

GROUP 26

FRONT AXLE

CONTENTS

GENERAL INFORMATION	26-2	FRONT AXLE HUB ASSEMBLY	26-7
SERVICE SPECIFICATIONS.....	26-3	REMOVAL AND INSTALLATION	26-7
LUBRICANTS	26-3	INSPECTION.....	26-9
SPECIAL TOOLS.....	26-3	DISASSEMBLY AND REASSEMBLY	26-9
ON-VEHICLE SERVICE.....	26-6	INSPECTION.....	26-10
WHEEL BEARING AXIAL PLAY CHECK..	26-6	DRIVESHAFT ASSEMBLY.....	26-11
HUB BOLT REPLACEMENT	26-6	REMOVAL AND INSTALLATION	26-11
		DISASSEMBLY AND REASSEMBLY	26-14
		INSPECTION.....	26-16
		EBJ BOOT (RESIN BOOT) REPLACEMENT	26-17

GENERAL INFORMATION

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The front axle consists of front wheel hub assembly, knuckles and driveshafts, and has the following features:

- The wheel bearing incorporates a unit ball bearing (double-row angular contact ball bearing) for reduced friction.
- The front wheel hub assembly combines the hub, wheel bearing, and oil seal in a single unit for fewer parts, better rigidity, improved assembly precision, and better structural organization.
- The driveshaft on wheel side incorporates an EBJ type constant velocity joint.

- The driveshaft on the differential side incorporates a TJ type constant velocity joint.
- ABS rotor for detecting the wheel speed is press-fitted to the EBJ.
- For environmental protection, a lead-free grease is used on the joints.

EBJ:Eight Ball Fixed Joint; The use of the smaller-sized eight balls inside the joint achieves weight saving and compact size compared with a BJ (Birfield Joint).

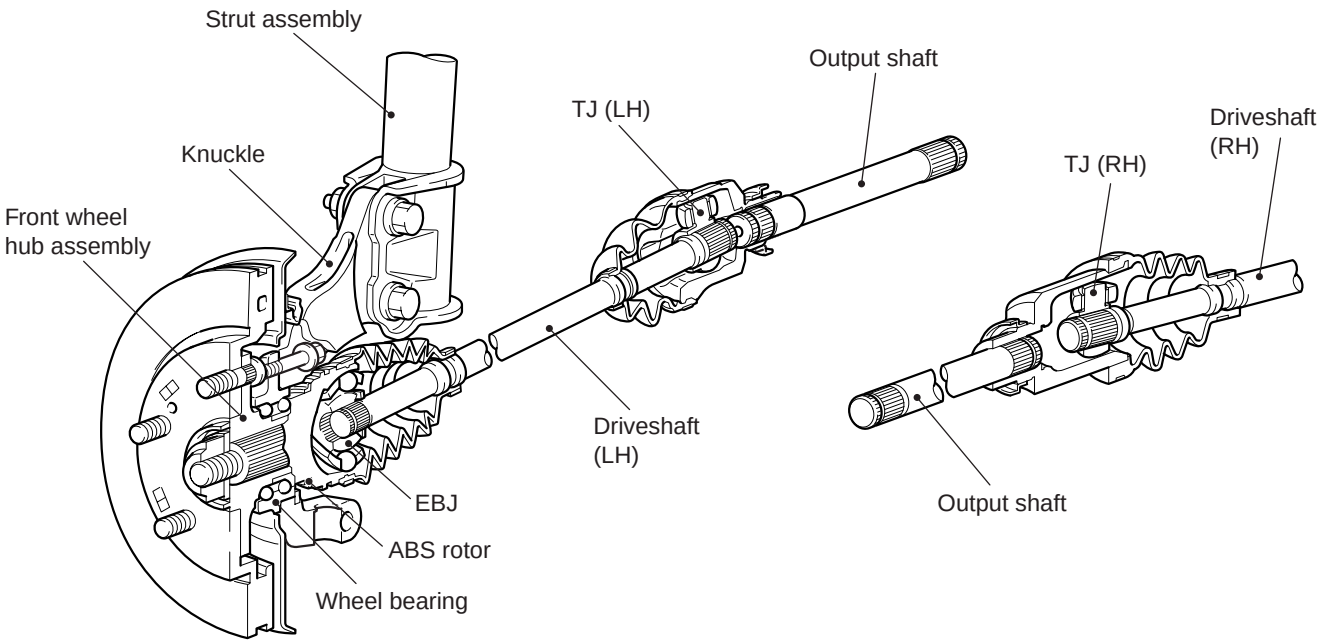
TJ: Tripod Joint

SPECIFICATIONS

Item			Specification
Wheel bearing	Type		Unit ball bearing (Double-row angular contact ball bearing)
Driveshaft	Joint type	Outer	EBJ
		Inner	TJ
	Length (joint to joint) × diameter mm	Left	352.5 × 26
		Right	429.5 × 26

NOTE: The wheel bearing is part of the hub, therefore its size is not listed here.

CONSTRUCTION DIAGRAM



SERVICE SPECIFICATIONS

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Item		Standard value	Limit
Wheel bearing axial play mm		—	0.05
Wheel bearing rotation starting torque N·m		—	1.03
Setting of TJ boot length mm		85 ± 3	—
Opening dimension of the special tool (MB991561) mm	When the EBJ boot band (small) is crimped	2.9	—
	When the EBJ boot band (large) is crimped	3.2	—
Crimped width of the EBJ boot band mm		2.4 – 2.8	—

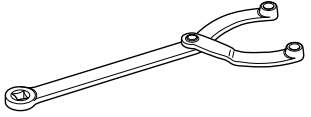
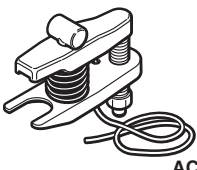
LUBRICANTS

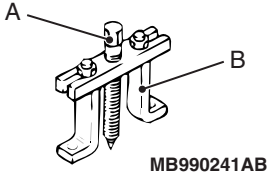
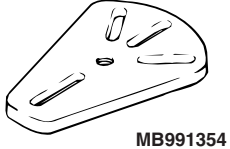
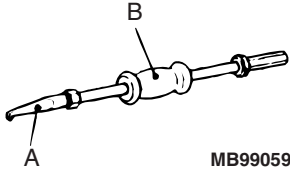
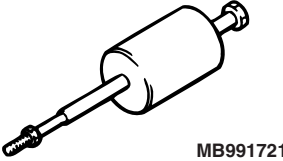
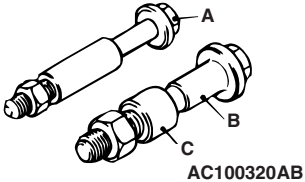
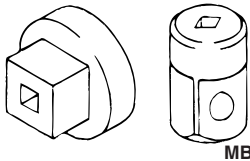
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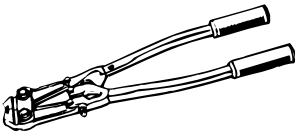
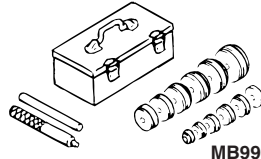
Item	Specified lubricant	Quantity
TJ boot grease	Repair kit grease	145 ± 10 g
EBJ boot grease	Repair kit grease	100 ± 10 g

