

GROUP 26

FRONT AXLE

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GENERAL INFORMATION

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For the front axle, the 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>

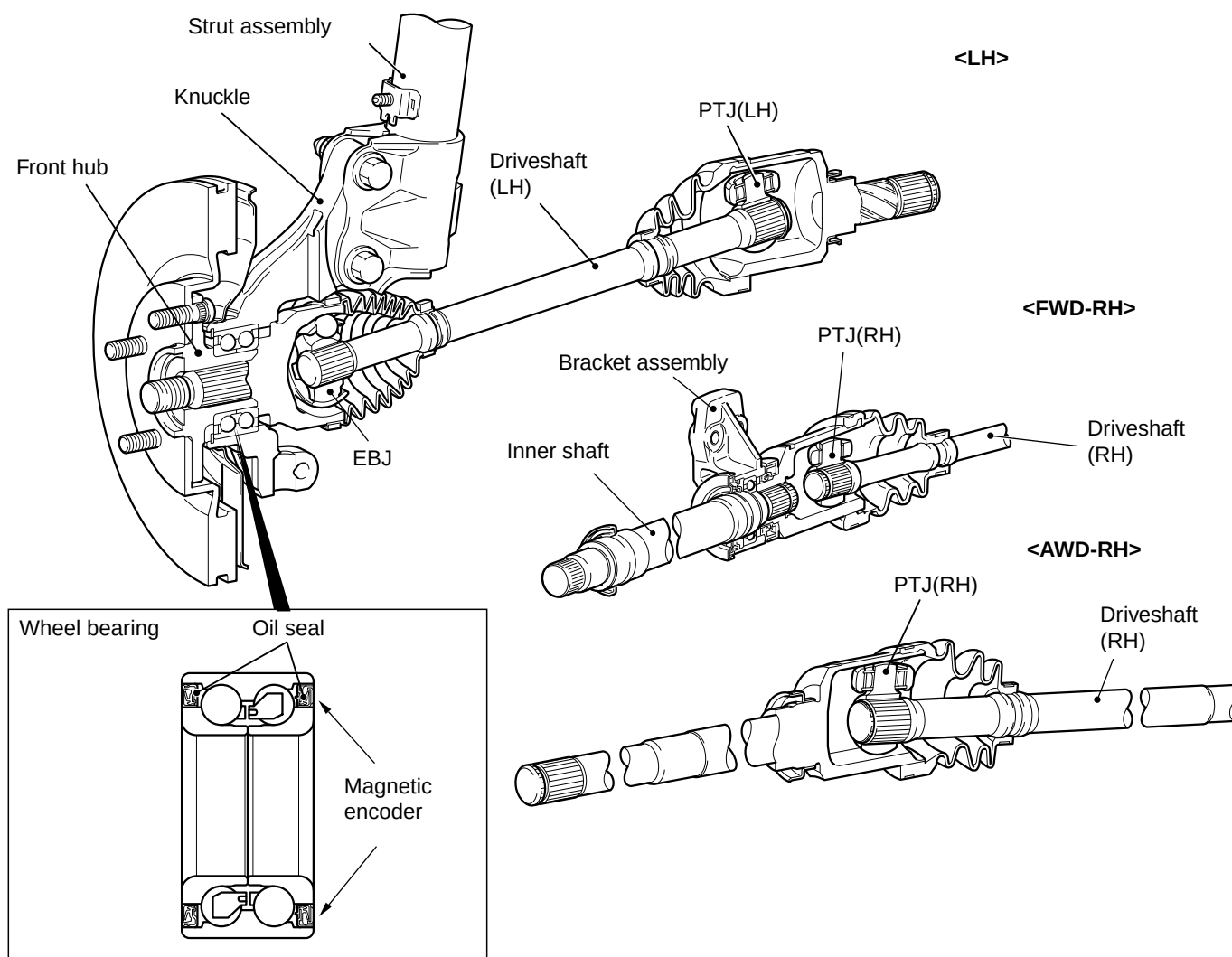
- Lead-free grease for the constant velocity joint is adopted.
- Hexavalent chromium is eliminated from the dust cover material.
- The number of parts is reduced by integrating the magnetic encoder for ABS wheel speed detection into the wheel bearing.

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



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GENERAL SPECIFICATIONS

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Item			Specification
Wheel bearing	Type		Double-row angular contact ball bearing
Driveshaft	Joint type	Outer	High efficiency compact birfield joint
		Inner	Pillow tripod joint

SERVICE SPECIFICATIONS

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Item		Standard value	Limit
Wheel bearing end play mm (in)		-	0.05 (0.002)
Wheel bearing rotation starting torque N·m (in-lb)		-	1.8 (16)
PTJ boot assembly dimension mm (in)		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

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Item	Specified lubricant		Quantity
PTJ boot grease	Repair kit grease	LH	245 ± 10 g (8.6 ± 0.3 oz)
		RH	255 ± 10 g (9.0 ± 0.3 oz)
EBJ boot grease	Repair kit grease		140 ± 10 g (4.9 ± 0.3 oz)
Dust seal inner grease	Repair kit grease		8 - 12 g (0.3 - 0.4 oz)
Dust seal outer grease	Repair kit grease		3 - 7 g (0.1 - 0.2 oz)

FRONT AXLE DIAGNOSIS

TROUBLESHOOTING STRATEGY

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

1. Gather information from the customer.

2. Verify that the condition described by the customer exists.

3. Find the malfunction by following the Symptom Chart.

4. Verify malfunction is eliminated.

SYMPTOM CHART

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Symptom		Inspection procedure	Reference page
Driveshaft	Noise during wheel rotation	1	P.26-4
	Noise due to excessive play of wheel in turning direction	2	P.26-5

SYMPTOM PROCEDURES

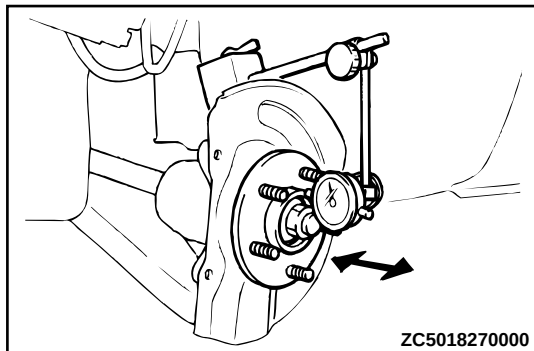
INSPECTION PROCEDURE 1: Noise during Wheel Rotation

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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.**STEP 4. Check the driveshaft assembly for wear or damage.****Q: Is the driveshaft assembly worn or damaged?****YES:** Replace the driveshaft assembly. Then go to Step 5.**NO:** There is no action to be taken.**STEP 5. Retest the system.****Q: Is the abnormal noise eliminated?****YES:** The procedure is complete.**NO:** Repeat from Step 1.

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

Direction

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DIAGNOSIS

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

Q:Is the play found?

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

NO: The procedure is complete.

STEP 2. Retest the system.

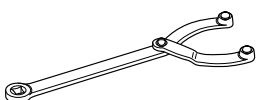
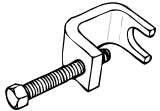
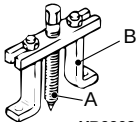
Q:Is the abnormal noise eliminated?

YES: The procedure is complete.

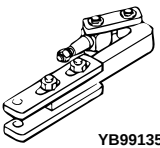
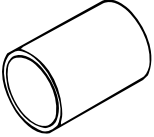
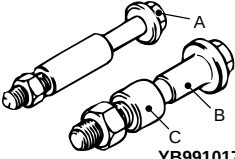
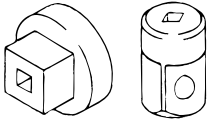
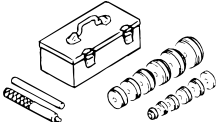
NO: Repeat from Step 1.

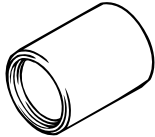
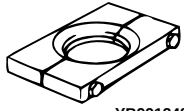
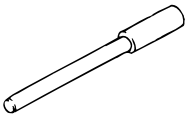
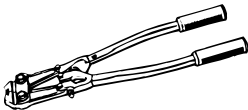
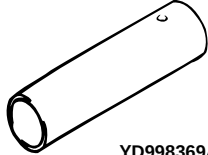
SPECIAL TOOLS

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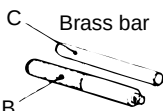
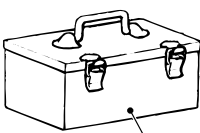
Tool	Tool number and name	Supersession	Application
 YB990767AA00	MB990767 Front hub and flange yoke holder	MB990767-01	Fixing of the hub
 YB991618AA00	MB991618 Hub bolt remover	General service tool	Removal of the hub bolt
 YB991897AA01	MB991897 or MB992011 Ball joint remover	MB991113-01, MB990635-01 or General service tool	Knuckle and tie rod end ball joint disconnection <i>NOTE: Steering linkage puller (MB990635 or MB991113) is also used to disconnect knuckle and tie rod end ball joint.</i>
 YB990241AA03	MB990241 Axle shaft puller A: MB990242 Puller shaft B: MB990244 Puller bar	MB990241-01 or General service tool	Removal of the driveshaft
 YB991354AA01	MB991354 Puller body	General service tool	

FRONT AXLE
SPECIAL TOOLS

Tool	Tool number and name	Supersession	Application
 YB991355AA01	MB991056 or MB991355 Knuckle arm bridge	MB991056-01	▪ Removal of the hub ▪ Removal of the wheel bearing
 YB991172AA01	MB991172 Inner shaft installer base	-	Press-fitting of the inner shaft
 YB991017AA02	A: MB991017 B: MB990998 C: MB991000 A, B: Front hub and remover 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 <i>NOTE: MB991000, which belongs to MB990998, should be used as a spacer.</i>
 YB990326AA01	MB990326 Preload socket	General service tool	Measurement of hub starting torque
 YB990810AA00	MB990810 Side bearing puller	General service tool	▪ Removal of the center bearing bracket ▪ Removal of the wheel bearing inner race (outside)
 YB990925AA03	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
 YB991388AA00	MB991388 Bush remover base	-	Press-fitting of the dust cover
 YB991576AA00	MB991576 Base	-	

Tool	Tool number and name	Supersession	Application
 YB990890AA00	MB990890 Rear suspension bushing base	MB990890-01	- Installation of the wheel bearing - Press-fitting of the dust seal outer, inner
 YB991248AA01	MB991248 Inner shaft remover	MD998348-01	Removal of the inner shaft
 YB990883AA01	MB990883 Rear suspension bushing arbor	MB990883-01	Installation of the wheel bearing
 YB991561AA01	MB991561 Boot band crimping tool	MB991561	BJ boot (resin boot) band installation
 YD998369AA01	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 Brass bar B Bar (Snap-in type)  Tool box ZC501852AA00	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	-

Tool	Type	Tool number	O D mm (in)
	C	MB990939	-

ON-VEHICLE SERVICE

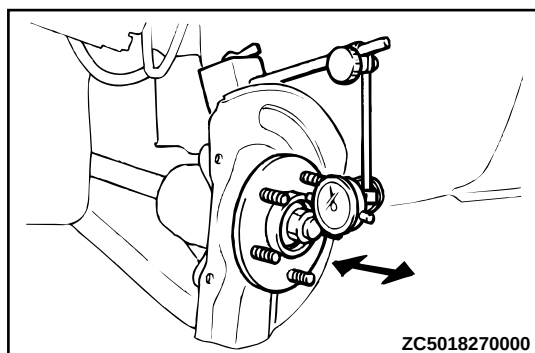
WHEEL BEARING END PLAY CHECK

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1. Remove the caliper assembly, and retain it with a wire and the like to prevent from falling.
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. After checking, install the brake disc and the caliper assembly, and tighten the caliper mounting bolt to the specified torque.

