GROUP 23C

AUTOMATIC TRANSAXLE

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GENERAL INFORMATION

M1231029300046

F6AJA and W6AJA models have been established.

For the AWD system mounted to some vehicles, based on the electronic control AWD which distributes the driving force to the rear wheels, the driving force control between front right and left wheels has been improved additionally, and S-AWC (Super All Wheel Control) for integrated control with Active Stability Control (ASC) and ABS has been adopted.

Transaxle model		F6AJA	W6AJA
Drive type		FWD	AWD
Torque converter	Model	3-element, 1-stage, 2-phase	
	Stall torque ratio	1.96	
	Lock-up	Present	
Shift position		P-R-N-D + sport mode	
Transaxle type		Forward 6-speed, reverse 1-stage	
Front and rear switching		Single pinion x 2 (front, rear) Double pinion x 1 (reduction) <Based on Lepelletier system>	
Clutch and brake		Clutch x 3 (low clutch, 3-5 reverse clutch, high clutch) Brake x 2 (2-6 brake, low and reverse brake)	
Oil pump		Trochoid type	
Maximum hydraulic pressure		2.0 MPa	
Torque capacity		320 N· m	
Solenoid valve		Linear x 6 pieces ON/OFF x 2 pieces	
Transmission ratio	1st	4.199	
	2nd	2.405	
	3rd	1.583	
	4th	1.161	
	5th	0.855	
	6th	0.685	
	Reverse	3.457	
Primary reduction ratio: A		1.071	
Final reduction ratio: B		3.333	
A × B		3.571	
Transmission fluid		DIA QUEEN ATF-J3	

TRANSAXLE

The transaxle is made up of the torque converter and gear train. A 3-element, 1-stage, 2-phase torque converter with built-in torque converter clutch is used. The gear train of F/W6AJA transaxle consists of 3 sets of multi-disc type clutches, 2 sets of multi-disc type brakes, and 2 sets of planetary gears which are composed of a sun gear, carrier, annulus gear, and pinion gear.

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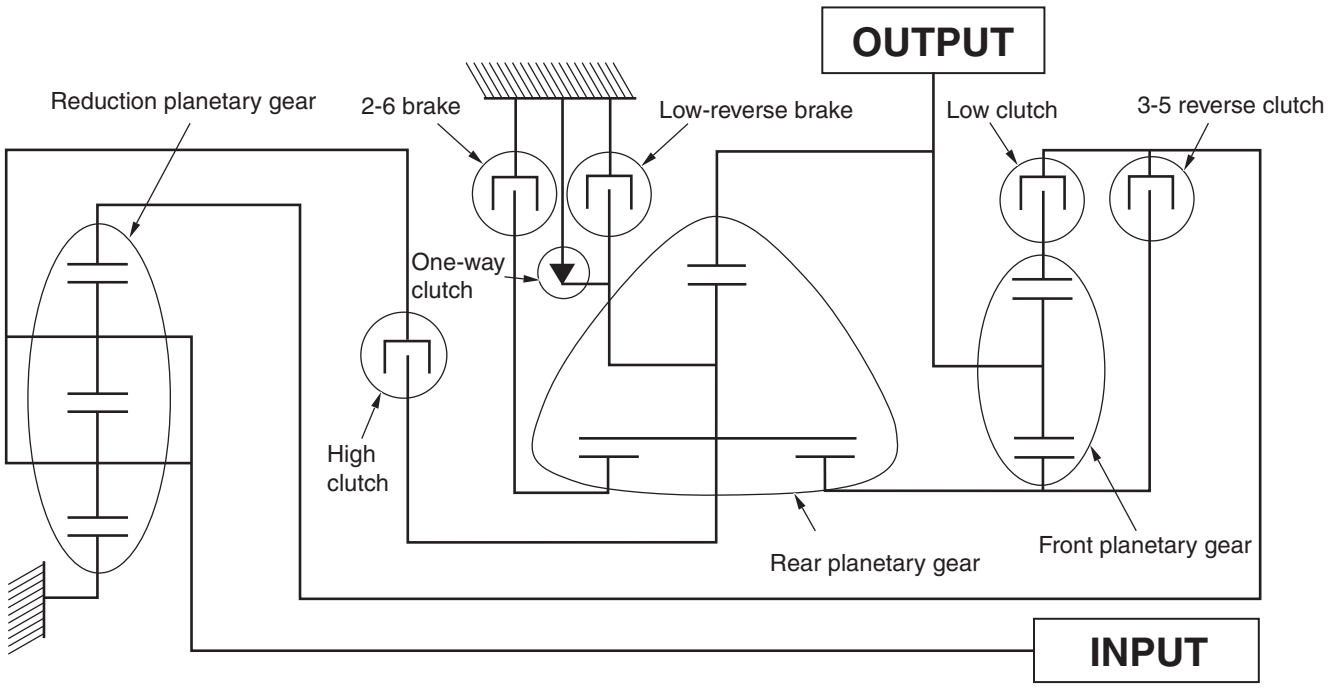
TRANSAXLE CONFIGURATION DRAWING



COMPONENTS AND FUNCTIONS

Parts name	Function
Low clutch	Works with 1st, 2nd, 3rd, and 4th gears, and transfers the input from 3-5 reverse clutch drum to the front internal gear.
3-5 reverse clutch	Works with 3rd, 5th, and reverse gears, and transfers the reduction internal gear input to the front sun gear.
High clutch	Works with 4th, 5th, and 6th gears, and transfers the input shaft input to the rear carrier.
Low and reverse brake	Works with engine brake, 1st and reverse gears, and fixes the rear carrier.
2-6 brake	Works with 2nd and 6th, and fixes the rear sun gear rotation.
One-way clutch	Works when in 1st gear under acceleration status, and fixes the rear carrier.

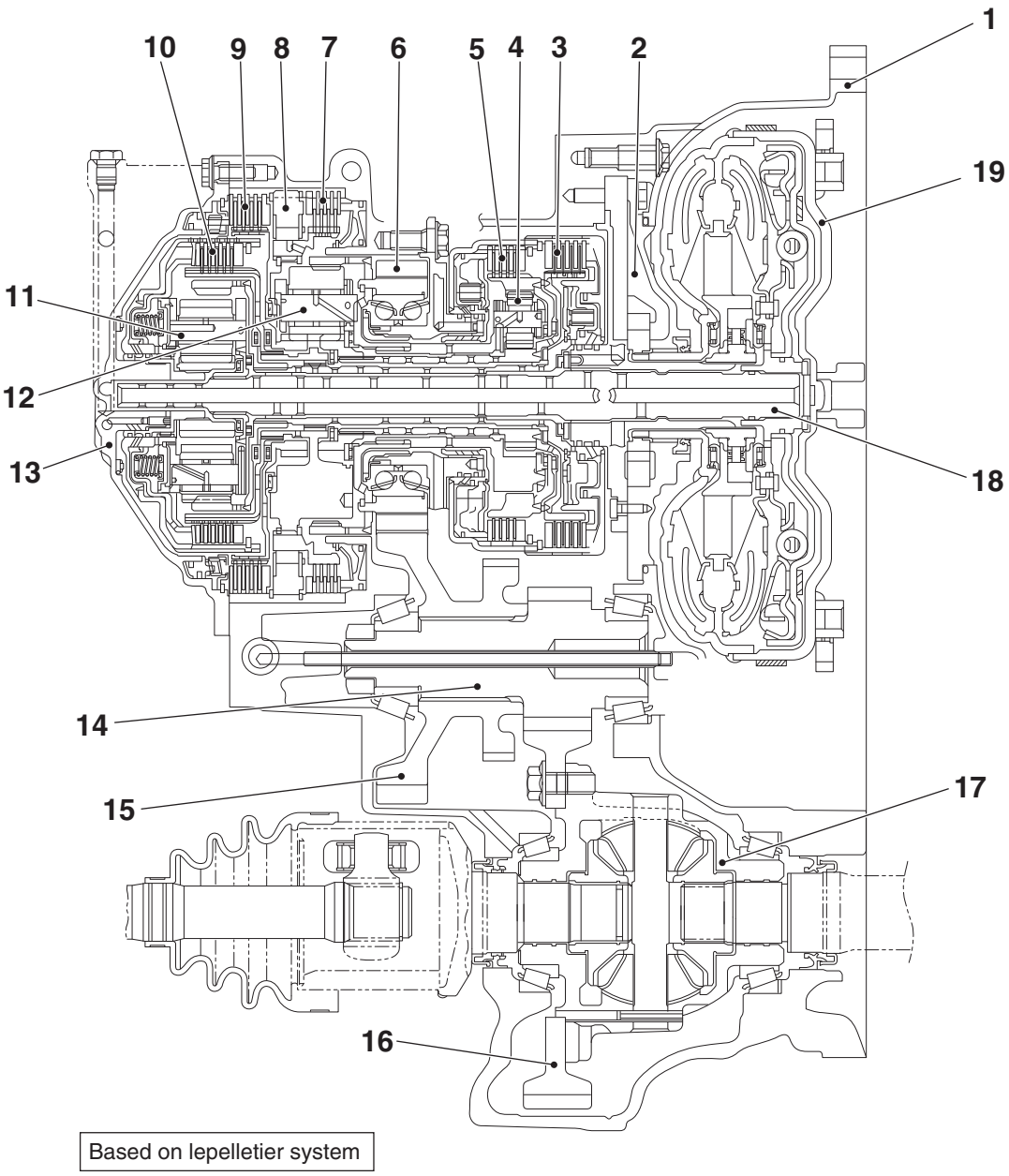
FUNCTION ELEMENT TABLE

Transmission range		Low clutch	3-5 reverse clutch	High clutch	Low and reverse brake	2-6 brake	One-way clutch
P		–	–	–	–	–	–
R		–	×	–	×	–	–
N		–	–	–	–	–	–
D	1st	×	–	–	–	–	×
	1st gear engine brake	×	–	–	×	–	–
	2nd	×	–	–	–	×	–
	3rd	×	×	–	–	–	–
	4th	×	–	×	–	–	–
	5th	–	×	×	–	–	–
	6th	–	–	×	–	×	–

×: Function element ÷: Not applicable

SECTIONAL VIEW

<F6AJA>



AC702758AB

1. Converter housing
2. Oil pump
3. 3-5 reverse clutch
4. Front planetary gear
5. Low clutch
6. Output gear
7. Low and reverse brake
8. One-way clutch
9. 2-6 brake
10. High clutch
11. Reduction planetary gear
12. Rear planetary gear
13. Side cover
14. Reduction pinion gear
15. Idler gear
16. Final gear
17. Differential case
18. Input shaft
19. Torque converter

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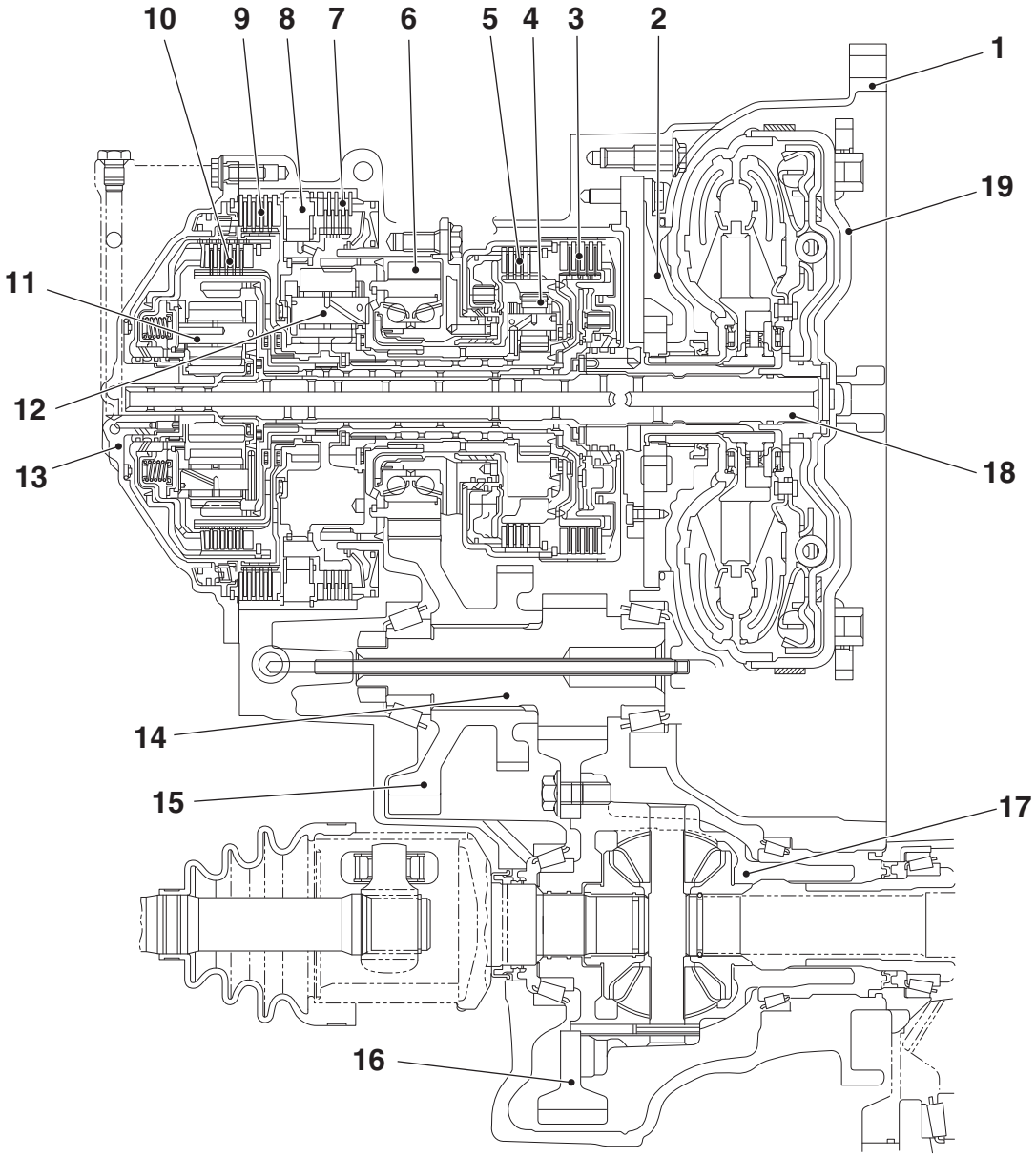
<W6AJA>



Based on lepelletier system

AC607448AG

1. Converter housing
2. Oil pump
3. 3-5 reverse clutch
4. Front planetary gear
5. Low clutch
6. Output gear
7. Low and reverse brake
8. One-way clutch
9. 2-6 brake
10. High clutch
11. Reduction planetary gear
12. Rear planetary gear
13. Side cover
14. Reduction pinion gear
15. Idler gear
16. Final gear
17. Differential case
18. Input shaft
19. Torque converter

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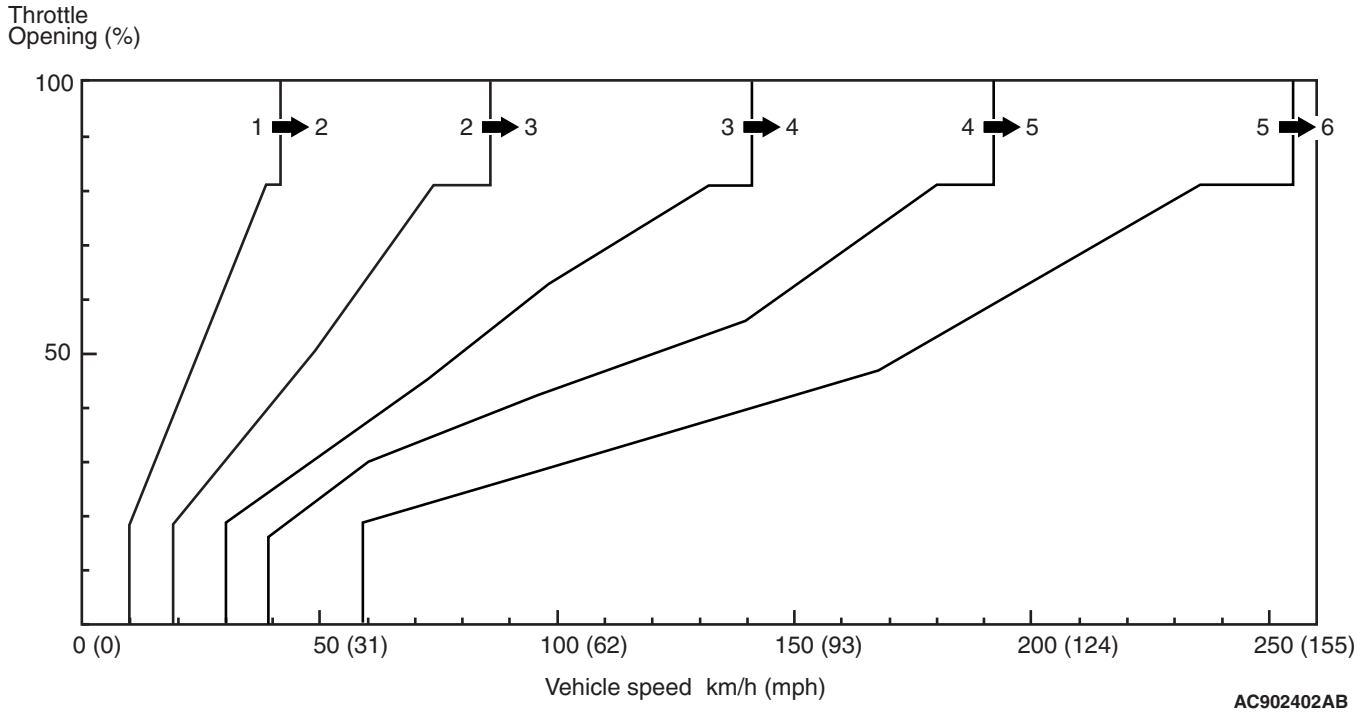
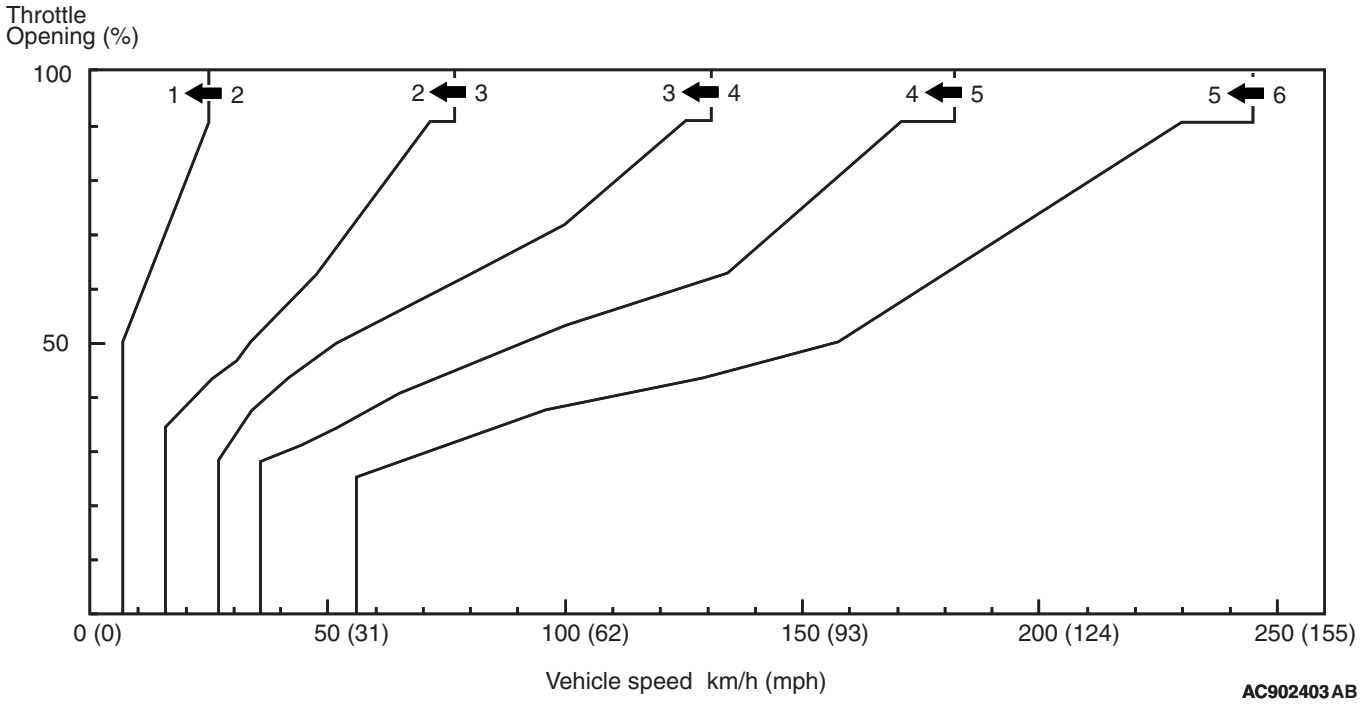
STANDARD SHIFT PATTERN CONTROL

