBLY

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R208]

Never change the total amount of washers as it changes the bearing preload.

Inspection

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INSPECTION AFTER DISASSEMBLY

Drive Gear and Drive Pinion

- Clean up the disassembled parts.
- If the gear teeth never mesh or line-up correctly, determine the cause and adjust or replace as necessary.
- If the gears are worn, cracked, damaged, pitted or chipped (by friction) noticeably, replace with new drive gear and drive pinion as a set.

Bearing

- Clean up the disassembled parts.
- If any chipped (by friction), pitted, worn, rusted or scratched marks, or unusual noise from the bearing is observed, replace as a bearing assembly (as a new set).

Side Gear and Pinion Mate Gear

- Clean up the disassembled parts.
- If any cracks or damage on the surface of the tooth is found, replace.
- If any worn or chipped mark on the contact sides of the thrust washer is found, replace.

Side Gear Thrust Washer and Pinion Mate Thrust Washer

- Clean up the disassembled parts.
- If it is chipped (by friction), damaged, or unusually worn, replace.

Oil Seal

- Whenever disassembled, replace.
- If wear, deterioration of adherence (sealing force lips), or damage is detected on the lips, replace them.

Differential Case

- Clean up the disassembled parts.
- If any wear or crack on the contact sides of the differential case is found, replace.

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DRIVE PINION

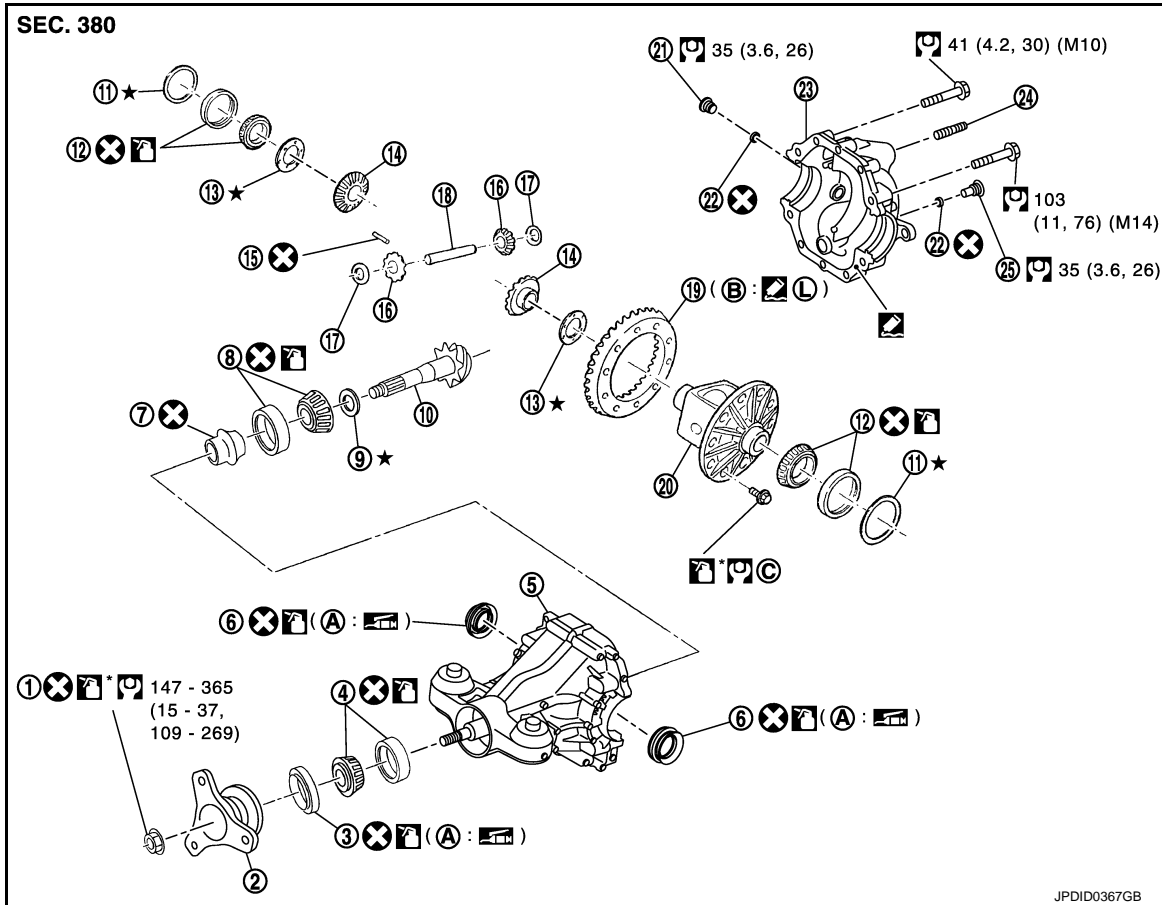
< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R208]

