







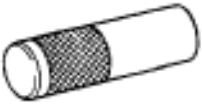




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# PROPELLER SHAFT

**PREPARATION****SST (SPECIAL SERVICE TOOLS)**

	09325-20010	Transmission Oil Plug	2JZ-GE M/T
	09325-40010	Transmission Oil Plug	2JZ-GE A/T
	09330-00021	Companion Flange Holding Tool	
	09330-50010	Propeller Shaft Center Bearing Replacer	2JZ-GE
	09370-50010	Drive Line Angle Gauge	
	09608-12010	Front Hub & Drive Pinion Bearing Replacer Set	
	(09608-00070)	Drive Pinion Rear Bearing Cone Replacer	Center support bearing
	09608-35014	Axle Hub & Drive Pinion Bearing Tool Set	
	(09608-06040)	Front Hub Inner Bearing Cone Replacer	Center support bearing
	09922-10010	Variable Open Wrench	Adjusting nut
	09950-00020	Bearing Remover	

**RECOMMENDED TOOLS**

PMSAC-01

	09905-00012	Snap Ring No. 1 Expander •	
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**EQUIPMENT**

Torque wrench	
Dial indicator	
Vernier calipers	

# PRECAUTION

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

# TROUBLESHOOTING

Use the table 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.

	See Page	Parts Name	Trouble					
	PR-12	Sleeve yoke spline worn						
	PR-9	Center bearing worn						
	PR-10 PR-12	Propeller shaft runout						
	—	Propeller shaft imbalance						
	PR-10 PR-12	Sleeve yoke spline stuck						
	PR-10 PR-12	Spider bearing worn or stuck						
	PR-9	Flexible rubber coupling worn						
	—	Transmission extension housing rear bushing worn						
Noise	2	1						
Vibration			3	4	2	4	3	1

# PRECAUTION

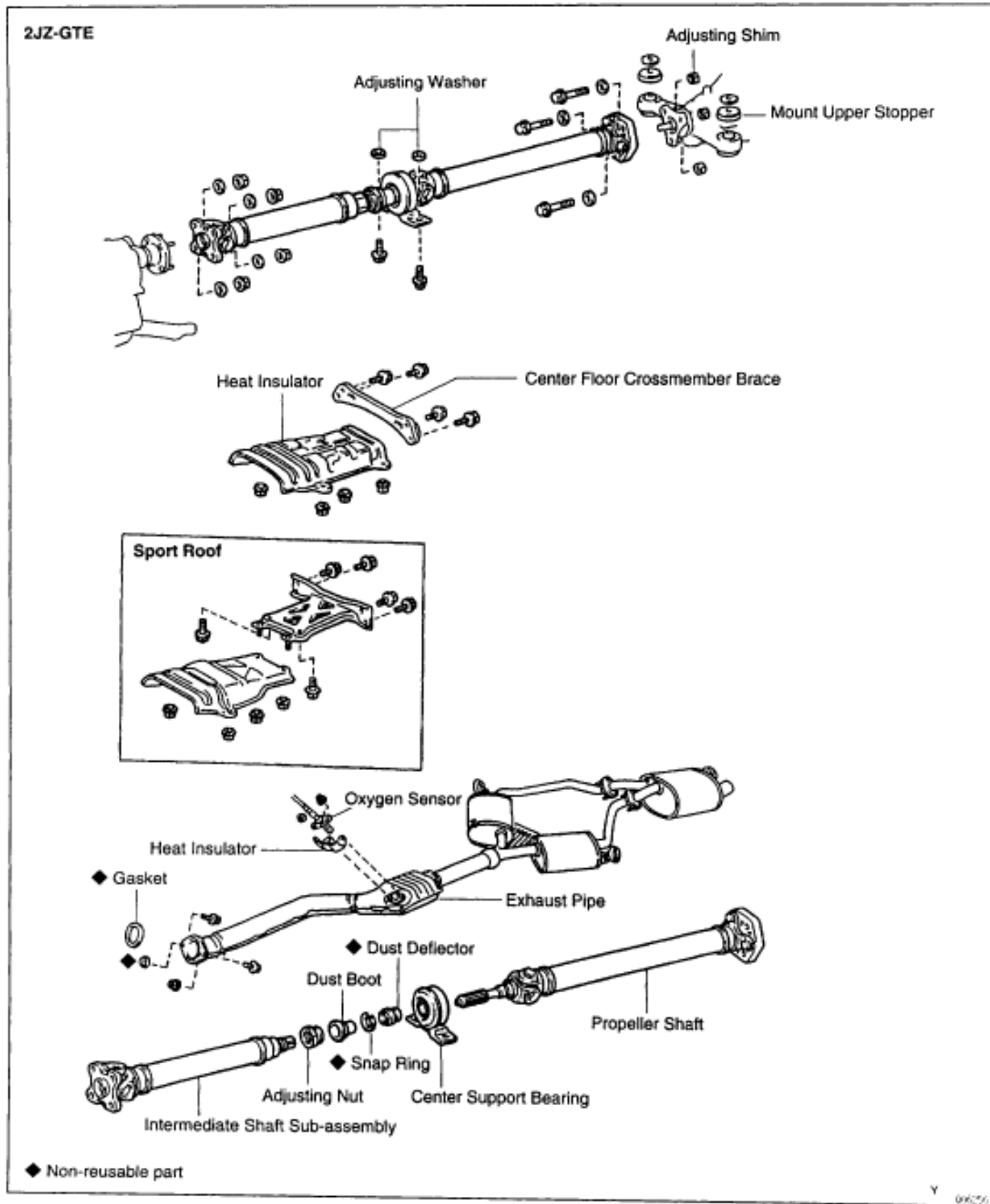
Be careful not to grip the propeller shaft tube too tightly in the vise as this will cause deformation.

# TROUBLESHOOTING

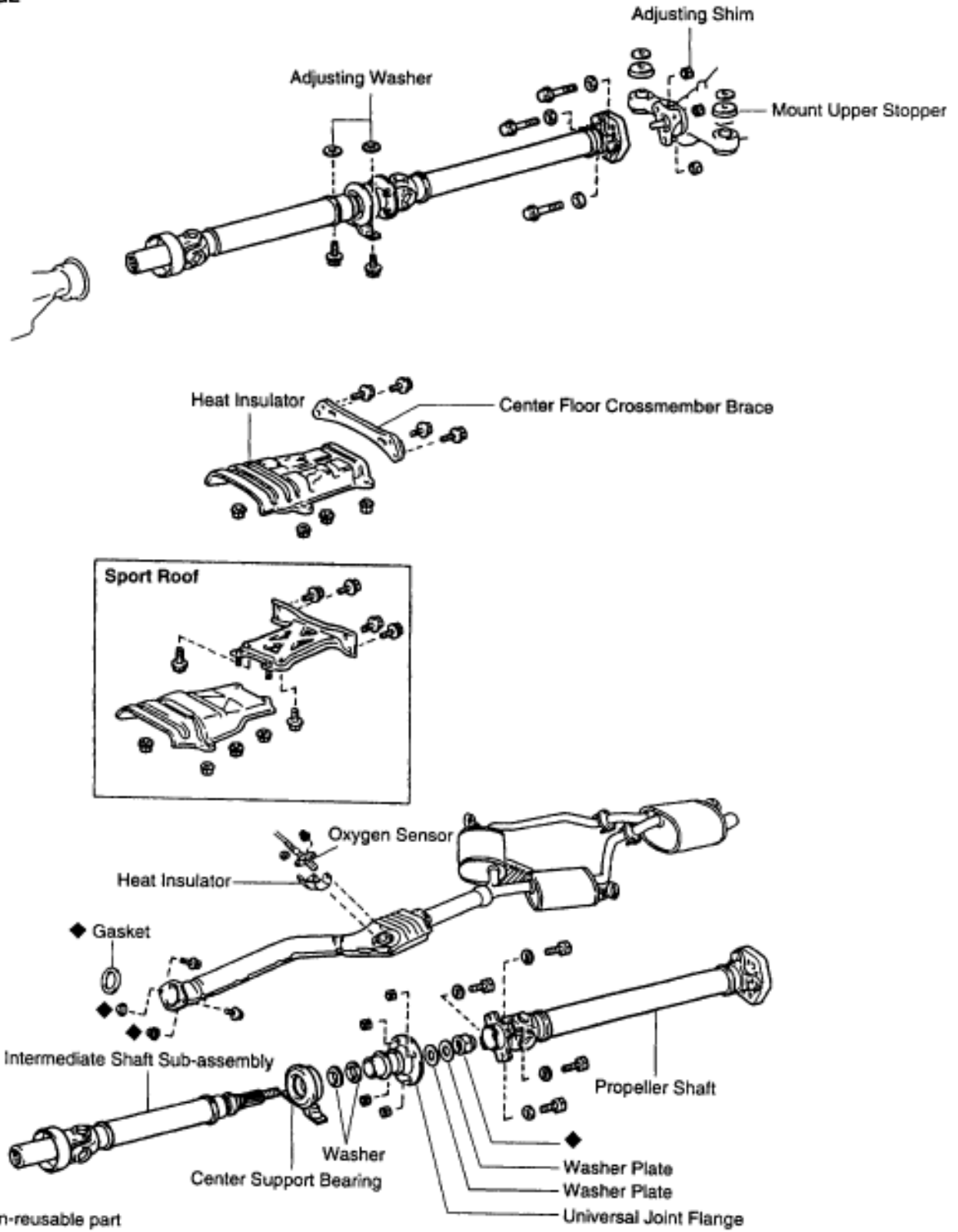
Use the table to help you find the cause of the problem. The numbers indicate the priority of the likely cause of the problem. Check each part in order. If necessary, replace these parts.