UPSHIFT PATTERN

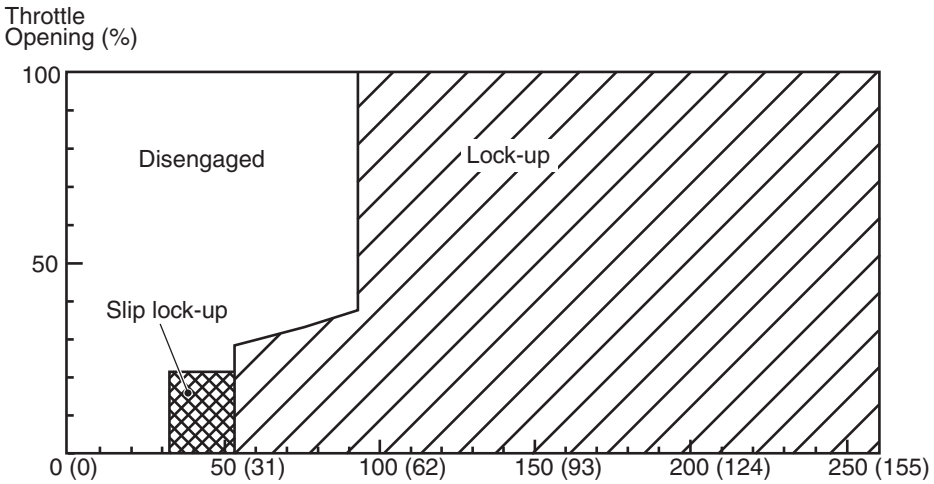


DOWNSHIFT PATTERN



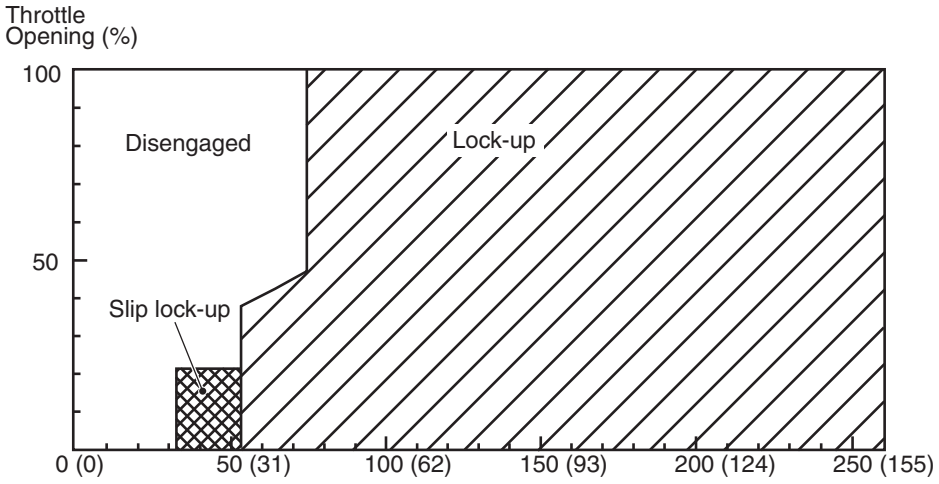
TORQUE CONVERTER CLUTCH CONTROL

6TH GEAR RANGE



AC607702 AC

5TH GEAR RANGE



AC607703AD

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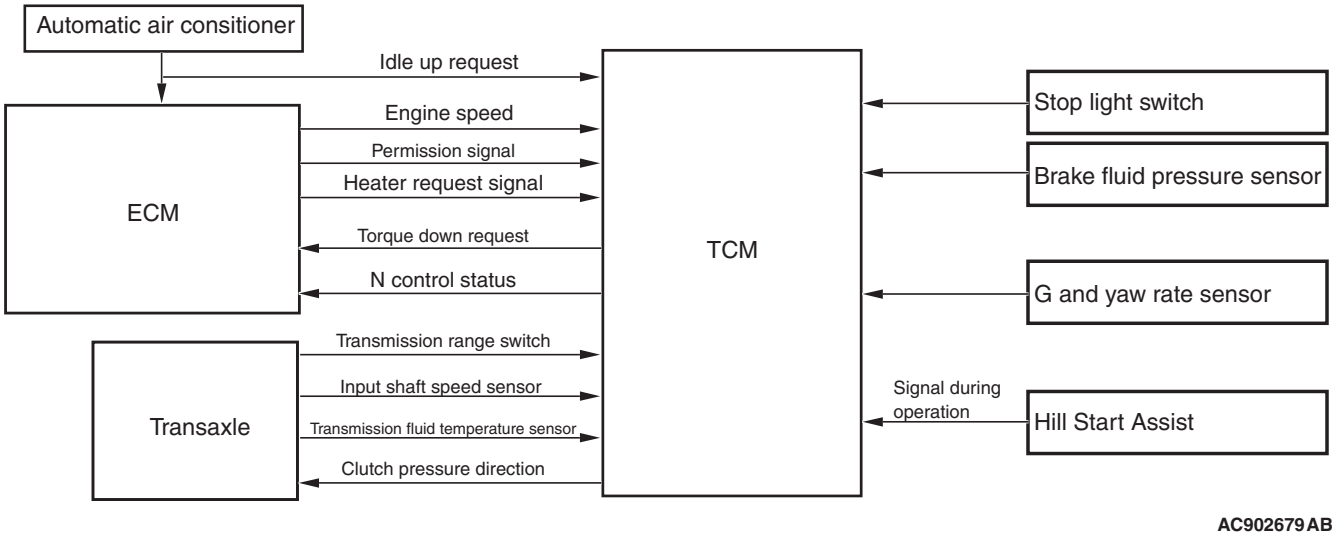
IDLE NEUTRAL CONTROL

The originally engaged starting clutch is slid to block the driving force (creep) which is generated when the vehicle is stopped with D range, improving the fuel consumption by reducing the load.

CONTROL SYSTEM DIAGRAM



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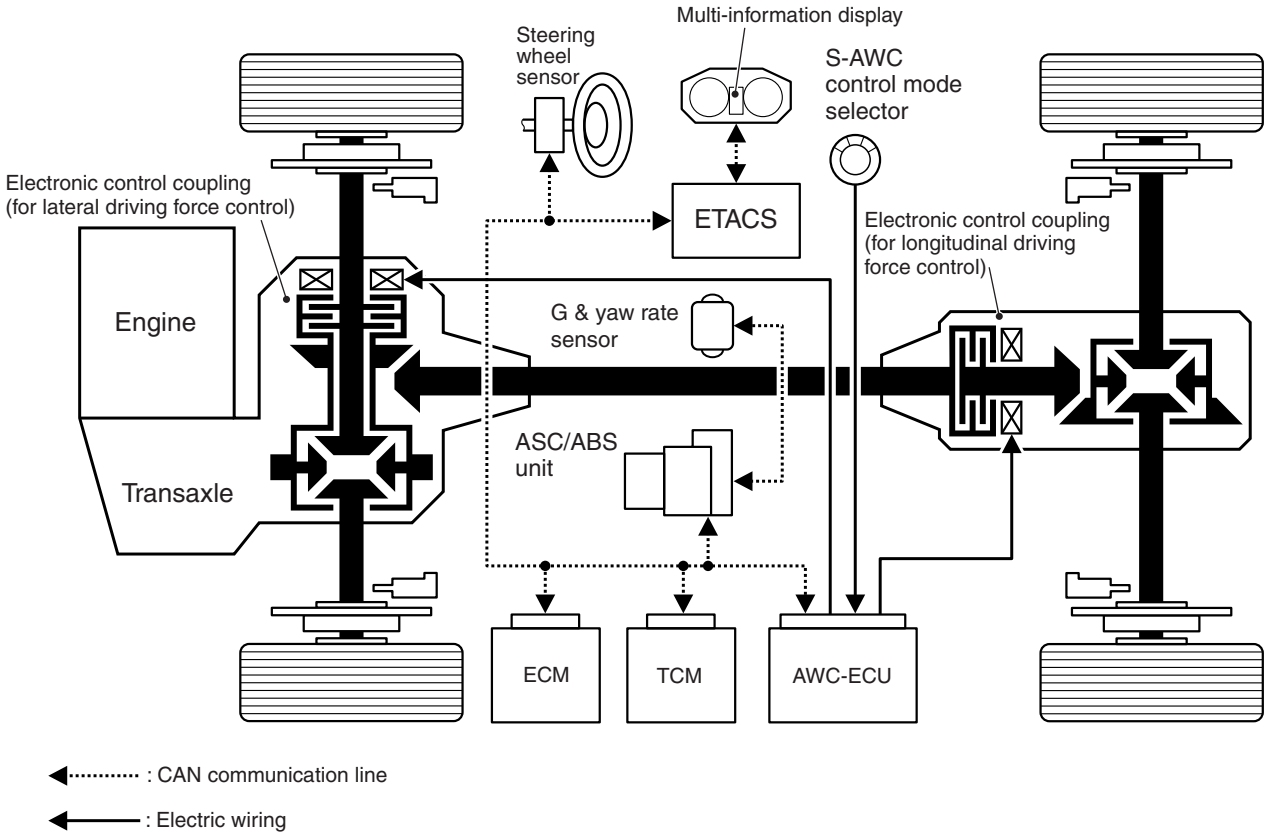
SUPER ALL WHEEL CONTROL (S-AWC)

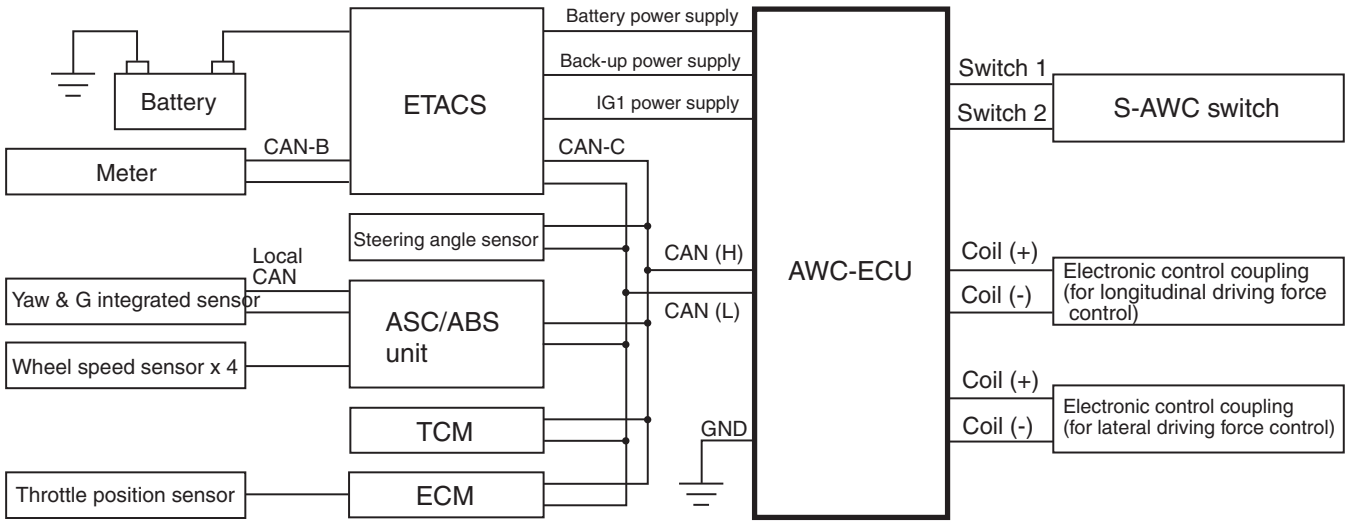
The S-AWC consists of two electronic couplings for longitudinal driving force control and lateral driving force control and the AWC-ECU for control of those two. The AWC-ECU is connected to sensors and other ECUs via the CAN communication line for detecting driver's operation and vehicle behaviour. In addition, the S-AWC control mode selector and indicator are provided for switching and displaying the control status.

· System configuration



AC900393AB

· System connection diagram



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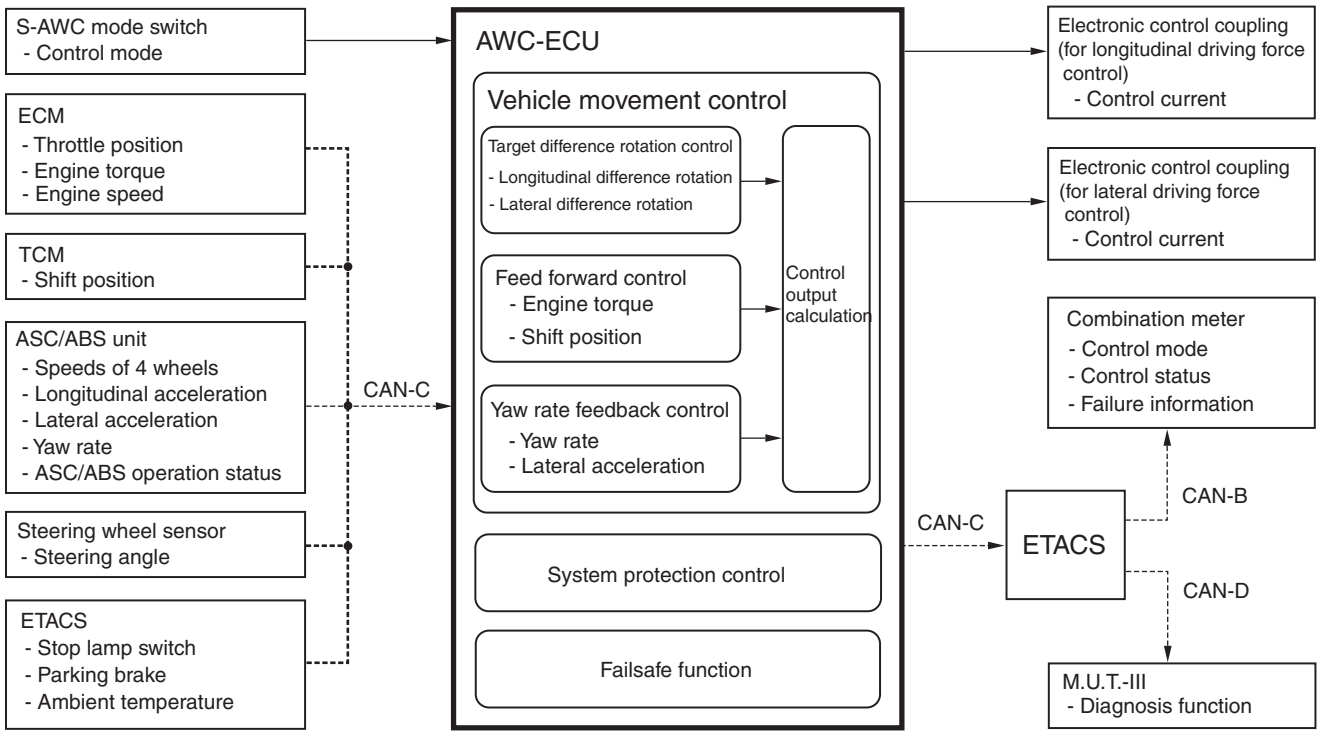
· Control schematic diagram

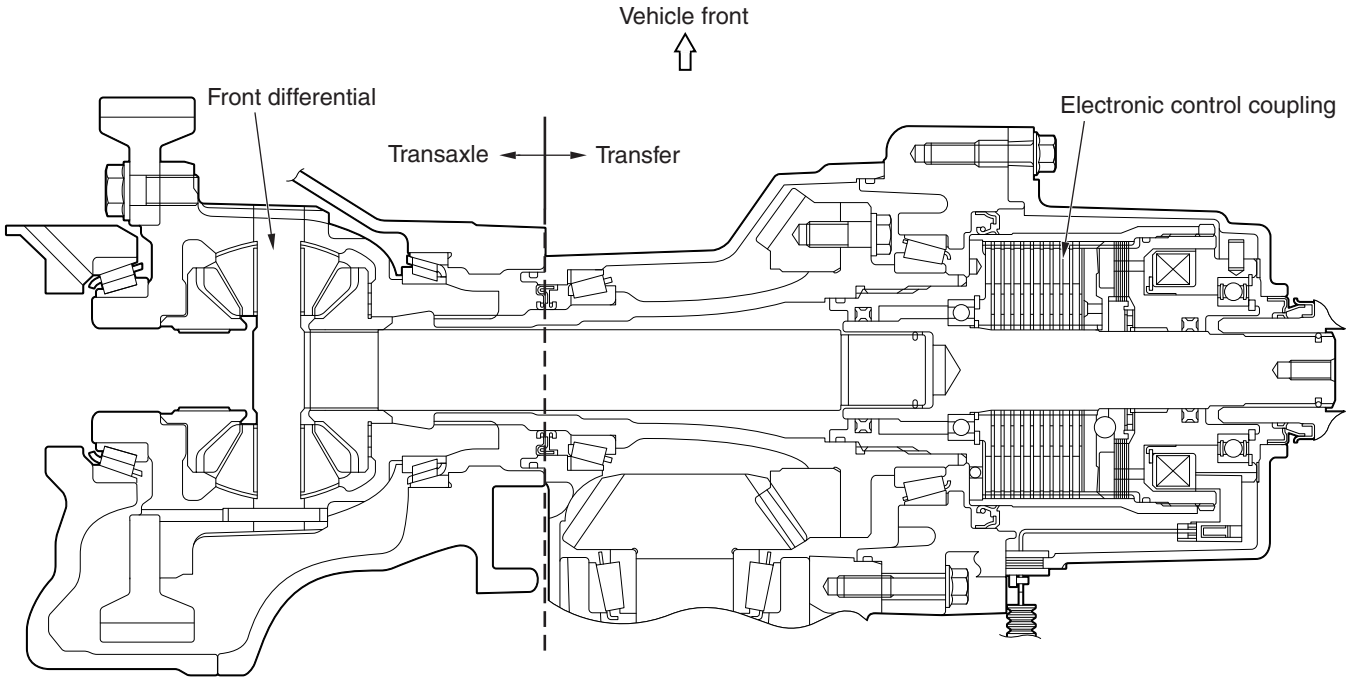


AC900408 AB

(1) ELECTRONIC CONTROL COUPLING (FOR LONGITUDINAL DRIVING FORCE CONTROL)

With the electronic control coupling installed in the rear differential, the driving force distribution to the rear wheels is controlled according to the driving status.

(2) ELECTRONIC CONTROL COUPLING (FOR LATERAL DRIVING FORCE CONTROL)



AC900394AB

The same electronic control coupling mechanism used for the electronic control AWD is installed in the transfer, and the driving force distribution to the front right and left wheels is controlled.

(3) AWC-ECU

With each sensor value acquired from the CAN communication and operation information of other ECUs, optimum driving force control amount is calculated and the control current for the two electronic control couplings is controlled.
Compared with the electronic control AWD ECU, the performance of the microcomputer is enhanced, resulting in improved accuracy and speed of calculation.

(4) SENSOR INFORMATION

Compared with the electronic control AWD ECU, the sensor information used for control has been added extensively. As a result, the vehicle driving status is judged accurately, achieving the control with good response and precision.

Sensor information	S-AWC	Electronic control AWD	Sensor information source
Wheel speed	×	×	ASC/ABS unit
Accelerator opening angle	×	×	ECM
Engine torque	×	–	ECM
Engine speed	×	–	ECM
Steering angle	×	–	Steering angle sensor
Shift position	×	–	TCM
Longitudinal acceleration	×	–	ASC/ABS unit
Lateral acceleration	×	–	ASC/ABS unit
Yaw rare	×	–	ASC/ABS unit

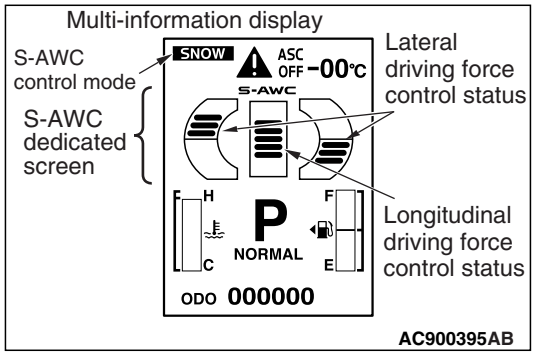
NOTE: ×: Used for control
÷ Not used

(5)S-AWC CONTROL MODE SELECTOR

Three control modes can be selected using the dial switch installed to the floor console.

(6) INDICATOR

The S-AWC control mode is always displayed on the upper part of multi information display.
On the information screen, a special screen to display the S-AWC operation status is established. The driving force control status between the front and rear wheels are displayed in the center, and the driving force control status between the front right and left wheels is displayed in right and left.



