GROUP 26

FRONT AXLE

CONTENTS

GENERAL INFORMATION

M1261000101232

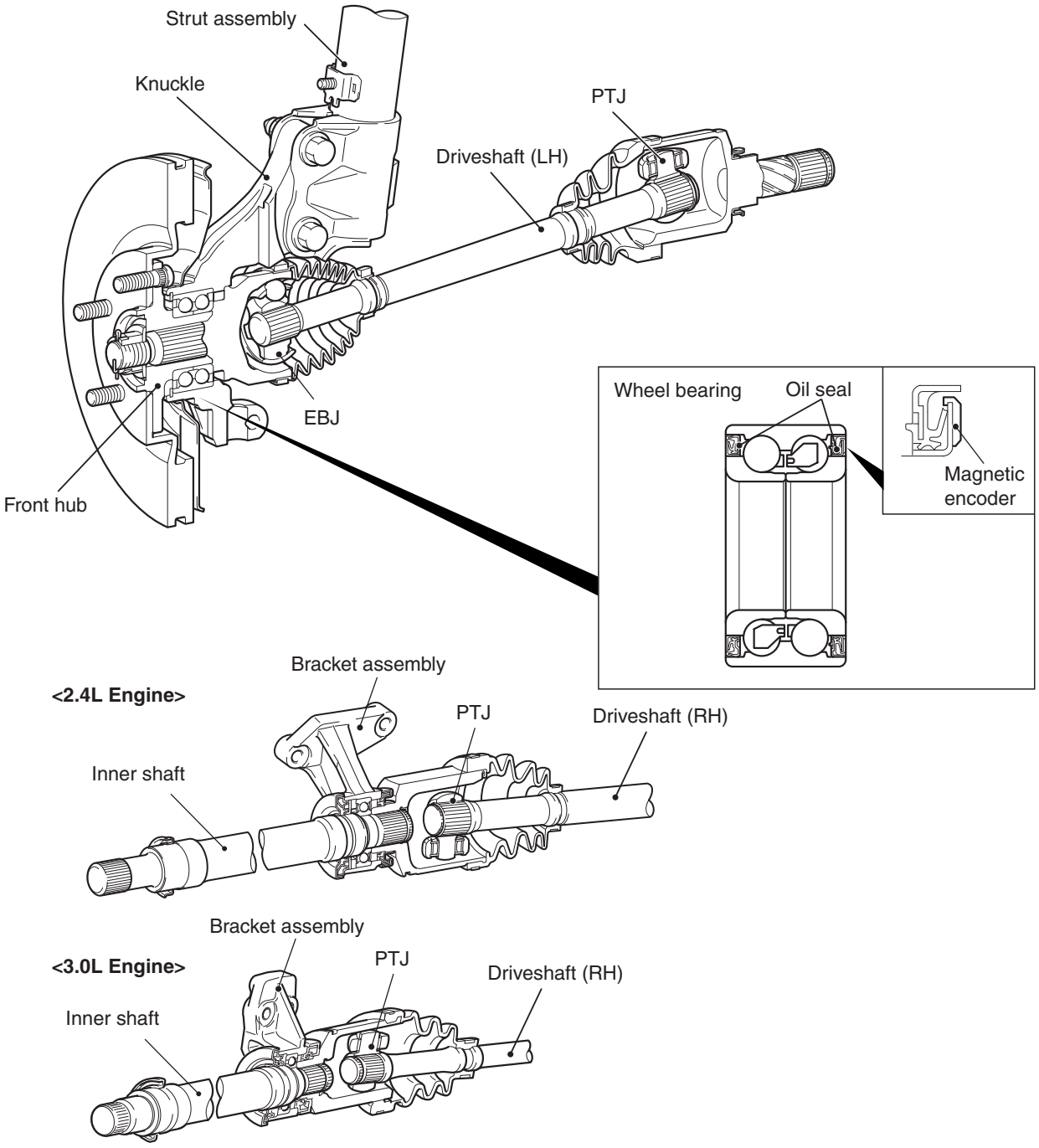
For the front axle, the unit ball bearing (double-row angular contact ball bearing) with an integral oil seal is used as a wheel bearing, and EBJ-PTJ type constant velocity joint as a driveshaft.
It has the following features:

- The driveshaft incorporates EBJ-PTJ type constant velocity joints with high transmission efficiency for low vibration and noise.
- Due to the use of the inner shaft and bracket assembly, the right and left driveshafts are approximately the same in length. This reduces noise, vibration and torque steer.<FWD-RH>
- The long stem integrated with the differential side constant velocity joint is adopted to streamline the structure.<AWD-RH>
- Due to the adoption of Super All Wheel Control (S-AWC) , the right and left driveshafts have been approximately the same in length. <AWD with S-AWC>
- Lead-free grease for the constant velocity joint is adopted.
- Hexavalent chromium is eliminated from the dust cover material.
- The number of parts is reduced by integrating the magnetic encoder for ABS wheel speed detection into the wheel bearing.

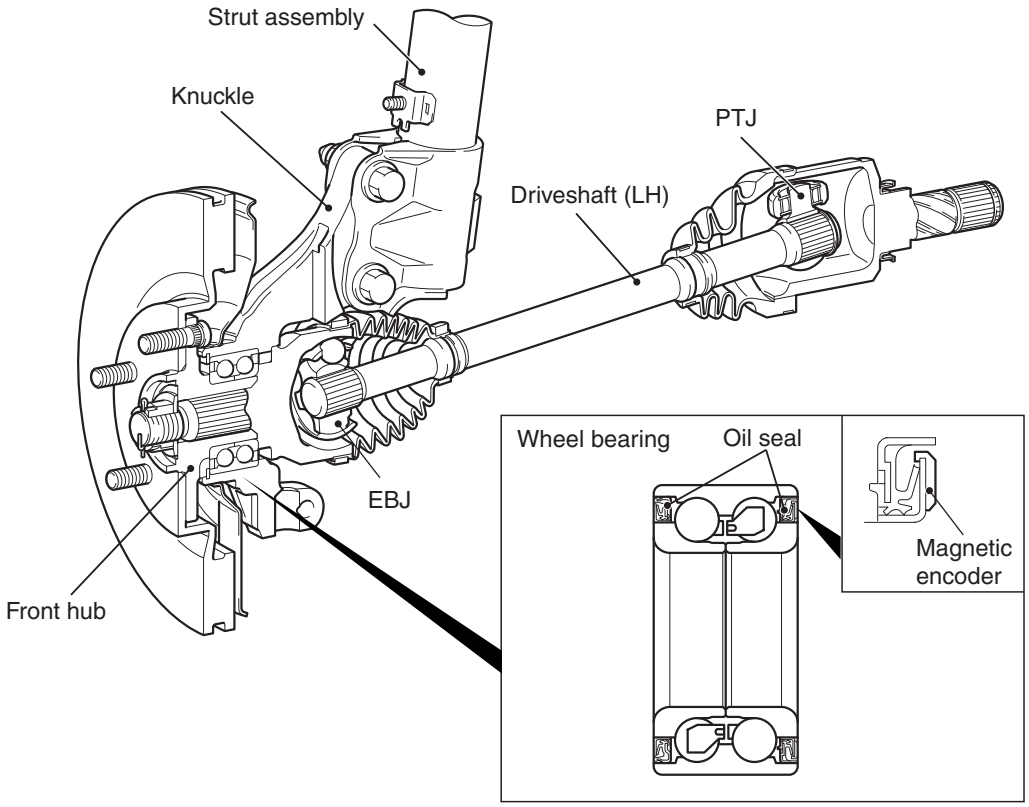
NOTE:
EBJ (High Efficiency Compact Birfield Joint): the lighter and smaller constant velocity joint compared with the conventional BJ has been achieved by adopting the eight small balls.
PTJ (Pillow Tripod Joint)

CONSTRUCTION DIAGRAM

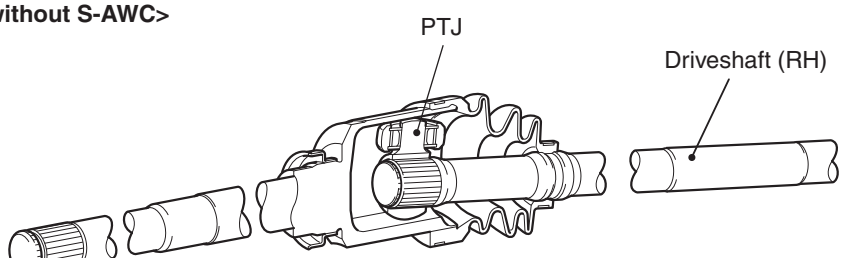
<FWD>



<AWD>



<Vehicles without S-AWC>



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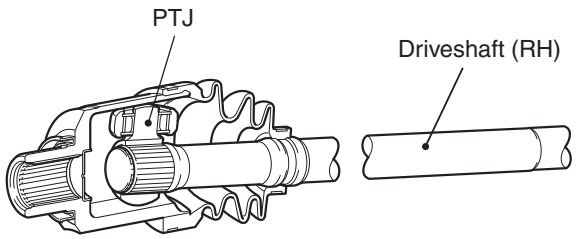

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GENERAL SPECIFICATIONS

M1261000200407

Item			Specification
Wheel bearing	Bearing type		Unit ball bearing (double-row angular contact ball bearing)
Driveshaft	Joint type	Outer	EBJ
		Inner	PTJ

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SERVICE SPECIFICATIONS

M1261000301021

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)
PTJ boot assembly dimension mm (in)		2.4L Engine	85 ± 3 (3.35 ± 0.12 inch)	–
		3.0L Engine	95 ± 3 (3.74 ± 0.12 inch)	–
Opening dimension of the special tool (MB991561) mm (in)	EBJ boot band (small) crimping		2.9 (0.11)	–
	EBJ boot band (large) crimping		3.2 (0.13)	–
EBJ boot band crimping size mm (in)			2.4 – 2.8 (0.10 – 0.11)	–

LUBRICANTS

M1261000401385

Item	Specified lubricant			Quantity
Inside of knuckle bore	Dowcorning/Molykote BR2 Plus or equivalent			As required [1.0 – 1.5 g (0.04 – 0.05 oz)]
PTJ boot grease	Repair kit grease	2.4L Engine -FWD	LH	210 ± 10 g (7.4 ± 0.3 oz)
			RH	225 ± 10 g (7.9 ± 0.3 oz)
		2.4L Engine -AWD	LH	210 ± 10 g (7.4 ± 0.3 oz)
			RH	200 ± 10 g (7.0 ± 0.3 oz)
		3.0L Engine	LH	245 ± 10 g (8.6 ± 0.3 oz)
			RH	255 ± 10 g (9.0 ± 0.3 oz), 250 ± 10 g (8.8 ± 0.3 oz)*
EBJ boot grease	Repair kit grease	2.4L Engine		120 ± 10 g (4.2 ± 0.3 oz)
		3.0L Engine		140 ± 10 g (4.9 ± 0.3 oz), 135 ± 10 g (4.8 ± 0.3 oz)*
Dust seal inner grease	Repair kit grease	2.4L Engine		6 – 10 g (0.2 – 0.3 oz)
		3.0L Engine		8 – 12 g (0.3 – 0.4 oz)
Dust seal outer grease	Repair kit grease			3 – 7 g (0.1 – 0.2 oz)

*NOTE: *Indicates Vehicles with S-AWC.*

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FRONT AXLE DIAGNOSIS

TROUBLESHOOTING STRATEGY

M1261005600251

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.

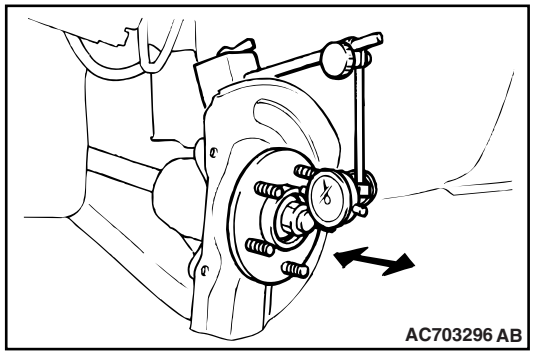
SYMPTOM CHART

M1261005700311

Symptom		Inspection procedure	Reference page
Driveshaft	Noise during wheel rotation	1	P.26-6
	Noise due to excessive play of wheel in turning direction	2	P.26-7

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: Noise during Wheel Rotation


AC703296 AB

DIAGNOSIS

STEP 1. Check the wheel bearing end play.

(1) Remove the 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.

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STEP4. 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.

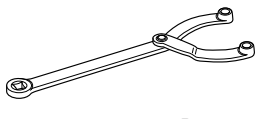
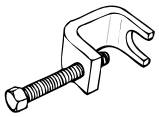
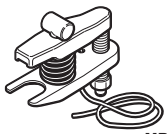
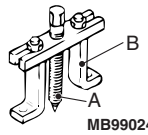
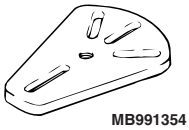
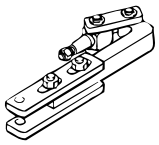
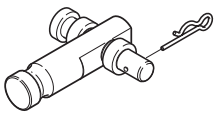
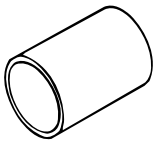
STEP 2. Retest the system.

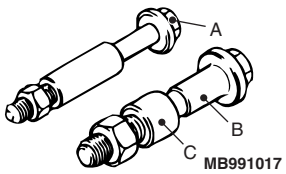
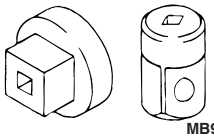
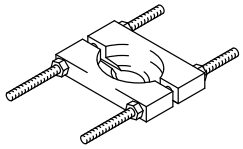
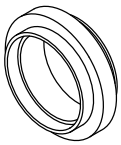
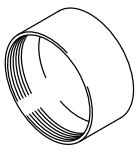
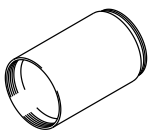
Q: Is the abnormal noise eliminated?

