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# FRONT AXLE

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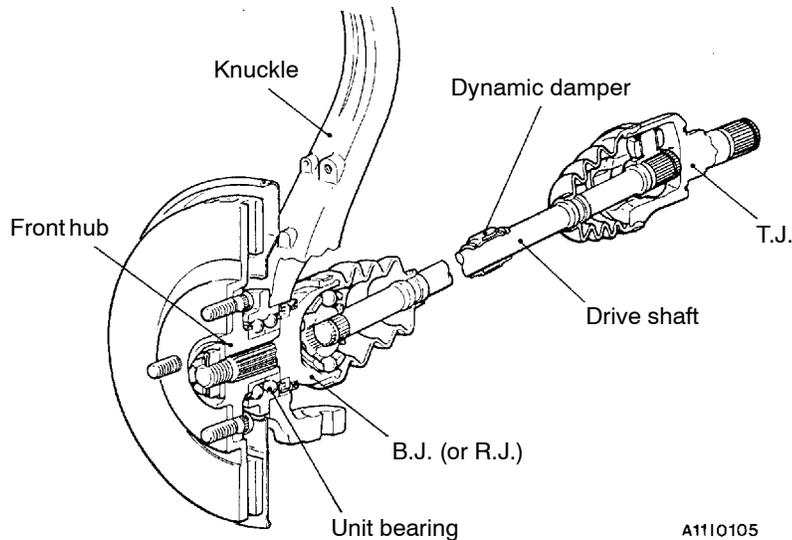


## GENERAL INFORMATION

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The front axle consists of a knuckle, front hub, unit bearing and drive shaft. The unit bearing is press-fitted to the front hub and bolted to the knuckle. Also, the unit bearing utilizes a double

row angular contact ball bearing. The drive shaft has a tripod joint (T.J.) on the transmission side and a birfield joint (B.J.) or rzeppa joint (R.J.) on the wheel side.



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## SERVICE SPECIFICATIONS

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Items		Standard value	Limit
Wheel bearing axial play mm		-	0.05
Wheel bearing rotation starting torque Nm		-	1.0 or less
Setting of T.J. boot length mm	2000 - petrol-powered vehicles	82	-
	2000 - diesel-powered vehicles, 2500	81	-
Opening dimension of the special tool (MB991561) mm	When the B.J. (or R.J.) boot band (small) is crimped	2.9	-
	When the B.J. (or R.J.) boot band (large) is crimped	3.2	-
Crimped width of the B.J. (or R.J.) boot band mm		2.4 - 2.8	-
Clearance between the B.J. (or R.J.) boot (large diameter side) and the stepped phase of the B.J. (or R.J.) housing mm		0.1 - 1.5	-

## LUBRICANTS

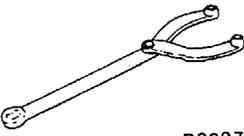
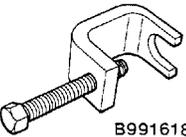
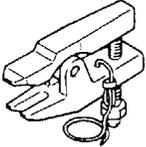
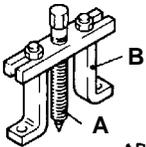
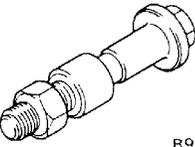
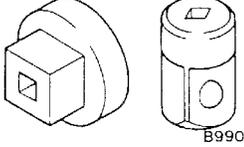
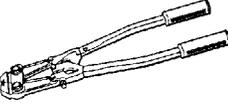
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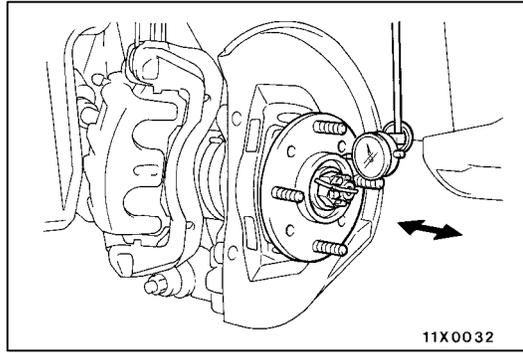
Items		Specified lubricant	Quantity g
T.J.	2000 - petrol-powered vehicles	Repair kit grease	120
	2000 - diesel-powered vehicles, 2500	Repair kit grease	150

Items		Specified lubricant	Quantity g
B.J. (or R.J.)	2000	Repair kit grease	120
	2500	Repair kit grease	135

**SPECIAL TOOLS**

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Tool	Number	Name	Use
 B990767	MB990767	End yoke holder	Fixing of the hub
 B991618	MB991618	Hub bolt remover	Hub bolt removal
 B991113	MB991406, MB990635 or MB991113	Steering linkage puller	Ball joint disconnection
 AB990241	MB990241 A: MB990242 B: MB990244	Axle shaft puller A: Puller shaft B: Puller bar	<ul style="list-style-type: none"> <li>• Front hub assembly removal</li> <li>• Drive shaft removal</li> </ul>
 B990998	MB990998	Front hub remover and installer	<ul style="list-style-type: none"> <li>• Removal of or pressing-in the hub</li> <li>• Provisional holding of the wheel bearing</li> </ul>
 B990326	MB990326	Preload socket	Wheel bearing rotation starting torque measurement
	MB991461	Plug	Preventing of entry of foreign objects into the transmission case
	MB991561	Boot band crimping tool	B.J. (or R.J.) boot band installation



## ON-VEHICLE SERVICE

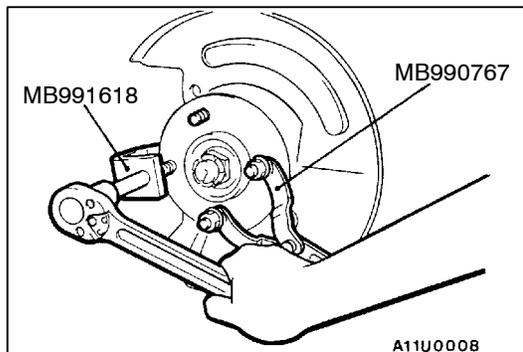
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### WHEEL BEARING AXIAL PLAY CHECK

1. Remove the disc brake caliper and suspend it with a wire.
2. Remove the brake disc from the front hub.
3. Attach a dial gauge as shown in the illustration, and then measure the axial play while moving the hub in the axial direction.

