

GROUP 27

REAR AXLE

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GENERAL DESCRIPTION

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

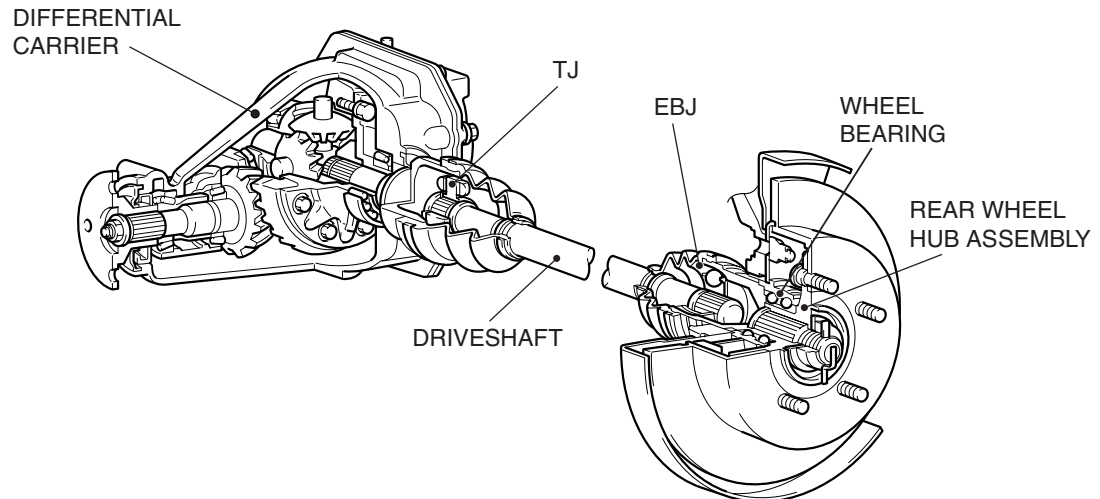
- The wheel bearing incorporates a unit ball bearing (double-row angular contact ball bearing) for reduced friction.
- The rear wheel hub assembly combines the hub, wheel bearing, housing, and oil seal in a single unit for fewer parts, better rigidity, improved assembly precision, and better structural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

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

EBJ: Eight Ball Fixed Joint; Due to the use of the smaller size eight balls inside the joint, this features weight saving and compact size compare with BJ (Birfield Joint).

TJ: Tripod Joint

CONSTRUCTION DIAGRAM



AC211190AB

REAR AXLE DIAGNOSIS

INTRODUCTION

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

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TROUBLESHOOTING STRATEGY

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.

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SYMPTOM CHART

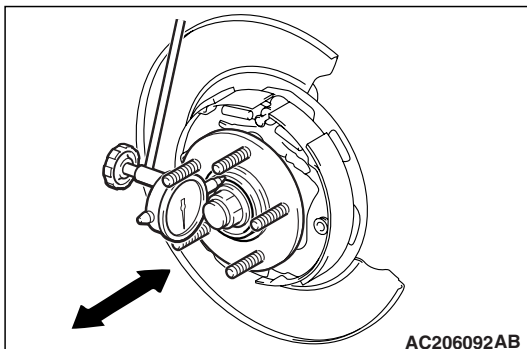
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SYMPTOM		INSPECTION PROCEDURE	REFERENCE PAGE
Driveshaft	Noise during wheel rotation	1	P.27-3
Differential	Constant noise	2	P.27-4
	Gear noise while driving	3	P.27-5
	Gear noise while coasting	4	P.27-6
	Bearing noise while driving or coasting	5	P.27-6
	Noise while turning	6	P.27-7
	Heat	7	P.27-7
	Oil leakage	8	P.27-8

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: Noise during Wheel Rotation <DRIVESHAFT>

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 the driveshaft for bent.

Q: Is the driveshaft bent?

YES : Replace the driveshaft assembly. 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.

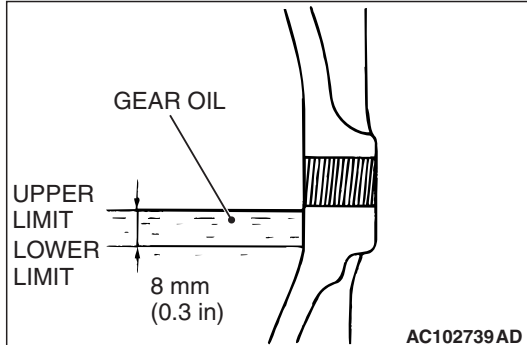
Q: Is the abnormal noise eliminated?

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 Mitsubishi Limited Slip Differential Oil (LSD) or equivalent. 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.27-34.).

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

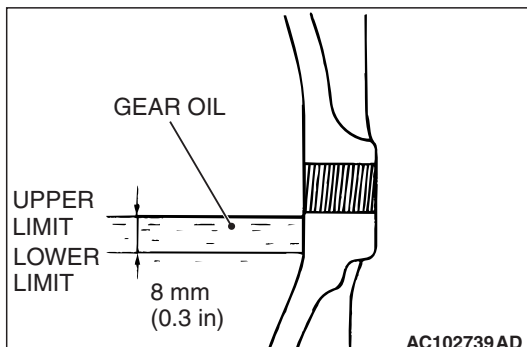
STEP 1. Check the oil level.

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 Mitsubishi Limited Slip Differential Oil (LSD) or equivalent. 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.
-

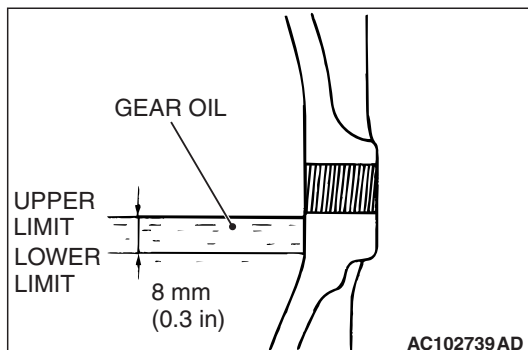
INSPECTION PROCEDURE 7: Heat <DIFFERENTIAL>

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 Mitsubishi Limited Slip Differential Oil (LSD) or equivalent. Then go to Step 3.
NO : Go to Step 2.



STEP 2. Check for excessive gear backlash. (Refer to [P.27-34.](#))

- 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.

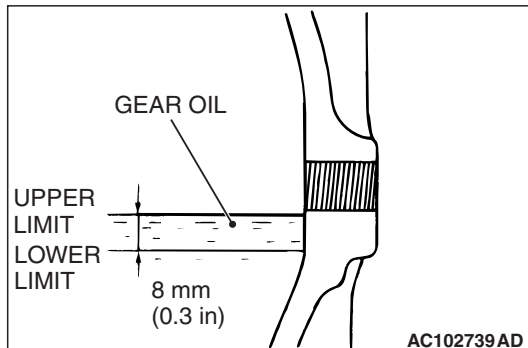
- Q: Is the heat eliminated?**
YES : The procedure is complete.
NO : Start over at Step 1.

INSPECTION PROCEDURE 8: Oil Leakage <DIFFERENTIAL>

DIAGNOSIS

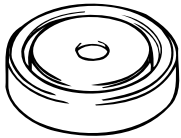
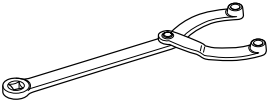
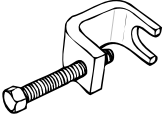
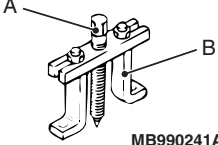

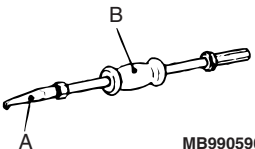
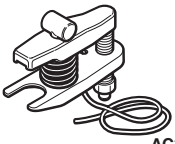
STEP 1. Check the cover installation.**Q: Is the cover installed correctly?****YES :** Go to Step 2.**NO :** Repair. Then go to Step 4.**STEP 2. Check the oil seal for wear or damage.****Q: Is the oil seal worn or damaged?****YES :** Replace the seal. Then go to Step 4.**NO :** Go to Step 3.**STEP 3. Check the oil level.**

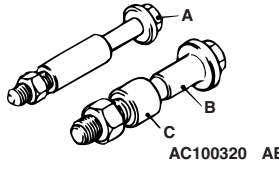
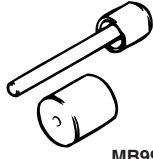
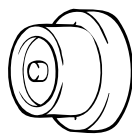
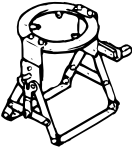
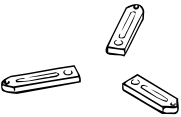


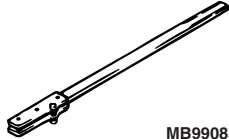
Remove the filler plug and check the gear oil level.

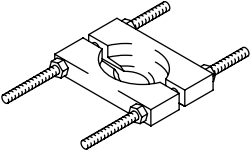
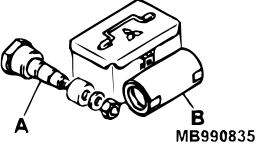
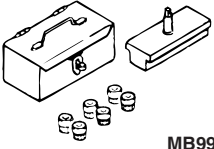
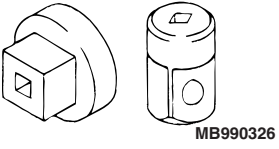

Q: Is the gear oil level more than 8 mm (0.3 inch) below the bottom of the filler plug hole?**YES :** Refill Mitsubishi Limited Slip Differential Oil (LSD) or equivalent. Then go to Step 4.**NO :** Go to Step 4.**STEP 4. Retest the system.****Q: Is there oil leakage?****YES :** Start over at Step 1.**NO :** The procedure is complete.

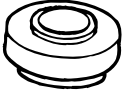
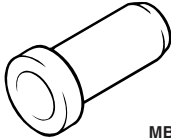
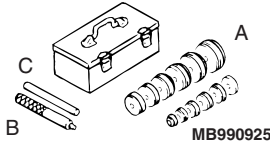
SPECIAL TOOLS

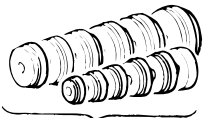



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TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
	MB991115 Oil seal installer	–	Press-fitting of the differential carrier oil seal (Use together with MB990938)
 B990767	MB990767 Front hub and flange yoke holder	MB990767-01	Rear wheel hub fixing
 MB991618	MB991618 Hub bolt remover	General service tool	Hub bolt removal
 MB990241AB	MB990241 Axle shaft puller A: MB990242 Puller shaft B: MB990244 Puller bar	MB990241-01 or General service tool	<ul style="list-style-type: none"> • Removal of the rear wheel hub • Removal of the driveshaft
 MB991354	MB991354 Puller body	General service tool	
 MB990590	MB990590 Rear axle shaft oil seal remover A: MB990212 Adapter B: MB990211 Slide hammer	–	Removal of the rear wheel hub
 AC106827	MB991897 Ball joint remover	MB991113-01, MB990635-01 or General service tool	<ul style="list-style-type: none"> • Knuckle and rear suspension arms ball joint disconnection <p><i>NOTE: Steering linkage puller (MB990635 or MB991113) is also used to disconnect knuckle and tie rod end ball joint.</i></p>

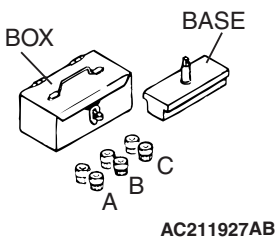
TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
	A: MB991017 B: MB990998 C: MB991000 A, B: Front hub remover and installer C: Spacer	MB990998-01	<ul style="list-style-type: none"> Provisional holding of the wheel bearing Measurement of wheel bearing breakaway torque Measurement of wheel bearing end play <i>NOTE: MB991000, which belongs to MB990998, should be used as a spacer.</i>
	MB990641 Lower arm bush (A) remover and installer	-	Removal and installation of the differential support member bushing
	MB991439 Bush remover and installer	-	
	MB990909 Working base	General service tool	Supporting of the differential carrier
	MB991116 Working base adapter	General service tool	
	MB990810 Side bearing puller	MB990810-01	<ul style="list-style-type: none"> Removal of the side bearing inner race Removal of the companion flange
	MB990811 Side bearing cup	MB990811-01	Removal of the side bearing inner race
	MB990850 End yoke holder	MB990767-01	Companion flange fixing

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
	MD998801 Remover	General service tool	Removal of drive pinion rear bearing inner race
	MB990835 Drive pinion setting gauge set A: MB990836 Drive pinion gauge assembly B: MB990392 Cylinder gauge	-	Adjustment of the drive pinion height
	MB990988 Side bearing holding tool set	-	Measurement of clutch plate preload
	MB990326 Preload socket	General service tool	<ul style="list-style-type: none"> • Measurement of the wheel bearing breakaway torque • Measurement of the drive pinion turning torque
	MB990685 Torque wrench	General service tool	

TOOL	TOOL NUMBER AND NAME	SUPERSESION	APPLICATION
 <p>MB990728</p>	MB990728 Bearing installer	MB99802-01	Press-fitting of the drive pinion rear bearing inner race
 <p>MB990727</p>	MB990727 Oil seal installer	MB990031-01	Press-fitting of the drive pinion oil seal
 <p>MB990925</p>	MB990925 Bearing and oil seal installer set A: MB990926 – MB990937 Installer adapter B: MB990938 Bar C: MB990939 Brass bar	MB990925-01 or General service tool	<ul style="list-style-type: none"> • Press-fitting of differential carrier oil seal (Use together with MB991115) • Inspection of final drive gear tooth contact • Removal and installation of drive pinion front/rear bearing outer race

TOOL	TYPE	TOOL NUMBER	O D mm (in)
 <p>A INSTALLER ADAPTER</p>  <p>C BRASS BAR</p>  <p>B BAR (SNAP-IN TYPE)</p>  <p>TOOL BOX ACX02372 AC</p>	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
	C	MB990939	–

SIDE GEAR HOLDING TOOL SET

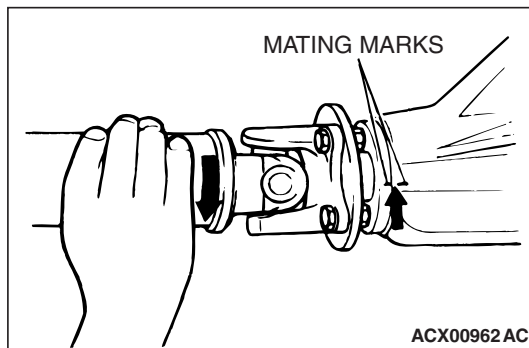
TOOL	TOOL NUMBER AND NAME	O D mm (in)
	MB990551 Box	—
	MB990989 Base	—
	MB990990 Tool A	25 (0.98)
	MB990991 Tool B	28 (1.10)
	MB990992 Tool C	31 (1.22)

ON-VEHICLE SERVICE

REAR AXLE TOTAL BACKLASH CHECK

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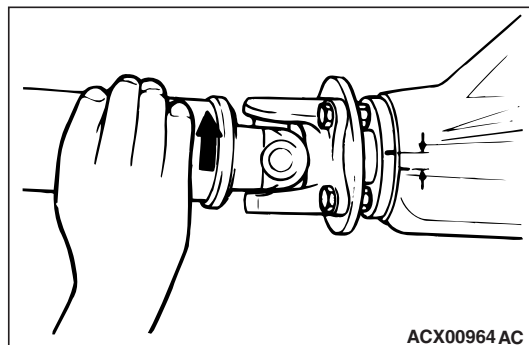
1. Park the vehicle on a flat, level surface.
2. Move the transmission gearshift lever to the neutral position. Apply the parking brake and jack up the vehicle.
3. Turn the propeller shaft clockwise as far as it will go. Make the mating marks on the dust cover of the companion flange and on the differential carrier.

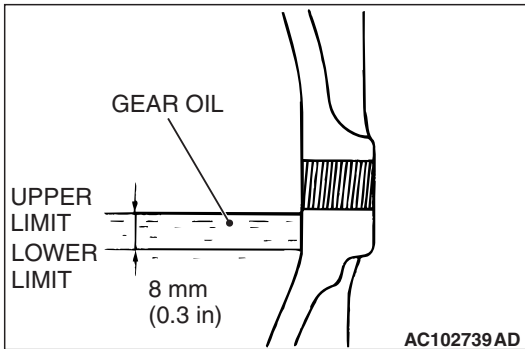


4. Turn the propeller shaft counterclockwise as far as it will go, and measure the amount of distance between the mating marks.

Limit: 6 mm (0.2 inch)

5. If the backlash exceeds the limit value, remove the differential carrier assembly and check the following.
 - Final drive gear backlash (Refer to [P.27-34.](#))
 - Differential gear backlash (Refer to [P.27-34.](#))



**GEAR OIL LEVEL CHECK**

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1. Remove the filler plug.
2. Check that gear oil level is not 8 mm (0.3 inch) below the bottom of filler plug hole.

