

GROUP 26

FRONT AXLE

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SERVICE SPECIFICATIONS

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Item		Standard value	Limit
Wheel bearing end play mm (in)		–	0.05 (0.002)
Wheel bearing rotation starting torque N·m (in-lb)		–	1.5 (13)
ETJ boot assembly dimension mm (in)		75 ± 3 (2.95 ± 0.11)	–
Opening dimension of the special tool (MB991561) mm (in)	EBJ, VUJ boot band (small) crimping	2.9 (0.11)	–
	EBJ, VUJ boot band (large) crimping	3.2 (0.13)	–
EBJ boot band crimping size mm (in)		2.4 – 2.8 (0.10 – 0.11)	–

LUBRICANTS

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Item	Specified lubricant	Quantity
Inside of knuckle bore	Dowcorning/Molykote BR2 Plus or equivalent	As required [0.5 – 1.5 g (0.02 – 0.05 oz)]
ETJ boot grease	Repair kit grease	75 ± 10 g (2.6 ± 0.4 oz)
EBJ boot grease	Repair kit grease	65 ± 10 g (2.3 ± 0.4 oz)
VUJ boot grease	Repair kit grease	70 ± 10 g (2.5 ± 0.4 oz)

FRONT AXLE DIAGNOSIS

TROUBLESHOOTING STRATEGY

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Use these steps to plan your diagnostic strategy. If you follow them carefully, you will be sure that you have exhausted most of the possible ways to find a front axle fault.

1. Gather information from the customer.
2. Verify that the condition described by the customer exists.
3. Find the malfunction by following the Symptom Chart.
4. Verify malfunction is eliminated.

SYMPTOM CHART

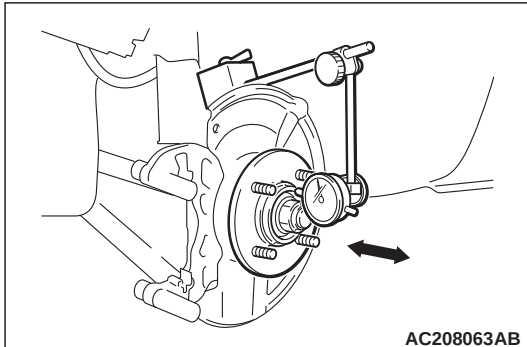
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Symptom		Inspection procedure	Reference page
Driveshaft	Noise during wheel rotation	1	P.26-3
	Noise due to excessive play of wheel in turning direction	2	P.26-4

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: Noise during Wheel Rotation

DIAGNOSIS



STEP 1. Check the wheel bearing end play.

- (1) Remove the brake caliper assembly 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 end play while moving the hub in the axial direction.

Limit: 0.05 mm (0.002 inch)

Q: Is the wheel bearing end play within the limit?

YES : Go to Step 2.

NO : Replace the part, then go to Step 5.

STEP 2. Check the driveshaft and inner shaft for bending.

Q: Is the driveshaft and inner shaft bent?

YES : Go to Step 3.

NO : Replace the part. Then go to Step 5.

STEP 3. Check the center bearing for wear.

Q: Is the center bearing worn?

YES : Replace the bearing. Then go to Step 5.

NO : Go to Step 4.

STEP 4. Check the driveshaft assembly for wear or damage.

Q: Is the driveshaft assembly worn or damaged?

YES : Replace the driveshaft assembly. Then go to Step 5.

NO : There is no action to be taken.

STEP 5. Retest the system.

Q: Is the abnormal noise eliminated?

YES : The procedure is complete.

NO : Repeat from Step 1.

INSPECTION PROCEDURE 2: Noise Due to Excessive Play of Wheel in Turning Direction

DIAGNOSIS

STEP 1. Check for play in the inner shaft and side gear serration, the driveshaft and side gear serration, or the driveshaft and front hub serration.

Q: Is the play found?

YES : Replace the part. Then go to Step 2.

NO : The procedure is complete.

STEP 2. Retest the system.

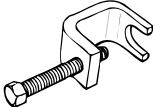
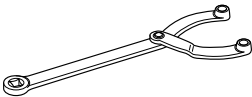
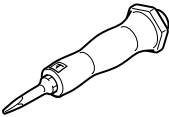
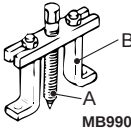
Q: Is the abnormal noise eliminated?

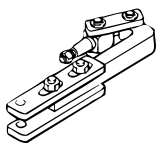
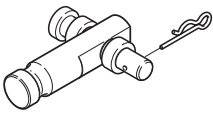
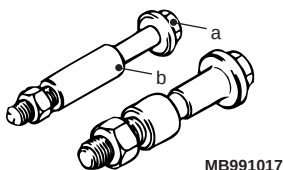
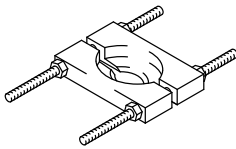
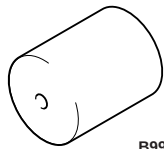
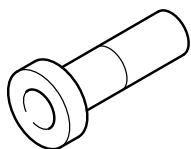
YES : The procedure is complete.

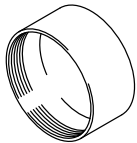
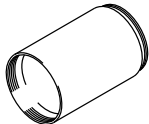
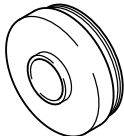
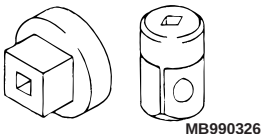
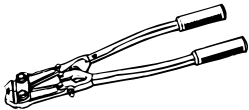
NO : Repeat from Step 1.

SPECIAL TOOLS

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Tool	Tool number and name	Supersession	Application
 MB991618	MB991618 Hub bolt remover	General service tool	Removal of the hub bolt
 B990767	MB990767 Front hub and flange yoke holder	MB990767-01	Fixing of the hub
 B992700	MB992700 Lock nut chisel	General service tool	Raising up the swaged part driveshaft nut
 MB991897	MB991897 or MB992011 Ball joint remover	MB991113-01, MB990635-01 or General service tool	Knuckle and tie-rod end ball joint disconnection <i>NOTE: Steering linkage puller (MB990635 or MB991113) is also used to disconnect knuckle and tie-rod end ball joint.</i>
 MB990241AD	MB990241 Axle shaft puller A: MB990242 Puller shaft B: MB990244 Puller bar	MB990241-01 or General service tool	Removal of the driveshaft

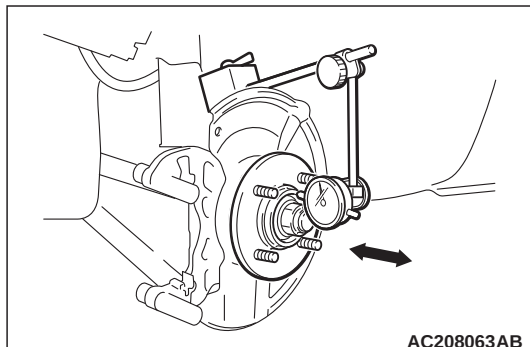
Tool	Tool number and name	Supersession	Application
	MB991056 or MB991355 Knuckle arm bridge	MB991056-01	- Removal of the hub - Removal of the wheel bearing
 B992250	MB992250 Knuckle arm bridge attachment	—	
 MB991017	a:MB991017 Front hub remover and installer b:MB991019 Spacer	MB990998-01	- Removal of hub - Measurement of wheel bearing rotation starting torque - Measurement of wheel bearing axial looseness - Removal of the wheel bearing inner race (outside) <i>NOTE: MB991019, which belongs to MB991017, should be used as a spacer.</i>
	MB992867 Front hub removal and installer spacer	—	Removal of hub Measurement of Wheel bearing rotation starting torque
	MD998801 Remover	—	Removal of the wheel bearing inner race (outside)
 B992254	MB992254 Base	—	Removal of wheel bearing outer race
	MD999547 Oil seal installer	—	Removal of wheel bearing outer race
 MB990800	MB990800 Ball joint B remover and installer	—	Hub press-fitting

Tool	Tool number and name	Supersession	Application
 MB990799	MB990799 Ball joint A remover and installer	—	Press-fitting of wheel bearing
	MD998812 Installer cap	—	Press-fitting of wheel bearing
	MD998813 Installer	—	
	MD998815 Installer adapter	—	
	MB991000 Spacer	—	• Measurement of wheel bearing rotation starting torque • Measurement of wheel bearing axial looseness
 MB991199	MB991199 Oil seal installer	—	Press-fitting of hub
	MB990685 Torque wrench	General service tool	Measurement of wheel bearing starting torque
 MB990326	MB990326 Preload socket	General service tool	
 MB991561	MB991561 Boot band crimping tool	MB991561	EBJ boot (resin boot) band installation

ON-VEHICLE SERVICE

WHEEL BEARING END PLAY CHECK

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1. Remove the brake caliper assembly and brake disc, and retain the brake caliper assembly with a wire and the like to prevent from falling (Refer to [P.26-8](#)).
2. Set a dial gauge as shown in the figure. Move the hub in the axial direction and measure the end play.

Limit : 0.05 mm (0.002 inch)

3. If the play exceeds the limit, disassemble hub knuckle assembly to check each component. If the wheel bearing is faulty, replace it (Refer to [P.26-14](#)).
4. After checking, install the brake disc and the brake caliper assembly (Refer to [P.26-8](#)).

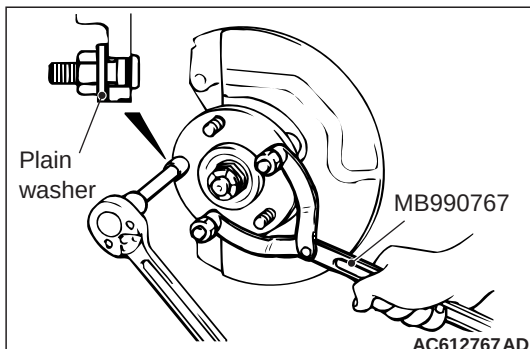
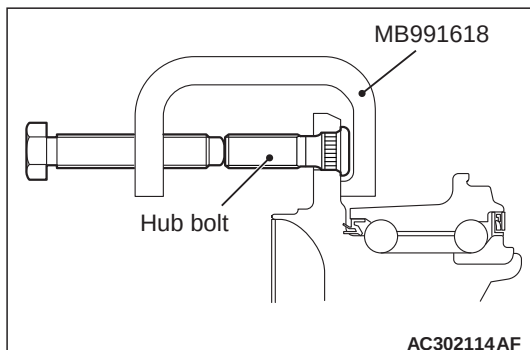
HUB BOLT REPLACEMENT

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Required Special Tools:

- MB991618: Hub Bolt Remover
- MB990767: Front Hub and Flange Yoke Holder

1. Remove the brake caliper assembly and brake disc, and retain the brake caliper assembly with a wire and the like to prevent from falling (Refer to [P.26-8](#)).
2. Use special tool MB991618 to remove the hub bolts.