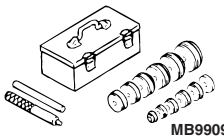
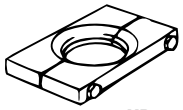
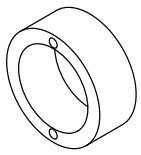
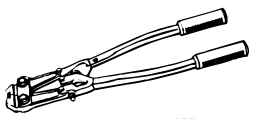
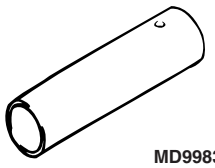
YES : The procedure is complete.
NO : Repeat from Step 1.

SPECIAL TOOLS

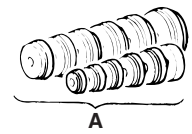
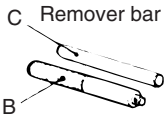
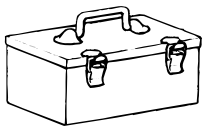
M1261000601259

Tool	Tool number and name	Supersession	Application
 B990767	MB990767 Front hub and flange yoke holder	MB990767-01	Fixing of the hub
 MB991618	MB991618 Hub bolt remover	General service tool	Removal of the hub bolt
 MB991897	MB991897 or MB992011 Ball joint remover	MB991113-01, MB990635-01 or General service tool	Knuckle and tie rod end ball joint disconnection *NOTE: Steering linkage puller (MB990635 or MB991113)is also used to disconnect knuckle and tie rod end ball joint.*
 MB990241AD	MB990241 Axle shaft puller A: MB990242 Puller shaft B: MB990244 Puller bar	MB990241-01 or General service tool	Removal of the driveshaft
 MB991354	MB991354 Puller body	General service tool	
	MB991056 or MB991355 Knuckle arm bridge	MB991056-01	• Removal of the hub • Removal of the wheel bearing
 B992250	MB992250 Knuckle arm bridge attachment	–	Removal of the hub *NOTE: Replace this attachment with a guide of MB991355 and use them.*
	MB991172 Inner shaft installer base	–	Press-fitting of the inner shaft

Tool	Tool number and name	Supersession	Application
	A: MB991017 B: MB990998 C: MB991000 A, B: Front hub remover and installer C: Spacer	MB990998-01	• Removal of the hub • Provisional holding of the wheel bearing • Measurement of hub starting torque • Measurement of wheel bearing end play *NOTE: MB991000, which belongs to MB990998, should be used as a spacer.* • Removal of the wheel bearing inner race (outside) (Use MB991000 with MD998801.)
	MB991099 Oil seal installer guide	–	Measurement of hub starting torque
	MB990326 Preload socket	General service tool	
	MB990810 Side bearing puller	General service tool	Removal of the center bearing bracket
	MD998801 Remover	–	Removal of the wheel bearing inner race (outside)
	MB992150 Oil seal installer	–	Installation of the wheel bearing inner race (outside)
	MD998812 Installer cap	–	
	MD998813 Installer	–	

Tool	Tool number and name	Supersession	Application
 MB990925	MB990925 Bearing and oil seal installer set	MB990925-01 or General service tool	• Removal of the wheel bearing • Removal and installation of the center bearing • Press-fitting of the dust seal outer, inner
 MB991388	MB991388 Bush remover base	–	Press-fitting of the dust cover
 MB991576	MB991576 Base	–	
 MB990890	MB990890 Rear suspension bushing base	MB990890-01	• Installation of the wheel bearing • Press-fitting of the dust seal outer, inner
 MB991248	MB991248 Inner shaft remover	MD998348-01	Removal of the inner shaft
	MD999528 Adapter	–	Installation of the wheel bearing
 MB991561	MB991561 Boot band crimping tool	MB991561	BJ boot (resin boot) band installation
 MD998369	MD998369 Bearing installer	–	Press-fitting of the seal plate

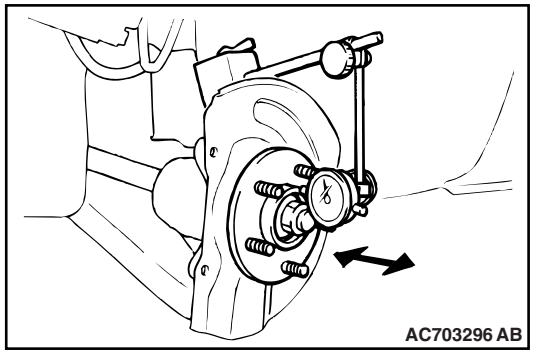
MB990925 BEARING AND OIL SEAL INSTALLER SET

Tool	Type	Tool number	O D mm (in)
MB990925  A Installer adapter  C Remover bar B Installer bar (Snap-in type)  Tool box AC703349 AB	A	MB990926	39.0 (1.54)
		MB990927	45.0 (1.77)
		MB990928	49.5 (1.95)
		MB990929	51.0 (2.00)
		MB990930	54.0 (2.13)
		MB990931	57.0 (2.24)
		MB990932	61.0 (2.40)
		MB990933	63.5 (2.50)
		MB990934	67.5 (2.66)
		MB990935	71.5 (2.81)
		MB990936	75.5 (2.97)
		MB990937	79.0 (3.11)
	B	MB990938	–
	C	MB990939	–

ON-VEHICLE SERVICE

WHEEL BEARING END PLAY CHECK

M1261001100362


AC703296 AB

1. Remove the front caliper assembly and front brake disc, and retain the front caliper assembly with a wire and the like to prevent from falling (Refer to P.26-13).
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 to check each component. If the front hub bearing is faulty, replace it.
4. After checking, install the front brake disc and the front caliper assembly (Refer to P.26-13).

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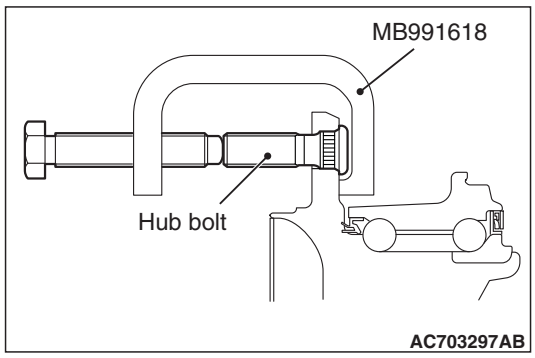
HUB BOLT REPLACEMENT

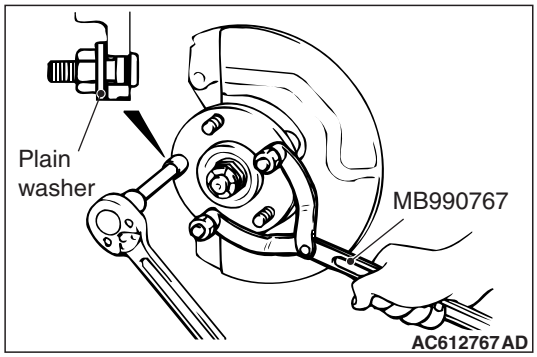
M1261001000536

Required Special Tools:

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

1. Remove the front caliper assembly and front brake disc, and retain the front caliper assembly with a wire and the like to prevent from falling (Refer to P.26-13).
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 front brake disc and the front caliper assembly (Refer to P.26-13).

FRONT AXLE HUB ASSEMBLY

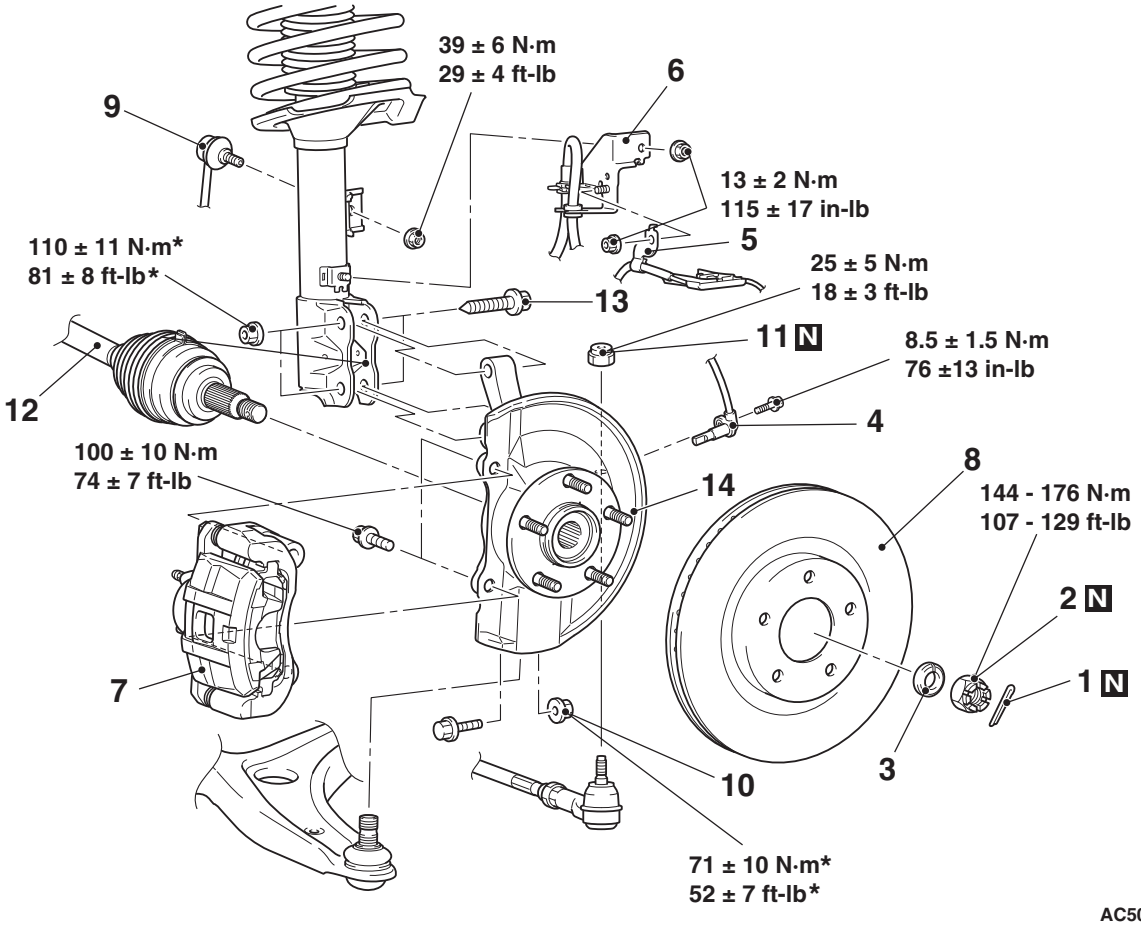
REMOVAL AND INSTALLATION

M1261001701679

⚠ 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.**

Post-installation operation
- Using your fingers, press the Ball Joint Dust Cover to check for a crack or damage.



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Removal steps
1. Cotter pin
<<A>> >>B<< 2. Driveshaft nut
>>B<< 3. Washer
4. Front wheel speed sensor
5. Front wheel speed sensor harness bracket
6. Brake hose bracket

Removal steps (Continued)
<<B>> 7. Caliper assembly
8. Brake disk
<<C>> >>A<< 9. Stabilizer link connection
10. Self-locking nut (lower arm ball joint connection)
<<D>> 11. Self-locking nut (tie-rod end connection)

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Removal steps (Continued)

<<E>>
12. Driveshaft and hub knuckle assembly connection
13. Hub knuckle assembly and strut mounting bolt and nuts
14. Hub knuckle assembly

Required Special Tools:

- MB990242: Puller Shaft
- MB990244: Puller Ball
- MB990767: Front Hub and Flange Yoke Holder
- MB991354: Puller Body
- MB991897 or MB992011: Ball Joint Remover

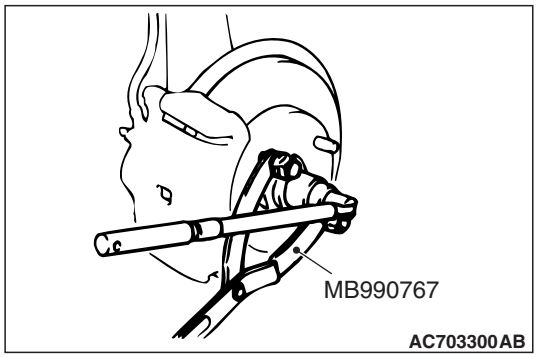
REMOVAL SERVICE POINTS

<<A>> DRIVESHAFT NUT REMOVAL

⚠ CAUTION

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

Use special tool MB990767 to counter the hub as shown in the figure to remove the driveshaft nut.

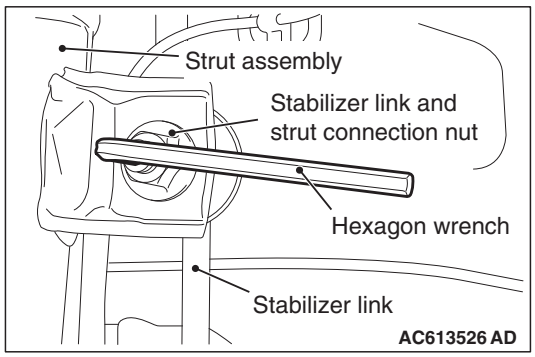


<<B>> CALIPER ASSEMBLY REMOVAL

1. Remove the caliper assembly with brake hose.
2. Secure the removed 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>> STABILIZER LINK DISCONNECTION

Use a hexagon wrench to remove the stabilizer link and strut connection nut as shown in the figure.

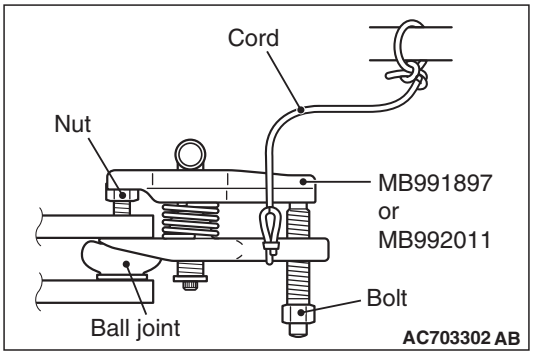


<<D>> SELF-LOCKING NUT (TIE-ROD END CONNECTION) REMOVAL

⚠ CAUTION

- **Loosen the self-locking nut (tie-rod end connection) from the ball joint, but do not remove here. Use the special tool.**
- **To prevent the special tool from dropping off, suspend it with a cord.**

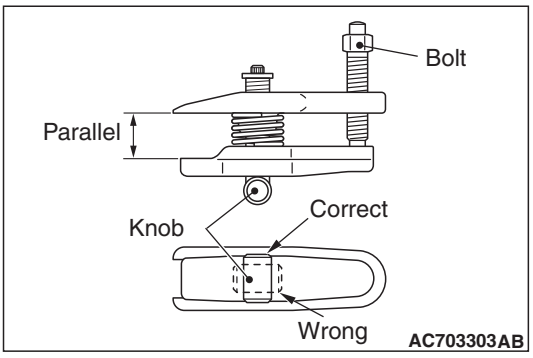
1. Install special tool MB991897 or MB992011 as shown in the figure.



