GROUP 22A

MANUAL TRANSAXLE

CONTENTS

GENERAL INFORMATION

M1221000101067

Item		Specification
Transaxle model		W5M6A
Transaxle type		5-speed forward, 1-speed reverse constant mesh
Gear ratio	1st	2.857
	2nd	1.950
	3rd	1.444
	4th	1.096
	5th	0.761
	Reverse	2.892
Final gear ratio		4.687
Helical gear LSD (front differential)		Present
Transfer	Reduction ratio	0.302
	Differential gear unit	Hydraulic pressure multiplate clutch (ACD)

SERVICE SPECIFICATION

M1221000300165

Item	Standard value
Hydraulic unit generation oil pressure MPa (psi)	0.9 –1.1 (130 –159)

LUBRICANT

M1221000400678

Item		Brand	Capacity
Transmission oil dm^3 (qt)		Mitsubishi genuine Dia-Queen new multi gear oil SAE 75W-80 (GL-3)	2.5 (2.6)
Transfer oil dm^3 (qt)		Mitsubishi genuine Dia-Queen LSD Gear Oil	0.8 (0.9)
AWC fluid dm^3 (qt)		Mitsubishi genuine Dia-Queen ATF SPIII	1.0 (1.1)
Front propeller shaft	Sleeve yoke section	Mitsubishi genuine Dia-Queen Super Hypoid Gear Oil SAE 90 (GL-5)	Adequate amount
Transfer	O-ring	Mitsubishi genuine Dia-Queen ATF SPIII	
Clutch release cylinder	Push rod section	0101011 or equivalent	
Transaxle assembly	Spline sections of input shaft and clutch disk		

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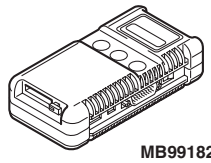
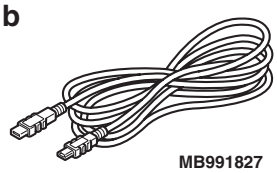
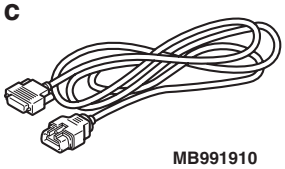
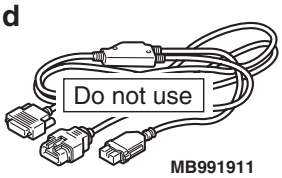
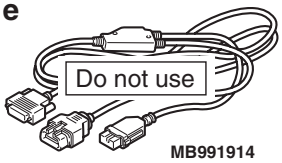
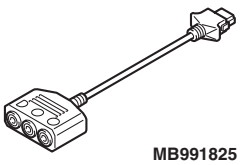
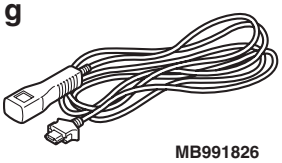
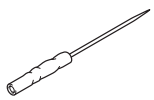
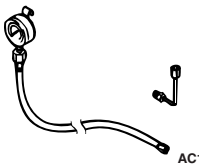
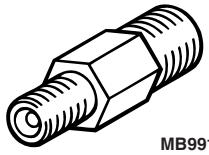
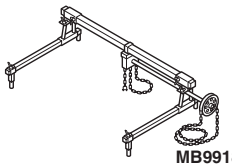
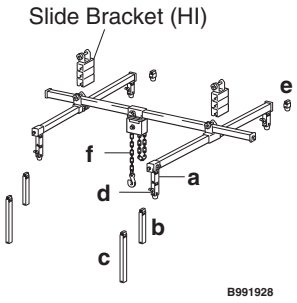
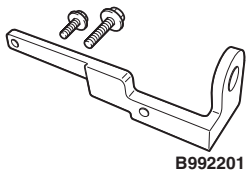
SPECIAL TOOLS

M1221000601040

Tool	Tool number and name	Supersession	Application
a  MB991824 b  MB991827 c  MB991910 d  MB991911 e  MB991914 f  MB991825 g  MB991826 MB991958	MB991958 a: MB991824 b: MB991827 c: MB991910 d: MB991911 e: MB991914 f: MB991825 g: MB991826 M.U.T.-III sub assembly a: Vehicle communication interface (V.C.I.) b: M.U.T.-III USB cable c: M.U.T.-III main harness A (Vehicles with CAN communication system) d: M.U.T.-III main harness B (Vehicles without CAN communication system) e: M.U.T.-III main harness C (for Daimler Chrysler models only) f: M.U.T.-III measurement adapter g: M.U.T.-III trigger harness	MB991824-KIT *NOTE: G: MB991826 M.U.T.-III trigger harness is not necessary when pushing V.C.I. ENTER key.*	Checking diagnostic trouble codes **⚠ CAUTION** **For vehicles with CAN communication, use M.U.T.-III main harness A to send simulated vehicle speed. If you connect M.U.T.-III main harness B instead, the CAN communication does not function correctly.**
 MB992006	MB992006 Extra fine probe	–	Making voltage and resistance measurement during troubleshooting

Tool	Tool number and name	Supersession	Application
 AC103525	MD998330 (Includes MD998331) Oil pressure gauge (3.0 MPa, 427 psi)	MD998330-01	Measurement of hydraulic pressure
 MB991705	MB991705	Adapter	
 MB991895	MB991895 Engine hanger	Tool not available	When the engine hanger is used: Supporting the engine assembly during removal and installation of the transaxle assembly
 B991928	MB991928 Engine hanger a: MB991929 Joint (50) × 2 b: MB991930 Joint (90) × 2 c: MB991931 Joint (140) × 2 d: MB991932 Foot (standard) × 4 e: MB991933 Foot (short) × 2 f: MB991934 Chain and hook assembly	Tool not available	
 B992201	MB992201 Engine hanger plate	–	

MANUAL TRANSAXLE DIAGNOSIS <MANUAL TRANSAXLE>

INTRODUCTION

M1221006900778

The manual transaxle can exhibit any of the following symptoms: noise or vibration is generated, oil leaks, shifting gears is hard or troublesome, or the transaxle jumps out of gear.

The causes of these symptoms could come from: incorrect mounting, the oil level may be low, or a component of the transaxle may be faulty.

TROUBLESHOOTING STRATEGY

M1221007000712

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

1. Gather information from the customer.
2. Verify that the condition described by the customer exists.
3. Find the malfunction by following the Symptom Chart.
4. Verify malfunction is eliminated.

SYMPTOM CHART

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Symptom	Inspection procedure	Reference page
Noise, Vibration	1	P.22A-5
Oil Leaks	2	P.22A-6
Hard Shifting	3	P.22A-7
Jumps Out of Gear	4	P.22A-8

SYMPTOM PROCEDURES

Inspection Procedure 1: Noise, Vibration

DIAGNOSTIC PROCEDURE

STEP 1. Check the idle speed.

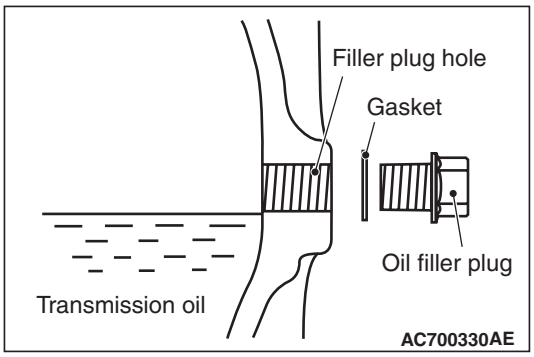
Q: Does the idle speed meet the standard values?

YES : Go to Step 2.
NO : Refer to GROUP 11A, On-vehicle Service –Idle Speed Check P.11A-12.

STEP 2. Check whether the transaxle and engine mount is loose or damaged.

Q: Are the transaxle and engine mount loose or damaged?

YES : Tighten or replace the part. Then go to Step 7.
NO : Go to Step 3.



STEP 3. Check that the oil level is up to the lower edge of the filler plug hole.

Q: Is the oil level up to the lower edge of the filler plug hole?

YES : Go to Step 4.

NO : Refill DiaQueen NEW MULTI GEAR OIL API classification GL-3, SAE 75W-80. Then go to Step 7.

STEP 4. Check for the specified oil.

Q: Is the specified oil DiaQueen NEW MULTI GEAR OIL API classification GL-3, SAE 75W-80?

YES : Go to Step 5.

NO : If in doubt, replace the oil. Refer to P.22A-116. Then go to Step 7.

STEP 5. Remove the transaxle. Check the end play of the input and output shafts.

Q: Does the end play of the input and output shafts meet the standard value?

YES : Go to Step 6.

NO : Adjust the end play of the input and output shafts. Then go to Step 7.

STEP 6. Disassemble the transaxle. Check the gears for wear and damage.

Q: Are the gears worn or damaged?

YES : Replace the gears. Go to Step 7.

NO : Go to Step 7.

STEP 7. Retest the systems.

Q: Is the noise or vibration still there?

YES : Return to Step 1.

NO : The procedure is complete.

Inspection Procedure 2: Oil Leaks

DIAGNOSTIC PROCEDURE

STEP 1. Visual check.

Raise the vehicle, and check for oil leaks. If oil leak is difficult to locate, steam clean the transaxle and drive the vehicle for at 10 minutes. Then check the leak again.

Q: Is the oil leak(s) found?

YES : Go to Step 2.

NO : Check for the oil leaks around the engine. Then go to Step 4.

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STEP 2. Visual check at the clutch housing.

Q: Do oil leaks appear around the joint between the engine and the clutch housing?
YES : Remove the transaxle. Check the input shaft oil seal, and replace if necessary. Then go to Step 4.
NO : Go to Step 3.

STEP 3. Check the oil seal or O-ring for damage.

Q: Is the oil seal or O-ring damaged?
YES : Replace the oil seal or the O-ring. Then go to Step 4.
NO : Go to Step 4.

STEP 4. Retest the system.

Q: Is the oil still leaking?
YES : Return to Step 1.
NO : The procedure is complete.

Inspection Procedure 3: Hard Shifting

DIAGNOSTIC PROCEDURE

STEP 1. Check the transaxle control

Q: Are the shift cable and the select cable in good condition?
YES : Go to Step 2.
NO : Repair or replace the shift cable and the select cable. Refer to P.22A-121. Then go to Step 7.

STEP 2. Check the transaxle oil.

Q: Is the oil dirty?
YES : Replace the oil. Refer to P.22A-116. Then go to Step 7
NO : Go to Step 3.

STEP 3. Check the clutch system.

Q: Is the clutch system normal?
YES : Go to Step 4.
NO : Repair or replace the clutch system. Refer to GROUP 21B, Clutch P.21B-4. Then go to Step 7.

STEP 4. Remove and disassemble the transaxle. Check the control housing.

Q: Is the control housing in good condition?
YES : Go to Step 5.
NO : Repair or replace the control housing (Refer to GROUP 22B, Transaxle P.22B-12) Then go to Step 7.

STEP 5. Check for poor meshing or worn synchronizer ring and gear cone.

Q: Is poor meshing or worn synchronizer ring and gear cone found?
YES : Repair or replace the synchronizer ring and gear cone. Then go to Step 7.
NO : Go to Step 6.

STEP 6. Check the synchronizer spring for weakness.

Q: Is the synchronizer spring weak?
YES : Replace the synchronizer spring. Then go to Step 7.
NO : Go to Step 7.

STEP 7. Retest the system.

Q: Is the shifting of the gears still hard?
YES : Return to Step 1.
NO : The procedure is complete.

Inspection Procedure 4: Jumps Out of Gear

DIAGNOSTIC PROCEDURE

STEP 1. Check the transaxle control

Q: Are the gearshift cable and the select cable in good condition?
YES : Go to Step 2.
NO : Repair or replace the gearshift cable and the select cable. Refer to P.22A-121. Then go to Step 5.

STEP 2. Remove and disassemble the transaxle. Check the control housing.

Q: Is the control housing in good condition?
YES : Go to Step 3.
NO : Repair or replace the control housing (Refer to GROUP 22B, Transaxle P.22B-12) Then go to Step 5.

STEP 3. Check the shift forks for wear.

Q: Is the shift forks worn?
YES : Replace the shift fork. Refer to GROUP 22B, transaxle P.22B-12. Then go to Step 5.
NO : Go to Step 4.

STEP 4. Check the clearance.

Q: Is the clearance between the synchronizer hub and sleeve excessive?
YES : Replace the synchronizer hub or sleeve. Refer to GROUP 22B, Input Shaft P.22B-27 and Output Shaft P.22B-35. Then go to Step 5.
NO : Go to Step 5.

STEP 5. Retest the system.

Q: Does the transaxle still jump out of gear?
YES : Return to Step 1.
NO : The procedure is complete.

DIAGNOSIS <S-AWC(SUPER ALL WHEEL CONTROL)>

INTRODUCTION

M1221006900831

The S-AWC system can exhibit any of the following symptoms: noise or vibration is generated or fluid leaks.
The causes of these symptoms could come from: incorrect mounting, the fluid level may be low, or a component of the S-AWC may be faulty.

TROUBLESHOOTING STRATEGY

M1221007000790

Use these steps to plan your diagnostic strategy. If you follow them carefully, you will find most S-AWC malfunctions.

1. Gather as much information as possible about the complaint from the customer.
2. Verify that the condition described by the customer exists.
3. Check the vehicle for any S-AWC Diagnostic Trouble Codes (DTCs).
4. If you can not verify the condition and there are no DTCs, the malfunction is intermittent. For information on how to cope with intermittent malfunctions, refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-15.
5. If you can verify the condition but there are no DTCs, or the system can not communicate with scan tool, refer to the Symptom Chart P.22A-14.
6. If there is a DTC, record the number of the code, then erase the code from memory using scan tool.
7. Reconfirm the symptom.
8. If a DTC is set again, go to the Inspection Chart for Diagnostic Trouble Codes.
9. If a DTC is not set again, the malfunction is intermittent. For information on how to cope with intermittent malfunctions, refer to GROUP 00, How to Use Troubleshooting/Inspection Service Points –How to Cope with Intermittent Malfunction P.00-15.
10. Verify malfunction is eliminated. After repairs are completed, the complaint conditions to confirm the malfunction has been eliminated.

PRECAUTIONS FOR DIAGNOSIS

Before diagnosis, check that all the following items are normal.

- A normal steering wheel is installed correctly to the neutral position of steering column shaft assembly.
- The size of tire and wheel, specification, tire pressure, balance, and wear status are normal.
- The wheel alignment is normal.
- No modifications to the engine, suspension, or others, which can affect the S-AWC system, is implemented.

DIAGNOSTIC FUNCTION

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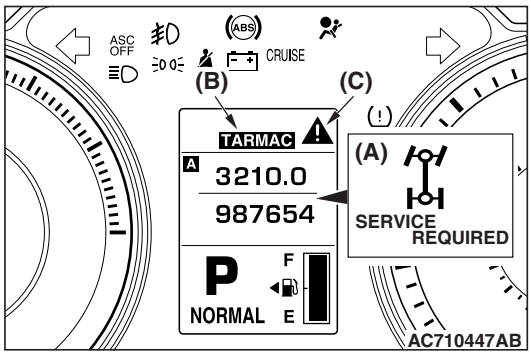
WARNING INDICATOR



When a malfunction occurs in the S-AWC system, the figure (A) will be displayed on the information screen of multi information display, and the mode display (B) will be turned off.
Subsequently, the screen returns to the one before the warning display, and then "!" indicator (C) will illuminate.
If the indicator (C) continues to be displayed on the information screen of multi information display, check the diagnostic trouble code that is set.

FAIL-SAFE FUNCTION

If an abnormality occurs to the signal of sensors, switches, solenoids, or others, the AWC-ECU performs a control for the driver safety and system protection. The control contents are as follows.

FAIL-SAFE REFERENCE TABLE

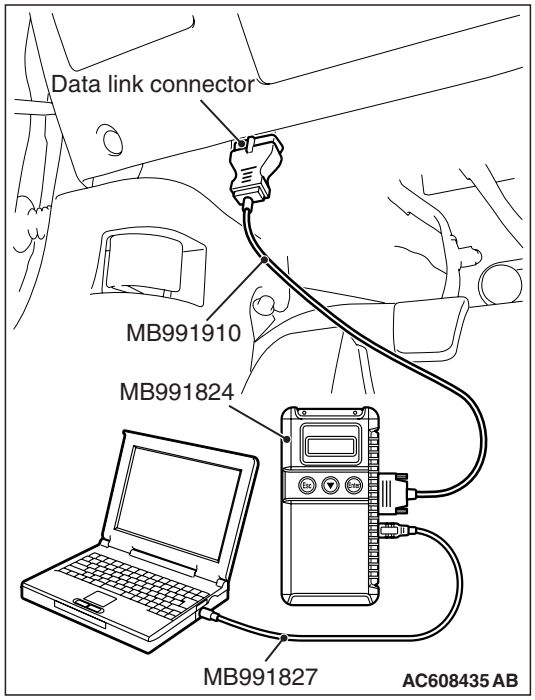
DTC No.	Item	Control content
C2203	VIN not written	Normal control
C1614	Parking brake switch	A warning is given to the driver with the trouble displayed to the multi information display, but the control is maintained because the vehicle behavior is not affected.
C1624	EEPROM	
C161F	AWC actuator protection 1	A warning is given to the driver by the flashing of multi information display control mode, and the control is stopped.
C1621	AWC actuator protection 2	
Others (other than above)		A warning is given to the driver with the trouble displayed to the multi information display, and the control is stopped.

NOTE: All the troubles will return to a normal status when the ignition switch is turned from OFF to ON.

HOW TO CONNECT THE SCAN TOOL (M.U.T.-III)

Required Special Tools:

- MB991958 Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827 M.U.T.-III USB Cable
  - MB991910 M.U.T.-III Main Harness A (Vehicles with CAN communication system)



⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

1. Ensure that the ignition switch is at the "LOCK" (OFF) position.
2. Start up the personal computer.
3. Connect special tool MB991827 to special tool MB991824 and the personal computer.
4. Connect special tool MB991910 to special tool MB991824.
5. Connect special tool MB991910 to the data link connector.
6. Turn the power switch of special tool MB991824 to the "ON" position.

   NOTE: When special tool MB991824 is energized, special tool MB991824 indicator light will be illuminated in a green color.
7. Start the scan tool system on the personal computer.

NOTE: Disconnecting scan tool MB991958 is the reverse of the connecting sequence, making sure that the ignition switch is at the "LOCK" (OFF) position.

FREEZE FRAME DATA CHECK

Data of when the diagnostic trouble code is determined is obtained, and the status of S-AWC is stored. By analyzing each data using the scan tool, troubleshooting can be carried out efficiently.

Display items of the freeze frame data are as follows.

DISPLAY ITEM LIST

Item No.	Item	Unit/display contents
1	Odometer	km
2	Ignition cycle	Count
4	Current trouble accumulative time	min
5	AWC control mode (for meter display)	• TARMAC • GRAVEL • SNOW
6	ASC control mode	• ASC ON • ASC OFF • ASC/BRC OFF • ASC fail

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Item No.	Item	Unit/display contents
7	AYC torque differential restriction direction (AYC request)	• No restriction • Restriction of right axle movement • Restriction of left axle movement • Restriction of lateral axle movement
8	Stoplight switch	• ON • OFF
9	Parking brake switch	• ON • OFF
10	ABS activation flag	• ON • OFF
11	Steering wheel sensor	deg
12	Accelerator opening angle	%
13	Wheel speed sensor <FL>	km/h
14	Wheel speed sensor <FR>	km/h
15	Wheel speed sensor <RL>	km/h
16	Wheel speed sensor <RR>	km/h
17	Master cylinder pressure sensor	MPa
18	Yaw rate sensor	deg/s
19	Lateral G-sensor	m/s^2
20	Longitudinal G-sensor	m/s^2
21	ACD target torque	Nm
22	AYC target torque	Nm
23	Brake control torque	Nm

NOTE: BRC: Brake Control System

DIAGNOSTIC TROUBLE CODE CHART

M1221007800097

⚠ CAUTION

During diagnosis, a DTC associated with other system may be set when the ignition switch is turned ON with connector(s) disconnected. On completion, confirm all systems for diagnostic trouble code(s). If diagnostic trouble code(s) are set, erase them all.

DTC No.	Item		Reference page
C1000	Stoplight switch system		P.22A-15
C100A	FL	Wheel speed sensor system (faulty circuit)	P.22A-19
C1015	FR		
C1020	RL		
C102B	RR		

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DTC No.	Item		Reference page
C1011	FL	Wheel speed sensor system (faulty signal)	P.22A-20
C101C	FR		
C1027	RL		
C1032	RR		
C1014	FL	Wheel speed sensor system (characteristics abnormality)	P.22A-21
C101F	FR		
C102A	RL		
C1035	RR		
C1078	Tire turning malfunction		P.22A-22
C1219	Steering wheel sensor system (faulty signal)		P.22A-24
C121A	Steering wheel sensor system (neutral learning abnormality)		P.22A-26
C123C	G and yaw rate sensor system (faulty signal)		P.22A-27
C1242	G and yaw rate sensor system (abnormality of longitudinal G sensor output signal)		P.22A-29
C1610	Electronic relay abnormality of AWC actuator power supply		P.22A-31
C1611	AWC pressure sensor system (low voltage)		P.22A-33
C1612	AWC pressure sensor system (high voltage)		P.22A-35
C1613	AWC switch system (ON sticking)		P.22A-37 <Vehicles with steering wheel audio remote control switch>
			P.22A-40 <Vehicles without steering wheel audio remote control switch>
C1614	Parking brake switch system (ON sticking)		P.22A-43
C1615	Brake control prohibition request		P.22A-45
C1616	Cranking signal system (ON sticking)		P.22A-46
C1617	AWC CAN main data system (data not received)		P.22A-49
C1618	AWC CAN local data system (data not received)		P.22A-50
C1619	AYC current value (abnormal)		Refer to GROUP 27 – Troubleshooting P.27-8.
C161A	AYC direction valve (right) system (output abnormality)		Refer to GROUP 27 – Troubleshooting P.27-8.
C161B	AYC direction valve (left) system (output abnormality)		Refer to GROUP 27 – Troubleshooting P.27-8.
C161C	ACD proportioning valve system (malfunction)		P.22A-53
C161D	Electric pump relay system (faulty circuit)		P.22A-56
C161E	Electric pump system		P.22A-59

DTC No.	Item	Reference page
C161F	AWC actuator protection 1	This is the code that is set when the control is suspended to protect AWC actuator, and not a malfunction.
C1620	AYC control system (abnormal)	Refer to GROUP 27 – Troubleshooting P.27-8.
C1621	AWC actuator protection 2	This is the code that is set when the control is suspended to protect AWC actuator, and not a malfunction.
C1622	ACD control system (abnormal)	P.22A-61
C1623	Brake control system (abnormal)	P.22A-62
C1624	AWC-ECU system (internal error)	P.22A-63
C1625	AWC pressure sensor system (power supply voltage abnormality)	P.22A-64
C2100	Battery voltage malfunction (low voltage)	P.22A-66
C2101	Battery voltage malfunction (high voltage)	P.22A-70
C2114	G and yaw rate sensor power supply (low voltage)	P.22A-72
C2115	G and yaw rate sensor power supply (high voltage)	P.22A-75
C2203	VIN not recorded	P.22A-77
C2204	G and yaw rate sensor system (internal error)	P.22A-78
C2205	Steering wheel sensor system (internal error)	P.22A-79
U0001	Bus-off	P.22A-80
U0100	Engine time-out error	P.22A-81
U0101	TC-SST time-out error	P.22A-82
U0121	ASC time-out error	P.22A-83
U0126	Steering wheel sensor time-out error	P.22A-84
U0141	ETACS time-out error	P.22A-85
U0401	Engine data error	P.22A-86
U0428	Steering wheel sensor data error	P.22A-87
U0431	ETACS data error	P.22A-88
U1003	Bus off (local CAN)	P.22A-90
U1415	Coding incomplete/fail	P.22A-91
U1417	Coding data malfunction	P.22A-93
U1425	TC-SST data error	P.22A-94
U1426	ASC data error	P.22A-95
U1427	Wheel speed sensor data error	P.22A-96
U1428	G and yaw rate sensor data error	P.22A-97

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SYMPTOM CHART

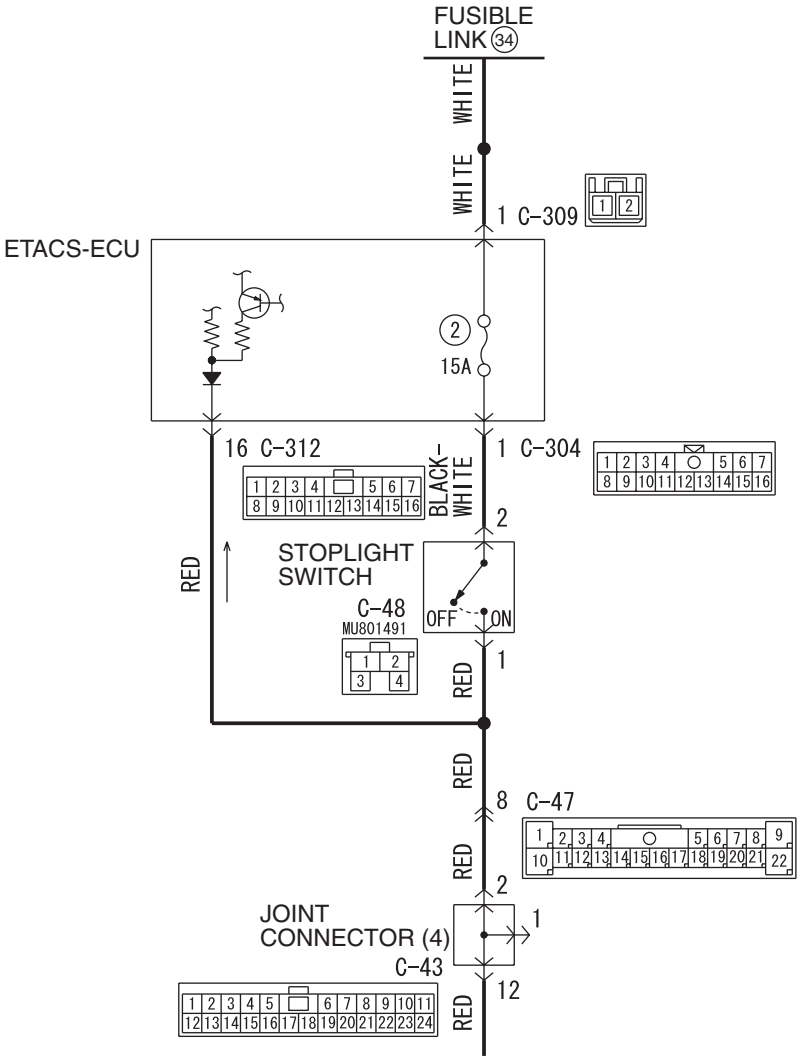
M1221007100827

Symptom	Inspection procedure No.	Reference page
Communication between the scan tool and AWC-ECU cannot be established	1	P.22A-99
Mode does not change even when the AWC switch is pressed.	2	P.22A-99<Vehicles with steering wheel audio remote control switch>
		P.22A-102<Vehicles without steering wheel audio remote control switch>
AWC-ECU power supply circuit malfunction	3	P.22A-104
AWC control mode display is flashing. (Diagnostic trouble code No. C161F or C1621 is set)	–	This is the symptom that AWC-ECU suspends the control to protect the actuator during severe driving, and not a malfunction. Turn the ignition switch from OFF to ON to return to control.

DIAGNOSTIC TROUBLE CODE PROCEDURES

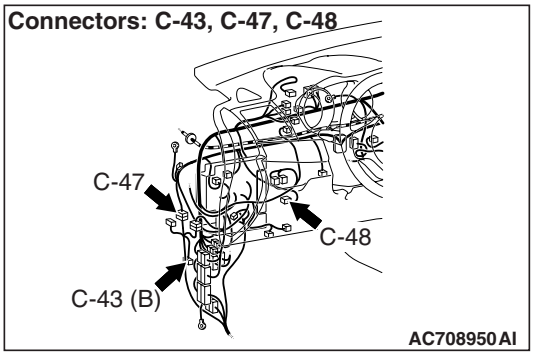
DTC C1000: Stoplight Switch System

Stoplight switch system circuit

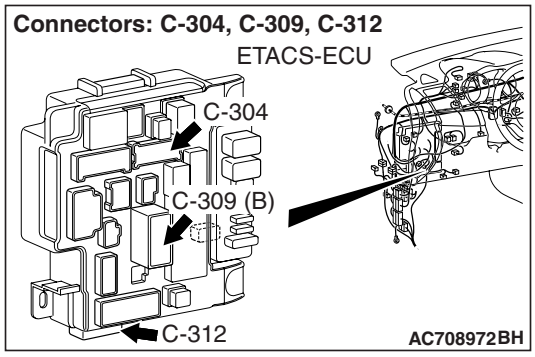


W8H22M000A

Connectors: C-43, C-47, C-48



Connectors: C-304, C-309, C-312



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⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION
AWC-ECU receives signals of stoplight switch from ETACS-ECU via the CAN bus lines.

DTC SET CONDITIONS
This diagnostic trouble code is set when the abnormality below is detected:
- The vehicle has run for a long time with the stop light switch turned ON.
- With the stoplight switch OFF, the vehicle speed is decelerated suddenly.