Tightening torque: 100 ± 10 N·m (74 ± 7 ft-lb)

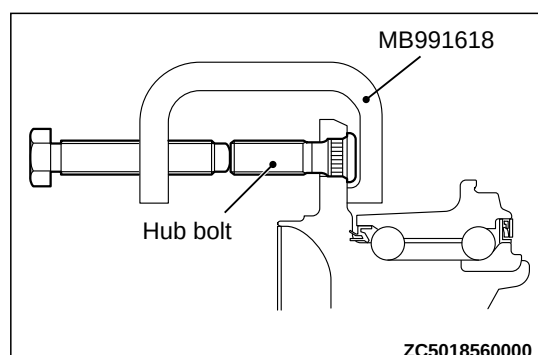
HUB BOLT REPLACEMENT

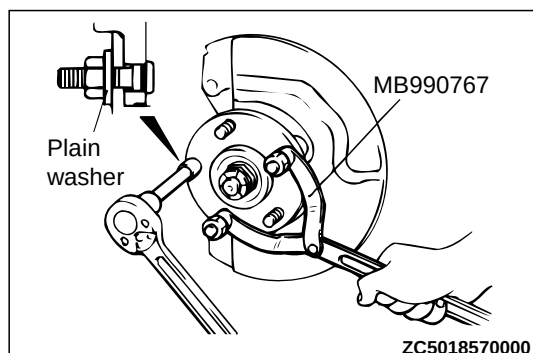
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Required Special Tools:

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

1. Remove the caliper assembly and suspend it with wire so that it does not fall.
2. Remove the brake disc.
3. Use special tool MB991618 to remove the hub bolts.





4. Install the plain washer to the new hub bolt, and install the bolt with a nut while holding the hub with special tool MB990767.
5. Install the brake disc, caliper assembly and tighten the caliper assembly mounting bolts to the specified torque.

Tightening torque: 100 ± 10 N·m (74 ± 7 ft-lb)

FRONT AXLE HUB ASSEMBLY

REMOVAL AND INSTALLATION

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CAUTION

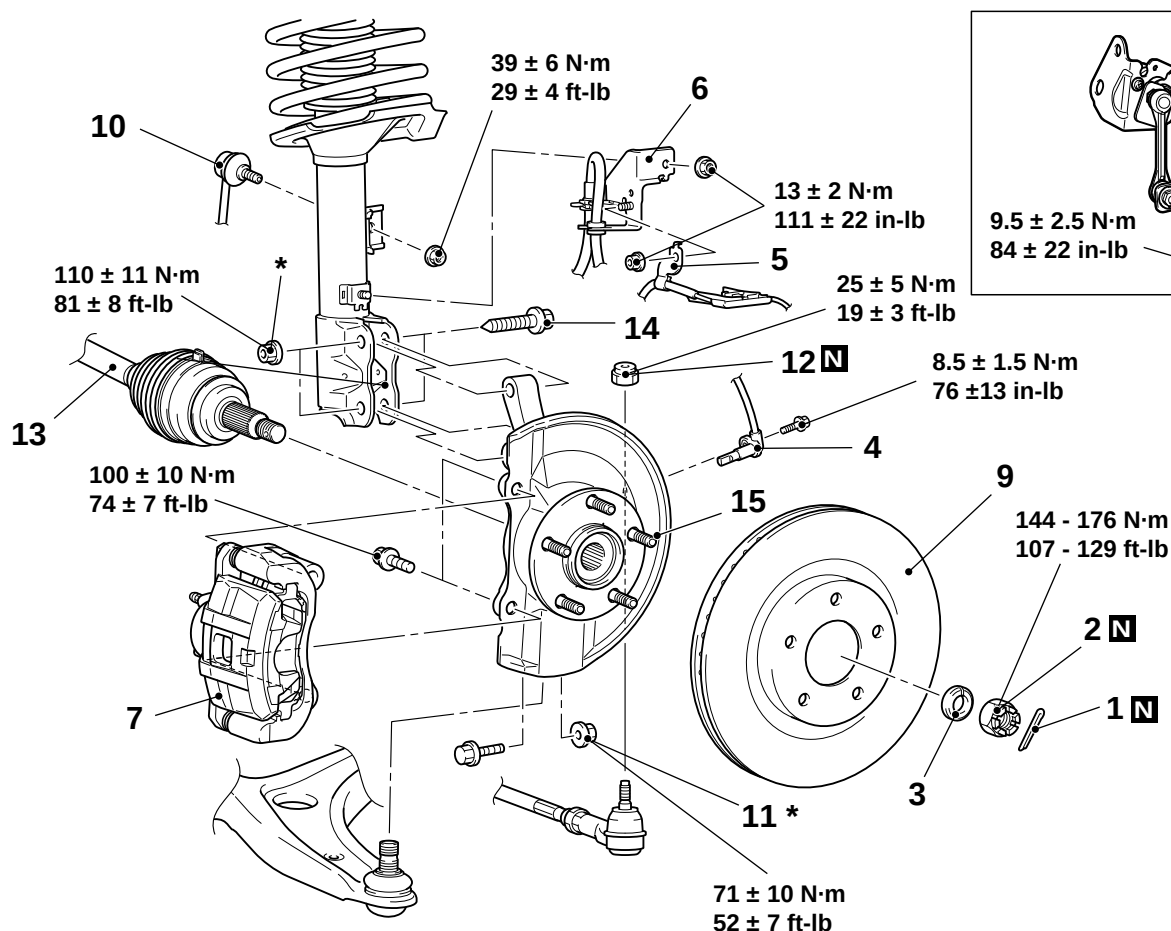
- The magnetic encoder collects metallic particles easily, because it is magnetized. Make sure that the magnetic encoder should not collect metallic particles. Check that there is not any trouble prior to reassembling it.
- When removing and installing the front wheel hub assembly, make sure that the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

Post-installation operation

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

- When removing and installing the front wheel speed sensor, make sure that the pole piece at the end does not contact with surrounding parts to avoid damage.
- 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.

FRONT AXLE FRONT AXLE HUB ASSEMBLY



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Removal steps

- <<A>> >>A<<
1. Cotter pin
 2. Driveshaft nut
 3. Washer
 4. Front wheel speed sensor
 5. Front wheel speed sensor harness bracket
 6. Brake hose bracket
 7. Caliper assembly
 8. Front height sensor to lower arm connection
- <>

Removal steps

- <<C>>
9. Brake disc
 10. Stabilizer link connection
 11. Self-locking nut (lower arm ball joint connection)
 12. Self-locking nut (tie-rod end connection)
 13. Driveshaft
 14. Hub knuckle assembly and strut mounting bolt and nuts
 15. Hub knuckle assembly
- <<D>>
- <<E>>

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

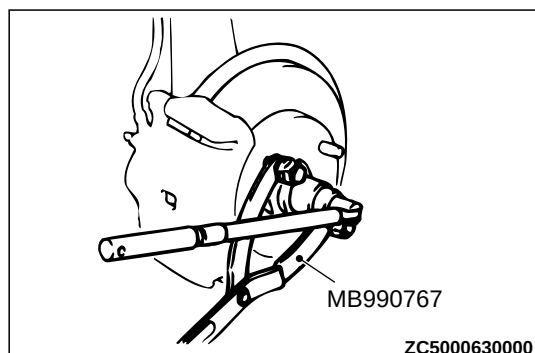
REMOVAL SERVICE POINTS

<<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.

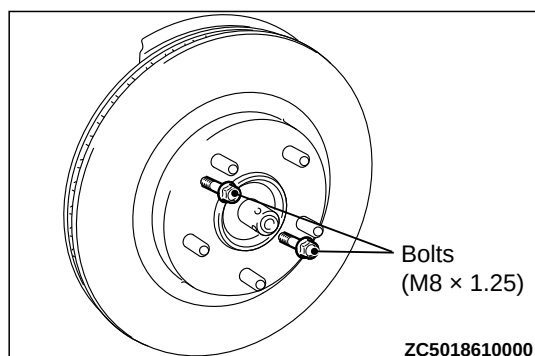


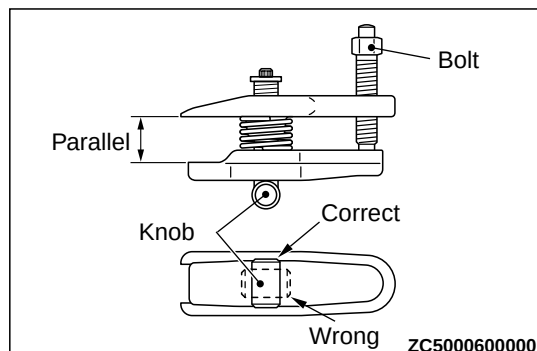
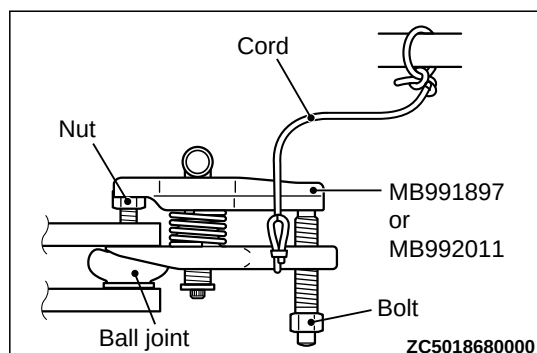
<> CALIPER ASSEMBLY REMOVAL

Secure the removed caliper assembly with wire, etc.

