GROUP 27

REAR AXLE

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GENERAL INFORMATION

M1271000100382

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

- The wheel bearing is a unit ball bearing (double-row angular contact ball bearing) for reduced friction.
- The drive shaft has EBJ-TJ constant velocity joints.
- ABS rotor for detecting the wheel speed is press-fitted to the EBJ.
- For environmental protection, lead-free grease is used on the joints.

Active Yaw Control (AYC) is adopted to improve the turning performance. AYC incorporates the torque transfer differential and the hydraulic unit.

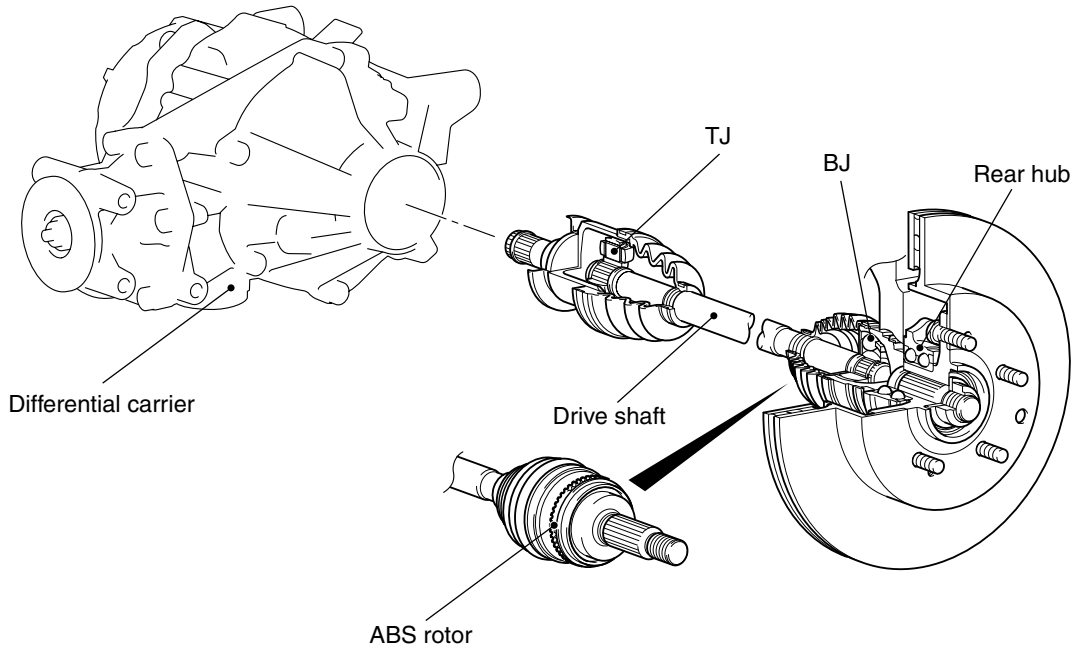
NOTE:

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

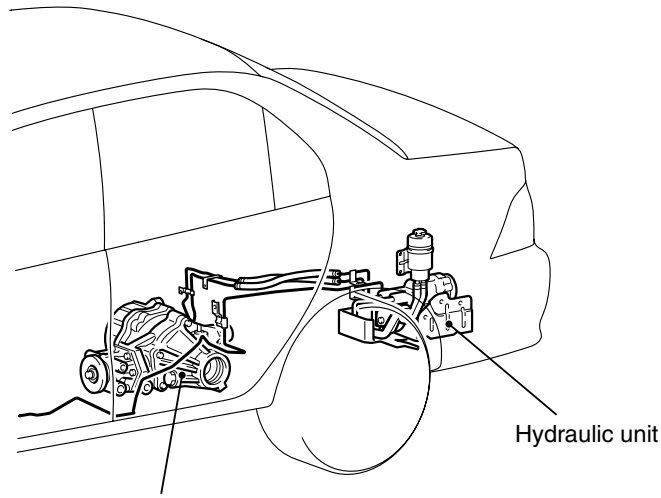
SPECIFICATIONS

Item			Specification
Wheel bearing	Type		Unit ball bearing (Double-row angular contact ball bearing)
	Bearing (OD x ID) mm		70 × 40
Drive shaft	Type	Outer	EBJ
		Inner	TJ
	Length (joint to joint) × diameter mm	Left	428.5 × 25
		Right	448.5 × 25

CONSTRUCTION DIAGRAM



AC310259AB



AC311159 AB

SERVICE SPECIFICATIONS

M1271000300557

Item	Standard value	Limit
Rear axle total backlash mm	–	6
Wheel bearing rotation starting torque N·m	–	1.0
Wheel bearing axial play mm	–	0.05
TJ boot assembly dimension mm	90 ± 3	–
Pressure generated by AYC hydraulic unit (pressure sensor value) MPa	0.9 – 1.1	–

LUBRICANTS

M1271000400286

Item		Specified lubricant	Quantity
AYC	Differential	Hypoid gear oil API classification GL-5 or higher Above 10°C: SAE 90 Below 10°C: SAE 80W	0.55 ± 0.02 L
	Torque transfer mechanism	ATF-SP III	0.55 – 0.6 L
AYC hydraulic piping		ATF-SP III	1 L
Torque transfer mechanism oil seal lip		Vaseline	As required
Drive shaft EBJ joint		Repair kit grease	80 ± 10 g
Drive shaft TJ joint		Repair kit grease	135 ± 10 g

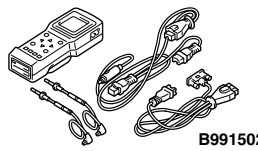
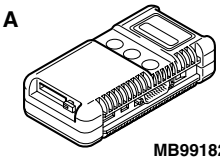
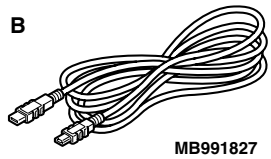
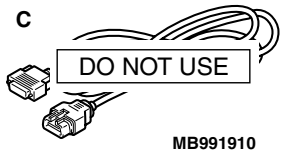
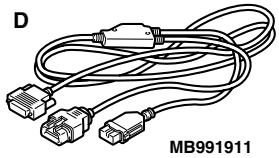
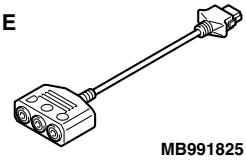
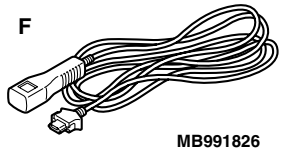
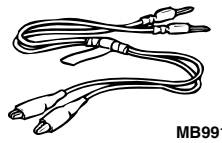
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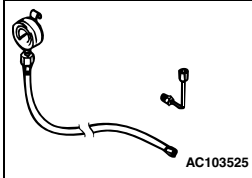
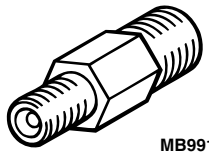
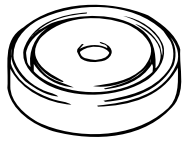
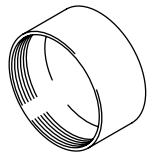
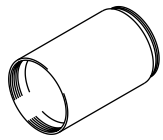
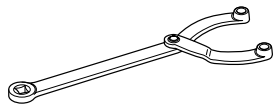
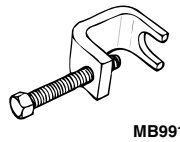
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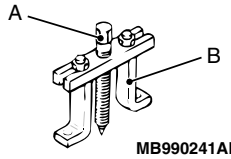
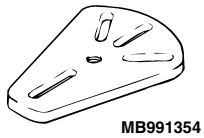
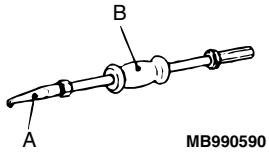
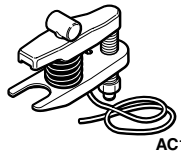
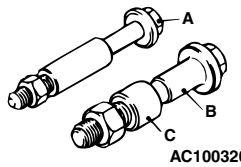
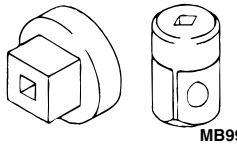
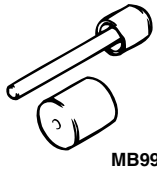
Item	Specified sealant	Remark
Vent plug	3M ATD Part No.8661 or equivalent	Semi-drying sealant
Differential carrier cover mounting part		

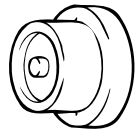
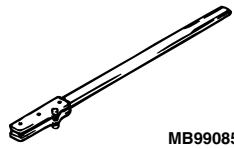
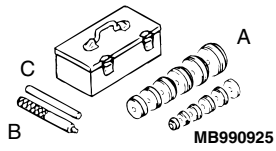
SPECIAL TOOLS

M1271000600569

Tool	Number	Name	Use
 B991502	MB991502	MUT-II sub assembly	Checking the AYC (Diagnosis display by using the MUT-II)
A  MB991824 B  MB991827 C  MB991910 D  MB991911 E  MB991825 F  MB991826 MB991955	MB991955 A: MB991824 B: MB991827 C: MB991910 D: MB991911 E: MB991825 F: MB991826	MUT-III sub-assembly A: Vehicle Communication Interface (V. C. I). B: MUT-III USB cable C: MUT-III main harness A (Vehicles with CAN communication system) D: MUT-III main harness B (Vehicles without CAN communication system) E: MUT-III measurement adapter F: MUT-III trigger harness	Checking the AYC (Diagnosis display by using the MUT-III)
 MB991529	MB991529	Diagnosis code check harness	Checking the AYC (Diagnosis display by using the ACD mode indicator lamp)

Tool	Number	Name	Use
 AC103525	MD998330	Oil pressure gauge	Hydraulic pressure measurement
 MB991705	MB991705	Hose adapter	
	MB991115	Oil seal installer	Press-fitting of the differential carrier oil seal (Use together with MB990938)
	MD998812	Installer cap	Press-fitting of the torque transfer mechanism oil seal
	MD998813	Installer 100	
	MD998829	Installer adapter (60)	
 B990767	MB990767	End yoke holder	Rear axle hub fixing
 MB991618	MB991618	Hub bolt remover	Removal of the hub bolt

Tool	Number	Name	Use
	MB990241 A: MB990242 B: MB990244	Axle shaft puller A: Puller shaft B: Puller bar	Removal of the drive shaft
	MB991354	Puller body	
	MB990590 A: MB990212 B: MB990211	Rear axle shaft oil seal remover A: Adapter B: Slide hammer	Removal of the rear wheel hub
	MB991897	Ball joint remover	Knuckle and tie rod end ball joint disconnection *NOTE: Steering linkage puller (MB990635 or MB991113)is also used to disconnect knuckle and tie rod end ball joint.*
	A: MB991017 B: MB990998 C: MB991000	A, B: Front hub remover and installer C: Spacer	• Provisional holding of the wheel bearing • Measurement of wheel bearing rotation starting torque • Measurement of wheel bearing axial play *NOTE: MB991000, which belongs to MB990998, should be used as a spacer.*
	MB990326	Preload socket	Measurement of the wheel bearing rotation starting torque
	MB990685	Torque wrench	
	MB990641	Lower arm bush (A) remover & installer	Removal and press-fitting of differential support member bushing

Tool	Number	Name	Use
 MB991439	MB991439	Bush remover & installer	Removal and press-fitting of differential support arm bushing
	MB991460	Plug	Prevention of AYC differential gear oil spilling and entry of foreign material
 MB990850	MB990850	End yoke holder	Companion flange fixing
 MB990925	MB990925 A: MB990926 – MB990937 B: MB990938 C: MB990939	Bearing and oil seal installer set A: Installer adapter B: Bar C: Brass bar	• Press-fitting of differential carrier oil seal (Use together with MB991115) For details of each installer, refer to GROUP 26 – Special Tools P.26-3.

TROUBLESHOOTING

TROUBLESHOOTING STRATEGY

M1272003900023

Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-6.

NOTE: Before starting the troubleshooting procedure, make sure that the following items have been checked.

- *The correct steering wheel has been installed in the neutral position of the steering column shaft.*
- *Tyre and wheel size are correct with correct specifications. Inflation pressure, balance, and wear conditions are okay.*
- *Wheel alignment is correct.*
- *The engine, suspension, and other parts have not been remodeled so as to affect the AYC system.*

DIAGNOSIS FUNCTION

M1272004000023

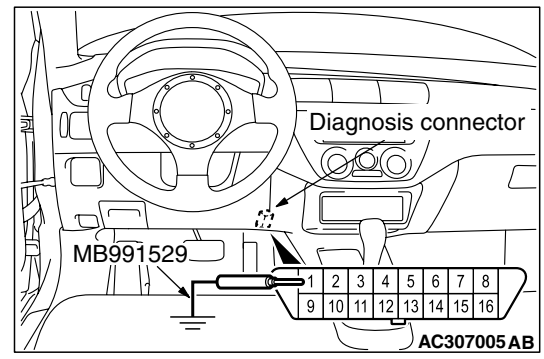
READING DIAGNOSIS CODES

WHEN USING THE MUT-II/III

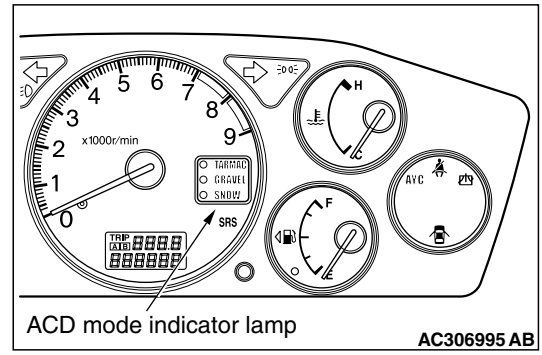
Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-6.

WHEN USING THE ACD MODE INDICATOR LAMP

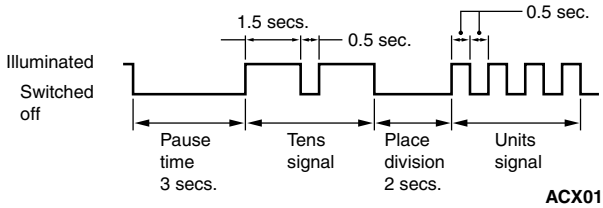
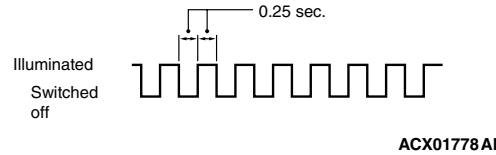
1. Turn the ignition switch to the "LOCK" (OFF) position.



2. Use special tool diagnosis code check harness (MB991529) to earth terminal number 1 (diagnosis control terminal) of the diagnosis connector.
3. Turn the ignition switch to the "ON" position.



4. Read out a diagnosis code by observing how the ACD mode indicator lamp flashes.

When the diagnosis code No.24 is set	When no diagnosis code is set
	

5. Turn the ignition switch to the "LOCK" (OFF) position.
6. Disconnect special tool diagnosis code check harness (MB991529).

ERASING DIAGNOSIS CODES

When using the MUT-II/III

Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points P.00-6.

When not using the MUT-II/III

1. Turn the ignition switch to the "LOCK" (OFF) position.
2. After disconnecting the battery cable from the battery (–) terminal for 10 seconds or more, reconnect the cable.
3. After the engine has warmed up, rung it at idle for about 15 minutes.

DIAGNOSIS CODE CHART

M1272004100064

Follow the inspection chart that is appropriate for the diagnosis code.

Diagnosis code No.	Inspection item	Diagnostic content	Reference page
12	Power supply voltage (valve power supply) system	Open circuit or short circuit	Refer to GROUP 22A, Troubleshooting <ACD> P.22A-9
13	Failsafe relay system (inside of 4WD-ECU)		Refer to GROUP 22A, Troubleshooting <ACD> P.22A-13
21	Front right wheel speed sensor system		Refer to GROUP 22A, Troubleshooting <ACD> P.22A-13
22	Front left wheel speed sensor system		
23	Rear right wheel speed sensor system		
24	Rear left wheel speed sensor system		

Diagnosis code No.	Inspection item	Diagnostic content	Reference page
25	Wrong size (diameter) tyre		Refer to GROUP 22A, Troubleshooting <ACD> P.22A-17
26	Wheel speed sensor (faulty output signal)		Refer to GROUP 22A, Troubleshooting <ACD> P.22A-17
31	Steer sensor (ST-1, ST-2, ST-N) system	Open circuit or short circuit	Refer to GROUP 22A, Troubleshooting <ACD> P.22A-19
32	Steer sensor (ST-N) system	Short circuit	Refer to GROUP 22A, Troubleshooting <ACD> P.22A-28
33		Fixing	
34	Steer sensor (ST-1, ST-2) system	Short circuit or output fixing	Refer to GROUP 22A, Troubleshooting <ACD> P.22A-32
41	TPS system	Open circuit or earth circuit	Refer to GROUP 22A, Troubleshooting <ACD> P.22A-36
42		Short circuit	
45	Pressure sensor system	Open circuit or earth circuit	Refer to GROUP 22A, Troubleshooting <ACD> P.22A-40
46	Pressure sensor system	Open earth	Refer to GROUP 22A, Troubleshooting <ACD> P.22A-45
47		Short circuit	Refer to GROUP 22A, Troubleshooting <ACD> P.22A-47
51	G sensor (longitudinal) system	Open circuit or short circuit	Refer to GROUP 22A, Troubleshooting <ACD> P.22A-51
52		Defective sensor	Refer to GROUP 22A, Troubleshooting <ACD> P.22A-60
56	G sensor (lateral) system	Open circuit or short circuit	Refer to GROUP 22A, Troubleshooting <ACD> P.22A-66
57		Defective sensor	Refer to GROUP 22A, Troubleshooting <ACD> P.22A-75
61	Stop lamp switch system	Open circuit	Refer to GROUP 22A, Troubleshooting <ACD> P.22A-81
62	ACD mode changeover switch	Stuck	Refer to GROUP 22A, Troubleshooting <ACD> P.22A-86

Diagnosis code No.	Inspection item	Diagnostic content	Reference page
63	Parking brake switch system	Short circuit or parking lever not released	Refer to GROUP 22A, Troubleshooting <ACD> P.22A-93
65	ABS monitor system	Open circuit or defective ABS	Refer to GROUP 22A, Troubleshooting <ACD> P.22A-98
71	Proportioning valve <AYC> system	Open circuit or short circuit	P.27-12
72	Directional control valve (right) system		P.27-16
73	Directional control valve (left) system		P.27-20
74	Proportioning valve <ACD> system		Refer to GROUP 22A, Troubleshooting <ACD> P.22A-104
81	Electric pump relay system	Open circuit or short circuit	Refer to GROUP 22A, Troubleshooting <ACD> P.22A-108
82		Electric pump malfunction or pressure sensor defective	Refer to GROUP 22A, Troubleshooting <ACD> P.22A-112
84	AYC control error		–
85	ACD control error		–

