GROUP 27B

REAR AXLE <AWD>

CONTENTS

GENERAL INFORMATION

M1271000101114

The rear axle has the following features.

- The wheel bearing is a unit ball bearing (double-row angular contact ball bearing) which incorporates the oil seals and is highly resistant to a thrust load.
- The number of parts has been reduced by integrating the magnetic encoder for ABS wheel speed detection into the wheel bearing.
- ETJ-type on the differential side and EUJ-type on the hub side constant velocity joints are featured in the driveshaft.
- Adoption of the electronic control AWD optimizes the size of the driveshaft constant velocity joint and achieves the weight saving.
- Adoption of the Super All Wheel Control (S-AWC) <Vehicles with S-AWC>
- Lead-free grease for the constant velocity joint has been adopted.
- Hexavalent chromium has been eliminated from the dust cover material.
- The electronic control coupling installed in front of the differential, which transfers the drive force to the rear wheels by pushing the clutch in according to the strength of the magnetic attraction generated by the magnetic coil (For more details, refer to Electronic Control AWD).
- Aluminum differential carrier is used for weight saving.
- Optimization of the hypoid gear ratio reduces the torque loss.
- Adoption of the hypoid gear with the same teeth height realizes the downsizing and increases the strength of the coupling.

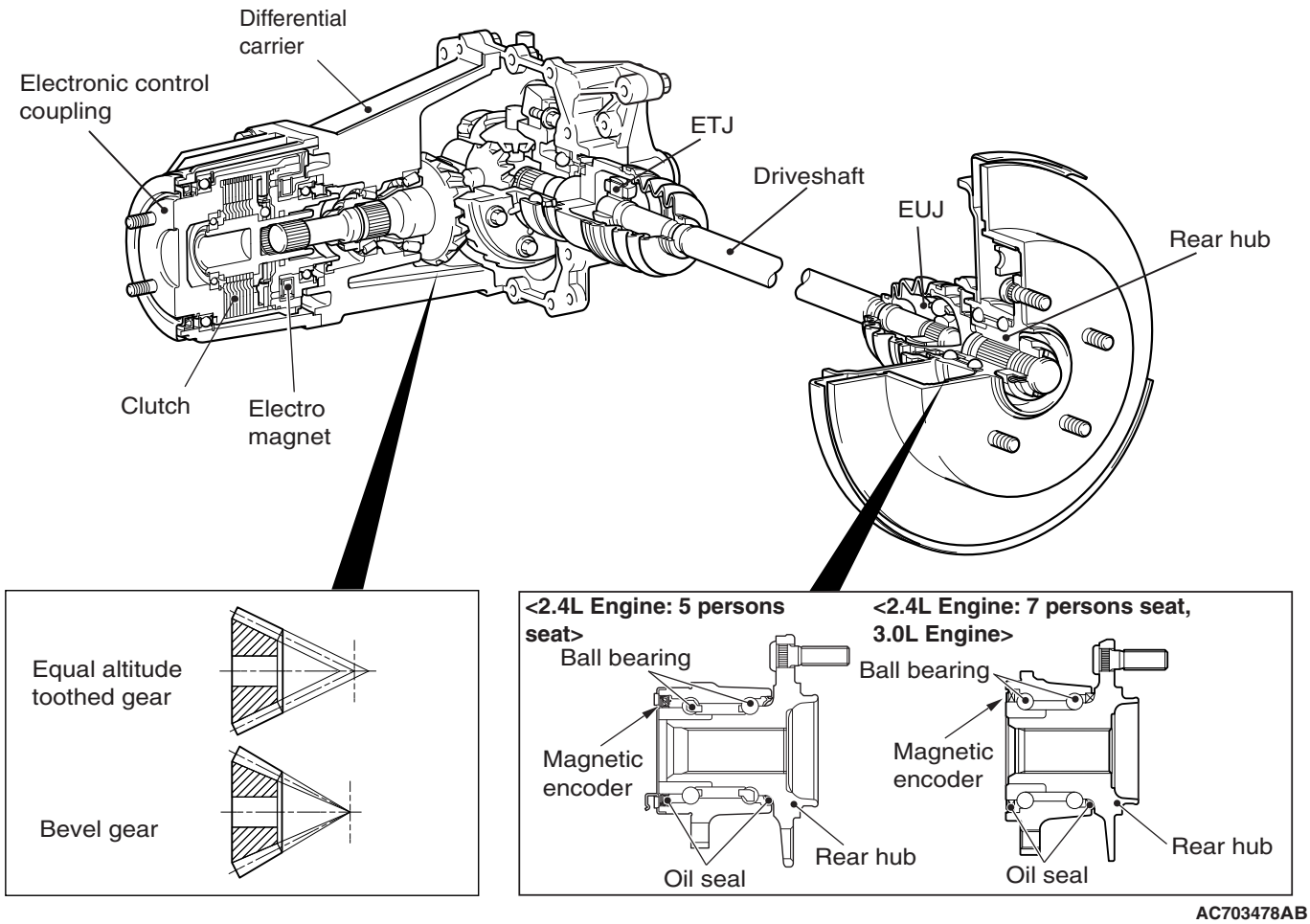
NOTE:

EUJ (High Efficiency Compact Undercut Joint): The lighter and smaller constant velocity joint compared with the conventional BJ has been achieved by adopting the eight small balls.

ETJ (High Efficiency Compact Tripod Joint): The lighter and smaller constant velocity joint compared with the conventional TJ has been installed.

For the Super All Wheel Control (S-AWC), refer to GROUP 23 – Super All Wheel Control (S-AWC) – Information of construction and operation.

CONSTRUCTION DIAGRAM



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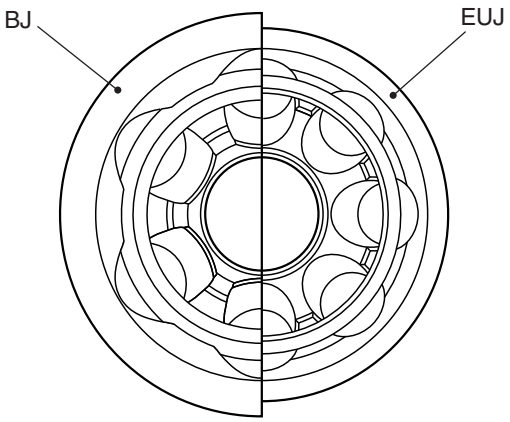
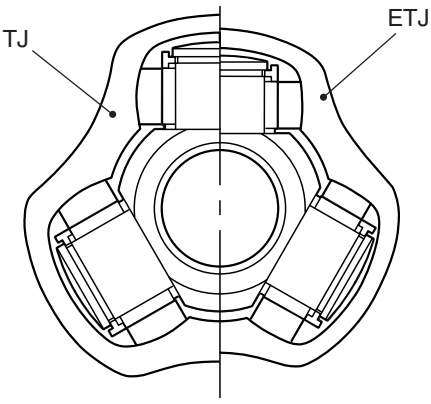
EUJ compared with BJ



ETJ compared with TJ



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GENERAL SPECIFICATIONS

M1271000200196

Item				Specification
Rear axle				
Wheel bearing	Type			Unit ball bearing (double-row angular contact ball bearing)
Driveshaft Joint	Type		Outer	EUJ
			Inner	ETJ
	Shaft length* x Shaft diameter mm (in)	2.4L Engine: 5 persons seat	LH	496.0 × 23 (19.53 × 0.91)
			RH	576.4 × 23 (22.69 × 0.91)
		2.4L Engine: 7 persons seat, 3.0L Engine	LH	505.5 × 23 (19.90 × 0.91)
			RH	586 × 23 (23.07 × 0.91)
Differential				
Reduction gear type				Hypoid gear
Reduction ratio				2.352
Differential gear type (Type × number of gears)			Side gear	Straight bevel gear × 2
			Pinion gear	Straight bevel gear × 2
Number of teeth	Drive gear			40
	Drive pinion			17
	Side gear			14
	Pinion gear			10
Bearings (Outside diameter × Inside diameter) mm (in)			Side	72 × 35 (2.83 × 1.38)
			Front	55 × 30 (2.17 × 1.18)
			Rear	68 × 40 (2.68 × 1.57)

*NOTE: *: Indicates the distance between the center of each joint.*

SERVICE SPECIFICATIONS

M1271000301215

Item		Standard value	Limit
Rear axle total backlash mm (in)		–	5 (0.2)
Wheel bearing end play mm (in)		–	0.05 (0.002)
Hub rotation starting torque N·m(ft-lb)		–	1.4 (1.03)
Electronic control coupling stud bolt length mm (in)		22.3 – 25.1 (0.88 – 0.99)	–
Final drive gear backlash mm (in)		0.08 – 0.15 (0.003 – 0.006)	–
Drive gear runout on backside mm (in)		–	0.05 (0.002)
Differential gear backlash mm (in)		0 – 0.076 (0 – 0.0030)	0.2 (0.01)
Drive pinion rotation torque N·m (in-lb)	When replaced with new one (coated with rust inhibitor oil)	0.7 – 1.2 (6.20 – 10.62)	–
ETJ boot assembly dimension mm (in)		75 ± 3 (2.95 ± 0.12)	–

LUBRICANTS

M1271000400606

Item	Specified lubricant	Quantity
Rear differential gear oil	Hypoid gear oil API classification GL-5, SAE 80	Approx. 0.5 dm^3 (0.53 qt)
ETJ joint	Repair kit grease	75 ± 10 g (2.6 ± 0.3 oz)

SEALANT AND ADHESIVE

M1271000500539

Item	Specified sealant and adhesive
Vent plug	3M™ AAD Part No.8672, 8679, 8678, 8661, 8663 or equivalent
Differential cover assembly	
Differential carrier and electronic control coupling mounting part	
Drive gear and differential case mounting part	3M™ AAD Part No. 8730, 8731 or equivalent

COMPONENT IDENTIFICATION

M1271003800142

DRIVE PINION SPACER

Height of drive pinion spacer mm (in)
24.3 (0.96)
23.6 (0.93)

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REAR AXLE DIAGNOSIS

INTRODUCTION

M1271004100287

Noise from the driveshaft or differential may be caused by defects in the components.

TROUBLESHOOTING STRATEGY

M1271004200314

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 rear 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.

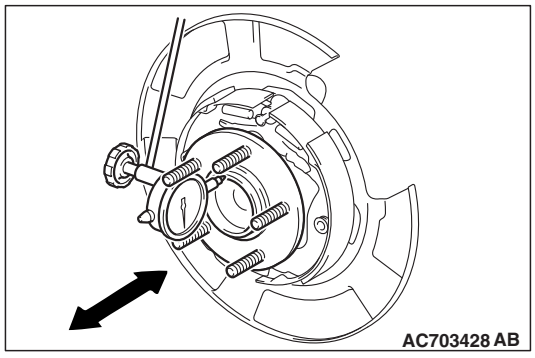
SYMPTOM CHART

M1271004300355

Symptom		Inspection procedure	Reference page
Driveshaft	Noise during wheel rotation	1	P.27B-6
Differential	Constant noise	2	P.27B-7
	Gear noise while driving	3	P.27B-9
	Gear noise while coasting	4	P.27B-10
	Bearing noise while driving or coasting	5	P.27B-10
	Noise while turning	6	P.27B-10
	Heat	7	P.27B-11
	Oil leakage	8	P.27B-11

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: Noise during Wheel Rotation <DRIVESHAFT>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DIAGNOSIS

STEP 1. Check the wheel bearing end play.

(1) Remove the caliper assembly, and suspend the caliper assembly with a wire and remove the brake disc.
(2) Fit the dial gauge as shown in the diagram and move the hub in the axial direction to measure the play.

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 4.

STEP 2. Check if the driveshaft is bent.

Q: Is the driveshaft bent?

YES : Replace the part. Then go to Step 3.
NO : Go to Step 4.

STEP3. 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 4.
NO : There is no action to be taken.

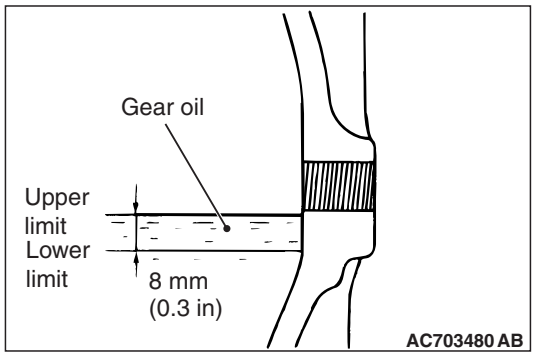
STEP 4. Retest the system.

Q: Is the abnormal noise eliminated?

YES : The procedure is complete.
NO : Start over at Step 1.

INSPECTION PROCEDURE 2: Constant Noise <DIFFERENTIAL>

DIAGNOSIS



STEP 1. Check the oil level.

Remove the filler plug and check the gear oil level.

Q: Is the gear oil level more than 8 mm (0.3 inch) below the bottom of the filler plug hole?

YES : Check the oil leakage from differential carrier, and repair if necessary. Then, refill Hypoid gear oil API classification GL-5 or higher, SAE80. Then go to Step 9.
NO : Go to Step 2.

STEP 2. Check the tooth contact (engagement) of the drive gear and drive pinion (Refer to P.27B-33).

Q: Is the tooth contact (engagement) of the drive gear and drive pinion correct?

YES : Go to Step 3.
NO : Adjust or replace the part. Then go to Step 9.

STEP 3. Check the side bearing for looseness, wear or damage.

Q: Is the side bearing loose, worn or damaged?

YES : Adjust or replace the part. Then go to Step 9.
NO : Go to Step 4.

STEP 4. Check the drive pinion bearing for wear or damage.

Q: Is the drive pinion bearing worn or damaged?

YES : Adjust or replace the part. Then go to Step 9.
NO : Go to Step 5.

STEP 5. Check the drive gear and drive pinion for wear.

Q: Is the drive gear or drive pinion worn?

YES : Replace the part. Then go to Step 9.
NO : Go to Step 6.

STEP 6. Check the side gear spacer or pinion shaft for wear.

Q: Is the side gear spacer or pinion shaft worn?

YES : Replace the part. Then go to Step 9.
NO : Go to Step 7.

STEP 7. Check the drive gear and differential case for wear or damage.

Q: Is the drive gear or differential case strained or damaged?

YES : Replace the part. Then go to Step 9.
NO : Go to Step 8.

STEP 8. Check for foreign material.

Q: Is any foreign material found?

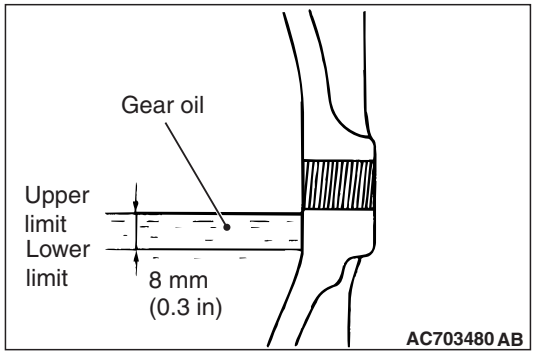
YES : Remove the foreign material and then inspect for damage. If necessary, replace the part. Then go to Step 9.
NO : Go to Step 9.

STEP 9. Retest the system.

Q: Is the abnormal noise eliminated?

YES : The procedure is complete.
NO : Start over at Step 1.

INSPECTION PROCEDURE 3: Gear Noise while Driving <DIFFERENTIAL>



DIAGNOSIS

STEP 1. Check the oil level.

Remove the filler plug and check the gear oil level.

Q: Is the gear oil level more than 8 mm (0.3 inch) below the bottom of the filler plug hole?

YES : Check the oil leakage from differential carrier, and repair if necessary. Then, refill Hypoid gear oil API classification GL-5 or higher, SAE80. Then go to Step 6.

NO : Go to Step 2.

STEP 2. Check the gear engagement.

Q: Is the gear engagement in good condition?

YES : Go to Step 3.

NO : Adjust or replace the part. Then go to Step 6.

STEP 3. Check the drive pinion turning torque.

Q: Is the drive pinion turning torque correct?

YES : Go to Step 4.

NO : Adjust the turning torque. Then go to Step 6.

STEP 4. Check the gear for damage.