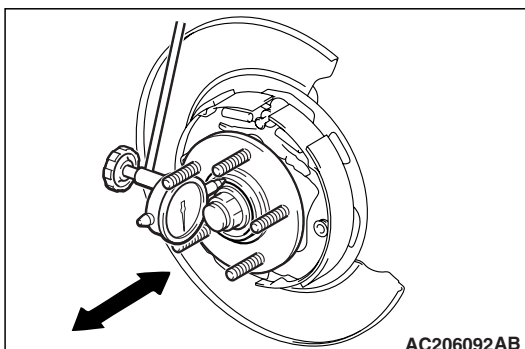
GEAR OIL REPLACEMENT

M1272004600092

1. Remove the filler plug.
2. Remove the drain plug and drain oil.
3. Tighten the drain plug to the specified torque.
Tightening torque: 64 ± 4 N·m (47 ± 3 ft-lb)
4. Add the oil until the level comes to the lower portion of the filler plug hole.
Specified gear oil: Mitsubishi Limited Slip Differential Oil (LSD) or equivalent
5. Tighten the filler plug to the specified torque.
Tightening torque: 49 ± 9 N·m (37 ± 6 ft-lb)

WHEEL BEARING END PLAY CHECK

M1271000900344



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)
3. If the play exceeds the limit, the driveshaft nut should be tightened to the specified torque and check the axial play again.
Tightening torque: 225 ± 25 N·m (166 ± 18 ft-lb)
4. Replace the rear hub assembly if adjustment cannot be made to within the limit.
5. Install the brake disc and caliper assembly, and tighten the caliper assembly mounting bolts to the specified torque.
Tightening torque: 54 ± 5 N·m (40 ± 4 ft-lb)

HUB BOLT REPLACEMENT

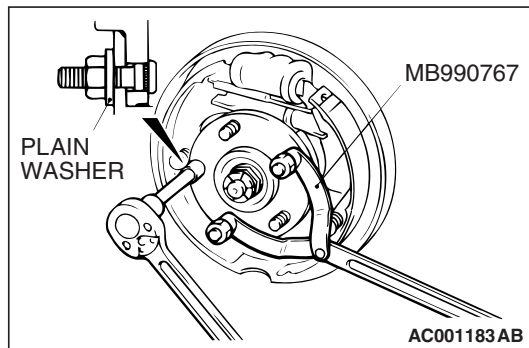
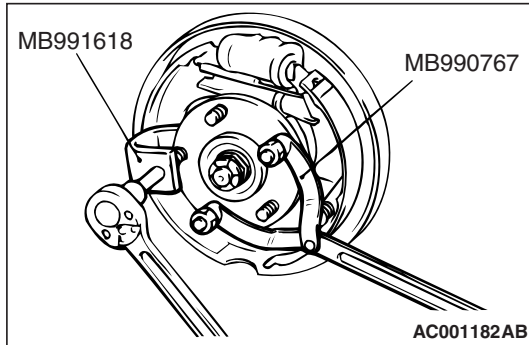
M1271001000195

Required Special Tools:

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

1. Remove the brake caliper and brake disc.
2. Use special tools MB990767 and MB991618 to remove the hub bolts.

NOTE: To retain a space for removing the hub bolts, remove near the retainer spring mounting position.

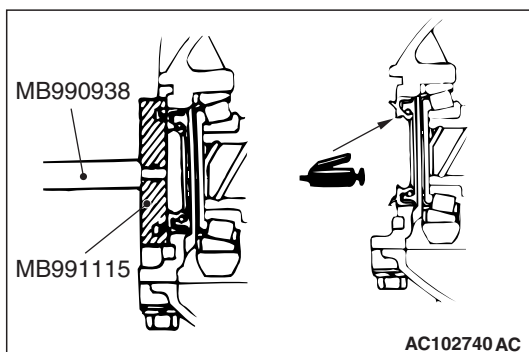


3. Install the plain washer to the new hub bolt, and install the bolt with a nut.

DIFFERENTIAL CARRIER OIL SEAL REPLACEMENT

M1272001300092

1. Remove the driveshaft from the differential carrier. (Refer to [P.27-22.](#))
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 driveshaft circlip with a new one, and install the driveshaft to the differential carrier. (Refer to [P.27-22.](#))



REAR AXLE HUB ASSEMBLY

REMOVAL AND INSTALLATION

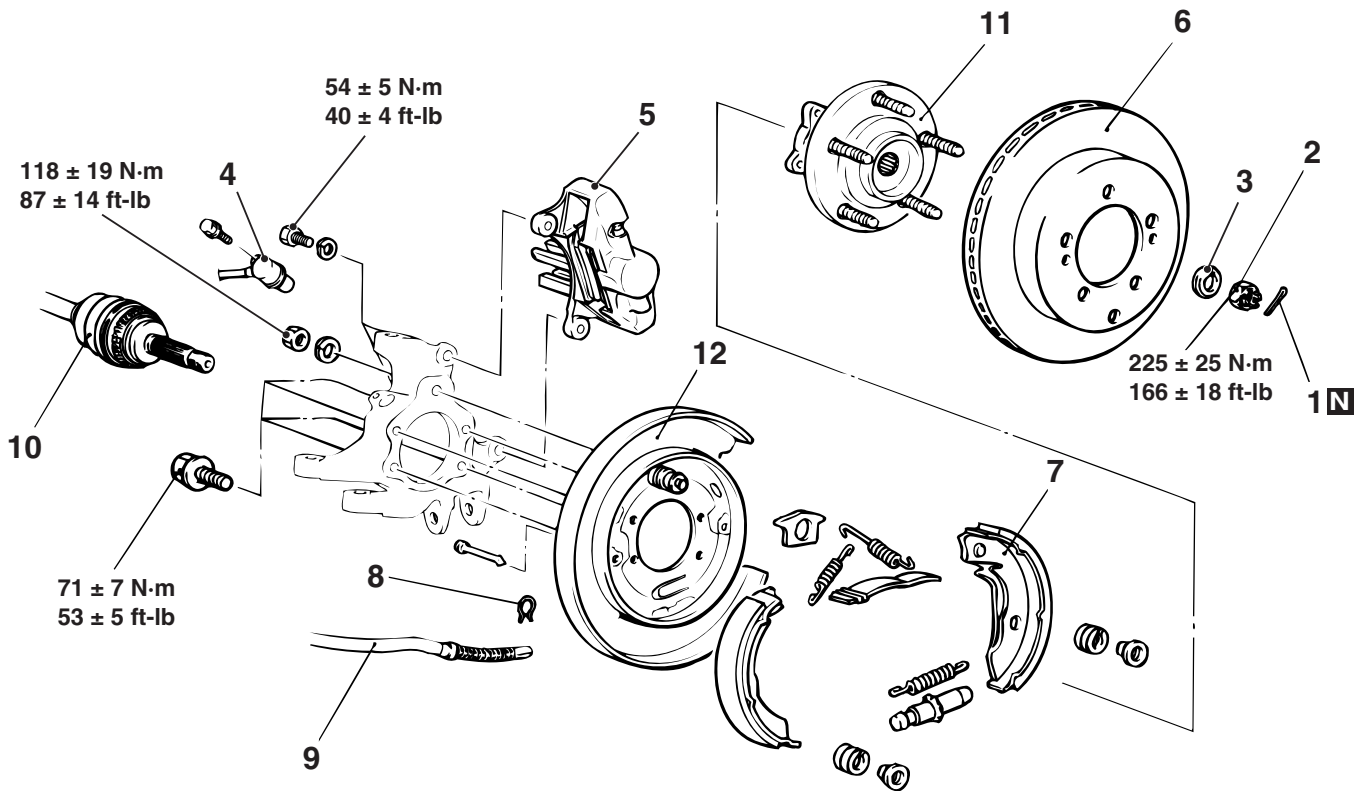
M1271002000563

CAUTION

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

Post-installation Operation

Parking Brake Lever Stroke Adjustment (Refer to GROUP 36, On-vehicle Service – Parking Brake Lever Stroke Check P.36-4).



AC211950 AC

REMOVAL STEPS

- <<A>> >>A<<
>>A<<
<>
1. COTTER PIN
 2. DRIVESHAFT NUT
 3. WASHER
 4. REAR ABS SENSOR
 5. CALIPER ASSEMBLY
 6. BRAKE DISC
 7. PARKING BRAKE SHOE AND LINING ASSEMBLY (REFER TO GROUP 36, PARKING BRAKE LINING AND DRUM P.36-8.)

REMOVAL STEPS (Continued)

- <<C>>
8. CLIP
 9. PARKING BRAKE CABLE CONNECTION
 10. REAR DRIVESHAFT CONNECTION
 11. REAR WHEEL HUB ASSEMBLY
 12. BACKING PLATE

Required Special Tool:

MB990767: Front Hub and Flange Yoke Holder

MB990241: Axle Shaft Puller

MB991354: Puller Body

MB990211: Slide Hammer

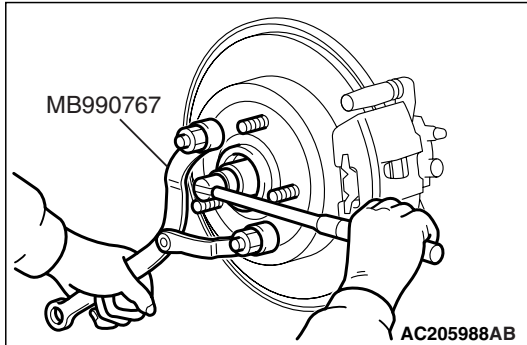
REMOVAL SERVICE POINTS

<<A>> DRIVESHAFT NUT REMOVAL

⚠ CAUTION

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

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



<> CALIPER ASSEMBLY REMOVAL

⚠ CAUTION

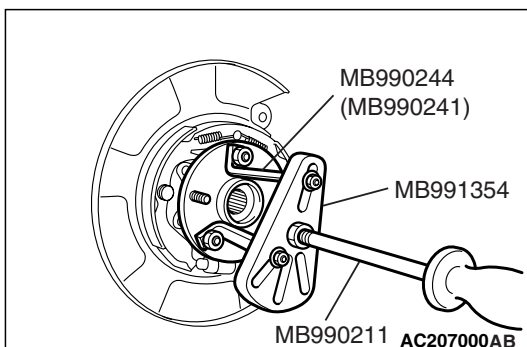
During maintenance, take care not to contact the parts or tools to the caliper because the paint of caliper will be scratched.

Secure the removed caliper assembly with wire, etc.

<<C>> REAR WHEEL HUB REMOVAL

If the rear wheel hub is seized, remove the rear wheel hub as follows.

1. Remove the knuckle with rear wheel hub and fix them with a vise. (Refer to P.27-20.)
2. Use special tools MB990244 (MB990241), MB991354 and MB990211 to pull out the rear wheel hub from the knuckle.



INSTALLATION SERVICE POINT

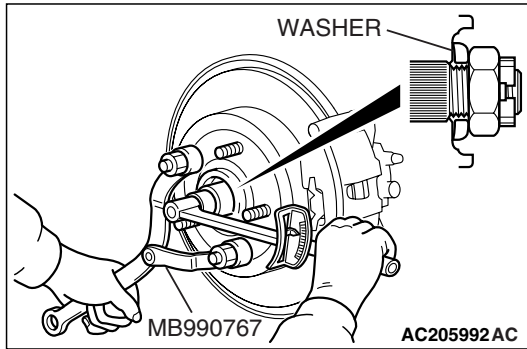
>>A<< WASHER/ DRIVESHAFT NUT INSTALLATION

CAUTION

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

1. Be sure to install the driveshaft washer in the specified direction.
2. Using special tool MB990767, tighten the driveshaft nut to the specified torque.

Tightening torque: 225 ± 25 N·m (166 ± 18 ft-lb)



INSPECTION

M1271002100195

WHEEL BEARING BREAKAWAY TORQUE AND AXIAL PLAY CHECK

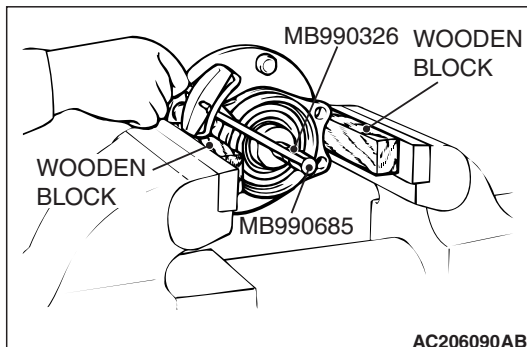
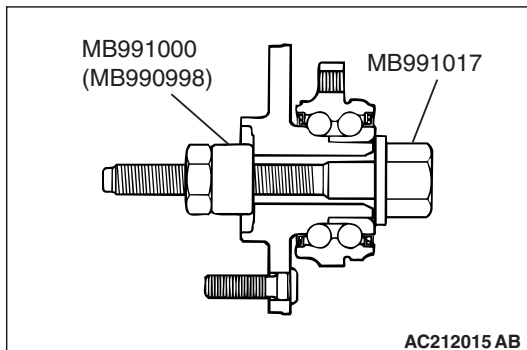
Required Special Tools:

- MB990998, MB991017: Front Hub Remover and Installer
- MB990326: Preload Socket
- MB990685: Torque Wrench

1. Tighten special tools MB991000 (MB990998) and MB991017 to the specified torque.

Tightening torque: 225 ± 25 N·m (166 ± 18 ft-lb)

2. Rotate the rear hub in order to seat the bearing.

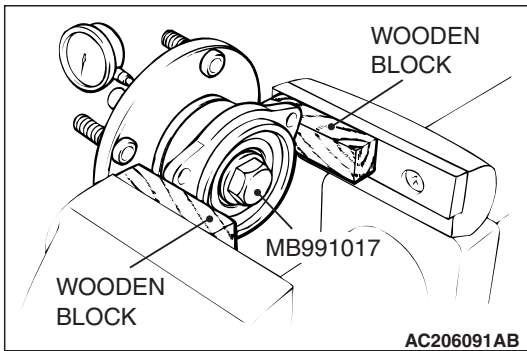


3. Hold the rear wheel hub assembly using way of wooden block.

4. Measure the wheel bearing breakaway torque by using special tools MB990326 and MB990685.

Limit: 1.0 N·m (0.74 ft-lb)

5. If the breakaway torque is not within the limit range while the nut is tightened to 225 ± 25 N·m (166 ± 18 ft-lb), replace the front wheel bearing assembly. If there is any signs of binding or tight spots when the wheel bearing turns, replace it.



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

Limit: 0.05 mm (0.002 inch)

7. If the play is not within the limit range while the nut is tightened to 225 ± 25 N·m (166 ± 18 ft-lb), replace the rear wheel hub assembly.

KNUCKLE

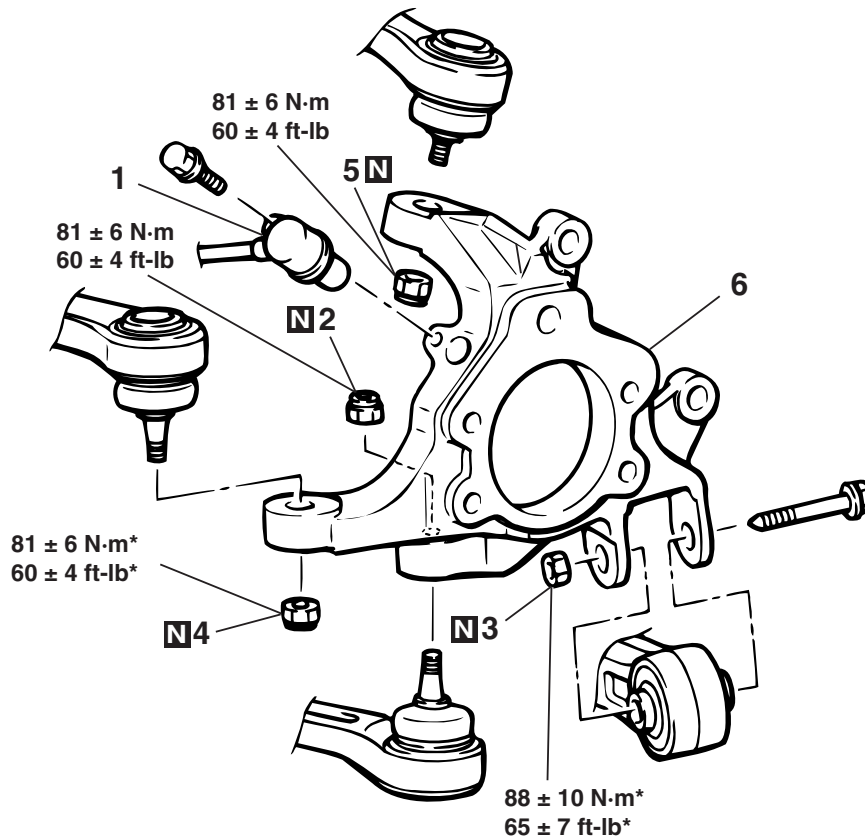
REMOVAL AND INSTALLATION

M1271003000232

CAUTION

- Be careful not to strike the pole piece at the tip of the rear ABS sensor with tools during servicing work.
- During maintenance, take care not to contact the parts or tools to the caliper because the paint of caliper will be scratched. And if there is brake fluid on the caliper, wipe it off quickly.
- *: Indicates parts which should be temporarily tightened, and then fully tightened with the vehicle on the ground in the unladen condition.

<p>Pre-removal Operation</p> <ul style="list-style-type: none"> • Rear Wheel Hub Assembly Removal (Refer to P.27-16). 	<p>Post-installation Operation</p> <ul style="list-style-type: none"> • Check the ball joint dust cover for cracks or damage by pushing it with your finger. • Rear Wheel Hub Assembly Installation (Refer to P.27-16).
---	--



AC211951AB

- <<A>>
- REMOVAL STEPS**
1. REAR ABS SENSOR
 2. SELF LOCKING NUT (TRAILING ARM CONNECTION)
 3. SELF LOCKING NUT (LOWER ARM CONNECTION)
 4. SELF LOCKING NUT (TOE CONTROL ARM CONNECTION)

- <<A>>
- REMOVAL STEPS (Continued)**
5. SELF LOCKING NUT (UPPER ARM CONNECTION)
 6. KNUCKLE

Required Special Tool:
MB991897: Ball Joint Remover

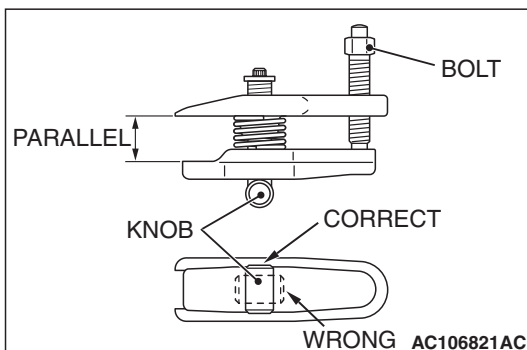
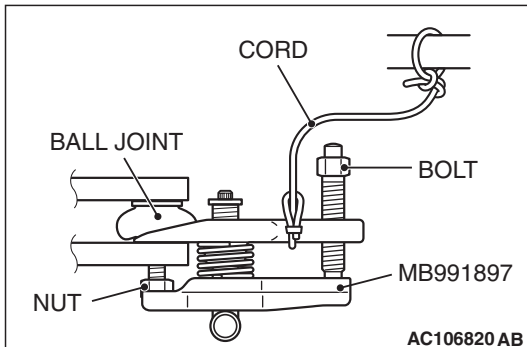
REMOVAL SERVICE POINT

<<A>>SELF LOCKING NUT (TRAILING ARM, TOE CONTROL ARM AND UPPER ARM CONNECTION)
REMOVAL

⚠ CAUTION

- Do not remove the nut from ball joint. Loosen it and use special tool MB991897 to avoid possible damage to ball joint threads.
- Hang special tool MB991897 with cord to prevent them from falling.