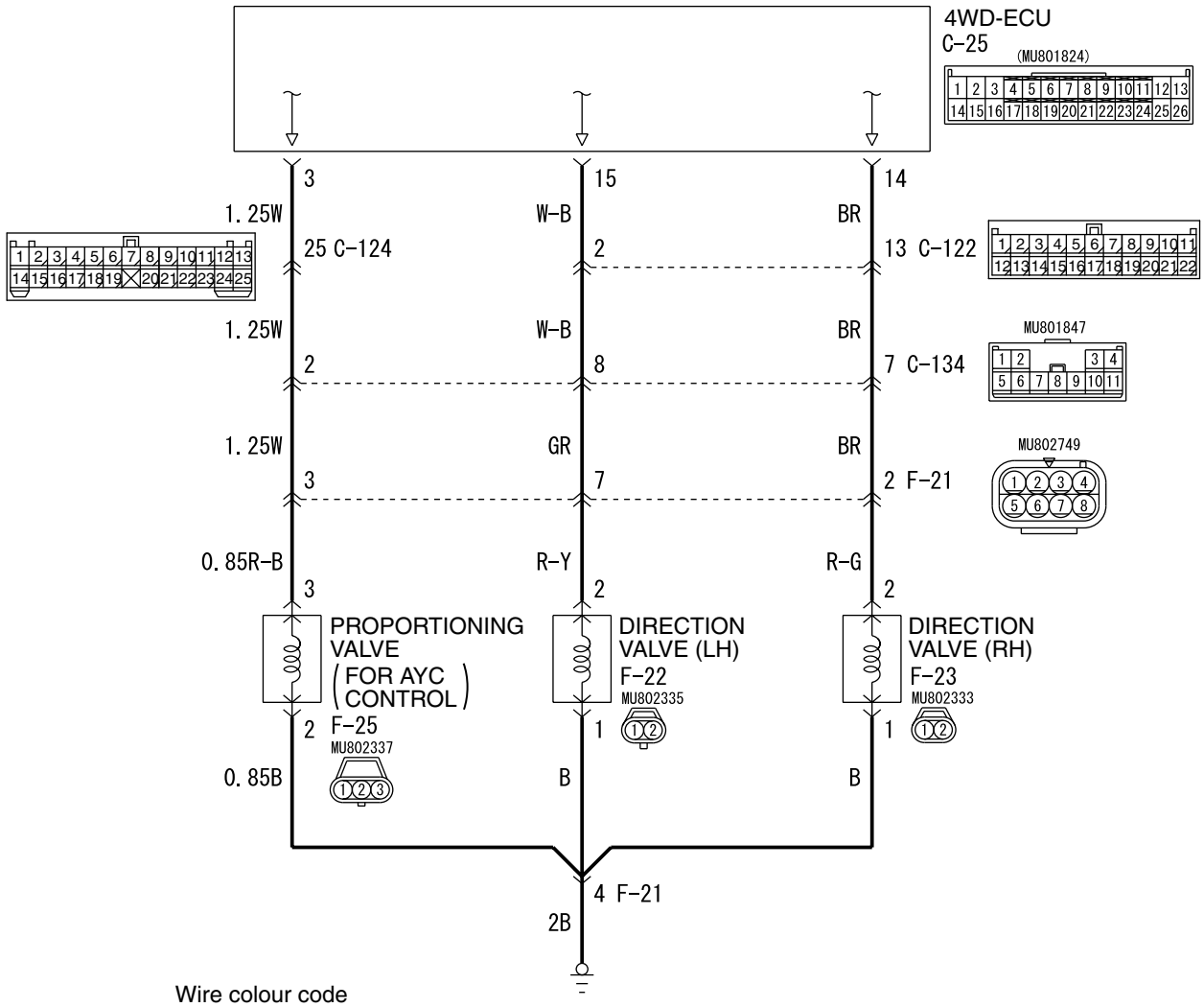
NOTE:

- *Code No.84 is not a code number output due to malfunction, but a code number output when control for 4WD-ECU to protect the AYC is stopped in excessive driving. AYC control can be recovered by turning the ignition switch to the "ON" position to "OFF" position and to "ON" position.*
- *Code No.85 is not a code number output due to malfunction, but a code number output when control for 4WD-ECU to protect the ACD is stopped in excessive driving. ACD control can be recovered by turning the ignition switch to the "ON" position to "OFF" position and to "ON" position.*

DIAGNOSTIC TROUBLE CODE PROCEDURES

Code No.71: Proportioning valve system

Proportioning valve system/direction valve system circuit



Wire colour code
B : Black LG : Light green G : Green L : Blue W : White Y : Yellow SB : Sky blue
BR : Brown O : Orange GR : Gray R : Red P : Pink V : Violet

W4J54E154A

OPERATION

- After processing information of various sensors and switches, the 4WD-ECU calculates the amount of AYC torque movement and direction, and controls the proportioning valve.
- The current flows from the 4WD-ECU to activate the proportioning valve, which controls oil pressure supplied to the AYC clutches.

DIAGNOSIS CODE SET CONDITIONS

Diagnosis code No.71 is set when the proportioning valve control circuit is open circuited or short-circuited.

PROBABLE CAUSES

- Malfunction of the proportioning valve
- Damaged harness wires and connectors
- Malfunction of the 4WD-ECU

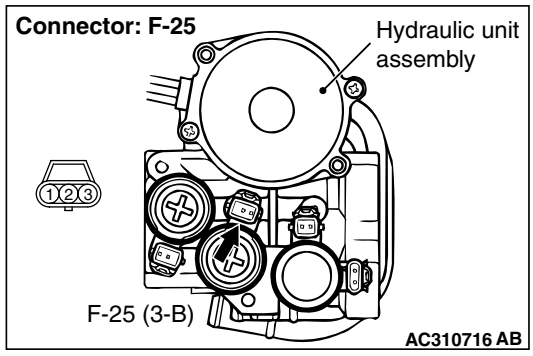
DIAGNOSIS

STEP 1. MUT-II/III data list

Set MUT-II/III to data reading mode, and check the data list item.
Item 12: Proportioning valve current <AYC> (Refer to Data List Table P.22A-141).

Q: Is the check result normal?
YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.
NO : Go to Step 2.

STEP 2. Measure the resistance at proportioning valve connector F-25.

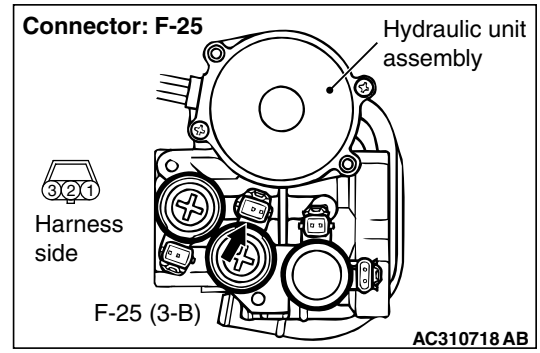


Disconnect the connector, and measure the resistance between terminal 2 and 3 at the proportioning valve side.

OK: 4.7 Ω or less

Q: Is the check result normal?
YES : Go to Step 3.
NO : Replace the hydraulic unit.

STEP 3. Measure the resistance at proportioning valve connector F-25.

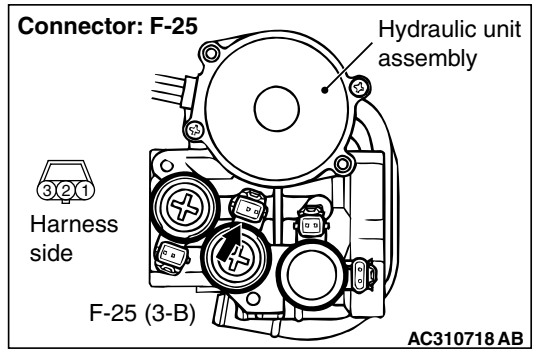


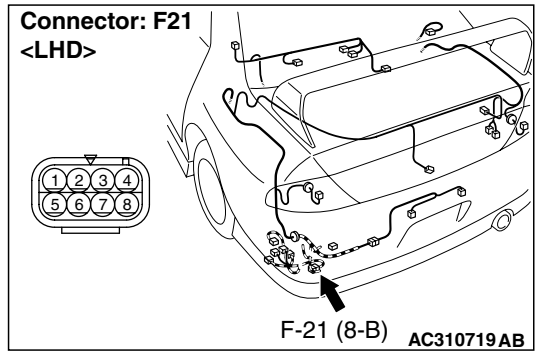
Measure the resistance between terminal 2 and earth at the wiring harness side.

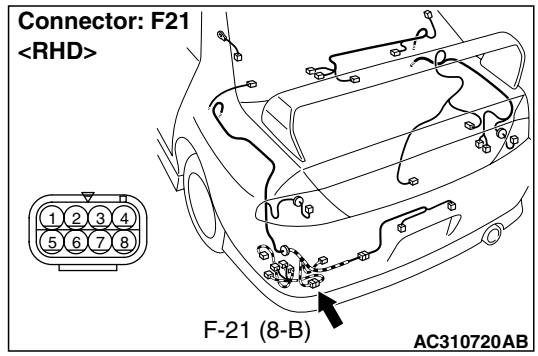
OK: 2 Ω or less

Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair the defective connector.

STEP 4. Connectors check: F-25 proportioning valve connector, F-21 intermediate connector



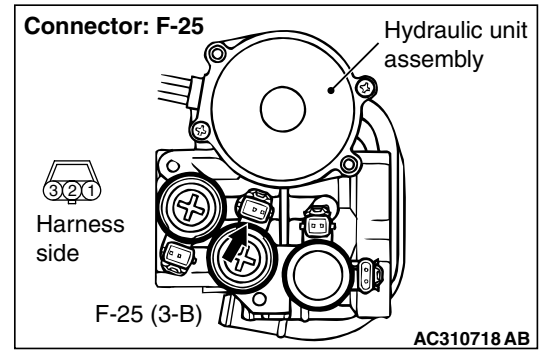


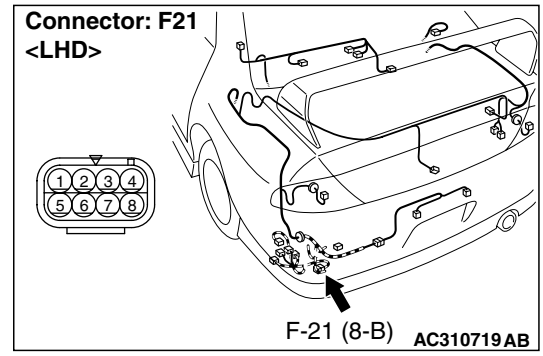


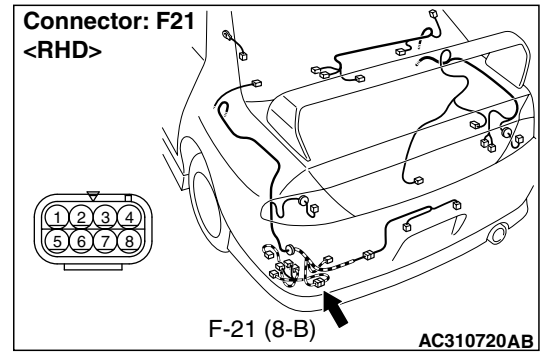
Check for the contact with terminals.

Q: Is the check result normal?
YES : Go to Step 5.
NO : Repair the defective connector.

STEP 5. Check the harness wires between proportioning valve connector F-25 terminal 2 and intermediate connector F-21 terminal 4 and earth.



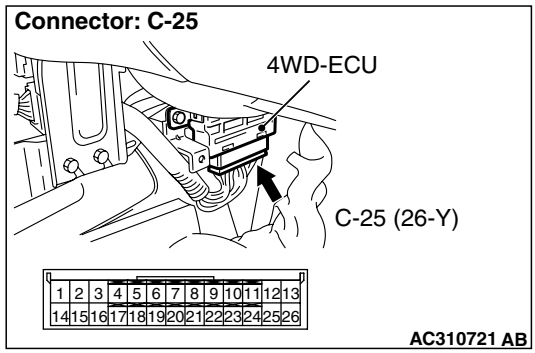


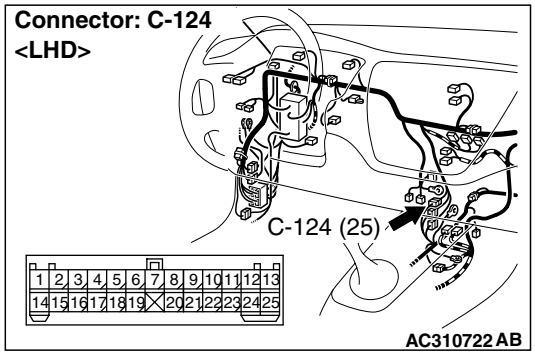


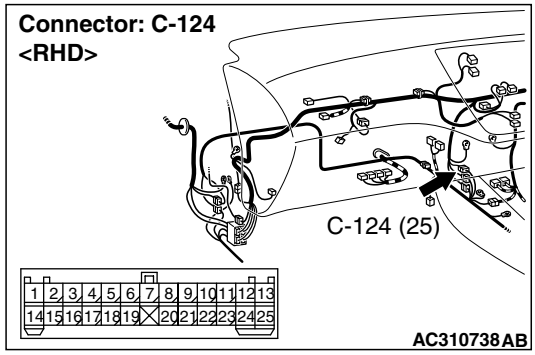
Check the earth line for open circuit.

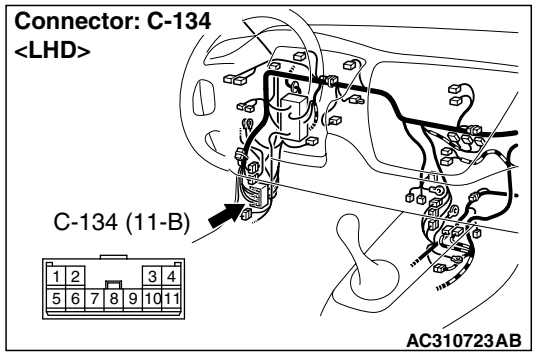
Q: Is the check result normal?
YES : Go to Step 6.
NO : Repair the wiring harness.

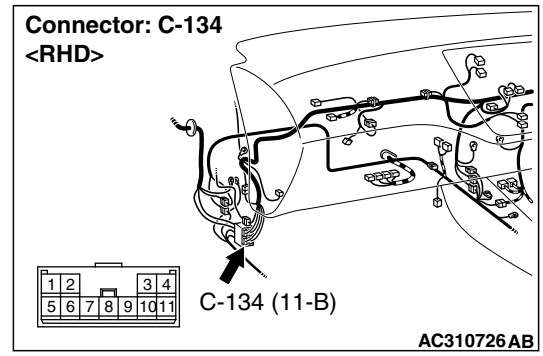
STEP 6. Connectors check: C-25 4WD-ECU connector, C-124, C-134 and F-21 intermediate connectors, and F-25 proportioning valve connector

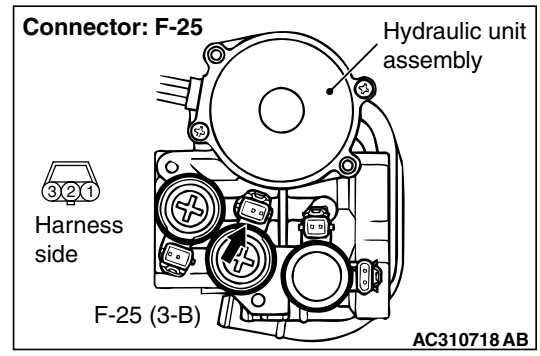


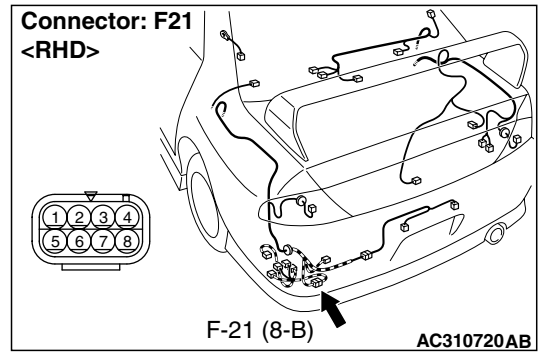


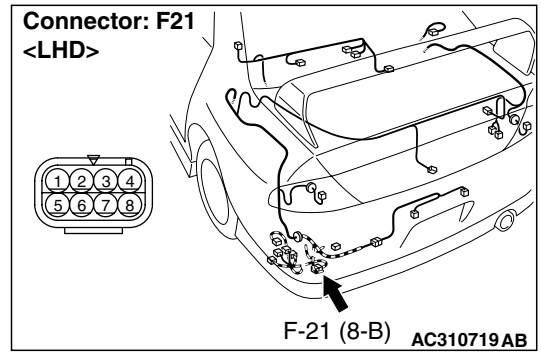








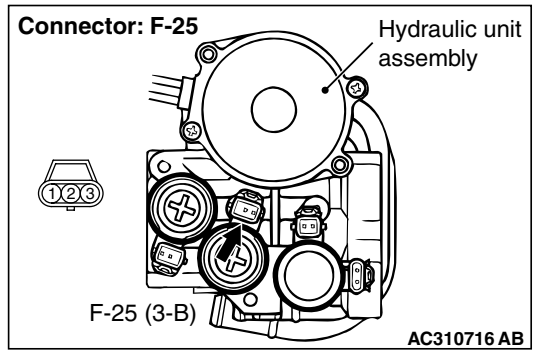


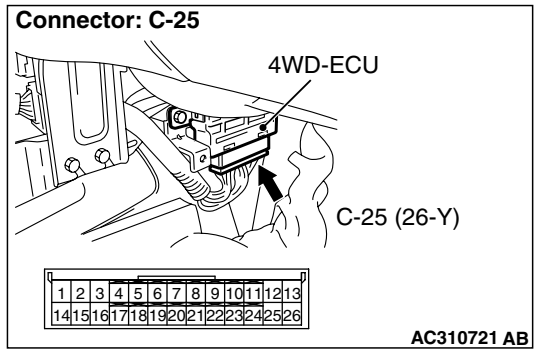


Check for the contact with terminals.

Q: Is the check result normal?
YES : Go to Step 7.
NO : Repair the defective connector.

STEP 7. Check the harness between proportioning valve connector F-25 terminal No.3 and 4WD-ECU connector C-25 terminal No.3.





Check the output line for short-circuited or open circuit.

Q: Is the check result normal?
YES : Replace the 4WD-ECU.
NO : Repair the wiring harness.

Code No.72: direction valve (RH) system

DIRECTION VALVE (RH) SYSTEM CIRCUIT

Refer to P.27-12.

OPERATION

- After processing information of various sensors and switches, the 4WD-ECU calculates the amount of AYC torque movement and direction, and controls the direction valve (RH).
- The current flows from the 4WD-ECU to activate the direction valve (RH), which supplies the oil pressure to the AYC right clutch.

DIAGNOSIS CODE SET CONDITIONS

Diagnosis code No.72 is set when the direction valve (RH) control circuit is open circuited or short-circuited.

PROBABLE CAUSES

- Malfunction of the direction valve (RH)
- Damaged harness wires and connectors
- Malfunction of the 4WD-ECU

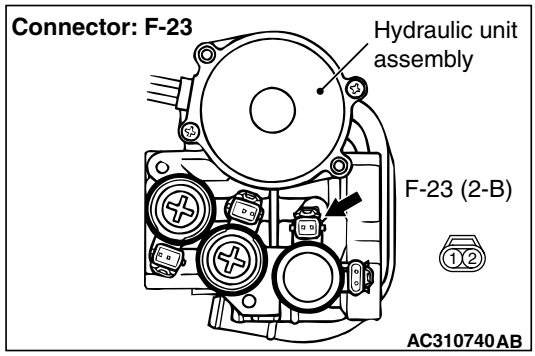
DIAGNOSIS

STEP 1. MUT-II/III data list

Set MUT-II/III to data reading mode, and check the data list item.
Item 59: direction valve (RH) (Refer to Data List Table P.22A-141).

Q: Is the check result normal?
YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.
NO : Go to Step 2.

STEP 2. Measure the resistance at direction valve (RH) connector F-23.

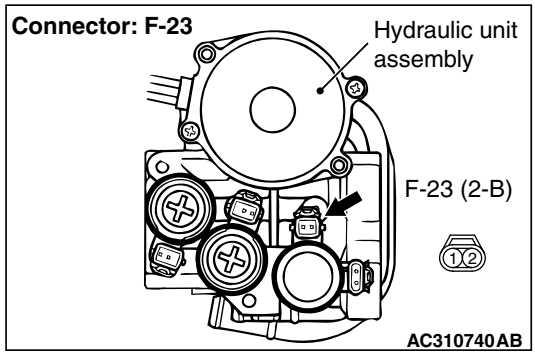


Disconnect the connector, and measure the resistance between terminal 1 and 2 at the direction valve (RH) side.

OK: 19 – 21 Ω or less

Q: Is the check result normal?
YES : Go to Step 3.
NO : Replace the hydraulic unit.

STEP 3. Measure the resistance at direction valve (RH) connector F-23.