<<C>> BRAKE DISC REMOVAL

If the brake disc removal is difficult, install bolts (M8 x 1.25 mm) shown in the figure, and tighten them evenly and gradually to remove the brake disc.



**<<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 rope.

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

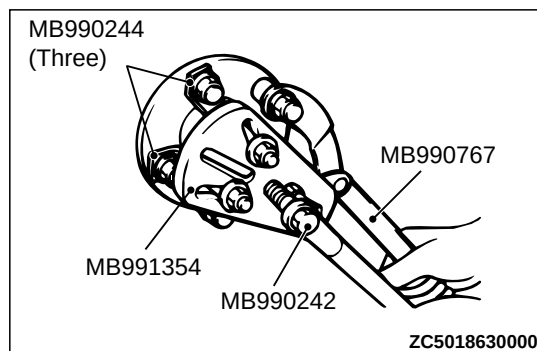
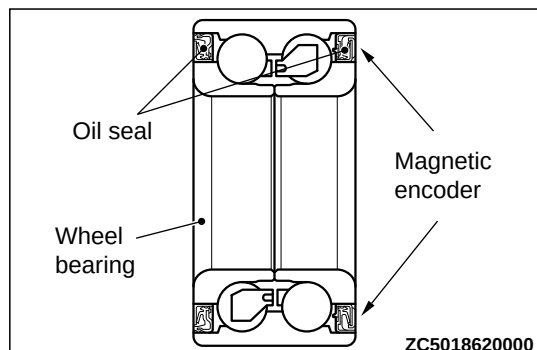
2. Turn the bolt and knob to make the special tool jaws parallel, then hand-tighten the bolt. After tightening, check that the jaws are still parallel.

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 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.



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<< WASHER/DRIVESHAFT NUT INSTALLATION

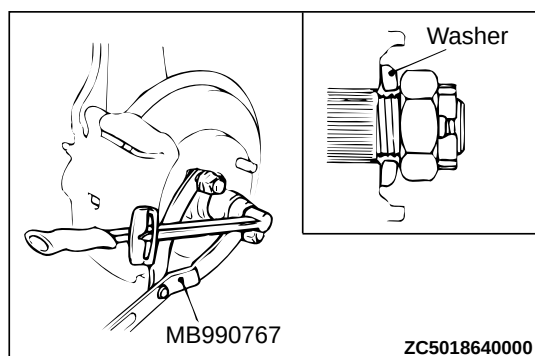
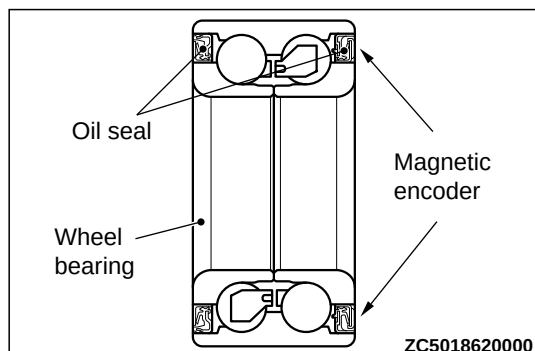
CAUTION

- 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

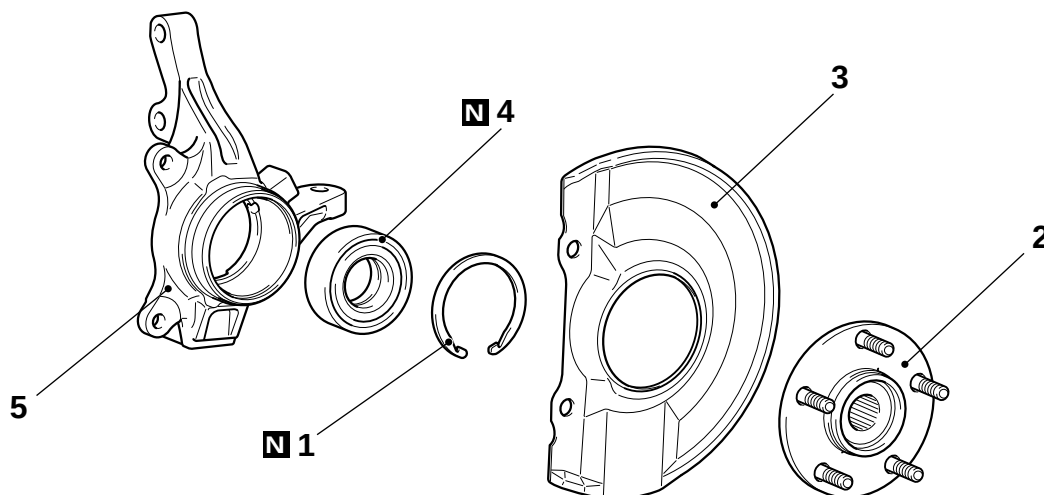
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- Check the hub for cracks and spline for wear.
- Check the knuckle for cracks.
- Check for defective bearing.

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

DISASSEMBLY AND ASSEMBLY

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Disassembly steps

<<A>>

1. Snap ring
2. Hub
3. Dust cover
4. Wheel bearing
5. Knuckle

<>

Assembly steps

5. Knuckle

Assembly steps

- | | |
|--|--|
| >>A<<

>>B<<

>>C<<
>>D<< | 4. Wheel bearing
1. Snap ring
2. Dust cover
3. Hub
· Hub starting torque check
· Wheel bearing end play check |
|--|--|

Required Special Tools:

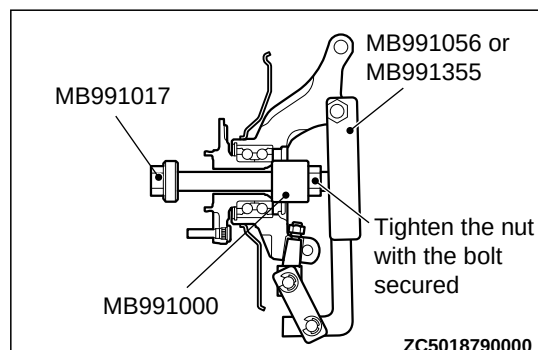
- MB990326: Preload Socket
- MB990810: Side Bearing Puller
- MB990883: Rear Suspension Bushing Arbor
- MB990890: Rear Suspension Bushing Base
- MB990935: Installer Adapter

- MB990938: Brass Bar
- MB991000: Spacer
- MB991017: Front Hub Remover and Installer
- MB991056 or MB991355: Knuckle Arm Bridge
- MB991388: Bush Remover Base
- MB991576: Base

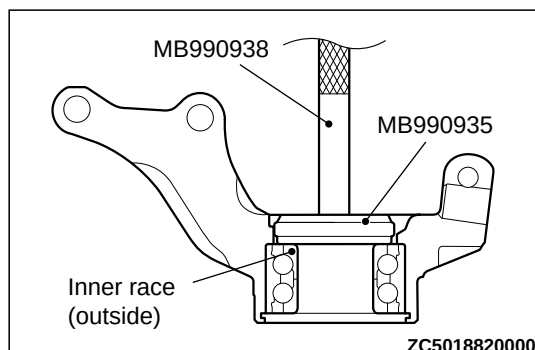
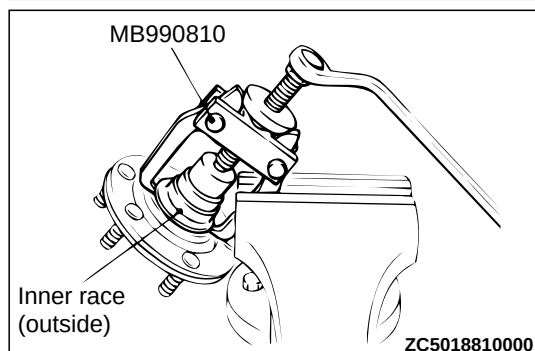
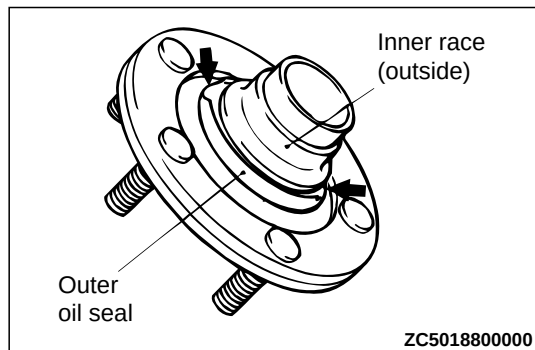
DISASSEMBLY SERVICE POINT**<<A>> HUB REMOVAL**

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

Use special tools MB991017, MB991056 or MB991355, MB991000 to pull out the hub from the knuckle.



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<> WHEEL BEARING REMOVAL

1. Deform the outer oil seal in the area shown in the figure with a screwdriver to engage the special tool tab with the wheel bearing inner race (outside).

CAUTION

When the inner race (outside) has been pulled out, be careful not to drop the hub.

2. Use special tool MB990810 to remove the wheel bearing inner race (outside) from the hub.

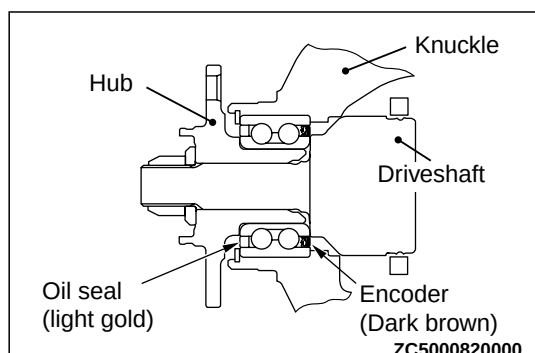
3. Assemble the inner race (outside) removed from the hub to the wheel bearing, and use the following special tools MB990935 and MB990938 to remove the wheel bearing.

