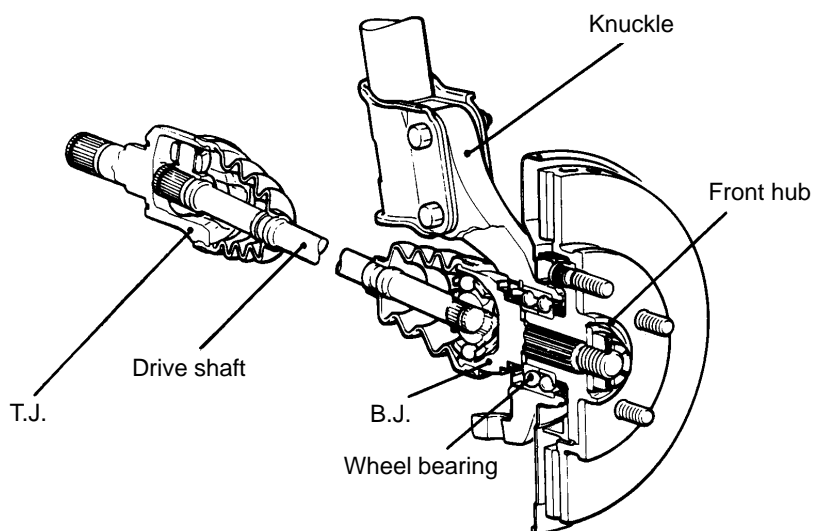


## GENERAL INFORMATION

The front axle consists of a knuckle, front hub, double-row angular contact ball bearing and drive shaft. The bearing is press-fitted to the hub and the hub and bearing assembly is press fitted in

the knuckle to support the drive shaft. The drive shaft has a tripod joint (T.J.) on the transmission side and a birfield joint (B.J.) on the wheel side.

## CONSTRUCTION DIAGRAM



22AE003N

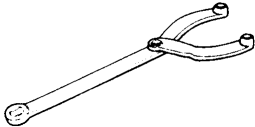
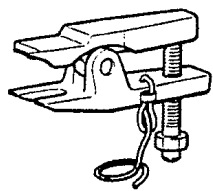
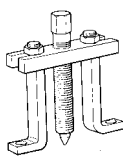
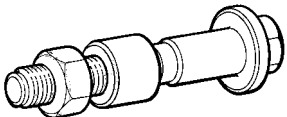
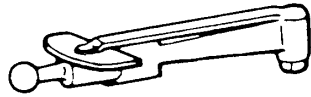
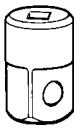

## SERVICE SPECIFICATIONS

Items		Standard value	Limit
Setting of the T.J. boot length mm		75±3	
Hub axial play mm		–	0.05
Wheel bearing breakaway torque Nm		–	1.8 or less
Opening dimension of the special tool (MB991561) mm	When the B.J boot band (small) is crimped	2.9	–
	When the B.J. boot band (big) is crimped	3.2	–
Crimped width of the B.J. boot band mm		2.4 – 2.8	–
Clearance between the B.J. boot (larger diameter side) and the stepped phase of the B.J. housing mm		0.1 – 1.55	–

## LUBRICANTS

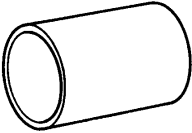
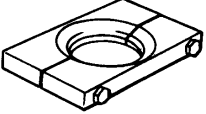
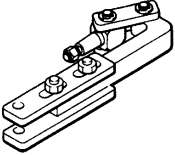


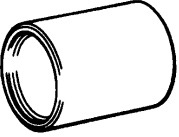

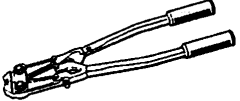
Items	Quantity g	Specified lubricant
T.J. boot grease	145	Repair kit grease
B.J. boot grease	160	Repair kit grease

## SPECIAL TOOLS

Tool	Tool number and name	Supersession	Application
	MB990767 End yoke holder	EMB990767	Hub fixing
	MB991113 or MB990635 Steering linkage puller	13-006	Tie rod end and lower arm ball joint removal
	MB990241 Axle shaft puller	—	Drive shaft removal
	MB990998 Front hub remover and installer	E2M45A	<ul style="list-style-type: none"> <li>• Wheel bearing provisional holding</li> <li>• Hub axial play measurement</li> <li>• Rotational starting torque measurement</li> </ul>
	MB990685 Torque wrench		Wheel bearing starting torque measurement
	MB990326 Preload wrench	EMB990326	Wheel bearing starting torque measurement
	MB990810 Bearing puller	E2M49	Removal of the wheel bearing inner race

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## 26 FRONT AXLE – Special Tools

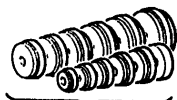
Tool	Tool number and name	Supersession	Application
	MB991172 Adaptor	–	Press-fitting
	MB991248 Inner shaft remover	–	Pressing-out
	MB991056 Knuckle arm bridge	E320	Removal of the hub
	MB990955 Oil seal installer	–	Press-fitting the oil seal
	MB990947 Lower arm bushing arbor	E17M15/16	Press-fitting the oil seal
	MB990890 Rear suspension bushing base	EMB990890	Press-fitting the wheel bearing
	MB990883 Rear suspension arbor	EMB990883	Press-fitting the wheel bearing
	MB991561 Boot band clipping tool	–	Resin boot band installation

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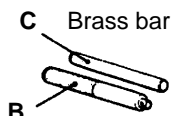
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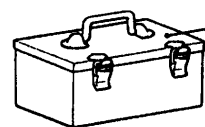
MB990925



**A**  
Installer adaptor



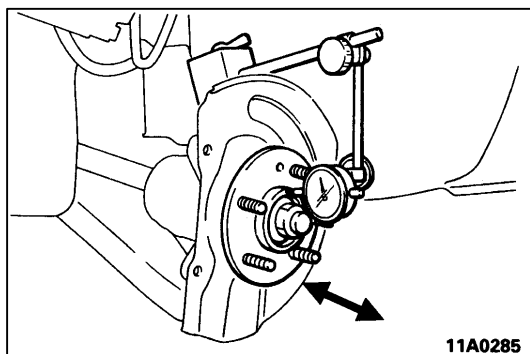
**C** Brass bar  
**B** Bar (snap-in type)



Tool box

A11W0113

Type	Tool number	O.D. mm	Type	Tool number	O.D. mm
A	MB990926	39	A	MB990933	63.5
	MB990927	45		MB990934	67.5
	MB990928	49.5		MB990935	71.5
	MB990929	51		MB990936	75.5
	MB990930	54		MB990937	79
	MB990931	57	B	MB990938	—
	MB990932	61	C	MB990939	—



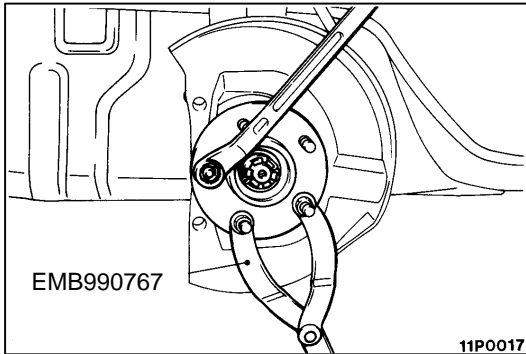
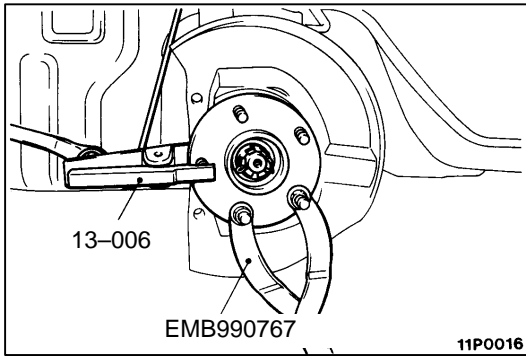
## ON-VEHICLE SERVICE

### HUB AXIAL PLAY CHECK

1. Remove the disc brake calliper 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: 0.01 mm**

4. If end play exceeds the limit, check that the driveshaft nut is tightened to specified torque, if correctly tensioned, replace the front hub bearing assembly.