DRIVE PINION

Exploded View

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- | | | |
|-----------------------------|-----------------------------------|------------------------------------------------------------------------------------------------------|
| 1. Drive pinion lock nut | 2. Companion flange | 3. Front oil seal |
| 4. Pinion front bearing | 5. Gear carrier | 6. Side oil seal |
| 7. Collapsible spacer | 8. Pinion rear bearing | 9. Pinion height adjusting washer |
| 10. Drive pinion | 11. Side bearing adjusting washer | 12. Side bearing |
| 13. Side gear thrust washer | 14. Side gear | 15. Lock pin |
| 16. Pinion mate gear | 17. Pinion mate thrust washer | 18. Pinion mate shaft |
| 19. Drive gear | 20. Differential case | 21. Filler plug |
| 22. Gasket | 23. Rear cover | 24. Stud bolt |
| 25. Drain plug | | |
| A. Oil seal lip | B. Screw hole | C. Comply with the assembly procedure when tightening. Refer to DLN-30, "Assembly" . |

⊗: Always replace after every disassembly

N-m: N-m (kg-m, ft-lb)

Apply multi purpose grease

Apply gear oil.


Apply anti-corrosion oil.

DRIVE PINION

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R208]

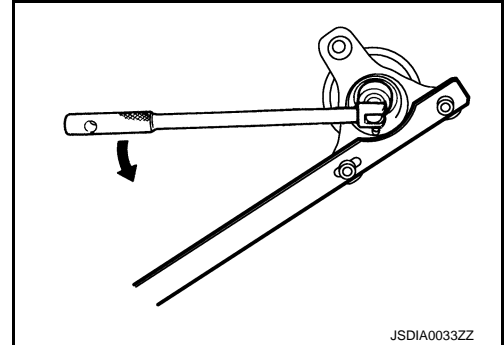
 Apply Genuine Silicone RTV or equivalent. Refer to [GI-23. "Recommended Chemical Products and Sealants"](#).

 Apply Genuine High Strength Thread Locking Sealant or equivalent. Refer to [GI-23. "Recommended Chemical Products and Sealants"](#).

Disassembly

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1. Remove differential case assembly. Refer to [DLN-28. "Disassembly"](#).
2. Remove drive pinion lock nut with the flange wrench (commercial service tool).



3. Put matching mark (B) on the end of drive pinion. The matching mark should be in line with the matching mark (A) on companion flange (1).

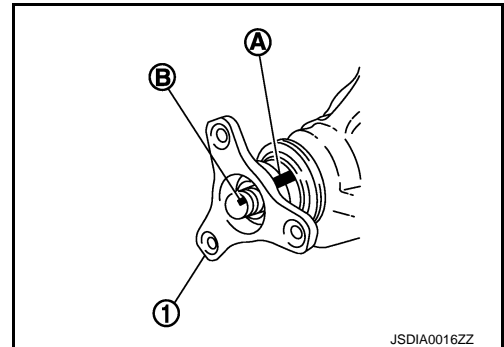
CAUTION:

For matching mark, use paint. Never damage companion flange and drive pinion.