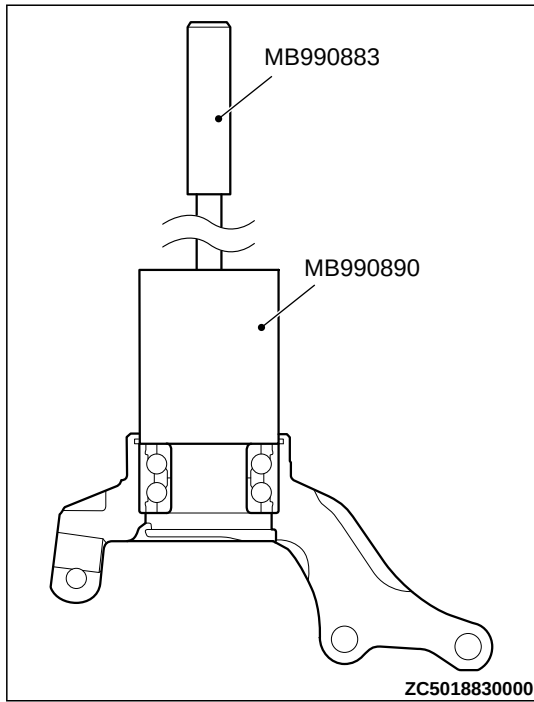
ASSEMBLY SERVICE POINT

>>A<< WHEEL BEARING INSTALLATION

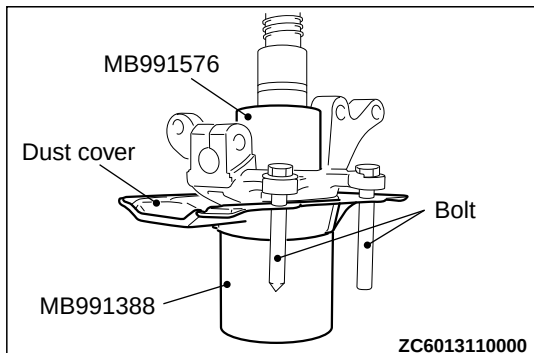
CAUTION

- 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.





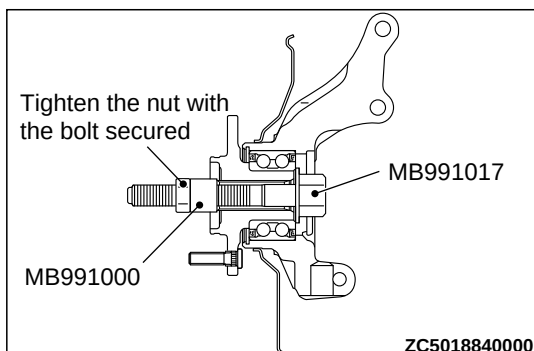
Use special tools MB990883 and MB 990890 to press-fit the wheel bearing.



>>B<< DUST COVER INSTALLATION

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

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

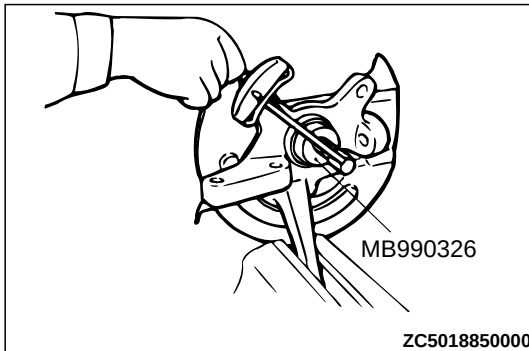


>>C<< HUB ROTATION STARTING TORQUE CHECK

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: $160 \pm 16 \text{ N}\cdot\text{m}$ ($118 \pm 11 \text{ in}\cdot\text{lb}$)

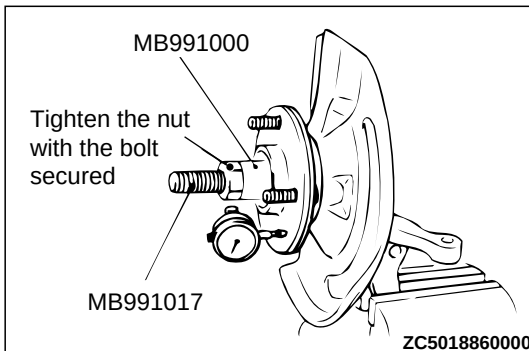
2. Rotate the hub to make the bearing well-greased.



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

Limit: 1.8 N·m (16 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: 160 ± 16 N·m (118 ± 11 in-lb)

INSPECTION

M12601000020USA0000010000

- 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

M12601000035USA0000010000

⚠ 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 wheel speed detection magnetic encoder (integrated with the inner oil seal) does not contact with surrounding parts to avoid damage.

Pre-removal operation

- Transmission Fluid Draining (Refer to GROUP 23A, On-vehicle Service, Transmission Fluid Change P.23A-153.)

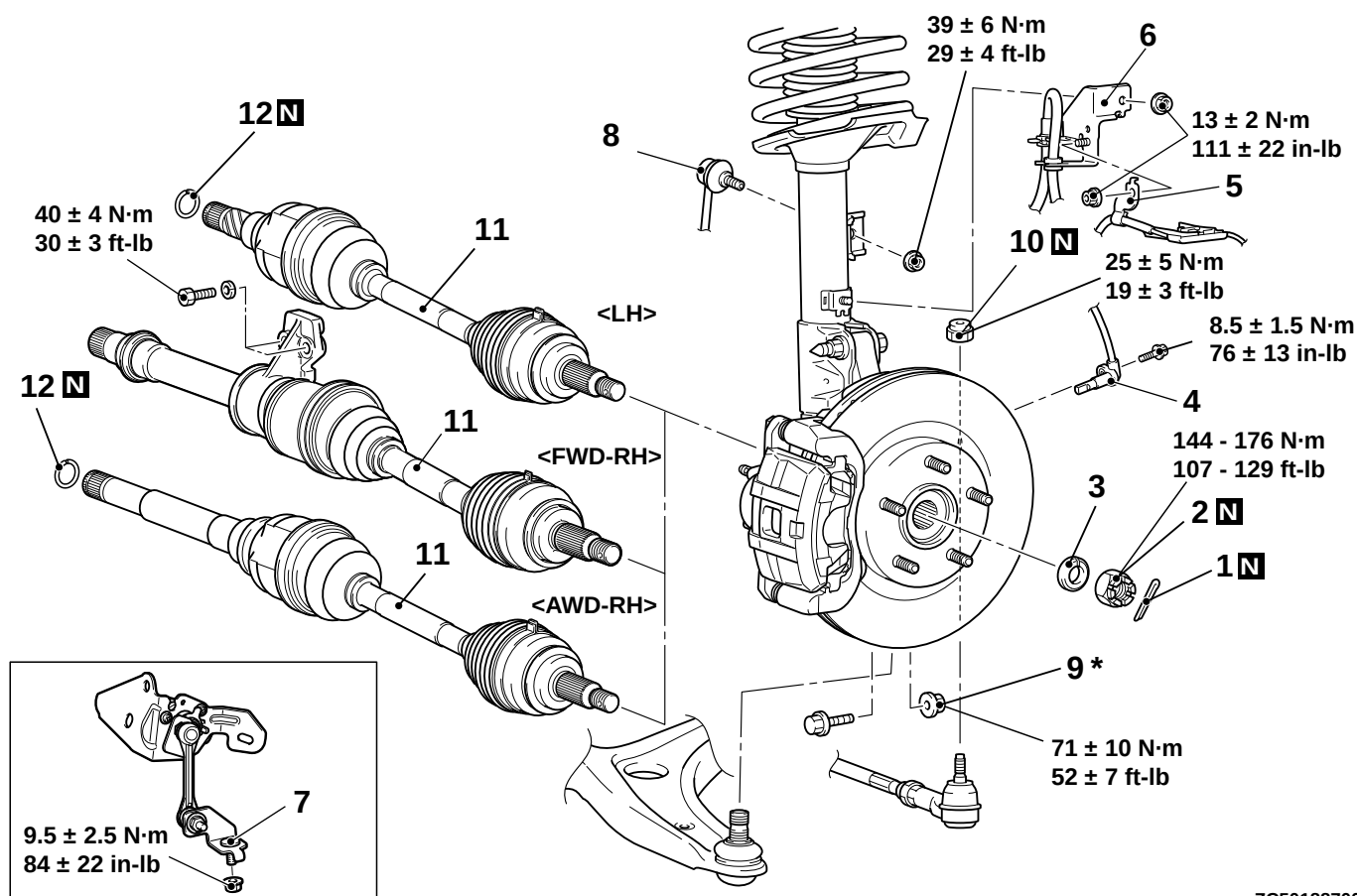
Post-installation operation

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

- When removing and installing the front wheel speed sensor, make sure that the pole piece at the end does not contact with surrounding parts to avoid damage.
- 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.

FRONT AXLE DRIVESHAFT ASSEMBLY

• Transmission Fluid Filling (Refer to GROUP 23A, On-vehicle Service, Transmission Fluid Change P.23A-153.)



ZC5018870000

Removal steps

- <<A>> >>B<<
>>B<<
1. Cotter pin
 2. Driveshaft nut
 3. Washer
 4. Front wheel speed sensor
 5. Front wheel speed sensor harness bracket
 6. Brake hose bracket
 7. Front height sensor to lower arm connection

Removal steps

- <>
<<C>> >>A<<
8. Stabilizer link connection
 9. Self-locking nut (lower arm ball joint connection)
 10. Self-locking nut (tie-rod end connection)
 11. Driveshaft assembly
 12. Circlip

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

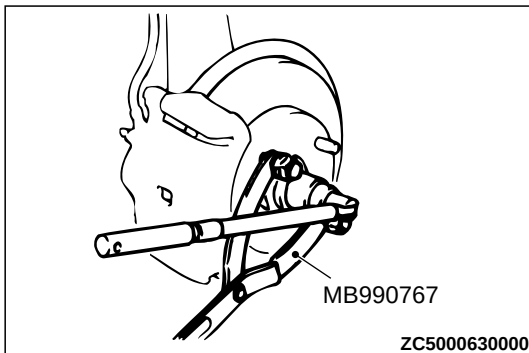
REMOVAL SERVICE POINTS

<<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.

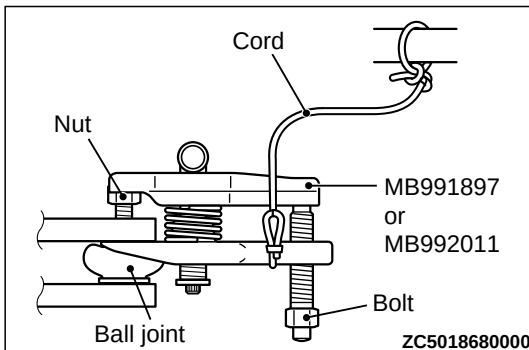


<> SELF-LOCKING NUT (TIE-ROD END CONNECTION) REMOVAL

⚠ 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 rope.

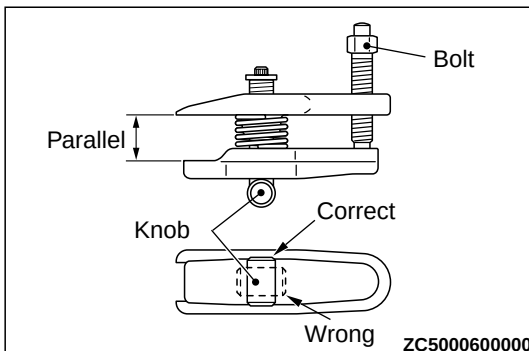
1. Install special tool MB991897 or MB992011, as shown in the figure.

