GROUP 27C

ELECTRONIC CONTROL AWD

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GENERAL INFORMATION

M1272000100084

- Electronic control AWD has been adopted to ensure the on-road performance, achieve lighter and smaller body, and realize better fuel economy.
- The electronic control AWD controls the torque of the electronic control coupling located between the propeller shaft and rear differential. This strategy is enabled by varying the torque distribution to the front and rear wheels from the status closer to the front wheel drive to the status closer to the direct coupling AWD and realizes the optimal drive force according to the various driving conditions.

AIMS OF DEVELOPMENT

Lightweight and simple construction of the electronic control AWD achieves good fuel efficiency and provides enjoyment of selecting the drive mode.

FUNCTION

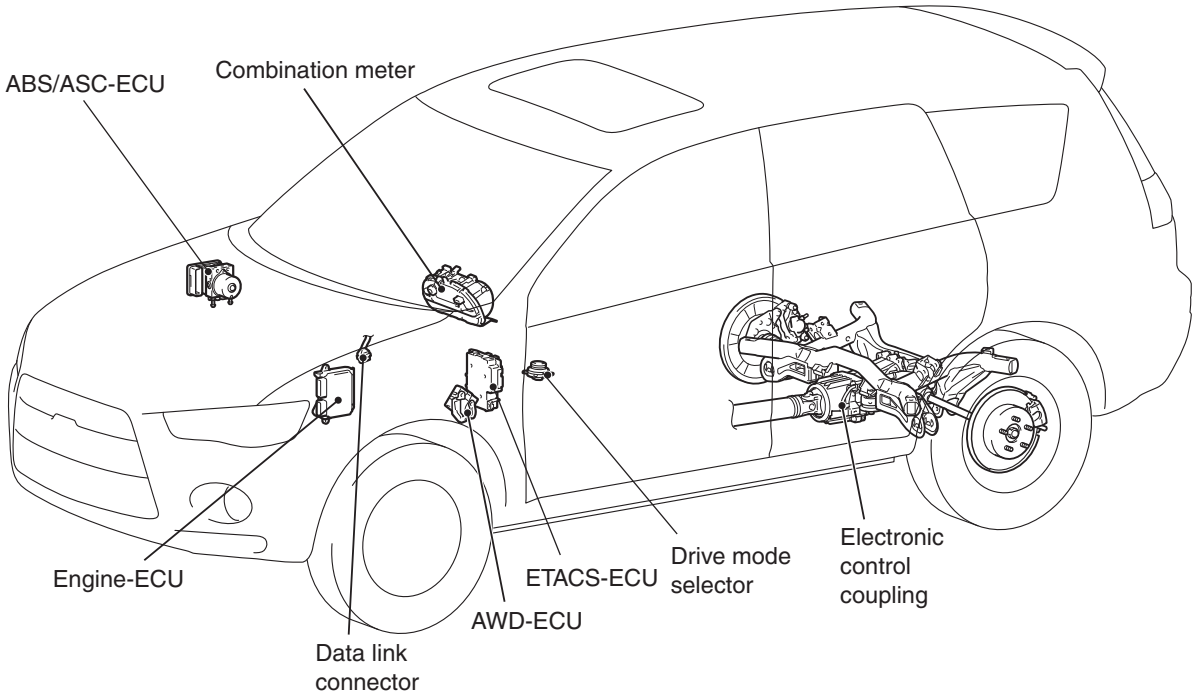
- The adoption of the electronic control coupling satisfies both of the tight corner braking phenomenon* and traction performance.

  *NOTE: *Tight corner braking indicates the following condition. When the AWD vehicle turns sharply on a pavement at low speed (ex. parallel parking), the rotational radius of the front and rear wheels differs, and this difference can no longer be compensated by the tire slippage. At this time, the driver feels as if the brake was applied.*
- The electronic control AWD receives the signals of the throttle position and vehicle speed via CAN* communication protocol, detects the vehicle driving condition and operation of the driver, and distributes the proper torque to the rear wheels.

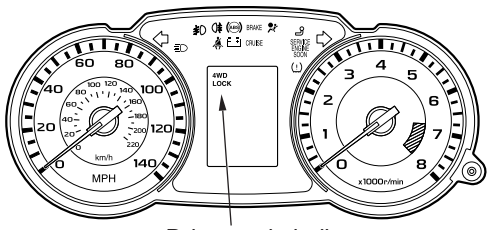
  *NOTE: *: For more information about CAN (Controller Area Network), refer to GROUP 54C .*
- Under severe driving condition, the system is protected by minimizing the limitation force of the differential.
- During high-speed driving, the fuel efficiency is improved by reducing the limitation force of the differential.
- The following drive modes are available according to the drivers' preference to provide the enjoyment of selecting functions.

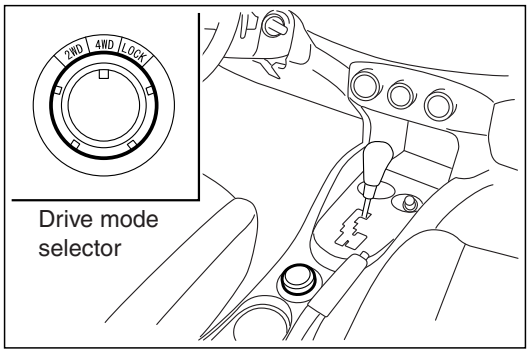
Drive mode	Control content	Appeal points
FWD (2WD)	Minimizes the limitation force of the differential.	High fuel efficiency mode which enables smoother turning performance of the FF vehicle
AWD (4WD)	Increases the limitation force of the differential according to the different rotation speed of the front and rear wheels and the throttle position.	Universal mode which automatically distributes the drive force to the rear wheels as necessary
LOCK	Further increases the limitation force of the differential compared to the AWD mode.	Mode which has an excellent driving performance when driving on rough road or in stuck situation and enables the powerful driving

CONSTRUCTION DIAGRAM

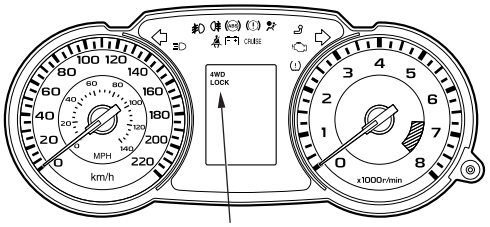


Vehicles for USA





Vehicles for Canada



AC901131AB

SYSTEM COMPONENT AND FUNCTION

Parts name	Functional description
Engine ECU	Sends the following signals required by AWD-ECU via CAN communication. • Engine torque signal • Throttle position signal • Engine speed signal
ABS/ASC-ECU	Sends the following signals required by AWD-ECU via CAN communication. • ABS sensor signal (wheel speed signal) [4 wheels] • ABS operation signal • AWD limitation torque signal
Drive mode selector	Sends the drive mode switch signal [FWD/AWD/LOCK] to AWD-ECU.
ETACS-ECU	• Receives the drive mode switch signal [FWD/AWD/LOCK] from AWD-ECU and flashes the indicators (AWD operation indicator and LOCK indicator) in the combination meter. • Flashes the indicators (AWD operation indicator and LOCK indicator) in the combination meter in case of failure.
	Controls diagnostic function (Compatible with scan tool).
AWD-ECU	Calculates the optimum differential limitation force judging from the vehicle condition and present drive mode based on the signals from each ECU and switch, and controls the current value flown to the electronic control coupling.
	Controls the indicators (AWD operation indicator and LOCK indicator) in the combination meter.
	Controls the self-diagnostic function and fail-safe function.
	Controls diagnostic function (Compatible with scan tool).
Electronic control coupling	Transmits the torque corresponding to the current value controlled by AWD-ECU to the rear wheels.
Drive mode indicator • AWD operation indicator • LOCK indicator	Integrated in the combination meter, and indicates the selected drive mode (Not displayed in FWD mode). • When the AWD operation indicator and LOCK indicator flash alternately, the system automatically enters the front wheel drive mode to protect the drive system components, and the drive mode changeover with the drive mode selector becomes unavailable. • When the drive system generates heat, the AWD operation indicator flashes. • The indicator light operation signal from AWD-ECU is sent to the combination meter via ETACS-ECU using CAN communication.
Data link connector	Outputs the diagnostic trouble code and establishes the communication with scan tool.

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SERVICE PRECAUTIONS

M1274005600057

TOWING

- The vehicle must be towed by a tow truck with all four wheels raised. If a vehicle is towed with only the front or rear wheels are raised, the drive system components may be damaged or the vehicle may jump out of a tow truck (cart).
- Even if the drive mode selector is switched to "FWD," the vehicle cannot be towed with only the front or rear wheels raised. The vehicle must be towed by a tow truck with all four wheels raised.

DRIVING ON SANDY OR SLUSHY ROAD

As the vehicle is intended for on-road use, long-time driving on a sandy or slushy road must be avoided. When the vehicle is driven on a sandy or slushy road for a long time, the fail-safe function of the electronic control AWD system tends to enter the protective control mode which switches the control from AWD to FWD gradually in order to protect the drive system, and the indicators ("AWD" and "LOCK") tends to illuminate.

WHEEL AND TIRE

Normally, all four tires must be same in size, in type, and in brand, except for when a spare tire is temporarily used. If a wheel or tire with incorrect size is installed or tire pressure is excessively out of the specified value, the electronic control AWD system will not operate correctly. In addition, drive system components may be damaged.

SPEED MEASUREMENT

When using the chassis dynamometer to measure the speed, always measure it under synchronized condition between front wheels' speed and rear wheels' speed. If the speed is measured with front wheels or rear wheels fixed, or with speed difference between front wheels and rear wheels, drive system components may be damaged.

SERVICE SPECIFICATIONS

M1274000100080

Item		Standard value
Electronic control coupling solenoid resistance Ω [at 20 °C (68° F)]	Electronic control 4WD	2.2 –4.0
	S-AWC	1.6 –3.7
Electronic control coupling stud bolt length mm (in)		22.3 –25.1 (0.88 –0.99)

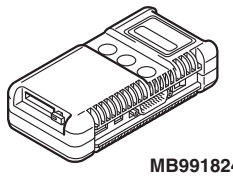
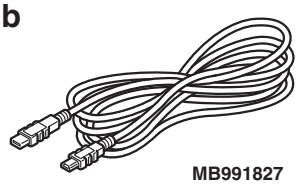
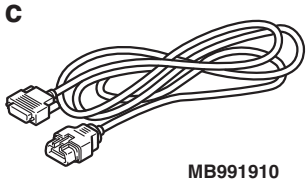
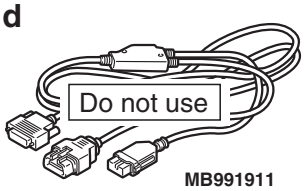
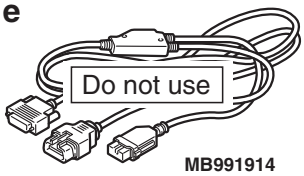
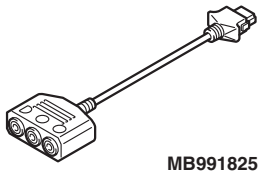
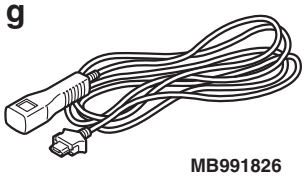
SEALANT

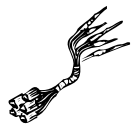
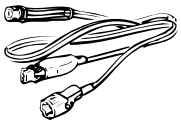
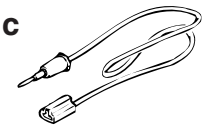
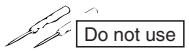
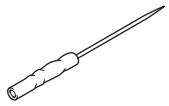
M1272000500123

Item	Specified sealant
Differential carrier and electronic control coupling mounting part	3M™ AAD Part No.8672, 8679, 8678, 8661, 8663 or equivalent

SPECIAL TOOLS

M1274000200054

Tool	Tool number and name	Supersession	Application
a  MB991824 b  MB991827 c  MB991910 d  Do not use MB991911 e  Do not use 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 Chrysler models only) f: M.U.T.-III Adapter Harness 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.*	**⚠ 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.** Check of the electronic control AWD (the diagnostic trouble code display, service data display, freeze frame data display, actuator test with scan tool)

Tool	Tool number and name	Supersession	Application
a  b  c  d  Do not use MB991223	MB991223 Harness set a: MB991219 Test harness b: MB991220 LED harness c: MB991221 LED harness adapter d: MB991222 Probe	MB991223	Continuity check and voltage measurement at the AWD-ECU wiring harness connector
 MB992006	MB992006 Extra fine probe	General service tool	

DIAGNOSIS

STANDARD FLOW OF DIAGNOSTIC TROUBLESHOOTING

M1274000400069

Refer to GROUP 00 –Troubleshooting Contents P.00-7.

PRECAUTIONS FOR DIAGNOSIS

M1274000500055

- After troubleshooting, and removing/installing of the electronic control AWD system components, check the diagnostic trouble code using scan tool. If a diagnostic trouble code is set, erase it and check again that no diagnostic trouble code is set.
- Before performing a troubleshooting, check that all four wheels and tyres are same in size, in type, and in brand. The electronic control AWD system will function correctly only when all four wheels and tyres are same in size, and tyre pressure is specified value.
- If any abnormality occurs in the electronic control AWD system, it flashes the indicators (4WD and LOCK) in the combination meter alternately to inform of the abnormality.
- When the vehicle is used under some severe operational conditions (such as a long-time driving in AWD on a sandy road, slushy road or road with deep snows or towing or long hill-climbing), the electronic control AWD system illuminates the drive system fluid temperature warning display in the combination meter in order to protect the electronic control coupling fluid, at the same time it flashes the indicator (4WD or LOCK) corresponding to the selected drive mode to inform of the abnormality.
- The electronic control AWD system is equipped with the fail-safe function which prohibits AWD control and shifts to FWD control if any abnormality occurs in the system. If there is a risk that the vehicle behavior suddenly changes, the gradual shifting to FWD control is chosen.

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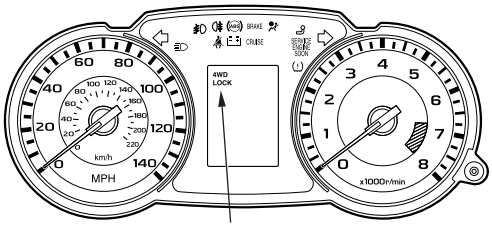
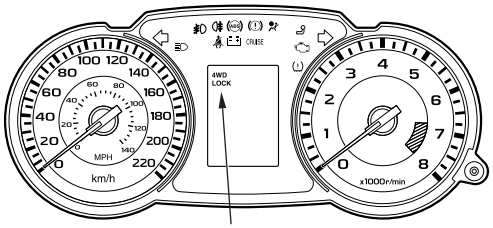
Vehicles for USA



Drive mode indicator

AC703673AB

Vehicles for Canada



Drive mode indicator

AC703674 AB

CHECK OF DRIVE MODE INDICATORS (4WD/LOCK)

M1274000600085

When the ignition switch is turned ON, check that the 4WD/LOCK indicators illuminate as follows:

Switch position	Indicator display
2WD (FWD)	(Not illuminated)
4WD (AWD)	4WD
LOCK	4WD, LOCK

Otherwise, check the diagnostic trouble code.

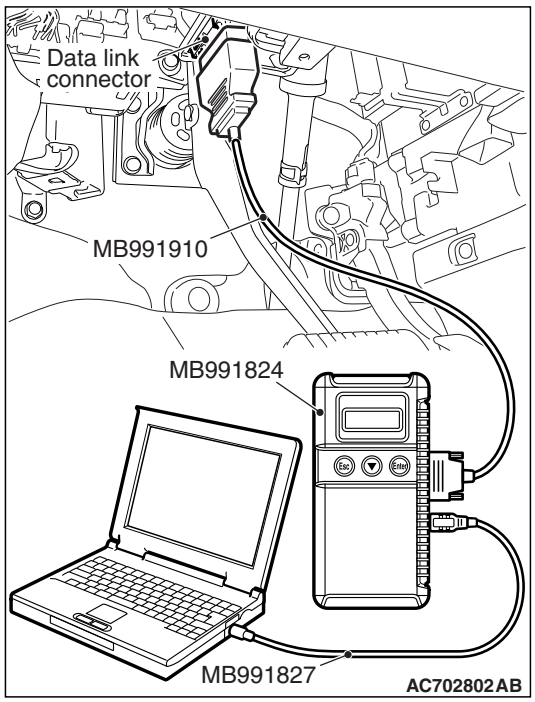
DIAGNOSTIC FUNCTION

M1274000700060

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

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles 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 M.U.T.-III 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.

HOW TO READ AND ERASE DIAGNOSTIC TROUBLE CODES

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicles 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.

NOTE: If the battery voltage is low, diagnostic trouble codes will not be set. Check the battery if scan tool MB991958 does not display.

1. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "System select" from the start-up screen.
4. Select "From 2006 MY" under "Model Year". Check that "Vehicle Information" contents are correct.
5. Select "ETACS" from "System List", and then press "OK" button.

   NOTE: If "Loading Option Setup" list is shown, click appropriate box.
6. Select "Diagnostic Trouble Code."
7. If a DTC is set, it is shown.
8. Choose "Erase DTCs" to read the DTC.

FREEZE FRAME DATA REFERENCE TABLE

M1274001200068

Scan tool can be used to read the freeze frame data (the driving status when the failure occurs) at each diagnostic trouble code detection.

FREEZE FRAME DATA SPECIFICATIONS

Item No.	Item	Unit/Content
01	Odometer	xxxx mile
02	Ignition cycle	–
03	Coupling torque	xxxx N· m
04	Current trouble accumulative time	xxxx min
06	Coupling temperature	xxxx °F
07	CAN communication (ABS/ASC) error flag	OFF (Normal)/ON (Malfunction)
08	CAN communication (engine) error flag	OFF (Normal)/ON (Malfunction)
09	CAN communication (ETACS) error flag	OFF (Normal)/ON (Malfunction)
15	AWD mode	2WD
		4WD
		4WD LOCK
16	FL wheel speed sensor	xxxx mph
17	FR wheel speed sensor	xxxx mph
18	RL wheel speed sensor	xxxx mph
19	RR wheel speed sensor	xxxx mph

NOTE: xxxx indicates the value.

DIAGNOSIS CODE CHART

M1274000800078

⚠ CAUTION

On troubleshooting, if the ignition switch is turned ON while disconnecting connector(s), diagnosis code(s) associated with other system may be set. On completion, confirm all systems for diagnosis code(s). If diagnosis code(s) are set, erase them all.

Diagnosis code No.	Diagnostic item	Reference page
C1078	Tire with incorrect diameter equipped	P.27C-12
C1456	Wiring harness or coupling coil overcurrent failure	P.27C-14
C145A	Wiring harness or coupling coil short circuit failure	P.27C-19
C145D	Wiring harness or coupling open circuit failure	P.27C-24
C145F	Coupling overload	P.27C-28
C1460	Drive mode selector circuit failure	P.27C-31
C2100	Abnormal battery voltage (too low)	P.27C-35
C2101	Abnormal battery voltage (too high)	P.27C-39
C211C	Abnormal IG1 power supply low voltage	P.27C-43
C211D	Abnormal IG1 power supply high voltage	P.27C-47
C211E	Abnormal power supply voltage (too low)	P.27C-51
C211F	Abnormal power supply voltage (too high)	P.27C-59
C2208	AWD-ECU internal error	P.27C-62
U0001	Bus-off error	P.27C-62
U0100	Engine CAN time-out	P.27C-63
U0121	ABS CAN time-out	P.27C-65
U0141	ETACS CAN time-out	P.27C-66
U0401	Engine CAN data error	P.27C-68
U0415	ABS CAN data error	P.27C-70
U113C	Wheel speed sensor data error	P.27C-72

DIAGNOSTIC TROUBLE CODE PROCEDURES

DTC C1078: Tire with incorrect diameter equipped

OPERATION

If the vehicle is driven with a tire with incorrect diameter (high-pressure type spare tire or flat tire) installed to either wheel in the AWD mode, AWD-ECU controls the coupling in high torque. If this is the case, the coupling temperature may rise to cause a seizure.

DTC SET CONDITIONS

If the following conditions are met simultaneously, AWD-ECU gradually reduces the AWD control torque to the specified torque, flashes the AWD/LOCK indicators alternately, and sets the DTC No. C1078.

- AWD selector switch: AWD/LOCK
- Difference in rotation speed between the front and rear wheels exceeds continuously a specific value.

⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

TROUBLESHOOTING HINTS

Current trouble

- Tire with incorrect diameter (high-pressure type spare tire or flat tire) equipped
- Improper adjusted tire pressure

Past trouble

- Tire with incorrect diameter (high-pressure type spare tire or flat tire) has been installed.
- The tire pressure has been adjusted due to improper tire pressure.

DIAGNOSIS

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Scan tool MB991958 CAN bus diagnostics

Use scan tool MB991958 to 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 – CAN bus diagnostic chart P.54C-17.) On completion, go to Step 2.

STEP 2. Check whether the DTC is reset after repairing the CAN bus line.

(1) Erase the DTC.
(2) Drive the vehicle straight with throttle opening angle of approximately 50% or less, and constant vehicle speed of 30 km/h or higher for 20 seconds or longer.
(3) Check if the DTC is set.

Q: Is the DTC No. C1078 set?

YES : Go to Step 3.

NO : The procedure is complete.

STEP 3. Tire check

Q: Are all installed wheels and tires same in size?

YES : Go to Step 4.
NO : Install the same size wheels and tires. Then go to Step 4.

STEP 4. Tire pressure check

Check that the tire pressure of the installed tires agrees with the tire pressure specified on the tire pressure label.

Q: Is the tire pressure normal?

YES : Go to Step 6.
NO : Adjust the tire pressure. Then go to Step 5.

STEP 5. Check whether the DTC is reset.

Drive the vehicle straight with throttle opening angle of approximately 50% or less, and constant vehicle speed of 30 km/h (18.6 mph) or higher for 20 seconds or longer.

Q: Is the DTC No. C1078 set?

YES : Go to Step 6.
NO : This code is set because the tire pressure was improper or a tire with incorrect diameter is installed.

STEP 6. Scan tool MB991958 data list

Check the following service data. (Refer to P.27C-87.)

- Item 16: FL wheel speed sensor
- Item 17: FR wheel speed sensor
- Item 18: RL wheel speed sensor
- Item 19: RR wheel speed sensor

Q: Is the check result normal?

YES : Go to Step 7.
NO : Troubleshoot the ABS system (Refer to GROUP 35B – Troubleshooting P.35B-15<Vehicles with ABS>), the ASC system (Refer to GROUP 35C –Troubleshooting P.35C-24 <Vehicles with ASC>). Then go to Step 7.

STEP 7. Check whether the DTC is reset.

Drive the vehicle straight with throttle opening angle of approximately 50% or less, and constant vehicle speed of 30 km/h (18.6 mph) or higher for 20 seconds or longer.

Q: Is the DTC No. C1078 set?