Q: Is the gear damaged?

YES : Replace the gear. Then go to Step 6.

NO : Go to Step 5.

STEP 5. Check for foreign material.

Q: Is foreign material found?

YES : Remove the foreign material and then inspect for damage. If necessary, replace the part. Then go to Step 6.

NO : Go to Step 6.

STEP 6. Retest the system.

Q: Is the abnormal noise eliminated?

YES : The procedure is complete.

NO : Start over at Step 1.

INSPECTION PROCEDURE 4: Gear Noise while Coasting <DIFFERENTIAL>

DIAGNOSIS

STEP 1. Check the drive pinion turning torque.

Q: Is the drive pinion turning torque correct?
YES : Go to Step 2.
NO : Adjust the turning torque. Then go to Step 3.

STEP 2. Check the gear for damage.

Q: Is the gear damaged?
YES : Replace the gear. Then go to Step 3.
NO : Go to Step 3.

STEP 3. Retest the system.

Q: Is the abnormal noise eliminated?
YES : The procedure is complete.
NO : Start over at Step 1.

INSPECTION PROCEDURE 5: Bearing Noise while Driving or Coasting <DIFFERENTIAL>

DIAGNOSIS

STEP 1. Check the drive pinion rear bearing for cracks or damage.

Q: Is the drive pinion rear bearing cracked or damaged?
YES : Replace the part. Then go to Step 2.
NO : Go to Step 2.

STEP 2. Retest the system.

Q: Is the abnormal noise eliminated?
YES : The procedure is complete.
NO : Start over at Step 1.

INSPECTION PROCEDURE 6: Noise while Turning <DIFFERENTIAL>

DIAGNOSIS

STEP 1. Check the side bearing for wear or damage.

Q: Is the side bearing worn or damaged?
YES : Replace the part. Then go to Step 3.
NO : Go to step 2.

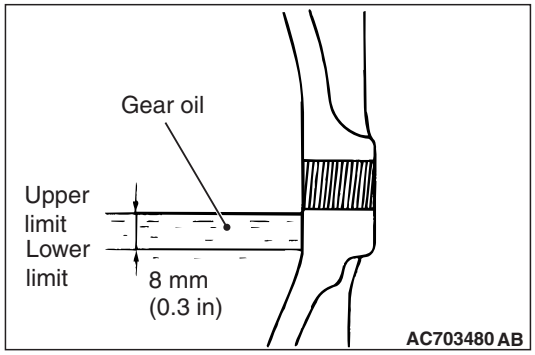
STEP 2. Check the side gear, pinion gear or pinion shaft for damage.

Q: Is the side gear, pinion gear or pinion shaft damaged?
YES : Replace the part. Then go to Step 3.
NO : Go to Step 3.

STEP 3. Retest the system.

Q: Is the abnormal noise eliminated?
YES : The procedure is complete.
NO : Start over at Step 1.

INSPECTION PROCEDURE 7: Heat <DIFFERENTIAL>



DIAGNOSIS

STEP 1. Check the oil level.
Remove the filler plug and check the gear oil level.

Q: Is the gear oil level more than 8 mm (0.3 inch) below the bottom of the filler plug hole?

YES : Check the oil leakage from differential carrier, and repair if necessary. Then, refill Hypoid gear oil API classification GL-5 or higher, SAE80. Then go to Step 3.

NO : Go to Step 2.

STEP 2. Check for excessive gear backlash (Refer to P.27B-39).

Q: Is the gear backlash correct?

YES : Go to Step 3.

NO : Adjust the backlash. Then go to step 3.

STEP 3. Retest the system.

Q: Is the heat eliminated?

YES : The procedure is complete.

NO : Start over at Step 1.

INSPECTION PROCEDURE 8: Oil Leakage <DIFFERENTIAL>

DIAGNOSIS

STEP 1. Check the cover installation.

Q: Is the cover installed correctly?

YES : Go to Step 2.

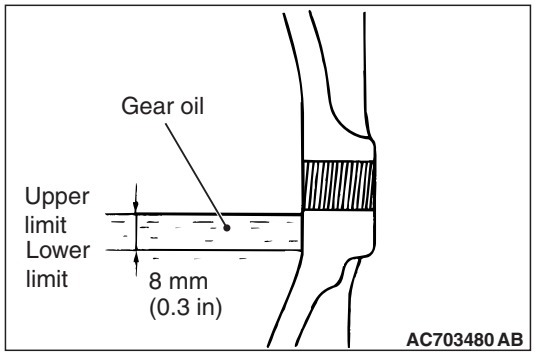
NO : Repair. Then go to Step 4.

STEP 2. Check the oil seal for wear or damage.

Q: Is the oil seal worn or damaged?

YES : Replace the seal. Then go to Step 4.

NO : Go to Step 3.



STEP 3. Check the oil level.

Remove the filler plug and check the gear oil level.

Q: Is the gear oil level more than 8 mm (0.3 inch) below the bottom of the filler plug hole?

YES : Refill Hypoid gear oil API classification GL-5 or higher, SAE80. Then go to Step 4 .

NO : Go to Step 4.

STEP 4. Retest the system.

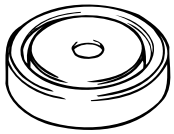
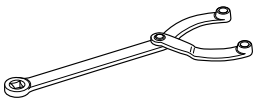
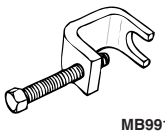
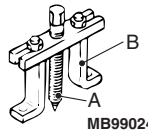
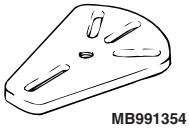
Q: Is there oil leakage?

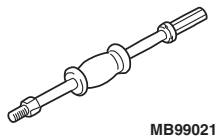
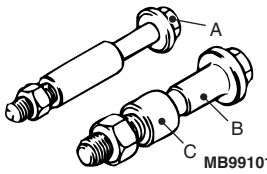
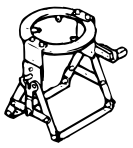
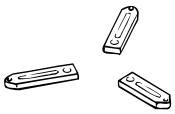
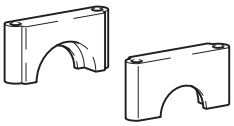
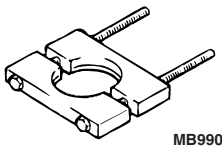
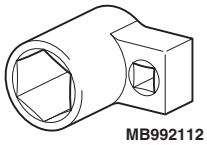
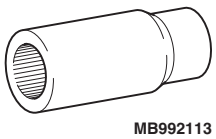
YES : Start over at Step 1.

NO : The procedure is complete.

SPECIAL TOOLS

M1271000600978

Tool	Tool number and name	Supersession	Application
	MB991115 Oil seal installer	MB991115-01	Oil seal press-fitting (used in combination with MB990938)
	MB990767 Front hub and flange yoke holder	MB990767-01	Hub fixing
	MB991618 Hub bolt remover	General service tool	Hub bolt removal
	MB990241 Axle shaft puller A: MB990242 Puller shaft B: MB990244 Puller bar	MB990241-01 or General service tool	• Driveshaft removal • Rear hub assembly removal
	MB991354 Puller body	General service tool	

Tool	Tool number and name	Supersession	Application
 MB990211	MB990211 Slide hammer	General service tool	Rear hub assembly removal
 MB991017	A: MB991017 B: MB990998 C: MB991000 A, B: Front hub remover and installer C: Spacer	MB990998-01	• Wheel bearing temporarily fixing • Hub rotation starting torque measurement • Wheel bearing axial looseness measurement Use MB991000 (a part of MB990998) for spacer
 MB990909	MB990909 Working base	General service tool	Differential carrier assembly disassembly/assembly
	MB991116 Working base adapter	General service tool	
 MB992111	MB992111 Side bearing holder	–	Differential carrier fixing
 MB990810	MB990810 Side bearing puller	MB990810-01	Differential side bearing inner race removal
 MB990560	MB990560 Rear axle shaft bearing remover	MD998348-01	Drive pinion rear bearing inner race removal
 MB992112	MB992112 Locking nut wrench	–	Differential nut removal
 MB992113	MB992113 Drive pinion holder	–	• Rear axle backlash inspection • Drive pinion fixing

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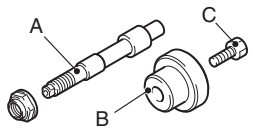
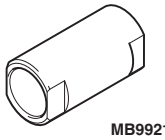
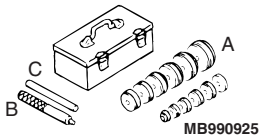
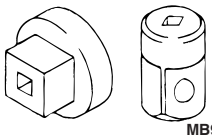
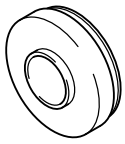
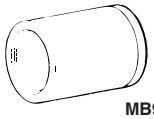
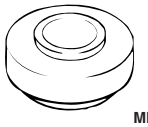
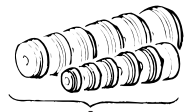
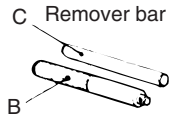
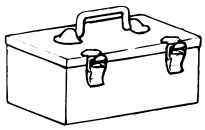
Tool	Tool number and name	Supersession	Application
 MB992114AB	MB992114 Dummy pinion gauge assembly A: MB992115 Dummy pinion gauge body B: MB992116 Dummy pinion gauge head C: MB992128 Hex socket head bolt	–	Drive pinion height adjustment
 MB992117	MB992117 Cylinder gauge	General service tool	
 MB990925	MB990925 Bearing and oil seal installer set A: MB990926 to MB990937 Installer adapter B:MB990938 Installer bar C:MB990939 Remover bar	MB990925-01 or General service tool	• Differential carrier oil seal driving in • Final drive gear teeth contact inspection • Drive pinion bearing removal/press-fitting
 MB990326	MB990326 Preload socket	General service tool	Hub rotation torque measurement
	MD998816 Bearing installer	–	Drive pinion rear bearing inner race press-fitting
 MB991180	MB991180 Bushing remover and installer base	–	Drive pinion oil seal press-fitting
 MB990829	MB990829 Pinion and side bearing installer	–	Side bearing inner race press-fitting

MB990925 Bearing and oil seal installer set

Tool	Type	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

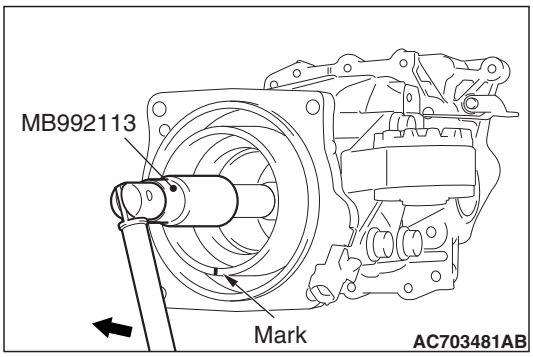
REAR AXLE TOTAL BACKLASH CHECK

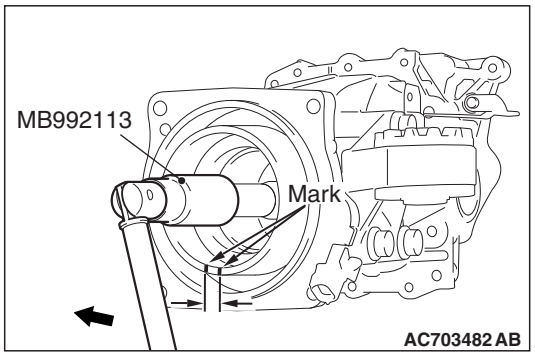
M1271001200445

Required Special Tool:

- MB992113: Drive Pinion Holder

1. Shift the selector lever in the Neutral position, pull the parking brake lever, and then raise the vehicle using a jack.
2. Remove the propeller shaft. (Refer to GROUP 25 – Propeller Shaft P.25-7.)
3. Remove the electronic control coupling.(Refer to P.27C-97.)
4. Install special tool MB992113 to the drive pinion. Lightly turn the special tool clockwise to eliminate free play between the drive pinion serration and the special tool, and then put a mark on the flange.





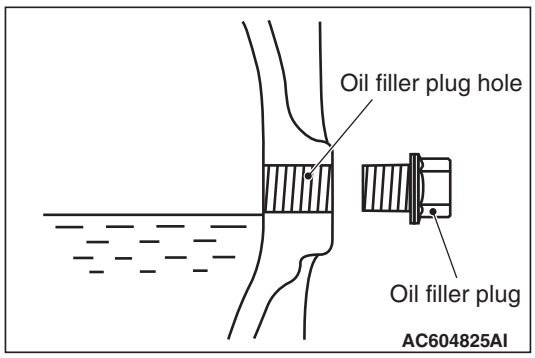
5. Rotate the special tool clockwise until it stops, and then put a mark on the flange. Measure the distance between the marks.

   Limit: 5 mm (0.2 inch)

6. If the backlash exceeds the limit, remove the differential carrier assembly and check the following.
   - Final drive gear backlash(Refer to P.27B-39)
   - Differential gear backlash(Refer to P.27B-39)

GEAR OIL LEVEL CHECK

M1271004900089



1. Remove the filler plug.
2. Check that the oil level is up to lower edge of the oil filler plug hole.
3. Check that the 0il is not noticeably dirty.
4. Tighten the filler plug to the specified torque.

   Tightening torque: 32 ± 2 N·m (23 ± 2 ft-lb)

GEAR OIL REPLACEMENT

M1272004600252

1. Remove the filler plug.
2. Remove the drain plug and drain oil.
3. Tighten the drain plug to the specified torque.

   Tightening torque: 32 ± 2 N·m (23 ± 2 ft-lb)

4. Add the oil until the level comes to the lower portion of the filler plug hole.

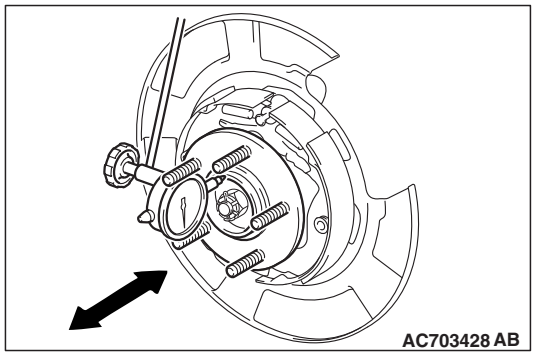
   Specified gear oil: Hypoid gear oil API classification GL-5, SAE 80

5. Tighten the filler plug to the specified torque.

   Tightening torque: 32 ± 2 N·m (23 ± 2 ft-lb)

WHEEL BEARING END PLAY CHECK

M1271000900861



1. Remove the caliper assembly and the brake disk. Retain the caliper assembly 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 looseness.
   Limit: 0.05 mm (0.002 inch)
3. When the looseness exceeds the limit value, replace the rear wheel hub assembly.
4. After checking, install the brake disk and the caliper assembly, and tighten the caliper mounting bolt to the specified torque (Refer to P.27B-19).

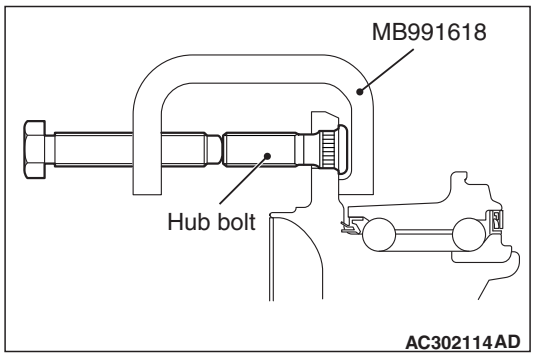
HUB BOLT REPLACEMENT

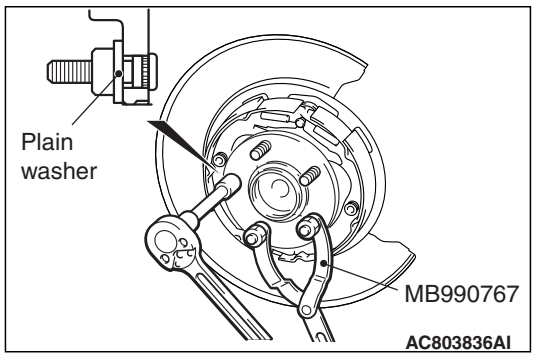
M1271001000582

Required Special Tools:

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

1. Remove the caliper assembly and the brake disk. Retain the caliper assembly with a wire and the like to prevent from falling.
2. Use special tool MB991618 to remove the hub bolts.