SPECIFICATIONS

SERVICE SPECIFICATIONS

M1231000300780

Item		Standard value
Transmission fluid temperature sensor kΩ	at 10° C (50° F)	Approx. 6.62
	at 25° C (77° F)	Approx. 3.51
	at 80° C (176° F)	Approx. 0.55
	at 110° C (230° F)	Approx. 0.25
Hydraulic pressure MPa (psi)	During idling	0.385 - 0.525 (56 - 76)
	During stall	Approx. 1.53 (Approx. 222)
Resistance of low clutch linear solenoid valve [at 20° C (68° F)] Ω		Approx. 5.3
Resistance of lock-up and low-reverse brake linear solenoid valve [at 20° C (68° F)] Ω		Approx. 5.3
Resistance of 2-6 brake linear solenoid valve [at 20° C (68° F)] Ω		Approx. 5.3
Resistance of line pressure linear solenoid valve [at 20° C (68° F)] Ω		Approx. 5.3
Resistance of 3-5 reverse clutch linear solenoid valve [at 20° C (68° F)] Ω		Approx. 5.3
Resistance of high clutch linear solenoid valve [at 20° C (68° F)] Ω		Approx. 5.3
Resistance of low-reverse brake shift solenoid valve [at 20° C (68° F)] Ω		Approx. 28
Resistance of low clutch shift solenoid valve [at 20° C (68° F)] Ω		Approx. 28
Stall speed r/min		2,300 –2,800
Amount of thermo valve lift when it is fully opened mm (in)		3 (0.12) or more

LUBRICANT

M1231000400884

Item	Specified lubricant	Quantity dm^3 (qt)
Transmission fluid	DIA QUEEN ATF-J3	8.2 (8.7)
Transfer oil <AWD>	Hypoid gear oil API classification GL-5 SAE80	0.49 (0.52)

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AUTOMATIC TRANSAXLE DIAGNOSIS <A/T>

DIAGNOSTIC TROUBLESHOOTING FLOW

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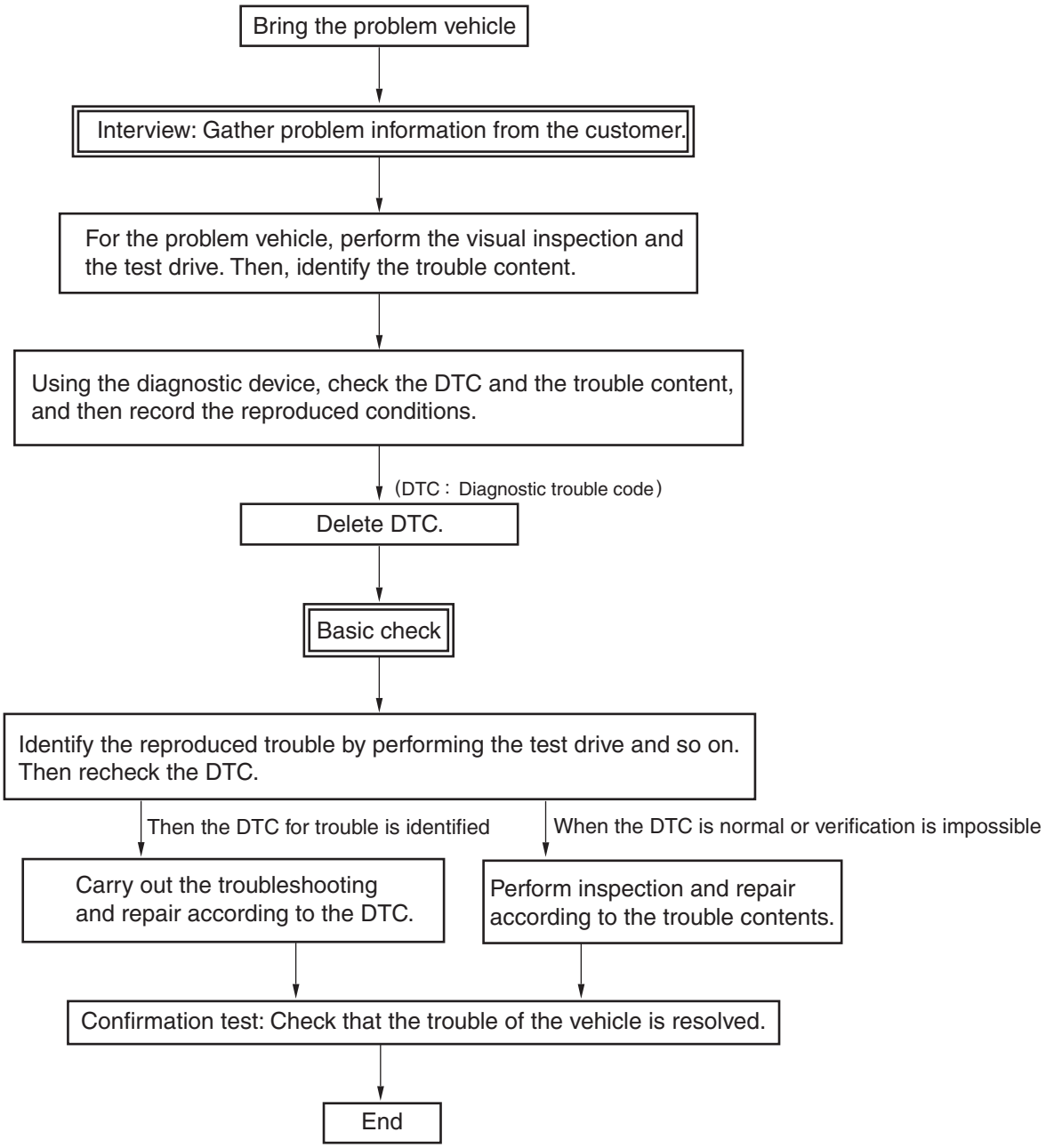

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INTRODUCTION TO A/T DIAGNOSIS

M1231012300282

When the A/T is failed, have an interview with the user to gather precise information on the failure status. After that, perform on-board test to check if the failure is reproduced, and then start repair work. If the repair work is started on the assumption that the A/T is the failure cause from the beginning, the cause would not be investigated, and moreover, the secondary failure may be caused, resulting in a waste of repair time.

Failures regarding the A/T are categorized as follows.

1. Poor adjustment, poor installation between the engine and body, and malfunction due to non-genuine device installation
2. Poor engine performance
3. Malfunction of the electronic control device
4. Malfunction of the A/T inside (hydraulic control system, etc.)
5. Others (oil leakage, damage, etc.)

A/T DIAGNOSTIC TROUBLESHOOTING STRATEGY

M1231007600384

Interview is the first step of the diagnosis. It requires a correct observation of the actual trouble symptom, and a proper judgment without preconceived idea. If the trouble symptom has occurred when the vehicle is brought, it is easy to check the fact. However, when the trouble has not occurred at that time, it is important to have an interview with the user to gather information about the reproduction conditions, and exert maximum effort to reproduce the trouble.

NOTE: These interviews should be listed up.

1. Does it occur when the engine is cold or after it is warmed up?
2. Does it occur on a specific road (slope, curve, long straight road, bumpy road, etc.)?
3. Does it occur with the vehicle speed in a specific range or at vehicle stop?
4. Does it occur during acceleration or deceleration?
5. Does it occur sometimes or consecutively?
6. Does it occur in the transmission range "P," "R," "N," or "D"?
7. Does it change in accordance with the vehicle speed or the engine speed?
8. Does it occur with a specific accelerator angle (e.g. half throttle)? Does it occur at the time of traffic jams?
9. Does it occur all of a sudden recently or has it been noticeable since the vehicle was delivered?
10. (Other) Does it occur after the vehicle experienced the following conditions?: Heavy load, rain, water passage or river, mountain road or rough road; Installation of car navigation, remote controlled starter, audio device, radio transmission equipment, theft prevention device, etc, Addition of battery fluid; Other vehicle troubles.

PRIMARY CHECK

M1231029600036

Basic adjustment and maintenance of the A/T needs to be checked.

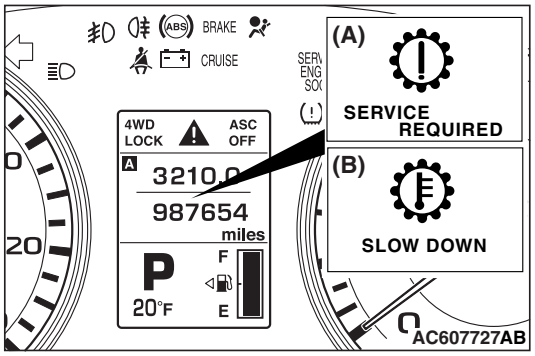
Check items

1. Check the power supply voltage, and check the voltage with the engine stopped. (If malfunction occurs, charge or replace that.)
2. Check the transmission fluid for abnormalities of level, smell, fouling, and color.
3. Check the transaxle control cable and linkage. (If dislocation occurs, adjust that.)
4. Check the connector connection, fouling, corrosion, and fixing status of the A/T-related electric wire.
5. Stall test (If the speed is below the specified value, check the engine side.)
6. Hydraulic pressure test
7. Engine idle speed, speed change occurrence (If a failure occurs, check the engine side.)
8. Check the presence of non-genuine devices (car navigation, remote controlled starter, audio device, radio transmission equipment, theft prevention device, aeroparts, etc.), the presence of power supply wiring and the additional signal wiring. Then, remove improper power supply, signal wiring, and parts to check.

DIAGNOSIS FUNCTION

M1231019000516

WARNING INDICATOR



When any malfunction occurs in the items related to the A/T system, which are described below, the symbol (A) continues being displayed in the information screen in the multi information display.
Check if the diagnostic trouble code is set when the symbol (A) continues being displayed in the information screen in the multi information display.

NOTE: When the symbol (B) is displayed in the information screen in the multi information display, the transmission fluid temperature is high. (Symbol (B) is turned on when the fluid temperature is approximately 140°C (284°F)or higher and turned off automatically when the fluid temperature drops below approximately 135°C(275°F).)

NOTE: When transmission fluid becomes a high temperature, control to lower temperature of transmission fluid acts, and "D" is displayed of a run with sports mode by a shift indicator in a multi information display; and normal from sports mode; shifting is replaced automatically. In addition, there is the case that does not accept operation to sports mode. It is control to lower temperature of transmission fluid, and this phenomenon is not trouble. If temperature of transmission fluid falls, A/T returns to normal movement.

ON-BOARD DIAGNOSTICS

The transaxle control module (TCM) monitors its input/output signals (some signals all the time and others under specified conditions). When an irregular signal is initially monitored, the TCM decides that a malfunction has occurred and records the occurrence as a diagnostic trouble code. There are 39 diagnostic items. The diagnostic results can be read with scan tool. Diagnostic trouble codes are kept in memory by direct battery feed. The codes are retained in memory even if the ignition switch is in the "LOCK" (OFF) position. DTCs are not erased even after the battery terminals and the TCM connector are disconnected. In addition, the diagnostic trouble code can also be erased by scan tool.

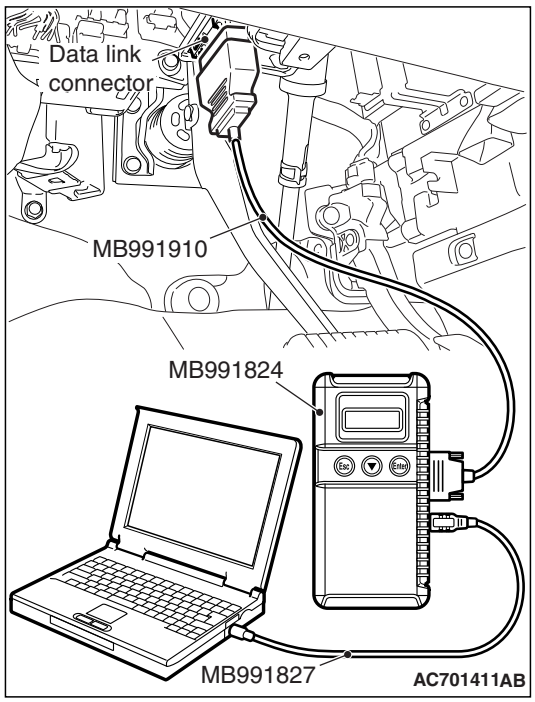
NOTE: If a sensor is disconnected when the ignition switch is in the "ON" position, a diagnostic trouble code is stored in memory. In this case, erase the DTC using scan tool.

The 39 diagnostic items are displayed in numeric order.

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

Required Special Tools:

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



⚠ 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.

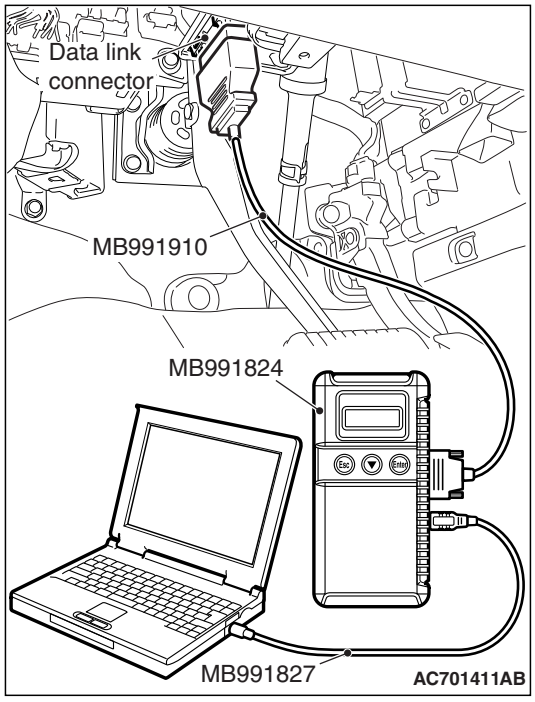
   NOTE: When special tool MB991824 is energized, special tool MB991824 indicator light will be illuminated in a green color.
7. Start the M.U.T.-III system on the personal computer.

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: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A



⚠ 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.

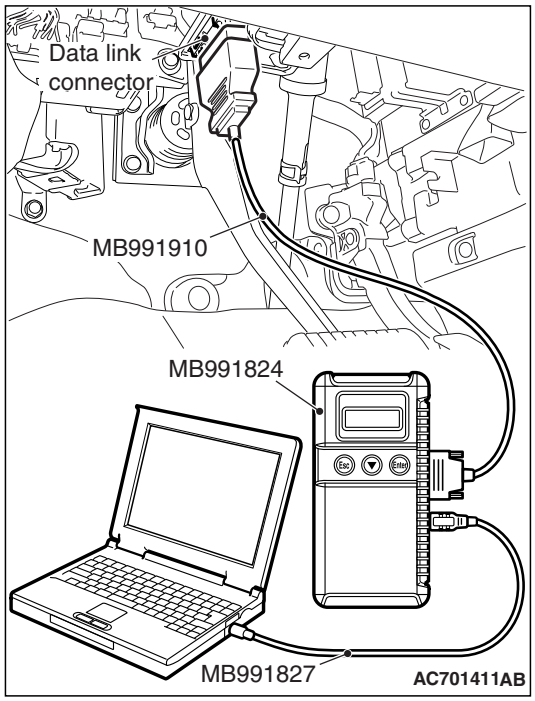
NOTE: If the battery voltage is low, diagnostic trouble codes will not be set. Check the battery if scan tool MB991958 does not display.

1. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "Interactive Diagnosis" from the start-up screen.
4. Select "System select."
5. Choose "ELC-A/T" from the "POWER TRAIN" tab.
6. Select "MITSUBISHI."
7. Select "Diagnostic Trouble Code."
8. If a DTC is set, it is shown.
9. Choose "Erase DTCs" to erase the DTC.

HOW TO READ DATA LIST

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A



⚠ 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. 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" of "Model Year." When the "Vehicle Information" is displayed, check the contents.
5. Select "ELC-A/T" from "System List", and press the "OK" button.

NOTE: When the "Loading Option Setup" list is displayed, check the applicable item.

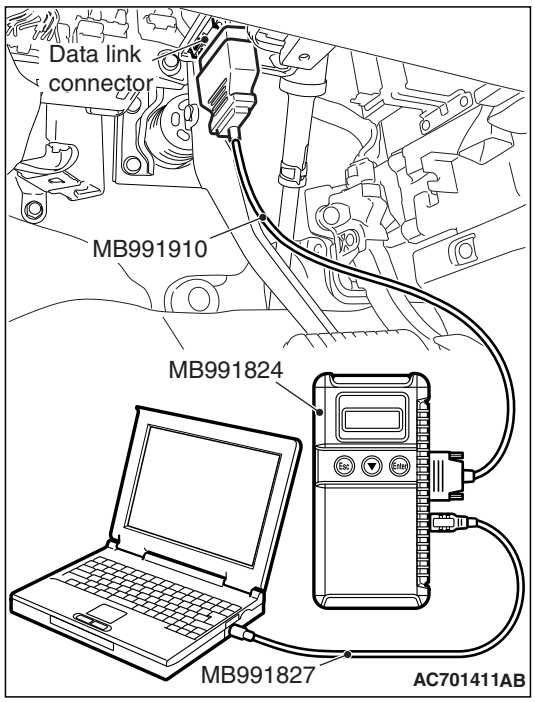
6. Select "MITSUBISHI."
7. Select "Data List."

NOTE: When the "Data List Reference Table" button is selected, the service data reference table is displayed, and the normal values can be checked.

HOW TO DIAGNOSE THE CAN BUS LINES

Required Special Tools:

- MB991958: Scan Tool (M.U.T.-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: M.U.T.-III USB Cable
  - MB991910: M.U.T.-III Main Harness A



⚠ 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. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "CAN Bus Diagnosis" from the start-up screen.
4. When the vehicle information is displayed, confirm that it matches the vehicle whose CAN bus lines will be diagnosed.
   - If they match, go to step 8.
   - If not, go to step 5.
5. Select the "view vehicle information" button.
6. Enter the vehicle information and select the "OK" button.
7. When the vehicle information is displayed, confirm again that it matches the vehicle whose CAN bus lines will be diagnosed.
   - If they match, go to step 8.
   - If not, go to step 5.
8. Select the "OK" button.
9. When the optional equipment screen is displayed, choose the one which the vehicle is fitted with, and then select the "OK" button.

HOW TO INITIALIZE A/T LEARNED VALUE

M1231022600325

PURPOSE

A/T learned value must be reset whenever the automatic transaxle, engine assembly, A/T valve body, or A/T solenoid valve is replaced. It cannot be reset by disconnecting the battery. Use the M.U.T.-III as follows:

INITIALIZATION PROCEDURE

1. Move the selector lever to the P range and turn the ignition switch to the LOCK (OFF) position. Then, connect scan tool to the data link connector.
2. Turn the ignition switch to the ON position, and then move the selector lever to the R range.
3. Depress the accelerator pedal while depressing the brake pedal. (Engine is not runnning.) Using the M.U.T.-III, execute the clear DTC function for the TCM (even if no codes are set).

NOTE: Performing initialization of the learned value will also erase the diagnostic trouble code.

FAIL-SAFE/BACKUP FUNCTION

M1231008300375

When a malfunction of a main sensor or actuator is detected by the PCM, the transaxle is controlled by pre-set control logic to maintain safe conditions for driving.

The following table shows how the fail-safe/backup function affects vehicle driveability and operation.

DTC code No.	Detection items	Fail-safe
P0703	Stoplight switch malfunction	• The lock-up operation range is shifted to the high speed side. • Inter lock detection is prohibited.
P0705	Transmission range switch system	• Fixed at the D range. • Manual mode is prohibited. • Lock-up is prohibited.
P0712	Transmission fluid temperature sensor system (Short circuit)	Not present.
P0713	Transmission fluid temperature sensor system (Open circuit)	Fixed to 5th gear during driving, and to 3rd gear after a vehicle stop.
P0715	Input shaft speed sensor system	• Fixed to the driving gear position during driving, and to 3rd gear after a vehicle stop.
P0720	Output shaft speed sensor system	
P0729	6th gear incorrect ratio	The current shift position is continued, and gear is fixed to 3rd gear after a vehicle stop.
P0731	1st gear incorrect ratio	• At engine runup detection: Fixed to 5th gear after a vehicle stop. • At gear ratio abnormality detection: Fixed to 2nd, 3rd, 4th gear.
P0732	2nd gear incorrect ratio	The current shift position is continued, and gear is fixed to 5th gear after a vehicle stop.
P0733	3rd gear ratio	The current shift position is continued, and gear is fixed to 6th gear after a vehicle stop.
P0734	4th gear incorrect ratio	The current shift position is continued, and gear is fixed to 3rd or 5th gear after a vehicle stop.
P0735	5th gear incorrect ratio	The current shift position is continued, and gear is fixed to 2nd gear after a vehicle stop.
P0736	Reverse gear incorrect ratio	Controlled by making the line pressure to maximum.
P0741	Torque converter clutch system (Stuck off)	Lock-up is prohibited.
P0742	Torque converter clutch system (Stuck on)	Lock-up is prohibited.
P0743	Lock-up and Low-reverse brake linear solenoid valve system	Fixed to 5th gear during driving and to 3rd gear after a vehicle stop.
P0748	Line pressure linear solenoid valve system	Controlled by making the line pressure to maximum.
P0753	Low clutch linear solenoid valve system	Fixed to 5th gear.
P0758	2-6 brake linear solenoid valve system	Fixed to 5th gear during driving, and to 3rd gear after a vehicle stop.
P0763	3-5 reverse clutch linear solenoid valve system	Fixed to 5th gear during driving, and to 3rd gear after a vehicle stop.
P0768	High clutch linear solenoid valve system	Fixed to 5th gear.
P0815	Paddle shift switch (up) system	The manual mode operation during the driving cycle*1 in question is prohibited.