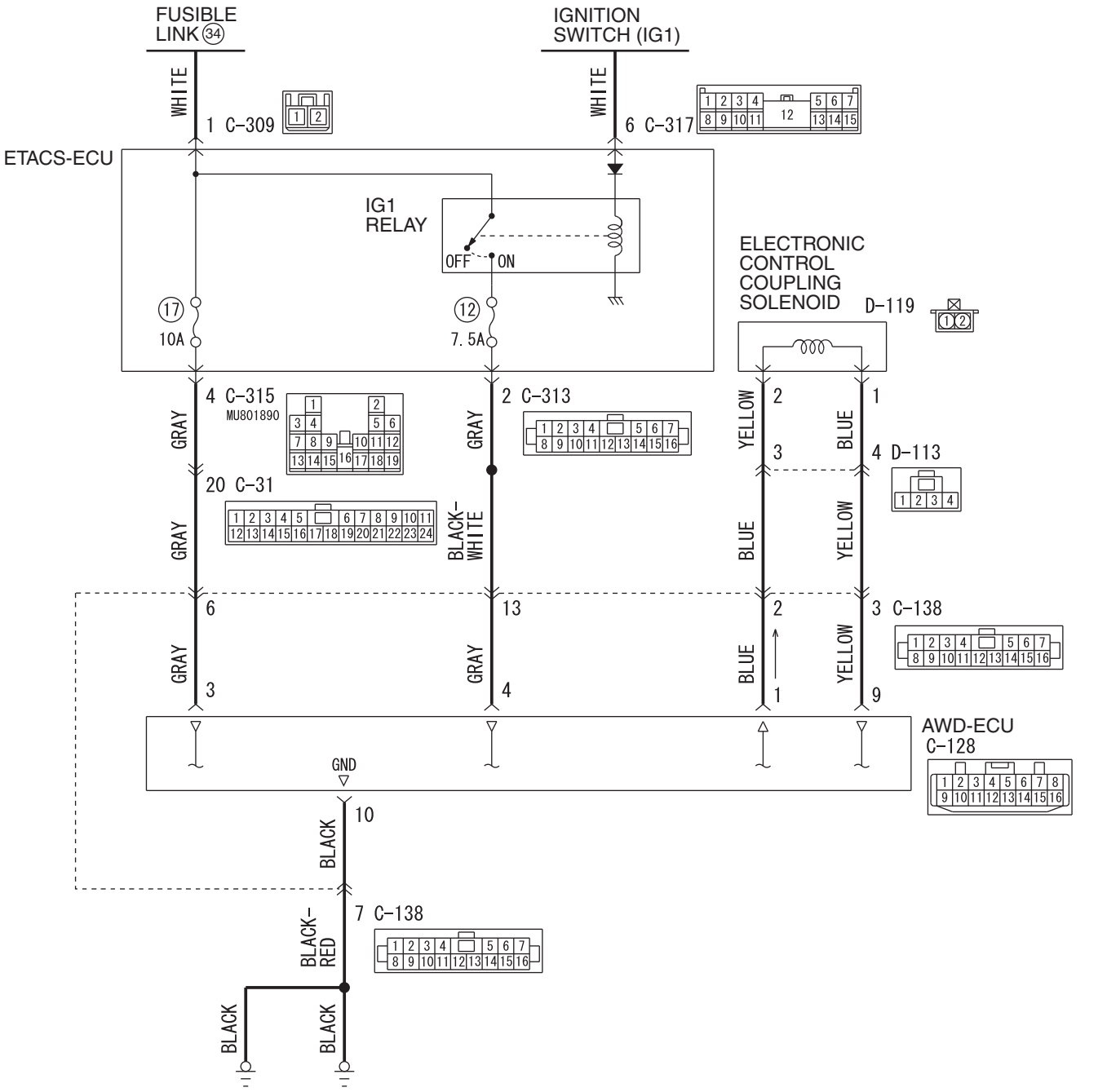
YES : Replace AWD-ECU. (Refer to P.27C-92.) Then go to Step 8.
NO : The procedure is complete.

STEP 8. Check whether the DTC is reset.

Q: Is the DTC No. C1078 set?

YES : Diagnose again from Step 1.
NO : The procedure is complete.

DTC C1456: Wiring harness or coupling coil overcurrent failure



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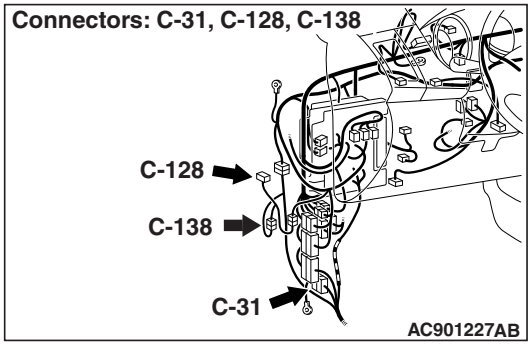

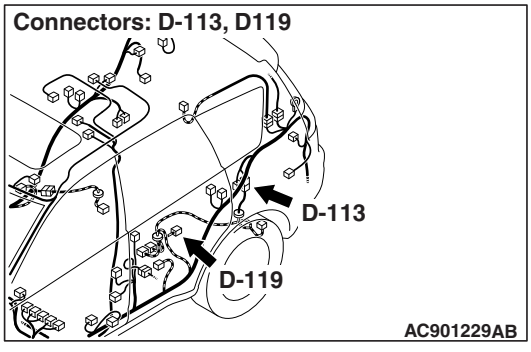

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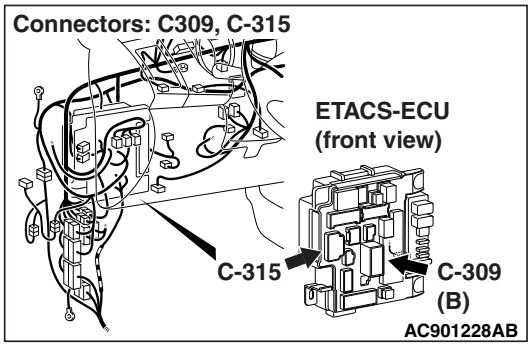


⚠ CAUTION
If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

OPERATION

The current flowing the coupling coil is monitored, and if it exceeds the specified value, the system is deactivated.

DTC SET CONDITIONS

If the following conditions are met when the system is in operation (always), AWD-ECU switches the control from AWD to FWD, flashes the AWD/LOCK indicators alternately, and sets the DTC No. C1456.

- Electronic control coupling solenoid current monitor value: 6 A or more (deviated from the normal current value range)

TROUBLESHOOTING HINTS

Current trouble

- Damaged harness wires and connector (Short to ground between AWD-ECU and the electronic control coupling solenoid)
- AWD-ECU internal error
- Short circuit in the coupling coil

Past trouble

- Intermittent wiring harness or connector failure

  NOTE: For diagnosis procedures, refer to "How to treat past trouble". (Refer to GROUP 00, How to Treat Past Trouble P.00-16.)
- Intermittent electronic control coupling failure (solenoid failure)

DIAGNOSIS

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Scan tool MB991958 CAN bus diagnostics
Use scan tool MB991958 to 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 – CAN bus diagnostic chart P.54C-17.) On completion, go to Step 2.

STEP 2. Check whether the DTC is reset after repairing the CAN bus line.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Fully depress the accelerator pedal, and maintain its position for 2 seconds.

NOTE: The coupling coil electronic control is also based on the accelerator pedal opening degree, thus the signal is sent to the ECU.

(4) Check if the DTC is set.

Q: Is the DTC No. C1456 set?

YES : Go to Step 3.
NO : The procedure is complete.

STEP 3. Scan tool MB991958 data list

Check the following service data. (Refer to P.27C-87.)

- Item 04: Coupling current command value
- Item 05: Coupling current monitor value

Q: Is the check result normal?

YES : Go to Step 10.
NO : Go to Step 4.

STEP 4. Check the following connector:

Check the connectors below for improper engagement, terminal damage or terminal drawn in the connector case.

- C-128 AWD-ECU connector
- C-138 intermediate connector
- D-113 intermediate connector
- D-119 electronic control coupling solenoid connector
- C-31 intermediate connector

Q: Are the connectors and terminals in good condition?

YES : Go to Step 5.
NO : Repair the connector(s) or terminal(s). Then go to Step 11.

STEP 5. Wiring harness check

Check the wiring harness between the C-128 AWD-ECU connector and the C-138 intermediate connector, the wiring harness between the C-138 intermediate connector and the D-113 intermediate connector, and the wiring harness between the D-113 intermediate connector and the D-119 electronic control coupling solenoid side connector for damage or other problem.

Q: Is the wiring harness in good condition?

YES : Go to Step 6.
NO : Repair damage or other problem in the wiring harness. Then go to Step 11.

STEP 6. Resistance measurement between electronic control coupling solenoid connector terminals

Disconnect the D-119 connector, and measure the resistance value between the connector terminals on the electronic control coupling side.

Standard value: 2.2 –4.0 Ω

Q: Is the measured resistance value within the standard value range?

YES : Go to Step 7.

NO : Replace the electronic control coupling. (Refer to P.27C-94.) Then go to Step 11.

STEP 7. Voltage measurement at the AWD-ECU connector

(1) Disconnect the C-128 AWD-ECU connector.

(2) Measure the voltage between the C-128 wiring harness side connector terminals No.3, No.4 (ignition switch "ON") and the body ground.

OK: System voltage

Q: Is the check result normal?

YES : Go to Step 8.

NO : Go to Step 9.

STEP 8. Wiring harness check

Check the wiring harness between the C-128 AWD-ECU connector (terminal No.10) and the body ground for damage or other problem.

Q: Is the wiring harness in good condition?

YES : Go to Step 10.

NO : Repair the wiring harness. Then go to Step 11.

STEP 9. Wiring harness check

NOTE: Prior to the wiring harness inspection, check the C-309 and C-315 ETACS-ECU connector, and repair if necessary.

Check the wiring harness between the C-128 AWD-ECU connector (terminal No.3) and the fusible link No. 34, and the wiring harness between the C-128 AWD-ECU connector [terminal No.4 (ignition switch "ON")] and the fusible link No. 34 for damage or other problem.

Q: Is the wiring harness in good condition?

YES : Go to Step 10.

NO : Repair the wiring harness. Then go to Step 11.

STEP 10. Check whether the DTC is reset.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Fully depress the accelerator pedal, and maintain its position for 2 seconds.

NOTE: The coupling coil electronic control is also based on the accelerator pedal opening degree, thus the signal is sent to the ECU.

(4) Check if the DTC is set.

Q: Is the DTC No. C1456 set?

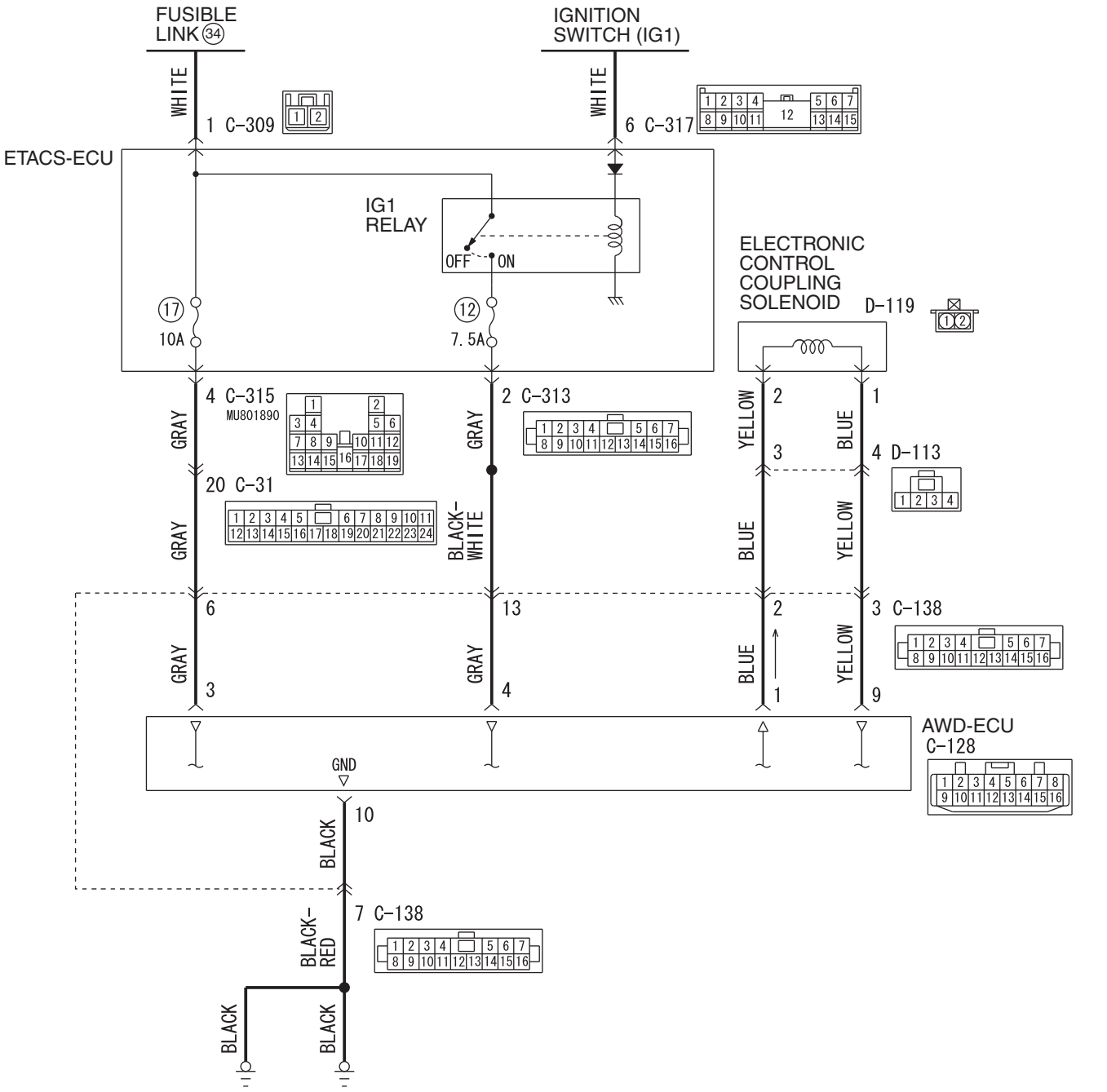
YES : Replace AWD-ECU. (Refer to P.27C-92.) Then go to Step 11.
NO : The trouble can be an intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 11. Check whether the DTC is reset.

Q: Is the DTC No. C1456 set?

YES : Diagnose again from Step 1.
NO : The procedure is complete.

DTC C145A: Wiring harness and coupling coil short circuit failure



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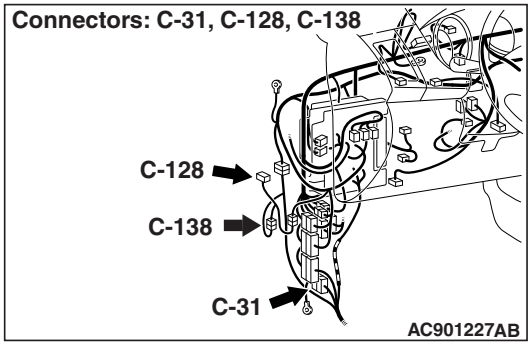

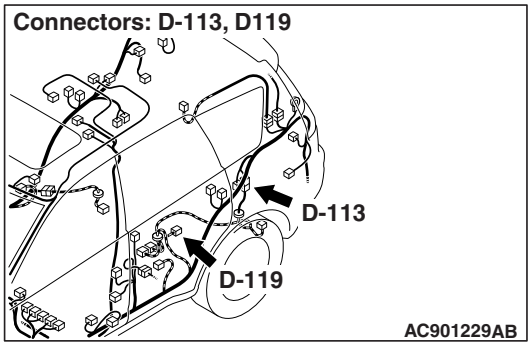

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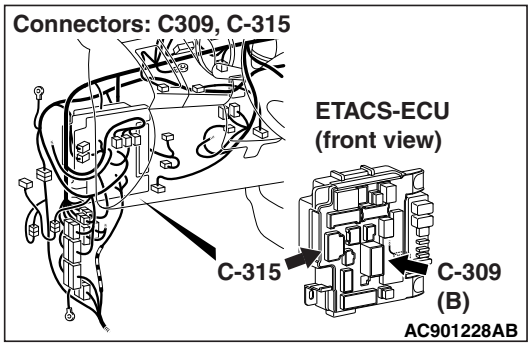


⚠ CAUTION
If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

OPERATION
If the current flowing the electronic control coupling solenoid coil is larger than the command value from AWD-ECU, the system is deactivated.

DTC SET CONDITIONS
If the following conditions are met when the system is activated, AWD-ECU switches the control from AWD to FWD, flashes the AWD/LOCK indicators alternately, and sets the DTC No. C145A.
- Sets the specified current command value to the electronic control coupling solenoid
- Drive current value of the electronic control coupling solenoid: Deviated over from the normal current range

TROUBLESHOOTING HINTS
Current trouble
- Short circuit inside the electronic control coupling solenoid
- Wiring harness or connector failure (short circuit between the electronic control coupling solenoid terminals)
- Damaged wiring harness and connectors
  - Short to ground between AWD-ECU and the electronic control coupling solenoid
- AWD-ECU internal error

Past trouble
- Intermittent wiring harness or connector failure

  NOTE: For diagnosis procedures, refer to "How to treat past trouble". (Refer to GROUP 00, How to Treat Past Trouble P.00-16.)
- Intermittent electronic control coupling failure (solenoid failure)

DIAGNOSIS
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Scan tool MB991958 CAN bus diagnostics
Use scan tool MB991958 to 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 – CAN bus diagnostic chart P.54C-17.) On completion, go to Step 2.

STEP 2. Check whether the DTC is reset after repairing the CAN bus line.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position and hold there for 2 seconds.
(3) Fully depress the accelerator pedal, and maintain its position for 2 seconds.

NOTE: The coupling coil electronic control is also based on the accelerator pedal opening degree, thus the signal is sent to the ECU.

(4) Check if the DTC is set.

Q: Is the DTC No. C145A set?

YES : Go to Step 3.
NO : The procedure is complete.

STEP 3. Scan tool MB991958 data list

Check the following service data. (Refer to P.27C-87.)

- Item 04: Coupling current command value
- Item 05: Coupling current monitor value

Q: Is the check result normal?

YES : Go to Step 10.
NO : Go to Step 4.

STEP 4. Check the following connector:

Check the connectors below for improper engagement, terminal damage or terminal drawn in the connector case.

- C-128 AWD-ECU connector
- C-138 intermediate connector
- D-113 intermediate connector
- D-119 electronic control coupling solenoid connector
- C-31 intermediate connector

Q: Are the connectors and terminals in good condition?

YES : Go to Step 5.
NO : Repair the connector(s) or terminal(s). Then go to Step 11.

STEP 5. Wiring harness check

Check the wiring harness between the C-128 AWD-ECU connector and the C-138 intermediate connector, the wiring harness between the C-138 intermediate connector and the D-113 intermediate connector, and the wiring harness between the D-113 intermediate connector and the D-119 electronic control coupling solenoid side connector for damage or other problem.

Q: Is the wiring harness in good condition?

YES : Go to Step 6.
NO : Repair damage or other problem in the wiring harness. Then go to Step 11.

STEP 6. Resistance measurement between electronic control coupling solenoid connector (coupling side) terminals

Disconnect the D-119 connector, and measure the resistance value between the connector terminals on the electronic control coupling side.

Standard value: 2.2 –4.0 Ω

Q: Is the measured resistance value within the standard value range?

YES : Go to Step 7.
NO : Replace the electronic control coupling. (Refer to P.27C-94.) Then go to Step 11.

STEP 7. Voltage measurement at the AWD-ECU connector

(1) Disconnect the C-128 AWD-ECU connector.
(2) Measure the voltage between the C-128 wiring harness side connector terminals No. 3, No.4 (Ignition switch "ON") and the body ground.

OK: System voltage

Q: Is the check result normal?

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

STEP 8. Wiring harness check

Check the wiring harness between the C-128 AWD-ECU connector (terminal No.10) and the body ground for damage or other problem.

Q: Is the wiring harness in good condition?

YES : Go to Step 10.
NO : Repair the wiring harness. Then go to Step 11.

STEP 9. Wiring harness check

NOTE: Prior to the wiring harness inspection, check the C-309 and C-315 ETACS-ECU connector, and repair if necessary.
Check the wiring harness between the C-128 AWD-ECU connector (terminal No.3) and the fusible link No. 34, and the wiring harness between the C-128 AWD-ECU connector [terminal No.4 (ignition switch "ON")] and the fusible link No. 34 for damage or other problem.

Q: Is the wiring harness in good condition?

YES : Go to Step 10.
NO : Repair the wiring harness. Then go to Step 11.

STEP 10. Check whether the DTC is reset.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position and hold there for 2 seconds.
(3) Fully depress the accelerator pedal, and maintain its position for 2 seconds.

NOTE: The coupling coil electronic control is also based on the accelerator pedal opening degree, thus the signal is sent to the ECU.

(4) Check if the DTC is set.

Q: Is the DTC No. C145A set?

YES : Replace AWD-ECU. (Refer to P.27C-92.) Then go to Step 11.
NO : The trouble can be an intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 11. Check whether the DTC is reset.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position and hold there for 2 seconds.
(3) Fully depress the accelerator pedal, and maintain its position for 2 seconds.

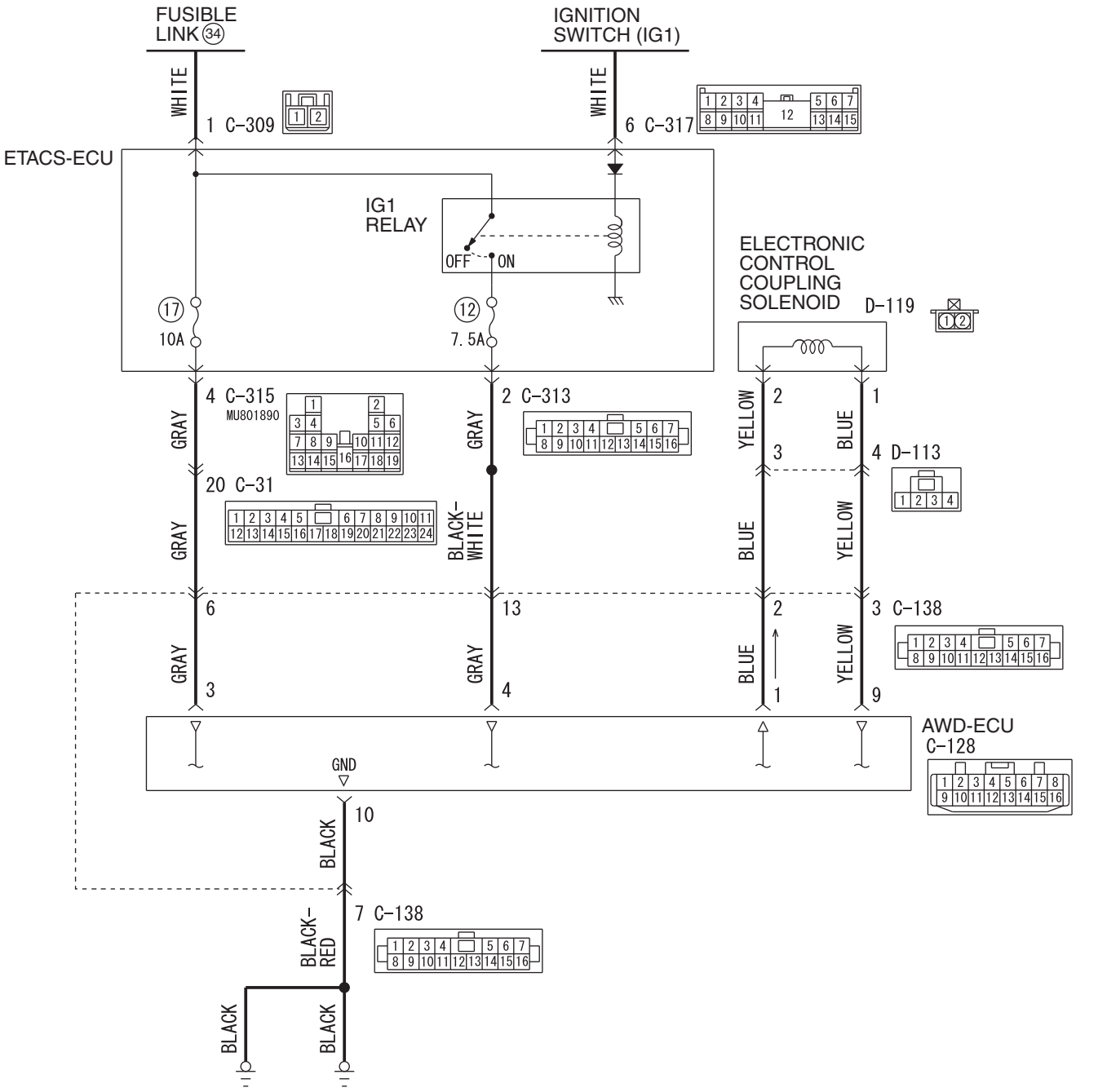
NOTE: The coupling coil electronic control is also based on the accelerator pedal opening degree, thus the signal is sent to the ECU.

(4) Check if the DTC is set.

Q: Is the DTC No. C145A set?

YES : Diagnose again from Step 1.
NO : The procedure is complete.