SPECIAL TOOLS

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Tool	Number	Name	Use
 B990767	MB990767	Front hub and end yoke holder	Fixing of the hub
 MB991618	MB991618	Hub bolt remover	Removal of the hub bolt
 AC106827	MB991897 or MB992011	Ball joint remover	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>

Tool	Number	Name	Use
 MB990241AB	MB990241 A: MB990242 B: MB990244	Axle shaft puller A: Puller shaft B: Puller bar	Removal of the driveshaft
 MB991354	MB991354	Puller body	
 MB990590	MB990590 A: MB990212 B: MB990211	Rear axle shaft oil seal remover A: Adapter B: Slide hammer	Removal of the front wheel hub
 MB991721	MB991721	Slide hammer	Removal of the output shaft
 AC100320AB	A: MB991017 B: MB990998 C: MB991000	A, B: Front hub remover and installer C: Spacer	- Removal of the hub - Provisional holding of the wheel bearing - Measurement of hub starting torque - Measurement of wheel bearing axial play <i>NOTE: MB991000, which belongs to MB990998, should be used as a spacer.</i>
	MB990685	Torque wrench	Measurement of hub starting torque
 MB990326	MB990326	Preload socket	

Tool	Number	Name	Use
 MB991561	MB991561	Boot band crimping tool	BJ boot (resin boot) band installation
 MB990925	MB990925	Bearing and oil seal installer set	- Removal of the wheel bearing - Removal and installation of the centre bearing - Press-fitting of the dust seal outer, inner

Tool	Type	Tool number	O D mm
MB990925  A Installer adapter C Brass bar  B Bar (snap-in type)  Tool box ACX02372 AC	A	MB990926	39.0
		MB990927	45.0
		MB990928	49.5
		MB990929	51.0
		MB990930	54.0
		MB990931	57.0
		MB990932	61.0
		MB990933	63.5
		MB990934	67.5
		MB990935	71.5
		MB990936	75.5
		MB990937	79.0
	B	MB990938	—
	C	MB990939	—

ON-VEHICLE SERVICE

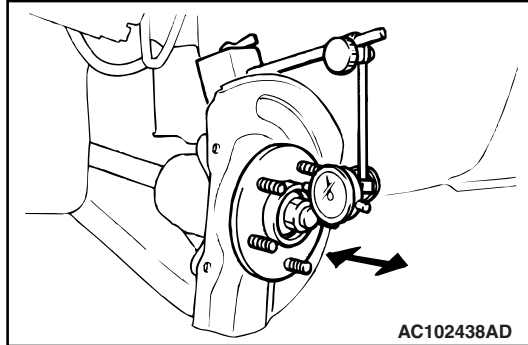
WHEEL BEARING AXIAL PLAY CHECK

M1261000900268

⚠ CAUTION

During maintenance, take care not to contact the parts or tools to the caliper because the paint of caliper will be scratched.

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 axial play while moving the hub in the axial direction.

Limit: 0.05 mm

4. If axial play exceeds the limit, disassemble the front hub assembly and check the parts.
5. Install the brake disc, caliper assembly and tighten the caliper assembly mounting bolts to the specified torque 108 ± 10 N·m.

HUB BOLT REPLACEMENT

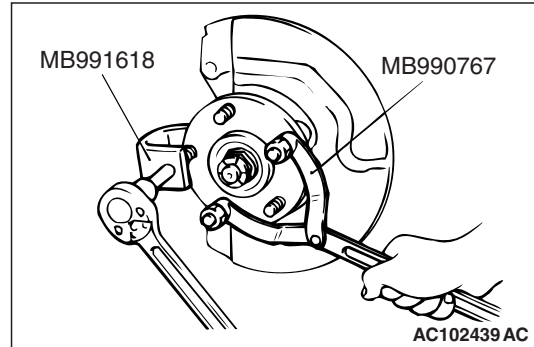
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⚠ CAUTION

During maintenance, take care not to contact the parts or tools to the caliper because the paint of caliper will be scratched.

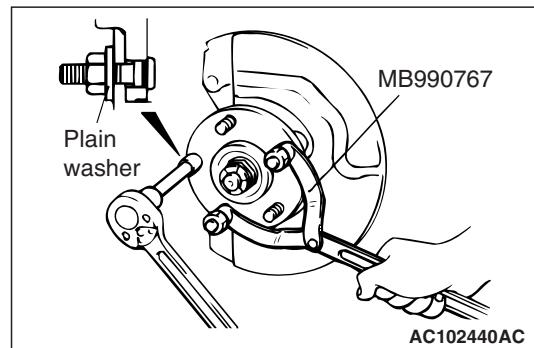
1. Remove the caliper assembly and suspend it with wire so that it does not fall.

2. Remove the brake disc.



3. Use the following special tools to remove the hub bolts.

- Front hub and end yoke holder (MB990767)
- Hub bolt remover (MB991618)



4. Install the plain washer to the new hub bolt, and install the bolt with a nut.
5. Install the brake disc, caliper assembly and tighten the caliper assembly mounting bolts to the specified torque 108 ± 10 N·m.

FRONT AXLE HUB ASSEMBLY

REMOVAL AND INSTALLATION

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CAUTION

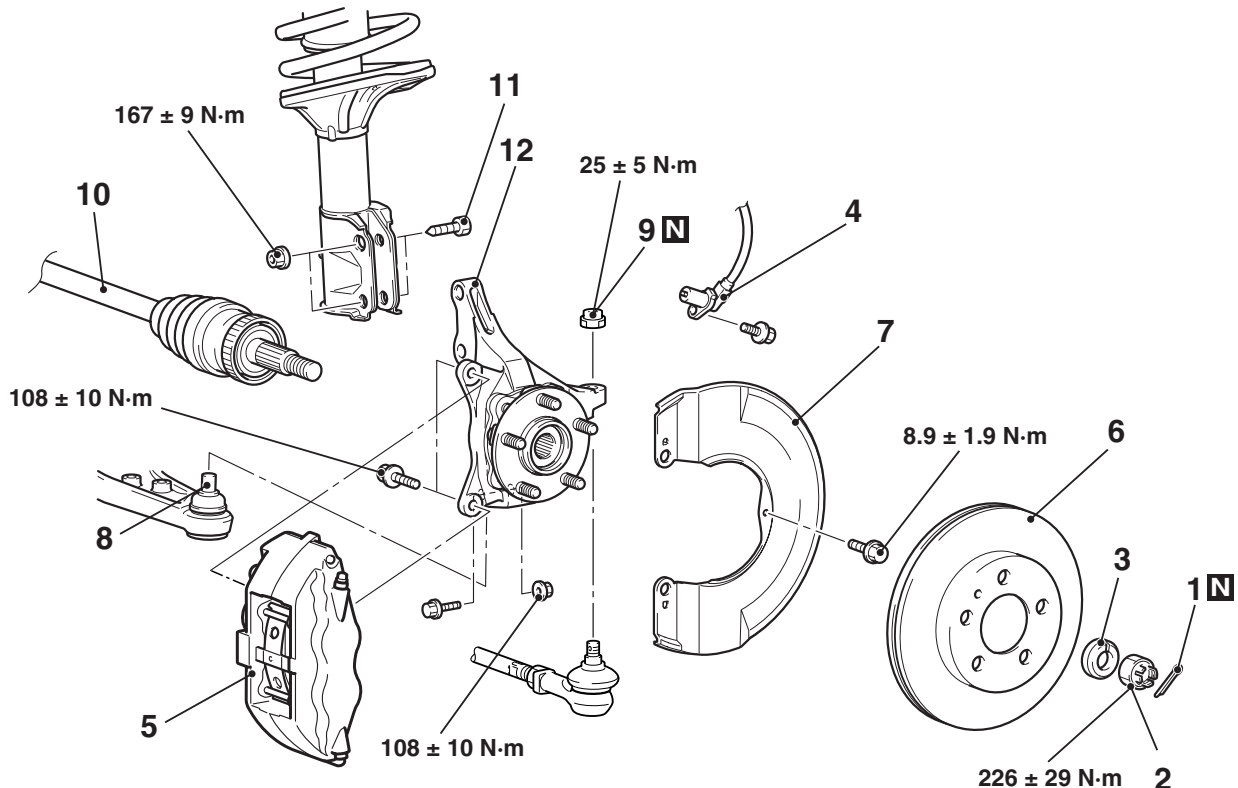
- Do not strike the ABS rotors installed to the EBJ outer race of driveshaft against other parts when removing or installing the driveshaft. Otherwise the ABS rotors will be damaged.
- Be careful not to strike the pole piece at the tip of the front ABS sensor with tools during servicing work.
- During maintenance, take care not to contact the parts or tools to the caliper because the paint of caliper will be scratched. And if there is brake fluid on the caliper, wipe off quickly.