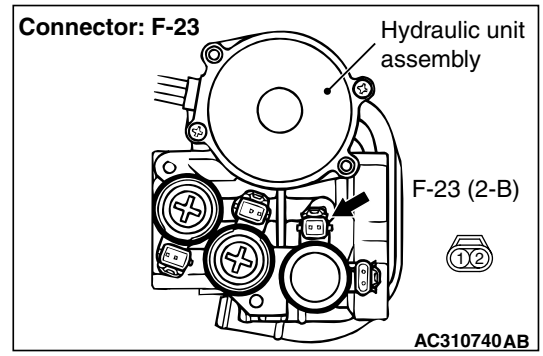


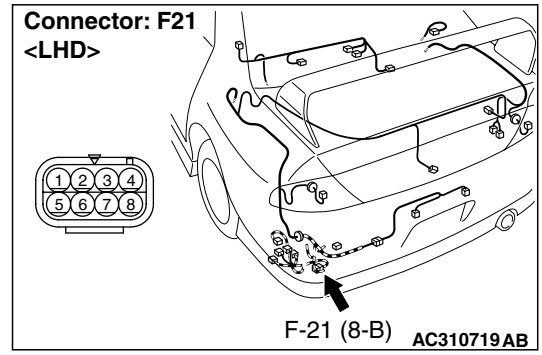
Measure the resistance between terminal 1 and earth at the direction valve (RH) side

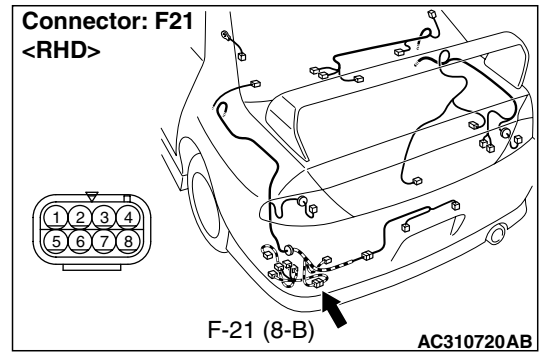
OK: 2 Ω or less

Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair the defective connector.

STEP 4. Connectors check: F-23 direction valve (RH) connector, F-21 intermediate connector



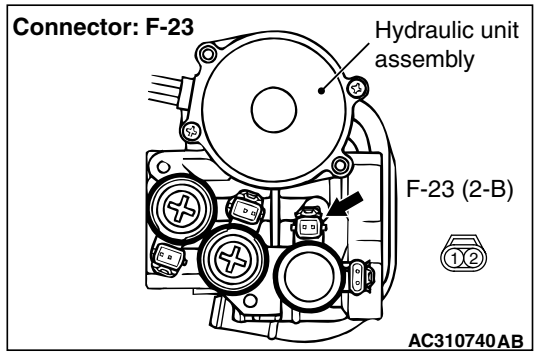


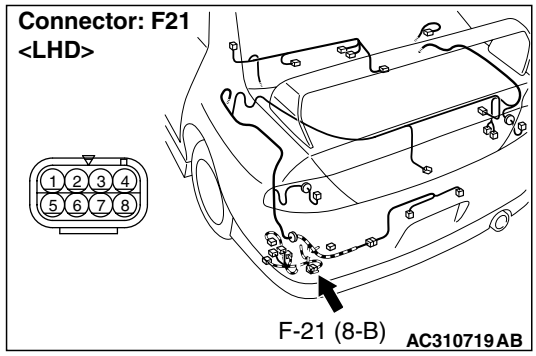


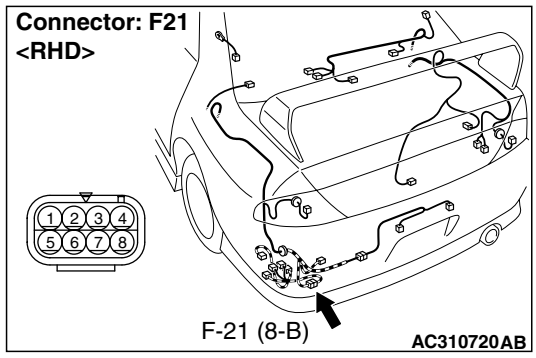
Check for the contact with terminals.

Q: Is the check result normal?
YES : Go to Step 5.
NO : Repair the defective connector.

STEP 5. Check the harness wires between direction valve (RH) connector F-23 terminal 1 and intermediate connector F-21 and earth.



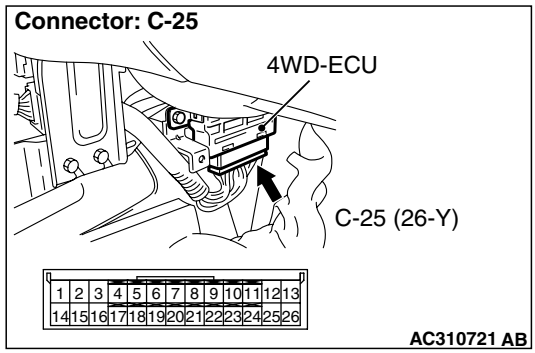


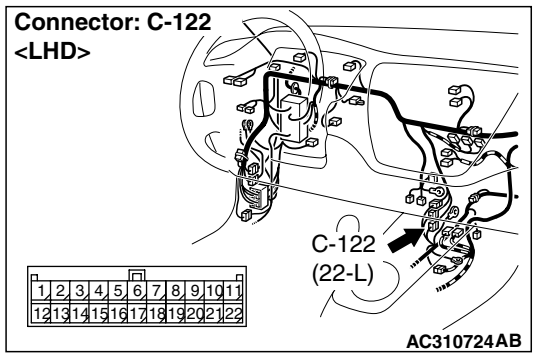


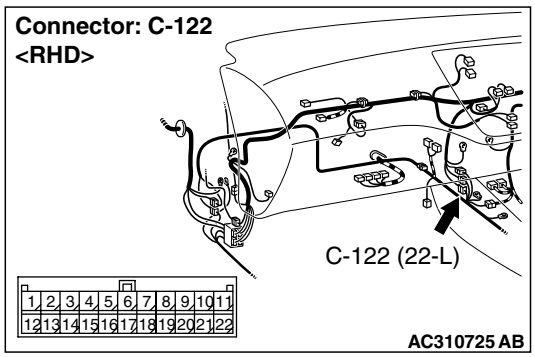
Check the earth line for open circuit.

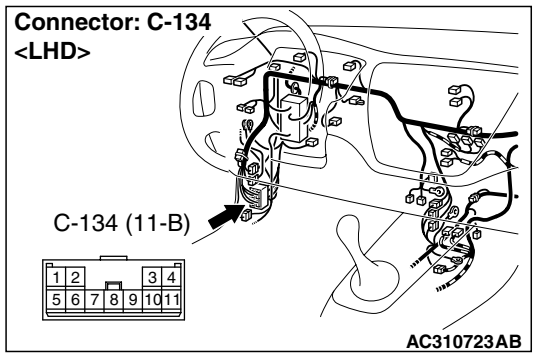
Q: Is the check result normal?
YES : Go to Step 6.
NO : Repair the wiring harness.

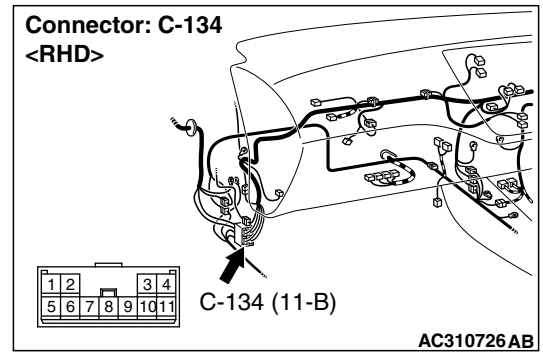
STEP 6. Connectors check: C-25 4WD-ECU connector, C-122, C-134 and F-21 intermediate connectors, and F-23 direction valve (RH) connector

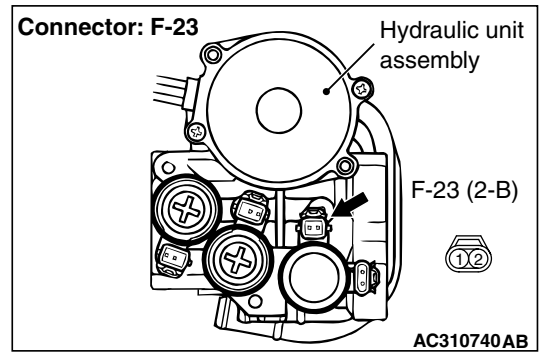


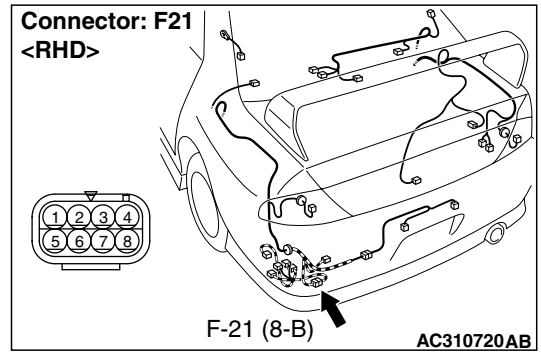


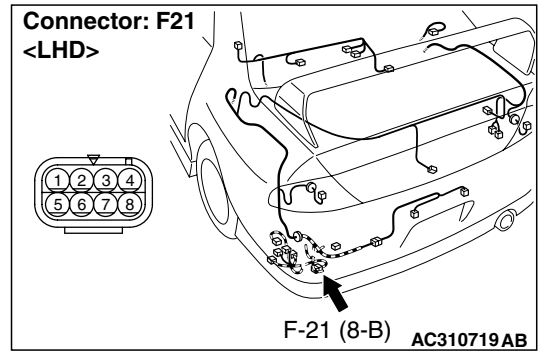








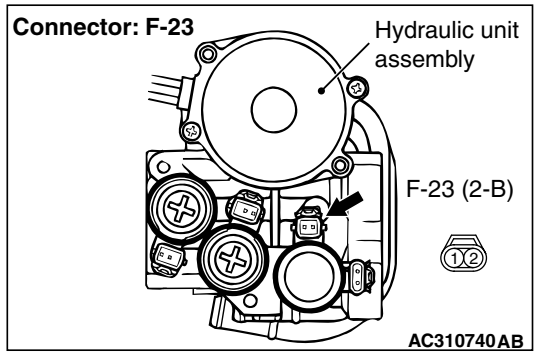


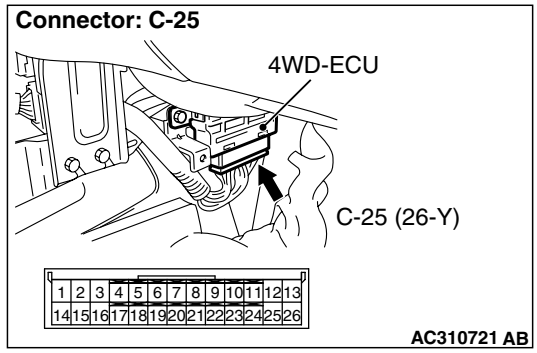


Check for the contact with terminals.

Q: Is the check result normal?
YES : Go to Step 7.
NO : Repair the defective connector.

STEP 7. Check the harness between direction valve (RH) connector F-23 terminal No.2 and 4WD-ECU connector C-25 terminal No.14.





Check the output line for short-circuited or open circuit.

Q: Is the check result normal?
YES : Replace the 4WD-ECU.
NO : Repair the wiring harness.

Code No.72: direction valve (LH) system

DIRECTION VALVE (LH) SYSTEM CIRCUIT

Refer to P.27-12.

OPERATION

- After processing information of various sensors and switches, the 4WD-ECU calculates the amount of AYC torque movement and direction, and controls the direction valve (LH).
- The current flows from the 4WD-ECU to activate the direction valve (LH), which supplies the oil pressure to the AYC left clutch.

DIAGNOSIS CODE SET CONDITIONS

Diagnosis code No.73 is set when the direction valve (LH) control circuit is open circuited or short-circuited.

PROBABLE CAUSES

- Malfunction of the direction valve (LH)
- Damaged harness wires and connectors
- Malfunction of the 4WD-ECU

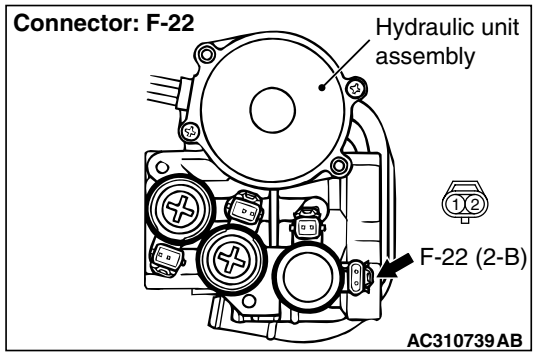
DIAGNOSIS

STEP 1. MUT-II/III data list

Set MUT-II/III to data reading mode, and check the data list item.
Item 60: direction valve (LH) (Refer to Data List Table P.22A-141).

Q: Is the check result normal?
YES : This malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunction P.00-6.
NO : Go to Step 2.

STEP 2. Measure the resistance at direction valve (LH) connector F-22.

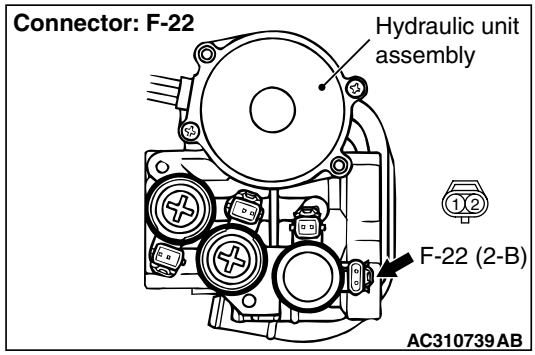


Disconnect the connector, and measure the resistance between terminal 1 and 2 at the direction valve (LH) side.

OK: 19 – 21 Ω or less

Q: Is the check result normal?
YES : Go to Step 3.
NO : Replace the hydraulic unit.

STEP 3. Measure the resistance at direction valve (LH) connector F-22.

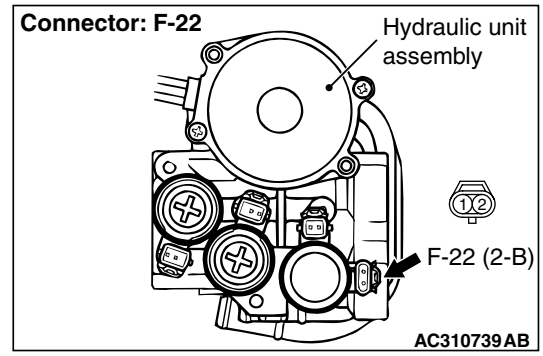


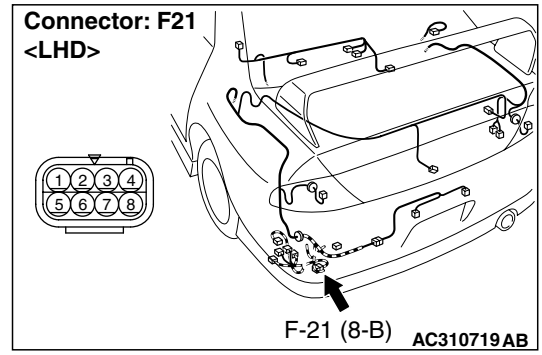
Measure the resistance between terminal 1 and earth at the direction valve (LH) side

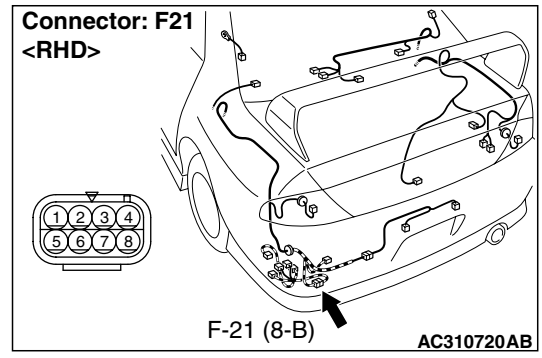
OK: 2 Ω or less

Q: Is the check result normal?
YES : Go to Step 4.
NO : Repair the defective connector.

STEP 4. Connectors check: F-22 direction valve (LH) connector, F-21 intermediate connector



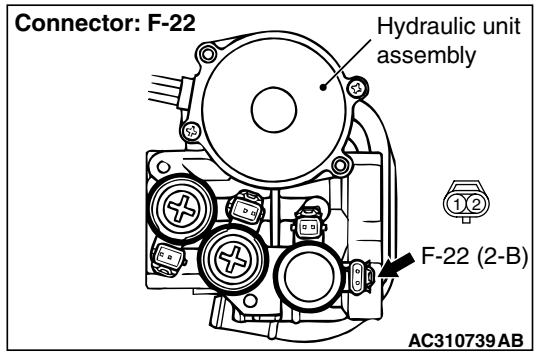


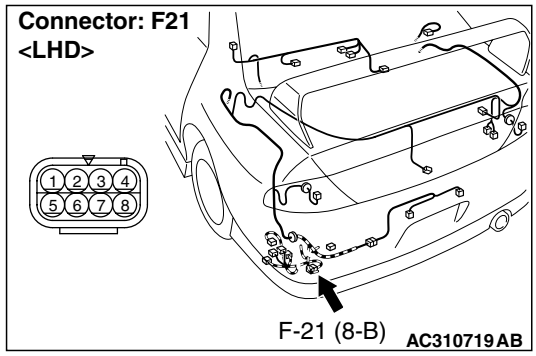


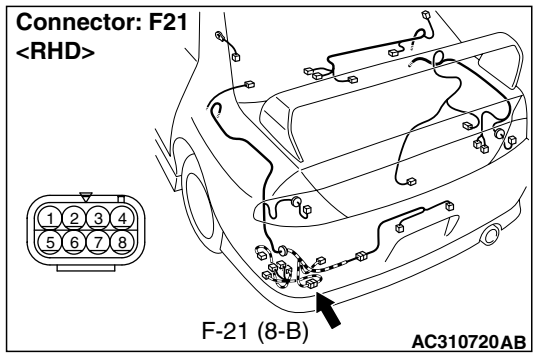
Check for the contact with terminals.

Q: Is the check result normal?
YES : Go to Step 5.
NO : Repair the defective connector.

STEP 5. Check the harness wires between direction valve (LH) connector F-22 terminal 1 and intermediate connector F-21 and body earth.



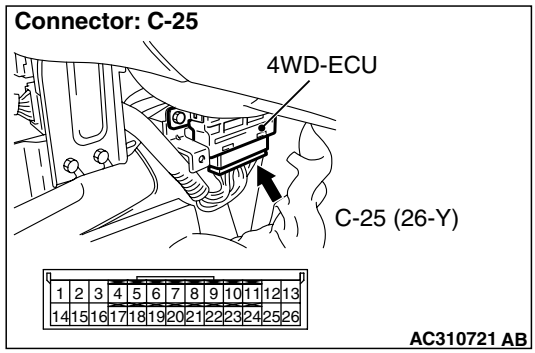


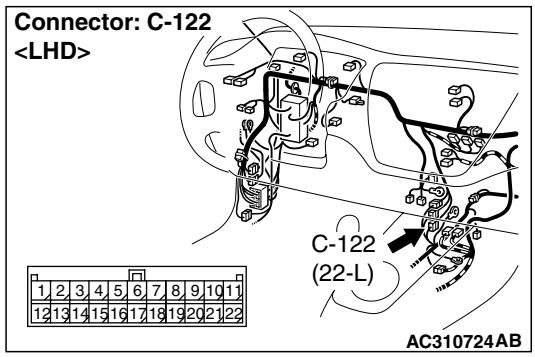


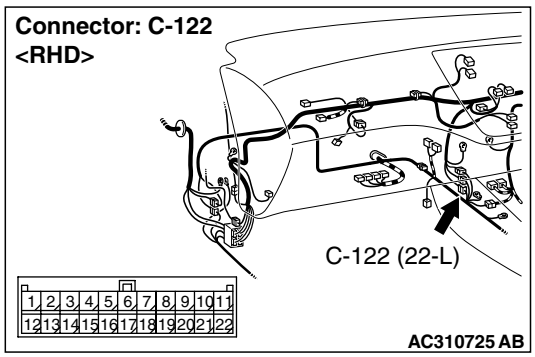
Check the earth line for open circuit.

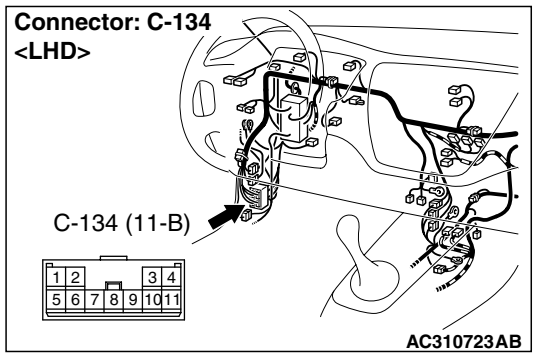
Q: Is the check result normal?
YES : Go to Step 6.
NO : Repair the wiring harness.