DTC C145D: Wiring harness and coupling coil open circuit failure



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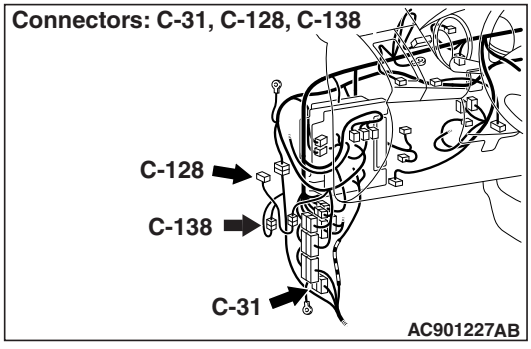

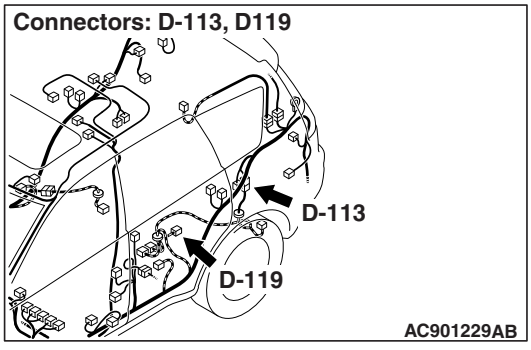

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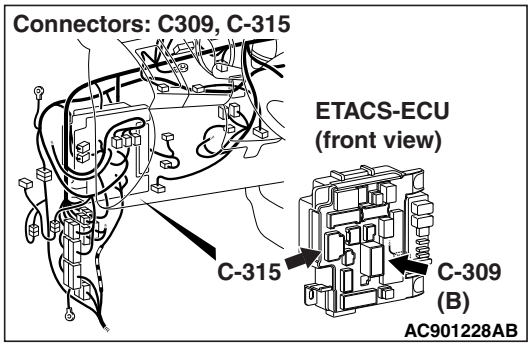


⚠ CAUTION
If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

OPERATION

If the current flowing in the electronic control coupling solenoid coil is smaller than the command value from AWD-ECU, the system is deactivated.

DTC SET CONDITIONS

If the following conditions are met when the system is activated, AWD-ECU switches the control from AWD to FWD, flashes the AWD/LOCK indicators alternately, and sets the DTC No. C145D.

- Sets the specified current command value to the electronic control coupling solenoid
- Drive current value of the electronic control coupling solenoid: Deviated below from the normal current range

TROUBLESHOOTING HINTS

Current trouble

- Open circuit inside the electronic control coupling solenoid
- Damaged wiring harness and connectors
  - Open circuit between AWD-ECU and the electronic control coupling solenoid
- AWD-ECU internal error

Past trouble

- Intermittent wiring harness or connector failure

  NOTE: For diagnosis procedures, refer to "How to treat past trouble". (Refer to GROUP 00, How to Treat Past Trouble P.00-16.)
- Intermittent electronic control coupling failure (solenoid failure)

DIAGNOSIS

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Scan tool MB991958 CAN bus diagnostics

Use scan tool MB991958 to 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 – CAN bus diagnostic chart P.54C-17.) On completion, go to Step 2.

STEP 2. Check whether the DTC is reset after repairing the CAN bus line.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position and hold there for 2 seconds.
(3) Fully depress the accelerator pedal, and maintain its position for 2 seconds.

NOTE: The coupling coil electronic control is also based on the accelerator pedal opening degree, thus the signal is sent to the ECU.

(4) Check if the DTC is set.

Q: Is the DTC No. C145D set?

YES : Go to Step 3.
NO : The procedure is complete.

STEP 3. Scan tool MB991958 data list

Check the following service data. (Refer to P.27C-87.)

- Item 04: Coupling current command value
- Item 05: Coupling current monitor value

Q: Is the check result normal?

YES : Go to Step 10.
NO : Go to Step 4.

STEP 4. Check the following connector:

Check the connectors below for improper engagement, terminal damage or terminal drawn in the connector case.

- C-128 AWD-ECU connector
- C-138 intermediate connector
- D-113 intermediate connector
- D-119 electronic control coupling solenoid connector
- C-31 intermediate connector

Q: Are the connectors and terminals in good condition?

YES : Go to Step 5.
NO : Repair the connector(s) or terminal(s). Then go to Step 11.

STEP 5. Wiring harness check

Check the wiring harness between the C-128 AWD-ECU connector and the C-138 intermediate connector, the wiring harness between the C-138 intermediate connector and the D-113 intermediate connector, and the wiring harness between the D-113 intermediate connector and the D-119 electronic control coupling solenoid side connector for damage or other problem.

Q: Is the wiring harness in good condition?

YES : Go to Step 6.
NO : Repair damage or other problem in the wiring harness. Then go to Step 11.

STEP 6. Resistance measurement between electronic control coupling solenoid connector (coupling side) terminals

Disconnect the D-119 connector, and measure the resistance value between the connector terminals on the electronic control coupling side.

Standard value: 2.2 –4.0 Ω

Q: Is the measured resistance value within the standard value range?

YES : Go to Step 7.
NO : Replace the electronic control coupling. (Refer to P.27C-94.) Then go to Step 11.

STEP 7. Voltage measurement at the AWD-ECU connector

(1) Disconnect the C-128 AWD-ECU connector.
(2) Measure the voltage between the C-128 wiring harness side connector terminals No.3, No.4 (Ignition switch "ON") and the body ground.

OK: System voltage

Q: Is the check result normal?

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

STEP 8. Wiring harness check

Check the wiring harness between the C-128 AWD-ECU connector (terminal No.10) and the body ground for damage or other problem.

Q: Is the wiring harness in good condition?

YES : Go to Step 10.
NO : Repair the wiring harness. Then go to Step 11.

STEP 9. Wiring harness check

NOTE: Prior to the wiring harness inspection, check the C-309 and C-315 ETACS-ECU connector, and repair if necessary.
Check the wiring harness between the C-128 AWD-ECU connector (terminal No.3) and the fusible link No. 34, and the wiring harness between the C-128 AWD-ECU connector [terminal No.4 (ignition switch "ON")] and the fusible link No. 34 for damage or other problem.

Q: Is the wiring harness in good condition?

YES : Go to Step 10.
NO : Repair the wiring harness. Then go to Step 11.

STEP 10. Check whether the DTC is reset.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position and hold there for 2 seconds.
(3) Fully depress the accelerator pedal, and maintain its position for 2 seconds.

NOTE: The coupling coil electronic control is also based on the accelerator pedal opening degree, thus the signal is sent to the ECU.

(4) Check if the DTC is set.

Q: Is the DTC No. C145D set?

YES : Replace AWD-ECU. (Refer to P.27C-92.) Then go to Step 11.
NO : The trouble can be an intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 11. Check whether the DTC is reset.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position and hold there for 2 seconds.
(3) Fully depress the accelerator pedal, and maintain its position for 2 seconds.

NOTE: The coupling coil electronic control is also based on the accelerator pedal opening degree, thus the signal is sent to the ECU.

(4) Check if the DTC is set.

Q: Is the DTC No. C145D set?

YES : Diagnose again from Step 1.
NO : The procedure is complete.

DTC C145F: Coupling Overload

⚠ CAUTION
If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

OPERATION

If AWD-ECU determines that the vehicle is used under some severe operational conditions (such as a long-time driving in AWD on a sandy road, slushy road or road with deep snows or towing or long hill-climbing), AWD-ECU detects the overload to the coupling. If abnormal overload is detected, AWD-ECU interrupts the system to prevent it from being damaged.

DTC SET CONDITIONS

If the following conditions are met, AWD-ECU gradually switches the control from AWD to FWD, makes the drive system fluid temperature warning light illuminate, and sets the DTC No. C145F.

- Drive mode selector: AWD or LOCK
- When the load to the electronic control coupling is large, the mode is switched to the FWD mode.

TROUBLESHOOTING HINTS

Current trouble

- The driving conditions are severe.
- Electronic control coupling failure (clutch slippage)
- AWD-ECU malfunction
- Abnormality in ABS wheel speed signal
- Abnormality in torque command value from the ABS/ASC-ECU

Past trouble

- The past driving conditions were severe.
- Electronic control coupling intermittent failure (clutch slippage)
- Abnormality in ABS wheel speed signal
- Abnormality in torque command value from the ABS/ASC-ECU

DIAGNOSIS

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Scan tool MB991958 CAN bus diagnostics

Use scan tool MB991958 to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 4.

NO : Repair the CAN bus line. (Refer to GROUP 54C – CAN bus diagnostic chart P.54C-17.) On completion, go to Step 2.

STEP 2. Check whether the DTC is reset after repairing the CAN bus line.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Check if the DTC is set.

Q: Is the DTC No. C145F set?

YES : Go to Step 3.

NO : The procedure is complete.

STEP 3. Scan tool MB991958 data list

Check the following service data. (Refer to P.27C-87.)

- Item 07: CAN system (ABS/ASC)
- Item 16: FL wheel speed sensor
- Item 17: FR wheel speed sensor
- Item 18: RL wheel speed sensor
- Item 19: RR wheel speed sensor

Q: Is the check result normal?

YES : Go to Step 4.

NO : Troubleshoot the ABS system (Refer to GROUP 35B – Troubleshooting P.35B-15<Vehicles with ABS>), the ASC system (Refer to GROUP 35C –Troubleshooting P.35C-24 <Vehicles with ASC>). Then go to Step 4.

STEP 4. Scan tool MB991958 actuator test

On a chassis dynamometer test, use scan tool MB991958 to forcibly activate the electronic control coupling from 600 N· m to 730 N· m (443 to 538 ft-lb) in 10 N· m(7.3 ft-lb) steps (Refer to P.27C-89).

Or on a test run of the vehicle, turn fully the steering wheel (lock condition) and use scan tool MB991958 to forcibly activate the electronic control coupling at 500 N· m (368 ft-lb) (Refer to P.27C-89). Then drive the vehicle forward (or back) at about 10 km/h (6.2 mph). If the system is normal, tight cornering phenomenon should occur.

- Item 01: AWD coupling control torque

Q: Does the electronic control coupling transfer the torque correctly?

YES : Go to Step 5.

NO : Replace the electronic control coupling. (Refer to P.27C-94.) Then go to Step 6.

STEP 5. Check whether the DTC is reset.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Check if the DTC is set.

Q: Is the DTC No. C145F set?

YES : Replace AWD-ECU. (Refer to P.27C-92.) Then go to Step 6.

NO : The code may be set because of some severe operational conditions such as a long-time high speed driving or long hill-climbing in AWD condition.

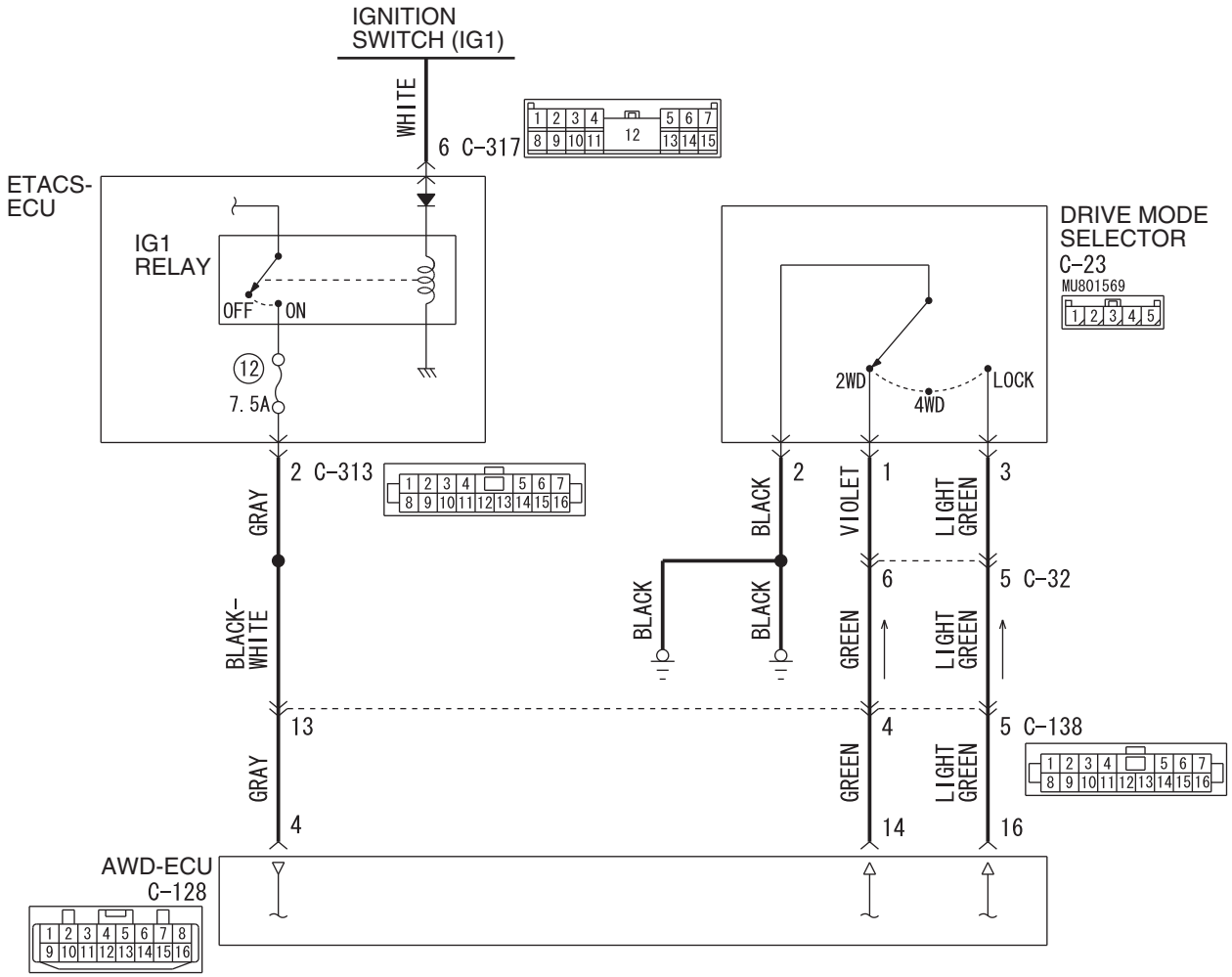
STEP 6. Check whether the DTC is reset.

Q: Is the DTC No. C145F set?

YES : Diagnose again from Step 1.

NO : The procedure is complete.

DTC C1460: Drive mode selector circuit failure



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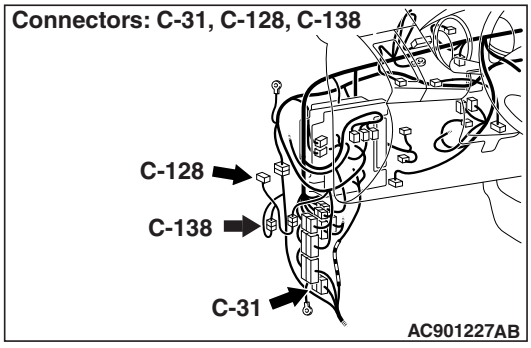

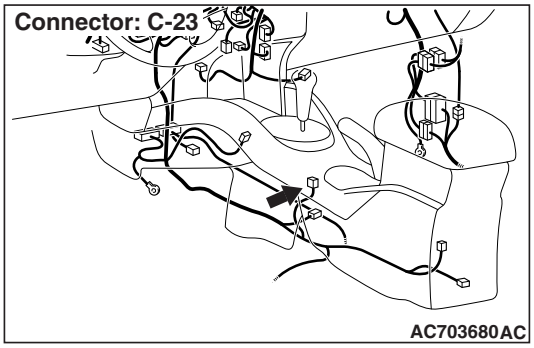

⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

OPERATION

Due to the drive mode selector failure, the drive mode is incognizable, AWD-ECU detects the drive mode selector internal circuit failure, and flashes the 4WD/LOCK indicators.

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DTC SET CONDITIONS

If the following conditions are met, AWD-ECU switches the control from AWD mode to AWD AUTO mode, flashes the 4WD/LOCK indicators alternately, and sets the DTC No. C1460.

- Drive mode selector internal short
- IG1 voltage: 7 V or more

TROUBLESHOOTING HINTS

Current trouble

- Drive mode selector internal short
- Short to ground between AWD-ECU and the drive mode selector
- AWD-ECU malfunction

Past trouble

- Intermittent wiring harness or connector failure

  NOTE: For diagnosis procedures, refer to "How to treat past trouble". (Refer to GROUP 00, How to Treat Past Trouble P.00-16.)
- Intermittent malfunction of drive mode selector

DIAGNOSIS

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Scan tool MB991958 CAN bus diagnostics

Use scan tool MB991958 to 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 – CAN bus diagnostic chart P.54C-17.) On completion, go to Step 2.

STEP 2. Check whether the DTC is reset after repairing the CAN bus line.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position and hold there for 15 seconds.
(3) Check if the DTC is set.

Q: Is the DTC No. C1460 set?

YES : Go to Step 3.

NO : The procedure is complete.

STEP 3. Scan tool MB991958 data list

Check the following service data. (Refer to P.27C-87.)

- Item 10: FWD SW
- Item 11: LOCK SW

Q: Is the check result normal?

YES : Go to Step 7.

NO : Go to Step 4.

STEP 4. Check the following connector:
Check the connectors below for improper engagement, terminal damage or terminal drawn in the connector case.
- C-128 AWD-ECU connector
- C-23 Drive mode selector connector
- C-138 intermediate connector
- C-32 intermediate connector

Q: Are the connectors and terminals in good condition?

YES : Go to Step 5.
NO : Repair the connector(s) or terminal(s). Then go to Step 8.

STEP 5. Wiring harness check
Check the wiring harness between the C-128 AWD-ECU connector and the C-23 drive mode selector connector for damage or other problem.

Q: Is the wiring harness in good condition?

YES : Go to Step 6.
NO : Repair damage or other problem in the wiring harness. Then go to Step 8.

STEP 6. Resistance measurement between the drive mode selector connector terminals
Disconnect the C-23 connector, and measure the resistance value between the connector terminals on the drive mode selector side.

Switch position	Terminal number	Normal conditions
2WD (FWD)	1 –2	Continuity exists (2 ohm or less).
	2 –3	No continuity
4WD (AWD)	1 –2	No continuity
	2 –3	
LOCK	1 –2	No continuity
	2 –3	Continuity exists (2 ohm or less).

Q: Is the measured resistance value within the standard value range?

YES : Go to Step 7.
NO : Replace the drive mode selector. (Refer to P.27C-93.) Then go to Step 8.

STEP 7. Check whether the DTC is reset.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position and hold there for 15 seconds.
(3) Check that the meter display is correct when the drive mode selector is switched to each position (FWD, AWD, and LOCK).
(4) Check if the DTC is set.

Q: Is the DTC No. C1460 set?

YES : Replace AWD-ECU. (Refer to P.27C-92.) Then go to Step 8.
NO : The trouble can be an intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

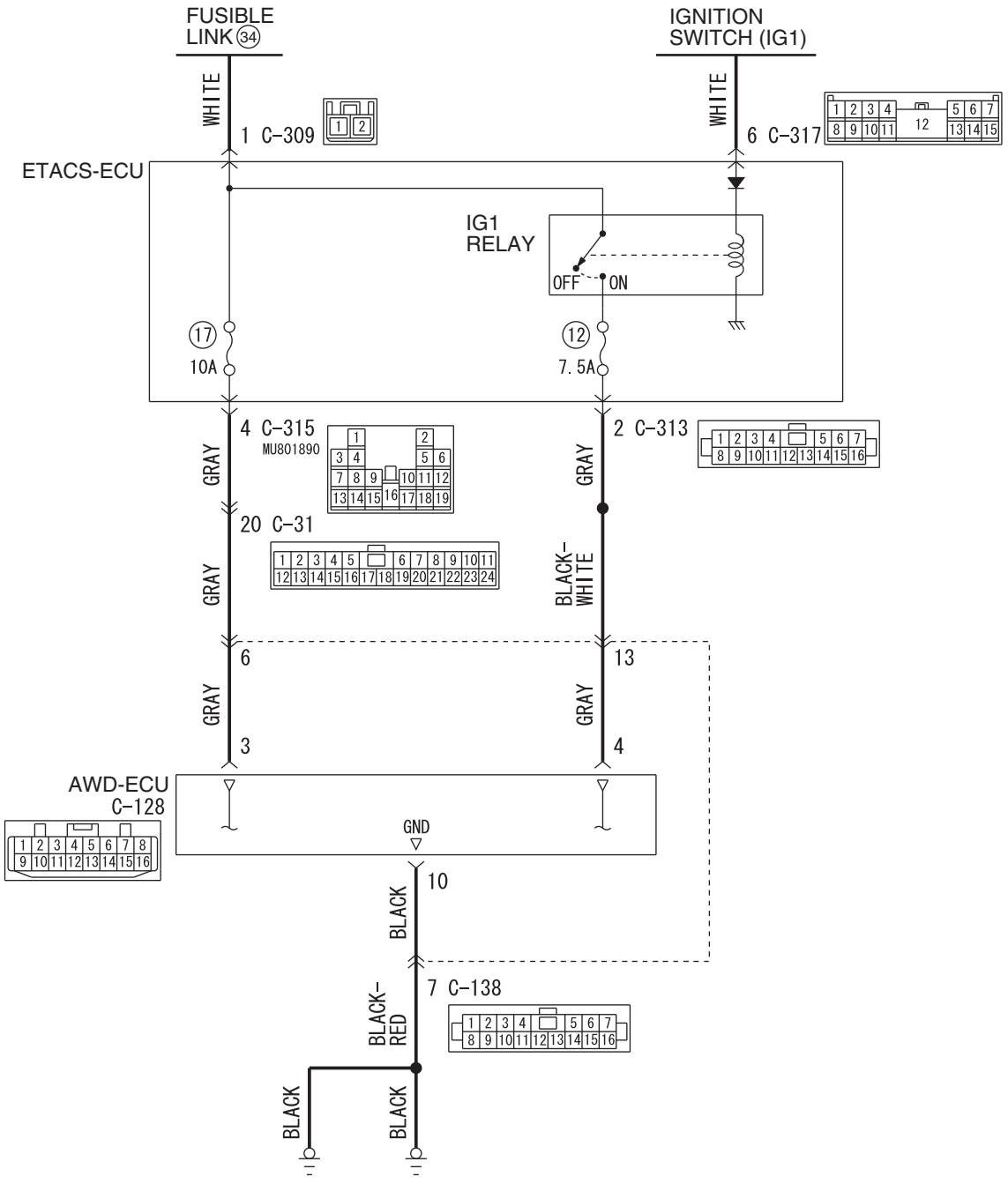
STEP 8. Check whether the DTC is reset.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position and hold there for 15 seconds.
(3) Check that the meter display is correct when the drive mode selector is switched to each position (FWD, AWD, and LOCK).
(4) Check if the DTC is set.

Q: Is the DTC No. C1460 set?

YES : Diagnose again from Step 1.
NO : The procedure is complete.

DTC C2100: Abnormal battery voltage (Too low)



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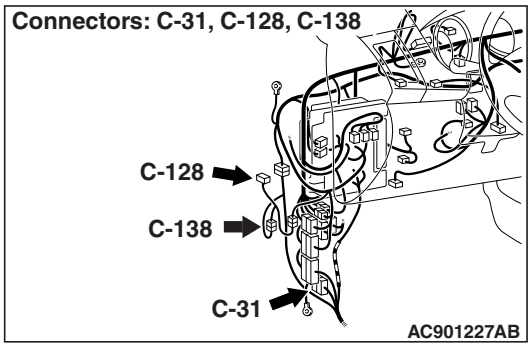

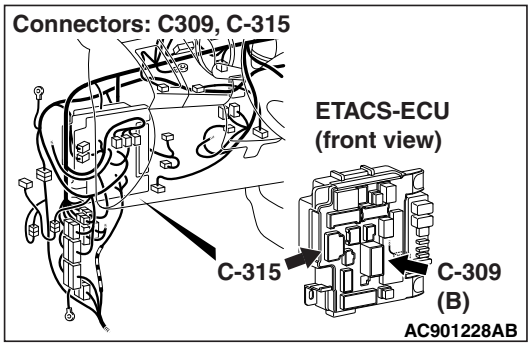

⚠ CAUTION
If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

OPERATION
AWD-ECU detects a power supply voltage abnormal drop, and if any abnormality occurs, it interrupts the system.