Pre-installation Operation

- Front Under Cover, Side Under Cover Removal
- Transmission Oil Draining (Refer to GROUP22A, On-vehicle Service – Manual Transmission Oil [P.22A-152.](#))
- Transfer Oil Draining (Refer to GROUP22A, On-vehicle Service –Transfer Oil [P.22A-152.](#))

Post-installation Operation

- Check the dust cover for cracks or damage by pushing it with your finger.
- Transfer Oil Filling (Refer to GROUP 22A, On-vehicle Service–Transfer Oil [P.22A-152.](#))
- Transmission Oil Filling (Refer to GROUP22A, On-vehicle Service – Manual Transmission Oil [P.22A-152.](#))
- Front Under Cover, Side Under Cover Installation



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Removal steps

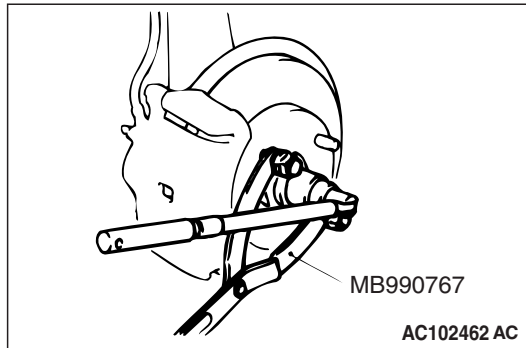
- <<A>> >>A<<
>>A<<
<>
<<C>>
1. Split pin
 2. Driveshaft nut
 3. Washer
 4. Front ABS sensor
 5. Caliper assembly
 6. Brake disc
 7. Dust cover

Removal steps (Continued)

- <<D>>
<<E>>
8. Connection for lower arm ball joint
 9. Self-locking nut (tie rod end connection)
 10. Driveshaft
 11. Nut (hub and knuckle to strut connection)
 12. Hub and knuckle assembly

REMOVAL SERVICE POINTS**<<A>> DRIVESHAFT NUT REMOVAL****⚠ CAUTION**

Do not apply pressure to wheel bearing by the vehicle weight to avoid possible damage when driveshaft nut is loosened.

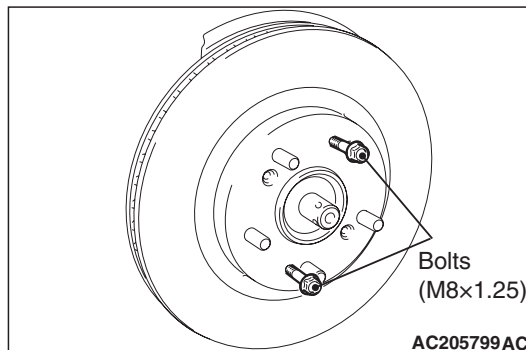


Use special tool front hub and end yoke holder (MB990767) to fix the hub and remove the driveshaft nut.

<> CALIPER ASSEMBLY REMOVAL**⚠ CAUTION**

During maintenance, take care not to contact the parts or tools to the caliper because the paint of caliper will be scratched.

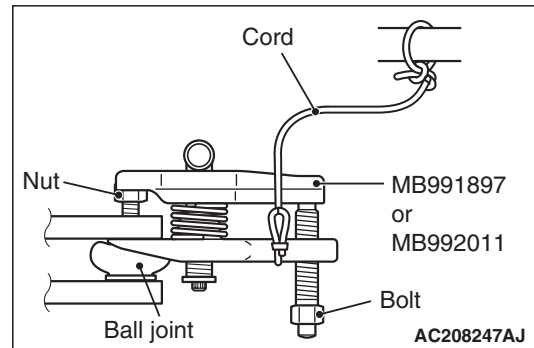
Secure the removed caliper assembly with wire, etc.

<<C>> BRAKE DISC REMOVAL

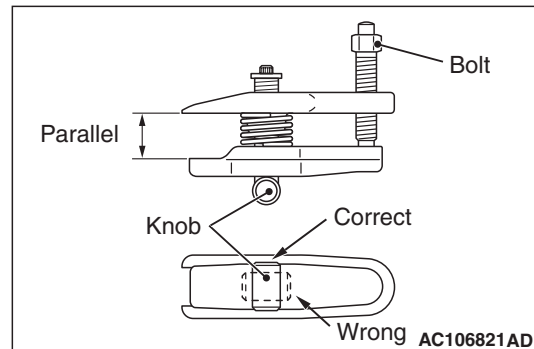
If the brake disc is seized, install a M8x1.25 mm bolts as shown, and remove the disc by tightening the bolts evenly and gradually.

<<D>> SELF-LOCKING NUT (TIE ROD END 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.



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

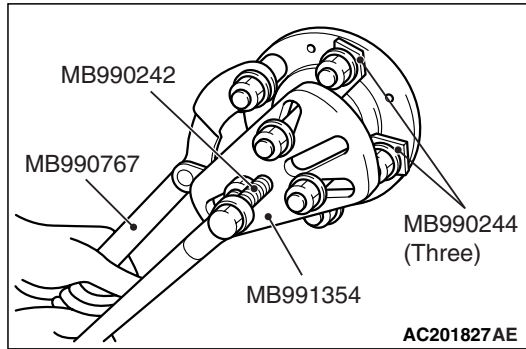


- Turn the bolt and knob as necessary to make the jaws of special tool parallel, tighten the bolt by hand and confirm that the jaws are still parallel.