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DTC code No.	Detection items	Fail-safe
P0816	Paddle shift switch (down) system	The manual mode operation during the driving cycle*1 in question is prohibited.
P0826	Shift switch assembly system	The manual mode during the driving cycle*1 in question is prohibited.
P0846	2-6 brake pressure switch system	Control is continued with always switch on.
P0876	High clutch pressure switch system	Control is continued with always switch on.
P0893	Interlock detection	Fixed to a feasible shift position.
P0988	Low-reverse brake pressure switch system	Control is continued with always switch on.
P1705	Throttle position sensor information (engine)	• Controlled with the throttle position fixed to 2/8 position. • Lock-up is prohibited.
P1706	Accelerator pedal position information	• Controlled with the throttle position fixed to 2/8 position. • Lock-up is prohibited.
P1731	1st engine brake detection	The low-reverse brake is released.
P1753	Low clutch shift solenoid valve system	Not present.
P1758	Low-reverse brake shift solenoid valve system	Fixed to 5th gear during driving, and to 3rd gear after a vehicle stop.
P1773	ABS Information (ASC)	The lock-up during the deceleration and when vehicle speed is 40 km/h (25 mph) or less is prohibited.
P1796	Idle neutral control	Idle neutral control is prohibited.
U0001	CAN bus off	Fixed to 5th gear during driving, and to 3rd gear after a vehicle stop.
U0100	ECM time out	Fixed to 5th gear during driving, and to 3rd gear after a vehicle stop.
U0121	ASC-ECU time out	No action
U0141	ETACS-ECU time out	Judges as brake ON, and continues control.

*1: Indicates the series of driving cycle "ignition key OFF →ON →drive →OFF."

ROAD TEST

M1231007800979

This test is performed to make a proper judgment on the trouble symptom and check after completion of service work.

1. With the actual driving, check if there is any abnormality in transmission.
2. Check if there is any shift shock or abnormal sound.
3. Check the driving status with all the shift ranges including "R."
4. Perform the driving test with the reproduction condition which is investigated in the interview to check the failure occurrence.

P-range test

1. Stop the vehicle completely on an upslope at the gradient of 5° to 10° , and then shift the selector lever to the "P" range. After that, release the foot brake gradually to check that the vehicle does not move.
2. With the status of the above Step 1, shift the selector lever from the "P" range to other ranges, and check that the vehicle moves.
3. Check the operation also on the downslope with the same manner.

Select time lag

⚠ CAUTION

- **Perform the test with the engine fully warmed up and the idling speed being stable.**
- **On completion of the first test, when one minute or more has elapsed after the selector lever is returned from another position to the "N" range, perform the following tests.**

1. Check the transmission fluid level and properties.
2. Check the transaxle control cable and linkage.
3. Chock the front and rear wheels on a level surface, and depress the foot brake to stop the vehicle.
4. Start the engine, and shift the selector lever from the "N" range to the "D" range. At this time, measure the time from the lever selection to shock occurrence using a stop watch.

   Standard value: –select time lag: 0.8 seconds
5. With the same manner, measure the select time from the "N" range to the "R" range.

   Standard value: –select time lag: 0.8 seconds

If the measured value is abnormally large exceeding one second, the operating hydraulic pressure reduction and the A/T internal clutch slippage are assumed to have occurred.

TORQUE CONVERTER STALL TEST

M1231005400629

This test measures the maximum engine speed when the selector lever is in the "D" position and the torque converter stalls. This tests the operation of the torque converter, stator and one-way clutch operation, as well as the holding performance of the clutches and brakes in the transaxle.

⚠ WARNING

Do not let anyone stand in front of or behind the vehicle while this test is performed.

1. Check the transmission fluid level and temperature. Check the engine coolant temperature.
   - Transmission fluid level: At the "HOT" mark on the dipstick
   - Transmission fluid temperature: 70 –80° C (158 – 176° F)
   - Engine coolant temperature: 80 –100° C (176 – 212° F)

   NOTE: Measure transmission fluid temperature with scan tool MB991958 (M.U.T.-III sub assembly).
2. Chock both rear wheels.
3. Connect a tachometer.
4. Apply the parking and service brakes fully.
5. Start the engine.

⚠ CAUTION

- **The throttle should not be fully open for more than five seconds.**
- **If you repeat the stall test when the transmission fluid temperature is greater than 80° C (176° F), move the selector lever to the "N" position and let the engine run at approximately 1,000 r/min for at least one minute. Wait until the transmission fluid temperature returns to 80° C (176° F) or less.**

6. Move the selector lever to the "D" position. Fully depress the accelerator pedal and read the maximum engine speed.

   Standard value: Stall speed: Approx. 2,300 – 2,800 r/min

HYDRAULIC PRESSURE TESTS

M1231205500114

⚠ ***WARNING***

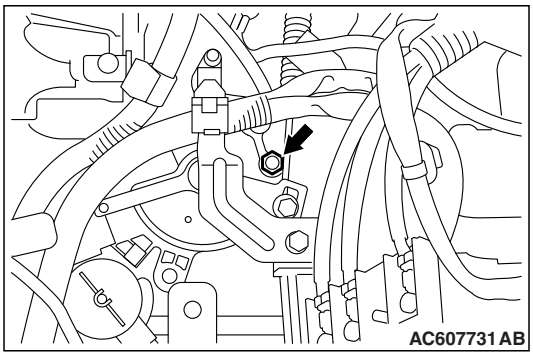
Do not let anyone stand in front of or behind the vehicle while this test is performed.

⚠ **CAUTION**

The transmission fluid temperature should be between 70 – 90° C (158 – 194° F) during the test.

1. Check the transmission fluid level and temperature. Check engine coolant temperature.
   - Transmission fluid level: "H" mark on the dipstick
   - Transmission fluid temperature: 70 – 90° C (158 – 194° F)
   - Engine coolant temperature: 80 – 100° C (176 – 212° F)
2. Raise the vehicle so that the wheels are free to turn.
3. Connect the special tools (3.0 MPa (427 psi) oil pressure gauge [MD998330] and adapters [MB992127]) to each pressure discharge port.
4. Apply the parking brakes fully.
5. Restart the engine.
6. Check that there are no leaks around the special tool port adapters.
7. At the "D" position, measure the hydraulic pressure during idling (engine speed: 650 ± 50 r/min).

   Standard value: Approx. 0.385 – 0.525 MPa (56 – 76 psi)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⚠ **CAUTION**

The throttle should not be fully open for more than five seconds.

8. At the "D" position, fully depress the foot brake pedal. Then fully depress the accelerator pedal while checking the hydraulic pressure indicator, and quickly read the maximum hydraulic pressure.

   Standard value: Approx. 1.53 MPa (222 psi)

9. Stop the engine.
10. Remove the O-ring from the port plug and replace it.
11. Remove the special tool, and install the plugs to the hydraulic pressure ports.
12. Start the engine and check that there are no leaks around the plugs.

DIAGNOSTIC TROUBLE CODE CHART

M1231007900965

⚠ CAUTION

During diagnosis, a DTC code 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 code(s). If DTC code(s) are set, erase them all.

DTC No.	Diagnosis item		Reference page
P0703	Stoplight switch malfunction		P.23C-29
P0705	Transmission range switch system		P.23C-34
P0712	Transmission fluid temperature sensor system	Short circuit	P.23C-39
P0713		Open circuit	P.23C-43
P0715	Input shaft speed sensor system		P.23C-46
P0720	Output shaft speed sensor system		P.23C-51
P0729	6th gear incorrect ratio		P.23C-57
P0731	1st gear incorrect ratio		P.23C-62
P0732	2nd gear incorrect ratio		P.23C-57
P0733	3rd gear incorrect ratio		P.23C-57
P0734	4th gear incorrect ratio		P.23C-57
P0735	5th gear incorrect ratio		P.23C-57
P0736	Reverse gear incorrect ratio		P.23C-65
P0741	Torque converter clutch system	Stuck off	P.23C-68
P0742		Stuck on	
P0743	Lock-up and Low-reverse brake linear solenoid valve system		P.23C-72
P0748	Line pressure linear solenoid valve system		P.23C-76
P0753	Low clutch linear solenoid valve system		P.23C-80
P0758	2-6 brake linear solenoid valve system		P.23C-83
P0763	3-5 reverse clutch linear solenoid valve system		P.23C-86
P0768	High clutch linear solenoid valve system		P.23C-89
P0815	Puddle shift switch (up) system		P.23C-93
P0816	Puddle shift switch (down) system		P.23C-95
P0826	Shift switch assembly system		P.23C-97
P0846	2-6 brake pressure switch system		P.23C-100
P0876	High clutch pressure switch system		P.23C-105
P0893	Interlock detection		P.23C-109
P0988	Low-reverse brake pressure switch system		P.23C-112
P1705	Throttle position sensor information (engine)		P.23C-116
P1706	Accelerator pedal position information		P.23C-118
P1731	1st engine brake detection		P.23C-120

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DTC No.	Diagnosis item	Reference page
P1753	Low clutch shift solenoid valve system	P.23C-122
P1758	Low-reverse brake shift solenoid valve system	P.23C-125
P1773	ABS information (ASC)	P.23C-128
P1796	Idle neutral control malfunction	P.23C-130
U0001	CAN bus off	P.23C-131
U0100	ECM time-out	P.23C-134
U0121	ASC-ECU time out	P.23C-136
U0141	ETACS-ECU time out	P.23C-137

SYMPTOM CHART

M1231008000512

⚠ CAUTION

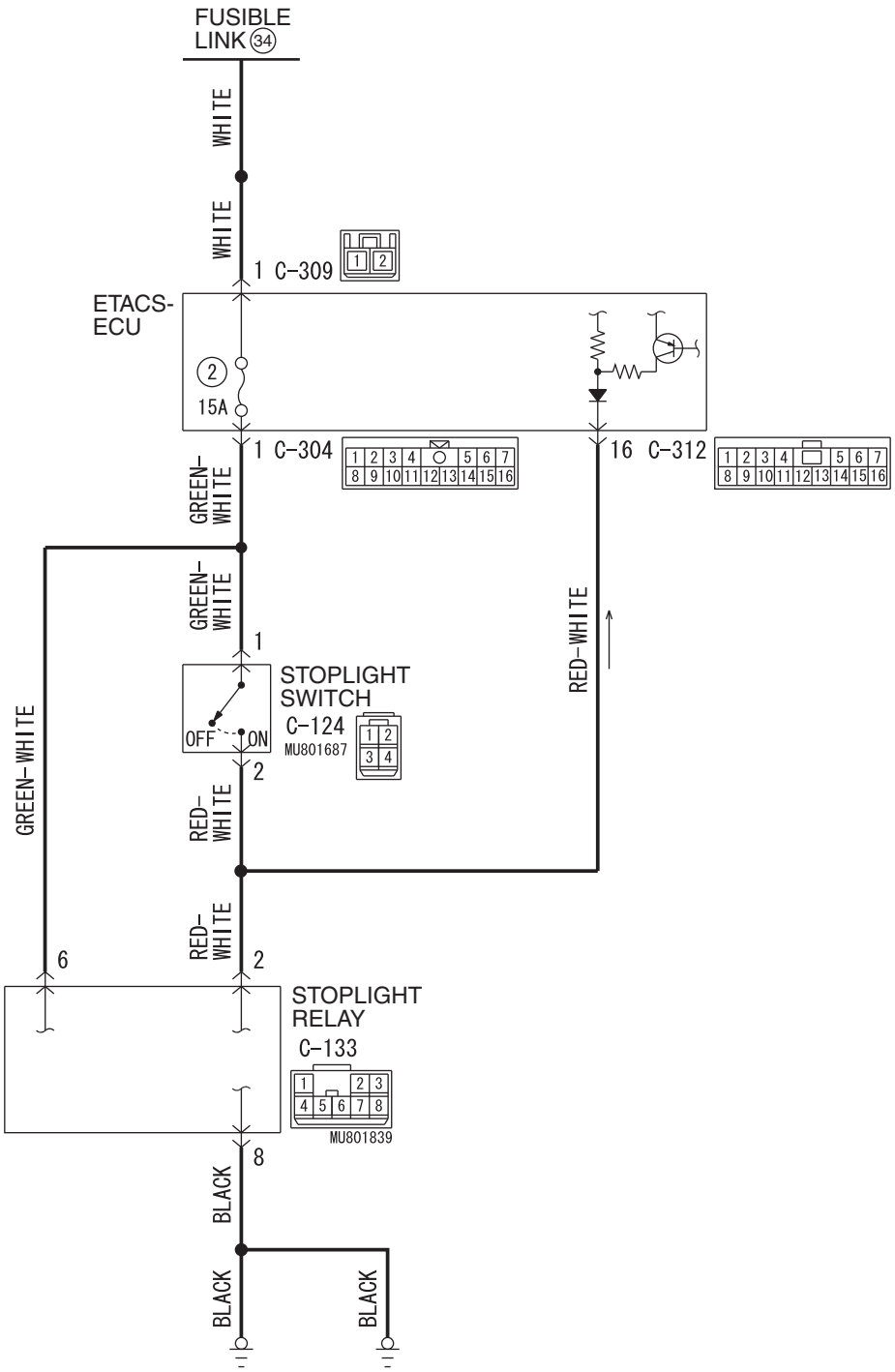
During diagnosis, a DTC code associated with other system may be set when the ignition switch is turned on with connector(s) disconnected. On completion, confirm all systems for DTC code(s). If DTC code(s) are set, erase them all.

Symptom	Inspection procedure No.	Reference page
The vehicle does not run at any range (including low power).	1	P.23C-138
The vehicle does not run at the "D" or the "R" range.	2	P.23C-139
The acceleration is poor.	3	P.23C-140
The vehicle moves at the "N" range.	4	P.23C-141
Gears cannot be shifted at all, or a certain gear shift (1st to 2nd, 2nd to 3rd, etc.) is not made.	5	P.23C-142
The torque converter is not locked up.	6	P.23C-143
The clutch slips when the vehicle starts or during gear shift.	7	P.23C-144
The engine brake is not applied.	8	P.23C-145
The shift shock is large at a certain gear shift. (1st to 2nd, 2nd to 3rd, etc.)	9	P.23C-146
The select shock is large when the transmission range is shifted from "N" to "D", and "N" to "R."	10	P.23C-147
Abnormal sound occurs during idling.	11	P.23C-148
Abnormal sound occurs during driving.	12	P.23C-149
Abnormal sound occurs during gear shift.	13	P.23C-150
Engine stall	14	P.23C-151
Oil leaks from the air breather.	15	P.23C-152
The starter does not rotate at the "P" or "N" range. (The engine does not start.)	16	P.23C-153

DIAGNOSTIC TROUBLE CODE PROCEDURES

DTC P0703: Stoplight Switch Malfunction

Stoplight switch system circuit



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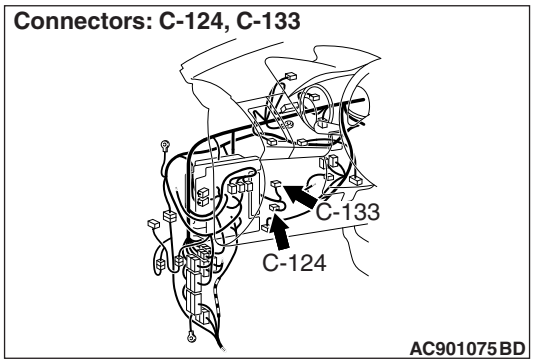
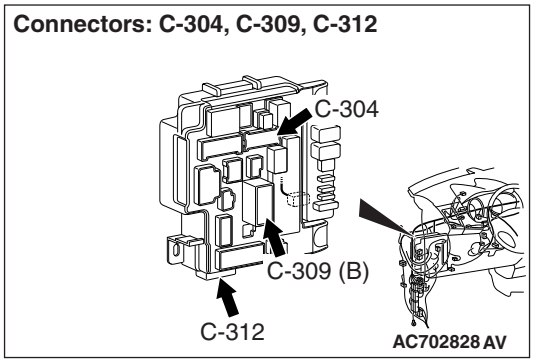




DESCRIPTIONS OF MONITOR METHODS

- Drive the vehicle at 30 km/h (18.6 mph) or more for 10 seconds, and then turn the ignition switch to the "LOCK" (OFF) position. In this sequential operation, no variation has been found in the stoplight switch input signal in two consecutive times.

MONITOR EXECUTION

- Drive with the vehicle speed 30 km/h (18.6 mph) or more for 10 seconds or more.

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

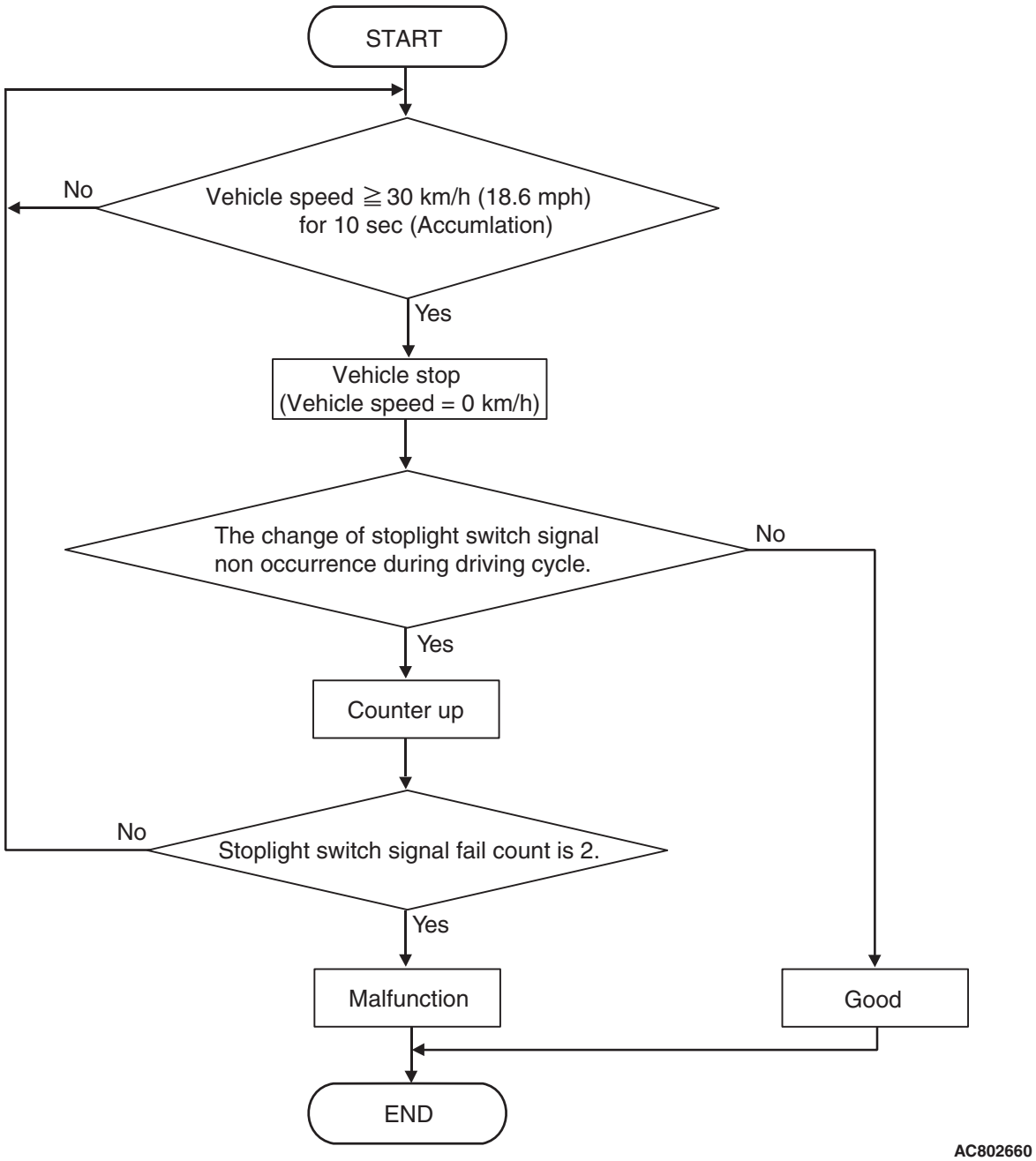
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Vehicle speed over 30 km/h (18.6 mph): 10 seconds or more.

