

PROPELLER SHAFT

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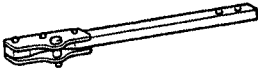
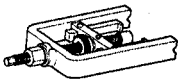
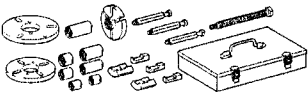
PRECAUTION

Be careful not to grip the propeller shaft tube too tightly in a vise as this will cause deformation. PROOT-05

PREPARATION

SST (SPECIAL SERVICE TOOLS)

PROOU-00

	09325-20010 Transmission Oil Plug	2-joint type: Transmission oil leakage prevention
	09325-40010 Transmission Oil Plug	3-joint type: Transmission oil leakage prevention
	09330-00021 Companion Flange Holding Tool	Flange removal and installation
	09332-25010 Universal Joint Bearing Remover & Replacer	Spider bearing replacement
	09950-30010 Puller A Set	Flange removal
	(09951-03010) Upper Plate	
	(09953-03010) Center Bolt	
	(09954-03010) Arm	
	(09955-03030) Lower Plate 130	
	(09956-03020) Adapter 18	

PROOV-08

EQUIPMENT

Dial indecator	
Torque wrench	

TROUBLESHOOTING

Use the table below to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace these parts.

PRO04-08

See Page	PR-8	PR-8	PR-7	PR-7	PR-8	PR-8	
Parts Name	Sleeve yoke spline worn	Center bearing worn	Propeller shaft runout	Propeller shaft imbalance	Sleeve yoke spline stuck	Spider bearing worn or stuck	Transmission extension housing rear bushing worn
Trouble							
Noise	2	1				3	
Vibration			3	4	2		1