PROBABLE CAUSES
- Incorrect adjustment of stoplight switch position
- Malfunction of stoplight switch
- Stoplight malfunction
- Damaged harness wires and connectors
- Malfunction of the ETACS-ECU
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics
Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. C1000 set?

YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. Check of the stoplight on and off
Check that the stoplight illuminates when the brake pedal is depressed, and the stoplight goes out when the brake pedal is released.

Q: Is the check result normal?

YES : Go to Step 16.
NO : Go to Step 4.

STEP 4. Stop light switch installation status check
Refer to GROUP 35A –On-vehicle Service P.35A-12.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Install the stop light switch correctly. Then go to Step 21.

STEP 5. Check the stop light switch.
Refer to GROUP 35A –Brake Pedal P.35A-26.

Q: Is the check result normal?

YES : Go to Step 6.
NO : Replace the stoplight switch. (Refer to GROUP 35A – Brake Pedal P.35A-25.) Then go to Step 21.

STEP 6. ETACS-ECU connector check: C-304

Q: Is the check result normal?

YES : Go to Step 7.
NO : Repair the defective connector. Then go to Step 21.

STEP 7. Measure the voltage at the C-304 ETACS-ECU connector.
With C-304 ETACS-ECU connector connected, measure the voltage between the terminal No. 1 and the body ground.

OK: Battery voltage (when the brake pedal is released)

Q: Is the check result normal?

YES : Go to Step 10.
NO : Go to Step 8.

STEP 8. ETACS-ECU fuse No. 2 check

Q: Is the check result normal?

YES : Replace the ETACS-ECU. (Refer to GROUP 54A – ETACS-ECU P.54A-676.) Then go to Step 21.
NO : Replace fuse No. 2. Then go to Step 9.

STEP 9. Check the wiring harness between C-304 ETACS-ECU connector terminal No. 1 and C-48 stoplight switch connector terminal No. 2.
Check that the wiring harness is not shorted (short to ground).

Q: Is the check result normal?

YES : Go to Step 21.
NO : Repair the wiring harness. Then go to Step 21.

STEP 10. Stop light switch connector check: C-48

Q: Is the check result normal?

YES : Go to Step 11.
NO : Repair the defective connector. Then go to Step 21.

STEP 11. Voltage measurement at the C-48 stoplight switch connector
Disconnect the connector, and measure the voltage between terminal No. 2 and ground at the wiring harness side.

OK: Battery positive voltage

Q: Is the check result normal?

YES : Go to Step 13.
NO : Go to Step 12.

STEP 12. Check the wiring harness between C-304 ETACS-ECU connector terminal No. 1 and C-48 stoplight switch connector terminal No. 2.
Check the wiring harness for open circuit.

Q: Is the check result normal?

YES : Go to Step 13.
NO : Repair the wiring harness. Then go to Step 21.

STEP 13. J/C (4), intermediate connector check: C-43, C-47

Q: Is the check result normal?

YES : Go to Step 14.
NO : Repair the defective connector. Then go to Step 21.

STEP 14. Voltage measurement at C-43 J/C (4)
Disconnect the connector, and measure the voltage between terminal No. 2 and ground at the wiring harness side.

OK: Battery positive voltage (brake pedal depressed)

Q: Is the check result normal?

YES : Go to Step 16.
NO : Go to Step 15.

STEP 15. Check the wiring harness between C-48 stoplight switch connector terminal No. 1 and the C-43 J/C (4) terminal No. 2.
Check the wiring harness for open or short circuit (short to ground).

Q: Is the check result normal?

YES : Go to Step 16.
NO : Repair the wiring harness. Then go to Step 21.

STEP 16. ETACS-ECU connector check: C-312

Q: Is the check result normal?

YES : Go to Step 17.
NO : Repair the defective connector. Then go to Step 21.

STEP 17. Measure the voltage at the C-312 ETACS-ECU connector.
Measure the voltage between C-312 ETACS-ECU connector terminal No. 16 and the body ground.

- **OK: 1 V or less (brake pedal released)**
- **OK: Battery positive voltage (brake pedal depressed)**

Q: Is the check result normal?

YES : Go to Step 19.
NO : Go to Step 18.

STEP 18. Check the wiring harness between C-312 ETACS-ECU connector terminal No. 16 and C-48 stoplight switch connector terminal No. 1.
Check the wiring harness for open circuit.

Q: Is the check result normal?

YES : Go to Step 19.
NO : Repair the wiring harness. Then go to Step 21.

STEP 19. Scan tool service data
Item No. 39: Stoplight switch (Refer to service data reference table P.22A-107.)

Q: Is the check result normal?

YES : Go to Step 20.
NO : Replace the ETACS-ECU. (Refer to GROUP 54A – ETACS-ECU P.54A-676.) Then go to Step 21.

STEP 20. Check whether the DTC is reset.

Q: Is DTC No. C1000 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 21.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).

STEP 21. Check whether the DTC is reset.

Q: Is DTC No. C1000 set?

YES : Return to Step 1.
NO : This diagnosis is complete.

DTC C100A <FL>, C1015 <FR>, C1020 <RL>, C102B <RR>: Wheel Speed Sensor System (Faulty Circuit)

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION

AWC-ECU receives the wheel speed data from ASC-ECU via the CAN communication.

DTC SET CONDITIONS

Observe the wheel speed at startup. If one or more of the wheel speed does not follow, the diagnostic trouble code of the relevant wheel speed sensor is set.

PROBABLE CAUSES

- Malfunction of wheel speed sensor
- Damaged harness wires and connectors
- Malfunction of encoder for wheel speed detection
- Malfunction of ASC-ECU
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics
Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the DTC is reset.

Q: Is the relevant wheel speed sensor diagnostic trouble code No. C100A <FL>, C1015 <FR>, C1020 <RL>, or C102B <RR> set?

YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. Scan tool diagnostic trouble code
Check the ASC diagnostic trouble code. (Refer to GROUP 35C –Troubleshooting P.35C-20.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 4.

STEP 4. Scan tool service data
Check the service data of the relevant wheel speed sensor.(Refer to P.22A-107.)

- Item No.22: FL wheel speed sensor <FL>
- Item No.23: FL wheel speed sensor <FR>
- Item No.24: FL wheel speed sensor <RL>
- Item No.25: FL wheel speed sensor <RR>

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)
NO : Replace the AWC-ECU.(Refer to P.22A-132.)

DTC C1011 <FL>, C101C <FR>, C1027 <RL>, C1032 <RR>: Wheel Speed Sensor System (Faulty Signal)

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION

AWC-ECU receives the wheel speed data from ASC-ECU via the CAN communication.

DTC SET CONDITIONS

When an irregular change in the wheel speed sensor is detected, the diagnostic trouble code of the relevant wheel speed sensor is set.

PROBABLE CAUSES

- Malfunction of wheel speed sensor
- Damaged harness wires and connectors
- Malfunction of encoder for wheel speed detection
- Malfunction of ASC-ECU
- Malfunction of AWC-ECU

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DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics
Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the DTC is reset.

Q: Is the relevant wheel speed sensor diagnostic trouble code No. C1011 <FL>, C101C <FR>, C1027 <RL>, or C1032 <RR> set?

YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. Scan tool diagnostic trouble code
Check the ASC diagnostic trouble code. (Refer to GROUP 35C –Troubleshooting P.35C-20.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 4.

STEP 4. Scan tool service data
Check the service data of the relevant wheel speed sensor.(Refer to P.22A-107.)

- Item No.22: FL wheel speed sensor <FL>
- Item No.23: FL wheel speed sensor <FR>
- Item No.24: FL wheel speed sensor <RL>
- Item No.25: FL wheel speed sensor <RR>

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)
NO : Replace the AWC-ECU.(Refer to P.22A-132.)

DTC C1014 <FL>, C101F <FR>, C102A <RL>, C1035 <RR>: Wheel speed sensor system (characteristics abnormality)

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION

AWC-ECU receives the wheel speed data from ASC-ECU via the CAN communication.

DTC SET CONDITIONS

If one or more of the wheel speed is out of the range of the specified value, the diagnostic trouble code of the relevant wheel speed sensor is set.

PROBABLE CAUSES

- Malfunction of wheel speed sensor
- Damaged harness wires and connectors
- Malfunction of encoder for wheel speed detection
- Malfunction of ASC-ECU
- Malfunction of AWC-ECU

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DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics
Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the DTC is reset.

Q: Is the relevant wheel speed sensor diagnostic trouble code No. C1014 <FL>, C101F <FR>, C102A <RL>, or C1035 <RR> set?

YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. Scan tool diagnostic trouble code
Check the ASC diagnostic trouble code. (Refer to GROUP 35C –Troubleshooting P.35C-20.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 4.

STEP 4. Scan tool service data
Check the service data of the relevant wheel speed sensor.(Refer to P.22A-107.)

- Item No.22: FL wheel speed sensor <FL>
- Item No.23: FL wheel speed sensor <FR>
- Item No.24: FL wheel speed sensor <RL>
- Item No.25: FL wheel speed sensor <RR>

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)
NO : Replace the AWC-ECU.(Refer to P.22A-132.)

DTC C1078: Tire Turning Malfunction

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION

AWC-ECU receives the wheel speed data from ASC-ECU via the CAN communication.

DTC SET CONDITIONS

The wheel speed is observed when the steering angle is in the neutral position, and the code is set when the wheel speed, which is more than the specified value, is detected.

PROBABLE CAUSES

- Tire with incorrect diameter equipped
- Improper tire pressure
- Malfunction of ASC-ECU
- Malfunction of AWC-ECU

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DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics
Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus line (Refer to GROUP 54C – Troubleshooting P.54C-14). After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. C1078 set?

YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. Check the tires
Check that the wheels/tires with the identical size are installed, and that each tire pressure is within the value specified on the tire pressure label.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Install the wheels/tires with the identical size, or adjust the tire pressure. Then go to Step 5.

STEP 4. Scan tool diagnostic trouble code
Check the ASC diagnostic trouble code. (Refer to GROUP 35C –Troubleshooting P.35C-20.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 5.

STEP 5. Scan tool service data
Check the following service data. (Refer to P.22A-107.)

- Item No.22: FL wheel speed sensor <FL>
- Item No.23: FL wheel speed sensor <FR>
- Item No.24: FL wheel speed sensor <RL>
- Item No.25: FL wheel speed sensor <RR>

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)
NO : Replace the AWC-ECU.(Refer to P.22A-132.)

DTC C1219: Steering Wheel Sensor System (Faulty Signal)

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the steering wheel sensor is replaced, calibrate the steering wheel sensor (refer to GROUP 35C –On-vehicle Service P.35C-267), and initialize the steering angle correction amount stored in AWC-ECU. (Item No.09: Steering angle correction amount initialization P.22A-113.)**
- **Do not drop the G and yaw rate sensor or subject it to a shock.**
- **When G and yaw rate sensor is replaced, calibrate G and yaw rate sensor (refer to GROUP 35C –On-vehicle Service P.35C-266), and initialize the lateral/longitudinal acceleration correction amount stored in AWC-ECU. (Refer to item No.10: Lateral acceleration correction amount initialization, and No. 11: Longitudinal acceleration correction amount initialization P.22A-113.)**

OPERATION

AWC-ECU receives steering wheel data from the steering wheel sensor via CAN communication.

DTC SET CONDITIONS

This diagnostic trouble code is set when the abnormality below is detected:

- The tolerance of neutral position of steering wheel sensor exceeds the specified range.
- Abnormality in steering wheel sensor output value
- Abnormality is detected by a comparison of output value from the steering wheel sensor with the output values from wheel speed sensor and G and yaw rate sensor.

PROBABLE CAUSES

- Improper installation of steering wheel sensor
- Malfunction of steering wheel sensor
- Malfunction of G and yaw rate sensor
- Malfunction of wheel speed sensor
- Malfunction of AWC-ECU
- Vehicle straight-ahead position and steering wheel neutral position is not matched.

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. C1219 set?

YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. Scan tool diagnostic trouble code

Q: Is DTC No. C2205 set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 4.

STEP 4. Scan tool diagnostic trouble code

Check if the wheel speed sensor-related, G and yaw rate sensor-related, or steering wheel sensor-related diagnostic trouble code is set.

Q: Is the DTC set?

YES : Carry out the appropriate troubleshooting. Then go to Step 9.
NO : Go to Step 5.

STEP 5. Check of steering wheel sensor installation status

Check that the steering wheel sensor is installed correctly. (Refer to GROUP 35C –Steering Wheel Sensor P.35C-279.)

Q: Is the check result normal?

YES : Go to Step 6.
NO : Install the steering wheel sensor correctly. Then go to Step 6.

STEP 6. Wheel alignment check

Q: Is the check result normal?

YES : After checking the wheel alignment, calibrate the steering wheel sensor (refer to GROUP 35C – On-vehicle Service P.35C-267,) and initialize AWC-ECU steering angle correction amount (refer to P.22A-113.) Then, go to Step 7.
NO : After adjusting the wheel alignment, calibrate the steering wheel sensor (refer to GROUP 35C – On-vehicle Service P.35C-267,) and initialize AWC-ECU steering angle correction amount (refer to P.22A-113.) Then, go to Step 7.

STEP 7. Scan tool service data

Item 11: Steering wheel sensor (refer to P.22A-107.)

Q: Is the check result normal?

YES : Go to Step 8.
NO : Replace the steering wheel sensor. (Refer to GROUP 35C –Steering Wheel Sensor P.35C-279.) Then, go to Step 9.

STEP 8. Check whether the DTC is reset.

Q: Is DTC No. C1219 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then, go to Step 9.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 9. Check whether the DTC is reset.

Q: Is DTC No. C1219 set?

YES : Return to Step 1.
NO : This diagnosis is complete.

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DTC C121A: Steering Wheel Sensor System (neutral learning abnormality)

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the steering wheel sensor is replaced, calibrate the steering wheel sensor (refer to GROUP 35C –On-vehicle Service P.35C-267), and initialize the steering angle correction amount stored in AWC-ECU. (Item No.09: Steering angle correction amount initialization P.22A-113.)**

OPERATION

Steering wheel sensor stores the neutral position learned by the scan tool. When the neutral position has not been learned, the steering wheel sensor outputs the signal indicating that the learning has not been performed.

DTC SET CONDITIONS

This DTC is set when it is detected that the steering wheel sensor has not learned the neutral position.

PROBABLE CAUSES

- Steering wheel sensor neutral point not learned
- Malfunction of steering wheel sensor
- Malfunction of AWC ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. C121A set?

YES : Go to Step 3.

NO : This diagnosis is complete.

STEP 3. Steering wheel sensor calibration

Perform calibration of the steering wheel sensor. (Refer to GROUP 35C –On-vehicle Service P.35C-267.)

Q: Has the calibration succeeded?

YES : Go to Step 4.

NO : Replace the steering wheel sensor. (Refer to GROUP 35C –Steering Wheel Sensor P.35C-279.) Then, go to Step 4.

STEP 4. Check whether the DTC is reset.

Q: Is DTC No. C121A set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then, go to Step 5.

NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 5. Check whether the DTC is reset.

Q: Is DTC No. C121A set?

YES : Return to Step 1.
NO : This diagnosis is complete.

DTC C123C: G and Yaw Rate Sensor (Faulty Signal)

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the steering wheel sensor is replaced, calibrate the steering wheel sensor (refer to GROUP 35C –On-vehicle Service P.35C-267), and initialize the steering angle correction amount stored in AWC-ECU. (Item No.09: Steering angle correction amount initialization P.22A-113.)**
- **Do not drop the G and yaw rate sensor or subject it to a shock.**
- **When G and yaw rate sensor is replaced, calibrate G and yaw rate sensor (refer to GROUP 35C –On-vehicle Service P.35C-266), and initialize the lateral/longitudinal acceleration correction amount stored in AWC-ECU. (Refer to item No.10: Lateral acceleration correction amount initialization, and No. 11: Longitudinal acceleration correction amount initialization P.22A-113.)**

OPERATION

The G and yaw rate sensor outputs the signal to ASC-ECU and AWC-ECU via the special CAN bus lines.

DTC SET CONDITIONS

This diagnostic trouble code is set when the abnormality below is detected:

- Abnormality in G and yaw rate sensor output value
- This diagnostic trouble code is set when AWC-ECU determines that an abnormality is present by comparing the measurement values of G and yaw rate sensor with the calculation value of G and yaw rate calculated by the measurement values of the wheel speed sensor and steering wheel sensor.

PROBABLE CAUSES

- Improper installation of G and yaw rate sensor
- Malfunction of G and yaw rate sensor
- Malfunction of wheel speed sensor
- Malfunction of steering wheel sensor
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. C123C set?

YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. Scan tool diagnostic trouble code

Q: Is DTC No. C2204 set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 4.

STEP 4. Scan tool diagnostic trouble code

Check if the local CAN communication-related, wheel speed sensor-related, or steering wheel sensor-related diagnostic trouble code is set.

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 5.

STEP 5. Check of G and yaw rate sensor installation status

Check that the G and yaw rate sensor is installed correctly. (Refer to GROUP 35C –G and Yaw Rate Sensor P.35C-278.)

Q: Is the check result normal?

YES : Go to Step 6.
NO : Reinstall the G and yaw rate sensor correctly. Then go to Step 6.

STEP 6. Scan tool service data

Check the following service data. (Refer to P.22A-107.)

- Item No. 26: Yaw rate sensor
- Item No. 29: Lateral G sensor

Q: Is the check result normal?

YES : Go to Step 7.
NO : Replace the G and yaw rate sensor. (Refer to GROUP 35C –G and Yaw Rate Sensor P.35C-278.) Then go to Step 11.

STEP 7. Check of steering wheel sensor installation status

Check that the steering wheel sensor is installed correctly. (Refer to GROUP 35C –Steering Wheel Sensor P.35C-279.)

Q: Is the check result normal?

YES : Go to Step 8.
NO : Install the steering wheel sensor correctly. Then go to Step 8.

STEP 8. Wheel alignment check

Q: Is the check result normal?

YES : After checking the wheel alignment, calibrate the steering wheel sensor (refer to GROUP 35C – On-vehicle Service P.35C-267,) and initialize AWC-ECU steering angle correction amount (refer to P.22A-113.) Then go to Step 9.

NO : After adjusting the wheel alignment, calibrate the steering wheel sensor (refer to GROUP 35C – On-vehicle Service P.35C-267,) and initialize AWC-ECU steering angle correction amount (refer to P.22A-113.) Then go to Step 9.

STEP 9. Scan tool service data

Item 11: Steering wheel sensor (refer to P.22A-107.)

Q: Is the check result normal?

YES : Go to Step 10.

NO : Replace the steering wheel sensor. (Refer to GROUP 35C –Steering Wheel Sensor P.35C-279.) Then go to Step 10.

STEP 10. Check whether the DTC is reset.

Q: Is DTC No. C123C set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 11.

NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 11. Check whether the DTC is reset.

Q: Is DTC No. C123C set?

YES : Return to Step 1.

NO : This diagnosis is complete.

DTC C1242: G and Yaw Rate Sensor (Longitudinal G Output Data Error)

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**
- **Do not drop the G and yaw rate sensor or subject it to a shock.**
- **When G and yaw rate sensor is replaced, calibrate G and yaw rate sensor (refer to GROUP 35C –On-vehicle Service P.35C-266), and initialize the lateral/longitudinal acceleration correction amount stored in AWC-ECU. (Refer to item No.10: Lateral acceleration correction amount initialization, and No. 11: Longitudinal acceleration correction amount initialization P.22A-113.)**

OPERATION

The G and yaw rate sensor outputs the signal to ASC-ECU and AWC-ECU via the special CAN bus lines.

DTC set conditions

This diagnostic trouble code is set when the abnormality below is detected:

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- Abnormality in G and yaw rate sensor output value
- This diagnostic trouble code is set when AWC-ECU determines that an abnormality is present by comparing the longitudinal G that is output from the G and yaw rate sensor during braking with the calculation value calculated by the data from the wheel speed sensor.

PROBABLE CAUSES

- Improper installation of G and yaw rate sensor
- Malfunction of G and yaw rate sensor
- Malfunction of wheel speed sensor
- Malfunction of stoplight switch
- Malfunction of AWC-ECU
- Malfunction of ASC-ECU

Diagnostic procedure

STEP 1. Scan tool CAN bus diagnostics
Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. C1242 set?

YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. Scan tool diagnostic trouble code
Check the ASC diagnostic trouble code. (Refer to GROUP 35C –Troubleshooting P.35C-20.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 4.

STEP 4. Scan tool diagnostic trouble code

Q: Is DTC No. C2204 set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 5.

STEP 5. Scan tool diagnostic trouble code
Check if the local CAN communication-related, stoplight switch-related, or wheel speed sensor-related diagnostic trouble code is set.

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 6.

STEP 6. Check of G and yaw rate sensor installation status

Check that the G and yaw rate sensor is installed correctly. (Refer to GROUP 35C –G and Yaw Rate Sensor P.35C-278.)

Q: Is the check result normal?

YES : Go to Step 7.
NO : Reinstall the G and yaw rate sensor correctly. Then go to Step 7.

STEP 7. Scan tool service data

Item No. 31: Longitudinal G sensor (refer to P.22A-107.)

Q: Is the check result normal?

YES : Go to Step 8.
NO : Replace the G and yaw rate sensor. (Refer to GROUP 35C –G and Yaw Rate Sensor P.35C-278.) Then go to Step 8.

STEP 8. Check whether the DTC is reset.

Q: Is DTC No. C1242 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 9.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 9. Check whether the DTC is reset.

Q: Is DTC No. C1242 set?

YES : Return to Step 1.
NO : This diagnosis is complete.

DTC C1610: AWC Actuator Power Supply Electronic Relay Malfunction

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION

A relay is incorporated in AWC-ECU, and the power is supplied to the actuator via this relay.

DTC SET CONDITIONS

When the actuator power supply relay in AWC-ECU is seized, the code is set.

PROBABLE CAUSES

- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. C1610 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.)

NO : This diagnosis is complete.

STEP 3. Check whether the DTC is reset.

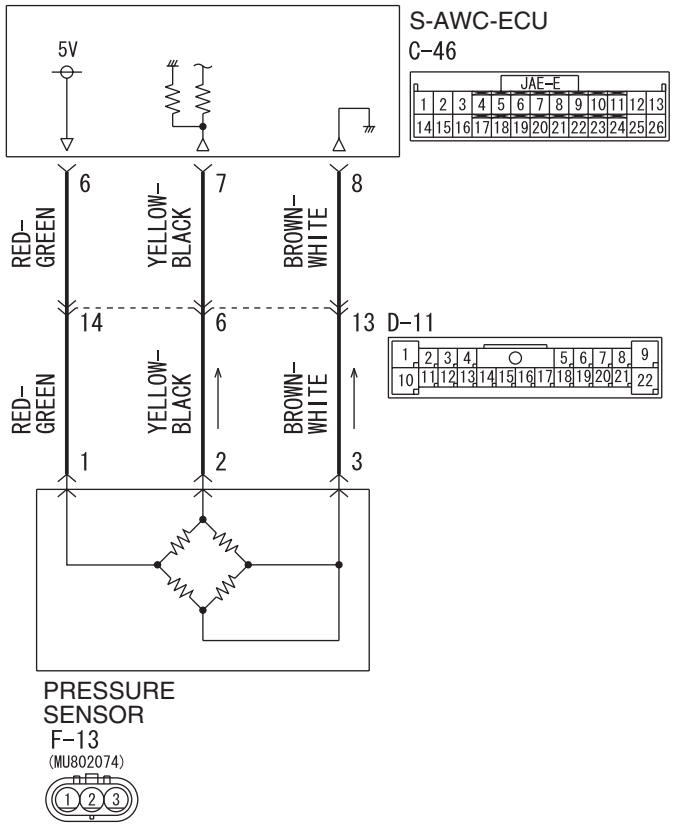
Q: Is DTC No. C1610 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.)

NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC C1611: AWC Pressure Sensor System (Low Voltage)

AWC pressure sensor system circuit



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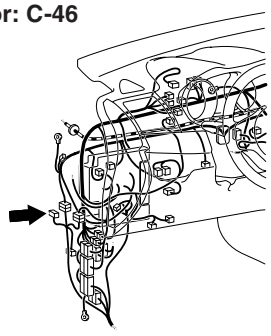
Connector: C-46



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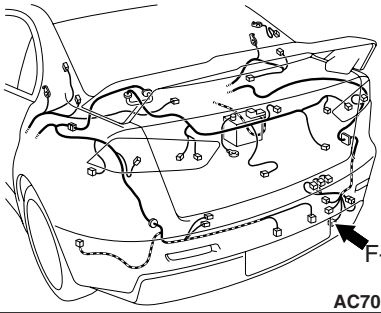
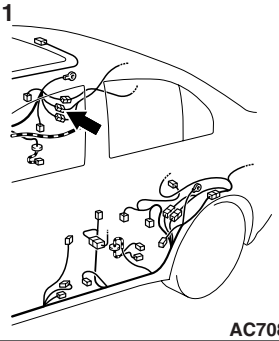
Connector: F-13



AC708970AS

Connector: D-11



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⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION

AWC-ECU controls the electric pump by the information from AWC pressure sensor.

DTC SET CONDITIONS

The code is set when AWC pressure sensor output voltage is 0.2 V or less.

PROBABLE CAUSES

- AWC pressure sensor malfunction
- Damaged harness wires and connectors
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. C1611 set?

YES : Go to Step 3.

NO : This diagnosis is complete.

STEP 3. AWC-ECU connector, intermediate connector, AWC pressure sensor connector check: C-46, D-11, F-13

Q: Is the check result normal?

YES : Go to Step 4.

NO : Repair the defective connector. Then go to Step 7.

STEP 4. Check the wiring harness between C-46 AWC-ECU connector terminal No. 7 and F-13 AWC pressure sensor connector terminal No. 2.

Check the wiring harness for short circuit.

Q: Is the check result normal?

YES : Go to Step 5.

NO : Repair the wiring harness. Then go to Step 7.

STEP 5. Scan tool service data

Item No. 87: Pressure sensor output voltage (Refer to service data reference table P.22A-107.)

Q: Is the check result normal?

YES : Go to Step 6.

NO : Replace the hydraulic unit. (Refer to GROUP 27 – Hydraulic Unit P.27-58.) Then go to Step 6.

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STEP 6. Check whether the DTC is reset.

Q: Is DTC No. C1611 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then, go to Step 7.

NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 7. Check whether the DTC is reset.

Q: Is DTC No. C1611 set?

YES : Return to Step 1.

NO : This diagnosis is complete.

DTC C1612: AWC Pressure Sensor System (High Voltage)

AWC PRESSURE SENSOR SYSTEM CIRCUIT

Refer to P.22A-33.

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION

AWC-ECU controls the electric pump by the information from AWC pressure sensor.

DTC SET CONDITIONS

The code is set when AWC pressure sensor output voltage is 4.6 V or more.

PROBABLE CAUSES

- AWC pressure sensor malfunction
- Damaged harness wires and connectors
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. C1612 set?

YES : Go to Step 3.

NO : This diagnosis is complete.

STEP 3. Scan tool diagnostic trouble code
Check if the AWC-related DTC No. C1625 is set.(Refer to P.22A-11.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting. Then go to Step 9.
NO : Go to Step 4.

STEP 4. AWC-ECU connector, intermediate connector, AWC pressure sensor connector check: C-46, D-11, F-13

Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair the defective connector. Then go to Step 9.

STEP 5. Check the wiring harness between C-46 AWC-ECU connector terminal No. 7 and F-13 AWC pressure sensor connector terminal No. 2.
Check the wiring harness for open or short circuit (short to power supply).

Q: Is the check result normal?

YES : Go to Step 6.
NO : Repair the wiring harness. Then go to Step 9.

STEP 6. Check the wiring harness between C-46 AWC-ECU connector terminal No. 8 and F-13 AWC pressure sensor connector terminal No. 3.
Check the wiring harness for open circuit.

Q: Is the check result normal?

YES : Go to Step 7.
NO : Check D-11 intermediate connector. When no problem is found, repair the wiring harness. Then go to Step 9.

STEP 7. Scan tool service data
Item No. 87: Pressure sensor output voltage (Refer to service data reference table P.22A-107.)

Q: Is the check result normal?

YES : Go to Step 8.
NO : Replace the hydraulic unit. (Refer to GROUP 27 – Hydraulic Unit P.27-58.) Then go to Step 8.

STEP 8. Check whether the DTC is reset.