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



2. After turning the bolt and knob to adjust the arms of special tool MB991897 in parallel, tighten the bolt by hand and confirm that the arms are parallel.

NOTE: When adjusting the arms in parallel, turn the knob so that it is at right angles to the arms.

3. Tighten the bolt with a wrench to disconnect the ball joint and remove the self locking nut.

INSPECTION

Check the knuckle for wear or cracks.

M1271003100132

DRIVESHAFT ASSEMBLY

REMOVAL AND INSTALLATION

M1271003300244

CAUTION

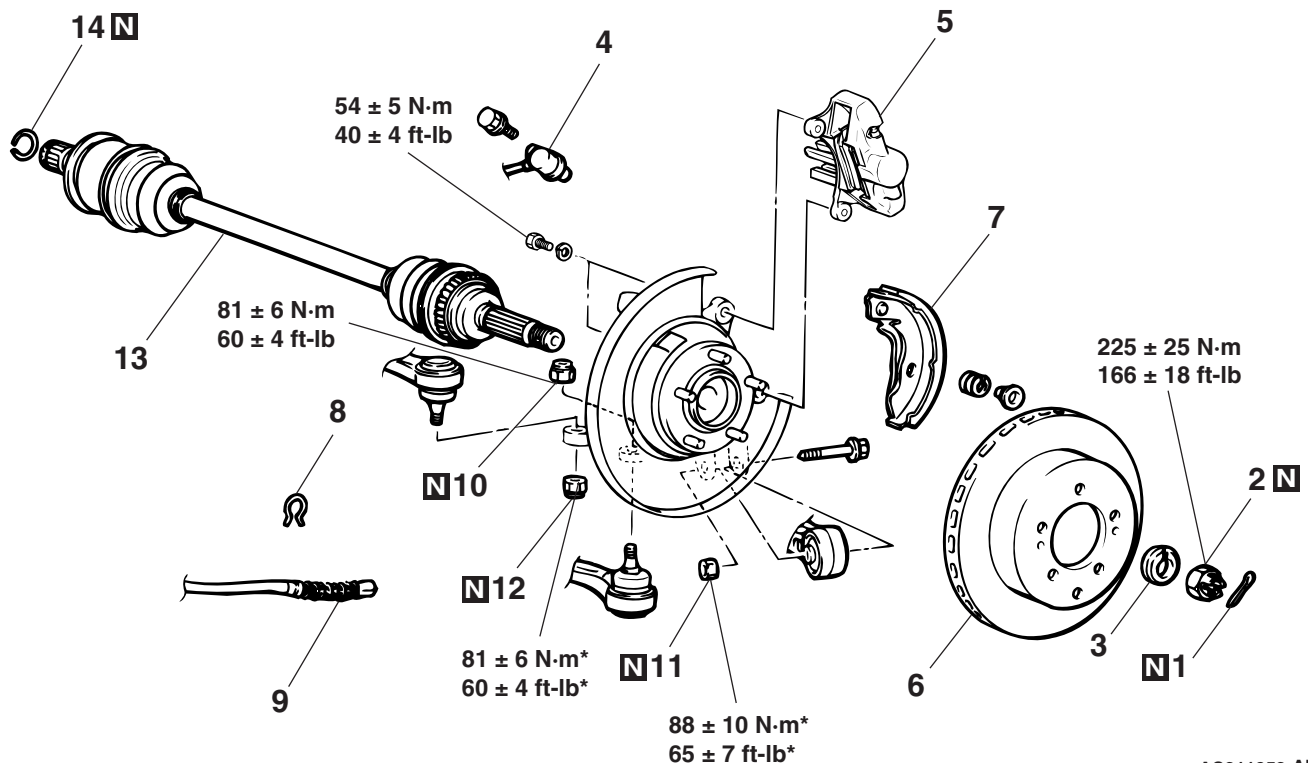
- Do not strike the ABS rotors installed to the EBJ outer race of driveshaft against other parts when removing or installing the driveshaft. The ABS rotors will be damaged.
- Be careful not to strike the pole piece at the tip of the rear ABS sensor with tools during servicing work.
- During maintenance,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

Pre-installation Operation

- Gear Oil Draining
- Center Exhaust Pipe Removal (Refer to GROUP 15, Exhaust Pipe and Main Muffler P.15-17).

Post-installation Operation

- Check the dust cover for cracks or damage by pushing it with your finger.
- Center Exhaust Pipe Installation (Refer to GROUP 15, Exhaust Pipe and Main Muffler P.15-17).
- Gear Oil Filling (Refer to P.27-14).
- Parking Brake Lever Stroke Adjustment (Refer to GROUP 36, On-vehicle Service –Parking Brake Lever Stroke Check and Adjustment P.36-4).
- Rear Wheel Alignment Check and Adjustment (Refer to GROUP 34, On-vehicle Service –Rear Wheel Alignment Check and Adjustment P.34-6).



AC211952 AB

REMOVAL STEPS

1. COTTER PIN
- <<A>> >>B<< 2. DRIVESHAFT NUT
- >>B<< 3. WASHER
4. REAR ABS SENSOR
- <> 5. CALIPER ASSEMBLY
6. BRAKE DISC

REMOVAL STEPS (Continued)

7. PARKING BRAKE SHOE AND LINING ASSEMBLY (REFER TO GROUP 36, PARKING BRAKE LINING AND DRUM P.36-8.)
8. CLIP
9. PARKING BRAKE CABLE CONNECTION

REMOVAL STEPS (Continued)		Required Special Tools:
<<C>>	10. SELF LOCKING NUT (TRAILING ARM CONNECTION)	MB990767: Front Hub and Flange Yoke Holder
<<C>>	11. SELF LOCKING NUT (LOWER ARM CONNECTION)	MB991354: Puller Body
<<C>>	12. SELF LOCKING NUT (TOE CONTROL ARM CONNECTION)	MB990241: Axle Shaft Puller MB991017: Front Hub Remover and Installer
<<D>> >>A<<	13. DRIVESHAFT	MB990998: Front Hub Remover and Installer
	14. CIRCLIP	MB991897: Ball Joint Remover

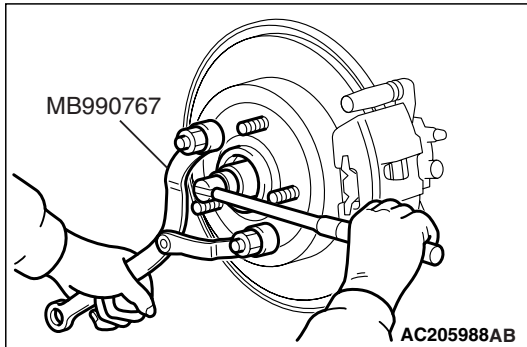
REMOVAL SERVICE POINTS

<<A>> DRIVESHAFT NUT REMOVAL

⚠ CAUTION

Do not apply pressure to wheel bearing by the vehicle weight to avoid possible damage to wheel bearing before tightening driveshaft nut fully.

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



<> CALIPER ASSEMBLY REMOVAL

⚠ CAUTION

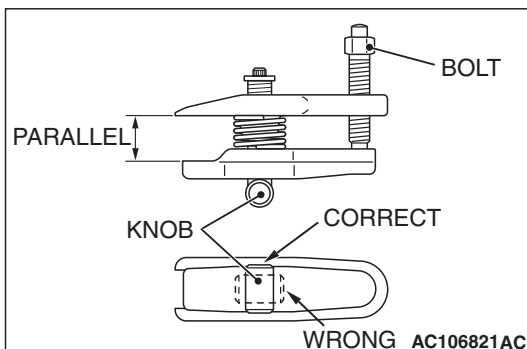
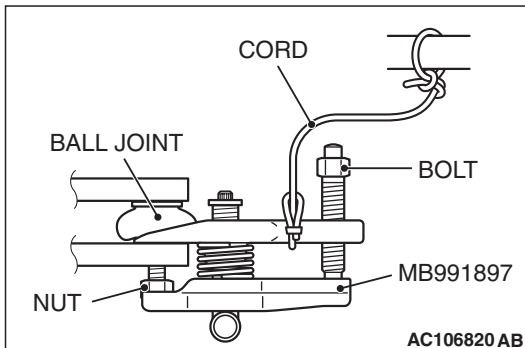
During maintenance, take care not to contact the parts or tools to the caliper because the paint of caliper will be scratched.

Secure the removed caliper assembly with wire, etc.

<<C>>SELF LOCKING NUT (TRAILING ARM, TOE CONTROL ARM AND UPPER ARM CONNECTION) REMOVAL**⚠ CAUTION**

- Do not remove the nut from ball joint. Loosen it and use special tool MB991897 to avoid possible damage to ball joint threads.
- Hang special tool MB991897 with cord to prevent them from falling.

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



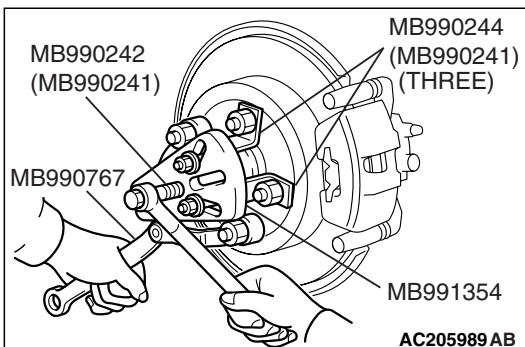
2. After turning the bolt and knob to adjust the arms of special tool MB991897 in parallel, tighten the bolt by hand and confirm that the arms are parallel.

NOTE: When adjusting the arms in parallel, turn the knob so that it is at right angles to the arms.

3. Tighten the bolt with a wrench to disconnect the ball joint and remove the self locking nut.

<<D>> DRIVESHAFT REMOVAL

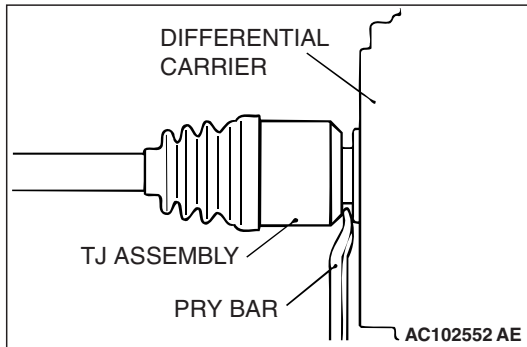
1. Use special tools MB990242, MB990244, MB991354 and MB990767 to push out the driveshaft from the hub.



⚠ CAUTION

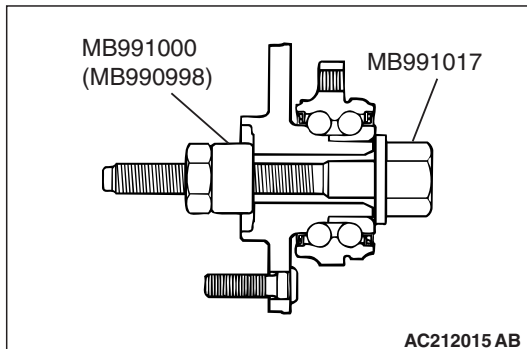
- Do not pull on the driveshaft. Doing so will damage the TJ. Be sure to use special tools MB991721, MB991833 and MB991961.
- When pulling the driveshaft out from the differential carrier, be careful that the spline part of the driveshaft does not damage the oil seal.

2. Remove the driveshaft from the differential carrier by using a pry bar.



⚠ CAUTION

Do not apply pressure to the wheel bearing by the vehicle weight to avoid possible damage when the driveshaft is removed. If, however, vehicle weight must be applied to the bearing in moving the vehicle, temporarily secure the wheel bearing by using the special tools MB991000(Spacer belongs to MB990998) and MB991017.



INSTALLATION SERVICE POINTS

>>A<< DRIVESHAFT INSTALLATION

⚠ CAUTION

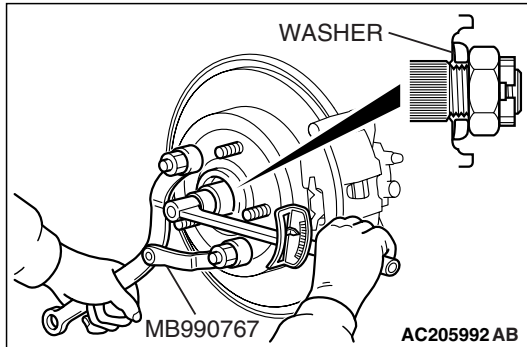
When installing the driveshaft, be careful that the spline part of the driveshaft does not damage the oil seal.

>>B<< WASHER/DRIVESHAFT NUT
INSTALLATION CAUTION

Do not apply pressure to wheel bearing by the vehicle weight to avoid possible damage to wheel bearing before tightening the driveshaft nut fully.

1. Assemble the driveshaft washer in the illustrated direction.
2. Tighten the driveshaft nut to the specified torque with special tool MB990767.

Tightening torque: 225 ± 25 N·m (166 ± 18 ft-lb)



INSPECTION

M1271003400047

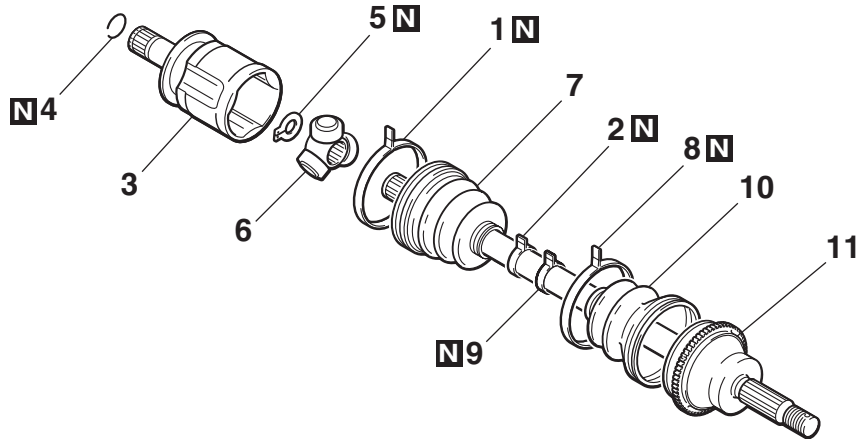
- Check the driveshaft for damage, bending or corrosion.
- Check the driveshaft spline part for wear or damage.
- Check the boots for deterioration, damage or cracking.
- Check the dust cover for damage or deterioration.

DISASSEMBLY AND ASSEMBLY

M1271003500130

CAUTION

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



<p>EBJ REPAIR KIT</p>	<p>TJ REPAIR KIT</p>
<p>EBJ BOOT REPAIR KIT</p>	<p>TJ BOOT REPAIR KIT</p>

AC201162AC

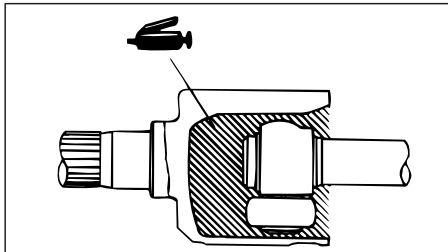
DISASSEMBLY STEPS

- >>C<< 1. TJ BOOT BAND (LARGE)
>>C<< 2. TJ BOOT BAND (SMALL)
<<A>> >>B<< 3. TJ CASE
4. CIRCLIP
5. SNAP RING
<<A>> >>B<< 6. SPIDER ASSEMBLY

DISASSEMBLY STEPS

- <> >>A<< 7. TJ BOOT
8. EBJ BOOT BAND (LARGE)
9. EBJ BOOT BAND (SMALL)
<> >>A<< 10. EBJ BOOT
13. EBJ ASSEMBLY

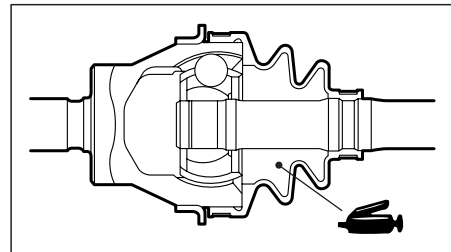
LUBRICATION POINTS



GREASE: REPAIR KIT GREASE
AMOUNT USED: 135 ± 10 g
(4.8 ± 0.4 oz)

CAUTION

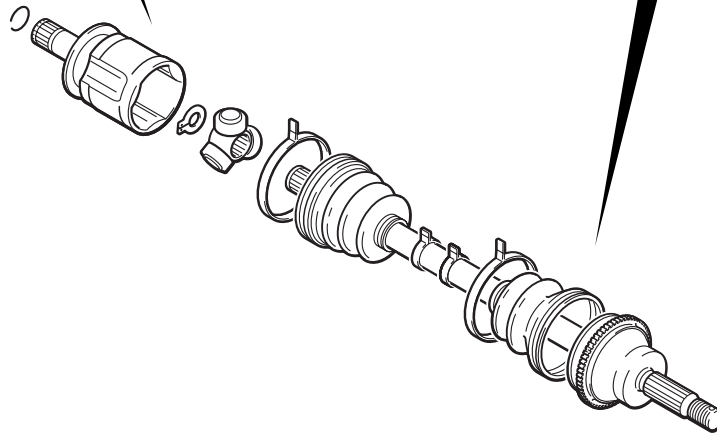
THE DRIVESHAFT JOINT USES SPECIAL GREASE. DO NOT MIX OLD AND NEW OR DIFFERENT TYPES OF GREASE.



