# **SECTION PROPELLER SHAFT**

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#### PREPARATION

#### PREPARATION

[2WD]

ADS0010A

#### **Special Service Tools**

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
ST38060002 (J-34311) Flange wrench		Removing and installing center flange lock nut
ST30031000 (J-22912-01) Puller a: 90 mm (3.54 in) dia. b: 50 mm (1.97 in) dia.	NT113	Remove rear propeller shaft center bearing
Commercial Service Tools		ADS0010B

Tool name		Description
Power tool	PBIC0190E	Loosening bolts and nuts

## NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING 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.

				-												_
Reference page		<u>PR-4</u>	<u>PR-7</u>	I	<u>PR-5</u>	I	<u>PR-4</u>	<u>PR-6</u>	NVH in RFD 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 PS section	B C PR E
Possible cause and SUSPECT		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	TIRES	ROAD WHEEL	DRIVE SHAFT	BRAKES	STEERING	G H J K L
	Noise	×	×	×	×	×	×	×	×	×	×	×	×	×	×	M
Symptom	Shake Vibration	~	×	~	~	×	~	~		×	×	×	×	×	×	
	VIDIALION	×	×	×	×	×	×	×		×	×		×		×	

×: Applicable

#### **REAR PROPELLER SHAFT**

#### On-Vehicle Inspection APPEARANCE AND NOISE INSPECTION

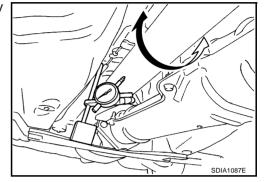
- Check the propeller shaft tube surface for dents or cracks. If damaged, replace propeller shaft assembly.
- If center bearing is noisy or damaged, replace center bearing.

#### **PROPELLER SHAFT VIBRATION**

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

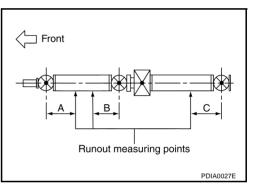
1. Measure propeller shaft runout at runout measuring points by rotating final drive companion flange with hands.

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



#### Propeller shaft runout measuring points Dimension A: 192 mm (7.56 in) B: 172 mm (6.77 in) C: 170 mm (6.69 in)

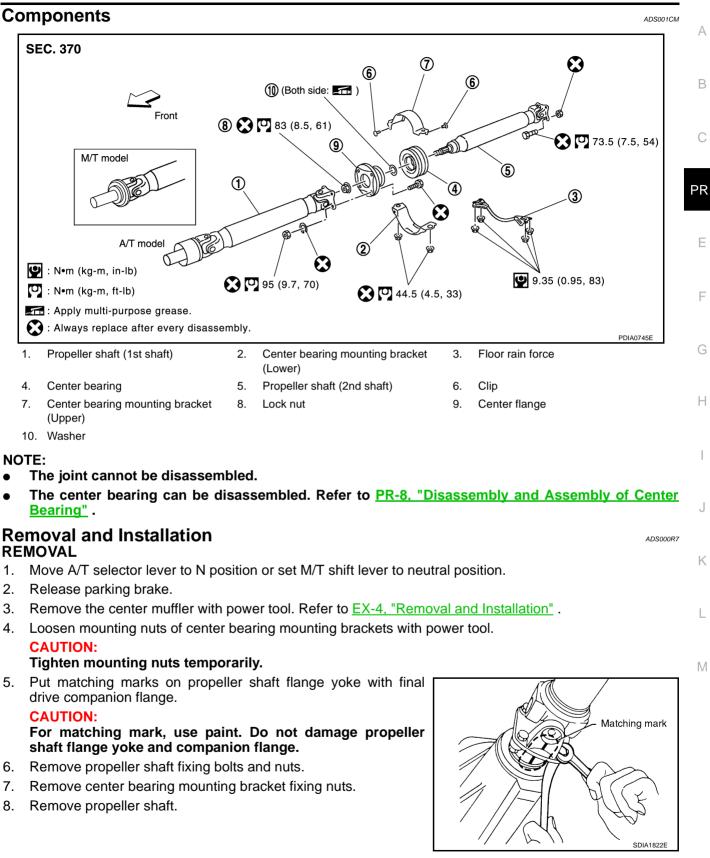
- 2. If runout still exceeds specifications, separate propeller shaft at final drive companion flange; then rotate companion flange 90, 180, 270 degrees and install propeller shaft.
- 3. Check runout again. If runout still exceeds specifications, replace propeller shaft assembly.
- 4. Check the vibration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