Q: Is DTC No. C1612 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 9.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

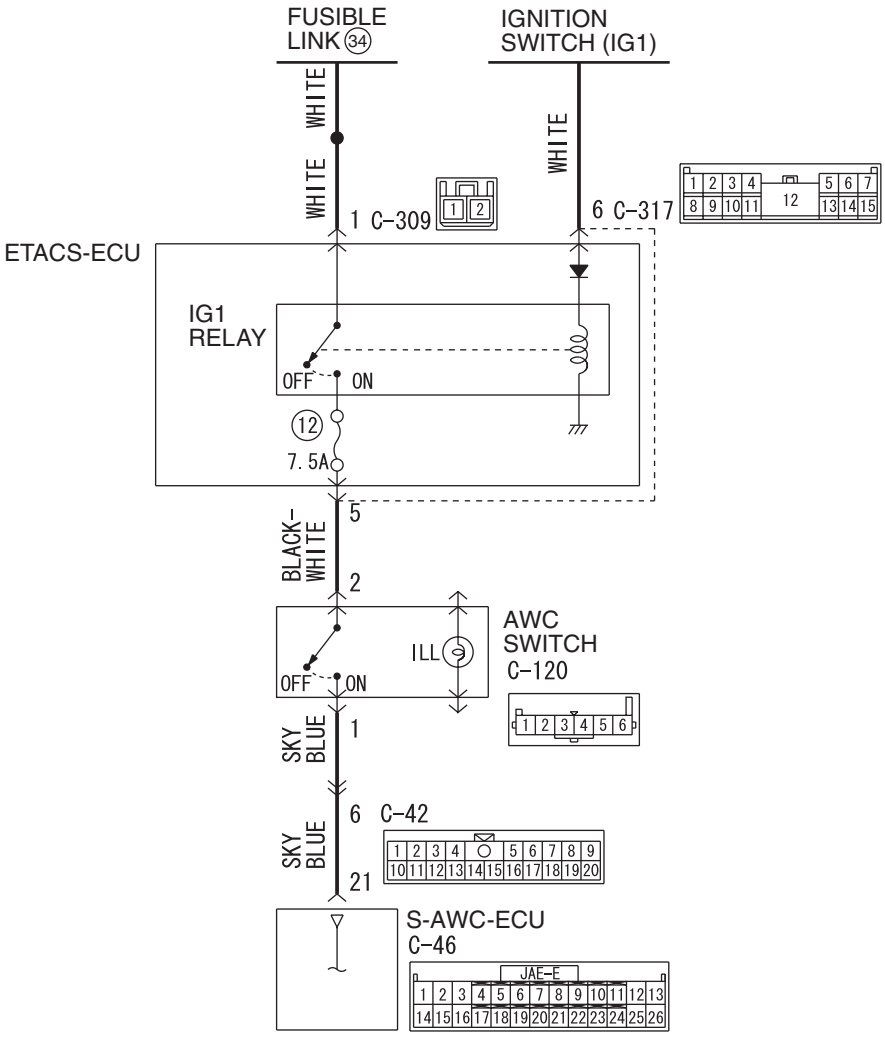
STEP 9. Check whether the DTC is reset.

Q: Is DTC No. C1612 set?

YES : Return to Step 1.
NO : This diagnosis is complete.

DTC C1613: AWC Mode Select Switch System (Clogging) <Vehicles with steering audio remote control switch >

AWC mode select switch system circuit



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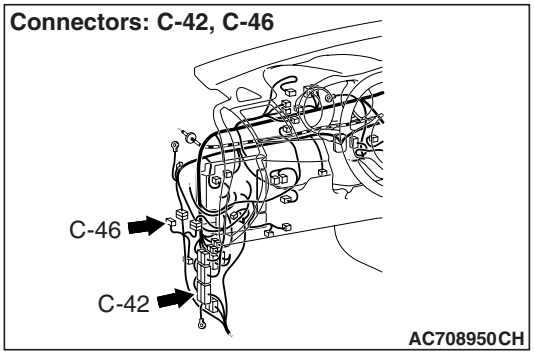
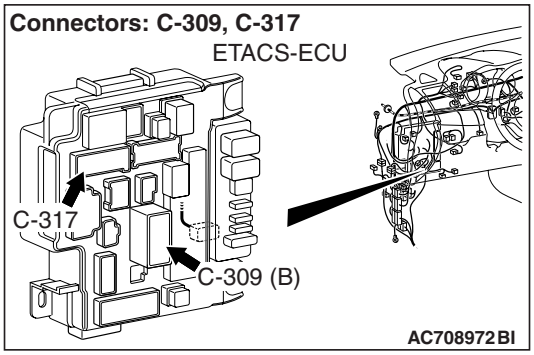
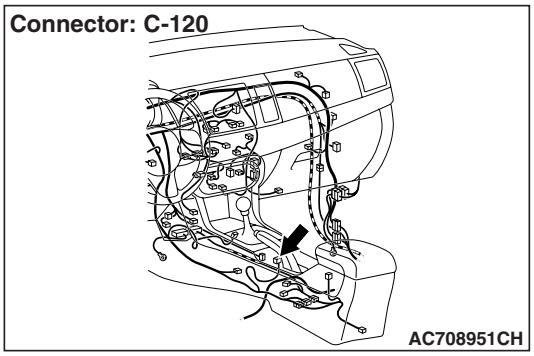






⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION

- AWC-ECU controls the driving mode by the information from AWC switch.
- AWC-ECU sends AWC control mode to the combination meter via ETACS-ECU.

DTC SET CONDITIONS

If the AWC switch is stuck on, the code is set.

PROBABLE CAUSES

- AWC switch malfunction
- Damaged harness wires and connectors
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. C1613 set?

YES : Go to Step 3.

NO : This diagnosis is complete.

STEP 3. Intermediate connector, AWC-ECU connector, AWC switch connector check: C-42, C-46, C-120

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair the defective connector. Then go to Step 8.

STEP 4. Wiring harness check between C-46 AWC-ECU connector terminal No. 21 and C-120 AWC switch connector terminal No. 1

Check the wiring harness for short circuit (short to power supply).

Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair the wiring harness. Then go to Step 8.

STEP 5. Scan tool service data

Item No. 89: AWC switch (Refer to service data reference table P.22A-107.)

Q: Is the check result normal?

YES : Go to Step 7.
NO : Go to Step 6.

STEP 6. AWC switch single unit check

Check the AWC switch.(Refer to P.22A-133.)

Q: Is the check result normal?

YES : Go to Step 7.
NO : Replace the AWC switch.(Refer to P.22A-132.) Then go to Step 8.

STEP 7. Check whether the DTC is reset.

Q: Is DTC No. C1613 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 8.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

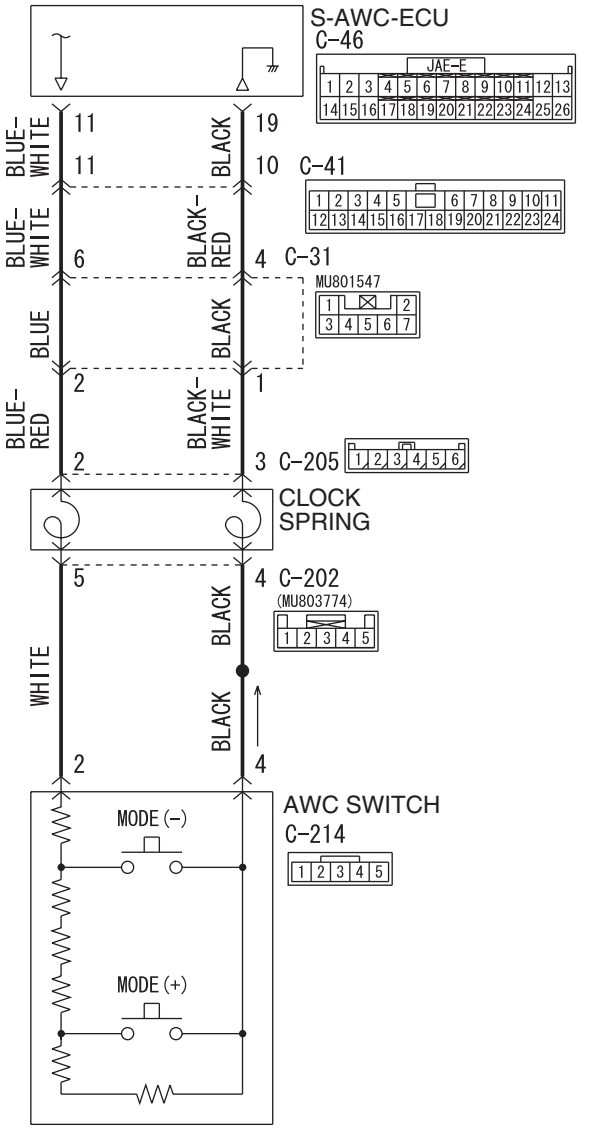
STEP 8. Check whether the DTC is reset.

Q: Is DTC No. C1613 set?

YES : Return to Step 1.
NO : This diagnosis is complete.

DTC C1613: AWC Mode Select Switch System (Clogging) <Vehicles without steering audio remote control switch >

AWC mode select switch system circuit



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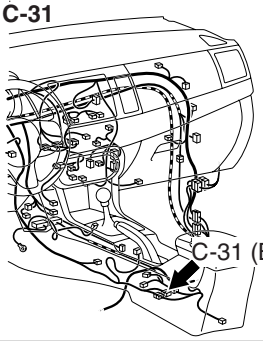
Connector: C-31



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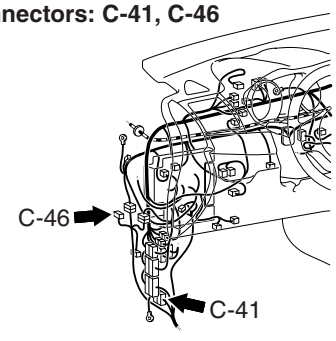
Connectors: C-41, C-46



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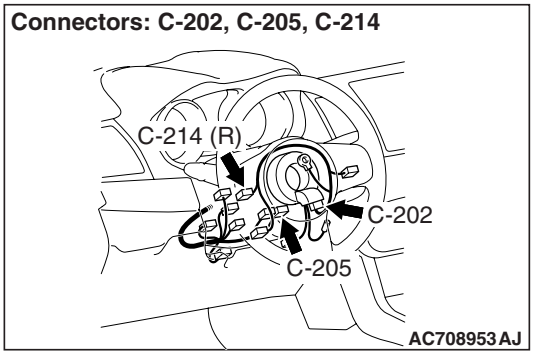


⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION

- AWC-ECU controls the driving mode by the information from AWC switch.
- AWC-ECU sends AWC control mode to the combination meter via ETACS-ECU.

DTC SET CONDITIONS

If the AWC switch is stuck on, the code is set.

PROBABLE CAUSES

- AWC switch malfunction
- Damaged harness wires and connectors
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. C1613 set?

YES : Go to Step 3.

NO : This diagnosis is complete.

STEP 3. AWC-ECU connector, intermediate connector, clock spring connector, AWC switch connector check: C-46, C-31, C-41, C-202, C-205, C-214

Q: Is the check result normal?

YES : Go to Step 4.

NO : Repair the defective connector. Then go to Step 8.

STEP 4. Wiring harness check between C-46 AWC-ECU connector terminal No. 11 and C-214 AWC switch connector terminal No. 2

Check that the wiring harness is not shorted (short to ground).

Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair the wiring harness. Then go to Step 8.

STEP 5. Scan tool service data

Item No. 90, 91: AWC switch (Refer to service data reference table P.22A-107.)

Q: Is the check result normal?

YES : Go to Step 7.
NO : Go to Step 6.

STEP 6. AWC switch single unit check

Check the AWC switch.(Refer to P.22A-133.)

Q: Is the check result normal?

YES : Go to Step 7.
NO : Replace the AWC switch.(Refer to P.22A-132.) Then go to Step 8.

STEP 7. Check whether the DTC is reset.

Q: Is DTC No. C1613 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 8.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

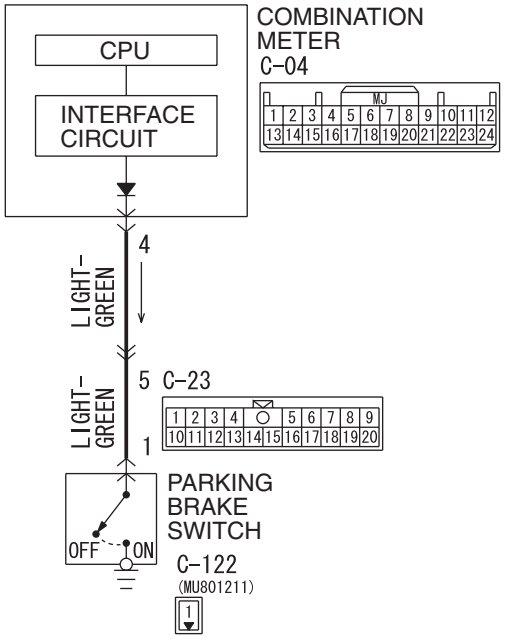
STEP 8. Check whether the DTC is reset.

Q: Is DTC No. C1613 set?

YES : Return to Step 1.
NO : This diagnosis is complete.

DTC C1614: Parking Brake Switch System (Clogging ON)

Parking brake switch system circuit



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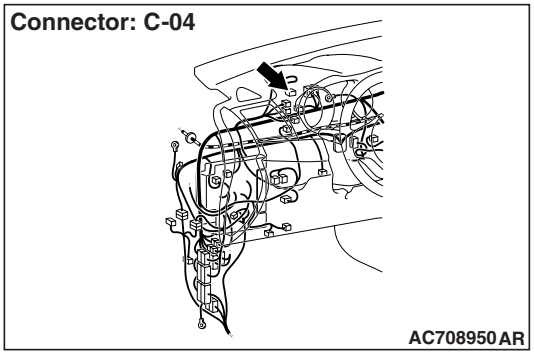
Connector: C-04



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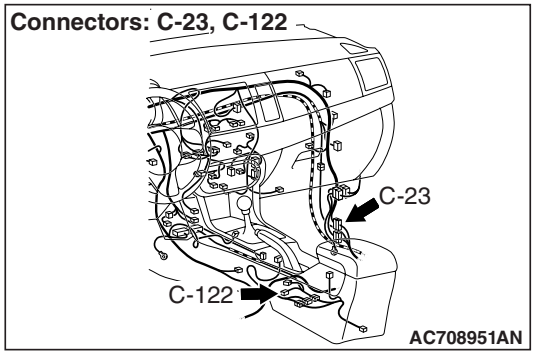
Connectors: C-23, C-122



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⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION

AWC-ECU receives the parking brake switch signal from the combination meter via ETACS-ECU.

DTC SET CONDITIONS

If the parking brake switch is stuck on, the code is set.

PROBABLE CAUSES

- Parking brake switch malfunction
- Damaged harness wires and connectors
- Malfunction of the ETACS-ECU
- Malfunction of the combination meter
- Malfunction of AWC-ECU
- Driving with the parking brake pulled

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DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics
Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. C1614 set?

YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. Scan tool service data
Item 40: Parking brake switch (Refer to service data reference table P.22A-107.)

Q: Is the check result normal?

YES : Go to Step 9.
NO : Go to Step 4.

STEP 4. Scan tool diagnostic trouble code

- Check whether the combination meter-related DTC is set. (Refer to GROUP 54A –Troubleshooting P.54A-28.)
- Check the ETACS diagnostic trouble code. (Refer to GROUP 54A –Troubleshooting P.54A-582.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 5.

STEP 5. Check the parking brake switch as single unit.
Check the parking brake switch. (Refer to GROUP 36 – On-vehicle Service P.36-12.)

Q: Is the check result normal?

YES : Go to Step 6.
NO : Replace the parking brake switch. (Refer to GROUP 36 –Parking Brake Lever P.36-13.) Then go to Step 9.

STEP 6. Combination meter connector, intermediate connector, and parking brake switch connector check: C-04, C-23, C-122

Q: Is the check result normal?

YES : Go to Step 7.
NO : Repair the defective connector. Then go to Step 9.

STEP 7. Check the wiring harness between C-04 combination meter connector terminal No. 4 and C-122 parking brake switch connector terminal No. 1.
Check that the wiring harness is not shorted (short to ground).

Q: Is the check result normal?

YES : Replace the combination meter. (Refer to GROUP 54A –Combination Meter P.54A-101.) Then go to Step 8.
NO : Repair the wiring harness. Then go to Step 8.

STEP 8. Check whether the DTC is reset.

Q: Is DTC No. C1614 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 9.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 9. Check whether the DTC is reset.

Q: Is DTC No. C1614 set?

YES : Return to Step 1.
NO : This diagnosis is complete.

DTC C1615: Brake control prohibition request

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION

AWC-ECU receives brake control signal from ASC-ECU via the CAN communication.

DTC SET CONDITIONS

The code is set when brake control prohibition request is received from ASC-ECU.

PROBABLE CAUSES

- Malfunction of ASC-ECU
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics
Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. C1615 set?

YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. Scan tool diagnostic trouble code

Check if the ASC diagnostic trouble code No. U0251, U0435, or U0440 is set. (Refer to GROUP 35C –Troubleshooting P.35C-20.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 4.

STEP 4. Scan tool diagnostic trouble code

Check other AWC diagnostic trouble code.(Refer to P.22A-11.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 5.

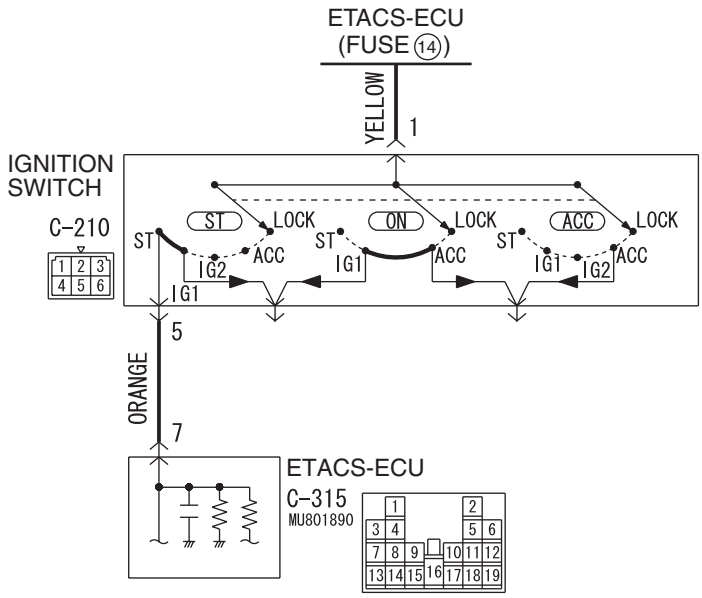
STEP 5. Check whether the DTC is reset.

Q: Is DTC No. C1615 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.)
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

DTC C1616: Cranking Signal System (ON sticking)

Cranking signal system circuit



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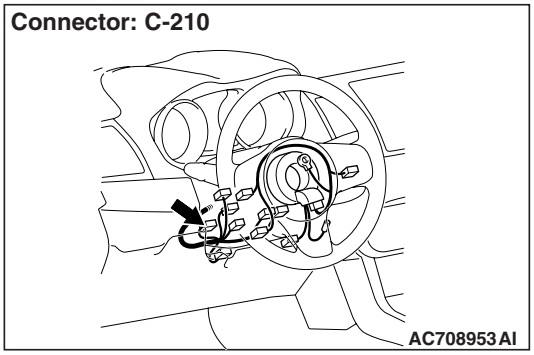
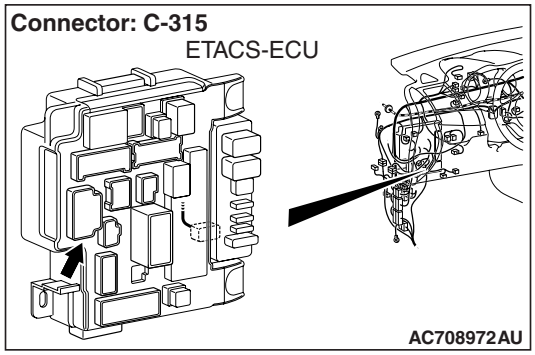




⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION

AWC-ECU receives the signal of the ignition switch from ETACS-ECU via CAN communication.

DTC SET CONDITIONS

The code is set when the cranking signal is set for five seconds or more continuously while driving.

PROBABLE CAUSES

- Malfunction of the ETACS-ECU
- Ignition switch malfunction
- Damaged harness wires and connectors
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. C1616 set?

YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. Scan tool diagnostic trouble code

- Check the KOS diagnostic trouble code. (Refer to GROUP 42B –Troubleshooting P.42B-20.)
- Check the WCM diagnostic trouble code. (Refer to GROUP 42C –Troubleshooting P.42C-14.)
- Check the ETACS diagnostic trouble code. (Refer to GROUP 54A –Troubleshooting P.54A-582.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 4.

STEP 4. Scan tool service data

Item 42: Ignition switch (Refer to Service Data Reference Table P.22A-107.)

Q: Is the check result normal?

YES : Go to Step 9.
NO : Go to Step 5.

STEP 5. Ignition switch check

(1) Disconnect C-210 ignition switch connector, and check the continuity between the terminals No. 1 and No. 5 at the ignition switch side.
(2) Turn the ignition switch to the "ON" position.

OK: No continuity

Q: Is the check result normal?

YES : Go to Step 6.
NO : Replace the ignition switch. (Refer to GROUP 54A – Ignition Switch P.54A-19.) Then go to Step 10.

STEP 6. Ignition switch connector, ETACS-ECU connector check: C-210, C-315

Q: Is the check result normal?

YES : Go to Step 7.
NO : Repair the defective connector. Then go to Step 10.

STEP 7. Check the wiring harness between C-210 ignition switch connector terminal No. 5 and C-315 ETACS-ECU connector terminal No. 7.

Check the wiring harness for short circuit (short to power supply).

Q: Is the check result normal?

YES : Go to Step 8.
NO : Repair the wiring harness. Then go to Step 10.

STEP 8. Scan tool service data

ETACS item No. 287: Starter switch (Refer to GROUP 54A – ETACS P.54A-630.)

Q: Is the check result normal?

YES : Go to Step 9.
NO : Replace the ETACS-ECU. (Refer to GROUP 54A – ETACS-ECU P.54A-676.) Then go to Step 9.

STEP 9. Check whether the DTC is reset.

Q: Is DTC No. C1616 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 10.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 10. Check whether the DTC is reset.

Q: Is DTC No. C1616 set?

YES : Return to Step 1.
NO : This diagnosis is complete.

DTC C1617: AWC CAN Main Data System (data not received)

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION

AWC-ECU receives various data from ECU via CAN communication.

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

The code is set when the signal necessary for AWC control cannot be received.

PROBABLE CAUSES

- The CAN bus line is defective.
- Malfunction of engine control module
- Malfunction of ASC-ECU
- Malfunction of steering wheel sensor
- Malfunction of the ETACS-ECU
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. C1617 set?

YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. Scan tool diagnostic trouble code

Check if the AWC-related DTC No. U0100, U0101, U0121, U0126, or U0141 is set.(Refer to P.22A-11.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 4.

STEP 4. Scan tool diagnostic trouble code

- Check the engine diagnostic trouble code. (Refer to GROUP 13A –Troubleshooting P.13A-44.)
- Check the ASC diagnostic trouble code. (Refer to GROUP 35C –Troubleshooting P.35C-20.)
- Check the ETACS diagnostic trouble code. (Refer to GROUP 54A –Troubleshooting P.54A-582.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 5.

STEP 5. Check whether the DTC is reset.

Q: Is DTC No. C1617 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 6.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 6. Check whether the DTC is reset.

Q: Is DTC No. C1613 set?

YES : Return to Step 1.
NO : This diagnosis is complete.

DTC C1618: AWC CAN Local Data System (data not received)

G AND YAW RATE SENSOR POWER SUPPLY

Refer to P.22A-72.

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**
- **Do not drop the G and yaw rate sensor or subject it to a shock.**
- **When G and yaw rate sensor is replaced, calibrate G and yaw rate sensor (refer to GROUP 35C –On-vehicle Service P.35C-266), and initialize the lateral/longitudinal acceleration correction amount stored in AWC-ECU. (Refer to item No.10: Lateral acceleration correction amount initialization, and No. 11: Longitudinal acceleration correction amount initialization P.22A-113.)**

OPERATION

AWC-ECU receives various data from ASC-ECU, G and yaw rate sensor via the local CAN communication.

DTC SET CONDITIONS

The code is set when the signal necessary for AWC control cannot be received.

PROBABLE CAUSES

- The CAN bus line is defective.
- Malfunction of local CAN bus line
- Malfunction of ASC-ECU
- Malfunction of G and yaw rate sensor
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics
Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. C1618 set?

YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. Scan tool diagnostic trouble code
Check if the AWC diagnostic trouble code No. U1003 is set.(Refer to P.22A-11.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 4.

STEP 4. Scan tool diagnostic trouble code
Check the ASC diagnostic trouble code. (Refer to GROUP 35C –Troubleshooting P.35C-20.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 5.

STEP 5. ASC-ECU connector, G and yaw rate sensor connector, AWC-ECU connector, intermediate connector, J/C (7) check: A-05, C-38, C-46, C-47, C-50

Q: Is the check result normal?

YES : Go to Step 6.
NO : Repair the defective connector. Then go to Step 10.

STEP 6. Check the wiring harness between C-46 AWC-ECU connector terminal No. 9, 10 and C-38 G and yaw rate sensor connector terminal No. 2, 3, and between C-46 AWC-ECU connector terminal No. 9, 10 and A-05 ASC-ECU connector terminal No. 18, 19.
Check the wiring harness for open and short circuit (to ground, to power supply, or line-to line).

Q: Is the check result normal?

YES : Go to Step 7.
NO : Repair the wiring harness. Then go to Step 9.

STEP 7. Scan tool service data

Check the following service data. (Refer to P.22A-107.)

- Item No. 26: Yaw rate sensor
- Item No. 29: Lateral G sensor
- Item No. 31: Longitudinal G sensor

Q: Is the check result normal?

YES : Go to Step 9.
NO : Go to Step 8.

STEP 8. Check the wiring harness between A-05 ASC-ECU connector terminal No. 22 and C-38 G and yaw rate sensor connector terminal No. 1, and between A-05 ASC-ECU connector terminal No. 29 and C-38 G and yaw rate sensor connector terminal No. 5.

Check the wiring harness for open or short circuit (short to ground).

Q: Is the check result normal?

YES : Replace the G and yaw rate sensor. (Refer to GROUP 35C –G and Yaw Rate Sensor P.35C-278.) Then go to Step 9.
NO : Repair the wiring harness. Then go to Step 10.

STEP 9. Check whether the DTC is reset.

Q: Is DTC No. C1618 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 10.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

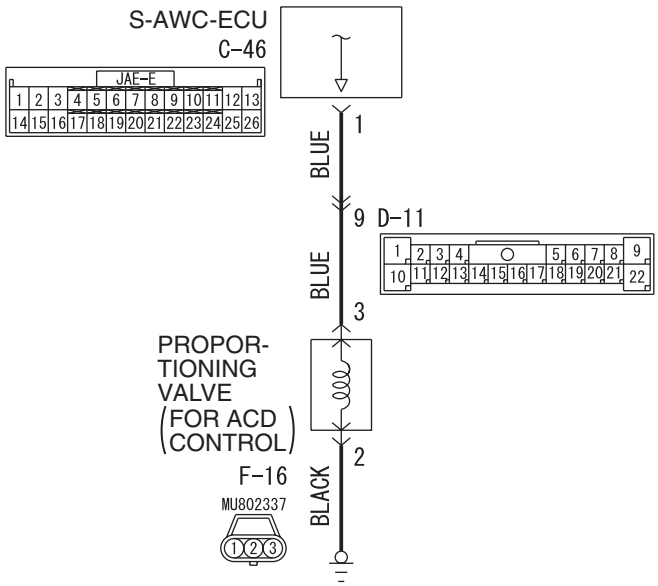
STEP 10. Check whether the DTC is reset.

Q: Is DTC No. C1618 set?

YES : Return to Step 1.
NO : This diagnosis is complete.

DTC C161C: ACD Proportioning Valve System (Malfunction)

ACD proportioning valve system



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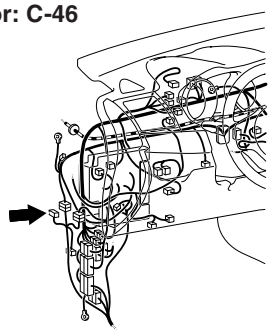
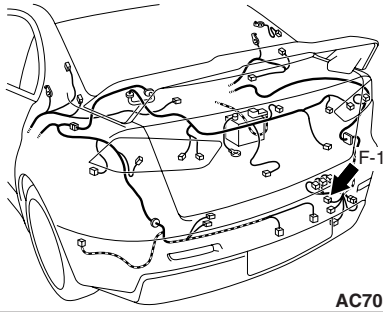
Connector: C-46



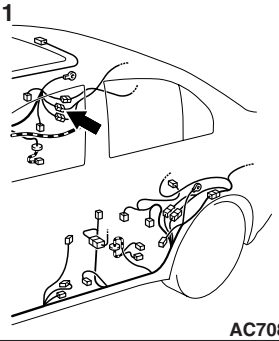
AC708950CG

Connector: F-16



AC708970AT

Connector: D-11



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⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION

AWC-ECU controls ACD proportioning valve.

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DTC SET CONDITIONS

The code is set when the current monitor value of the ACD proportioning valve solenoid is determined to be abnormal.

PROBABLE CAUSES

- ACD proportioning valve malfunction
- Damaged harness wires and connectors
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics
Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. C161C set?

YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. ACD proportioning valve single unit check
Measure the resistance of ACD proportioning valve.

Standard value: 3.7 ±0.3 Ω

Q: Is the check result normal?

YES : Go to Step 4.
NO : Replace the hydraulic unit. (Refer to GROUP 27 – Hydraulic Unit P.27-58.) Then go to Step 8.