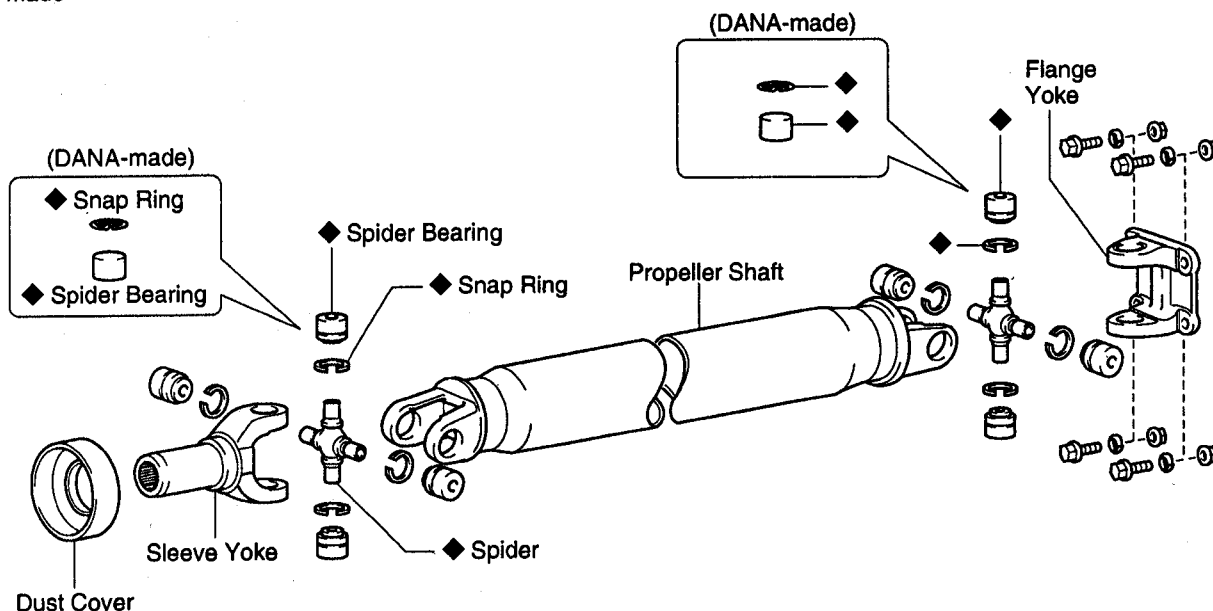
PR

V04454

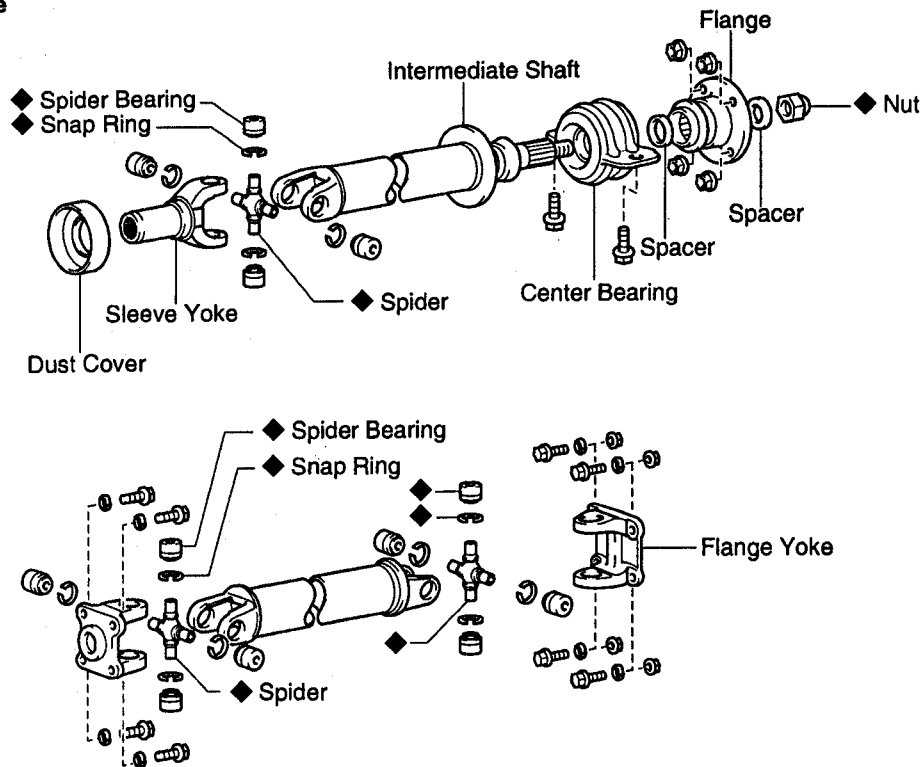
PROPELLER SHAFT COMPONENTS

PR020-08

[2WD]
2-Joint Type
TMC-made



3-Joint Type



007222

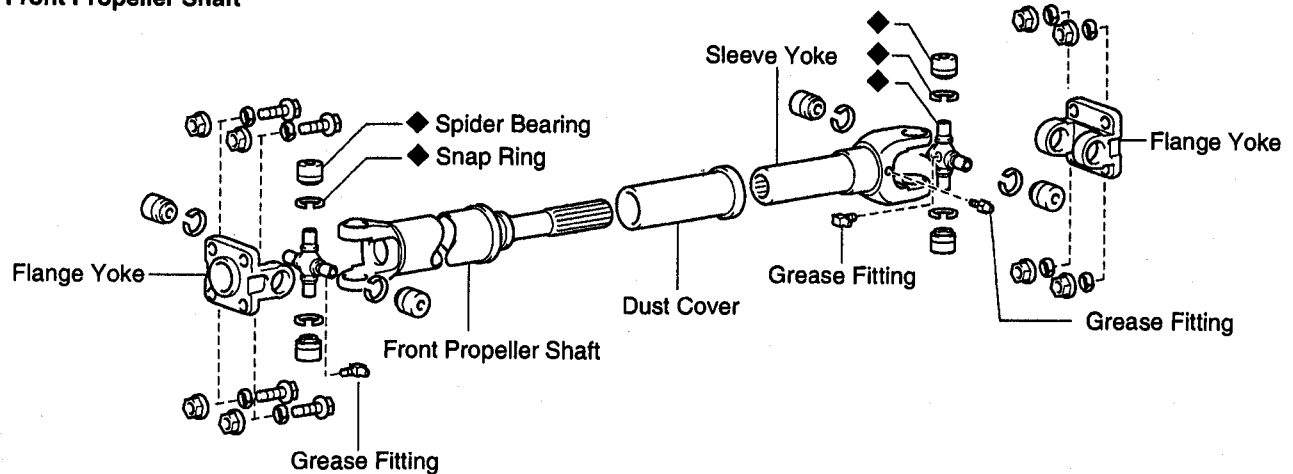
◆ Non-reusable part

Y

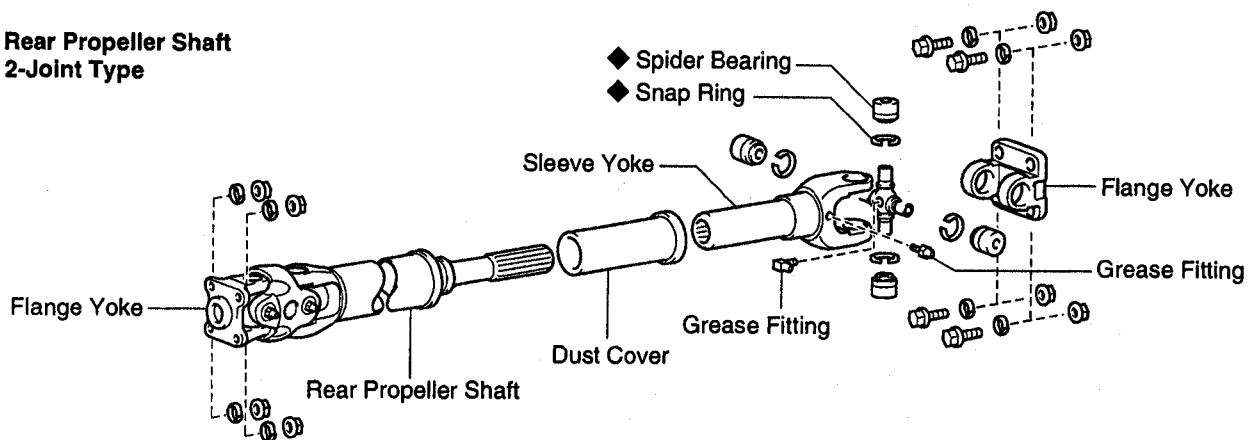
Z16692

[4WD]