GREASE: REPAIR KIT GREASE
AMOUNT USED: 80 ± 10 g
(2.8 ± 0.4 oz)

CAUTION

THE DRIVESHAFT JOINT USES SPECIAL GREASE. DO NOT MIX OLD AND NEW OR DIFFERENT TYPES OF GREASE.



AC103560AE

DISASSEMBLY SERVICE POINTS

<<A>> TJ CASE/SPIDER ASSEMBLY REMOVAL

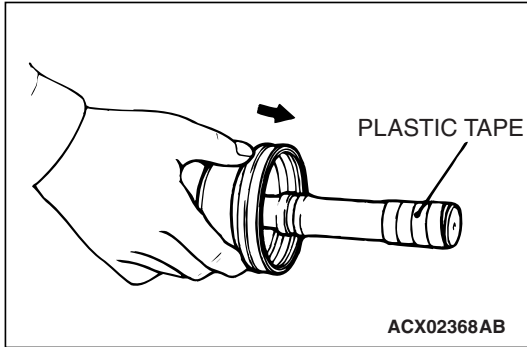
CAUTION

Do not disassemble the spider assembly.

1. Wipe off grease from the TJ case and spider assembly.
2. If there is water or foreign material in the wiped grease, be sure to clean the spider assembly.

<> TJ BOOT/EBJ BOOT REMOVAL

1. Wipe off grease from the shaft spline part.
2. Wrap plastic tape around the spline part on the TJ side of the driveshaft so that TJ and EBJ boots are not damaged when they are removed.



ASSEMBLY SERVICE POINTS

>>A<< EBJ BOOT/TJ BOOT INSTALLATION

Wrap plastic tape around the spline part on the TJ side of the driveshaft, and then install EBJ and TJ boots.

>>B<< SPIDER ASSEMBLY/TJ CASE INSTALLATION

⚠ CAUTION

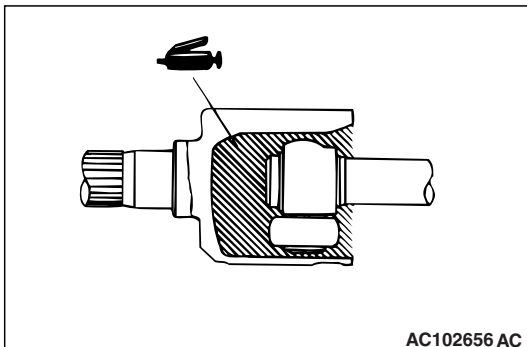
Do not mix old and new or different types of grease, as a special grease is used in the joint.

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

Specified grease: Repair kit grease

Used amount: 135 ± 10 g (4.8 ± 0.4 oz)

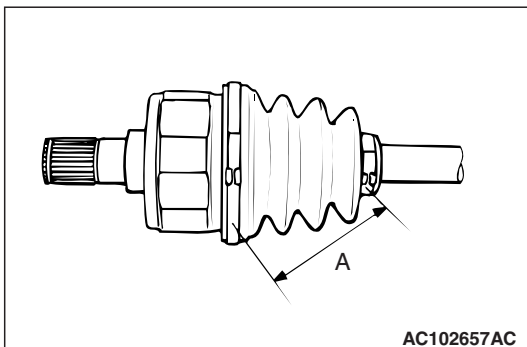
NOTE: The grease in the repair kit should be divided in half for use, respectively, at the joint and inside the boot.



>>C<< TJ BOOT BAND(SMALL)/TJ BOOT BAND(LARGE) INSTALLATION

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

Standard value (A): 90 ± 3 mm (3.5 ± 0.1 inches)



DIFFERENTIAL CARRIER ASSEMBLY

REMOVAL AND INSTALLATION

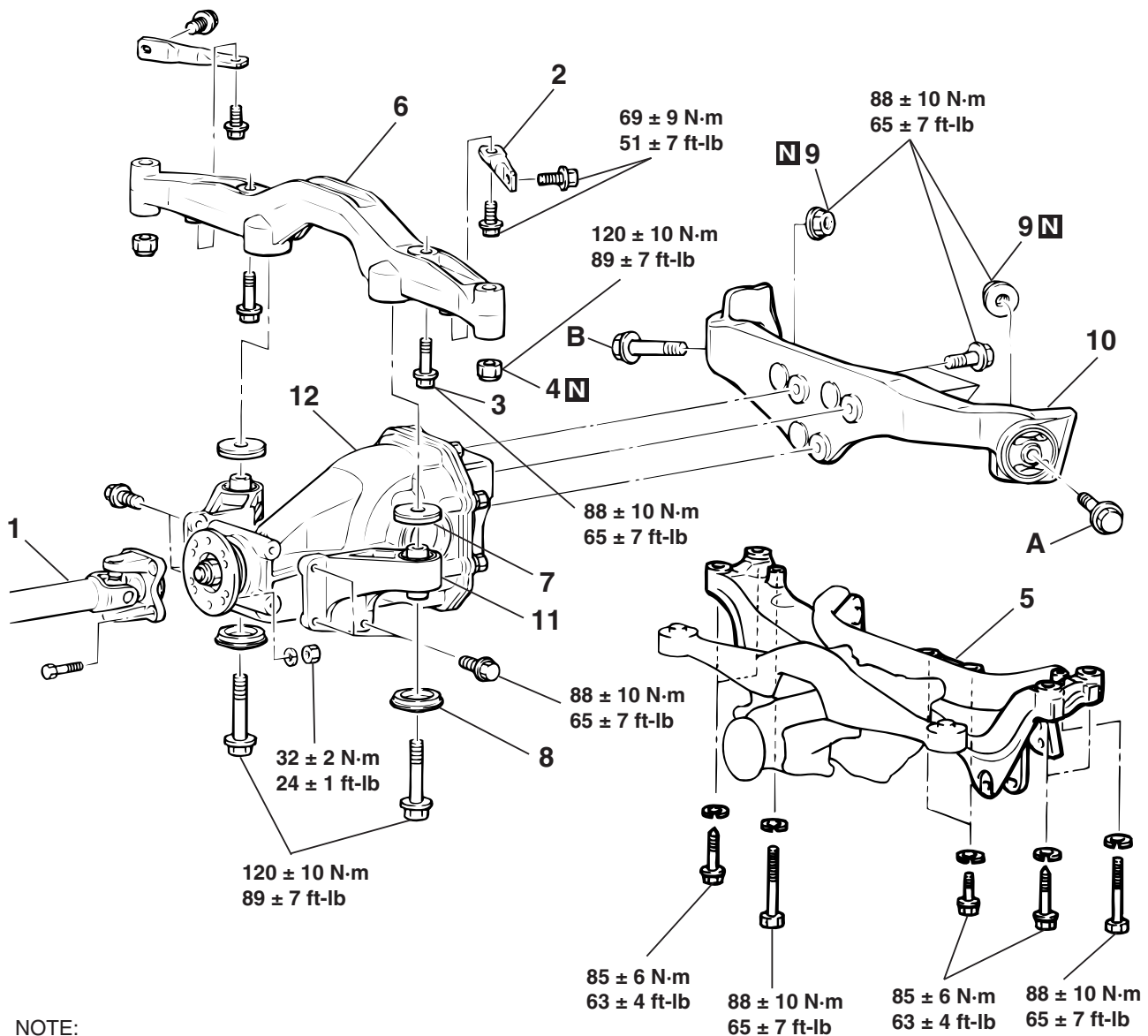
M1272002000425

Pre-removal Operation

- Center Exhaust Pipe Removal (Refer to GROUP 15, Exhaust Pipe and Main Muffler P.15-17.)
- Differential Gear Oil Draining
- Driveshaft Removal (Refer to P.27-22.)
- Stabilizer Bar Bushing Removal (Refer to GROUP 34, Stabilizer Bar P.34-25.)

Post-installation Operation

- Stabilizer Bar Bushing Installation (Refer to GROUP 34, Stabilizer Bar P.34-25.)
- Driveshaft Installation (Refer to P.27-22.)
- Differential Gear Oil Filling (Refer to P.27-14.)
- Center Exhaust Pipe Installation (Refer to GROUP 15, Exhaust Pipe and Main Muffler P.15-17.)
- Rear Wheel Alignment Check and Adjustment (Refer to GROUP 34, On-vehicle Service – Rear Wheel Alignment Check and Adjustment P.34-6.)



NOTE:
Bolts A and B can be inserted from the opposite direction.

AC212039 AB

REMOVAL STEPS

- <<A>> >>B<<
1. PROPELLER SHAFT CONNECTION
 2. TOE CONTROL BAR

REMOVAL STEPS (Continued)

3. DIFFERENTIAL SUPPORT MEMBER MOUNTING BOLT
4. SELF LOCKING NUT

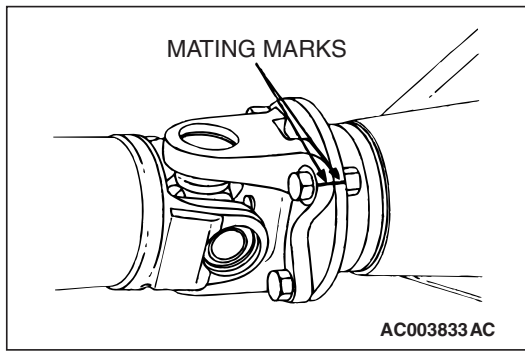
REMOVAL STEPS (Continued)

- <> >>A<< 5. REAR CROSSMEMBER AND DIFFERENTIAL CARRIER ASSEMBLY
6. DIFFERENTIAL SUPPORT MEMBER
7. UPPER STOPPER
8. LOWER STOPPER
9. SELF LOCKING NUT
10. DIFFERENTIAL SUPPORT ARM
11. DIFFERENTIAL MOUNT BRACKET
12. DIFFERENTIAL CARRIER ASSEMBLY

REMOVAL SERVICE POINTS

<<A>> PROPELLER SHAFT DISCONNECTION

1. Make mating marks on the differential companion flange and the propeller shaft assembly.
2. Suspend the removed propeller shaft from the body with a wire to prevent bending.



<> REAR CROSSMEMBER AND DIFFERENTIAL CARRIER ASSEMBLY REMOVAL

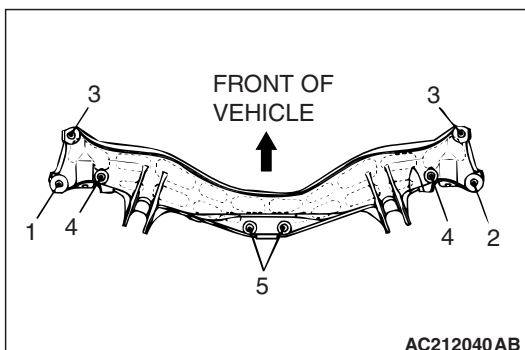
1. Using a jack, support the differential carrier from its underside.
2. Remove the rear crossmember mounting bolts and remove the differential carrier, where it is attached to the rear crossmember, from the vehicle.

INSTALLATION SERVICE POINTS

>>A<< REAR CROSSMEMBER AND DIFFERENTIAL CARRIER ASSEMBLY INSTALLATION

Tighten the rear crossmember mounting bolts in the numerical order shown.

NOTE: To ensure both good installation accuracy and ease of installation, the rear crossmember mounting holes have different diameters between front and rear. This is the reason for specifying the tightening sequence of the mounting bolts.



NO.	BOLT TYPE	BOLT SIZE (THREAD DIA. × LENGTH) mm(in)
1, 2, 3	Flange bolt (with washer)	12 × 105 (0.5 × 4.1)
4	Bolt (with spring washer and washer)	12 × 152 (0.5 × 6.0)
5	Flange bolt (with washer)	12 × 80 (0.5 × 3.1)

>>B<< PROPELLER SHAFT INSTALLATION

Align the mating marks of differential companion flange and propeller shaft assembly.

DIFFERENTIAL SUPPORT MEMBER BUSHING REPLACEMENT

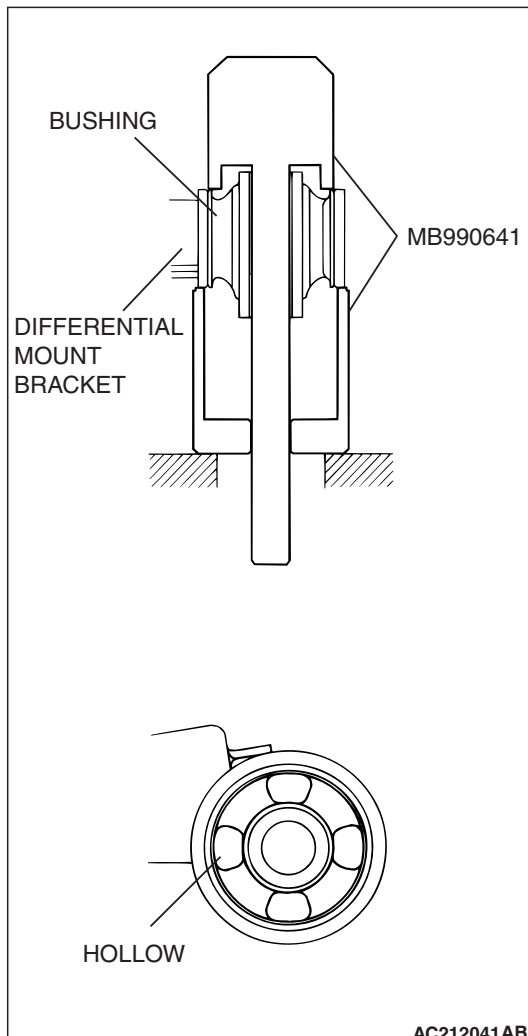
M1272001400044

Required Special Tools:

- MB990641: Lower Arm Bush (A) Remover and Installer
- MB991439: Bush Remover and Installer

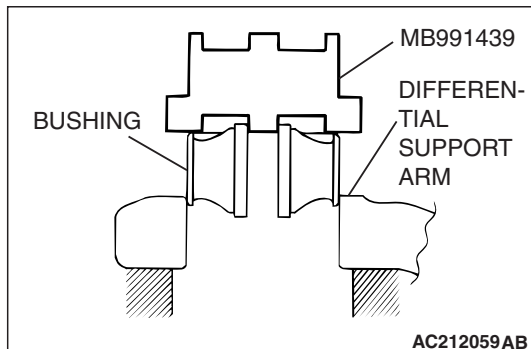
<DIFFERENTIAL MOUNT BRACKET>

1. Use special tool MB990641 to remove or install the bushing.
2. Press-fit the bushing with its hollow portion facing in the direction shown.
3. Press-fit the bushing until the bushing outer case end face is flush with the differential mount bracket.



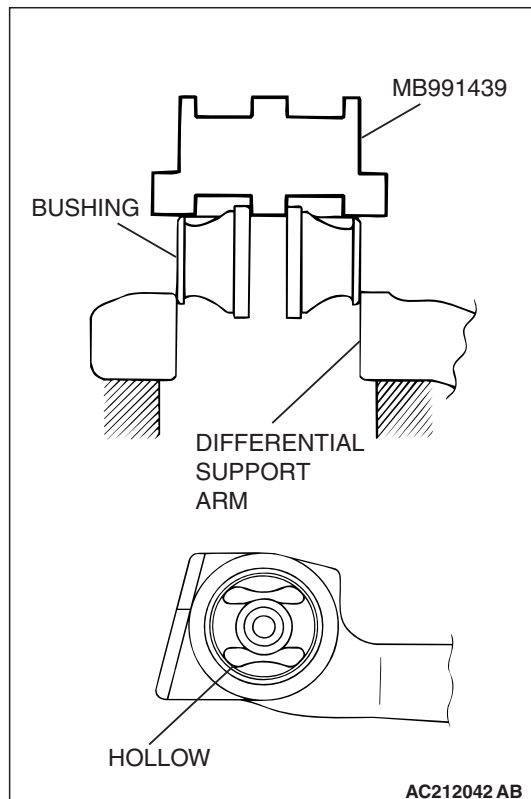
<DIFFERENTIAL SUPPORT ARM>

1. Use special tool MB991439 to remove the bushing.

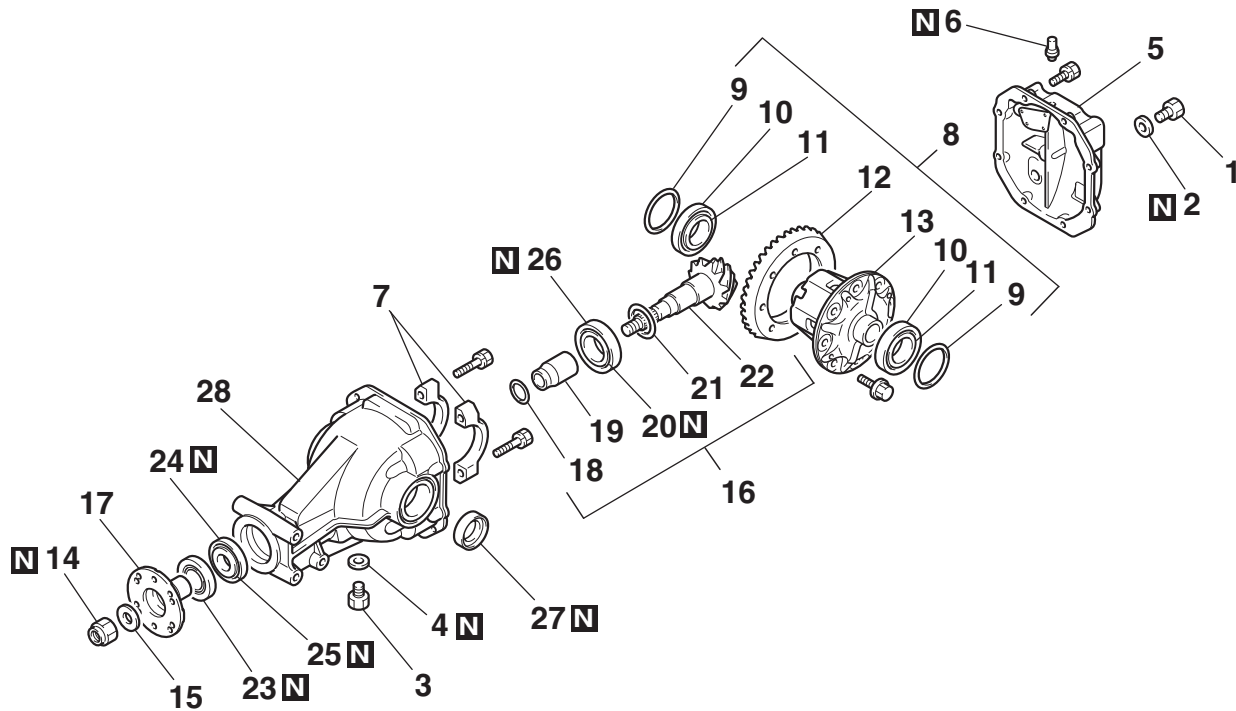


2. Press-fit the bushing with its marks facing in the direction shown.

3. Press-fit the bushing until the bushing outer case end face is flush with the differential support arm.



DISASSEMBLY



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DISASSEMBLY STEPS

- INSPECTION BEFORE DISASSEMBLY (REFER TO P.27-35.)
- 1. FILLER PLUG
- 2. GASKET
- 3. DRAIN PLUG
- 4. PACKING
- 5. DIFFERENTIAL COVER
- 6. VENT PLUG
- 7. BEARING CAP
- <<A>> 8. DIFFERENTIAL CASE ASSEMBLY
- <<A>> 9. SIDE BEARING SPACER
- <<A>> 10. DIFFERENTIAL SIDE BEARING OUTER RACE
- <> 11. DIFFERENTIAL SIDE BEARING INNER RACE
- <<C>> 12. DRIVE GEAR
- <<C>> 13. LIMITED SLIP DIFFERENTIAL CASE ASSEMBLY
- <<D>> 14. SELF-LOCKING NUT
- 15. WASHER