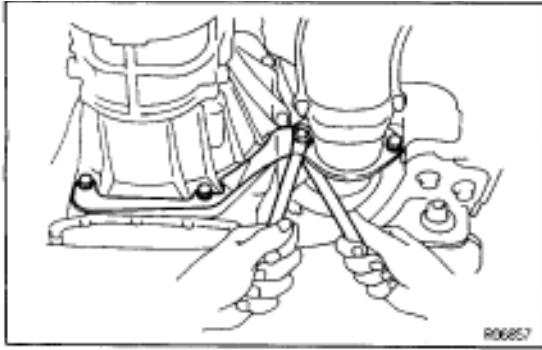
	See Page	Parts Name	Trouble	Noise	Vibration
	PR-12	Sleeve yoke spline worn		2	
	PR-9	Center bearing worn		1	
	PR-10 PR-12	Propeller shaft runout			3
	—	Propeller shaft imbalance			4
	PR-10 PR-12	Sleeve yoke spline stuck			2
	PR-10 PR-12	Spider bearing worn or stuck		4	
	PR-9	Flexible rubber coupling worn		3	
	—	Transmission extension housing rear bushing worn			1

# PROPELLER SHAFT COMPONENTS



2JZ-GE





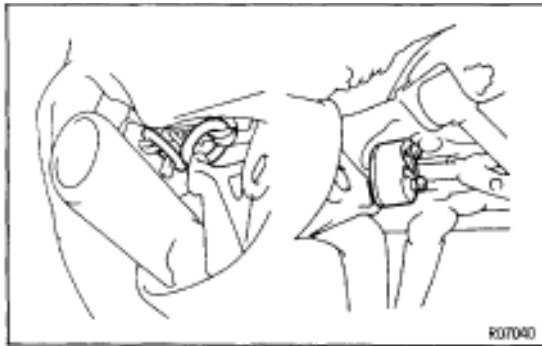
## PROPELLER SHAFT REMOVAL

### 1. REMOVE OXYGEN SENSOR

- (a) Remove the 2 bolts.
- (b) Remove the oxygen sensor and heat insulator

### 2. REMOVE EXHAUST PIPE

- (a) Remove the 2 bolts on the transmission side.
- (b) Remove the 2 bolts and nuts, and pipe support bracket.



- (c) Remove the 2 exhaust pipe support rings.
- (d) Remove the 2 exhaust pipe support O-rings.
- (e) Remove the exhaust pipe.
- (f) Remove the gasket.

### 3. REMOVE HEAT INSULATOR

Remove the 4 nuts and heat insulator.

### 4. REMOVE CENTER FLOOR CROSSMEMBER BRACE

Normal Roof:

Remove the 4 bolts and crossmember brace.

Sport Roof:

Remove the 6 bolts and crossmember brace.

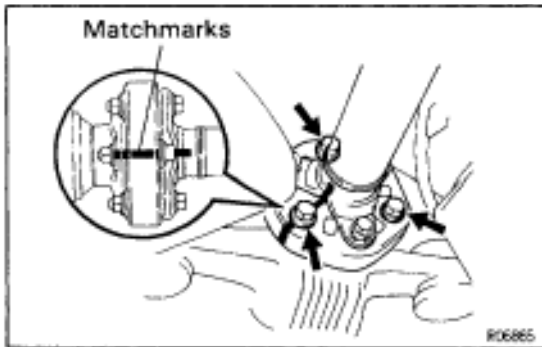
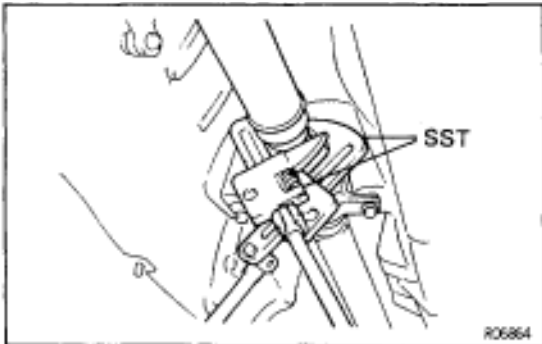
### 5. REMOVE PROPELLER SHAFT

#### 2JZ-GTE:

- (a) Using SST, loosen the adjusting nut until it can be turned by hand.

SST 09922-10010

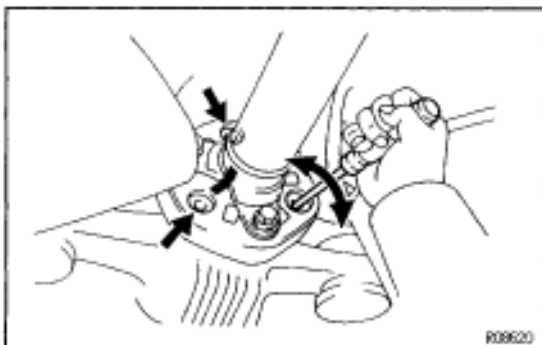
HINT: Use 2 of the same type of SST.



- (b) Place the matchmarks on the differential companion flange and flexible coupling.

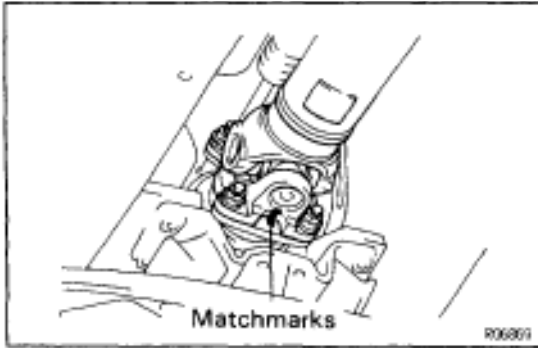
- (c) Remove the 3 bolts inserted in the differential companion flange.

**NOTICE:** The bolts inserted in the propeller shaft companion flange should not be removed.

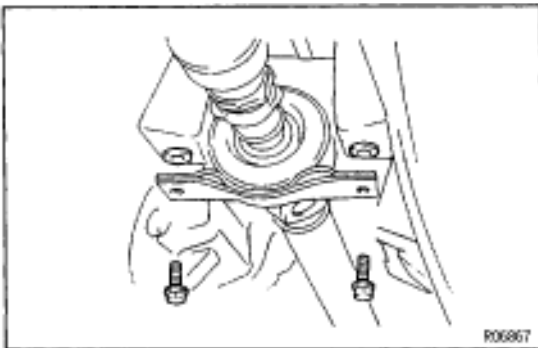


- (d) Separate the flexible coupling from the differential side.  
HINT: If the flexible coupling cannot be easily separated by hand, insert a screwdriver into the bolt hole of the flexible coupling, as shown in the illustration, then pry the coupling out.  
**NOTICE:** Do not bring the screwdriver blade in direct contact with the flexible coupling's rubber portion.