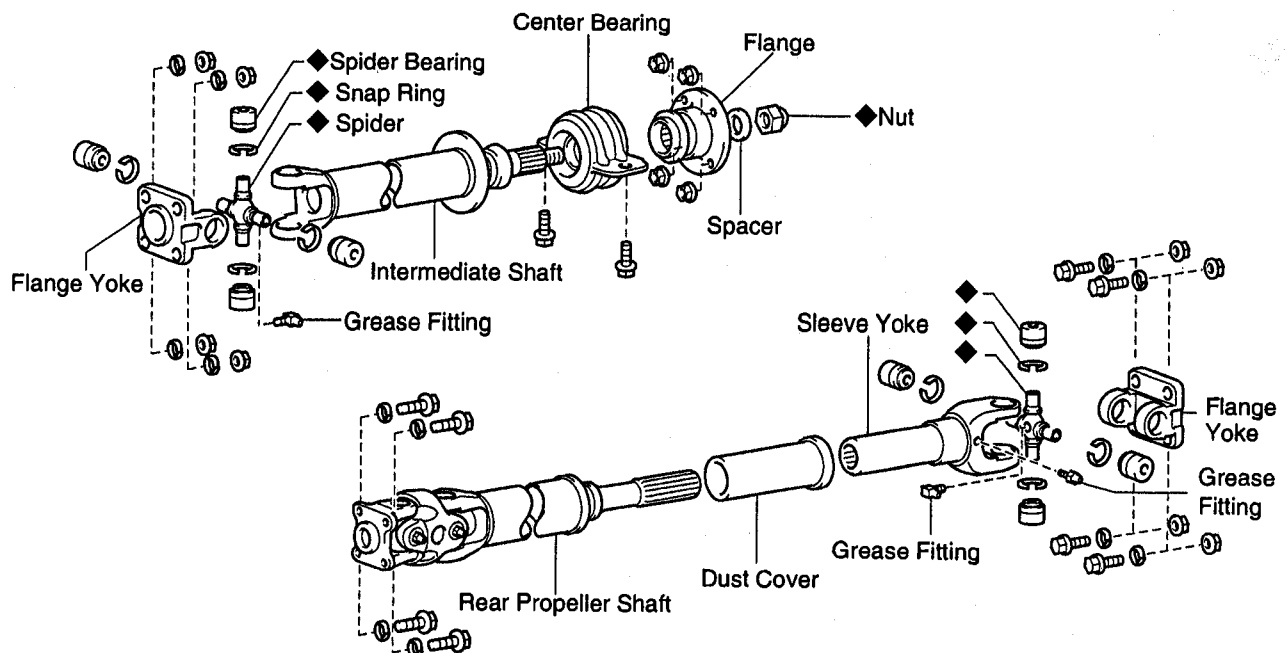
Front Propeller Shaft



Rear Propeller Shaft
2-Joint Type

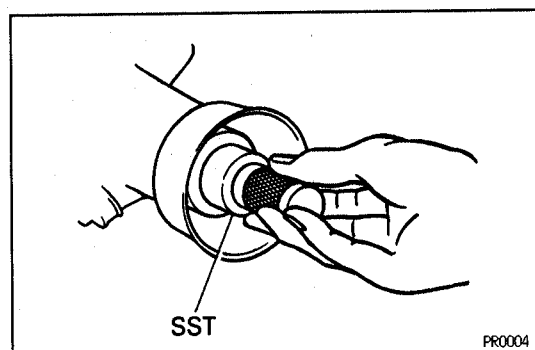
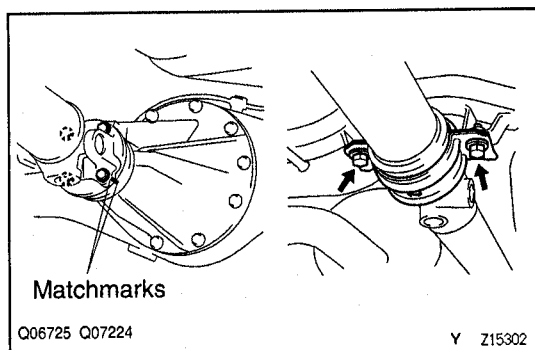


3-Joint Type



007223

◆ Non-reusable part



PROPELLER SHAFT REMOVAL

2WD:

REMOVE PROPELLER SHAFT

- (a) Place matchmarks on the propeller shaft and differential flanges.
- (b) Remove the 4 nuts, bolts and washers.
Torque: 74 N·m (750 kgf·cm, 54 ft·lbf)
- (c) 3-joint type:
Remove the 2 bolts and center support bearing from the frame crossmember.
Torque: 36 N·m (370 kgf·cm, 27 ft·lbf)
- (d) Pull the yoke from the transmission.
- (e) Insert SST in the transmission to prevent oil leakage.
SST 09325-20010 (2-joint type)
09325-40010 (3-joint type)

PROPELLER SHAFT REMOVAL

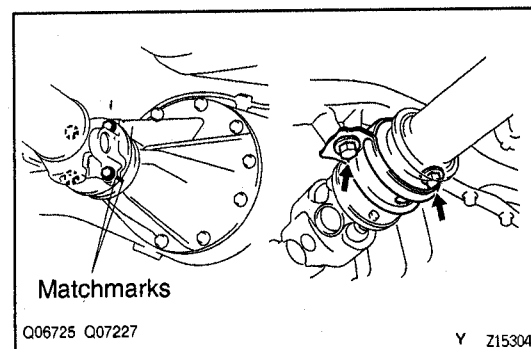
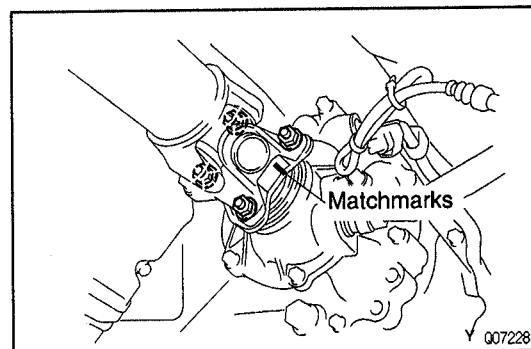
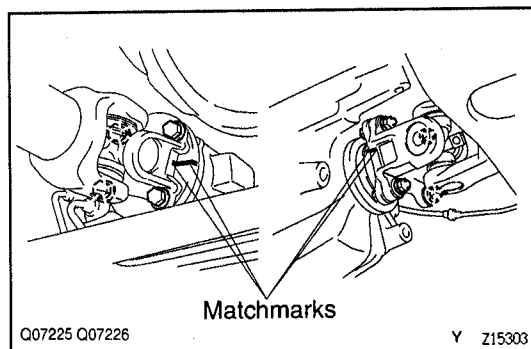
4WD:

1. REMOVE FRONT PROPELLER SHAFT

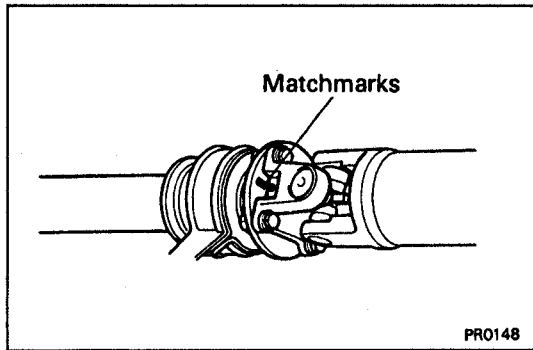
- (a) Place matchmarks on the propeller shaft and differential flanges.
- (b) Remove the 4 nuts, bolts and washers.
Torque: 74 N·m (750 kgf·cm, 54 ft·lbf)
- (c) Suspend the front side of the propeller shaft.
- (d) Place matchmarks on the propeller shaft and transfer flanges.
- (e) Remove the 4 nuts and washers.
Torque: 74 N·m (750 kgf·cm, 54 ft·lbf)
- (f) Remove the front propeller shaft.

2. REMOVE REAR PROPELLER SHAFT

- (a) Place matchmarks on the propeller shaft and transfer flanges.
- (b) Remove the 4 nuts and washers.
Torque: 74 N·m (750 kgf·cm, 54 ft·lbf)
- (c) Place matchmarks on the propeller shaft and differential flanges.
- (d) Remove the 4 nuts, bolts and washers.
Torque: 74 N·m (750 kgf·cm, 54 ft·lbf)
- (e) 3-joint type:
Remove the 2 bolts and center support bearing from the frame crossmember.
Torque: 36 N·m (370 kgf·cm, 27 ft·lbf)
- (f) Remove the rear propeller shaft.

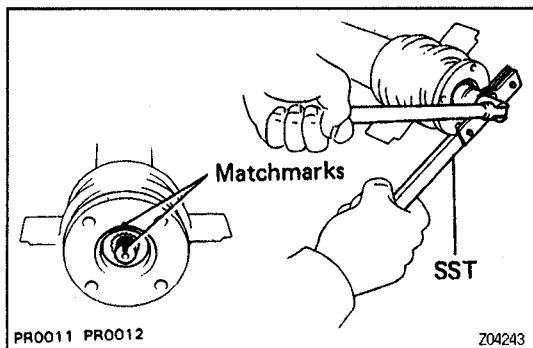


PROPELLER SHAFT DISASSEMBLY



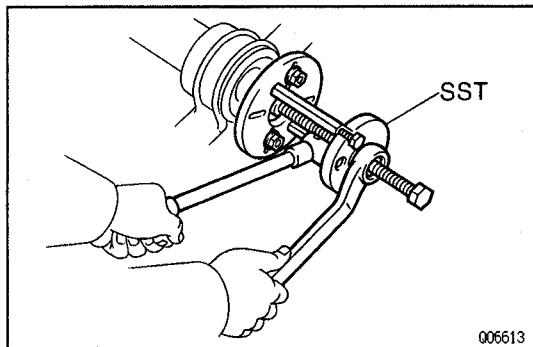
1. SEPARATE PROPELLER SHAFT AND INTERMEDIATE SHAFT

- Place matchmarks on the flanges.
- Remove the 4 nuts, bolts and washers.