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

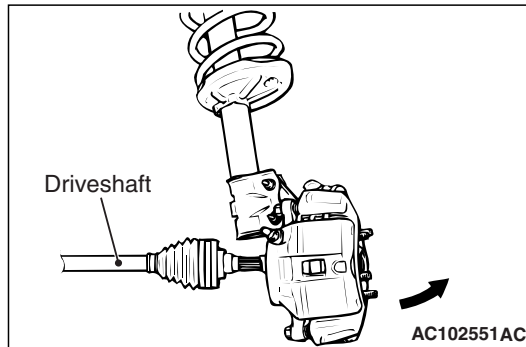
- Tighten the bolt with a wrench to disconnect the tie rod end.

<<E>> DRIVESHAFT REMOVAL



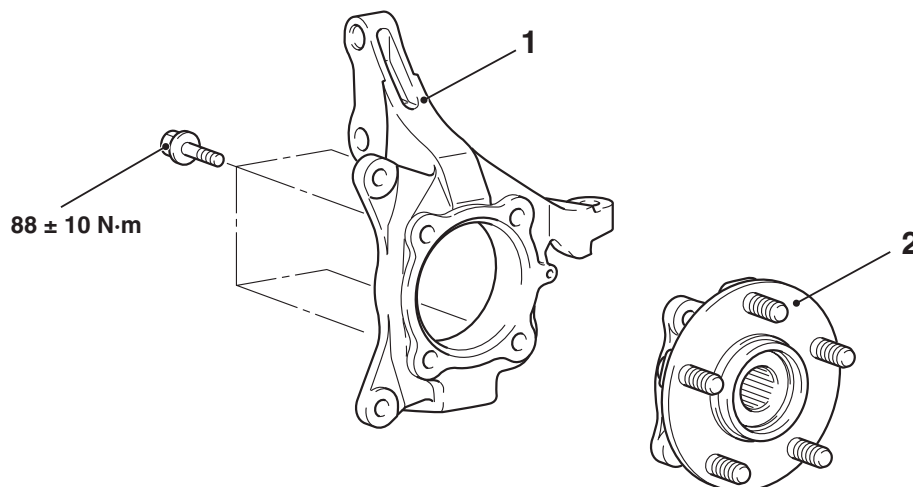
1. Use the following special tools to push out the driveshaft from the hub and knuckle.

- Puller shaft (MB990242)
- Puller bar (MB990244)
- Puller body (MB991354)
- Front hub and end yoke holder (MB990767)



2. Withdraw the driveshaft from the hub by pulling the bottom of the hub and knuckle towards you.
3. Hang the driveshaft on the vehicle body with a rope.

DISASSEMBLY AND REASSEMBLY



Disassembly steps

1. Knuckle
2. Front wheel hub assembly

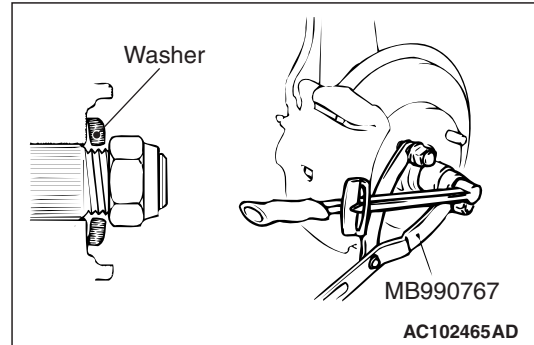
<<A>>

INSTALLATION SERVICE POINT

>>A<< WASHER/ DRIVESHAFT NUT INSTALLATION

⚠ CAUTION

Before securely tightening the driveshaft nuts, make sure there is no load on the wheel bearings. Otherwise the wheel bearings will be damaged.



1. Be sure to install the driveshaft washer in the specified direction.
2. Using special tool front hub and end yoke holder (MB990767), tighten the driveshaft nut to the specified torque.

Tightening torque: 226 ± 29 N·m

INSPECTION

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

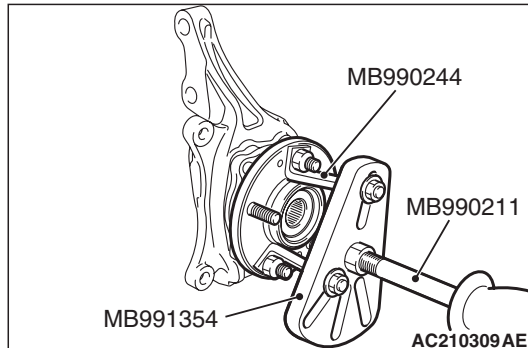
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DISASSEMBLY SERVICE POINTS

<<A>> FRONT WHEEL HUB ASSEMBLY
REMOVAL

1. If the front wheel hub is seized, remove the knuckle together with front wheel hub and fix them with a vise.

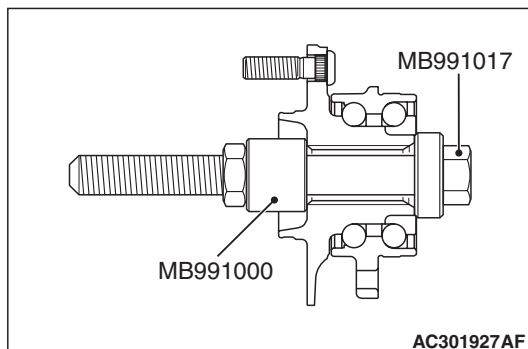


2. Use the following special tools to pull out the front wheel hub from the knuckle.
 - Puller bar (MB990244)
 - Puller body (MB991354)
 - Slide hammer (MB990211)

INSPECTION

WHEEL BEARING ROTATION STARTING
TORQUE AND AXIAL PLAY CHECK

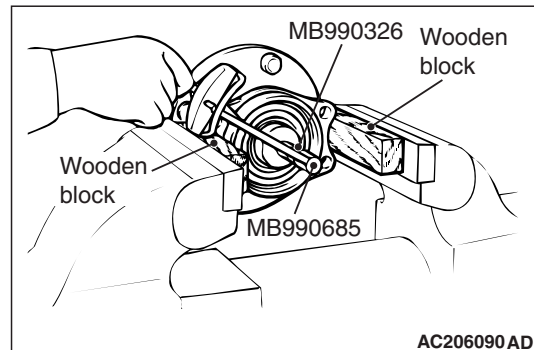
M1261002000108



1. Tighten the following special tools to the specified torque.
 - Front hub remover and installer (MB991017)
 - Spacer (MB991000)

Tightening torque: 226 ± 29 N·m

2. Hold the front wheel hub assembly in a vice with a wooden block.
3. Rotate the hub in order to seat the bearing.

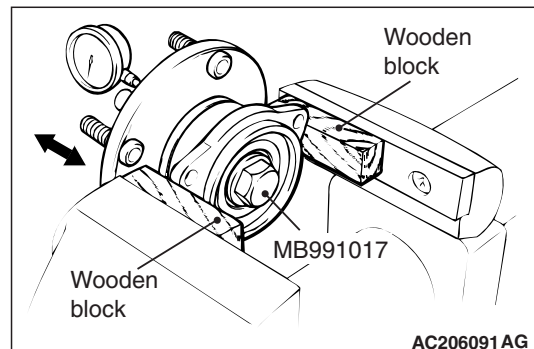


4. Measure the wheel bearing rotation starting torque by using the following special tools.

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

Limit: 1.03 N·m

5. If the rotation starting torque is not within the limit range while the nut is tightened to 226 ± 29 N·m, replace the front wheel hub assembly. If there are any signs of binding or tight spots when the wheel bearing turns, replace it.