Judgment Criteria

- The change of brake switch signal during driving cycle: no occurrence. (10 seconds)
- Stoplight switch signal fail: 2 count or more. (10 seconds)

OBD-II DRIVE CYCLE PATTERN

Drive with the vehicle speed 30 km/h (18.6 mph) or more for 10 seconds or more, and then stop the vehicle. Again, drive with the vehicle speed 30 km/h (18.6 mph) or more for 10 seconds or more, and then stop the vehicle.

PROBABLE CAUSES

- Malfunction of the CAN bus
- Malfunction of the stoplight switch
- Damaged wiring harness and connectors
- Malfunction of TCM
- Malfunction of ETACS-ECU

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DIAGNOSTIC PROCEDURE

STEP 1. Using scan tool MB991958, diagnose the CAN bus line.

Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the CAN bus lines (Refer to GROUP 54C, Troubleshooting –Diagnostic Trouble Code Chart P.54C-17).

STEP 2. M.U.T.-III data list

Item 60: Brake switch

OK: The service data changes in response to the brake operation.

Q: Is the check result normal?

YES : Intermittent malfunction

NO : Go to Step 3.

STEP 3. Check the following connector:

- C-304 ETACS-ECU connector
- C-312 ETACS-ECU connector
- C-124 Stoplight switch connector

Check the contact status of the terminals.

Q: Is the check result normal?

YES : Go to Step 4.

NO : Repair the defective connector.

STEP 4. Stoplight Switch Check

Refer to GROUP 35A, Brake Pedal P.35A-27.

Q: Is the check result normal?

YES : Go to Step 5.

NO : Replace the stoplight switch.

STEP 5. Check for open circuit in the wiring harness between the stoplight switch connector and the ETACS-ECU connector.

Between C-124 Stoplight switch connector (terminal No.1) and C-304 ETACS-ECU harness-side connector (terminal No.1)

Q: Is the check result normal?

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

STEP 6. Check for open circuit or short to ground in wiring harness between the stoplight switch connector and the ETACS-ECU

Between C-124 Stoplight switch connector (terminal No. 2) and C-312 ETACS-ECU harness-side connector (terminal No. 16)

Q: Is the check result normal?

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

STEP 7. Symptom recheck after erasing diagnostic trouble code

Q: Is the check result normal?

YES : Intermittent malfunction
NO : Replace the ETACS-ECU, and then go to Step 8.

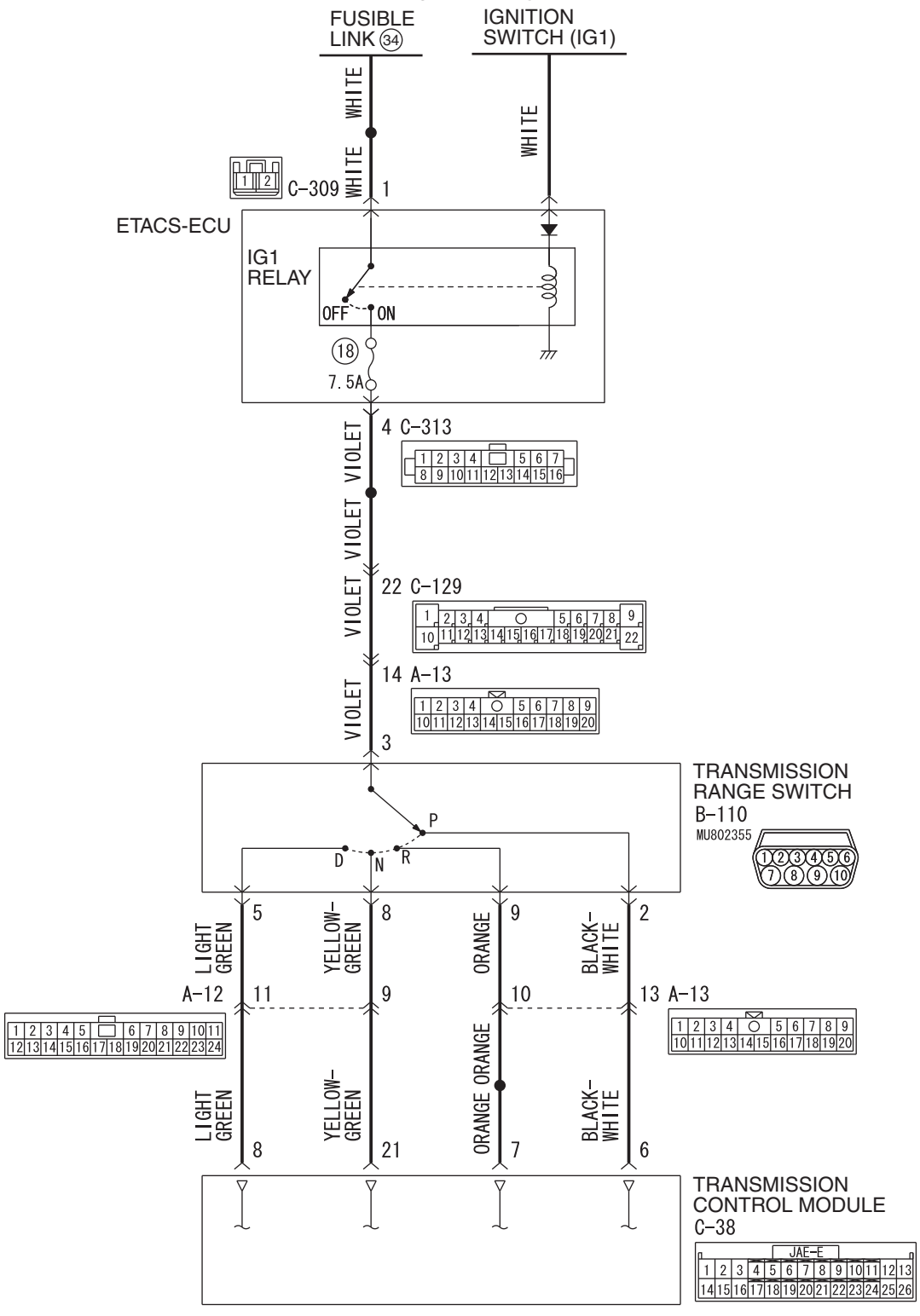
STEP 8. Symptom recheck after erasing diagnostic trouble code

Q: Is the check result normal?

YES : Intermittent malfunction
NO : Replace TCM.

DTC P0705: Transmission Range Switch System

Transmission range switch system circuit



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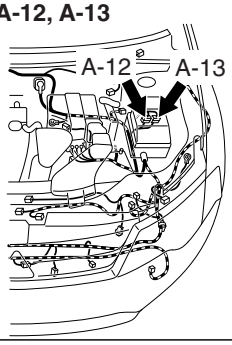
Connectors: A-12, A-13



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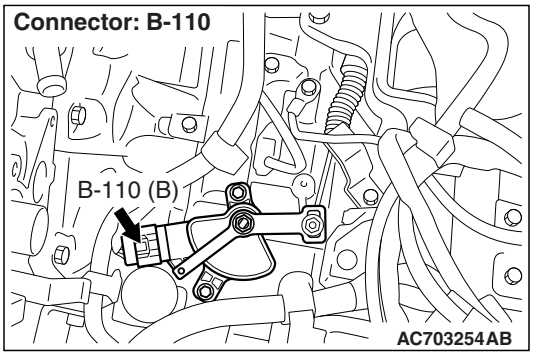
Connector: B-110



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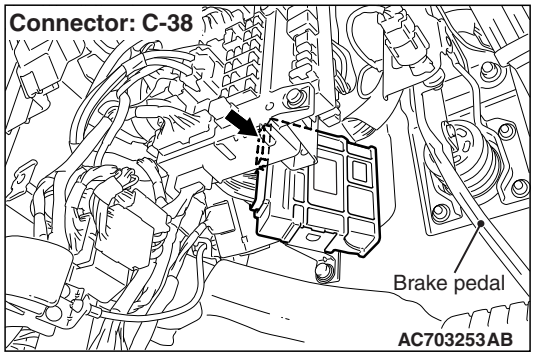
Connector: C-38



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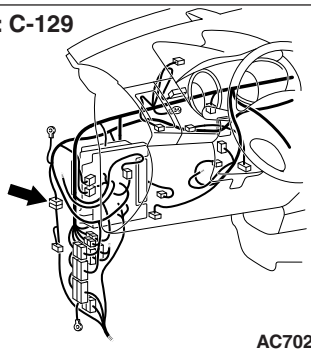
Connector: C-129



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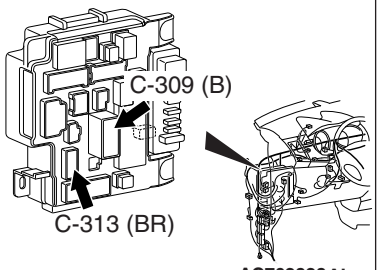
Connectors: C-309, C-313



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DESCRIPTIONS OF MONITOR METHODS

- The TCM receives no input signal from the transmission range switch.
- The TCM receives multiple input signals simultaneously from the transmission range switch.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

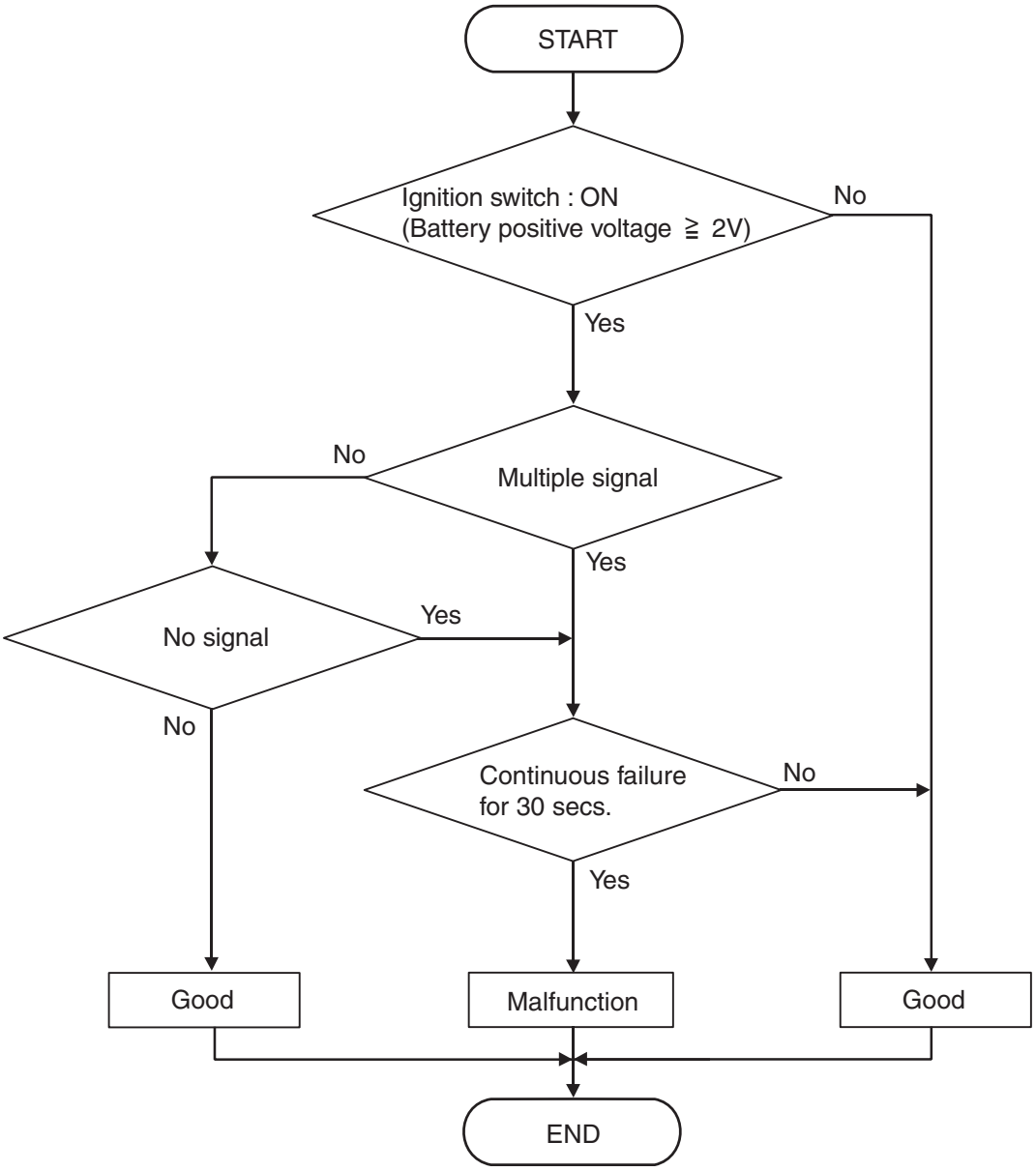
- P0712: Malfunction of the transmission fluid temperature sensor (Short circuit)
- P0731: Malfunction of the 1st gear incorrect ratio
- P0732: Malfunction of the 2nd gear incorrect ratio
- P0733: Malfunction of the 3rd gear incorrect ratio
- P0734: Malfunction of the 4th gear incorrect ratio
- P0735: Malfunction of the 5th gear incorrect ratio
- P0729: Malfunction of the 6th gear incorrect ratio
- P0736: Malfunction of the Reverse gear incorrect ratio
- P0742: Malfunction of the Torque converter clutch system (Stuck on)
- P0846: Malfunction of the 2-6 brake pressure switch system
- P0876: Malfunction of the High clutch pressure switch system
- P0988: Malfunction of the Low-reverse brake pressure switch system

Sensor (The sensor below is determined to be normal)

- Transmission fluid temperature sensor

TSB Revision

LOGIC FLOW CHARTS (Monitor Sequence)



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DTC SET CONDITIONS

Check Conditions

- Voltage of battery: 2 volts or more.

Judgment Criteria

- Transmission range switch: no signal detected. (30 seconds)
- Transmission range switch: multiple signal. (30 seconds)

OBD-II DRIVE CYCLE PATTERN

Start the engine, keep the vehicle stopped in "P," "R," "N," "D" ranges respectively for more than one minute, and turn "LOCK" (OFF) the ignition switch. Then restart the engine, and stop the vehicle in "P," "R," "N," "D" ranges respectively for more than one minute.

TSB Revision

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the transmission range switch system circuit
- Damaged harness or connector
- Improper installation angle of transmission range switch
- Malfunction of the transmission range switch
- Malfunction of the TCM

DIAGNOSIS

STEP 1. Check the TCM terminal voltage.

[C-38 TCM connector (vehicle side, connected)]

Turn ON the ignition switch, and check by shifting to each range.

- "P" range: Terminal No. 6 to body ground →Battery positive voltage
- "R" range: Terminal No. 7 to body ground →Battery positive voltage
- "N" range: Terminal No. 21 to body ground →Battery positive voltage
- "D" range: Terminal No. 8 to body ground →Battery positive voltage

Q: Is the check result normal?

YES : Go to Step 6.
NO : Go to Step 2.

STEP 2. Check the path between the ignition switch and the transmission range switch.

Turn OFF the ignition switch, and check the following items.

- Open/short circuit of wiring harness between the ignition switch and B-110 transmission range switch connector terminal No. 3.
- Blown fuse

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair or replace the failure section.

STEP 3. Check the wiring harness between the transmission range switch and TCM.
Check for continuity between B-110 transmission range switch terminals and C-38 TCM terminals.

NOTE: Prior to the wiring harness inspection, check the intermediate connectors A-12 and A-13, and repair that if necessary.

- Between B-110 terminal No. 2 and C-38 terminal No. 6: At the "P" range, continuity exists.
- Between B-110 terminal No. 9 and C-38 terminal No. 7: At the "R" range, continuity exists.
- Between B-110 terminal No. 8 and C-38 terminal No. 21: At the "N" range, continuity exists.
- Between B-110 terminal No. 5 and C-38 terminal No. 8: At the "D" range, continuity exists.

When the continuity check result is OK, check that the wiring harness is not shorted to the body and other wiring harness.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair or replace the failure section.

STEP 4. Check the transmission range switch as a single unit.
Refer to P.23C-269.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Go to Step 7.

STEP 5. Check the TCM connector pin terminal and the connection status.

Q: Is there a failure point?

YES : Repair or replace the failure section.
NO : Replace the TCM.

STEP 6. Erase the DTC code, and drive the vehicle for a while.
Check that the normal code is displayed.

Q: Is the check result normal?

YES : The procedure is complete.
NO : Replace the TCM.

STEP 7. Adjust the transmission range switch.
Refer to P.23C-269.
After adjustment, check the continuity between the terminals again.

Q: Is the check result normal?

YES : Go to Step 8.
NO : Replace the transmission range switch.

STEP 8. Erase the DTC code, and drive the vehicle for a while.

Check that the normal code is displayed.

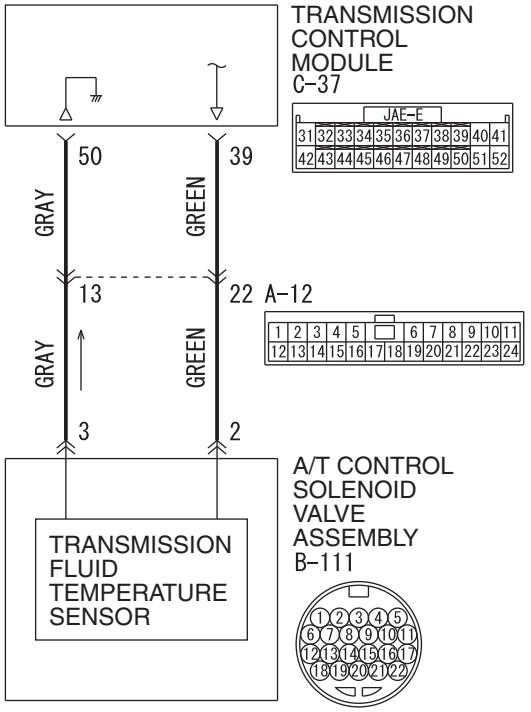
Q: Is the check result normal?

YES : The procedure is complete.

NO : Return to START.