## HUB BOLT REPLACEMENT

1. Remove the calliper 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.

### Caution

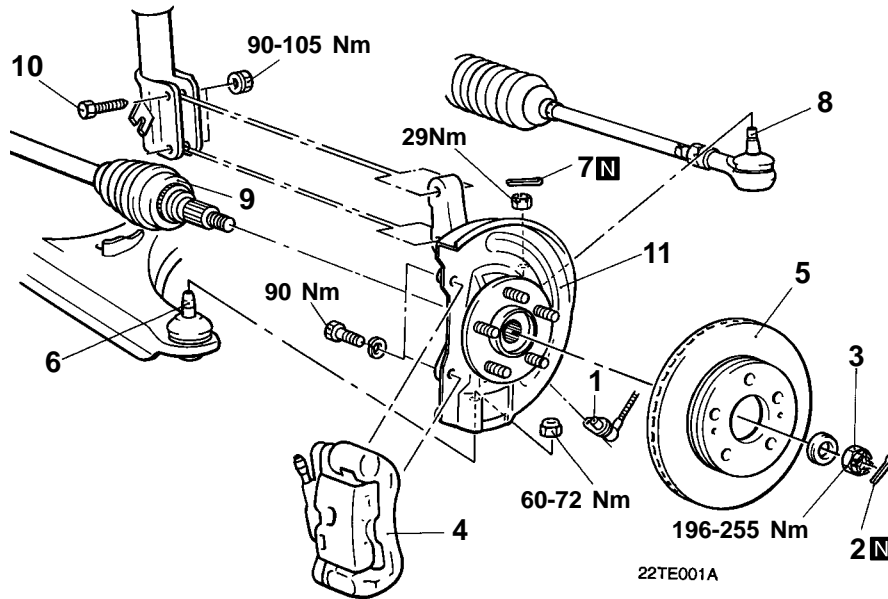
The special tool should be suspended by a cord to prevent it from coming off.

4. Align the splines on the hub bolt with the splines in the hub and use the wheel nuts to securely install the new hub bolts.

# FRONT HUB AND KNUCKLE ASSEMBLY REMOVAL AND INSTALLATION

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## Removal steps

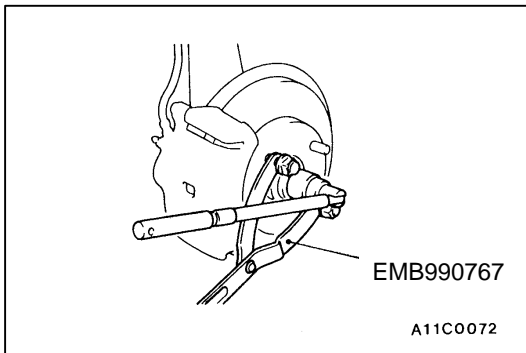
1. Front speed sensor <Vehicles with ABS>
2. Split pin
3. Drive shaft nut
4. Calliper assembly
5. Brake disc



6. Connection for lower arm ball joint
7. Split pin
8. Connection for tie rod end
9. Drive shaft
10. Front strut mounting bolt
11. Hub and knuckle

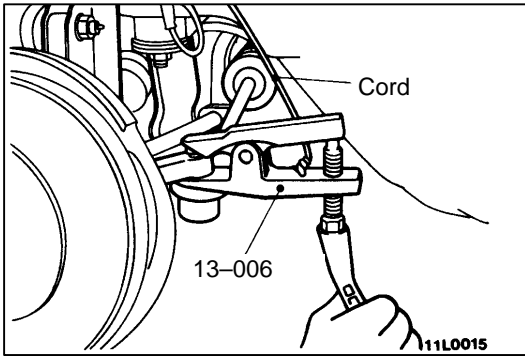
## REMOVAL SERVICE POINTS

### ◀A▶ DRIVE SHAFT NUT REMOVAL



### ◀B▶ CALLIPER ASSEMBLY REMOVAL

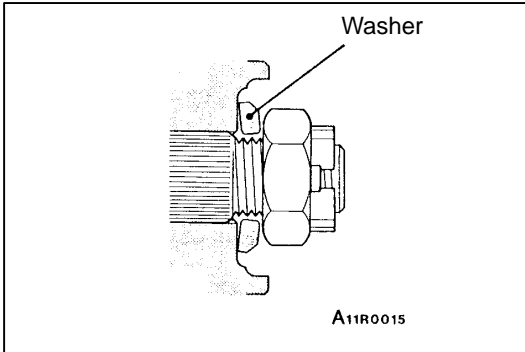
Secure the calliper assembly with wire to avoid placing load on the brake hose.



## ◀C▶ DISCONNECTION OF LOWER ARM BALL JOINT/ TIE ROD END

### Caution

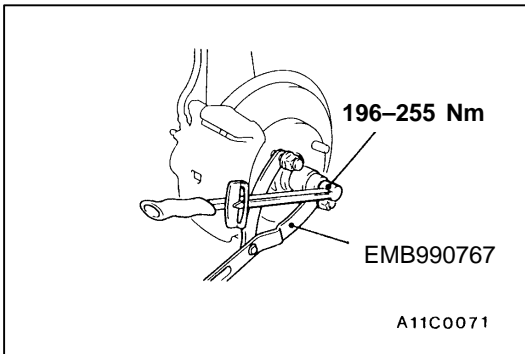
1. Be sure to tie the cord of the special tool to a nearby part.
2. Loosen the nut but do not remove it.



## 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 to the lower end of the specified torque range.

### Caution

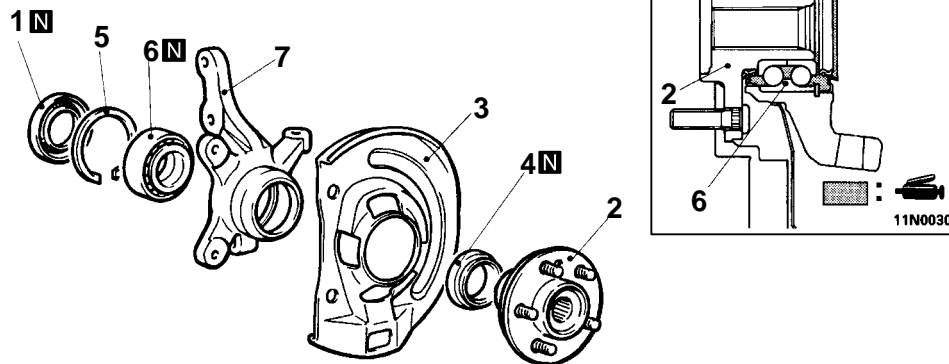
**There should be no load on the wheel bearings when the drive shaft nut is tightened.**

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

## DISASSEMBLY AND REASSEMBLY

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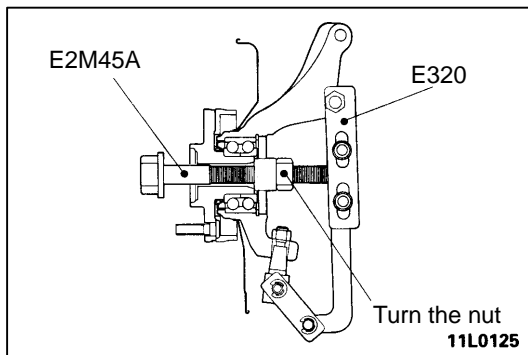
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22TE004A

### Disassembly Procedure

- |                                   |   |                           |  |
|-----------------------------------|---|---------------------------|--|
| <p>▶D▶<br/>▶C▶</p> <p>▶A▶ ▶C▶</p> | <p>1. Oil seal (Drive shaft side)</p> <ul style="list-style-type: none"> <li>• Adjustment of the wheel bearing starting torque</li> <li>• Adjustment of the hub end play</li> </ul> <p>2. Hub</p> | <p>▶B▶</p> <p>▶B▶ ▶A▶</p> | <p>3. Dust shield</p> <p>4. Oil seal</p> <p>5. Snap ring</p> <p>6. Wheel bearing</p> <p>7. Knuckle</p> |
|-----------------------------------|---|---------------------------|--|



### SERVICE POINTS OF DISASSEMBLY

#### ▶A▶ REMOVAL OF HUB FROM KNUCKLE

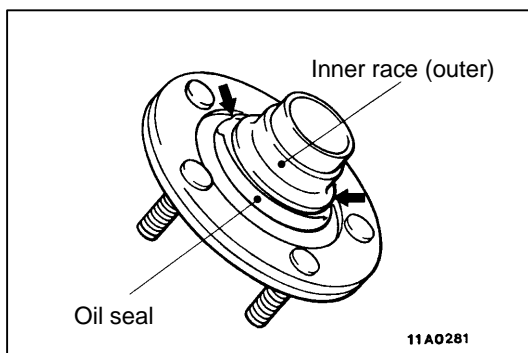
1. Attach the special tools to the knuckle and hub.
2. Secure the knuckle in a vice.
3. Tighten the nut of the special tool to remove the hub from the knuckle.