DTC SET CONDITIONS
If the following conditions are met when the system is activated, AWD-ECU gradually switches the control from AWD to FWD, flashes the AWD/LOCK indicators alternately, and sets the DTC No. C2100.
- IG1 voltage: Less than 8 V
- Voltage between the battery and ETACS-ECU: Less than 8 V
- Engine speed: more than 1500 r/min

TROUBLESHOOTING HINTS
Current trouble
- Damaged wiring harness and connectors
  - Short to ground or open circuit between the battery and AWD-ECU

Past trouble
- Intermittent wiring harness or connector failure

  NOTE: For diagnosis procedures, refer to "How to treat past trouble". (Refer to GROUP 00, How to Treat Past Trouble P.00-16.)

DIAGNOSIS
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Battery voltage check
Check the battery voltage.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Charge or replace the battery.

STEP 2. Voltage measurement at the ETACS-ECU connector
(1) Disconnect the C-309 ETACS-ECU connector.
(2) Measure the voltage between the C-309 harness side connector terminal No. 1 and the body ground.

OK: System voltage

Q: Is the check result normal?
YES : Go to Step 4.
NO : Go to Step 3.

STEP 3. Wiring harness check
Check the wiring harness between the battery and the C-309 ETACS-ECU connector for damage or other problem.

Q: Is the wiring harness in good condition?

YES : Go to Step 12.
NO : Repair damage or other problem in the wiring harness. Then go to Step 12.

STEP 4. Scan tool MB991958 CAN bus diagnostics
Use scan tool MB991958 to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 6.
NO : Repair the CAN bus line. (Refer to GROUP 54C – CAN bus diagnostic chart P.54C-17.) On completion, go to Step 5.

STEP 5. Check whether the DTC is reset after repairing the CAN bus line.
(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Start the engine, and continue to run at 1500 r/min or more.
(4) Check if the DTC is set.

Q: Is the DTC No. C2100 set?

YES : Go to Step 6.
NO : The procedure is complete.

STEP 6. Check the following connector:
Check the connectors below for improper engagement, terminal damage or terminal drawn in the connector case.
- C-128 AWD-ECU connector
- C-309, C-315 ETACS-ECU connector
- C-138 intermediate connector
- C-31 intermediate connector

Q: Are the connectors and terminals in good condition?

YES : Go to Step 7.
NO : Repair the connector(s) or terminal(s). Then go to Step 12.

STEP 7. Wiring harness check
Check the wiring harness between the C-128 AWD-ECU connector and the C-315 ETACS-ECU connector for damage or other problem.

Q: Is the wiring harness in good condition?

YES : Go to Step 8.
NO : Repair damage or other problem in the wiring harness. Then go to Step 12.

STEP 8. Voltage measurement at the AWD-ECU connector

(1) Disconnect the C-128 AWD-ECU connector.
(2) Measure the voltage between the C-128 wiring harness side connector terminals No.3, No. 4 (Ignition switch "ON") and the body ground.

OK: System voltage

Q: Is the check result normal?

YES : Go to Step 9.
NO : Go to Step 10.

STEP 9. Wiring harness check

Check the wiring harness between the C-128 AWD-ECU connector (terminal No.10) and the body ground for damage or other problem.

Q: Is the wiring harness in good condition?

YES : Go to Step 11.
NO : Repair the wiring harness. Then go to Step 12.

STEP 10. Wiring harness check

Check the wiring harness between the C-128 AWD-ECU connector (terminal No.3) and the C-315 ETACS-ECU connector (terminal No.4), and the wiring harness between the C-128 AWD-ECU connector (terminal No.4) and the C-313 ETACS-ECU connector (terminal No.2) for damage or other problem.

Q: Is the wiring harness in good condition?

YES : Go to Step 11.
NO : Repair the wiring harness. Then go to Step 12.

STEP 11. Check whether the DTC is reset.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Start the engine, and continue to run at 1500 r/min or more.
(4) Check if the DTC is set.

Q: Is the DTC No. C2100 set?

YES : Replace AWD-ECU. (Refer to P.27C-92.) Then go to Step 12.
NO : The trouble can be an intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 12. Check whether the DTC is reset.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Start the engine, and continue to run at 1500 r/min or more.
(4) Check if the DTC is set.

Q: Is the DTC No. C2100 set?

YES : Diagnose again from Step 1.
NO : The procedure is complete.

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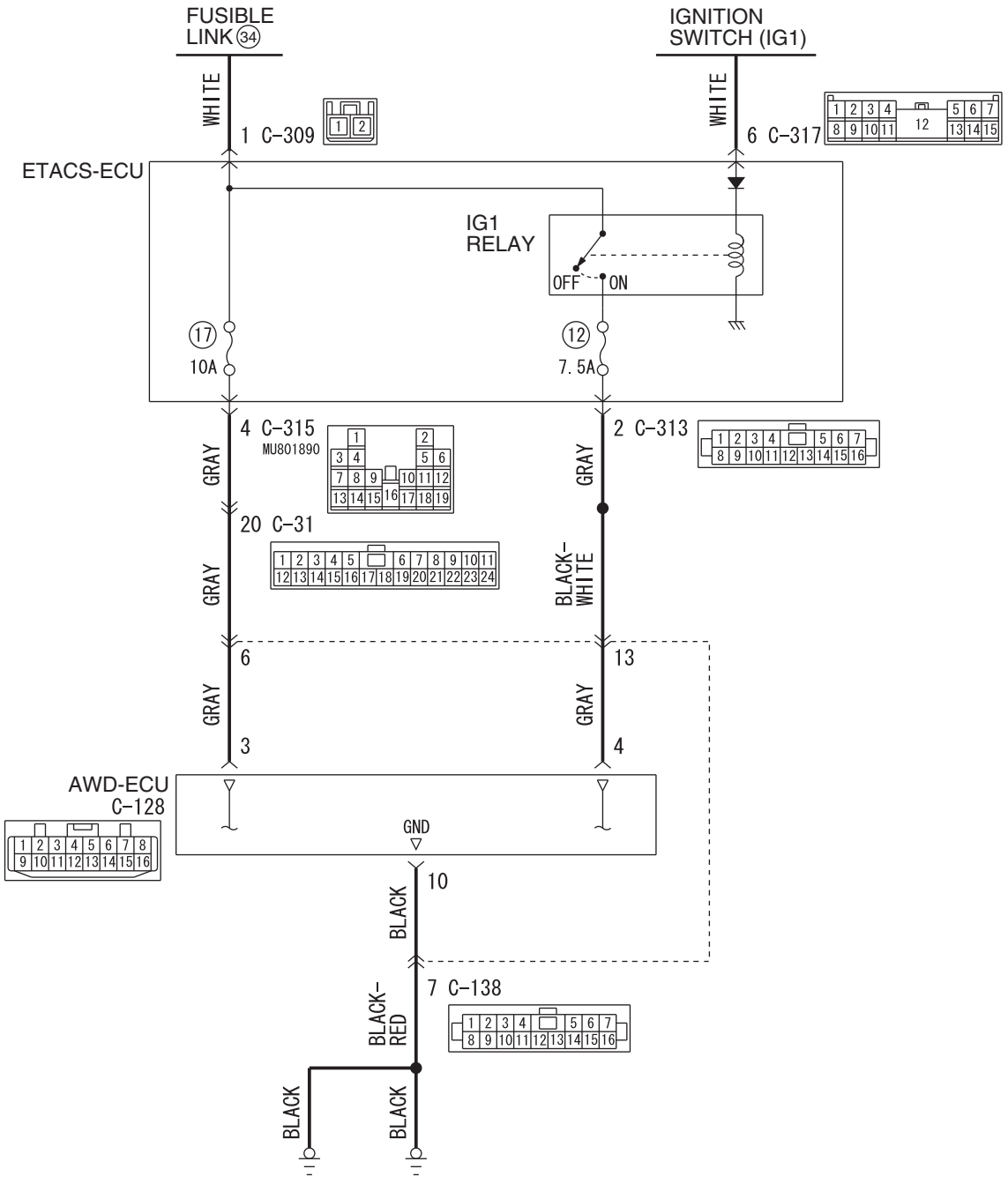
DTC C2101: Abnormal battery voltage (Too high)



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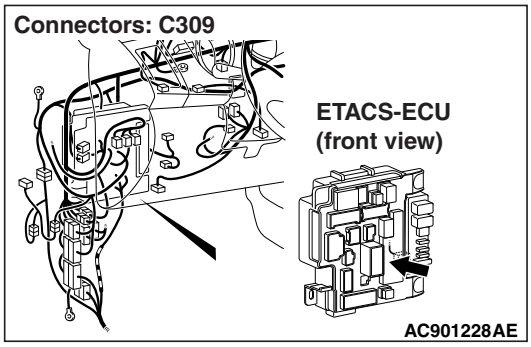


⚠ CAUTION
If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

OPERATION
AWD-ECU detects a power supply voltage abnormal increase, and if any abnormality occurs, it interrupts the system.

DTC SET CONDITIONS
If the following conditions are met when the system is activated, AWD-ECU gradually switches the control from AWD to FWD, flashes the AWD/LOCK indicators alternately, and sets the DTC No. C2101.
- IG1 voltage: More than 17 V
- Voltage between the battery and ETACS-ECU: More than 17 V

TROUBLESHOOTING HINTS
Current trouble
- Damaged wiring harness and connectors
  - High-voltage short-circuit between the battery and AWD-ECU
  - Malfunction of generator or other power supply systems

Past trouble
- Intermittent wiring harness or connector failure

  NOTE: For diagnosis procedures, refer to "How to treat past trouble". (Refer to GROUP 00, How to Treat Past Trouble P.00-16.)
- Malfunction of generator or other power supply systems

DIAGNOSIS
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Battery voltage check
Check the battery voltage.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Charge or replace the battery.

STEP 2. Generator output current check
Check if the generator is correctly operated (Refer to GROUP 16 –On-vehicle Service, Output Current Test P.16-7).

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

STEP 3. Voltage measurement at the ETACS-ECU connector

(1) Disconnect the C-309 ETACS-ECU connector.
(2) Measure the voltage between the C-309 harness side connector terminal No.1 and the body ground.

OK: System voltage

Q: Is the check result normal?

YES : Go to Step 5.
NO : Go to Step 4.

STEP 4. Wiring harness check

Check the wiring harness between the battery and the C-309 ETACS-ECU connector for damage or other problem.

Q: Is the wiring harness in good condition?

YES : Go to Step 8.
NO : Repair damage or other problem in the wiring harness. Then go to Step 8.

STEP 5. Scan tool MB991958 CAN bus diagnostics

Use scan tool MB991958 to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 7.
NO : Repair the CAN bus line. (Refer to GROUP 54C – CAN bus diagnostic chart P.54C-17.) On completion, go to Step 6.

STEP 6. Check whether the DTC is reset after repairing the CAN bus line.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Check if the DTC is set.

Q: Is the DTC No. C2101 set?

YES : Go to Step 7.
NO : The procedure is complete.

STEP 7. Check whether the DTC is reset.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Check if the DTC is set.

Q: Is the DTC No. C2101 set?

YES : Replace AWD-ECU. (Refer to P.27C-92.) Then go to Step 8.
NO : The trouble can be an intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

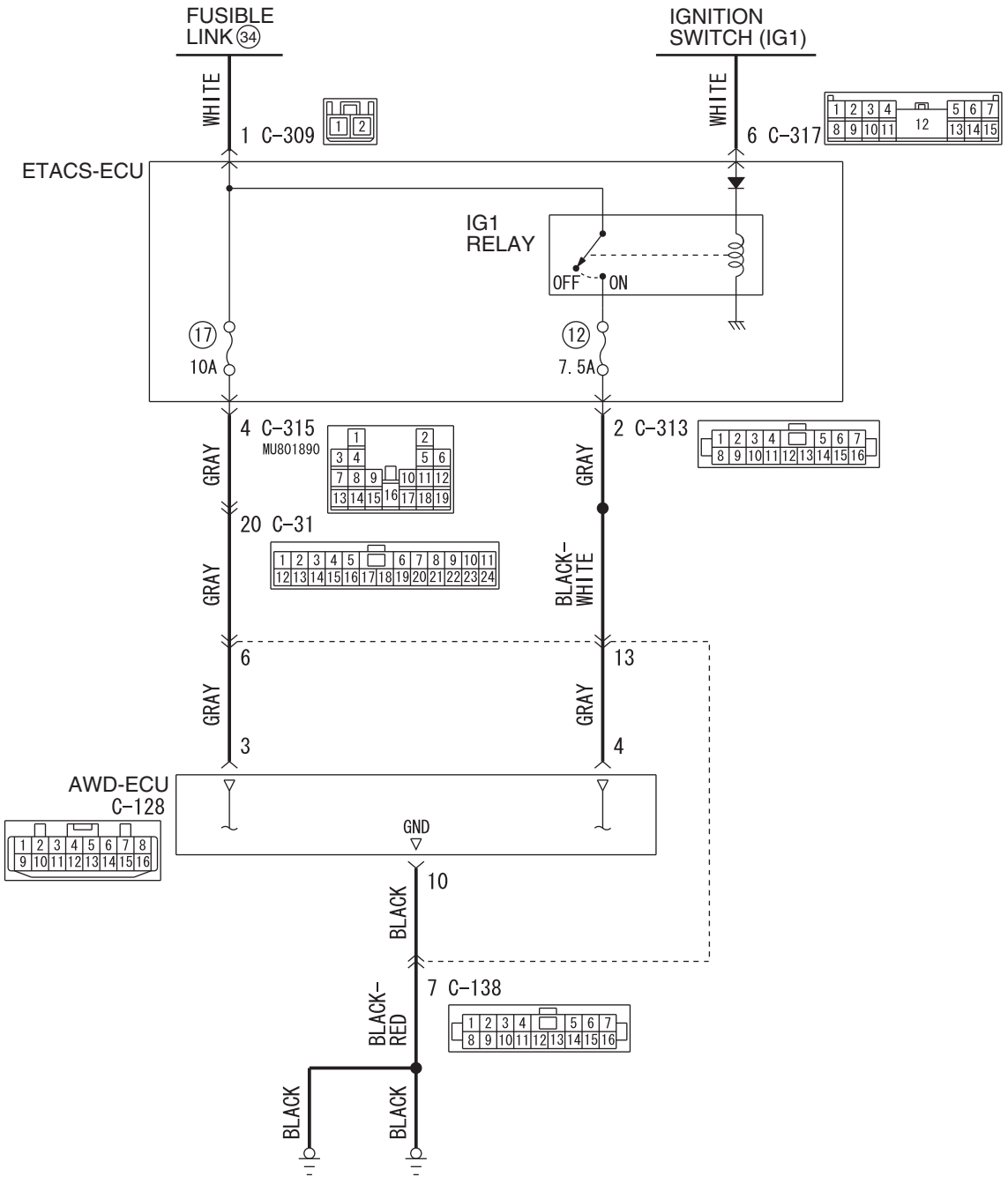
STEP 8. Check whether the DTC is reset.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Check if the DTC is set.

Q: Is the DTC No. C2101 set?

YES : Diagnose again from Step 1.
NO : The procedure is complete.

DTC C211C: Abnormal IG1 power supply low voltage



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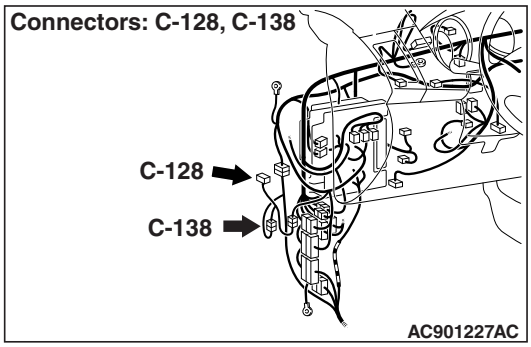

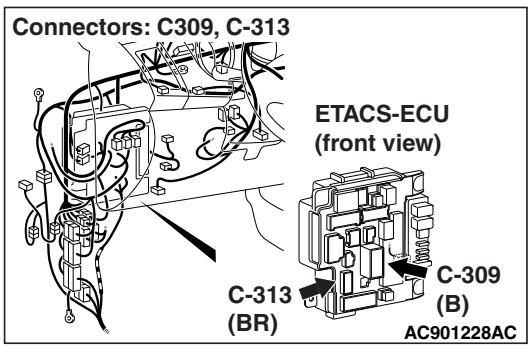

⚠ CAUTION
If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

OPERATION
AWD-ECU detects an IG1 power supply voltage abnormal drop, and if any abnormality occurs, it interrupts the system.

DTC SET CONDITIONS
If the following conditions are met when the system is activated, AWD-ECU gradually switches the control from AWD to FWD, flashes the AWD/LOCK indicators alternately, and sets the DTC No. C211C.
- IG1 voltage: Less than 8 V
- Battery voltage: More than 9 V

PROBABLE CAUSES
Current trouble
- Malfunction of IG1 relay in ETACS-ECU
- Damaged wiring harness and connectors
- Short to ground or open circuit between the battery and AWD-ECU

TROUBLESHOOTING HINTS
- Intermittent wiring harness or connector failure

  NOTE: For diagnosis procedures, refer to "How to treat past trouble". (Refer to GROUP 00, How to Treat Past Trouble P.00-16.)
- Intermittent malfunction of ETACS-ECU (malfunction of IG1 relay)

DIAGNOSIS
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Scan tool MB991958 CAN bus diagnostics
Use scan tool MB991958 to 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 – CAN bus diagnostic chart P.54C-17.) On completion, go to Step 2.

STEP 2. Check whether the DTC is reset after repairing the CAN bus line.
(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Check if the DTC is set.

Q: Is the DTC No. C211C set?
YES : Go to Step 3.
NO : The procedure is complete.

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STEP 3. Check the following connector:

Check the connectors below for improper engagement, terminal damage or terminal drawn in the connector case.

- C-128 AWD-ECU connector
- C-309, C-313 ETACS-ECU connector
- C-138 intermediate connector

Q: Are the connectors and terminals in good condition?

YES : Go to Step 4.

NO : Repair the connector(s) or terminal(s). Then go to Step 8.

STEP 4. Voltage measurement at the AWD-ECU connector

(1) Disconnect the C-128 AWD-ECU connector.

(2) Measure the voltage between the C-128 wiring harness side connector terminals No. 4 (Ignition switch "ON") and the body ground.

OK: Battery voltage

Q: Is the check result normal?

YES : Go to Step 5.

NO : Go to Step 6.

STEP 5. Wiring harness check

Check the wiring harness between the C-128 AWD-ECU connector (terminal No.10) and the body ground for damage or other problem.

Q: Is the wiring harness in good condition?

YES : Go to Step 7.

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

STEP 6. Wiring harness check

Check the wiring harness between the C-128 AWD-ECU connector (terminal No.4) and the C-313 ETACS-ECU connector (terminal No.2) for damage or other problem.

Q: Is the wiring harness in good condition?

YES : Go to Step 7.

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

STEP 7. Check whether the DTC is reset.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Check if the DTC is set.

Q: Is the DTC No. C211C set?

YES : Replace AWD-ECU. (Refer to P.27C-92.) Then go to Step 8.
NO : The trouble can be an intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

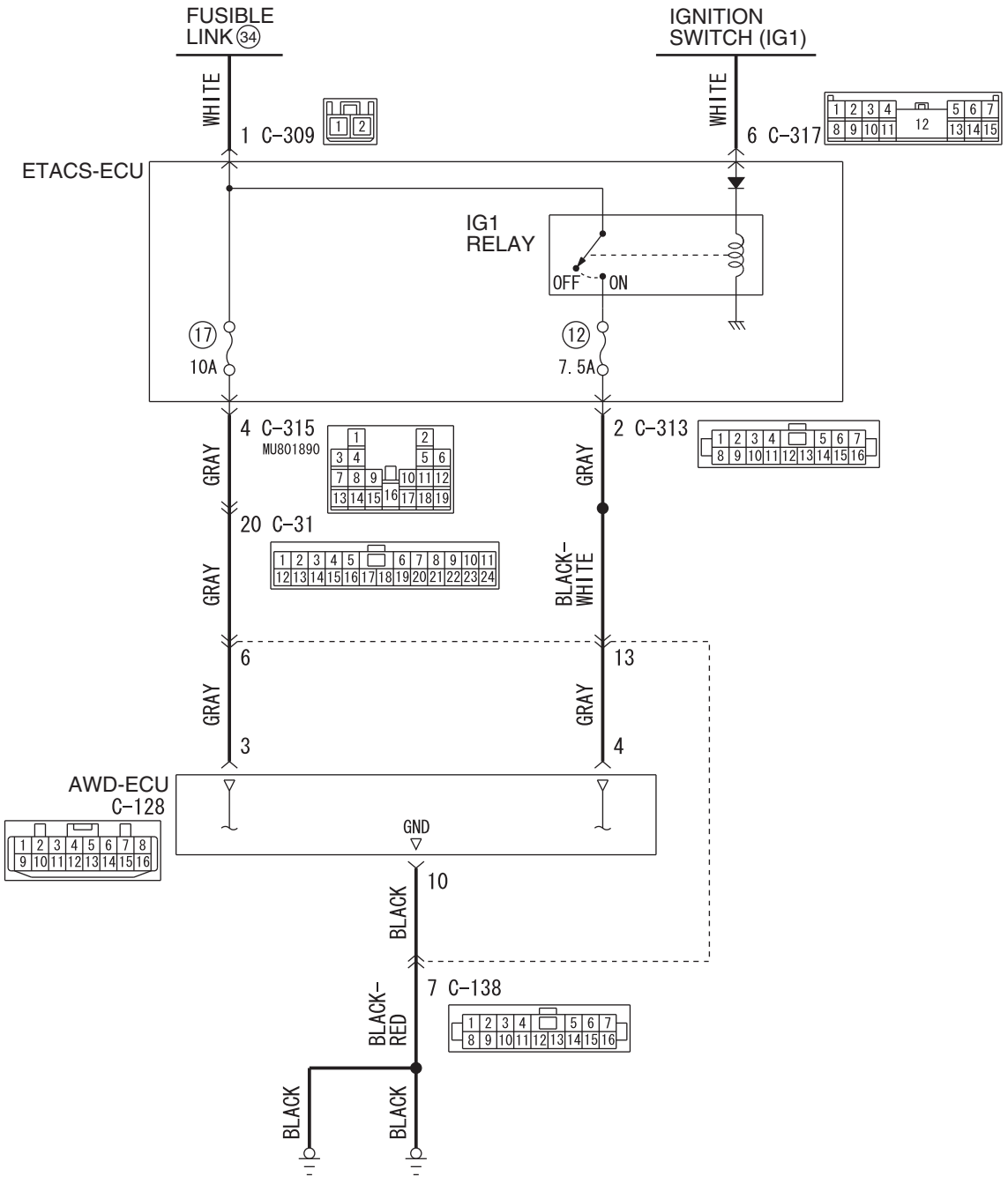
STEP 8. Check whether the DTC is reset.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Check if the DTC is set.

Q: Is the DTC No. C211C set?

YES : Diagnose again from Step 1.
NO : The procedure is complete.

DTC C211D: Abnormal IG1 power supply high voltage



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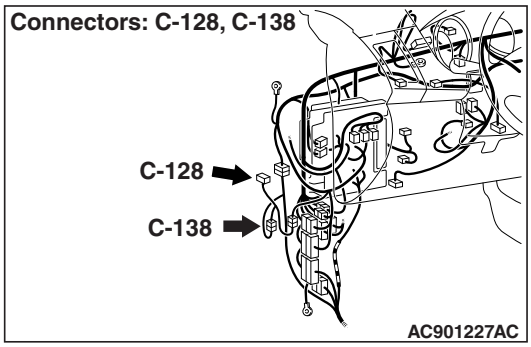
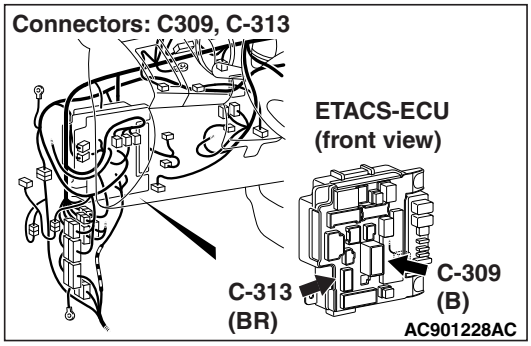




⚠ CAUTION

If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

OPERATION

AWD-ECU detects an IG1 power supply voltage abnormal increase, and if any abnormality occurs, it interrupts the system.