**Limit: 0.05 mm**

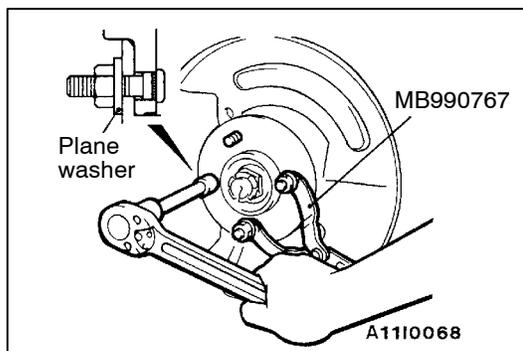
4. If axial play exceeds the limit, replace the front hub assembly.



### HUB BOLT REPLACEMENT

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1. Remove the caliper assembly and secure it with wire so that it does not fall.
2. Remove the brake disc.
3. Use the special tools to remove the hub bolts.



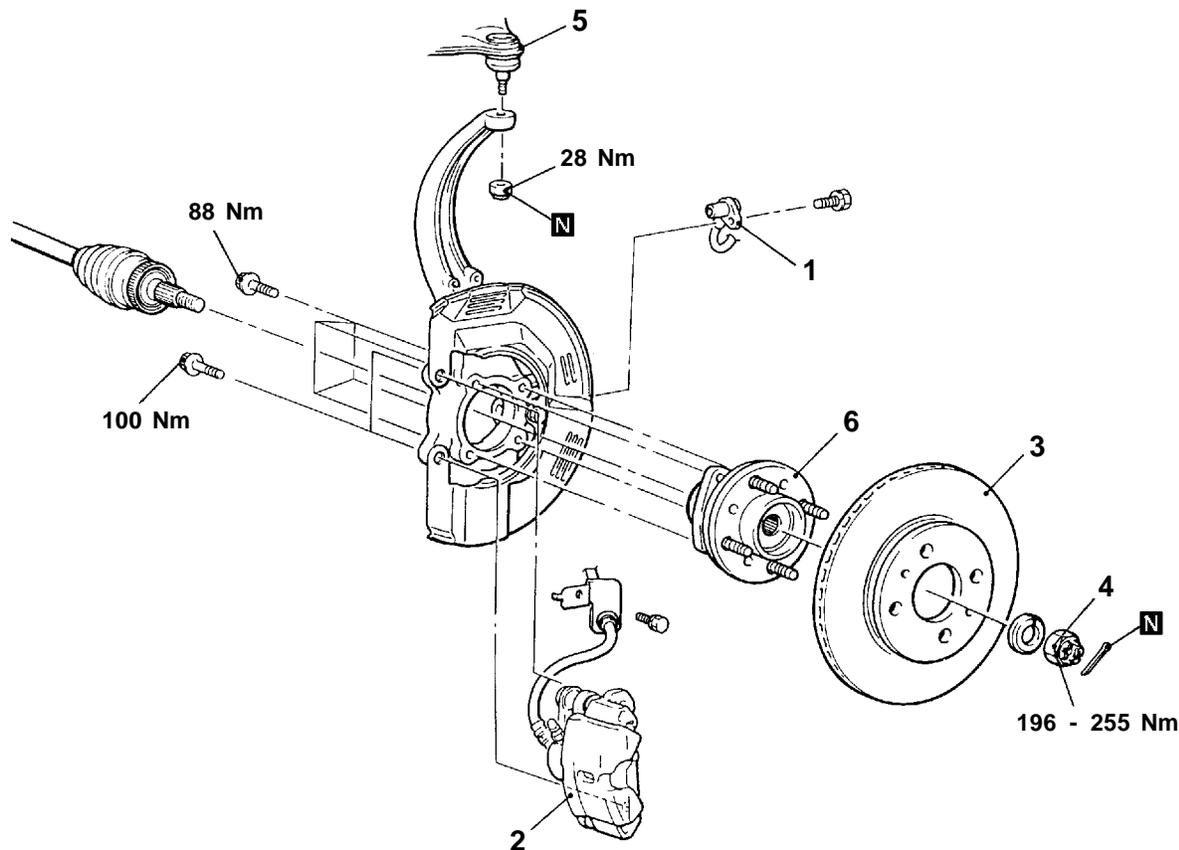
4. Install the plain washer to the new hub bolt, and install the bolt with a nut.

FRONT HUB ASSEMBLY

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REMOVAL AND INSTALLATION

**Post-installation Operation**  
 Check the Dust Cover for Cracks or Damage by Pushing it with Finger.



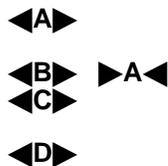
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**Removal steps**

1. Front wheel speed sensor  
 <Vehicles with ABS>  
 (Refer to GROUP 35B.)
2. Caliper assembly
3. Brake disc
4. Drive shaft nut
5. Upper arm ball joint and knuckle connection
6. Front hub assembly

**Caution**

The front hub assembly should not be disassembled. When removing the front hub assembly, the wheel bearing inner race may be left at the spindle side. In this case, always replace the front hub assembly, otherwise the hub will damage the oil seal, causing oil leaks or excessive play.



**REMOVAL SERVICE POINTS**

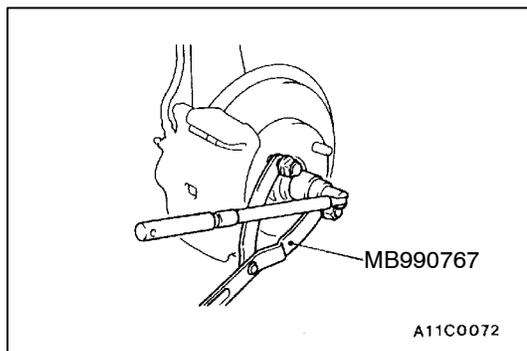
**◀A▶ CALIPER ASSEMBLY REMOVAL**

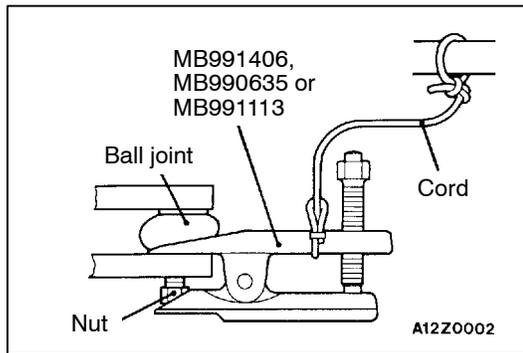
Secure the removed caliper assembly with wire, so that it does not fall.

**◀B▶ DRIVE SHAFT NUT REMOVAL**

**Caution**

Do not apply the vehicle weight to the wheel bearing while loosening the drive shaft nut.