#### Caution

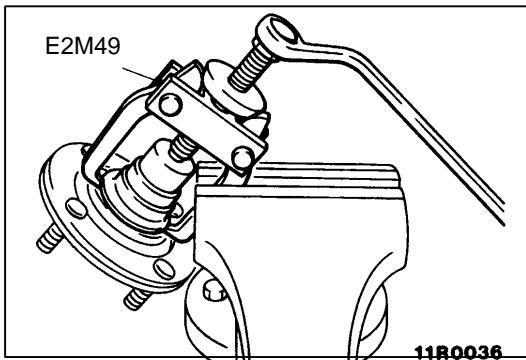
1. Always use the special tool to remove the hub.
2. Never strike the hub or knuckle with a hammer to separate them as the bearing will be damaged.

#### ▶B▶ WHEEL BEARING

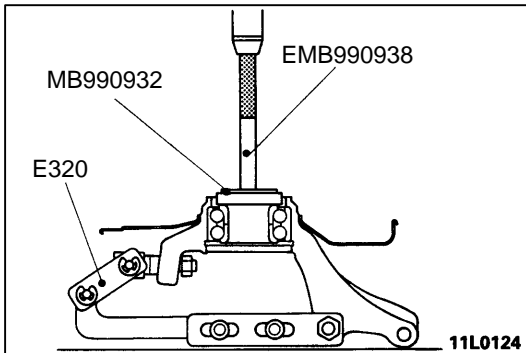
1. Crush the oil seal in two places so that the tabs of the special tool can be engaged on the wheel bearing inner race.







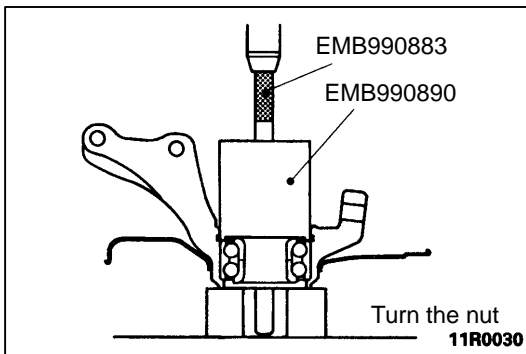
2. Remove the wheel bearing inner race from the front hub by using the special tool, as shown in the illustration.



3. Drive the wheel bearing out with a press, using a 61 mm installer adaptor.

## INSPECTION

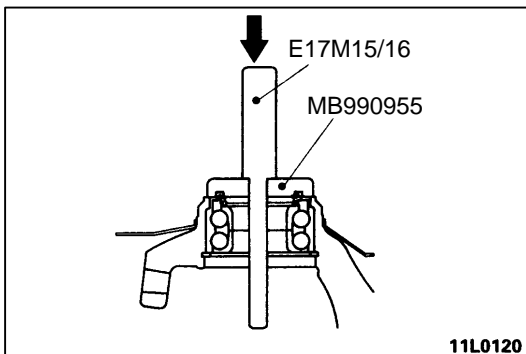
- Check the front hub and brake disc mounting surfaces for fretting and contamination.
- Check the knuckle inner surface for galling or cracks.
- Check for a defective bearing.



## SERVICE POINTS OF REASSEMBLY

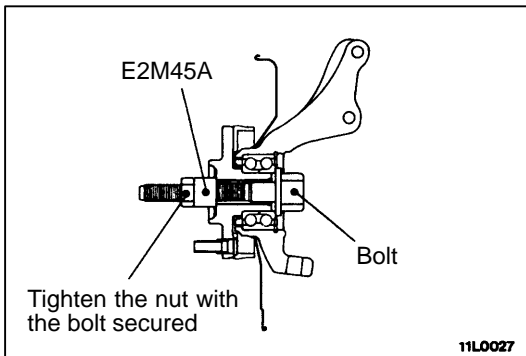
### ►A◄ WHEEL BEARING

1. Fill the wheel bearing with multipurpose grease.
2. Apply a thin coating of multipurpose grease to the knuckle and bearing contact surfaces.
3. Press-in the bearing using the special tools.



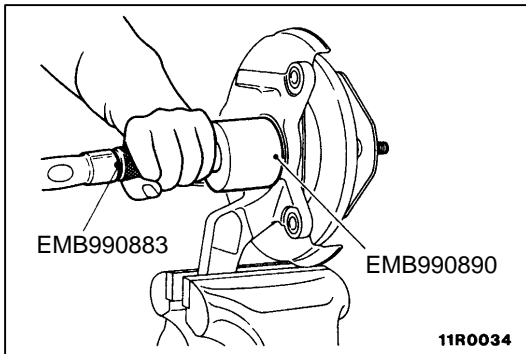
### ►B◄ OIL SEAL (HUB SIDE)

1. Drive the oil seal (hub side) into the knuckle by using the special tools until it is flush with the knuckle end surface.
2. Apply multipurpose grease to the lip of the oil seal and to the surfaces of the oil seal which contact the front hub.



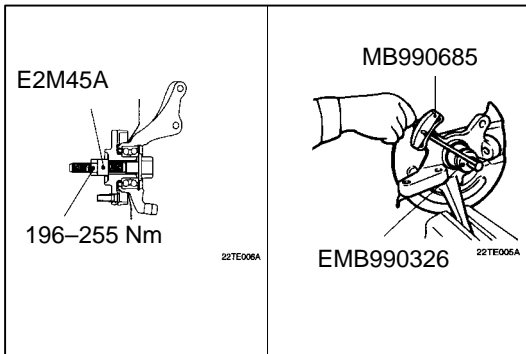
## ►C◄ INSTALLING HUB (ON TO KNUCKLE)

1. Use the special tool to mount the hub on to the knuckle.
2. Torque the nut of the special tool to 196-255 Nm.
3. Rotate the hub in order to seat the bearing.
4. Leave the special tool in place and take the measurements described under "Inspection".



## ►D◄ OIL SEAL (DRIVE SHAFT SIDE)

1. Drive the oil seal (drive shaft side) into the knuckle until it contacts the snap ring.
2. Apply multipurpose grease to the lip of the oil seal.



## INSPECTION

### WHEEL BEARING BREAKAWAY TORQUE CHECK

1. Tighten the special tool to the front hub assembly to the specified torque 196–255 Nm.
2. Use the special tool to measure the hub rotation starting torque.

**Limit: 1.8 Nm or less**

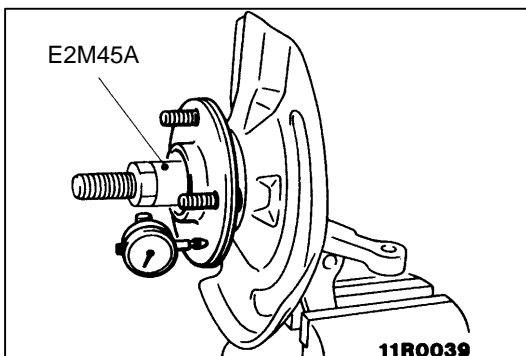
3. The hub rotation breakaway torque should be within the limit value range, and there should be no tight spots or feeling of roughness.