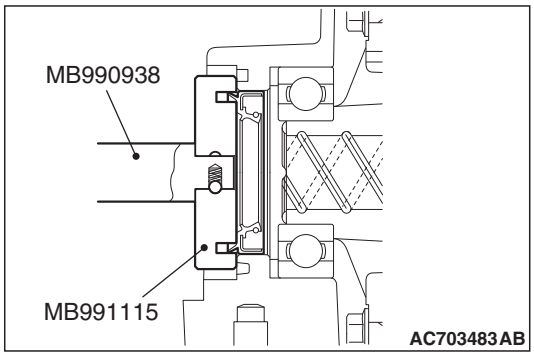




3. After fixing the hub using special tool MB990767, install the plain washer to the new hub bolt, and tighten the bolt with a nut.
4. Install the brake disk, caliper assembly and tighten the caliper assembly mounting bolts to the specified torque (Refer to P.27B-19).

DIFFERENTIAL CARRIER OIL SEAL REPLACEMENT

M1271005100053



Required Special Tools:

- MB990938: Installer Bar
- MB991115: Oil Seal Installer

1. Remove the driveshaft.(Refer to P.27B-24.)
2. Remove the differential carrier oil seal.
3. Use special tools MB990938 and MB991115 to press-fit a new oil seal.
4. Apply multi-purpose grease to the oil seal lip and driveshaft oil seal seating area.
5. Replace the drive shaft circlip with a new one, and install the driveshaft. (Refer to P.27B-24.)

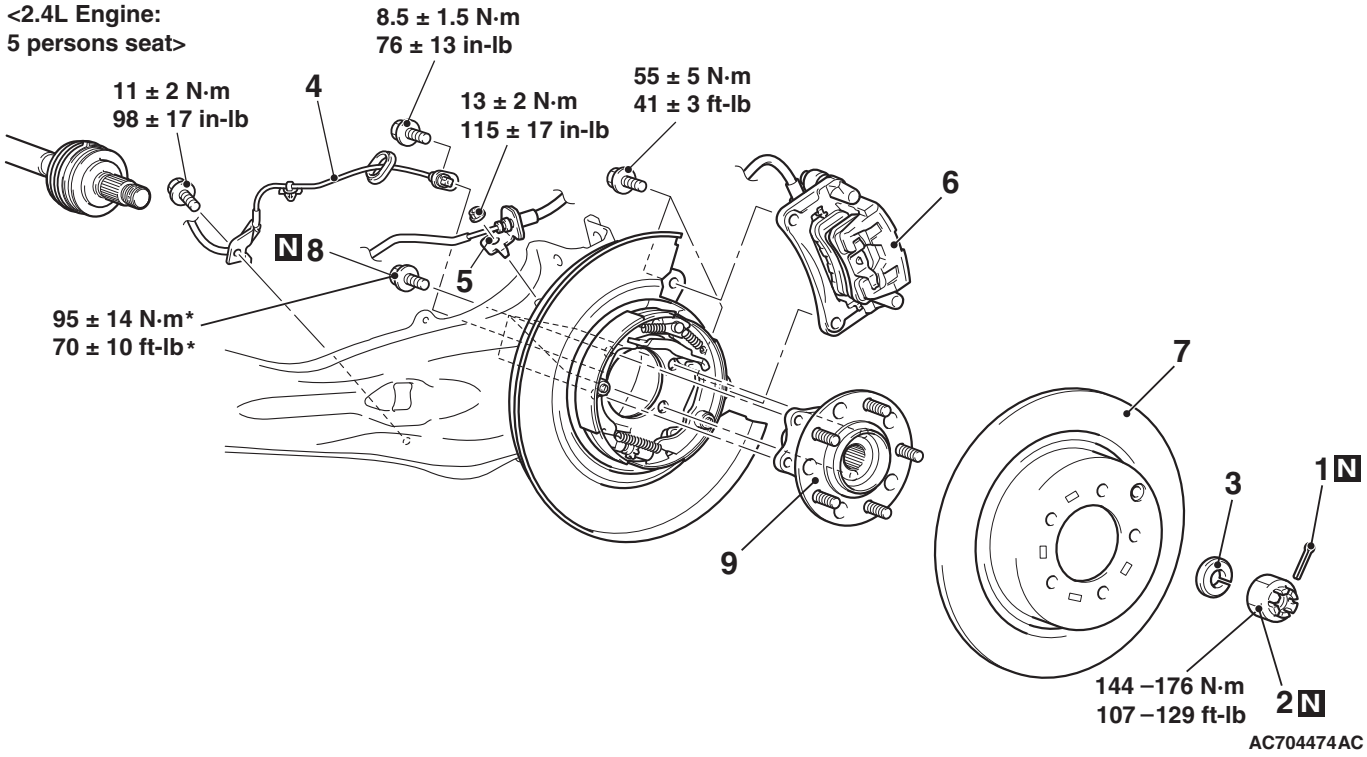
REAR AXLE HUB ASSEMBLY

REMOVAL AND INSTALLATION

M1271002000938

⚠ CAUTION

- **Do not disassemble the rear wheel hub assembly.**
- **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 the rear wheel hub assembly is removed/installed, make sure that the magnetic encoder (integrated with inner oil seal) does not contact with surrounding parts to avoid damage.**
- **When removing and installing the rear wheel speed sensor, make sure that its sensor head does not contact with surrounding parts to avoid damage.**
- **The part indicated with * is the bolt with friction coefficient stabilizer. In removal, replace it with a new one.**



			Removal steps
		1.	Cotter pin
<<A>>	>>A<<	2.	Driveshaft nut
	>>A<<	3.	Washer
		4.	Rear wheel speed sensor
		5.	Rear brake hose bracket

	Removal steps (Continued)
<<B>>	6. Caliper assembly
	7. Brake disk
	8. Rear wheel hub assembly mounting bolt
<<C>>	9. Rear wheel hub assembly

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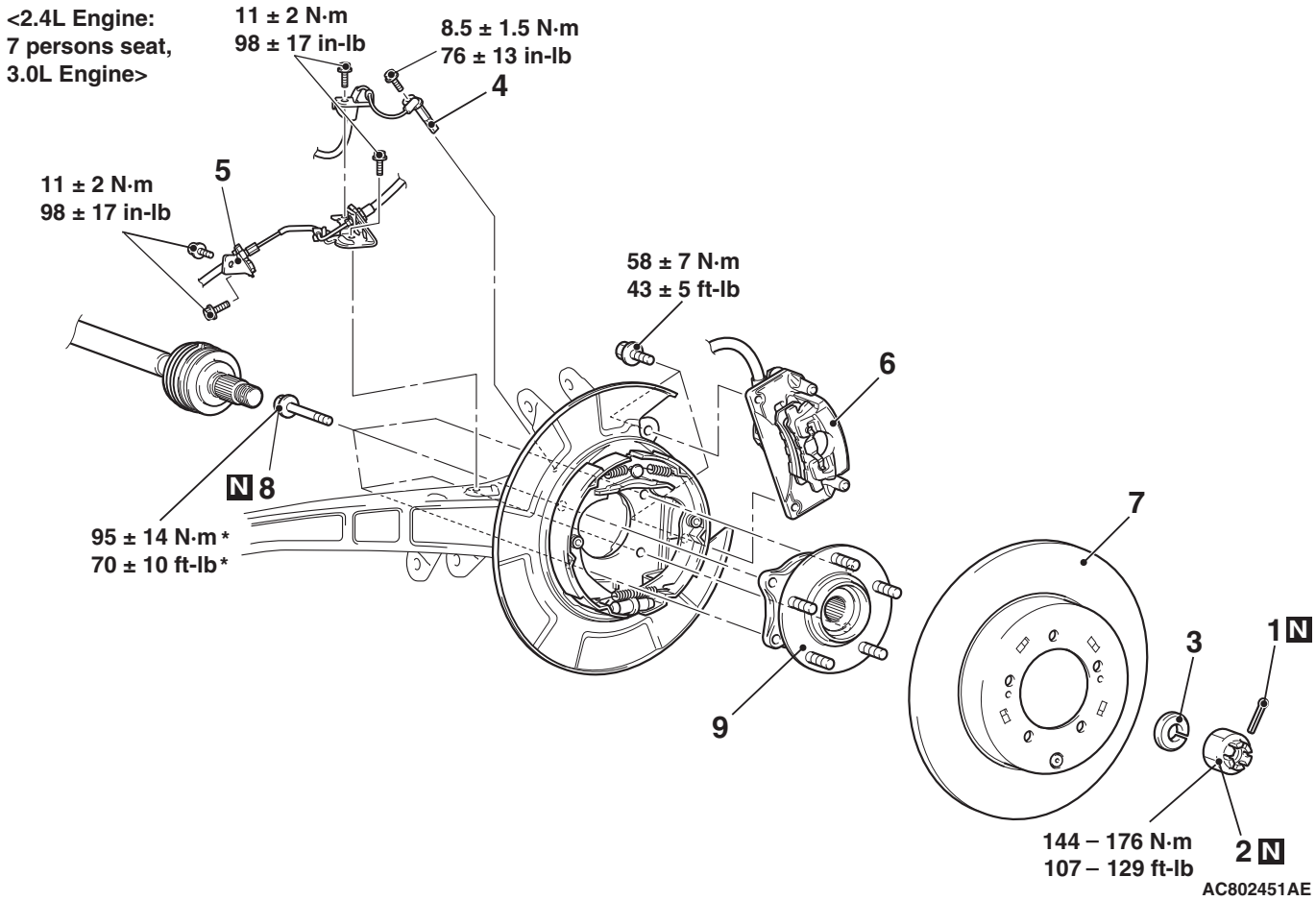


Removal steps

1. Cotter pin
2. Driveshaft nut
3. Washer
4. Rear wheel speed sensor
5. Rear brake hose bracket

Removal steps (Continued)

6. Caliper assembly
7. Brake disk
8. Rear wheel hub assembly mounting bolt
9. Rear wheel hub assembly

Required Special Tools:

- MB990211: Slide Hammer
- MB990241: Rear Axle Shaft Puller
- MB990242: Puller Shaft
- MB990244: Puller Bar
- MB990767: Front Hub and Flange Yoke Holder
- MB991354: Puller Body

TSB Revision

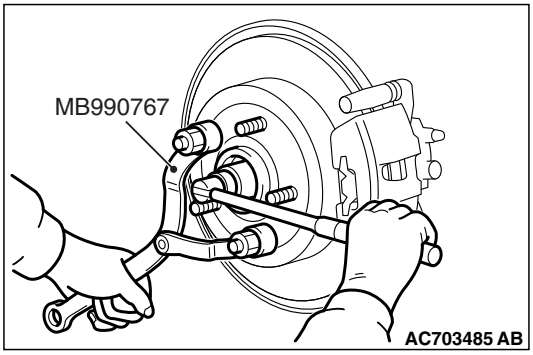
REMOVAL SERVICE POINTS

<<A>> DRIVESHAFT NUT REMOVAL

⚠ CAUTION

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

Use special tool MB990767 to fix the hub and remove the driveshaft nut.

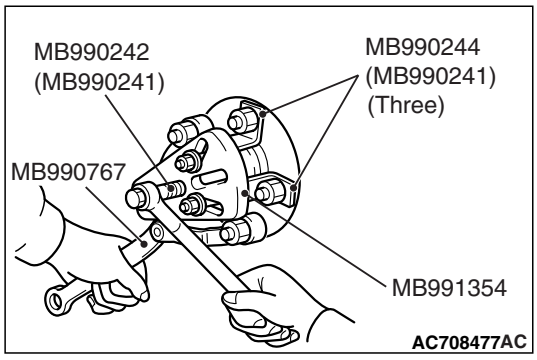


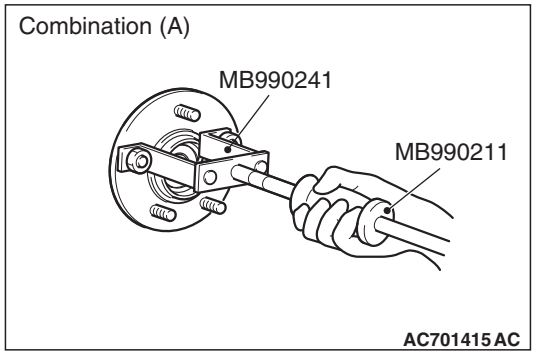
<<B>> CALIPER ASSEMBLY REMOVAL

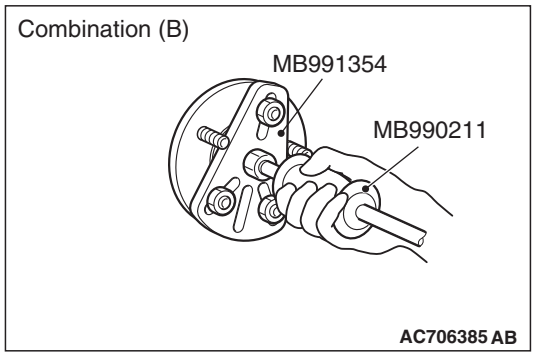
1. Remove the caliper assembly with brake hose.
2. Secure the removed caliper assembly with a wire or other similar material at a position where it will not interfere with the removal and installation of the rear wheel hub assembly.

<<C>> REAR WHEEL HUB ASSEMBLY REMOVAL

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







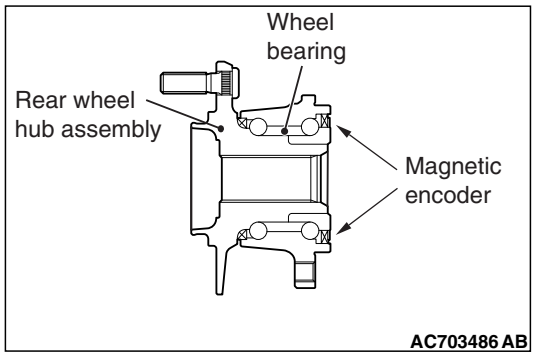
2. If the rear wheel hub assembly is seized with the knuckle, use special tools MB990211 and MB990241 {combination (A)}, or MB990211 and MB991354 {combination (B)} to remove the rear wheel hub assembly.

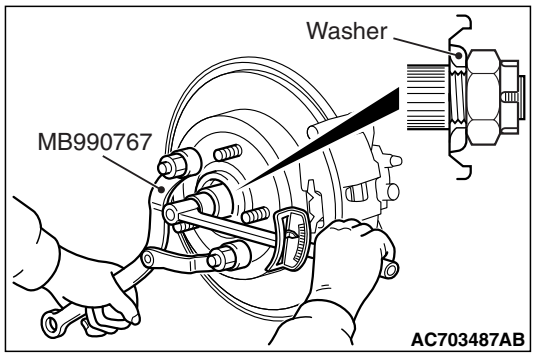
INSTALLATION SERVICE POINTS

>>A<< WASHER/DRIVESHAFT NUT INSTALLATION

⚠ CAUTION

- **The magnetic encoder collects metallic particles easily, because it is magnetized. Make sure that the magnetic encoder does not collect metallic particles. Check that there is not any trouble prior to reassembling it.**
- **When installing the drive shaft, 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 rear wheel hub assembly before fully tightening the driveshaft nuts. Otherwise, the wheel bearing will be broken.**





1. Incorporate the driveshaft washer as shown in the figure.
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 split ping to fit it.