2. REMOVE CENTER SUPPORT BEARING FROM INTERMEDIATE SHAFT

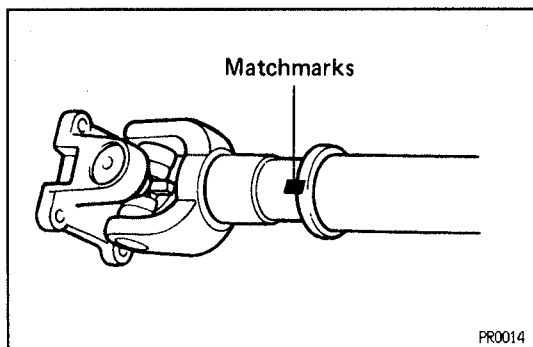
- Using a chisel and hammer, loosen the staked part of the nut.
- Using SST to hold the flange, remove the nut. SST 09930-00021
- Place matchmarks on the flange and shaft.



- Using SST, remove the flange from the intermediate shaft.

SST 09950-30010 (09951-03010, 09953-03010, 09954-03010, 09955-03030, 09956-03020)

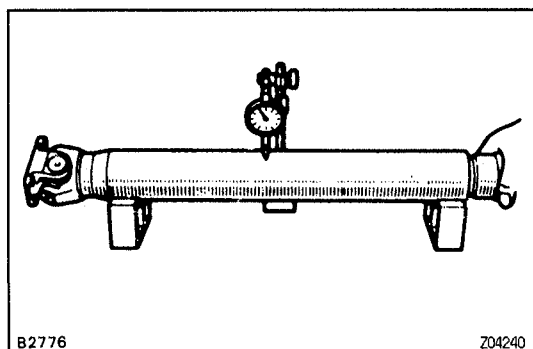
PR



3. 4WD:

REMOVE SLEEVE YOKE FROM PROPELLER SHAFT

- Place matchmarks on the sleeve yoke and shaft.
- Pull out the sleeve yoke from the shaft.
- Remove the dust cover from the shaft.



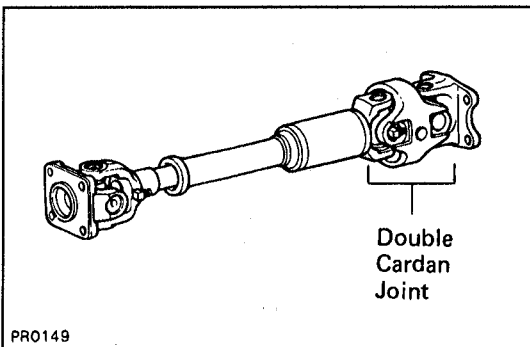
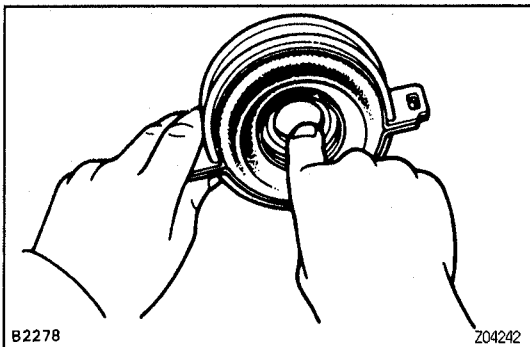
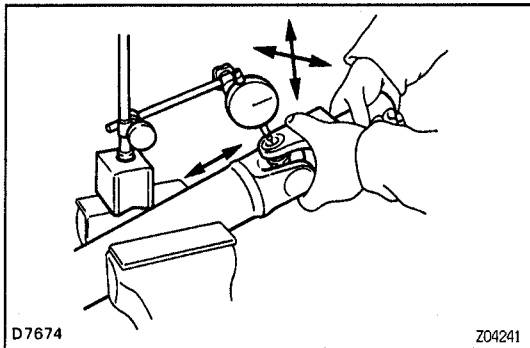
PROPELLER SHAFT INSPECTION

1. INSPECT PROPELLER SHAFT AND INTERMEDIATE SHAFTS FOR DAMAGE OR RUNOUT

Using a dial indicator, check the runout of shafts.

Maximum runout: 0.8 mm (0.031 in.)

If shaft runout is greater than maximum, replace the shaft.



2. INSPECT SPIDER BEARINGS

- Inspect the spider bearings for wear or damage.
- Using a dial indicator, check the spider bearing axial play by turning the yoke while holding the shaft tightly.

Bearing axial play:

w/o double cardan joint propeller shaft

Maximum 0.05 mm (0.0020 in.)

If necessary, replace the spider bearing.

Bearing axial play:

w/ double cardan joint propeller shaft

Maximum 0.05 mm (0.0020 in.)

If necessary, replace the propeller shaft.

3. INSPECT CENTER SUPPORT BEARING FOR WEAR OR DAMAGE

- Check that the bearing turns freely.

If the bearing is damaged, worn, or does not turn freely, replace it.

4. INSPECT WITH DOUBLE CARDAN JOINT PROPELLER SHAFT

HINT: Double cardan joint is used on 4WD rear propeller shafts.

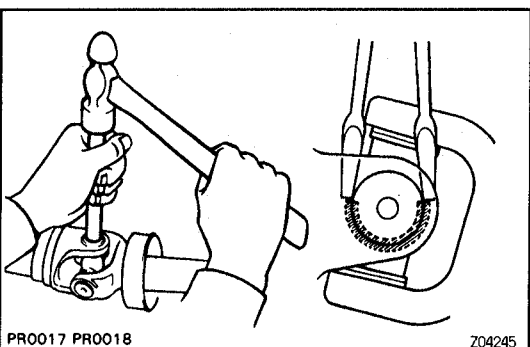
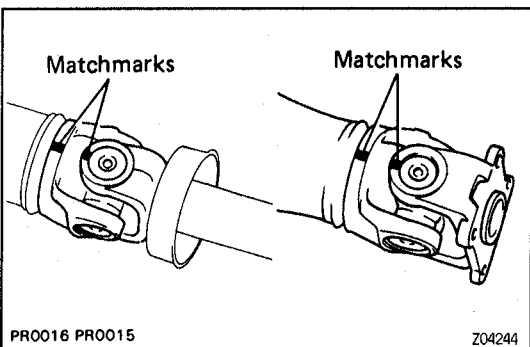
- Inspect the shaft for wear or damage.
- Inspect the double cardan joint for wear or damage.