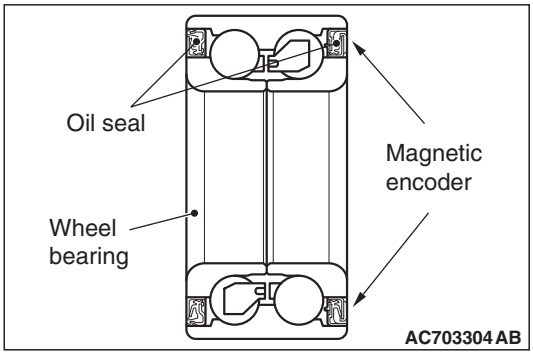
2. Turn the bolt and knob to make the special tool jaws parallel, then hand-tighten the bolt. After tightening, check that the jaws are still parallel.

   NOTE: To adjust the special tool jaws to be parallel, set the orientation of the knob as shown in the figure.

3. Unscrew the bolt to disconnect the ball joint.

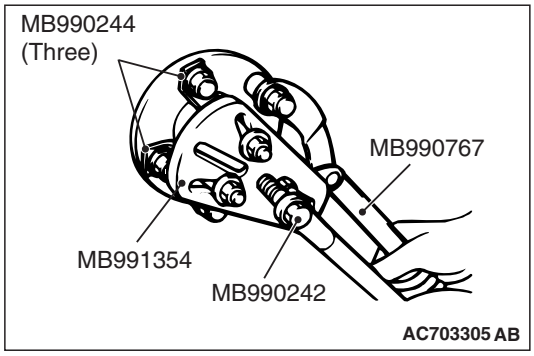


<<E>> DRIVESHAFT AND HUB KNUCKLE ASSEMBLY DISCONNECTION



⚠ 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.**

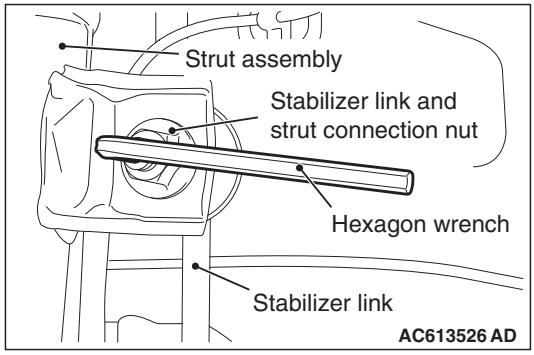


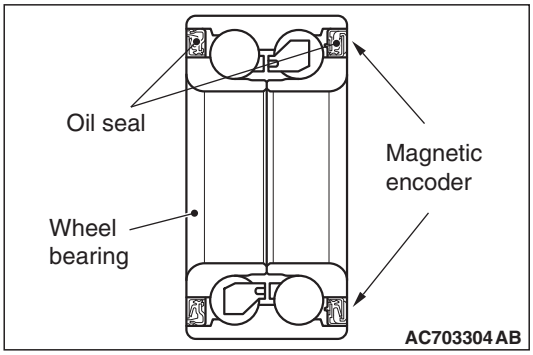
If the driveshaft is seized, use special tools MB990242 and MB990244, MB991354 and MB990767 to push the driveshaft out from the hub.

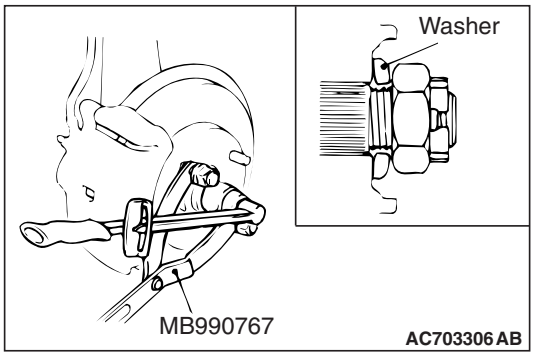
INSTALLATION SERVICE POINTS

>>A<< STABILIZER LINK CONNECTION

Use a hexagon wrench to install the stabilizer link and strut connection nut as shown in the figure.







>>B<< WASHER/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.**

1. Be sure to install the driveshaft washer in the illustrated direction.
2. Use special tool MB990767 to tighten the driveshaft nuts. At this time, tighten the nuts within the specified torque range considering the final tightening.

   Tightening torque: 144 – 176 N·m (107 – 129 ft-lb)
3. If the pin holes do not align with the pins, tighten the driveshaft nut [less than 200 N·m(147 ft-lb)] and find the nearest hole then bend the cotter pin to fit it.

INSPECTION

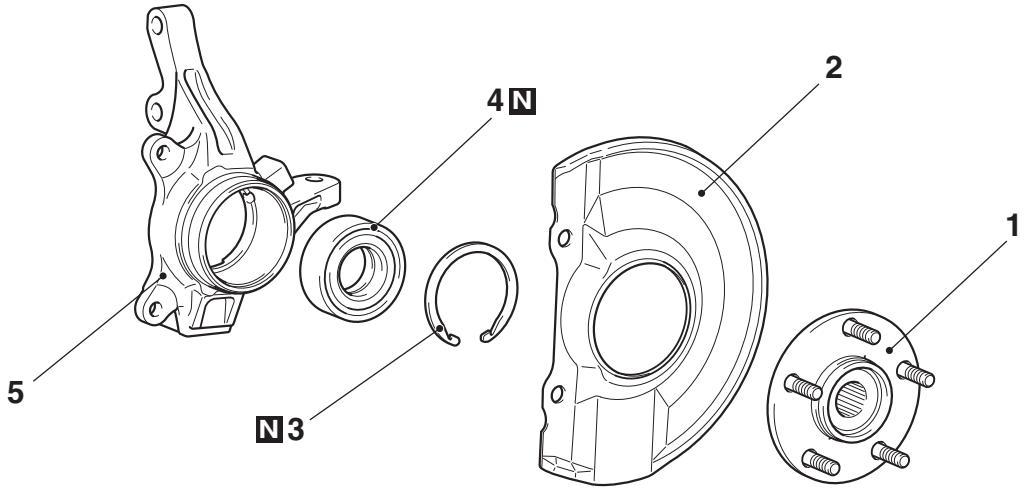
M1261001800424

- 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

M1261001900669



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			Disassembly steps
<<**A**>>		1.	Hub
		2.	Dust shield
		3.	Snap ring
<<**B**>>		4.	Wheel bearing
		5.	Knuckle
			Assembly steps
		5.	Knuckle
	>>**A**<<	4.	Wheel bearing
		3.	Snap ring
	>>**B**<<	2.	Dust shield
		1.	Hub
	>>**C**<<	•	Hub starting torque check
	>>**D**<<	•	Wheel bearing end play check

Required Special Tools:

- MB990326: Preload Socket
- MB990890: Rear Suspension Bushing Base
- MB990935: Installer Adapter
- MB990938: Installer Bar
- MB991000: Spacer
- MB991017: Front Hub Remover and Installer
- MB991355: Knuckle Arm Bridge
- MB991388: Bush Remover Base
- MB991576: Base
- MB992150: Oil Seal Installer
- MB992250: Knuckle Arm Bridge Attachment
- MD999528: Adapter
- MD998801: Remover
- MD998812: Installer Cap
- MD998813: Installer

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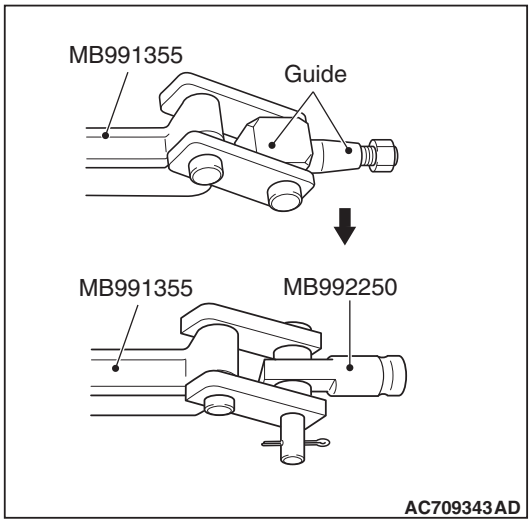
DISASSEMBLY SERVICE POINTS

<<A>> HUB REMOVAL

⚠ CAUTION

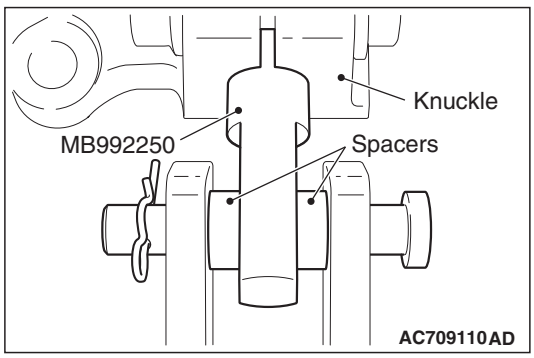
In the hub removal operation, make sure to replace the wheel bearing with new one.

1. Replace special tool MB992250 with a guide of special MB991355 as shown in the figure.

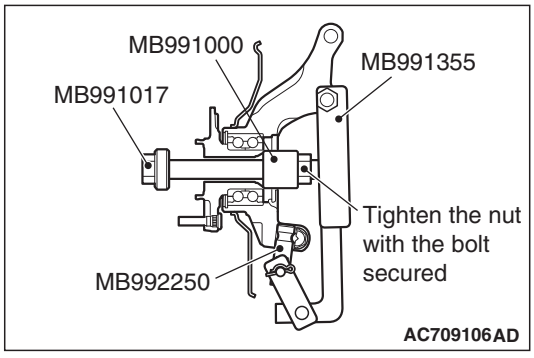


2. Insert special tool MB992250 in the knuckle and tighten it with a bolt and nut.

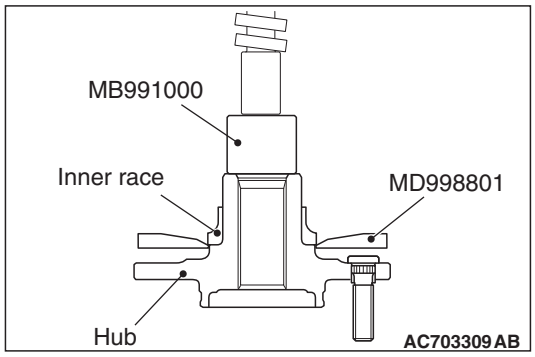
   NOTE: Set the spacers of special tool MB992250 as shown in the figure.



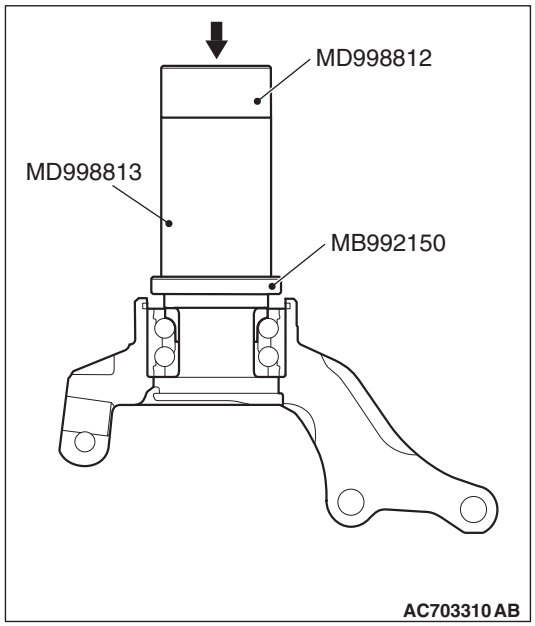
3. Use special tools MB991000, MB991017, MB991355 and MB992250 to remove the hub.



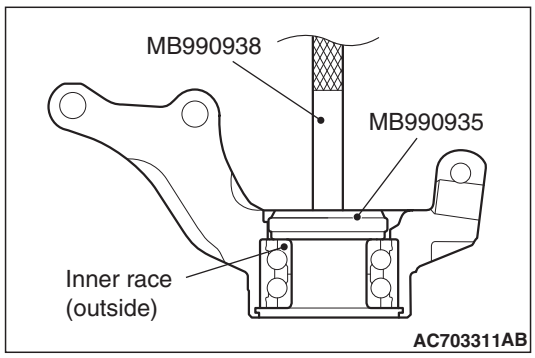
<<B>> WHEEL BEARING REMOVAL



1. Use special tools MD998801 and MB991000 to remove the wheel bearing inner race (outside) from the hub.



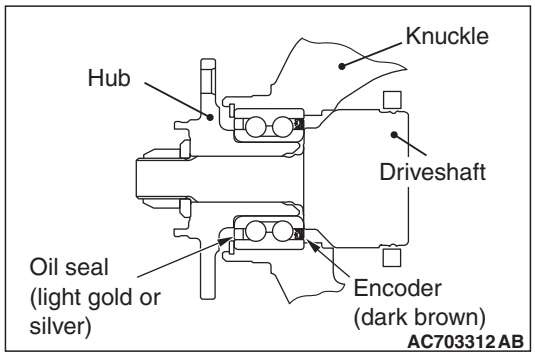
2. Use special tools MB992150, MD998812 and MD998813 to assemble the inner race (outside) removed from the hub to the wheel bearing.