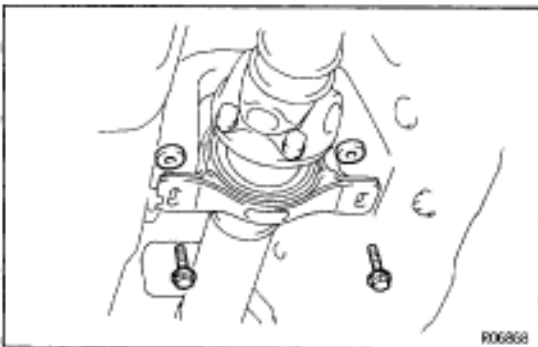


- (e) Place matchmarks on the transmission companion flange and propeller shaft flanges.
- (f) Remove the 4 washers and nuts.

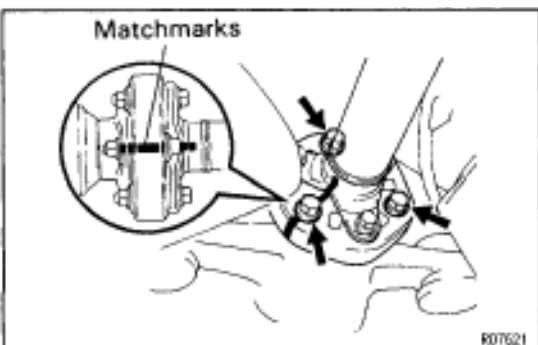


- (g) Remove the 2 center support bearing set bolts and the adjusting washers.  
HINT: Some vehicles are not equipped with an adjusting washer.  
**NOTICE: When removing the set bolts, support the center support bearing by hand so that the transmission and intermediate shaft, and propeller shaft and differential, remain in a straight line.**

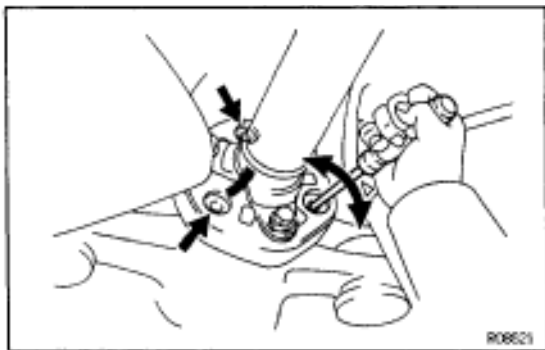
- (h) Remove the propeller shaft from the transmission.
- (i) Push the rear propeller shaft straight forward to compress the propeller shaft and pull out the propeller shaft from the centering pin of the differential.  
**NOTICE: Press the propeller shaft straight ahead to keep the transmission and intermediate shaft aligned straight.**
- (j) Pull the propeller shaft out toward the vehicle's rear.  
**NOTICE: The intermediate shaft and propeller shaft should not be separated.**

**2JZ-GE:**

- (a) Remove the 2 center support bearing set bolts and the adjusting washers.  
HINT: Production vehicles are not equipped with adjusting washers.  
**NOTICE: When removing the set bolts, support the center support bearing by hand so that the transmission and intermediate shaft, and propeller shaft and differential, remain in a straight line.**



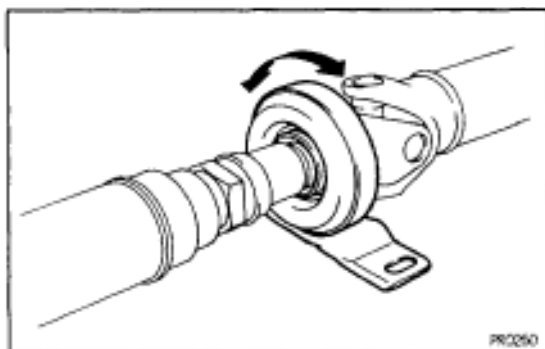
- (b) Place the matchmarks on the differential companion flange and flexible coupling.
- (c) Remove the 3 bolts inserted in the differential companion flange.  
**NOTICE: The bolts inserted in the propeller shaft companion flange should not be removed.**



- (d) Separate the flexible coupling from the differential side.  
 HINT: If the flexible coupling cannot be easily separated by hand, insert a screwdriver into the bolt hole of the flexible coupling, as shown in the illustration then pry the coupling out.  
**NOTICE: Do not bring the screwdriver blade in direct contact with the flexible coupling's rubber portion.**
- (e) Pull the yoke from the transmission.



- (f) Install SST in the transmission to prevent oil leakage.  
 SST 09325-20010 (M/T)  
 09325-40010 (A/T)

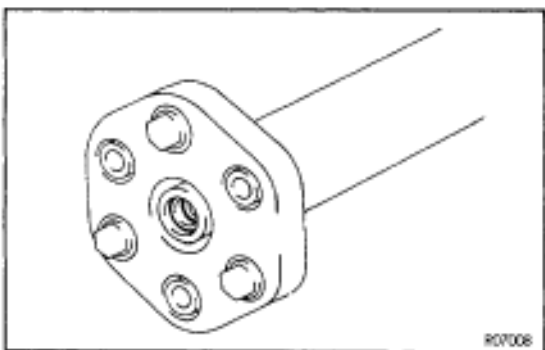


## CENTER SUPPORT BEARING AND FLEXIBLE COUPLINGS INSPECTION

### 1. INSPECT CENTER SUPPORT BEARING

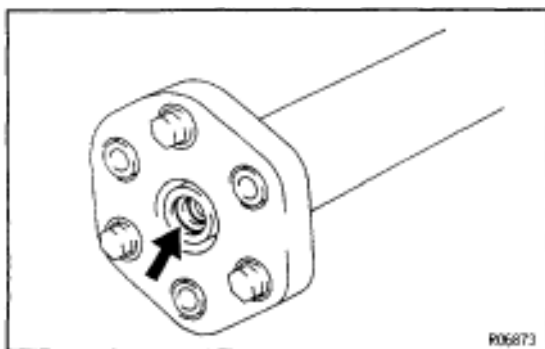
- Check for cracks in or damage to the cushion.
- Check if the bearing turns smoothly.

If the center support bearing is damaged, worn or does not turn smoothly, replace it.



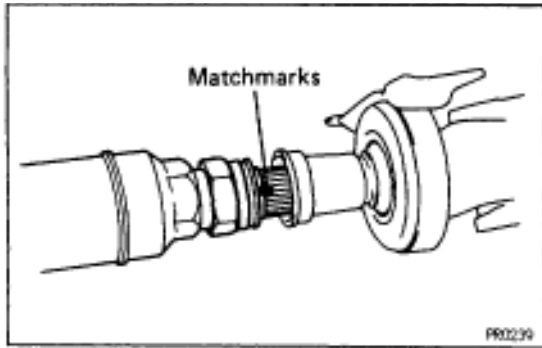
### 2. INSPECT FLEXIBLE COUPLINGS

- Check for cracks in or damage to rear flexible couplings.
- If the flexible coupling is damaged, replace the propeller shaft assembly.



### 3. INSPECT FLEXIBLE COUPLING CENTERING BUSHING

- Check for damage to the bushing.
- If the bushing is damaged, replace the propeller shaft assembly.



## CENTER SUPPORT BEARING REPLACEMENT

### 2JZ-GTE:

#### 1. SEPARATE INTERMEDIATE SHAFT AND PROPELLER SHAFT

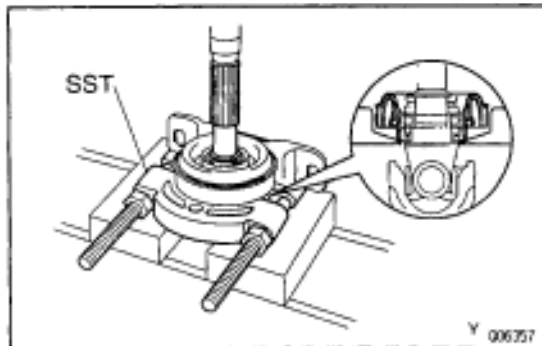
- Place matchmarks on the intermediate shaft and propeller shaft.
- Separate the intermediate shaft and propeller shaft.
- Remove the dust boot from the propeller shaft.

HINT: If the dust boot is reused, remove it after wrapping vinyl tape around the spline, so it will not be damaged.

#### 2. REMOVE CENTER SUPPORT BEARING

- Using a snap ring expander, remove the snap ring.
- Using SST, remove the center support bearing with dust deflector.