STEP 4. AWC-ECU connector, intermediate connector, proportioning valve (for ACD) connector check: C-46, D-11, F-16

Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair the defective connector. Then go to Step 8.

STEP 5. Check the wiring harness between C-46 AWC-ECU connector terminal No. 1 and F-16 proportioning valve (for ACD) connector terminal No. 3 and between F-16 proportioning valve (for ACD) connector terminal No. 2 and body ground.
Check the output line and ground line for open or short circuit.

Q: Is the check result normal?

YES : Go to Step 6.
NO : Repair the wiring harness. Then go to Step 8.

STEP 6. Scan tool service data

Item 92: ACD proportional valve indicator current (Refer to service data reference table P.22A-107.)

Q: Is the check result normal?

YES : Go to Step 7.

NO : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 7.

STEP 7. Check whether the DTC is reset.

Q: Is DTC No. C161C set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 8.

NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 8. Check whether the DTC is reset.

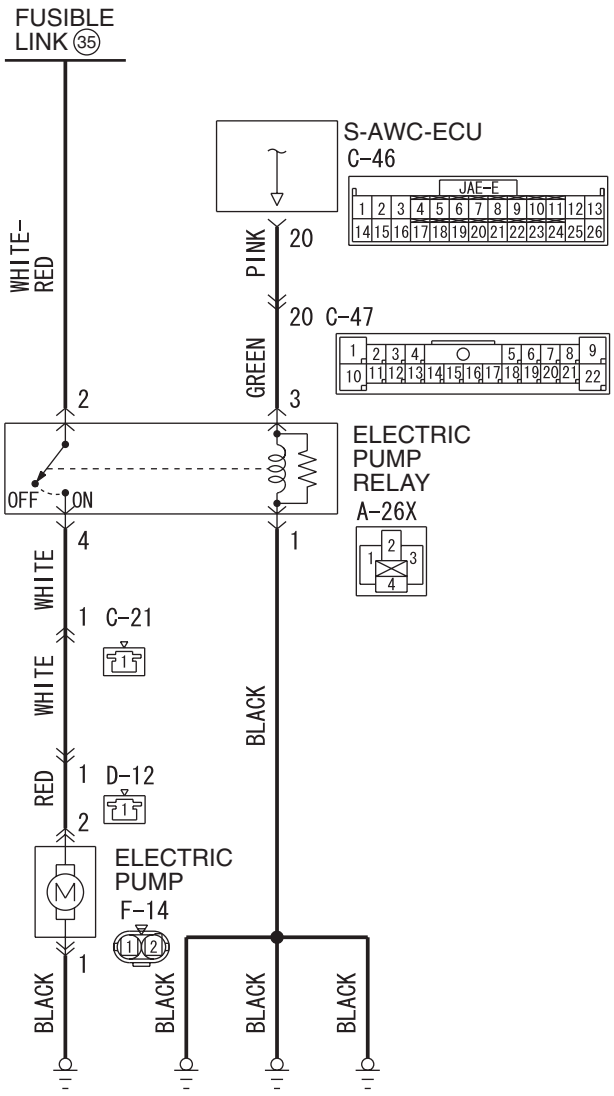
Q: Is DTC No. C161C set?

YES : Return to Step 1.

NO : This diagnosis is complete.

DTC C161D: Electric Pump Relay Circuit System (Malfunction)

AWC pump relay circuit system circuit



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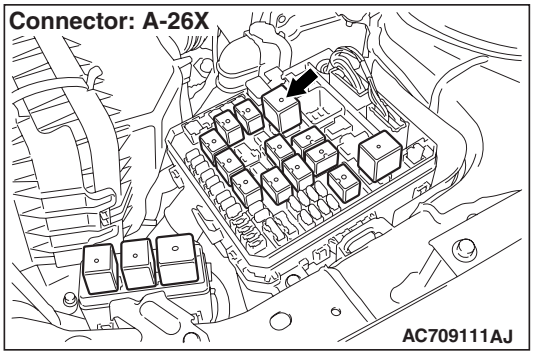

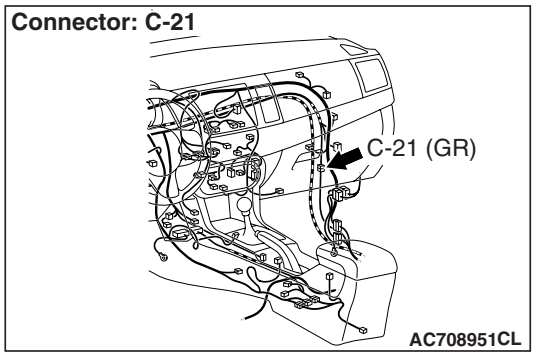

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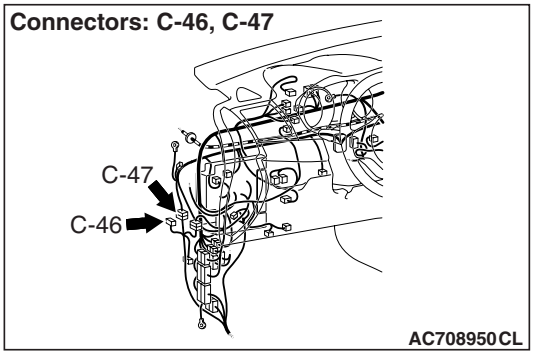
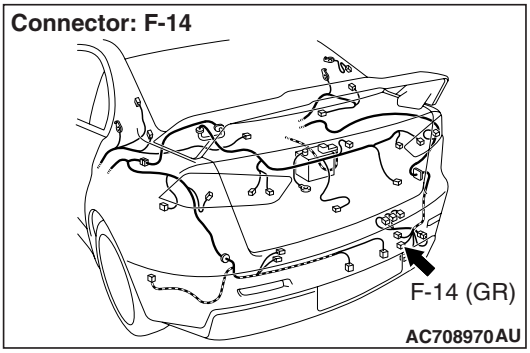
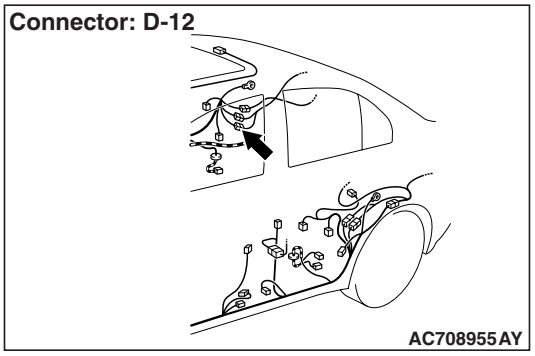
Connectors: C-46, C-47



Connector: F-14



Connector: D-12



⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION

AWC-ECU operates the electric pump via the electric pump relay.

DTC SET CONDITIONS

The code is set when the electric pump relay coil side circuit is open or shorted.

PROBABLE CAUSES

- Electric pump relay malfunction
- Damaged harness wires and connectors
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. C161D set?

YES : Go to Step 3.

NO : This diagnosis is complete.

STEP 3. Scan tool actuator test

OK: Operating sound of the electric pump can be heard.

Q: Is the check result normal?

YES : Go to Step 8.
NO : Go to Step 4.

STEP 4. Electric pump relay single unit check

Check the electric pump relay.(Refer to P.22A-133.)

Q: Is the check result normal?

YES : Go to Step 5.
NO : Replace the electric pump relay. (Refer to P.22A-132.) Then go to Step 9.

STEP 5. Electric pump relay connector, AWC-ECU connector check: A-26X, C-46

Q: Is the check result normal?

YES : Go to Step 6.
NO : Repair the defective connector. Then go to Step 9.

STEP 6. Check the wiring harness between A-26X electric pump relay connector terminal No. 3 and C-46 AWC-ECU connector terminal No. 20.

Check the power supply line for short or open circuit.

Q: Is the check result normal?

YES : Go to Step 7.
NO : Check C-47 intermediate connector. When no problem is found, repair the wiring harness. Then go to Step 9.

STEP 7. Check the wiring harness between A-26X electric pump relay connector terminal No. 1 and body ground.

Check the ground line for open circuit.

Q: Is the check result normal?

YES : Go to Step 8.
NO : Repair the wiring harness. Then go to Step 9.

STEP 8. Check whether the DTC is reset.

Q: Is DTC No. C161D set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 9.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 9. Check whether the DTC is reset.

Q: Is DTC No. C161D set?

YES : Return to Step 1.
NO : This diagnosis is complete.

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DTC C161E: Electric Pump Relay Circuit System (Stuck)

AWC PUMP RELAY SYSTEM CIRCUIT

Refer to P.22A-56.

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION

AWC-ECU controls the electric pump by the information from AWC pressure sensor and electric pump relay.

DTC SET CONDITIONS

The code is set when the electric pump operation signal is output from AWC-ECU, and when the AWC pressure sensor signal is not reached the specified pressure after the specified time has elapsed.

PROBABLE CAUSES

- Fluid malfunction (low fluid level)
- AWC pressure sensor malfunction
- Electric pump relay malfunction
- Hydraulic unit malfunction
- Electric pump malfunction
- Damaged harness wires and connectors
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. C161E set?

YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. Fluid check

Check that the fluid level is adequate. (Refer to GROUP 27 – On-vehicle Service P.27-29.)

Q: Is the check result normal?

YES : Go to Step 4.
NO : Add the fluid. Then go to Step 14.

STEP 4. Scan tool diagnostic trouble code

Check if the AWC diagnostic trouble code No. C1611, C1612, C1625, or C161D is set.(Refer to P.22A-11.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 5.

STEP 5. Scan tool actuator test

OK: Operating sound of the electric pump can be heard.

Q: Is the check result normal?

YES : Go to Step 13.
NO : Go to Step 6.

STEP 6. Electric pump relay single unit check

Check the electric pump relay.(Refer to P.22A-133.)

Q: Is the check result normal?

YES : Go to Step 7.
NO : Replace the electric pump relay. (Refer to P.22A-132.) Then go to Step 14.

STEP 7. Electric pump relay connector check: A-26X

Q: Is the check result normal?

YES : Go to Step 8.
NO : Repair the defective connector. Then go to Step 14.

STEP 8. Check the wiring harness between A-26X electric pump relay connector terminal No. 2 and fusible link (35).

Check the power supply line for short or open circuit.

Q: Is the check result normal?

YES : Go to Step 9.
NO : Repair the wiring harness. Then go to Step 14.

STEP 9. Electric pump connector check: F-14

Q: Is the check result normal?

YES : Go to Step 10.
NO : Repair the defective connector. Then go to Step 14.

STEP 10. Check the wiring harness between A-26X electric pump relay connector terminal No. 4 and F-14 electric pump connector terminal No. 2.

Check the power supply line for short or open circuit.

Q: Is the check result normal?

YES : Go to Step 11.
NO : Check C-21 and D-12 intermediate connectors. When no problem is found, repair the wiring harness. Then go to Step 14.

STEP 11. Check the wiring harness between F-14 electric pump connector terminal No. 1 and body ground.

Check the ground line for open circuit.

Q: Is the check result normal?

YES : Go to Step 12.
NO : Repair the wiring harness. Then go to Step 14.

STEP 12. Check whether the DTC is reset.

Q: Is DTC No. C161E set?

YES : Replace the hydraulic unit. (Refer to GROUP 27 – Hydraulic Unit P.27-58.) Then go to Step 13.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 13. Check whether the DTC is reset.

Q: Is DTC No. C161E set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 14.
NO : This diagnosis is complete.

STEP 14. Check whether the DTC is reset.

Q: Is DTC No. C161E set?

YES : Return to Step 1.
NO : This diagnosis is complete.

DTC C1622: ACD Controlled System (Malfunction)

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION

AWC-ECU provides power supply to the ACD proportioning valve.

DTC SET CONDITIONS

After protecting the ACD clutch, the code is set when the current value of the ACD proportioning valve solenoid exceeds the specified value for a prolonged period.

PROBABLE CAUSES

- The driving and road conditions are severe.
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. C1622 set?

YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. Scan tool diagnostic trouble code
Check other AWC diagnostic trouble code.(Refer to P.22A-11.)

Q: Is the DTC set?
YES : Perform the relevant troubleshooting.
NO : Go to Step 4.

STEP 4. Check whether the DTC is reset.

Q: Is DTC No. C1622 set?
YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 5.
NO : This diagnosis is complete. (The clutch protection activated in such driving or road condition as ACD control is applied for a prolonged period.)

STEP 5. Check whether the DTC is reset.

Q: Is DTC No. C1622 set?
YES : Return to Step 1.
NO : This diagnosis is complete.

DTC C1623: Brake Controlled System (Malfunction)

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION
AWC-ECU controls brakes for AYC control.

DTC SET CONDITIONS
The code is set when the AYC brake control operates for a prolonged period.

PROBABLE CAUSES
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics
Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. C1623 set?
YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. Scan tool diagnostic trouble code
Check other AWC diagnostic trouble code.(Refer to P.22A-11.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 4.

STEP 4. Check whether the DTC is reset.

Q: Is DTC No. C1623 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 5.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 5. Check whether the DTC is reset.

Q: Is DTC No. C1623 set?

YES : Return to Step 1.
NO : This diagnosis is complete.

DTC C1624: AWC-ECU System (Internal Malfunction)

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION

AWC-ECU monitors the malfunction in the ECU.

DTC SET CONDITIONS

The code is set when a malfunction is found in AWC-ECU.

PROBABLE CAUSES

- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics
Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. C1624 set?

YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. Scan tool diagnostic trouble code
Check other AWC diagnostic trouble code.(Refer to P.22A-11.)

Q: Is the DTC set?
YES : Perform the relevant troubleshooting.
NO : Go to Step 4.

STEP 4. Check whether the DTC is reset.

Q: Is DTC No. C1624 set?
YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 5.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 5. Check whether the DTC is reset.

Q: Is DTC No. C1624 set?
YES : Return to Step 1.
NO : This diagnosis is complete.

DTC C1625: AWC Pressure Sensor System (Abnormal Power Supply Voltage)

AWC PRESSURE SENSOR SYSTEM CIRCUIT
Refer to P.22A-33.

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION
AWC-ECU monitors the AWC pressure sensor power supply voltage.

DTC SET CONDITIONS
The code is set when the power supply voltage to the AWC pressure sensor is outside the specified value.

PROBABLE CAUSES
- AWC pressure sensor malfunction
- Damaged harness wires and connectors
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics
Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. C1625 set?
YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. Voltage measurement at F-13 AWC pressure sensor connector

(1) Disconnect the connector, and measure the voltage between the terminal No. 1 and the body ground.
(2) Turn the ignition switch to the "ON" position.

OK: Approx. 5 V

Q: Is the check result normal?

YES : Go to Step 6.
NO : Go to Step 4.

STEP 4. AWC-ECU connector, AWC pressure sensor connector check: C-46, F-13

Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair the defective connector. Then go to Step 8.

STEP 5. Check the wiring harness between C-46 AWC-ECU connector terminal No. 6 and F-13 AWC pressure sensor connector terminal No. 1.

Check the power supply line for short or open circuit.

Q: Is the check result normal?

YES : Go to Step 6.
NO : Check D-11 intermediate connector. When no problem is found, repair the wiring harness. Then go to Step 8.

STEP 6. Scan tool service data

Item No. 86: Pressure sensor power supply voltage (Refer to service data reference table P.22A-107.)

Q: Is the check result normal?

YES : Go to Step 7.
NO : Replace the hydraulic unit. (Refer to GROUP 27 – Hydraulic Unit P.27-58.) Then go to Step 7.

STEP 7. Check whether the DTC is reset.

Q: Is DTC No. C1625 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 8.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

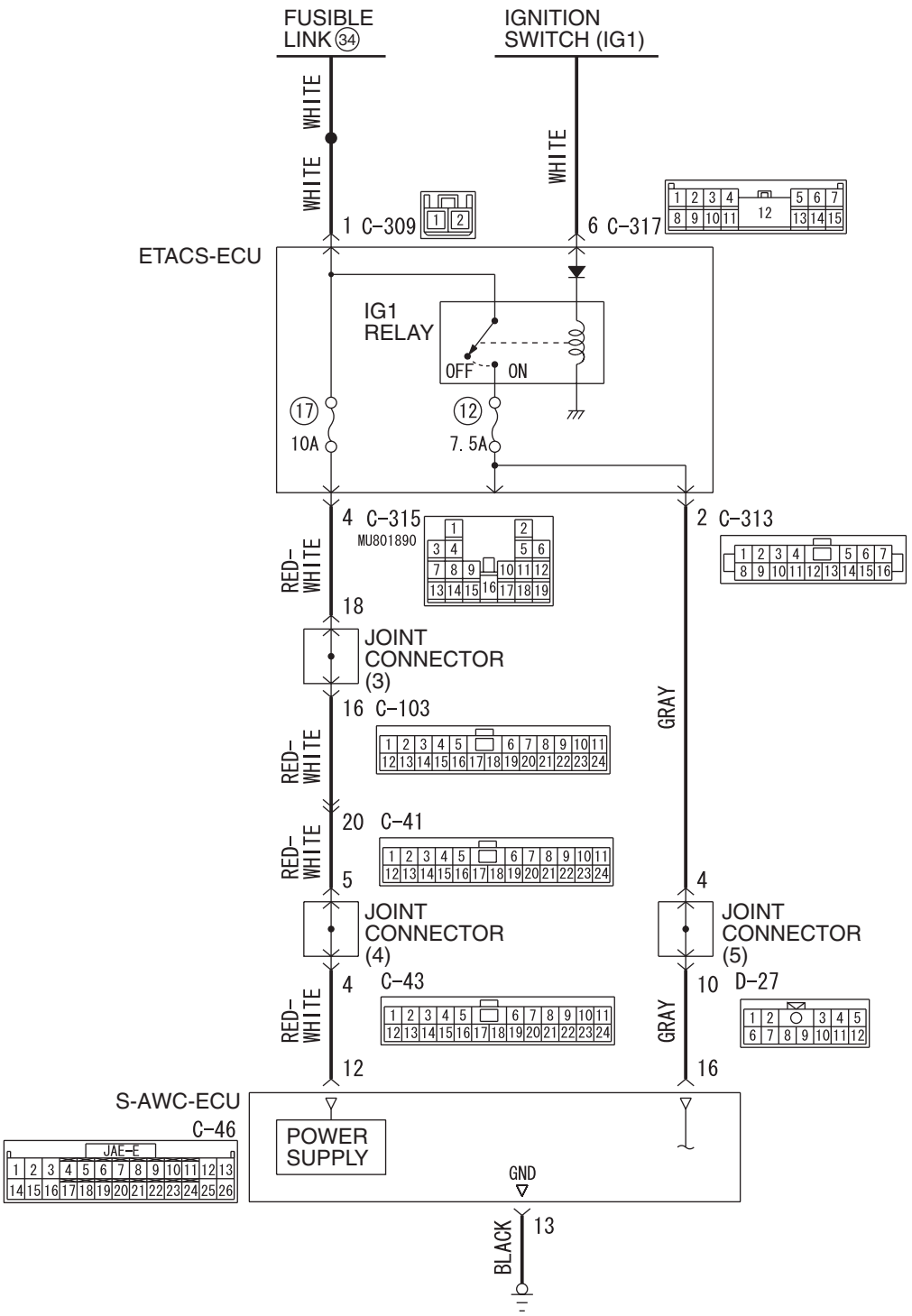
STEP 8. Check whether the DTC is reset.

Q: Is DTC No. C1625 set?

YES : Return to Step 1.
NO : This diagnosis is complete.

DTC C2100: Battery Voltage Malfunction (Low Voltage)

Power supply system circuit



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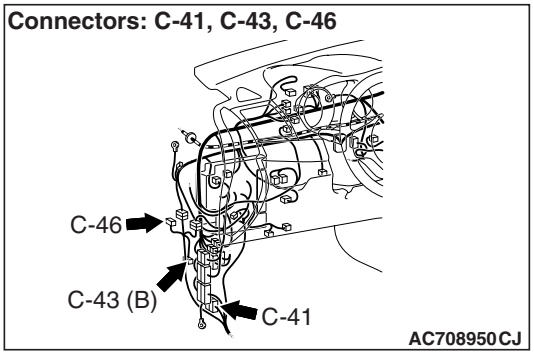
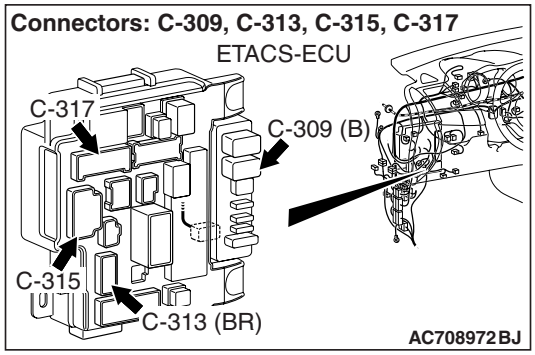
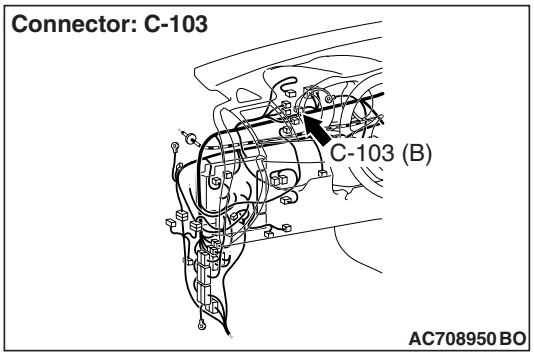
Connectors: C-41, C-43, C-46



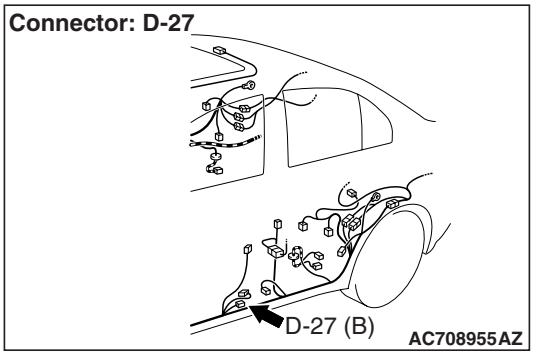
Connectors: C-309, C-313, C-315, C-317



Connector: C-103



Connector: D-27



⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION

AWC-ECU power supply is provided from the battery via ETACS-ECU.

DTC SET CONDITIONS

This diagnostic trouble code is set when the abnormality below is detected:

- When the AWC-ECU power supply voltage and solenoid valve power supply voltage are 9 V or less.
- When ASC-ECU low voltage is detected.

PROBABLE CAUSES

- Malfunction of ASC-ECU
- Malfunction of the ETACS-ECU
- Defective battery
- Charging system failed
- Damaged harness wires and connectors
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. C2100 set?

YES : Go to Step 3.

NO : This diagnosis is complete.

TSB Revision

STEP 3. Scan tool diagnostic trouble code
Check the ASC diagnostic trouble code. (Refer to GROUP 35C –Troubleshooting P.35C-20.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 4.

STEP 4. Scan tool diagnostic trouble code
Check the ETACS diagnostic trouble code. (Refer to GROUP 54A –Troubleshooting P.54A-582.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 5.

STEP 5. Check the battery.
Refer to GROUP 54A –Battery Test P.54A-9.

Q: Is the check result normal?

YES : Go to Step 7.
NO : Charge or replace the battery. Then go to Step 6.

STEP 6. Check the charging system.
Refer to GROUP 16 –Charging System P.16-7.

Q: Is the check result normal?

YES : Go to Step 7.
NO : Repair or replace the charging system component(s).

STEP 7. Voltage measurement at C-46 AWC-ECU connector
Measure the voltage between C-46 AWC-ECU connector terminal No.12 –and the body ground.

OK: Battery positive voltage

Q: Is the check result normal?

YES : Go to Step 11.
NO : Go to Step 8.

STEP 8. AWC-ECU connector, ETACS-ECU connector check: C-46, C-315

Q: Is the check result normal?

YES : Go to Step 9.
NO : Repair the defective connector. Then go to Step 14.

STEP 9. Check the wiring harness between C-46 AWC-ECU connector terminal No. 12 and C-315 ETACS-ECU connector terminal No.4.

Check the wiring harness for open or short circuit (short to ground).

Q: Is the check result normal?

YES : Go to Step 10.

NO : Check C-41 intermediate connector, C-43 J/C (4), C-103 J/C (3). When no problem is found, repair the wiring harness. Then go to Step 14.

STEP 10. Scan tool service data

Item No. 43: Battery voltage (Refer to service data reference table P.22A-107.)

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

NO : Replace the ETACS-ECU. (Refer to GROUP 54A – ETACS-ECU P.54A-676.) Then go to Step 14.

STEP 11. AWC-ECU connector check: C-46

Q: Is the check result normal?

YES : Go to Step 12.

NO : Repair the defective connector. Then go to Step 14.

STEP 12. Check the wiring harness between C-46 AWC-ECU connector terminal No. 13 and body ground.

Check the wiring harness for open circuit.

Q: Is the check result normal?

YES : Go to Step 13.

NO : Repair the wiring harness. Then go to Step 14.

STEP 13. Scan tool service data

Item No. 43: Battery voltage (Refer to service data reference table P.22A-107.)

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

NO : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 14.

STEP 14. Check whether the DTC is reset.

Q: Is DTC No. C2100 set?

YES : Return to Step 1.

NO : This diagnosis is complete.

DTC C2101: Battery Voltage Malfunction (High Voltage)

BATTERY VOLTAGE SYSTEM CIRCUIT

Refer to P.22A-66.

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION

AWC-ECU power supply is provided from the battery via ETACS-ECU.

DTC SET CONDITIONS

The code is set when the AWC-ECU power supply voltage and solenoid valve power supply voltage are 18 V or more.

PROBABLE CAUSES

- Loose battery terminal
- Defective battery
- Charging system failed
- Malfunction of the ETACS-ECU
- Damaged harness wires and connectors
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. C2101 set?

YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. Scan tool diagnostic trouble code

Check the ETACS diagnostic trouble code. (Refer to GROUP 54A –Troubleshooting P.54A-582.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 4.

STEP 4. Battery terminal check

Check that the battery terminal is not loose.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Securely install the battery terminal. Then go to Step 5.

STEP 5. Check the battery.

Refer to GROUP 54A –Battery Test P.54A-9.

Q: Is the check result normal?

YES : Go to Step 7.
NO : Charge or replace the battery. Then go to Step 6.

TSB Revision

STEP 6. Check the charging system.
Refer to GROUP 16 –Charging System P.16-7.

Q: Is the check result normal?

YES : Go to Step 7.
NO : Repair or replace the charging system component(s).

STEP 7. Voltage measurement at C-46 AWC-ECU connector
Measure the voltage between C-46 AWC-ECU connector terminal No.12 –and the body ground.

OK: Battery positive voltage

Q: Is the check result normal?

YES : Go to Step 11.
NO : Go to Step 8.

STEP 8. AWC-ECU connector, ETACS-ECU connector check: C-46, C-315

Q: Is the check result normal?

YES : Go to Step 9.
NO : Repair the defective connector. Then go to Step 12.

STEP 9. Check the wiring harness between C-46 AWC-ECU connector terminal No. 12 and C-315 ETACS-ECU connector terminal No.4.
Check the wiring harness for short circuit (short to power supply).

Q: Is the check result normal?

YES : Go to Step 10.
NO : Check C-41 intermediate connector, C-43 J/C (4), C-103 J/C (3). When no problem is found, repair the wiring harness. Then go to Step 12.

STEP 10. Scan tool service data
Item No. 43: Battery voltage (Refer to service data reference table P.22A-107.)

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)
NO : Replace the ETACS-ECU. (Refer to GROUP 54A – ETACS-ECU P.54A-676.) Then go to Step 12.

STEP 11. Scan tool service data
Item No. 43: Battery voltage (Refer to service data reference table P.22A-107.)

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)
NO : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 12.

STEP 12. Check whether the DTC is reset.