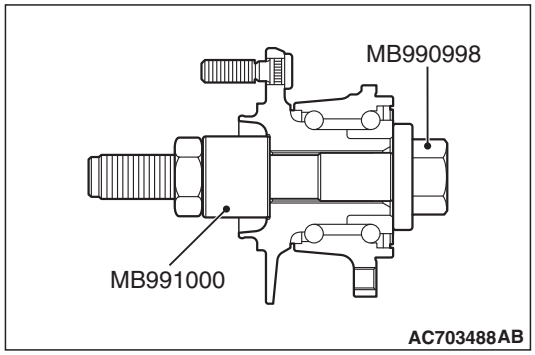
INSPECTION

M1271002100430

HUB ROTATION STARTING TORQUE AND WHEEL BEARING END PLAY CHECK

Required Special Tools:

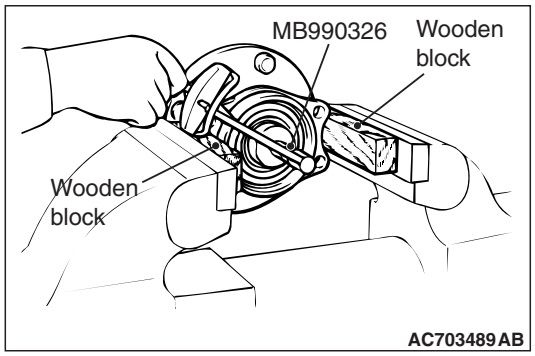
- MB990326: Preload Socket
- MB990998: Front Hub Remover and Installer
- MB991000: Spacer



1. Tighten special tools MB990998 and MB991000 to the specified torque.

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

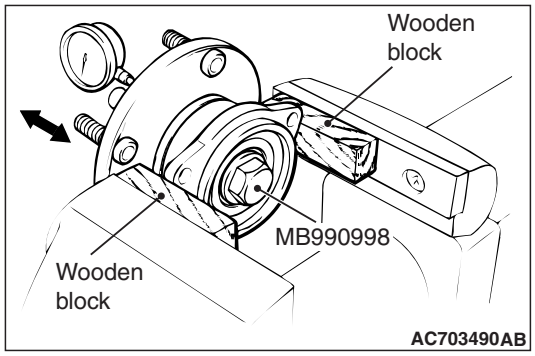
2. Fix the hub in a vice using a piece of wood or the like.
3. Rotate the rear hub in order to seat the bearing.



4. Use special tool MB990326 to measure the hub rotation starting torque.

   Limit value: 1.4 N·m (1.03 ft-lb)

5. If the hub rotation starting torque at the specified tightening torque [144 – 176 N·m (107 – 129 ft-lb)] exceeds the limit value, replace the hub. If there are rough or gritty feelings in rotation, replace the hub.



6. Set a dial gauge, and move the hub in the axial direction to measure the wheel bearing end play.

   Limit: 0.05 mm (0.002 inch)

7. If the wheel bearing end play at the specified tightening torque [144 – 176 N·m (107 – 129 ft-lb)] exceeds the limit value, replace the hub.

DRIVESHAFT ASSEMBLY

REMOVAL AND INSTALLATION

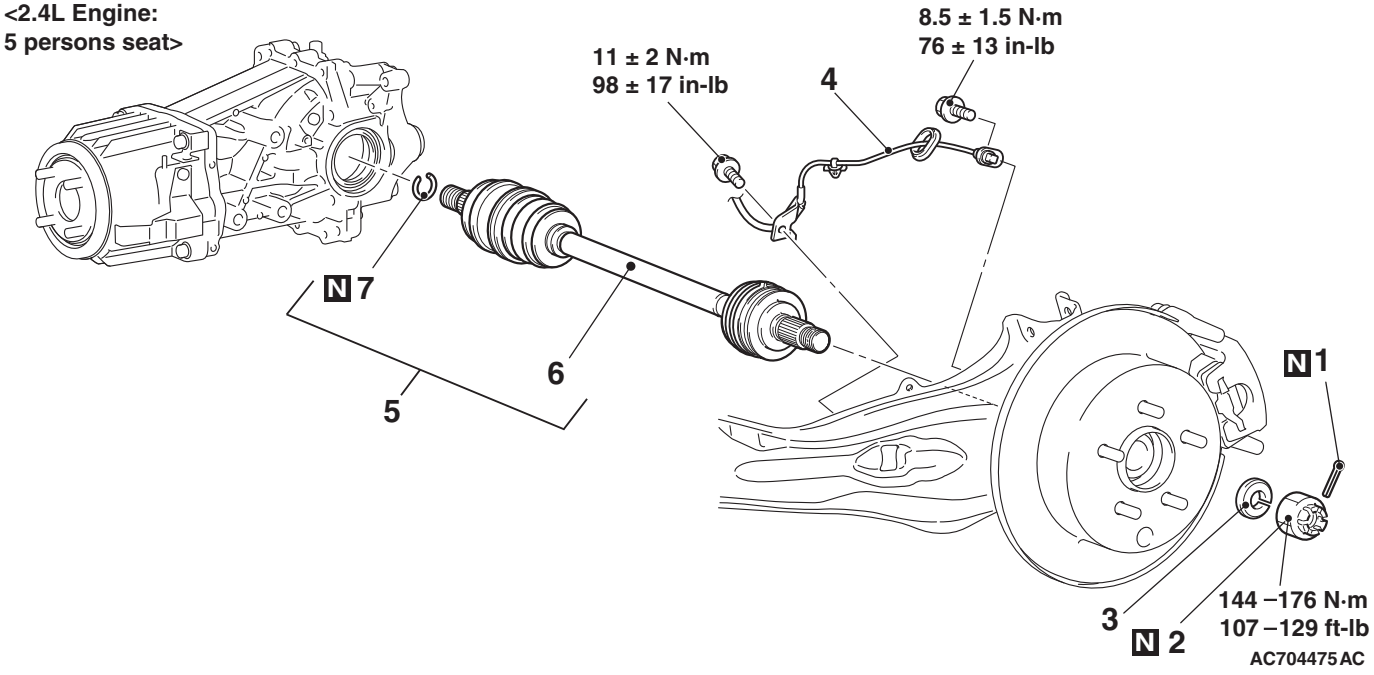
M1271003300675

⚠ CAUTION

When removing and installing the rear wheel speed sensor, make sure that its sensor head does not contact with surrounding parts to avoid damage.

Pre-installation Operation	Post-installation Operation
• Differential Gear Oil Draining • Disconnect joints between Lower Arm, Trailing Arm, Shock Absorber, and Stabilizer Link. (Refer to GROUP 34 – Control Link, Upper Arm, Lower Arm Removal and Installation P.34-12.) • Disconnect joint between Upper Arm and Trailing Arm. (Refer to GROUP 34– Control Link, Upper Arm, Lower Arm Removal and Installation P.34-12.)	• Connect Upper Arm and Trailing arm. (Refer to GROUP 34 – Control Link, Upper Arm, Lower Arm Removal and Installation P.34-12.) • Connect Lower Arm, Trailing Arm, Shock Absorber, and Stabilizer Link. (Refer to GROUP 34 – Control Link, Upper Arm, Lower Arm Removal and Installation P.34-12.) • Differential Gear Oil Filling (Refer to P.27B-16.) • Rear Wheel Alignment Check and Adjustment (Refer to GROUP 34, On-vehicle Service-Rear Wheel Alignment Check and Adjustment P.34-10.)

<2.4L Engine:
5 persons seat>



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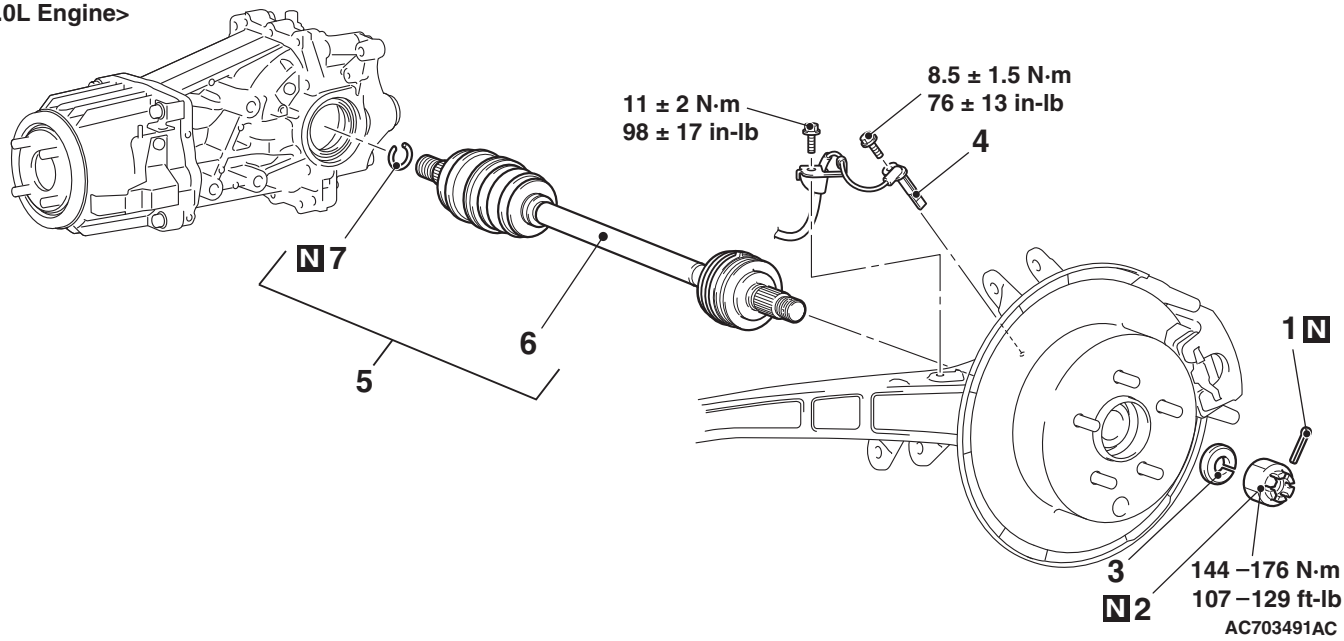
<2.4L Engine: 7 persons seat,
3.0L Engine>



Removal steps

1. Cotter pin
<<**A**>> >>**B**<< 2. Driveshaft nut
>>**B**<< 3. Washer

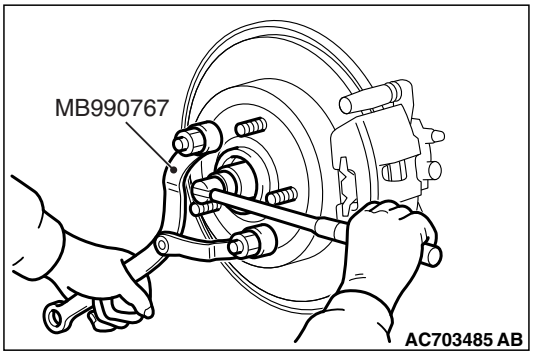
Removal steps (Continued)

4. Rear wheel speed sensor
<<**B**>> >>**A**<< 5. Driveshaft
6. Circlip

Required Special Tools:
MB990242: Puller Shaft
MB990244: Puller Bar
MB990767: Front Hub and Flange Yoke Holder
MB990998: Front Hub Remover and Installer
MB991000: Spacer
MB991354: Puller Body

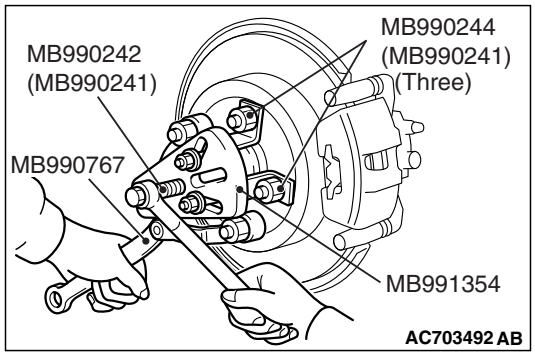
REMOVAL SERVICE POINTS

<<A>> DRIVESHAFT NUT REMOVAL



⚠ **CAUTION**
Do not apply the vehicle weight on the rear wheel hub assembly before fully tightening the driveshaft nuts. Otherwise, the wheel bearing will be broken.
Use special tool MB990767 to fix the hub and remove the driveshaft nut.

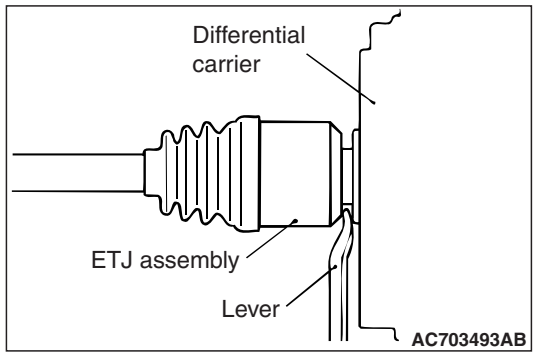
<<B>> DRIVESHAFT REMOVAL



1. Use special tools MB990242, MB990244, MB991354 and MB990767 to push out the driveshaft from the hub.

⚠ CAUTION

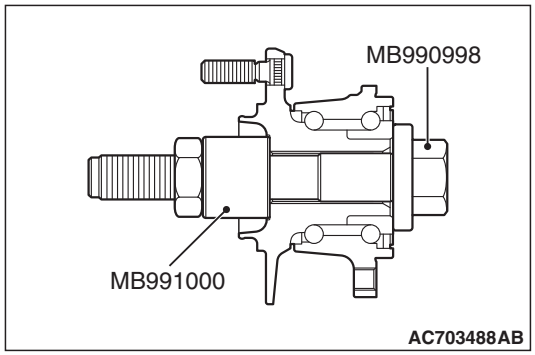
- **Do not pull out the driveshaft from the EUJ assembly side. Otherwise, the ETJ assembly will be damaged. Be sure to remove the driveshaft from the ETJ assembly side, by using a lever.**
- **Care must be taken to ensure that the oil seal of the differential carrier is not damaged by the spline part of the driveshaft.**



2. Use a lever to remove the driveshaft (ETJ assembly side) from the differential carrier.

⚠ CAUTION

Do not apply the vehicle weight to the wheel bearing with the driveshaft removed. If, however, the vehicle weight shall be applied to the bearing (in order to move the vehicle), use special tools MB990998 and MB991000 for tightening to the specified torque [144 – 176 N·m (107 – 129 ft-lb)].

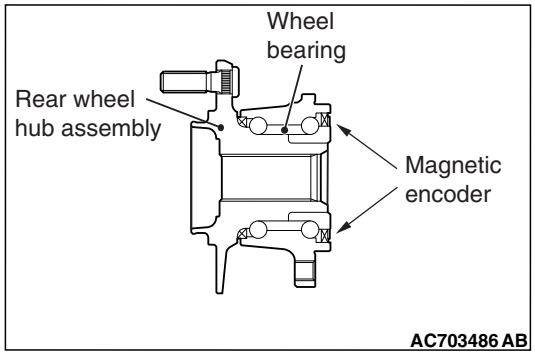


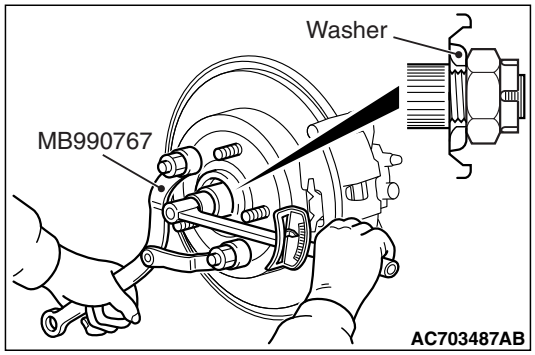
INSTALLATION SERVICE POINTS

>>A<< DRIVESHAFT INSTALLATION

⚠ CAUTION

Care must be taken to ensure that the oil seal of the differential carrier is not damaged by the spline part of the driveshaft.