If any problem is found, replace the propeller shaft assembly.

SPIDER BEARING REPLACEMENT

PROEL-02

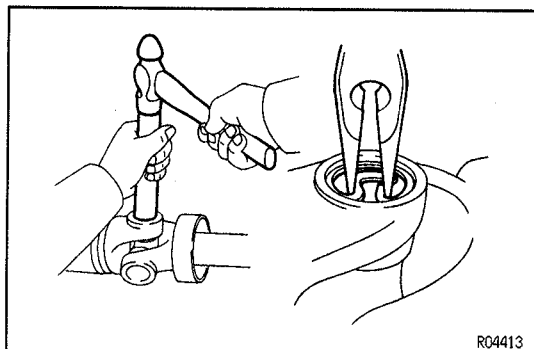
1. PLACE MATCHMARKS ON SHAFT AND YOKE



2. REMOVE SNAP RINGS

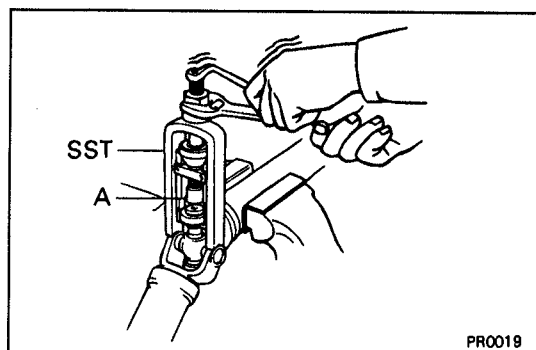
TMC—made:

- Using a brass bar and hammer, slightly tap in the bearing outer races.
- Using 2 screwdrivers, remove the 4 snap rings from the grooves.



DANA — made:

- (a) Using a brass bar and hammer, slightly tap in the bearing outer races.
- (b) Using pliers, remove the 4 snap rings from the grooves.



3. REMOVE SPIDER BEARINGS

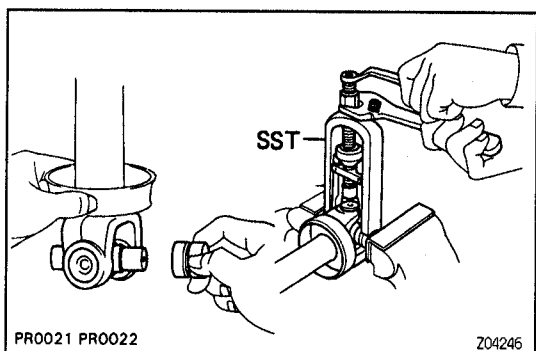
- (a) Using SST, push out the bearing from the propeller shaft.

SST 09332-25010

HINT: Sufficiently raise the part indicated by A so that it does not come into contact with the bearing.

- (b) Clamp the bearing outer race in a vise and tap off the propeller shaft with a hammer.

HINT: Remove the bearing on opposite side in the same procedure.



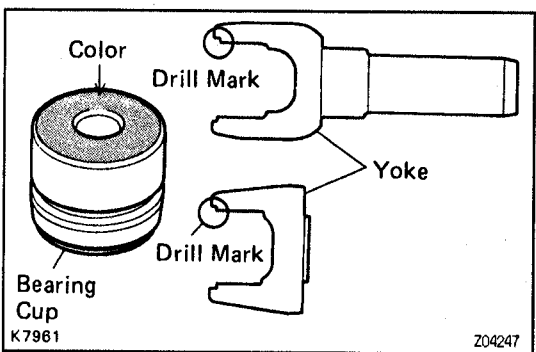
- (c) Install the 2 removed bearing outer races to the spider.

- (d) Using SST, push out the bearing from the yoke.

SST 09332-25010

- (e) Clamp the outer bearing race in a vise and tap off the yoke with a hammer.

HINT: Remove the bearing on the opposite side in the same procedure.



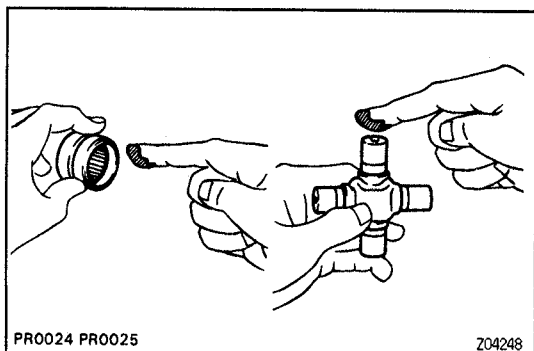
4. SELECT SPIDER BEARING

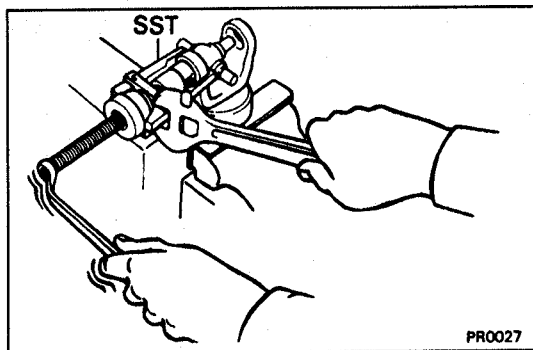
Select the bearing according to whether or not there is a drill mark on the yoke section.

Yoke	Bearing
With drill mark	With color mark (Red)
No drill mark	No color mark

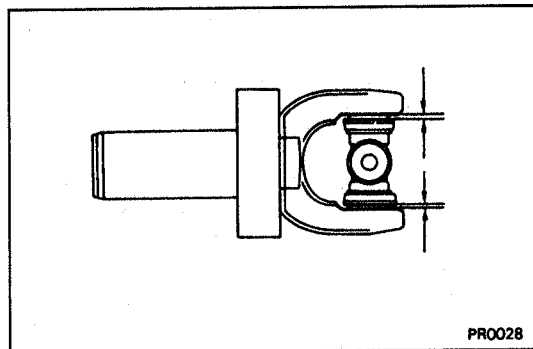
5. INSTALL SPIDER BEARINGS

- (a) Apply MP grease to a new spider and bearings.
NOTICE: Be careful not to apply too much grease.
- (b) Align the matchmarks on the yoke and shaft.