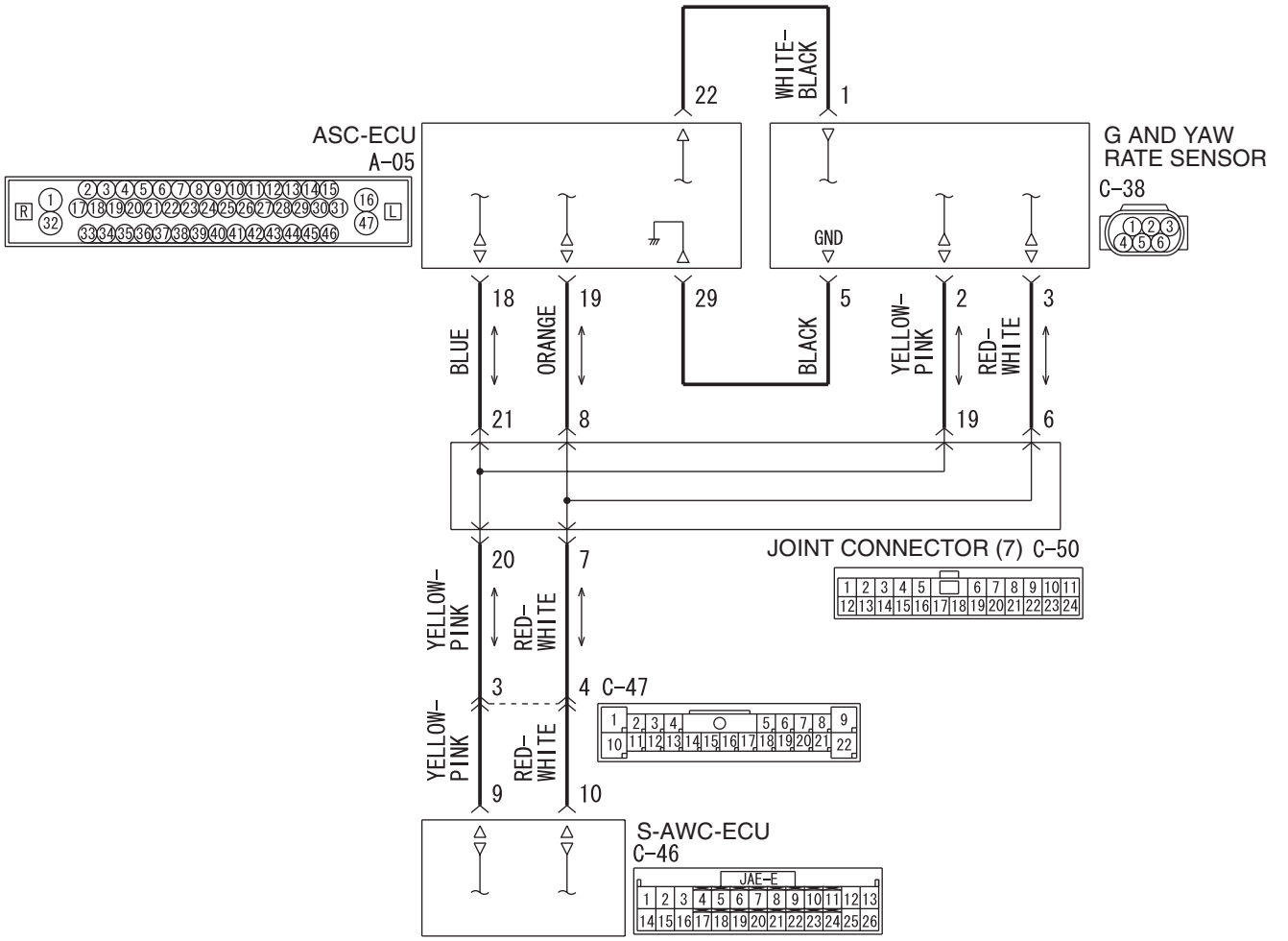
Q: Is DTC No. C2101 set?

YES : Return to Step 1.

NO : This diagnosis is complete.

DTC C2114: G and Yaw Rate Sensor Power Supply (Low Voltage)

G and yaw rate sensor power supply



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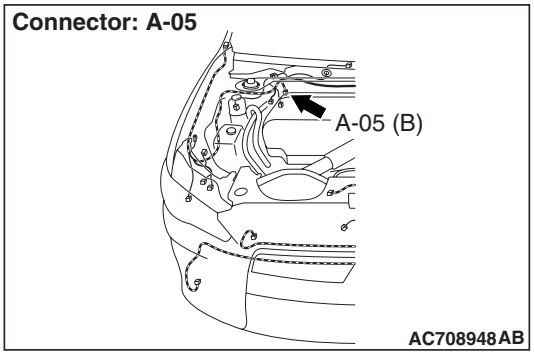

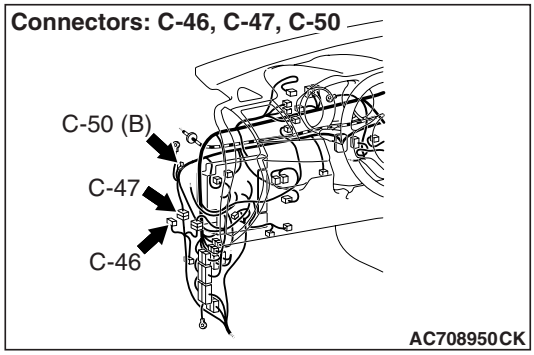

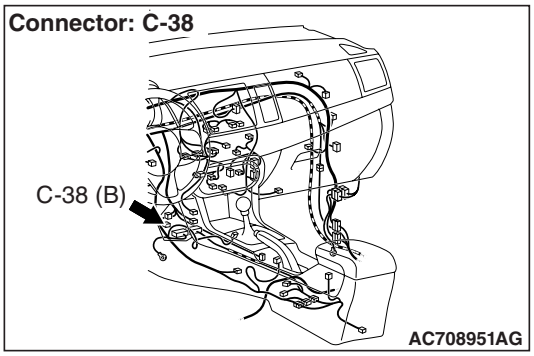

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**
- **Do not drop the G and yaw rate sensor or subject it to a shock.**
- **When G and yaw rate sensor is replaced, calibrate G and yaw rate sensor (refer to GROUP 35C –On-vehicle Service P.35C-266), and initialize the lateral/longitudinal acceleration correction amount stored in AWC-ECU. (Refer to item No.10: Lateral acceleration correction amount initialization, and No. 11: Longitudinal acceleration correction amount initialization P.22A-113.)**

OPERATION

AWC-ECU receives the self-diagnosis status of G and yaw rate sensor.

DTC SET CONDITIONS

The code is set when low voltage status information of G and yaw rate sensor power supply is received.

PROBABLE CAUSES

- Malfunction of G and yaw rate sensor
- Malfunction of ASC-ECU
- Damaged harness wires and connectors
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. C2114 set?

YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. Scan tool diagnostic trouble code

Check the ASC diagnostic trouble code. (Refer to GROUP 35C –Troubleshooting P.35C-20.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 4.

STEP 4. ASC-ECU connector, G and yaw rate sensor connector check: A-05, C-38

Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair the defective connector. Then go to Step 10.

STEP 5. Voltage measurement at the C-38 G and yaw rate sensor connector

(1) Disconnect the connector, and measure the voltage between terminal No. 1 and ground at the harness side.
(2) Turn the ignition switch to the "ON" position.

OK: Battery positive voltage

Q: Is the check result normal?

YES : Go to Step 7.
NO : Go to Step 6.

STEP 6. Check the wiring harness between A-05 ASC-ECU connector terminal No. 22 and C-38 G and yaw rate sensor connector terminal No. 1.

Check the wiring harness for open or short circuit (short to ground).

Q: Is the check result normal?

YES : Replace the ASC-ECU. (Refer to GROUP 35C – Hydraulic Unit P.35C-272.) Then go to Step 10.
NO : Repair the wiring harness. Then go to Step 10.

STEP 7. Check the wiring harness between A-05 ASC-ECU connector terminal No. 29 and C-38 G and yaw rate sensor connector terminal No. 5.

Check the wiring harness for open circuit.

Q: Is the check result normal?

YES : Go to Step 8.
NO : Repair the wiring harness. Then go to Step 10.

STEP 8. Scan tool service data

Check the following service data. (Refer to P.22A-107.)

- Item No. 26: Yaw rate sensor
- Item No. 29: Lateral G sensor
- Item No. 31: Longitudinal G sensor
- Item No. 75: G and yaw rate sensor low voltage abnormality flag

Q: Is the check result normal?

YES : Go to Step 9.

NO : Replace the G and yaw rate sensor. (Refer to GROUP 35C –G and Yaw Rate Sensor P.35C-278.) Then go to Step 9.

STEP 9. Check whether the DTC is reset.

Q: Is DTC No. C2114 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 10.

NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 10. Check whether the DTC is reset.

Q: Is DTC No. C2114 set?

YES : Return to Step 1.

NO : This diagnosis is complete.

DTC C2115: G and Yaw Rate Sensor Power Supply (High Voltage)

G AND YAW RATE SENSOR POWER SUPPLY

Refer to P.22A-72.

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**
- **Do not drop the G and yaw rate sensor or subject it to a shock.**
- **When G and yaw rate sensor is replaced, calibrate G and yaw rate sensor (refer to GROUP 35C –On-vehicle Service P.35C-266), and initialize the lateral/longitudinal acceleration correction amount stored in AWC-ECU. (Refer to item No.10: Lateral acceleration correction amount initialization, and No. 11: Longitudinal acceleration correction amount initialization P.22A-113.)**

OPERATION

AWC-ECU receives the self-diagnosis status of G and yaw rate sensor.

DTC SET CONDITIONS

The code is set when high voltage status information of G and yaw rate sensor power supply is received.

PROBABLE CAUSES

- Malfunction of G and yaw rate sensor
- Malfunction of ASC-ECU
- Damaged harness wires and connectors
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. C2115 set?

YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. Scan tool diagnostic trouble code

Check the ASC diagnostic trouble code. (Refer to GROUP 35C –Troubleshooting P.35C-20.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 4.

STEP 4. ASC-ECU connector, G and yaw rate sensor connector check: A-05, C-38

Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair the defective connector. Then go to Step 8.

STEP 5. Voltage measurement at the C-38 G and yaw rate sensor connector

(1) Disconnect the connector, and measure the voltage between terminal No. 1 and ground at the harness side.
(2) Turn the ignition switch to the "ON" position.

OK: Battery positive voltage

Q: Is the check result normal?

YES : Go to Step 8.
NO : Go to Step 6.

STEP 6. Scan tool service data

Check the following service data. (Refer to P.22A-107.)

- Item No. 26: Yaw rate sensor
- Item No. 29: Lateral G sensor
- Item No. 31: Longitudinal G sensor
- Item No. 76: G and yaw rate sensor high voltage abnormality flag

Q: Is the check result normal?

YES : Go to Step 7.

NO : Replace the G and yaw rate sensor. (Refer to GROUP 35C –G and Yaw Rate Sensor P.35C-278.) Then go to Step 7.

STEP 7. Check whether the DTC is reset.

Q: Is DTC No. C2115 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 8.

NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 8. Check whether the DTC is reset.

Q: Is DTC No. C2115 set?

YES : Return to Step 1.

NO : This diagnosis is complete.

DTC C2203: VIN not Recorded

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION

AWC-ECU receives chassis number information from the engine control module. (AWC-ECU receives chassis number information from the engine control module via CAN, and writes to AWC-ECU.))

DTC SET CONDITIONS

When the chassis number is not written.

PROBABLE CAUSES

- The CAN bus line is defective.
- Malfunction of engine control module
- VIN not written
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Scan tool diagnostic trouble code
Check the engine diagnostic trouble code. (Refer to GROUP 13A –Troubleshooting P.13A-44.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 3.

STEP 3. Check whether the DTC is reset.

Q: Is DTC No. C2203 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 4.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).

STEP 4. Check whether the DTC is reset.

Q: Is DTC No. C2203 set?

YES : Return to Step 1.
NO : This diagnosis is complete.

DTC C2204: G and Yaw Rate Sensor System (Internal Malfunction)

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**
- **Do not drop the G and yaw rate sensor or subject it to a shock.**
- **When G and yaw rate sensor is replaced, calibrate G and yaw rate sensor (refer to GROUP 35C –On-vehicle Service P.35C-266), and initialize the lateral/longitudinal acceleration correction amount stored in AWC-ECU. (Refer to item No.10: Lateral acceleration correction amount initialization, and No. 11: Longitudinal acceleration correction amount initialization P.22A-113.)**

OPERATION
AWC-ECU receives the self-diagnosis status of G and yaw rate sensor.

DTC SET CONDITIONS
The code is set when abnormality is detected by the self-diagnosis of the G and yaw rate sensor.

PROBABLE CAUSES
- Malfunction of G and yaw rate sensor
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics
Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

TSB Revision

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. C2204 set?

YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. Scan tool diagnostic trouble code

Check the ASC diagnostic trouble code. (Refer to GROUP 35C –Troubleshooting P.35C-20.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 4.

STEP 4. Scan tool service data

Check the following service data. (Refer to P.22A-107.)

- Item No. 26: Yaw rate sensor
- Item No. 29: Lateral G sensor
- Item No. 31: Longitudinal G sensor

Q: Is the check result normal?

YES : Go to Step 5.
NO : Replace the G and yaw rate sensor. (Refer to GROUP 35C –G and Yaw Rate Sensor P.35C-278.) Then go to Step 5.

STEP 5. Check whether the DTC is reset.

Q: Is DTC No. C2204 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 6.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 6. Check whether the DTC is reset.

Q: Is DTC No. C2204 set?

YES : Return to Step 1.
NO : This diagnosis is complete.

DTC C2205: Steering Wheel Sensor System (Internal Malfunction)

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the steering wheel sensor is replaced, calibrate the steering wheel sensor (refer to GROUP 35C –On-vehicle Service P.35C-267), and initialize the steering angle correction amount stored in AWC-ECU. (Item No.09: Steering angle correction amount initialization P.22A-113.)**

OPERATION

AWC-ECU receives the self-diagnosis status of steering wheel sensor.

DTC SET CONDITIONS

The code is set when abnormality is detected by the self-diagnosis of the steering wheel sensor.

TSB Revision

PROBABLE CAUSES

- Malfunction of steering wheel sensor
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics
Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. C2205 set?

YES : Go to Step 3.
NO : This diagnosis is complete.

STEP 3. Scan tool service data
Item 13: Steering wheel sensor (refer to P.22A-107.)

Q: Is the check result normal?

YES : Go to Step 4.
NO : Replace the steering wheel sensor. (Refer to GROUP 35C –Steering Wheel Sensor P.35C-279.) Then go to Step 5.

STEP 4. Check whether the DTC is reset.

Q: Is DTC No. C2205 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 5.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 5. Check whether the DTC is reset.

Q: Is DTC No. C2205 set?

YES : Return to Step 1.
NO : This diagnosis is complete.

DTC U0001: Bus Off

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

DTC SET CONDITIONS

The code is set when AWC-ECU ceases (bus-off).

PROBABLE CAUSES

- The CAN bus line is defective.
- Malfunction of AWC-ECU
- ECU malfunction of other system

TSB Revision

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics
Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the DTC is reset.

Q: Is DTC No. U0001 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 3.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 3. Check whether the DTC is reset.

Q: Is DTC No. U0001 set?

YES : Return to Step 1.
NO : This diagnosis is complete.

DTC U0100: Engine Time-out Error

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION

AWC-ECU communicates with the engine control module via the CAN bus lines.

DTC SET CONDITIONS

The code is set when the signal sent from the engine ECU cannot be received for a certain period.

PROBABLE CAUSES

- The CAN bus line is defective.
- Malfunction of engine control module
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics
Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Scan tool diagnostic trouble code
Check the engine diagnostic trouble code. (Refer to GROUP 13A –Troubleshooting P.13A-44.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 3.

STEP 3. Check whether the DTC is reset.

Q: Is DTC No. U0100 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 4.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 4. Check whether the DTC is reset.

Q: Is DTC No. U0100 set?

YES : Return to Step 1.
NO : This diagnosis is complete.

DTC U0101: TC-SST Time-out Error

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION

AWC-ECU communicates with TC-SST-ECU via the CAN bus lines.

DTC SET CONDITIONS

The code is set when the signal sent from the TC-SST-ECU cannot be received for a certain period.

PROBABLE CAUSES

- The CAN bus line is defective.
- Malfunction of TC-SST-ECU
- ETACS coding data error
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics
Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.)

STEP 2. Scan tool diagnostic trouble code
Check the TC-SST diagnostic trouble code. (Refer to GROUP 22C –Troubleshooting P.22C-10.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 3.

STEP 3. ETACS-ECU coding data check

Check the transaxle coding data stored in ETACS-ECU for any abnormality. (Refer to GROUP 00 –Coding Reference Table P.00-39.)

Q: Is the check result normal?

YES : Go to Step 4.

NO : Replace the ETACS-ECU. (Refer to GROUP 54A – ETACS-ECU P.54A-676.) Then go to Step 5.

STEP 4. Check whether the DTC is reset.

Q: Is DTC No. U0101 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 5.

NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 5. Check whether the DTC is reset.

Q: Is DTC No. U0101 set?

YES : Return to Step 1.

NO : This diagnosis is complete.

DTC U0121: ASC Time-out Error

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION

AWC-ECU communicates with the ASC-ECU via the CAN bus lines.

DTC SET CONDITIONS

The code is set when the signal sent from the ASC-ECU cannot be received for a certain period.

PROBABLE CAUSES

- The CAN bus line is defective.
- Malfunction of ASC-ECU
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.)

STEP 2. Scan tool diagnostic trouble code
Check the ASC diagnostic trouble code. (Refer to GROUP 35C –Troubleshooting P.35C-20.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 3.

STEP 3. Check whether the DTC is reset.

Q: Is DTC No. U0121 set?

YES : Replace the AWC-ECU. (Refer to P.22A-132.) Then go to Step 4.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 4. Check whether the DTC is reset.

Q: Is DTC No. U0121 set?

YES : Return to Step 1.
NO : This diagnosis is complete.

DTC U0126: Steering Wheel Sensor Time-out Error

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the steering wheel sensor is replaced, calibrate the steering wheel sensor (refer to GROUP 35C –On-vehicle Service P.35C-267), and initialize the steering angle correction amount stored in AWC-ECU. (Item No.09: Steering angle correction amount initialization P.22A-113.)**

OPERATION

AWC-ECU communicates with the steering wheel sensor via the CAN bus lines.

DTC SET CONDITIONS

The code is set when the signal sent from the steering wheel sensor cannot be received for a certain period.

PROBABLE CAUSES

- The CAN bus line is defective.
- Malfunction of steering wheel sensor
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics
Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.)

STEP 2. Scan tool service data
Item No.11: Steering wheel sensor (Refer to service data reference table P.22A-107.)

Q: Is the check result normal?
YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)
NO : Replace the steering wheel sensor. (Refer to GROUP 35C –Steering Wheel Sensor P.35C-279.) Then go to Step 3.

STEP 3. Check whether the DTC is reset.

Q: Is DTC No. U0126 set?
YES : Replace the AWC-ECU. (Refer to P.22A-132.) Then go to Step 4.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 4. Check whether the DTC is reset.

Q: Is DTC No. U0126 set?
YES : Return to Step 1.
NO : This diagnosis is complete.

DTC U0141: ETACS Time-out Error

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION
AWC-ECU communicates with the ETACS-ECU via the CAN bus lines.

DTC SET CONDITIONS
The code is set when the signal sent from the ETACS-ECU cannot be received for a certain period.

PROBABLE CAUSES
- The CAN bus line is defective.
- Malfunction of the ETACS-ECU
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics
Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.)

STEP 2. Scan tool diagnostic trouble code
Check the ETACS diagnostic trouble code. (Refer to GROUP 54A –Troubleshooting P.54A-582.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 3.

STEP 3. Check whether the DTC is reset.

Q: Is DTC No. U0141 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 4.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 4. Check whether the DTC is reset.

Q: Is DTC No. U0141 set?

YES : Return to Step 1.
NO : This diagnosis is complete.

DTC U0401: Engine Data Error

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION

AWC-ECU communicates with the engine control module via the CAN bus lines.

DTC SET CONDITIONS

The code is set when abnormality is detected in the signal received from the engine control module.

PROBABLE CAUSES

- The CAN bus line is defective.
- Engine malfunction
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics
Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.)

STEP 2. Scan tool diagnostic trouble code
Check the engine diagnostic trouble code. (Refer to GROUP 13A –Troubleshooting P.13A-44.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 3.

STEP 3. Scan tool service data
Check the following service data. (Refer to service data reference table P.22A-107.)
- Item No.15: Engine speed
- Item No. 16: Engine torque (Driver request value)

Q: Is the check result normal?
YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)
NO : Go to Step 4.

STEP 4. Check whether the DTC is reset.

Q: Is DTC No. U0401 set?
YES : Replace the AWC-ECU. (Refer to P.22A-132.) Then go to Step 5.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 5. Check whether the DTC is reset.

Q: Is DTC No. U0401 set?
YES : Return to Step 1.
NO : This diagnosis is complete.

DTC U0428: Steering Wheel Sensor Data Error

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the steering wheel sensor is replaced, calibrate the steering wheel sensor (refer to GROUP 35C –On-vehicle Service P.35C-267), and initialize the steering angle correction amount stored in AWC-ECU. (Item No.09: Steering angle correction amount initialization P.22A-113.)**

OPERATION
AWC-ECU communicates with the steering wheel sensor via the CAN bus lines.

DTC SET CONDITIONS
The code is set when abnormality is detected in the signal received from the steering wheel sensor.

PROBABLE CAUSES
- The CAN bus line is defective.
- Malfunction of steering wheel sensor
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics
Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.)

STEP 2. Scan tool service data
Item No.11: Steering wheel sensor (refer to P.22A-107.)

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)
NO : Replace the steering wheel sensor. (Refer to GROUP 35C –Steering Wheel Sensor P.35C-279.) Then go to Step 3.

STEP 3. Check whether the DTC is reset.

Q: Is DTC No. U0428 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 4.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 4. Check whether the DTC is reset.

Q: Is DTC No. U0428 set?

YES : Return to Step 1.
NO : This diagnosis is complete.

DTC U0431: ETACS Data Error

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION

AWC-ECU communicates with the ETACS-ECU via the CAN bus lines.

DTC SET CONDITIONS

The code is set when abnormality is detected in the signal received from the ETACS-ECU.

PROBABLE CAUSES

- The CAN bus line is defective.
- Malfunction of the ETACS-ECU
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics
Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.)

STEP 2. Scan tool diagnostic trouble code

Check the ETACS diagnostic trouble code. (Refer to GROUP 54A –Troubleshooting P.54A-582.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 3.

STEP 3. Scan tool service data

Check the following service data. (Refer to service data reference table P.22A-107.)

- Item No. 39: Stoplight switch
- Item No. 43: Battery positive voltage

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)
NO : Go to Step 4.

STEP 4. Check whether the DTC is reset.

Q: Is DTC No. U0431 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 5.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 5. Check whether the DTC is reset.

Q: Is DTC No. U0431 set?

YES : Return to Step 1.
NO : This diagnosis is complete.

DTC U1003: Bas-off (Local CAN)

G AND YAW RATE SENSOR POWER SUPPLY

Refer to P.22A-72.

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**
- **Do not drop the G and yaw rate sensor or subject it to a shock.**
- **When G and yaw rate sensor is replaced, calibrate G and yaw rate sensor (refer to GROUP 35C –On-vehicle Service P.35C-266), and initialize the lateral/longitudinal acceleration correction amount stored in AWC-ECU. (Refer to item No.10: Lateral acceleration correction amount initialization, and No. 11: Longitudinal acceleration correction amount initialization P.22A-113.)**

OPERATION

AWC-ECU communicates with ASC-ECU and G and yaw rate sensor via the local CAN.

DTC SET CONDITIONS

The code is set when local CAN ceases (bus-off).

PROBABLE CAUSES

- Malfunction of the CAN bus line (local)
- Malfunction of ASC-ECU
- Malfunction of G and yaw rate sensor
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.)

STEP 2. Scan tool diagnostic trouble code

Check the ASC diagnostic trouble code. (Refer to GROUP 35C –Troubleshooting P.35C-20.)

Q: The diagnostic trouble code is set.

YES : Perform the relevant troubleshooting.
NO : Go to Step 3.

STEP 3. ASC-ECU connector, G and yaw rate sensor connector, AWC-ECU connector, intermediate connector, J/C (7) check: A-05, C-38, C-46, C-47, C-50

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair the defective connector. Then go to Step 7.

STEP 4. Check the wiring harness between C-46 AWC-ECU connector terminal No. 9, 10 and C-38 G and yaw rate sensor connector terminal No. 2, 3, and between C-46 AWC-ECU connector terminal No. 9, 10 and A-05 ASC-ECU connector terminal No. 18, 19.

Check the wiring harness for open and short circuit (to ground, to power supply, or line-to-line).

Q: Is the check result normal?

YES : Go to Step 5.

NO : Repair the wiring harness. Then go to Step 7.

STEP 5. Scan tool service data

Check the following service data. (Refer to P.22A-107.)

- Item No. 26: Yaw rate sensor
- Item No. 29: Lateral G sensor
- Item No. 31: Longitudinal G sensor

Q: Is the check result normal?

YES : Go to Step 6.

NO : Replace the G and yaw rate sensor. (Refer to GROUP 35C –G and Yaw Rate Sensor P.35C-278.) Then go to Step 6.

STEP 6. Check whether the diagnostic trouble code is reset.

Q: Is DTC No. U1003 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 7.

NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 7. Check whether the DTC is reset.

Q: Is DTC No. U1003 set?

YES : Return to Step 1.

NO : This diagnosis is complete.

DTC U1415: Coding incomplete/fail

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the diagnostic trouble code No. U1415 is set in AWC-ECU, the diagnostic trouble code may also be set in ETACS-ECU. When the diagnostic trouble code is set in ETACS-ECU, perform the diagnosis of the diagnostic trouble code for ETACS-ECU first.**

OPERATION

AWC-ECU receives the vehicle information stored in ETACS-ECU via CAN bus lines.

DTC SET CONDITIONS

The diagnostic trouble code is set when the AWC-ECU coding has not been performed.

PROBABLE CAUSES

- Variant coding for ETACS-ECU has not been implemented.
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics
Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.)

STEP 2. Scan tool diagnostic trouble code
Check the ETACS diagnostic trouble code. (Refer to GROUP 54A –Troubleshooting P.54A-582.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 3.

STEP 3. ETACS-ECU coding data check
Using the scan tool, check if there is any abnormality to the coding data stored in the ETACS-ECU. (Refer to GROUP 00 – Coding Reference Table P.00-39.)

Q: Is the check result normal?

YES : Go to Step 4.
NO : Replace the ETACS-ECU. (Refer to GROUP 54A – ETACS-ECU P.54A-676.) Then go to Step 5.

STEP 4. Check whether the DTC is reset.

Q: Is DTC No. U1415 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 5.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 5. Check whether the DTC is reset.

Q: Is DTC No. U1415 set?

YES : Return to Step 1.
NO : This diagnosis is complete.

DTC U1417: Coding Data Malfunction

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the communication circuit is normal.**
- **When the diagnostic trouble code No. U1417 is set in AWC-ECU, the diagnostic trouble code may also be set in ETACS-ECU. When the diagnostic trouble code is set in ETACS-ECU, perform the diagnosis of the diagnostic trouble code for ETACS-ECU first.**

OPERATION

AWC-ECU receives the vehicle information stored in ETACS-ECU via CAN bus lines.

DTC SET CONDITIONS

The code is set when the vehicle information received from ETACS-ECU is not correct.

PROBABLE CAUSES

- The CAN bus line is defective.
- Malfunction of the ETACS-ECU
- Malfunction of AWC-ECU
- ETACS-ECU has been interchanged between two vehicles.

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.)

STEP 2. Scan tool diagnostic trouble code

Check the ETACS diagnostic trouble code. (Refer to GROUP 54A –Troubleshooting P.54A-582.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 3.

STEP 3. ETACS-ECU coding data check

Using the scan tool, check if there is any abnormality to the coding data stored in the ETACS-ECU. (Refer to GROUP 00 – Coding Reference Table P.00-39.)

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair the coding data or replace ETACS-ECU. (Refer to GROUP 54A –ETACS-ECU P.54A-676.) Then go to Step 5.

STEP 4. Check whether the DTC is reset.

Q: Is DTC No. U1417 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 5.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

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STEP 5. Check whether the DTC is reset.

Q: Is DTC No. U1417 set?

YES : Return to Step 1.
NO : This diagnosis is complete.

DTC U1425: TC-SST Data Error

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION

AWC-ECU communicates with TC-SST-ECU via the CAN bus lines.

DTC SET CONDITIONS

The code is set when abnormality is detected in the signal received from the TC-SST-ECU.

PROBABLE CAUSES

- The CAN bus line is defective.
- Malfunction of TC-SST-ECU
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.)

STEP 2. Scan tool diagnostic trouble code

Check the TC-SST diagnostic trouble code. (Refer to GROUP 22C –Troubleshooting P.22C-10.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 3.

STEP 3. Scan tool service data

Item No. 17: T/M shift range (Refer to P.22A-107.)

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)
NO : Go to Step 4.

STEP 4. Check whether the DTC is reset.

Q: Is DTC No. U1425 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 5.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 5. Check whether the DTC is reset.

Q: Is DTC No. U1425 set?

YES : Return to Step 1.
NO : This diagnosis is complete.

DTC U1426: ASC Data Error

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION

AWC-ECU communicates with the ASC-ECU via the CAN bus lines.

DTC SET CONDITIONS

The code is set when abnormality is detected in the signal received from the ASC-ECU.

PROBABLE CAUSES

- The CAN bus line is defective.
- Malfunction of ASC-ECU
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.)

STEP 2. Scan tool diagnostic trouble code

Check the ASC diagnostic trouble code. (Refer to GROUP 35C –Troubleshooting P.35C-20.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 3.

STEP 3. Scan tool service data

Item No. 38: Master cylinder pressure sensor (Refer to P.22A-107.)

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)
NO : Go to Step 4.

STEP 4. Check whether the DTC is reset.

Q: Is DTC No. U1426 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 5.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

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STEP 5. Check whether the DTC is reset.

Q: Is DTC No. U1415 set?

YES : Return to Step 1.
NO : This diagnosis is complete.

DTC U1427: Wheel Speed Sensor Data Error

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

OPERATION

AWC-ECU communicates with the ASC-ECU via the CAN bus lines.