6. Measure to determine whether the wheel bearing axial play is within the specified limit or not.

Limit: 0.05 mm

7. If the play is not within the limit range while the nut is tightened to 226 ± 29 N·m, replace the front wheel hub assembly.

DRIVESHAFT ASSEMBLY

REMOVAL AND INSTALLATION

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CAUTION

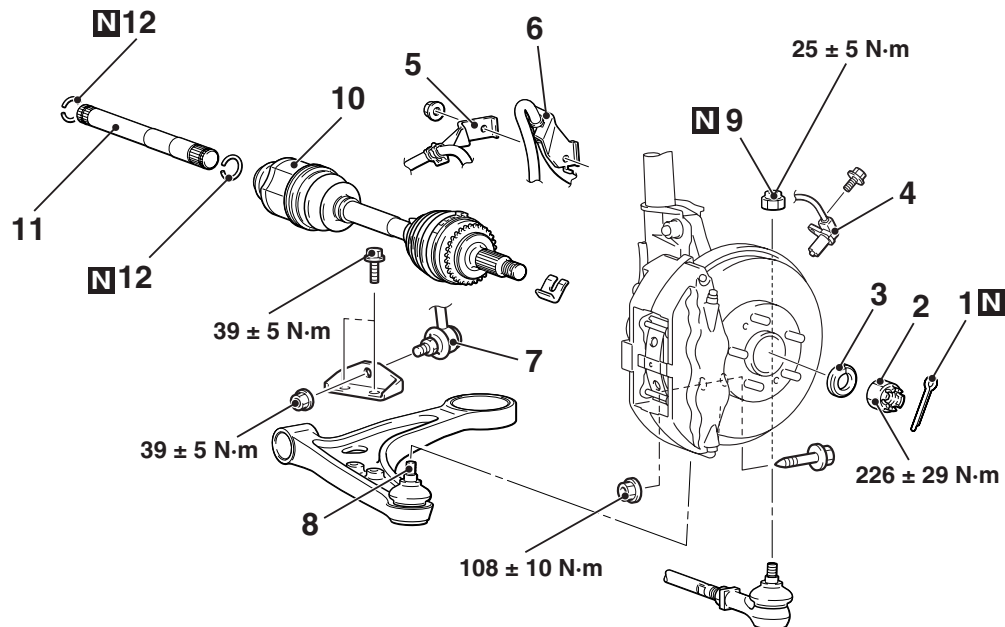
- Do not strike the ABS rotors installed to the EBJ outer race of driveshaft against other parts when removing or installing the driveshaft. Otherwise the ABS rotors will be damaged.
- Be careful not to strike the pole piece at the tip of the front ABS sensor with tools during servicing work.
- During maintenance, take care not to contact the parts or tools to the caliper because the paint of caliper will be scratched. And if there is brake fluid on the caliper, wipe off quickly.

Pre-installation Operation

- Front under cover, side under cover removal
- Transmission Fluid Draining (Refer to GROUP 22A, On-vehicle service – Transmission oil replacement [P.22A-152](#)).
- Transfer Oil Draining (Refer to GROUP 22A, On-vehicle service – Transfer oil [P.22A-152](#)).

Post-installation Operation

- Check the ball Joint dust cover for cracks or damage by pushing it with your finger.
- Transfer Oil Filling (Refer to GROUP 22A, On-vehicle service – Transfer oil [P.22A-152](#)).
- Transmission Fluid Filling (Refer to GROUP 22A, On-vehicle service – Transmission oil replacement [P.22A-152](#)).
- Front Under cover, side under cover Installation



AC211632 AC

Removal steps

- <<A>> >>B<< <> <<C>> >>A<< <<D>> >>A<<
1. Split pin
 2. Driveshaft nut
 3. Washer
 4. Front ABS sensor
 5. Front ABS sensor harness bracket
 6. Brake hose bracket
 7. Stabilizer bar link connection

Removal steps (Continued)

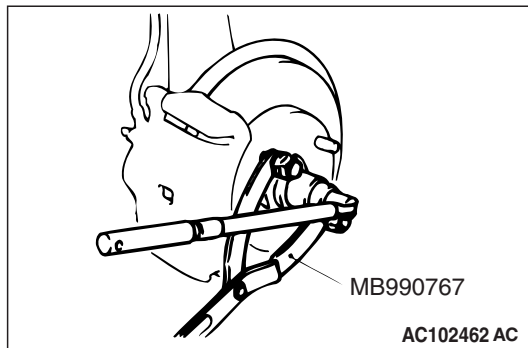
8. Lower arm ball joint connection
9. Self-locking nut (tie rod end connection)
10. Driveshaft
11. Output shaft
12. Circlip

REMOVAL SERVICE POINTS

<<A>> DRIVESHAFT NUT REMOVAL

CAUTION

Do not apply pressure to the wheel bearing by the vehicle weight to avoid possible damage when the driveshaft nut is loosened.

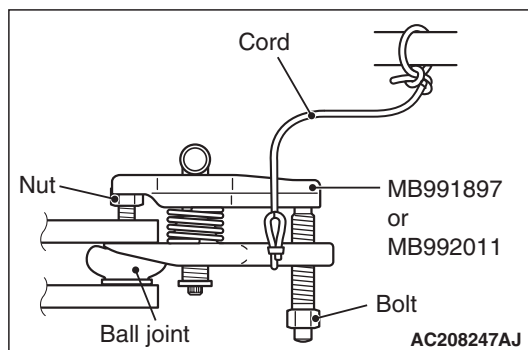


Use special tool front hub and end yoke holder (MB990767) to fix the hub and remove the driveshaft nut.

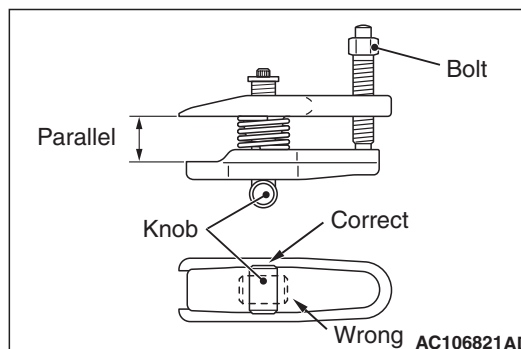
<> SELF-LOCKING NUT (TIE ROD END CONNECTION) REMOVAL

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.

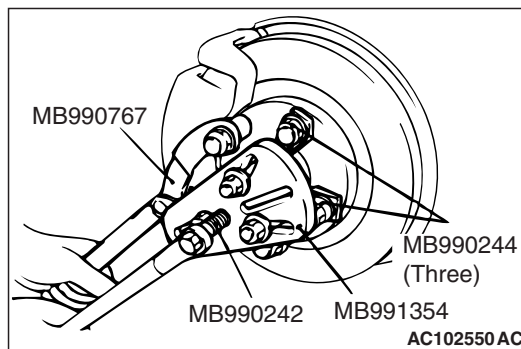


1. Install special tool ball joint remover (MB991897 or MB992011) as shown in the figure.

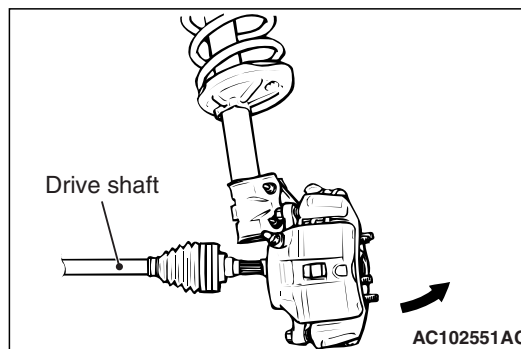


2. Turn the bolt and knob as necessary to make the jaws of special tool parallel, tighten the bolt by hand and confirm that the jaws are still parallel.
NOTE: When adjusting the jaws in parallel, make sure the knob is in the position shown in the figure.
3. Tighten the bolt with a wrench to disconnect the tie rod end.