3. Install the plain washer to the new hub bolt, and install the bolt with a nut while holding the hub with special tool MB990767.
4. Install the brake disc and the brake caliper assembly (Refer to [P.26-8](#)).

FRONT AXLE HUB ASSEMBLY

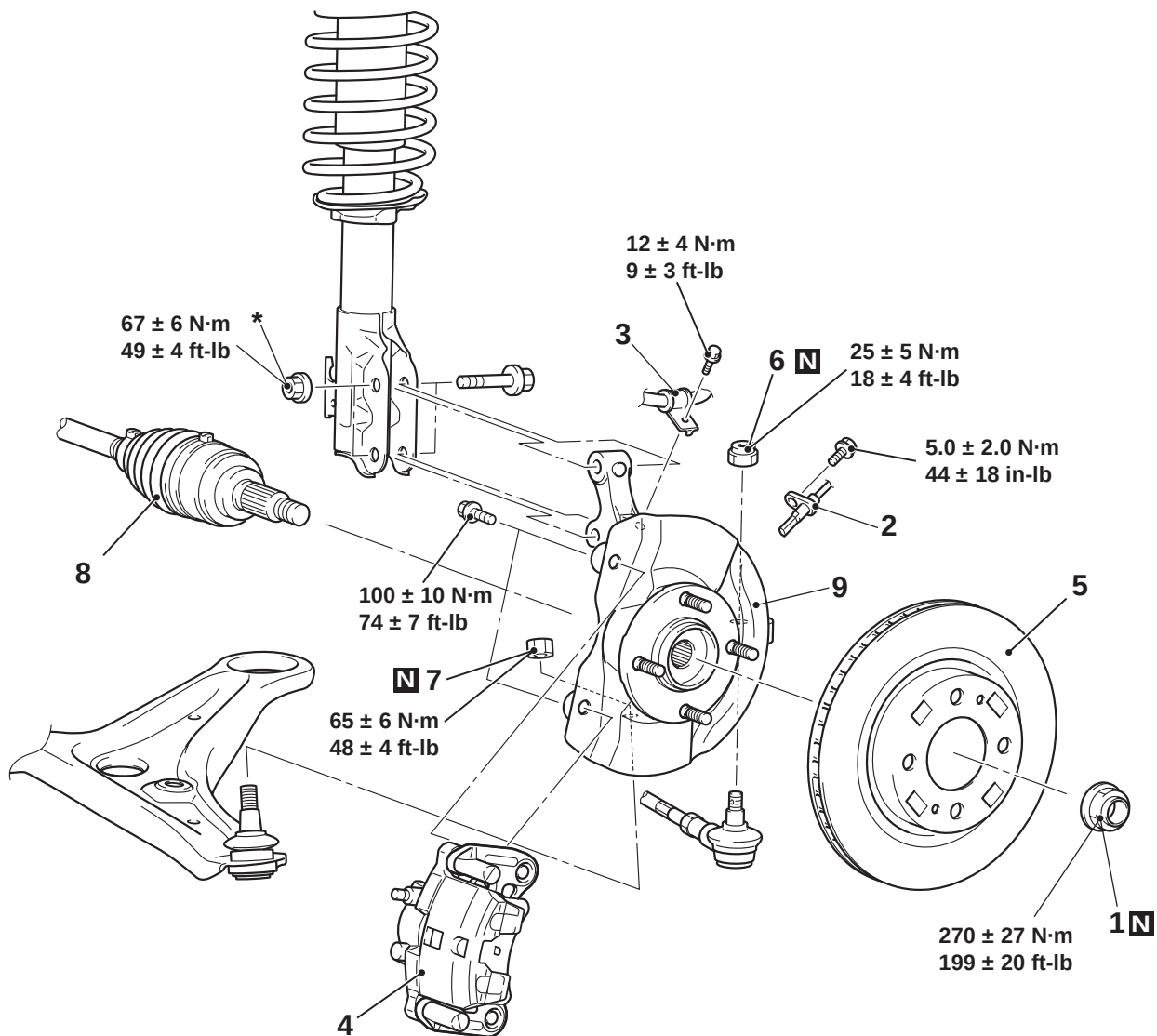
REMOVAL AND INSTALLATION

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 CAUTION

- The magnetic encoder collects metallic particles easily, because it is magnetized. Make sure that the magnetic encoder should not collect metallic particles. Check that there is not any trouble prior to reassembling it.
- When removing and installing the front wheel hub assembly, make sure that the magnetic encoder (integrated with the inner oil seal) does not contact with surrounding parts to avoid damage.
- When removing and installing the front wheel speed sensor, make sure that the sensor head at the end does not contact with surrounding parts to avoid damage.
- The parts indicated by * are the nuts with friction coefficient stabilizer. In removal, ensure there is no damage, clean dust and soiling from the bearing and thread surfaces, and tighten them to the specified torque.

Pre-removal operation • Front under cover removal (Refer to GROUP 51, Under Cover Removal and Installation P.51-15). • Lower arm assembly and Stabilizer bar Connection Removal (Refer to GROUP 33, Stabilizer bar Removal and Installation P.33-21).	Post-installation operation • Using your fingers, press the Ball Joint Dust Cover to check for a crack or damage. • Lower arm assembly and Stabilizer bar Connection Installation (Refer to GROUP 33, Stabilizer bar Removal and Installation P.33-21). • Front under cover installation (Refer to GROUP 51, Under Cover Removal and Installation P.51-15). • Check the beam direction of the headlight (Low beam) (Refer to GROUP 54A – Headlight Aiming P.54A-93).
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Removal steps

- <<A>> >>A<<
1. Driveshaft nut
 2. Front wheel speed sensor (Refer to GROUP 35C – Wheel Speed Sensor [P.35C-139](#))
 3. Brake hose clip
 4. Brake caliper assembly
 5. Brake disc
 6. Self-locking nut (tie rod end connection)
 7. Self-locking nut (lower arm ball joint connection)
- <>
- <<C>>
- <<C>>

Removal steps (Continued)

- <<D>>
8. Driveshaft and hub knuckle assembly connection
 9. Hub and knuckle assembly

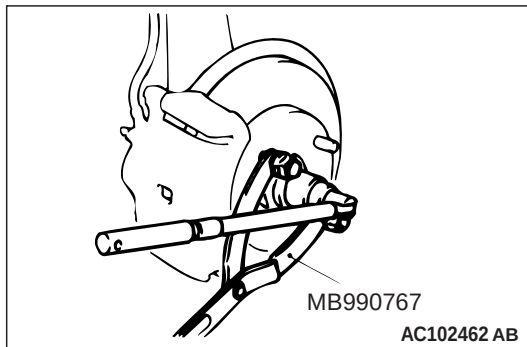
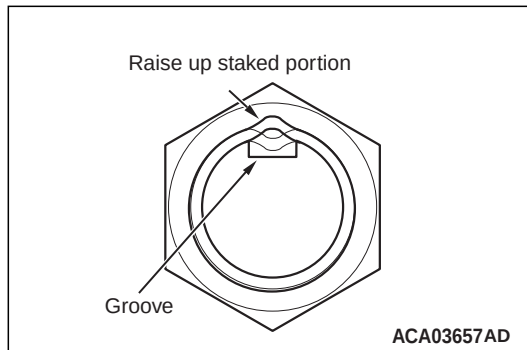
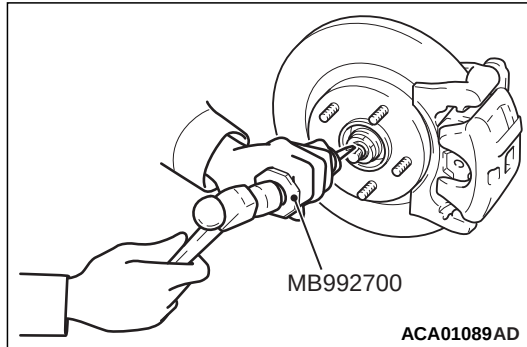
Required Special Tools:

- MB992700: Lock Nut Chisel
- MB990767: Front Hub and Flange Yoke Holder
- MB991897 or MB992011: Ball Joint Remover
- MB990241: Axle Shaft Puller

REMOVAL SERVICE POINTS

<<A>> DRIVESHAFT NUT REMOVAL

1. The staked portion of the driveshaft nut must face upwards.

**⚠ CAUTION**

- Make sure that the lock nut chisel is set in the correct direction. Otherwise, the groove or thread in the driveshaft may be broken, or the tip of the chisel may be chipped.
- Never use a chisel which tip is damaged.
- For how to use the lock nut chisel, refer to the manufacturer's operating instructions.

2. Set the special tool lock nut chisel (MB992700) in the groove of the driveshaft with its "UPPER" mark facing upwards. Then strike the staked portion of the driveshaft nut with the chisel and a hammer to raise up.

⚠ CAUTION

Be careful not to damage the thread of the driveshaft.

3. Raise up the staked portion of the driveshaft nut until it does not interfere with the shaft thread.

⚠ CAUTION

- Never use a impact wrench to loosen the driveshaft nut.
- Do not apply the vehicle weight on the wheel bearing with the driveshaft nut loosened. Otherwise, the wheel bearing may be broken.

4. Use special tool front hub and flange yoke holder (MB990767) to counter the hub as shown in the figure to remove the driveshaft nut.