DTC SET CONDITIONS

The code is set when abnormality is detected in the signal received from the wheel speed sensor.

PROBABLE CAUSES

- The CAN bus line is defective.
- Malfunction of the CAN bus line (local)
- Malfunction of ASC-ECU
- Malfunction of wheel speed sensor
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.)

STEP 2. Scan tool diagnostic trouble code

Check if the AWC diagnostic trouble code No. U1003 is set.(Refer to P.22A-11.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 3.

STEP 3. Scan tool diagnostic trouble code

Check the ASC diagnostic trouble code. (Refer to GROUP 35C –Troubleshooting P.35C-20.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 4.

STEP 4. Scan tool service data

Check the service data below.(Refer to P.22A-107.)

- Item No.22: FL wheel speed sensor <FL>
- Item No.23: FL wheel speed sensor <FR>
- Item No.24: FL wheel speed sensor <RL>
- Item No.25: FL wheel speed sensor <RR>

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

NO : Go to Step 5.

STEP 5. Check whether the DTC is reset.

Q: Is DTC No. U1427 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 6.

NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 6. Check whether the DTC is reset.

Q: Is DTC No. U1415 set?

YES : Return to Step 1.

NO : This diagnosis is complete.

DTC U1428: G and Yaw Rate Sensor Data Error

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**
- **Do not drop the G and yaw rate sensor or subject it to a shock.**
- **When G and yaw rate sensor is replaced, calibrate G and yaw rate sensor (refer to GROUP 35C –On-vehicle Service P.35C-266), and initialize the lateral/longitudinal acceleration correction amount stored in AWC-ECU. (Refer to item No.10: Lateral acceleration correction amount initialization, and No. 11: Longitudinal acceleration correction amount initialization P.22A-113.)**

OPERATION

AWC-ECU communicates with the G and yaw rate sensor via the CAN bus lines.

DTC SET CONDITIONS

The code is set when abnormality is detected in the signal received from the G and yaw rate sensor.

PROBABLE CAUSES

- Malfunction of the CAN bus line (local)
- Malfunction of G and yaw rate sensor
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics
Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.)

STEP 2. Scan tool diagnostic trouble code
Check if the AWC diagnostic trouble code No. U1003 is set.(Refer to P.22A-11.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 3.

STEP 3. Scan tool diagnostic trouble code
Check if the AWC diagnostic trouble code No. C123C, C1242, C2114, C2115, or C2204 is set.(Refer to P.22A-11.)

Q: Is the DTC set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 4.

STEP 4. Scan tool service data
Check the service data below.(Refer to P.22A-107.)

- Item No. 26: Yaw rate sensor
- Item No. 29: Lateral G sensor
- Item No. 31: Longitudinal G sensor

Q: Is the check result normal?

YES : Go to Step 5.
NO : Replace the G and yaw rate sensor. (Refer to GROUP 35C –G and Yaw Rate Sensor P.35C-278.) Then go to Step 6.

STEP 5. Check whether the DTC is reset.

Q: Is DTC No. U0428 set?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 6.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 6. Check whether the DTC is reset.

Q: Is DTC No. U0428 set?

YES : Return to Step 1.
NO : This diagnosis is complete.

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: Communication between the scan tool and AWC-ECU cannot be established

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect trouble symptom may occur. Prior to this diagnosis, always diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

COMMENTS ON TROUBLE SYMPTOM
CAN bus line, AWC-ECU power supply circuit, or AWC-ECU may have a problem.

PROBABLE CAUSES
- Wrong M.U.T.-III wiring harness
- The CAN bus line is defective.
- AWC-ECU power supply circuit malfunction
- Malfunction of AWC-ECU
- ECU malfunction of other system

STEP 1. Scan tool CAN bus diagnostics
Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Check/repair the AWC-ECU power supply circuit.(Refer to P.22A-104.)

NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.)

INSPECTION PROCEDURE 2: Mode does not change even when the AWC switch is pressed <Vehicles with steering wheel audio remote control switch>

AWC MODE SELECT SWITCH SYSTEM CIRCUIT
Refer to P.22A-37.

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect trouble symptom may occur. Prior to this diagnosis, always diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

COMMENTS ON TROUBLE SYMPTOM
AWC switch or AWC-ECU may have a problem.

PROBABLE CAUSES
- AWC switch malfunction
- Malfunction of the ETACS-ECU
- Malfunction of the combination meter
- Damaged harness wires and connectors
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics
Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Retest the system.

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)
NO : Go to Step 3.

STEP 3. Scan tool service data
Item No. 89: AWC switch (Refer to service data reference table P.22A-107.)

Q: Is the check result normal?

YES : Go to Step 11.
NO : Go to Step 4.

STEP 4. AWC switch single unit check
Check the AWC switch.(Refer to P.22A-133.)

Q: Is the check result normal?

YES : Go to Step 5.
NO : Replace the AWC switch.(Refer to P.22A-132.) Then go to Step 13.

STEP 5. Measure the voltage at C-120 AWC switch connector.
(1) Disconnect the connector, and measure the voltage between terminal No.2 and ground at the harness side.
(2) Turn the ignition switch to the "ON" position.

OK: Battery positive voltage

Q: Is the check result normal?

YES : Go to Step 8.
NO : Go to Step 6.

STEP 6. AWC switch connector, ETACS-ECU connector check: C-120, C-317

Q: Is the check result normal?

YES : Go to Step 7.
NO : Repair the defective connector. Then go to Step 13.

STEP 7. Check the wiring harness between C-120 AWC switch connector terminal No. 2 and C-317 ETACS-ECU connector terminal No. 5.

Check the wiring harness for open or short circuit (short to ground).

Q: Is the check result normal?

YES : Replace the ETACS-ECU. (Refer to GROUP 54A – ETACS-ECU P.54A-676.) Then go to Step 12.

NO : Repair the wiring harness. Then go to Step 13.

STEP 8. Voltage measurement at C-46 AWC-ECU connector

(1) With C-46 AWC-ECU connector connected, measure the voltage between terminal No. 21 and ground at the harness side.

(2) Turn the ignition switch to the "ON" position.

OK: Battery voltage (Press and hold the AWC switch)

OK: 1 V or less (Release the AWC switch)

Q: Is the check result normal?

YES : Go to Step 11.

NO : Go to Step 9.

STEP 9. Intermediate connector, AWC-ECU connector, AWC switch connector check: C-42, C-46, C-120

Q: Is the check result normal?

YES : Go to Step 10.

NO : Repair the defective connector. Then go to Step 13.

STEP 10. Wiring harness check between C-46 AWC-ECU connector terminal No. 21 and C-120 AWC switch connector terminal No. 1

Check the wiring harness for open or short circuit (short to ground).

Q: Is the check result normal?

YES : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 13.

NO : Repair the wiring harness. Then go to Step 11.

STEP 11. Scan tool service data

Combination meter item No. F13, F14, F15: Mode display (Refer to GROUP 54A –Combination Meter P.54A-78.)

Q: Is the check result normal?

YES : Go to Step 12.

NO : Replace the combination meter. (Refer to GROUP 54A –Combination Meter P.54A-101.) Then go to Step 12.

STEP 12. Retest the system.

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

NO : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 13.

STEP 13. Retest the system.

Q: Is the check result normal?

YES : Return to Step 1.

NO : This diagnosis is complete.

INSPECTION PROCEDURE 2: Mode does not change even when the AWC switch is pressed <Vehicles without steering wheel audio remote control switch>

POWER SUPPLY SYSTEM CIRCUIT

Refer to P.22A-66.

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect trouble symptom may occur. Prior to this diagnosis, always diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

COMMENTS ON TROUBLE SYMPTOM

AWC switch or AWC-ECU may have a problem.

PROBABLE CAUSES

- AWC switch malfunction
- Malfunction of the combination meter
- Damaged harness wires and connectors
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics

Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Retest the system.

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

NO : Go to Step 3.

STEP 3. Scan tool service data
Item No. 90, 91: AWC switch (Refer to service data reference table P.22A-107.)

Q: Is the check result normal?

YES : Go to Step 11.
NO : Go to Step 4.

STEP 4. AWC switch single unit check
Check the AWC switch.(Refer to P.22A-133.)

Q: Is the check result normal?

YES : Go to Step 5.
NO : Replace the AWC switch.(Refer to P.22A-132.) Then go to Step 13.

STEP 5. Measure the voltage at C-214 AWC switch connector.
(1) Disconnect the connector, and measure the voltage between terminal No.2 and ground at the harness side.
(2) Turn the ignition switch to the "ON" position.

OK: Battery positive voltage

Q: Is the check result normal?

YES : Go to Step 9.
NO : Go to Step 6.

STEP 6. Voltage measurement at C-46 AWC-ECU connector
(1) With C-46 AWC-ECU connector connected, measure the voltage between terminal No. 11 and ground at the harness side.
(2) Turn the ignition switch to the "ON" position.

OK: battery voltage

Q: Is the check result normal?

YES : Go to Step 7.
NO : Go to Step 12.

STEP 7. AWC-ECU connector, intermediate connector, clock spring connector, AWC switch connector check: C-46, C-31, C-41, C-202, C-205, C-214

Q: Is the check result normal?

YES : Go to Step 8.
NO : Repair the defective connector. Then go to Step 13.

STEP 8. Wiring harness check between C-46 AWC-ECU connector terminal No. 11 and C-214 AWC switch connector terminal No. 2
Check the wiring harness for open or short circuit (short to ground).

Q: Is the check result normal?

YES : Go to Step 12.
NO : Repair the wiring harness. Then go to Step 13.

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STEP 9. AWC-ECU connector, intermediate connector, clock spring connector, AWC switch connector check: C-46, C-31, C-41, C-202, C-205, C-214

Q: Is the check result normal?

YES : Go to Step 10.
NO : Repair the defective connector. Then go to Step 13.

STEP 10. Wiring harness check between C-46 AWC-ECU connector terminal No. 19 and C-214 AWC switch connector terminal No. 4

Check the wiring harness for open circuit.

Q: Is the check result normal?

YES : Go to Step 11.
NO : Repair the wiring harness. Then go to Step 13.

STEP 11. Scan tool service data

Combination meter item No. F13, F14, F15: Mode display (Refer to GROUP 54A –Combination Meter P.54A-78.)

Q: Is the check result normal?

YES : Go to Step 12.
NO : Replace the combination meter. (Refer to GROUP 54A –Combination Meter P.54A-101.) Then go to Step 12.

STEP 12. Retest the system.

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)
NO : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 13.

STEP 13. Retest the system.

Q: Is the check result normal?

YES : Return to Step 1.
NO : This diagnosis is complete.

INSPECTION PROCEDURE 3: AWC-ECU power supply circuit malfunction

POWER SUPPLY SYSTEM CIRCUIT

Refer to P.22A-66.

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect trouble symptom may occur. Prior to this diagnosis, always diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**

COMMENTS ON TROUBLE SYMPTOM

If the S-AWC system does not work, or does not communicate with the scan tool, AWC-ECU power supply circuit, ground circuit, or AWC-ECU may have a problem.

PROBABLE CAUSES

- Malfunction of the ETACS-ECU
- Damaged harness wires and connectors
- Malfunction of AWC-ECU

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DIAGNOSTIC PROCEDURE

STEP 1. Scan tool CAN bus diagnostics
Using scan tool MB991958, diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-14.) After repairing the CAN bus line, go to Step 2.

STEP 2. Retest the system.

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)
NO : Go to Step 3.

STEP 3. Voltage measurement at C-46 AWC-ECU connector
Measure the voltage between C-46 AWC-ECU connector terminal No.12 –and the body ground.

OK: Battery positive voltage

Q: Is the check result normal?

YES : Go to Step 6.
NO : Go to Step 4.

STEP 4. AWC-ECU connector, ETACS-ECU connector check: C-46, C-315

Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair the defective connector. Then go to Step 13.

STEP 5. Check the wiring harness between C-46 AWC-ECU connector terminal No. 12 and C-315 ETACS-ECU connector terminal No.4.
Check the wiring harness for open circuit.

Q: Is the check result normal?

YES : Go to Step 12.
NO : Check C-41 intermediate connector, C-43 J/C (4), C-103 J/C (3). When no problem is found, repair the wiring harness. Then go to Step 12.

STEP 6. Voltage measurement at C-46 AWC-ECU connector
(1) With C-46 AWC-ECU connector connected, measure the voltage between the terminal No. 16 and the body ground.
(2) Turn the ignition switch to the "ON" position.

OK: Battery positive voltage

Q: Is the check result normal?

YES : Go to Step 9.
NO : Go to Step 7.

STEP 7. AWC-ECU connector, ETACS-ECU connector check: C-46, C-313

Q: Is the check result normal?

YES : Go to Step 8.
NO : Repair the defective connector. Then go to Step 13.

STEP 8. Check the wiring harness between C-46 AWC-ECU connector terminal No. 16 and C-313 ETACS-ECU connector terminal No. 2.
Check the wiring harness for open circuit.

Q: Is the check result normal?

YES : Go to Step 12.
NO : Check D-27 J/C (5). When no problem is found, repair the wiring harness. Then go to Step 12.

STEP 9. AWC-ECU connector check: C-46

Q: Is the check result normal?

YES : Go to Step 10.
NO : Repair the defective connector. Then go to Step 13.

STEP 10. Check the wiring harness between C-46 AWC-ECU connector terminal No. 13 and body ground.
Check the wiring harness for open circuit.

Q: Is the check result normal?

YES : Go to Step 11.
NO : Repair the wiring harness. Then go to Step 13.

STEP 11. Scan tool service data
Item No. 43: Battery voltage (Refer to service data reference table P.22A-107.)

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)
NO : Replace the AWC-ECU.(Refer to P.22A-132.) Then go to Step 13.

STEP 12. Retest the system.

Q: Is the check result normal?

YES : Replace the ETACS-ECU. (Refer to GROUP 54A – ETACS-ECU P.54A-676.) Then go to Step 13.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 13. Retest the system.

Q: Is the check result normal?

YES : Return to Step 1.
NO : This diagnosis is complete.

DATA LIST REFERENCE TABLE

M1221011200087

Item No.	Display on scan tool	Item name	Check conditions		Normal conditions
1	AWC control mode	AWC control mode	TARMAC is selected (displayed on multi information display).		TARMAC
			GRAVEL is selected (displayed on multi information display).		GRAVEL
			SNOW is selected (displayed on multi information display).		SNOW
2	T/M gear position hold request	T/M shift range storing request flag	Perform a test run of the vehicle.	Retention requested	ON
				Retention not requested	OFF
3	System fail	System malfunction	Normal		Correct
			Faulty		Malfunction
4	ACD target torque (for Meter)	ACD target torque (Meter display)	Perform a test run of the vehicle.		0 –5 seg
5	Request Yaw moment (for Meter)	Requested yaw moment (Meter display)	Perform a test run of the vehicle.		-5 ~ 5 seg
6	FL brake control indication	Brake control instruction <FL>	Perform a test run of the vehicle.	Not requested	Not requested
				Brake pressure command	Brake pressure
				Slip ratio command	Slip ratio
				Brake pressure and slip ratio command	Brake pressure and slip ratio
7	FR brake control indication	Brake control instruction <FR>	Perform a test run of the vehicle.	Not requested	Not requested
				Brake pressure command	Brake pressure
				Slip ratio command	Slip ratio
				Brake pressure and slip ratio command	Brake pressure and slip ratio
8	RL brake control indication	Brake control instruction <RL>	Perform a test run of the vehicle.	Not requested	Not requested
				Brake pressure command	Brake pressure
				Slip ratio command	Slip ratio
				Brake pressure and slip ratio command	Brake pressure and slip ratio

Item No.	Display on scan tool	Item name	Check conditions		Normal conditions
9	RR brake control indication	Brake control instruction <RR>	Perform a test run of the vehicle.	Not requested	Not requested
				Brake pressure command	Brake pressure
				Slip ratio command	Slip ratio
				Brake pressure and slip ratio command	Brake pressure and slip ratio
10	Rear ABS control request status	Rear ABS independent control request	Perform a test run of the vehicle.	Not requested	Not requested
				Independent control	Independent control
				Select low	Select low
				Error	Malfunction
11	Steering angle sensor	Steering wheel sensor	Steering wheel: Steered 90° to right		R90 deg
			Steering wheel: Steered 90° to left		L90 deg
12	Steering angle speed	Steering wheel steering angle speed	Steering wheel: Without steering wheel operation		0 deg/s
			Steering wheel: With steering wheel operation		Changes depending on the turning speed.
13	Steering angle sensor (status)	Steering wheel sensor (status)	Normal		Correct
			Faulty		Malfunction
			Neutral point not learned		Neutral not learned
			Neutral point not learned or failed		Neutral not learned and Malfunction
14	Accelerator position	Accelerator opening angle	Release the accelerator pedal		18~22%
			Depress the accelerator pedal		Increases in response to the depression amount
			Accelerator pedal fully opened		80% or more
15	Engine speed	Engine speed	Idling and test run		Nearly the same as the tachometer display
16	Engine torque (Driver request)	Engine torque (Driver request value)	Operate the accelerator pedal		The torque changes

Item No.	Display on scan tool	Item name	Check conditions	Normal conditions
17	T/M Gear position <Vehicles with TC-SST>	T/M shift range	Shift lever position: P	P
			Shift lever position: R	R
			Shift lever position: Drive at D	D1 –D6
			Shift lever position: Manual mode	M/T
18	FL wheel speed (raw value)	Wheel speed sensor <FL>	–(reference because of rpm)	–
19	FR wheel speed (raw value)	Wheel speed sensor <FR>		
20	RL wheel speed (raw value)	Wheel speed sensor <RL>		
21	RR wheel speed (raw value)	Wheel speed sensor <RR>		
22	FL wheel speed sensor	Wheel speed sensor <FL>	Perform a test run of the vehicle.	Nearly the same as the speedometer display
23	FR wheel speed sensor	Wheel speed sensor <FR>		
24	RL wheel speed sensor	Wheel speed sensor <RL>		
25	RR wheel speed sensor	Wheel speed sensor <RR>		
26	Yaw rate sensor	Yaw rate sensor	Perform a test run of the vehicle.	–100 –100 deg/s
27	Yaw rate sensor (acceleration)	Yaw rate sensor (Angle acceleration)	Perform a test run of the vehicle.	The value changes depending on the yaw change speed.
28	Yaw rate sensor (status)	Yaw rate sensor (Status)	Normal	Correct
			Faulty	Malfunction
			Self-diagnosis	Under testing
			System malfunction	System malfunction
29	Lateral G sensor	Lateral G sensor	Vehicle is stopped (horizontal state).	–1.1 –1.1 m/s^2
			Perform a test run of the vehicle.	–10 –10 m/s^2
30	Lateral G sensor (status)	Lateral G sensor (Status)	Normal	Correct
			Faulty	Malfunction
			Self-diagnosis	Under testing
			System malfunction	System malfunction
31	Longitudinal G sensor	Longitudinal G sensor	Vehicle is stopped (horizontal state).	–1.1 –1.1 m/s^2
			Perform a test run of the vehicle.	–10 –10 m/s^2

Item No.	Display on scan tool	Item name	Check conditions	Normal conditions
32	Longitudinal G sensor (status)	Longitudinal G sensor (Status)	Normal	Correct
			Faulty	Malfunction
			Self-diagnosis	Under testing
			System malfunction	System malfunction
38	Master cylinder pressure sensor	Master cylinder pressure sensor	The brake pedal is depressed	Rises depending on the depression value.
			The brake pedal is released	-0.3~0.3 MPa
39	Brake switch (CAN input)	Stoplight switch	Brake pedal: Depressed	ON
			Brake pedal: Released	OFF
40	Parking brake SW (CAN input)	Parking brake switch	Parking brake lever: Pulled	ON
			Parking brake lever: Released	OFF
41	Back up lamp SW (CAN input)	Back-up light switch	Shift lever: Operated to reverse (vehicles with SST only)	ON
			Shift lever: Other than above	OFF
42	Ignition SW (CAN input)	Ignition switch	Ignition switch: ON	ON
			Ignition switch: START	START
43	Battery voltage (CAN input)	Battery positive voltage	Ignition switch: ON	Battery positive voltage
44	IOD fuse (CAN input)	IOD fuse	Fuse inserted	ON
			Fuse removed	OFF
45	Odometer (CAN input)	Odometer	Ignition switch: ON	The same as the meter display
46	ETACS coding status	ETACS coding status	Coding incomplete	Not complete
			Coding data requested	Data request
			Coding completed	Complete
47	ECU connection (ABS)	ECU connection (ABS)	ASC-ECU connected	Present
			ASC-ECU disconnected	Not present
48	ECU connection (ENGINE)	ECU connection (Engine)	Engine control module connected	Present
			Engine control module disconnected	Not present
49	ECU connection (T/M)	ECU connection (T/M)	SST-ECU connected	Present
			SST-ECU disconnected	Not present
50	ECU connection (SAS)	ECU connection (Steering wheel sensor)	Steering sensor connected	Present
			Steering sensor disconnected	Not present
51	Coding status	T/M, R/D coding status	Coding incomplete	Not complete
			Coding completed	Complete

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Item No.	Display on scan tool	Item name	Check conditions	Normal conditions
52	T/M type (CAN input)	T/M type	5M/T	5M/T
			TC-SST	SST
53	Rear diff type (CAN input)	Rear differential type	Mechanical differential	LOM
			AYC differential	AYC
54	FL wheel ABS actuation flag	ABS activation flag <FL>	Operating	ON
			Inactive	OFF
55	FR wheel ABS actuation flag	ABS activation flag <FR>	Operating	ON
			Inactive	OFF
56	RL wheel ABS actuation flag	ABS activation flag <RL>	Operating	ON
			Inactive	OFF
57	RR wheel ABS actuation flag	ABS activation flag <RR>	Operating	ON
			Inactive	OFF
58	ABS fail flag	ABS fail flag	Faulty	ON
			Normal	OFF
61	FL wheel ASC actuation flag	ASC activation flag <FL>	Operating	ON
			Inactive	OFF
62	FR wheel ASC actuation flag	ASC activation flag <FR>	Operating	ON
			Inactive	OFF
63	RL wheel ASC actuation flag	ASC activation flag <RL>	Operating	ON
			Inactive	OFF
64	RR wheel ASC actuation flag	ASC activation flag <RR>	Operating	ON
			Inactive	OFF
65	ASC fail flag	ASC fail flag	Faulty	ON
			Normal	OFF
66	ASC switch mode	ASC OFF switch	When ASC is ON	ON
			When ASC is OFF	OFF
			When ASC is completely OFF	Completely OFF
67	Brake control enable flag	Brake control permission flag	Prohibited	Prohibited
			Permitted	Permitted
69	Yaw rate selftest start req.flag	Yaw rate self test start request	Start requested	ON
			Start not requested	OFF
70	G sensor selftest start req.flag	Longitudinal/lateral G sensor self test start request	Start requested	ON
			Start not requested	OFF
71	G sensor selftest executing flag	Longitudinal/lateral G sensor during self test flag	Self-diagnosis	ON
			Normal condition	OFF
72	Yaw rate selftest executing flag	Yaw rate during self test flag	Self-diagnosis	ON
			Normal condition	OFF

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Item No.	Display on scan tool	Item name	Check conditions	Normal conditions
73	Sensor cluster initial check	G and yaw rate sensor initial check	Initial check uncompleted	Not complete
			Initial check completed	Complete
74	Flame No reception flag	SYNC frame not received flag	Not received	ON
			Correct	OFF
75	Sensor cluster low voltage flag	G and yaw rate sensor low voltage abnormality flag	Low voltage	ON
			Correct	OFF
76	Sensor cluster high voltage flag	G and yaw rate sensor high voltage abnormality flag	High voltage	ON
			Correct	OFF
83	IG1	IG1 (ignition switch)	ON	ON
			OFF	OFF
84	ECU power supply voltage	ECU power supply voltage	Ignition switch: ON	10 –16 V
85	Output load voltage	Power supply voltage for output load	Ignition switch: ON	10 –16 V
86	Pressure sensor power voltage	Pressure sensor power supply voltage	Ignition switch: ON	Approx. 5 V
87	Pressure sensor output voltage	Pressure sensor output voltage	During electric pump motor operation	1.86 –2.67 V
88	Pressure sensor	Pressure sensor	During electric pump motor operation	1–1.6 MPa
89	Mode SW	AWC switch <Vehicles with steering wheel audio remote control switch>	Mode selection switch: Pressed	ON
			Mode selection switch: Released	OFF
90	Mode SW(steering) 1	AWC switch (steering) 1 <Vehicles without steering wheel audio remote control switch>	Mode selection switch: Pressed to the upper side	ON
			Mode selection switch: Released	OFF
91	Mode SW(steering) 2	AWC switch (steering) 2 <Vehicles without steering wheel audio remote control switch>	Mode selection switch: Pressed to the down side	ON
			Mode selection switch: Released	OFF
92	ACD proportion valve (indicated)	ACD proportioning valve indicator current	During ACD operation	50 –1,000 mA
93	AYC proportion valve (indicated)	AYC proportioning valve indicator current	During AYC operation	50 –1,000 mA
94	LH direction V drive indication	Left direction valve driving indicator flag	ON	ON
			OFF	OFF
95	RH direction V drive indication	Right direction valve driving indicator flag	ON	ON
			OFF	OFF
96	Motor relay drive indication	Motor relay driving indicator flag	ON	ON
			OFF	OFF

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Item No.	Display on scan tool	Item name	Check conditions		Normal conditions
97	Yaw rate sensor (adjusted value)	Yaw rate sensor (Correction amount)	Ignition switch: ON		−6 −6 deg/s
98	SAS (adjusted value)	Steering sensor (Correction amount)	Ignition switch: ON		−15 −15 deg
99	Lateral G sensor(adjusted value)	Lateral G sensor (Correction amount)	Ignition switch: ON		−1.7 −1.7 m/s^2
100	Longitudinal G (adjusted value)	Longitudinal G sensor (Correction amount)	Ignition switch: ON		−3 −3 m/s^2
101	Chassis Number writing counter	Chassis number writing count	Ignition switch: ON		Writing count
102	Chassis Number (original) lock	Chassis number (original) lock	Ignition switch: ON	Locked	Lock
				Unlocked	Unlock
103	Mileage counter	Mileage counter	Ignition switch: ON		Counter value
104	Coding counter	Coding count	Ignition switch: ON		Coding count

SPECIAL FUNCTION REFERENCE TABLE

M1221011300062

ACTUATOR TEST TABLE

Item No.	Display on scan tool	Check items	Test content	Normal conditions
1	ACD air bleeding	Air bleeding <ACD>	According to the steering angle of steering wheel, energize the proportioning valve, and operate the proportioning valve for 5 minutes.	No air comes out from the bleeder screw established to the transfer.
2	AYC air bleeding	Air bleeding <AYC>	According to the steering angle of steering wheel, energize the proportioning valve, and operate the direction valve for 5 minutes.	No air comes out from the bleeder screw established to the torque transfer differential.
3	Oil level check	Oil level check	Operate the direction valve to left and right for 20 seconds.	Oil level of reservoir tank is adequate.
4	Motor drive	Electric pump operation	Operate the electric pump for 3 seconds.	Operating sound of the electric pump can be heard.
5	ACD operation check	ACD operation check	Operate the proportioning valve <ACD>, and supply the maximum hydraulic pressure to the multiplate clutch.	The tight corner braking phenomenon occurs.
6	AYC operation check (left)	Clutch operation check <left side>	Operate the direction valve, and supply the maximum hydraulic pressure to the left clutch.	With the wheels lifted, a speed difference is generated between left and right rear wheels.
7	AYC operation check (right)	Clutch operation check <right side>	Operate the direction valve, and supply the maximum hydraulic pressure to the right clutch.	With the wheels lifted, a speed difference is generated between left and right rear wheels.

Item No.	Display on scan tool	Check items	Test content	Normal conditions
8	Control OFF	Control OFF	Turn OFF the electric pump relay, and turn OFF the ACD and AYC control.	With the actual driving of vehicle, there is a difference between when the control is ON and OFF.

1. The actuator test can be performed only when all the following conditions are satisfied.
   - Every wheel speed sensor input is 20 km/h or less.
   - No system malfunction is detected.
   - The steering angle of steering wheel is within ±30° from the neutral position.
2. With the actuator test, when any of the conditions below is met, the forced activation will be canceled.
   - Any of the wheel speed sensors detects an input of 20 km/h or more (excluding item No. 08 "Control OFF").
   - A system malfunction is detected.
   - The forced activation time has elapsed.
   - Scan tool is removed.
   - Scan tool clear key is operated.

SENSOR NEUTRAL POSITION LEARNED INITIALIZATION LIST

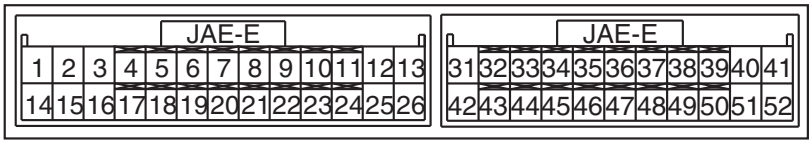
Item No.	Display on scan tool	Item	Initialization contents
1	SAS calibration	Steering angle correction amount initialization	Reset the steering angle sensor neutral position learned value.
2	Lateral G sensor calibration	Lateral acceleration correction amount initialization	Reset the lateral acceleration sensor neutral position learned value.
3	Longitudinal G SNS.calibration	Longitudinal acceleration correction amount initialization	Reset the longitudinal acceleration sensor neutral position learned value.