### WHEEL BEARING AXIAL PLAY CHECK

1. Tighten the special tool to the front hub assembly to the specified torque 196–255 Nm.
2. Measure the play in the wheel bearing axial direction.

**Limit: 0.01 mm**

3. If the limit value of wheel bearing axial play cannot be obtained, replace the front hub assembly.

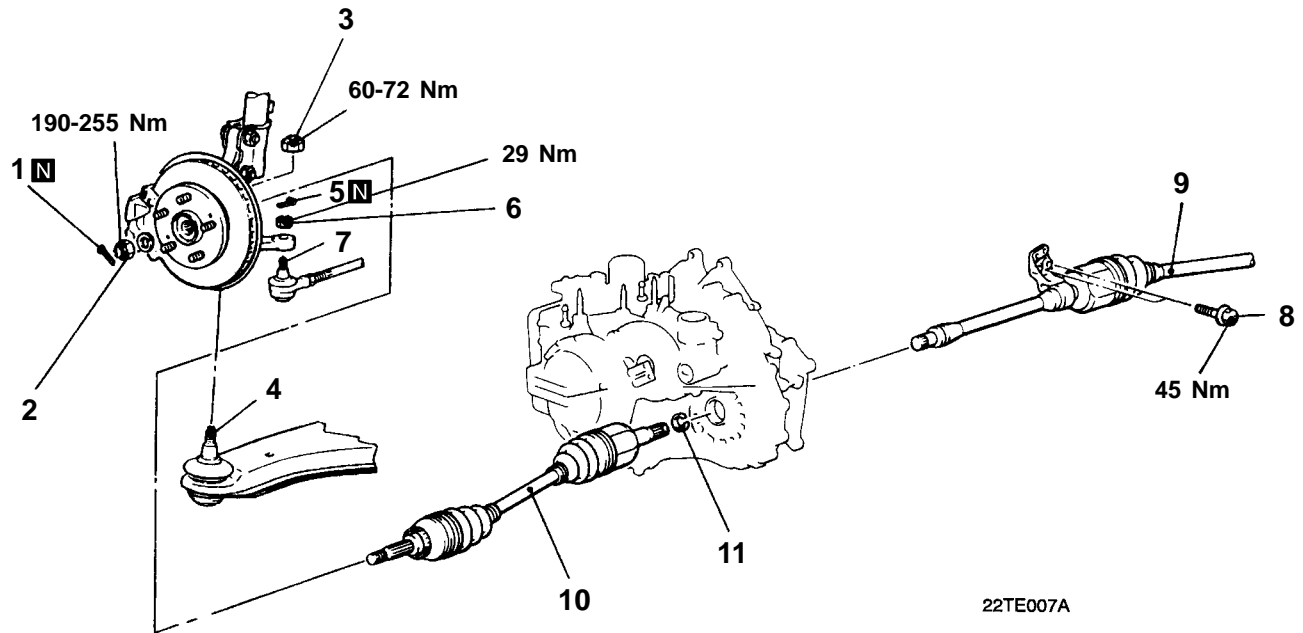


# DRIVE SHAFT

## REMOVAL AND INSTALLATION

### Pre-removal and Post-installation Operation

- Remove the transmission under cover.
- Drain and replenish the transmission fluid.



### Removal steps

- 1. Drive shaft cotter pin
- 2. Drive shaft nut
- 3. Lower arm ball joint retaining nut
- 4. Connection for lower arm ball joint
- 5. Tie rod end cotter pin
- 6. Tie rod end retaining nut
- 7. Connection for tie rod end
- 8. Centre bearing bracket bolts

- 9. Drive shaft and inner shaft assembly (RH)
- 10. Drive shaft (LH)
- 11. Circlip

### Caution

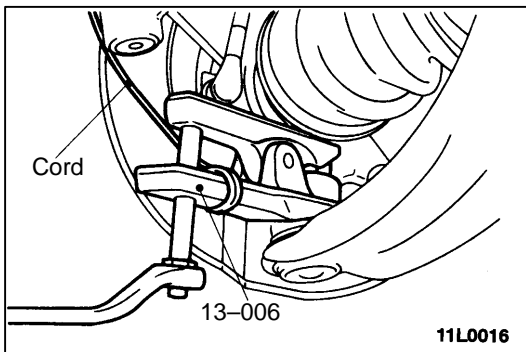
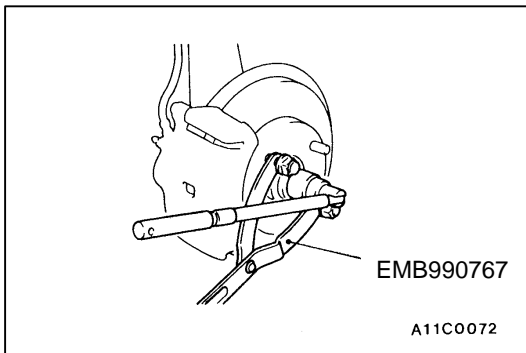
\*: Indicates parts which should be temporarily tightened, and then fully tightened with the vehicle on the ground in the unladen condition.

## REMOVAL SERVICE POINTS

### ◀A▶ DRIVE SHAFT NUT REMOVAL

#### Caution

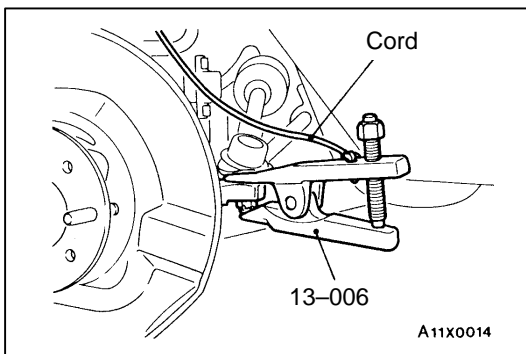
Do not apply the vehicle weight to the wheel bearing while loosening the drive shaft nut.



### ◀B▶ DISCONNECTION OF LOWER ARM BALL JOINT

#### Caution

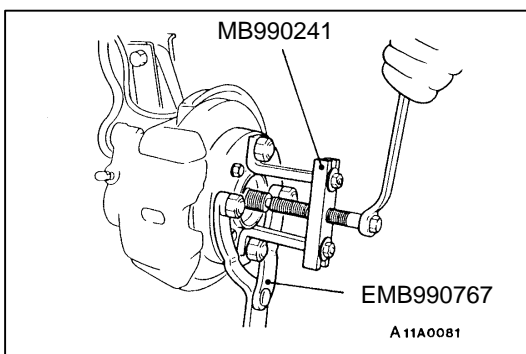
1. Be sure to tie the cord of the special tool to the nearby part.
2. Loosen the nut but do not remove it.
1. Disconnect the ball joint by using the special tool.



### ◀C▶ TIE ROD END REMOVAL

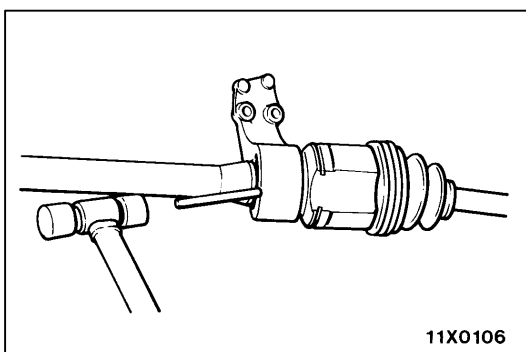
#### Caution

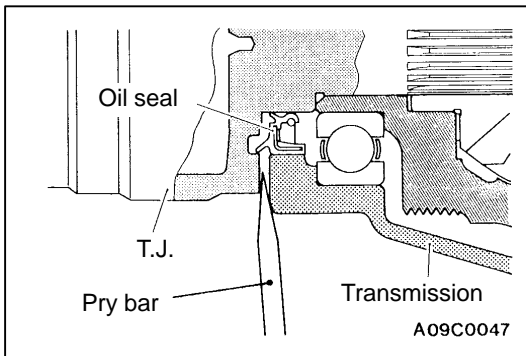
1. Be sure to tie the cord of the special tool to a nearby part.
2. Loosen the nut but do not remove it.