DTC SET CONDITIONS

If the following conditions are met when the system is activated, AWD-ECU gradually switches the control from AWD to FWD, flashes the AWD/LOCK indicators alternately, and sets the DTC No. C211D.

- IG1 voltage: More than 17 V
- Battery voltage: Less than 16 V

TROUBLESHOOTING HINTS

Current trouble

- Malfunction of IG1 relay in ETACS-ECU
- Damaged wiring harness and connectors
- Short or open circuit between the battery and AWD-ECU
- Malfunction of generator or other power supply systems

Past trouble

- Intermittent wiring harness or connector failure

  NOTE: For diagnosis procedures, refer to "How to treat past trouble". (Refer to GROUP 00, How to Treat Past Trouble P.00-16.)
- Intermittent malfunction of ETACS-ECU (malfunction of IG1 relay)
- Malfunction of generator or other power supply systems

DIAGNOSIS

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Scan tool MB991958 CAN bus diagnostics

Use scan tool MB991958 to 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 – CAN bus diagnostic chart P.54C-17.) On completion, go to Step 2.

STEP 2. Check whether the DTC is reset after repairing the CAN bus line.
(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Check if the DTC is set.

Q: Is the DTC No. C211D set?

YES : Go to Step 3.
NO : The procedure is complete.

STEP 3. Check the following connector:
Check the connectors below for improper engagement, terminal damage or terminal drawn in the connector case.
- C-128 AWD-ECU connector
- C-309, C-313 ETACS-ECU connector
- C-138 intermediate connector

Q: Are the connectors and terminals in good condition?

YES : Go to Step 4.
NO : Repair the connector(s) or terminal(s). Then go to Step 8.

STEP 4. Voltage measurement at the AWD-ECU connector
(1) Disconnect the C-128 AWD-ECU connector.
(2) Measure the voltage between the C-128 wiring harness side connector terminals No. 4 (Ignition switch "ON") and the body ground.

OK: System voltage

Q: Is the check result normal?

YES : Go to Step 5.
NO : Check if the generator is correctly operated (Refer to GROUP 16 –On-vehicle Service, Output Current Test P.16-8), and then go to Step 6.

STEP 5. Wiring harness check
Check the wiring harness between the C-128 AWD-ECU connector (terminal No.10) and the body ground for damage or other problem.

Q: Is the wiring harness in good condition?

YES : Go to Step 7.
NO : Repair the wiring harness. Then go to Step 8.

STEP 6. Wiring harness check
Check the wiring harness between the C-128 AWD-ECU connector (terminal No. 4) and the C-313 ETACS-ECU connector (terminal No. 2) for damage or other problem.

Q: Is the wiring harness in good condition?

YES : Go to Step 7.
NO : Repair the wiring harness. Then go to Step 8.

STEP 7. Check whether the DTC is reset.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Check if the DTC is set.

Q: Is the DTC No. C211D set?

YES : Replace AWD-ECU. (Refer to P.27C-92.) Then go to Step 8.
NO : The trouble can be an intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

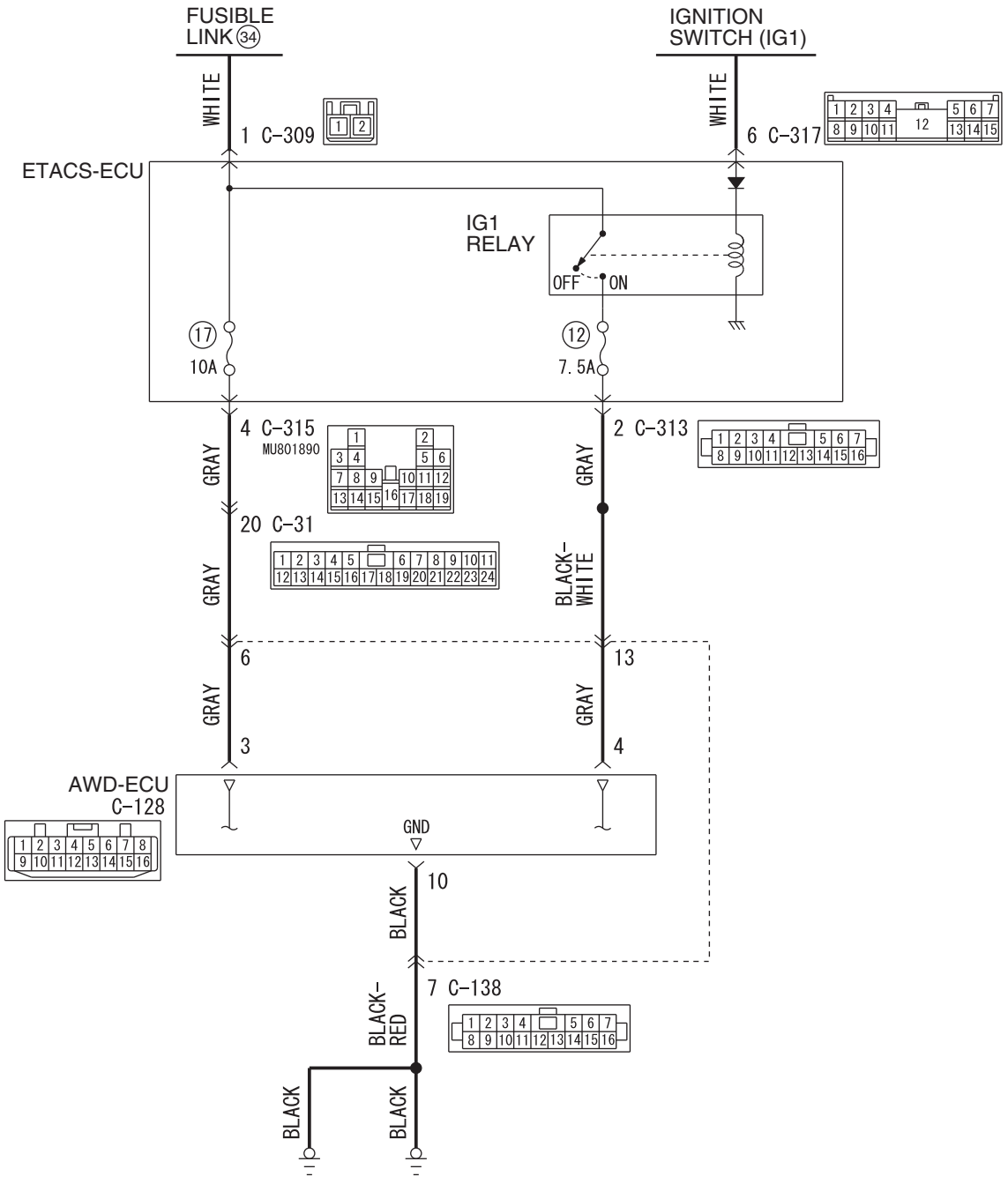
STEP 8. Check whether the DTC is reset.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Check if the DTC is set.

Q: Is the DTC No. C211D set?

YES : Diagnose again from Step 1.
NO : The procedure is complete.

DTC C211E: Abnormal power supply voltage (Too low)



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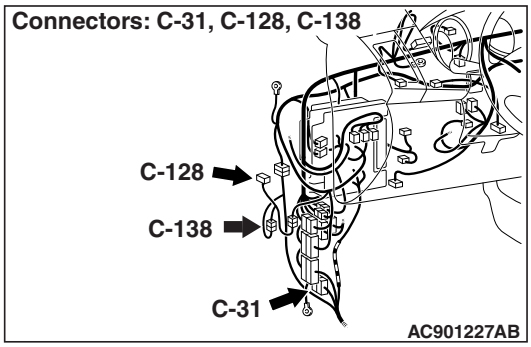

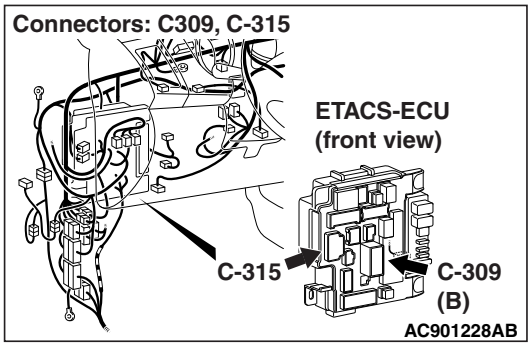

⚠ CAUTION
If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

OPERATION

- AWD-ECU detects a power supply voltage abnormal drop, and if any abnormality occurs, it interrupts the system.
- If any abnormality occurs in the AWD-ECU, the system is deactivated.

DTC SET CONDITIONS

If the following conditions are met when the system is activated, AWD-ECU gradually switches the control from AWD to FWD, flashes the AWD/LOCK indicators alternately, and sets the DTC No. C211E.

- IG1 voltage: 7.5 V or more
- Battery power supply voltage is less than 2V
- Abnormal voltage in the ECU

TROUBLESHOOTING HINTS

Current trouble

- Damaged wiring harness and connectors
- Short to ground or open circuit between the battery and AWD-ECU
- AWD-ECU malfunction

Past trouble

- Intermittent wiring harness or connector failure

  NOTE: For diagnosis procedures, refer to "How to treat past trouble". (Refer to GROUP 00, How to Treat Past Trouble P.00-16.)

DIAGNOSIS

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Scan tool MB991958 CAN bus diagnostics
Use scan tool MB991958 to 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 – CAN bus diagnostic chart P.54C-17.) On completion, go to Step 2.

STEP 2. Check whether the DTC is reset after repairing the CAN bus line.
(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Check if the DTC is set.

Q: Is the DTC No. C211E set?

YES : Go to Step 3.
NO : The procedure is complete.

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STEP 3. Check the following connector:

Check the connectors below for improper engagement, terminal damage or terminal drawn in the connector case.

- C-128 AWD-ECU connector
- C-309, C-315 ETACS-ECU connector
- C-138 intermediate connector
- C-31 intermediate connector

Q: Are the connectors and terminals in good condition?

YES : Go to Step 4.
NO : Repair the connector(s) or terminal(s). Then go to Step 8.

STEP 4. Voltage measurement at the AWD-ECU connector

(1) Disconnect the C-128 AWD-ECU connector.
(2) Measure the voltage between the C-128 wiring harness side connector terminals No.3, No.4 (Ignition switch "ON") and the body ground.

OK: System voltage

Q: Is the check result normal?

YES : Go to Step 5.
NO : Go to Step 6.

STEP 5. Wiring harness check

Check the wiring harness between the C-128 AWD-ECU connector (terminal No.10) and the body ground for damage or other problem.

Q: Is the wiring harness in good condition?

YES : Go to Step 7.
NO : Repair the wiring harness. Then go to Step 8.

STEP 6. Wiring harness check

Check the wiring harness between the C-128 AWD-ECU connector (terminal No.3) and the C-315 ETACS-ECU connector (terminal No.4) for damage or other problem.

Q: Is the wiring harness in good condition?

YES : Go to Step 7.
NO : Repair the wiring harness. Then go to Step 8.

STEP 7. Check whether the DTC is reset.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Check if the DTC is set.

Q: Is the DTC No. C211E set?

YES : Replace AWD-ECU. (Refer to P.27C-92.) Then go to Step 8.
NO : The trouble can be an intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

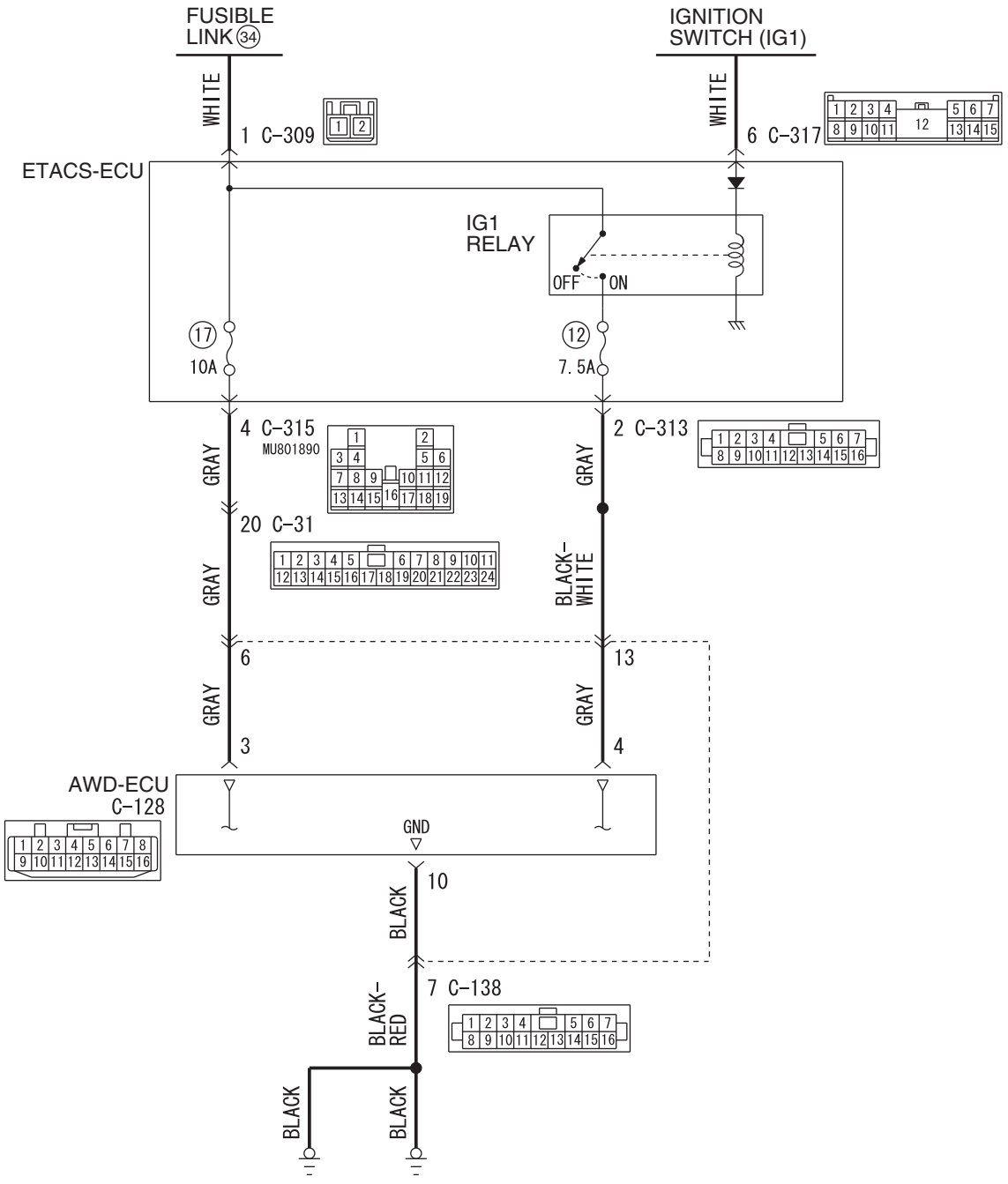
STEP 8. Check whether the DTC is reset.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Check if the DTC is set.

Q: Is the DTC No. C211E set?

YES : Diagnose again from Step 1.
NO : The procedure is complete.

DTC C211F: Abnormal power supply voltage (Too high)



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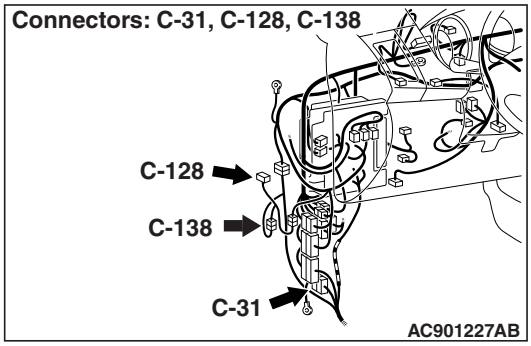
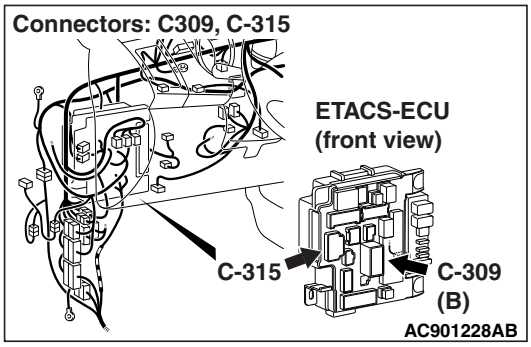




⚠ CAUTION
If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

OPERATION
AWD-ECU detects a power supply voltage abnormality, and if any abnormality occurs, it interrupts the system.

DTC SET CONDITIONS
If the following conditions are met when the system is activated, AWD-ECU gradually switches the control from AWD to FWD, flashes the AWD/LOCK indicators alternately, and sets the DTC No. C211F.
- Power supply voltage: 17 V or more
- Battery power supply voltage is less than 16 V

TROUBLESHOOTING HINTS
Current trouble
- Damaged wiring harness and connectors
- Short to power supply between the battery and AWD-ECU
- Malfunction of generator or other power supply systems

Past trouble
- Intermittent wiring harness or connector failure

  NOTE: For diagnosis procedures, refer to "How to treat past trouble". (Refer to GROUP 00, How to Treat Past Trouble P.00-16.)
- Malfunction of generator or other power supply systems

DIAGNOSIS
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Generator output current check
Check if the generator is correctly operated (Refer to GROUP 16 –On-vehicle Service, Output Current Test P.16-7).

Q: Is the check result normal?

YES : Go to Step 2.
NO : Replace the generator.

STEP 2. Scan tool MB991958 CAN bus diagnostics
Use scan tool MB991958 to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair the CAN bus line. (Refer to GROUP 54C – CAN bus diagnostic chart P.54C-17.) On completion, go to Step 3.

STEP 3. Check whether the DTC is reset after repairing the CAN bus line.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Check if the DTC is set.

Q: Is the DTC No. C211F set?

YES : Go to Step 4.
NO : The procedure is complete.

STEP 4. Check the following connector:

Check the connectors below for improper engagement, terminal damage or terminal drawn in the connector case.

- C-128 AWD-ECU connector
- C-309, C-315 ETACS-ECU connector
- C-138 intermediate connector
- C-31 intermediate connector

Q: Are the connectors and terminals in good condition?

YES : Go to Step 5.
NO : Repair the connector(s) or terminal(s). Then go to Step 9.

STEP 5. Voltage measurement at the AWD-ECU connector

(1) Disconnect the C-128 AWD-ECU connector.
(2) Measure the voltage between the C-128 wiring harness side connector terminals No.3, No.4 (Ignition switch "ON") and body ground.

OK: System voltage

Q: Is the check result normal?

YES : Go to Step 6.
NO : Check if the generator is correctly operated (Refer to GROUP 16 –On-vehicle Service, Output Current Test P.16-8), and then go to Step 7.

STEP 6. Wiring harness check

Check the wiring harness between the C-128 AWD-ECU connector (terminal No.10) and the body ground for damage or other problem.

Q: Is the wiring harness in good condition?

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

STEP 7. Wiring harness check

Check the wiring harness between the C-128 AWD-ECU connector (terminal No.3) and the C-315 ETACS-ECU connector (terminal No.4), and the wiring harness between the C-128 AWD-ECU connector (terminal No.4) and the C-313 ETACS-ECU connector (terminal No.2) for damage or other problem.

Q: Is the wiring harness in good condition?

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

STEP 8. Check whether the DTC is reset.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Check if the DTC is set.

Q: Is the DTC No. C211F set?

YES : Replace AWD-ECU. (Refer to P.27C-92.) Then go to Step 9.
NO : The trouble can be an intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

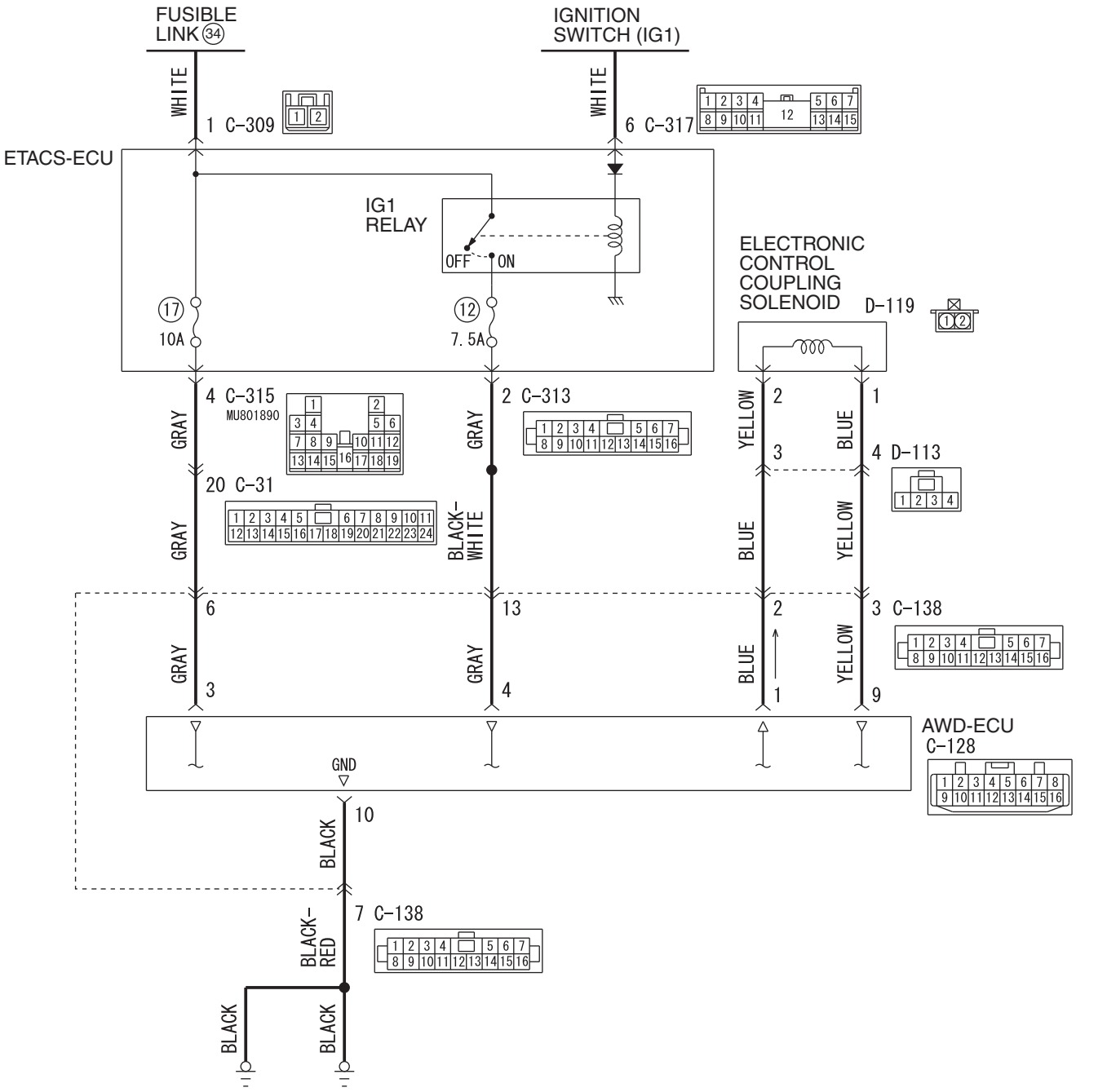
STEP 9. Check whether the DTC is reset.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Check if the DTC is set.

Q: Is the DTC No. C211F set?

YES : Diagnose again from Step 1.
NO : The procedure is complete.