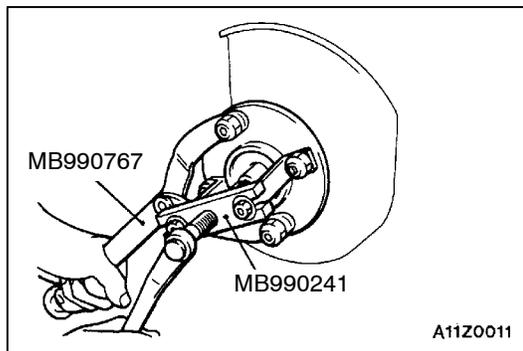




### ◀C▶ UPPER ARM BALL JOINT AND KNUCKLE DISCONNECTION

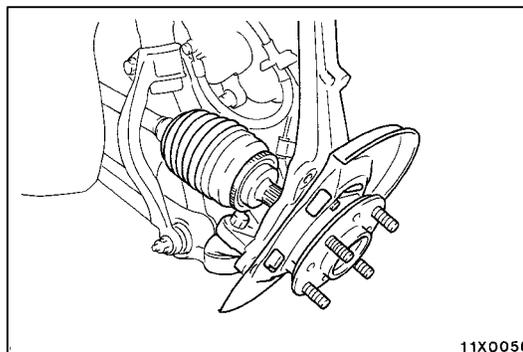
#### Caution

1. Use the special tool to loosen the nut only; do not remove it from the ball joint.
2. Tie the special tool with a cord not to let it fall off.



### ◀D▶ FRONT HUB ASSEMBLY REMOVAL

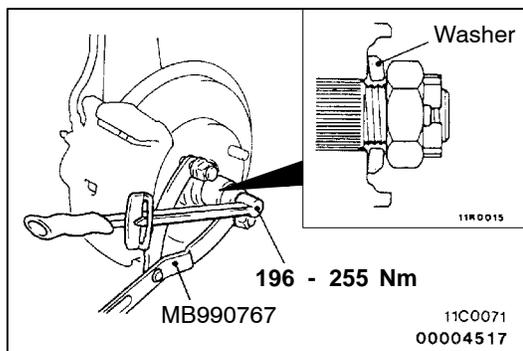
- (1) Use the special tool to push out the drive shafts from the hub.



- (2) Shift the knuckle to the outside in order to maintain the clearance between the front hub assembly mounting bolts and the drive shaft.

#### Caution

1. Do not damage the ball joint boot.
2. Be careful not to damage the rotor.



### INSTALLATION SERVICE POINT

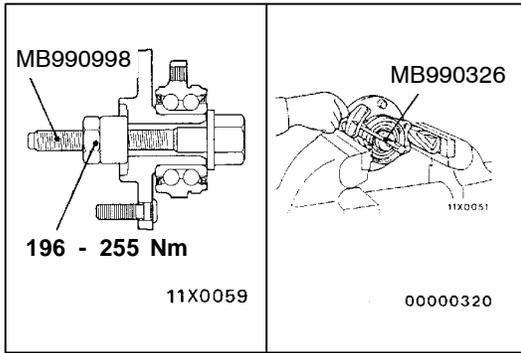
#### ▶A◀ DRIVE SHAFT NUT INSTALLATION

- (1) Install the drive shaft washer in the specified direction.
- (2) Using the special tool, tighten the drive shaft nut.

#### Caution

**Before securely tightening the drive shaft nuts, make sure there is no load on the wheel bearings.**

- (3) If the position of the split pin holes does not match, tighten the nut up to 255 Nm in maximum.
- (4) Install the split pin in the first matching holes and bend it securely.

**INSPECTION**

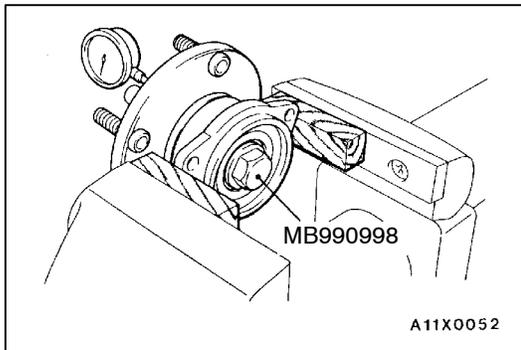
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**WHEEL BEARING ROTATION STARTING TORQUE CHECK**

- (1) Install the special tool to the front hub assembly and tighten the nut to the specified torque 196 - 255 Nm.
- (2) Use the special tool to measure the wheel bearing starting torque.

**Limit: 1.0 Nm or less**

- (3) The wheel bearing starting torque should be within the limit value range, and there should be no engagement or feeling of roughness.

**WHEEL BEARING AXIAL PLAY CHECK**

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- (1) Install the special tool to the front hub assembly and tighten the nut to the specified torque 196 - 255 Nm.
- (2) Measure the play in the hub axial direction.

**Limit: 0.05 mm**

- (3) If the limit value of hub axial play cannot be obtained, replace the front hub assembly.