>>B<< WASHER/DRIVESHAFT NUT INSTALLATION

⚠ CAUTION

- **The magnetic encoder collects metallic particles easily, because it is magnetized. Make sure that the magnetic encoder does not collect metallic particles. Check that there is not any trouble prior to reassembling it.**
- **When installing the drive shaft, 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 rear wheel hub assembly before fully tightening the driveshaft nuts. Otherwise, the wheel bearing will be broken.**

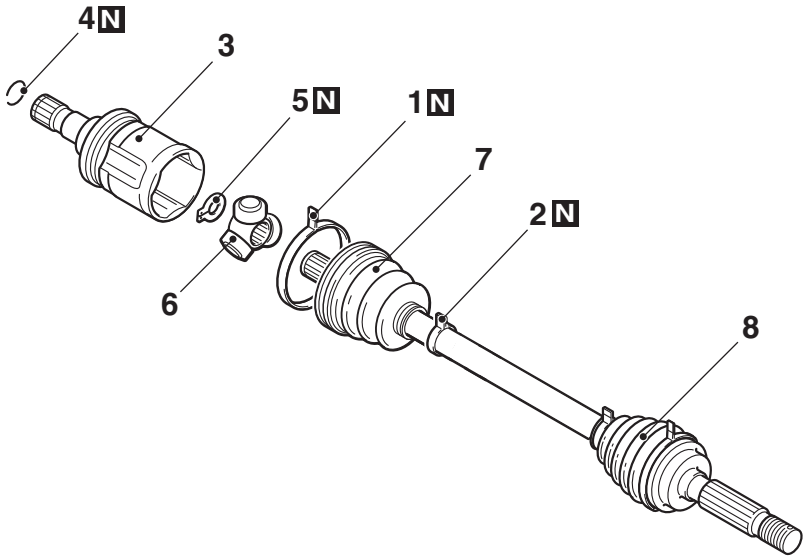
1. Assemble the driveshaft washer in the illustrated direction.
2. Use special tool MB990767 to tighten the driveshaft nuts. At this time, tighten the nuts within the specified torque range considering the final tightening.

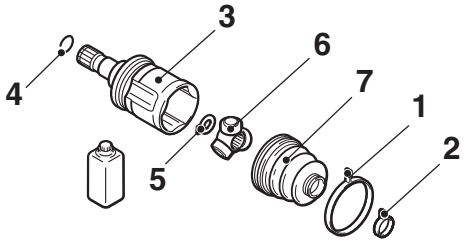
   Tightening torque: 144 – 176 N·m (107 – 129 ft-lb)
3. If the pin holes do not align with the pins, tighten the driveshaft nut [less than 200 N·m (147 ft-lb)] and find the nearest hole then bend the cotter pin to fit it.

DISASSEMBLY AND ASSEMBLY

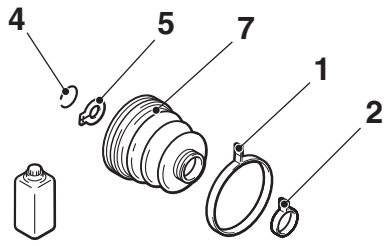
M1271003500367

⚠ CAUTION
EUJ assembly cannot be disassembled.





ETJ repair kit



ETJ boot repair kit

AC703494AB

Disassembly steps

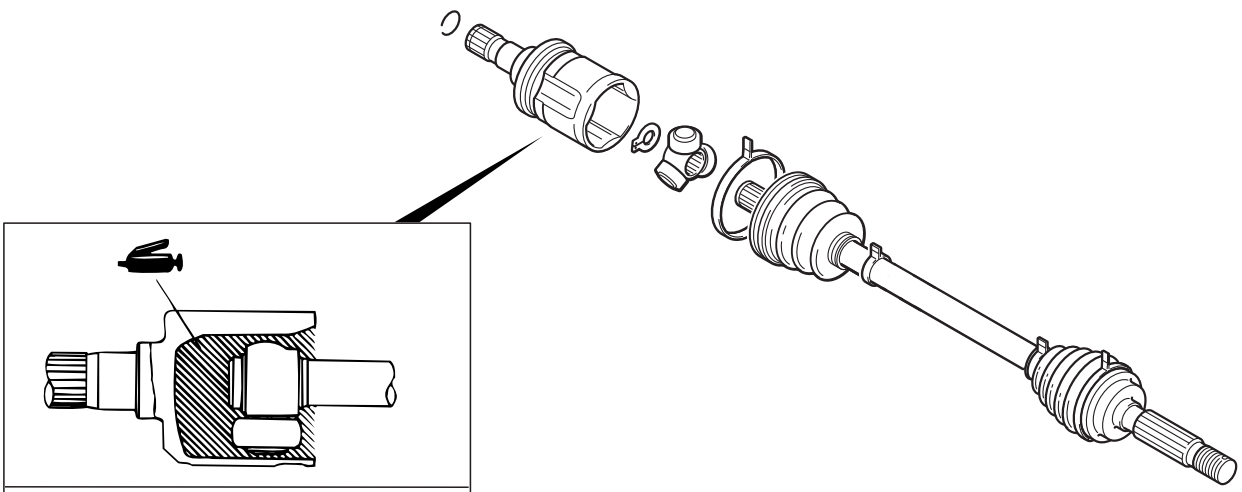
	>>**B**<<	1.	ETJ boot band (large)
	>>**B**<<	2.	ETJ boot band (small)
<<**A**>>	>>**A**<<	3.	ETJ case
		4.	Circlip

Disassembly steps (Continued)

		5.	Snap ring
<<**A**>>	>>**A**<<	6.	Spider assembly
<<**B**>>		7.	ETJ boot
		8.	EUJ assembly

TSB Revision

LUBRICATION POINT



AC703495 AB

DISASSEMBLY SERVICE POINTS

<<A>> ETJ CASE/SPIDER ASSEMBLY REMOVAL

⚠ CAUTION

Do not disassemble the spider assembly.

1. Wipe off the grease inside the ETJ case and on the spider assembly.
2. If the grease is contaminated with the foreign material (water, dust, etc.), be sure to wash the spider assembly.

<<B>> ETJ BOOT REMOVAL

1. Wipe off the grease on the shaft spline.
2. If the ETJ boot is reused, protect the shaft spline area with taping from the damage in removal of the boot.

ASSEMBLY SERVICE POINTS

>>A<< SPIDER ASSEMBLY/ETJ CASE INSTALLATION

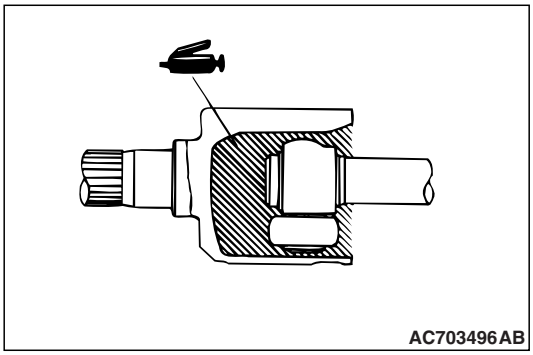
⚠ CAUTION

Special grease is used for the joint. Do not mix the new and previous types of grease or different types of grease.

Fill the ETJ case with the specified grease, insert the driveshaft, and then fill the specified grease again.

Specified grease: Repair kit grease
Application amount: 75 ± 10 g (2.6 ± 0.3 oz)

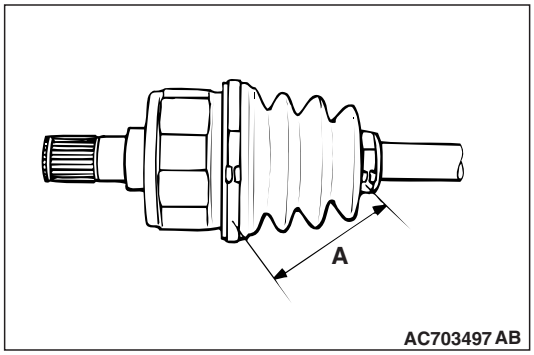
NOTE: When using the repair kit grease, fill the half of the grease into the joint and the other half into the boot as a guideline, and consume the grease completely.


AC703496AB

>>B<< ETJ BOOT BAND (SMALL)/ETJ BOOT BAND (LARGE) TIGHTENING

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

Standard value (A): 75 ± 3 mm (2.95 ± 0.12 inches)



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DIFFERENTIAL CARRIER ASSEMBLY

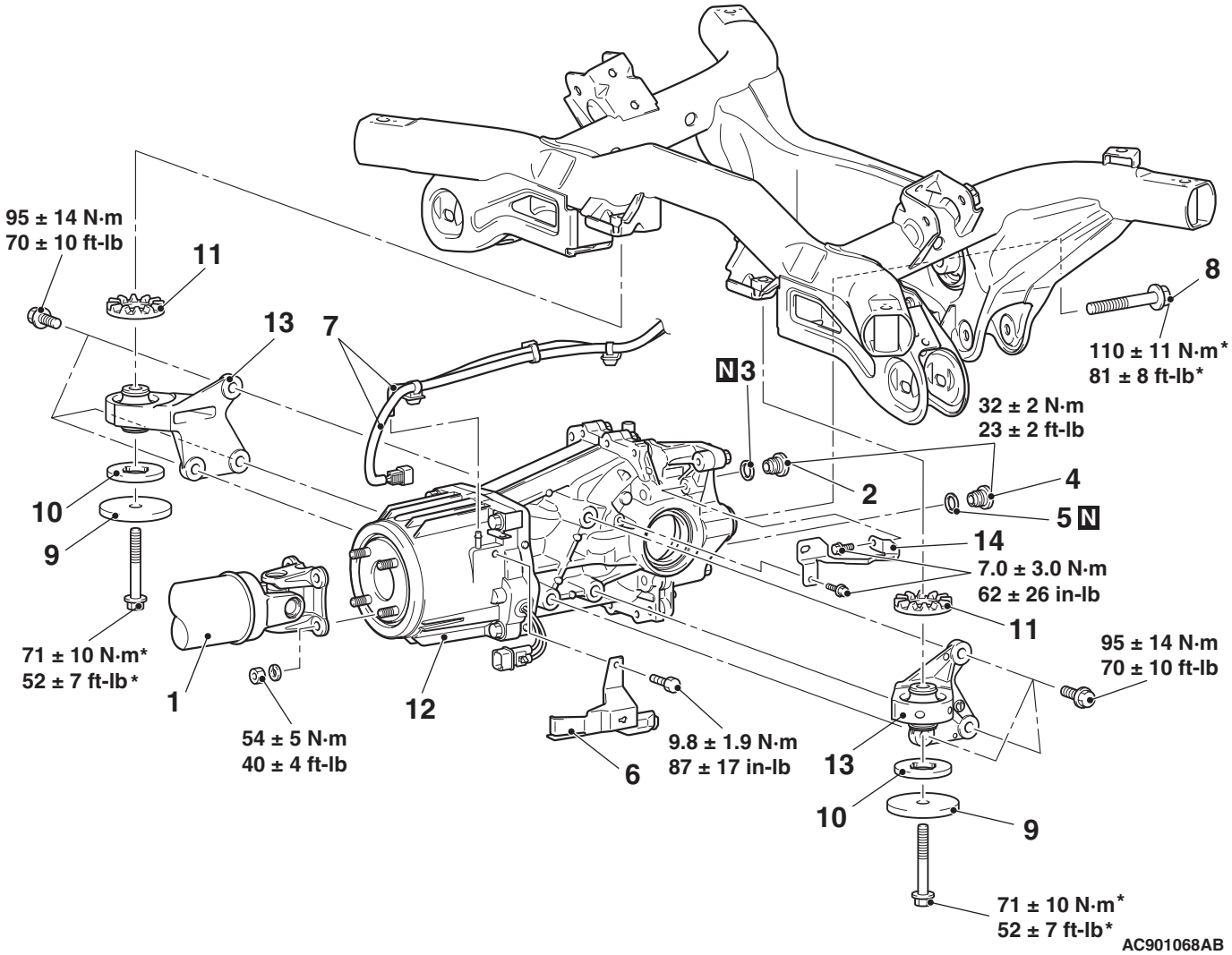
REMOVAL AND INSTALLATION

M1271005300154

⚠ CAUTION

- **The parts indicated by * are the bolts 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
• Spare Tire Removal • Exhaust Pipe and Main Muffler Removal (Refer to GROUP 15, Exhaust Pipe and Muffler P.15-22, P.15-25). • Differential Gear Oil Draining (Refer to P.27B-16). • Driveshaft Removal (Refer to P.27B-24).	• Driveshaft Installation (Refer to P.27B-24). • Differential Gear Oil Filling (Refer to P.27B-16). • Exhaust Pipe and Main Muffler Installation (Refer to GROUP 15, Exhaust Pipe and Muffler P.15-22, P.15-25). • Spare Tire Installation



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<<A>>

Removal steps

1. Propeller shaft connection
2. Filler plug
3. Gasket
4. Drain plug
5. Gasket
6. Cover

Removal steps (Continued)

7. Electronic control coupling harness connection, breather hose connection
8. Differential to rear suspension crossmember connecting bolt
9. Weight

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Removal steps (Continued)

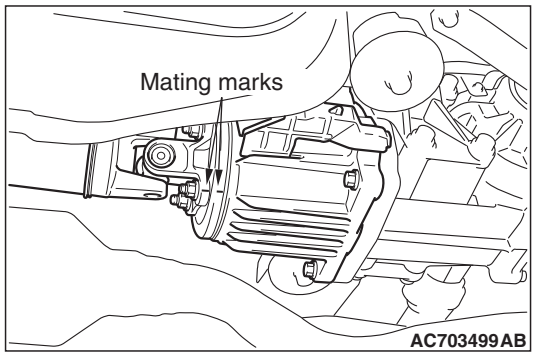
10. Lower stopper
11. Upper stopper

>>**A**<< 12. Differential carrier assembly

13. Differential mount bracket (LH/RH)
14. Differential bracket

REMOVAL SERVICE POINTS

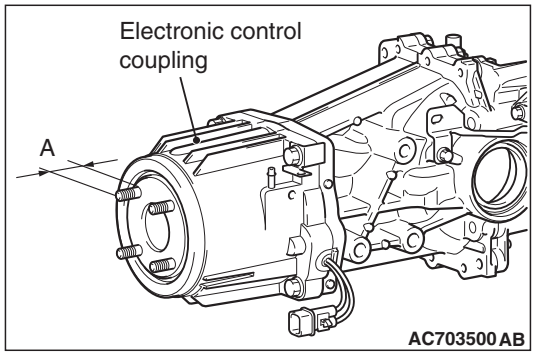
<<A>> PROPELLER SHAFT DISCONNECTION



1. Put mating marks on the flange yoke and the electronic control coupling.
2. Hold the disconnected propeller shaft with a wire so that it will not hang at a sharp angle.

INSTALLATION SERVICE POINTS

>>A<< DIFFERENTIAL CARRIER ASSEMBLY INSTALLATION



1. Check that the length of the electronic control coupling stud bolt (A) is within the standard value range.

   Standard value: 22.3 – 25.1 mm (0.88 – 0.99 inch)

2. If the length exceeds the standard value, replace the stud bolt.

   Specified torque: 15 ± 3 N·m (11 ± 2 ft-lb)

   NOTE: When replacing the stud bolts, always clean the stud bolt threaded holes.