3. Use special tools MB990935 and MB990938 to remove the wheel bearing.

ASSEMBLY SERVICE POINTS

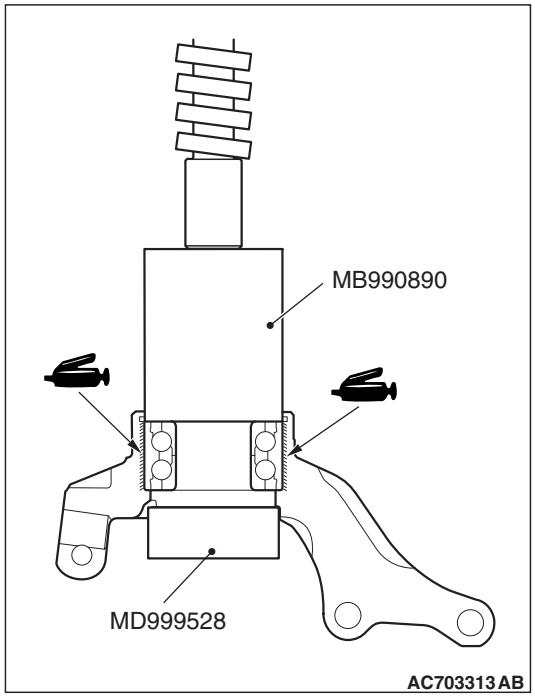
>>A<< WHEEL BEARING INSTALLATION



⚠ CAUTION

- **The magnetic encoder for wheel speed sensor is installed in the wheel bearing. Install the wheel bearing so that the encoder is positioned in the direction shown in the figure.**
- **When press-fit the wheel bearing, push the outer race.**
- **After press-fit the wheel bearing, wipe off the extra grease in order not to remain on the magnetic encoder.**

1. Remove grease and foreign material cleanly from the inside of knuckle bore.

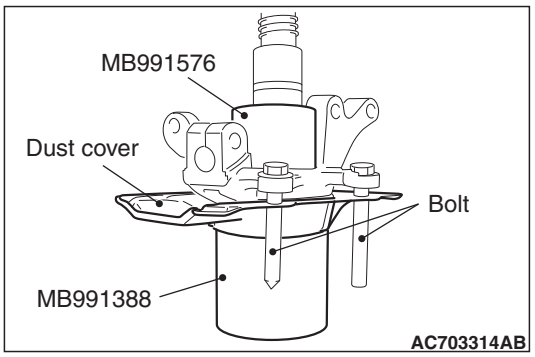


2. Apply the specified grease thinly and evenly to the inside of knuckle as shown in the figure.

   Specified grease: Dowcorning/Molykote BR2 Plus
   Amount to use: as required {1.0 – 1.5 g (0.04 –0.05 ounce)}

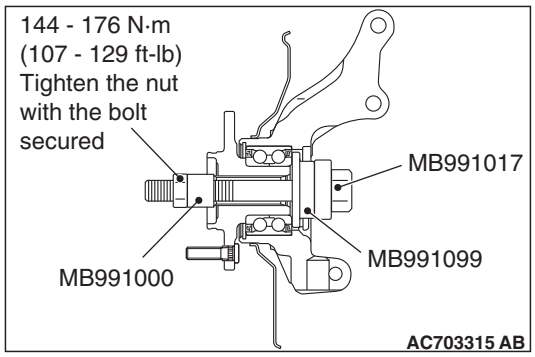
3. Use special tools MB990883 and MB 990890 to press-fit the wheel bearing.
4. Remove excessive grease seeped out between knuckle and wheel bearing outer race after press-fitting the wheel bearing.

>>B<< DUST SHIELD INSTALLATION



Use special tools MB991388 and MB991576 to press-fit the knuckle into the dust shield.

NOTE: Use the bolts (M12) to align the caliper mounting holes.

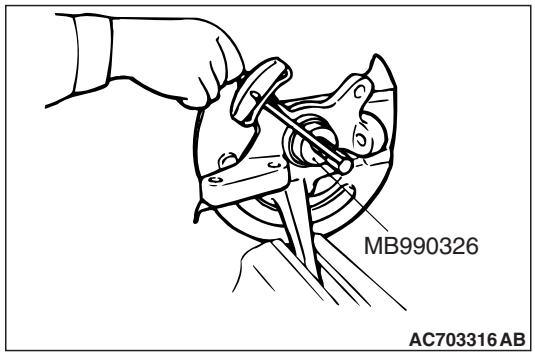


>>C<< HUB ROTATION STARTING TORQUE CHECK

1. Set special tools MB991000 and MB991017 as shown in the figure, tighten the nut to the specified torque, and press-fit the hub into the knuckle.

   Tightening torque: 144 – 176 N·m (107 – 129 ft-lb)

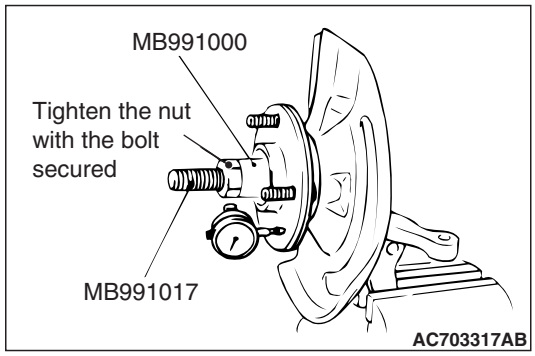
2. Rotate the hub to make the bearing well-greased.



3. Use Special tool MB990326 to measure the hub rotation starting torque.

   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.



>>D<< WHEEL BEARING END PLAY CHECK

1. Use special tools MB991000 and MB991017 to measure to determine whether the wheel bearing end play is within the specified limit or not.

   Limit: 0.05 mm(0.002 inch)

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

   Tightening torque: 144 – 176 N·m (107 – 129 ft-lb)

INSPECTION

M1261002000142

- 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

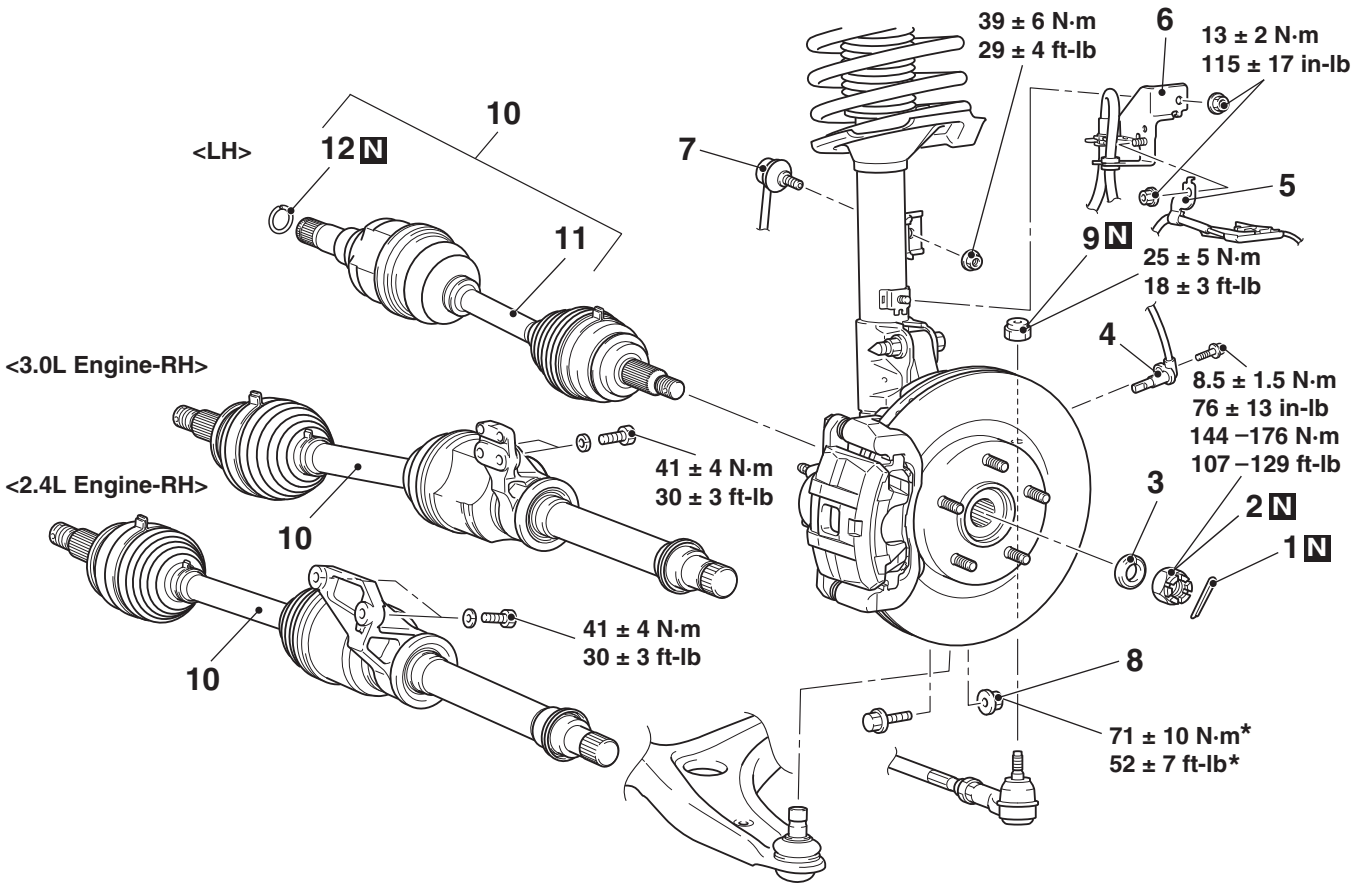
M1261003501961

⚠ 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 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	Post-installation operation
• Transmission Fluid Draining (Refer to GROUP 23A, On-vehicle Service, Transmission Fluid Change P.23A-140.)<2.4 L engine> • Automatic Transmission Fluid Draining (Refer to GROUP 23C, On-vehicle Service, Transmission Fluid Change P.23C-265.)<3.0 L engine>	• Using your fingers, press the Ball Joint Dust Cover to check for a crack or damage. • Transmission Fluid Filling (Refer to GROUP 23A, On-vehicle Service, Transmission Fluid Change P.23A-140.)<2.4 L engine> • Automatic Transmission Fluid Filling (Refer to GROUP 23C, On-vehicle Service, Transmission Fluid Change P.23C-265.)<3.0 L engine>

<FWD>



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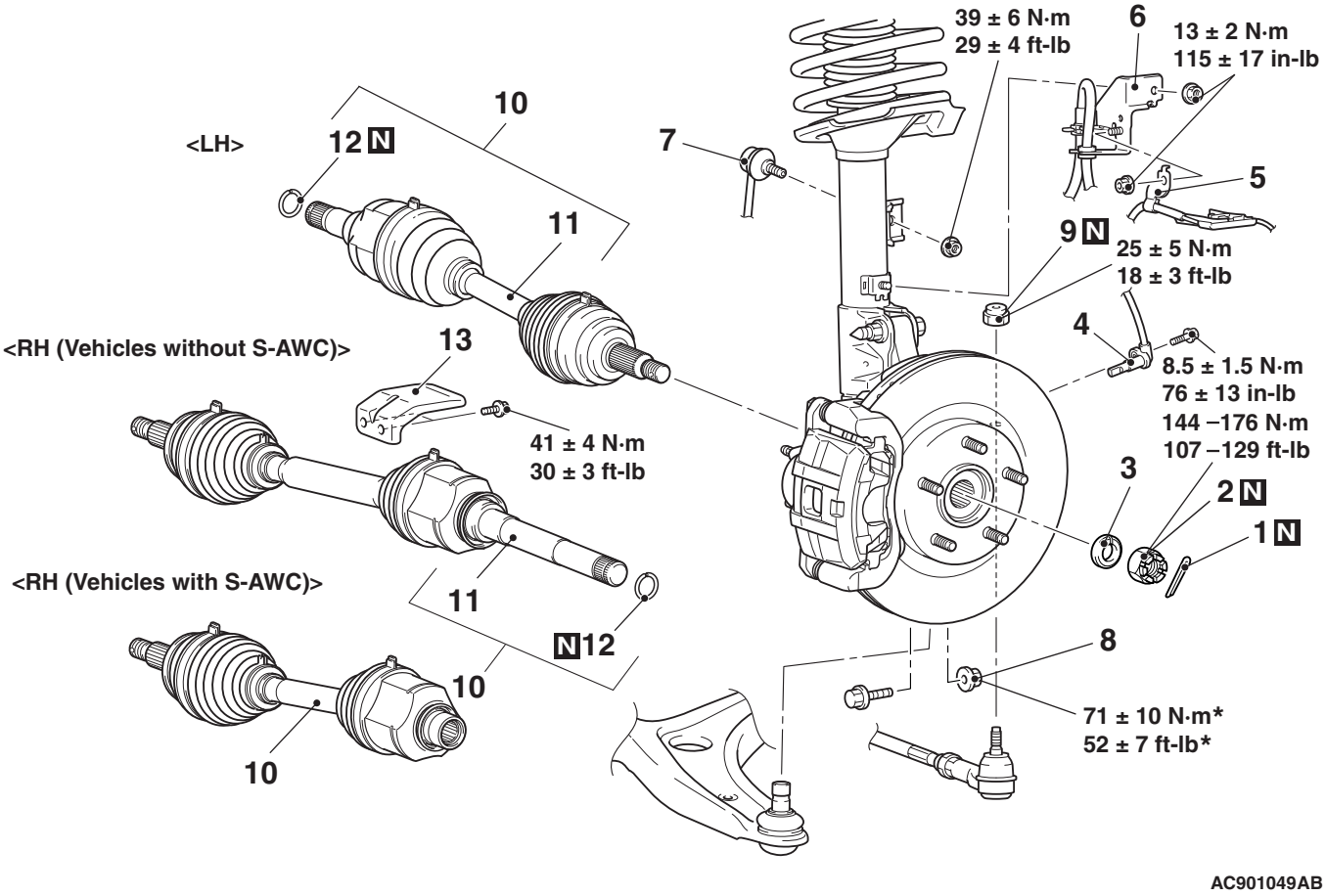
TSB Revision

Removal steps

1. Cotter pin
<<A>> >>C<< 2. Driveshaft nut
>>C<< 3. Washer
4. Front wheel speed sensor
5. Front wheel speed sensor harness bracket
6. Brake hose bracket
<<B>> >>B<< 7. Stabilizer link connection
8. Self-locking nut (lower arm ball joint connection)
<<C>> 9. Self-locking nut (tie-rod end connection)
<<D>> >>A<< 10. Driveshaft assembly
11. Driveshaft
12. Circlip