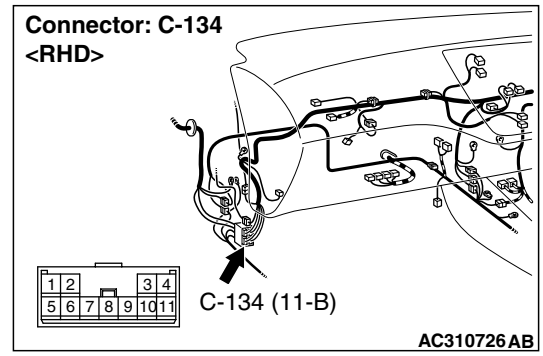
STEP 6. Connectors check: C-25 4WD-ECU connector, C-122, C-134 and F-21 intermediate connectors, and F-22 direction valve (LH) connector

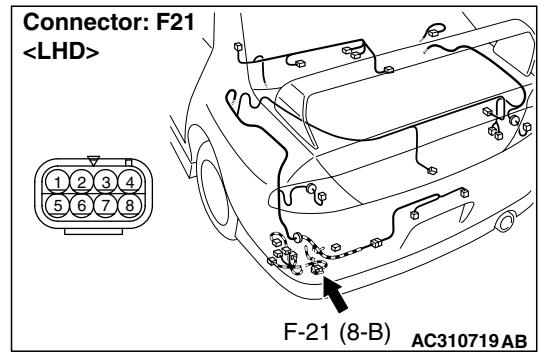


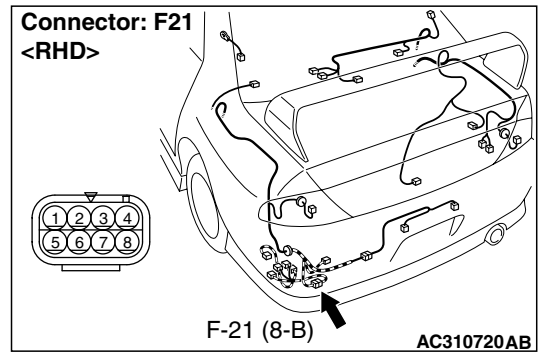


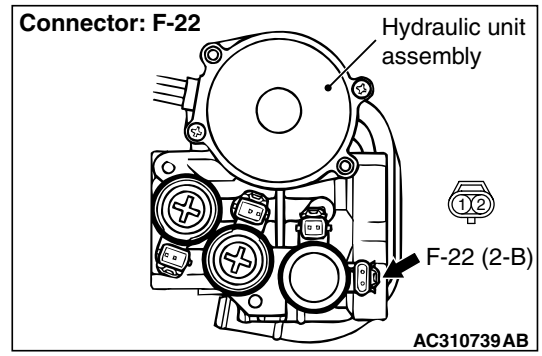








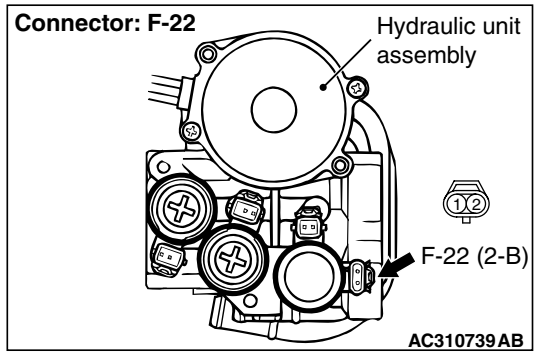


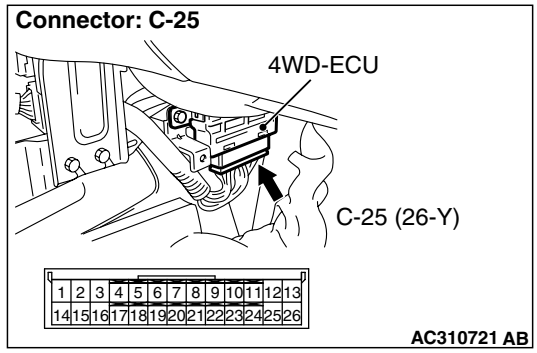


Check for the contact with terminals.

Q: Is the check result normal?
YES : Go to Step 7.
NO : Repair the defective connector.

STEP 7. Check the harness between direction valve (LH) connector F-22 terminal No.2 and 4WD-ECU connector C-25 terminal No.15.





Check the output line for short-circuited or open circuit.

Q: Is the check result normal?
YES : Replace the 4WD-ECU.
NO : Repair the wiring harness.

SYMPTOM CHART

M1272004200027

Trouble symptom	Inspection procedure No.	Reference page
Communication with the MUT-II/III is not possible	1	Refer to GROUP 22A, Troubleshooting–Symptom chart P.22A-117.
Communication between the MUT-II/III and 4WD-ECU is not possible	2	
Three ACD mode indicator lamps do not light up when the ignition key is turned to "ON" position (engine stopped).	3	
Three ACD mode indicator lamps remain lit up after the engine has started.	4	
AYC is inoperative. Unable to start or accelerate on slippery road surface.	5	P.27-25
Rear tyres are noisy during low-speed cornering. Vehicle skews.	6	P.27-25
Noise is produced from the torque transfer differential during turning.	7	P.27-26

INSPECTION PROCEDURE FOR TROUBLE SYMPTOMS

INSPECTION PROCEDURE 5: AYC is inoperative. Unable to start or accelerate on slippery road surfaces.

COMMENTS ON TROUBLE SYMPTOM
The hydraulic oil level is probably low, there is an oil leak, the hydraulic unit is defective, or the torque transfer differential is defective.

POSSIBLE CAUSES
- Low hydraulic oil level
- Oil leak
- Malfunction of the hydraulic unit
- Malfunction of the torque transfer differential

DIAGNOSIS

STEP 1.Gear oil levl check
Check the gear oil level of AYC differential part and torque transfer mechanism part (Refer to P.27-27).

Q: Is the check result normal?
YES : Go to Step 2.
NO : After checking for oil leakage, repair it and refill the gear oil (Refer to P.27-27).

STEP 2. Fluid level check
Check the fluid level (Refer to P.27-29).

Q: Is the check result normal?
YES : Go to Step 3.
NO : After checking the hydraulic pressure line for fluid leakage, repair it and refill the fluid (Refer to P.27-29).

STEP 3. AYC operation check
Check the AYC operation (Refer to P.27-30).

Q: Does a malfunction take place again?
YES : Go to Step 4.
NO : The procedure is complete.

STEP 4. Oil pump pressure test
Measure the oil pump pressure of the hydraulic unit. (Refer to P.27-31).

Q: Is the check result normal?
YES : Go to Step 6.
NO : Go to Step 5.

STEP 5. AYC bleeding
Bleed the AYC system (Refer to P.27-29).

Q: Does a malfunction take place again?
YES : Replace the hydraulic unit (Refer to P.27-51).
NO : Go to Step 6.

STEP 6. Hydraulic pressure line check
Check the hydraulic pressure line for entry of foreign matter.

Q: Is there foreign matter trapped in the hydraulic pressure line?
YES : Remove the foreign matter in the hydraulic pressure line.
NO : Replace the torque transfer differential.

INSPECTION PROCEDURE 6: Rear tyres are noisy during low-speed cornering. Vehicle skews.

COMMENTS ON TROUBLE SYMPTOM
The hydraulic unit or the torque transfer differential is probably defective.

POSSIBLE CAUSES
- Malfunction of the hydraulic unit
- Malfunction of the torque transfer differential

DIAGNOSIS

STEP 1. Fluid level check
Check the fluid level (Refer to P.27-29).

Q: Is the check result normal?
YES : Go to Step 2.
NO : After checking the hydraulic pressure line for fluid leakage, repair it and refill the fluid (Refer to P.27-29).

STEP 2. AYC operation check
Check the AYC operation (Refer to P.27-30).

Q: Does a malfunction take place again?
YES : Go to Step 3.
NO : The procedure is complete.

STEP 3. Oil pump pressure test
Measure the oil pump pressure of the hydraulic unit. (Refer to P.27-31).

Q: Is the check result normal?
YES : Go to Step 5.
NO : Go to Step 4.

STEP 4. AYC bleeding
Bleed the AYC system (Refer to P.27-29).

Q: Does a malfunction take place again?
YES : Replace the hydraulic unit (Refer to P.27-51).
NO : Go to Step 5.

STEP 5. Hydraulic pressure line check
Check the hydraulic pressure line for entry of foreign matter.

Q: Is there foreign matter trapped in the hydraulic pressure line?
YES : Remove the foreign matter in the hydraulic pressure line.
NO : Replace the torque transfer differential.

INSPECTION PROCEDURE 7: Noise is produced from the torque transfer differential during turning

COMMENTS ON TROUBLE SYMPTOM
The torque transfer differential is probably defective.

POSSIBLE CAUSES
- Malfunction of the torque transfer differential

DIAGNOSIS

STEP 1. MUT-II/III actuator test
(1) Replace the torque transfer gear oil (Refer to P.27-27).
(2) Set MUT-II/III to actuator test mode, and drive the vehicle in straight with the speed 20 km/h or less and with the steering wheel on neutral position.
(3) Test the following items for 5 times respectively.
- Item 06: Clutch operation (left)
- Item 07: Clutch operation (right)

OK: Noise is not produced.

Q: Is the check result normal?
YES : The procedure is complete and replace the torque transfer gear oil (Refer to P.27-27).
NO : Go to Step 2.

STEP 2. MUT-II/III actuator test
Test again the following items for 5 times respectively with the same condition described in STEP 2.
- Item 06: Clutch operation (left)
- Item 07: Clutch operation (right)

OK: Noise is not produced.

Q: Is the check result normal?
YES : The procedure is complete and replace the torque transfer gear oil (Refer to P.27-27).
NO : Replace the torque transfer differential.

DATA LIST REFERENCE TABLE
M1272004300024
Refer to GROUP 22A, Data list reference table P.22A-141.

ACTUATOR TEST REFERENCE TABLE
M1272005200020
Refer to GROUP 22A, Actuator test reference table P.22A-143.

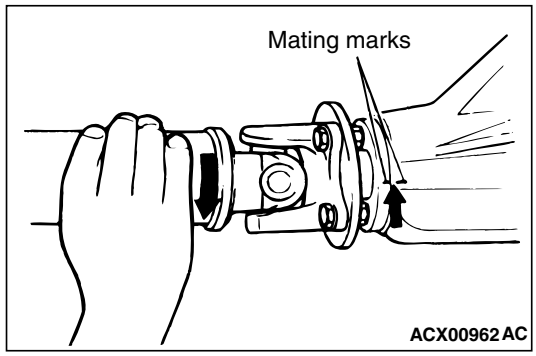
CHECK AT 4WD-ECU TERMINAL
M1272004500028
Refer to GROUP 22A, Check at 4WD-ECU terminal P.22A-144.

ON-VEHICLE SERVICE

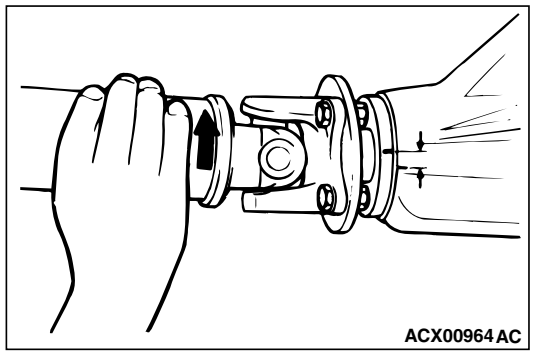
REAR AXLE TOTAL BACKLASH CHECK

M1271001200252

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 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.

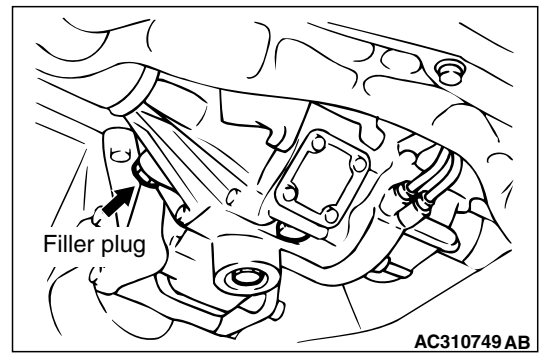
   Limit: 6 mm

5. If the backlash exceeds the limit value, replace the differential carrier assembly.

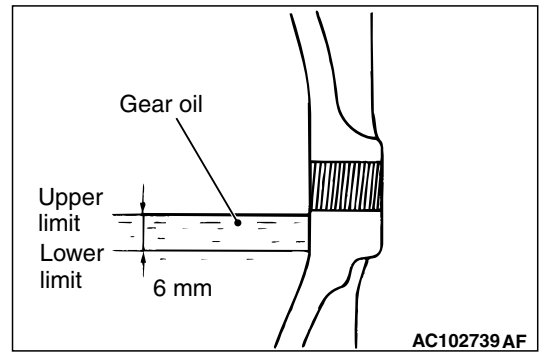
GEAR OIL LEVEL CHECK

M1272001200244

Differential part



1. Remove the filler plug.



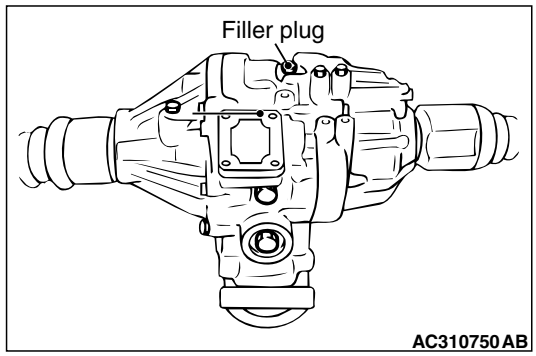
2. Check that the gear oil level is within the specified range from the bottom end of the filler plug hole.
3. If the gear oil level exceeds the standard value, add the specified gear oil up to the bottom end of the filler plug hole.

   Specified gear oil:
   Hypoid gear oil API classification GL-5 or higher
   Above 10°C: SAE 90
   Below 10°C: SAE 80W

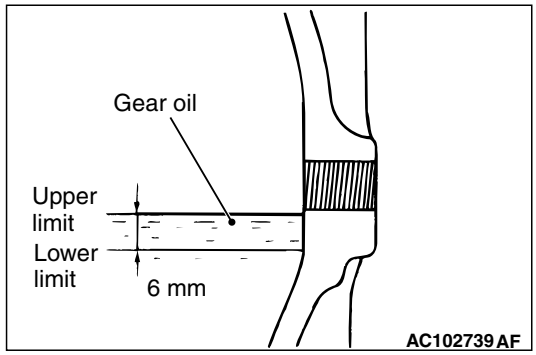
4. Fit the filler plug and tighten it to the specified torque.

   Tightening torque: 49 ± 9 N·m

Torque transfer mechanism part



1. Remove the filler plug.



2. Check that the gear oil level is within the specified range from the bottom end of the filler plug hole.
3. If the gear oil level exceeds the standard value, add the specified gear oil up to the bottom end of the filler plug hole.

   Specified gear oil: ATF-SP III

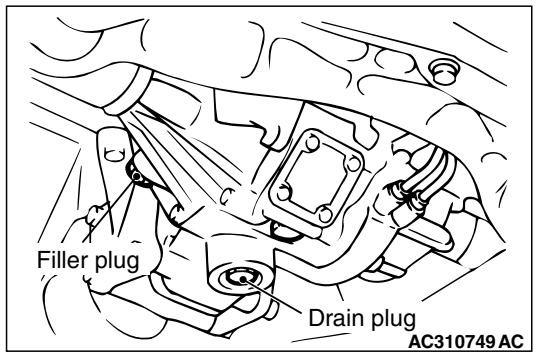
4. Fit the filler plug and tighten it to the specified torque.

   Tightening torque: 49 ± 9 N·m

GEAR OIL REPLACEMENT

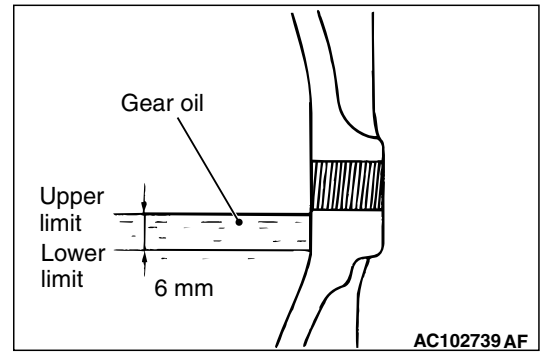
M1272004600025

Differential part



1. Remove the drain plug to discharge the gear oil.
2. Fit the drain plug and tighten it to the specified torque.

   Tightening torque: 49 ± 9 N·m



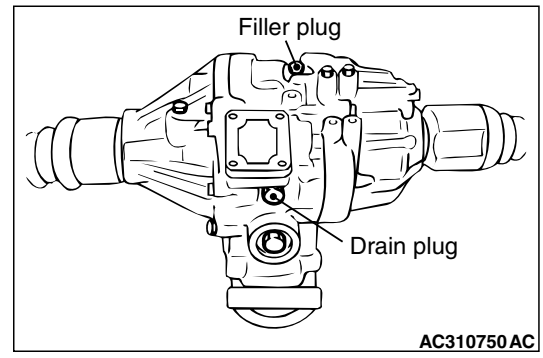
3. Remove the filler plug and add the specified gear oil up to the bottom end of the filler plug hole.

   Specified gear oil:
   Hypoid gear oil API classification GL-5 or higher
   Above 10°C: SAE 90
   Below 10°C: SAE 80W
   Amount to use: 0.55 ± 0.02 L

4. Fit the filler plug and tighten it to the specified torque.

   Tightening torque: 49 ± 9 N·m

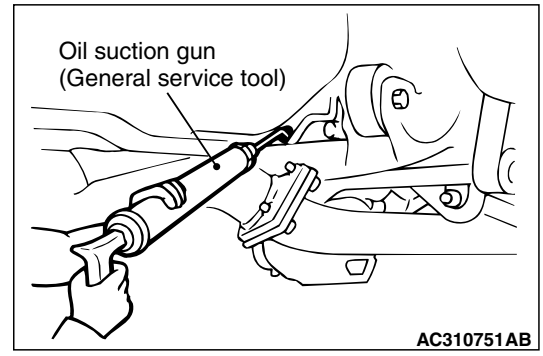
Torque transfer mechanism part



1. Remove the drain plug to discharge the gear oil.
2. Fit the drain plug and tighten it to the specified torque.

   Tightening torque: 49 ± 9 N·m

3. Remove the filler plug.



4. Using the oil suction gun (general service tool), between the body and differential support arm, apply the specified gear oil up to the under of the filler plug hall.

   Amount to use: 0.55 – 0.6 L
   Specified gear oil: ATF-SP III

5. Fit the filler plug and tighten it to the specified torque.

   Tightening torque: 49 ± 9 N·m

FLUID LEVEL CHECK

M1272004700022

1. Remove the maintenance lid located in the luggage compartment.
2. <Not using MUT-II/III>

   If the vehicle has been run, leave it for 90 min. or more in an ordinary temperature (10°C – 30°C) to allow the accumulator internal pressure to drop.

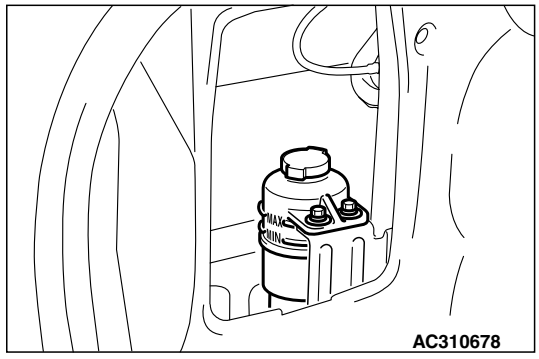
   NOTE: If the ambient temperature is 10°C or less, allow more time to leave the vehicle to stand idle.

3. <Using MUT-II/III>

⚠ CAUTION
Turn the ignition switch to the "LOCK (OFF)" position before connecting or disconnecting the MUT-II/III.

4. Set MUT-II/III to 16 pin diagnostic connector. Turn the ignition switch to the "ON" position, operate MUT-II/III to drive (item 03: directional valve) forcibly, release the pressure in the accumulator.

   NOTE:
   - *To drive (oil level check mode) forcibly, turn the directional valve of the hydraulic unit 20 turns from side to side, release the differential automatically. Drive can also be cleared forcibly using the clear key of MUT-II/III.*
   - *If the function has been stopped by fail safe, the hydraulic unit cannot be cleared forcibly.*



5. Check that the fluid level in the oil reservoir is in the range between MAX and MIN.
6. If the fluid level is lower than MIN, add the specified fluid.