DTC C2208: AWD-ECU internal error



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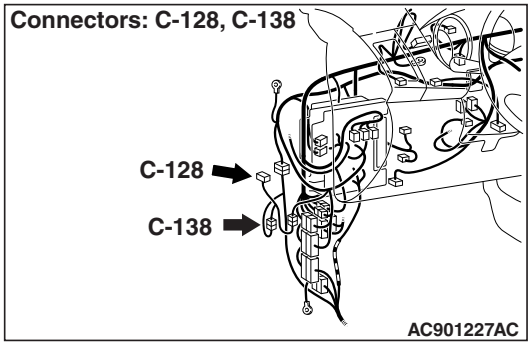

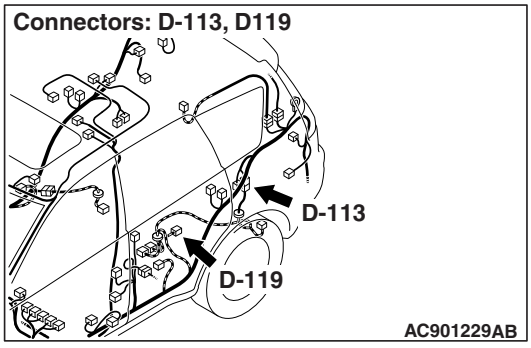

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⚠ CAUTION
If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, always diagnose the CAN bus lines.

OPERATION
AWD-ECU monitors the coupling solenoid wiring harness abnormality and AWD-ECU internal error, and if any abnormality occurs, it deactivates the system.

DTC SET CONDITIONS
If the following conditions are met when the system is activated, AWD-ECU switches the control from AWD to FWD, flashes the AWD/LOCK indicators alternately, and sets the DTC No. C2208.

- AWD-ECU internal malfunction detection or short to power supply at harness between AWD-ECU and the electronic control coupling solenoid

TROUBLESHOOTING HINTS
Current trouble
- AWD-ECU internal error
- Damaged wiring harness and connectors
  - Short to power supply between AWD-ECU and the electronic control coupling solenoid

Past trouble
- Intermittent wiring harness or connector failure

  NOTE: For diagnosis procedures, refer to "How to treat past trouble". (Refer to GROUP 00, How to Treat Past Trouble P.00-16.)
- AWD-ECU internal error

DIAGNOSIS
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Scan tool MB991958 CAN bus diagnostics
Use scan tool MB991958 to 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 – CAN bus diagnostic chart P.54C-17.) On completion, go to Step 2.

STEP 2. Check whether the DTC is reset after repairing the CAN bus line.
(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position at least 3 times.
(3) Fully depress the accelerator pedal, and maintain its position for 2 seconds.

NOTE: The coupling coil electronic control is also based on the accelerator pedal opening degree, thus the signal is sent to the ECU.

(4) Check if the DTC is set.

Q: Is the DTC No. C2208 set?

YES : Go to Step 3.
NO : The procedure is complete.

STEP 3. Check the following connector:
Check the connectors below for improper engagement, terminal damage or terminal drawn in the connector case.
- C-128 AWD-ECU connector
- C-138 intermediate connector
- D-113 intermediate connector
- D-119 electronic control coupling solenoid connector

Q: Are the connectors and terminals in good condition?

YES : Go to Step 4.
NO : Repair the connector(s) or terminal(s). Then go to Step 6.

STEP 4. Wiring harness check
Check the wiring harness between the C-128 AWD-ECU connector and the C-138 intermediate connector, the wiring harness between the C-138 intermediate connector and the D-113 intermediate connector, and the wiring harness between the D-113 intermediate connector and the D-119 electronic control coupling solenoid side connector for damage or other problem.

Q: Is the wiring harness in good condition?

YES : Go to Step 5.
NO : Repair damage or other problem in the wiring harness. Then go to Step 6.

STEP 5. Check whether the DTC is reset.
(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position at least 3 times.
(3) Check if the DTC is set.

Q: Is the DTC No. C2208 set?

YES : Replace AWD-ECU. (Refer to P.27C-92.) Then go to Step 6.
NO : The trouble can be an intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 6. Check whether the DTC is reset.
(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position at least 3 times.
(3) Check if the DTC is set.

Q: Is the DTC No. C2208 set?

YES : Diagnose again from Step 1.
NO : The procedure is complete.

DTC U0001: Bus-off error

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, always diagnose the CAN bus lines.**
- **Before replacing the ECU, ensure that the communication circuit is normal.**

OPERATION
AWD-ECU monitors the CAN C-bus off interruption, and if any abnormality occurs, it interrupts the system.

DTC SET CONDITIONS
If the following conditions are met when the system is in operation (always), AWD-ECU gradually switches the control from AWD to FWD, flashes the AWD/LOCK indicators alternately, and sets the DTC No. U0001.
- IG1 voltage: 10 V or more
- When CAN C-bus off interruption is detected

TROUBLESHOOTING HINTS
Current trouble
- Wiring harness or connector failure of CAN bus line
- AWD-ECU malfunction

Past trouble
- Intermittent wiring harness or connector failure

  NOTE: For diagnosis procedures, refer to "How to treat past trouble". (Refer to GROUP 00, How to Treat Past Trouble P.00-16.)

DIAGNOSIS
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Scan tool MB991958 CAN bus diagnostics
Use scan tool MB991958 to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the CAN bus line. (Refer to GROUP 54C – CAN bus diagnostic chart P.54C-17.) Then go to Step 3.

STEP 2. Check whether the DTC is reset.
(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Check if the DTC is set.

Q: Is the DTC No. U0001 set?

YES : Replace AWD-ECU. (Refer to P.27C-92.) Then go to Step 3.

NO : The trouble can be an intermittent malfunction such as loose connector fit, wiring harness open circuit. (Refer to GROUP –How to Cope with Intermittent Malfunction P.00-15.)

STEP 3. Check whether the DTC is reset.

Q: Is the DTC No. U0001 set?

YES : Diagnose again from Step 1.
NO : This diagnosis is complete.

DTC U0100: Engine CAN time-out

⚠ CAUTION

- **If more than three minutes elapse after the ignition switch is turned ON without starting engine, AWD-ECU may set DTC U0100 as past trouble.**
- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, always diagnose the CAN bus lines.**
- **Before replacing the ECU, ensure that the communication circuit is normal.**

OPERATION

AWD-ECU temporarily limits the AWD functions if it has not received the signal from the engine control module.

DTC SET CONDITIONS

If the following conditions are met when the system is in operation (always), AWD-ECU gradually switches the control from AWD to AWD AUTO, flashes the AWD/LOCK indicators alternately, and sets the DTC No. U0001.

- IG1 power supply voltage: 10 V or more
- Chassis No. signal, throttle angle signal, or engine speed signal cannot be received.

TROUBLESHOOTING HINTS

Current trouble

- Wiring harness or connector failure in the CAN bus lines between the engine ECU and AWD-ECU
- Engine ECU malfunction
- AWD-ECU malfunction

Past trouble

- Refer to "How to treat past trouble" (GROUP 00 – How to Treat Past Trouble P.00-16) for proceeding the diagnostics. Diagnose mainly wiring harness or connector failure in the CAN bus lines between the engine ECU and AWD-ECU, and malfunction in the power supply system for the engine ECU.

  NOTE: For a past trouble, you cannot find it by the scan tool MB991958 CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, check the CAN bus lines in the same manner as How to cope with intermittent malfunction (refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15). You can narrow down the possible cause of the trouble by referring to the DTC, which is set regarding the CAN communication-linked ECUs. (Refer to GROUP 54C –CAN Bus Line Diagnostic Flow P.54C-10.)

DIAGNOSIS

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Scan tool MB991958 CAN bus diagnostics
Use scan tool MB991958 to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus line. (Refer to GROUP 54C – CAN bus diagnostic chart P.54C-17.) Then go to Step 2.

STEP 2. Scan tool MB991958 DTC of other systems

Check that the bus-off error DTC is set in the engine control system.

Q: Is the DTC set?

YES : Troubleshoot the engine control system (Refer to GROUP 13A –Troubleshooting <4B1>P.13A-49 , GROUP 13B –Troubleshooting <6B3>P.13B-51).

NO : Go to Step 3.

STEP 3. Scan tool MB991958 DTC of other systems

Check if a DTC, which relates to the CAN communication-linked systems below, is set.

- Combination meter
  U0100: Engine CAN time-out DTC
- ETACS
  U0100: Engine CAN time-out DTC

Q: Is the DTC set?

YES : Go to Step 4.

NO : Go to Step 5.

STEP 4. Check whether the DTC is reset.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Check if the DTC is set.

Q: Is the DTC No. U0100 set?

YES : Replace the engine control module (Refer to GROUP 13A –Engine Control Module <4B1>P.13A-982 , GROUP 13B –Engine Control Module <6B3>P.13B-894). Then go to Step 6 .

NO : A poor connection, open circuit or other intermittent malfunction in the CAN bus lines between the engine ECU and the AWD-ECU is suspected. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.) Then go to Step 5

STEP 5. Check whether the DTC is reset.

Q: Is the DTC No. U0100 set?

YES : Replace AWD-ECU. (Refer to P.27C-92.) Then go to Step 6.

NO : A poor connection, open circuit or other intermittent malfunction in the CAN bus lines between the engine ECU and AWD-ECU is suspected. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 6. Check whether the DTC is reset.

Q: Is the DTC No. U0100 set?

YES : Diagnose again from Step 1.

NO : This diagnosis is complete.

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DTC U0121: ABS CAN time-out

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, always diagnose the CAN bus lines.**
- **Before replacing the ECU, ensure that the communication circuit is normal.**

OPERATION
AWD-ECU receives the data (such as ABS sensor signal, ABS operation signal) via the CAN bus lines. If it cannot receive such data, it interrupts the system.

DTC SET CONDITIONS
If the following conditions are met when the system is activated, AWD-ECU gradually switches the control from AWD to FWD, flashes the AWD/LOCK indicators alternately, and sets the DTC No. U0121.
- IG1 voltage: 10 V or more
- ABS signal (such as wheel speed signal) cannot be received.

TROUBLESHOOTING HINTS
Current trouble
- Wiring harness or connector failure between ABS/ASC-ECU and the stoplight switch
- Malfunction of the ABS sensor
- Malfunction of the stoplight switch
- ABS/ASC-ECU malfunction
- AWD-ECU malfunction

Past trouble
- Refer to "How to treat past trouble" (GROUP 00 – How to Treat Past Trouble P.00-16) for proceeding the diagnostics.

DIAGNOSIS
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Scan tool MB991958 CAN bus diagnostics
Use scan tool MB991958 to diagnose the CAN bus lines.

Q: Is the check result normal?
YES : Go to Step 2.
NO : Repair the CAN bus line. (Refer to GROUP 54C – CAN bus diagnostic chart P.54C-17.) Then go to Step 2.

STEP 2. Scan tool MB991958 data list
Check the following service data. (Refer to P.27C-87.)
- Item 07: CAN system (ABS/ASC)

Q: Is the check result normal?
YES : Go to Step 6.
NO : Go to Step 3.

STEP 3. Scan tool MB991958 DTC of other systems
Check if a DTC, which relates to the CAN communication-linked systems below, is set.
- Engine
  U0121: ABS/ASC time-out DTC

Q: Is the DTC set?
YES : Go to Step 4.
NO : Go to Step 5.

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STEP 4. Check whether the DTC is reset.
(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Check if the DTC is set.

Q: Is the DTC No. U0121 set?

YES : Troubleshoot the ABS system (Refer to GROUP 35B – Troubleshooting P.35B-15<Vehicles with ABS>), the ASC system (Refer to GROUP 35C –Troubleshooting P.35C-12 <Vehicles with ASC>). Then go to Step 5.
NO : Go to Step 6.

STEP 5. Check whether the DTC is reset.
(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Check if the DTC is set.

Q: Is the DTC No. U0121 set?

YES : Replace AWD-ECU. (Refer to P.27C-92.) Then go to Step 6.
NO : The procedure is complete.

STEP 6. Check whether the DTC is reset.

Q: Is the DTC No. U0121 set?

YES : Diagnose again from Step 1.
NO : The procedure is complete.

DTC U0141: ETACS CAN time-out

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, always diagnose the CAN bus lines.**
- **Before replacing the ECU, ensure that the communication circuit is normal.**

OPERATION
AWD-ECU receives the data (such as drive mode display signal, failure information signal) from ETACS-ECU via the CAN bus lines. If it cannot receive such data, illuminates the AWD indicator.

DTC SET CONDITIONS
If the following conditions are met when the system is in operation (always), AWD-ECU flashes the AWD/LOCK indicators alternately, and sets the DTC No. U0141.
- IG1 power supply voltage: 8 V or more
- The signal output from ETACS-ECU cannot be received.

TROUBLESHOOTING HINTS
Current trouble
- Wiring harness or connector failure in the CAN bus lines between ETACS-ECU and AWD-ECU
- Malfunction of ETACS-ECU
- AWD-ECU malfunction

Past trouble
- Refer to "How to treat past trouble" (GROUP 00 – How to Treat Past Trouble P.00-16) for proceeding the diagnostics. Diagnose mainly wiring harness or connector failure in the CAN bus lines between ETACS-ECU and AWD-ECU, and malfunction in the power supply system for ETACS-ECU.

TSB Revision

NOTE: For a past trouble, you cannot find it by the scan tool MB991958 CAN bus diagnostics even if there is any failure in CAN bus lines. In this case, check the CAN bus lines in the same manner as How to Cope with Intermittent Malfunction (refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15). You can narrow down the possible cause of the trouble by referring to the DTC, which is set regarding the CAN communication-linked ECUs. (Refer to GROUP 54C –CAN Bus Line Diagnostic Flow P.54C-10.)

DIAGNOSIS

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Scan tool MB991958 CAN bus diagnostics

Use scan tool MB991958 to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus line. (Refer to GROUP 54C – CAN bus diagnostic chart P.54C-17.) Then go to Step 2.

STEP 2. Scan tool MB991958 data list

Check the following service data. (Refer to P.27C-87.)

- Item 09: CAN system (ETACS)

Q: Is the check result normal?

YES : Go to Step 6.
NO : Go to Step 3.

STEP 3. Scan tool MB991958 DTC of other systems

Check if a DTC, which relates to the CAN communication-linked systems below, is set.

- Meter
  U0141: ETACS CAN time-out DTC
- A/C
  U0141: ETACS CAN time-out DTC
- Engine
  U0141: ETACS CAN time-out DTC

Q: Is the DTC set?

YES : Go to Step 4.
NO : Go to Step 5.

STEP 4. Check whether the DTC is reset.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Check if the DTC is set.

Q: Is the DTC No. U0141 set?

YES : Replace ETACS-ECU. Then go to Step 6.
NO : A poor connection, open circuit or other intermittent malfunction in the CAN bus lines between ETACS-ECU and AWD-ECU is suspected. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 5. Check whether the DTC is reset.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Check if the DTC is set.

Q: Is the DTC No. U0141 set?

YES : Replace AWD-ECU. (Refer to P.27C-92.) Then go to Step 6.
NO : A poor connection, open circuit or other intermittent malfunction in the CAN bus lines between ETACS-ECU and AWD-ECU is suspected. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 6. Check whether the DTC is reset.

Q: Is the DTC No. U0141 set?

YES : Diagnose again from Step 1.
NO : This diagnosis is complete.

DTC U0401: Engine CAN data error

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, always diagnose the CAN bus lines.**
- **Before replacing the ECU, ensure that the communication circuit is normal.**

OPERATION

AWD-ECU temporarily limits the AWD functions if an abnormality in the throttle opening angle signal is detected.

DTC SET CONDITIONS

If the following conditions are met when the system is in operation (always), AWD-ECU gradually switches the control from AWD to AWD AUTO, flashes the AWD/LOCK indicators alternately, and sets the DTC No. U0401.

- IG1 voltage: 10 V or more
- Throttle opening angle signal: More than 100%

TROUBLESHOOTING HINTS

Current trouble

- Damaged wiring harness and connectors
- Malfunction of accelerator pedal position sensor
- Malfunction of crankshaft position sensor
- Engine ECU malfunction
- AWD-ECU malfunction

TSB Revision

Past trouble

- Refer to "How to treat past trouble" (GROUP 00 – How to Treat Past Trouble P.00-16) for proceeding the diagnostics. Diagnose mainly wiring harness or connector failure between the engine ECU and the accelerator pedal position sensor or between the engine ECU and the crank angle sensor.

DIAGNOSIS

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Scan tool MB991958 CAN bus diagnostics

Use scan tool MB991958 to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the CAN bus line. (Refer to GROUP 54C – CAN bus diagnostic chart P.54C-17.) Then go to Step 2.

STEP 2. Scan tool MB991958 data list

Check the following service data (Refer to P.27C-87).

- Item 08: CAN data (Engine)

Q: Is the check result normal?

YES : Go to Step 7.

NO : Go to Step 3.

STEP 3. Scan tool MB991958 DTC of other systems

Check if a DTC related to the accelerator pedal position sensor system or the crank angle sensor system is set in the engine control system.

Q: Is the DTC set?

YES : Troubleshoot the engine control system (Refer to GROUP 13A –Troubleshooting <4B1>P.13A-49 , GROUP 13B –Troubleshooting <6B3>P.13B-51).

NO : Go to Step 4.

STEP 4. Scan tool MB991958 DTC of other systems

Check if a DTC, which relates to the CAN communication-linked systems below, is set.

- Meter
  U0401: DTC of engine-related failure information

Q: Is the DTC set?

YES : Go to Step 5.

NO : Go to Step 6.

STEP 5. Check whether the DTC is reset.

Q: Is the DTC No. U0401 set?

YES : Replace the engine control module (Refer to GROUP 13A –Engine Control Module <4B1>P.13A-982 , GROUP 13B –Engine Control Module <6B3>P.13B-894). Then go to Step 7 .

NO : A poor connection, open circuit or other intermittent malfunction between the engine ECU and the accelerator pedal position sensor, or between the engine ECU and the crank angle sensor is suspected. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15). Then to Step 6.

STEP 6. Check whether the DTC is reset.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Depress the throttle pedal fully.
(4) Check if the DTC is set.

Q: Is the DTC No. U0401 set?

YES : Replace AWD-ECU. (Refer to P.27C-92.) Then go to Step 7.

NO : A poor connection, open circuit or other intermittent malfunction between the engine ECU and the accelerator pedal position sensor, or between the engine ECU and the crank angle sensor is suspected. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).

STEP 7. Check whether the DTC is reset.

Q: Is the DTC No. U0401 set?

YES : Diagnose again from Step 1.

NO : The procedure is complete.

DTC U0415: ABS CAN data error

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, always diagnose the CAN bus lines.**
- **Before replacing the ECU, ensure that the communication circuit is normal.**

OPERATION

AWD-ECU receives the data (such as wheel speed sensor signal) from ASC-ECU via the CAN bus lines. If it detects malfunction of the wheel speed signal, it interrupts the system.

DTC SET CONDITIONS

If the following conditions are met when the system is in operation (always), AWD-ECU gradually switches the control from AWD to FWD, flashes the AWD/LOCK indicators alternately, and sets the DTC No. U0415.

- IG1 voltage: 10 V or more
- If the received wheel speed of one or more wheels reaches or exceeds the threshold value of 4000 r/min, or the received wheel speed of one or more wheels is SNA.

  NOTE: SNA (Signal not available)

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TROUBLESHOOTING HINTS

Current trouble

- Wiring harness or connector failure between ASC-ECU and the stoplight switch
- Malfunction of the ABS sensor
- Malfunction of the stoplight switch
- ASC-ECU malfunction
- AWD-ECU malfunction

Past trouble

- Refer to "How to treat past trouble" (GROUP 00 – How to Treat Past Trouble P.00-16) for proceeding the diagnostics.

DIAGNOSIS

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Scan tool MB991958 CAN bus diagnostics

Use scan tool MB991958 to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the CAN bus line. (Refer to GROUP 54C – CAN bus diagnostic chart P.54C-17.) Then go to Step 2.

STEP 2. Scan tool MB991958 data list

Check the following service data. (Refer to P.27C-87.)

- Item 07: CAN system (ABS/ASC)
- Item 16: FL wheel speed sensor
- Item 17: FR wheel speed sensor
- Item 18: RL wheel speed sensor
- Item 19: RR wheel speed sensor

Q: Is the check result normal?

YES : Go to Step 3.

NO : Troubleshoot the ABS system (Refer to GROUP 35B – Troubleshooting P.35B-15<Vehicles with ABS>), the ASC system (Refer to GROUP 35C –Troubleshooting P.35C-24 <Vehicles with ASC>). Then go to Step 3 .

STEP 3. Check whether the DTC is reset.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Check if the DTC is set.

Q: Is the DTC No. U0415 set?

YES : Replace AWD-ECU. (Refer to P.27C-92.) Then go to Step 4.

NO : The procedure is complete.

STEP 4. Check whether the DTC is reset.

Q: Is the DTC No. U0415 set?

YES : Diagnose again from Step 1.

NO : The procedure is complete.

DTC U113C: Wheel speed sensor data error

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect DTC may be set. Prior to this diagnosis, always diagnose the CAN bus lines.**
- **Before replacing the ECU, ensure that the communication circuit is normal.**

OPERATION
AWD-ECU receives the data (such as ABS sensor signal, ABS operation signal) via the CAN bus lines. If it cannot receive such data, it interrupts the system.

DTC SET CONDITIONS
If the following conditions are met when the system is activated, AWD-ECU gradually switches the control from AWD to FWD, flashes the AWD/LOCK indicators alternately, and sets the DTC No. U113C.
- IG1 voltage: 8 V or more
- ABS signal (such as wheel speed signal) cannot be received.
- DTC No.U0121 ABS CAN time-out is not detected.

TROUBLESHOOTING HINTS
Current trouble
- Wiring harness or connector failure between ABS/ASC-ECU and the stoplight switch
- Malfunction of the wheel speed sensor
- Malfunction of the stoplight switch
- ABS/ASC-ECU malfunction
- AWD-ECU malfunction

Past trouble
- Refer to "How to treat past trouble" (GROUP 00 – How to Treat Past Trouble P.00-16) for proceeding the diagnostics. Diagnose mainly wiring harness or connector failure in the CAN bus lines between ABS/ASC-ECU and each wheel speed sensor, or between ABS/ASC-ECU and the stoplight switch.

DIAGNOSIS
- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Scan tool MB991958 CAN bus diagnostics
Use scan tool MB991958 to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the CAN bus line. (Refer to GROUP 54C – CAN bus diagnostic chart P.54C-17.) Then go to Step 2.

STEP 2. Scan tool MB991958 data list
Check the following service data. (Refer to P.27C-87.)
- Item 07: CAN system (ABS/ASC)
- Item 16: FL wheel speed sensor
- Item 17: FR wheel speed sensor
- Item 18: RL wheel speed sensor
- Item 19: RR wheel speed sensor

Q: Is the check result normal?

YES : Go to Step 3.

NO : Troubleshoot the ABS system (Refer to GROUP 35B – Troubleshooting P.35B-15<Vehicles with ABS>), the ASC system (Refer to GROUP 35C –Troubleshooting P.35C-24 <Vehicles with ASC>). Then go to Step 3.

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STEP 3. Check whether the DTC is reset.

(1) Erase the DTC.
(2) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(3) Check if the DTC is set.

Q: Is the DTC No. U113C set?

YES : Replace AWD-ECU. (Refer to P.27C-92.) Then go to Step 4.

NO : A poor connection, open circuit or other intermittent malfunction in the CAN bus lines between ABS/ASC-ECU and each wheel speed sensor, or between ABS/ASC-ECU and the stoplight switch is suspected. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).

STEP 4. Check whether the DTC is reset.

Q: Is the DTC No. U113C set?

YES : Diagnose again from Step 1.

NO : The procedure is complete.

TROUBLE SYMPTOM CHART

M1274000900075

⚠ 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 DTC(s). If DTC(s) are set, erase them all.