DISASSEMBLY STEPS (Continued)

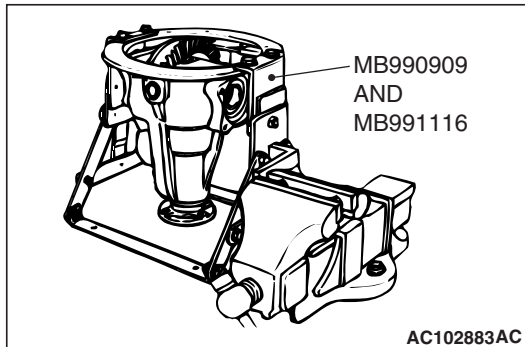
- <<E>> 16. DRIVE PINION ASSEMBLY
- <<E>> 17. COMPANION FLANGE
- 18. DRIVE PINION FRONT SHIM (FOR ADJUSTING PRELOAD OF DRIVE PINION)
- 19. DRIVE PINION SPACER
- <<F>> 20. DRIVE PINION REAR BEARING INNER RACE
- <<F>> 21. DRIVE PINION REAR SHIM (FOR ADJUSTING DRIVE PINION HEIGHT)
- <<G>> 22. DRIVE PINION
- <<G>> 23. OIL SEAL
- <<G>> 24. DRIVE PINION FRONT BEARING INNER RACE
- <<G>> 25. DRIVE PINION FRONT BEARING OUTER RACE
- <<H>> 26. DRIVE PINION REAR BEARING OUTER RACE
- 27. OIL SEAL
- 28. DIFFERENTIAL CARRIER

Required Special Tools:

- MB990909: Working Base
- MB991116: Working Base Adapter
- MB990939: Brass Bar
- MB990810: Side Bearing Puller
- mb990811: Side Bearing Cup
- MB990850: End Yoke Holder
- MD998801: Remover

INSPECTION BEFORE DISASSEMBLY

1. Remove the cover.
2. Hold special tools MB990909 and MB991116 in a vise, and install the differential carrier assembly to special tools MB990909 and MB991116.

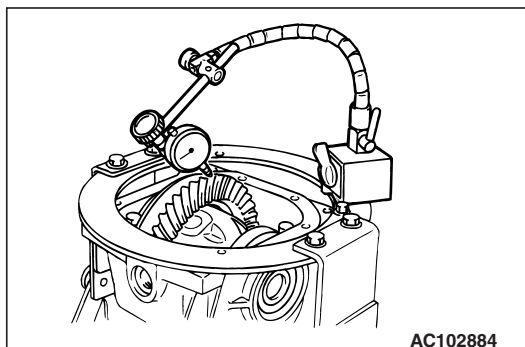


FINAL DRIVE GEAR BACKLASH

1. With the drive pinion locked in place, use a dial gauge to measure the drive gear backlash in four or more places on the drive gear.

Standard value: 0.11 – 0.16 mm (0.004 – 0.006 inch)

2. If the backlash is not within the standard value, adjust the final drive gear backlash (Refer to [P.27-40](#)).
3. After the adjustment, inspect the final drive gear tooth contact.

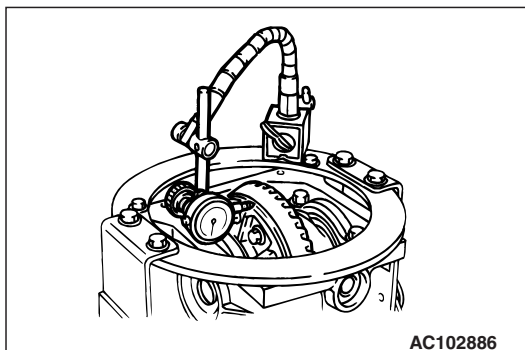


DRIVE GEAR RUNOUT

1. Measure the drive gear runout at the shoulder on the reverse side of the drive gear.

Limit: 0.05 mm (0.002 inch)

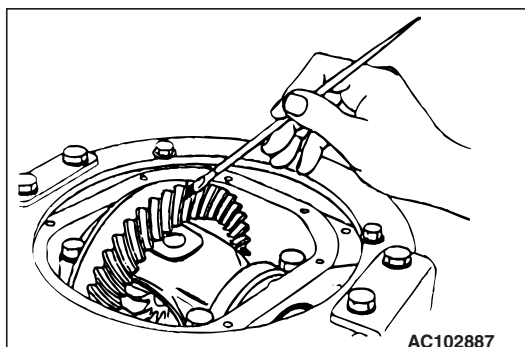
2. When runout exceeds the limit value, check for foreign material between drive gear rear side and differential case, or for loose drive gear installation bolts.
3. When step (2) gives normal results, reposition the drive gear and differential case and remeasure.
4. If adjustment is impossible, replace the differential case, or replace the drive gear and pinion as a set.



FINAL DRIVE GEAR TOOTH CONTACT

Check the tooth contact of drive gear by following the steps below.

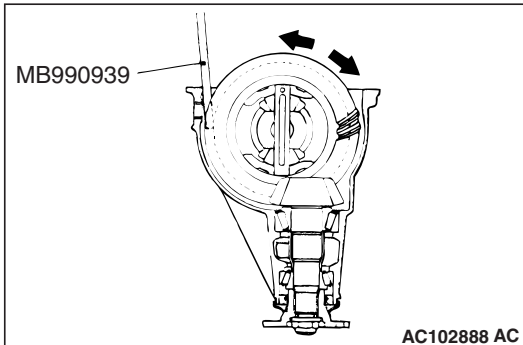
1. Apply a thin, uniform coat of machine blue to both surfaces of the drive gear teeth.

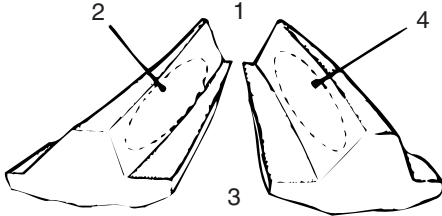
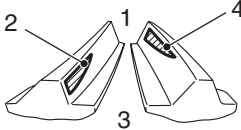
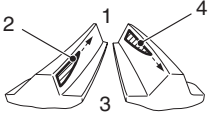
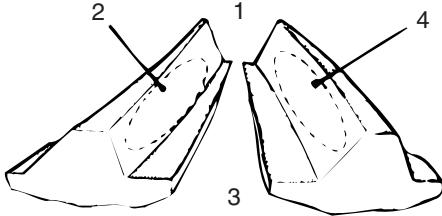
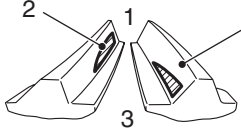
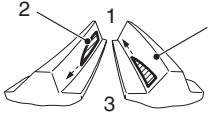


CAUTION

If the drive gear is rotated too much, the tooth contact pattern will become unclear and difficult to check.

2. Insert special tool MB990939 between the differential carrier and the differential case, and then rotate the companion flange by hand (once in the normal direction, and then once in the reverse direction) while applying a load to the drive gear so that the revolution torque [approximately 2.5 – 3.0 N·m (22.1 – 26.6 in-lb)] is applied to the drive pinion.
3. Check the tooth contact condition of the drive gear and drive pinion.



STANDARD TOOTH CONTACT PATTERN	PROBLEM	SOLUTION
<p>1. Narrow tooth side 2. Drive-side tooth surface (the side applying power during forward movement) 3. Wide tooth side 4. Coast-side tooth surface (the side applying power during reverse movement)</p>  <p style="text-align: right;">ACX01039 AF</p>	<p>Tooth contact pattern resulting from excessive pinion height</p>  <p style="text-align: right;">AC107260 AB</p> <p>The drive pinion is positioned too far from the center of the drive gear.</p>	 <p style="text-align: right;">AC107261 AB</p> <p>Increase the thickness of the drive pinion rear shim, and position the drive pinion closer to the center of the drive gear. Also, for backlash adjustment, position the drive gear farther from the drive pinion.</p>
 <p style="text-align: right;">ACX01039 AF</p>	<p>Tooth contact pattern resulting from insufficient pinion height</p>  <p style="text-align: right;">AC107262 AB</p> <p>The drive pinion is positioned too close to the center of the drive gear.</p>	 <p style="text-align: right;">AC107263 AB</p> <p>Decrease the thickness of the drive pinion rear shim, and position the drive pinion farther from the center of the drive gear. Also, for backlash adjustment, position the drive gear closer to the drive pinion.</p>

NOTE: Check the tooth contact pattern to confirm that the adjustments of the pinion height and backlash have been done properly. Continue to adjust the pinion height and backlash until the tooth contact pattern resembles the standard pattern. If, even after adjustments have been made, the correct tooth contact pattern cannot be obtained, it means that the drive gear and the drive pinion have become worn beyond the allowable limit. Replace the gear set.

DISASSEMBLY SERVICE POINTS

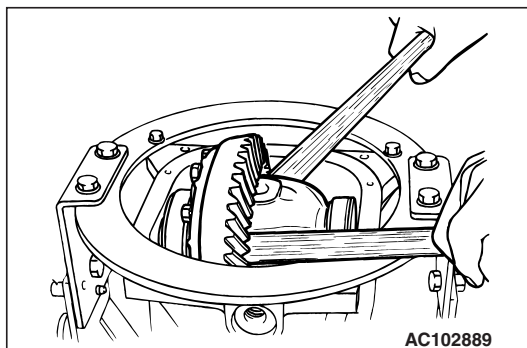
<<A>> DIFFERENTIAL CASE ASSEMBLY/DIFFERENTIAL SIDE BEARING SPACER/DIFFERENTIAL SIDE BEARING OUTER RACE REMOVAL

CAUTION

When taking out the differential case assembly, be careful not to drop and damage the differential side bearing spacers and differential side bearing outer races.

Use the wooden handle of a hammer to remove the differential case assembly, differential side bearing spacers and differential side bearing outer races.

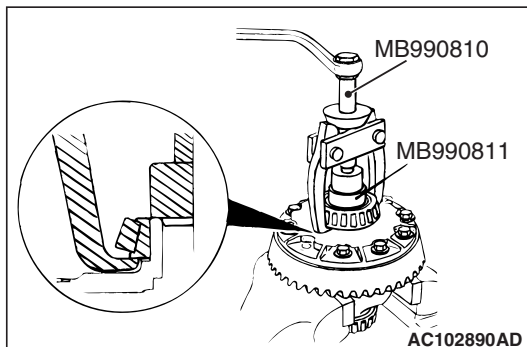
NOTE: Keep the right and left side bearings and side bearing spacers separate, so that they do not become mixed during reassembly.



<> DIFFERENTIAL SIDE BEARING INNER RACE REMOVAL

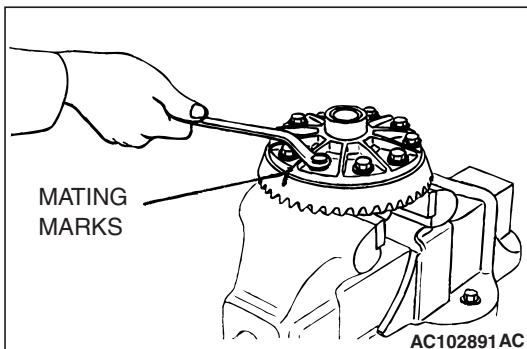
Use special tools MB990810 and MB990811 to pull out the side bearing inner races.

NOTE: There are two notches provided (at the differential case side) for the claw part of the special tools; use special tool MB990810 at that position.



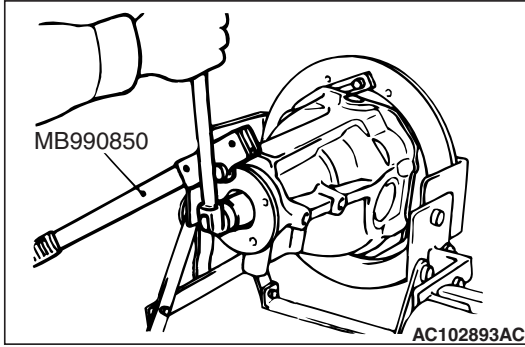
<<C>> DRIVE GEAR REMOVAL

1. Make the mating marks to the differential case and the drive gear.
2. Loosen the drive gear attaching bolts in a diagonal sequence to remove the drive gear.



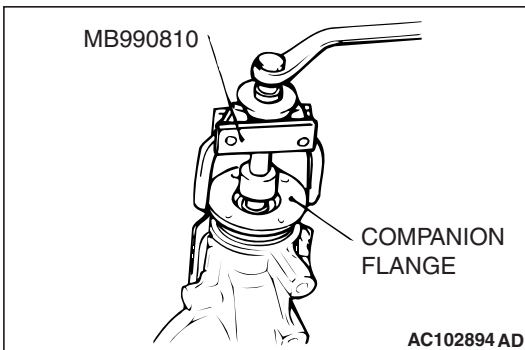
<<D>> SELF-LOCKING NUT REMOVAL

Use special tool MB990850 to hold the companion flange, and then remove the companion flange self-locking nut.

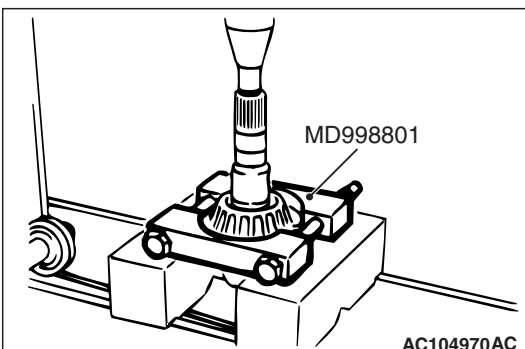
**<<E>> DRIVE PINION ASSEMBLY/COMPANION FLANGE REMOVAL****⚠ CAUTION**

The mating mark made on the companion flange must not be on the coupling surface of the companion flange and the front propeller shaft.

1. Make mating marks on the drive pinion and companion flange.
2. Use special tool MB990810 to pull out the companion flange.

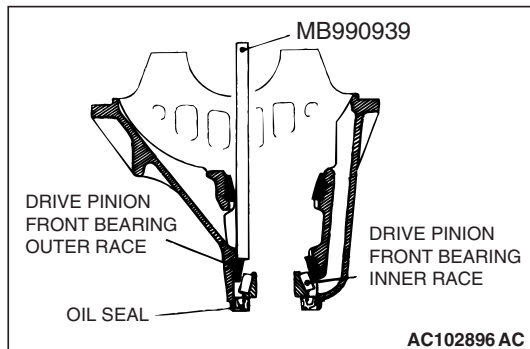
**<<F>> DRIVE PINION REAR BEARING INNER RACE REMOVAL**

Use special tool MD998801 to pull out the drive pinion rear bearing inner race.



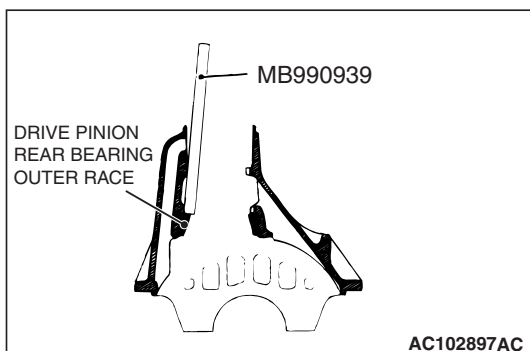
**<<G>> OIL SEAL/DRIVE PINION FRONT BEARING
INNER RACE/DRIVE PINION FRONT BEARING
OUTER RACE REMOVAL**

Use special tool MB990939 to remove the oil seal, drive pinion front bearing inner race, and drive pinion front bearing outer race.