DISASSEMBLY

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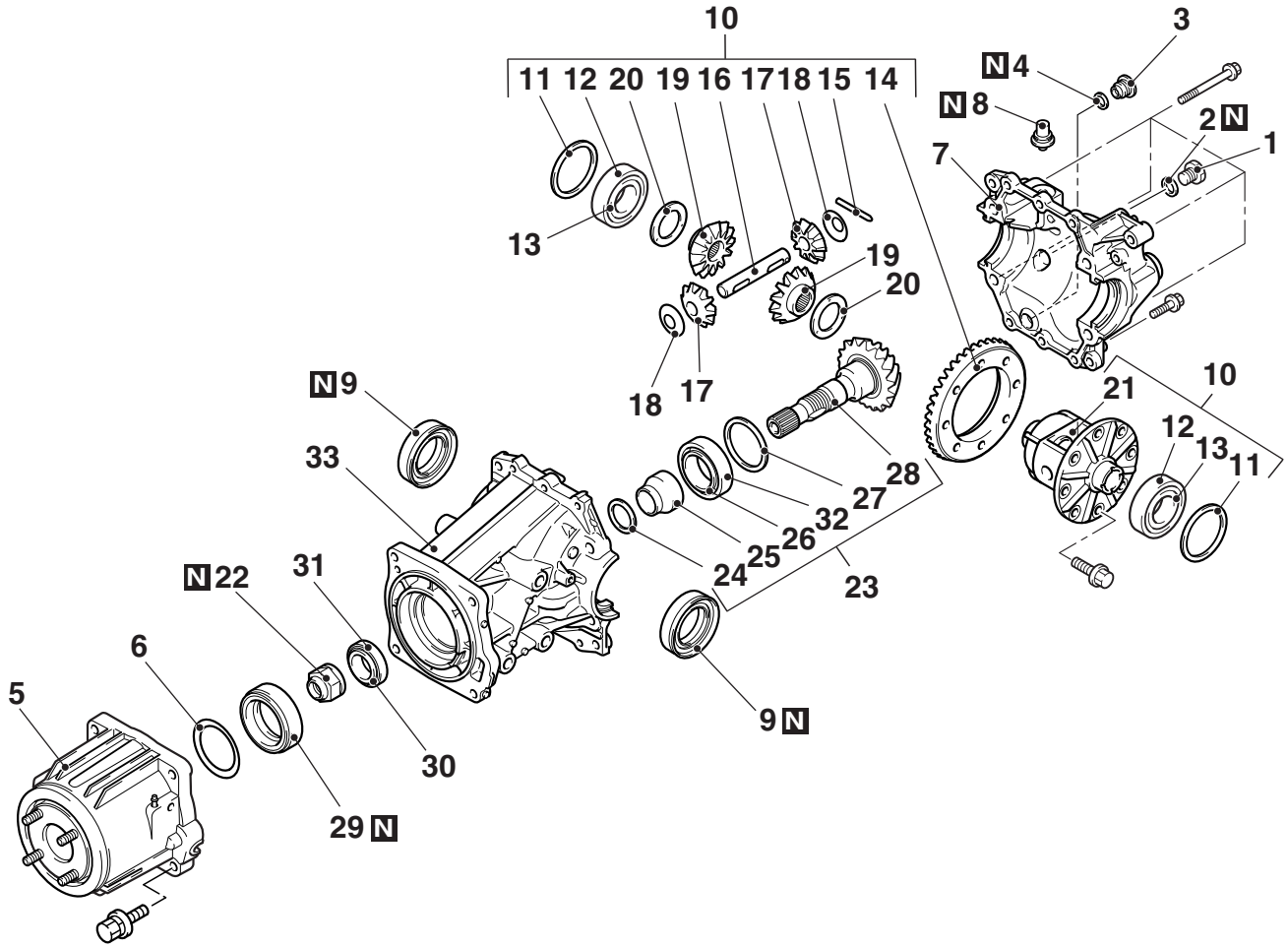

AC703501AB

Disassembly steps

1. Filler plug
2. Gasket
3. Drain plug
4. Gasket
5. Electronic control coupling
6. Washer
7. Differential cover assembly
8. Vent plug
9. Oil seal

<<A>> 10. Pre-disassembly check

<<B>> • Differential case assembly

<<B>> 11. Differential side bearing spacer

<<B>> 12. Differential side bearing outer race

<<C>> 13. Differential side bearing inner race

<<D>> 14. Drive gear

<<E>> 15. Lock pin

16. Pinion shaft
17. Pinion gear
18. Pinion washer
19. Side gear

Disassembly steps (Continued)

20. Side gear spacer
21. Differential case

<<F>> 22. Differential nut

23. Drive pinion assembly
24. Drive pinion front shim (for drive pinion rotation torque adjustment)
25. Drive pinion spacer

<<G>> 26. Drive pinion rear bearing inner race

27. Drive pinion rear shim (for drive pinion height adjustment)
28. Drive pinion
29. Oil seal
30. Drive pinion front bearing inner race

<<H>> 31. Drive pinion front bearing outer race

<<I>> 32. Drive pinion rear bearing outer race

33. Differential carrier

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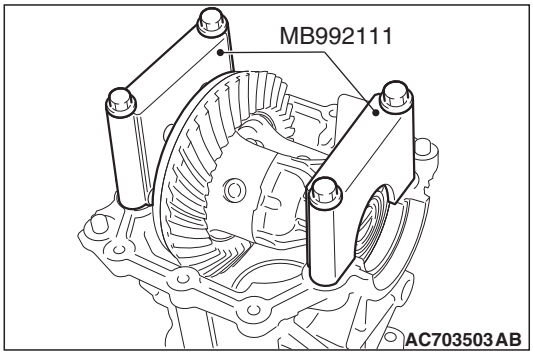
Required Special Tools:
- MB990560: Rear Axle Shaft Bearing Remover
- MB990810: Side Bearing Puller
- MB990909: Working Base
- MB990939: Remover Bar
- MB991116: Working Base Adapter
- MB992111: Side Bearing Holder
- MB992112: Lock Nut Wrench
- MB992113: Drive Pinion Holder

DISASSEMBLY SERVICE POINT

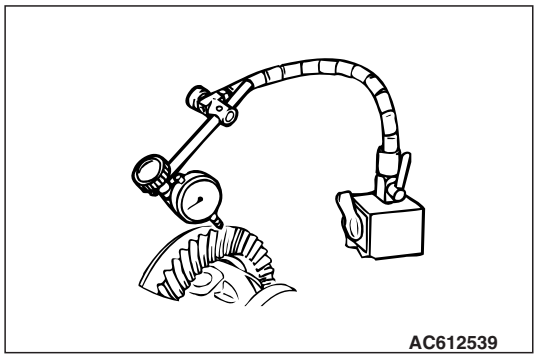
<<A>> INSPECTION BEFORE DISASSEMBLY



1. Remove the differential case assembly, differential side bearing spacer and differential side bearing.
2. Hold special tools MB990909 and MB991116 in a vise, and install the differential carrier assembly to the special tool.
3. Use special tool MB992111 to install the differential case assembly, differential side bearing spacer and differential side bearing to the differential carrier, then perform the following checks.

   Tightening torque: 48 ± 6 N·m (36 ± 4 ft-lb)

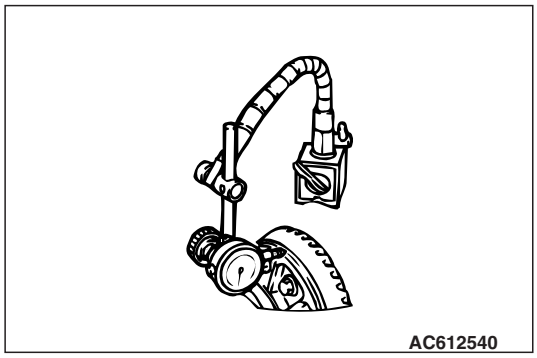
DRIVE GEAR BACKLASH



1. Set a dial gauge against the drive gear teeth edge and fix the drive pinion. Rotate the drive gear to measure the backlash at four or more points.

   Standard value: 0.08 – 0.15 mm (0.003 – 0.006 inch)
2. When the backlash is not within the standard value range, adjust the final drive gear backlash. (Refer to P.27B-39.)
3. After adjustment, check the final drive gear teeth contact.

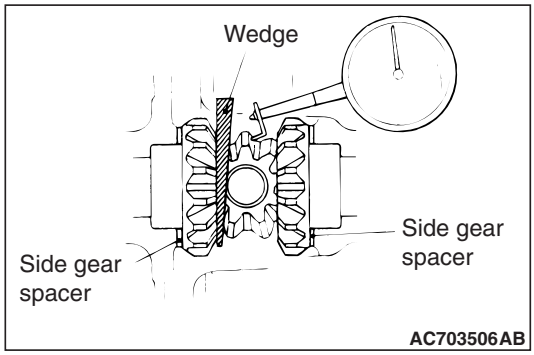
DRIVE GEAR RUNOUT ON BACKSIDE



1. Set a dial gauge against the backside of the drive gear. Rotate the drive gear to measure the runout.

   Limit: 0.05 mm (0.002 inch)
2. When the runout exceeds the limit value, check for the foreign material between the backside of the drive gear and the differential gear case, and looseness of the drive gear mounting bolt.
3. When the runout measured in step 2 is normal, change the position of the drive gear and differential case, and measure the runout again.
4. If the adjustment is not possible, replace the differential case or the drive gear and the drive pinion as a set.

DIFFERENTIAL GEAR BACKLASH



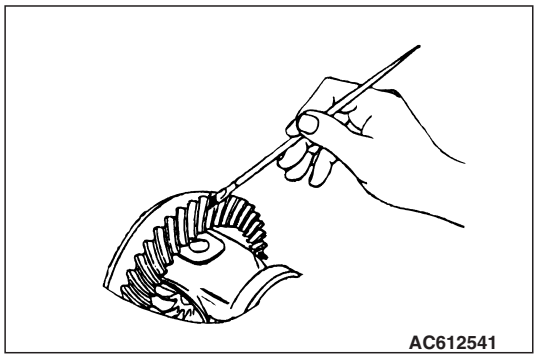
1. Drive the wooden wedge between one of the side gears and the pinion shaft to fix one side of the side gear. Then, set a dial gauge (with the measuring rod extended) against the pinion gear, and measure the backlash to check that it is within the standard value. Repeat the same procedure to measure the backlash at the other pinion gear.

   Standard value: 0 – 0.076 mm (0 – 0.0030 inch)
   Limit: 0.2 mm (0.01 inch)

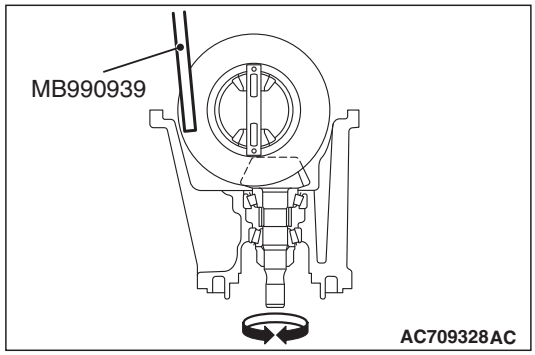
2. When the backlash exceeds the limit value, adjust the backlash of the differential gear.(Refer to P.27B-39.)
3. When the adjustment is not possible, replace the side gear and the pinion gear as a set.

FINAL DRIVE GEAR TEETH CONTACT ADJUSTMENT

Check the final drive gear teeth contact in the following steps:



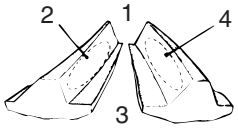
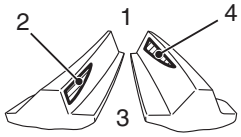
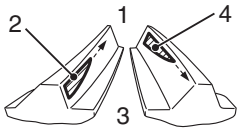
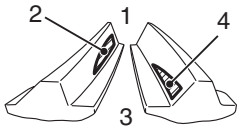
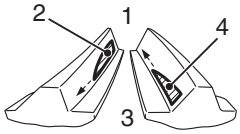
1. Apply the bearing blue on the drive gear teeth (on both sides) thinly and evenly.



2. Insert special tool MB990939 between the differential carrier and the drive gear installation side of the differential case. While applying load to the drive gear so that the rotation torque [approximately 2.5 – 2.9 N·m (22.1 – 25.7 in-lb)] is applied to the drive pinion, rotate the drive pinion by hand (360 degrees clockwise and counterclockwise respectively).

⚠ CAUTION
Do not let the drive gear rotated over 360 degrees. It makes the gear contact pattern unclear.

3. Check contact of the final drive gear teeth.

Normal contact pattern	Cause	Measures
1. Small-end side 2. Drive-side tooth face (the side to which the force is applied while driving forward) 3. Large-end side 4. Coast-side tooth face (the side to which the force is applied while driving backward)  AC703509AB	Contact pattern indicating that the drive pinion height is too high  AC703510AB Drive pinion is too much away from the center of the drive gear.	 AC703511AB Increase thickness of the drive pinion rear shim to bring the drive pinion closer to the center of the drive gear. Then move the drive gear away from the drive pinion for the final drive gear backlash adjustment.
	Contact pattern indicating that the drive pinion height is too low  AC703512AB Drive pinion is too close to the center of the drive gear.	 AC703513AB Reduce thickness of the drive pinion rear shim to bring the drive pinion away from the center of the drive gear. Then move the drive gear closer to the drive pinion for the final drive gear backlash adjustment.

NOTE:

1. *Checking the contact pattern is the method to check that the drive pinion height and the final drive gear backlash are or are not adjusted properly. Repeat the adjustments of the drive pinion height and the final drive gear backlash until the contact pattern similar to the normal pattern.*
2. *If the normal contact pattern cannot be obtained even after making the adjustments, the drive gear and the drive pinion have been worn exceeding the usage limit. Replace both gears as a set.*

<<B>> DIFFERENTIAL CASE ASSEMBLY/DIFFERENTIAL SIDE BEARING SPACER/DIFFERENTIAL SIDE BEARING OUTER RACE REMOVAL

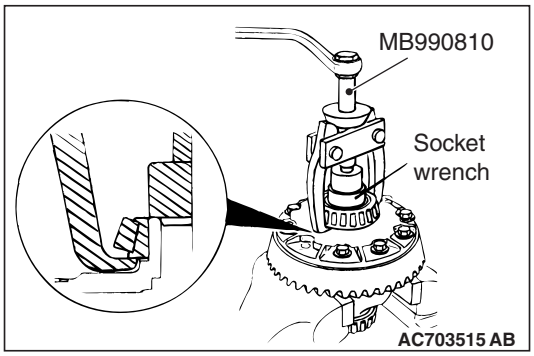
⚠ CAUTION

When removing the differential case assembly, remove it slowly with care not to drop the differential side bearing spacer and the differential side bearing outer race.

Remove the differential case assembly, differential side bearing spacer and differential side bearing outer race.

NOTE: Identify the RH and LH side bearing spacers as a reference for the reassembly operation.

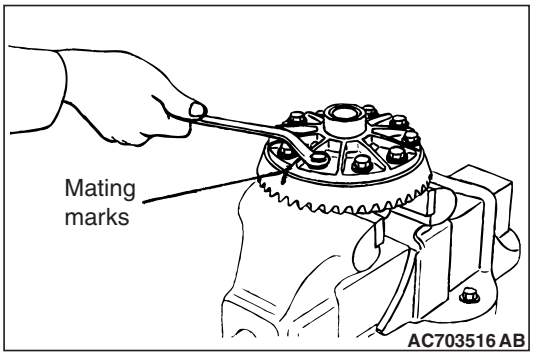
<<C>> DIFFERENTIAL SIDE BEARING INNER RACE REMOVAL



Use special tool MB990810 to remove the differential side bearing inner race.

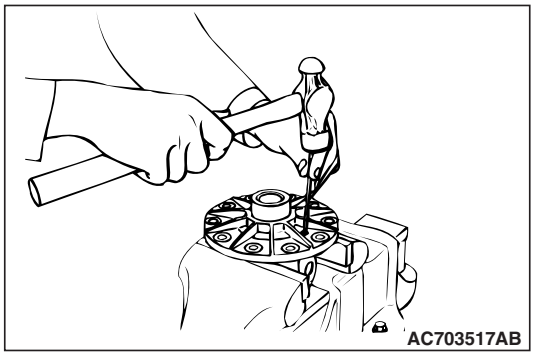
NOTE: Hook the claws of the special tool on the differential side bearing inner race through two cut-off parts on the differential case side.

<<D>> DRIVE GEAR REMOVAL



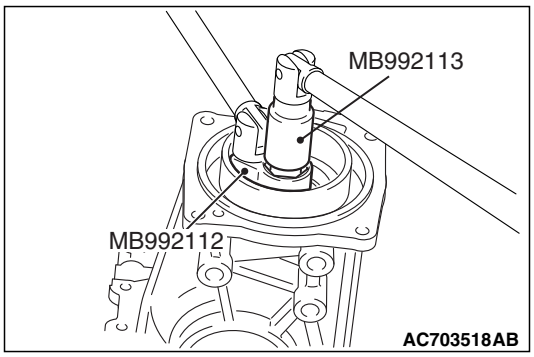
1. Put mating marks on the drive gear and differential case as a reference for the reassembly operation.
2. Loosen the drive gear tightening bolts in a diagonal order to remove the drive gear.

<<E>> LOCK PIN DRIVING OUT



Drive out the lock pin with a punch.