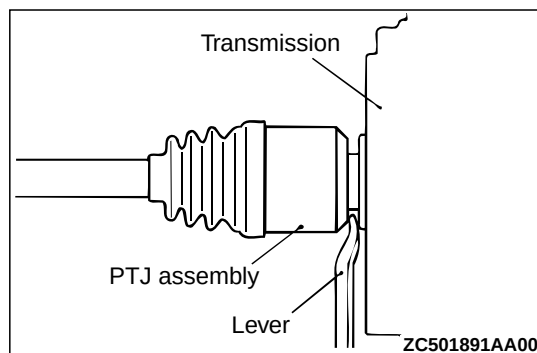
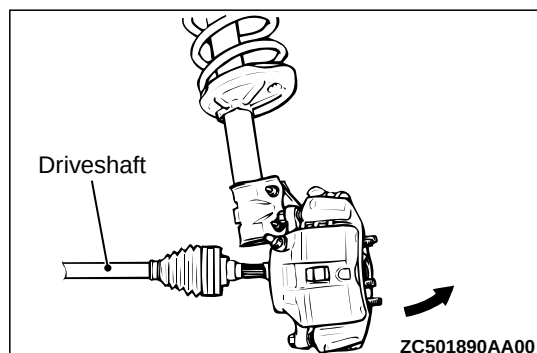
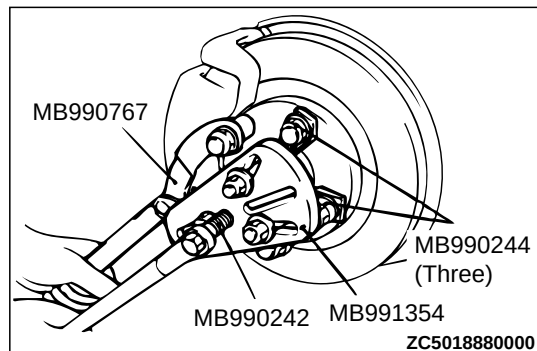
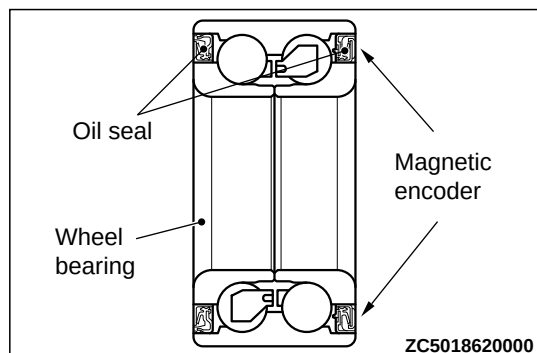


2. Turn the bolt and knob to make the special tool jaws parallel, then hand-tighten the bolt. After tightening, check that the jaws are still parallel.

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.





<<C>> DRIVESHAFT ASSEMBLY REMOVAL

CAUTION

• The magnetic encoder collects metallic particles easily, because it is magnetized. Make sure that the magnetic encoder does not collect metallic particles.

• When removing the driveshaft, make sure that it does not contact with the magnetic encoder (integrated with the inner oil seal) to avoid damage.

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

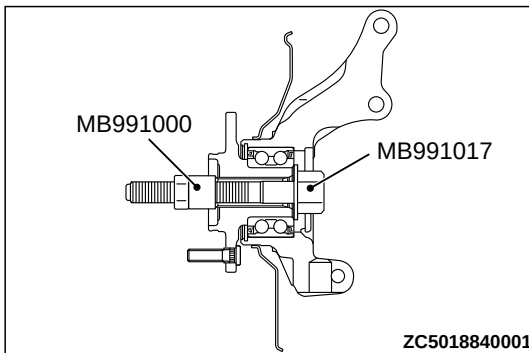
2. While pulling the lower side of the brake disc toward you, remove the driveshaft assembly from the hub.

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. Insert a lever between the transaxle case or transfer and driveshaft assembly, and then pull the driveshaft assembly out from the transaxle.



⚠ CAUTION

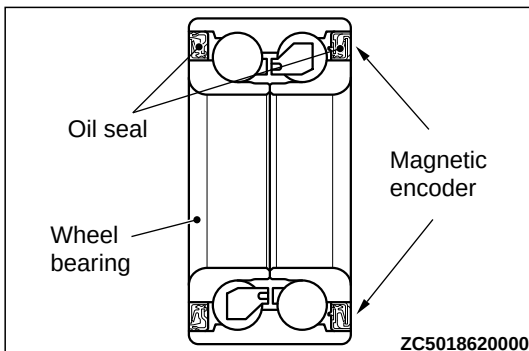
Do not apply the vehicle weight to the wheel bearing with the driveshaft assembly removed. If, however, the vehicle weight shall be applied to the bearing (in order to move the vehicle), tighten the following special tools MB991000 and MB991017 to the specified torque $160 \pm 16 \text{ N}\cdot\text{m}$ ($118 \pm 11 \text{ ft}\cdot\text{lb}$).

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<< WASHER/DRIVESHAFT NUT INSTALLATION

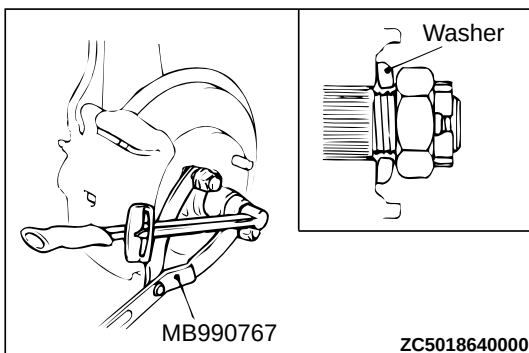
⚠ CAUTION

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: $144 - 176 \text{ N}\cdot\text{m}$ ($107 - 129 \text{ ft}\cdot\text{lb}$)

3. If the pin holes do not align with the pins, tighten the driveshaft nut [less than $200 \text{ N}\cdot\text{m}$ ($147 \text{ ft}\cdot\text{lb}$)] and find the nearest hole then bend the cotter pin to fit it.

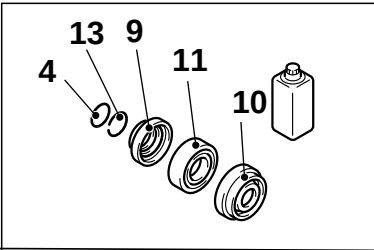


DISASSEMBLY AND ASSEMBLY <FWD>

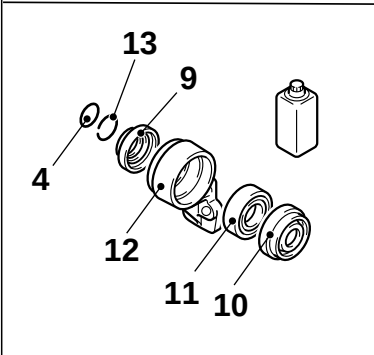
M12601000037USA0000010000

CAUTION

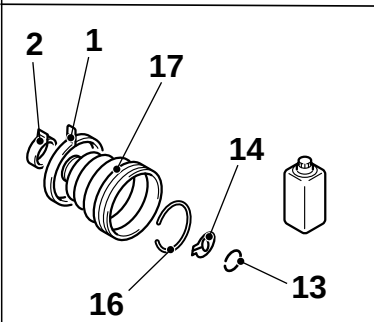
As for the EBJ assembly, only the EBJ boot can be replaceable, and other parts cannot be disassembled.



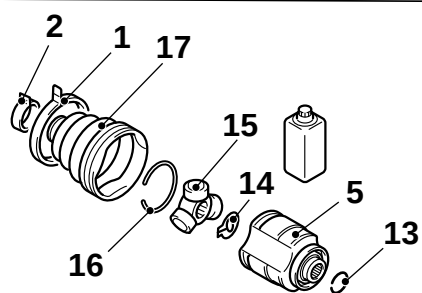
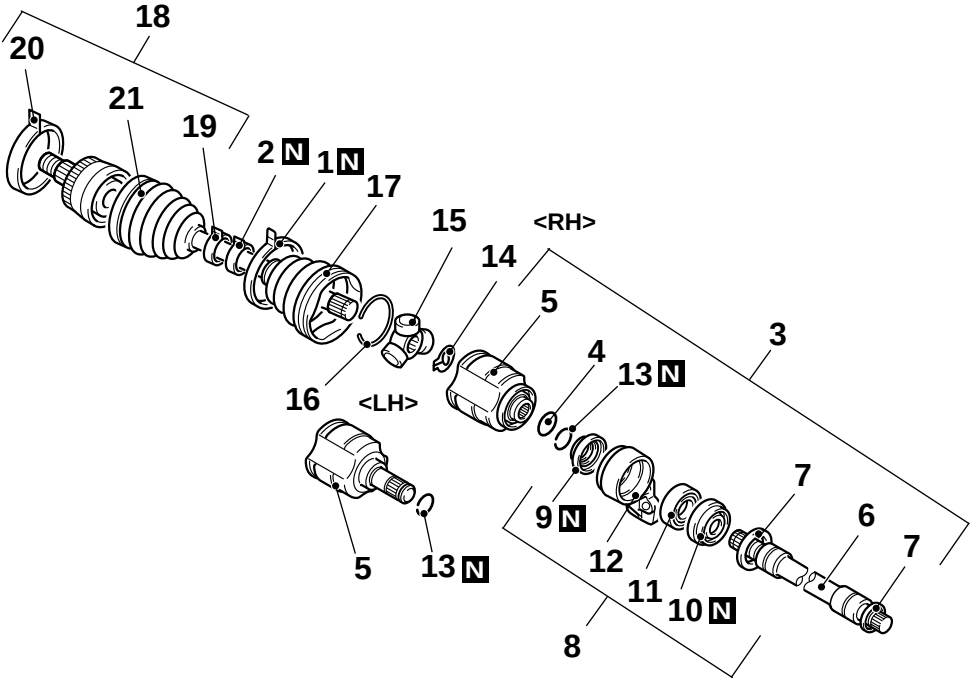
Bearing dust seal repair kit



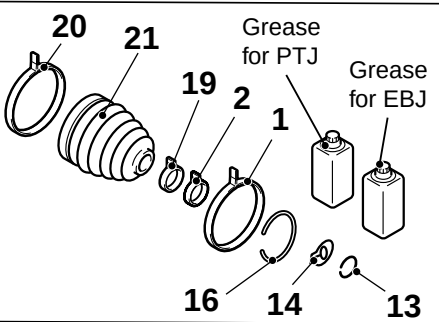
Bracket assembly repair kit



PTJ boot repair kit



PTJ repair kit



EBJ boot repair kit

ZC5018950000

Disassembly steps

- >>F<< 1. PTJ boot band (large)
>>F<< 2. PTJ boot band (small)
>>E<< 3. PTJ case and inner shaft assembly RH
<<A>> >>E<< 4. Seal plate