### ◀D▶ DRIVE SHAFT AND INNER SHAFT (RH) AND DRIVESHAFT (LH) REMOVAL

1. Use the special tools to push out the drive shaft from the hub.
2. Tap the centre bearing bracket with a hammer, to remove the drive shaft and inner shaft (RH) from the transmission.

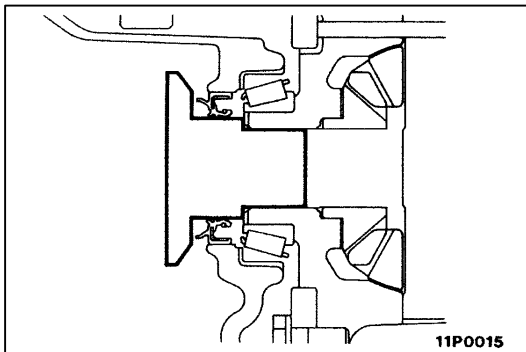




3. Insert a pry bar between the transmission case and the drive shaft, and then pry the drive shaft from the transmission.

## Caution

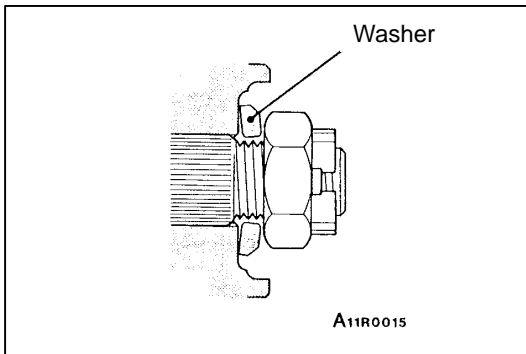
1. Do not pull on the drive shaft; doing so will damage the T.J.; be sure to use the pry bar.
2. Do not insert the pry bar so deep as to damage the oil seal.



4. Use a suitable plug to prevent the entry of foreign objects into the transmission.

## Caution

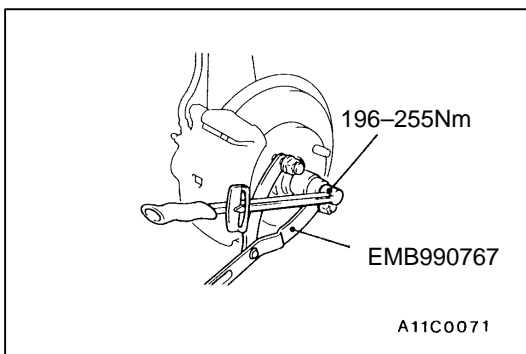
Do not apply the full load of the vehicle onto the wheel bearings when the drive shaft has been removed. If you need to apply a load to the bearings in order to move the vehicle, for instance, use the special tool to provisional secure the bearings.



## 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 to the lower end of the specified torque range.

## Caution

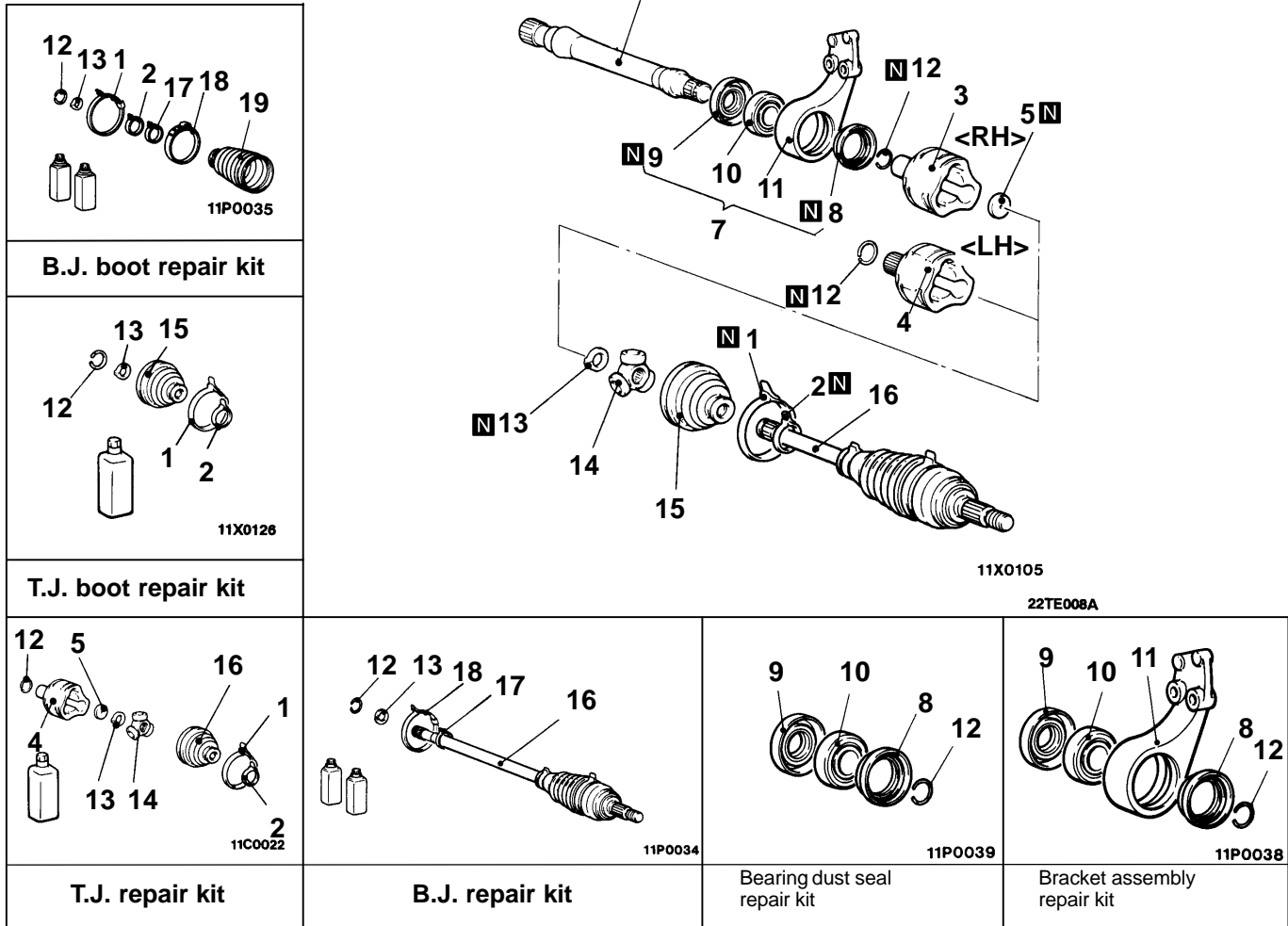
There should be no load on the wheel bearings when the drive shaft nut is tightened.

3. If the position of the cotter pin holes does not match, tighten the nut to a maximum of 255 Nm.
4. Install the cotter pin in the first matching holes and bend it securely.

## INSPECTION

- Check the drive shaft boot for damage or deterioration.
- Check the ball joints for wear or operating condition.
- Check the spline part for wear or damage.