- (c) Fit the spider into the yoke.
 (d) Using SST, install new bearings on the spider.
 SST 09332-25010



- (e) Using SST, adjust both bearings so that the snap ring grooves are at maximum and equal widths.

6. INSTALL SNAP RINGS

- (a) Install 2 new snap rings of equal thickness which will allow 0–0.05 mm (0–0.0020 in.) axial play.

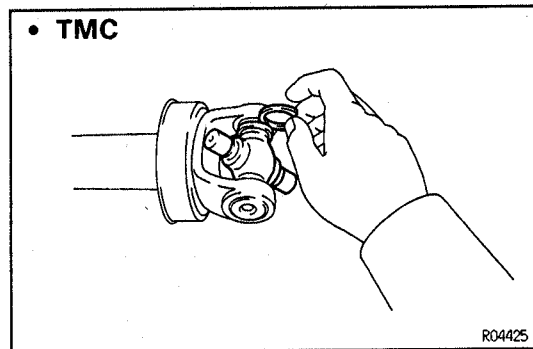
HINT: Do not reuse the snap rings.

TMC—made:

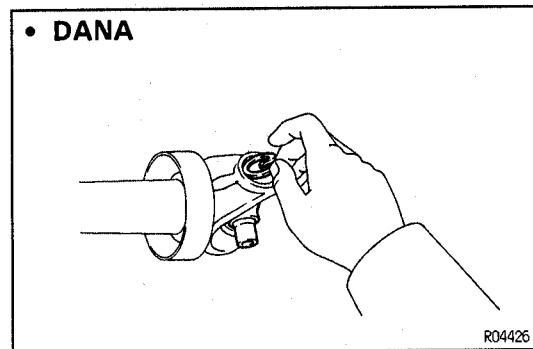
Color	Mark	Thickness mm (in.)
—	1	2.100 – 2.150 (0.0827 – 0.0846)
—	2	2.150 – 2.200 (0.0846 – 0.0866)
—	3	2.200 – 2.250 (0.0866 – 0.0886)
Brown	—	2.250 – 2.300 (0.0886 – 0.0906)
Blue	—	2.300 – 2.350 (0.0906 – 0.0925)
—	6	2.350 – 2.400 (0.0925 – 0.0945)
—	7	2.400 – 2.450 (0.0945 – 0.0965)
—	8	2.450 – 2.500 (0.0965 – 0.0984)

V01997

• TMC



• DANA



DANA—made:

Color	Thickness mm (in.)
Green	1.384 (0.0545)
Red	1.435 (0.0565)
Black	1.486 (0.0585)
Copper	1.511 (0.0595)
Silver	1.537 (0.0605)
Yellow	1.588 (0.0625)
Blue	1.638 (0.0645)

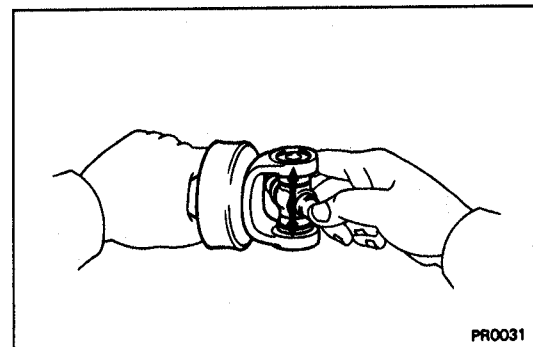
- (b) Using a hammer, tap the yoke until there is no clearance between the bearing outer race and snap ring.

7. CHECK SPIDER BEARING

- Check that the spider bearing moves smoothly.
- Check the spider bearing axial play.

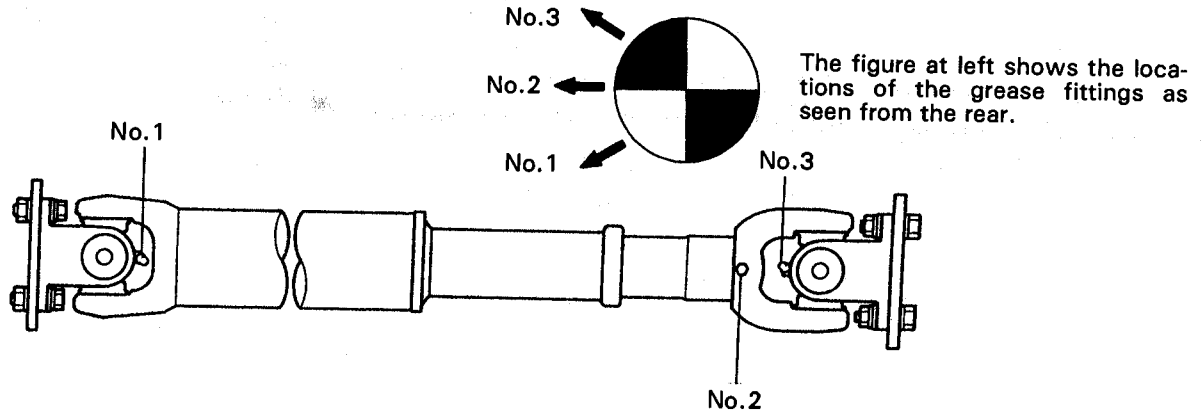
Bearing axial play: Maximum 0.05 mm (0.0020 in.)

HINT: Install new spider bearings on the shaft side in the procedure described above.

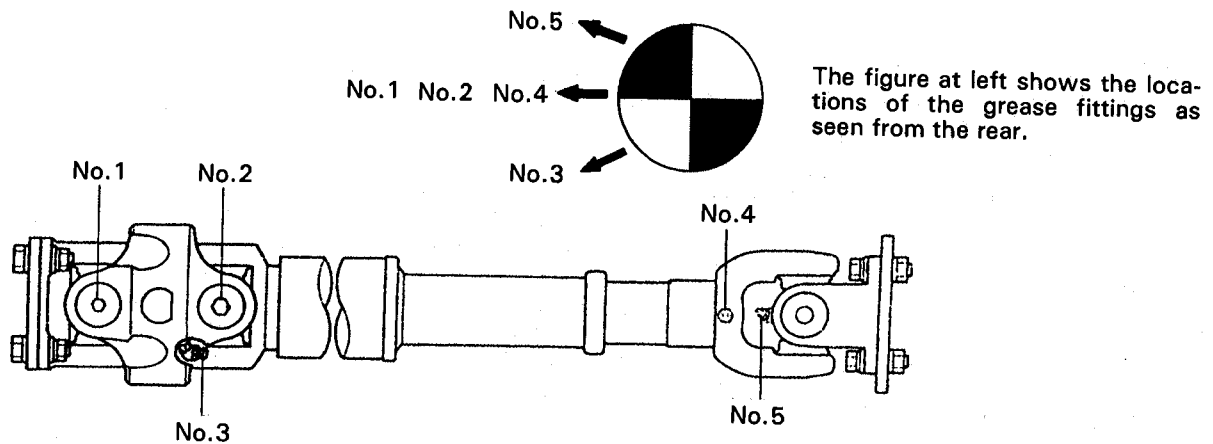


HINT: When replacing the rear propeller shaft spider on 4WD vehicles, be sure that the grease fitting assembly hole is facing in the direction shown in the illustration.