# KNUCKLE

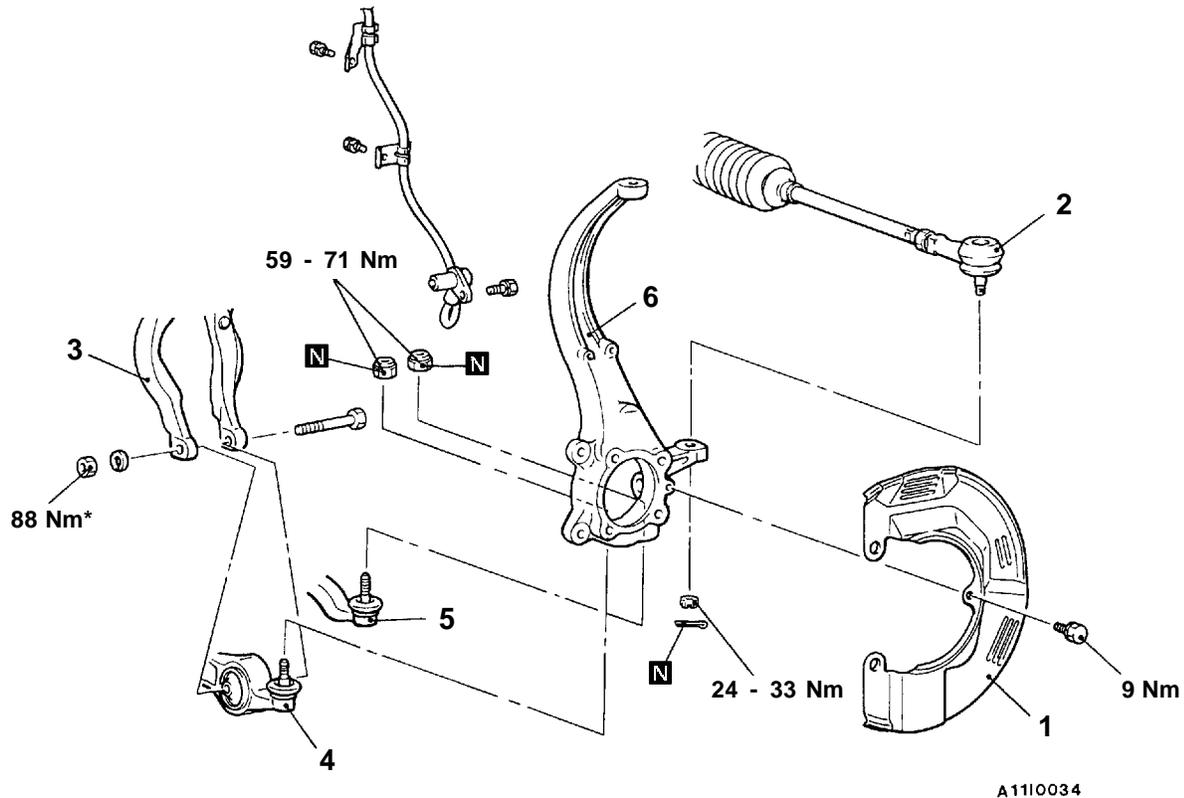
## REMOVAL AND INSTALLATION

### Pre-removal Operation

Front Hub Assembly Removal (Refer to P.26-5.)

### Post-installation Operation

- Check the Dust Cover for Cracks or Damage by Pushing it with Finger.
- Front Hub Assembly Installation (Refer to P.26-5.)



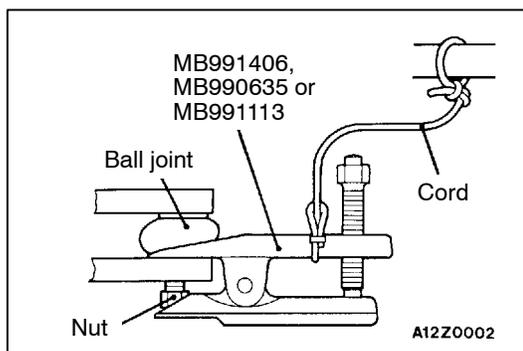
### Removal steps

- ◀A▶ 1. Dust shield
- ◀A▶ 2. Tie rod end and knuckle connection
- ◀A▶ 3. Damper fork and lateral lower arm connection
- ◀A▶ 4. Lateral lower arm and knuckle connection
- ◀A▶ 5. Compression lower arm and knuckle connection

6. Knuckle

### Caution

\*: Indicates parts which should be temporarily tightened, and then fully tightened with the vehicle on the ground in the unladen condition.



### REMOVAL SERVICE POINT

- ◀A▶ TIE ROD END AND KNUCKLE/LATERAL LOWER ARM AND KNUCKLE/COMPRESSION LOWER ARM AND KNUCKLE DISCONNECTION

### Caution

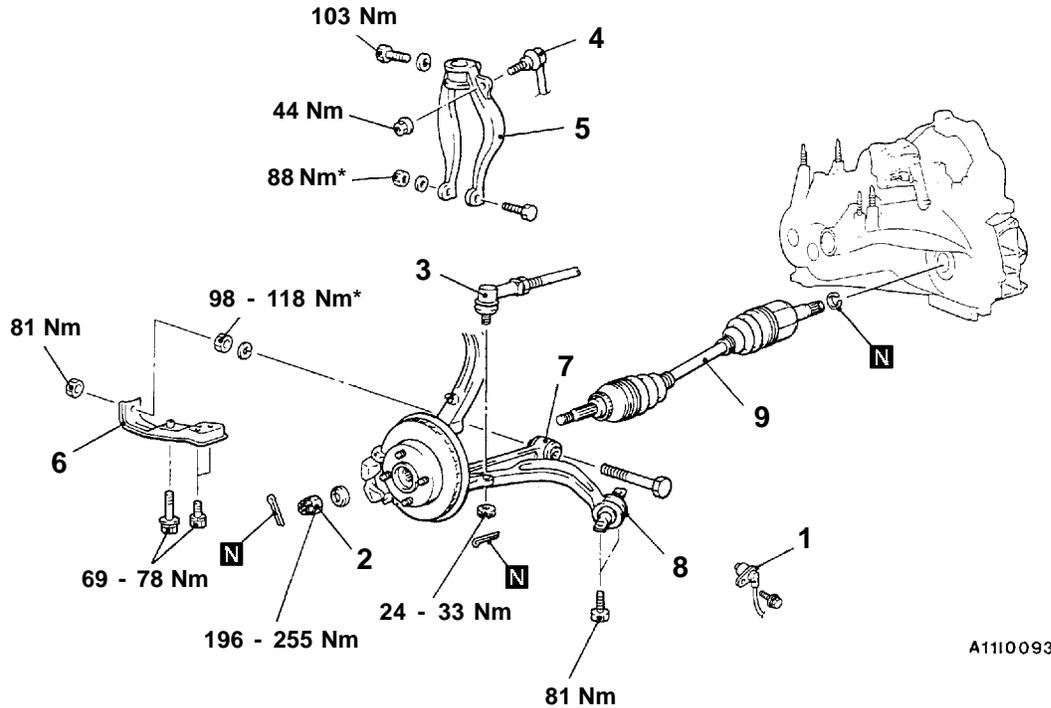
1. Use the special tool to loosen the nut only; do not remove it from the ball joint.
2. Tie the special tool with a cord not to let it fall off.

# DRIVE SHAFT

## REMOVAL AND INSTALLATION

### Post-installation Operation

- Check the Dust Cover for Cracks or Damage by Pushing it with Finger.
- Wheel Alignment Check and Adjustment (Refer to GROUP 33A - On-vehicle Service.)