## DISASSEMBLY AND REASSEMBLY



## Disassembly steps

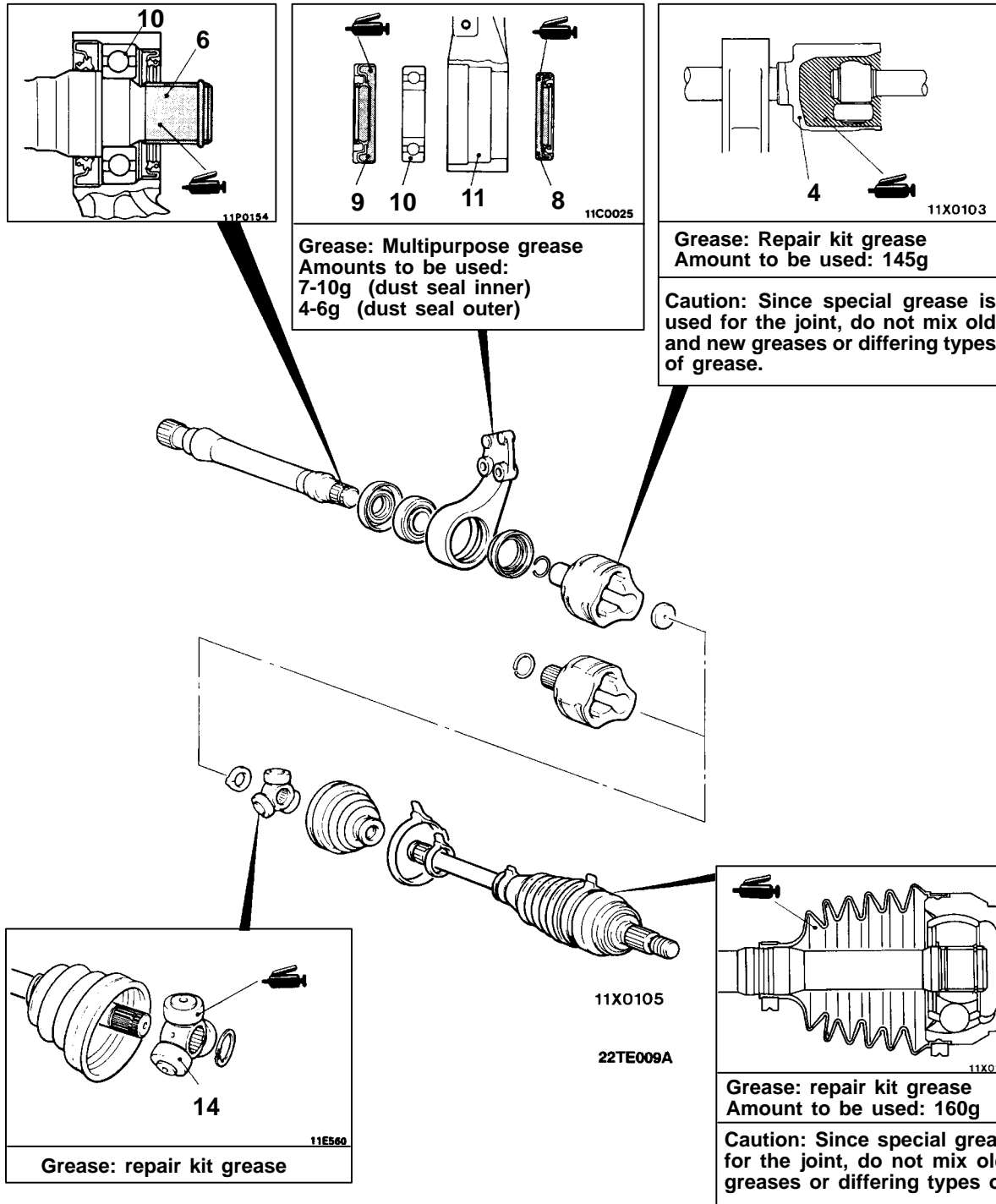
- |    |                            |
|----|----------------------------|
| ▶G | 1. Boot band (large)       |
| ▶G | 2. Boot band (small)       |
| ▶F | 3. T.J. case (RH)          |
| ▶B | 4. T.J. case (LH)          |
| ▶E | 5. Seal plate              |
| ▶E | 6. Inner shaft             |
| ▶E | 7. Bracket assembly        |
| ▶D | 8. Dust seal outer         |
| ▶D | 9. Dust seal inner         |
| ▶C | 10. Centre bearing         |
| ▶C | 11. Centre bearing bracket |
| ▶C | 12. Circlip                |

- |    |                            |
|----|----------------------------|
| ▶B | 13. Snap ring              |
| ▶A | 14. Spider assembly        |
| ▶B | 15. T.J. boot              |
| ▶A | 16. B.J. assembly          |
| ▶E | 17. B.J. boot band (small) |
|    | 18. B.J. boot band         |
|    | 19. B.J. boot              |

## Caution

Do not disassemble the B.J. assembly or remove the boot bands unless boot replacement is required.

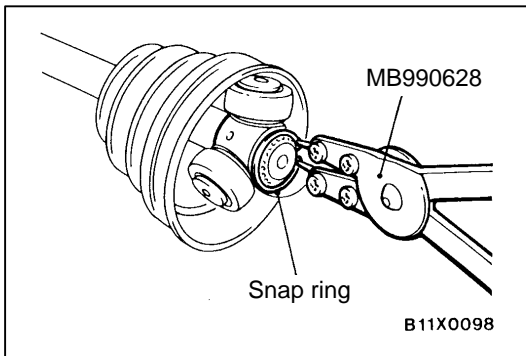
## LUBRICANT POINTS



## DISASSEMBLY SERVICE POINTS

### ◀A▶ T.J. CASE REMOVAL

Remove the T.J. case from the B.J. assembly, and wipe off the grease inside the T.J. case.

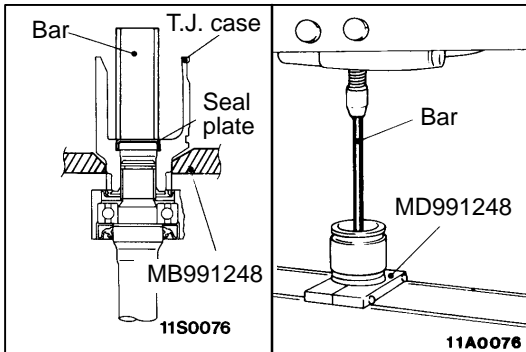


## ◀B▶ SNAP RING/SPIDER ASSEMBLY REMOVAL

1. Remove the snap ring from the drive shaft with the special tool.
2. Take out the spider assembly from the drive shaft.
3. Clean the spider assembly.

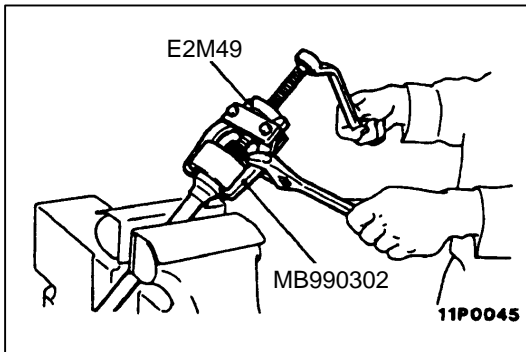
### Caution

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

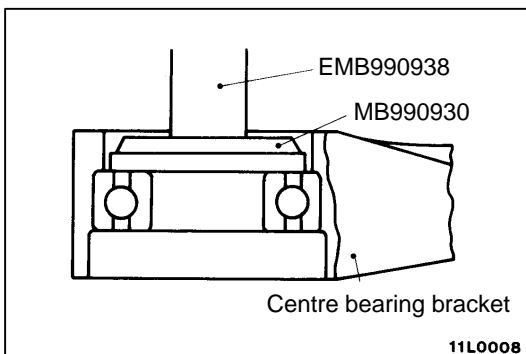


## ◀C▶ INNER SHAFT

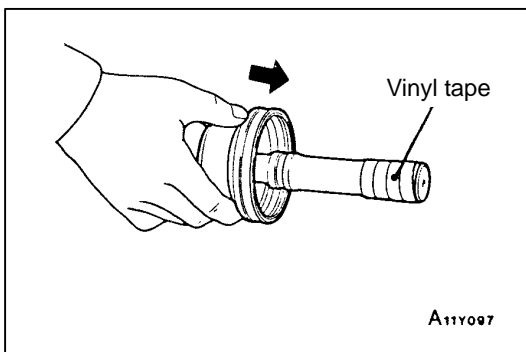
1. Using the special tool, secure the T.J. case.
2. Push the seal plate with a bar (Diam 20mm), and press out the inner shaft assembly together with the seal plate.