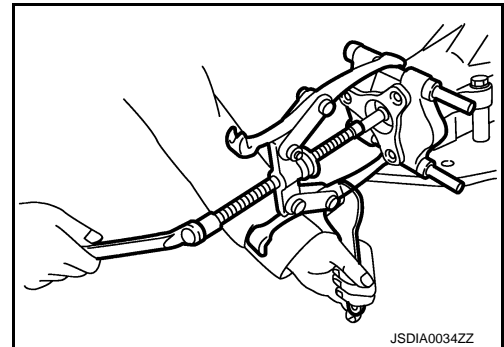
NOTE:

The matching mark on the final drive companion flange indicates the maximum vertical runout position.

When replacing companion flange, matching mark is not necessary.



4. Remove companion flange using the suitable pullers (commercial service tool).

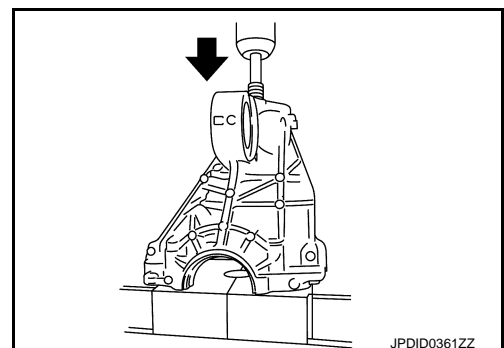


5. Press drive pinion assembly out of gear carrier.

CAUTION:

Never drop drive pinion assembly.

6. Remove front oil seal.
7. Remove pinion front bearing inner race.
8. Remove collapsible spacer.



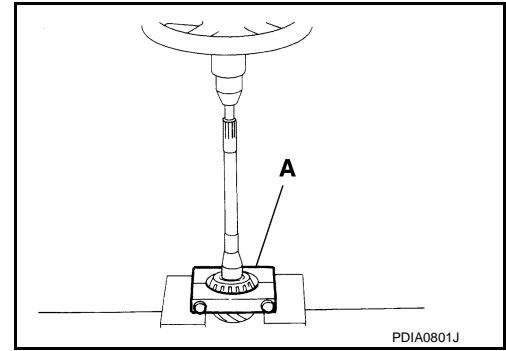
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DRIVE PINION

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R208]

9. Remove pinion rear bearing inner race and pinion height adjusting washer with the replacer (A) (commercial service tool).

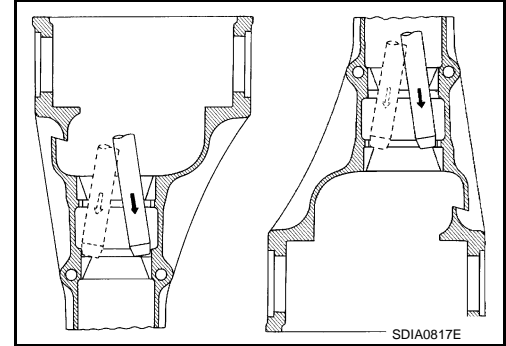


10. Tap pinion front/rear bearing outer races uniformly using a brass rod or equivalent to remove them.

CAUTION:

Never damage gear carrier.

11. Perform inspection after disassembly. Refer to [DLN-44, "Inspection"](#).



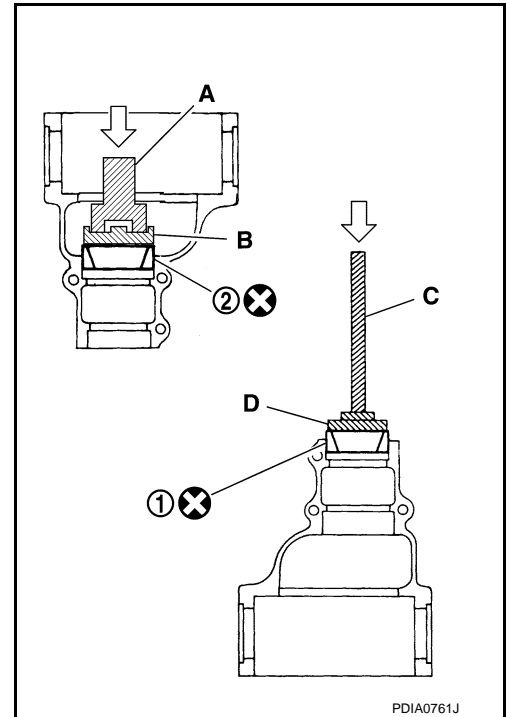
Assembly

1. Install front bearing outer race (1) and rear bearing outer race (2) using drifts (A, B and D) and drift bar (C).

- A : Drift [SST: ST30720000 (J-25405)]
B : Drift [SST: KV40105230 (—)]
C : Drift bar [SST: ST30611000 (J-25742-1)]
D : Drift [SST: ST30621000 (J-25742-5)]