Trouble symptom	Inspection procedure	Reference pages or actions
Scan tool MB991958 cannot communicate with the electronic control AWD system.	1	P.27C-74
The switch position of the drive mode selector does not match with the indicator display in the combination meter.	2	P.27C-77
The tight corner braking phenomenon* appears with the drive mode selector in the FWD or AWD position. *NOTE: The vehicle is tuned so that the tight corner braking phenomenon appears at a certain level with the drive mode selector in the LOCK position.*	3	P.27C-82
No DTC is set even when the AWD/LOCK indicator lamps flash.	4	P.27C-86

*NOTE: *Tight corner braking phenomenon: When a AWD vehicle makes sharp cornering in a paved road at low speed (ex. parallel parking), there is a difference in turning radius between front and rear wheels. If such a difference can no longer be compensated by tire slippage, the vehicle behaves as if it is under braking.*

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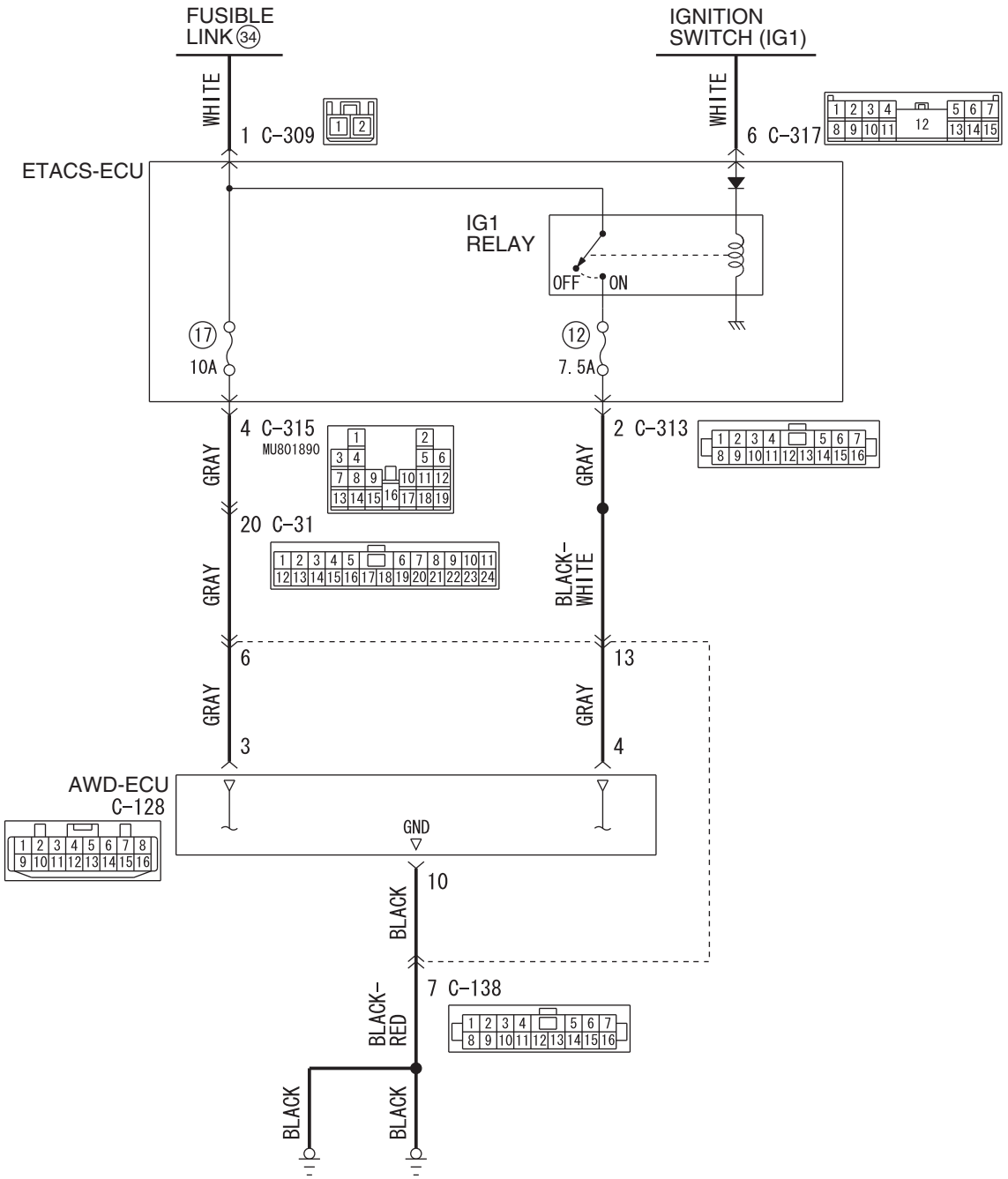
SYMPTOM PROCEDURES

Inspection Procedure 1: Scan tool MB991958 cannot Communicate with the Electronic Control AWD System.



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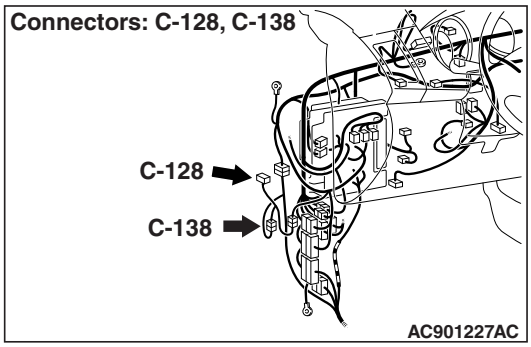
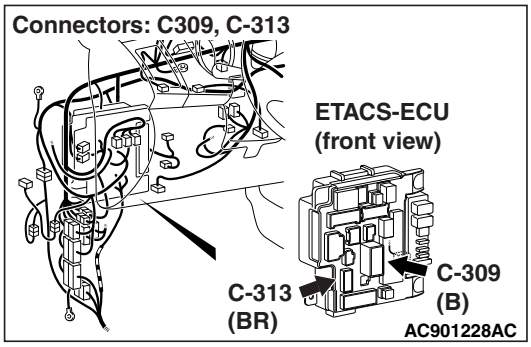




COMMENTS ON TROUBLE SYMPTOM

If scan tool MB991958 cannot communicate with the electronic control AWD system, the CAN bus lines may have a problem. If the electronic control AWD system is not in operation (in case of no AWD operation), the AWD-ECU power supply circuit system or AWD-ECU may have a problem.

TROUBLESHOOTING HINTS

- Damaged wiring harness and connectors
- AWD-ECU malfunction

DIAGNOSIS

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Scan tool MB991958 CAN bus diagnostics

Use scan tool MB991958 to diagnose the CAN bus lines.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the CAN bus line. (Refer to GROUP 54C – CAN bus diagnostic chart P.54C-17.) On completion, go to Step 2.

STEP 2. Check the following connector:

Check the connectors below for improper engagement, terminal damage or terminal drawn in the connector case.

- C-128 AWD-ECU connector
- C-309, C-313 ETACS-ECU connector
- C-138 intermediate connector

Q: Are the connectors and terminals in good condition?

YES : Go to Step 3.

NO : Repair the connector(s) or terminal(s). Then go to Step 8.

STEP 3. Voltage measurement at the AWD-ECU connector

(1) Disconnect the C-128 AWD-ECU connector.
(2) Turn the ignition switch to the ON position.
(3) Measure the voltage between the C-128 wiring harness side connector terminals No.3, No.4 (Ignition switch "ON") and the body ground.

OK: System voltage

Q: Is the check result normal?

YES : Go to Step 5.
NO : Go to Step 4.

STEP 4. Wiring harness check

Check the wiring harness between the C-128 AWD-ECU connector (terminal No.4) and the C-313 ETACS-ECU connector (terminal No.2) for damage or other problem.

Q: Is the wiring harness in good condition?

YES : Go to Step 7.
NO : Repair the wiring harness. Then go to Step 8.

STEP 5. Resistance measurement at the AWD-ECU connector

(1) Disconnect the C-128 AWD-ECU connector.
(2) Measure the resistance between the C-128 wiring harness side connector terminals No. 10 and the body ground.

OK: Continuity exists (2 ohm or less)

Q: Is the check result normal?

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

STEP 6. Wiring harness check

Check the wiring harness between the C-128 AWD-ECU connector (terminal No.10) and the body ground for damage or other problem.

Q: Is the wiring harness in good condition?

YES : Go to Step 7.
NO : Repair the wiring harness. Then go to Step 8.

STEP 7. Retest the system.

Q: Does the malfunction occur again?

YES : Replace AWD-ECU. (Refer to P.27C-92.) Then go to Step 8.
NO : The trouble can be an intermittent malfunction (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).

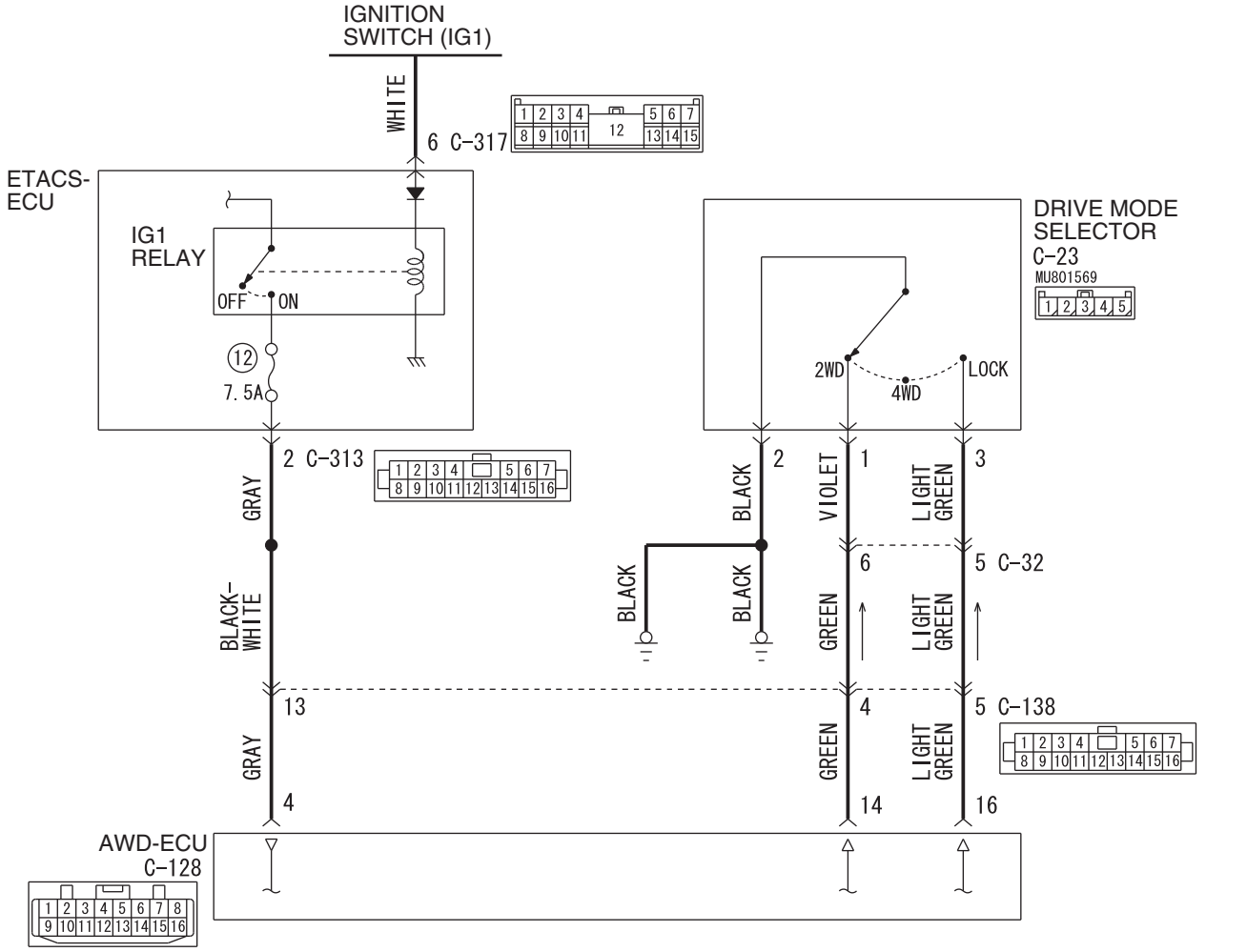
STEP 8. Retest the system.

Q: Does the malfunction occur again?

YES : Diagnose again from Step 1.
NO : The procedure is complete.

TSB Revision

Inspection Procedure 2: The Switch Position of the Drive Mode Selector does not Match with the Indicator Display in the Combination Meter.



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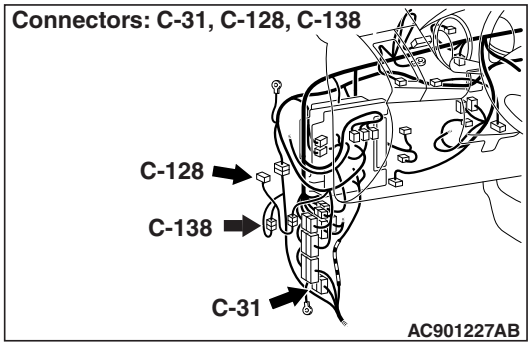
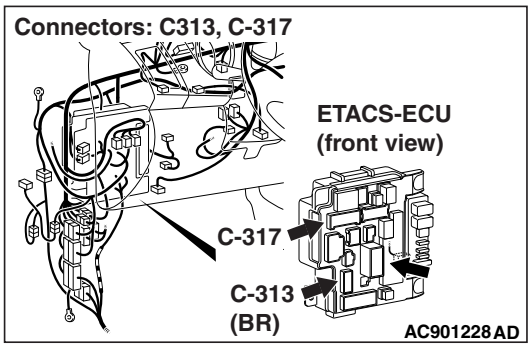
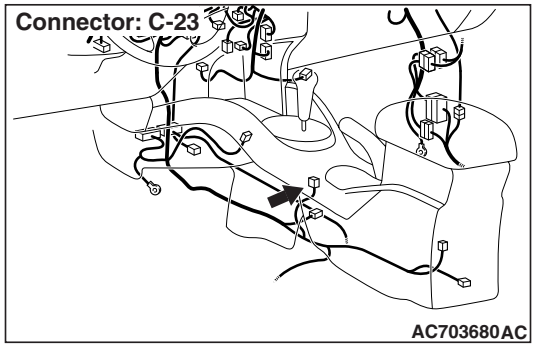




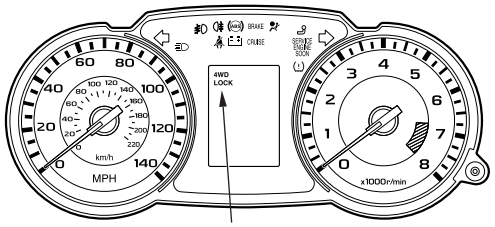
TSB Revision



DRIVE MODE SELECTOR POSITION AND INDICATOR DISPLAY (NORMAL)

Switch position	Indicator display
2WD (FWD)	-(Not illuminated)
4WD (AWD)	4WD
LOCK	4WD, LOCK

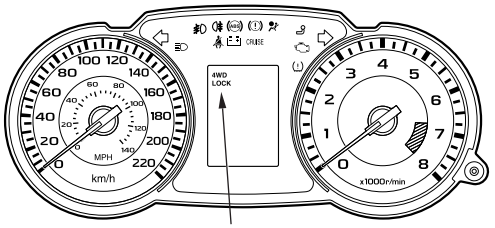
Vehicles for USA



Drive mode indicator

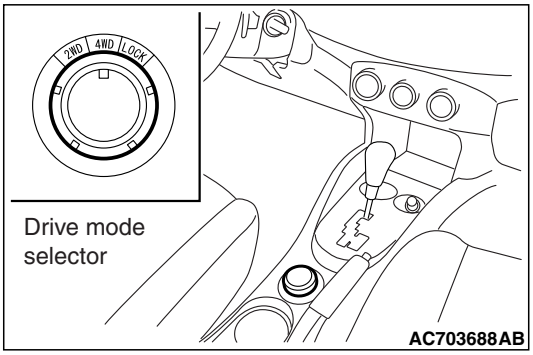
AC703673AB

Vehicles for Canada



Drive mode indicator

AC703674AB



TSB Revision

COMMENTS ON TROUBLE SYMPTOM

- If the drive mode selector switch position and indicator display in the combination meter do not match, the drive mode selector, wiring harness connector between AWD-ECU and drive mode selector, wiring harness connector in the ground circuit for the drive mode selector, AWD-ECU or combination meter may have a problem.

TROUBLESHOOTING HINTS

- Damaged wiring harness and connectors
- Malfunction of drive mode selector
- AWD-ECU malfunction
- Combination meter malfunction

DIAGNOSIS

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Check the following connector:

Check the connectors below for improper engagement, terminal damage or terminal drawn in the connector case.

- C-128 AWD-ECU connector
- C-138 intermediate connector
- C-32 Intermediate connector
- C-23 Drive mode selector connector

Q: Are the connectors and terminals in good condition?

YES : Go to Step 2.

NO : Repair the connector(s) or terminal(s). Then go to Step 9.

STEP 2. Resistance measurement between the drive mode selector connector terminals

(1) Remove the drive mode selector (Refer P.27C-93.)
(2) Measure the resistance between the following terminals.

Switch position	Terminal number	Normal conditions
2WD (FWD)	1 –2	Continuity exists (2 ohm or less).
	2 –3	No continuity
4WD (AWD)	1 –2	No continuity
	2 –3	
LOCK	1 –2	No continuity
	2 –3	Continuity exists (2 ohm or less).

Q: Is the check result normal?

YES : Go to Step 3.
NO : Replace the drive mode selector. Then go to Step 9.

STEP 3. Wiring harness check

- Wiring harness between the C-128 AWD-ECU connector (terminal No. 16) and the C-23 drive mode selector connector (terminal No. 3)
- Wiring harness between the C-128 AWD-ECU connector (terminal No. 14) and the C-23 drive mode selector connector (terminal No. 1)

Check the wiring harness above for damage or other problem.

Q: Is the wiring harness in good condition?

YES : Go to Step 4.
NO : Repair the wiring harness. Then go to Step 9.

STEP 4. Resistance measurement at the drive mode selector connector

(1) Disconnect the C-23 drive mode selector connector.
(2) Measure the resistance between the C-23 wiring harness side connector terminal No. 2 and the body ground.

OK: Continuity exists (2 ohm or less)

Q: Is the check result normal?

YES : Go to Step 6.
NO : Go to Step 5.

STEP 5. Wiring harness check

Check the wiring harness between the C-23 drive mode selector connector (terminal No.2) and the body ground for damage or other problem.

Q: Is the wiring harness in good condition?

YES : Go to Step 8.

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

STEP 6. Check the following connector:

Check the connectors below for improper engagement, terminal damage or terminal drawn in the connector case.

- C-128 AWD-ECU connector
- C-138 intermediate connector
- C-313, C-317 ETACS-ECU connector

Q: Are the connectors and terminals in good condition?

YES : Go to Step 7.

NO : Repair the connector(s) or terminal(s). Then go to Step 9.

STEP 7. Wiring harness check

Check the wiring harness between the C-128 AWD-ECU connector (terminal No.4) and the C-313 ETACS-ECU connector (terminal No.2) for damage or other problem.

Q: Is the wiring harness in good condition?

YES : Go to Step 8.

NO : Repair damage or other problem in the wiring harness. Then go to Step 9.

STEP 8. Retest the system.

Q: Does the malfunction occur again?

YES : Replace AWD-ECU. (Refer to P.27C-92.) Then go to Step 9.

NO : The trouble can be an intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

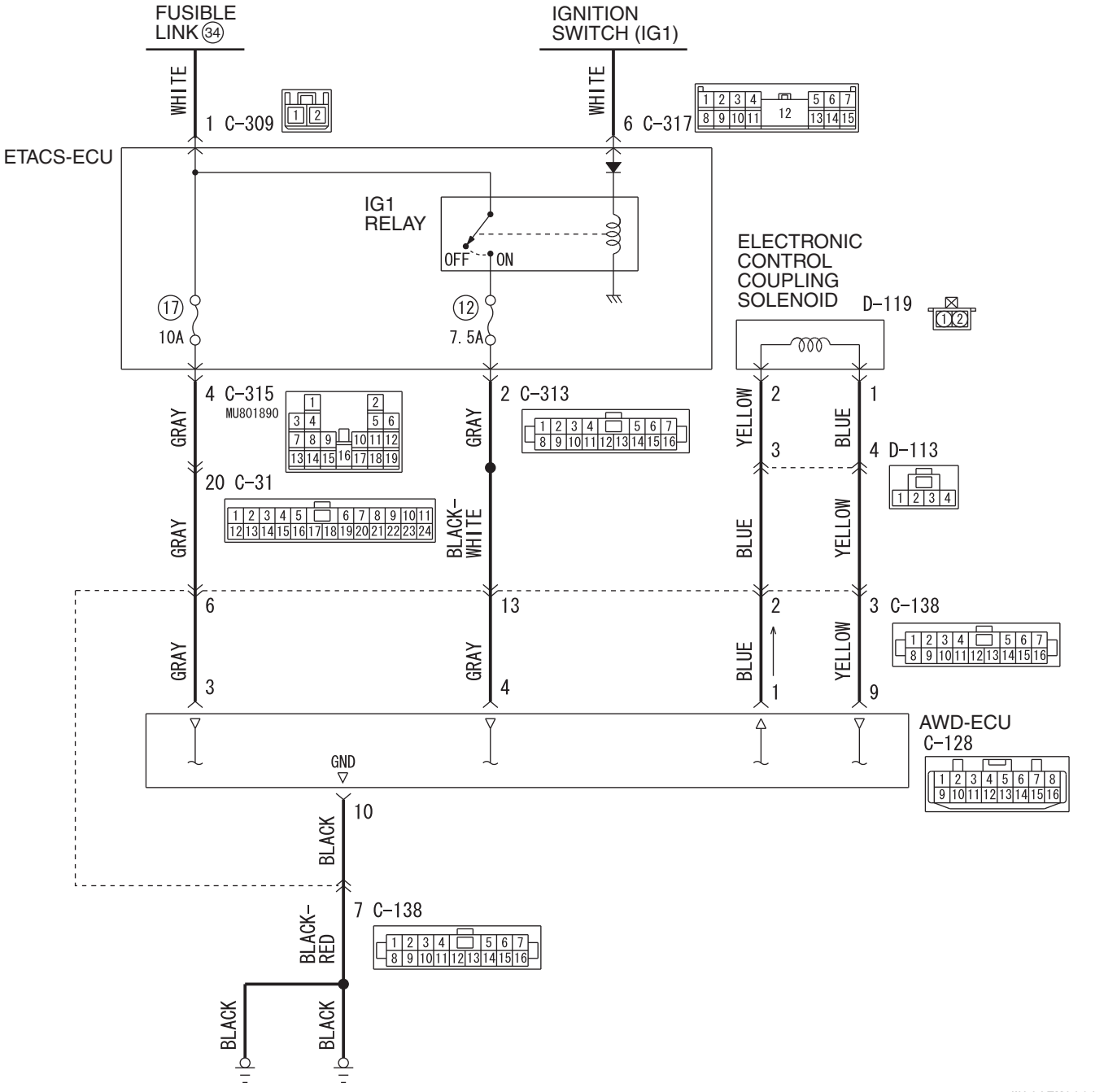
STEP 9. Retest the system.

Q: Does the malfunction occur again?

YES : Troubleshoot the combination meter multi information display (Refer to GROUP 54A –Troubleshooting P.54A-70). Then diagnose again from Step 1.

NO : The procedure is complete.

Inspection Procedure 3: The Tight Corner Braking Phenomenon* Appears with the Drive Mode Selector in the FWD or AWD Position.



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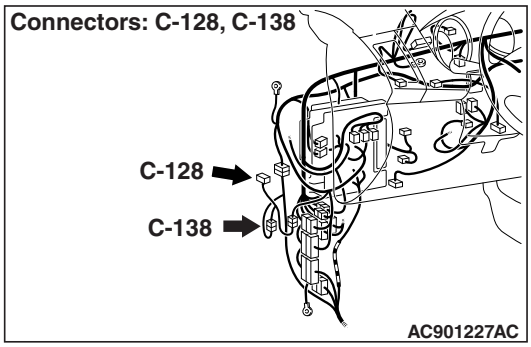

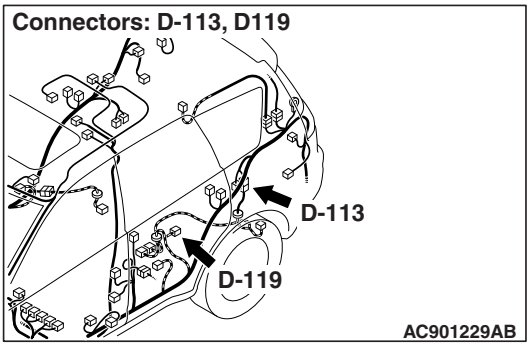

NOTE:

- **Tight corner braking phenomenon: When a AWD vehicle makes sharp cornering in a paved road at low speed (ex. parallel parking), there is a difference in turning radius between front and rear wheels. If such a difference can no longer be compensated by tire slippage, the vehicle behaves as if it is under braking.*
- *The vehicle is tuned so that the tight corner braking phenomenon appears at a certain level with the drive mode selector in the LOCK position.*

COMMENTS ON TROUBLE SYMPTOM

If the tight corner braking phenomenon occurs with the drive mode selector being on the FWD position, the electronic control coupling may have a problem. If the tight corner braking phenomenon occurs only with the drive mode selector being on the AWD position, the data received by AWD-ECU from each ECU, the electronic control coupling, or AWD-ECU may have a problem.