<> BRAKE CALIPER ASSEMBLY REMOVAL

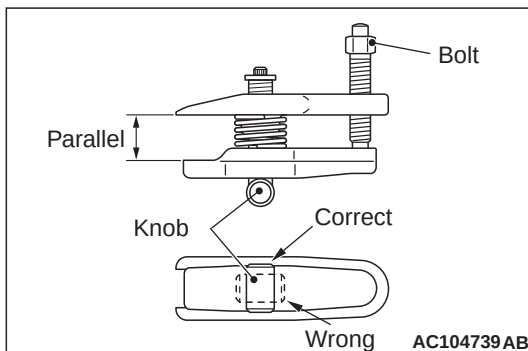
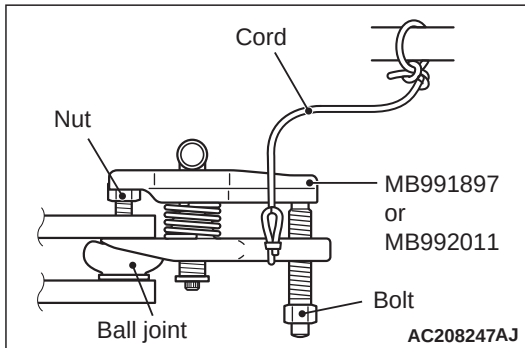
1. Remove the brake caliper assembly with brake hose.
2. Secure the removed brake caliper assembly with a wire or other similar material at a position where it will not interfere with the removal and installation of the hub knuckle assembly.

<<C>> SELF-LOCKING NUT (TIE ROD END CONNECTION)/SELF-LOCKING NUT (LOWER ARM BALL JOINT CONNECTION) REMOVAL

CAUTION

- Do not remove the nut from ball joint. Loosen it and use the special tool to avoid possible damage to ball joint threads.
- Hang the special tool with cord to prevent it from falling.

1. Install special tool ball joint remover (MB991897 or MB992011) as shown in the figure.



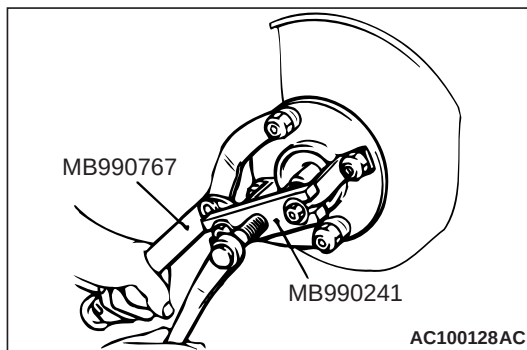
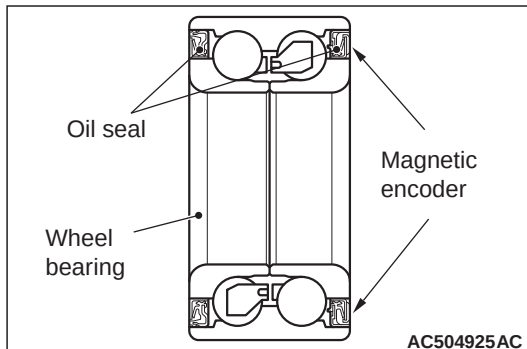
2. Turn the bolt and knob as necessary to make the jaws of special tool parallel, tighten the bolt by hand and confirm that the jaws are still parallel.

NOTE: When adjusting the jaws in parallel, make sure the knob is in the position shown in the figure.

3. Tighten the bolt with a wrench to disconnect the tie rod end, lower arm ball joint.

<<D>> DRIVESHAFT AND HUB KNUCKLE
ASSEMBLY DISCONNECTION**⚠ CAUTION**

- The magnetic encoder collects metallic particles easily, because it is magnetized. Make sure that the magnetic encoder does not collect metallic particles.
- When removing the driveshaft, make sure that it does not contact with the magnetic encoder (integrated with the inner oil seal) to avoid damage.



If the driveshaft is seized, use the following special tools to push the driveshaft out from the hub.

- Front hub & flange yoke holder (MB990767)
- Axle shaft puller (MB990241)

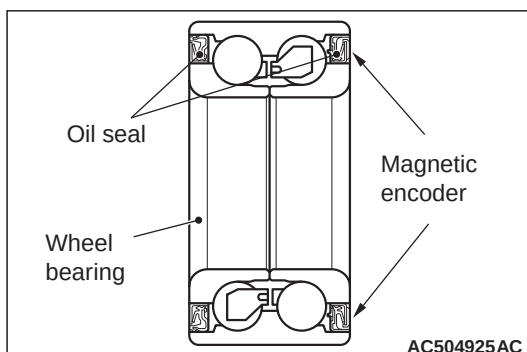
INSTALLATION SERVICE POINT

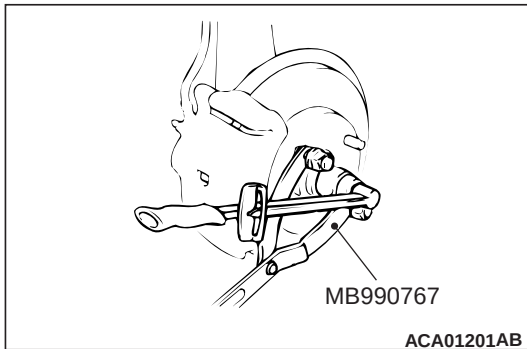
>>A<< DRIVESHAFT NUT INSTALLATION

⚠ CAUTION

- The magnetic encoder collects metallic particles easily, because it is magnetized. Make sure that the magnetic encoder should not collect metallic particles. Check that there is not any trouble prior to reassembling it.
- When installing the driveshaft, make sure that it does not contact with the magnetic encoder (integrated with the inner oil seal) to avoid damage.
- Do not apply the vehicle weight on the wheel bearing before fully tightening the driveshaft nut. Otherwise, the wheel bearing may be broken.
- Insert the driveshaft so that no hub bolt is vertically above the groove of the driveshaft assembly.

1. Check the hub seated surface for damage or corrosion. Whenever solvent is used for removing the corrosion, the surface should be degreased.
2. Check that the new driveshaft nut can be turned smoothly by hand. Then tighten it until it is seated.

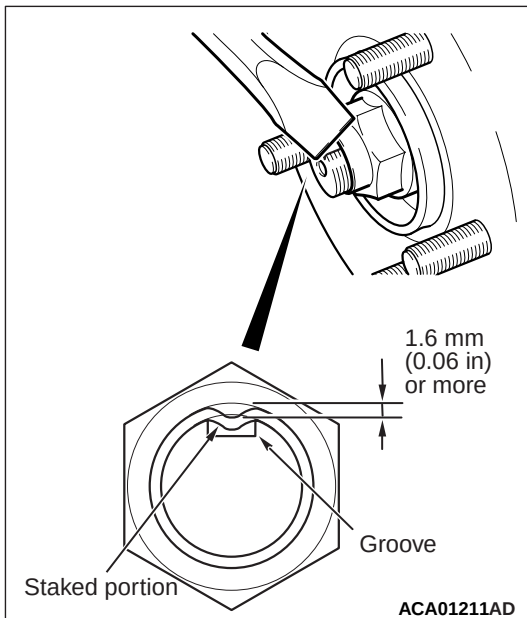




3. Using special tool front hub and flange yoke holder (MB990767), tighten the driveshaft nut.

Tightening torque: 270 ± 27 N·m (199 ± 20 ft-lb)

4. After tightening to the specified torque, check that the nut is seated securely.



5. Use the chisel and a hammer to stake the nut until the center in the staked portion reaches the shown dimension.
6. Finally, check that the nut is not cracked at its staked portion.

INSPECTION

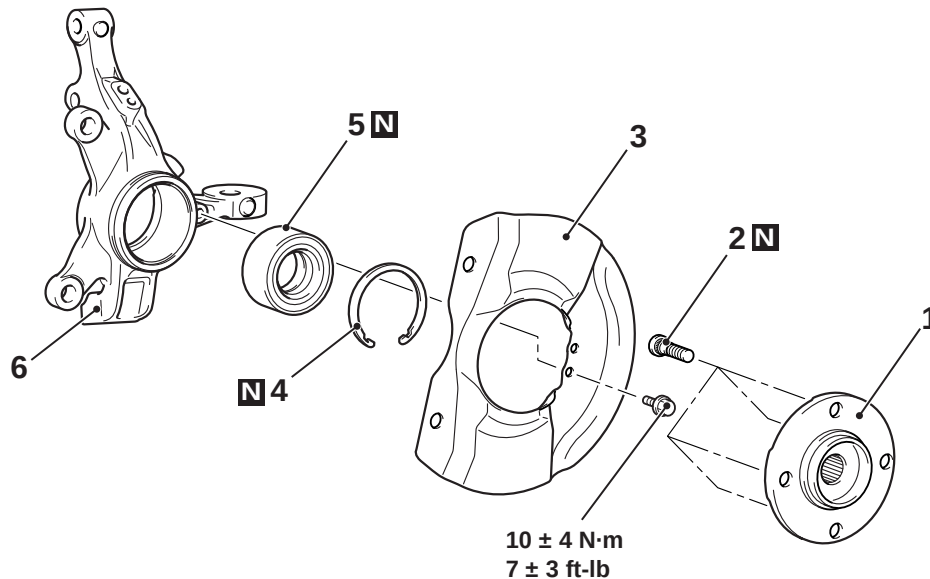
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- Check the hub for cracks and spline for wear.
- Check the knuckle for cracks.
- Check for defective bearing.

NOTE: If the meshing of the wheel bearing outer race and the knuckle, or of the wheel bearing inner race and the hub, is loose, replace the bearing or damaged parts.