The sensor neutral position learned value initialization can be performed only when the vehicle is stopped.

AWD-ECU TERMINAL VOLTAGE REFERENCE CHART FOR ACD

M1221011400058

C-46



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Terminal No.	Inspection Items	Inspection requirement		Normal Condition
1	Proportioning valve (for ACD)	With the actuator test (item No. 01), operate the proportioning valve <ACD>.	While executing the actuator test	0-4 V
			After completing the actuator test	1 V or less

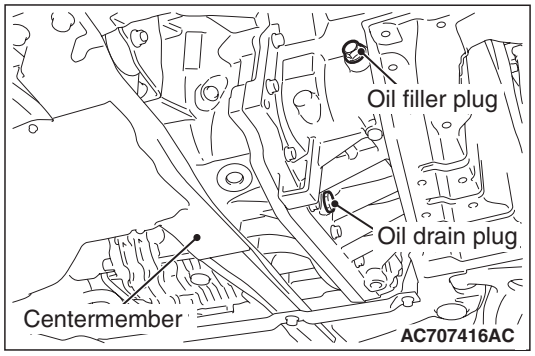
Terminal No.	Inspection Items	Inspection requirement		Normal Condition
2	Proportioning valve (for AYC)	With the actuator test (item No. 02), operate the proportioning valve <AYC>.	While executing the actuator test	0–4 V
			After completing the actuator test	1 V or less
3	Direction valve (right)	With the actuator test (item No. 07), operate the direction valve <right>.	While executing the actuator test	Battery voltage
			After completing the actuator test	1 V or less
4	CAN-H	–		–
5	CAN-L	–		–
6	Pressure sensor power supply	Ignition switch: ON		Approx.5 V
7	Pressure sensor output voltage	Ignition switch: ON		0.5–1.5 V
8	Pressure sensor ground	Any time		1 V or less
9	Local CAN (ASC-ECU)	–		–
10	Local CAN (ASC-ECU)	–		–
11	AWC switch power supply <Vehicles without steering wheel audio remote control switch>	Ignition switch: ON	Switch is operated to upper side (+) and held.	Approx. 1.6 V
			Switch is operated to down side (–) and held.	Approx. 0.3 V
			Release the switch.	Approx. 4.7 V
12	Power supply	Any time		Battery voltage
13	Ground	Any time		1 V or less
14	Direction valve (left)	With the actuator test (item No. 06), operate the direction valve <left>.	While executing the actuator test	Battery voltage
			After completing the actuator test	1 V or less
16	Ignition switch	Ignition switch: ON		Battery voltage
		Ignition switch: OFF		1 V or less
17	Back up power supply	Any time		Battery voltage
19	AWC switch ground <Vehicles without steering wheel audio remote control switch>	Any time		1 V or less
20	Electric pump relay	When the electric pump motor is not operating		0 V
		While the electric pump motor is operating		System voltage
21	AWC switch <Vehicles with steering wheel audio remote control switch>	Ignition switch: ON	Press and hold the switch.	Battery voltage
			Release the switch.	1 V or less

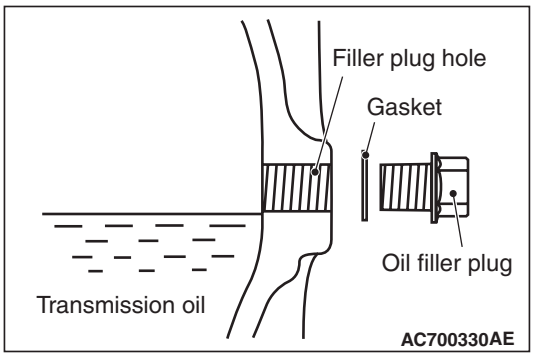
ON-VEHICLE SERVICE

TRANSMISSION OIL LEVEL CHECK

M1221000900770

1. Remove the engine room under cover front B assembly. (Refer to GROUP 51, Under cover P.51-16.)
2. Remove the oil filler plug and gasket.





3. Check that the oil level is just below the lower edge of the oil filler plug hole.
4. Check that the oil is not excessively foul and has moderate viscosity.
5. Install the oil filler plug and new gasket, then tighten them to the specified torque.

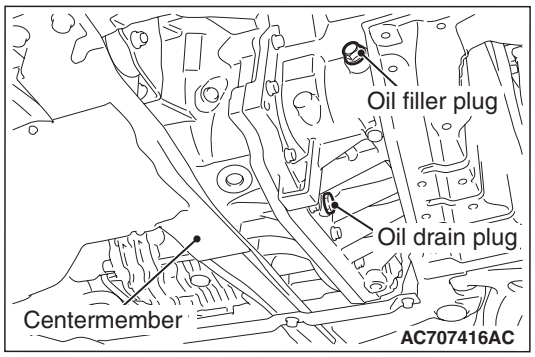
   Tightening torque: 32 ±2 N· m (24 ±1 ft-lb)
6. Install the engine room under cover front B assembly. (Refer to GROUP 51, Under cover P.51-16.)

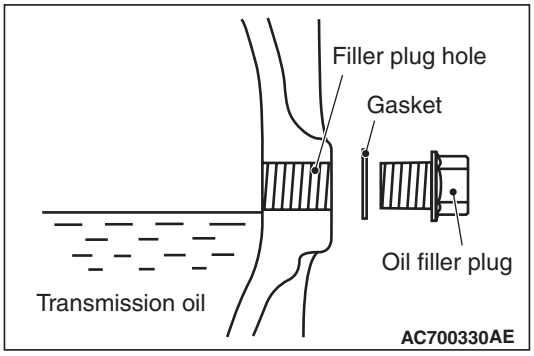
TRANSMISSION OIL CHANGE

M1221001000800

1. Remove the engine room under cover front B assembly. (Refer to GROUP 51, Under cover P.51-16.)
2. Remove the oil drain plug and gasket to drain the oil.
3. Install the oil drain plug and new gasket, then tighten them to the specified torque.

   Tightening torque: 32 ±2 N· m (24 ±2 ft-lb)





4. Remove the oil filler plug and gasket, then fill the oil up to the lower edge of the oil filler plug.

   Brand name: Mitsubishi genuine Dia-Queen New Multi Gear Oil SAE 75W-80 API GL-3

   Quantity: 2.5 dm^3 (2.6 quarts)
5. Install the oil filler plug and new gasket, then tighten them to the specified torque.

   Tightening torque: 32 ±2 N· m (24 ±1 ft-lb)
6. Install the engine room under cover front B assembly. (Refer to GROUP 51, Under cover P.51-16.)

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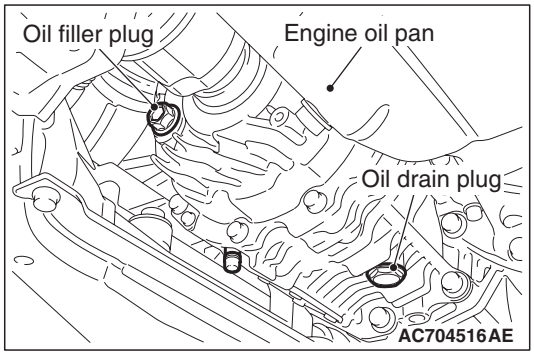
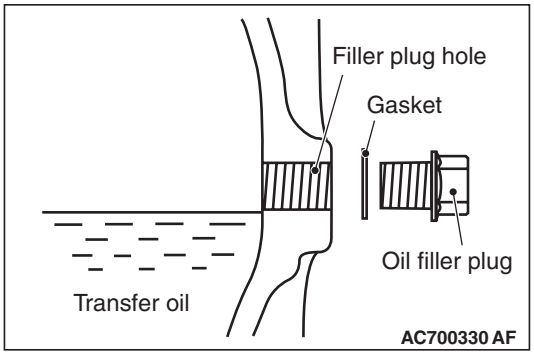
TRANSFER OIL CHECK

M1221001100238

1. Remove the engine room under cover front B assembly. (Refer to GROUP 51, Under cover P.51-16.)
2. Remove the oil filler plug and gasket.





3. Check that the oil level is just below the lower edge of the oil filler plug hole.
4. Check that the oil is not excessively foul and has moderate viscosity.
5. Install the oil filler plug and new gasket, then tighten them to the specified torque.

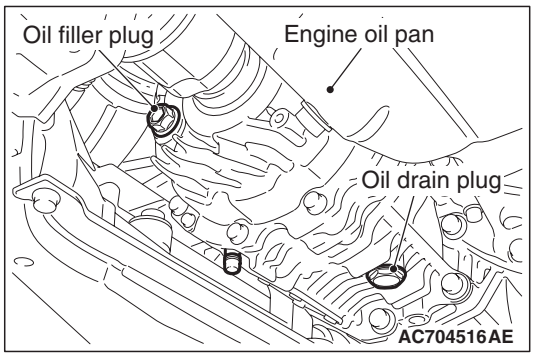
   Tightening torque: 32 ±2 N· m (24 ±1 ft-lb)
6. Install the engine room under cover front B assembly. (Refer to GROUP 51, Under cover P.51-16.)

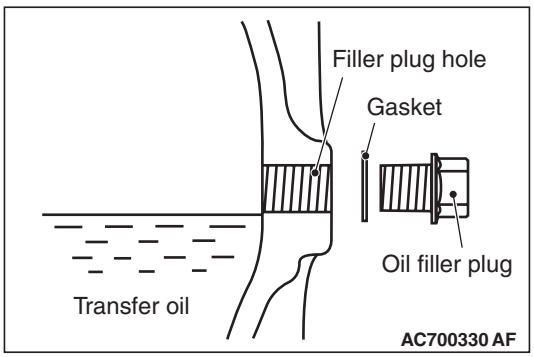
TRANSFER OIL CHANGE

M1221001200235

1. Remove the engine room under cover front B assembly. (Refer to GROUP 51, Under cover P.51-16.)
2. Remove the oil drain plug and gasket to drain the oil.
3. Install the oil drain plug and new gasket, then tighten them to the specified torque.

   Tightening torque: 32 ±2 N· m (24 ±1 ft-lb)





4. Remove the oil filler plug and gasket, then fill the oil up to the lower edge of the oil filler plug hole.

   Brand name: Mitsubishi genuine Dia-Queen LSD Gear Oil

   Quantity: 0.8 dm^3 (0.9 quarts)
5. Install the oil filler plug and new gasket, then tighten them to the specified torque.

   Tightening torque: 32 ±2 N· m (24 ±1 ft-lb)
6. Install the engine room under cover front B assembly. (Refer to GROUP 51, Under cover P.51-16.)

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FLUID CHECK

M1221011500066

Refer to GROUP 27, On-vehicle service P.27-29.

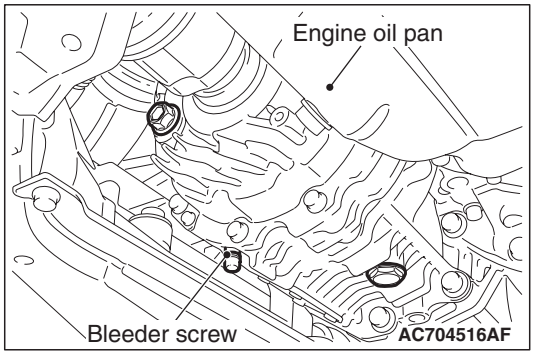
BLEEDING

M1221011600052

⚠ CAUTION

At low temperature the fluid viscosity is so high that air bleeding becomes degenerated. Air bleeding should be done at normal temperatures {10 to 30°C (50 to 86°F)}.

1. Raise the vehicle.
2. Remove the engine room under cover front B assembly. (Refer to GROUP 51, Under cover P.51-16.)
3. Remove the bleeder screw cap of the transfer, then connect the vinyl hose.



⚠ CAUTION

Before connecting or disconnecting scan tool, always turn the ignition switch to the LOCK (OFF) position.

4. Connect scan tool to the data link connector.(Refer to P.22A-9.)
5. Position the steering wheel in a straight ahead direction.
6. Turn the ignition switch to the "ON" position.
7. Perform the actuator test (item No. 01) of scan tool to forcibly activate the hydraulic unit.

   NOTE:
   - *The forced activation (item No. 01: Air bleeding mode) is continued for 5 minutes, then it will be canceled automatically. Also, using the clear key on the scan tool, the activation can be forcibly canceled.*
   - *When the hydraulic unit functions are stopped due to the fail-safe, the forced activation cannot be performed.*
8. From the straight-ahead position, gradually rotate the steering wheel to the right or left. Loosen the bleeder screw, and check that the air is bled with fluid.

⚠ CAUTION

- **During the air bleeding, fill the fluid so that the fluid constantly remains in the oil reservoir.**
- **When the oil is filled into the empty oil reservoir, check that the oil is filled up under the filter inside the oil reservoir.**

9. After bleeding the air, tighten the bleeder screw.
10. Repeat Steps 7 and 8 for two to three times. After checking that air mixing is eliminated, tighten the bleeder screw to the specified torque.

    Tightening torque: 5.0 ±1.0 N·m (44 ±9 in-lb)

⚠ CAUTION

If the air bleeding is insufficient, the noise from the hydraulic unit occurs, which may deteriorate the pump durability.

11. After the air bleeding is complete, check the fluid level.(Refer to GROUP 27, On-vehicle service P.27-29.)

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12.Install the engine room under cover front B assembly. (Refer to GROUP 51, Under cover P.51-16.)

ACD OPERATION CHECK

M1221011700060

⚠ CAUTION

Before connecting or disconnecting scan tool, always turn the ignition switch to the LOCK (OFF) position.

1. Connect scan tool to the data link connector.(Refer to P.22A-9.)
2. Start the engine.
3. Position the steering wheel in a straight ahead direction.
4. Perform the actuator test (item No. 05) of scan tool to forcibly activate ACD.

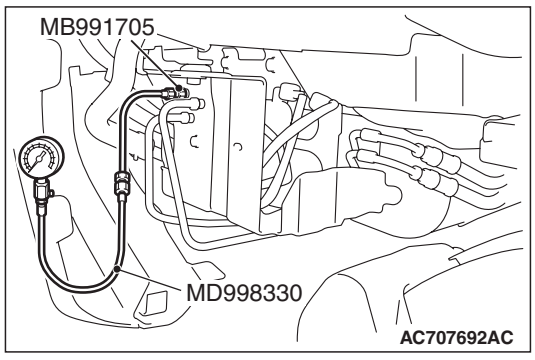
   NOTE:
   - *The forced activation (item No. 05: ACD operation check mode) is continued for 1 minute, then it will be canceled automatically. Also, using the clear key on the scan tool, the activation can be forcibly canceled.*
   - *When the ACD functions are stopped due to the fail-safe, the forced activation cannot be performed.*
5. Rotate the steering wheel 180° or more to the right or left, and drive the vehicle at 20 km/h or less to check that the tight corner braking phenomenon occurs.

   NOTE:
   - *The occurrence levels of body vibration and noise caused by the tight corner braking phenomenon will differ depending on the conditions of tire and road surface.*
   - *If the tight corner braking phenomenon does not occur, the system may have an abnormality. Therefore, check the hydraulic pressure.*

HYDRAULIC PRESSURE CHECK

M1221011800089

1. Remove the rear wheel (RH), then remove the rear wheel splash shield.(Refer to GROUP 42A, Splash shield P.42A-13.)
2. Raise the vehicle.
3. Disconnect the hydraulic unit from the ACD pressure tube assembly. Then, connect the special tool below to the hydraulic unit side.
   - Hose adapter (MB991705)
   - Oil pressure gauge (MD998330)



⚠ CAUTION

Before connecting or disconnecting scan tool, always turn the ignition switch to the LOCK (OFF) position.

4. Connect scan tool to the data link connector.(Refer to P.22A-9.)
5. Turn the ignition switch to the "ON" position.
6. Perform the actuator test (item No. 05) of scan tool to forcibly activate ACD.

NOTE:

- *The forced activation (item No. 05: ACD operation check mode) is continued for 1 minute, then it will be canceled automatically. Also, using the clear key on the scan tool, the activation can be forcibly canceled.*
- *When the ACD functions are stopped due to the fail-safe, the forced activation cannot be performed.*

⚠ CAUTION

During the hydraulic pressure check, fill the fluid so that the fluid constantly remains in the oil reservoir.

7. Check that the generated hydraulic pressure of the hydraulic unit is within the standard value.

   Standard valve: 0.9 –1.1 MPa (130 –159 psi)

8. If the measured value exceeds the standard value, replace the hydraulic unit.
9. After applying oil to the flare nut thread of ACD pressure tube assembly, connect the assembly to the hydraulic unit, then tighten to the specified torque.

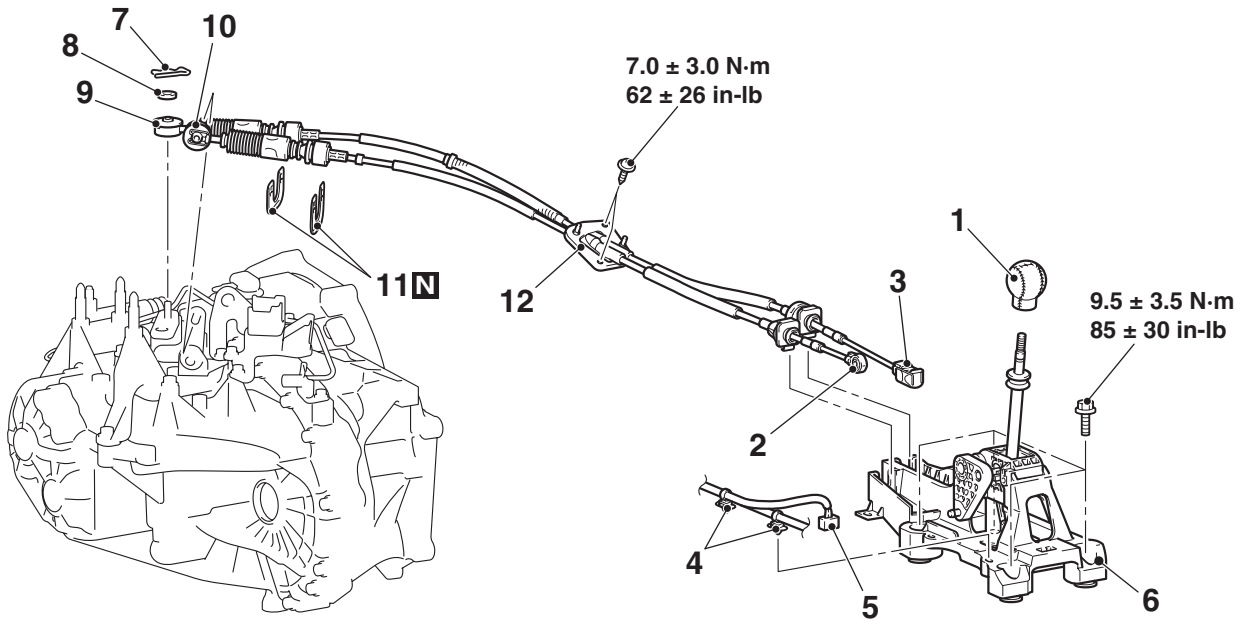
   Tightening torque: 26 ±4 N· m (19 ±3 ft-lb)

10. Perform the air bleeding. (Refer to P.22A-118.)

TRANSAXLE CONTROL

REMOVAL AND INSTALLATION

M1221003801106



AC705547AC

Shift lever assembly removal steps

1. Shift knob
- Floor console bracket (A) (Refer to GROUP 52A, Floor console assembly P.52A-9.)
2. Select cable connection (shift lever side)

>>B<< 3. Shift cable connection (shift lever side)

4. Harness clip connection
5. Connector connection
6. Shift lever assembly

Shift cable and select cable assembly removal steps

1. Shift knob
- SRS-ECU (Refer to GROUP 52B, SRS-ECU P.52B-383.)
- G and yaw rate sensor and G and yaw rate sensor bracket (Refer to GROUP 35C –G and Yaw Rate Sensor P.35C-278.)
2. Select cable connection (shift lever side)

>>B<< 3. Shift cable connection (shift lever side)

<<A>> >>A<< 10. Select cable connection (transaxle side)

<<A>> >>A<< 11. Clip

12. Shift cable and select cable assembly

Shift cable and select cable assembly removal steps

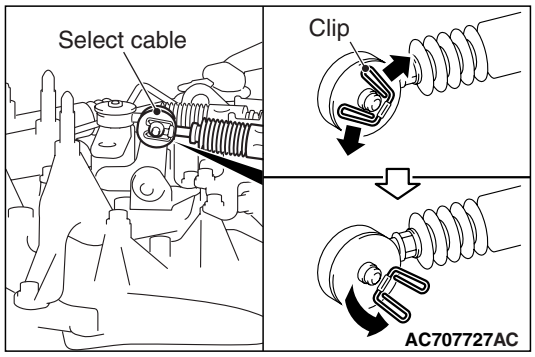
- Air cleaner assembly (Refer to GROUP 15, Air cleaner P.15-10.)
- Engine control harness connector bracket (Refer to GROUP 54A, Battery P.54A-10.)

7. Snap pin
8. Washer
9. Shift cable connection (transaxle side)

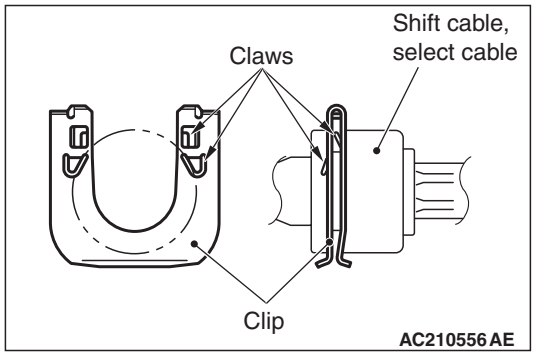
TSB Revision

REMOVAL SERVICE POINT

<<A>> SELECT CABLE CONNECTION (TRANSAXLE SIDE) / CLIP REMOVAL



1. Set the select cable clips to a status shown in the figure, then disconnect the cable.



2. Push down the clip claw using a screwdriver or others. Then, remove the clip together with the cable from the bracket.

INSTALLATION SERVICE POINTS

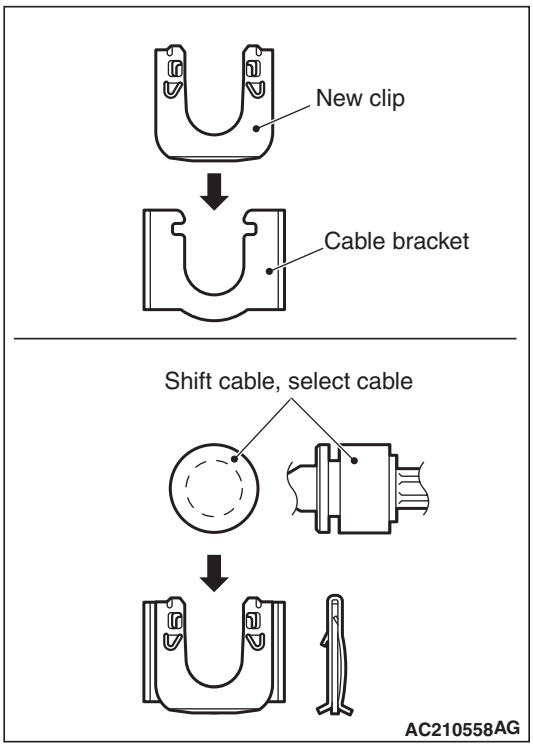
>>A<< CLIP/SHIFT CABLE CONNECTION (TRANSAXLE SIDE)/SELECT CABLE CONNECTION (TRANSAXLE SIDE) INSTALLATION

⚠ CAUTION

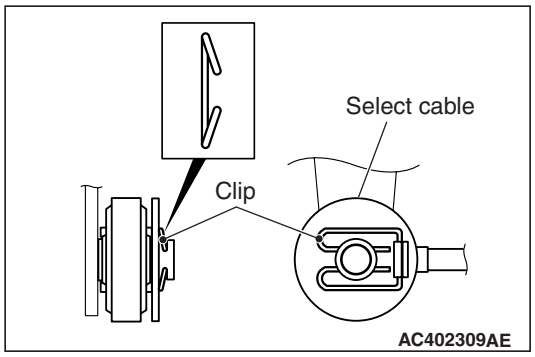
Securely insert the clip, shift cable, and select cable until they click into place.

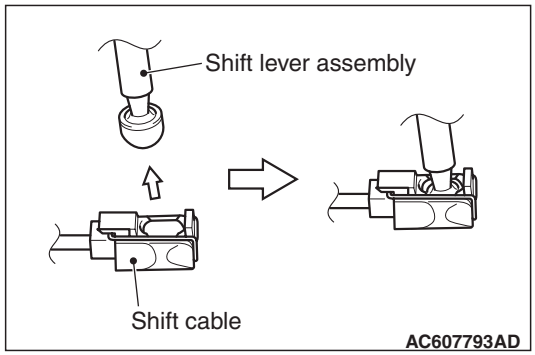
1. After inserting the new clip into the cable bracket, insert the shift cable or select cable into the cable bracket.

NOTE: The clip can be installed either with its face side down or under side down.



2. After assembling the clip of select cable as shown in the figure, connect the cables to the levers.





>>B<< SHIFT CABKE CONNECTION (SHIFT LEVER SIDE)

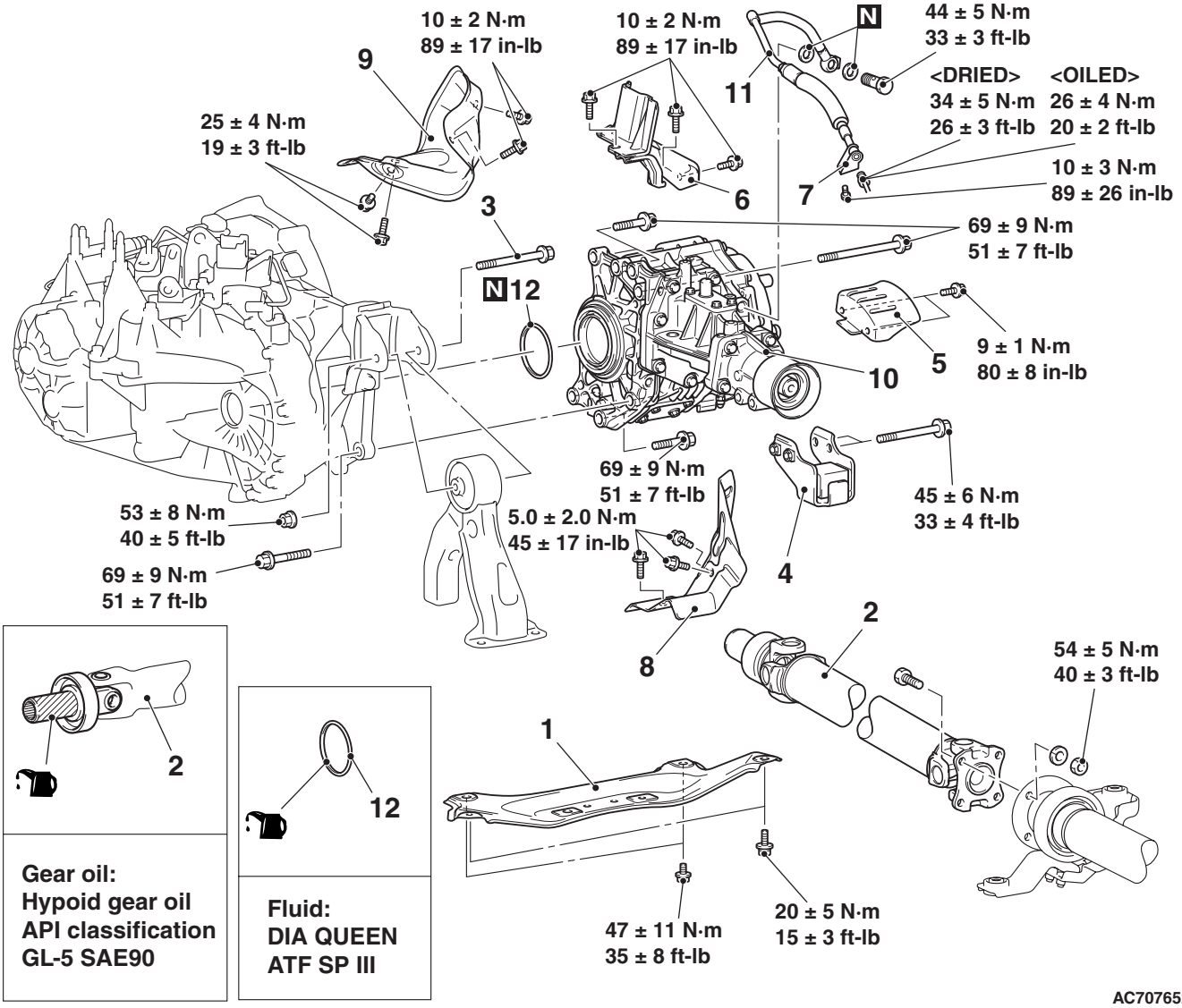
To the area of shift lever assembly shown in the figure, securely insert the shift cable tip until it clicks into place.