Removal steps (Continued)

<AWD>



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Removal steps

1. Cotter pin
<<A>> >>C<< 2. Driveshaft nut
>>C<< 3. Washer
4. Front wheel speed sensor
5. Front wheel speed sensor harness bracket
6. Brake hose bracket
<<B>> >>B<< 7. Stabilizer link connection
8. Self-locking nut (lower arm ball joint connection)
<<C>> 9. Self-locking nut (tie-rod end connection)
<<D>> >>A<< 10. Driveshaft assembly

Removal steps (Continued)

11. Driveshaft
12. Circlip
13. Heat protector <3.0L engine without S-AWC>

Required Special Tools:

- MB990242: Puller Shaft
- MB990244: Puller Bar
- MB990767: Front Hub and Flange Yoke Holder
- MB991000: Spacer
- MB991017: Front Hub Remover and Installer
- MB991354: Puller Body
- MB991897 or MB992011: Ball Joint Remover

TSB Revision

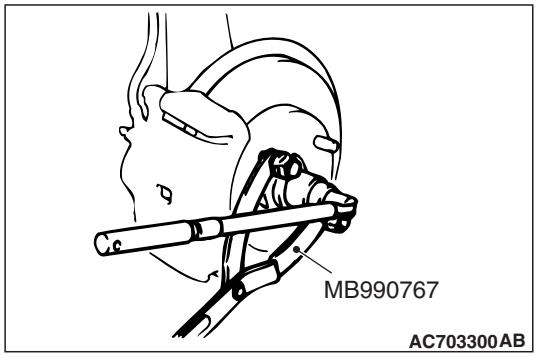
REMOVAL SERVICE POINTS

<<A>> DRIVESHAFT NUT REMOVAL

⚠ CAUTION

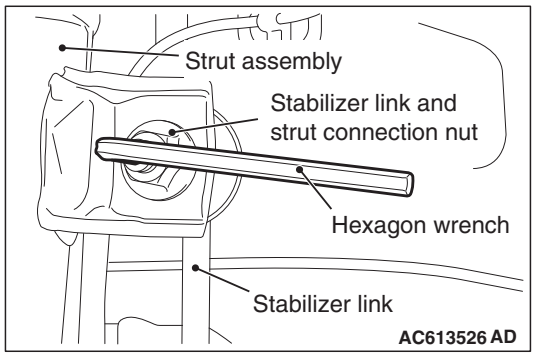
Do not apply the vehicle weight on the wheel bearing with the driveshaft nut loosened. Otherwise, the wheel bearing may be broken.

Use special tool MB990767 to counter the hub as shown in the figure to remove the driveshaft nut.



<<B>> STABILIZER LINK DISCONNECTION

Use a hexagon wrench to remove the stabilizer link and strut connection nut as shown in the figure.

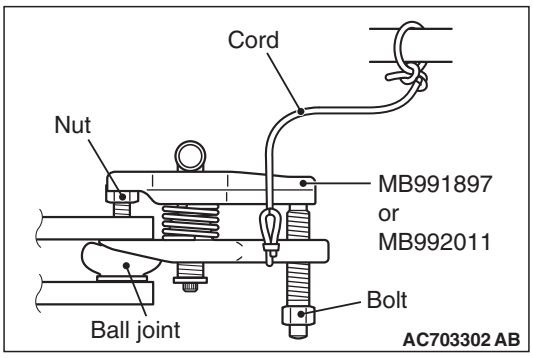


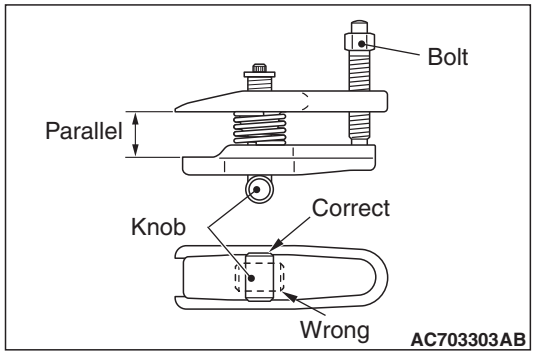
<<C>> SELF-LOCKING NUT (TIE-ROD END CONNECTION) REMOVAL

⚠ CAUTION

- **Loosen the self-locking nut (tie-rod end connection) from the ball joint, but do not remove here. Use the special tool.**
- **To prevent the special tool from dropping off, suspend it with a cord.**

1. Install special tool MB991897 or MB992011, as shown in the figure.





2. Turn the bolt and knob to make the special tool jaws parallel, then hand-tighten the bolt. After tightening, check that the jaws are still parallel.

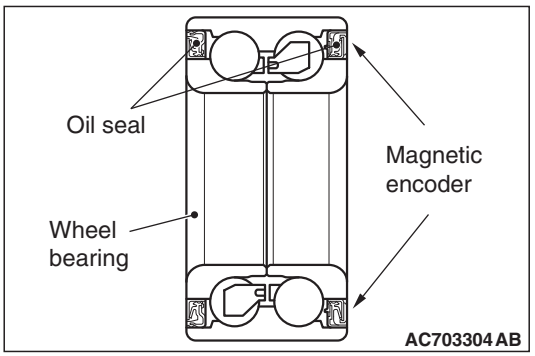
   NOTE: To adjust the special tool jaws to be parallel, set the orientation of the knob as shown in the figure.

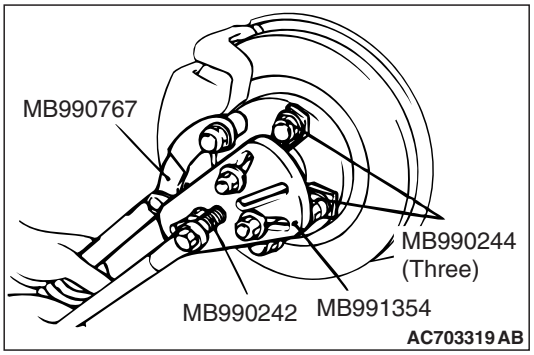
3. Unscrew the bolt to disconnect the ball joint.

<<D>> DRIVESHAFT ASSEMBLY REMOVAL

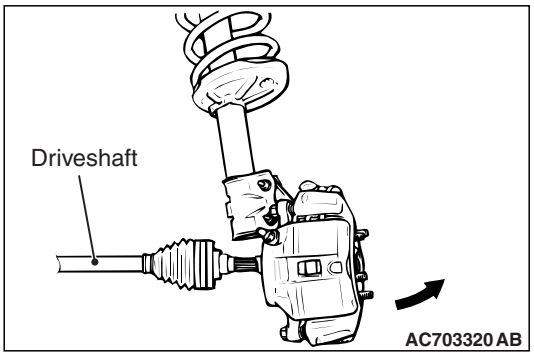
⚠ CAUTION

- **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 special tools MB990242 and MB990244, MB990767 and MB991354 to push the driveshaft assembly out from the hub.

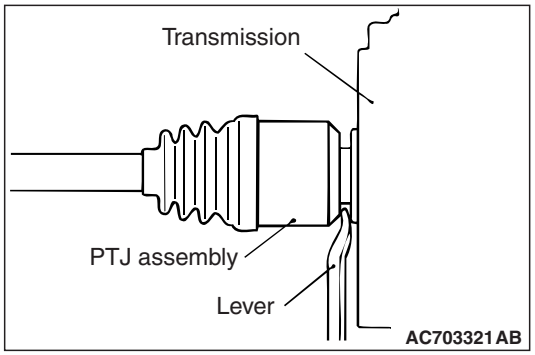


2. While pulling the lower side of the brake disk toward you, remove the driveshaft assembly from the hub.

⚠ CAUTION

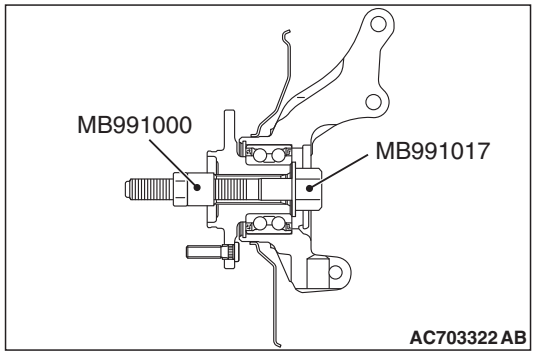
- **Never pull out the driveshaft assembly from the EBJ assembly side. Otherwise, the PTJ assembly may be damaged. Always pull out from the PTJ side with a lever.**
- **Care must be taken to ensure that the oil seal of the transaxle is not damaged by the spline part of the driveshaft assembly.**

3. For driveshafts other than FWD-RH driveshafts, insert a lever between the transaxle case or transfer and driveshaft assembly, and then pull the driveshaft assembly out 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 MB991000 and MB991017 to the specified torque 144 – 176 N·m (107 – 129 ft-lb).

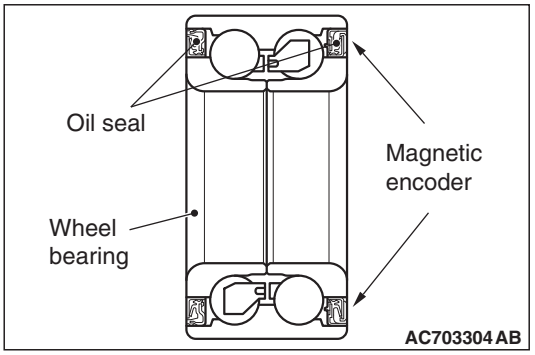


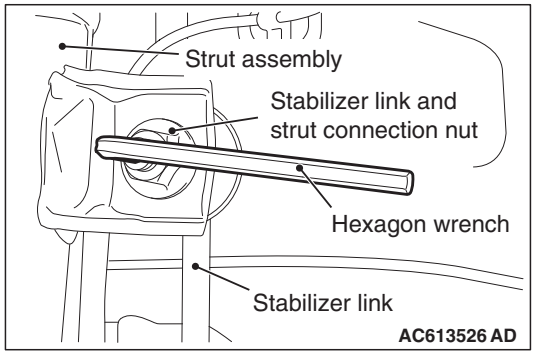
INSTALLATION SERVICE POINTS

>>A<< DRIVESHAFT 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 driveshaft assembly.**





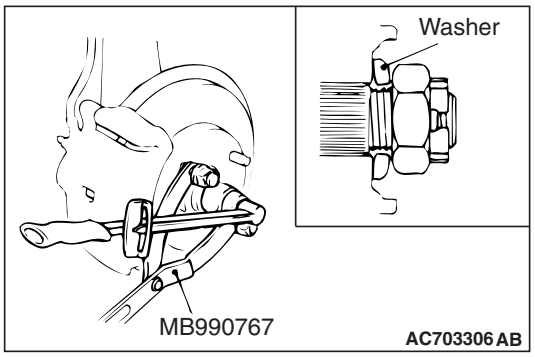
>>B<< STABILIZER LINK CONNECTION

Use a hexagon wrench to install the stabilizer link and strut connection nut as shown in the figure.

>>C<< WASHER/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. Incorporate the driveshaft assembly washer as shown in the illustration.
2. Use special tool MB990767 to tighten the driveshaft nuts. At this time, tighten the nuts within the specified torque range considering the final tightening.

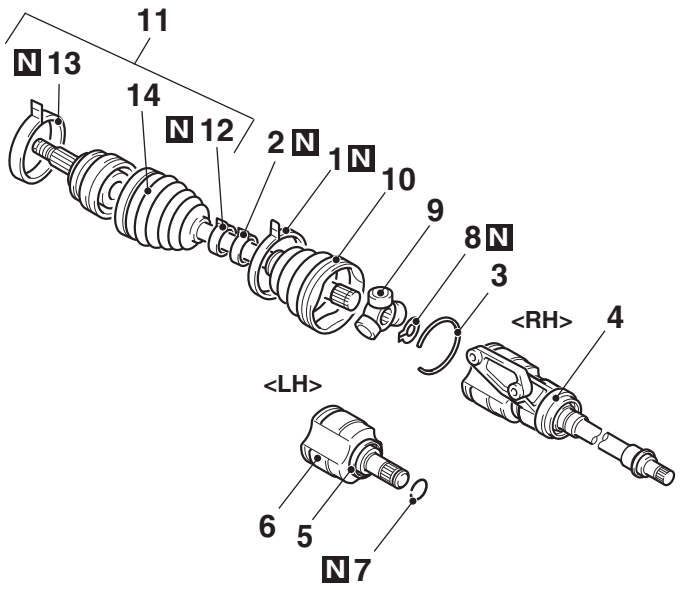
   Tightening torque: 144 – 176 N·m (107 – 129 ft-lb)
3. If the pin holes do not align with the pins, tighten the driveshaft nut [less than 200 N·m(147 ft-lb)] and find the nearest hole then bend the cotter pin to fit it.