DISASSEMBLY AND ASSEMBLY

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Disassembly steps

- <<A>> 1. Hub
 <> 2. Hub bolt
 <<C>> 3. Dust shield
 <<C>> 4. Snap ring
 <<C>> 5. Wheel bearing
 <<C>> 6. Knuckle

Reassembly steps

- >>A<< 6. Knuckle
 >>A<< 5. Wheel bearing
 >>A<< 4. Snap ring
 >>A<< 3. Dust shield
 >>B<< 2. Hub bolt
 >>C<< 1. Hub
 >>D<< • Wheel bearing starting torque check
 >>E<< • Wheel bearing end play check

Required Special Tools:

- MB991017: Front Hub Remover and Installer
- MB991355: Knuckle Arm Bridge

- MB992250: Knuckle Arm Bridge attachment
- MB992867: Front Hub Remover and Installer Spacer
- MB991618: Hub Bolt Remover
- MB991019: Spacer
- MD998801: Remover
- MB992254: Base
- MD999547: Oil Seal Installer
- MB990799: Ball Joint A Remover and Installer
- MD998812: Installer Cap
- MD998813: Installer 100
- MD998815: Installer Adapter
- MB990767: Front Hub and Flange Yoke Holder
- MB990800: Ball Joint B Remover and Installer
- MB991199: Oil Seal Installer
- MB991000: Spacer
- MB990326: Preload Socket
- MB990685: Torque Wrench

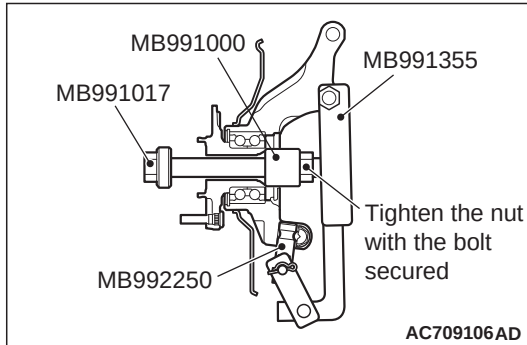
DISASSEMBLY SERVICE POINTS

<<A>> HUB REMOVAL

CAUTION

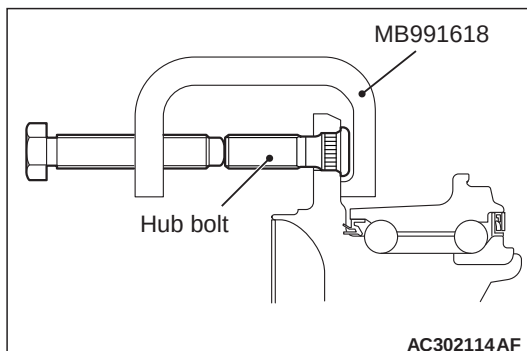
When the hub has been removed, always replace the wheel bearing with a new part because wheel bearing frictional surface will be damaged when removing the hub. Use the following special tools to pull out the front wheel hub assembly from the knuckle.

- Front hub remover and installer (MB991017)
- NOTE: Except spacer (MB991019).
- Knuckle arm bridge (MB991355)
- Knuckle Arm Bridge attachment (MB992250)
- Front hub remover and installer spacer (MB992867)



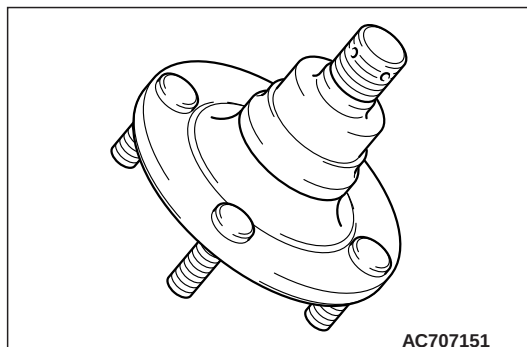
<> HUB BOLT REMOVAL

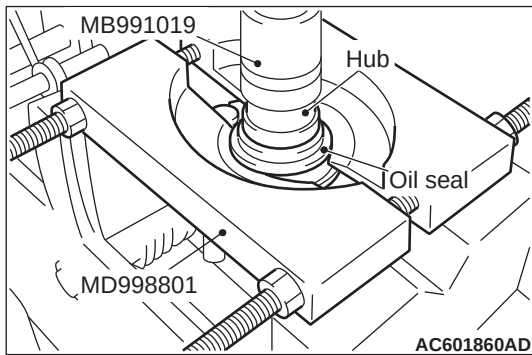
Use special tool hub bolt remover (MB991618) to remove the hub bolt.



<<C>> SNAP RING AND WHEEL BEARING REMOVAL

1. From the inner race of the wheel bearing outer side, remove the ball bearing.

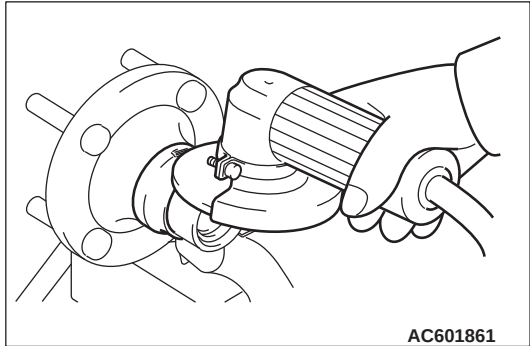




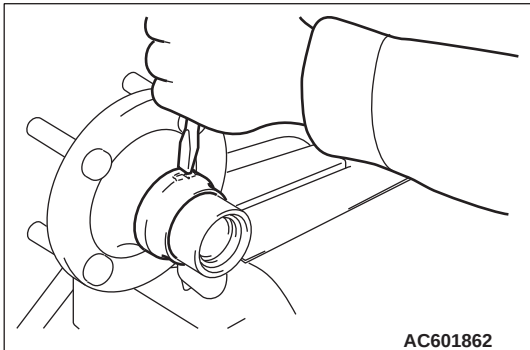
2. Using the bearing remover special tool, remove the oil seal from the hub.
 - Spacer (MB991019)
 - Remover (MD998801)

CAUTION

- Be careful not to grind the inner race press-fit section when grinding off the outer side inner race.
- When the inner race (outside) has been pulled out, be careful not to drop the hub.

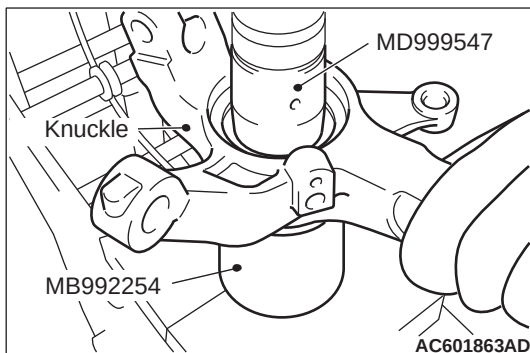


3. Fix the hub, then grind off the inner race of wheel bearing outer side.



4. Wedge a chisel or a similar tool into the ground section, and remove the inner race of wheel bearing outer side.

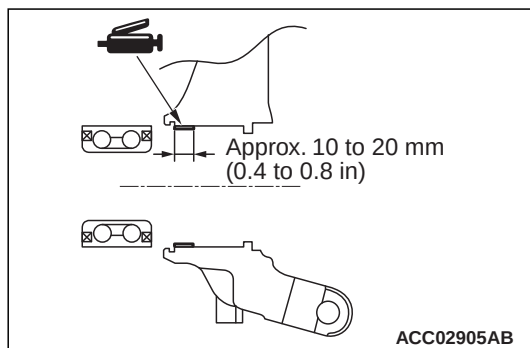
5. Using snap ring pliers, remove the snap ring from the knuckle.



6. Use the following special tools to remove the wheel bearing outer race from the knuckle.
 - Base (MB992254)
 - Oil seal installer (MD999547)

REASSEMBLY SERVICE POINTS

>>A<< KNUCKLE/WHEEL BEARING INSTALLATION

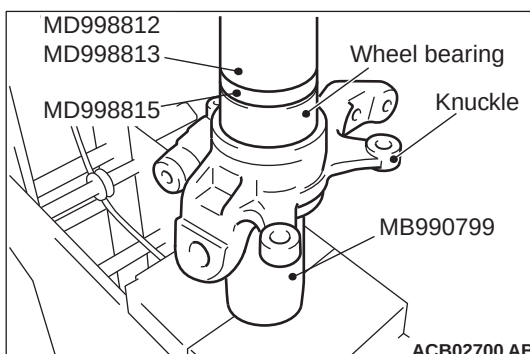
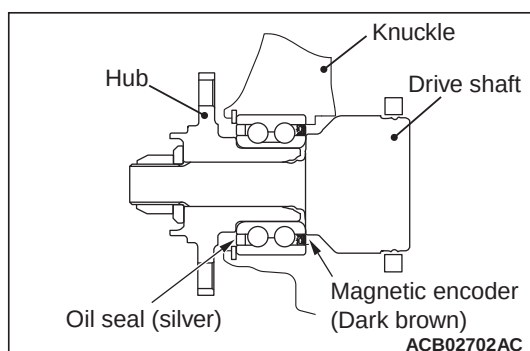


1. Remove the remaining grease, anti-corrosion oil and foreign material from the inner circumference of the knuckle.
2. Apply the specified grease to the inner circumference of the knuckle evenly as shown. {The application width should be approx. 10 to 20 mm (0.4 to 0.8 in).}

Specified grease: Dowcorning/Molykote BR2 Plus
Amount to use: as required {0.5 – 1.5 g (0.02 – 0.05 oz)}

⚠ CAUTION

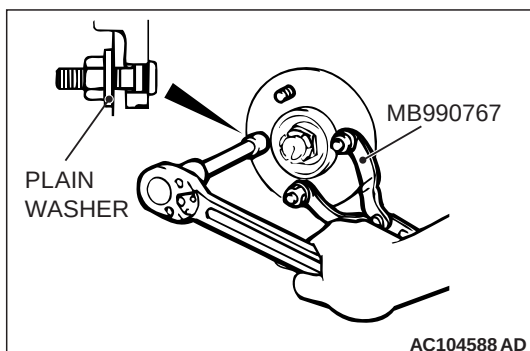
- The magnetic encoder is integrated into the wheel bearing. Make sure that the wheel bearing is installed as shown in the illustration.
- Press the outer race when pressing-in the wheel bearing. Otherwise the wheel bearing will be damaged.