   Specified fluid: ATF-SP III

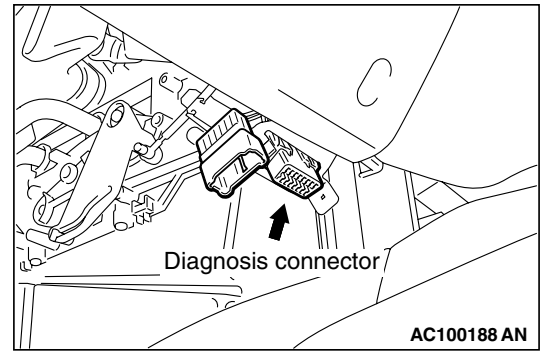
7. Reinstall the maintenance lid.

AYC BLEEDING

M1272004800029

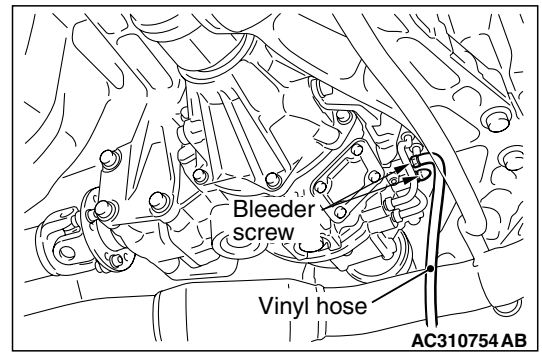
1. Lift up the vehicle.

⚠ CAUTION
Turn the ignition switch to the "LOCK (OFF)" position before connecting or disconnecting the MUT-II/III.



2. Set the MUT-II/III to the 16-pin diagnosis connector.
3. Turn the ignition switch to the "ON" position.
4. Set the steering wheel in the straight-ahead position.
5. Operating the MUT-II/III, drive the hydraulic unit (item No.02) forcibly.

   NOTE:
   - *Drive the bleeding mode forcibly for 5 minutes, release the operation automatically. Drive can also be cleared forcibly using the Clear key of MUT-II/III.*
   - *If the function has been stopped by fail safe, the hydraulic unit cannot be cleared forcibly.*



6. Remove the cap of the left bleeder screw on the torque transfer differential and connect a vinyl hose.
7. Gradually turn the steering wheel clockwise from the straight-ahead position. At this time, loosen the left bleeder screw and check that fluid is discharged with air.

⚠ CAUTION
While the system is being bled of air, add fluid as necessary to ensure that it is left in the oil reservoir during the entire procedure.

8. After air has been completely discharged, tighten bleeder screw and turn the steering wheel in the straight-ahead position.
9. Repeat steps 6 and 7 two to three times until no air bubbles are recognized in the fluid that comes out. Then, tighten the bleeder screw to the specified torque.

   Tightening torque: 9 ± 1 N·m

10. Perform steps 5 through 8 for the right bleeder screw. Note, however, that the steering wheel should be turned counterclockwise.
11. When removing the hydraulic unit, bleed the fluid line in ACD side (Refer to GROUP 22A - On-vehicle Service P.22A-151).

⚠ CAUTION
If the system is not completely bled of air, the hydraulic unit could generate noise, degrading pump durability.

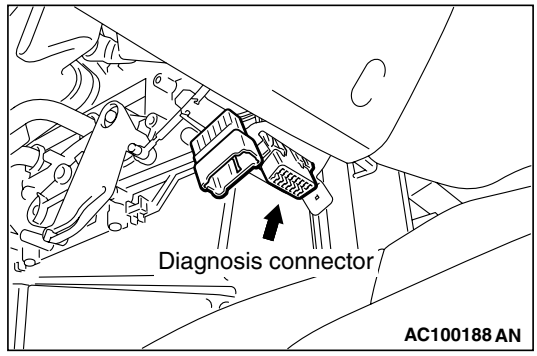
12. After the system has been completely bled of air, check for the fluid level (Refer to P.27-29).

AYC OPERATION CHECK

M1272004900026

1. Lift up the vehicles.

⚠ CAUTION
Turn the ignition switch to the "LOCK (OFF)" position before connecting or disconnecting the MUT-II/III.



2. Set the MUT-II/III to the 16-pin diagnosis connector.
3. Start the engine.
4. Set the gear to the 2nd gear or above, operate MUT-II/III, and check from the service data (Item No.09) that the wheel speed is within 10 km/h to 20 km/h.

   NOTE:
   - *Set the steering wheel to the neutral position.*
   - *When turning the steering wheel, AYC operates continually (operation sound from the torque transfer differential), but it is not system fault. In this case, set the steering wheel to the neutral position, and perform the following operations in order to stop the ACD.*
     - *Release the clutch.*
     - *Set the gear to "Neutral".*
     - *Stop the engine.*
5. Operate the MUT-II/III, drive the torque transfer differential (item No.06 and 07) forcibly.

   NOTE:
   - *Drive the clutch operating mode forcibly for 1 minute, release the operation automatically. Drive can also be cleared forcibly using the Clear key of MUT-II/III.*
   - *If the hydraulic unit function has been stopped by fail-safe, the torque transfer differential cannot be forcibly driven.*
6. Operating the MUT-II/III, by service data (item no.07 and 08), check the condition of the wheel speed below.

<Driving item No.06 forcibly>
The left rear wheel is faster 2km/h than right rear wheel.
<Driving item No.07 forcibly>
The right rear wheel is faster 2km/h than left rear wheel.

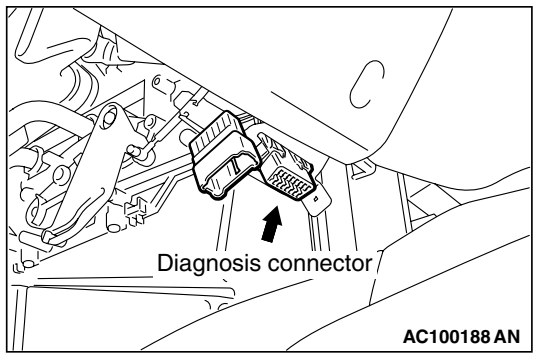
NOTE: If the above are not satisfied, check the oil pressure as the system may be faulty.

OIL PRESSURE CHECK

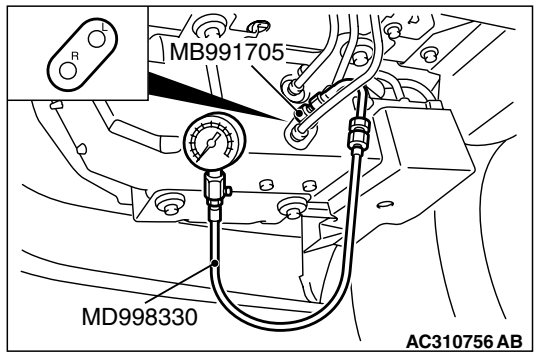
M1272005000026

1. Lift up the vehicles.

⚠ CAUTION
Turn the ignition switch to the "LOCK (OFF)" position before connecting or disconnecting the MUT-II/III.



2. Set the MUT-II/III to the 16-pin diagnosis connector.
3. Turn the ignition switch to "ON" position.



4. Disconnect the hydraulic unit and the hydraulic unit hose assembly, connect the special tool to L port, put the lid to R port or connect the hydraulic unit hose assembly disconnected from L port to R port.
   - Oil pressure gauge (MD998330)
   - Hose adaptor (MB991705)
5. Operating the MUT-II/III, drive the hydraulic unit forcibly (item No.02).

   NOTE:
   1. *Drive the operation check mode of the clutch left side for 1 minute, release the operation automatically. Drive can also be cleared forcibly using the Clear key of MUT-II/III.*
   2. *If the function has been stopped by fail safe, the hydraulic unit cannot be cleared forcibly.*

⚠ CAUTION
While the oil pressure is checked, add fluid as necessary to ensure that it is left in the oil reservoir during the entire procedure.

6. Check that the generated oil pressure of the hydraulic unit satisfies the standard value.

   Standard value: 0.9 – 1.1 MPa
7. Check the oil pressure of the clutch right side following step 4 through 6. Connect the special tool to R port, put the lid to L port or hydraulic unit hose assembly disconnected from R port to L port, use the MUT-II/III drive item No.07 (operation check mode of clutch right side) forcibly.
8. If the measured value exceeds the standard value, replace the hydraulic unit.
9. Connect the hydraulic unit and the hydraulic unit hose assembly, and connect the torque transfer differential and hydraulic unit hose assembly, tighten the flare nut in specified torque.

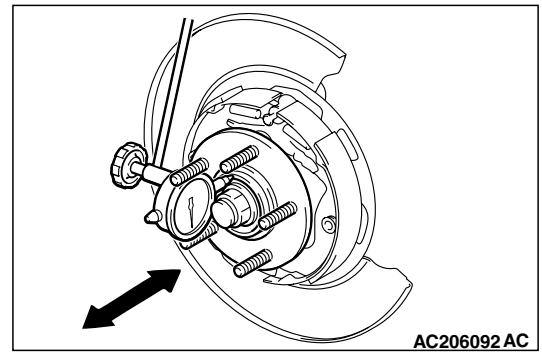
   Tightening torque:
   34 ± 5 N·m (Thread is not lubricated)
   26 ± 4 N·m (Thread is lubricated)
10. Supply the specified fluid up to the MAX level of the oil reservoir, and bleed.

    Specified fluid: ATF-SP III
    Amount to use: 1 L

WHEEL BEARING AXIAL PLAY CHECK

M1271000900515

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

3. If the play exceeds the limit, the drive shaft nut should be tightened to the specified torque and check the axial play again.

   Tightening torque: 225 ± 25 N·m

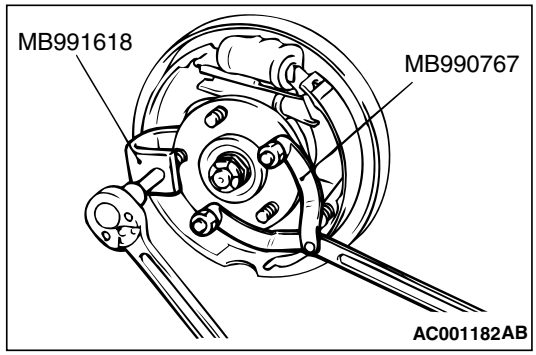
4. Replace the rear hub assembly if adjustment cannot be made to within the limit.
5. Install the brake disc and caliper assembly, and tighten the caliper assembly mounting bolts to the specified torque.

   Tightening torque: 54 ± 5 N·m

HUB BOLT REPLACEMENT

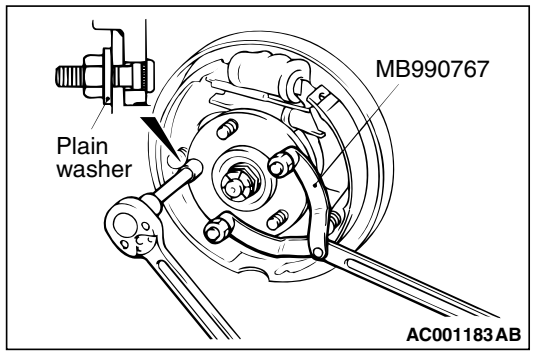
M1271001000195

1. Remove the brake caliper and brake disc.



2. Use the following special tools to remove the hub bolts.
   - End yoke holder (MB990767)
   - Hub bolt remover (MB991618)

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



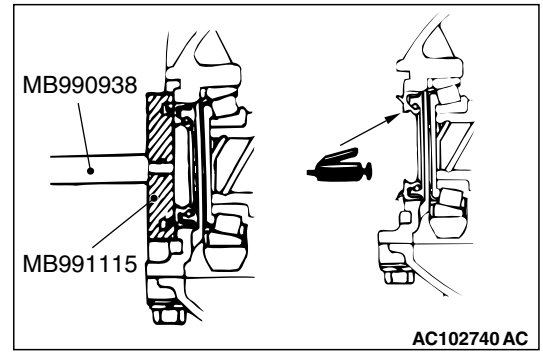
3. Install the plain washer to the new hub bolt, and install the bolt with a nut.

DIFFERENTIAL CARRIER OIL SEAL REPLACEMENT

M1272001300133

Differential part

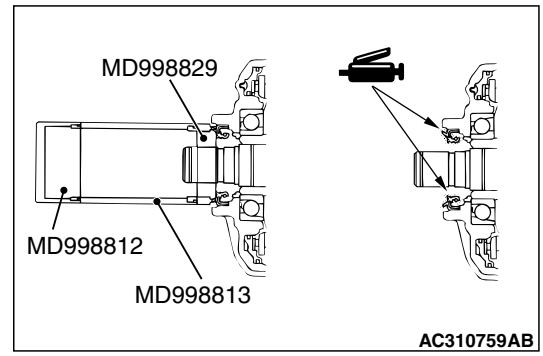
1. Remove the drive shaft from the differential carrier. (Refer to P.27-38).
2. Remove the differential carrier oil seal.



3. Use the following special tools to press-fit a new oil seal.
   - Installer bar (MB990938)
   - Oil seal installer (MB991115)
4. Apply multi-purpose grease to the oil seal lip and drive shaft oil seal seating area.
5. Replace the drive shaft circlip with a new one, and install the drive shaft to the differential carrier. (Refer to P.27-38).

Torque transfer mechanism part

1. Remove the drive shaft from the differential carrier. (Refer to P.27-38).
2. Remove the differential carrier oil seal.



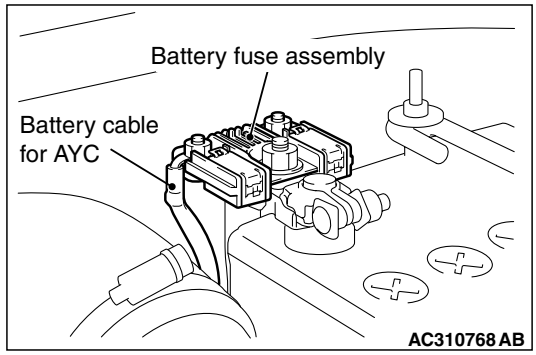
3. Use the following special tools to press-fit a new oil seal.
   - Installer cap (MD998812)
   - Installer 100 (MD998813)
   - Installer adaptor (MD998829)
4. Apply specified grease to the oil seal lip and drive shaft oil seal seating area.

   Specified grease: Vaseline

5. Replace the drive shaft circlip with a new one, and install the drive shaft to the differential carrier. (Refer to P.27-38).

REMEDY FOR A DISCHARGED BATTERY

M1272005100023



When the engine is started using a booster cable where the battery has completely run down and you attempt to start the vehicle without waiting for the battery to recover a certain charge, the engine can misfire and you just cannot start to move it. In such cases, charge the battery sufficiently; or, remove the AYC battery cable from the battery fuse assembly to make AYC inactive before attempting to start the vehicles. When the battery cable is removed, the ACD mode indicator lamp lights up. After the battery has been recharged, fit the battery cable back again and start the engine to ensure that the ACD mode indicator lamp is off.

REAR AXLE HUB ASSEMBLY

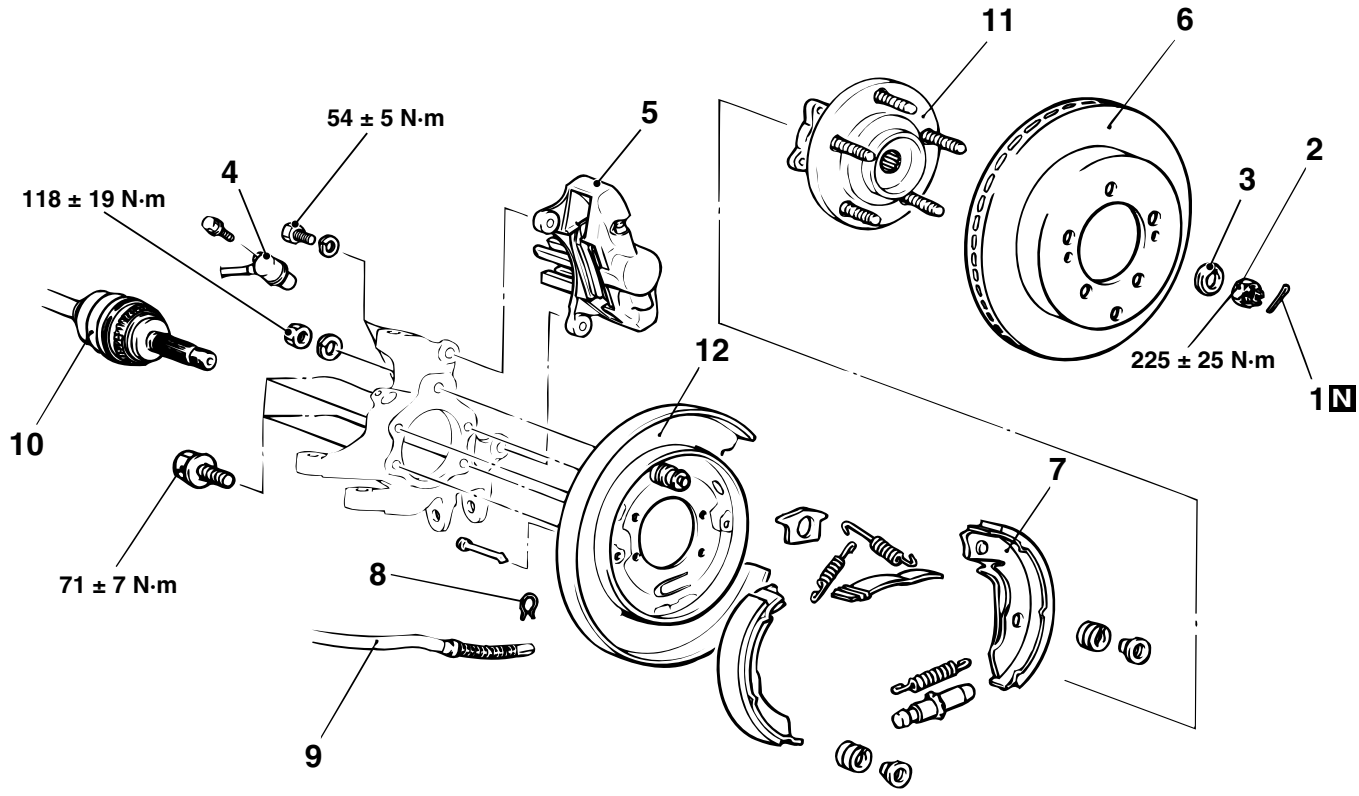
REMOVAL AND INSTALLATION

M1271002000466

⚠ CAUTION

- **Do not strike the ABS rotors installed to the EBJ outer race of drive shaft against other parts when removing or installing the drive shaft. 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.**

Pre-installation Operation	Post-installation Operation
• Gear Oil Draining (Refer to P.27-27).	• Gear Oil Filling (Refer to P.27-27). • Parking Brake Lever Stroke Adjustment (Refer to GROUP 36, On–vehicle Service – Parking Brake Lever Stroke Check P.36-3).



AC211950 AC

Removal steps

1. Split pin
<<A>> >>A<< 2. Drive shaft nut
>>A<< 3. Washer
4. Rear ABS sensor
<<B>> 5. Caliper assembly
6. Brake disc

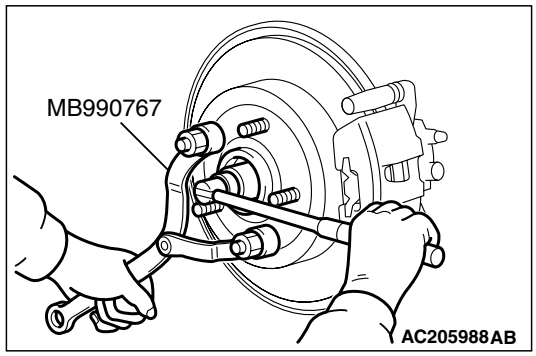
Removal steps (Continued)

7. Parking brake shoe and lining assembly (Refer to GROUP 36, Parking brake lining and drum P.36-6).
8. Clip
9. Parking brake cable connection
10. Rear drive shaft assembly
<<C>> 11. Rear wheel hub assembly
12. Backing plate

REMOVAL SERVICE POINTS

<<A>> DRIVE SHAFT NUT REMOVAL

⚠ CAUTION
Do not apply pressure to the wheel bearing by the vehicle weight to avoid possible damage when the drive shaft nut is loosened.



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

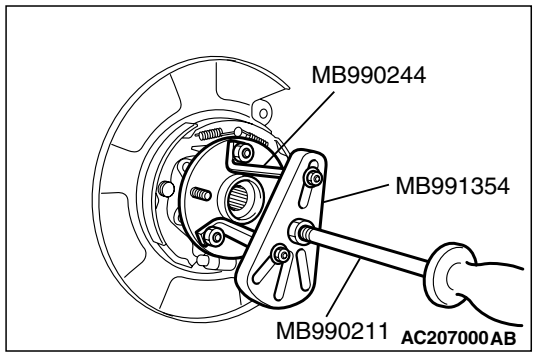
<<B>> CALIPER ASSEMBLY REMOVAL

⚠ 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.27-37).