Disassembly steps

- <> 5. PTJ case
<<C>> >>D<< 6. Inner shaft RH
7. Dust cover RH
8. Bracket assembly RH

		Disassembly steps		Disassembly steps
	>>C<<	9. Dust seal outer RH		16. Circlip
	>>C<<	10. Dust seal inner RH	<<E>>	17. PTJ boot
<<D>>	>>B<<	11. Center bearing RH		18. EBJ assembly
		12. Center bearing bracket RH		19. EBJ boot band (small)
		13. Circlip		20. EBJ boot band (large)
		14. Snap ring		21. EBJ boot
<>	>>A<<	15. Spider assembly		

NOTE:

PTJ: Pillow Tripod Joint

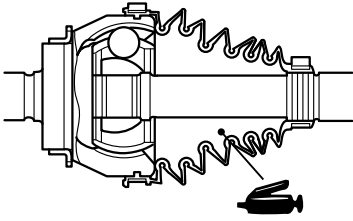
EBJ: High Efficiency Compact Birfield Joint

Required Special Tools:

- MB990810: Side Bearing Puller
- MB990890: Rear Suspension Bushing Base
- MB990930: Installer Adapter

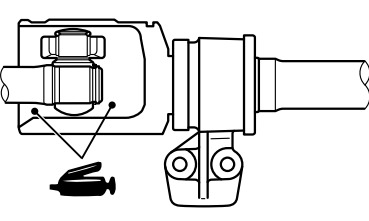
- MB990932: Installer Adapter
- MB990934: Installer Adapter
- MB990938: Bar (snap-in type)
- MB991172: Inner Shaft Installer Base
- MB991248: Inner Shaft Remover
- MD998369: Bearing Installer

LUBRICATION POINTS



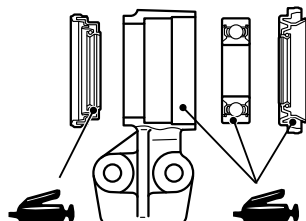
Grease: Repair kit grease amount used:
140 ± 10 g (4.9 ± 0.3 oz)

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

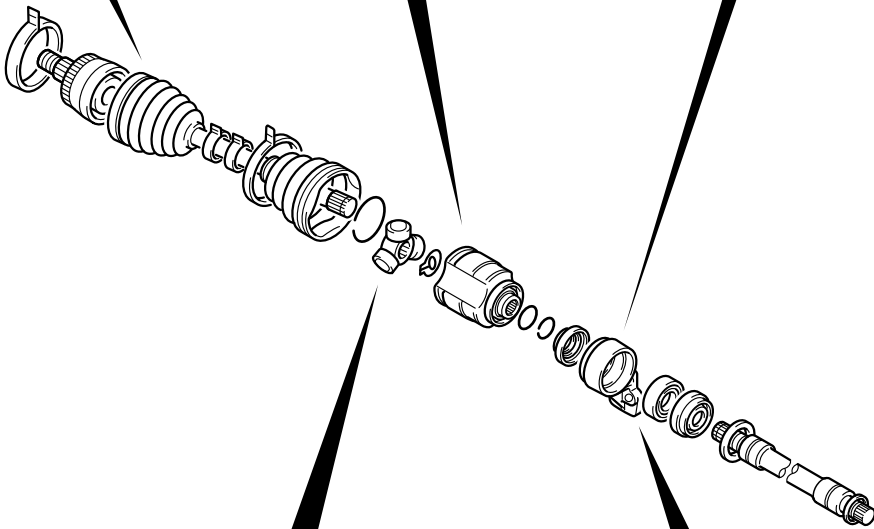


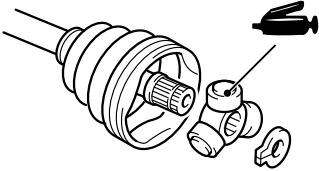
Grease: Repair kit grease amount used:
<RH> 255 ± 10 g (9.0 ± 0.3 oz)
<LH> 245 ± 10 g (8.6 ± 0.3 oz)

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

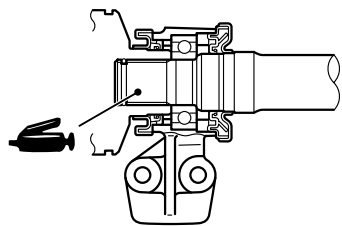


Grease: Repair kit grease amount used:
Dust seal inner: 8 - 12 g (0.3 - 0.4 oz)
Dust seal outer: 3 - 7 g (0.1 - 0.2 oz)





Grease: Repair kit grease

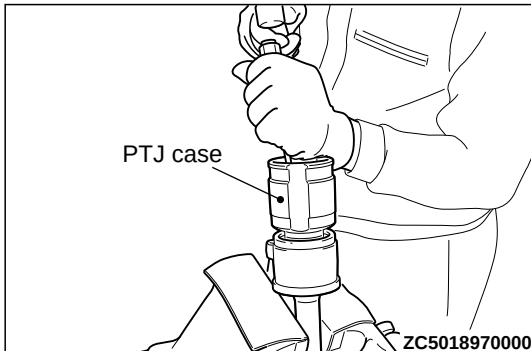


Grease: Repair kit grease

DISASSEMBLY SERVICE POINTS

<<A>> SEAL PLATE REMOVAL

Use a slotted screwdriver to make a hole in the seal plate inside the PTJ case.



<> PTJ CASE/SPIDER ASSEMBLY REMOVAL

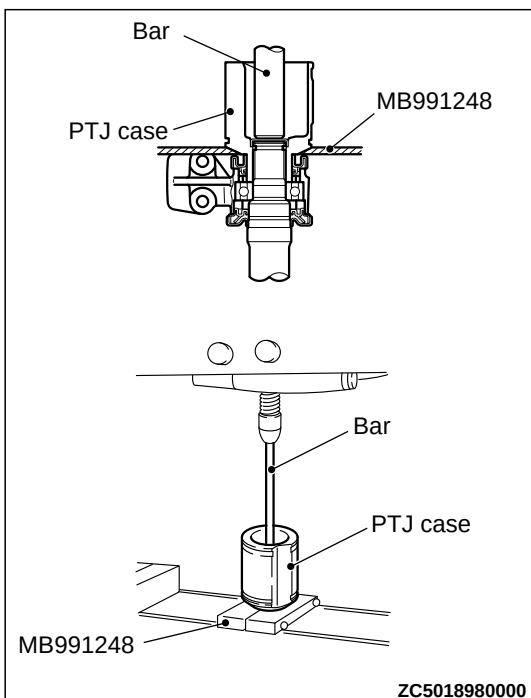
CAUTION

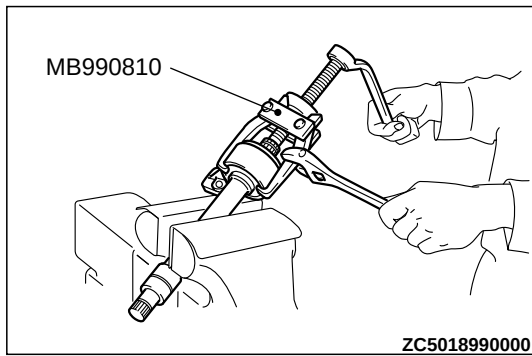
When removing the spider assembly, be careful not to drop the roller part from the spider, because it easily comes off.

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.

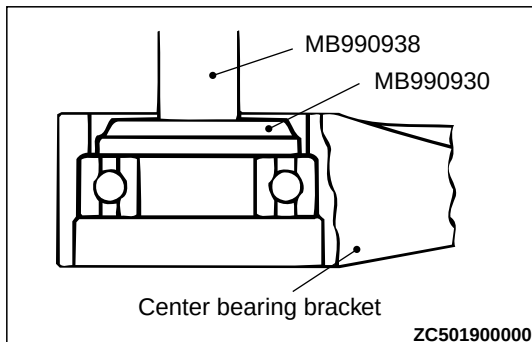
<<C>> INNER SHAFT RH REMOVAL

1. Use special tool MB991248 to remove the inner shaft assembly from the PTJ case.





2. Use special tool MB990810 to remove the center bearing bracket from the inner shaft.



<<D>> CENTER BEARING RH REMOVAL

Use special tools MB990938 and MB990930 to remove the center bearing from the center bearing bracket.

<<E>> 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

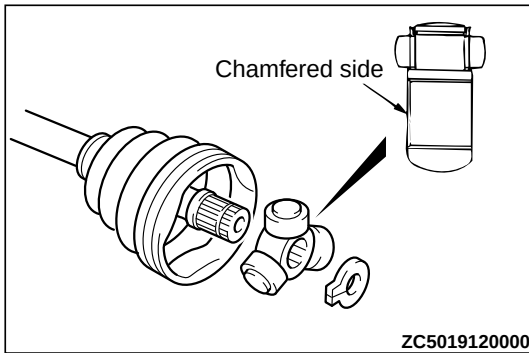
>>A<< SPIDER ASSEMBLY INSTALLATION

⚠ CAUTION

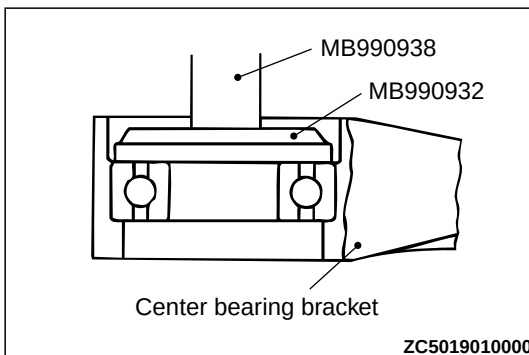
- The driveshaft joint use special grease. Do not mix old and new or different types of grease.
- If the spider assembly has been cleaned, take special care to apply the specified grease.

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.



>>B<< CENTER BEARING RH INSTALLATION

Use special tools MB990938 and MB990932 to press-fit the center bearing into the center bearing bracket.

>>C<< DUST SEAL INNER RH /DUST SEAL OUTER RH INSTALLATION

⚠ CAUTION

When applying grease, make sure that it does not adhere to anything outside the lip.