CAUTION:

- At first, using a hammer, tap bearing outer race until it becomes flat to gear carrier.
- Never reuse pinion front and rear bearing outer race.



DRIVE PINION

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R208]

2. Temporarily install pinion height adjusting washer (1).

When hypoid gear set has been replaced

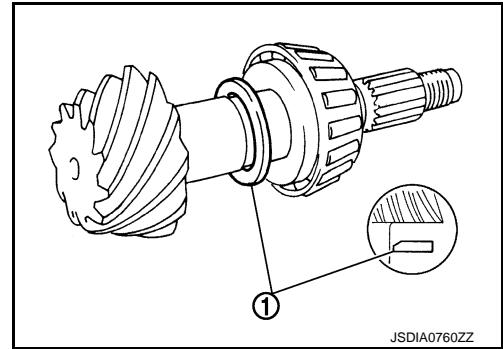
- Select pinion height adjusting washer. Refer to [DLN-44](#), "Adjustment".

When hypoid gear set has been reused

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

CAUTION:

Pay attention to the direction of pinion height adjusting washer. (Assemble as shown in the figure.)



3. Install pinion rear bearing inner race (1) to drive pinion with the drift (A) [SST: ST30901000 (J-26010-01)].

CAUTION:

Never reuse pinion rear bearing inner race.

4. Check and adjust the tooth contact and back lash of drive gear and drive pinion following the procedure below.

- a. Assemble drive pinion into gear carrier.

CAUTION:

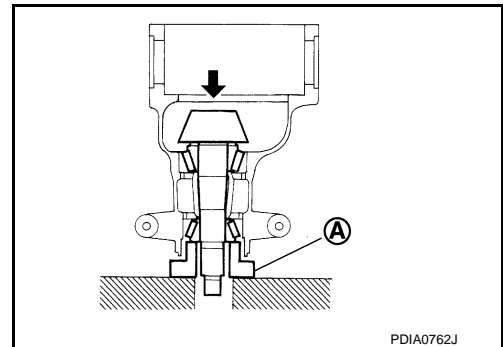
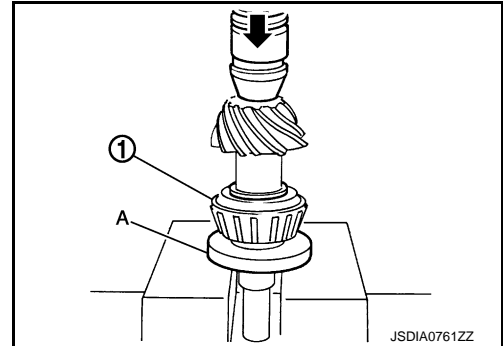
- **Never assemble a collapsible spacer.**
- **Apply gear oil to pinion rear bearing.**

- b. Assemble pinion front bearing inner race to drive pinion assembly.

CAUTION:

- **Never reuse pinion front bearing inner race.**
- **Apply gear oil to pinion front bearing.**

- c. Using suitable spacer (A) (commercial service tool), press the pinion front bearing inner race to drive pinion as far as drive pinion nut can be tightened.



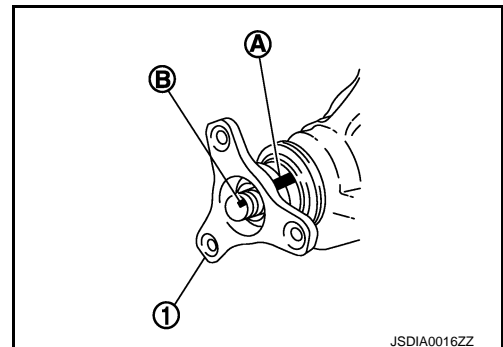
- d. Install companion flange.