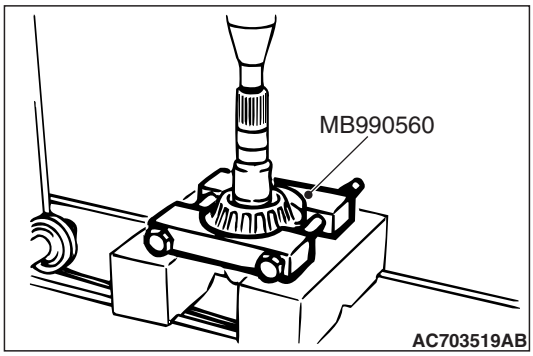
<<F>> DIFFERENTIAL NUT REMOVAL



Use special tools MB992112 and MB992113 to remove the differential nut:

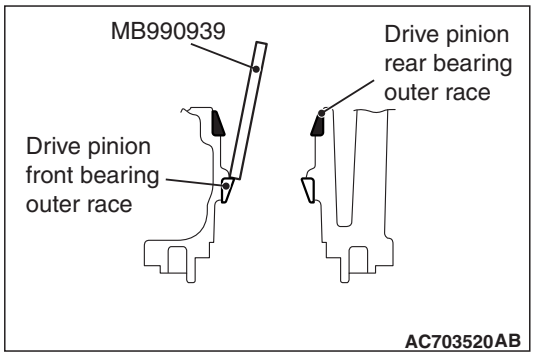
<<G>> DRIVE PINION REAR BEARING INNER RACE REMOVAL

Use special tool MB990560 to remove the drive pinion rear bearing inner race.



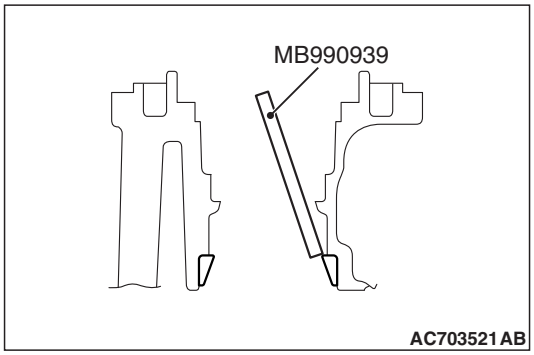
<<H>> DRIVE PINION FRONT BEARING OUTER RACE REMOVAL

Use special tool MB990939 to remove the drive pinion front bearing outer race.



<<I>> DRIVE PINION REAR BEARING OUTER RACE REMOVAL

Use special tool MB990939 to remove the drive pinion rear bearing outer race.



ASSEMBLY

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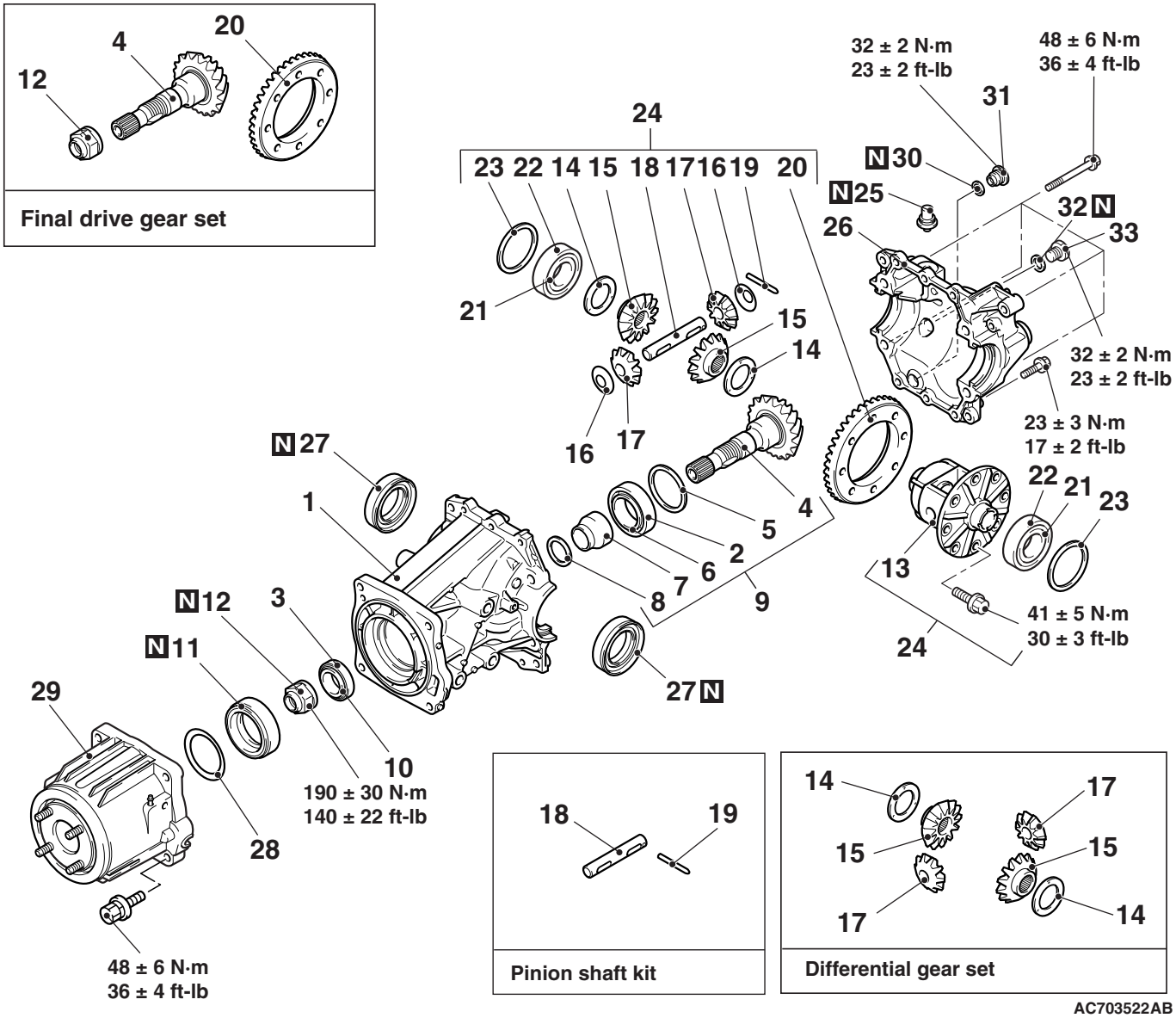

AC703522AB

Assembly steps

1. Differential carrier
>>A<< 2. Drive pinion rear bearing outer race
>>B<< 3. Drive pinion front bearing outer race
>>C<< • Drive pinion height adjustment
4. Drive pinion
5. Drive pinion rear shim (for drive pinion height adjustment)
6. Drive pinion rear bearing inner race
7. Drive pinion spacer
>>D<< • Drive pinion rotation torque adjustment
8. Drive pinion front shim (for drive pinion rotation torque adjustment)
9. Drive pinion assembly

Assembly steps (Continued)

10. Drive pinion front bearing inner race
>>D<< 11. Oil seal
12. Differential nut
13. Differential case
>>E<< • Differential gear backlash adjustment
14. Side gear spacer
15. Side gear
16. Pinion washer
17. Pinion gear
18. Pinion shaft
>>F<< 19. Lock pin
>>G<< 20. Drive gear
>>H<< 21. Differential side bearing inner race
22. Differential side bearing outer race
23. Differential side bearing spacer
24. Differential case assembly

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Assembly steps (Continued)

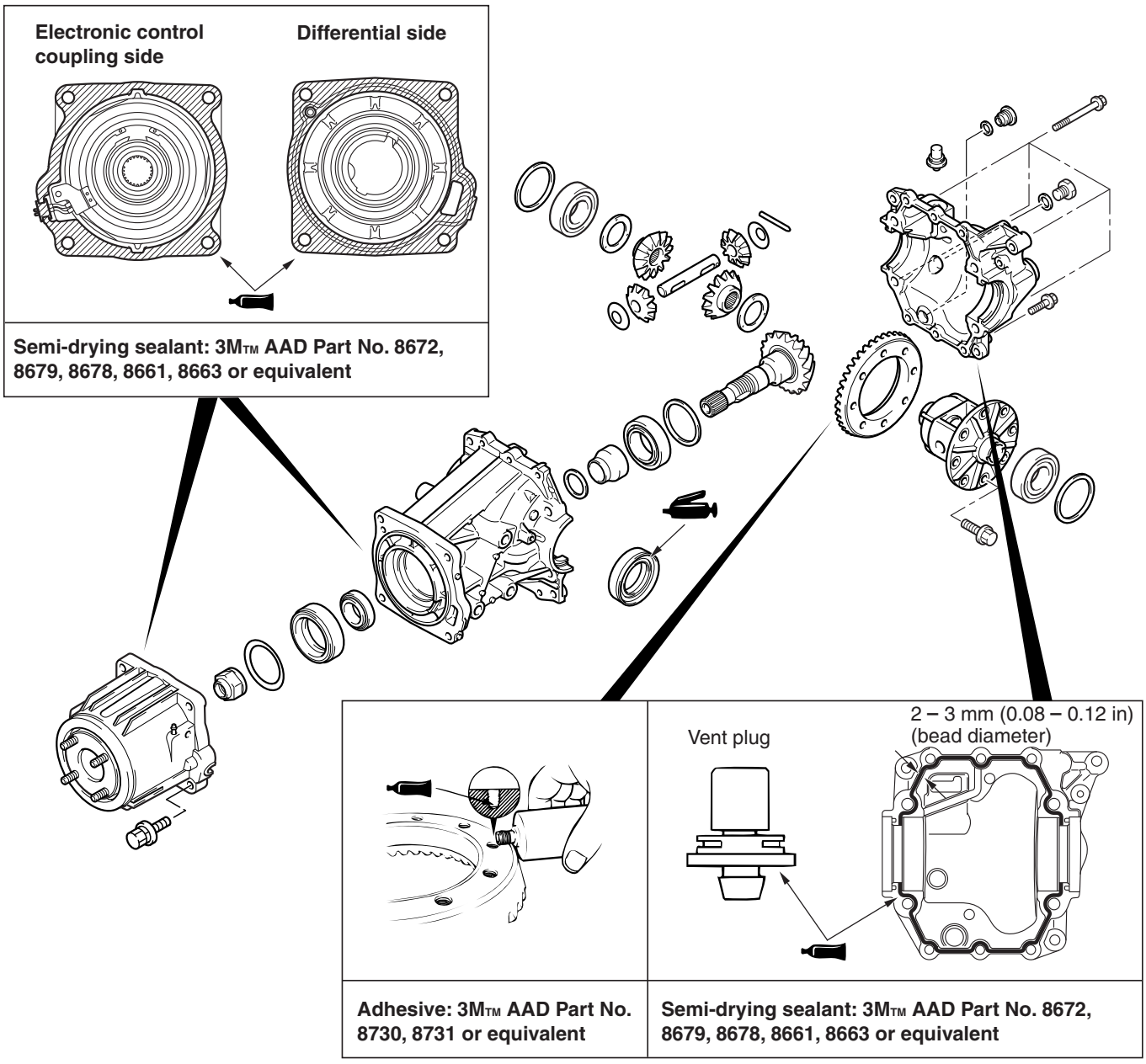
>>I<< • Final drive gear backlash adjustment
25. Vent plug
26. Differential cover assembly

>>J< 27. Oil seal
28. Washer
29. Electronic control coupling
30. Gasket
31. Drain plug
32. Gasket
33. Filler plug

Required Special Tools:

- MB990810: Side Bearing Puller
- MB990829: Pinion & Side Bearing Installer
- MB990930: Installer Adapter
- MB990934: Installer Adapter
- MB990938: Installer Bar
- MB991115: Oil Seal Installer
- MB991180: Bush Remover & Installer Base
- MB992111: Side Bearing Holder
- MB992112: Lock Nut Wrench
- MB992113: Drive Pinion Holder
- MB992115: Dummy Pinion Gauge body
- MB992116: Dummy Pinion Gauge Head
- MB992117: Cylinder Gauge
- MB992128: Hex Socket Head Bolt
- MD998816: Installer Adapter

LUBRICANT/SEALANT APPLICATION POINTS



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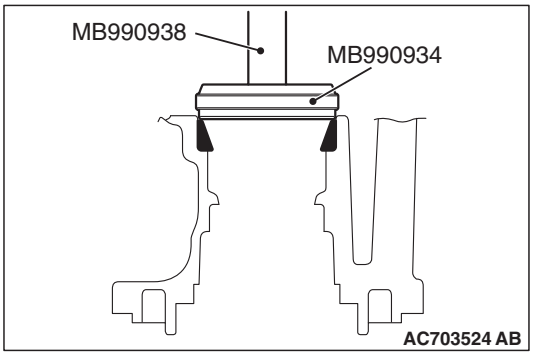
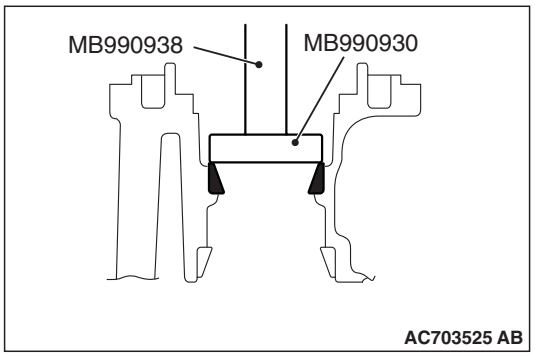
ASSEMBLY SERVICE POINT

>>A<< DRIVE PINION REAR BEARING OUTER RACE PRESS-FITTING



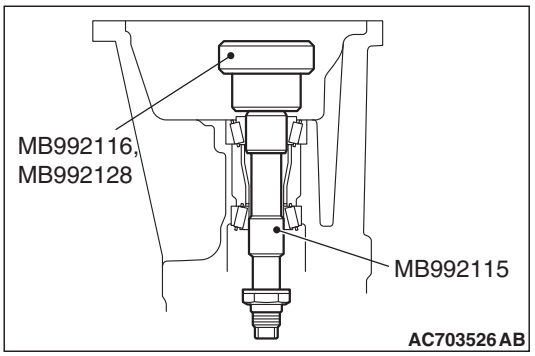
Use special tools MB990934 and MB990938 to press-fit the drive pinion rear bearing outer race.

>>B<< DRIVE PINION FRONT BEARING OUTER RACE PRESS-FITTING



Use special tools MB990930 and MB990938 to press-fit the drive pinion front bearing outer race.

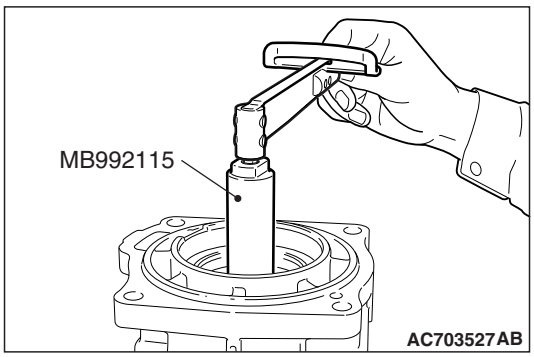
>>C<< DRIVE PINION HEIGHT ADJUSTMENT



Adjust the drive pinion height in the following steps.

1. Use special tools MB992115, MB992116 and MB992128 to assemble the drive pinion front and rear bearing inner races onto the differential carrier:

⚠ CAUTION
The bearing must be free from gear oil.



2. Measure the drive pinion rotation torque.

Standard value:

Bearing division	Bearing lubrication	Rotation torque N·m (in-lb)
New	None (coated with rust inhibitor oil)	0.7 – 1.2 (6.20 – 10.62)

NOTE: After seating the bearing, measure the rotation torque.

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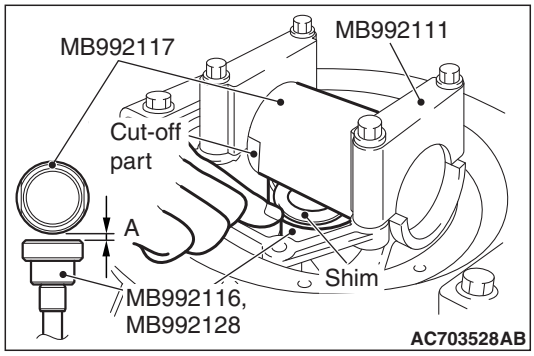


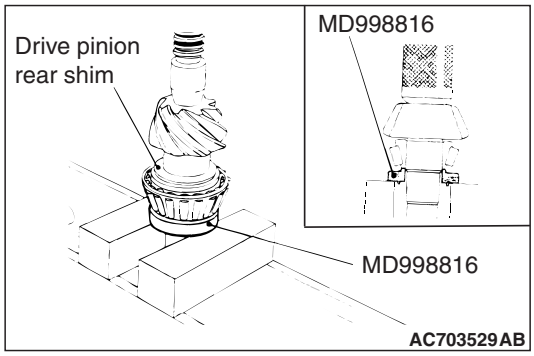
3. Set special tool MB992117 on the differential carrier side bearing, and use special tool MB992111 to assemble it onto the differential carrier.