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### Removal steps

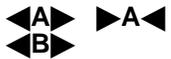
1. Front wheel speed sensor  
<Vehicles with ABS>  
(Refer to GROUP 35B.)
2. Drive shaft nut
3. Tie rod end and knuckle connection
4. Stabilizer link and damper fork connection
5. Damper fork
6. No.2 stay
7. Lateral lower arm connection

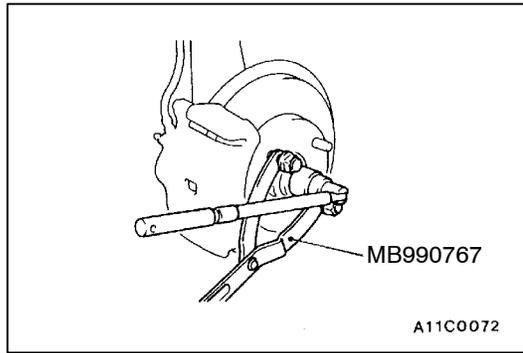


8. Compression lower arm connection
9. Drive shaft

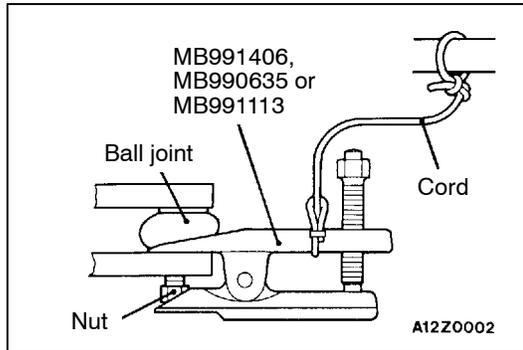
### Caution

1. \*: Indicates parts which should be temporarily tightened, and then fully tightened with the vehicle on the ground in the unladen condition.
2. For vehicles with ABS, be careful not to damage the rotors installed to the B.J. (or R.J.) outer race during removal and installation of the drive shaft.

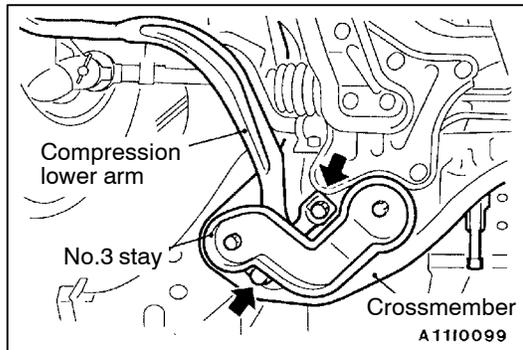


**REMOVAL SERVICE POINTS****◀A▶ DRIVE SHAFT NUT REMOVAL****Caution**

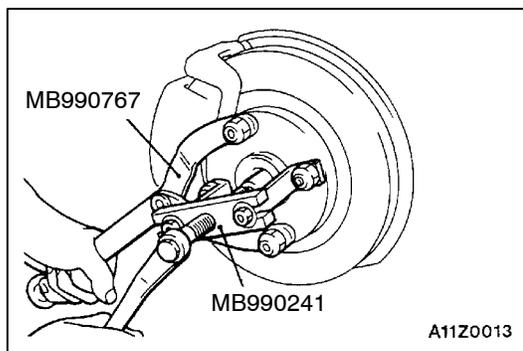
Do not apply the vehicle weight to the wheel bearing while loosening the drive shaft nut.

**◀B▶ TIE ROD END AND KNUCKLE DISCONNECTION****Caution**

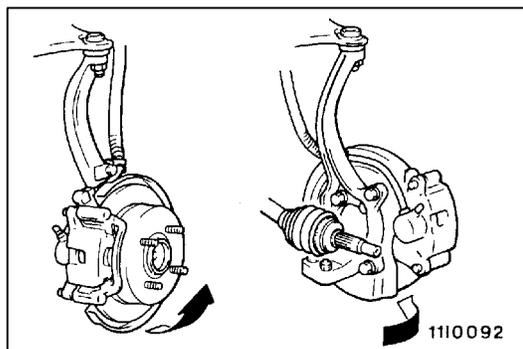
1. Use the special tool to loosen the nut only; do not remove it from the ball joint.
2. Tie the special tool with a cord not to let it fall off.

**◀C▶ COMPRESSION LOWER ARM DISCONNECTION**

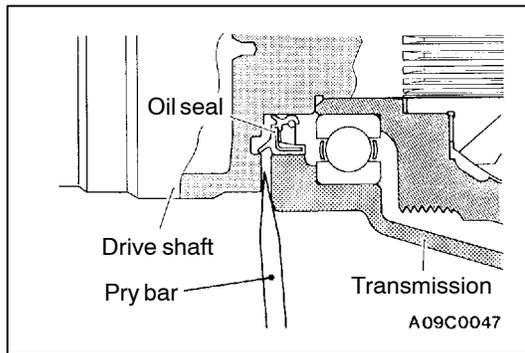
To remove the compression lower arm from the crossmember, No.3 stay must not be removed as it is tightened together with the crossmember.

**◀D▶ DRIVE SHAFT REMOVAL**

- (1) Use the special tools to push out the drive shafts from the hub.



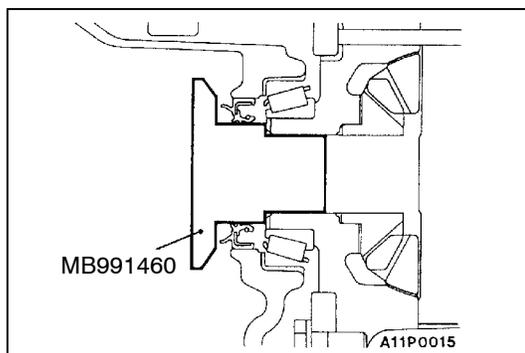
- (2) While pulling out the lower side of the rotor toward you, rotate it toward the rear side of the vehicle 90° to remove the drive shaft from the hub.



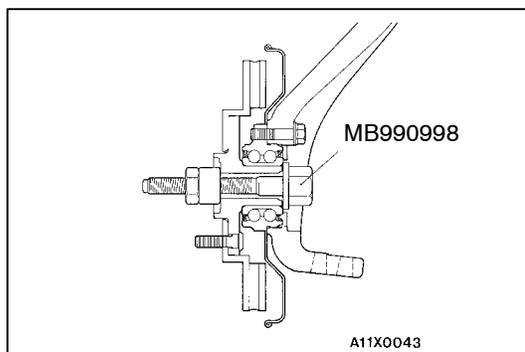
- (3) Insert a pry bar between the transmission case and the drive shaft, and then pry the drive shaft from the transmission.

**Caution**

1. Always use a lever as pulling out the drive shaft from B.J. (or R.J.) assembly may damage the T.J. assembly.
2. Do not insert the pry bar so deep as to damage the oil seal.