CAUTION:

Never assemble front oil seal.

NOTE:

When reusing drive pinion, align the matching mark (B) of drive pinion with the matching mark (A) of companion flange, and then install companion flange (1).



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DRIVE PINION

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R208]

- e. Temporarily tighten removed drive pinion nut to drive pinion using flange wrench (commercial service tool).

A : Preload gauge [SST: ST3127S000 (J-25765-A)]

NOTE:

Use removed drive pinion nut only for the preload measurement.

- f. Rotate drive pinion more than 20 times to adjust bearing.
g. Tighten to drive pinion lock nut using flange wrench (commercial service tool), while adjusting pinion bearing preload torque using preload gauge [SST: ST3127S000 (J-25765-A)].

Pinion bearing preload (without oil seal) : 1.0 - 1.3 N·m (0.11 – 0.13 kg-m, 9 – 11 in-lb)

CAUTION:

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

- h. Assemble removed drive side bearing adjusting washer or same thickness of it and install differential case assembly. Refer to [DLN-30. "Assembly"](#).

CAUTION:

Apply differential gear oil to the side bearings.

- i. Check and adjust tooth contact, drive gear to drive pinion backlash. Refer to [DLN-33. "Adjustment"](#).
j. Remove differential case assembly.
k. Remove companion flange.
l. Remove drive pinion assembly from gear carrier.
m. Remove pinion front bearing inner race.
5. Assemble collapsible spacer.

CAUTION:

Never reuse collapsible spacer.

6. Assemble drive pinion into gear carrier.

CAUTION:

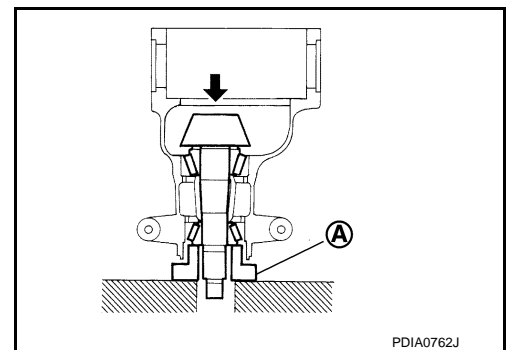
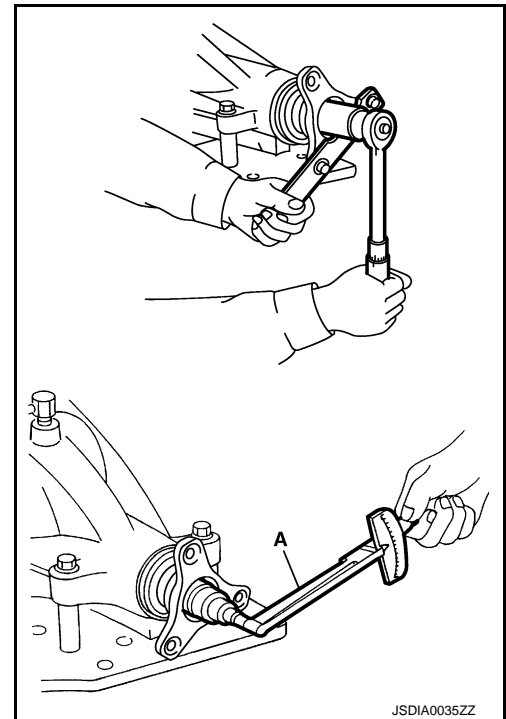
Apply gear oil to pinion rear bearing.

7. Assemble pinion front bearing inner race to drive pinion assembly.

CAUTION:

- Never reuse pinion front bearing inner race.
- Apply gear oil to pinion front bearing.

8. Using suitable spacer (A) (commercial service tool), press the pinion front bearing inner race to drive pinion as far as drive pinion nut can be tightened.