SST 09950-00020

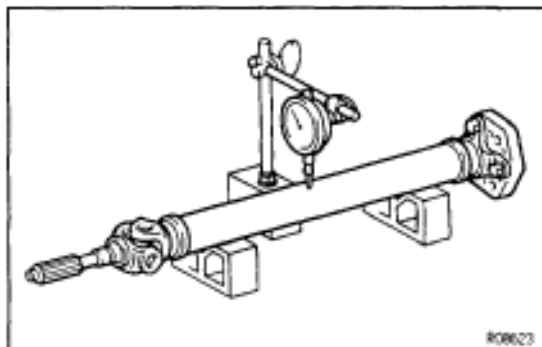


#### 3. INSPECT RUNOUT OF INTERMEDIATE SHAFT AND PROPELLER SHAFT

Maximum runout:

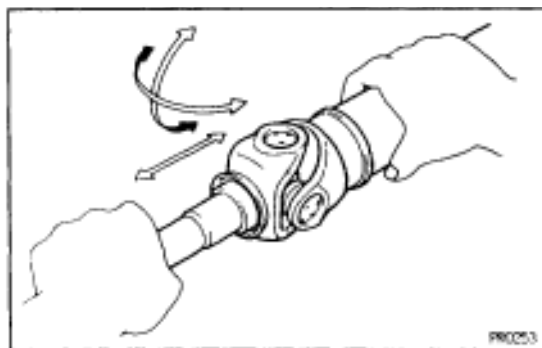
0.8 mm (0.031 in.)

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



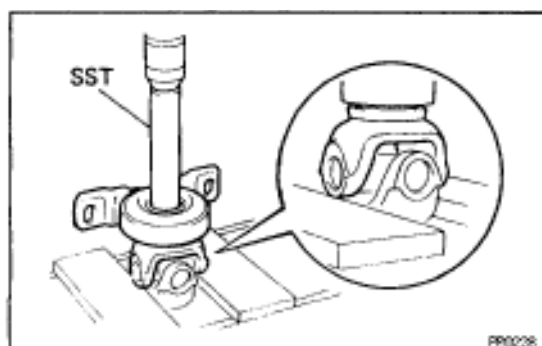
#### 4. INSPECT SPIDER BEARING

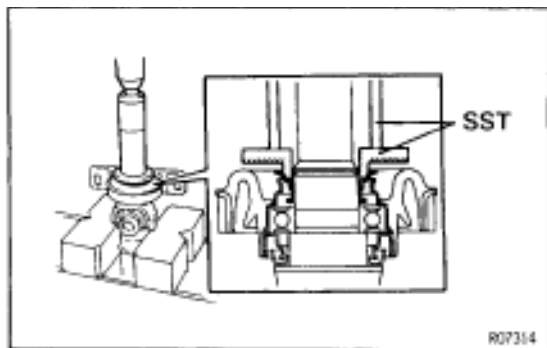
- Check if the spider bearing rotates smoothly.
  - Check if there is any play in the spider bearing.
- If necessary, replace the propeller shaft assembly.



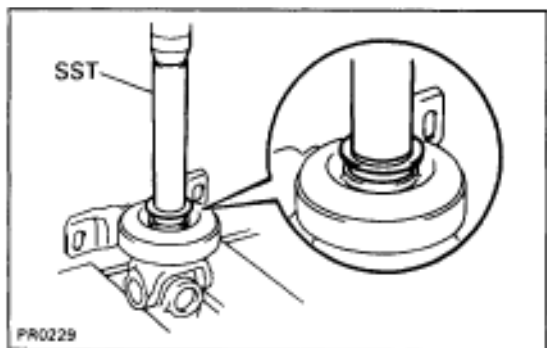
#### 5. INSTALL CENTER SUPPORT BEARING

- Using SST and a press, install the center support bearing.
- SST 09330-50010

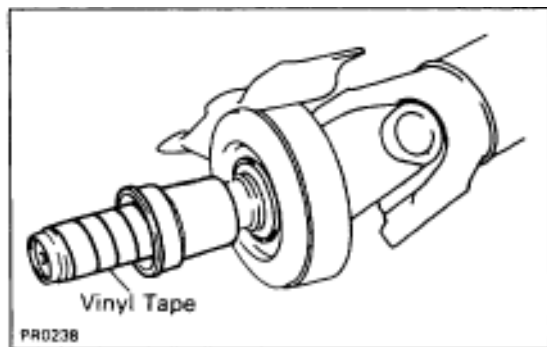




- (b) Using SST and a press, insert a new dust deflector until it almost touches the rubber of the center support bearing.  
SST 09608-12010 (09608-00070),  
09608-35014 (09608-06040)



- (c) Using SST and a press, install the dust deflector to the end.  
SST 09330-50010  
(d) Using a snap ring expander, install a new snap ring.



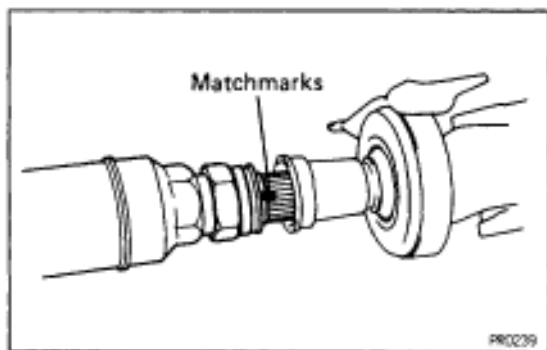
## 6. ASSEMBLE INTERMEDIATE SHAFT AND PROPELLER SHAFT

- (a) Install the dust boot.  
**NOTICE: Assemble after wrapping vinyl tape around the spline so it will not damage the boot.**

- (b) Apply grease to the spline.

**Grease:**

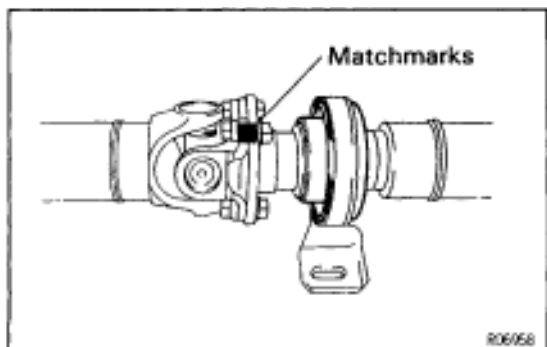
**Molybdenum disulphide lithium base, NLGI No.2.**



- (c) Align the matchmarks and assemble the intermediate shaft and propeller shaft.

- (d) Cover the adjusting nut with the dust boot.

- (e) Tighten the adjusting nut fully by hand.

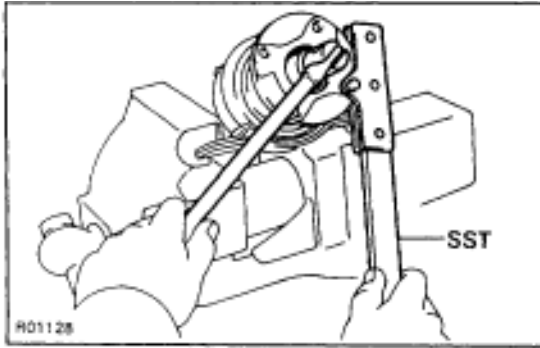


## 2JZ-GE:

### 1. SEPARATE PROPELLER SHAFT AND INTERMEDIATE SHAFT

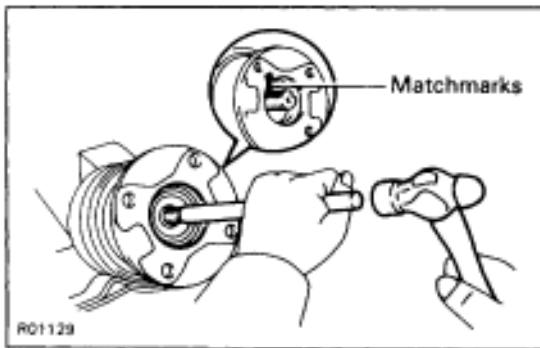
- (a) Place the matchmarks on the flanges.

- (b) Remove the 4 bolts, washers and nuts.

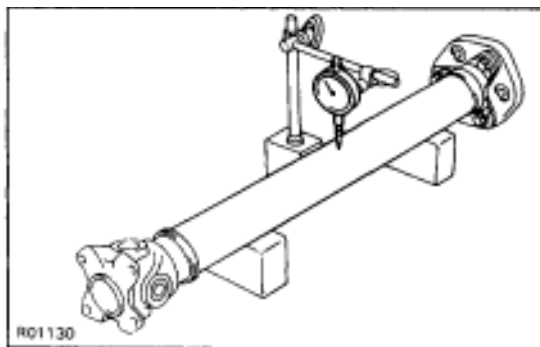


## 2. REMOVE CENTER SUPPORT BEARING FROM INTERMEDIATE SHAFT

- (a) Using a hammer and chisel, loosen the staked part of the nut.
- (b) Using SST to hold the flange, remove the nut.  
SST 09930-00021
- (c) Remove the 2 washers.