<<C>> DRIVESHAFT REMOVAL



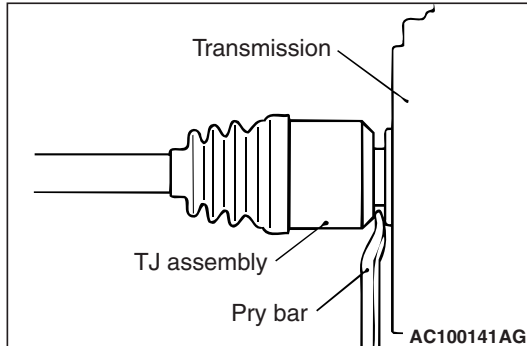
1. Use the following special tools to push out the driveshaft from the hub.
 - Puller shaft (MB990242)
 - Puller bar (MB990244)
 - Puller body (MB991354)
 - Front hub and end yoke holder (MB990767)



2. Remove the driveshaft from the hub by pulling the bottom of the brake disc towards you.

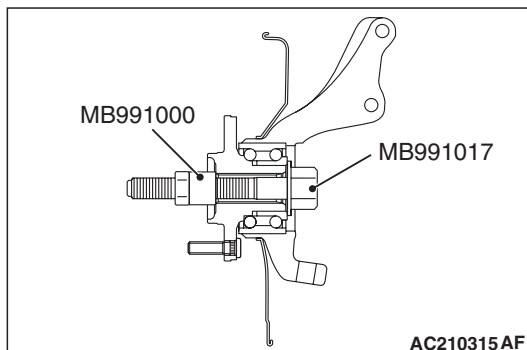
CAUTION

- Do not pull on the driveshaft; doing so will damage the TJ; be sure to use the pry bar.
- When pulling the driveshaft out from the transmission, be careful that the spline part of the driveshaft does not damage the oil seal.



3. Insert a pry bar between the transmission case and the driveshaft, and then pry and remove the driveshaft from the transmission.

CAUTION



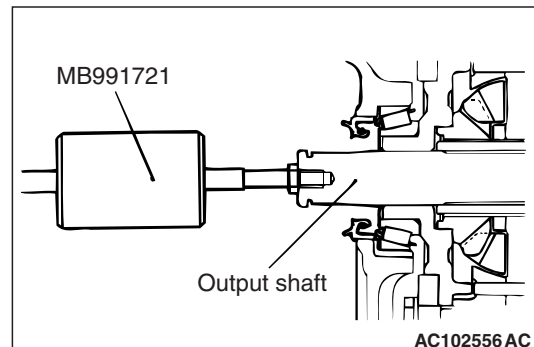
Do not apply pressure to the wheel bearing by the vehicle weight to avoid possible damage when the driveshaft is removed. If, however, vehicle weight must be applied to the bearing in moving the vehicle, temporarily secure the wheel bearing by using the following special tools.

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

<<D>>OUTPUT SHAFT REMOVAL

CAUTION

When pulling the output shaft out from the tansaxle, be careful that the spline part of the output shaft does not damage the oil seal.



Use special tool slide hammer (MB991721) to remove the output shaft.

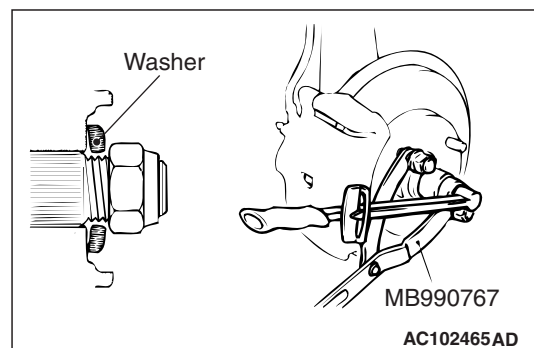
INSTALLATION SERVICE POINTS

>>A<< OUTPUT SHAFT/DRIVESHAFT INSTALLATION

CAUTION

When installing the output shaft or the driveshaft, be careful that the spline part of the output shaft or the driveshaft do not damage the oil seal.

>>B<< WASHER/DRIVESHAFT NUT INSTALLATION



1. Be sure to install the driveshaft washer in the specified direction.

CAUTION

Before securely tightening the driveshaft nuts, make sure there is no load on the wheel bearings. Otherwise the wheel bearing will be damaged.

2. Using special tool front hub and end yoke holder (MB990767), tighten the driveshaft nut to the specified torque.

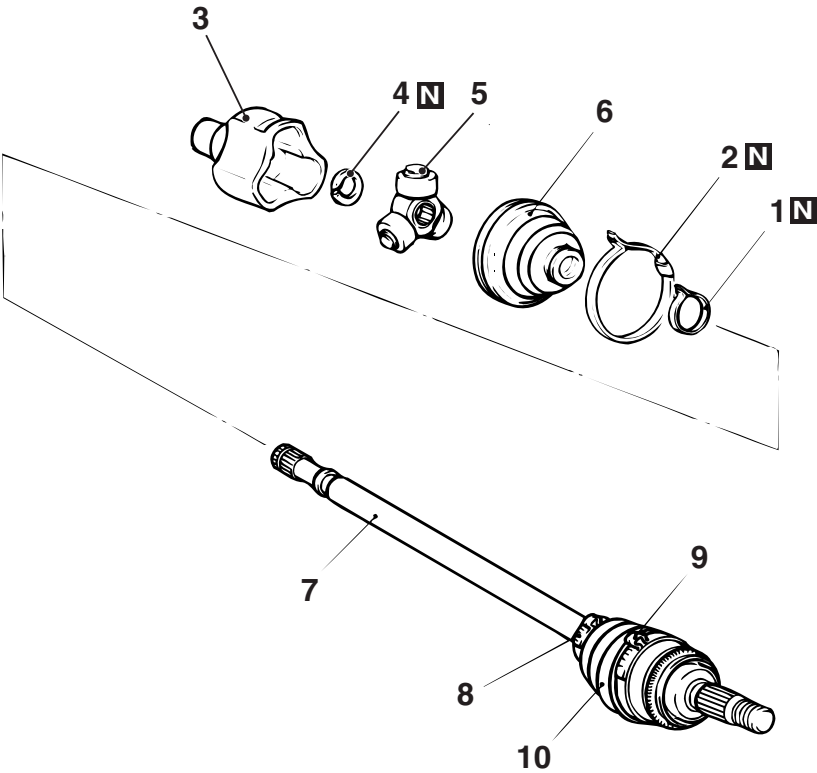
Tightening torque: 226 ± 29 N·m

DISASSEMBLY AND REASSEMBLY

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CAUTION

- Be careful not to damage the ABS rotor, which is attached to the EBJ outer race during disassembly and reassembly.
- Never disassemble the EBJ assembly except when replacing the EBJ boot.