DRIVE PINION

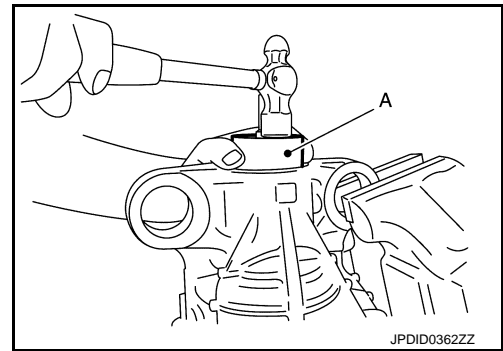
< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R208]

9. Install front oil seal until it becomes flush with the carrier end, using the drift (A) [SST: KV40104710 (—)] as shown in figure.

CAUTION:

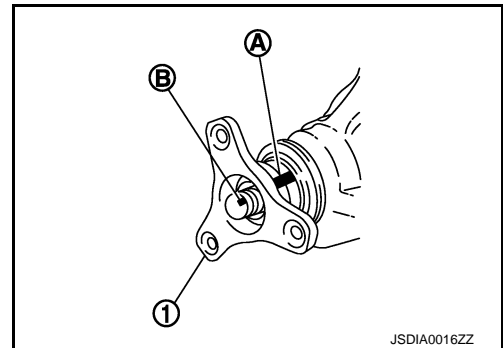
- Never reuse oil seal.
- When installing, never incline oil seal.
- Apply multi-purpose grease onto oil seal lips, and gear oil onto the circumference of oil seal.



10. Install companion flange.

NOTE:

When reusing drive pinion, align the matching mark (B) of drive pinion with the matching mark (A) of companion flange, and then install companion flange (1).



11. Apply anti-corrosion oil to the thread and seat of drive pinion lock nut, and temporarily tighten drive pinion lock nut to drive pinion, using flange wrench (commercial service tool).

A : Preload gauge [SST: ST3127S000 (J-25765-A)]

CAUTION:

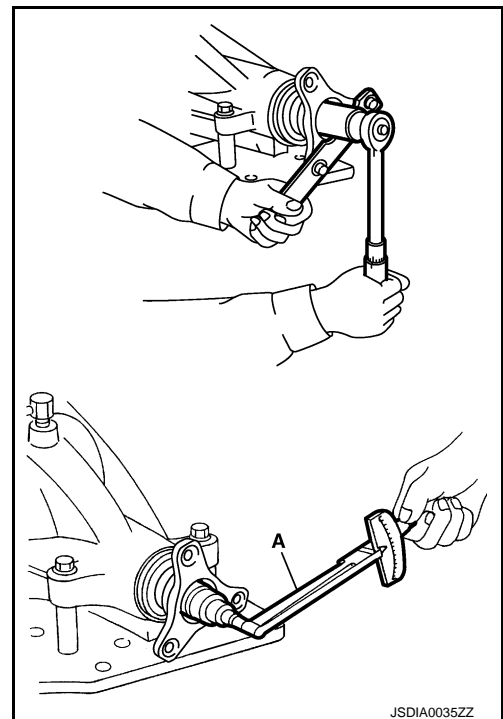
Never reuse drive pinion lock nut.

12. Adjust to the drive pinion lock nut tightening torque and pinion bearing preload torque, using preload gauge [SST: ST3127S000 (J-25765-A)].

Pinion bearing preload : Refer to [DLN-45, "Pre-load Torque"](#)

CAUTION:

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



13. Install differential case assembly. Refer to [DLN-30, "Assembly"](#).

CAUTION:

Never install rear cover at this timing.

14. Check and adjust drive gear runout, tooth contact, and drive gear to drive pinion backlash. Refer to [DLN-33, "Adjustment"](#).
15. Check total preload torque. Refer to [DLN-33, "Adjustment"](#).
16. Install rear cover. Refer to [DLN-30, "Assembly"](#).