DTC P0712: Transmission Fluid Temperature Sensor System (Short Circuit)

Transmission fluid temperature sensor circuit



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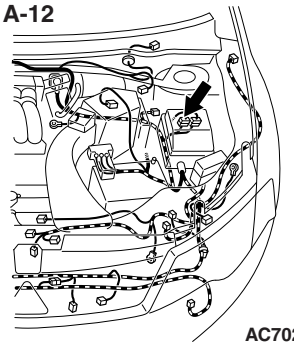
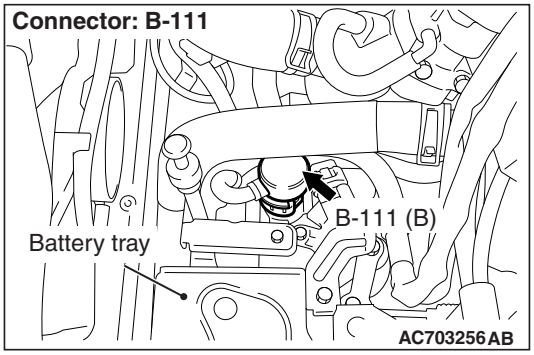
Connector: A-12



AC702932AH

Connector: B-111



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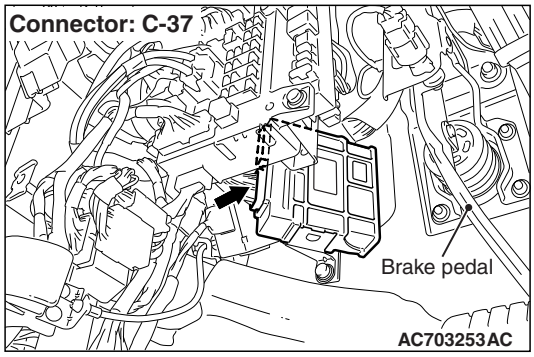


DESCRIPTIONS OF MONITOR METHODS

- When the status of transmission fluid temperature 180° C (356° F) or more is detected for 10 minutes continuously with the conditions as follows; Vehicle speed: 10 km/h (6.2 mph) or more, transmission range switch position: D, accelerator pedal position: 12.5% or more, engine speed: more than 500 r/min

MONITOR EXECUTION

- transmission range:D
- Vehicle speed: more than 10 km/h (6.2 mph)
- Throttle valve opening: more than 1/8
- Engine speed: more than 305 r/min

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

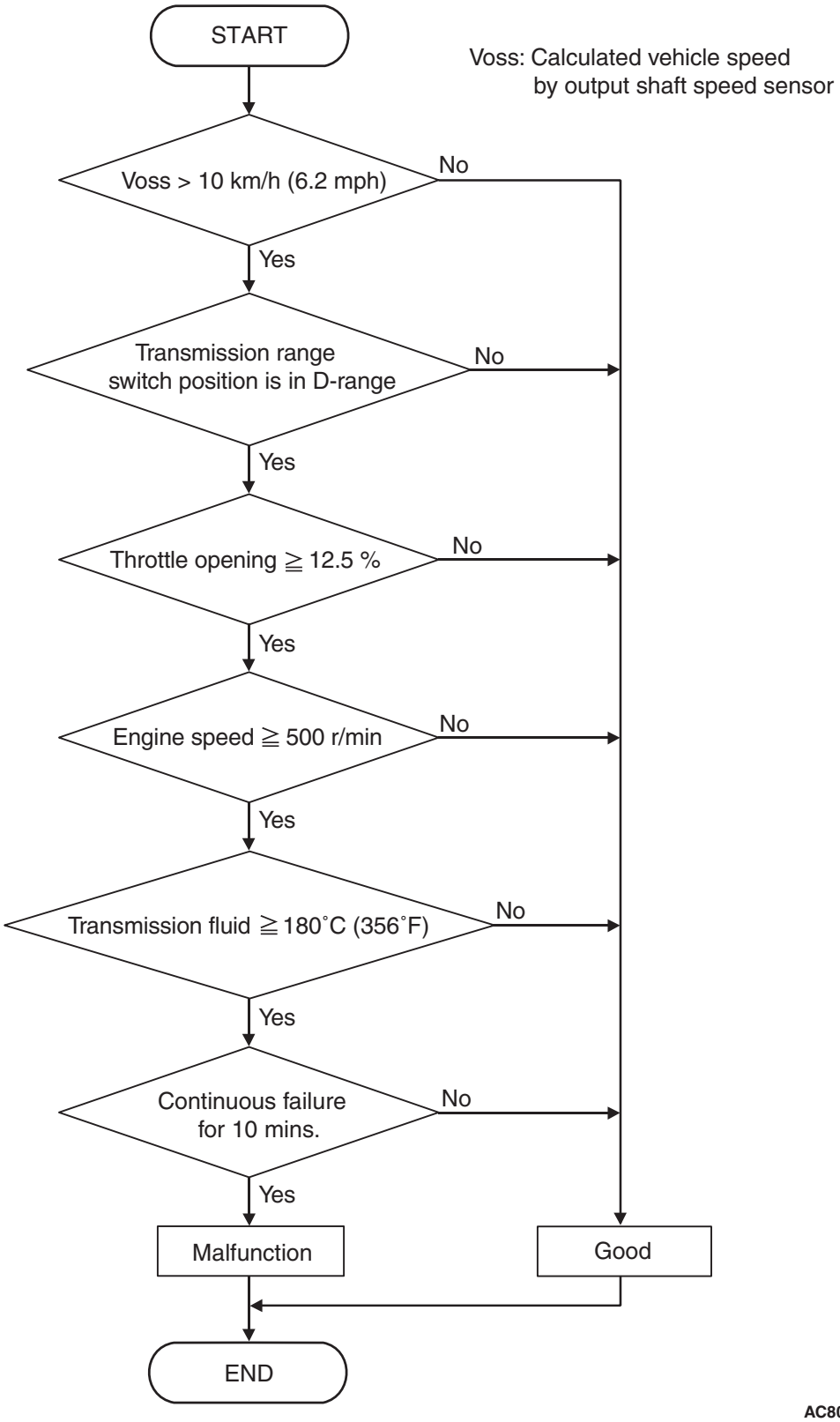
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Vehicle speed: 10 km/h (6.2 mph) or more.
- Transmission range switch position: D.
- Throttle opening: 12.5 % or more.
- Engine speed: more than 500 r/min.

TSB Revision

Judgment Criteria

- Value of temperature of transmission fluid: 180° C (356° F) or more. (10 minutes)

OBD-II DRIVE CYCLE PATTERN

With the vehicle speed 10 km/h (6.2 mph) or more and the throttle valve opening 12.5% or more, drive for 10 minutes or more.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the transmission fluid temperature sensor system (Short circuit) circuit
- Malfunction of the transmission fluid temperature sensor
- Malfunction of the TCM

DIAGNOSIS

STEP 1. Check the TCM terminal voltage.

[C-38 TCM connector (vehicle side, connected)]
Turn ON the ignition switch, and check the voltage between terminal No. 39 and No. 50.

- Transmission fluid 20° C (68° F): Approx. 2.52 V
- Transmission fluid 80° C (176° F): Approx. 0.69 V

Q: Is the check result normal?

YES : Go to Step 6.
NO : Go to Step 2.

STEP 2. Check the transmission fluid temperature sensor.

Refer to P.23C-275.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Replace the valve body assembly.

STEP 3. Check the wiring harness between the transmission fluid temperature sensor and TCM.

Check that the wiring harness between the A/T control solenoid valve assembly connector and TCM is not shorted to the body and other wiring harness.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair or replace the failure section.

STEP 4. Check the TCM power supply and ground.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair or replace the failure section.

STEP 5. Check the TCM connector pin terminal and the connection status.

Q: Is there a failure point?

YES : Repair or replace the failure section.
NO : Replace the TCM.

STEP 6. Erase the DTC code, and drive the vehicle for a while.
Check that the normal code is displayed.

Q: Is the check result normal?

YES : The procedure is complete.
NO : Replace the TCM.

DTC P0713: Transmission Fluid Temperature Sensor System (Open Circuit)

DESCRIPTIONS OF MONITOR METHODS

- With the vehicle speed 10 km/h (6.2 mph) or more, when the status of transmission fluid temperature -40° C (-104° F) or less is detected

MONITOR EXECUTION

- Vehicle speed: more than 10 km/h (6.2 mph)

TRANSMISSION FLUID TEMPERATURE SENSOR SYSTEM CIRCUIT

Refer to P.23C-39.

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

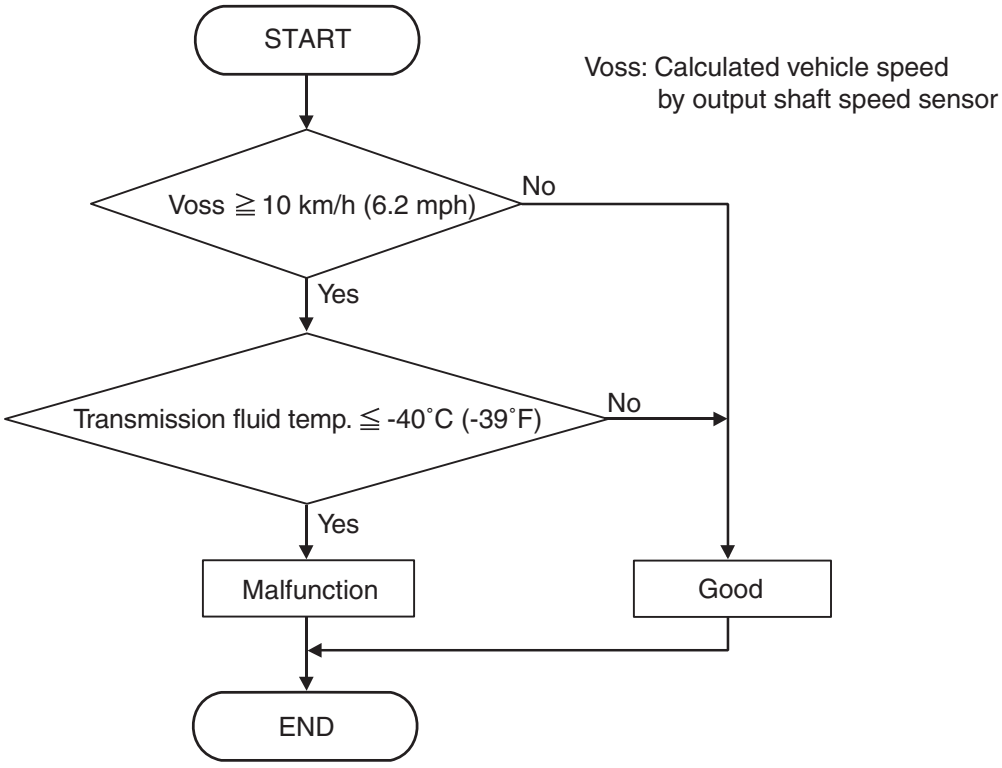
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0846: Malfunction of the 2-6 brake pressure switch system
- P0876: Malfunction of the High clutch pressure switch system
- P0988: Malfunction of the Low-reverse brake pressure switch system

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Vehicle speed: 10 km/h (6.2 mph) or more.

Judgment Criteria

- Value of temperature of transmission fluid: -40° C (-104° F) or less. (At once)

OBD-II DRIVE CYCLE PATTERN

Drive with the vehicle speed 10 km/h (6.2 mph) or more.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the transmission fluid temperature sensor system (open circuit) circuit
- Damaged harness or connector
- Malfunction of the transmission fluid temperature sensor system (open circuit)
- Malfunction of the TCM

DIAGNOSIS

STEP 1. Check the TCM terminal voltage.

[C-37 connector (vehicle side, connected)]

Turn ON the ignition switch, and check the voltage between terminal No. 39 and No. 50.

- Transmission fluid 20° C (68° F): Approx. 2.52 V
- Transmission fluid 80° C (176° F): Approx. 0.69 V

Q: Is the check result normal?

YES : Go to Step 6.
NO : Go to Step 2.

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STEP 2. Check the transmission fluid temperature sensor as a single unit.
Refer to P.23C-275.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Replace the valve body assembly.

STEP 3. Check the wiring harness between the transmission fluid temperature sensor and TCM.
Check for continuity between B-111 A/T control solenoid valve assembly connector terminals and C-37 TCM terminals.

NOTE: Prior to the wiring harness inspection, check the intermediate connectors A-12 and repair that if necessary.

- Between B-111 terminal No. 2 and C-37 terminal No. 39: Continuity exists.
- Between B-111 terminal No. 3 and C-37 terminal No. 50: Continuity exists.

When the continuity check result is OK, check that the wiring harness is not shorted to the body and other wiring harness.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair or replace the failure section.

STEP 4. Check the TCM power supply and ground.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair or replace the failure section.

STEP 5. Check the TCM connector pin terminal and the connection status.

Q: Is there a failure point?

YES : Repair or replace the failure section.
NO : Replace the TCM.

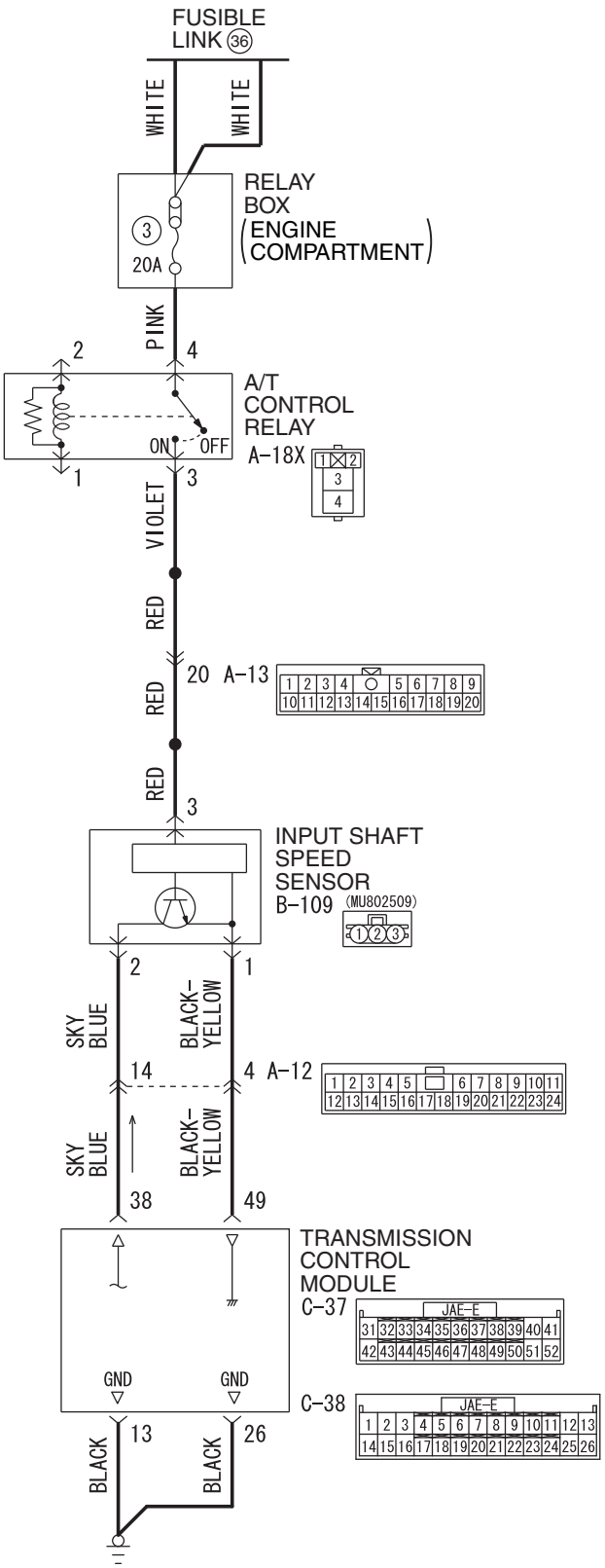
STEP 6. Erase the DTC code, and drive the vehicle for a while.
Check that the normal code is displayed.

Q: Is the check result normal?

YES : The procedure is complete.
NO : Return to START.

DTC P0715: Input Shaft Speed Sensor System

Input shaft speed sensor system circuit



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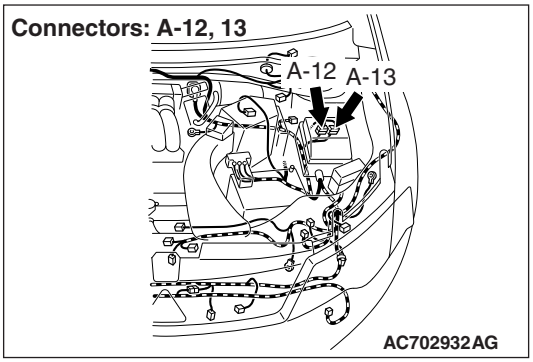
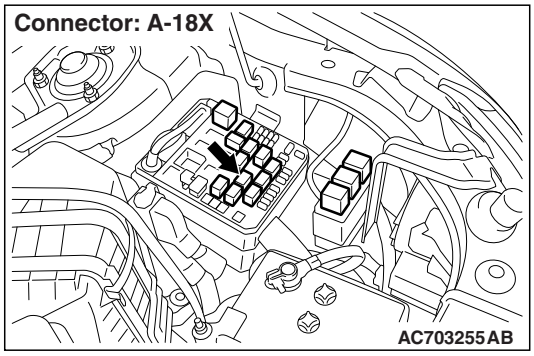
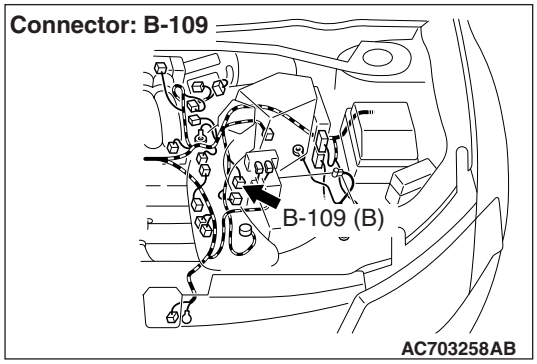
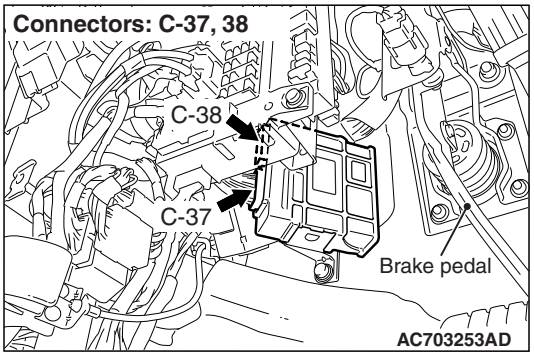








DESCRIPTIONS OF MONITOR METHODS

- With the idle switch OFF, vehicle speed 40 km/h (24.9 mph) or more, and engine speed 1,600 r/min or more, when the status of input shaft speed 600 r/min or less is detected for 5 seconds continuously

MONITOR EXECUTION

- Vehicle speed: 40 km (24.9 mph) or more
- Engine speed: 1,600 r/min or more

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

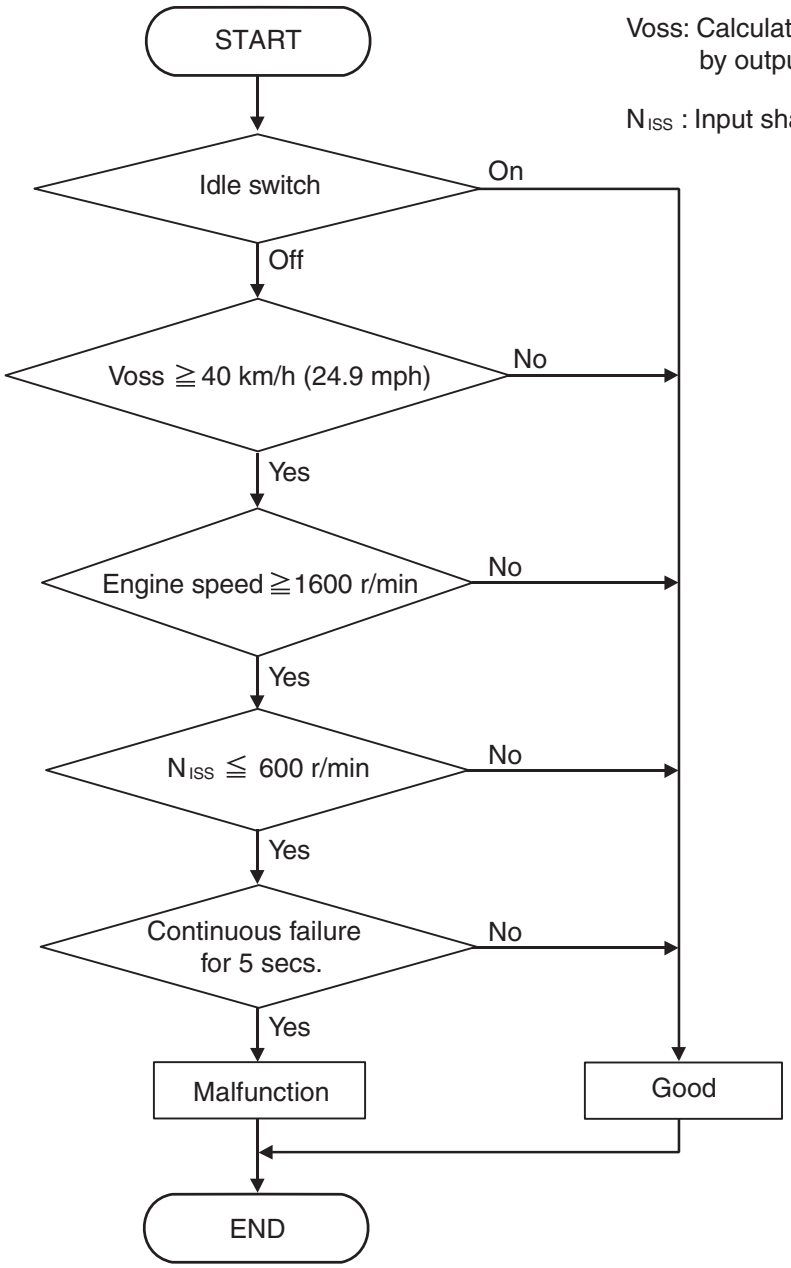
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0731: Malfunction of the 1st gear incorrect ratio
- P0732: Malfunction of the 2nd gear incorrect ratio
- P0733: Malfunction of the 3rd gear incorrect ratio
- P0734: Malfunction of the 4th gear incorrect ratio
- P0735: Malfunction of the 5th gear incorrect ratio
- P0729: Malfunction of the 6th gear incorrect ratio
- P0736: Malfunction of the Reverse gear incorrect ratio
- P0741: Malfunction of the Malfunction of the Torque converter clutch system (Stuck off)
- P0742: Malfunction of the Torque converter clutch system (Stuck on)
- P0846: Malfunction of the 2-6 brake pressure switch system
- P0876: Malfunction of the High clutch pressure switch system
- P0988: Malfunction of the Low-reverse brake pressure switch system

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Idle switch: OFF.
- Vehicle speed: 40 km/h (24.9 mph) or more.
- Engine speed: 1,600 r/min or more.