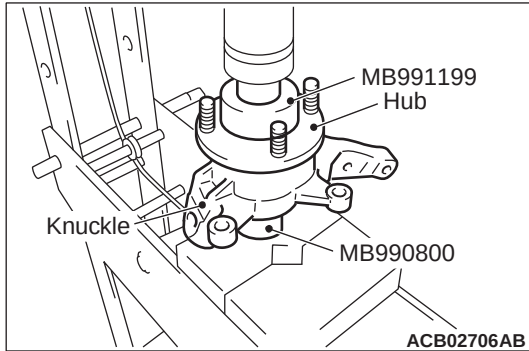


3. Use the following special tools to press-fit the wheel bearing to the knuckle.
 - Ball joint A remover and installer (MB990799)
 - Installer cap (MD998812)
 - Installer 100 (MD998813)
 - Installer adapter (MD998815)

>>B<< HUB BOLT INSTALLATION

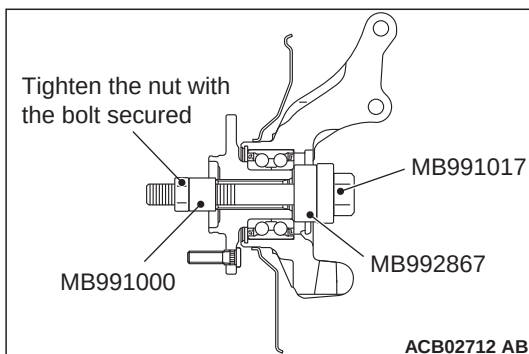
After fixing the hub using special tool front hub and flange yoke holder (MB990767), install the plain washer to the new hub bolt, and tighten the bolt with a nut.



**>>C<< HUB INSTALLATION**

Use the following special tools to press-fit the hub to the knuckle wheel bearing.

- Ball joint B remover and installer (MB990800)
- Oil seal installer (MB991199)

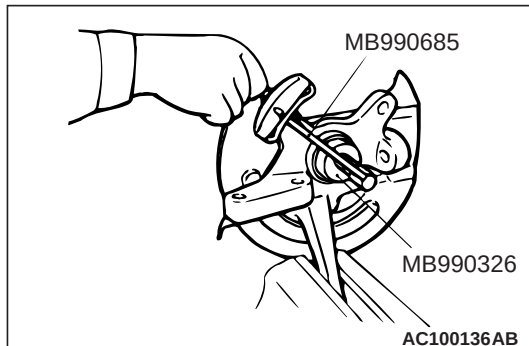
**>>D<< WHEEL BEARING STARTING TORQUE CHECK**

1. Set the following special tools as shown in the figure, tighten the nut to the specified torque, and press-fit the hub into the knuckle:

- Spacer (MB991000)
- Front hub remover and installer (MB991017)
- NOTE: Except spacer (MB991019).*
- Front hub remover and installer spacer (MB992867)

Tightening torque: 270 ± 27 N·m (199 ± 20 ft-lb)

2. Rotate the hub to make the bearing well-greased.

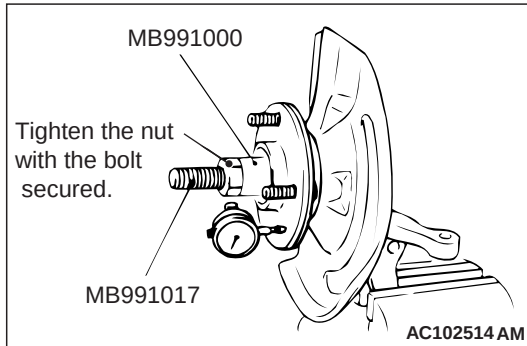
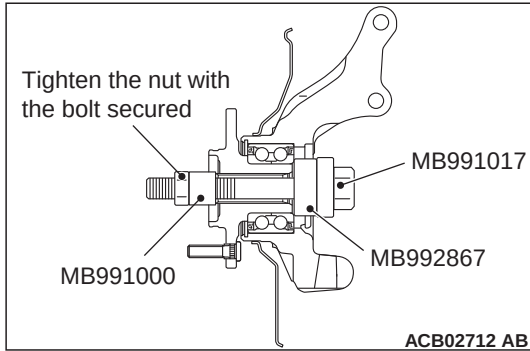


3. Use the following special tools to measure the hub rotation starting torque.

- Preload socket (MB990326)
- Torque wrench (MB990685)

Limit: 1.5 N·m (13 in-lb)

4. Hub rotation starting torque should be within the limit value, and there should be no roughness and gritty feeling in rotation.



>>E<< WHEEL BEARING END PLAY CHECK

1. Use the following special tools to measure the wheel bearing end play:

- Spacer (MB991000)
- Front hub remover and installer (MB991017)

NOTE: Except spacer (MB991019).

- Front hub remover and installer (MB992867)

Limit: 0.05 mm (0.002 in)

2. If the end play is not within the limit range while the nut is tightened to the specified torque, the bearing, hub and/or knuckle have probably not been installed correctly. Replace the bearing and re-install.

Tightening torque: 270 ± 27 N·m (199 ± 20 ft·lb)

INSPECTION

M1261002000175

- Check the front hub and brake disc mounting surfaces for galling and contamination.
- Check the knuckle inner surface for galling and cracks.

DRIVESHAFT ASSEMBLY

REMOVAL AND INSTALLATION

M1261003502674

 CAUTION

- The magnetic encoder collects metallic particles easily, because it is magnetized. Make sure that the magnetic encoder should not collect metallic particles. Check that there is not any trouble prior to reassembling it.
- When removing and installing the driveshaft assembly, make sure that the magnetic encoder (integrated with the inner oil seal) does not contact with surrounding parts to avoid damage.
- When removing and installing the front wheel speed sensor, make sure that the pole piece at the end does not contact with surrounding parts to avoid damage.

Pre-removal operation • Front under cover removal (Refer to GROUP 51, Under Cover Removal and Installation P.51-15). • Transmission fluid draining (Refer to GROUP 22A, On-vehicle Service, Transmission Oil Change P.22A-7). <M/T> • CVT fluid draining (Refer to GROUP 23A, On-vehicle Service, CVT Fluid Change P.23A-121). <CVT> • Lower arm assembly and Stabilizer bar Connection Removal (Refer to GROUP 33, Stabilizer bar Removal and Installation P.33-21).	Post-installation operation • Using your fingers, press the Ball Joint Dust Cover to check for a crack or damage. • Lower arm assembly and Stabilizer bar Connection Installation (Refer to GROUP 33, Stabilizer bar Removal and Installation P.33-21). • Transmission fluid refilling (Refer to GROUP 22A, On-vehicle Service, Transmission Oil Change P.22A-7). <M/T> • CVT fluid refilling (Refer to GROUP 23A, On-vehicle Service, CVT Fluid Change P.23A-121). <CVT> • Front under cover installation (Refer to GROUP 51, Under Cover Removal and Installation P.51-15). • Check the beam direction of the headlight (Low beam) (Refer to GROUP 54A – Headlight Aiming P.54A-93).
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Removal steps (Continued)

10. Circlip
11. Heat protector

- MB992700: Lock Nut Chisel
- MB990767: Front Hub and Flange Yoke Holder
- MB991897 or MB992011: Ball Joint Remover
- MB990241: Axle Shaft Puller
- MB990823: Spacer
- MB991017: Front Hub Removal and Installer
- MB992867: Front Hub Remover and Installer
Spacer

REMOVAL SERVICE POINTS

<<A>> DRIVESHAFT NUT REMOVAL

1. The staked portion of the driveshaft nut must face upwards.

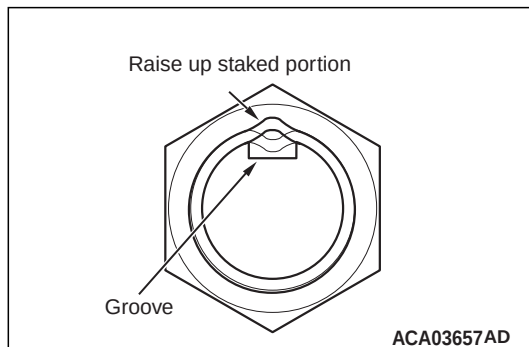
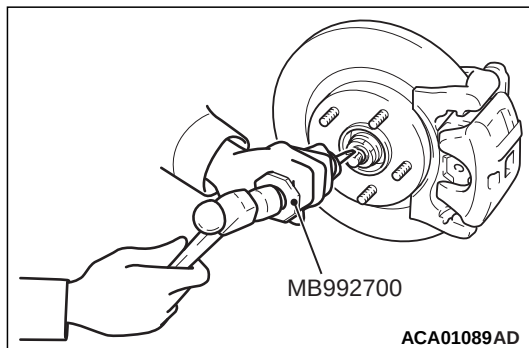
⚠ CAUTION

- Make sure that the lock nut chisel is set in the correct direction. Otherwise, the groove or thread in the drive-shaft may be broken, or the tip of the chisel may be chipped.
- Never use a chisel which tip is damaged.
- For how to use the lock nut chisel, refer to the manufacturer's operating instructions.

2. Set the special tool Lock Nut Chisel (MB992700) in the groove of the driveshaft with its "UPPER" mark facing upwards. Then strike the staked portion of the driveshaft nut with the chisel and a hammer to raise up.

⚠ CAUTION

Be careful not to damage the thread of the driveshaft.

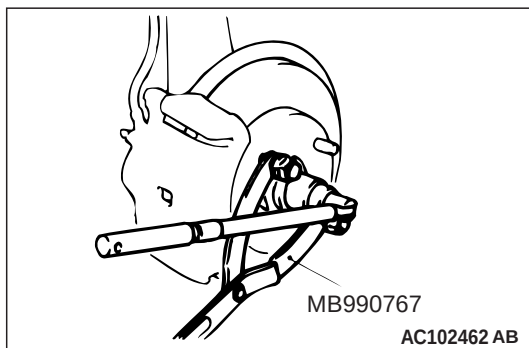


3. Raise up the staked portion of the driveshaft nut until it does not interfere with the shaft thread.

⚠ CAUTION

- Never use a impact wrench to loosen the driveshaft nut.
- Do not apply the vehicle weight on the wheel bearing with the driveshaft nut loosened. Otherwise, the wheel bearing may be broken.

4. Use special tool front hub and flange yoke holder (MB990767) to counter the hub as shown in the figure to remove the driveshaft nut.