A
B
C
DLN
E
F
G
H
I
J
K
L
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O
P

DRIVE PINION

< UNIT DISASSEMBLY AND ASSEMBLY >

[REAR FINAL DRIVE: R208]

INFOID:000000008143360

Adjustment

PINION GEAR HEIGHT

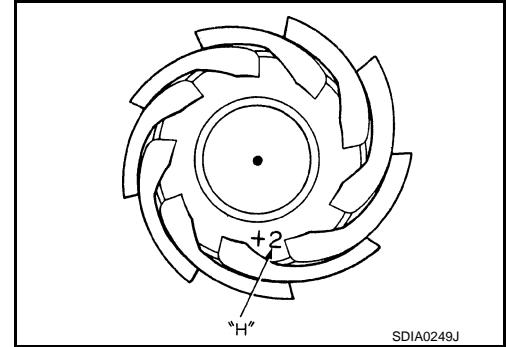
If the hypoid gear set has been replaced, select the pinion height adjusting washer.

1. Use the formula below to calculate pinion height adjusting washer thickness.

Washer selection equation:

$$T = T_0 + (t_1 - t_2)$$

- T:** Correct washer thickness
- T₀:** Removed washer thickness
- t₁:** Old drive pinion head letter "H × 0.01"
("H": machined tolerance 1/100 mm × 100)
- t₂:** New drive pinion head letter "H × 0.01"
("H": machined tolerance 1/100 mm × 100)



Example:

$$T = 3.21 + [(2 \times 0.01) - (-1 \times 0.01)] = 3.24$$

- T₀:** 3.21
- t₁:** +2
- t₂:** -1

2. Select the proper pinion height adjusting washer. For selecting adjusting washer, refer to the latest parts information.

CAUTION:

If unable to find a washer of desired thickness, use a washer with thickness closest to the calculated value.

Example:

Calculated value... T = 3.22 mm

Used washer... T = 3.21 mm

Inspection

INFOID:000000008143361

INSPECTION AFTER DISASSEMBLY

Drive Gear and Drive Pinion

- Clean up the disassembled parts.
- If the gear teeth never mesh or line-up correctly, determine the cause and adjust or replace as necessary.
- If the gears are worn, cracked, damaged, pitted or chipped (by friction) noticeably, replace with new drive gear and drive pinion as a set.

Bearing

- Clean up the disassembled parts.
- If any chipped (by friction), pitted, worn, rusted or scratched marks, or unusual noise from the bearing is observed, replace as a bearing assembly (as a new set).

Oil Seal

- Whenever disassembled, replace.
- If wear, deterioration of adherence (sealing force lips), or damage is detected on the lips, replace them.

Companion Flange

- Clean up the disassembled parts.
- If any chipped mark [about 0.1 mm, (0.004 in)] or other damage on the contact sides of the lips of the companion flange is found, replace.

SERVICE DATA AND SPECIFICATIONS (SDS)

< SERVICE DATA AND SPECIFICATIONS (SDS)

[REAR FINAL DRIVE: R208]

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specifications

INFOID:000000008143362

Applied model	Engine type	VQ35HR
	Motor type	HM34
	Transmission type	A/T
Final drive model		R208
Gear ratio		2.611
Number of teeth (Drive gear/Drive pinion)		47/18
Oil capacity (Approx.)	ℓ (US pt, Imp pt)	1.15 (2-3/8, 2)
Number of pinion gears		2
Drive pinion adjustment spacer type		Collapsible

Drive Gear Runout

INFOID:000000008143363

Unit: mm (in)

Item	Limit
Drive gear back face runout	0.05 (0.0020)

Differential Side Gear Clearance

INFOID:000000008143364

Unit: mm (in)

Item	Standard
Side gear backlash (Clearance between side gear and differential case)	0.10 (0.004) or less (Each gear should rotate smoothly without excessive resistance during differential motion.)

Preload Torque

INFOID:000000008143365

Unit: N·m (kg·m, in·lb)

Item	Standard
Pinion bearing (P1)	1.16 – 1.86 (1.12 – 0.18, 11 – 16)
Side bearing (P2)	0.58 – 0.81 (0.06 – 0.08, 6 – 7)
Side bearing to pinion bearing (Total preload) (Total preload = P1 + P2)	1.74 – 2.67 (0.18 – 0.278, 16 – 23)

Backlash

INFOID:000000008143366

Unit: mm (in)

Item	Standard
Drive gear to drive pinion gear	0.10 – 0.15 (0.0039 – 0.0059)