TROUBLESHOOTING HINTS

- Malfunction of electronic control coupling
- Malfunction of data transmitted from ABS or ASC system
- Malfunction of data transmitted from the engine control system
- AWD-ECU malfunction

DIAGNOSIS

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Check for the tight corner braking phenomenon occurrence during driving on a flat road

Check if the tight corner braking phenomenon occurs during driving on a flat road with the drive mode selector being on the FWD or AWD position.

Q: Does the tight corner braking phenomenon occur?

YES : Go to Step 2.
NO : The procedure is complete.

STEP 2. Wiring harness check

NOTE: Prior to the wiring harness inspection, check the following connectors for improper engagement, terminal damage or terminal drawn in the connector case.

- C-128 AWD-ECU connector
- C-138 Intermediate connector
- D-113 Intermediate connector

Check the wiring harness between the C-128 AWD-ECU connector (terminal No.1) and the D-119 electronic control coupling solenoid connector (terminal No.2), and the wiring harness between the C-128 AWD-ECU connector (terminal No.9) and the D-119 electronic control coupling solenoid connector (terminal No.1) for damage or other problem.

Q: Is the wiring harness in good condition?

YES : Go to Step 3.

NO : Repair damage or other problem in the wiring harness. Then go to Step 7.

STEP 3. Scan tool MB991958 data list

Check the service data for the items below. (Refer to P.27C-87.)

- Item 10: FWD SW
- Item 11: LOCK SW
- Item 15: AWD mode
- Item 16: FL wheel speed sensor
- Item 17: FR wheel speed sensor
- Item 18: RL wheel speed sensor
- Item 19: RR wheel speed sensor
- Item 26: Throttle position

Q: Does the service data meet the standard value range?

YES : Go to Step 5.

NO (Item10 or 11) : Perform the troubleshooting of the drive mode selector (refer to P.27C-31). Then go to Step 4.

NO (Item16 to 19) : Perform the troubleshooting of the ABS system (Refer to GROUP 35B –Troubleshooting P.35B-15<Vehicles with ABS>), the ASC system (Refer to GROUP 35C –Troubleshooting P.35C-24 <Vehicles with ASC>). Then go to Step 4.

NO (Item26) : Perform the troubleshooting of the engine control system (Refer to GROUP 13A – Troubleshooting <4B1>P.13A-49 , GROUP 13B – Troubleshooting <6B3>P.13B-51). Then go to Step 4.

STEP 4. Check for the tight corner braking phenomenon occurrence during driving on a flat road

Check if the tight corner braking phenomenon occurs during driving on a flat road with the drive mode selector being on the FWD position.

Q: Does the tight corner braking phenomenon occur?

YES (Coil current is 0 A) : Measure the coil current when the tight corner braking occurs. If the coil current measures 0 A, replace the electronic control coupling (Refer to P.27C-94). Then go to Step 5.

YES (Coil current is other than 0 A) : Measure the coil current when the tight corner braking occurs. If the coil current is other than 0 A, go to Step 5.

NO : The procedure is complete.

STEP 5. Retest the system.

Q: Does the malfunction occur again?

YES : Replace AWD-ECU. (Refer to P.27C-92.) Then go to Step 6.

NO : The trouble can be an intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15.)

STEP 6. Retest the system.

Q: Does the malfunction occur again?

YES : Replace the electronic control coupling. (Refer to P.27C-94.) Then go to Step 7.

NO : The procedure is complete.

STEP 7. Retest the system.

Q: Does the malfunction occur again?

YES : Diagnose again from Step 1.

NO : The procedure is complete.

Inspection Procedure 4: No DTC is set even when the AWD/LOCK Indicator Lights Flash.

COMMENTS ON TROUBLE SYMPTOM

- In case that the AWD/LOCK indicator flashes but no DTC is set, the AWD-ECU power supply circuit system or AWD-ECU may have a problem.
- If the AWD-ECU power supply voltage is approximately 6.5 V or less when the system is in operation (always), the CPU of AWD-ECU automatically shuts down. At this time, if the AWD control is in operation, it switches to the FWD control. AWD-ECU cannot set the DTC because the CPU shuts down. In addition, the combination meter determines the AWD-ECU time-out, and flashes both AWD and LOCK indicators.

PROBABLE CAUSES

- Damaged wiring harness and connectors
- AWD-ECU malfunction

DIAGNOSIS

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: Vehicle Communication Interface
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A

STEP 1. Check if 4WD/LOCK Indicator Lights flash simultaneously

(1) Turn the ignition switch from the LOCK (OFF) position to the ON position.
(2) Check that the 4WD/LOCK indicator lights flash simultaneously when the drive mode selector is switched to 4WD (AWD) position, or LOCK position.

Q: Does the 4WD/LOCK Indicator Lights flash simultaneously?

YES :
- When the drive system fluid temperature warning display illuminates in the combination meter, cool down the electronic control coupling.
- When the drive system fluid temperature warning display does not illuminate in the combination meter, referring to "Inspection Procedure 1: Scan tool MB991958 cannot Communicate with the Electronic Control AWD System<ECU power supply circuit system check> ", perform the check P.27C-74.

NO : Referring to the Inspection Chart for Trouble Symptoms, perform the check P.27C-73.

DATA LIST REFERENCE TABLE

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Scan tool can read the following items among various control data (input data from each ECU and switch) used by the electronic control AWD system.

SYSTEM IS NORMAL.

Item No.	Check item	Check condition		Normal condition
01	Vehicle speed (AWD calculated value)	Perform a test run of the vehicle.		The speedometer display and the scan tool display almost agree with each other.
02	Ignition power supply voltage	Ignition switch: ON		9 –16 V
03	Coupling torque	• Drive mode selector: 4WD (AWD) • Perform a test run of the vehicle.		0 –730 N· m (0 – 538 ft-lb)
04	Coupling current (command value)	• Drive mode selector: 4WD (AWD) • Perform a test run of the vehicle.		The current changes between 0 and 3 A. (Command value and actual value agree with each other.)
05	Coupling current (monitor value)	• Drive mode selector: 4WD (AWD) • Perform a test run of the vehicle.		The current changes between 0 and 3 A. (Command value and actual value agree with each other.)
06	Coupling temperature	• Drive mode selector: 4WD (AWD) • Perform a test run of the vehicle.		0 –200° C (0 – 392° F) *NOTE: Due to road surface condition the load to coupling varies, thus the temperature indication changes.*
07	CAN system (ABS/ASC)	Ignition switch: ON	When ABS/ASC-ECU data is correctly received	OK
			When ABS/ASC-ECU data reception error occurs	No reception
08	CAN system (engine)	Ignition switch: ON	When engine control module data is correctly received	OK
			When engine control module data reception error occurs	No reception

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Item No.	Check item	Check condition		Normal condition
09	CAN system (ETACS)	Ignition switch: ON	When ETACS-ECU data is correctly received	OK
			When ETACS-ECU data reception error occurs	No reception
10	FWD SW	Ignition switch: ON	Drive mode selector: 2WD (FWD)	ON
			Drive mode selector: 4WD (AWD)	OFF
			Drive mode selector: LOCK	OFF
11	LOCK SW	Ignition switch: ON	Drive mode selector: LOCK	ON
			Drive mode selector: 2WD (FWD)	OFF
			Drive mode selector: 4WD (AWD)	OFF
15	AWD mode	Ignition switch: ON	Drive mode selector: 2WD (FWD)	FWD
			Drive mode selector: 4WD (AWD)	AWD
			Drive mode selector: LOCK	AWD LOCK
16	FL wheel speed sensor	Perform a test run of the vehicle. Check that there is difference between the right wheel speed and the left wheel speed when the vehicle turns.		The speedometer display and the scan tool display almost agree with each other.
17	FR wheel speed sensor			
18	RL wheel speed sensor			
19	RR wheel speed sensor			
21	Engine speed	Perform a test run of the vehicle.		The tachometer display and the scan tool display almost agree with each other.
23	Ignition position	ON		ON
		START		START
26	Throttle position	Ignition switch: ON	Release the accelerator pedal.	Approximately 0%
			Gradually depress the accelerator pedal.	0 –100%
			Fully depress the accelerator pedal.	Approximately 100% (within 100%)
28	Limited torque <Vehicles with ASC>	Perform a test run of the vehicle.	Usually	–
			When ASC works and AWD-ECU limits the torque in cooperation control with ASC *NOTE: Electronic control AWD will limit occasionally the rear wheel transmission torque in cooperation control with ASC. When this limit is applied, the limited torque will be shown.*	0 –730 N· m (0 – 538 ft-lb)

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SYSTEM SHUT-DOWN

Scan tool display data does not agree with the actual data when AWD-ECU deactivates the AWD control function by the fail-safe function.

ACTUATOR TEST TABLE

M1274001100061

Scan tool can be used to forcibly activate the electronic control coupling and indicators (AWD indicator and LOCK indicator) in the combination meter according to the following items.

NOTE:

- *If AWD-ECU is deactivated by the fail-safe function, no actuator test can be performed.*
- *As for the item No. 01, the chassis dynamometer is used to check the AWD torque. A simple AWD status check method, however, can be applied by checking whether a tight corner braking phenomenon appears during driving.*

⚠ CAUTION

When the item No. 01 is checked, the speed difference between front and rear wheels must be 5 km/h (3 mph) or lower. If the speed difference exceeds 5 km/h (3mph), AWD-ECU changes from the actuator test mode to the normal control mode.

Actuator test specifications

Item No.	Check item	Driven component	Operating duration
01	AWD coupling control torque	Drive the electronic control coupling with the control torque of 0 N· m to 730 N· m (0 to 538 ft-lb).	Maximum 10 seconds
02	AWD mode	AWD LOCK	Maximum 1 minute
		AWD	Maximum 1 minute
		FWD	Maximum 1 minute

CHECK AT ECU TERMINALS

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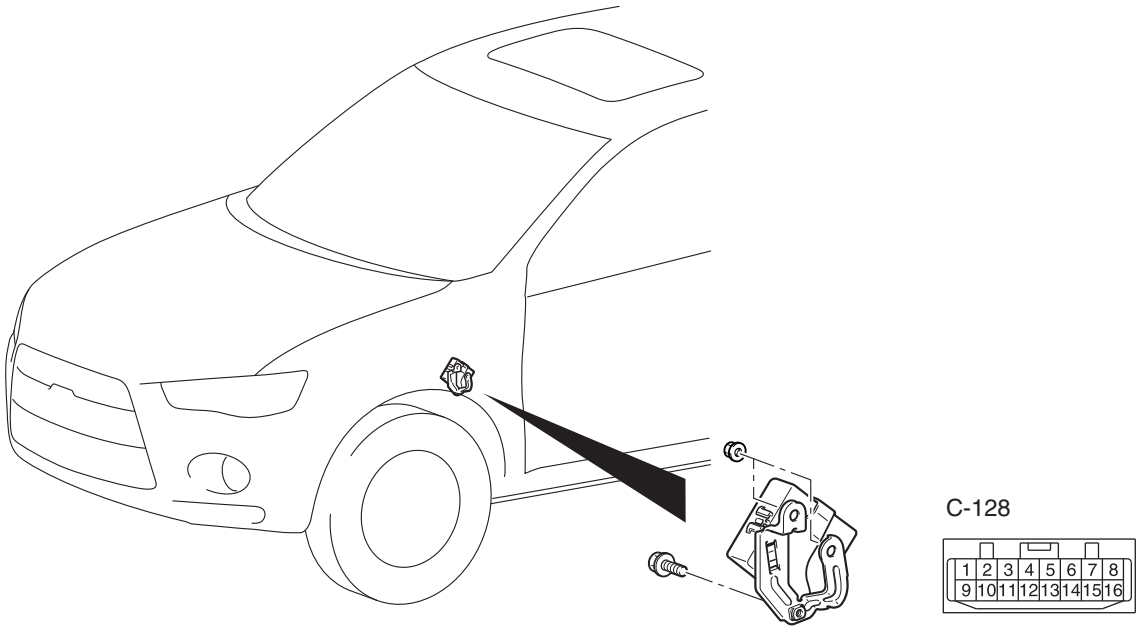

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Terminal No.	Check item	Check condition		Normal condition
1	Current command value of electronic control coupling solenoid	• Drive mode selector: 4WD (AWD) • Perform a test run of the vehicle.		0 to 3 A
3	Electronic control coupling solenoid power supply	Always		System voltage
4	Ignition power supply voltage	Ignition switch: ON		System voltage
		Ignition switch: OFF		1 V or less
9	Electronic control coupling solenoid current monitor value	• Drive mode selector: 4WD (AWD) • Perform a test run of the vehicle.		0 to 3 A
10	Ground	Always		1 V or less
14	Drive mode selector FWD signal	Ignition switch: ON	Drive mode selector: 2WD (FWD)	1 V or less
			Drive mode selector: 4WD (AWD) or LOCK	System voltage
16	Drive mode selector LOCK signal	Ignition switch: ON	Drive mode selector: LOCK	1 V or less
			Drive mode selector: 2WD (FWD) or 4WD (AWD)	System voltage

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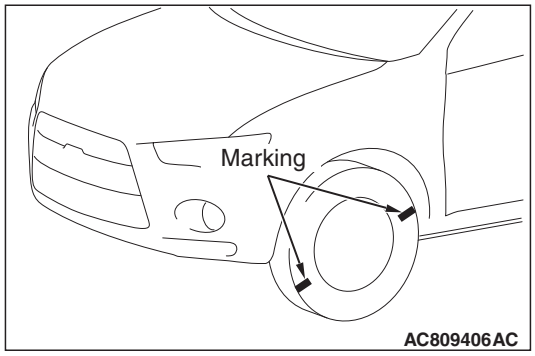
ON-VEHICLE SERVICE

CHECK OF ELECTRONIC CONTROL COUPLING

M1274005700140

SIMPLE OPERATION CHECK OF ELECTRONIC CONTROL COUPLING



1. Raise the vehicle.
2. Mark the front and rear tires for easy identification of tire rotation.
3. Adjust the parking brake lever to the normal conditions. (Refer to GROUP 36 –On-vehicle Service, Parking Brake Lever Stroke Check and Adjustment P.36-9.)
4. Pull the parking brake lever by two notches.

   NOTE: Activating the parking brake slightly prevents the drive force transferring to the rear wheels by a friction in the electronic control coupling. If the following FWD mode is checked without the parking brake activation, the drive force is transferred to the rear wheels by a friction in the electronic control coupling.
5. Start the engine, and move the shift lever into the D position.
6. Depress the accelerator pedal gradually, and maintain the vehicle speed at approximately 10 km/h (6.0 mph).
7. Switch the drive mode selector to the FWD mode, and check that the rear wheels are under FWD control (At this time, the AWD/LOCK indicators in the combination meter do not illuminate).
8. Stop the engine.
9. Start the engine again, and move the shift lever into the D position.
10. Depress the accelerator pedal gradually, and maintain the vehicle speed at approximately 10 km/h (6.0 mph).

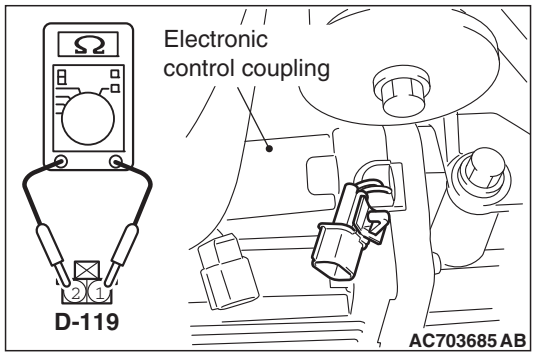
⚠ CAUTION

The following checks in the AWD mode must be completed within one minute in total to protect the AWD drive system components and parking brake.

11. Switch the drive mode selector to the AWD mode, and check that the rear wheels are rotating. (At this time, the AWD indicator in the combination meter illuminates.)

After the above checks are completed, if the rear wheel rotation satisfies the above conditions, it is judged that the electronic control coupling operates correctly. If the rear wheel rotation does not satisfy the above conditions, replace the electronic control coupling. (Refer to P.27C-94.)

RESISTANCE MEASUREMENT BETWEEN ELECTRONIC CONTROL COUPLING SOLENOID CONNECTOR TERMINALS



Disconnect the D-119 connector, and measure the resistance value between the connector terminals on the electronic control coupling side. If the measured resistance value is out of the standard value range, replace the electronic control coupling. (Refer to P.27C-94.)

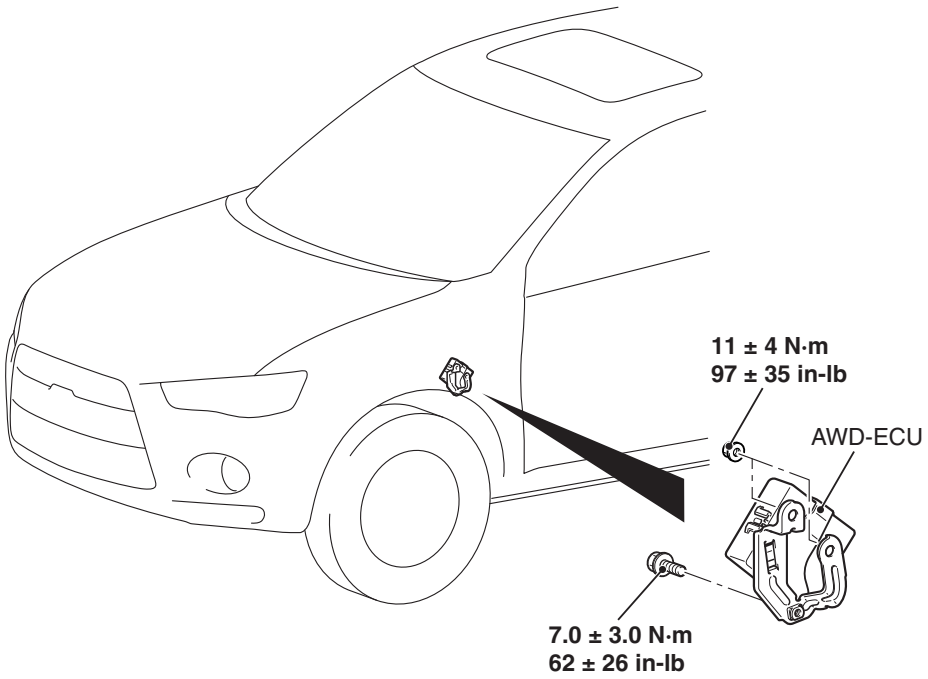
Standard value: 2.2 –4.0 Ω

AWD-ECU

REMOVAL AND INSTALLATION

M1274009200039

Pre-removal and post-installation operation
Removal and installation of the bottom cover assembly and glove box (Refer to GROUP 52A –Instrument Panel Assembly P.52A-2.)



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DRIVE MODE SELECTOR

REMOVAL AND INSTALLATION

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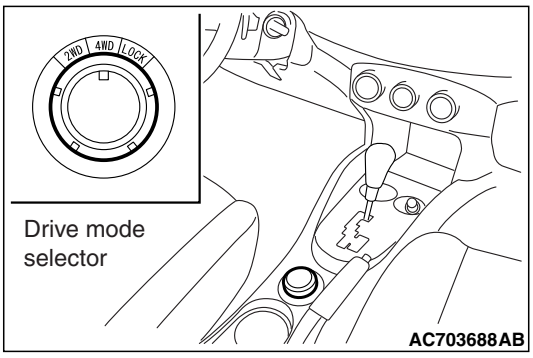

Refer to GROUP 52A –Instrument Panel Assembly P.52A-2.

DRIVE MODE SELECTOR CHECK

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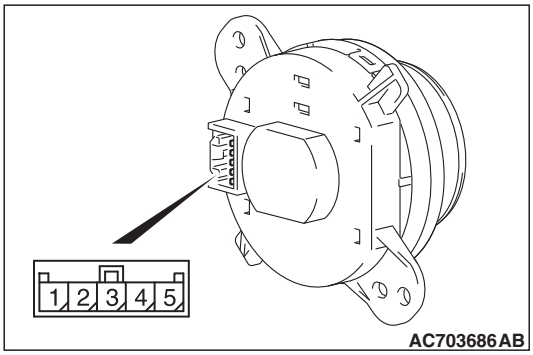

Switch position	Terminal number	Normal conditions
2WD (FWD)	1 –2	Continuity exists (2 ohm or less).
	2 –3	No continuity
4WD (AWD)	1 –2	No continuity
	2 –3	
LOCK	1 –2	No continuity
	2 –3	Continuity exists (2 ohm or less).

ELECTRONIC CONTROL COUPLING

REMOVAL AND INSTALLATION

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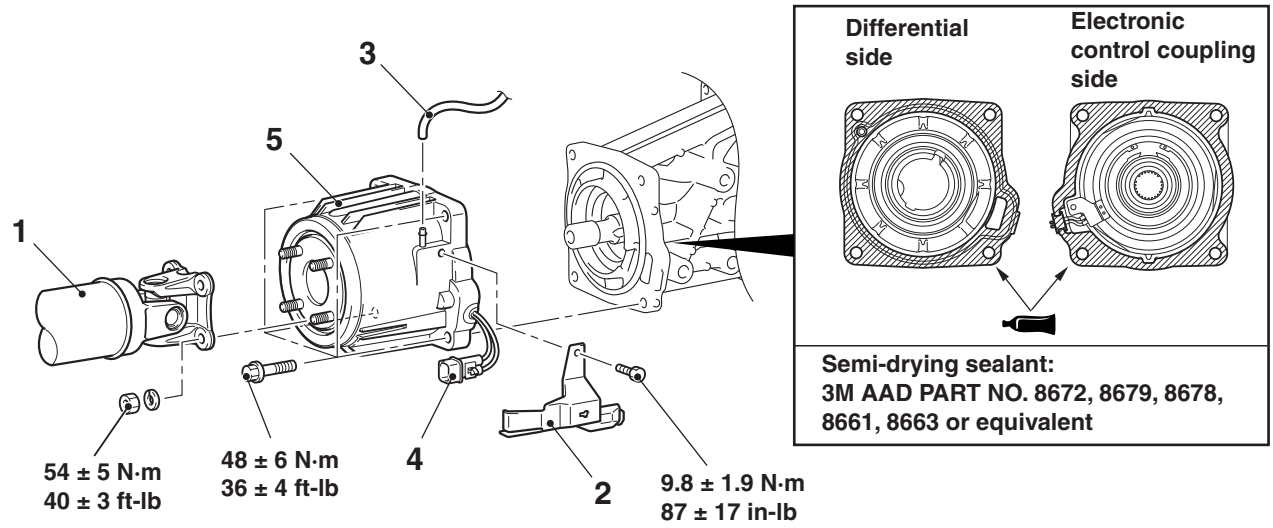


AC703698 AB

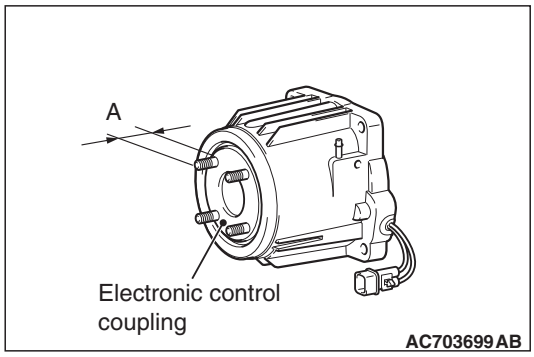
Removal steps

1. Propeller shaft assembly (Refer to GROUP 25 –Propeller Shaft P.25-6.)
2. Cover
3. Breather hose connection
4. Connector connection

A 5. Electronic control coupling

INSTALLATION SERVICE POINT

>>A<< ELECTRONIC CONTROL COUPLING INSTALLATION



AC703699 AB

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

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

2. If it exceeds either of the limits, clean the threads for the electronic control coupling and replace the stud bolt.

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