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#### Components



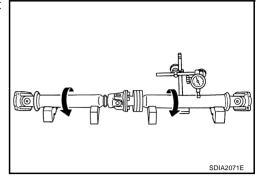


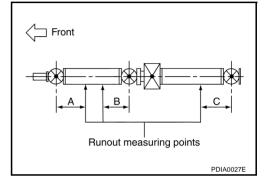
#### INSPECTION

• Inspect propeller shaft runout at measuring points. If runout exceeds specifications, replace propeller shaft assembly.

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

A: 192 mm (7.56 in) B: 172 mm (6.77 in) C: 170 mm (6.69 in)





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

#### Journal axial play : 0 mm (0 in)

Propeller shaft runout measuring points

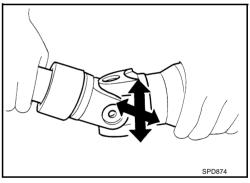
• Check propeller shaft for bend and damage. If damage is detected, replace relevant propeller shaft.

#### CAUTION:

#### Do not disassemble joints.

Dimension

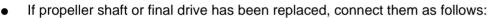
 Check center bearing for noise and damage. If noise or damage is detected, replace center bearing. Refer to <u>PR-8</u>, "Disassembly and Assembly of Center Bearing".



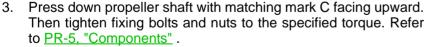
#### INSTALLATION

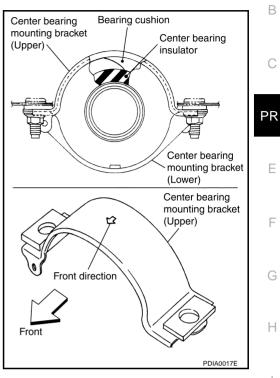
Note the following, and install in the reverse order of removal.

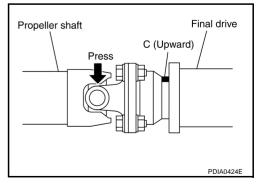
- Align matching marks to install propeller shaft to final drive companion flange, and then tighten to specified torque. Refer to <u>PR-5</u>, "Components".
- Install center bearing mounting bracket (Upper) with its arrow mark facing forward.
- Adjust position of mounting bracket sliding back and forth to prevent play in thrust direction of center bearing insulator. Install bracket to vehicle.
- After assembly, perform a driving test to check propeller shaft vibration. If vibration occurred, separate propeller shaft from final drive. Reinstall companion flange after rotating it by 90, 180, 270 degrees. Then perform driving test and check propeller shaft vibration again at each point.

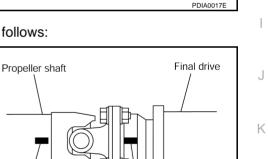


- 1. Install propeller shaft while aligning its matching mark A with the matching mark B on the joint as close as possible.
- 2. Temporarily tighten bolts and nuts.









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# Disassembly and Assembly of Center Bearing DISASSEMBLY

1. Put matching marks on propeller shaft and center flange, then disassemble the 1st and 2nd propeller shaft.

#### CAUTION:

For matching mark, use paint. Do not damage the propeller shaft flange and center flange.

2. Put matching marks onto the center flange and propeller shaft end as shown.

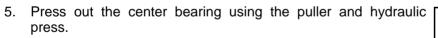
#### CAUTION:

For matching mark, use paint. Do not damage propeller shaft end and center flange.

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

#### Tool number : ST38060002 (J-34311)

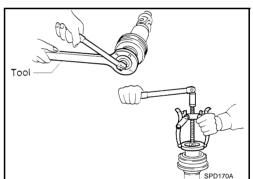
4. Remove the center flange using a commercial available bearing puller then remove washer.



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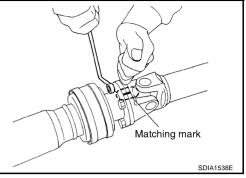


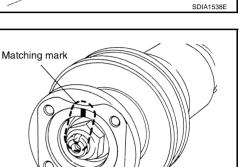




Hydraulic press

Tool





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SDIA1539E

#### ASSEMBLY

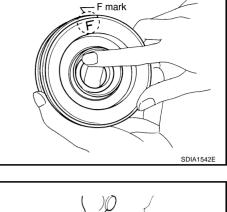
- 1. Install the center bearing with its "F" mark facing the rear of the vehicle.
- 2. Apply multi-purpose grease to the each face of the washer, then install washer.
- 3. Install the center flange onto the propeller shaft with aligning the marks that are marked while removal.
- Install and tighten the lock nut to specified torque. Refer to <u>PR-5</u>, <u>"Components"</u>.
   CAUTION:

Do not use the lock nut.

5. Place a piece of wood under the center flange, stake the lock nut against the propeller shaft groove.

- 6. Assemble the 1st and 2nd shaft propeller shafts while aligning the matching marks that are marked during removal.
- Install and tighten the bolts/nuts and tighten them to specified torque. Refer to <u>PR-5</u>, "Components".
  CAUTION:

Do not reuse the bolts, nuts and washers.



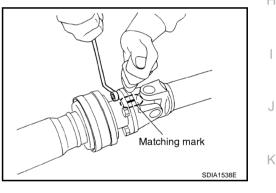
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#### SERVICE DATA AND SPECIFICATIONS (SDS)

## SERVICE DATA AND SPECIFICATIONS (SDS) General Specifications

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[2WD]

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		VQ35DE							
Applied model		M/T	A/T						
Propeller shaft model		3S	80A						
Number of joints			3						
Coupling method with transmis	sion	Sleev	re type						
Chaft langth	1st (Spider to spider)	619 mm (24.37 in)	581 mm (22.87 in)						
Shaft length	2nd (Spider to spider)	902 mm (35.51 in)							
Ohaff autor lienator		82.6 mm (3.25 in)							
Shaft outer diameter	2nd	82.6 mm (3.25 in)							
Journal Axal Play			ADS001CO						
Model		3S80A							
Journal axial play		0 mm (0 in)							
Propeller Shaft Rur	nout		ADS001CP						
Model		3S80A							
Propeller shaft runout limit		0.6 mm (0.024 in) or less							

#### PREPARATION

#### [AWD]

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illustrated here.
Description
Removing and installing center flange lock nut
Removing rear propeller shaft center bearing
ADS001CR
Description
Loosening bolts and nuts

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#### NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING 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.

										uc	•				
	Front	<u>PR-13</u>	I	I	I	I	<u>PR-13</u>	<u>PR-15</u>	section	ou, and RSU section					
Reference page	Rear	<u>PR-16</u>	<u>PR-19</u>	I	<u>PR-17</u>	I	<u>PR-16</u>	<u>PR-18</u>	NVH in FFD and RFD 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 PS section
Possible cause and SUSPECT		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	TIRES	ROAD WHEEL	DRIVE SHAFT	BRAKES	STEERING
	Noise	×	×	×	×	×	×	×	×	×	×	×	×	×	×
Symptom	Shake		×			×				×	×	×	×	×	×
	Vibration	×	×	×	×	×	×	×		×	×		×		×

×: Applicable

#### FRONT PROPELLER SHAFT

#### FRONT PROPELLER SHAFT

### On-Vehicle Inspection

#### APPEARANCE AND NOISE INSPECTION

• Check the propeller shaft tube surface for dents or cracks. If damaged, replace propeller shaft assembly.

#### **PROPELLER SHAFT VIBRATION**

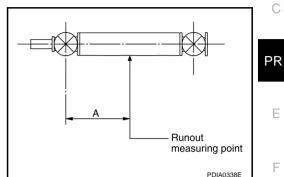
If vibration is present at high speed, inspect propeller shaft runout first.

1. Measure propeller shaft runout at runout measuring point by rotating final drive companion flange with hands.

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

#### Propeller shaft runout measuring point Dimension A: 381.5 mm (15.01 in)

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



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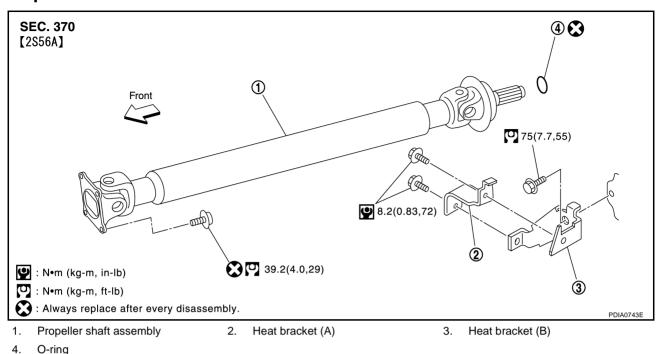
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#### Components



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ADS001CV



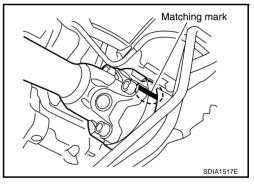
#### Removal and Installation REMOVAL

- 1. Remove the engine undercover with a power tool.
- 2. Remove three way catalyst (right bank) with power tool. Refer to EM-27, "Removal and Installation" .
- 3. Put matching marks onto propeller shaft flange yoke and final drive companion flange.

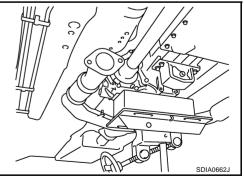
#### **CAUTION:**

## For matching mark, use paint. Do not damage propeller shaft flange and companion flange.

4. Remove the propeller shaft fixing bolts.



Set the transmission jack at the transfer, remove rear engine mounting bolts, and then lower transmission jack about 40-50 mm (0.16 - 0.21 in).
 Remove propeller shaft from the front final drive and transfer.



#### INSPECTION

• Inspect propeller shaft runout at measuring point. If runout exceeds specifications, replace propeller shaft assembly.

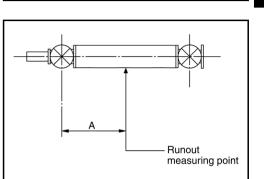
Propeller shaft runout limit : 0.6 mm (0.024 in) or less

A: 381.5 mm (15.01 in)

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 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)

Propeller shaft runout measuring point

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

CAUTION:

Do not disassemble joints.

**Dimension** 

#### INSTALLATION

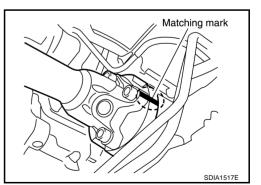
Note the following, install in the reverse order of removal.

 Align matching marks to install propeller shaft to final drive companion flange, and then tighten to specified torque. Refer to <u>PR-</u> <u>14, "Components"</u>.

CAUTION:

#### Do not reuse the bolts.

 After assembly, perform a driving test to check propeller shaft vibration. If vibration occurred, separate propeller shaft from final drive or transfer. Reinstall companion flange after rotating it by 90, 180, 270 degrees. Then perform driving test and check propeller shaft vibration again at each point.



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#### On-Vehicle Inspection APPEARANCE AND NOISE INSPECTION

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

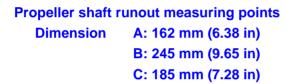
#### **PROPELLER SHAFT VIBRATION**

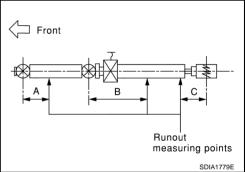
If vibration is present at high speed, inspect propeller shaft runout first.

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

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

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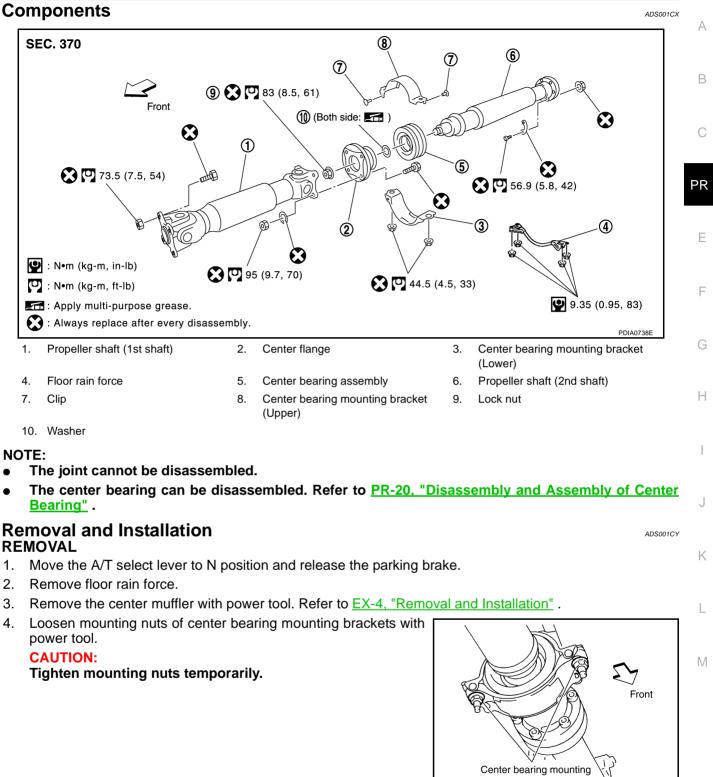