- (d) Place matchmarks on the flange and intermediate shaft.
- (e) Using a brass bar and hammer, remove the flange, 2 washers and center support bearing from the intermediate shaft.

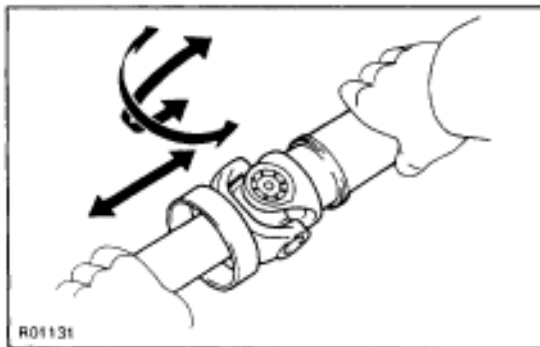


## 3. INSPECT RUNOUT OF INTERMEDIATE SHAFT AND PROPELLER SHAFT

Maximum runout:

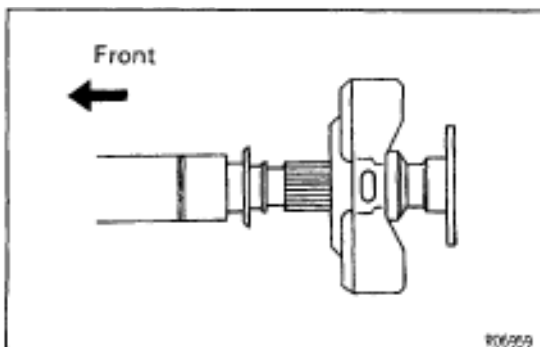
**0.8 mm (0.031 in.)**

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



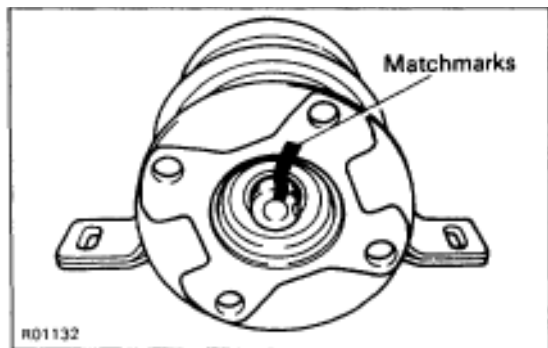
## 4. INSPECT SPIDER BEARING

- Check if the spider bearing rotates smoothly.
  - Check if there is any play in the spider bearing.
- If necessary, replace the propeller shaft assembly.



## 5. INSTALL CENTER SUPPORT BEARING ON INTERMEDIATE SHAFT

HINT: Install the center support bearing in the direction, as shown and install the 2 washers.



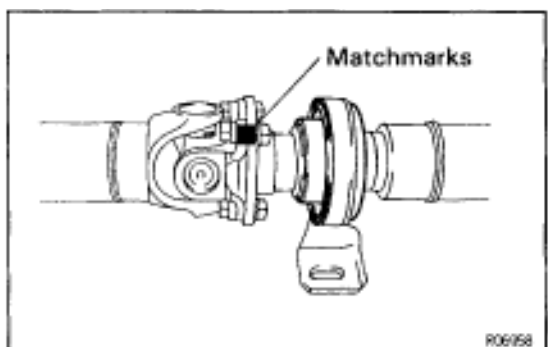
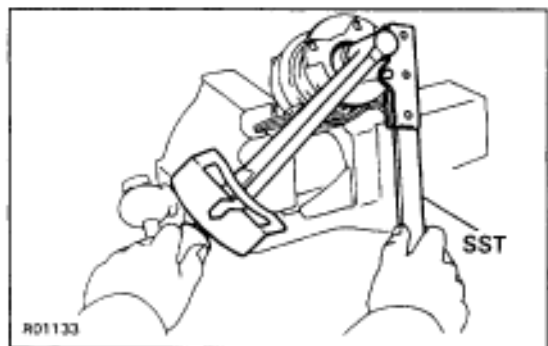
## 6. INSTALL FLANGE ON INTERMEDIATE SHAFT

- (a) Coat the spline 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 yoke of the intermediate shaft and the rear yoke of the propeller shaft are facing in the same direction.
- (c) Install the 2 washers.
- (d) Using SST to hold the flange, press the bearing into position by tightening down a new nut.

SST 09330-00021

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

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



## 7. 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 yoke of the intermediate shaft and the rear yoke of the propeller shaft are facing in the same direction.
- (b) Torque the 4 bolts and nuts.  
**Torque: 74 N·m (750 kgf·cm, 54 ft·lbf)**

# PROPELLER SHAFT INSTALLATION

## 1. INSTALL PROPELLER SHAFT

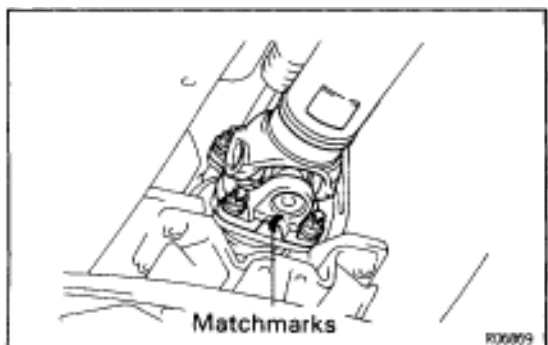
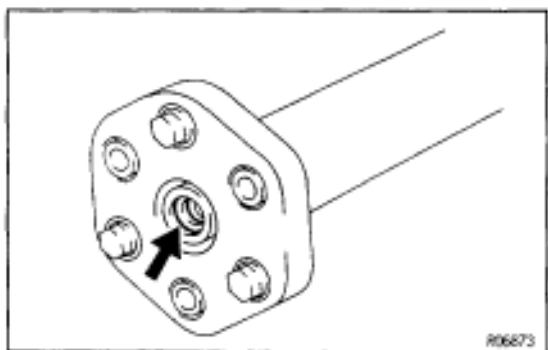
- (a) Apply grease to the flexible coupling centering bushings.  
**Grease:**

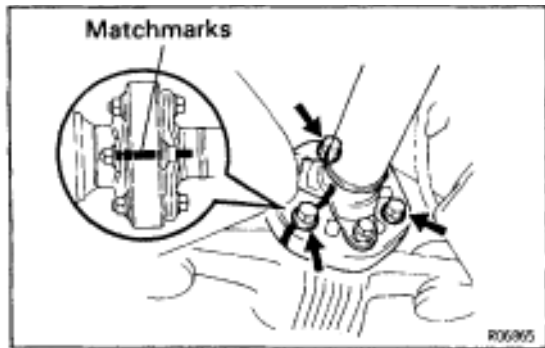
**Molybdenum disulphide lithium base, NLGI No. 1 or No. 2.**

### 2JZ-GTE:

- (a) Align the matchmarks on the flanges and connect the flanges with the 4 nuts and washers.
- (b) Torque the 4 nuts.  
**Torque: 56 N·m (570 kgf·cm, 41 ft·lbf)**
- (c) Insert the propeller shaft from the vehicle's rear and connect the transmission and differential.

**NOTICE: Support the center support bearing by hand so that the transmission and intermediate shaft, and propeller shaft and differential, remain in a straight line.**

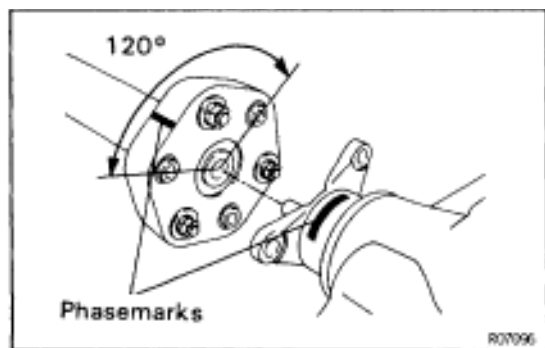




- (d) Temporarily install the center support bearing set bolts with the adjusting washers.  
HINT: Use the adjusting washers which were removed.
- (e) Align the matchmarks and install the propeller shaft on the differential with the 3 bolts, washers and nuts.