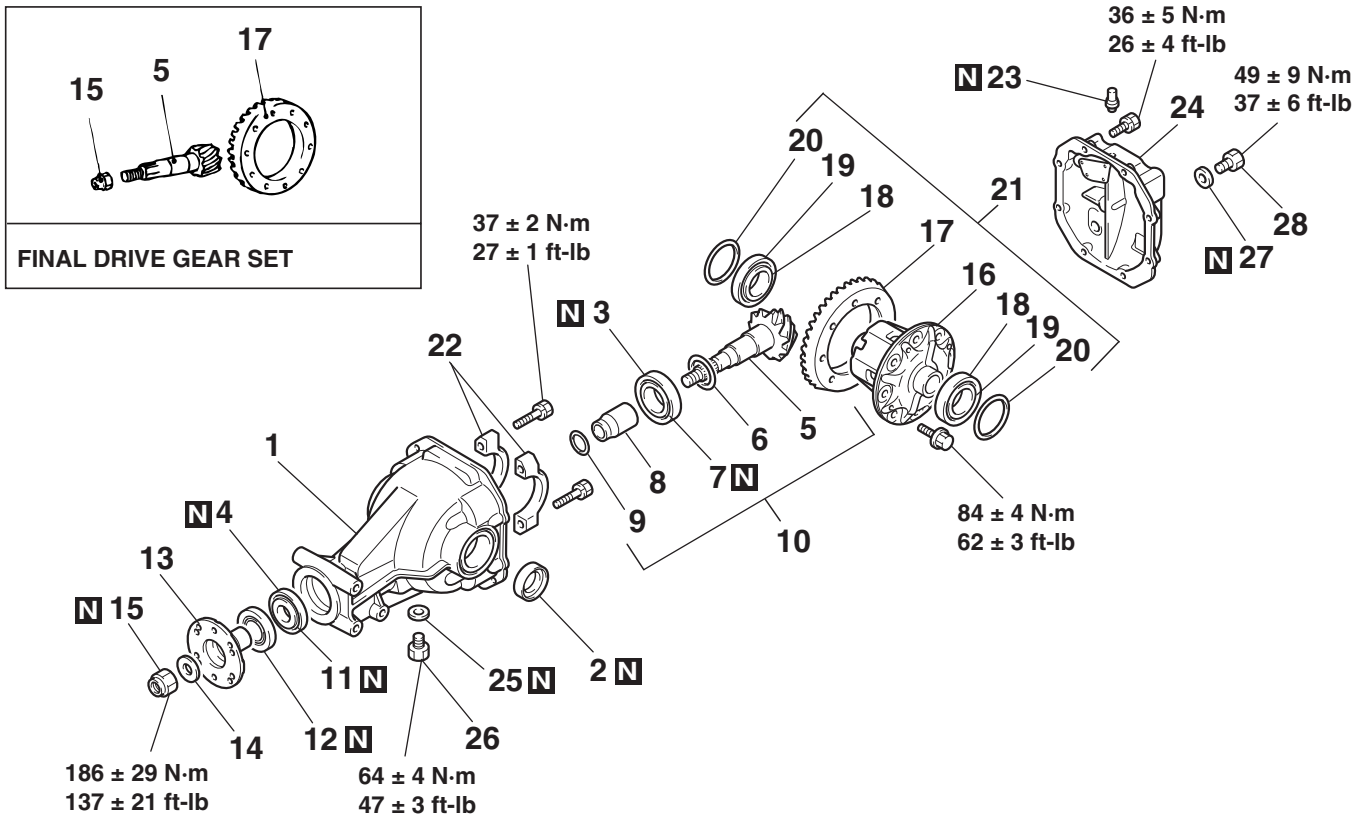


**<<H>> DRIVE PINION REAR BEARING OUTER
RACE REMOVAL**

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



ASSEMBLY



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ASSEMBLY STEPS

1. DIFFERENTIAL CARRIER
- >>A<< 2. OIL SEAL
- >>B<< 3. DRIVE PINION REAR BEARING
OUTER RACE
- >>C<< 4. DRIVE PINION FRONT BEARING
OUTER RACE
- >>D<< • DRIVE PINION HEIGHT
ADJUSTMENT
5. DRIVE PINION
6. DRIVE PINION REAR SHIM (FOR
ADJUSTING DRIVE PINION
HEIGHT)
7. DRIVE PINION REAR BEARING
INNER RACE
8. DRIVE PINION SPACER
- >>E<< • DRIVE PINION TURNING TORQUE
ADJUSTMENT
9. DRIVE PINION FRONT SHIM (FOR
ADJUSTING DRIVE PINION
TURNING TORQUE)
10. DRIVE PINION ASSEMBLY
11. DRIVE PINION FRONT BEARING
INNER RACE
- >>E<< 12. OIL SEAL

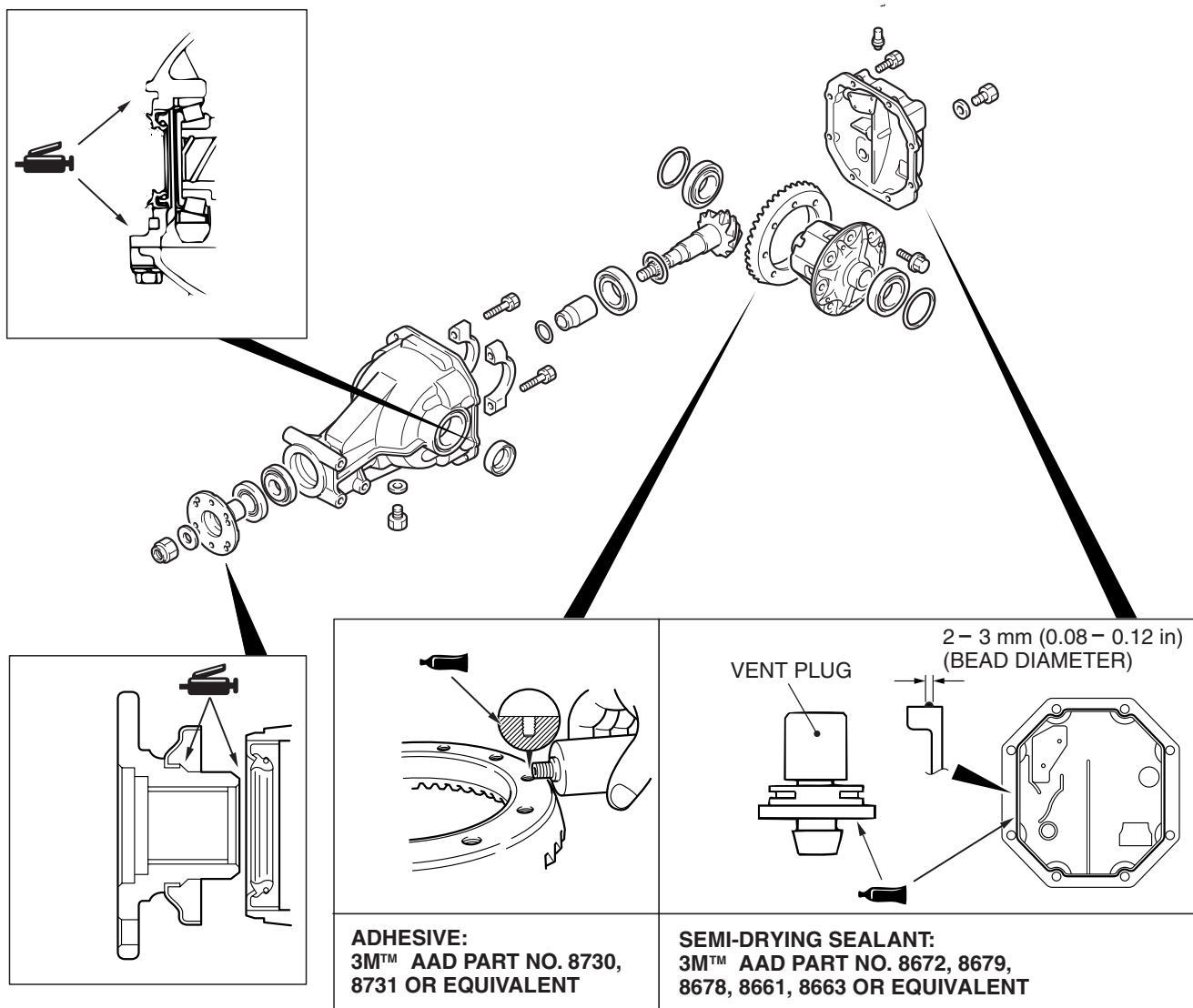
ASSEMBLY STEPS (Continued)

13. COMPANION FLANGE
14. WASHER
15. SELF-LOCKING NUT
16. LIMITED SLIP DIFFERENTIAL CASE
ASSEMBLY
- >>F<< 17. DRIVE GEAR
- >>G<< 18. DIFFERENTIAL SIDE BEARING
INNER RACE
19. DIFFERENTIAL SIDE BEARING
OUTER RACE
20. DIFFERENTIAL SIDE BEARING
SPACER
21. DIFFERENTIAL CASE ASSEMBLY
- >>H<< 22. BEARING CAP
23. VENT PLUG
24. DIFFERENTIAL COVER
25. PACKING
26. DRAIN PLUG
27. GASKET
28. FILLER PLUG
- >>H<< • FINAL DRIVE GEAR BACKLASH
ADJUSTMENT

Required Special Tools:

- MB990326: Preload Socket
- MB990685: Torque Wrench
- MB990727: Oil Seal Installer
- MB990728: Bearing Installer
- MB990810: Side Bearing Puller
- MB990811: Side Bearing Cup
- MB990835: Drive Pinion Setting Gauge Set
- MB990850: End Yoke Holder
- MB990934: Installer Adapter
- MB990936: Installer Adapter
- MB990938: Bar
- MB991115: Oil Seal Installer

LUBRICATION AND ADHESIVE POINTS

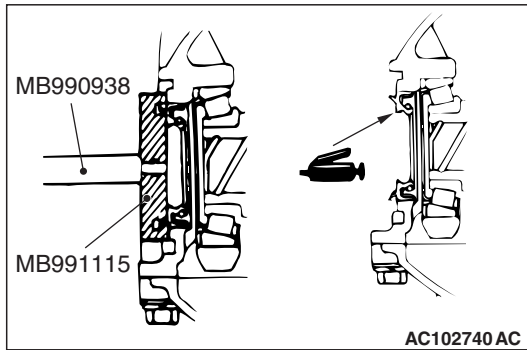


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ASSEMBLY SERVICE POINTS

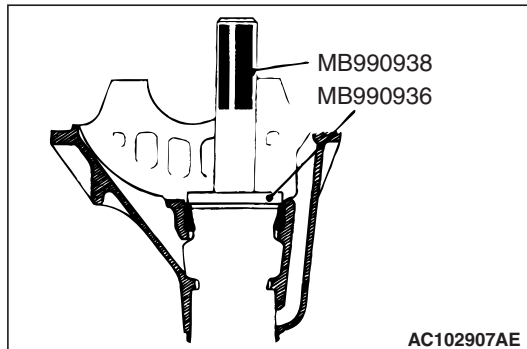
>>A<< OIL SEAL PRESS-FITTING

Use special tools MB990938 and MB991380 to press-fit the oil seal.



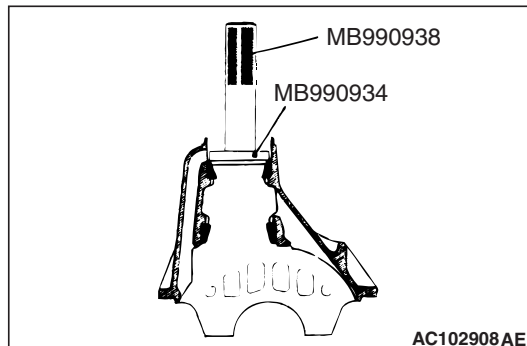
>>B<< DRIVE PINION REAR BEARING OUTER RACE PRESS-FITTING

Use special tools MB990938 and MB990936 to press-fit the drive pinion rear bearing outer race.



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

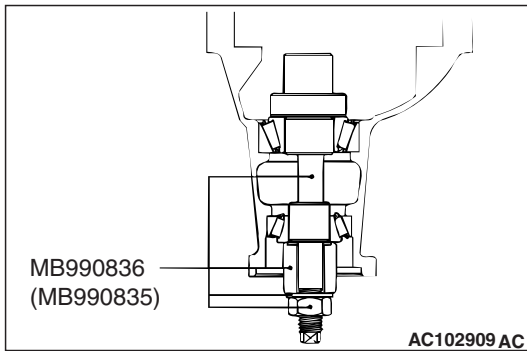
Use special tools MB990938 and MB990934 to press-fit the drive pinion front bearing outer race.



>>D<< DRIVE PINION HEIGHT ADJUSTMENT

Adjust the drive pinion height by the following procedures:

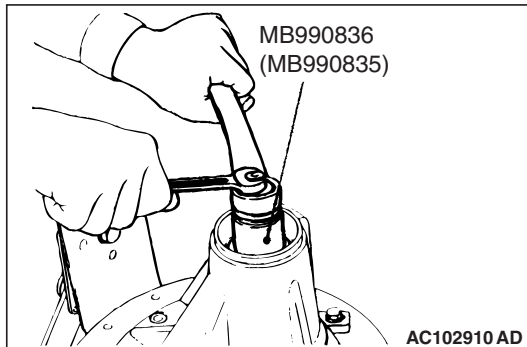
1. Apply multipurpose grease to the washer of special tool MB990903.



2. Install special tool MB990836(MB990835), drive pinion front and rear bearing inner races to the differential carrier as shown in the illustration.

⚠ CAUTION

There should be no gear oil adhered to the bearing.

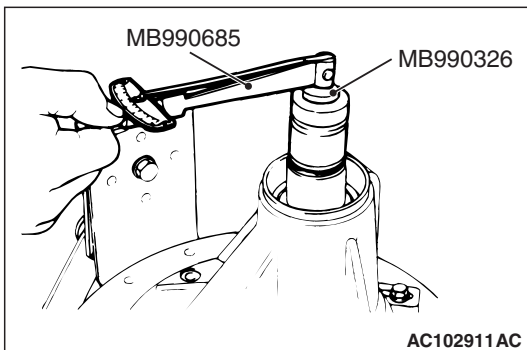


3. Tighten the nut of special tool MB990836(MB990835) a little at a time, while measuring the turning torque of the drive pinion. Then confirm that the turning torque (without the drive pinion oil seal) is at the standard value.

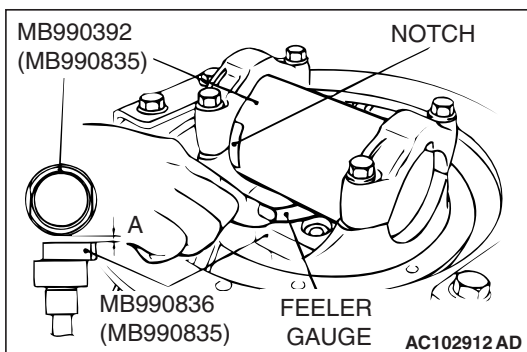
Standard value:

BEARING DIVISION	TURNING TORQUE
New	0.88 – 1.17 N·m (7.8 – 10.4 in-lb)

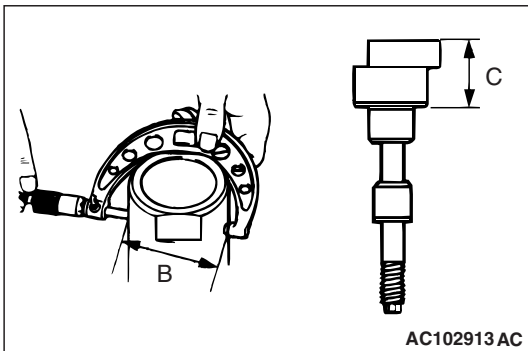
NOTE: Because the special tool cannot be turned one turn, turn it several times within the range that it can be turned; then, after fitting to the bearing, measure the turning torque.



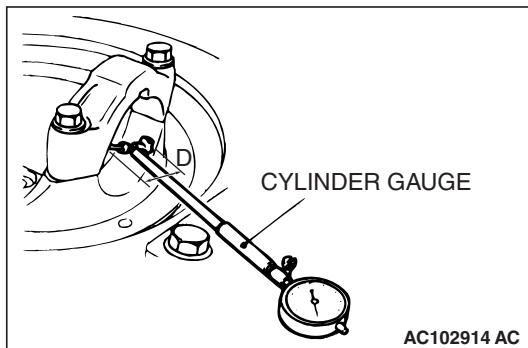
4. Clean the side bearing seat of the differential carrier and bearing caps.



5. Place special tool MB990392 in the side bearing seat of the differential carrier, and position the notch as shown in the illustration. Then install the bearing caps.
6. Use a feeler gauge to measure the clearance (A) between special tools MB990392 and MB990836.
7. Remove the bearing caps and special tools MB990392 and MB990836.



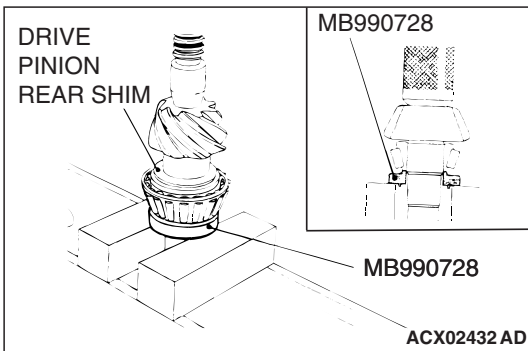
8. Use a micrometer to measure the shown dimensions (B, C) of special tools MB990392 and MB990836.



9. Install the bearing cap, and then use a cylinder gauge to measure the inside diameter (D) of the bearing cap.

10. Calculate thickness (F) of the required drive pinion rear shim by the following formula. Select a shim which most closely matches this thickness.

$$F = A + B + C - 1/2D - 86.00 \text{ mm (3.385 inches)}$$



11. Fit the selected drive pinion rear shim(s) to the drive pinion, and press-fit the drive pinion rear bearing inner race by using special tool MB990728.

>>E<< DRIVE PINION TURNING TORQUE ADJUSTMENT/OIL SEAL INSTALLATION

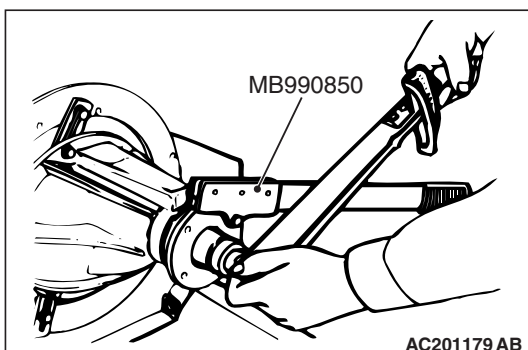
Adjust the drive pinion turning torque by the following procedures:

1. Insert the drive pinion into the differential carrier, and then install the following parts in sequence from the carrier rear side: drive pinion spacer, drive pinion front shim, drive pinion front bearing inner race and companion flange.