DISASSEMBLY AND ASSEMBLY <2.4L ENGINE- FWD>

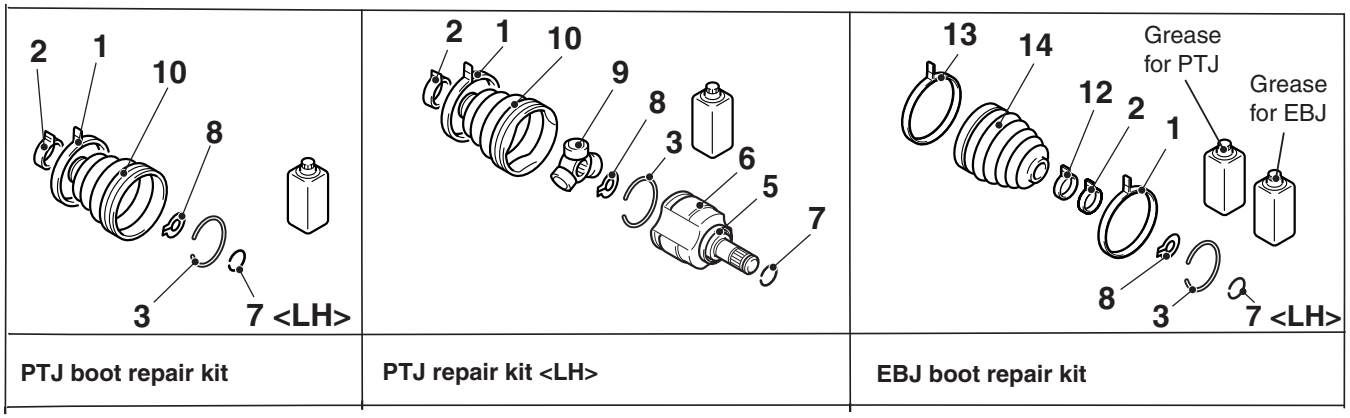
M1261003701716

⚠ CAUTION

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



ACA01260



PTJ boot repair kit	PTJ repair kit <LH>	EBJ boot repair kit

ACA01310AC

Disassembly steps

	>>H<<	1.	PTJ boot band (large)
	>>H<<	2.	PTJ boot band (small)
		3.	Circlip
<<A>>	>>G<<	4.	PTJ case/Inner shaft assembly
		5.	Dust cover <LH>
<<A>>	>>G<<	6.	PTJ case <LH>
		7.	Circlip
		8.	Snap ring
	>>C<<	9.	Spider assembly
<<F>>	>>B<<	10.	PTJ boot
		11.	EBJ assembly
		12.	EBJ boot band (small)

Disassembly steps (Continued)

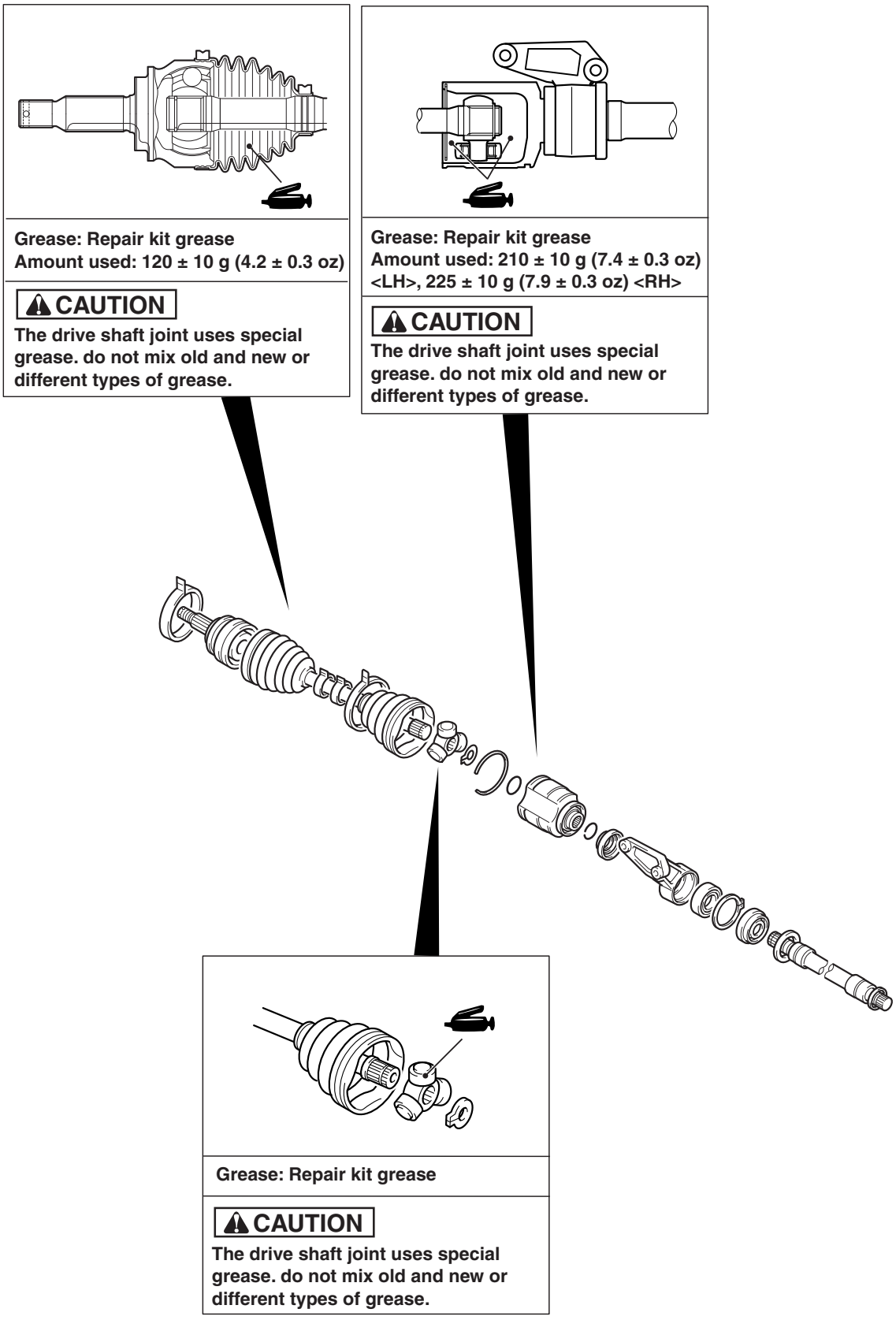
	13.	EBJ boot band (large)
>>A<<	14.	EBJ boot

Required Special Tools:

- MB990810: Side Bearing Puller
- MB990890: Rear Suspension Bushing Base
- MB990930: Installer Adapter
- MB990932: Installer Adapter
- MB990934: Installer Adapter
- MB990938: Installer bar (snap-in type)
- MB991172: Inner Shaft Installer Base
- MD998369: Bearing Installer
- MD998801: Remover

TSB Revision

LUBRICATION POINTS



ACA02743AB

TSB Revision

DISASSEMBLY SERVICE POINTS

<<A>>PTJ CASE/INNER SHAFT ASSEMBLY REMOVAL

⚠ CAUTION

When removing the PTJ case and inner shaft assembly, be careful not to drop off the roller part of spider assembly, because it easily departs from the spider assembly.

<<F>> PTJ BOOT REMOVAL

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

ASSEMBLY SERVICE POINTS

>>A<< EBJ BOOT INSTALLATION

Wrap plastic tape around the shaft spline, and then install the EBJ boot.

>>B<< PTJ BOOT INSTALLATION

Wrap plastic tape around the shaft spline, and then install the PTJ boot.

>>C<< SPIDER ASSEMBLY INSTALLATION

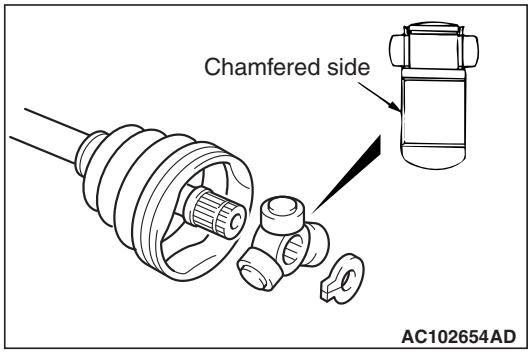
⚠ CAUTION

- **The drive shaft 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.



>>G<<PTJ CASE/INNER SHAFT ASSEMBLY INSTALLATION

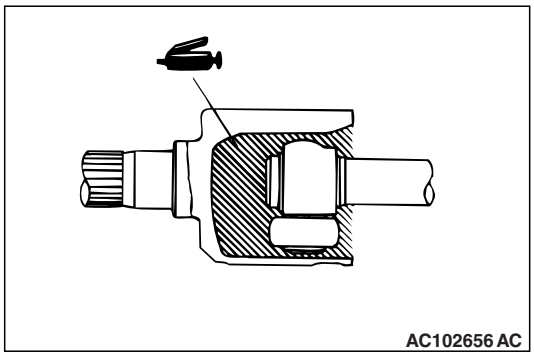
⚠ CAUTION

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

After applying the specified grease to the PTJ case, insert the driveshaft and apply grease again.

Specified grease: Repair kit grease
Amount to use: 210 ± 10 g (7.4 ± 0.3 ounce) <LH>, 225 ± 10 g (7.9 ± 0.3 ounce) <RH>

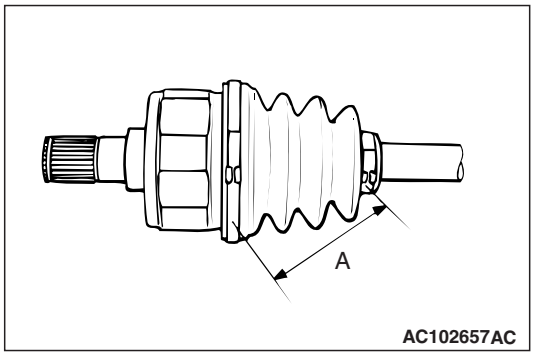
NOTE: The grease in the repair kit should be divided in half for use, respectively, at the joint and inside the boot.


AC102656 AC

>>H<< PTJ BOOT BAND (SMALL)/PTJ BOOT BAND (LARGE) INSTALLATION

Set the PTJ boot bands at the specified distance in order to adjust the amount of air inside the PTJ boot, and then tighten the PTJ boot band (small), PTJ boot band (large) securely.

Standard value (A): 85 ± 3 mm (3.35 ± 0.12 inches)



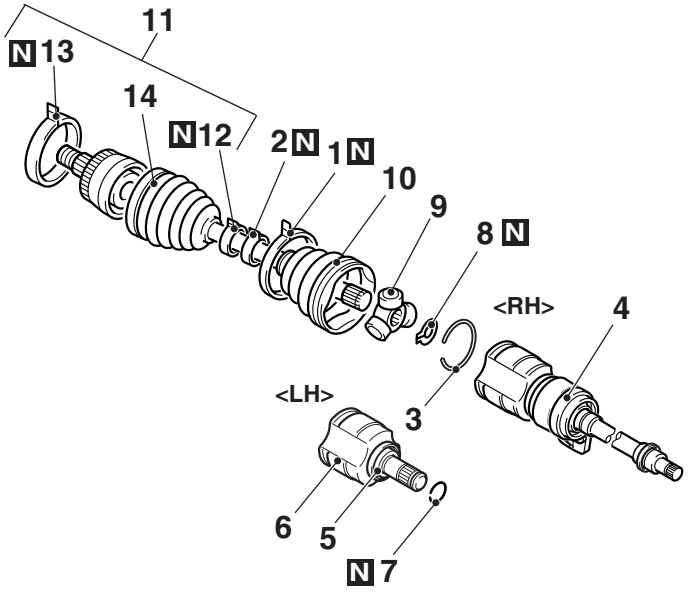
AC102657 AC

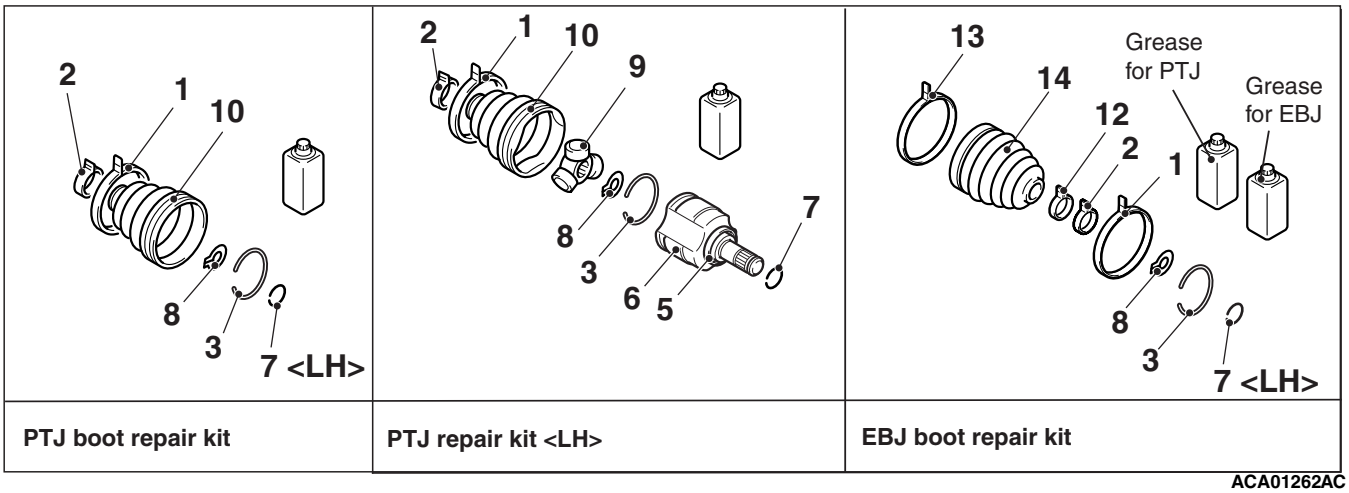
DISASSEMBLY AND ASSEMBLY <3.0L ENGINE- FWD>

M1261003701653

⚠ CAUTION

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





PTJ boot repair kit	PTJ repair kit <LH>	EBJ boot repair kit

ACA01262AC

Disassembly steps

	>>H<<	1.	PTJ boot band (large)
	>>H<<	2.	PTJ boot band (small)
		3.	Circlip
<<A>>	>>G<<	4.	PTJ case and inner shaft assembly <RH>
		5.	Dust cover <LH>
<<A>>	>>G<<	6.	PTJ case <LH>
		7.	Circlip
		8.	Snap ring
	>>C<<	9.	Spider assembly
<<F>>	>>B<<	10.	PTJ boot
		11.	EBJ assembly
		12.	EBJ boot band (small)

Disassembly steps (Continued)