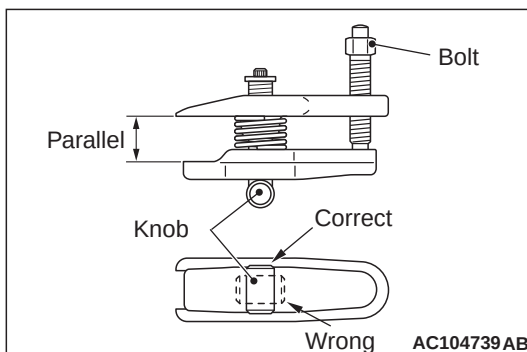
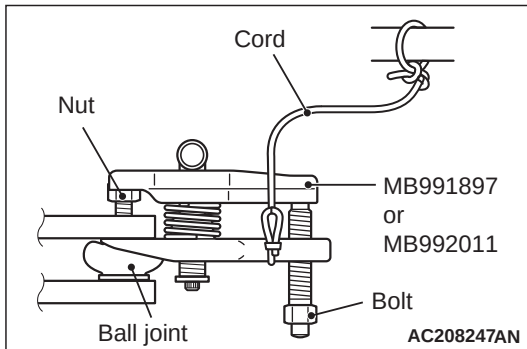


<> SELF-LOCKING NUT (TIE ROD END CONNECTION)/SELF-LOCKING NUT (LOWER ARM BALL JOINT CONNECTION) REMOVAL

CAUTION

- Do not remove the nut from ball joint. Loosen it and use special tool to avoid possible damage to ball joint threads.
- Hang special tool with cord to prevent it from falling.

1. Install special tool ball joint remover (MB991897 or MB992011) as shown in the figure.



2. Turn the bolt and knob as necessary to make the jaws of special tool parallel, tighten the bolt by hand and confirm that the jaws are still parallel.

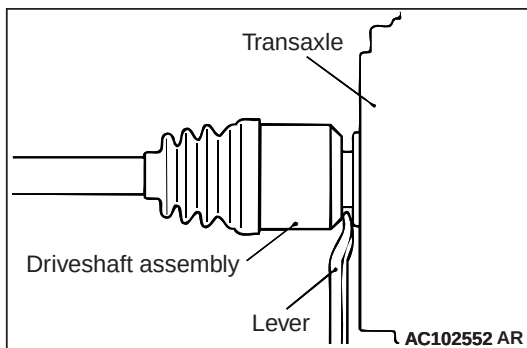
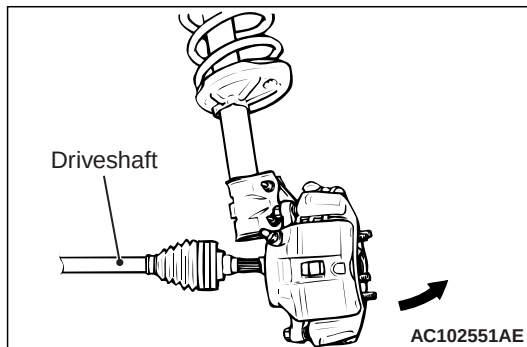
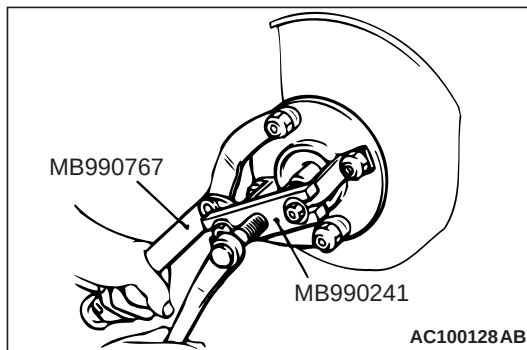
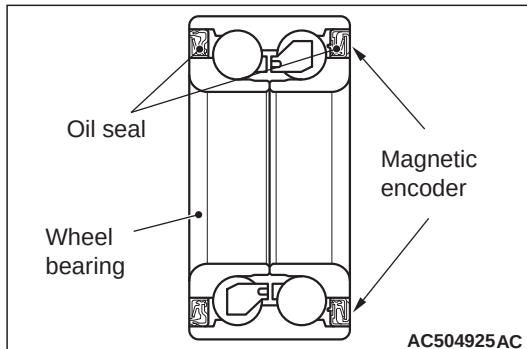
NOTE: When adjusting the jaws in parallel, make sure the knob is in the position shown in the figure.

3. Tighten the bolt with a wrench to disconnect the tie rod end, lower arm ball joint.

<<C>> DRIVESHAFT ASSEMBLY REMOVAL

⚠ CAUTION

- The magnetic encoder collects metallic particles easily, because it is magnetized. Make sure that the magnetic encoder does not collect metallic particles.
- When removing the driveshaft, make sure that it does not contact with the magnetic encoder (integrated with the inner oil seal) to avoid damage.



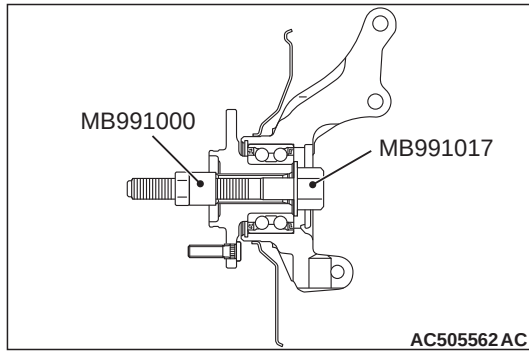
1. If the driveshaft is seized with the hub, use the following special tools to push the driveshaft assembly out from the hub:

- Axle shaft puller (MB990241)
- Front hub & flange yoke holder (MB990767)

2. While pulling the lower side of the brake disc toward you, remove the driveshaft assembly from the hub.

⚠ CAUTION

- Never pull out the driveshaft assembly from the EBJ or VUJ assembly side. Otherwise, the ETJ assembly may be damaged. Always pull out from the ETJ side with a lever.
 - Care must be taken to ensure that the oil seal of the transaxle is not damaged by the spline part of the driveshaft assembly.
3. Insert a pry bar between the transaxle case and the driveshaft, and then pry and remove the driveshaft from the transaxle.



⚠ CAUTION

Do not apply the vehicle weight to the wheel bearing with the driveshaft assembly removed. If, however, the vehicle weight shall be applied to the bearing (in order to move the vehicle), tighten the following special tools to the specified torque [270 ± 27 N·m (199 ± 20 ft·lb)]:

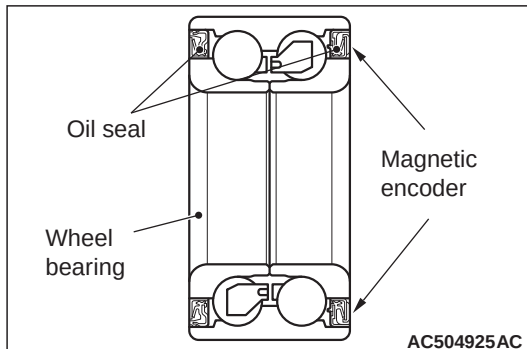
- Spacer (MB990823)
- Front hub removal and installer (MB991017) except spacer (MB991019)
- Front hub remover and installer spacer (MB992867)

INSTALLATION SERVICE POINTS

>>A<< OUTPUT SHAFT ASSEMBLY (RH)/DRIVE-SHAFT ASSEMBLY INSTALLATION

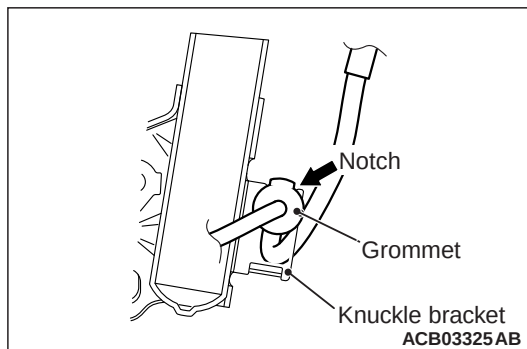
⚠ CAUTION

- The magnetic encoder collects metallic particles easily, because it is magnetized. Make sure that the magnetic encoder should not collect metallic particles. Check that there is not any trouble prior to reassembling it.
- When installing the driveshaft, make sure that it does not contact with the magnetic encoder (integrated with the inner oil seal) to avoid damage.
- Care must be taken to ensure that the oil seal of the transaxle is not damaged by the spline part of the output shaft assembly or driveshaft assembly.



>>B<< BRAKE HOSE GROMMET INSTALLATION

Insert grommet to knuckle bracket securely as shown. The notch of grommet must be coincided with the top end of knuckle bracket.

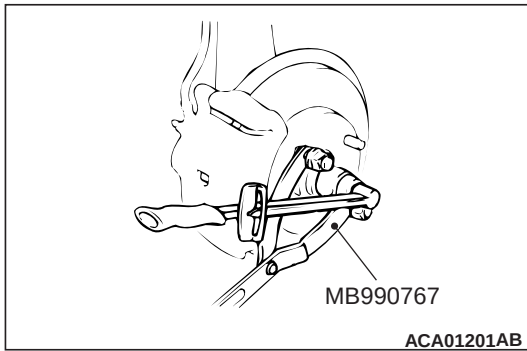


>>C<< DRIVESHAFT NUT INSTALLATION

⚠ CAUTION

Do not apply the vehicle weight on the front wheel hub assembly before fully tightening the driveshaft nut. Otherwise, the wheel bearing may be broken.

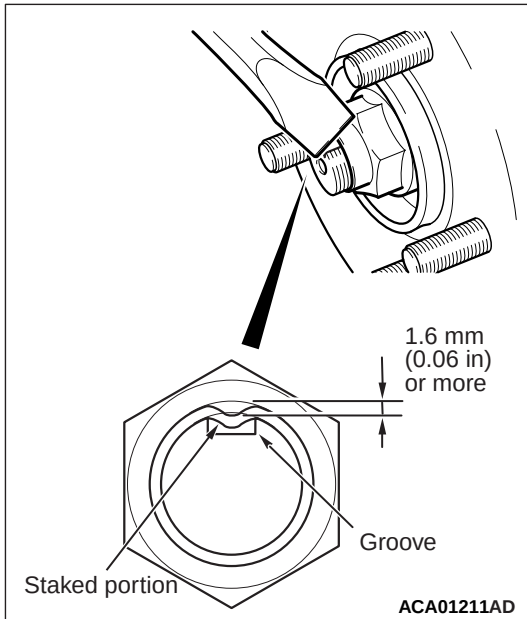
1. Check the hub seated surface for damage or corrosion. Whenever solvent is used for removing the corrosion, the surface should be degreased.
2. Check that the new driveshaft nut can be turned smoothly by hand. Then tighten it until it is seated.