NOTE: Do not install the oil seal.

2. Tighten the companion flange self-locking nut to the specified torque while holding the companion flange with special tool MB990850.

Tightening torque: 186 ± 29 N·m (137 ± 21 ft-lb)



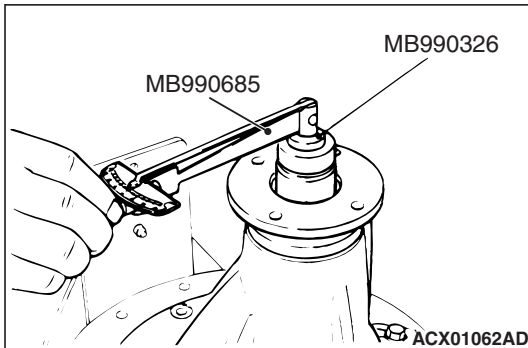
CAUTION

There should be no gear oil adhered to the bearing.

- Use special tools MB990685 and MB990326 to measure the drive pinion turning torque (without the drive pinion oil seal).

Standard value:

BEARING DIVISION	TURNING TORQUE
New	0.88 – 1.17 N·m (7.8 – 10.4 in-lb)

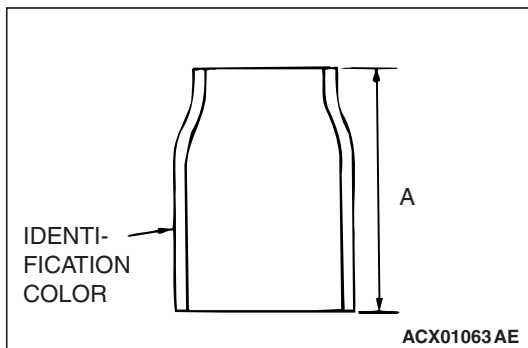


- If the drive pinion turning torque is not within the standard value, adjust the turning torque by replacing the drive pinion front shim(s) or the drive pinion spacer.

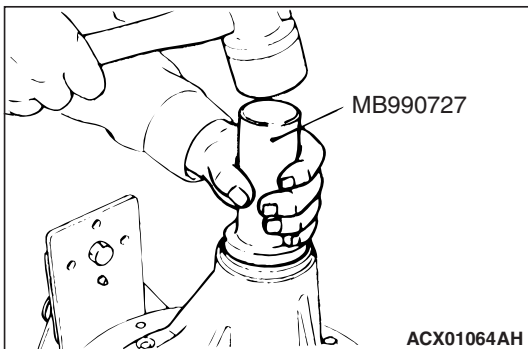
NOTE: When selecting the drive pinion front shims, if the number of shims is large, reduce the number of shims to a minimum by selecting the drive pinion spacers.

Select the drive pinion spacer from the following two types.

HEIGHT OF DRIVE PINION SPACER (A) mm (in)	IDENTIFICATION COLOR
57.72 (2.27)	–
57.08 (2.25)	Red

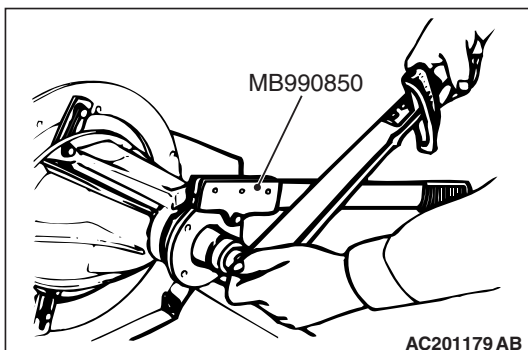


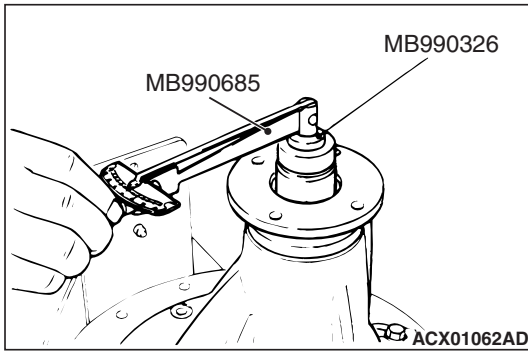
- Remove the companion flange and drive pinion again. Then insert the drive pinion front bearing inner race into the differential carrier. Use special tool MB990727 to press-fit the drive pinion oil seal.



- Install the drive pinion assembly and companion flange with the mating marks properly aligned. Tighten the companion flange self-locking nut to the specified torque while holding the companion flange with special tool MB990850.

Tightening torque: 186 ± 29 N·m (137 ± 21 ft-lb)





- Use special tools MB990685 and MB990326 to measure the drive pinion turning torque (with drive pinion oil seal) to verify that the drive pinion turning torque complies with the standard value.

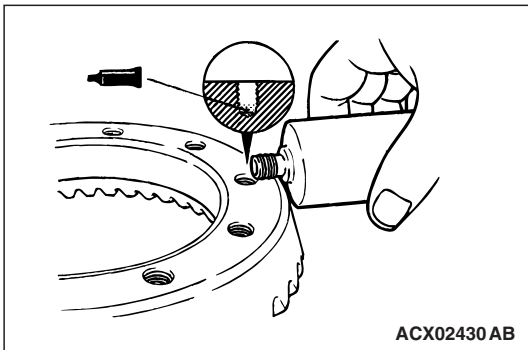
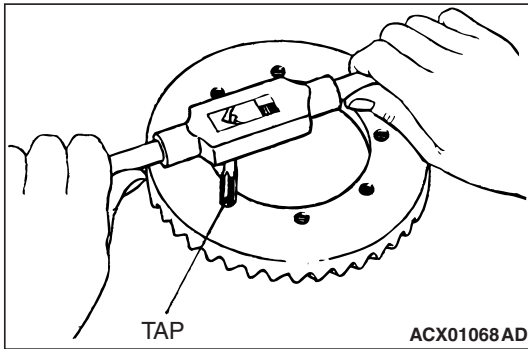
Standard value:

BEARING DIVISION	COMPANION FLANGE LUBRICATION	TURNING TORQUE
New	None (with anti-rust agent)	0.98 – 1.27 N·m 8.67 – 11.24 in-lb
	Gear oil applied	0.49 – 0.58 N·m 4.34 – 5.13 in-lb

- If the turning torque is not within the standard value, check the tightening torque of the companion flange self-locking nut, and the installation of the oil seal.

>>F<< DRIVE GEAR INSTALLATION

- Clean the drive gear attaching bolts.
- Remove the adhesive adhered to the threaded holes of the drive gear by turning the tap (M10 x 1.25). Clean the threaded holes by applying compressed air.

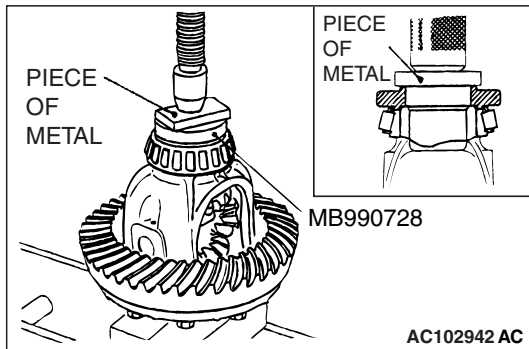


- Apply 3M™ AAD Part No.8730, 8731 or equivalent to the threaded holes of the drive gear.
- Install the drive gear onto the limited slip differential case with the mating marks properly aligned. Tighten the drive gear attaching bolts to the specified torque in a diagonal sequence.

Tightening torque: 84 ± 4 N·m (62 ± 3 ft-lb)

>>G<< DIFFERENTIAL SIDE BEARING INNER RACE INSTALLATION

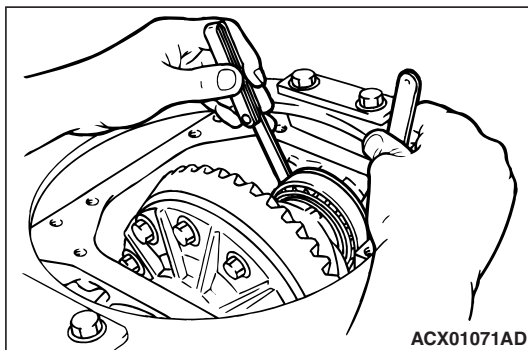
Use special tool MB990728 to press-fit the differential side bearing inner races into the differential case.



>>H<< BEARING CAP INSTALLATION/FINAL DRIVE GEAR BACKLASH ADJUSTMENT

Adjust the final drive gear backlash by the following procedure:

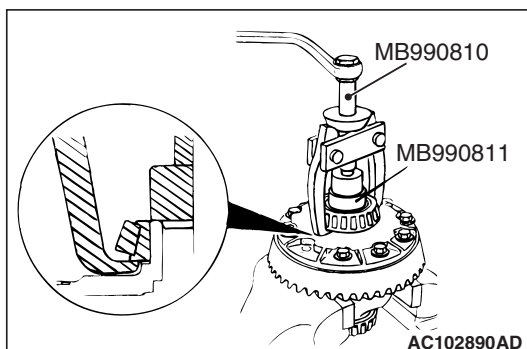
1. Assemble the differential case with the side bearing outer race to the differential carrier.
2. Press the differential case to one side to measure the clearance of the side bearing outer race and the differential carrier.
3. Select two pairs of side bearing spacers. Determine the thickness by adding 1/2 of the clearance to the pre-load 0.05mm (0.002 inch).



4. Remove the side bearing by using special tools MB990810 and MB990811.

NOTE: Hook the claws of special tool MB990810 with the side bearing inner race by using the notches (two areas) of the limited slip differential case side.

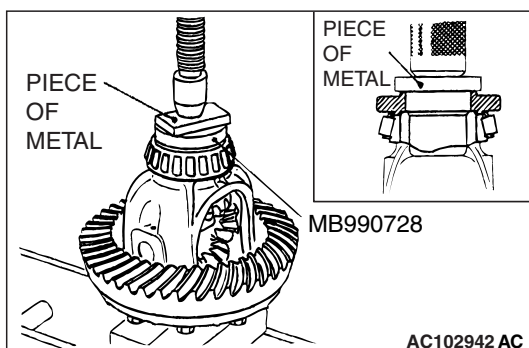
5. Assemble the selected side bearing spacers to each side.

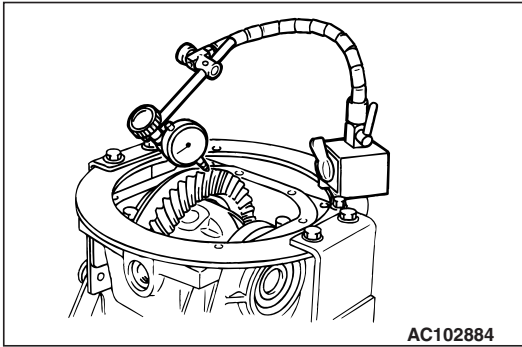


6. Use special tool MB990728 to press-fit the side bearing inner race into the limited slip differential case. After installing the outer race, assemble the limited slip differential case to the differential carrier.

7. Align the mating marks of differential carrier and the bearing cap with each other and tighten the bearing cap attaching bolts to the specified torque.

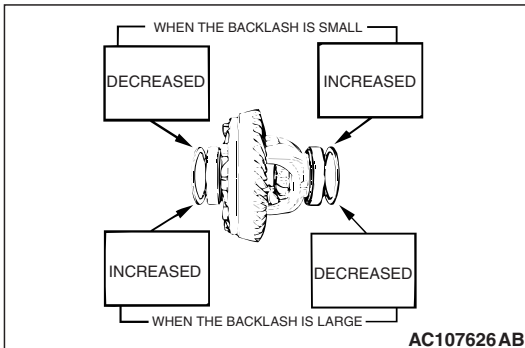
Tightening torque: 37 ± 2 N·m (27 ± 1 ft-lb)





8. Measure the final drive gear backlash at four points or more on the circumference of the drive gear.

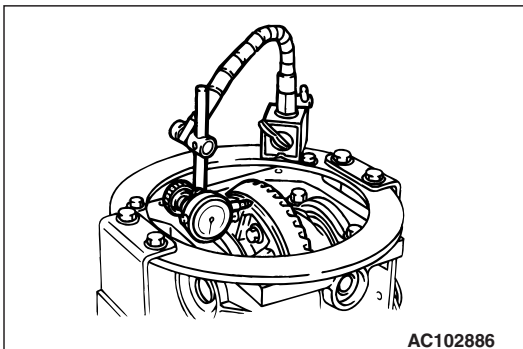
Standard value: 0.11 – 0.16 mm (0.004 – 0.006 inch)



9. If the backlash is not within the standard value, move the side bearing spacer as shown in the illustration to adjust the backlash.

NOTE: The increment of side bearing spacer must be the same as the decreased amount.

10. Inspect the tooth condition at the final drive gear and replace if required. (Refer to [P.27-34.](#))



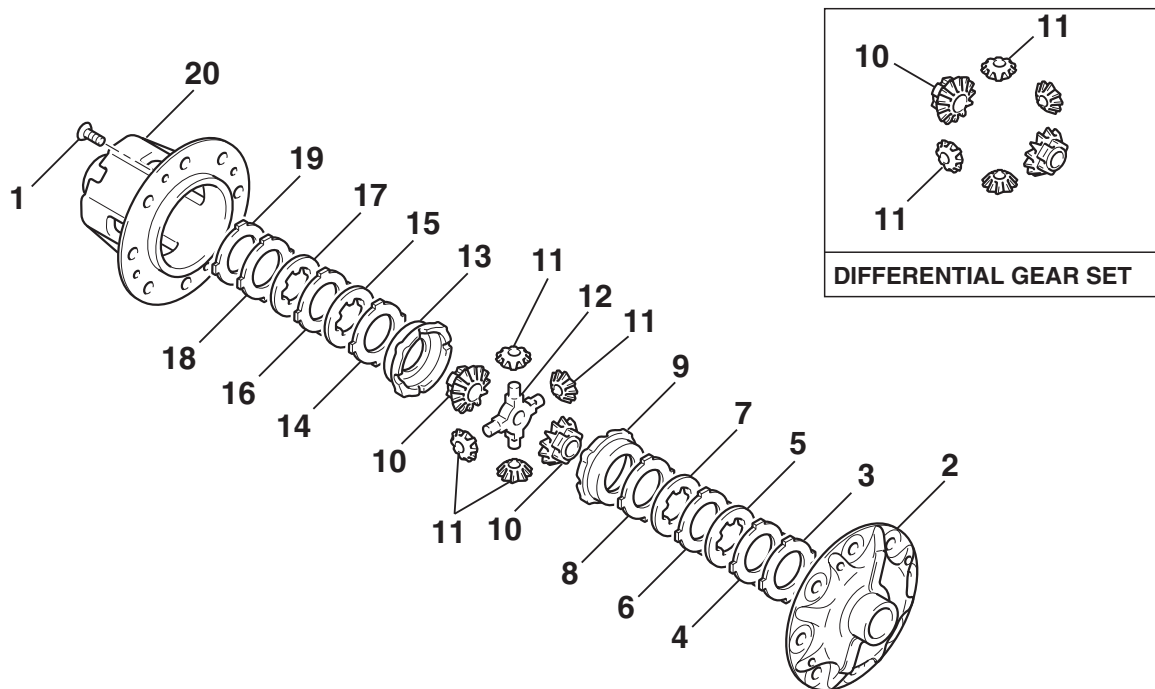
11. Measure the drive gear runout.

Limit: 0.05 mm (0.002 inch)

12. If drive gear runout exceeds the limit, remove the differential case and then the drive gears, moving them to different positions and reinstall them.
13. If adjustment is not possible, replace the differential case or drive gear and drive pinion as a set.

DISASSEMBLY AND ASSEMBLY

M1273001400025



AC212154 AB

DISASSEMBLY STEPS

- >>C<< • LSD DIFFERENTIAL TORQUE CHECK
- <<A>> >>B<<
1. SCREW
 2. DIFFERENTIAL CASE A
 3. SPRING PLATE
 4. FRICTION PLATE
 5. FRICTION DISC
 6. FRICTION PLATE
 7. FRICTION DISC
 8. FRICTION PLATE
 9. PRESSURE RING

DISASSEMBLY STEPS (Continued)

10. SIDE GEAR
11. PINION GEAR
12. PINION SHAFT
13. PRESSURE RING
14. FRICTION PLATE
15. FRICTION DISC
16. FRICTION PLATE
17. FRICTION DISC
18. FRICTION PLATE
19. FRICTION PLATE
- >>A<< 20. DIFFERENTIAL CASE B

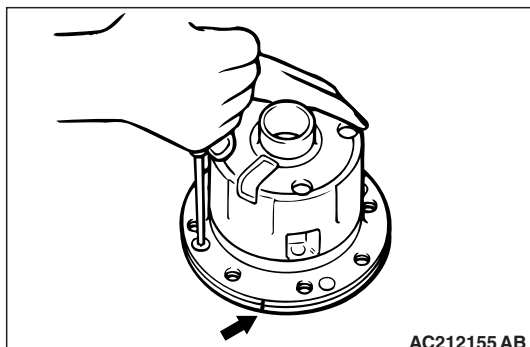
Required Special Tools:

- MB990989: Base
- MB990990: Tool A

DISASSEMBLY SERVICE POINTS

<<A>> SCREW REMOVAL

1. Check out the alignment marks.
2. Loosen uniformly, little by little the screws securing differential case A to B.
3. Separate differential case B from differential case A and remove their components.
4. Keep the removed spring plates, friction plates, and friction discs organized in order of removal and separated for right and left use.