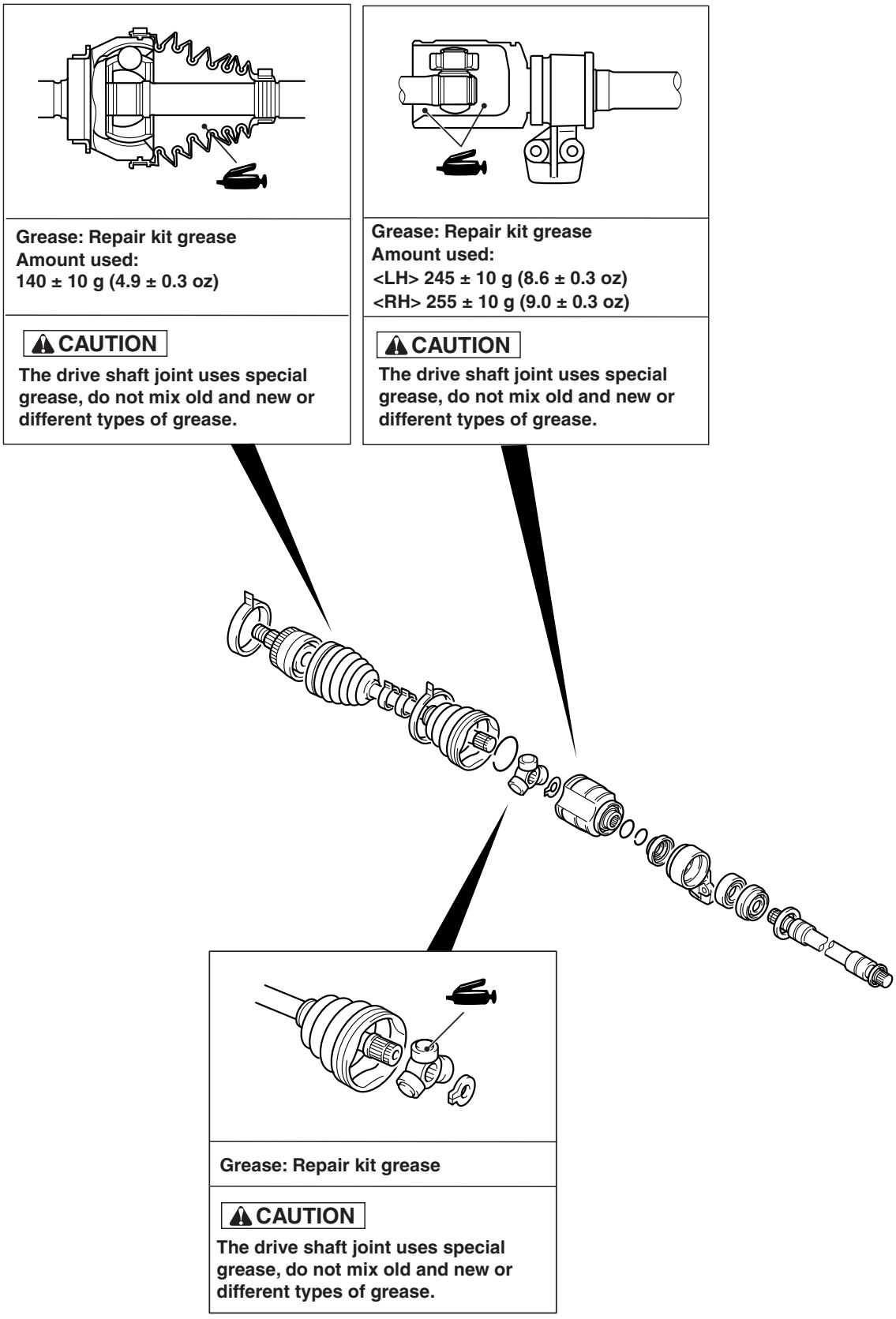
	13.	EBJ boot band (large)
>>A<<	14.	EBJ boot

Required Special Tools:

- MB990810: Side Bearing Puller
- MB990890: Rear Suspension Bushing Base
- MB990930: Installer Adapter
- MB990932: Installer Adapter
- MB990934: Installer Adapter
- MB990938: Installer Bar (snap-in type)
- MB991172: Inner Shaft Installer Base
- MD998369: Bearing Installer
- MD998801: Remover

TSB Revision

LUBRICATION POINTS



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TSB Revision

DISASSEMBLY SERVICE POINTS

<<A>>PTJ CASE/INNER SHAFT ASSEMBLY REMOVAL

⚠ CAUTION

When removing the PTJ case and inner shaft assembly, be careful not to drop off the roller part of spider assembly, because it easily departs from the spider assembly.

<<F>> PTJ BOOT REMOVAL

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

ASSEMBLY SERVICE POINTS

>>A<< EBJ BOOT INSTALLATION

Wrap plastic tape around the shaft spline, and then install the EBJ boot.

>>B<< PTJ BOOT INSTALLATION

Wrap plastic tape around the shaft spline, and then install the PTJ boot.

>>C<< SPIDER ASSEMBLY INSTALLATION

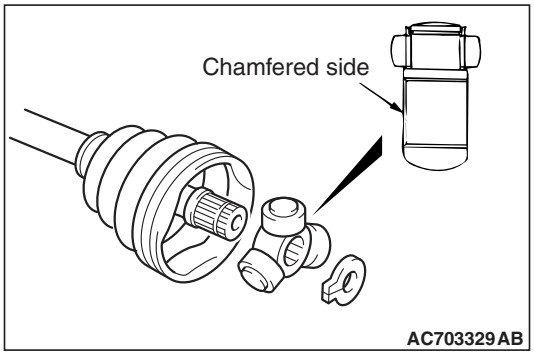
⚠ CAUTION

- **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

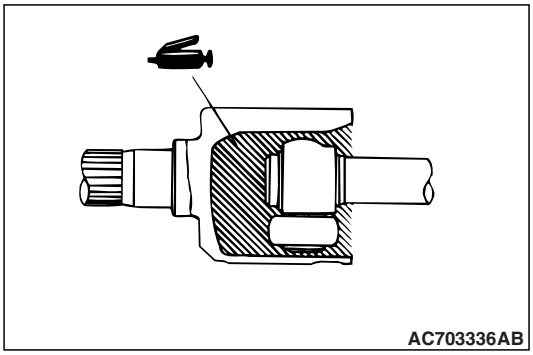
2. Install the spider assembly to the shaft from the direction of the spline chamfered side.



>>G<< PTJ CASE AND INNER SHAFT ASSEMBLY INSTALLATION

⚠ CAUTION

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

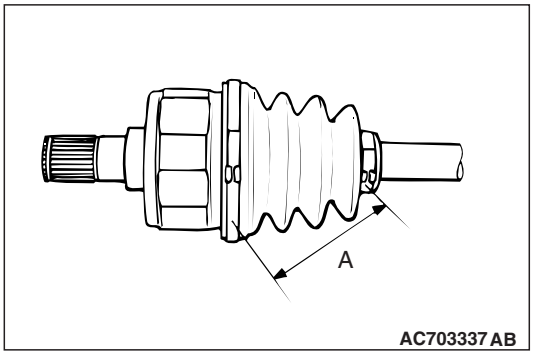

AC703336AB

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

Specified grease: Repair kit grease
Amount to use:
245 ± 10 g (8.6 ± 0.3 ounce) <LH>
255 ± 10 g (9.0 ± 0.3 ounce) <RH>

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

>>H<< PTJ BOOT BAND (SMALL)/PTJ BOOT BAND (LARGE) INSTALLATION



AC703337AB

Set the PTJ boot bands at the specified distance in order to adjust the amount of air inside the PTJ boot, and then tighten the PTJ boot band (small), PTJ boot band (large) securely.

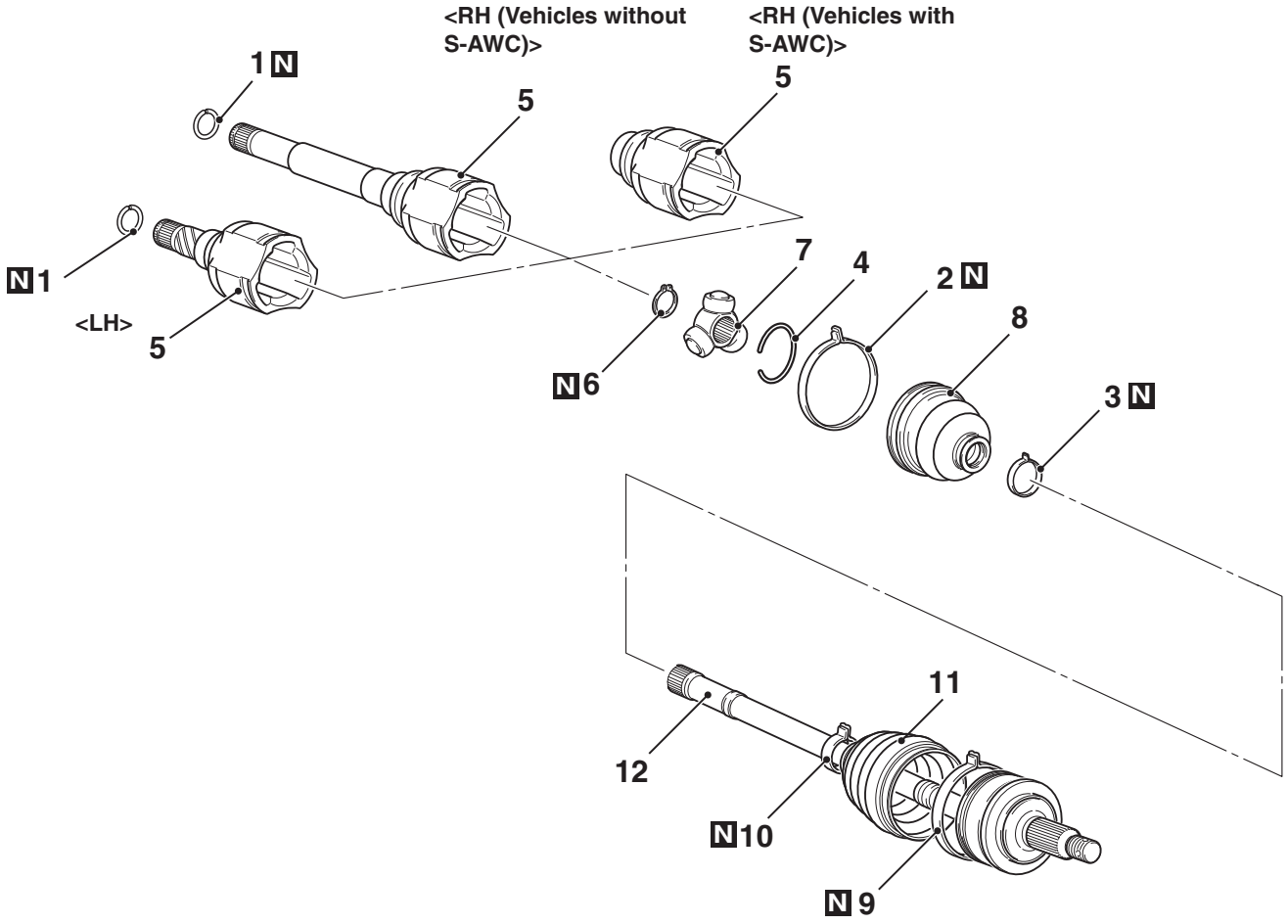
Standard value (A):
95 ± 3 mm (3.74 ± 0.12 inches)

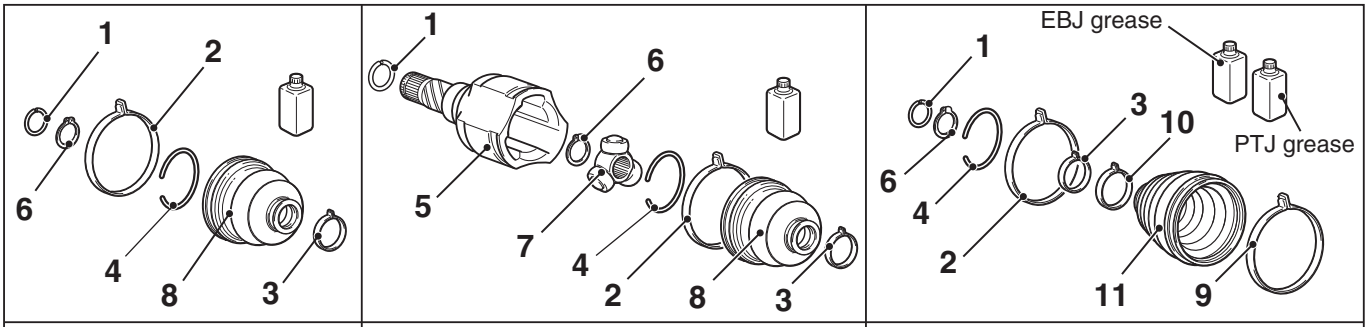
DISASSEMBLY AND ASSEMBLY <AWD>

M1261003702106

⚠ CAUTION

- **As for the EBJ assembly, only the EBJ boot can be replaceable, and other parts cannot be disassembled.**
- **The EBJ boot for 3.0L Engine-RH is not replaceable.**