**NOTICE: Bolts should be inserted from the propeller shaft side.**

**Torque: 79 N·m (805 kgf·cm, 58 ft·lbf)**



**If using a new propeller shaft**

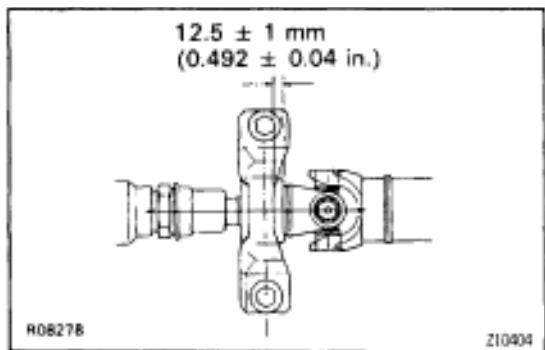
**w/ Phasemarks:**

Install the propeller shaft phasemarks and differential phase-marks so that their respective alignment phasemarks match. If the propeller shaft phasemarks and differential phase-marks do not align, install the propeller shaft and differential alignment phasemarks as close together as possible.

**w/o Phasemarks:**

Install the propeller shaft.

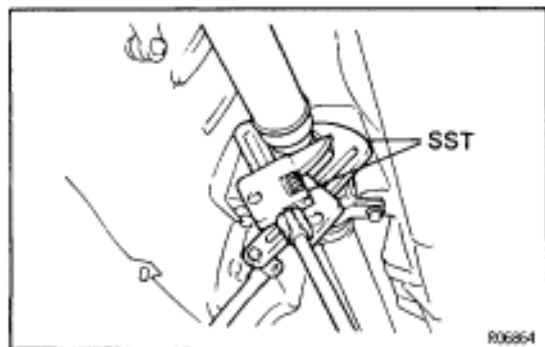
(See page [PR-13](#))



- (f) Torque the 2 center support bearing set bolts.

**Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)**

HINT: Adjust the center support bearing to keep the dimension, as shown with the vehicle in the unladen condition. Under the same condition, check if the center line of the center support bearing is at right angles to the shaft axial direction.

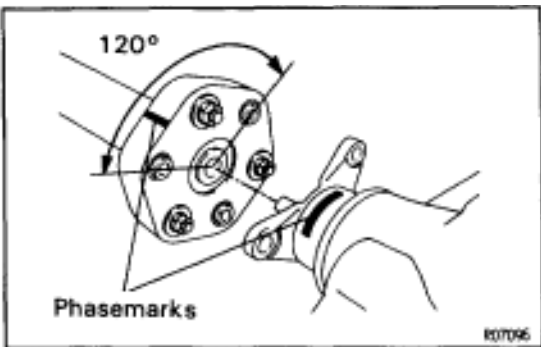
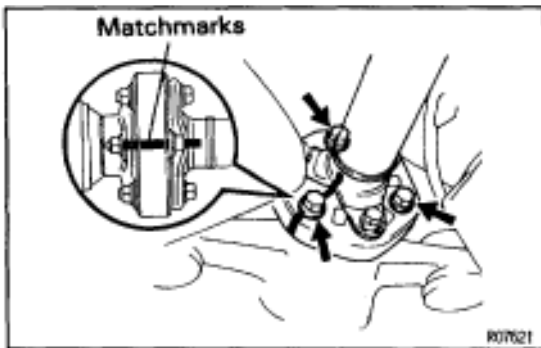


- (g) Using SST, torque the adjusting nut.

SST 09922-10010

**Torque: 50 N·m (515 kgf·cm, 37 ft·lbf)**

HINT: Use torque wrench with a fulcrum length of 34.5 cm (13.6 in.)

**2JZ-GE:**

- (a) Remove SST.
- (b) Insert the propeller shaft to the transmission.
- (c) Insert the propeller shaft from the vehicle's rear and connect the transmission and differential.

**NOTICE: Support the center support bearing by hand so that the transmission and intermediate shaft, and propeller shaft and differential, remain in a straight line.**

- (d) Temporarily install the center support bearing set bolts with the adjusting washers.

HINT: Use the adjusting washers which were removed.

- (e) Align the matchmarks and install the propeller shaft on the differential with the 3 bolts, washers and nuts.

**NOTICE: Bolts should be inserted from the propeller shaft side.**

**Torque: 79 N·m (805 kgf·cm, 58 ft·lbf)**

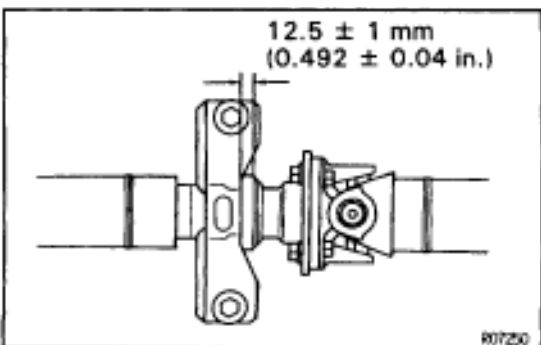
**If using a new propeller shaft****w/ Phasemarks:**

Install the propeller shaft phasemarks and differential phase-marks so that their respective alignment phasemarks match. If the propeller shaft phasemarks and differential phase-marks do not align, install the propeller shaft and differential alignment phasemarks as close together as possible.

**w/o Phasemarks:**

Install the propeller shaft.

(See page [PR-13](#))



- (f) Torque the 2 center support bearing set bolts.

**Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)**

HINT: Adjust the center support bearing to keep the dimension, as shown with the vehicle in the unladen condition.

Under the same condition, check if the center line of the center support bearing is at right angles to the shaft axial direction.



**2. INSPECT PROPELLER SHAFT JOINT ANGLE****(See page PR-17)****NOTICE: The joint angle should be checked when the propeller shaft is removed and installed.****3. INSTALL CROSSMEMBER BRACE**

Normal Roof:

Install the center floor crossmember brace and torque the 4 bolts.

**Torque: 13 N·m (130 kgf·cm, 8 ft·lbf)**

Sport Roof:

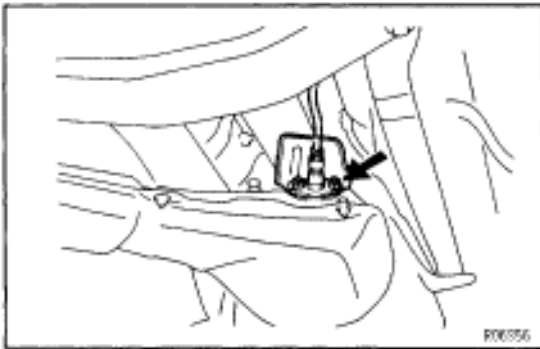
Install the center floor crossmember brace and torque the 6 bolts.

**Torque: 13 N·m (130 kgf·cm, 8 ft·lbf)****4. INSTALL HEAT INSULATOR**

Install the heat insulator and torque the 4 nuts.

**Torque: 5.4 N·m (55 kgf·cm, 48 in·lbf)****5. INSTALL EXHAUST PIPE**

- (a) Install a new gasket.
- (b) Insert the exhaust pipe.
- (c) Install the exhaust pipe to the 2 exhaust pipe support rings.
- (d) Install the exhaust pipe to the 2 exhaust pipe support O-rings.
- (e) Temporary install the pipe support bracket to the transmission with 2 bolts.
- (f) Install the exhaust pipe with the 2 bolts and new 2 nuts.  
**Torque: 58 N·m (590 kgf·cm, 43 ft·lbf)**
- (g) Torque the 2 bolts.  
**Torque: 37 N·m (380 kgf·cm, 27 ft·lbf)**

**6. INSTALL OXYGEN SENSOR**

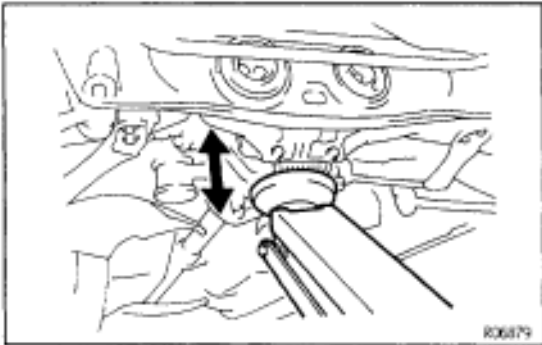
- (a) Install the oxygen sensor with heat insulator.  
**NOTICE: After installing the oxygen sensor, check that the wire is not twisted.**
- (b) Torque the 2 nuts.  
**Torque: 44 N·m (450 kgf·cm, 34 ft·lbf)**

## JOINT ANGLE INSPECTION AND ADJUSTMENT

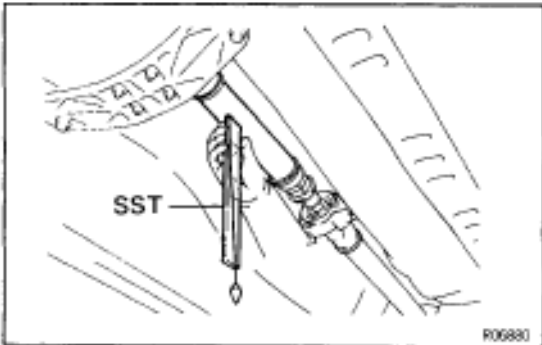
**NOTICE:** When doing operations which involve the removal and installation of the propeller shaft, always check the joint. Make adjustments if necessary.