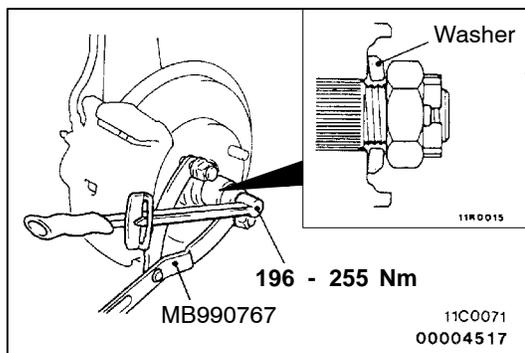


- (4) Use the special tool as a cover not to let foreign objects get into the transmission case.



**Caution**

Do not apply the vehicle weight to the wheel bearing while loosening the drive shaft nut. If, however, the vehicle weight must be applied to the bearing (because of moving the vehicle), temporarily secure the wheel bearing by using the special tool.



**INSTALLATION SERVICE POINT**

**▶A◀ DRIVE SHAFT NUT INSTALLATION**

- (1) Be sure to install the drive shaft washer in the specified direction.
- (2) Using the special tool, tighten the drive shaft nut.

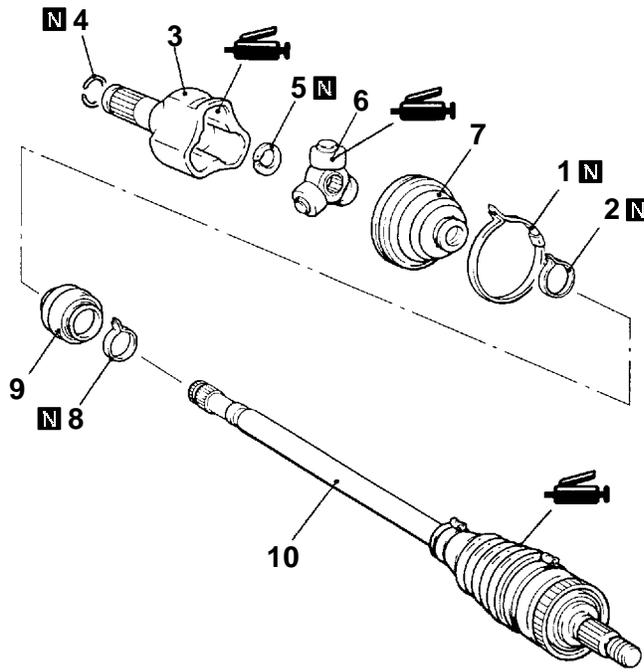
**Caution**

Before securely tightening the drive shaft nuts, make sure there is no load on the wheel bearings.

- (3) If the position of the split pin holes does not match, tighten the nut up to 255 Nm in maximum.
- (4) Install the split pin in the first matching holes and bend it securely.

DISASSEMBLY AND REASSEMBLY

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<p>1110100</p>	<p>1110101</p>	<p>1110070</p>
<p>T.J. repair kit</p>	<p>T.J. boot repair kit</p>	<p>B.J. (or R.J.) boot repair kit</p>

Disassembly steps

- ◀C▶ 1. T.J. boot band (large)
- ◀C▶ 2. T.J. boot band (small)
- ◀A▶ ▶B▶ 3. T.J. case
- ▶B▶ 4. Circlip
- ▶B▶ 5. Snap ring
- ◀A▶ ▶B▶ 6. Spider assembly
- ◀B▶ ▶A▶ 7. T.J. boot
- ▶A▶ 8. Damper band
- ▶A▶ 9. Dynamic damper

- 10. B.J. (or R.J.) assembly
- 11. B.J. (or R.J.) boot band (small)
- 12. B.J. (or R.J.) boot band (large)
- 13. B.J. (or R.J.) boot

Caution

1. Never disassemble the B.J. (or R.J.) assembly except when replacing the B.J. (or R.J.) boot.
2. On vehicles with ABS, be sure not to damage the rotor attached to the B.J. (or R.J.) outer race.

**DISASSEMBLY SERVICE POINTS****◀A▶ T.J. CASE/SPIDER ASSEMBLY REMOVAL**

- (1) Wipe off grease from the spider assembly and the inside of the T.J. case.
- (2) Always clean the spider assembly when the grease contains water or foreign material.

**Caution**

1. Do not disassemble the spider assembly.
2. Use care in handling so as not to damage the drive shaft.

**◀B▶ T.J. BOOT REMOVAL**

- (1) Wipe off grease from the shaft spline.
- (2) When reusing the T.J. boot, wrap plastic tape around the shaft spline to avoid damaging the boot.

**REASSEMBLY SERVICE POINTS****▶A◀ DYNAMIC DAMPER/DAMPER BAND/T.J. BOOT INSTALLATION**

- (1) Straighten the B.J. (or R.J.) assembly, and secure the dynamic damper with the damper band as shown in the figure.

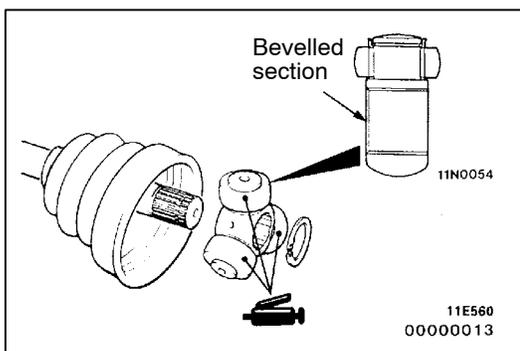
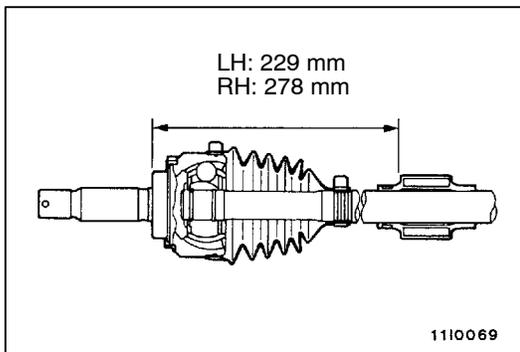
**Caution**

There should be no grease adhered to the rubber part of the dynamic damper.

**NOTE**

The damper band and the T.J. boot band (small) are the same parts.

- (2) Wrap plastic tape around the shaft spline, and then install the T.J. boot band (small) and T.J. boot.