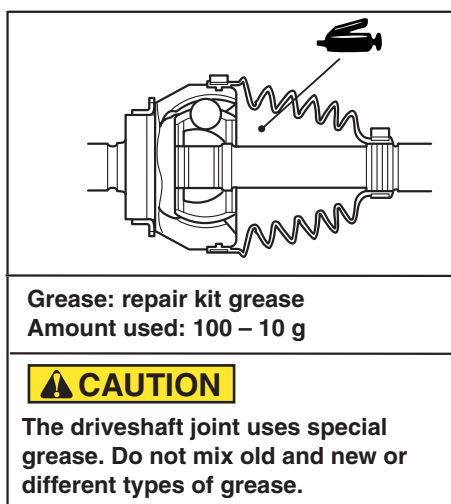
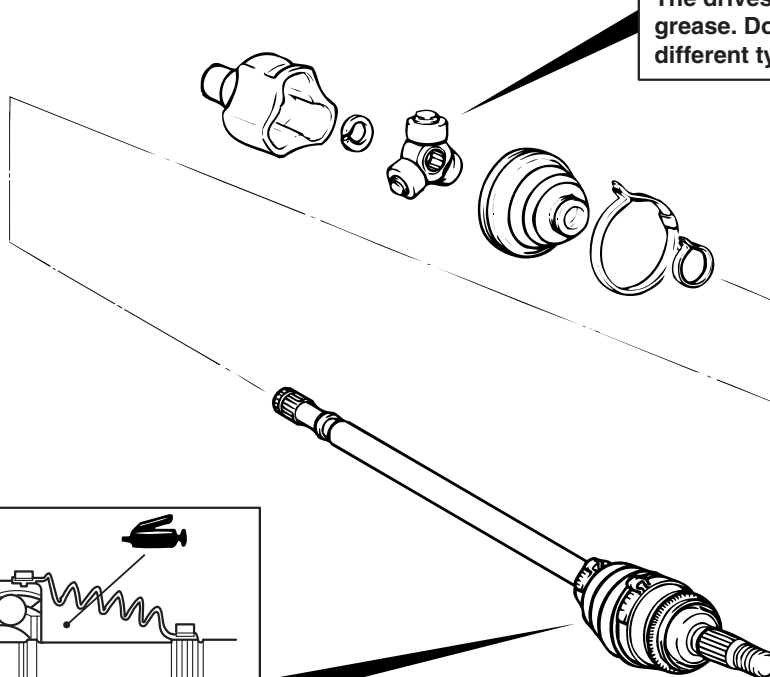
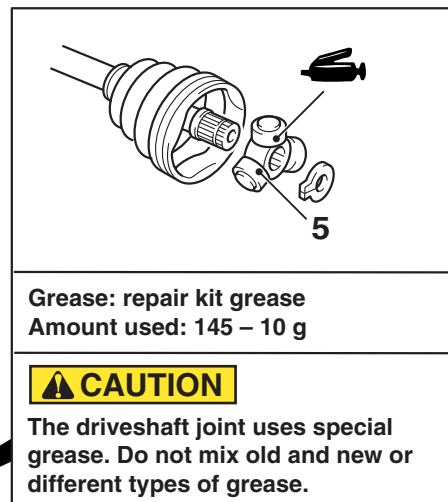


TJ boot repair kit	TJ repair kit	EBJ boot repair kit

AC211633 AC

- | | | |
|-------|--------------------------|--------------------------------------|
| | Disassembly steps | Disassembly steps (Continued) |
| >>D<< | 1. TJ boot band (large) | 8. EBJ boot band (small) |
| >>D<< | 2. TJ boot band (small) | 9. EBJ boot band (large) |
| <<A>> | >>C<< | 10. EBJ boot |
| | 3. TJ case | |
| | 4. Snap ring | |
| <<A>> | >>B<< | |
| <> | >>A<< | |
| | 5. Spider assembly | |
| | 6. TJ boot | |
| | 7. EBJ assembly | |
- TJ: Tripod Joint
EBJ: Eight Ball Fixed Joint

LUBRICATION POINTS



DISASSEMBLY SERVICE POINTS**<<A>> TJ CASE/SPIDER ASSEMBLY
REMOVAL****⚠ CAUTION**

Do not disassemble the spider assembly.

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

<> TJ BOOT REMOVAL

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

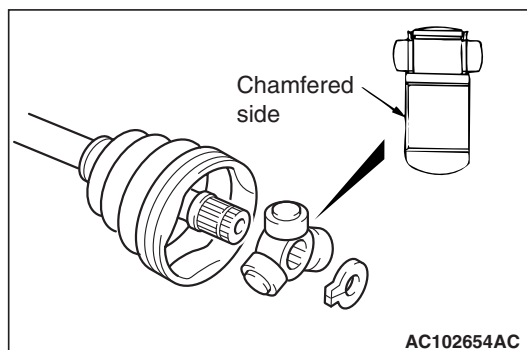
REASSEMBLY SERVICE POINTS**>>A<< TJ BOOT INSTALLATION**

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

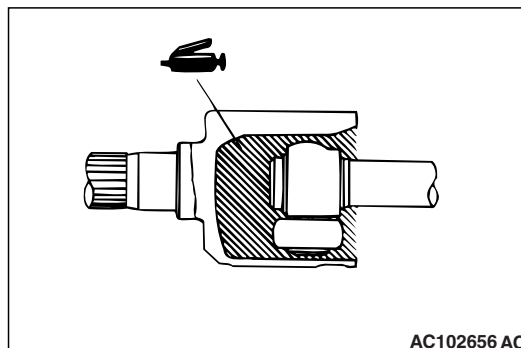
Specified grease: Repair kit grease



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

>>C<< TJ CASE INSTALLATION**⚠ CAUTION**

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

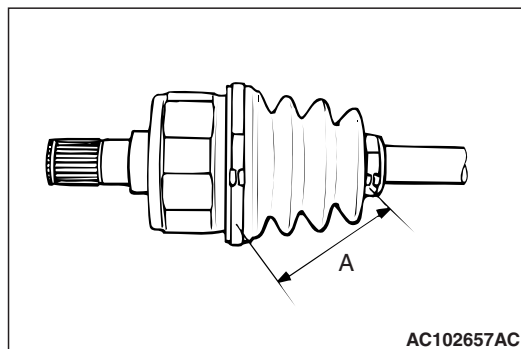


After applying the specified grease to the TJ case, insert the driveshaft and apply grease one more time.