3. Using special tool MB990767, tighten the driveshaft nut.

Tightening torque: 270 ± 27 N·m (199 ± 20 ft-lb)

4. After tightening to the specified torque, check that the nut is seated securely.



5. Use the chisel and a hammer to stake the nut until the center in the staked portion reaches the shown dimension.

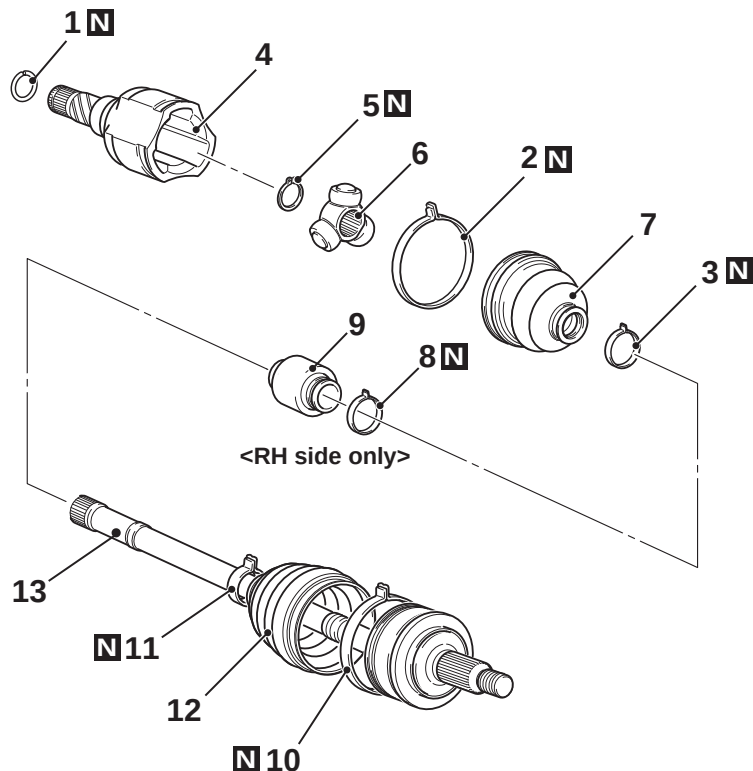
6. Finally, check that the nut is not cracked at its staked portion.

DISASSEMBLY AND ASSEMBLY

M1261003702883

⚠ CAUTION

As for the EBJ or VUJ assembly, only the EBJ or VUJ boot can be replaceable, and other parts cannot be disassembled.



ETJ boots repair kit	ETJ repair kit	VUJ boots repair kit

ACC02910AB

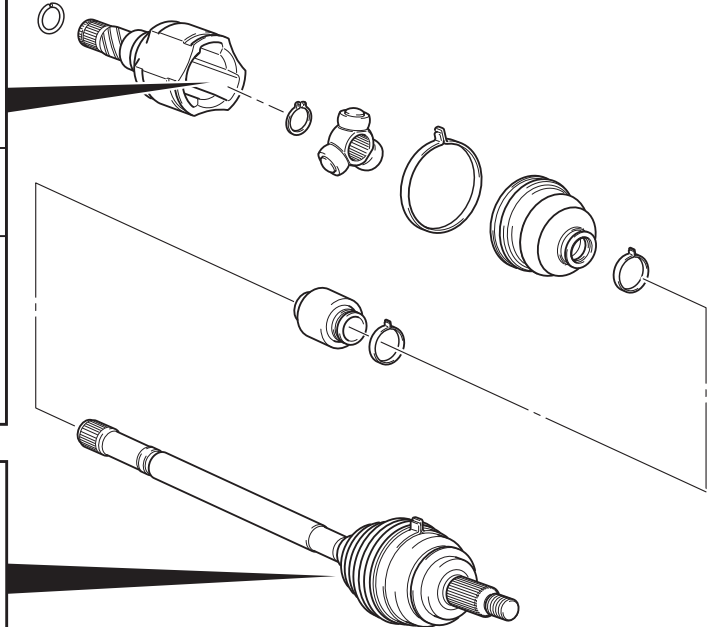
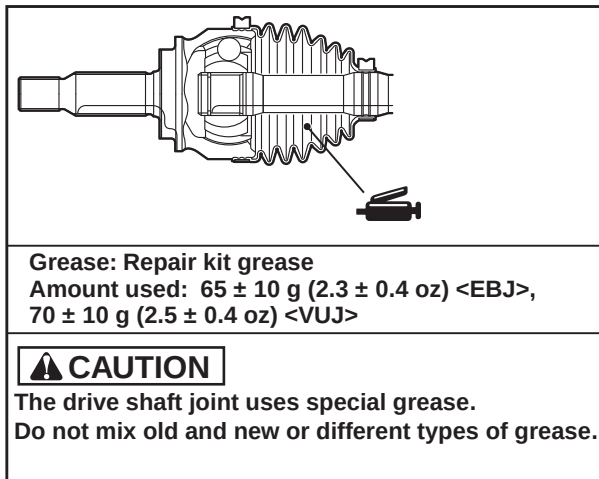
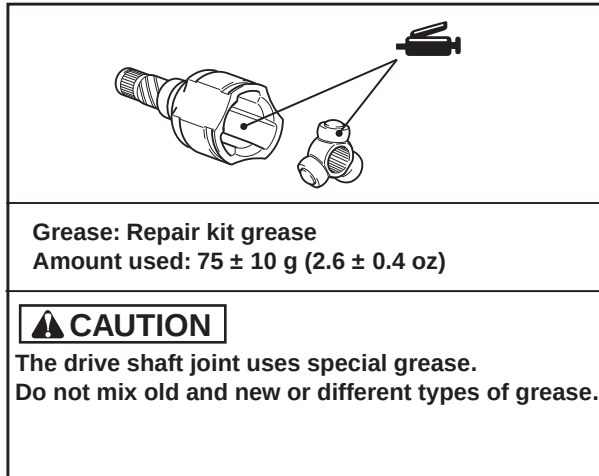
Disassembly steps

1. Circlip
- >>D<< 2. ETJ boot band (large)
- >>D<< 3. ETJ boot band (small)
- <<A>> >>C<< 4. ETJ case
- <<A>> >>B<< 5. Snap ring
- <> >>A<< 6. Spider assembly
7. ETJ boot

Disassembly steps (Continued)

8. Damper band <RH side only>
9. Dynamic damper <RH side only>
10. EBJ or VUJ boot band (large)
11. EBJ or VUJ boot band (small)
12. EBJ or VUJ boot
13. EBJ or VUJ assembly

LUBRICATION POINTS



ACC02915AB

DISASSEMBLY SERVICE POINTS

<<A>> ETJ CASE/SPIDER ASSEMBLY REMOVAL

CAUTION**Do not disassemble the spider assembly.**

1. Wipe off grease from the spider assembly and the inside of the ETJ case.
2. Always clean the spider assembly when the grease contains water or foreign material.

<> ETJ BOOT REMOVAL

1. Wipe off grease from the shaft spline.
2. When reusing the ETJ boot, wrap plastic tape around the shaft spline to avoid damaging the boot.

ASSEMBLY SERVICE POINTS

>>A<< ETJ BOOT INSTALLATION

Wrap plastic tape around the shaft spline, and then install the ETJ boot band (small) and ETJ boot.

>>B<< SPIDER ASSEMBLY INSTALLATION

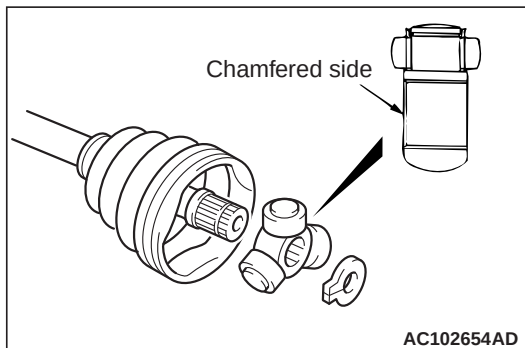
CAUTION

- The driveshaft joint use special grease. Do not mix old and new or different types of grease.
- If the spider assembly has been cleaned, take special care to apply the specified grease.

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

2. Install the spider assembly to the shaft from the direction of the spline chamfered side.



>>C<< ETJ CASE INSTALLATION

CAUTION

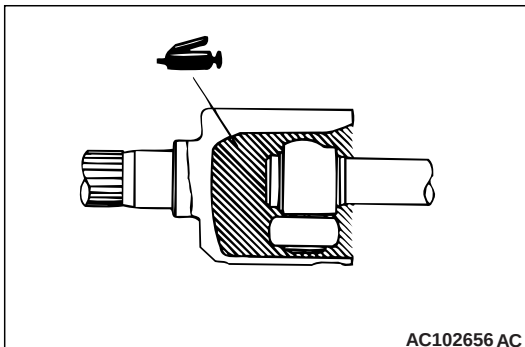
The driveshaft joint use special grease. Do not mix old and new or different types of grease.

After applying the specified grease to the ETJ case, insert the driveshaft and apply grease one more time.

Specified grease: Repair kit grease

75 ± 10 g (2.6 ± 0.4 oz)

NOTE: When using the repair kit grease, fill the half of the grease into the joint and the other half into the boot as a guide-line, and consume the grease completely.

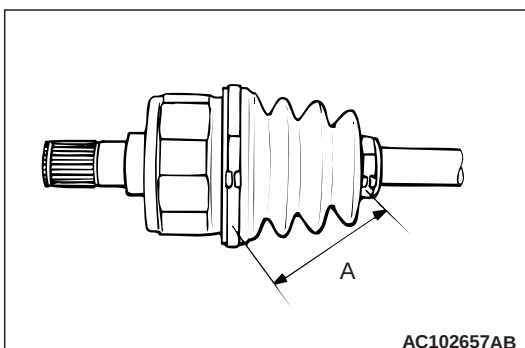


>>D<< ETJ BOOT BAND (SMALL)/ETJ BOOT BAND (LARGE) INSTALLATION

Adjust the distance (A shown in the illustration) between the boot bands to the standard value to adjust the air volume inside the ETJ boot to the specified value, then be sure to tighten the ETJ boot band (large) and ETJ boot band (small).