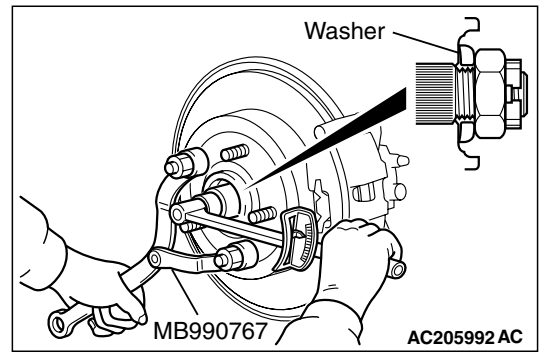


2. Use the following special tools to pull out the rear wheel hub from the knuckle.
   - Puller bar (MB990244)
   - Puller body (MB991354)
   - Slide hammer (MB990211)

INSTALLATION SERVICE POINT

>>A<< WASHER/ DRIVE SHAFT NUT INSTALLATION

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

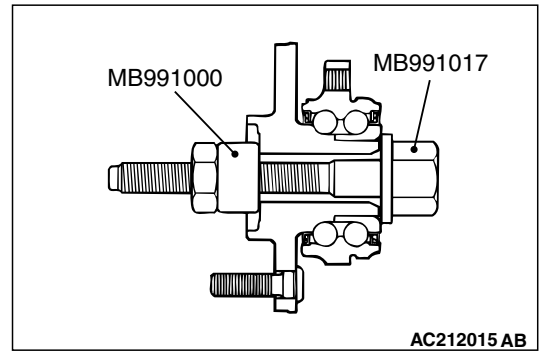


1. Be sure to install the drive shaft washer in the specified direction.
2. Using special tool end yoke holder (MB990767), tighten the drive shaft nut to the specified torque.
   Tightening torque: 225 ± 25 N·m

INSPECTION

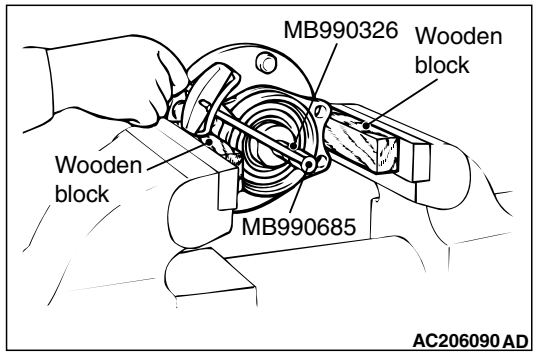
M1271002100300

WHEEL BEARING ROTATION STARTING TORQUE AND AXIAL PLAY CHECK



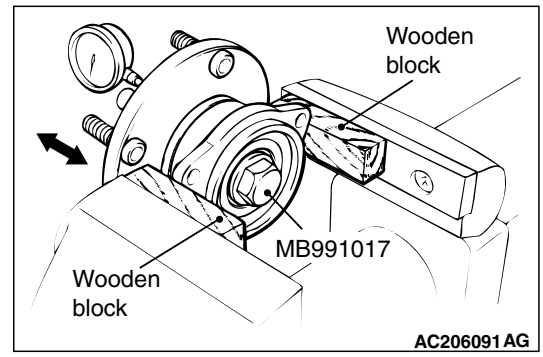
1. Tighten the following special tools to the specified torque.
   - Front hub remover and installer (MB991017)
   - Spacer (MB991000)

   Tightening torque: 225 ± 25 N·m
2. Rotate the rear hub in order to seat the bearing.



3. Hold the rear wheel hub assembly with wooden blocks.
4. Measure the wheel bearing rotation starting torque by using the following special tools.
   - Preload socket (MB990326)
   - Torque wrench (MB990685)

   Limit: 1.0 N·m
5. If the rotation starting torque is not within the limit range while the nut is tightened to 225 ± 25 N·m, replace the front wheel bearing assembly. If there are any signs of binding or tight spots when the wheel bearing turns, replace it.



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

   Limit: 0.05 mm
7. If the play is not within the limit range while the nut is tightened to 225 ± 25 N·m, replace the rear wheel hub assembly.

KNUCKLE

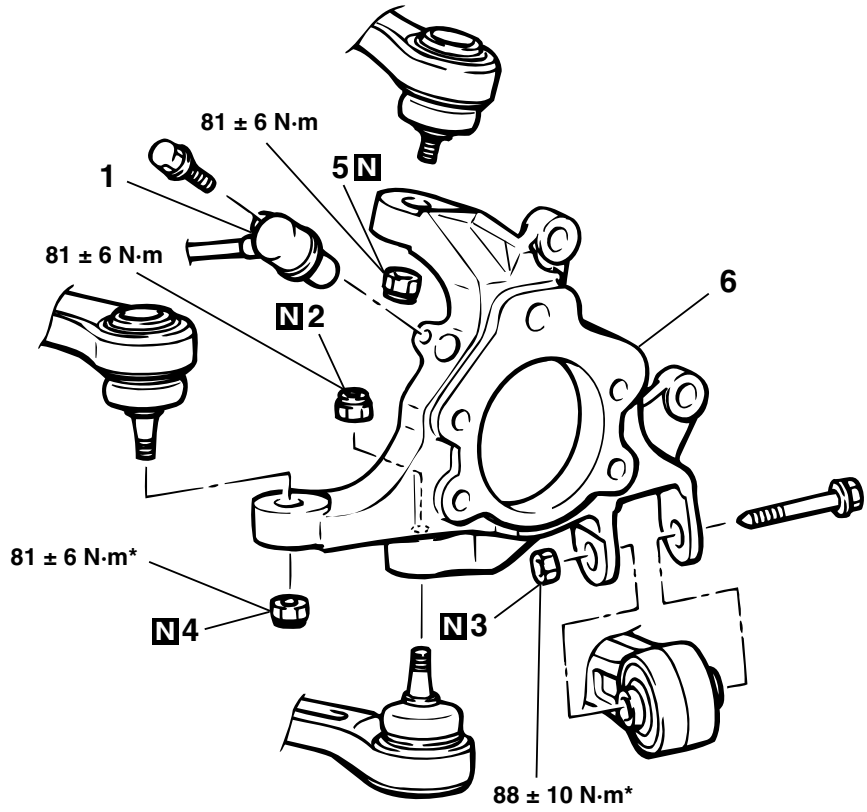
REMOVAL AND INSTALLATION

M1271003000243

⚠ 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.**

Pre-removal Operation	Post-installation Operation
• Rear Wheel Hub Assembly Removal (Refer to P.27-34).	• Check the ball joint dust cover for cracks or damage by pushing it with your finger. • Rear Wheel Hub Assembly Installation (Refer to P.27-34).



AC211951AB

Removal steps

1. Rear ABS sensor
<<A>> 2. Self-locking nut (trailing arm connection)
3. Self-locking nut (lower arm connection)

Removal steps (Continued)

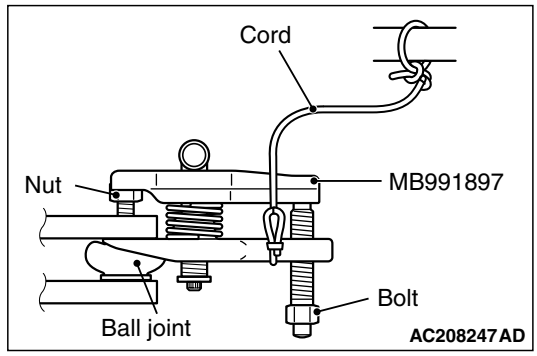
<<A>> 4. Self-locking nut (toe control arm connection)
<<A>> 5. Self-locking nut (upper arm connection)
6. Knuckle

REMOVAL SERVICE POINT

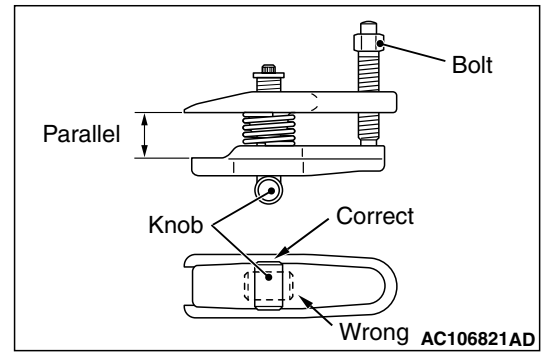
<<A>>SELF-LOCKING NUT (TRAILING ARM, TOE CONTROL ARM AND UPPER ARM CONNECTION) REMOVAL

⚠ CAUTION

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



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



2. After turning the bolt and knob to adjust the arms of special tool 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

M1271003100154

Check the knuckle for wear or cracks.

DRIVE SHAFT ASSEMBLY

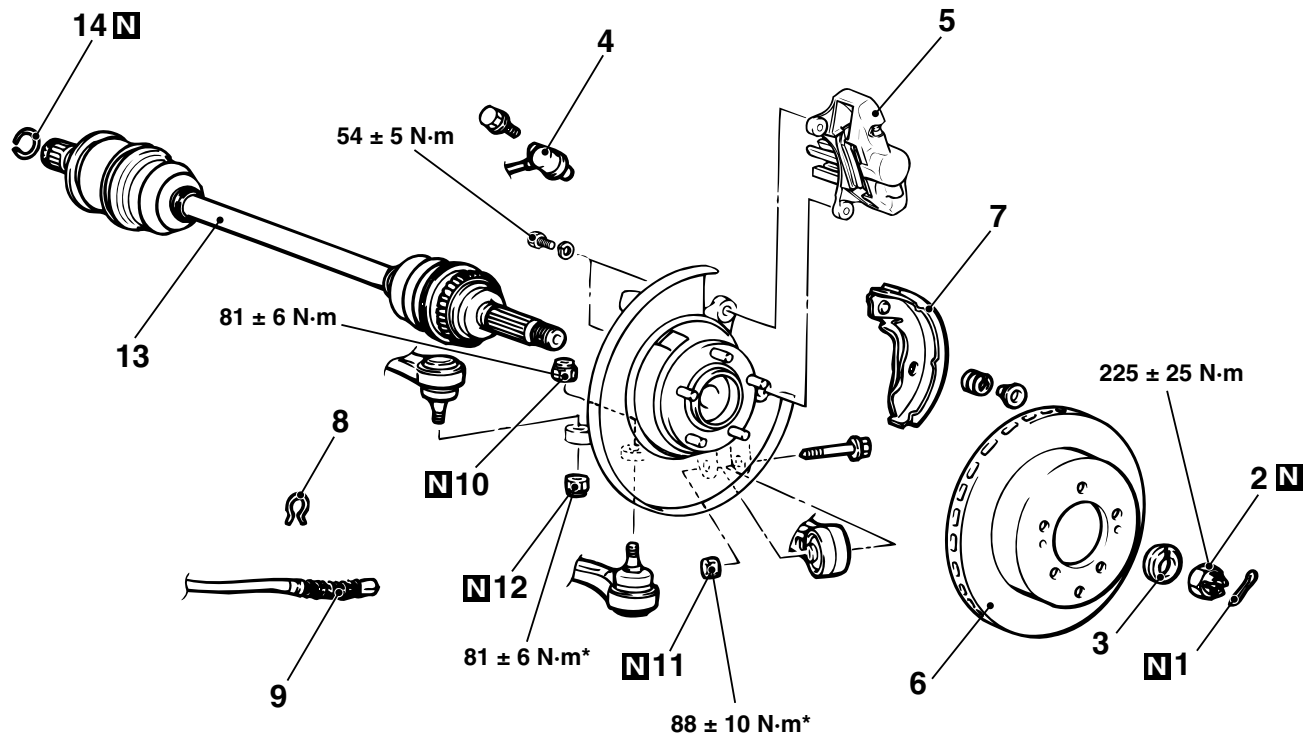
REMOVAL AND INSTALLATION

M1271003300181

⚠ CAUTION

- **Do not strike the ABS rotors installed to the EBJ outer race of drive shaft against other parts when removing or installing the drive shaft. 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	Post-installation Operation
• Gear Oil Draining (Refer to P.27-27). • Centre Exhaust Pipe Removal (Refer to GROUP15, Exhaust Pipe and Main Muffler P.15-19).	• Check the dust cover for cracks or damage by pushing it with your finger. • Centre Exhaust Pipe Installation (Refer to GROUP 15, Exhaust Pipe and Main Muffler P.15-19). • Gear Oil Filling (Refer to P.27-27). • Parking Brake Lever Stroke Adjustment (Refer to GROUP 36, On-vehicle Service – Parking Brake Lever Stroke Check and Adjustment P.36-3). • Rear Wheel Alignment Check and Adjustment (Refer to GROUP34, On-vehicle Service–Rear Wheel Alignment Check and Adjustment P.34-4).



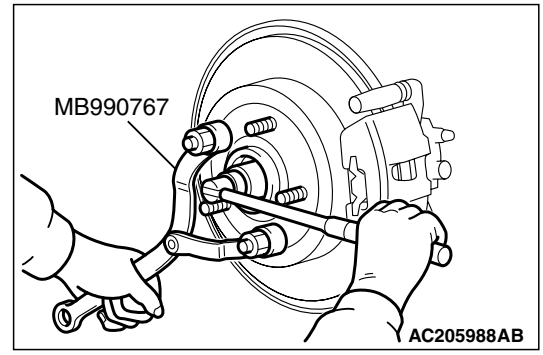
Removal steps

1. Split pin
<<A>> >>B<< 2. Drive shaft nut
>>B<< 3. Washer
4. Rear ABS sensor
<<B>> 5. Caliper assembly
6. Brake disc
7. Parking brake shoe and lining assembly (Refer to GROUP 36, Parking brake lining and drum P.36-6).
8. Clip
9. Parking brake cable connection
<<C>> 10. Self-locking nut (trailing arm connection)
<<C>> 11. Self-locking nut (lower arm connection)
<<C>> 12. Self-locking nut (toe control arm connection)
<<D>> >>A<< 13. Drive shaft
14. Circlip

REMOVAL SERVICE POINTS

<<A>> DRIVE SHAFT NUT REMOVAL

⚠ CAUTION
Do not apply pressure to wheel bearing by the vehicle weight to avoid possible damage to wheel bearing before tightening drive shaft nut fully.



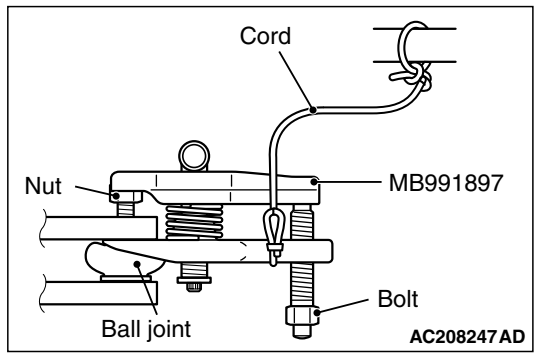
Use special tool end yoke holder (MB990767) to fix the hub and remove the drive shaft nut.

<<B>> CALIPER ASSEMBLY REMOVAL

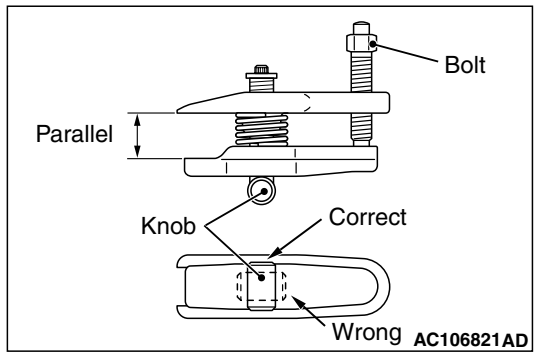
⚠ CAUTION
During maintenance, take care not to contact the parts or tools to the caliper because the paint of caliper will be scratched.
Secure the removed caliper assembly with wire, etc.

<<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 the special tool to avoid possible damage to ball joint threads.**
- **Hang the special tool with code to prevent them from falling.**



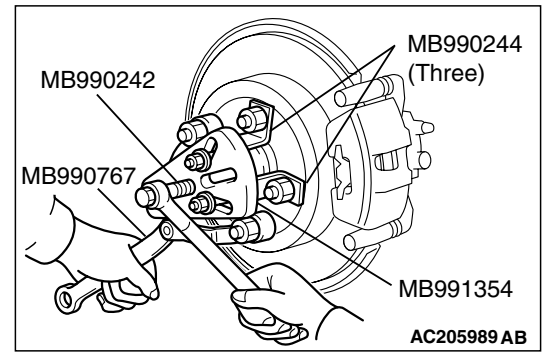
1. Install special tool ball joint remover (MB991897) as shown in the figure.



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

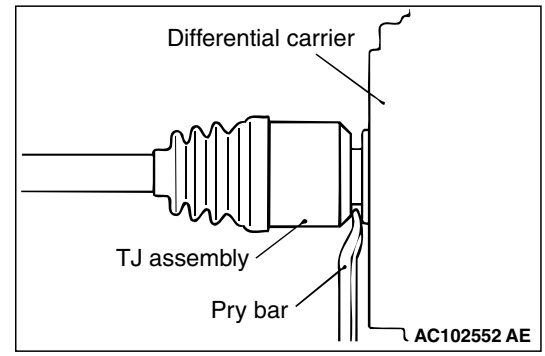
   NOTE: When adjusting the arms in parallel, turn the knob so that it is at right angles to the arms.
3. Tighten the bolt with a wrench to disconnect the ball joint and remove the self-locking nut.

<<D>> DRIVE SHAFT REMOVAL



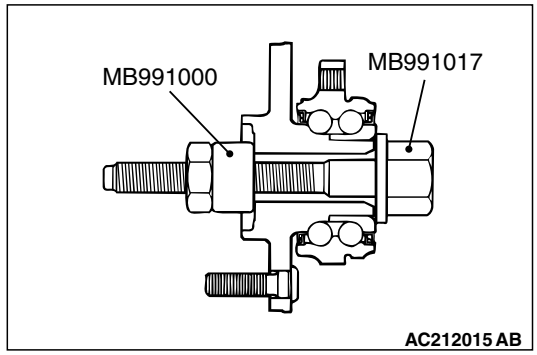
1. Use the following special tools to push out the drive shaft from the hub.
   - Puller shaft (MB990242)
   - Puller bar (MB990244)
   - Puller body (MB991354)
   - End yoke holder (MB990767)

⚠ CAUTION
- **Do not pull on the drive shaft. Doing so will damage the TJ. Be sure to use the pry bar.**
- **When pulling the drive shaft out from the differential carrier, be careful that the spline part of the drive shaft does not damage the oil seal.**



2. Remove the drive shaft 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 drive shaft is removed. If, however, vehicle weight must be applied to the bearing in moving the vehicle, temporarily secure the wheel bearing by using the following special tools.

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

INSTALLATION SERVICE POINTS

>>A<< DRIVE SHAFT INSTALLATION

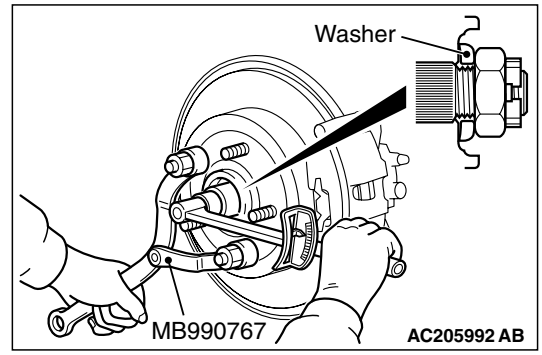
⚠ CAUTION

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

>>B<< WASHER/DRIVE SHAFT NUT INSTALLATION

⚠ CAUTION

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



1. Assemble the drive shaft washer in the illustrated direction.
2. Tighten the drive shaft nut to the specified torque with special tool end yoke holder (MB990767).