1. Apply the specified grease to the rear surface of all dust seals.

Specified grease: Repair kit grease

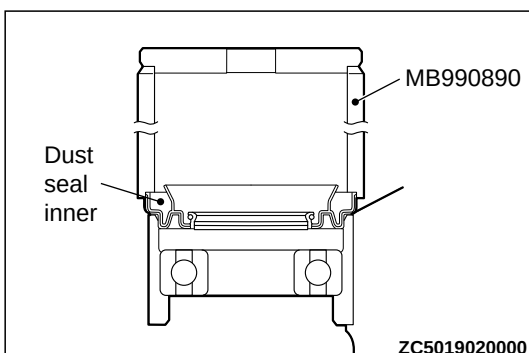
Amount used:

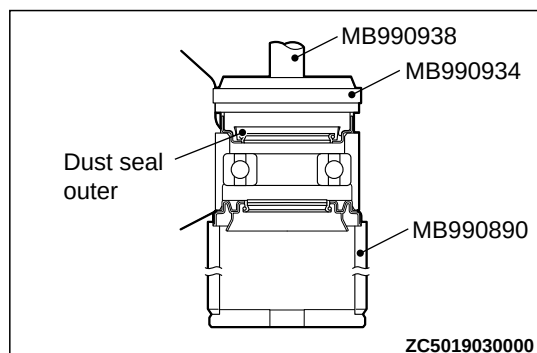
Dust seal inner: 8 - 12 g (0.3 - 0.4 ounce)

Amount used:

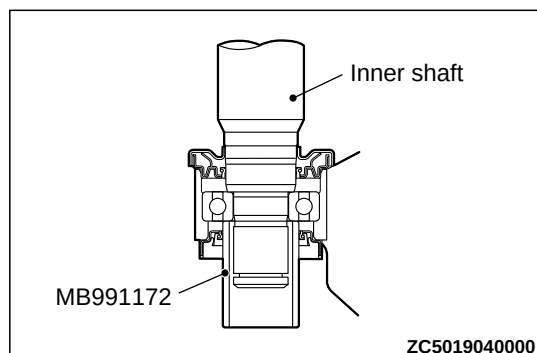
Dust seal outer: 3 - 7 g (0.1 - 0.2 ounce)

2. Use special tools MB990890, MB990938, and MB990934 to press the dust seals into the center bearing bracket until they are flush with each other.
3. Apply repair kit grease to the lip of each dust seal.



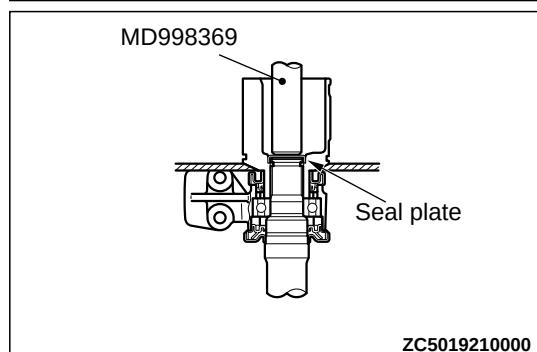
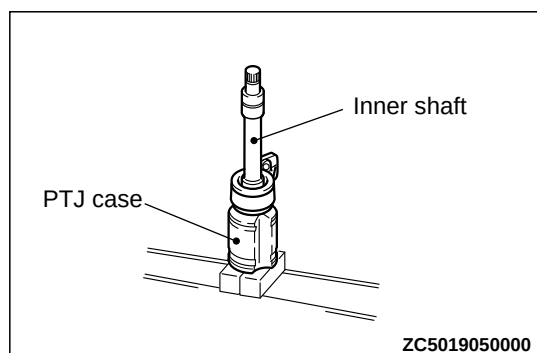
**>>D<< INNER SHAFT RH INSTALLATION**

1. Use special tool MB991172 to hold the center bearing inner race, and then press-in the inner shaft.

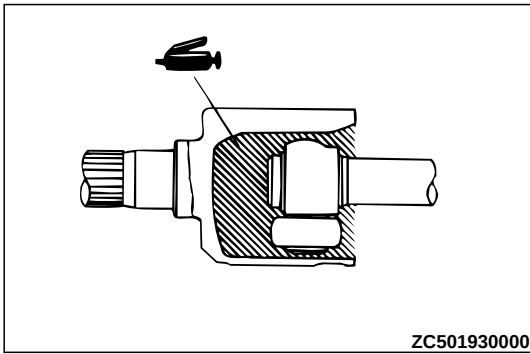
**>>E<< SEAL PLATE/PTJ CASE AND INNER SHAFT ASSEMBLY INSTALLATIONRH**

1. Apply repair kit grease to the inner shaft spline, then press fit it into the PTJ case.

NOTE: When press-fitting the inner shaft into the PTJ case, apply a thin coat of repair kit grease to the dust seal outer lip part and the outside edge of the PTJ axial part.



2. Use special tool MD998369 to press in the seal plate.



⚠ CAUTION

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

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

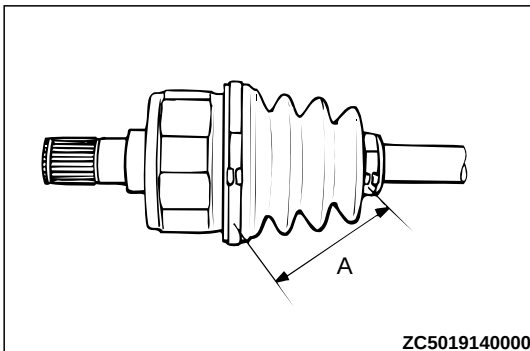
Specified grease: Repair kit grease

Amount to use:

255 ± 10 g (9.0 ± 0.3 ounce) RH

245 ± 10 g (8.6 ± 0.3 ounce) LH

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



>>F<< 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.

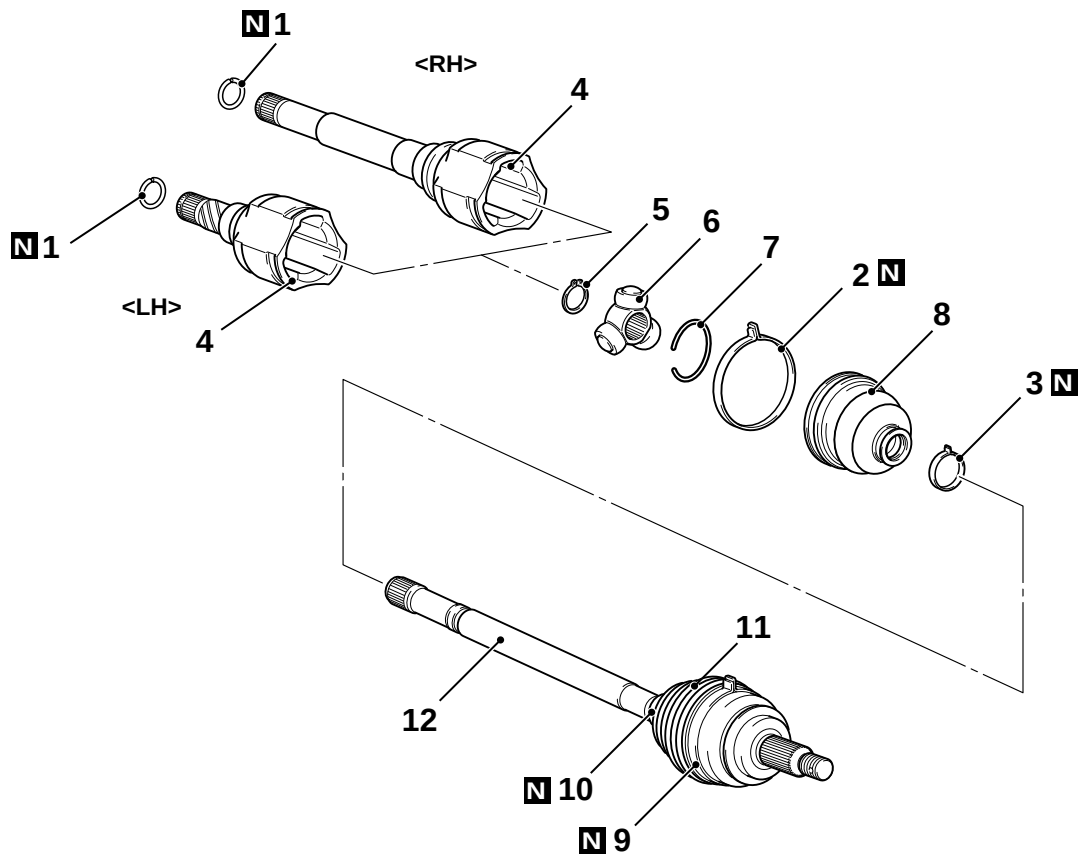
Standard value (A):

95 ± 3 mm (3.74 ± 0.12 inches)

DISASSEMBLY AND ASSEMBLY <AWD>

⚠ CAUTION

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



PTJ boots repair kit	PTJ repair kit	EBJ boots repair kit

ZC5019320000

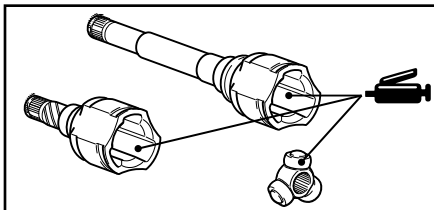
Disassembly steps

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

Disassembly steps

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

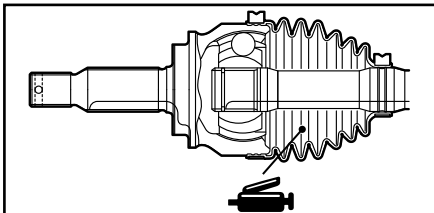
LUBRICATION POINTS



Grease: Repair kit grease
amount used:
<LH> 245 ± 10 g (8.6 ± 0.3 oz)
<RH> 255 ± 10 g (9.0 ± 0.3 oz)

CAUTION

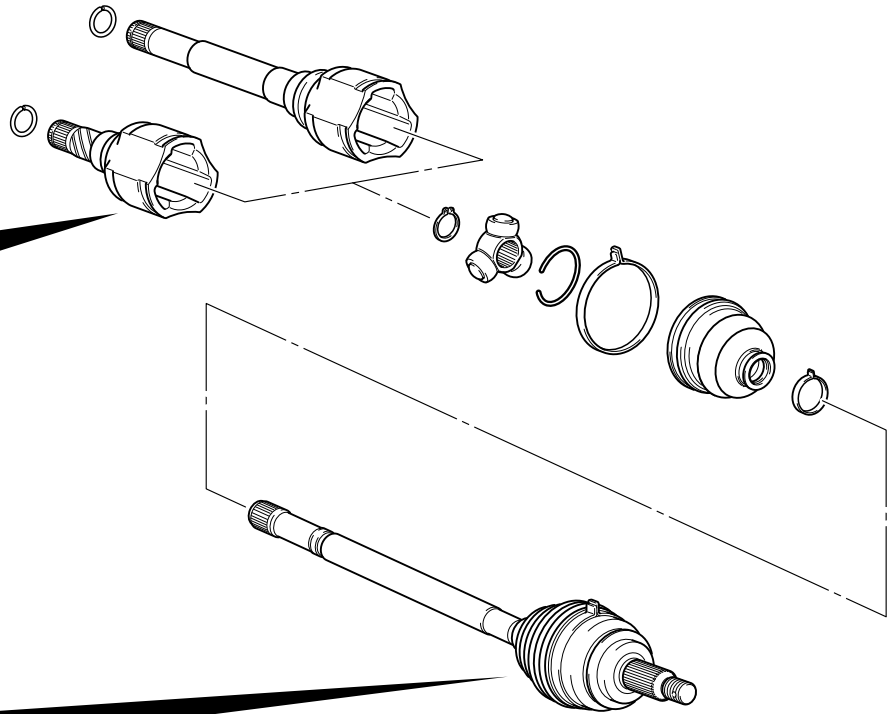
The drive shaft joint uses special grease. do not mix old and new or different types of grease.