Specified grease: Repair kit grease

Amount to use: 145 ± 10 g

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

**>>D<< TJ BOOT BAND (SMALL)/TJ BOOT
BAND (LARGE) INSTALLATION**

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

Standard value (A): 85 ± 3 mm

INSPECTION

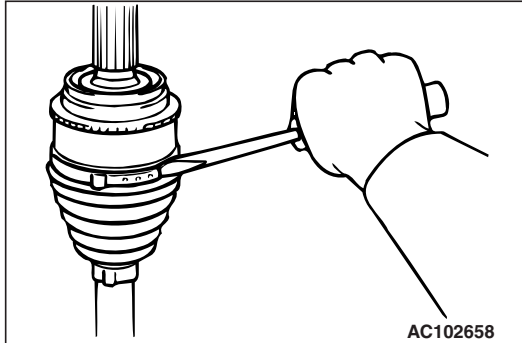
M1261003800215

- Check the driveshaft for damage, bending or corrosion.
- Check the driveshaft spline part for wear or damage.
- Check the spider assembly for roller rotation, wear or corrosion.
- Check the groove inside TJ case for wear or corrosion.

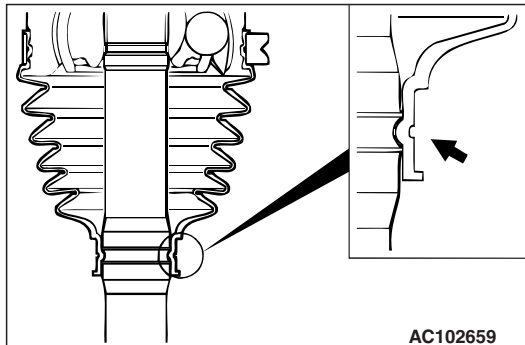
- Check the boots for deterioration, damage or cracking.

EBJ BOOT (RESIN BOOT) REPLACEMENT

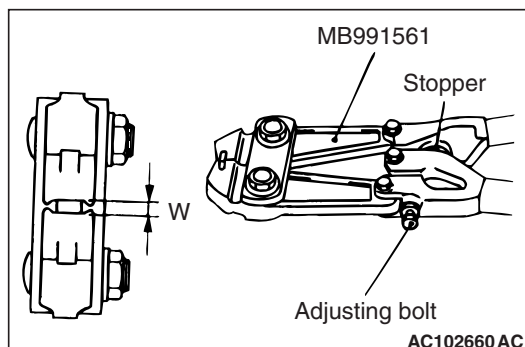
M1261005200435



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 centre groove on the EBJ 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.

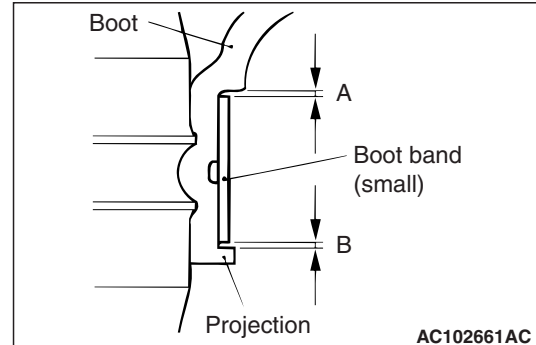
Standard value (W): 2.9 mm

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

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

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

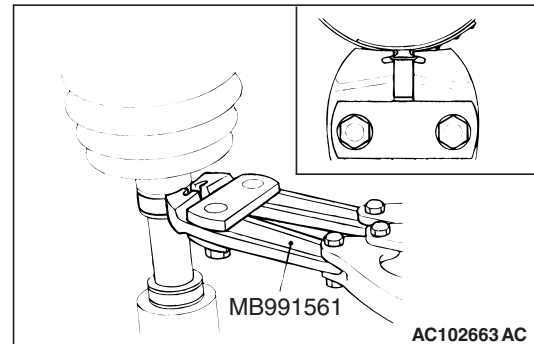
NOTE: The adjusting bolt should not be turned more than once.



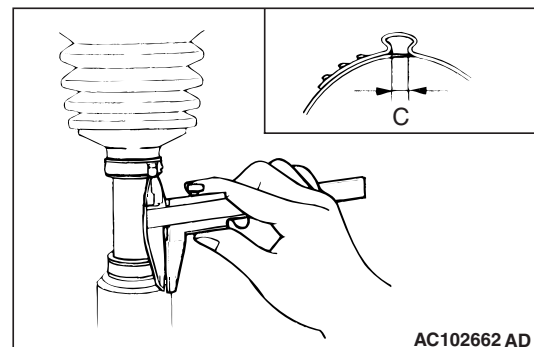
6. Position the EBJ boot band (small) so that there is even clearance at either end (A and B).

⚠ CAUTION

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



7. Use the special tool 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

<If the crimping amount is larger than 2.8 mm >

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

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

Example: If $C = 2.9 \text{ mm}$, then $W = 2.6 \text{ mm}$.

<If the crimping amount is smaller than 2.4 mm >

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.

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

Example: If $C = 2.3 \text{ mm}$, then $W = 3.2 \text{ mm}$.

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.

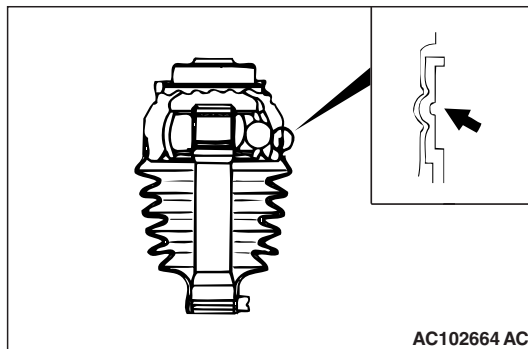
CAUTION

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.

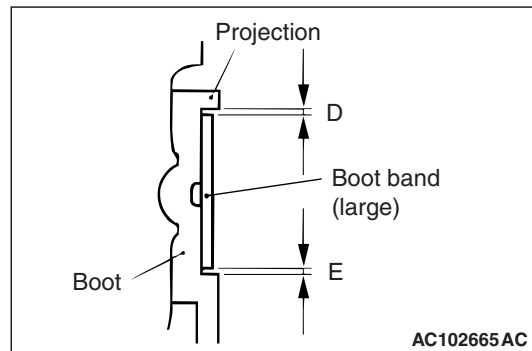
Specified grease: Repair kit grease

Amount to use: $100 \pm 10 \text{ g}$

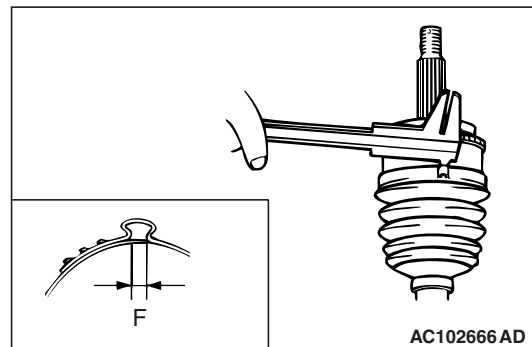


11. Align the centre groove on the EBJ boot big end with the EBJ case groove.
12. Follow the same procedure as in step 5 to adjust the size of the opening (W) on the special tool so that it is at the standard value.

Standard value (W): 3.2 mm



13. Position the EBJ boot band (large) so that there is even clearance at either end (D and E).
14. Use the special tool 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

<If the crimping amount is larger than 2.8 mm >

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

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

Example: If $F = 2.9 \text{ mm}$, then $W = 2.9 \text{ mm}$.

<If the crimping amount is smaller than 2.4 mm >

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.

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

Example: If $F = 2.3 \text{ mm}$, then $W = 3.5 \text{ mm}$.

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.