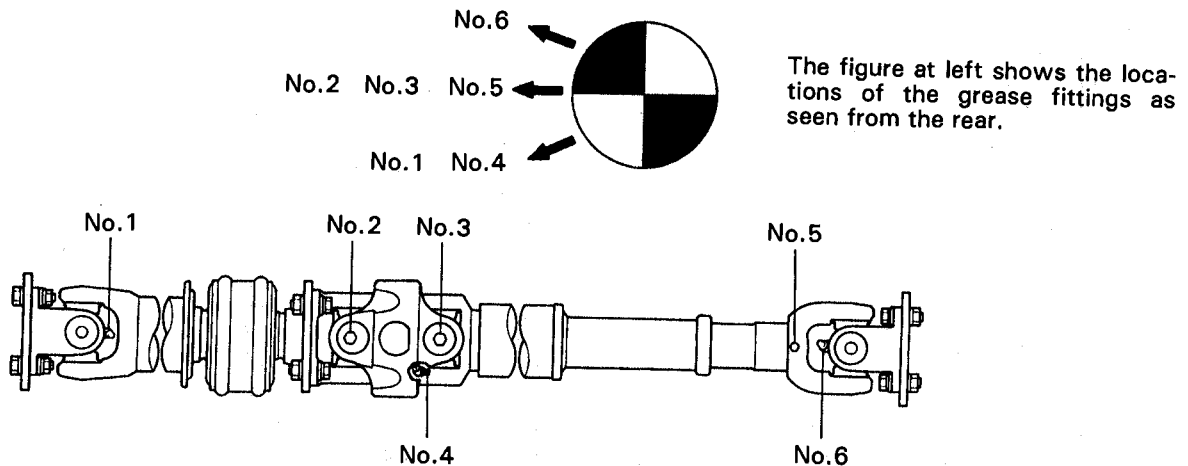
SPIDER GREASE FITTING ASSEMBLY DIRECTION FOR 4WD FRONT PROPELLER SHAFT



SPIDER GREASE FITTING ASSEMBLY DIRECTION FOR 4WD REAR PROPELLER SHAFT 2-JOINT TYPE



SPIDER GREASE FITTING ASSEMBLY DIRECTION FOR 4WD REAR PROPELLER SHAFT 3-JOINT TYPE

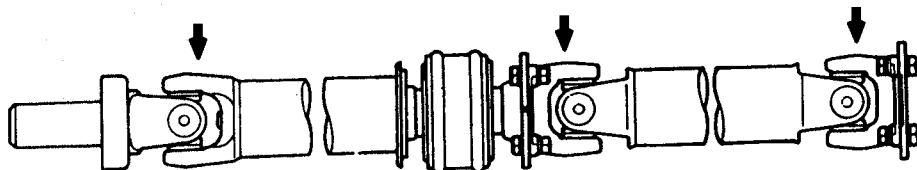


Q07229
Q07230
Q07231

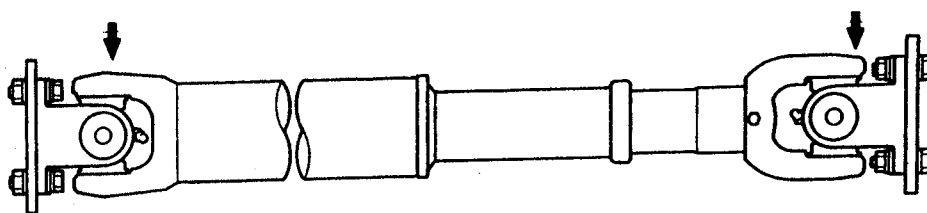
PROPELLER SHAFT ASSEMBLY

HINT: When replacing the propeller shaft, install the new parts facing, as shown in the illustration.

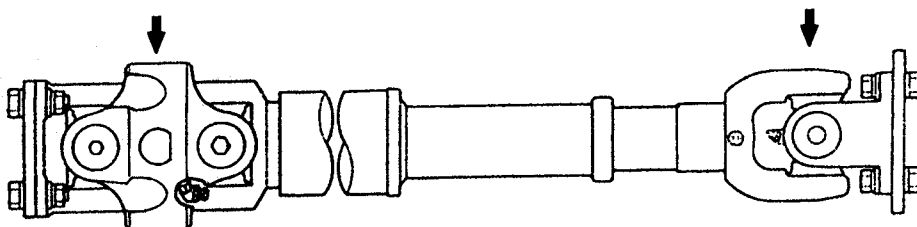
2WD
3-Joint Type



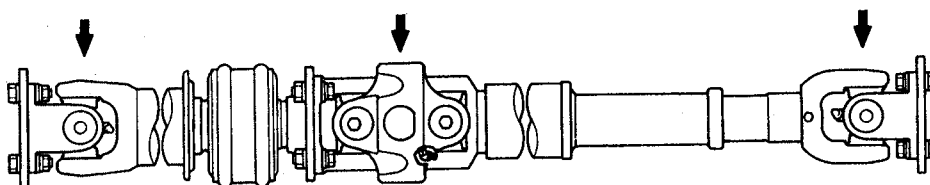
4WD Front



4WD Rear
2-Joint Type



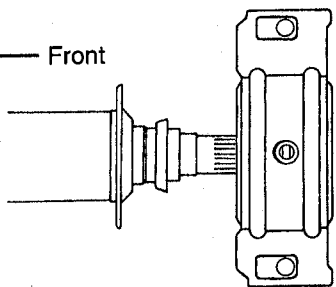
4WD Rear
3-Joint Type



Q07232
Q07229
Q07230
Q07231

Z15306

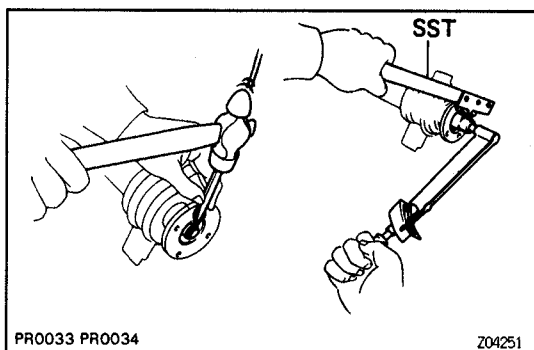
← Front



Y007493

1. INSTALL CENTER SUPPORT BEARING ON INTER-MEDIATE SHAFT

HINT: Install the center support bearing with the cutout toward the rear.