3. Using the special tool, remove the inner shaft from the centre bearing bracket.



## ◀D▶ CENTRE BEARING



## ◀E▶ T.J. BOOT REMOVAL

1. Wipe the grease off of the spline portion.
2. Remove the T.J. boot.

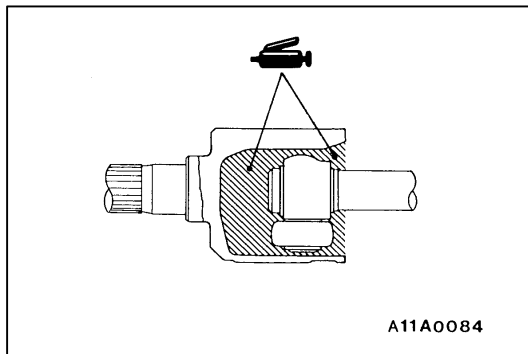
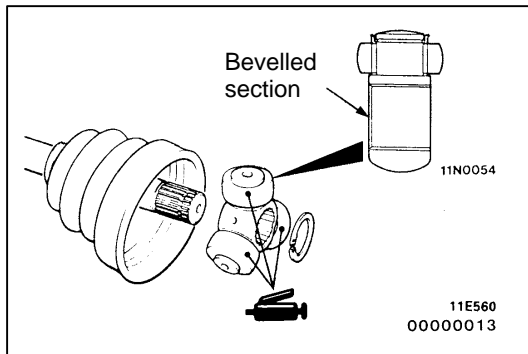
### NOTE

If the boot is to be reused, wrap vinyl tape around the drive shaft spline so that the boot is not damaged when it is removed.



**REASSEMBLY SERVICE POINTS****►A◄ T.J. BOOT INSTALLATION**

Wrap vinyl tape around the spline part on the drive shaft, and then install the T.J. boot band (small) and T.J. boot.

**►B◄ SPIDER ASSEMBLY/T.J. CASE INSTALLATION (LH)**

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:**

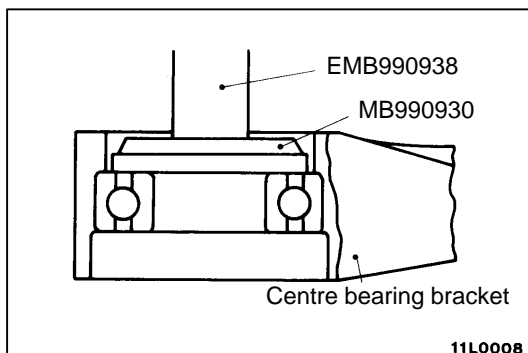
**Repair kit grease 145g**

**NOTE**

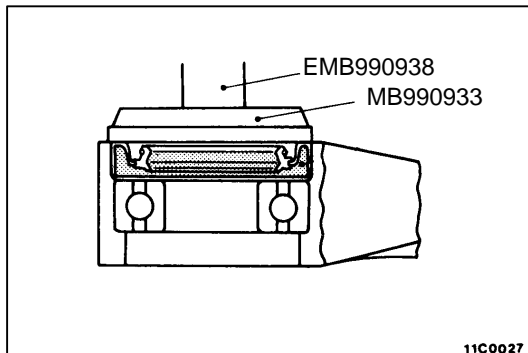
When using the repair kit grease, use the whole amount, aiming at filling the inside of the joint and the inside of the boot with about half each.

**Caution**

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

**►C◄ CENTRE BEARING**

1. Using a 61mm installer, press in the centre bearing.



## ►D◄ DUST SEAL INNER/DUST SEAL OUTER

1. Fill the back surfaces of each dust seal with multipurpose grease.

### Amount to be used:

7-10g (dust seal inner)

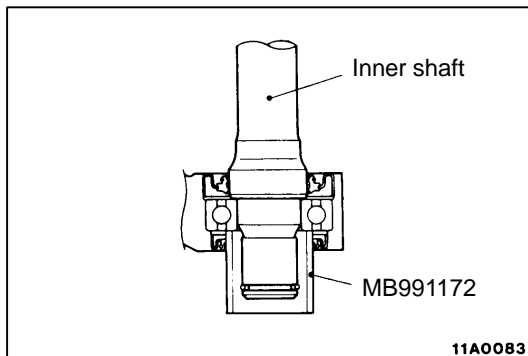
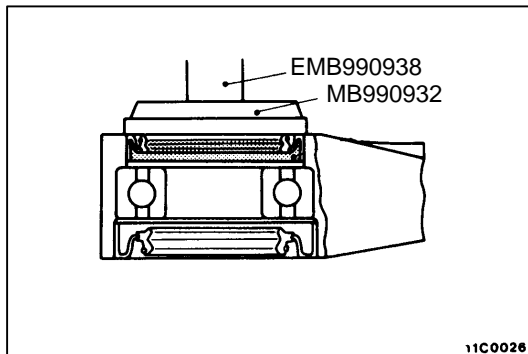
4-6g (dust seal outer)

2. Using a 61mm installer, drive in the oil seal until it is flat against the end face of the centre bearing bracket.

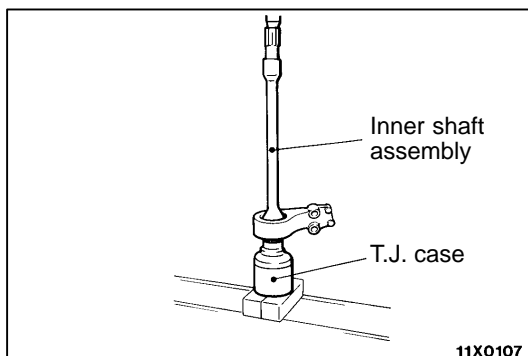
3. Coat the lip parts of each dust seal with multipurpose grease.

### NOTE

Coat so that grease does not adhere to the outside of the lip.

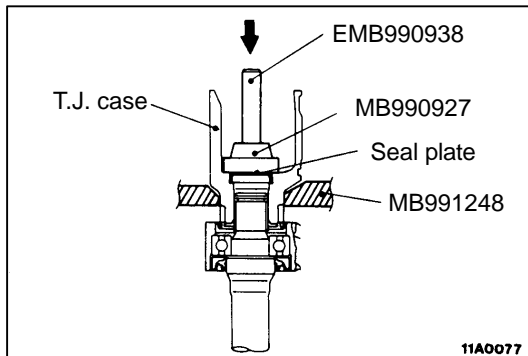


## ►E◄ INNER SHAFT/CENTRE BEARING ASSEMBLY



## ►F◄ INNER SHAFT ASSEMBLY/T.J. CASE (RH) ASSEMBLY

1. Coat the spline part of the inner shaft with multipurpose grease and force the inner shaft assembly into the T.J. case.
2. Using the special tool, force the seal plate into the T.J. case.



3. Fill the T.J. case with the specified grease, then insert the drive shaft, and once again fill with the specified grease.

**Specified grease: Repair kit grease**

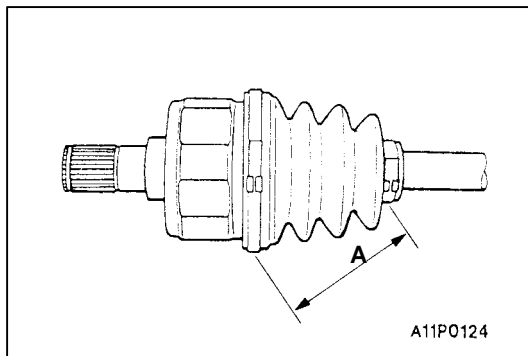
**Amount to be used: 145g**

## NOTE

When using the repair kit grease, use the whole amount, aiming at filling the inside of the joint and the inside of the boot with about half each.

## Caution

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



## ►G◄ 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): 75±3 mm**

## INSPECTION

- 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 boots for deterioration, damage or cracking.