AC212155 AB

ASSEMBLY SERVICE POINTS

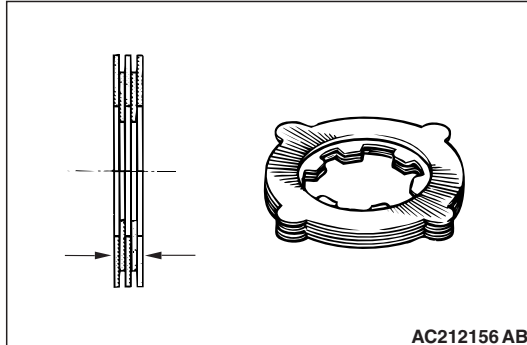
>>A<< DIFFERENTIAL CASE B INSTALLATION

Before starting the assembly procedure, perform the following steps to adjust dimensional differences (clutch plate friction force) in the axial direction of the components inside the differential case and axial clearance of the differential side gear.

1. Place friction discs (two each) and friction plates (three each) one on top of another as illustrated and, using a micrometer, measure the thickness of each of the right and left assemblies. Select different discs and plates so that the difference between the right and left assemblies falls within the specified range.

Standard value: 0 – 0.05 mm (0 – 0.002 inch)

NOTE: If a new part is used, note that the friction disc comes in two thickness: 1.6 mm (0.063 inch) and 1.7 mm (0.067 inch).



AC212156 AB

2. Measure the thickness of each of the right and left spring plates.
3. Assemble the pressure ring internal parts (pinion shaft and pressure ring), friction plates, and friction discs and, using a micrometer, measure the overall width.

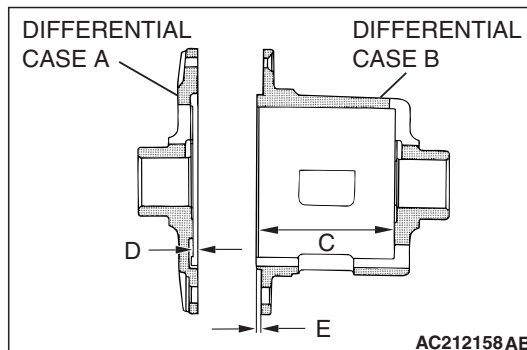
NOTE: When taking measurements, press the assembly from both sides so that the pinion shaft makes a positive contact with the groove in the pressure ring.

4. Find value (A) which is the thickness measured in step (3) added to the thickness of two spring plates.
5. Find dimension (B) between the spring plate facing surfaces when differential case A and B are assembled together.

$$B = C + D - E$$

6. If the clearance between the spring plate and differential case (B - A) is outside the specified range, change the friction discs and make adjustments.

Standard value: 0.06 – 0.25 mm (0.002 – 0.010 inch)

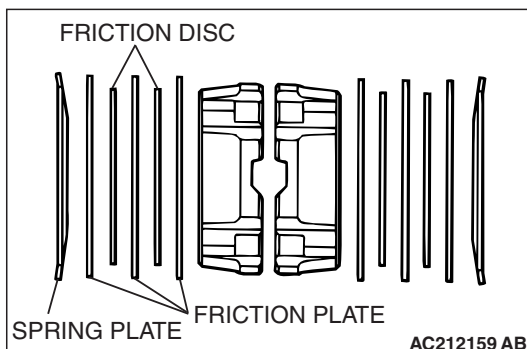


AC212158 AB

7. Coat each part with the specified gear oil and mount it in the specified direction and order into differential case B.

MITSUBISHI Limited Slip Differential Oil (LSD) or equivalent

NOTE: Apply a careful coat of gear oil to the contacting and sliding surfaces.

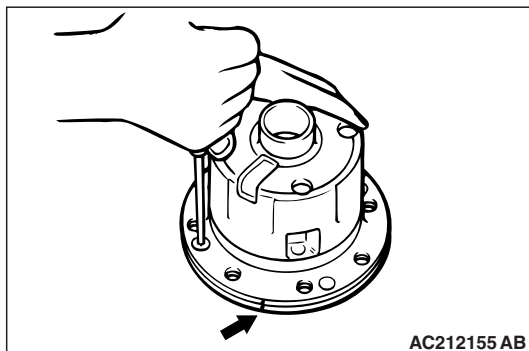
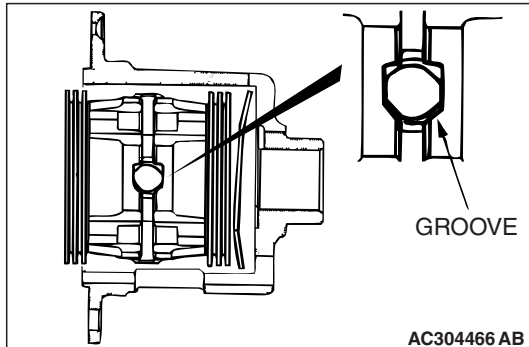


AC212159 AB

⚠ CAUTION

When installing the pressure ring into the differential case B, the groove should be faced in the direction shown in the figure. Otherwise it may cause a malfunction.

8. Mount each part in the specified direction and order into differential case B.



>>B<< SCREW TIGHTENING

1. Align the alignment mark on differential case A with that on differential case B.
2. Tighten the screws connecting differential case A and B a uniform amount little by little in the diagonal order.

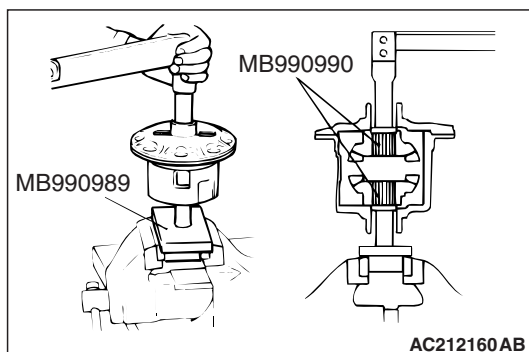
NOTE: If tightening the screws does not bring the two cases properly together, the spring plates are not probably assembled properly. Reassemble from the start.

>>C<< LSD DIFFERENTIAL TORQUE CHECK

1. Use special tools MB990989 and MB990990 to check for differential torque.

Standard value:

Item	LSD DIFFERENTIAL TORQUE N·m (ft-lb)
When new clutch plate is installed	5 – 19 (3.7 – 14)
When existing clutch plate is installed	2 – 19 (1.5 – 14)



NOTE: Before measuring the differential torque, first turn the gears so they snug each other, then take measurements during rotation.

2. If the measurement falls outside the specified range, disassemble the differential case assembly and repair or replace defective parts.

INSPECTION

DIFFERENTIAL CASE INTERNAL PARTS
CONTACT/SLIDING SURFACE CHECK

1. Clean the disassembled parts with cleaning oil and dry them with compressed air.

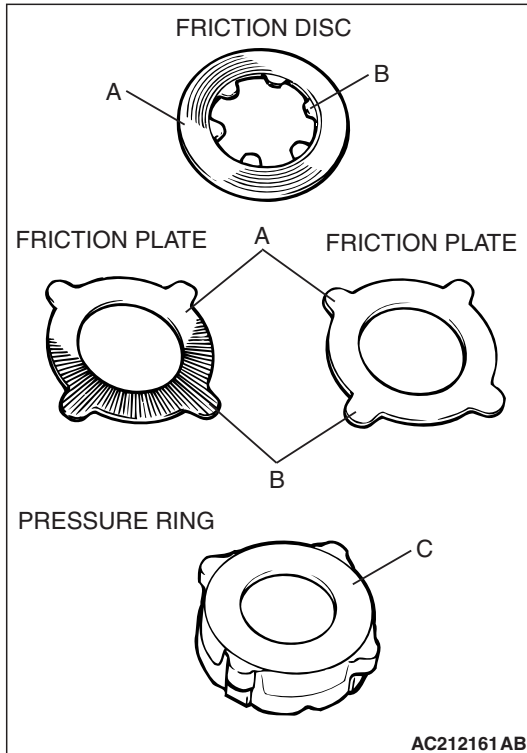
2. Check each plate, disc, and pressure ring for the following:

- A: Friction and sliding surfaces of friction discs, friction plates, and spring plates. Replace a defective part that has heat discoloration and excessive wear, as it degrades locking performance.

NOTE: If the inner periphery of the friction face shows traces of harsh contact, it is because of the spring tension of each plate, disc and other part. Do not confuse this with abnormal wear.

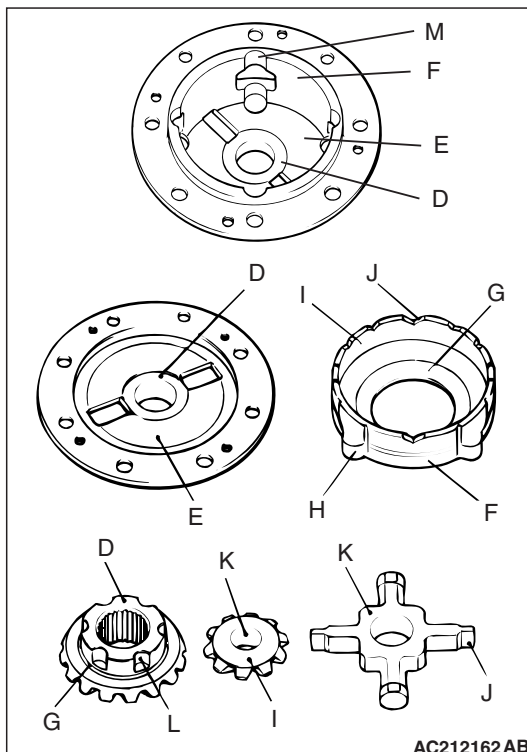
- B: Inner periphery and outer periphery protrusions of friction discs, friction plates, and spring plates. Replace a cracked or damaged part.
- C: Friction and sliding surfaces between pressure rings and friction discs. Grind a dented or scratched part with oil stone and then lap and correct with a compound on a surface plate.

NOTE: If the inner periphery of the friction face shows traces of harsh contact, it is because of the spring tension of each plate, disc and other part. Do not confuse this with abnormal wear.

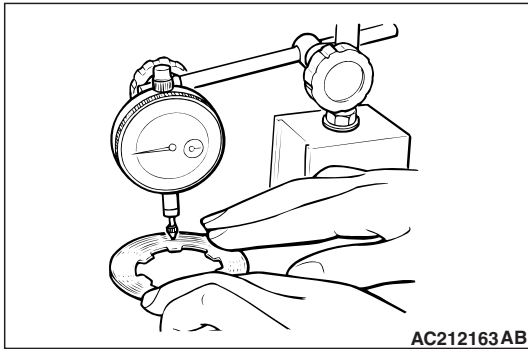


3. Check the following parts for contact and sliding surfaces (D to M) and correct burrs and dents with oil stone.

- D: Sliding surfaces of side gear and case
- E: Contacting surfaces of differential case and spring plate
- F: Contacting surfaces of pressure ring and differential case inner face
- G: Sliding surfaces of pressure ring hole and side gear
- H: Protrusions on outer periphery of pressure ring
- I: Pressure ring inner surface and differential pinion gear spherical surface
- J: Pressure ring V-groove and pinion shaft V
- K: Sliding surfaces of pinion shaft and differential pinion gear hole
- L: Side gear grooves on outer periphery
- M: Slits in inner periphery of differential



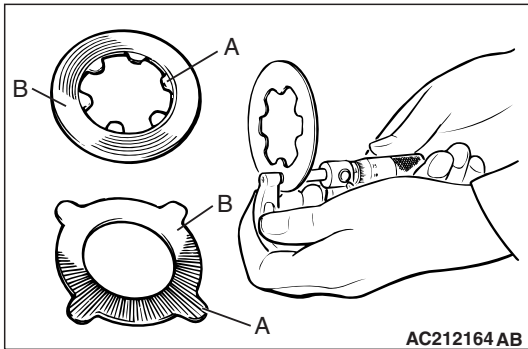
FRICTION PLATE AND FRICTION DISC DISTORSION CHECK



Apply a dial indicator to the friction plate or disc on a surface plate and, turning the friction plate or disc, measure the distortion (flatness).

Limit: 0.08 mm (0.003 inch) [total runout]

FRICTION PLATE, FRICTION DISC, AND SPRING PLATE WEAR CHECK



1. For the purpose of determining wear, measure thickness (A, B) of the friction surface and protrusion at several places and find the difference between the two.

Limit: 0.1 mm (0.004 inch)

2. If the wear exceeds the limit, replace the part with a new one.

SPECIFICATIONS**FASTENER TIGHTENING SPECIFICATIONS**

M1271004000309

ITEM	SPECIFICATION
Rear wheel hub assembly, driveshaft assembly	
Driveshaft nut	225 ± 25 N· m (166 ± 18 ft-lb)
Rear wheel hub assembly mounting bolt	71 ± 7 N· m (53 ± 5 ft-lb)
Brake caliper mounting bolt	54 ± 5 N· m (40 ± 4 ft-lb)
Backing plate mounting nut	118 ± 19 N· m (87 ± 14 ft-lb)
Knuckle	
Self locking nut (Trailing arm connection)	81 ± 6 N· m (60 ± 4 ft-lb)
Self locking nut (Lower arm connection)	88 ± 10 N· m (65 ± 7 ft-lb)
Self locking nut (Toe control arm connection)	81 ± 6 N· m (60 ± 4 ft-lb)
Self locking nut (Upper arm connection)	81 ± 6 N· m (60 ± 4 ft-lb)
Differential carrier assembly	
Propeller shaft and differential companion flange connecting nut	32 ± 2 N· m (24 ± 1 ft-lb)
Differential mount bracket bolt	88 ± 10 N· m (65 ± 7 ft-lb)
Differential mount bracket to differential support member connecting bolt	120 ± 10 N· m (89 ± 7 ft-lb)
Differential support member mounting bolt	88 ± 10 N· m (65 ± 7 ft-lb)
Differential support arm to differential carrier mounting bolt	88 ± 10 N· m (65 ± 7 ft-lb)
Differential support arm mounting nut	88 ± 10 N· m (65 ± 7 ft-lb)
Rear crossmember mounting bolt (long)	88 ± 10 N· m (65 ± 7 ft-lb)
Rear crossmember mounting bolt (short)	85 ± 6 N· m (63 ± 4 ft-lb)
Toe control bar mounting bolt	69 ± 9 N· m (51 ± 7 ft-lb)
Differential cover bolt	36 ± 5 N· m (26 ± 4 ft-lb)
Drain plug	64 ± 4 N· m (47 ± 3 ft-lb)
Drive gear and limited slip differential case mounting bolt	84 ± 4 N· m (62 ± 3 ft-lb)
Companion flange self-locking nut	186 ± 29 N· m (137 ± 21 ft-lb)
Filler plug	49 ± 9 N· m (37 ± 6 ft-lb)
Bearing cap bolt	37 ± 2 N· m (27 ± 1 ft-lb)

GENERAL SPECIFICATIONS

M1271000200129

ITEM		SPECIFICATION	
Rear axle			
Wheel bearing	Type	Unit ball bearing (Double-row angular contact ball bearing)	
Driveshaft Joint	Type	Outer	EBJ
		Inner	TJ
	Length (joint to joint) × diameter mm (in)	Left	485.6 × 25 (19.1 × 1.0)
		Right	575.5 × 25 (22.7 × 1.0)
Differential			
Reduction gear type		Hypoid gear	
Reduction ratio		3.307	
Differential gear type (Type × number of gears)	Side gear	Straight bevel gear × 2	
	Pinion gear	Straight bevel gear × 4	
Number of teeth	Drive gear	43	
	Drive pinion	13	
Bearings (Outside diameter × Inside diameter) mm (in)	Side	72.0 × 25.0 (2.83 × 1.0)	
	Front	62.0 × 25.0 (2.44 × 1.0)	
	Rear	72.0 × 25.0 (2.83 × 1.0)	

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

SERVICE SPECIFICATIONS

M1271000300386

ITEM		STANDARD VALUE	LIMIT	
Rear axle total backlash mm (in)		–	6 (0.2)	
Wheel bearing breakaway torque N· m (ft-lb)		–	1.0 (0.74)	
Wheel bearing end play mm (in)		–	0.05 (0.002)	
TJ boot assembly dimension mm (in)		90 ± 3 (3.5 ± 0.1)	–	
Drive gear backlash mm (in)		0.11 – 0.16 (0.004 – 0.006)	–	
Drive gear runout mm (in)		–	0.05 (0.002)	
Drive pinion turning torque N· m (in-lb)	Without oil seal	0.88 – 1.17 (7.8 – 10.4)	–	
	With oil seal	Companion flange (oil seal contacting area) with anti-rust agent	0.98 – 1.27 (8.67 – 11.24)	
		Companion flange (oil seal contacting area) with gear oil applied	0.49 – 0.58 (4.34 – 5.13)	–
LSD case assembly	Right-to-left difference in combined thickness of friction plate and friction disc mm (in)		0 – 0.05 (0 – 0.002)	
	Clearance between spring plate and differential case mm (in)		0.06 – 0.25 (0.002 – 0.010)	
	LSD differential torque N· m (ft-lb)	When new clutch plate is installed	5 – 19 (3.7 – 14)	–
		When existing clutch plate is installed	2 – 19 (1.5 – 14)	–
	Distortion of friction plate and friction disc mm (in)		–	0.08 (0.003)
	Difference in thickness between friction plate, friction disc, and spring plate mm (in)		–	0.1 (0.004)

LUBRICANTS

M1271000400338

ITEM	SPECIFIED LUBRICANT	QUANTITY
Rear differential gear oil	mitsubishi Limited Slip Differential Oil (LSD) or equivalent	0.55 dm ³ (0.58 qt)
Driveshaft EBJ joint	Repair kit grease	80 ± 10 g (2.8 ± 0.4 oz)
Driveshaft TJ joint	Repair kit grease	135 ± 10 g (4.8 ± 0.4 oz)

SEALANT AND ADHESIVE

M1271000500186

ITEM	SPECIFIED SEALANT AND ADHESIVE
Differential cover, vent plug	3M™ AAD Part No. 8672, 8679, 8678, 8661, 8663 or equivalent
Drive gear and differential case mounting part	3M™ AAD Part No. 8730, 8731 or equivalent

COMPONENT IDENTIFICATION

M1271003800119

DRIVE PINION SPACER

HEIGHT OF DRIVE PINION SPACER mm (in)	IDENTIFICATION COLOR
57.72 (2.27)	–
57.08 (2.25)	Red

NOTES