2. INSTALL FLANGE ON INTERMEDIATE SHAFT

- (a) Coat the splines of the intermediate shaft with MP grease.
- (b) Place the flange on the shaft and align the matchmarks.

HINT: If replacing either the center flange or intermediate shaft, reassemble them so that the front flange yoke of the intermediate shaft and the rear flange yoke of the propeller shaft are facing in the same direction.

- (c) Using SST to hold the flange, press the bearing into position by tightening down a new nut.

SST 09930-00021

Torque: 181 N·m (1,850 kgf·cm, 134 ft·lbf)

- (d) Loosen the nut.
 - (e) Torque the nut again.
- Torque: 69 N·m (700 kgf·cm, 51 ft·lbf)**
- (f) Using a chisel and hammer, stake the nut.

3. INSTALL PROPELLER SHAFT

- (a) Align the matchmarks on the flanges and connect the flanges with 4 bolts, washers and nuts.

HINT: If replacing either the center flange or intermediate shaft, reassemble them so that the front flange yoke of the intermediate shaft and the rear flange yoke of the propeller shaft are facing in the same direction.

- (b) Torque the bolts.
- Torque: 74 N·m (750 kgf·cm, 54 ft·lbf)**

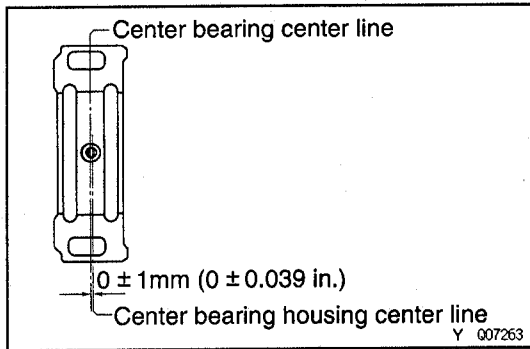
4. 4WD:

INSERT SLEEVE YOKE INTO PROPELLER SHAFT

- (a) Apply grease to the propeller shaft spline and sleeve yoke sliding surface.

Grease: Molybdenum disulfide lithium base chassis grease, NLGI No.2.

- (b) Install the dust cover to the shaft.
- (c) Align the matchmarks on the yoke and propeller shaft.



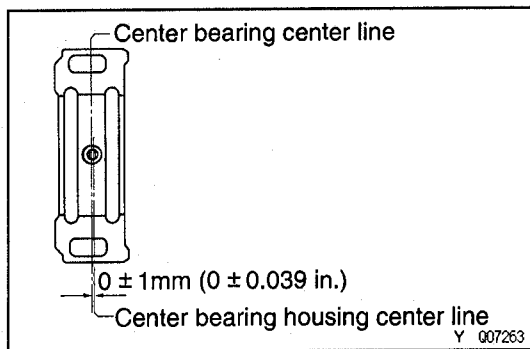
PROPELLER SHAFT INSTALLATION

2WD:

Installation is in the reverse order of removal.

HINT 3—joint type:

- Center bearing center line and the center bearing housing center line must be adjusted within ± 1 mm of each other in the vehicles longitudinal direction when the vehicle is unloaded.
- When adjusting the center bearing housing center line, it should be perpendicular to the axis of front propeller shaft.



PROPELLER SHAFT INSTALLATION

4WD:

Installation is in the reverse order of removal.

HINT: Rear propeller shaft 3—joint type:

- Center bearing center line and the center bearing housing center line must be adjusted within ± 1 mm of each other in the vehicles longitudinal direction when the vehicle is unloaded.
- When adjusting the center bearing housing center line, it should be perpendicular to the axis of front propeller shaft.

HINT: With a grease gun, pump grease into each fitting until it begins to flow around the oil seal.

Grease:

Spiders:

Lithium base chassis grease, NLGI No.2.

Sleeve yoke and double cardan joint:

Molybdenum disulfide lithium base chassis grease, NLGI No.2.

SERVICE SPECIFICATIONS

SERVICE DATA

PR013-02

Propeller shaft runout	Maximum	0.8 mm (0.031 in.)
Spider bearing axial play		0.05 mm (0.0020 in.)
Spider bearing selection	Mark	
Bearing cup outer diameter	None	29.008 — 29.021 mm (1.1420 — 1.1426 in.)
	Red	29.028 — 29.041 mm (1.1428 — 1.1433 in.)
Bearing hole inner diameter	None	29.000 — 29.020 mm (1.1417 — 1.1425 in.)
	Drill	29.021 — 29.042 mm (1.1426 — 1.1434 in.)
Snap ring thickness	TMC—made	mark color
	1	— 2.100 — 2.150 mm (0.0827 — 0.0846 in.)
	2	— 2.150 — 2.200 mm (0.0846 — 0.0866 in.)
	3	— 2.200 — 2.250 mm (0.0866 — 0.0886 in.)
	— Brown	2.250 — 2.300 mm (0.0886 — 0.0906 in.)
	— Blue	2.300 — 2.350 mm (0.0906 — 0.0925 in.)
	6	— 2.350 — 2.400 mm (0.0925 — 0.0945 in.)
	7	— 2.400 — 2.450 mm (0.0945 — 0.0965 in.)
	8	— 2.450 — 2.500 mm (0.0965 — 0.0984 in.)
	DANA—made	color
	Green	1.384 mm (0.0545 in.)
	Red	1.435 mm (0.0565 in.)
	Black	1.486 mm (0.0585 in.)
	Copper	1.511 mm (0.0595 in.)
	Silver	1.537 mm (0.0605 in.)
	Yellow	1.588 mm (0.0625 in.)
	Blue	1.638 mm (0.0645 in.)

PR

TORQUE SPECIFICATIONS

PR014-03

Part tightened		N·m	kgf·cm	ft·lbf
Front differential x Front propeller shaft	4WD	74	750	54
Front propeller shaft x Transfer	4WD	74	750	54
Propeller shaft x Rear differential	4WD	74	750	54
Propeller shaft x Transfer	4WD	74	750	54
Intermediate shaft x Propeller shaft	4WD	74	750	54
Propeller shaft x Differential	2WD	74	750	54
Intermediate shaft x Propeller shaft	2WD	74	750	54
Center support bearing x Frame		36	370	27
Intermediate shaft x Center bearing x Joint flange	4WD			
	1st	181	1,850	134
	2nd		Loosen nut	
	3rd	69	700	51

PR