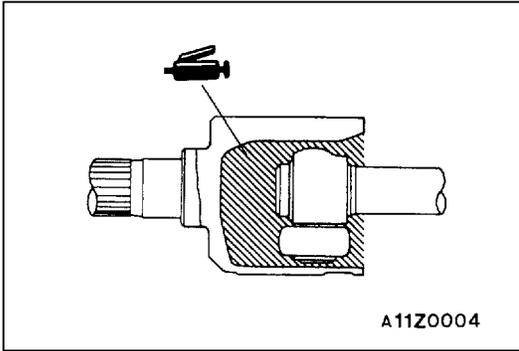
**▶B◀ SPIDER ASSEMBLY/T.J. CASE INSTALLATION**

- (1) Apply the specified grease furnished in the repair kit to the spider assembly between the spider axle and the roller.

**Specified grease: Repair kit grease**

**Caution**

1. The drive shaft joint uses special grease. Do not mix old and new or different types of grease.
2. If the spider assembly has been cleaned, take special care to apply the specified grease.



- (2) Install the spider assembly to the shaft from the direction of the spline bevelled section.
- (3) After applying the specified grease to the T.J. case, insert the drive shaft and apply grease one more time.

**Specified grease: Repair kit grease**

**Amount to use:**

<2000 - petrol-powered vehicles> 120 g

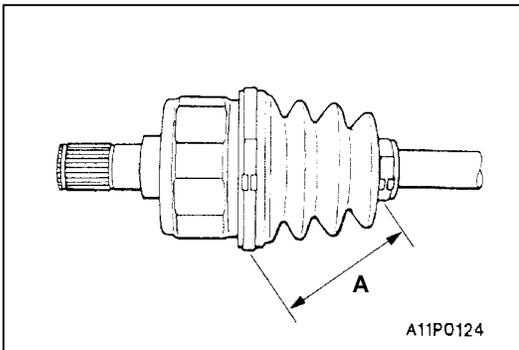
<2000 - diesel-powered vehicles, 2500> 150 g

**NOTE**

The grease in the repair kit should be divided in half for use, respectively, at the joint and inside the boot.

**Caution**

The drive shaft joint uses special grease. Do not mix old and new or different types of grease.



### ▶◀ T.J. BOOT BAND (SMALL)/T.J. BOOT BAND (LARGE) INSTALLATION

Set the T.J. boot bands at the specified distance in order to adjust the amount of air inside the T.J. boot, and then tighten the T.J. boot bands securely.

**Standard value (A):**

<2000 - petrol-powered vehicles> 82 mm

<2000 - diesel-powered vehicles, 2500> 81 mm

### INSPECTION

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- Check the drive shaft for damage, bending or corrosion.
- Check the drive shaft spline part for wear or damage.
- Check the spider assembly for roller rotation, wear or corrosion.
- Check the groove inside T.J. case for wear or corrosion.
- Check the dynamic damper for damage or cracking.
- Check the boots for deterioration, damage or cracking.

### B.J. (or R.J.) BOOT (RESIN BOOT) REPLACEMENT

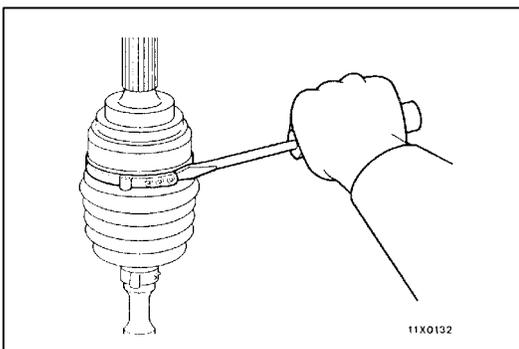
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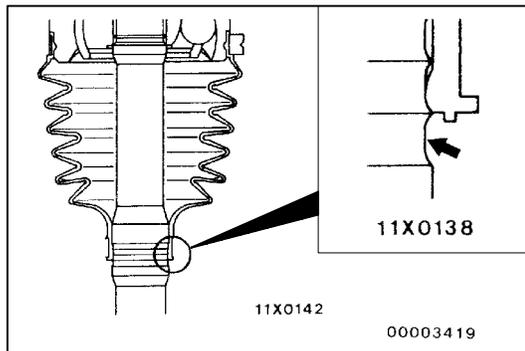
- (1) Remove the B.J. (or R.J.) boot bands (large and small).

**NOTE**

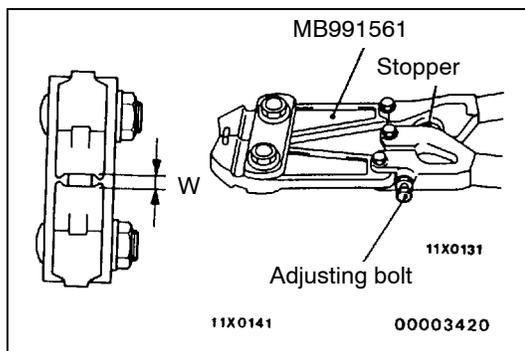
The B.J. (or R.J.) boot bands cannot be re-used.

- (2) Remove the B.J. (or R.J.) boot.
- (3) Wrap a plastic tape around the shaft spline, and assemble the B.J. (or R.J.) boot band and B.J. (or R.J.) boot.





- (4) Install the B.J. (or R.J.) boot with the part with the smallest diameter in a position such that the shaft groove can be seen.



- (5) Turn the adjusting bolt on the special tool so that the size of the opening (W) is at the standard value.

**Standard value (W): 2.9 mm**

**<If it is larger than 2.9 mm>**

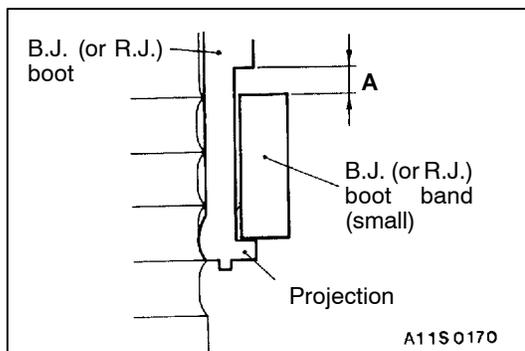
**Tighten the adjusting bolt.**

**<If it is smaller than 2.9 mm>**

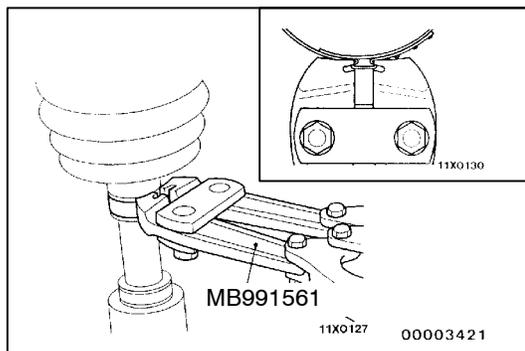
**Loosen the adjusting bolt.**

**NOTE**

- (1) The value of W will change by approximately 0.7 mm for each turn of the adjusting bolt.
- (2) The adjusting bolt should not be turned more than once.