TRANSFER ASSEMBLY

REMOVAL AND INSTALLATION

M1221003200338

Pre-removal Operation	Post-installation Operation
• Engine Room Under Cover Front B Assembly Removal (Refer to GROUP 51, Under Cover P.51-16.) • Transfer Oil Draining (Refer to P.22A-117.)	• ACD Air Bleeding (Refer to P.22A-118.) • Transfer Oil Supplying (Refer to P.22A-117.) • Engine Room Under Cover Front B Assembly Installation (Refer to GROUP 51, Under Cover P.51-16.)



AC707652AC

<<A>>

Removal Steps

1. Front floor backbone brace
2. Front propeller shaft assembly
   - Front drive shaft assembly and output shaft assembly (Refer to GROUP 26, Drive shaft assembly P.26-15.)
   - Centermember and front roll stopper assembly (Refer to GROUP 32, Engine roll stopper and centermember P.32-8.)

<<B>>

Removal Steps

- Front exhaust pipe (Refer to GROUP 15, Exhaust pipe and main muffler P.15-24.)
3. Rear roll stopper center bolt
4. Dynamic damper
5. Drive shaft heater protector
6. Transfer heater protector
7. Transfer pressure hose assembly connection
8. Steering gear and linkage heat protector
9. Turbocharger protector A
10. Transfer assembly

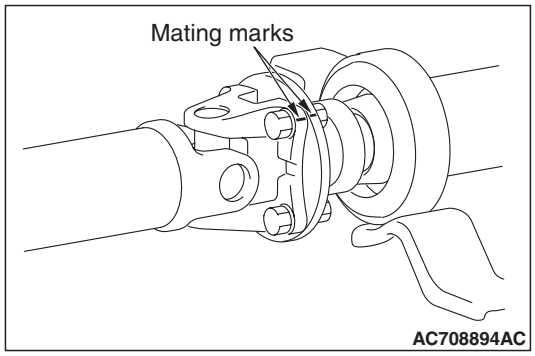
TSB Revision

Removal Steps

>>**A**<< 11. Transfer pressure hose assembly
12. O-ring

REMOVAL SERVICE POINT

<<A>> FRONT PROPELLER SHAFT ASSEMBLY REMOVAL



Make mating marks on the front propeller shaft assembly and companion flange, then remove the connecting nut.

<<B>> TRANSFER ASSEMBLY REMOVAL

Move the engine and transaxle assembly toward the front of the vehicle to create a gap between the engine/transaxle assembly and the crossmember. Pull out the transfer assembly through this gap.

INSTALLATION SERVICE POINT

>>A<< TRANSFER PRESSURE HOSE ASSEMBLY INSTALLATION

⚠ CAUTION

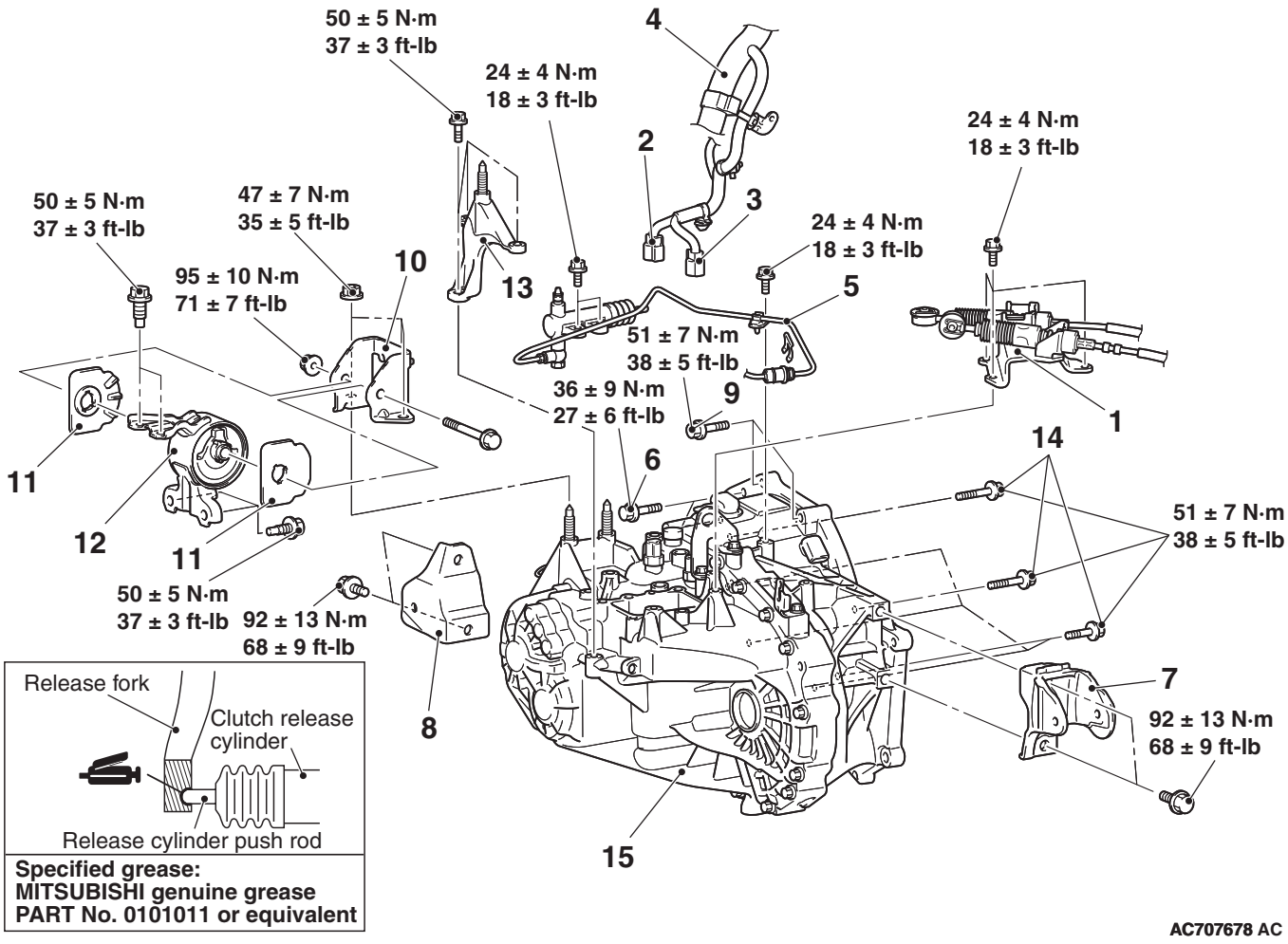
When installing the transfer pressure hose assembly, use caution that the assembly does not interfere with surrounding components.

TRANSAXLE ASSEMBLY

REMOVAL AND INSTALLATION

M1221002701139

Pre-removal Operation	Post-installation Operation
• Engine Room Under Cover Front B Assembly, Engine Room Side Cover Removal (Refer to GROUP 51, Under Cover P.51-16.) • Transmission Oil Draining (Refer to P.22A-116.) • Engine Upper Cover Removal (Refer to GROUP 16, Ignition Coil P.16-39.) • Air Cleaner Assembly, Air Cleaner Bracket Removal (Refer to GROUP 15, Air Cleaner P.15-10.) • Headlight Support Panel Cover Removal (Refer to GROUP 51, Front Bumper Assembly and Radiator Grille P.51-3.) • Engine Control Harness Connector Bracket Removal (Refer to GROUP 54A, Battery P.54A-10.) • Radiator Cap Assembly Mounting Bolt, Radiator Condenser Tank, Radiator Condenser Tank Bracket Removal (Refer to GROUP 14, Radiator P.14-31.) • Relay box mounting bolt removal • Front Exhaust Pipe Removal (Refer to GROUP 15, Exhaust Pipe and Main Muffler P.15-24.) • Water pump pulley Removal (Refer to GROUP 14, Water pump P.14-25.)	• Water pump pulley Installation (Refer to GROUP 14, Water pump P.14-25.) • Front Exhaust Pipe Installation (Refer to GROUP 15, Exhaust Pipe and Main Muffler P.15-24.) • Relay Box Mounting Bolt Installation • Radiator Cap Assembly Mounting Bolt, Radiator Condenser Tank, Radiator Condenser Tank Bracket Installation (Refer to GROUP 14, Radiator P.14-31). • Engine Control Harness Connector Bracket Installation (Refer to GROUP 54A, Battery P.54A-10.) • Headlight Support Panel Cover Installation (Refer to GROUP 51, Front Bumper Assembly and Radiator Grille P.51-3.) • Air Cleaner Assembly, Air Cleaner Bracket Installation (Refer to GROUP 15, Air Cleaner P.15-10.) • Engine Upper Cover Installation (Refer to GROUP 16, Ignition Coil P.16-39.) • Transmission Oil Refilling (Refer to P.22A-116.) • Engine Room Under Cover Front B Assembly, Engine Room Side Cover Installation (Refer to GROUP 51, Under Cover P.51-16.)



AC707678 AC

TSB Revision

Removal steps

<<A>>
- Strut tower bar (Refer to GROUP 42A –Strut Tower Bar P.42A-15.)
- Front driveshaft assembly, output shaft assembly (Refer to GROUP 26, Driveshaft assembly P.26-15.)

<<B>> >>C<<
1. Shift cable, select cable assembly and cable bracket connection
2. Backup light switch connector connection
3. 1–2nd rail switch connector connection
4. Control harness connection
5. Connection of clutch release cylinder and clutch tube assembly B

<<C>>
6. Starter mounting bolt

<<D>>
- Clutch release bearing connection

<<E>>
- Front axle crossmember assembly (Refer to GROUP 32 –Crossmember P.32-10.)
- Transfer assembly (Refer to P.22A-125.)

7. Rear roll stopper bracket
8. Front roll stopper bracket
9. Transaxle assembly upper part coupling bolt

<<F>>
10. Transaxle mounting bracket

>>B<<
11. Transaxle mounting insulator stopper
12. Transaxle mounting insulator
13. Stud adapter

<<G>>
- Engine assembly support

14. Transaxle assembly lower part coupling bolt

>>A<<
15. Transaxle assembly

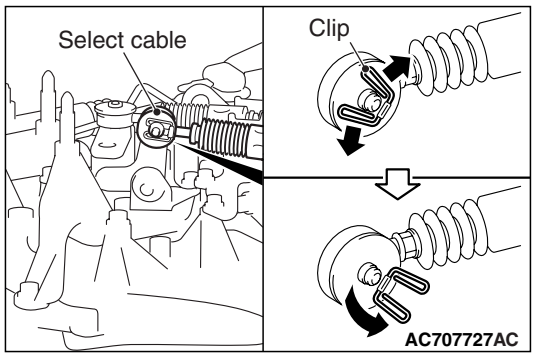
REMOVAL SERVICE POINTS

<<A>> STRUT TOWER BAR REMOVAL

After removing the strut tower bar, temporarily install the strut assembly.

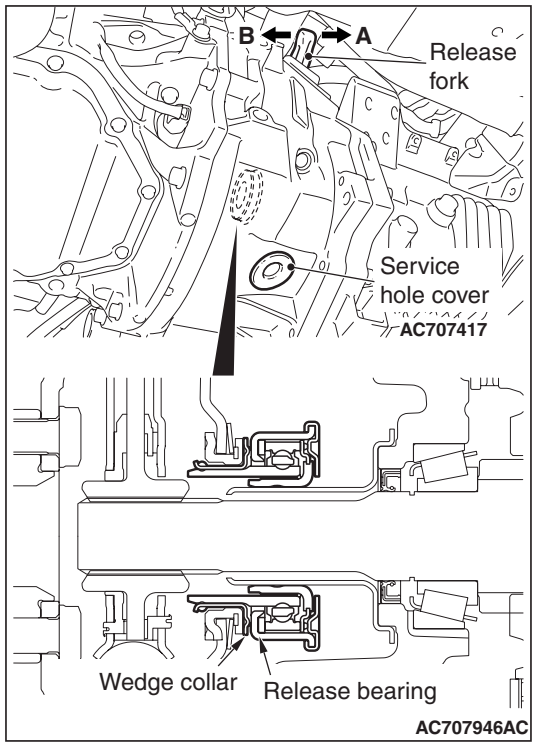
<<B>> SHIFT CABLE/SELECT CABLE ASSEMBLY AND CABLE BRACKET REMOVAL

Set the select cable clips to a status shown in the figure, then disconnect the cable.



<<C>> STARTER MOUNTING BOLT REMOVAL

Remove the starter with its connector connected. Keep the starter fixed to the engine side.



<<D>> CLUTCH RELEASE BEARING DISCONNECTION

1. Remove the service hole cover of the clutch housing part.

⚠ CAUTION

- **Do not insert the flat-tipped screwdriver before moving the release fork toward direction A.**
- **Do not mistakenly insert a flat-tipped screwdriver between the wedge collar and the wave spring.**

2. Move the release fork slightly toward direction A with hand, and while holding the release fork, insert a flat-tipped screwdriver between the release bearing and the wedge collar.

⚠ CAUTION

If the flat-tipped screwdriver cannot be turned easily (release bearing cannot be disengaged), remove the screw driver, and move the release fork toward direction A for two or three times. Then, repeat the procedure. If the screwdriver is turned forcibly, the release bearing may be damaged.

3. (Disconnect the release bearing from the wedge collar by twisting the flat-tipped screw driver slightly (twist the handle 90°).

   NOTE: When the release bearing is disconnected, the release fork moves to the direction B by the return spring.

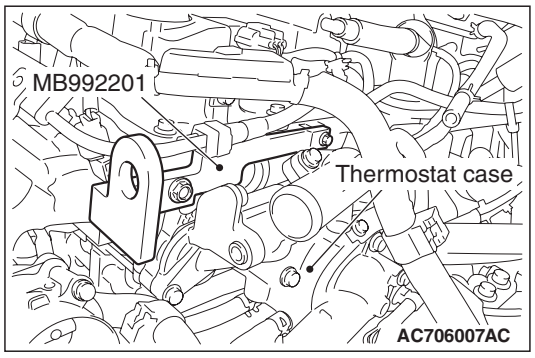
<<E>> TRANSAXLE ASSEMBLY UPPER PART MOUNTING BOLT REMOVAL

Only loosen the bolts from the engine and transaxle assembly (do not remove).

<<F>>TRANSAXLE MOUNTING BRACKET INSTALLATION

1. Place a garage jack against the transaxle case with a piece of wood in between to support the engine and transaxle assembly.
2. Operate the garage jack so that the engine and transaxle assembly weight is not applied to the transaxle mounting insulator, and remove the transaxle mounting bracket.

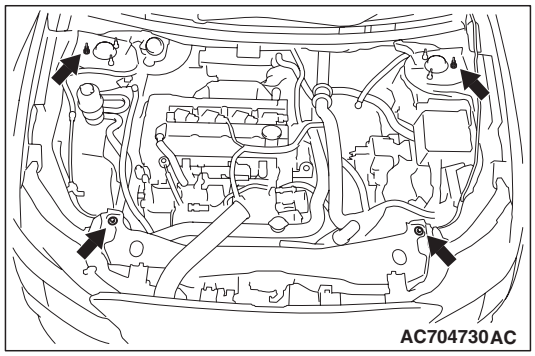
<<G>> ENGINE ASSEMBLY SUPPORT



1. Remove the vacuum pipe assembly (refer to GROUP 14 – Water Hose and Water Pipe P.14-26), and install the engine hanger plate (Special tool: MB992201), then tighten the bolts to the specified torque.

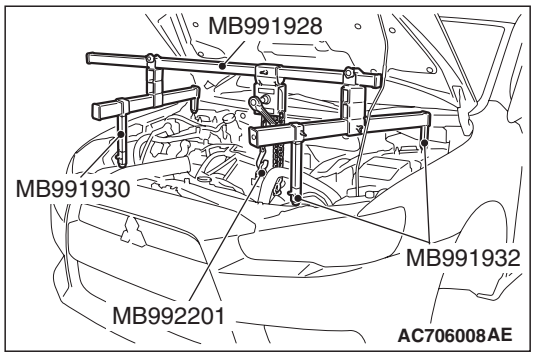
   Tightening torque: 11 ±1 N· m (8 ±1 ft-lb)

2. <When engine hanger (special tool MB991928) is used>
   (1) Assemble the engine hanger (special tool MB991928). (Set following parts to the base hanger.)
- Slide bracket (HI)
- Foot x 4 (standard) (MB991932)
- Joint x 2 (90) (MB991930)



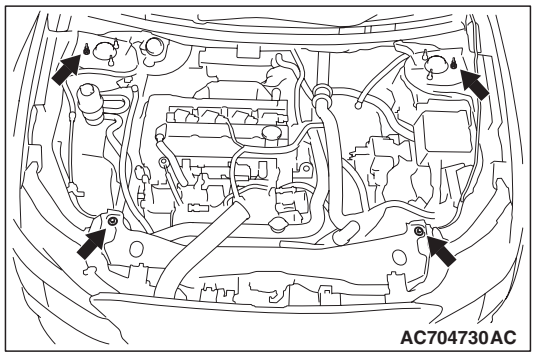
(2) Set the feet of the special tool as shown in the figure.

NOTE: Adjust the engine hanger balance by sliding the slide bracket (HI).



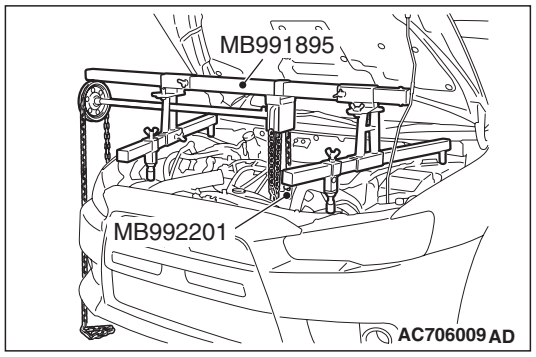
(3) Set the chain to the engine hanger plate (Special tool: MB992201) to support the engine and transaxle assembly. Remove the garage jack, and then remove the transaxle assembly upper part coupling bolts that have been loosened previously.

3. <Engine mechanical hanger (special tool MB991895) is used>



(1) Set the feet of the engine mechanical hanger (special tool MB991895) as shown in the figure.

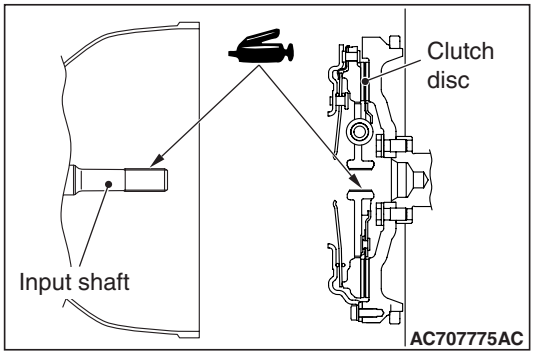
NOTE: Slide the front foot of the engine mechanical hanger (Special tool: MB991895) to balance the engine hanger.



(2) Set the chain to the engine hanger plate (Special tool: MB992201) to support the engine and transaxle assembly. Remove the garage jack, and then remove the transaxle assembly upper part coupling bolts that have been loosened previously.

INSTALLATION SERVICE POINTS

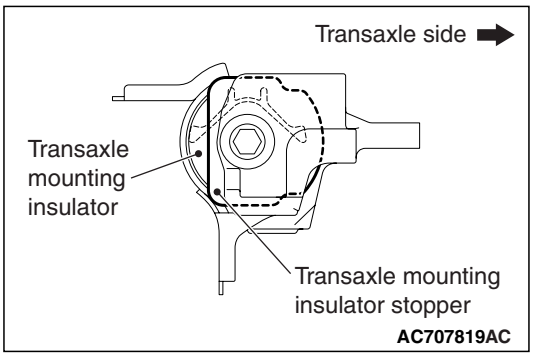
>>A<< TRANSAXLE ASSEMBLY INSTALLATION



When installing the transaxle assembly, apply the specified grease to the spline sections of clutch disk and input shaft, and then rub in the grease using a brush.

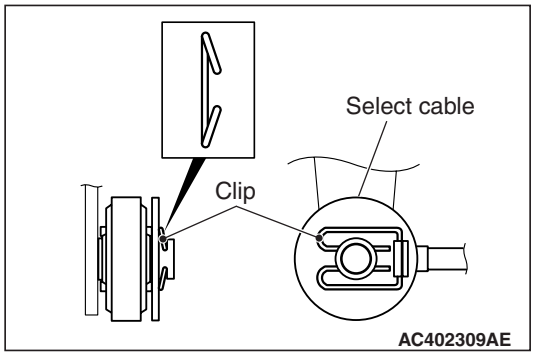
Grease
Brand name: 0101011 or equivalent

>>B<< TRANSAXLE MOUNTING INSULATOR STOPPER INSTALLATION



Install the transaxle mounting insulator stopper as shown in the figure.

>>C<< SHIFT CABLE /SELECT CABLE ASSEMBLY/CABLE BRACKET INSTALLATION



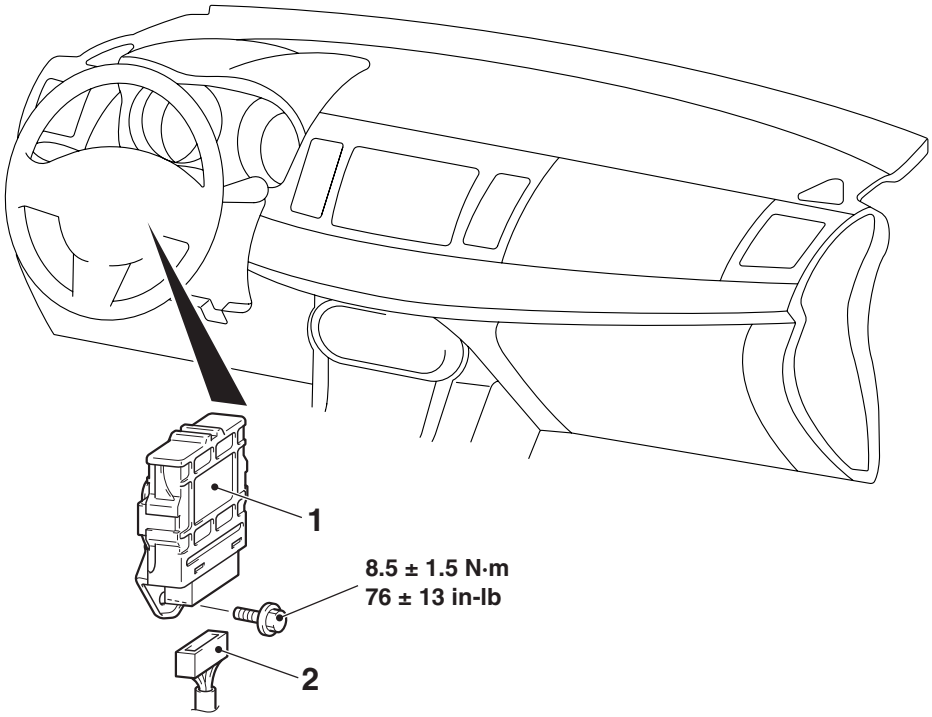
After assembling the clip to the cable as shown in the figure, connect the cables to the levers.

AWC-ECU

REMOVAL AND INSTALLATION

M1221021300030

Pre-removal and Post-installation Operation
- Bottom Cover Removal and Installation (Refer to GROUP 52A –Glove Box P.52A-6.)



AC710454 AB

Removal steps
1. AWC-ECU
2. AWC-ECU connector connection

SENSOR, SWITCH AND RELAY

REMOVAL AND INSTALLATION

M1221012300098

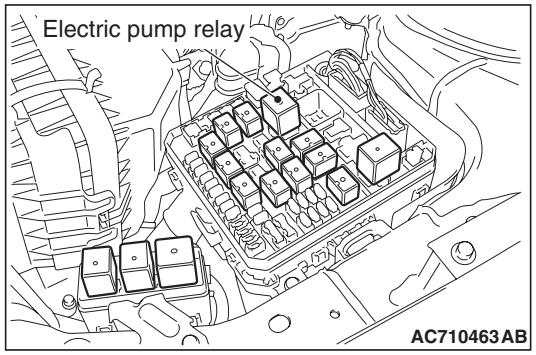
STEERING WHEEL SENSOR
Refer to GROUP 35C, Steering wheel sensor P.35C-279.

G AND YAW RATE SENSOR
Refer to GROUP 35C, G and yaw rate sensor P.35C-278.

WHEEL SPEED SENSOR
Refer to GROUP 35C, Wheel speed sensor P.35C-274.

AWC SWITCH
Refer to GROUP 37 –Steering <vehicles without steering wheel audio remote control switch>P.37-22 or GROUP 52A –Floor Console <vehicles with steering wheel audio remote control switch>P.52A-9 .

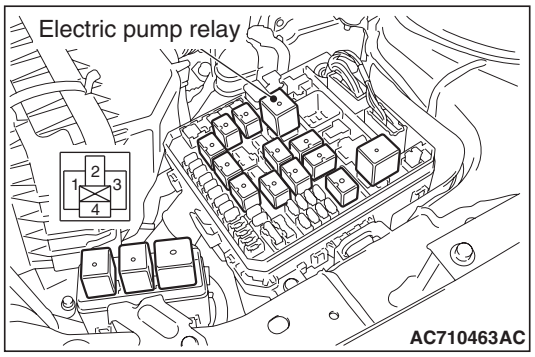
ELECTRIC PUMP RELAY

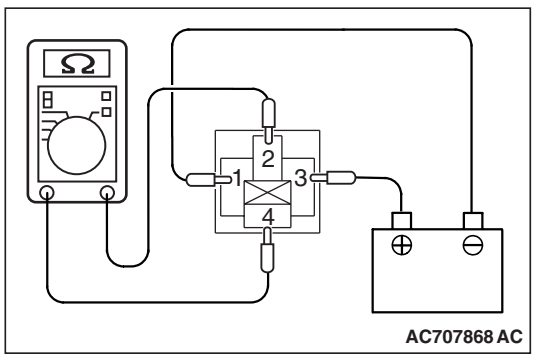


INSPECTION

ELECTRIC PUMP RELAY CHECK

M1221021700027





1. Using a jumper wire, connect the positive battery terminal (+) to the electric pump relay terminal No. 3, and the negative battery terminal (-) to the terminal No. 1.
2. Check for continuity between the electric pump relay terminals No. 2 and No. 4.

Jumper wire	Continuity between terminals No. 2 and No. 4
Connect	Yes (2 Ω or less)
Disconnect	No

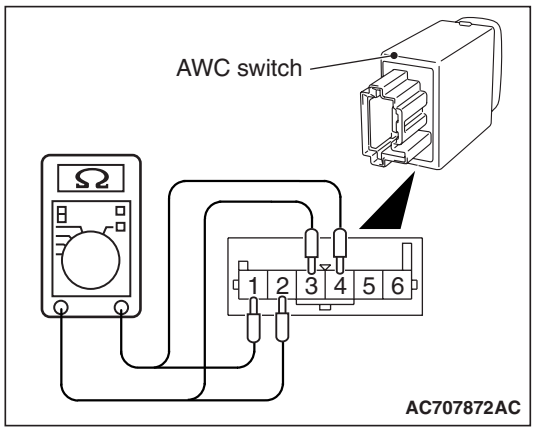
3. If defective, replace the electric pump relay.

AWC SWITCH CHECK

M1221021800024

<VEHICLES WITH STEERING WHEEL VOICE CONTROL SWITCH>

1. Check the continuity between the AWC switch connector terminals.

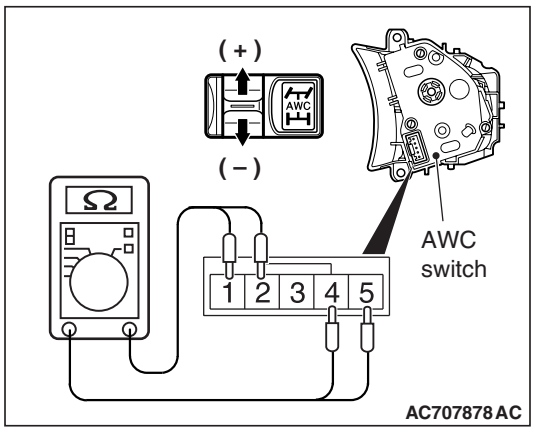


AWC selection switch terminal No.	AWC selection switch	Continuity
1 –2	ON	Yes (2 Ω or less)
	OFF	No
3 –4	–	Present

2. When other than above, replace the AWC switch.

<EXCEPT VEHICLES WITH STEERING WHEEL VOICE CONTROL SWITCH>

1. Check the resistance and continuity between the AWC switch connector terminals.



AWC selection switch terminal No.	AWC selection switch	Resistance value
2 –4	(–)	Approximately 270 Ω
	(+)	Approximately 2.1 kΩ
	OFF	Approximately 71 kΩ

Terminal No.	Probe (Tester: Ω range)	Continuity
1	–	Present
5	+	
1	+	No
5	–	

2. When other than above, replace the AWC switch.

HYDRAULIC UNIT

REMOVAL AND INSTALLATION

M1221012800059

Refer to GROUP 27, Hydraulic unit P.27-58.

HYDRAULIC UNIT DISPOSAL

M1221012900045

Refer to GROUP 27 –Hydraulic Unit Disposal P.27-60.

TSB Revision