Grease: Repair kit grease
amount used: 140 ± 10 g
(4.9 ± 0.3 oz)

CAUTION

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



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DISASSEMBLY SERVICE POINT

<<A>> PTJ CASE/SPIDER ASSEMBLY REMOVAL

CAUTION

Do not disassemble 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.

<> 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.

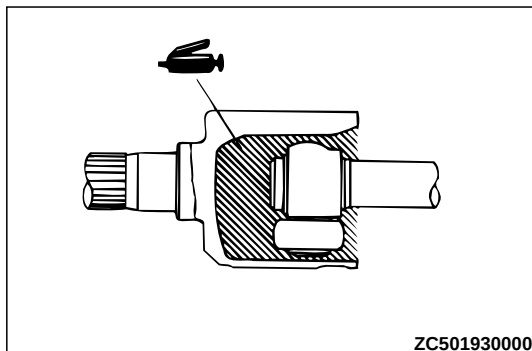
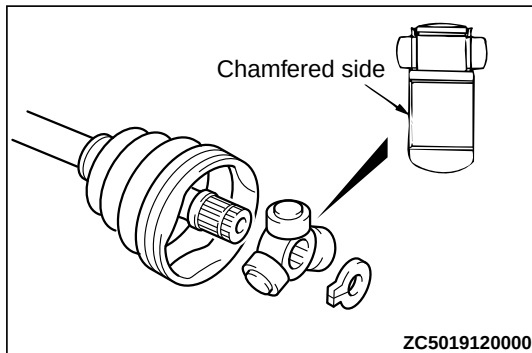
>>B<< SPIDER ASSEMBLY/PTJ CASE INSTALLATION**⚠ CAUTION**

- 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:

245 ± 10 g (8.6 ± 0.3 ounce) LH

255 ± 10 g (9.0 ± 0.3 ounce) RH

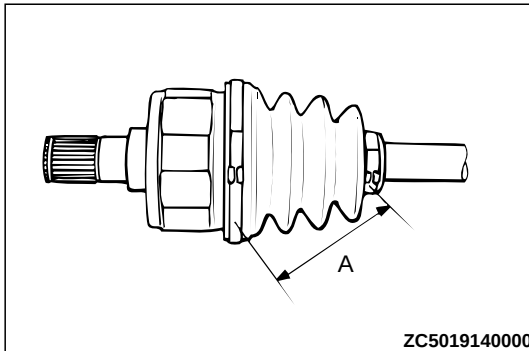
NOTE: When using the repair kit grease, fill the half of the grease into the joint and the other half into the boot as a guideline, and consume the grease completely.

>>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):

$95 \pm 3 \text{ mm}$ ($3.74 \pm 0.12 \text{ inches}$)



INSPECTION

M12601000038USA0000010000

- 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

M12601000075USA0000010000

Required Special Tool:

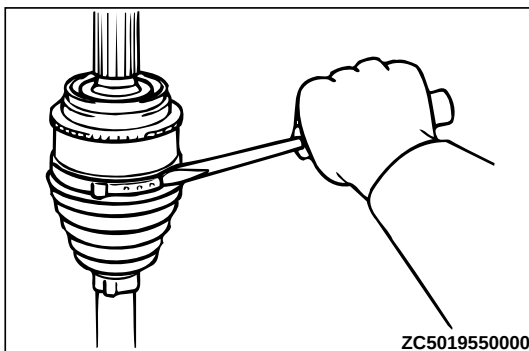
MB991561: Boot Band Crimping Tool

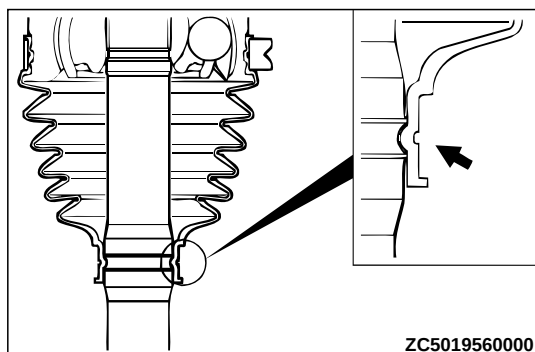
1. Remove the boot bands (large and small).

NOTE: The boot bands cannot be re-used.

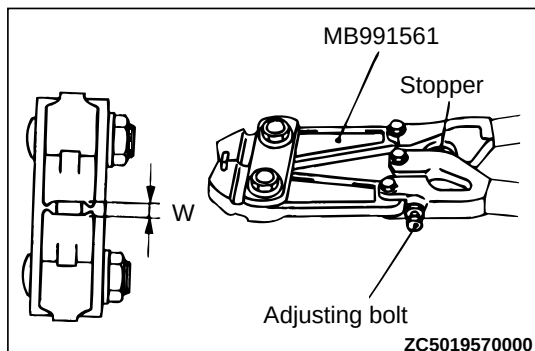
2. Remove the EBJ boot.

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)**

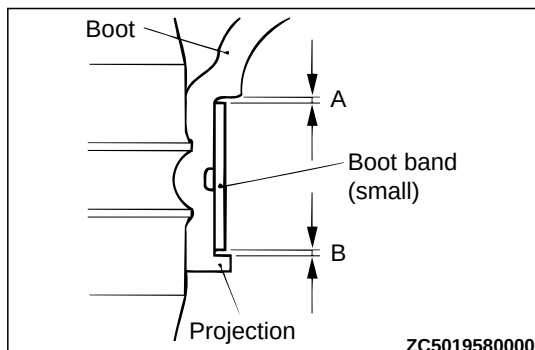
Tighten the adjusting bolt.

***If it is smaller than 2.9 mm (0.11 inch)**

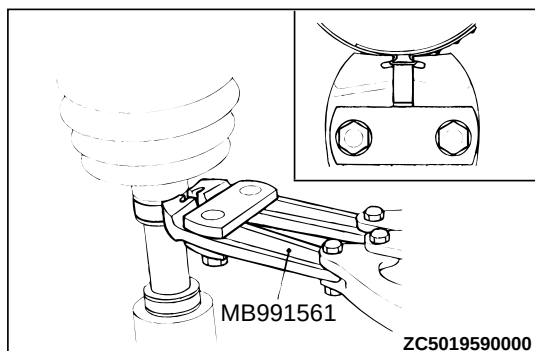
Loosen the adjusting bolt.

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).

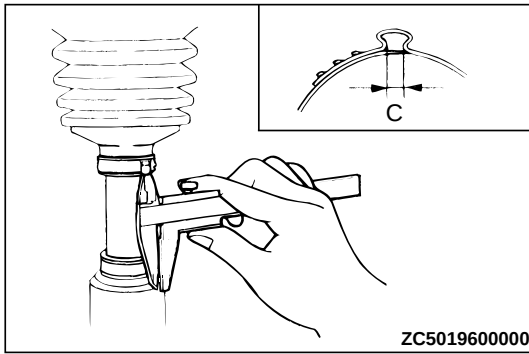


CAUTION

***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.

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

Example: If $C = 2.9 \text{ mm (0.11 inch)}$, then $W = 2.6 \text{ mm (0.10 inch)}$

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.

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

Example: If $C = 2.3 \text{ mm (0.09 inch)}$, then $W = 3.2 \text{ mm (0.13 inch)}$

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.

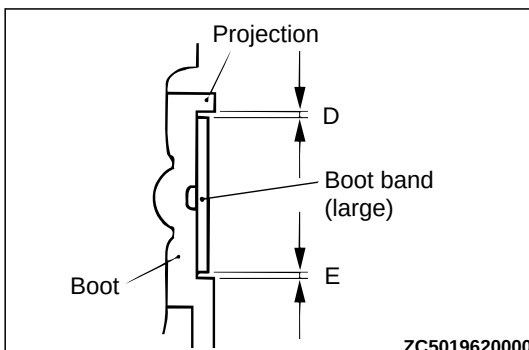
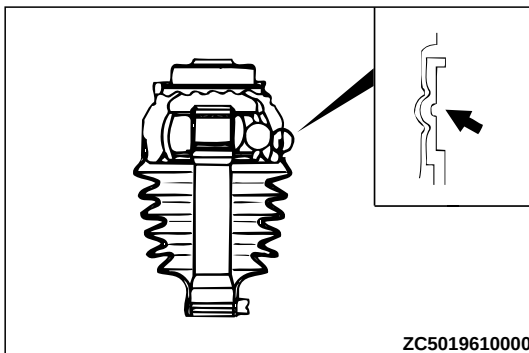
Specified grease: Repair kit grease

Amount to use: $140 \pm 10 \text{ g (4.9 \pm 0.3 ounces)}$

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

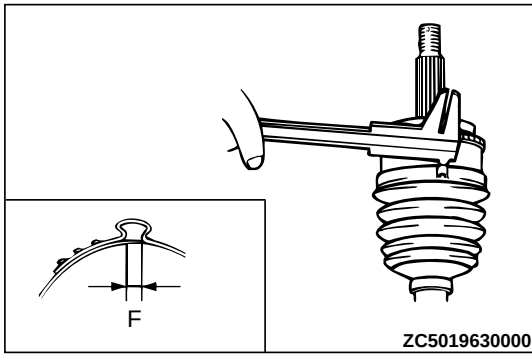
12. Follow the same procedure as in step 5 to adjust the size of the opening (W) on the special tool so that it is at the standard value.

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.

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

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

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.

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

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

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