PTJ Boots repair kit	PTJ repair kit	EBJ boots repair kit

AC809231AC

Disassembly steps

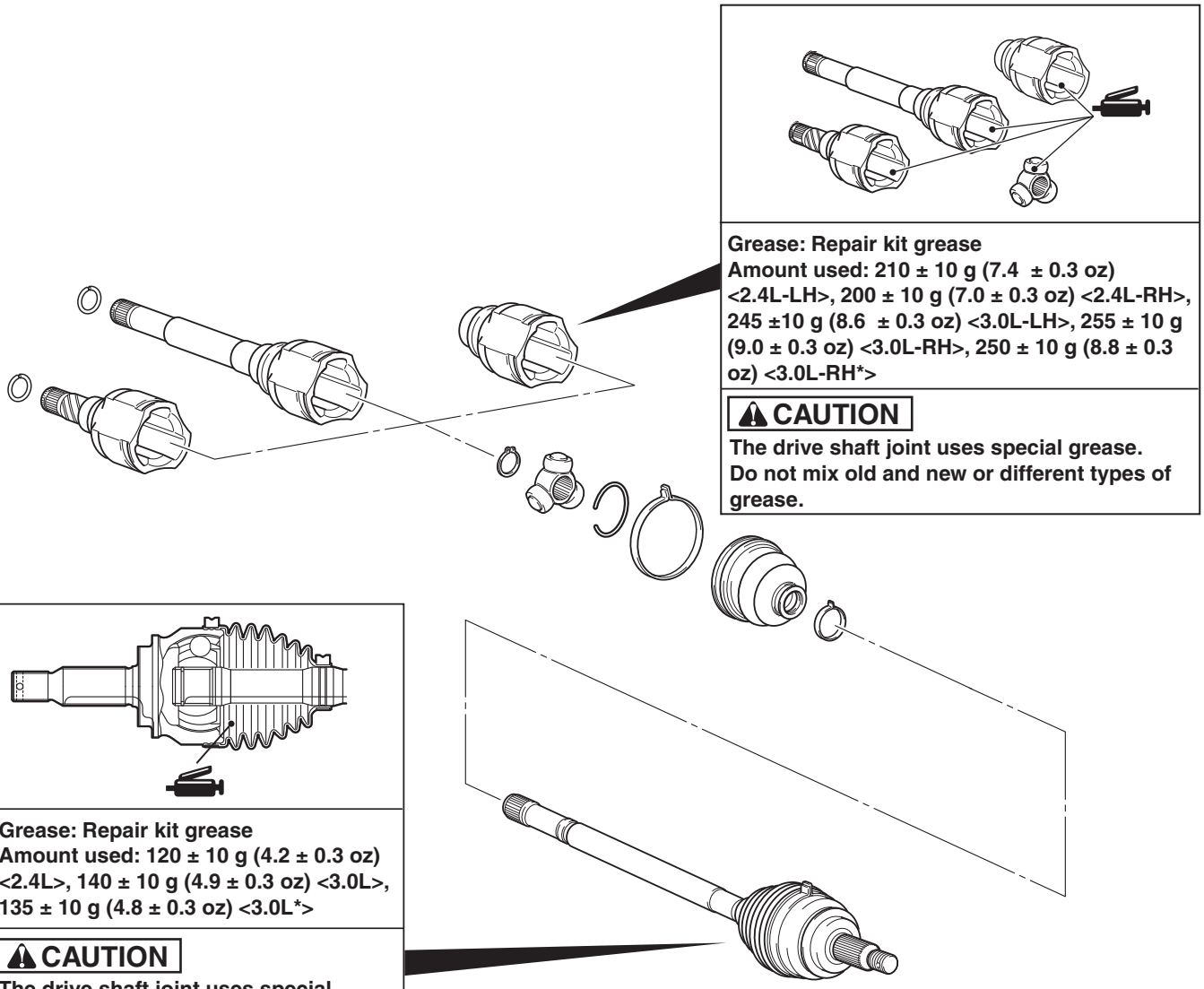
	1.	Circlip
>>C<<	2.	PTJ boot band (large)
>>C<<	3.	PTJ boot band (small)
	4.	Circlip
<<A>> >>B<<	5.	PTJ case
	6.	Snap ring

Disassembly steps (Continued)

<<A>> >>B<<	7.	Spider assembly
<<B>> >>A<<	8.	PTJ boot
	9.	EBJ boot band (large)
	10.	EBJ boot band (small)
	11.	EBJ boot
	12.	EBJ assembly

TSB Revision

LUBRICATION POINTS



NOTE:
* Indiactes Vehicles with S-AWC.

AC901051AB

DISASSEMBLY SERVICE POINT

<<A>> PTJ CASE/SPIDER ASSEMBLY REMOVAL

⚠ CAUTION

When removing the PTJ case, be careful not to drop off the roller part of spider assembly, because it easily departs from the spider assembly.

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

<<B>> PTJ BOOT REMOVAL

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

ASSEMBLY SERVICE POINT

>>A<< PTJ BOOT INSTALLATION

Apply a tape to the shaft spline area. Then incorporate the PTJ boot band (small) and PTJ boot.

>>B<< SPIDER ASSEMBLY/PTJ CASE INSTALLATION

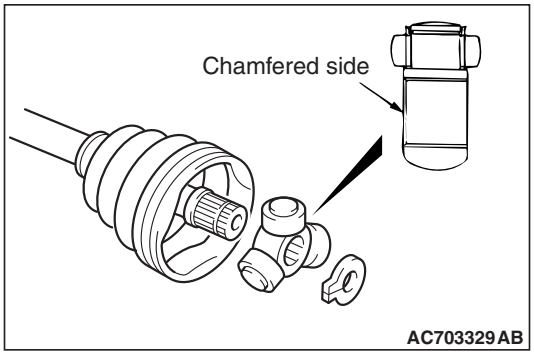
⚠ CAUTION

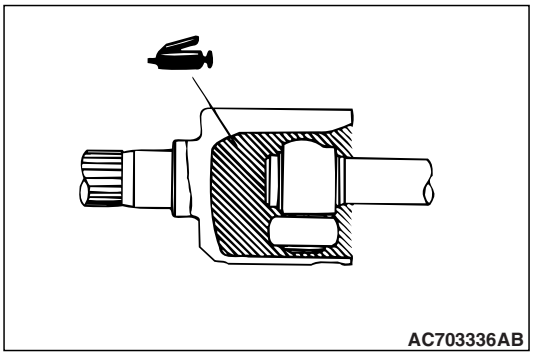
- **The driveshaft joint use special grease. Do not mix old and new or different types of grease.**
- **If the spider assembly has been cleaned, take special care to apply the specified grease.**

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.



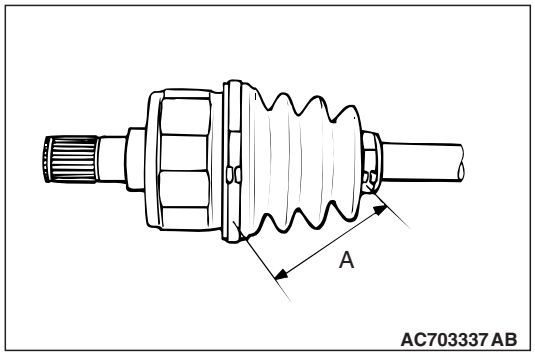


3. After applying the specified grease to the PTJ case, insert the driveshaft and apply grease one more time.

   Specified grease: Repair kit grease
   Amount to use:
   210 ± 10 g (7.4 ± 0.3 ounce) <2.4L Engine-LH>
   200 ± 10 g (7.0 ± 0.3 ounce) <2.4L Engine-RH>
   245 ± 10 g (8.6 ± 0.3 ounce) <3.0L Engine-LH>
   255 ± 10 g (9.0 ± 0.3 ounce) <3.0L Engine-RH>
   250 ± 10 g (8.8 ± 0.3 ounce) <3.0L Engine-RH with S-AWC>

   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 guideline, and consume the grease completely.

>>C<< PTJ BOOT BAND (SMALL)/PTJ 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 PTJ boot to the specified value, then be sure to tighten the PTJ boot band (large) and PTJ boot band (small).

Standard value (A):
85 ± 3 mm (3.35 ± 0.12 inches) <2.4L Engine>
95 ± 3 mm (3.74 ± 0.12 inches) <3.0L Engine>

INSPECTION

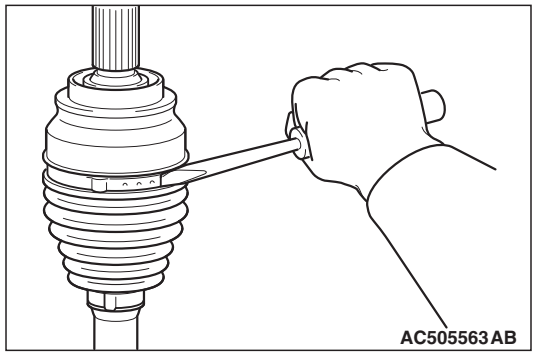
M1261003800323

- Check the driveshaft for damage, bending or corrosion.
- Check the inner shaft 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 inner shaft 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 PTJ case for wear or corrosion.
- Check the boots for deterioration, damage or cracking.
- Check the center bearing for seizure, discoloration or roughness of rolling surface.
- Check the dust cover for damage or deterioration.

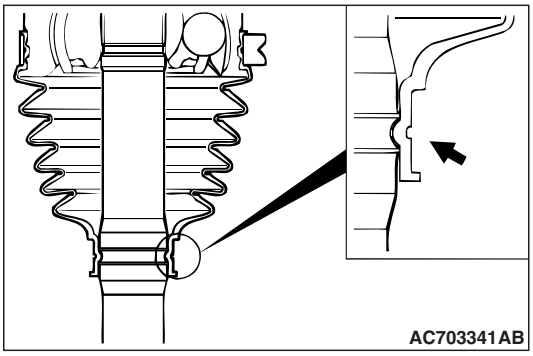
EBJ BOOT REPLACEMENT

M1261007500238

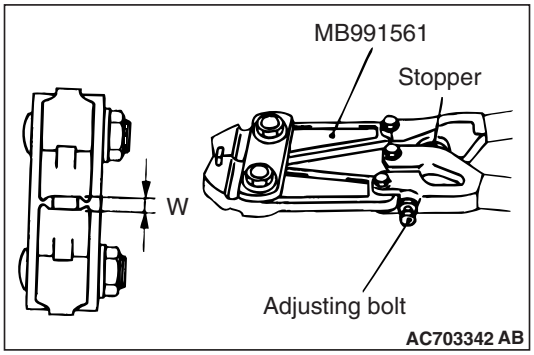
Required Special Tool:
- MB991561:Boot Band Crimping Tool



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



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

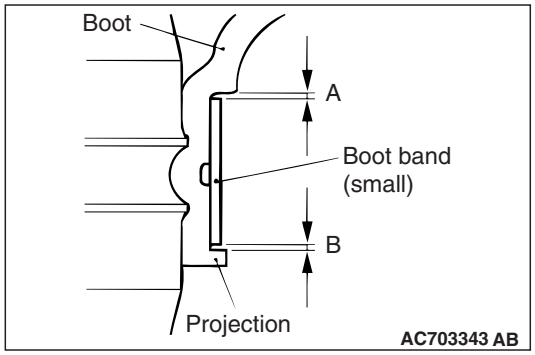


5. Turn the adjusting bolt on special tool MB991561 so that the size of the opening (W) is at the standard value.

   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.**

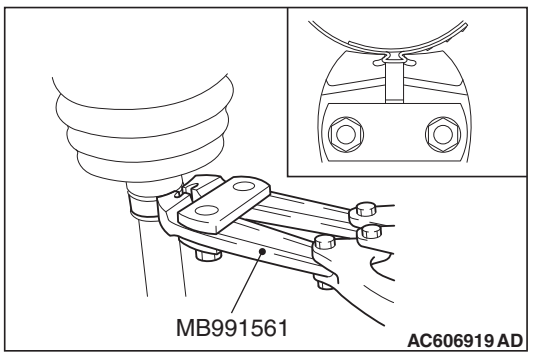
   NOTE: The value of W will change by approximately 0.7 mm (0.03 inch) for each turn of the adjusting bolt.

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

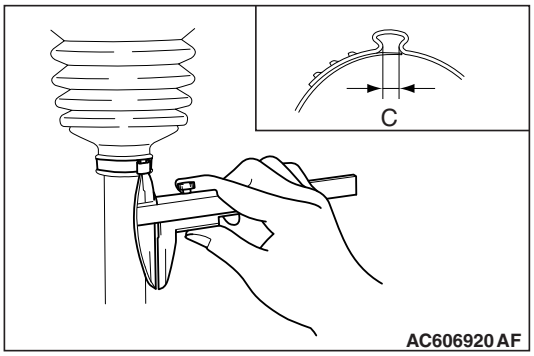


6. Position the EBJ boot band (small) so that there is even clearance at either end (A and B).

⚠ CAUTION
- **Secure the driveshaft in an upright position and clamp part of the boot band to be crimped securely in the jaws of the 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 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 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 boot band.

   W = 5.5 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

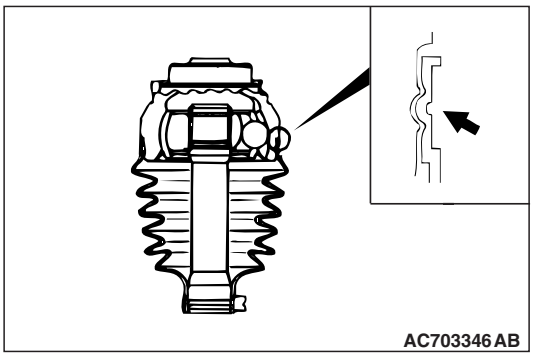
The driveshaft joint uses special grease. Do not mix old and new or different types of grease.

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

    Specified grease: Repair kit grease

    Amount to use: 120 ± 10 g (4.2 ± 0.3 ounces) <2.4L Engine>

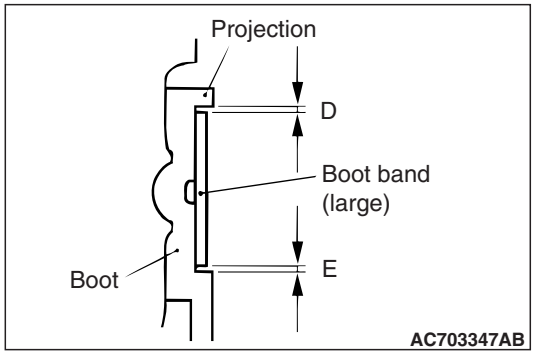
    Amount to use: 140 ± 10 g (4.9 ± 0.3 ounces) <3.0L Engine>



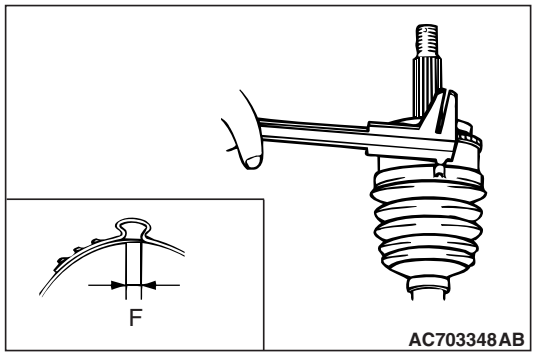
11. Align the center groove on the EBJ boot big end with the EBJ case groove.

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 boot band (large) so that there is even clearance at either end (D and E).



14. Use special tool MB991561 to crimp the EBJ boot band (large) in the same way as in step 7.
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 mm (0.23 inch) – F

Example: If F = 2.9 mm (0.11 inch), then W = 2.9 mm (0.11 inch)

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

Remove the EBJ 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 boot band.

W = 5.8 mm (0.23 inch) – F

Example: If F = 2.3 mm (0.09 inch), then W = 3.5 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