Judgment Criteria

- Input shaft speed sensor signal: 600 r/min. or less (5 seconds)

OBD-II DRIVE CYCLE PATTERN

Drive with the vehicle speed 40 km/h (24.9 mph) or more, and engine speed 1,600 r/min or more.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the Input shaft speed sensor system circuit
- Damaged harness or connector
- Malfunction of the Input shaft speed sensor
- Malfunction of the TCM
- Malfunction of the input shaft speed sensor rotor (A/T assembly)

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DIAGNOSIS

STEP 1. Check the TCM terminal voltage and frequency.
[C-37 TCM connector (vehicle side, connected)]
Check that the voltage between C-37 terminal No. 49 and C-38 terminal No. 13 or C-38 terminal No. 26 is 0 V, and then check the frequency of C-37 terminal No. 38.
- At D range, and the engine speed is 700 r/min: Approx. 353 Hz

Q: Is the check result normal?
YES : Go to Step 8.
NO : Go to Step 2.

STEP 2. Check the power supply and sensor ground.
[B-109 input shaft speed sensor connector (vehicle side, disconnected)]
- With the ignition switch ON: Terminal No. 3 to terminal No. 1 →Battery positive voltage

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

STEP 3. Check the wiring harness between the input shaft speed sensor and TCM.
Check for continuity between B-109 input shaft speed sensor connector terminals and C-37 TCM terminals.
NOTE: Prior to the wiring harness inspection, check the intermediate connectors A-12 and repair that if necessary.
- Between B-109 terminal No. 2 and C-37 terminal No. 38: Continuity exists.

When the continuity check result is OK, check that the wiring harness is not shorted to the body and other wiring harness.

Q: Is the check result normal?
YES : Replace the input shaft speed sensor with the one of the same transaxle of the same model. Then go to Step 5.
NO : Repair or replace the failure section, and then go to Step 8.

STEP 4. Check the path between the fusible link No.36 and the input shaft speed sensor.
- Check the wiring harness for an open/short circuit between the ignition switch and B-109 input shaft speed sensor connector terminal No. 3.
- Check for a blown fuse.

Q: Is the check result normal?
YES : Go to Step 6.
NO : Repair or replace the failure section.

STEP 5. After replacing the input shaft speed sensor, drive the vehicle for a while, and then check the DTC again.

Q: Is the check result normal?

YES : Replace the input shaft speed sensor.
NO : Replace the TCM.

STEP 6. Check the wiring harness between the input shaft speed sensor and TCM.

Check for continuity between B-109 input shaft speed sensor terminals and C-37 TCM terminals.

NOTE: Prior to the wiring harness inspection, check the intermediate connectors A-12 and repair that if necessary.

- Between B-109 terminal No. 1 and C-37 terminal No. 49: Continuity exists.

When the continuity check result is OK, check that the wiring harness is not shorted to the body and other wiring harness.

Q: Is the check result normal?

YES : Go to Step 7.
NO : Repair or replace the failure section.

STEP 7. Check the TCM connector pin terminal and the connection status.

Q: Is there a failure point?

YES : Repair or replace the failure section.
NO : Replace the TCM. Then go to Step 9.

STEP 8. Drive the vehicle for a while.

Check that the normal code is displayed.

Q: Is the check result normal?

YES : The procedure is complete.
NO : Replace the TCM.

STEP 9. diagnostic trouble code recheck.

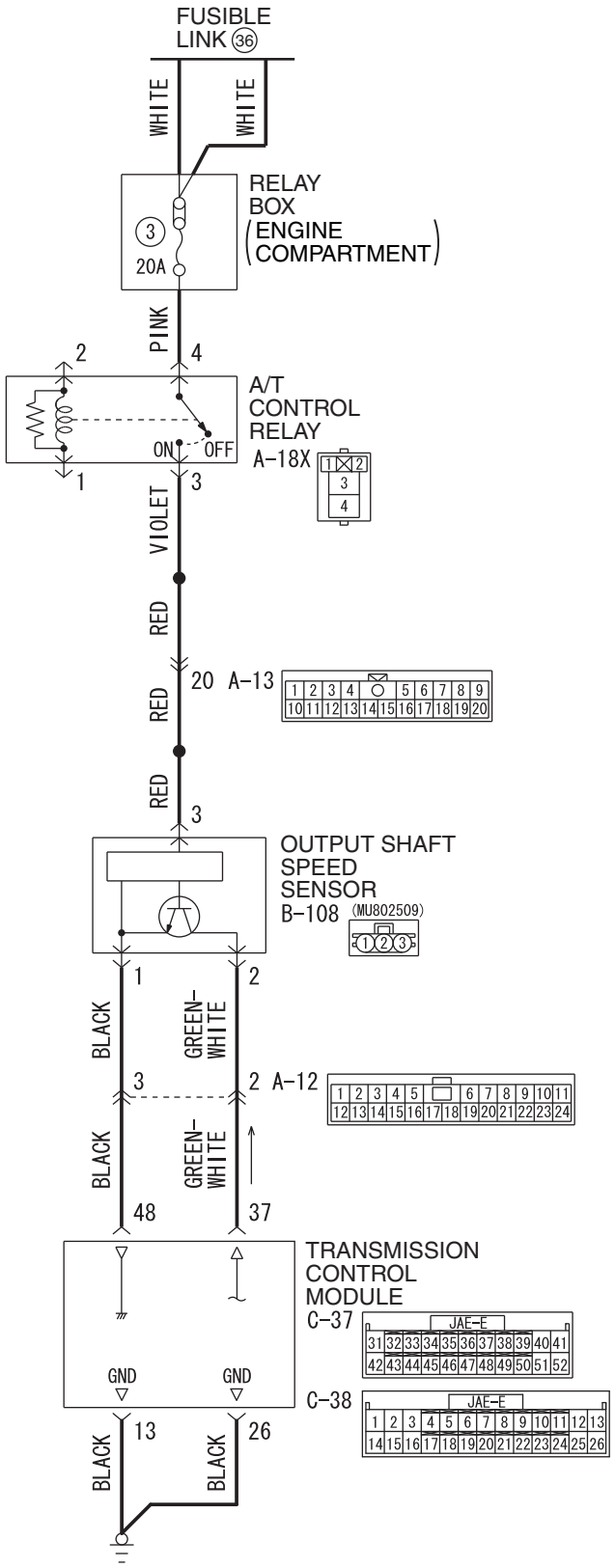
1. Erase the diagnostic trouble code.
2. Drive the vehicle at 40 km/h (24 mph) or more (engine speed at 1,600 r/min or more).
3. Check if the diagnostic trouble code is set.

Q: Is the diagnostic trouble code set?

YES : Remove the A/T. Carry out the internal check and repair the defective part (the input shaft speed sensor rotor may be defective).
NO : Replace the TCM.

Code No. P0720: Output Shaft Speed Sensor System

Output shaft speed sensor system circuit



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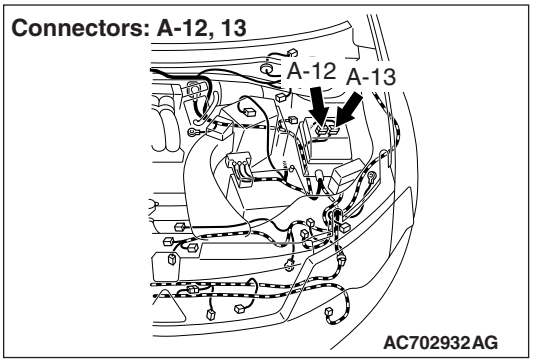
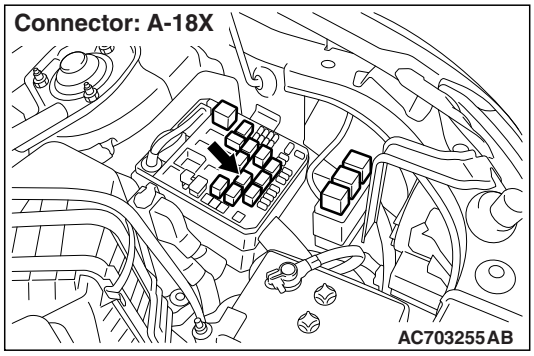
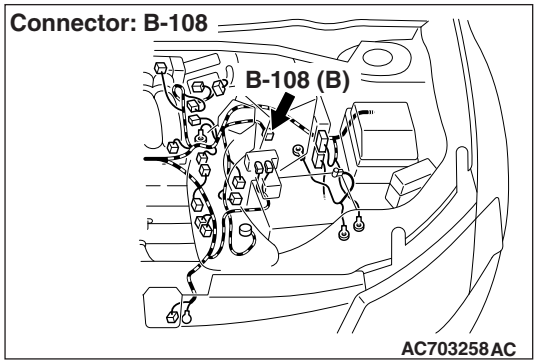
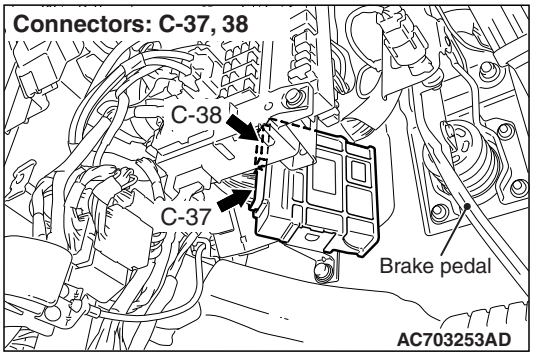








DESCRIPTIONS OF MONITOR METHODS

- With the vehicle speed more than 20 km/h (12.4 mph), when the vehicle speed is decelerated by 20 km/h (12.4 mph) or more in 0.05 seconds

MONITOR EXECUTION

- Vehicle speed 20 km/h (12.4 mph) or more.

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

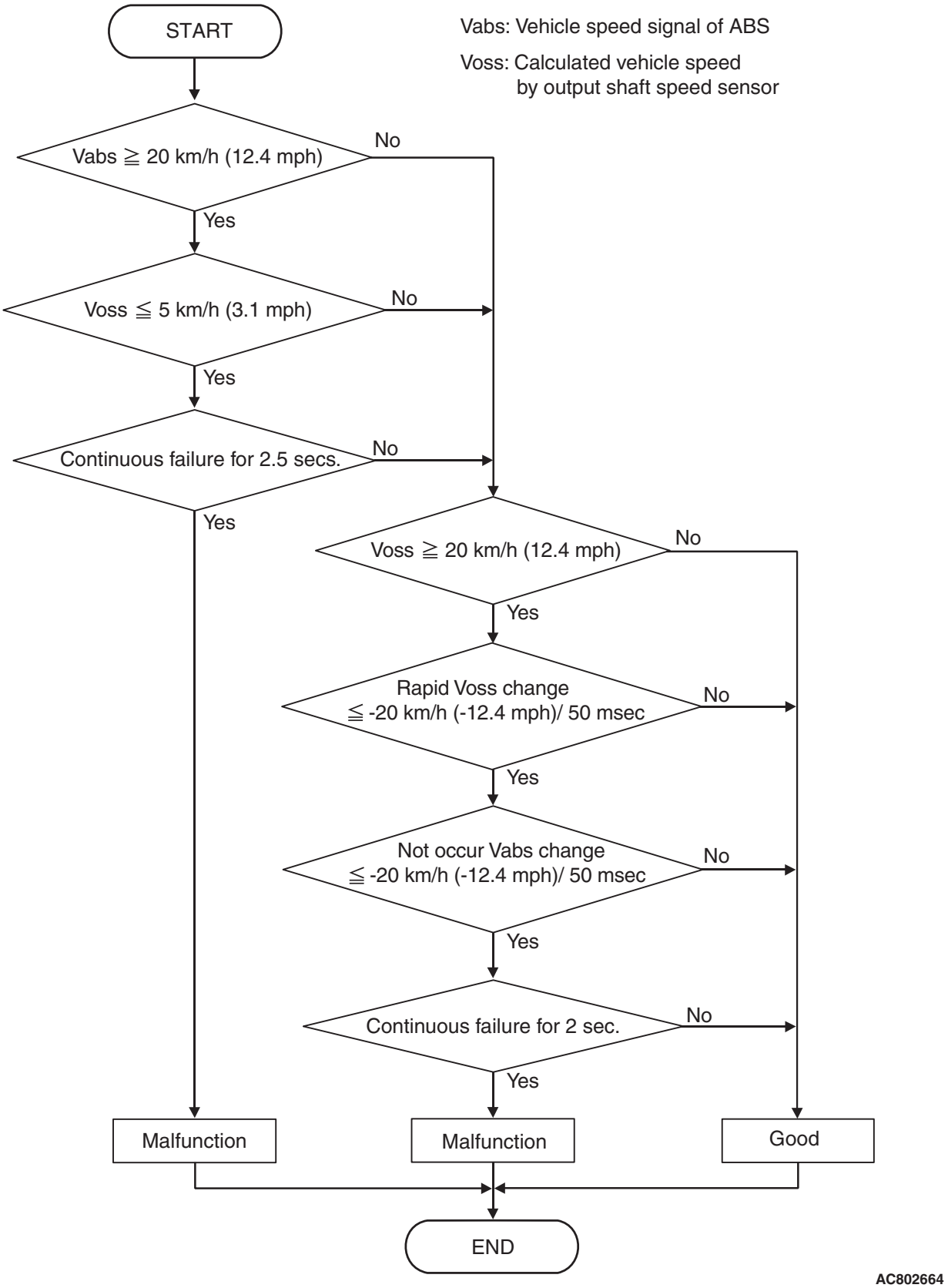
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0712: Malfunction of the transmission fluid temperature sensor (Short circuit)
- P0713: Malfunction of the transmission fluid temperature sensor (Open circuit)
- P0731: Malfunction of the 1st gear incorrect ratio
- P0732: Malfunction of the 2nd gear incorrect ratio
- P0733: Malfunction of the 3rd gear incorrect ratio
- P0734: Malfunction of the 4th gear incorrect ratio
- P0735: Malfunction of the 5th gear incorrect ratio
- P0729: Malfunction of the 6th gear incorrect ratio
- P0736: Malfunction of the Reverse gear incorrect ratio
- P0742: Malfunction of the Torque converter clutch system (Stuck on)
- P0846: Malfunction of the 2-6 brake pressure switch system
- P0876: Malfunction of the High clutch pressure switch system
- P0988: Malfunction of the Low-reverse brake pressure switch system
- P0893: Malfunction of the Interlock detection
- P1705: Malfunction of the Throttle position sensor information (engine)
- P1773: Malfunction of the ABS information (ASC)

Sensor (The sensor below is determined to be normal)

- Transmission fluid temperature sensor

LOGIC FLOW CHARTS (Monitor Sequence)



TSB Revision

DTC SET CONDITIONS

Check Conditions
- Vehicle speed: 20 km/h (12.4 mph) or more.
- Vehicle speed signal from ABS: more than -20 km/h (-12.4 mph)/0.05 seconds.

Judgment Criteria
- Rapid vehicle speed change: -20 km/h (-12.4 mph)/0.05 second or less. (2 seconds)

Check Conditions
- Vehicle speed signal from ABS: 20 km/h (12.4 mph) or more.

Judgment Criteria
- Vehicle speed: 5 km/h (3.1 mph) or less. (2.5 seconds)

OBD-II DRIVE CYCLE PATTERN

Drive with the vehicle speed 20 km/h (12.4 mph).

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the output shaft speed sensor system circuit
- Damaged harness or connector
- Malfunction of the output shaft speed sensor
- Malfunction of the TCM
- Malfunction of the output shaft speed sensor rotor (A/T assembly)

DIAGNOSIS

STEP 1. Check the TCM terminal voltage and frequency.

[C-37 TCM connector (vehicle side, connected)]

Check that the voltage between C-37 terminal No. 48 and C-38 terminal No. 13 or C-38 terminal No. 26 is 0 V, and then check the frequency of C-37 terminal No. 37.
- At D range, vehicle speed is 30 km/h (19 mph): Approx. 588 Hz

Q: Is the check result normal?

YES : Go to Step 6.
NO : Go to Step 2.

STEP 2. Check the power supply and sensor ground.

[B-108 output shaft speed sensor connector (vehicle side, disconnected)]
- With the ignition switch ON: Terminal No. 1 to No. 3 →Battery positive voltage

Q: Is the check result normal?

YES : Go to Step 3.
NO : Go to Step 4.

STEP 3. Check the wiring harness between the output shaft speed sensor and TCM.

Check for continuity between B-108 output shaft speed sensor terminals and C-37 TCM terminals.

NOTE: Prior to the wiring harness inspection, check the intermediate connectors A-12 and repair that if necessary.

- Between B-108 terminal No. 2 and C-37 terminal No. 37: Continuity exists.

When the continuity check result is OK, check that the wiring harness is not shorted to the body and other wiring harness.

Q: Is the check result normal?

YES : Replace the output shaft speed sensor with the one of the same transaxle of the same model. Then go to Step 7.

NO : Repair or replace the failure section, and then go to Step 6.

STEP 4. Check the path between the ignition switch and the output shaft speed sensor.

- Check the wiring harness for an open/short circuit between the ignition switch and B-108 output shaft speed sensor connector terminal No. 1.
- Check for a blown fuse.

Q: Is the check result normal?

YES : Go to Step 5.

NO : Repair or replace the failure section.

STEP 5. Check the wiring harness between the output shaft speed sensor and TCM.

Check for continuity between B-108 output shaft speed sensor terminals and C-37 TCM terminals.

NOTE: Prior to the wiring harness inspection, check the intermediate connectors A-12 and repair that if necessary.

- Between B-108 terminal No. 1 and C-37 terminal No. 48: Continuity exists.

When the continuity check result is OK, check that the wiring harness is not shorted to the body and other wiring harness.

Q: Is the check result normal?

YES : Go to Step 8.

NO : Repair or replace the failure section.

STEP 6. Drive the vehicle for a while.

Check that the normal code is displayed.

Q: Is the check result normal?

YES : The procedure is complete.

NO : Replace the TCM.

STEP 7. After replacing the output shaft speed sensor, drive the vehicle for a while, and then check the DTC again.

Q: Is the check result normal?

YES : Replace the output shaft speed sensor.
NO : Replace the TCM. Then go to Step 9.

STEP 8. Check the TCM connector pin terminal and the connection status.

Q: Is there a failure point?

YES : Repair or replace the failure section.
NO : Replace the TCM.

STEP 9. diagnostic trouble code recheck.

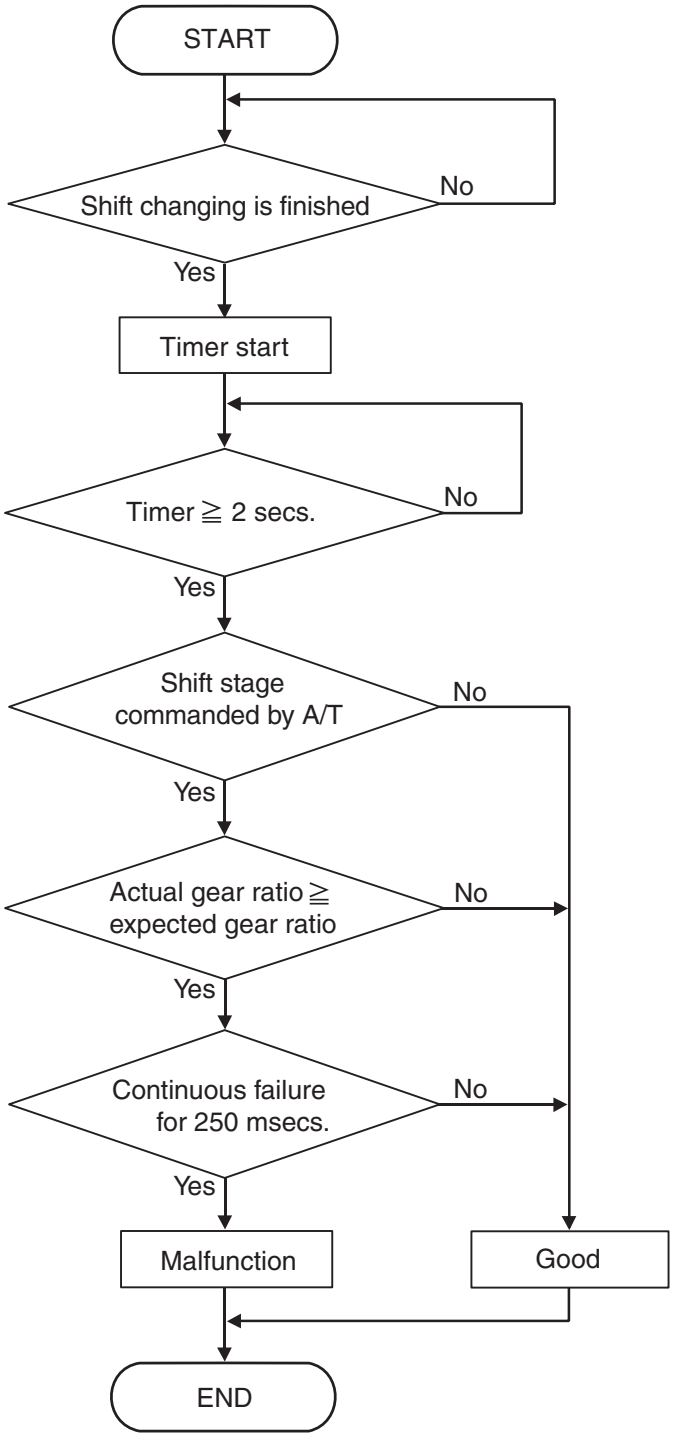
1. Erase the diagnostic trouble code.
2. Drive the vehicle at 20 km/h (12 mph) or more.
3. Check if the diagnostic trouble code is set.