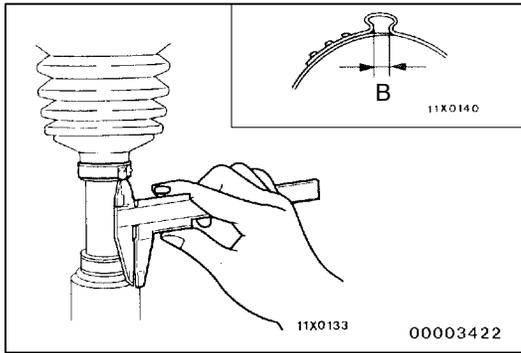
- (6) Place the B.J. (or R.J.) boot band (small) against the projection at the edge of the boot, and then secure it so that there is a clearance left as shown by (A) in the illustration.



- (7) Use the special tool to crimp the B.J. (or R.J.) boot band (small).

**Caution**

1. **Secure the drive shaft in an upright position and clamp the part of the B.J. (or R.J.) boot band to be crimped securely in the jaws of the special tool.**
2. **Crimp the B.J. (or R.J.) boot band until the special tool touches the stopper.**



- (8) Check that the crimping amount (B) of the B.J. (or R.J.) boot band is at the standard value.

**Standard value (B): 2.4 - 2.8 mm**

<If the crimping amount is larger than 2.8 mm>  
Readjust the value of (W) in step (5) according to the following formula, and then repeat the operation in step (7).

$$W = 5.5 \text{ mm} - B$$

Example: If B = 2.9 mm, then W = 2.6 mm.

<If the crimping amount is smaller than 2.4 mm>  
Remove the B.J. (or R.J.) boot band, readjust the value of (W) in step (5) according to the following formula, and then repeat the operations in steps (6) and (7) using a new B.J. (or R.J.) boot band.

$$W = 5.5 \text{ mm} - B$$

Example: If B = 2.3 mm, then W = 3.2 mm.

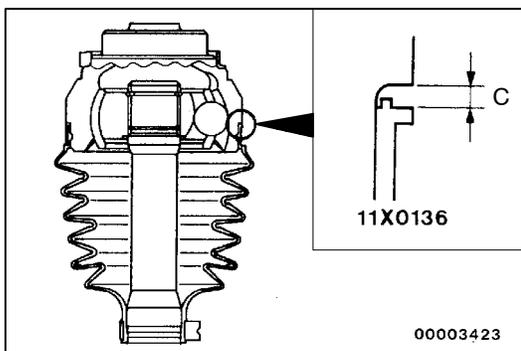
- (9) Check that the B.J. (or R.J.) boot band is not sticking out past the place where it has been installed. If the B.J. (or R.J.) boot band is sticking out, remove it and then repeat the operations in steps (6) to (8) using a new B.J. (or R.J.) boot band.
- (10) Fill the inside of the B.J. (or R.J.) boot with the specified amount of the specified grease.

**Specified grease: Repair kit grease**

**Amount to use: <2000> 120 g, <2500> 135 g**

**Caution**

The drive shaft joint uses special grease. Do not mix old and new or different types of grease.

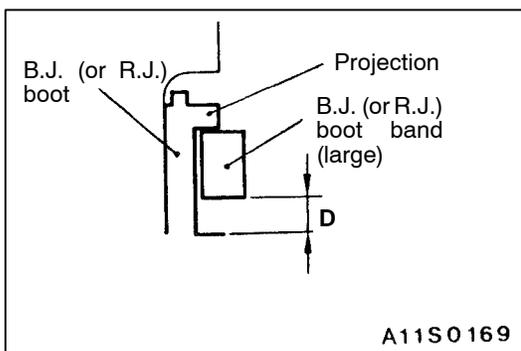


- (11) Install the B.J. (or R.J.) boot band (large) so that there is the clearance (C) between it and the B.J. (or R.J.) housing is at the standard value.

**Standard value (C): 0.1 - 1.5 mm**

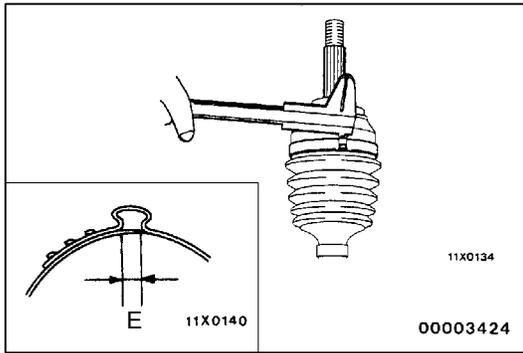
- (12) Follow the same procedure as in step (5) to adjust the size of the opening (W) on the special tool so that it is at the standard value.

**Standard value (W): 3.2 mm**



- (13) Place the B.J. (or R.J.) boot band (large) against the projection at the edge of the boot, and then secure it so that there is a clearance left as shown by (D) in the illustration.

- (14) Use the special tool to crimp the B.J. (or R.J.) boot band (large) in the same way as in step (7).



- (15) Check that the crimping amount (E) of the B.J. (or R.J.) boot band is at the standard value.

**Standard value (e): 2.4 - 2.8 mm**

<If the crimping amount is larger than 2.8 mm>  
Readjust the value of (W) in step (12) according to the following formula, and then repeat the operation in step (14).

$$W = 5.8 \text{ mm} - E$$

Example: If E = 2.9 mm, then W = 2.9 mm.

<If the crimping amount is smaller than 2.4 mm>  
Remove the B.J. (or R.J.) boot band, readjust the value of (W) in step (12) according to the following formula, and then repeat the operations in steps (13) and (14) using a new B.J. (or R.J.) boot band.

$$W = 5.8 \text{ mm} - E$$

Example: If E = 2.3 mm, then W = 3.5 mm.

- (16) Check that the B.J. (or R.J.) boot band is not sticking out past the place where it has been installed.  
If the B.J. (or R.J.) boot band is sticking out, remove it and then repeat the operations in steps (13) to (15) using a new B.J. (or R.J.) boot band.

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## NOTES