1. **STABILIZE PROPELLER SHAFT AND DIFFERENTIAL**
  - (a) Turn the propeller shaft several times by hand to stabilize the center support bearing and flexible couplings.



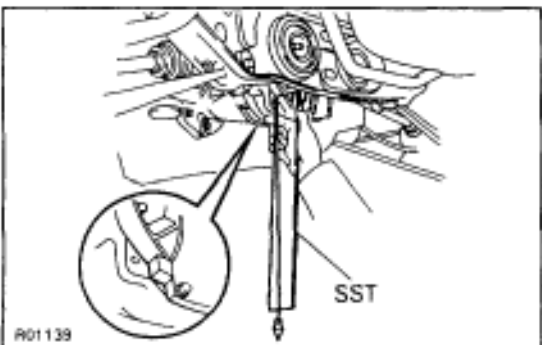
- (b) Using a jack, raise and lower the differential to stabilize the differential mounting cushion.



2. **CHECK JOINT ANGLE OF NO.2 JOINT AND NO.3 JOINT**
  - (a) Using SST, measure the installation angle of the intermediate shaft and propeller shaft.

SST 09370-50010

HINT: The SST should be directly underneath the tube.



- (b) Using SST, measure the installation angle of the differential.

SST 09370-50010

HINT: Measure the installation angle by placing the SST in the position, as shown in the illustration.

- (c) Calculate the No.2 joint angle.

**No.2 joint angle:**

$$A - B = -1^{\circ} 09' \pm 36'$$

**A: Intermediate shaft installation angle**

**B: Propeller shaft installation angle**

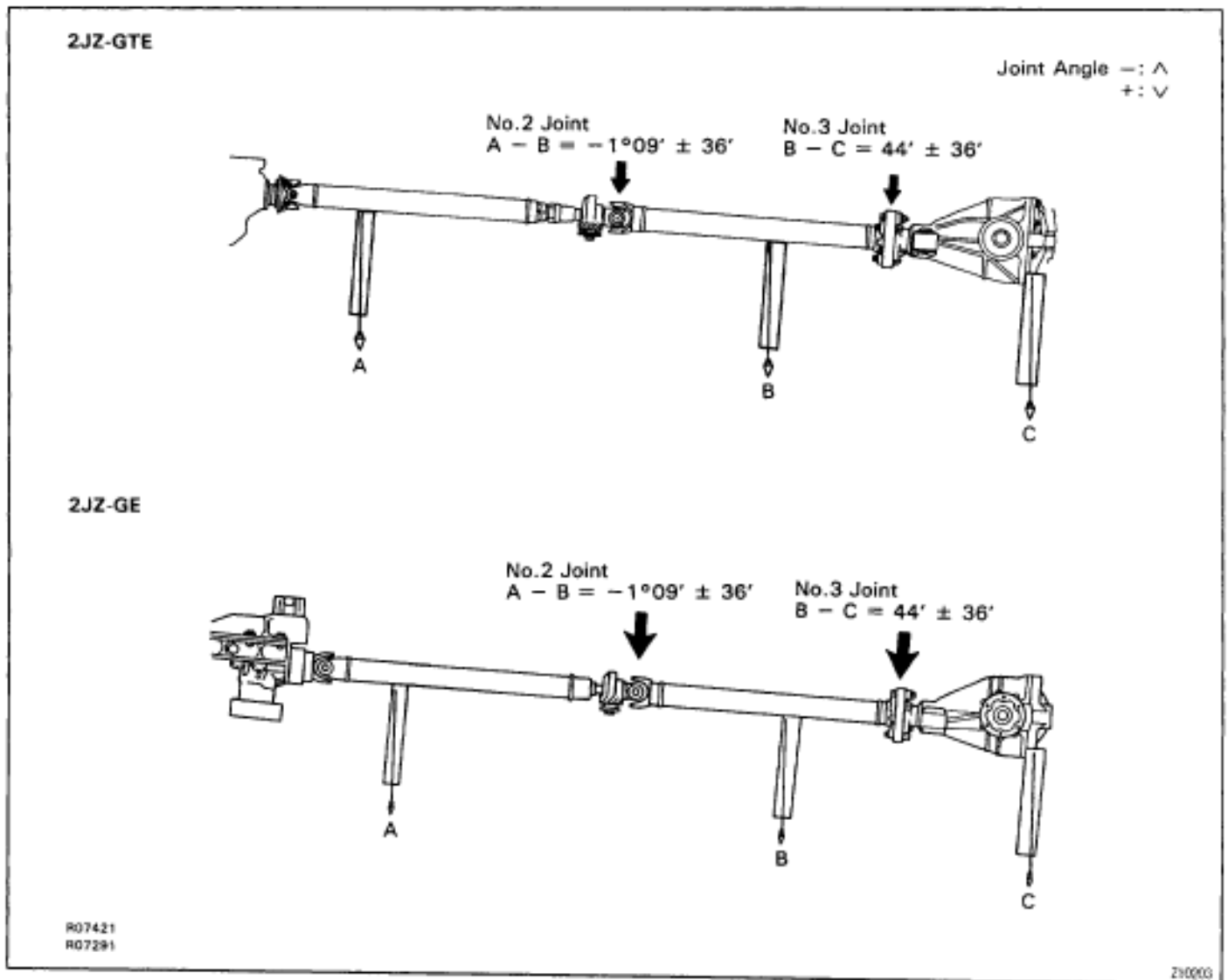
- (d) Calculate the No.3 joint angle.

**No.3 joint angle:**

$$B - C = 44' \pm 36'$$

**B: Propeller shaft installation angle**

**C: Differential installation angle**



If the measured angle is not within the specification, adjust it with the center support bearing adjusting washer, differential mount upper stopper and adjusting shim.

		Thickness mm (in.)	Remarks
Center support bearing	Adjusting washer	2.0 (0.079) 4.0 (0.157) 6.0 (0.236) 8.5 (0.335)	<ul style="list-style-type: none"> <li>• Left and right washers should be the same thickness.</li> <li>• 2 washers should not be assembled together.</li> <li>• Some vehicles are not assembled with washers.</li> </ul>
Differential	Adjusting	1.0 (0.039) 1.6 (0.063) 2.0 (0.079)	<ul style="list-style-type: none"> <li>• Left and right washers should be the same thickness</li> <li>• This shim is installed on top of the mount upper stopper and is used for adjustment.</li> </ul>

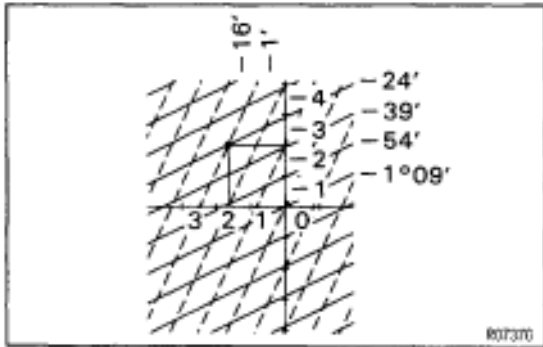
## ADJUSTMENT CHART

### HOW TO READ THIS CHART

Take measurements, then calculate the No.2 and No.3 joint angle.

Mark the calculated values on the chart and read the coordinates.

Replace the adjusting washer, shim and mount upper stopper in accordance with the coordinates read and adjust the joint angles.



### Example

#### Measurements (Installation angle):

Intermediate shaft 1° 50'

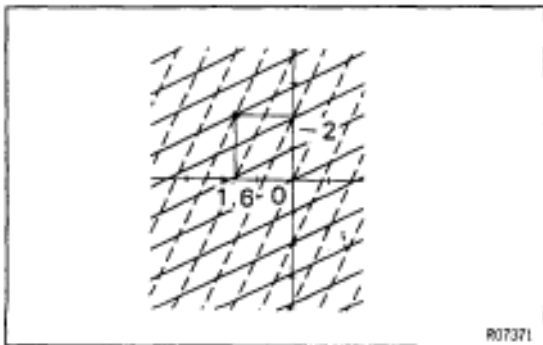
Propeller shaft 2° 14'

Differential 2° 15'

#### Joint angle:

$$\text{NO.2 } 1^\circ 50' - 2^\circ 14' = -24'$$

$$\text{NO.3 } 2^\circ 14' - 2^\circ 15' = -1'$$



#### Adjustment:

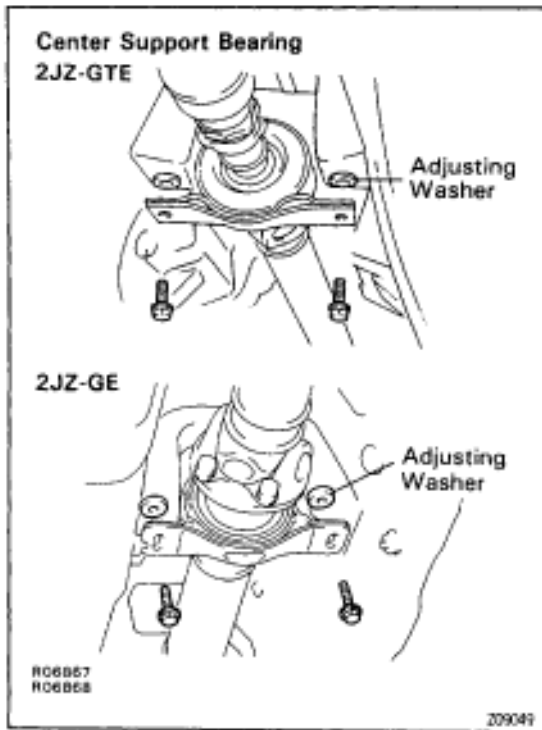
**Center support bearing**

Standard parts 4 mm – 2 mm = 2 mm

Use adjusting washers which are 2 mm (0.079 in.) thicker.

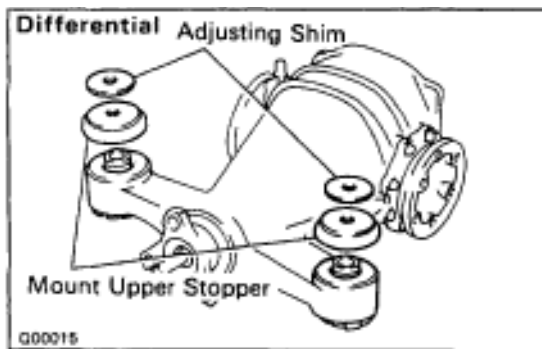
#### Differential

Use adjusting shims which are 1.6 mm (0.063 in.) thicker.

**HINT:**

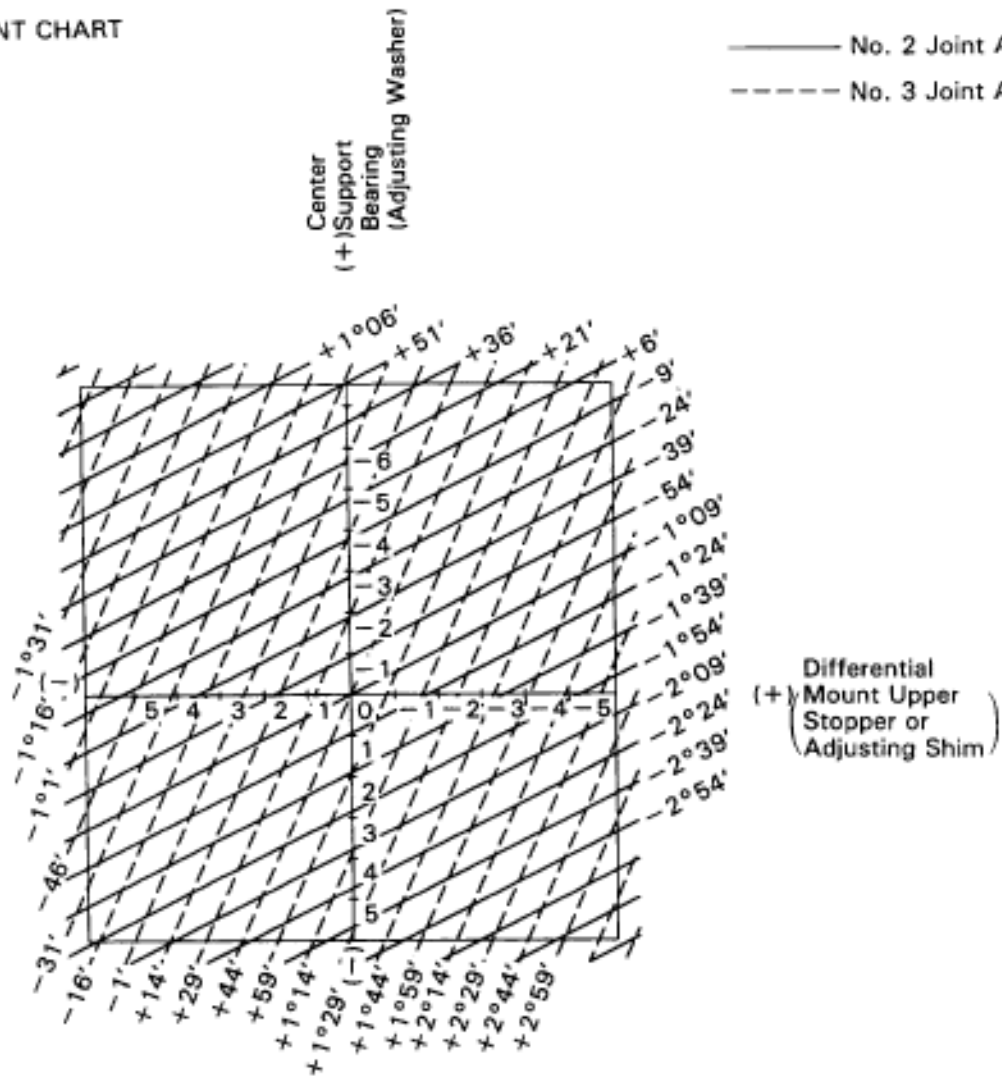
- Maintain the same thickness for the adjusting washers and adjusting shims on both the left and right sides.
- If a washer, stopper and shim of the exact thickness are not available, use the parts which are nearest in thickness.

**NOTICE:** Check the joint angle once again after making the adjustment.



ADJUSTMENT CHART

———— No. 2 Joint Angle  
 - - - - - No. 3 Joint Angle



# SERVICE SPECIFICATIONS

## SERVICE DATA

Shaft runout	Limit	0.8 mm (0.031 in.)
Joint angle	No.2 joint	-1° 09' ± 36'
	No.3 joint	44' ± 36'

## TORQUE SPECIFICATIONS

Part tightened	N·m	kgf·cm	ft·lbf
Propeller shaft x Differential	79	805	58
Propeller shaft x Intermediate shaft (2JZ-GE)	74	750	54
Propeller shaft x Transmission (2JZ-GTE)	56	570	41
Intermediate shaft x Center bearing x Universal joint flange (2JZ-GE)			
1st	181	1,850	134
Loosen nut			
2nd	69	700	51
Center support bearing x Body	49	500	36
Oxygen sensor x Exhaust front pipe	44	450	34
Exhaust pipe x Exhaust manifold	58	590	43
Crossmember x Body	13	130	8
Heat insulator x Body	5.4	55	48 in.·lbf
Adjusting Nut (2JZ-GTE)	50 (69)	515 (700)	37 (51)
Exhaust pipe support bracket X Transmission	37	380	27

( ): For use without SST