Q: Is the diagnostic trouble code set?

YES : Remove the A/T. Carry out the internal check and repair the defective part (the output shaft speed sensor rotor may be defective).
NO : Replace the TCM.

DTC P0729, P0732,P0733, P0734, P0735: 6th, 2nd, 3rd, 4th, 5th Gear Ratio

LOGIC FLOW CHARTS (Monitor Sequence)



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DESCRIPTIONS OF MONITOR METHODS <DTC P0729>

- After 6th gear is achieved for 2 seconds, the engine runup[*1] is detected for 250 milliseconds.

[*1]: The actual gear ratio deviates from the target gear ratio to the high engine (turbine) speed.

MONITOR EXECUTION <DTC P0729>

- 6th gear driving

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MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR) <DTC P0729>

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)
- P0846: Malfunction of the 2-6 brake pressure switch system
- P0876: Malfunction of the High clutch pressure switch system
- P0988: Malfunction of the Low-reverse brake pressure switch system

Sensor (The sensor below is determined to be normal)
- Input shaft speed sensor
- Output shaft speed sensor
- Transmission range switch
- Lock-up and low-reverse brake linear solenoid
- Low clutch linear solenoid
- 2-6 brake linear solenoid
- 3-5 reverse clutch linear solenoid
- High clutch linear solenoid
- Low clutch shift solenoid
- Low-reverse brake shift solenoid
- Engine revolution signal
- CAN communication

DESCRIPTIONS OF MONITOR METHODS <DTC P0732>

- After 2nd gear is achieved for 2 seconds, the engine runup[*1] is detected for 250 milliseconds.

[*1]: The actual gear ratio deviates from the target gear ratio to the high engine (turbine) speed.

MONITOR EXECUTION <DTC P0732>

- 2nd gear driving

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR) <DTC P0732>

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)
- P0846: Malfunction of the 2-6 brake pressure switch system
- P0876: Malfunction of the High clutch pressure switch system
- P0988: Malfunction of the Low-reverse brake pressure switch system

Sensor (The sensor below is determined to be normal)
- Input shaft speed sensor

DTC SET CONDITIONS <DTC P0729>

Check Conditions
- Shift stage: 6th gear.
- Time after shift changing finish: 2 seconds or more.

Judgement Criteria
- Gear ratio: 0.753 or more. (0.25 second)

OBD-II DRIVE CYCLE PATTERN <DTC P0729>

6th gear driving for 5 seconds or more

- Output shaft speed sensor
- Transmission range switch
- Lock-up and low-reverse brake linear solenoid
- Low clutch linear solenoid
- 2-6 brake linear solenoid
- 3-5 reverse clutch linear solenoid
- High clutch linear solenoid
- Low clutch shift solenoid
- Low-reverse brake shift solenoid
- Engine revolution signal
- CAN communication

DTC SET CONDITIONS <DTC P0732>

Check Conditions
- Shift stage: 2nd gear.
- Time after shift changing finish: 2 seconds or more.

Judgement Criteria
- Gear ratio: 3.225 or more. (0.25 second)

OBD-II DRIVE CYCLE PATTERN <DTC P0732>

2nd gear driving for 5 seconds or more

DESCRIPTIONS OF MONITOR METHODS <DTC P0733>

- After 3rd gear is achieved for 2 seconds, the engine runup[*1] is detected for 250 milliseconds.
  [*1]: The actual gear ratio deviates from the target gear ratio to the high engine (turbine) speed.

MONITOR EXECUTION <DTC P0733>

- 3rd gear driving

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR) <DTC P0733>

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0846: Malfunction of the 2-6 brake pressure switch system
- P0876: Malfunction of the High clutch pressure switch system
- P0988: Malfunction of the Low-reverse brake pressure switch system

Sensor (The sensor below is determined to be normal)

- Input shaft speed sensor
- Output shaft speed sensor
- Transmission range switch
- Lock-up and low-reverse brake linear solenoid
- Low clutch linear solenoid
- 2-6 brake linear solenoid
- 3-5 reverse clutch linear solenoid
- High clutch linear solenoid
- Low clutch shift solenoid
- Low-reverse brake shift solenoid
- Engine revolution signal
- CAN communication

DTC SET CONDITIONS <DTC P0733>

Check Conditions

- Shift stage: 3rd gear.
- Time after shift changing finish: 2 seconds or more.

Judgement Criteria

- Gear ratio: 1.947 or more. (0.25 second)

OBD-II DRIVE CYCLE PATTERN <DTC P0733>

3rd gear driving for 5 seconds or more

DESCRIPTIONS OF MONITOR METHODS <DTC P0734>

- After 4th gear is achieved for 2 seconds, the engine runup[*1] is detected for 250 milliseconds.
  [*1]: The actual gear ratio deviates from the target gear ratio to the high engine (turbine) speed.

MONITOR EXECUTION <DTC P0734>

- 4th gear driving

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR) <DTC P0734>

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0846: Malfunction of the 2-6 brake pressure switch system
- P0876: Malfunction of the High clutch pressure switch system
- P0988: Malfunction of the Low-reverse brake pressure switch system

Sensor (The sensor below is determined to be normal)

- Input shaft speed sensor
- Output shaft speed sensor
- Transmission range switch
- Lock-up and low-reverse brake linear solenoid
- Low clutch linear solenoid
- 2-6 brake linear solenoid
- 3-5 reverse clutch linear solenoid
- High clutch linear solenoid
- Low clutch shift solenoid
- Low-reverse brake shift solenoid
- Engine revolution signal
- CAN communication

DTC SET CONDITIONS <DTC P0734>

Check Conditions

- Shift stage: 4th gear.
- Time after shift changing finish: 2 seconds or more.

Judgement Criteria

- Gear ratio: 1.340 or more. (0.25 second)

OBD-II DRIVE CYCLE PATTERN <DTC P0734>

4th gear driving for 5 seconds or more

DESCRIPTIONS OF MONITOR METHODS <DTC P0735>

- After 5th gear is achieved for 2 seconds, the engine runup[*1] is detected for 250 milliseconds.

[*1]: The actual gear ratio deviates from the target gear ratio to the high engine (turbine) speed.

MONITOR EXECUTION <DTC P0735>

- 5th gear driving

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR) <DTC P0735>

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0846: Malfunction of the 2-6 brake pressure switch system
- P0876: Malfunction of the High clutch pressure switch system
- P0988: Malfunction of the Low-reverse brake pressure switch system

Sensor (The sensor below is determined to be normal)

- Input shaft speed sensor
- Output shaft speed sensor
- Transmission range switch
- Lock-up and low-reverse brake linear solenoid
- Low clutch linear solenoid
- 2-6 brake linear solenoid
- 3-5 reverse clutch linear solenoid
- High clutch linear solenoid
- Low clutch shift solenoid
- Low-reverse brake shift solenoid
- Engine revolution signal
- CAN communication

DTC SET CONDITIONS <DTC P0735>

Check Conditions

- Shift stage: 5th gear.
- Time after shift changing finish: 2 seconds or more.

Judgement Criteria

- Gear ratio: 0.984 or more. (0.25 second)

OBD-II DRIVE CYCLE PATTERN <DTC P0735>

5th gear driving for 5 seconds or more

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Transaxle assembly powertrain parts failure
- Malfunction of the P0715: input shaft speed sensor system
- Malfunction of the P0720: output shaft speed sensor system
- Malfunction of the P0748: line pressure linear solenoid valve system circuit
- Malfunction of the P0753: low clutch linear solenoid valve system circuit
- Malfunction of the P0758: 2-6 brake linear solenoid valve system circuit
- Malfunction of the P0763: 3-5 reverse clutch linear solenoid valve system circuit
- Malfunction of the P0768: high clutch linear solenoid valve system circuit
- Malfunction of the P1753: low clutch shift solenoid valve system circuit
- Malfunction of the low clutch, 2-6 brake, 3-5 reverse clutch, high clutch
- Malfunction of the valve body assembly

DIAGNOSIS

STEP 1. Check the DTC.

Check that P0715 (input shaft speed sensor) and P0720 (output shaft speed sensor) are set.

Q: Is the DTC set?

YES : Check and repair the relevant DTC system.
NO : Go to Step 2.

STEP 2. Check the DTC.
Check that the DTC other than P0729, P0732, P0733, P0734, P0735 (6th, 2nd, 3rd, 4th, 5th gear ratio) is set.

Q: Is the DTC set?

YES : Check and repair the relevant DTC system.
NO : Go to Step 3.

STEP 3. Check the transmission fluid properties.
Check the status of the transmission fluid properties (smell, color, fouling).

- Black: A/T inside damage, seizure
- Milky: Water intrusion

Q: Is the check result normal?

YES : Go to Step 4.
NO : Remove the A/T from the vehicle, then check and repair the inside.

STEP 4. Check the transmission fluid level.

Q: Is the check result normal?

YES : Adjust the transmission fluid level, and then go to Step 5.
NO : Go to Step 5.

STEP 5. Check the signals of input shaft speed sensor and output shaft speed sensor.
Check the signals of C-37 TCM connector terminal No. 37 and No. 38.
Refer to P.23C-159.

Q: Is the check result normal?

YES : Go to Step 6.
NO : Repair or replace the failure section.

STEP 6. Hydraulic pressure test
Refer to P.23C-24.

Q: Is the check result normal?

YES : Go to Step 7.
NO : Remove the A/T from the vehicle, then check and repair the inside.

STEP 7. Erase the DTC code, and drive the vehicle for a while.
Check that the normal code is displayed.

Q: Is the check result normal?

YES : The procedure is complete.
NO : Return to START.

DTC P0731: 1st Gear Incorrect Ratio

DESCRIPTIONS OF MONITOR METHODS

- After 1st gear is achieved for 2 seconds, the abnormal gear ratio[*1] is detected for 2 seconds continuously, or the engine runup[*2] is detected for 250 milliseconds.

[*1]: The actual gear ratio deviates from the target gear ratio to the low engine (turbine) speed.
[*2]: The actual gear ratio deviates from the target gear ratio to the high engine (turbine) speed.

MONITOR EXECUTION

- 1st gear driving

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

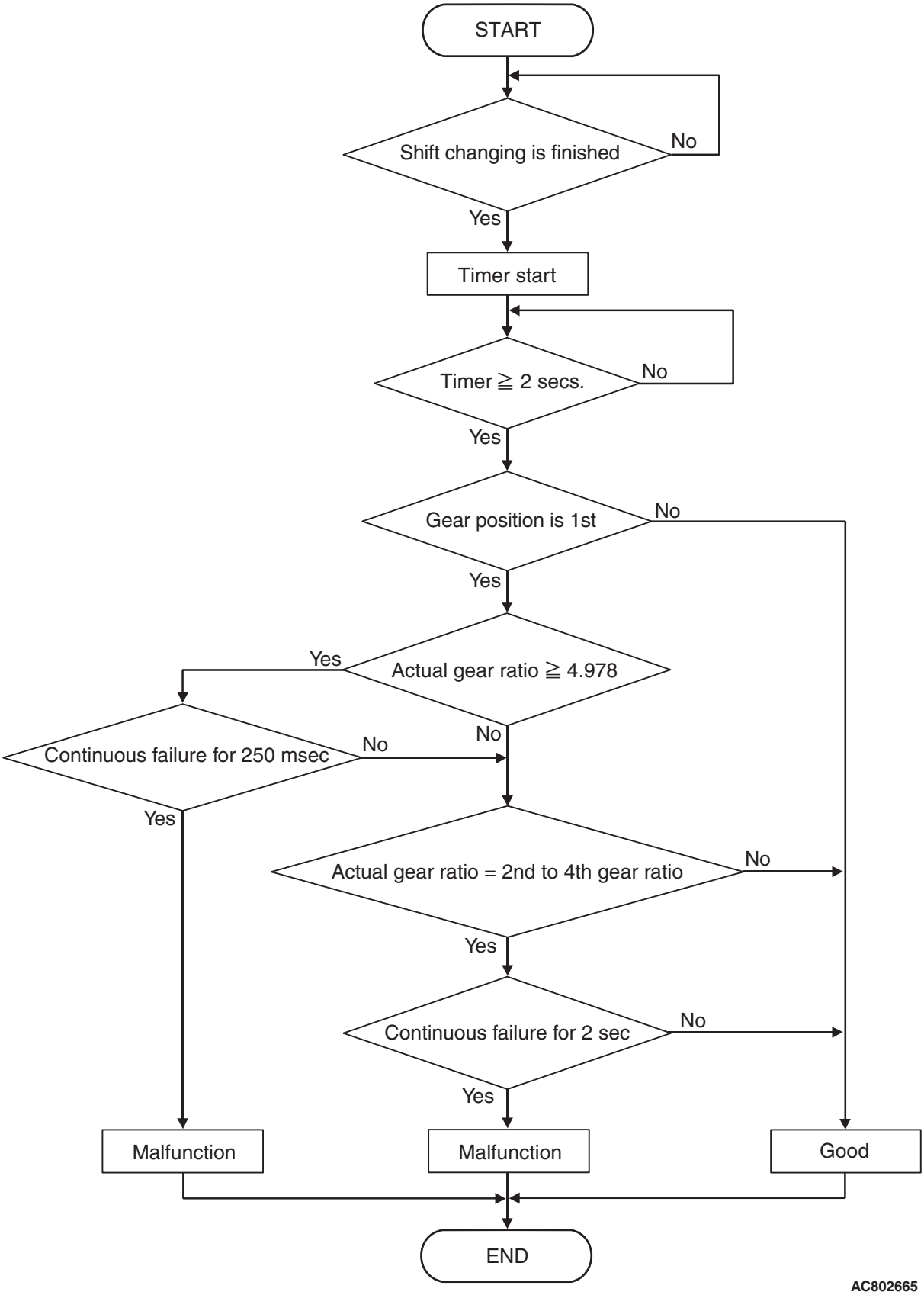
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0846: Malfunction of the 2-6 brake pressure switch system
- P0876: Malfunction of the High clutch pressure switch system
- P0988: Malfunction of the Low-reverse brake pressure switch system

Sensor (The sensor below is determined to be normal)

- Input shaft speed sensor
- Output shaft speed sensor
- Transmission range switch
- Lock-up and low-reverse brake linear solenoid
- Low clutch linear solenoid
- 2-6 brake linear solenoid
- 3-5 reverse clutch linear solenoid
- High clutch linear solenoid
- Low clutch shift solenoid
- Low-reverse brake shift solenoid
- Engine revolution signal
- CAN communication

LOGIC FLOW CHARTS (Monitor Sequence)



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DTC SET CONDITIONS

Check Conditions

- Shift stage: 1st gear.
- Time after shift changing finish: 2 seconds or more.

Judgement Criteria

- Gear ratio: 4.978 or more. (0.25 second)
- Gear ratio: 2.114 or more and 2.584 or less. (2 seconds)
- Gear ratio: 1.392 or more and 1.701 or less. (2 seconds)
- Gear ratio: 1.021 or more and 1.247 or less. (2 seconds)

OBD-II DRIVE CYCLE PATTERN

1st gear driving for 5 seconds or more

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Transaxle assembly powertrain parts failure
- Malfunction of the P0715: input shaft speed sensor system
- Malfunction of the P0720: output shaft speed sensor system
- Malfunction of the P0748: line pressure linear solenoid valve system circuit
- Malfunction of the P0753: low clutch linear solenoid valve system circuit
- Malfunction of the P1758: low-reverse brake shift solenoid valve system circuit
- Malfunction of the low clutch
- Malfunction of the low one-way clutch
- Malfunction of the valve body assembly

DIAGNOSIS

STEP 1. Check the DTC.

Check that P0715 (input shaft speed sensor) and P0720 (output shaft speed sensor) are set.

Q: Is the DTC set?

YES : Check and repair the relevant DTC system.
NO : Go to Step 2.

STEP 2. Check the DTC.

Check if the DTC other than P0731 (1st gear ratio) is set.

Q: Is the DTC set?

YES : Check and repair the relevant DTC system.
NO : Go to Step 3.

STEP 3. Check the transmission fluid properties.

Check the status of the transmission fluid properties (smell, color, fouling).

- Black: A/T inside damage, seizure
- Milky: Water intrusion

Q: Is the check result normal?

YES : Go to Step 4.
NO : Remove the A/T from the vehicle, then check and repair the inside.

STEP 4. Check the transmission fluid level.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Adjust the transmission fluid level, and then go to Step 5.

STEP 5. Check the signals of input shaft speed sensor and output shaft speed sensor.
Check the signals of C-37 TCM connector terminal No. 37 and No. 38.
Refer to P.23C-159.

Q: Is the check result normal?

YES : Go to Step 6.
NO : Repair or replace the failure section.

STEP 6. Hydraulic pressure test
Refer to P.23C-24.

Q: Is the check result normal?

YES : Go to Step 7.
NO : Remove the A/T from the vehicle, then check and repair the inside.

STEP 7. Erase the DTC code, and drive the vehicle for a while.
Check that the normal code is displayed.

Q: Is the check result normal?

YES : The procedure is complete.
NO : Return to START.

DTC P0736: Reverse Gear Incorrect Ratio

DESCRIPTIONS OF MONITOR METHODS

Check Conditions, Judgement Criteria

- During reverse driving, engine runup[*1] is detected for 250 milliseconds or more.

[*1]: The actual gear ratio deviates from the target gear ratio to the high engine (turbine) speed.

MONITOR EXECUTION

- Reverse gear driving

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

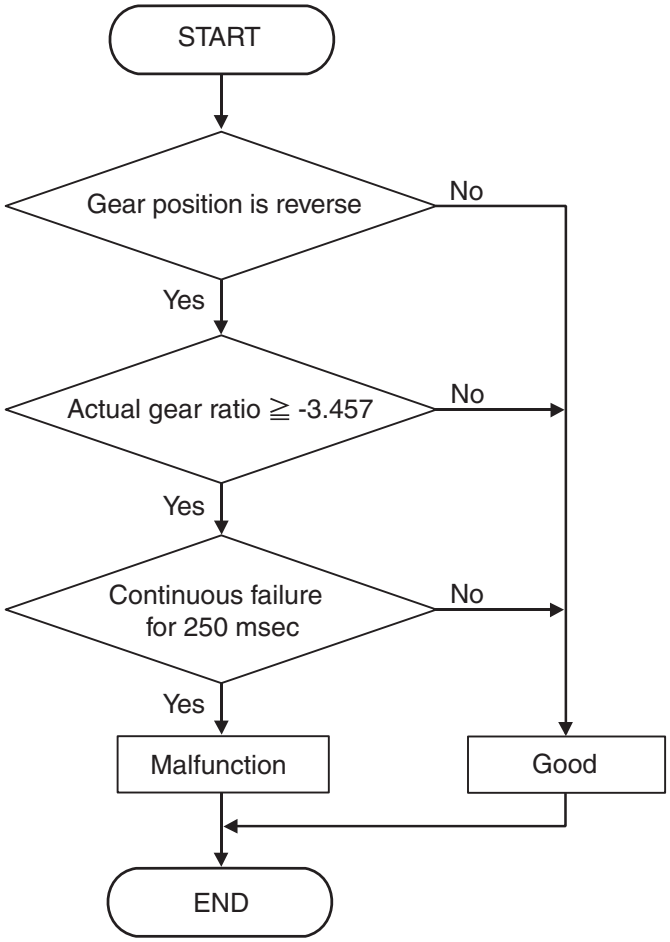
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0846: Malfunction of the 2-6 brake pressure switch system
- P0876: Malfunction of the High clutch pressure switch system
- P0988: Malfunction of the Low-reverse brake pressure switch system

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



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DTC SET CONDITIONS

Check Conditions

- Shift stage: reverse gear.

Judgement Criteria

- Gear ratio: more than -3.457. (0.25 second)

OBD-II DRIVE CYCLE PATTERN

Reverse gear driving for 5 seconds or more

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Transaxle assembly powertrain parts failure
- