

SECTION **PR**
PROPELLER SHAFT

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PREPARATION

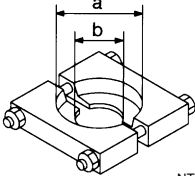
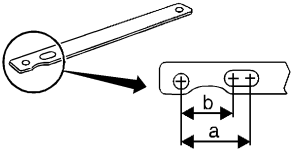
PREPARATION

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Special Service Tools

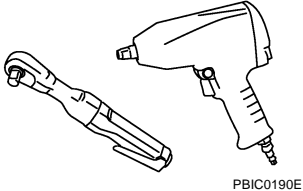
ADS000KJ

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
<p>ST30031000 (J22912-01) a: 90 mm (3.54 in) b: 50 mm (1.97 in) Puller</p>  <p style="text-align: right; margin-right: 20px;">NT411</p>	<p>Removing rear propeller shaft center bearing</p>
<p>KV40104000 (-) a: 85 mm (3.35 in) b: 65 mm (2.56 in) Flange wrench</p>  <p style="text-align: right; margin-right: 20px;">NT659</p>	<p>Removing and installing center flange lock nut</p>

Commercial Service Tools

ADS000KC

Tool name	Description
<p>Power tool</p>  <p style="text-align: right; margin-right: 20px;">PBIC0190E</p>	<p>Loosening bolts and nuts</p>

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

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NVH Troubleshooting Chart

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

Symptom		Possible cause and suspected parts												
		Uneven rotation torque	Center bearing improper installation	Excessive joint angle	Rotation imbalance	Excessive runout	Differential	Axle and suspension	Tires	Road wheel	Drive shaft	Brakes	Steering	
Noise	Propeller shaft	x	x	x	x	x	x	x	x	x	x	x	x	x
			x	x				x	x	x	x	x	x	
		x	x	x	x	x		x	x		x		x	

x: Applicable

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FRONT PROPELLER SHAFT

FRONT PROPELLER SHAFT

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On-Vehicle Service PROPELLER SHAFT VIBRATION

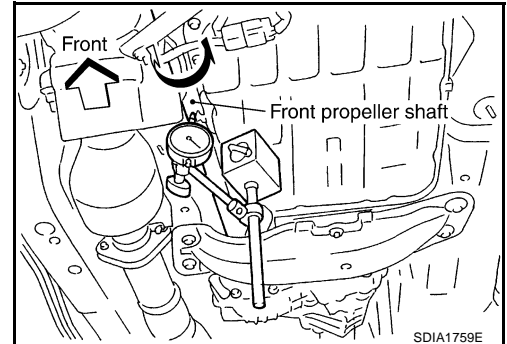
ADS000KL

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

1. Measure propeller shaft runout at several points by rotating final drive companion flange with your hands.

Propeller shaft runout limit : 0.6 mm (0.024 in) or less

2. If runout still exceeds specifications, disconnect propeller shaft at the final drive companion flange; then rotate companion flange 90, 180, 270 degrees and reconnect propeller shaft.
3. Check runout again. If runout still exceeds specifications, replace propeller shaft assembly.
4. Check the vibration by driving the vehicle.

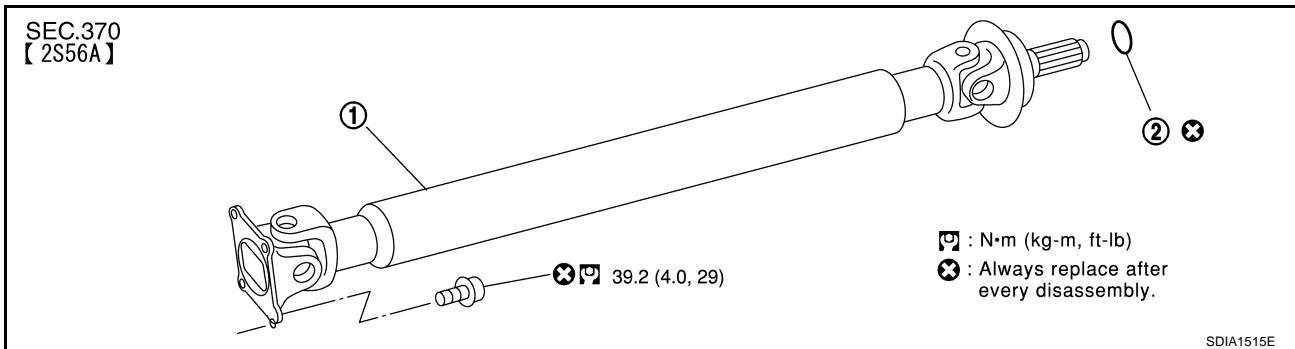


APPEARANCE CHECKING

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

Removal and Installation

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1. Propeller shaft assembly

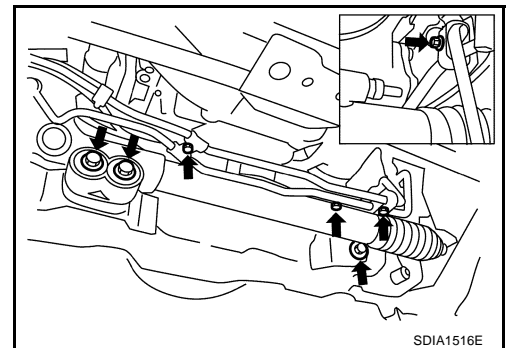
2. O-ring

REMOVAL

1. Remove the front and rear engine undercover with power tool.
2. Remove the front cross bar with power tool. Refer to [FSU-6, "FRONT SUSPENSION ASSEMBLY"](#).
3. Remove the exhaust front tube bracket with power tool. Refer to [EX-3, "EXHAUST SYSTEM"](#).
4. Disconnect the heated oxygen sensor harness connector.
5. Remove the exhaust front tube mounting nuts with power tool. Refer to [EX-3, "EXHAUST SYSTEM"](#).
6. Remove the right bank catalytic converter with power tool. Refer to [EM-25, "Removal and Installation"](#) (VQ35DE), [EM-177, "Removal and Installation"](#) (VK45DE).
7. Remove the power steering piping mounting bolts. Refer to [PS-41, "HYDRAULIC LINE"](#).
8. Remove the power steering gear box fixing bolts to secure working area for removal of propeller shaft. Refer to [PS-19, "POWER STEERING GEAR AND LINKAGE"](#).

CAUTION:

Be careful not to damage the steering gear box piping during removal.

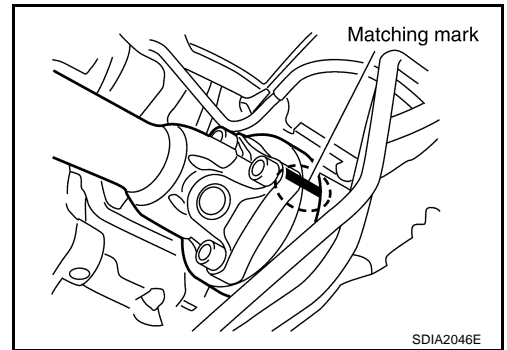


FRONT PROPELLER SHAFT

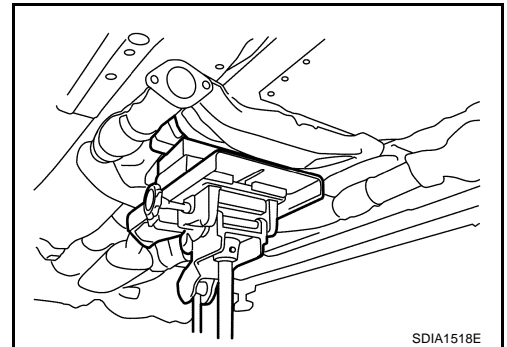
- Put matching marks on propeller shaft flange and companion flange on the front drive as shown.

CAUTION:

For matching mark, use paint. Never damage the propeller shaft flange and companion flange on the front drive.



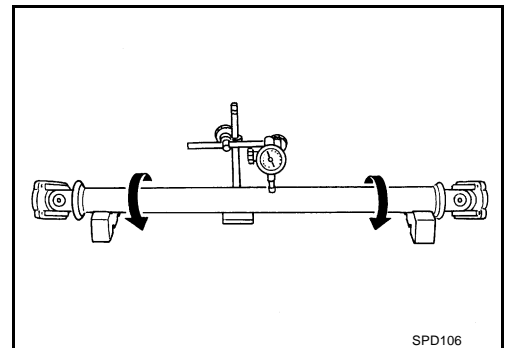
- Set the transmission jack at the transfer, remove the mounting bolts and rear engine mounting bracket. On the VK45DE engine, lower the transmission jack about 40 - 50 mm (0.16 - 0.20 in).
- Remove the bolts and then remove the propeller shaft from the front final drive and transfer.



INSPECTION

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

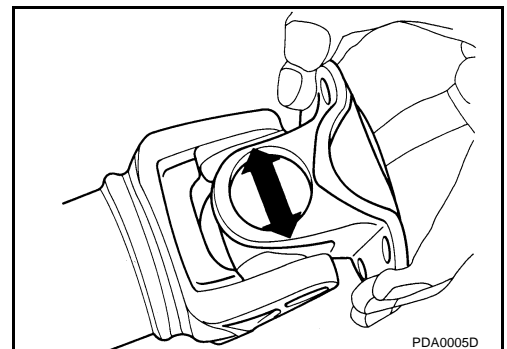
Propeller shaft runout limit : 0.6mm (0.024in) or less



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

Journal axial play : 0 mm (0 in)

- Check propeller shaft for bend and damage. If damage is detected, replace propeller shaft assembly.



INSTALLATION

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

- Install the propeller shaft into the transfer.

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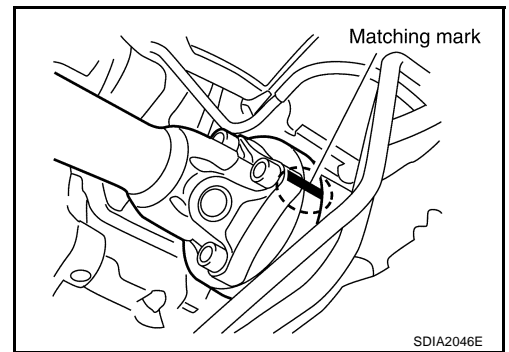
FRONT PROPELLER SHAFT

- Install the propeller shaft onto the front final drive flange while matching marks that are marked during removal.
- Tighten the drive flange bolts to specified torque.

CAUTION:

Do not reuse the bolts and nuts. Always replace it with a new one.

- After installation, check the vibration by driving the vehicle. If the vibration is present, remove the propeller shaft from the final drive companion flange and turn the propeller shaft 90, 180 or 270 degrees and reinstall the propeller shaft to the companion flange.
Recheck the vibration by driving the vehicle.



REAR PROPELLER SHAFT

REAR PROPELLER SHAFT

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Service Information

ADS000KK

Do not support the rear cover (aluminium), when supporting the gear carrier with a transmission jack.

On-Vehicle Service

ADS000KE

PROPELLER SHAFT VIBRATION

CAUTION:

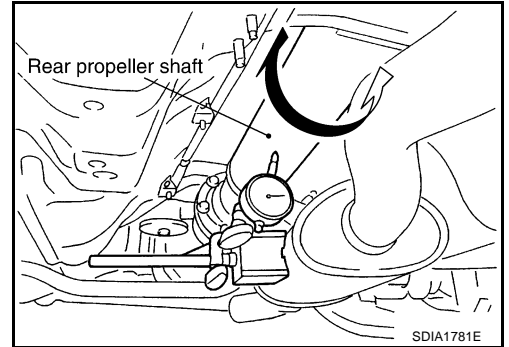
If vibration is present at high speed, check mounting between propeller shaft and companion flange.

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

1. Measure propeller shaft runout at several points by rotating final drive companion flange with your hands.

Propeller shaft runout limit : 0.6 mm (0.024 in) or less

2. If runout still exceeds specifications, disconnect propeller shaft at final drive companion flange: then rotate companion flange 90, 180, 270 degrees and reconnect propeller shaft.
3. Check runout again. If runout still exceeds specifications, replace propeller shaft assembly.
4. Perform driving test to check.
5. If the runout exceeds the service limit, do the following:
 - Remove the propeller shaft from the final drive companion flange.
 - Turn the propeller shaft 60, 120, 180, 240, 300 degrees and reinstall the propeller shaft to the companion flange, then measure the runout again.
 - If the runout still exceeds the service limit, replace the propeller shaft assembly.
 - Check the vibration by driving the vehicle.



APPEARANCE AND NOISE INSPECTION

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

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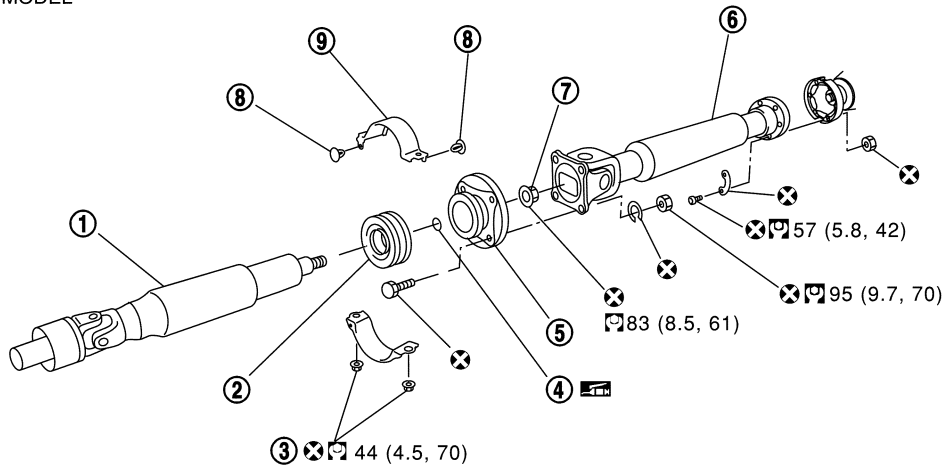
REAR PROPELLER SHAFT

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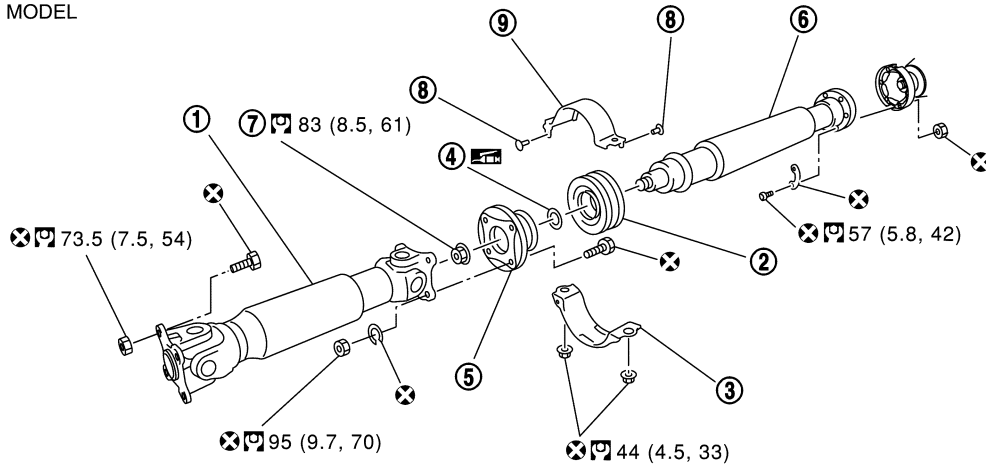
Removal and Installation

SEC.370

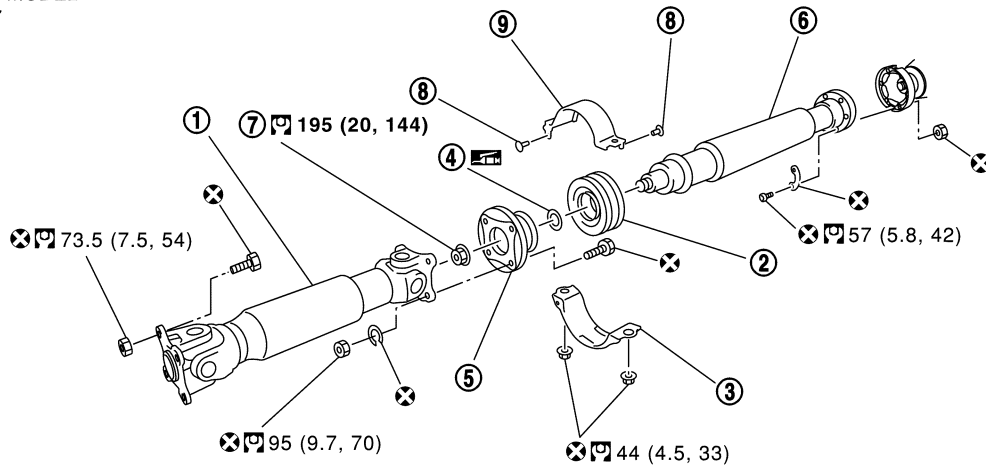
VQ35DE 2WD MODEL
3S80A-1VL107



VQ35DE AWD MODEL
3F80A-1VL107



VK45DE AWD MODEL
3F80A-1VL107



: N·m (kg-m,ft-lb)

: N·m (kg-m,in-lb)

: Always replase after every disassembly.

: Apply multi-purpose grease.

SDIA2047E

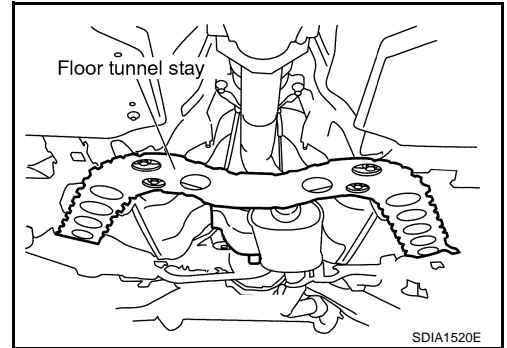
REAR PROPELLER SHAFT

- | | | |
|--------------------------------|----------------------------|--|
| 1. Propeller shaft (1st shaft) | 2. Center bearing assembly | 3. Center bearing mounting bracket (lower) |
| 4. Washer | 5. Center flange | 6. Propeller shaft (2nd shaft) |
| 7. Lock nut | 8. Clip | 9. Center bearing mounting bracket (upper) |

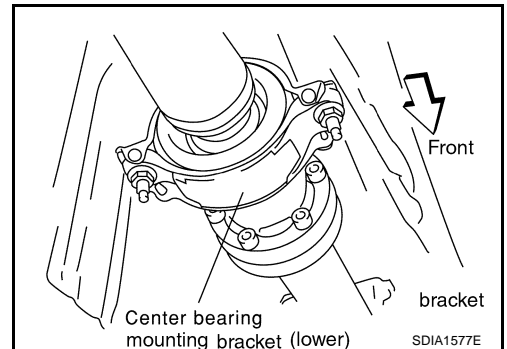
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REMOVAL

1. Move the A/T select lever to N position and release the parking brake.
2. Remove the tunnel stay with power tool. Refer to [RSU-5, "REAR SUSPENSION ASSEMBLY"](#).
3. Remove the center muffler with power tool. Refer to [EX-3, "EXHAUST SYSTEM"](#) for details.



4. Loosen the center bearing mounting bracket (lower) fixing nuts with power tool.

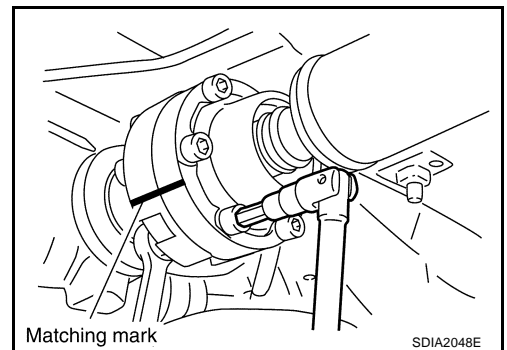


5. Put matching marks on flange and rear propeller shaft.

CAUTION:

For matching mark, use paint. Never damage the propeller shaft flange and companion flange on the rear final drive.

6. Remove the propeller shaft fixing bolts and nuts.
7. Remove the center bearing mounting bracket (lower) fixing nuts, remove the propeller shaft from the vehicle.



INSPECTION

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

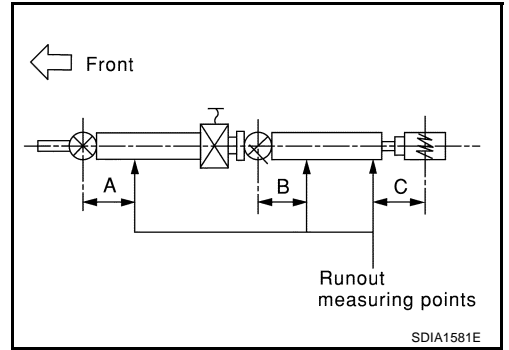
Propeller shaft runout limit : 0.6 mm (0.024 in) or less

REAR PROPELLER SHAFT

Propeller shaft runout measuring point (2WD models):

Unit: mm (in)

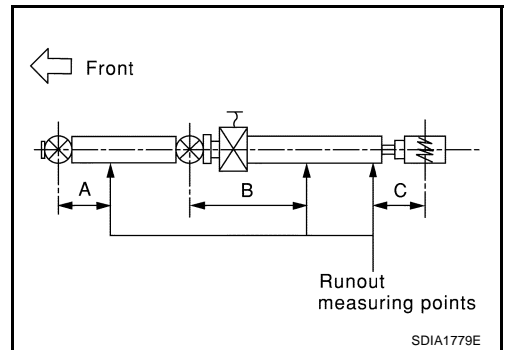
Distance	A	B	C
	192 (7.56)	190 (7.48)	185 (7.28)



Propeller shaft runout measuring point (AWD models):

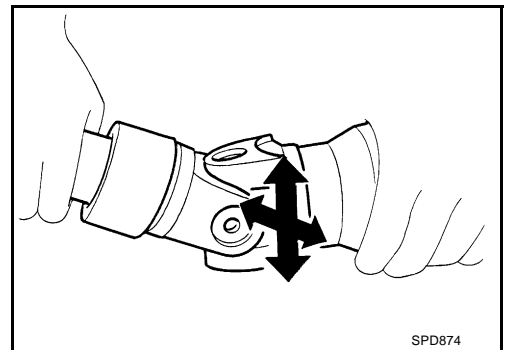
Unit: mm (in)

Distance	A	B	C
	162 (6.38)	245 (9.65)	185 (7.28)



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

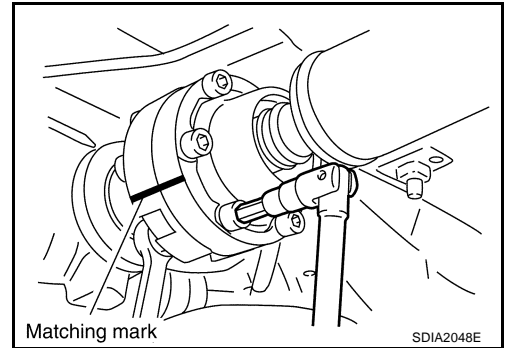
Journal axial play : 0 mm (0 in)



REAR PROPELLER SHAFT

INSTALLATION

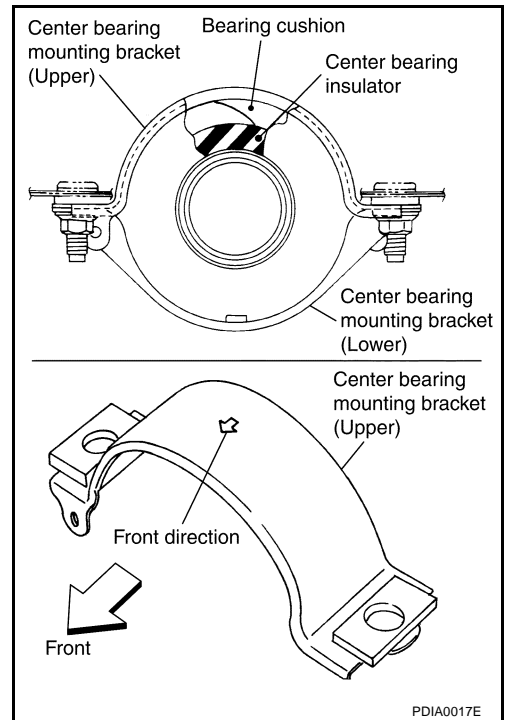
1. Paying attention to following items, install in the reverse order of removal.
 - a. Install the propeller shaft onto the rear final drive companion flange while aligning the matching marks that are marked during removal.



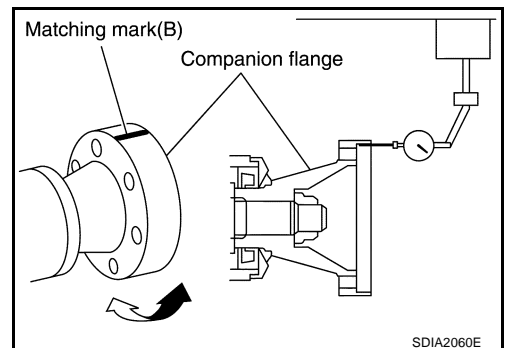
- b. Adjust position of the bearing cushion so as not to apply thrust play to the center bearing insulator.
 - c. Position the bearing cushion overlap as shown in the figure.
 - d. Install the center bearing bracket (upper) with its arrow mark facing forward.
 - e. Tighten the center bearing mounting bracket (upper) fixing nuts to specified torque.

CAUTION:

Do not reuse the nuts. Always replace the nuts with a new ones.



2. If companion flange has been removed, put new alignment matching mark B on it. Then, reassemble using the following procedure. Perform these steps when either of final drive and shaft is replaced with a new one.
 - a. Erase original mark B from companion flange with suitable solvent.
 - b. Measure companion flange vertical runout.
 - c. Determine the position where maximum runout is read on dial gauge. Put mark (shown by B in figure) on flange perimeter corresponding to maximum runout position.



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REAR PROPELLER SHAFT

3. If the propeller shaft or final drive has been replaced, connect the propeller shaft and final drive as follows:

NOTE:

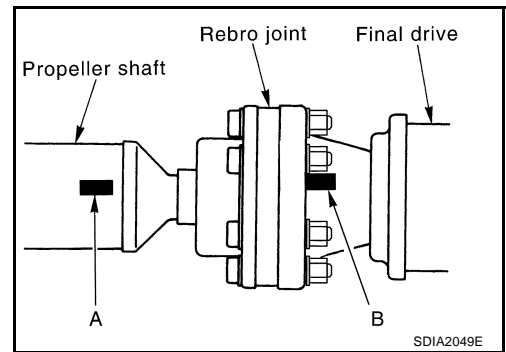
Avoid damaging the rebro joint boot, protect it with a shop towel or equivalent.

- Install the propeller shaft while aligning its matching mark A with the mark B on the joint as close as possible.
- Tighten the joint bolts/nuts to specified torque.

CAUTION:

Do not reuse the bolts, and washers. Always replace the them with new ones.

- After installation, check the vibration by driving the vehicle. If the vibration is present, remove the propeller shaft from the final drive companion flange.
- Turn the propeller shaft 60, 120, 180, 240 or 300 degrees and reinstall the propeller shaft to the companion flange, then measure the runout again by driving the vehicle on each angle position.



Disassembly and Assembly DISASSEMBLY

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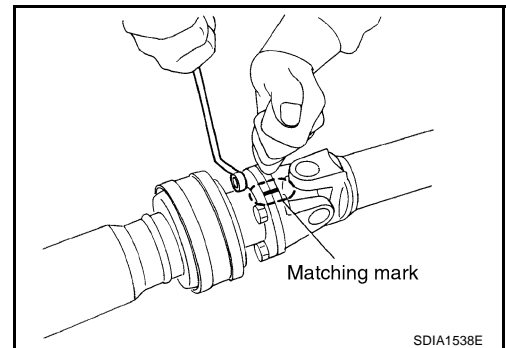
Center Bearing

NOTE:

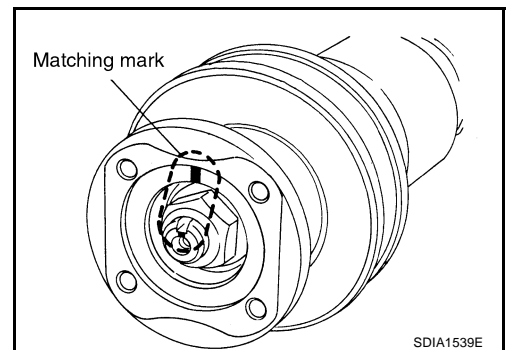
- The joint cannot be disassembled.
 - The center bearing can be disassembled.
1. Remove the propeller shaft assembly from the vehicle. Refer to [PR-9, "REMOVAL"](#).
 2. Put matching marks on propeller shaft and center flange, then disassemble the 1st and 2nd propeller shaft.

CAUTION:

For matching mark, use paint. Never damage the propeller shaft flange and center flange.



3. Put matching marks onto the center flange and propeller shaft end as shown.
4. Stake center flange lock nut with a punch (except 3F80A-1VL107- type/VK45DE, AWD).

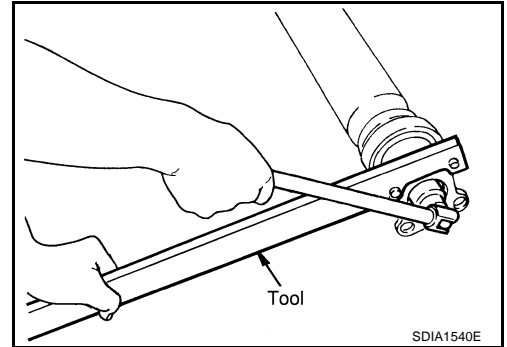


REAR PROPELLER SHAFT

5. Hold the center flange using a flange wrench, and remove the lock nut.

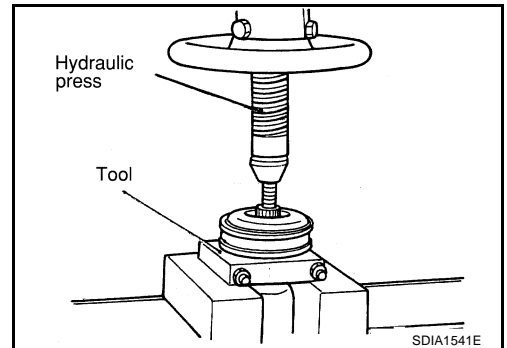
Tool number : KV40104000 (-)

6. Remove the center flange using a commercial available bearing puller.



7. Press out the center bearing using a puller and hydraulic press.

Tool number : ST30031000 (J22912-01)



ASSEMBLY

1. Apply multi-purpose grease to the each end of the center bearing and each face of the washer.
2. For the 3S80A-1VL107 (VQ35DE/2WD) and 3F80A-1VL107 (VK45DE/AWD) type, install the center bearing with its "F" mark facing the front of the vehicle.
For the 3F80A-1VL107(VQ35DE/AWD) type, install the center bearing with its "F" mark facing the rear of the vehicle.

3. Install the washer.

4. Install the center flange onto the propeller shaft with aligning the marks that are marked while removal.

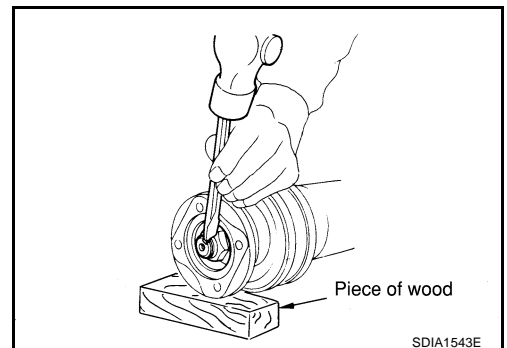
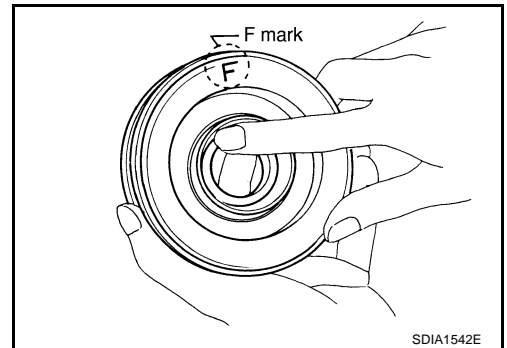
5. Install and tighten the new lock nut to specified torque using a torque wrench.

For the 3S80A-1VL107 (VQ35DE/2WD) and 3F80A-1VL107 (VQ35DE/AWD) type, tighten the lock nut to specified torque.

6. For the 3S80A-1VL107 (VQ35DE/2WD) and 3F80A-1VL107 (VQ35DE/AWD) type, place a piece of wood under the center flange, stake the lock nut against the propeller shaft groove.

CAUTION:

Do not use the lock nut. Always replace the lock nut with a new one.



7. Temporality tighten the lock nut to the following torque.

Loosen the lock nut, then retighten it to specified torque.

For 3F80A-1VL107 (VK45DE/AWD) type, tighten the lock nut to specified torque.

CAUTION:

Do not reuse the lock nut. Always replace the lock nut with a new one.

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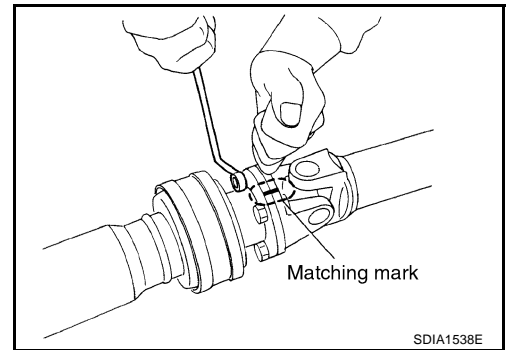
REAR PROPELLER SHAFT

8. Assemble the 1st and 2nd shaft propeller shafts while aligning the matching marks that are marked during removal.
9. Install and tighten the bolts/nuts and tighten them to specified torque.

CAUTION:

Do not reuse the bolts, nuts and washers. Always replace the them with new ones.

10. Recheck the tightening torque using a torque wrench.
11. Install the propeller shaft assembly. Refer to [PR-11, "INSTALLATION"](#) .



SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

General Specifications 2WD MODEL

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Applied model	VQ35DE
Propeller shaft model	3S80A-1VL107
Number of joints	3
Coupling method with transmission	Sleeve type

AWD MODEL

Applied model		VQ35DE	VK45DE
Front propeller shaft	Propeller shaft model	2S56A	
	Number of joints	2	
	Coupling method with front final drive	Flange type	
	Coupling method with transfer	Sleeve type	
Rear propeller shaft	Propeller shaft model	3F80A-1VL107	
	Number of joints	3	
	Coupling method with transfer	Flange type	

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Front Propeller Shaft JOURNAL AXIAL PLAY

ADS0000A

Model	2S56A
Yoke journal bearing axial play	0 mm (0 in)

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PROPELLER SHAFT RUNOUT LIMIT

Model	2S56A
Propeller shaft runout limit	0.6 mm (0.024 in) or less

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Rear Propeller Shaft JOURNAL AXIAL PLAY

ADS0000B

Model	3S80A-1VL107, 3F80A-1VL107
Yoke journal bearing thrust play	0 mm (0 in)

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PROPELLER SHAFT RUNOUT LIMIT

Model	3S80A-1VL107, 3F80A-1VL107
Propeller shaft runout limit	0.6 mm (0.024 in) or less

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SERVICE DATA AND SPECIFICATIONS (SDS)