Standard value:

75 ± 3 mm (2.95 ± 0.11 inch)



INSPECTION

M1261003800367

- Check the driveshaft for damage, bending or corrosion.
- Check the output shaft for damage, bending or corrosion.
- Check the driveshaft spline part for wear or damage.
- Check the output shaft spline part for wear or damage.
- Check the spider assembly for roller rotation, wear or corrosion.
- Check the groove inside ETJ or VUJ case for wear or corrosion.
- Check the boots for deterioration, damage or cracking.

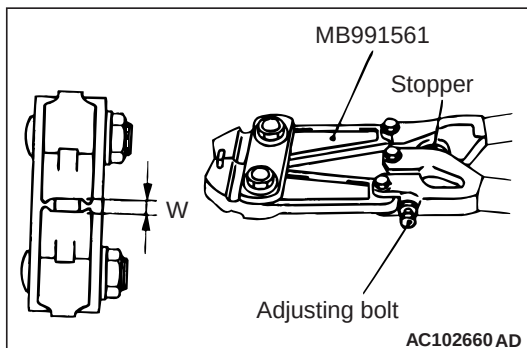
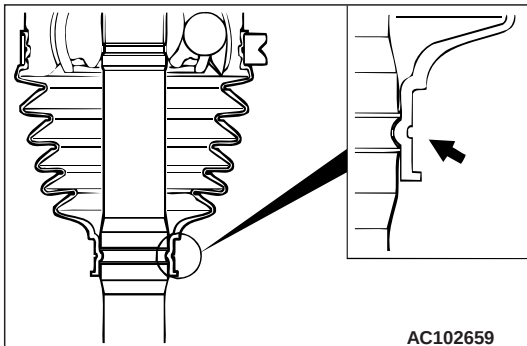
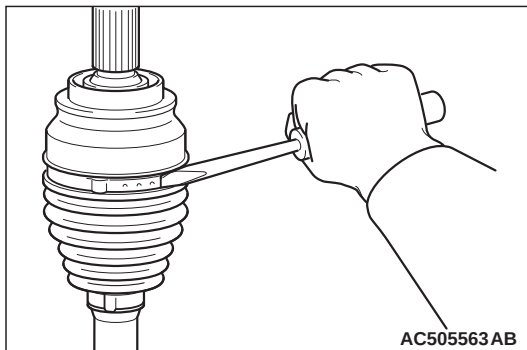
EBJ/VUJ BOOT REPLACEMENT

M1261007500539

Required Special Tool:

MB991561: Boot Band Crimping Tool

1. Remove the boot bands (large and small).
- NOTE: The boot bands cannot be re-used.*
2. Remove the EBJ or VUJ boot.
3. Wrap a plastic tape around the shaft spline, and assemble the boot band and EBJ or VUJ boot.



4. Align the center groove on the EBJ or VUJ boot small end with the shaft groove.

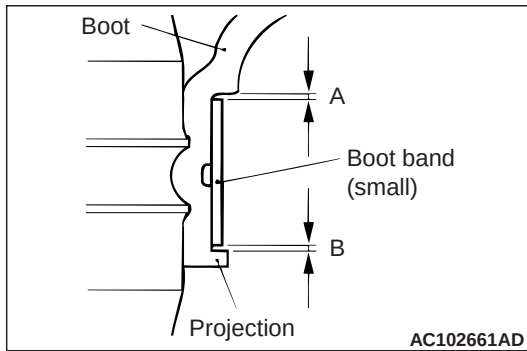
5. Turn the adjusting bolt on special tool boot band crimping tool (MB991561) so that the size of the opening (W) is at the standard value.

Standard value (W): 2.9 mm (0.11 inch)

- <If it is larger than 2.9 mm (0.11 inch)>
Tighten the adjusting bolt.
- <If it is smaller than 2.9 mm (0.11 inch)>
Loosen the adjusting bolt.

NOTE: The value of W will change by approximately 0.7 mm (0.03 inch) for each turn of the adjusting bolt.

NOTE: The adjusting bolt should not be turned more than once.

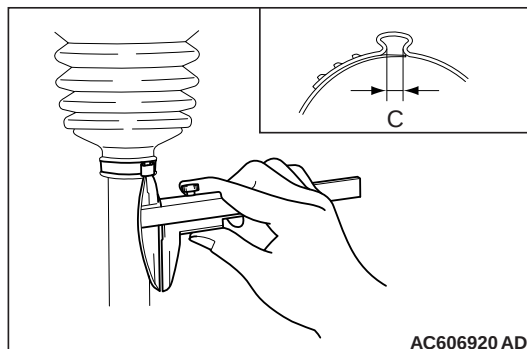
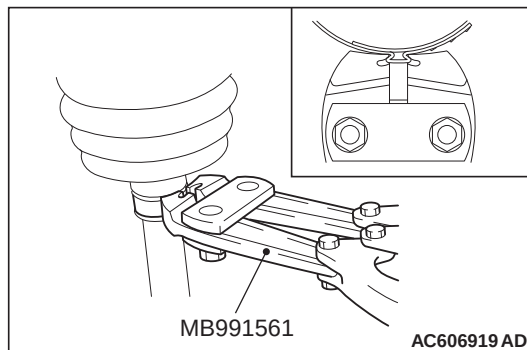


6. Position the EBJ or VUJ boot band (small) so that there is even clearance at either end (A and B).

⚠ CAUTION

- Secure the driveshaft in an upright position and clamp part of the boot band to be crimped securely in the jaws of special tool MB991561.
- Crimp the boot band until special tool MB991561 touches the stopper.

7. Use special tool MB991561 to crimp the boot band (small).



8. Check that the crimping amount (C) of the boot band is at the standard value.

Standard value (C): 2.4 – 2.8 mm (0.10 – 0.11 inch)

<If the crimping amount is larger than 2.8 mm (0.11 inch)>

Readjust the value of (W) in step 5 according to the following formula, and then repeat the operation in step 7.

$$W = 5.5 \text{ mm (0.22 inch)} - C$$

Example: If C = 2.9 mm (0.11 inch), then W = 2.6 mm (0.10 inch)

<If the crimping amount is smaller than 2.4 mm (0.10 inch)>

Remove the EBJ or VUJ 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 EBJ or VUJ boot band.

$$W = 5.5 \text{ mm (0.22 inch)} - C$$

Example: If C = 2.3 mm (0.09 inch), then W = 3.2 mm (0.13 inch)

9. Check that the boot band is not sticking out past the place where it has been installed. If the boot band is sticking out, remove it and then repeat steps 6 to 8, using a new boot band.

⚠ CAUTION

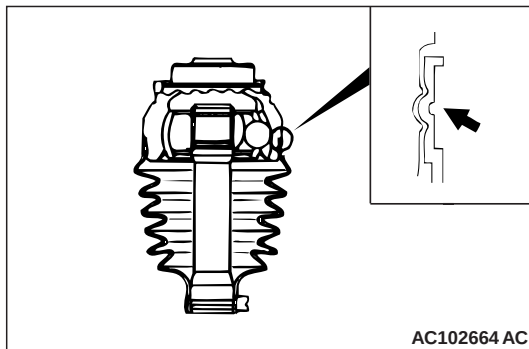
The driveshaft joint uses special grease. Do not mix old and new or different types of grease.

10. Fill the inside of the boot with the specified amount of the specified grease.

Specified grease: Repair kit grease

- Amount to use :
- 65 ± 10 g (2.3 ± 0.4 oz) <EBJ>
- 70 ± 10 g (2.5 ± 0.4 oz) <VUJ>

11. Align the center groove on the EBJ or VUJ boot big end with the EBJ or VUJ case groove.



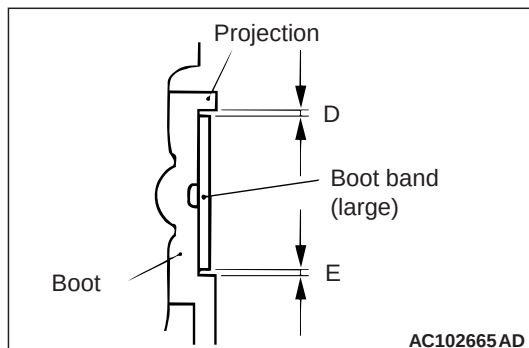
AC102664 AC

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 (0.13 inch)

13. Position the EBJ or VUJ boot band (large) so that there is even clearance at either end (D and E).

14. Use special tool MB991561 to crimp the EBJ or VUJ boot band (large) in the same way as in step 7.



AC102665 AD

15. Check that the crimping amount (F) of the boot band is at the standard value.

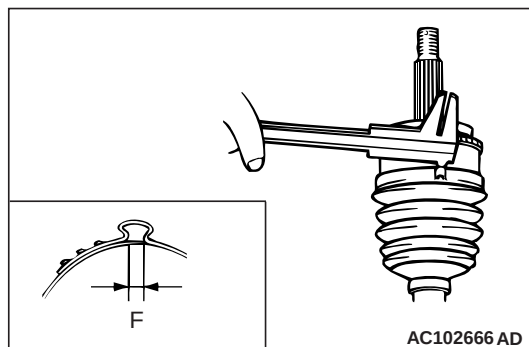
Standard value (F): 2.4 – 2.8 mm (0.10 – 0.11 inch)

<If the crimping amount is larger than 2.8 mm (0.11 inch)>

Readjust the value of (W) in step 12 according to the following formula, and then repeat the operation in step 14.

$$W = 5.8 \text{ mm (0.23 inch)} - F$$

Example: If $F = 2.9 \text{ mm (0.11 inch)}$, then $W = 2.9 \text{ mm (0.11 inch)}$



AC102666 AD

<If the crimping amount is smaller than 2.4 mm (0.10 inch)>

Remove the EBJ or VUJ 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 EBJ or VUJ boot band.

$W = 5.8 \text{ mm (0.23 inch)} - F$

Example: If $F = 2.3 \text{ mm (0.09 inch)}$, then $W = 3.5 \text{ mm (0.14 inch)}$

16. Check that the boot band is not sticking out past the place where it has been installed. If the boot band is sticking out, remove it and then repeat steps 13 to 15, using a new boot band.

NOTES