   Make sure that the cut-off part of the cylinder gauge is positioned as shown in the figure, and the cylinder gauge is closely contacted with the side bearing.

   Tightening torque: 48 ± 6 N·m (36 ± 4 ft-lb)

4. Select the drive pinion rear shim(s) that corresponds to the gap between the special tools.

   NOTE:
   1. Clean the side bearing.
   2. When setting the special tool, make sure that its cut-off part is positioned as shown in the figure, and it is closely contacted with the side bearing.
   3. Try to minimize the number of the drive pinion rear shim(s) to be used.



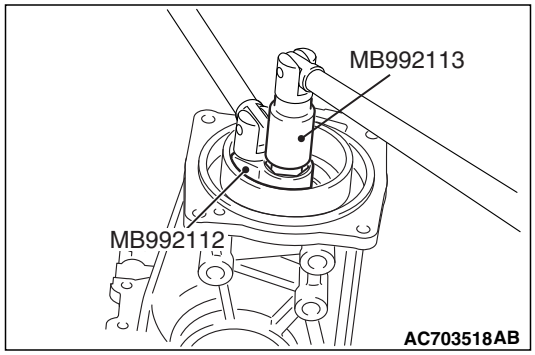
5. Fit the selected drive pinion rear shim(s) onto the drive pinion. Use special tool MD998816 to press-fit the drive pinion rear bearing inner race.

>>D<< DRIVE PINION ROTATION TORQUE ADJUSTMENT/OIL SEAL PRESS-FITTING

Adjust the drive pinion rotation torque in the following steps:

1. Insert the drive pinion into the differential carrier. From rear side of the carrier, assemble the drive pinion spacer, drive pinion front shim and drive pinion front bearing inner race.

   NOTE: Do not assemble the oil seal.



2. Use special tools MB992112 and MB992113 to tighten the differential nut to the specified torque.
3. Rotate the drive pinion several turns, and then measure the drive pinion rotation torque.

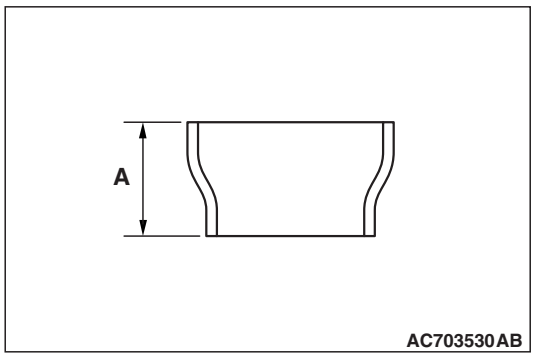
   Standard value:

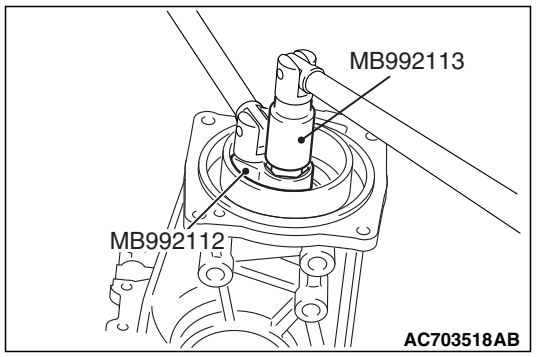
Bearing division	Bearing lubrication	Rotation torque N·m (in-lb)
New	None (coated with rust inhibitor oil)	0.7 – 1.2 (6.20 – 10.62)

4. When the rotation torque is not within the standard value range, adjust the torque by selecting the drive pinion front shim(s).

   NOTE: When selecting the drive pinion front shim(s), select the drive pinion spacer to minimize the number of the shims to be used. There are two drive pinion spacers available:

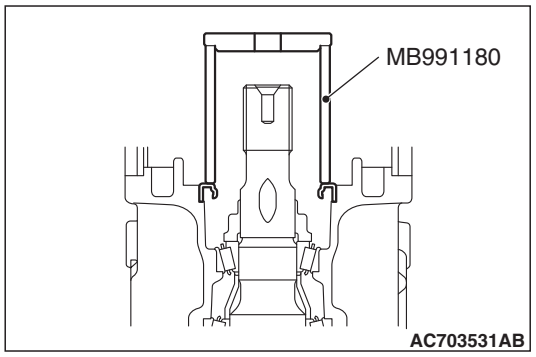
Drive pinion spacer height A mm (in)
24.3 (0.96)
23.6 (0.93)





5. Use special tools MB992112 and MB992113 to tighten the differential nut to the specified torque.

   Tightening torque: 190 ± 3 N·m (140 ± 22 ft-lb)



6. Use special tool MB991180 to press-fit the oil seal.
7. Rotate the drive pinion several turns, and then measure the drive pinion rotation torque.

   Standard value:

Bearing division	Bearing lubrication	Rotation torque N·m (in-lb)
New	None (coated with rust inhibitor oil)	0.7 – 1.2 (6.20 – 10.62)

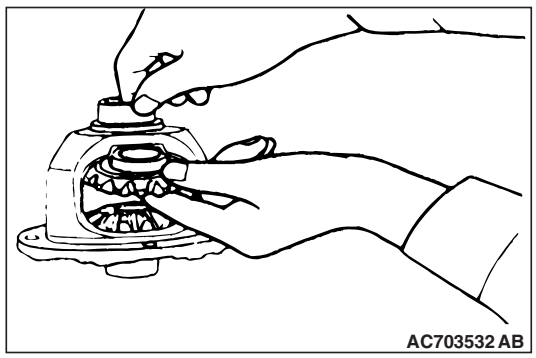
8. When the rotation torque is not within the standard value, check the differential locking nut tightening torque or the oil seal assembly condition.

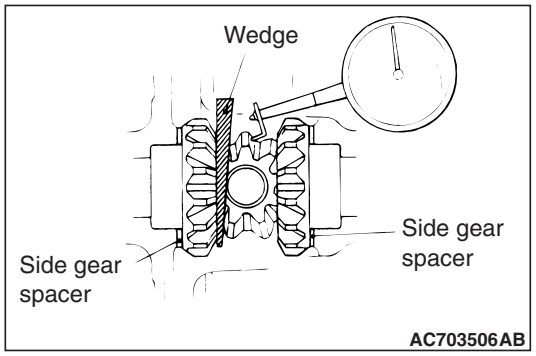
>>E<< DIFFERENTIAL GEAR BACKLASH ADJUSTMENT

Adjust the differential gear backlash in the following steps.

1. Assemble the side gear, side gear spacer, pinion gear and pinion washer into the differential case.
2. Temporarily assemble the pinion shaft.

   NOTE: Do not assemble the lock pin at this stage.

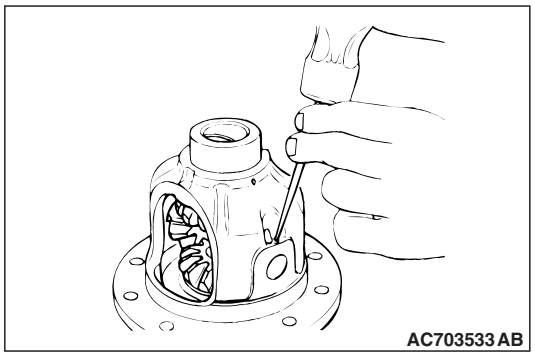




3. Drive a wooden wedge between one of the side gears and the pinion shaft to fix the side gear.
4. Set a dial gauge (with the measuring rod extended) against the pinion gear and measure the backlash. Repeat the same procedure to measure the backlash at the other pinion gear.

   Standard value: 0 – 0.076 mm (0 – 0.0030 inch)
   Limit: 0.2 mm (0.01 inch)
5. When the backlash exceeds the limit value, adjust it by selecting the side gear spacer.
6. When the adjustment is not possible, replace the side gear and the pinion gear as a set.
7. After the adjustments, make sure that the backlash is within the limit value and the differential gear rotates smoothly.

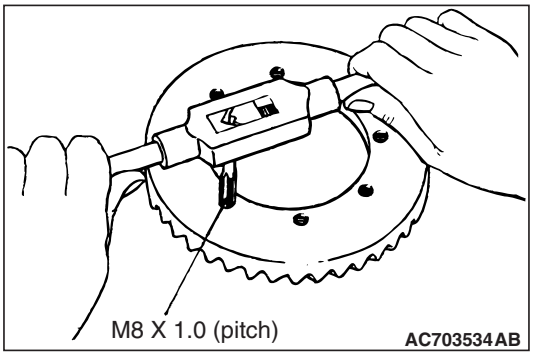
>>F<< LOCK PIN INSTALLATION

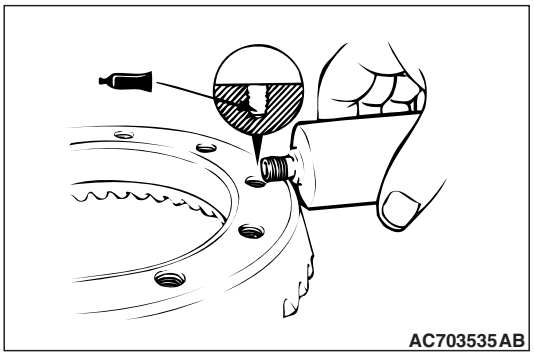


1. Align the lock pin holes in the pinion shaft and in the differential case, and drive in the lock pin.
2. Use a punch to crimp two points.

>>G<< DRIVE GEAR INSTALLATION

1. Remove adhesive on the drive gear tightening bolts.
2. Use a tap to remove adhesive in the drive gear screw holes, and clean the holes by blowing air.



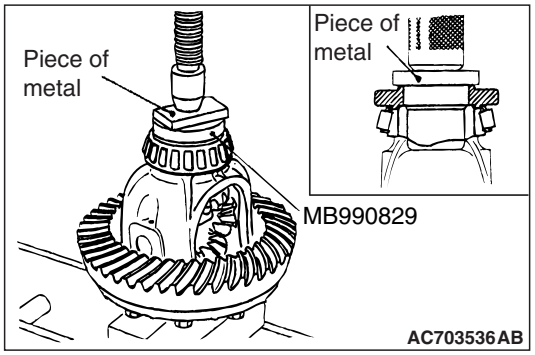


3. Apply the specified thread locking compound in the drive gear screw holes.

   Specified adhesive: 3M ™ AAD Part No.8730, 8731 or equivalent
4. Align the mating marks and assemble the drive gear to the differential case.

   Tightening torque: 41 ± 5 N·m (30 ± 3 ft-lb)

>>H<< DIFFERENTIAL SIDE BEARING INNER RACE INSTALLATION

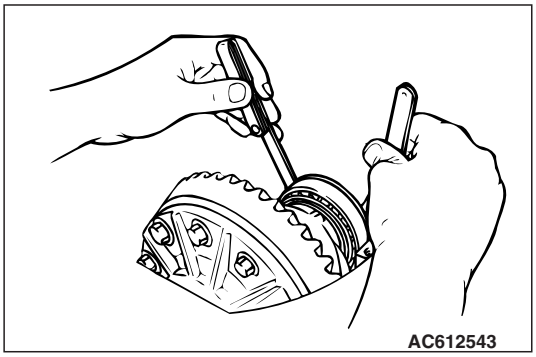


Use special tool MB990829 to press-fit the differential side bearing inner race.

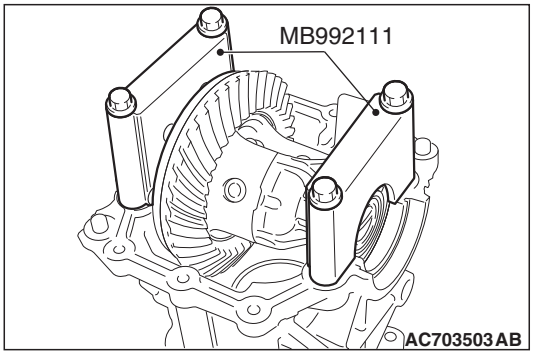
>>I<< FINAL DRIVE GEAR BACKLASH ADJUSTMENT

Adjust the final drive gear backlash in the following steps:

1. To the differential carrier, install the differential case with the side bearing outer race assembled.
2. Press the differential case to one side, and measure clearance between the side bearing outer race and the differential carrier.

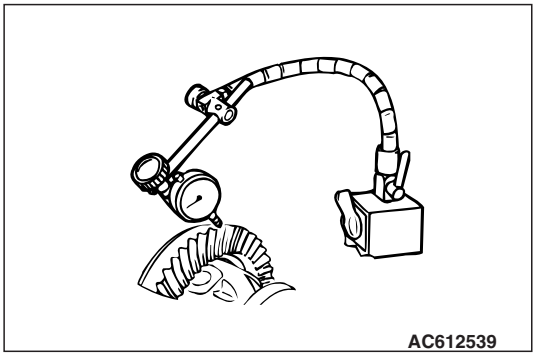


3. Select two pairs of the side bearing spacers. (Thickness: 1/2 of the measured clearance with 0.05 mm (0.002 inch) preload added)



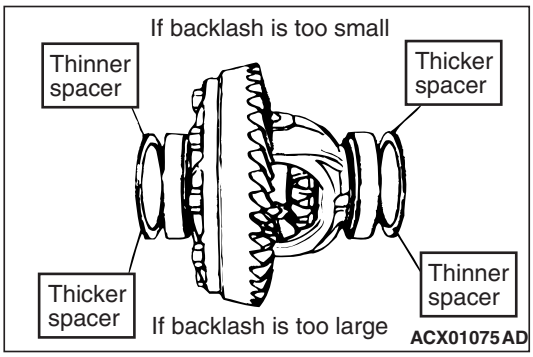
4. Use special tool MB992111 to install the differential case to the differential carrier.

   Tightening torque: 48 ± 6 N·m (36 ± 4 ft-lb)



5. Measure the final drive gear backlash at four or more points.

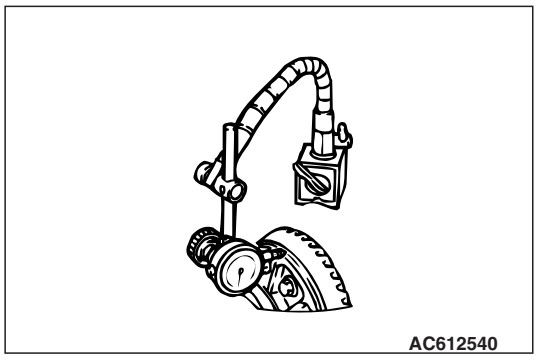
   Standard value: 0.08 – 0.15 mm (0.003 – 0.006 inch)



6. When the backlash is not within the standard value range, move the side bearing spacers as shown in the figure to adjust the backlash.

   NOTE: Increase the side bearing spacers by the same amount as for the decrease.

7. Check the final drive gear teeth contact, and if not proper, adjust it.(Refer to P.27B-33.)



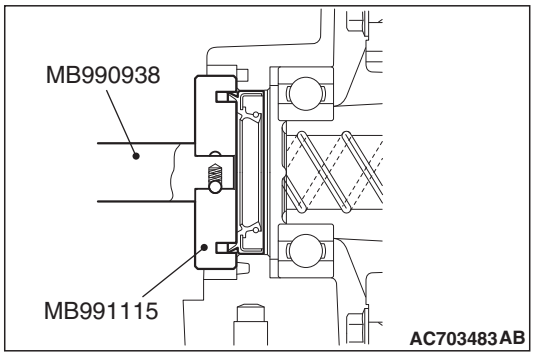
8. Measure the drive gear runout on the backside.

   Limit: 0.05 mm (0.002 inch)

9. When the runout exceeds the limit, change position of the drive gear and differential case, and measure the runout again.
10. If the adjustment is not possible, replace the differential case or the drive gear and the drive pinion as a set.

>>J<< OIL SEAL PRESS-FITTING

Use special tools MB990938 and MB991115 to press-fit the oil seal.



NOTES