Tightening torque: 225 ± 25 N·m

INSPECTION

M1271003400081

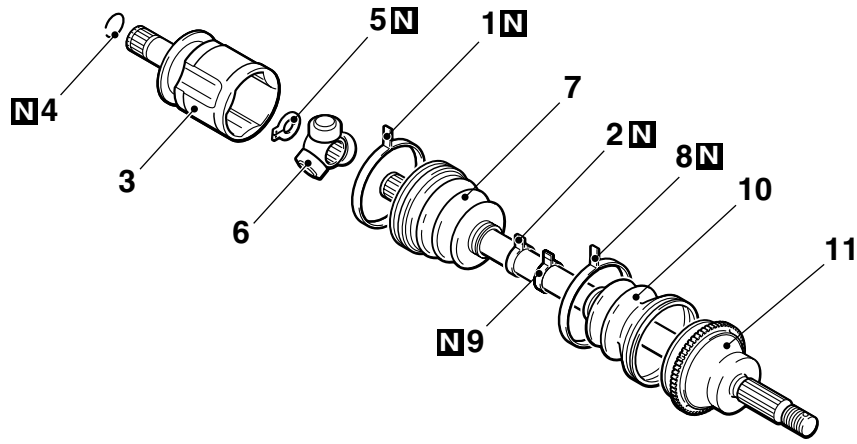
- Check the drive shaft for damage, bending or corrosion.
- Check the drive shaft spline part for wear or damage.
- Check the boots for deterioration, damage or cracking.
- Check the dust cover for damage or deterioration.

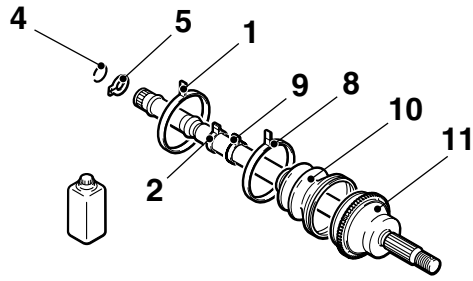
DISASSEMBLY AND REASSEMBLY

M1271003500204

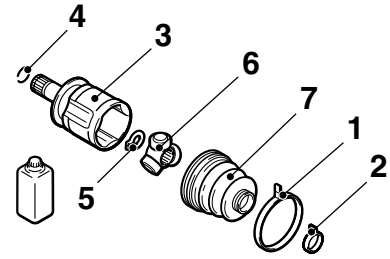
⚠ CAUTION

- **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.**

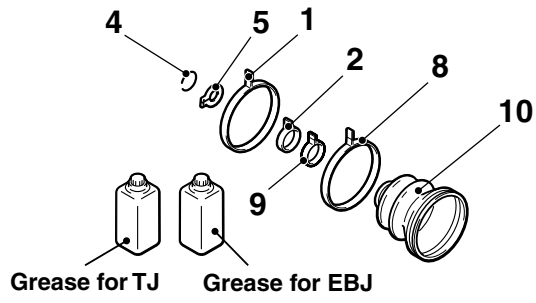




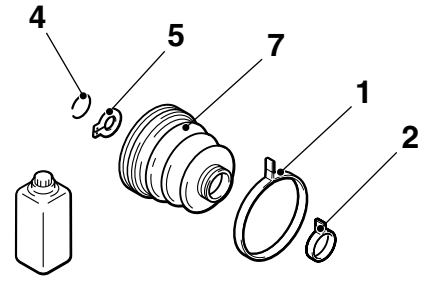
EBJ repair kit



TJ repair kit



EBJ boot repair kit



TJ boot repair kit

AC201162 AC

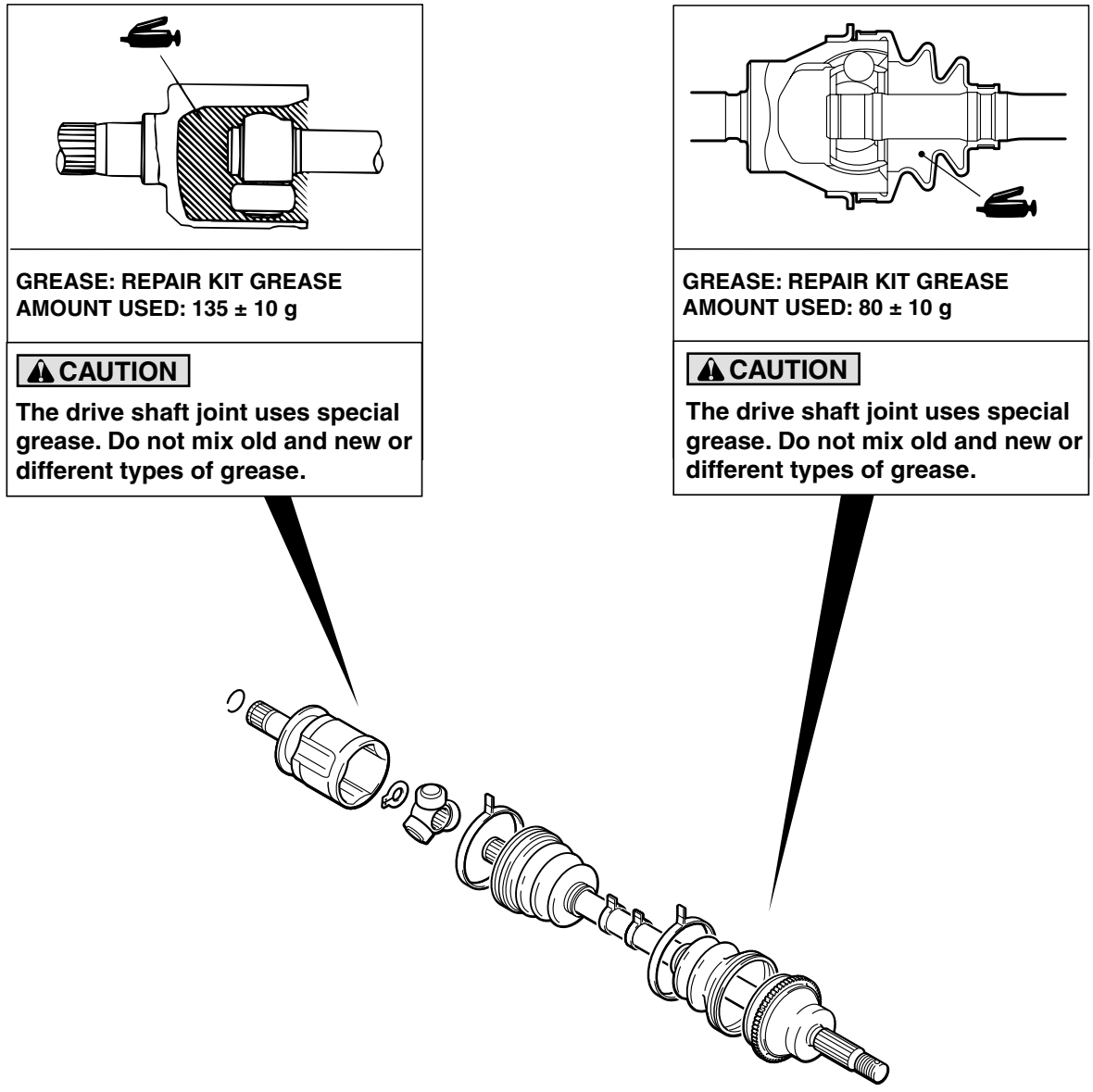
Disassembly steps

>>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 (Continued)

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

LUIBRICATION POINTS



AC103560 AE

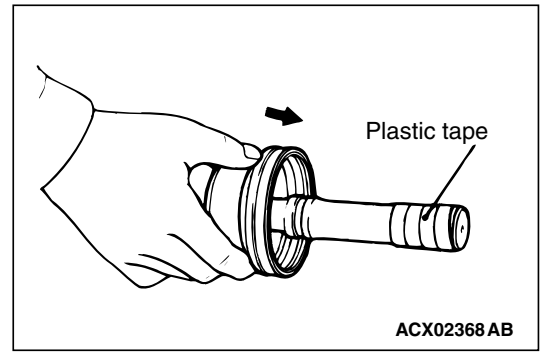
DISASSEMBLY SERVICE POINTS

<<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.

<<B>> 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 drive shaft so that TJ and EBJ boots are not damaged when they are removed.

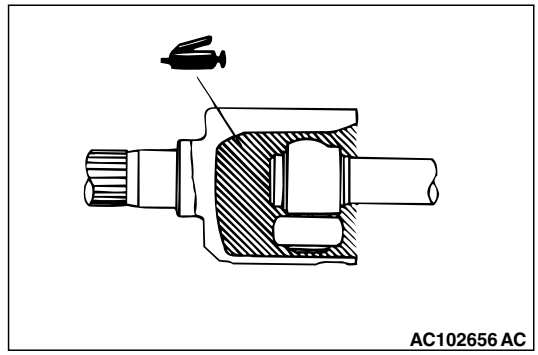
REASSEMBLY SERVICE POINTS

>>A<< EBJ BOOT/TJ BOOT INSTALLATION

Wrap plastic tape around the spline part on the TJ side of the drive shaft, 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 special grease is used in the joint.

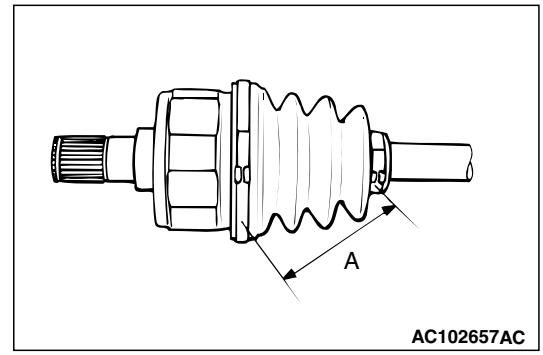

AC102656 AC

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

Specified grease: Repair kit grease
Amount to use: 135 ± 10 g

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



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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.

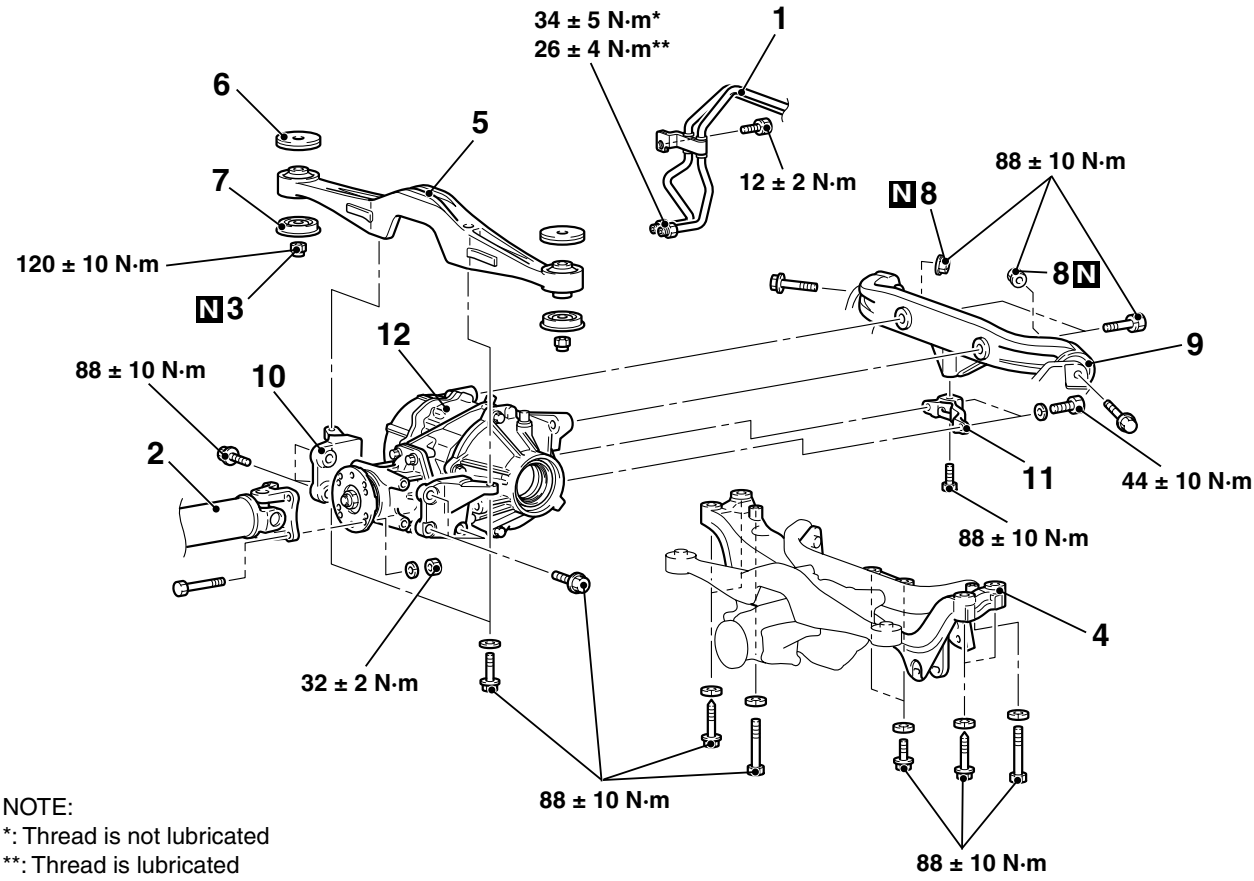
Standard value (A): 90 ± 3 mm

DIFFERENTIAL CARRIER ASSEMBLY

REMOVAL AND INSTALLATION

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Pre-removal Operation	Post-installation Operation
• Hydraulic Piping Fluid Draining • Differential Gear Oil Draining (Refer to P.27-28). • Lower Arm Assembly Removal (Refer to GROUP 34, Lower Arm Assembly and Assist Link –P.34-13). • Rear Stabilizer Bar Removal (Refer to GROUP 34, Stabilizer Bar P.34-21). • Drive Shaft Removal (Refer to P.27-38).	• Drive Shaft Installation (Refer to P.27-38). • Rear Stabilizer Bar Installation (Refer to GROUP 34, Stabilizer Bar P.34-21). • Lower Arm Assembly Installation (Refer to GROUP 34, Lower Arm Assembly and Assist Link –P.34-13). • Differential Gear Oil Filling (Refer to P.27-28). • Hydraulic Piping Fluid Filling (Refer to P.27-28). • Hydraulic Piping Bleeding (Refer to P.27-29).



NOTE:
*: Thread is not lubricated
**: Thread is lubricated

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Removal steps

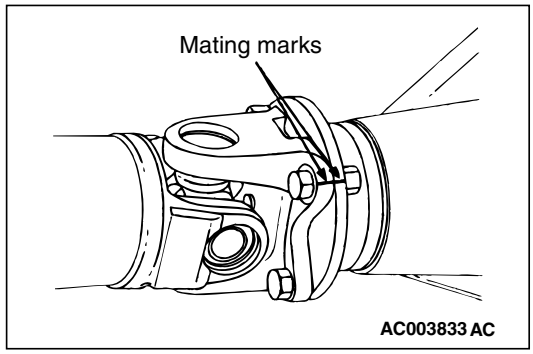
1. Hydraulic unit hose assembly connection
<<A>> >>C<< 2. Propeller shaft connection (Refer to GROUP 25, Propeller shaft P.25-3).
3. Differential support member mounting nut
<<B>> >>B<< 4. Rear crossmember and differential carrier assembly
5. Differential support member

Removal steps (Continued)

>>A<< 6. Upper stopper
>>A<< 7. Lower stopper
8. Differential support arm mounting nut
9. Differential support arm
10. Differential mount bracket
11. Differential mount bracket
12. Differential carrier assembly

REMOVAL SERVICE POINTS

<<A>> PROPELLER SHAFT DISCONNECTION



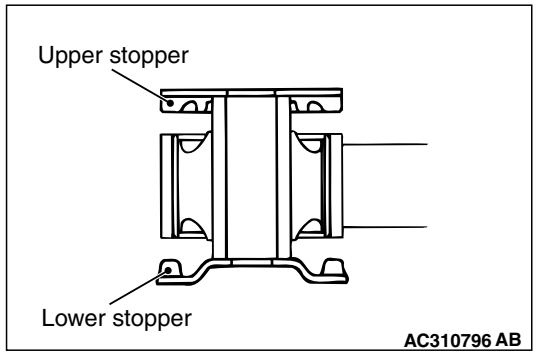
1. Make mating marks on the differential companion flange and the propeller shaft assembly.
2. Suspend the removed propeller shaft from the body with a wire to prevent bending.

<<B>> 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.

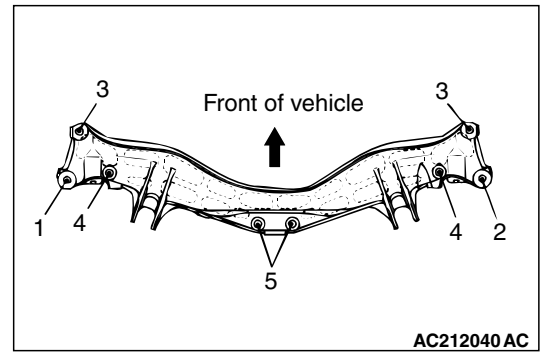
INSTALLATION SERVICE POINTS

>>A<< LOWER STOPPER/UPPER STOPPER INSTALLATION



Install the lower and upper stopper as shown in the illustration.

>>B<< 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
1, 2, 3	Flange bolt (with washer)	12 × 105
4	Bolt (with spring washer and washer)	12 × 152
5	Flange bolt (with washer)	12 × 70

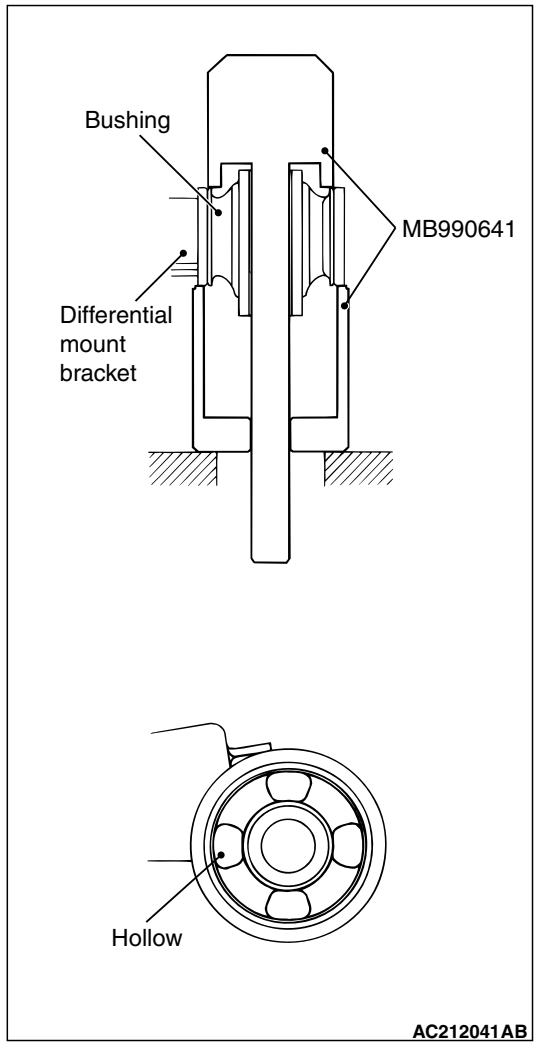
>>C<< PROPELLER SHAFT INSTALLATION

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

DIFFERENTIAL SUPPORT MEMBER BUSHING REPLACEMENT

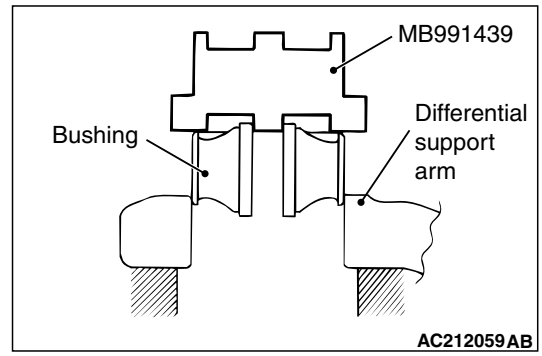
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<DIFFERENTIAL MOUNT BRACKET>

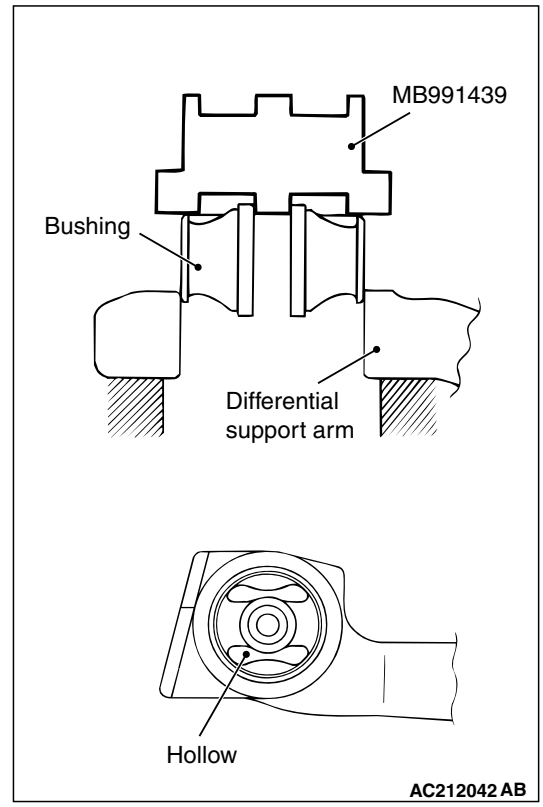


1. Use special tool lower arm bush (A) remover and installer (MB990641) to remove or install the bushing.
2. Press-fit the bushing with its hollow portion facing in the direction shown.
3. Press-fit the bushing until the bushing outer case end face is flush with the differential mount bracket.