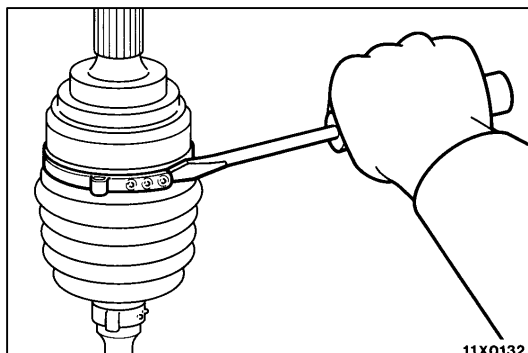
## B.J. BOOT (RUBBER BOOT) REPLACEMENT

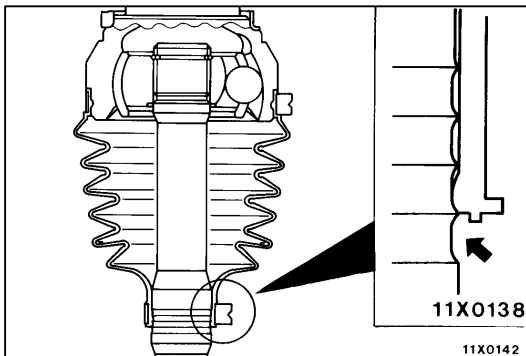
1. Remove the B.J. boot bands (large and small).

### NOTE

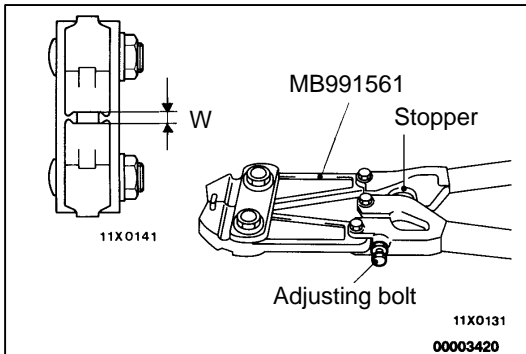
The B.J. boot bands cannot be re-used.

2. Remove the B.J. boot.





3. Install the B.J. boot with the part with the smallest diameter in a position such that the shaft groove can be seen.



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

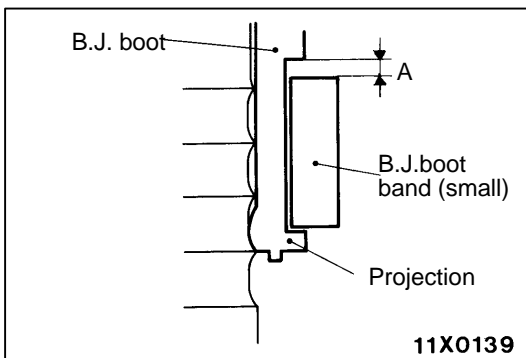
**Standard value (W): 2.9 mm**

**<If it is larger than 2.9 mm>  
Tighten the adjusting bolt.**

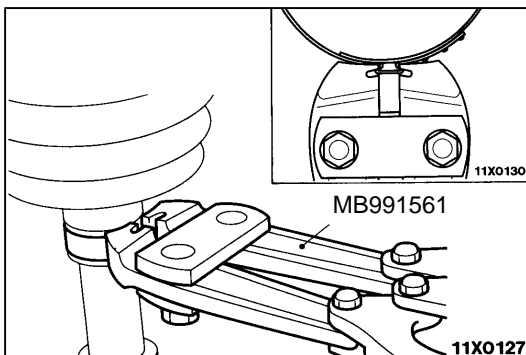
**<If it is smaller than 2.9 mm>  
Loosen the adjusting bolt.**

#### 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.



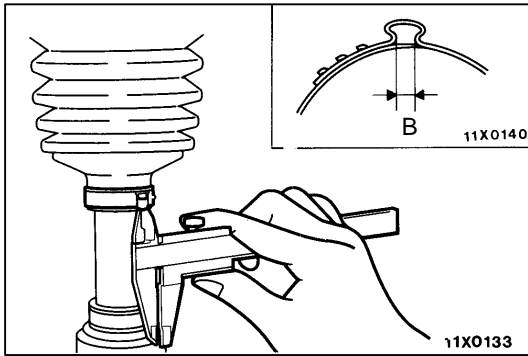
5. Place the B.J. boot band (small) against the projection at the edge of the boot, and then secure it so that there is a clearance left as shown by (A) in the illustration.



6. Use the special tool to crimp the B.J. boot band (small).

#### Caution

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



7. Check that the crimping amount (B) of the B.J. boot band is at the standard value.

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

**<If the crimping amount is larger than 2.8 mm>**  
Readjust the value of (W) in step (4) according to the following formula, and then repeat the operation in step (6).

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

**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. boot band, readjust the value of (W) in step (4) according to the following formula, and then repeat the operations in steps (5) and (6) using a new B.J. boot band.

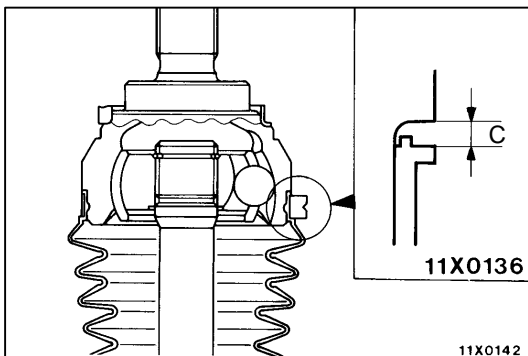
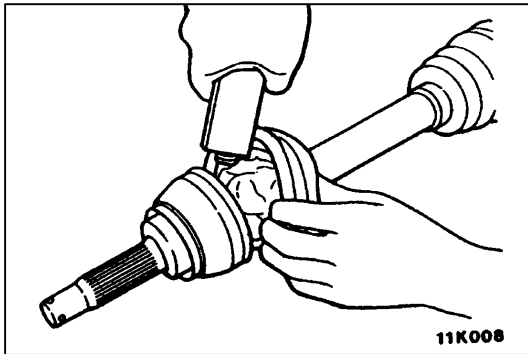
$$W = 5.5 \text{ mm} - B$$

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

8. Check that the B.J. boot band is not sticking out past the place where it had been installed.  
If the B.J. boot band is sticking out, remove it and then repeat the operations in step (5) to (7) using a new boot band.
9. Fill the inside of the B.J. boot with the specified grease.

**Specified grease: Repair kit grease**

**Amount to be used: 145g**

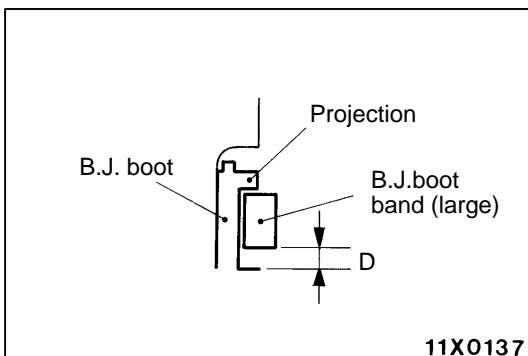


10. Install the B.J. boot band (large) so that there is the clearance (C) between it and the B.J. housing is at the standard value.

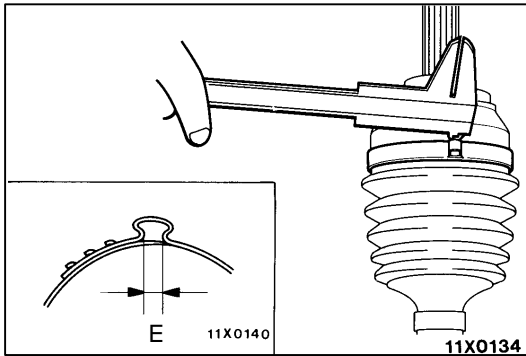
**Standard value (C): 0.1 – 1.55 mm**

11. Follow the same procedure as in step (4) 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**



12. Place the B.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.
13. Use the special tool to crimp the B.J. boot band (large) in the same way as in step (6).



14. Check that the crimping amount (E) of the B.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 (4) according to the following formula, and then repeat the operation in step (13).**

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

**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. boot band, readjust the value of (W) in step (11) according to the following formula, and then repeat the operations in steps (12) and (13) using a new B.J. boot band.**

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

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

15. Check that the B.J. boot is not sticking out past the place where it has been installed.

If the B.J. boot band is sticking out, remove it and then repeat operations in steps (12) to (14) using a new B.J. boot band.