- 2. If runout still exceeds specifications, separate propeller shaft at final drive companion flange; then rotate companion flange 60, 120, 180, 240, 300 degrees and install propeller shaft.
- 3. Check runout again. If runout still exceeds specifications, replace propeller shaft assembly.
- 4. Check the vibration by driving vehicle.

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#### **Components**

#### [AWD]



PDIA0402E

bracket fixing nut

5. Put matching marks on propeller shaft flange yoke with transfer companion flange and on rebro joint with final drive companion flange.

#### CAUTION:

For matching mark, use paint. Do not damage propeller shaft flange yoke, rebro joint and companion flanges.

- 6. Remove propeller shaft fixing bolts and nuts.
- 7. Remove center bearing mounting bracket fixing nuts.
- 8. Remove propeller shaft.

#### **CAUTION:**

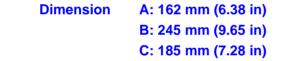
If constant velocity joint was bent during propeller shaft

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.

#### **INSPECTION**

• Inspect propeller shaft runout at measuring points. If runout exceeds specifications, replace propeller shaft assembly.

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



Propeller shaft runout measuring points

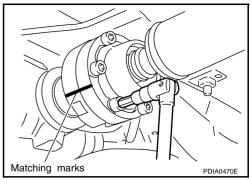
 As shown in the figure, while fixing yoke on one side, check axial play of joint. If outside the standard, replace relevant propeller shaft.

#### Journal axial play : 0 mm (0 in)

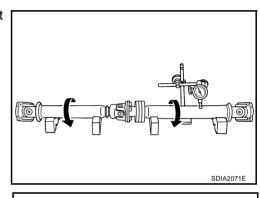
• Check propeller shaft for bend and damage. If damage is detected, replace relevant propeller shaft.

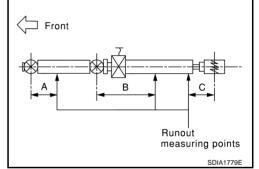
#### CAUTION:

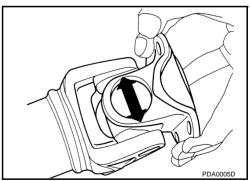
- Do not disassemble joints.
- Check center bearing for noise and damage. If noise or damage is detected, replace center bearing. Refer to <u>PR-20, "Disassembly and Assembly of Center Bearing"</u>.



[AWD]







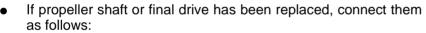
#### INSTALLATION

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

#### **CAUTION:**

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

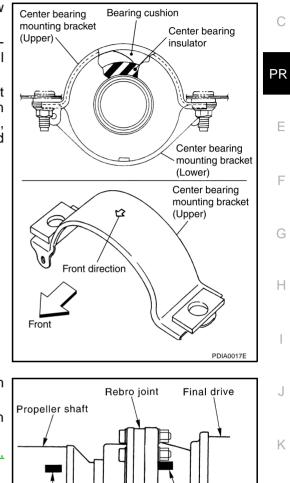
- Align matching marks to install propeller shaft to final drive and transfer companion flanges, and then tighten to specified torque. Refer to <u>PR-17, "Components"</u>.
- Install center bearing mounting bracket (Upper) with its arrow mark facing forward.
- Adjust position of mounting bracket sliding back and forth to prevent play in thrust direction of center bearing insulator. Install bracket to vehicle.
- After assembly, perform a driving test to check propeller shaft vibration. If vibration occurred, separate propeller shaft from final drive. Reinstall companion flange after rotating it by 60, 120, 180, 240, 300 degrees. Then perform driving test and check propeller shaft vibration again at each point.



- 1. Install the propeller shaft while aligning its matching mark A with the matching mark B on the joint as close as possible.
- 2. Tighten the joint bolts to the specified torque. Refer to <u>PR-17</u>, <u>"Components"</u>.

#### **CAUTION:**

Do not reuse the bolts, nuts and washers.



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#### **Disassembly and Assembly of Center Bearing** DISASSEMBLÝ

1. Put matching marks on propeller shaft and center flange, then disassemble the 1st and 2nd propeller shaft.

#### CAUTION:

For matching mark, use paint. Do not damage the propeller shaft flange and center flange.

2. Put matching marks onto the center flange and propeller shaft end as shown.

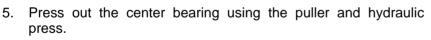
#### **CAUTION:**

For matching mark, use paint. Do not damage propeller shaft end and center flange.

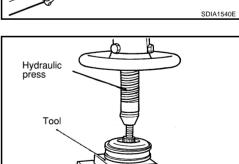
3. Hold the center flange using the flange wrench, and remove the lock nut.

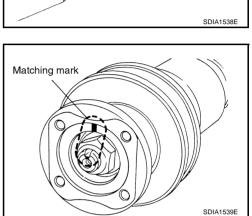
#### : KV40104000 ( — ) **Tool number**

4. Remove the center flange using a commercial available bearing puller then remove washer.

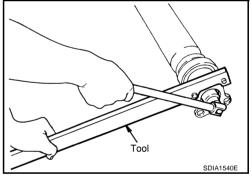


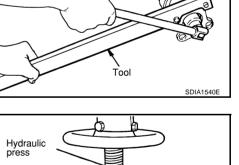
**Tool number** : ST30031000 (J-22912-01)





Matching mark





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[AWD]

#### ASSEMBLY

- 1. Install the center bearing with its "F" mark facing the rear of the vehicle.
- 2. Apply multi-purpose grease to the each face of the washer, then install washer.
- 3. Install the center flange onto the propeller shaft with aligning the marks that are marked while removal.
- Install and tighten the lock nut to specified torque. Refer to <u>PR-17, "Components"</u>.

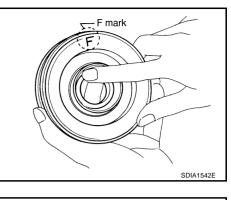
#### CAUTION:

Do not use the lock nut.

5. Place a piece of wood under the center flange, stake the lock nut against the propeller shaft groove.

- 6. Assemble the 1st and 2nd shaft propeller shafts while aligning the matching marks that are marked during removal.
- Install and tighten the bolts/nuts and tighten them to specified torque. Refer to <u>PR-17</u>, "Components".
  CAUTION:

Do not reuse the bolts, nuts and washers.

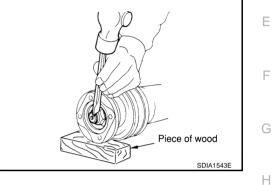


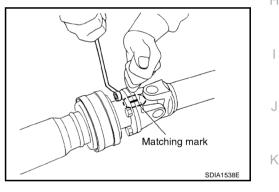
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#### SERVICE DATA AND SPECIFICATIONS (SDS)

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#### **General Specifications**

PFP:00030

[AWD]

ADS001D0

ADS001D1

ADS001D2

Applied	d model		VQ35DE				
Front	Propeller shaft	model	2S56A				
	Number of join	ts	2				
	Coupling meth	od with transfer	Sleeve type				
	Coupling meth	od with front final drive	Flange type				
	Shaft length (S	pider to spider)	763 mm (30.04 in)				
	Shaft outer dia	meter	42.7 mm (1.68 in)				
Rear	Propeller shaft	model	3F80A-1VL107				
	Number of join	ts	3				
	Coupling method with transfer		Flange type				
	Coupling method with rear final drive		Rebro joint type				
	1st (Spider to spider)		399 mm (15.71 in)				
	Shaft length 2nd (Spider to rebro joint center)		753 mm (29.65 in)				
	Shaft outer	1st	82.6 mm (3.25 in)				
	diameter	2nd	82.6 mm (3.25 in)				

#### **Journal Axal Play**

Model	Front propeller shaft	Rear propeller shaft	
	2S56A	3F80A-1VL107	
Journal axial play	0 mm	0 mm (0 in)	

#### Propeller Shaft Runout

Model	Front propeller shaft	Rear propeller shaft
	2S56A	3F80A-1VL107
Propeller shaft runout limit	0.6 mm (0.024 in) or less	