<DIFFERENTIAL SUPPORT ARM>



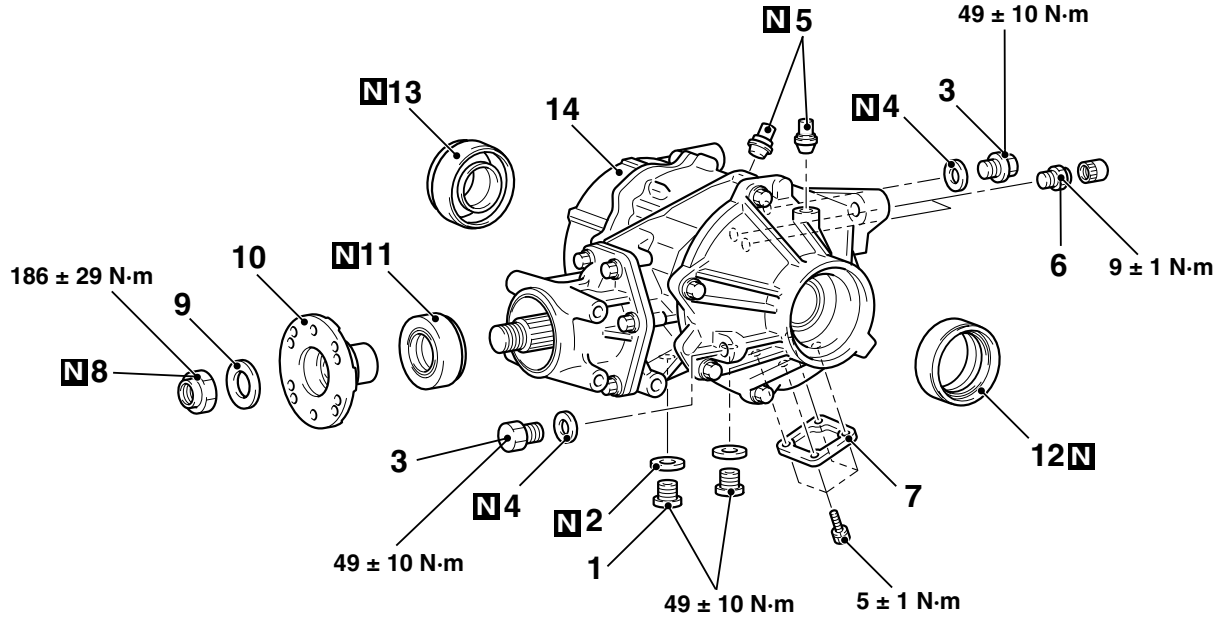
1. Use special tool bush remover and installer (MB991439) to remove the bushing.



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 AND REASSEMBLY

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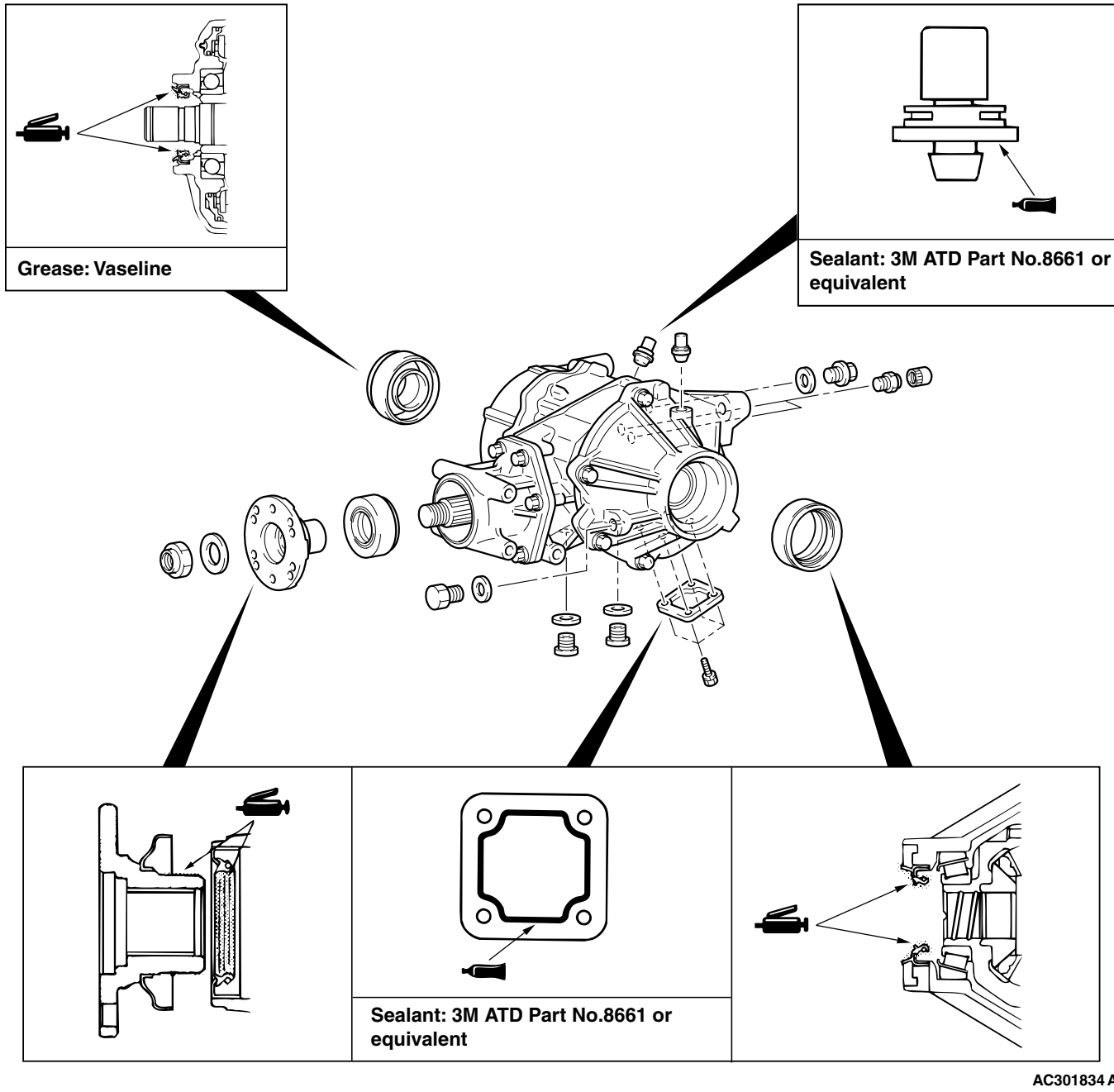
Disassembly steps

1. Drain plug
2. Packing
3. Filler plug
4. Gasket
5. Vent plug
6. Bleeder screw
7. Cover

Disassembly steps (Continued)

<<A>> >>C<< 8. Self-locking nut
9. Washer
10. Companion flange
11. Oil seal
>>B<< 12. Oil seal
>>A<< 13. Oil seal
14. Differential carrier assembly

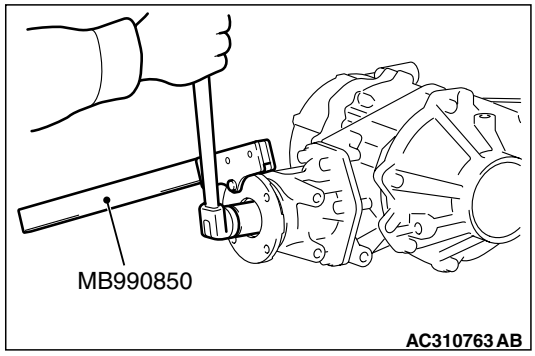
Lubrication and Adhesive Points



DISASSEMBLY SERVICE POINTS

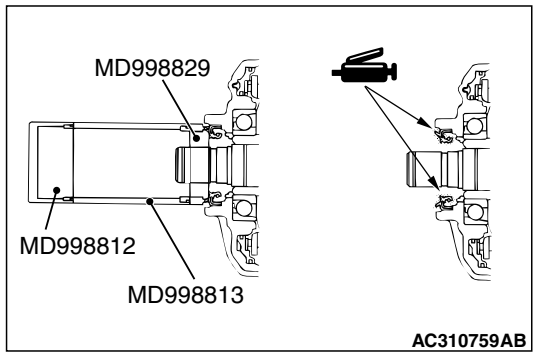
<<A>> SELF-LOCKING NUT REMOVAL

Use special tool end yoke holder (MB990850) to hold the companion flange, and then remove the companion flange self-locking nut.



REASSEMBLY SERVICE POINTS

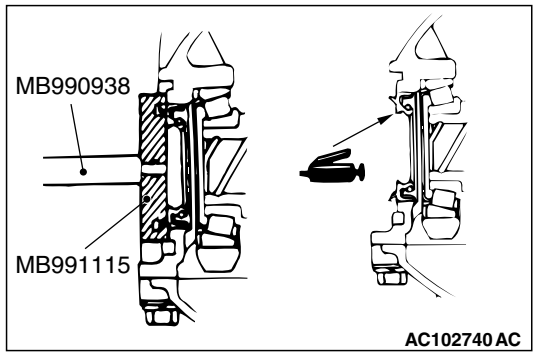
>>A<< OIL SEAL PRESS-FITTING



1. Use the following special tools to press-fit the oil seal.
   - Installer cap (MD998812)
   - Installer 100 (MD998813)
   - Installer adaptor (MD998829)
2. Apply specified grease to the oil seal lip and drive shaft oil seal seating area.

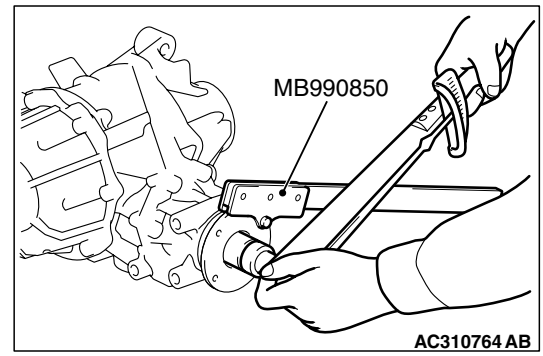
   Specified grease: Vaseline

>>B<< OIL SEAL PRESS-FITTING



1. Use the following special tools to press-fit the oil seal.
   - Installer bar (MB990938)
   - Oil seal installer (MB991115)
2. Apply multi-purpose grease to the oil seal lip and drive shaft oil seal seating area.

>>C<< SELF-LOCKING NUT INSTALLATION



Tighten the companion flange self-locking nut to the specified torque while holding the companion flange with special tool end yoke holder (MB990850).

Tightening torque: 186 ± 29 N·m

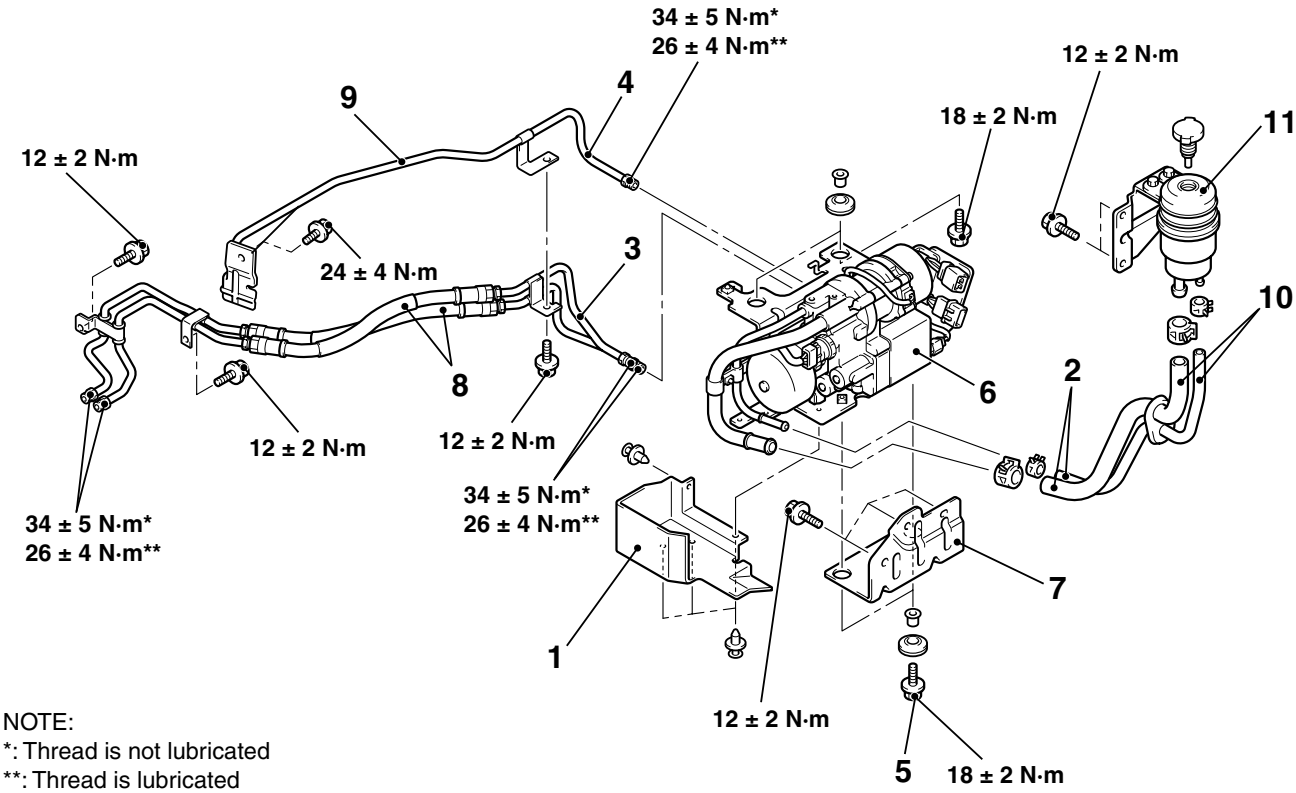
REMOVAL AND INSTALLATION

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⚠ CAUTION

- **When connecting the return hose and suction hose, do not apply lubricant.**
- **No foreign matter should be allowed in the hydraulic piping and joints.**

Pre-removal Operation	Post-installation Operation
• Trunk Room Side Trim Removal (Refer to GROUP 52A–Trims P.52A-10). • Hydraulic Piping Fluid Draining	• Hydraulic Piping Fluid Filling (Refer to P.27-28). • Hydraulic Piping Bleeding (Refer to P.27-29). • Trunk Room Side Trim Installation (Refer to GROUP 52A–Trims P.52A-10).



NOTE:
*: Thread is not lubricated
**: Thread is lubricated

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Removal steps

1. Dust guard
2. Reservoir hose assembly and hydraulic unit connection
3. Hydraulic unit hose assembly and hydraulic unit connection
4. Transfer connector assembly and hydraulic unit connection
5. Hydraulic unit bracket assembly mounting bolt

>>B<< 6. Hydraulic unit assembly

Removal steps (Continued)

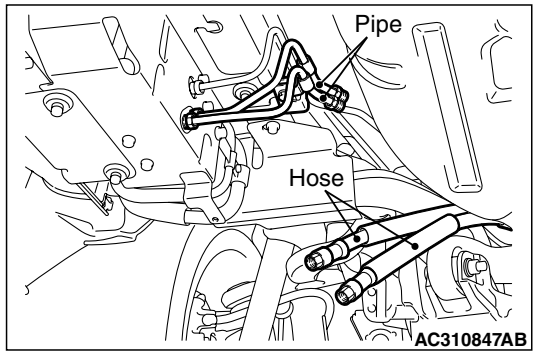
7. Hydraulic unit bracket
   - Stabilizer bar to differential support arm connection (Refer to GROUP 34, Stabilizer bar P.34-21).
   - Differential support arm (Refer to P.27-45).

<<A>> 8. Hydraulic unit hose assembly
9. Transfer connector assembly

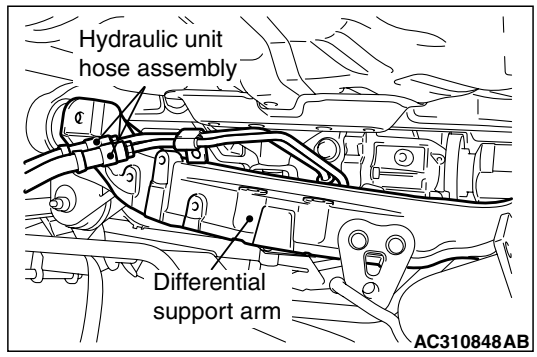
>>A<< 10. Reservoir hose assembly
11. Oil reservoir

REMOVAL SERVICE POINTS

<<A>> HYDRAULIC UNIT HOSE ASSEMBLY REMOVAL



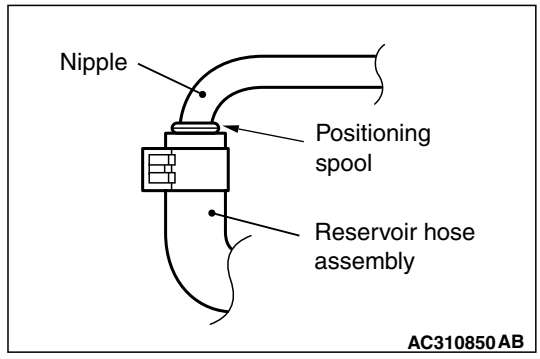
1. Disconnect the hydraulic unit side pipe and hose.



2. Pull down the differential support arm, remove the hydraulic unit hose assembly.

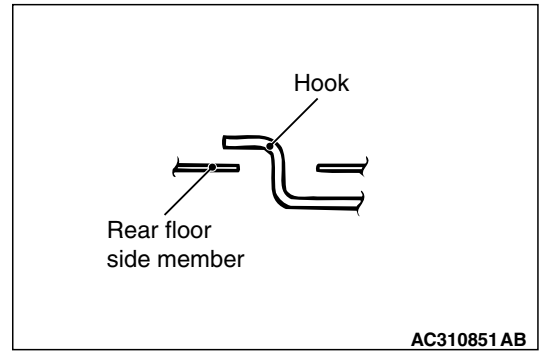
INSTALLATION SERVICE POINTS

>>A<< RESERVOIR HOSE ASSEMBLY INSTALLATION



Insert the reservoir hose assembly to the positioning spool.

>>B<< HYDRAULIC UNIT ASSEMBLY INSTALLATION



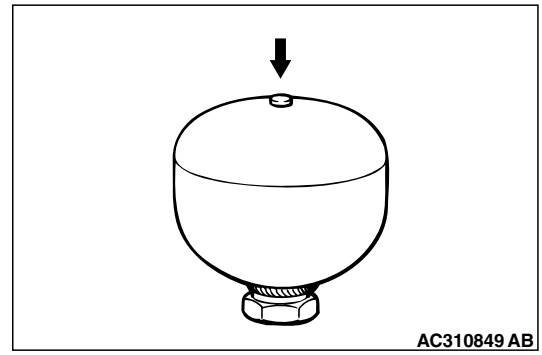
Hook the hydraulic unit assembly hook to the rear floor side member and tighten the hydraulic unit assembly mounting bolt.

HYDRAULIC UNIT DISPOSAL

M1272008300026

⚠ CAUTION

- **The hydraulic unit has its accumulator filled with a high-pressure gas. Never throw it into a fire. Also, never attempt to disassemble, press, weld or melt it.**
- **When drilling a hole in the accumulator, be sure to wear safety goggles since drill chips may blow out together with the gas.**



When discarding the hydraulic unit, drill a hole in the accumulator at the illustrated position beforehand in order to release the inside gas.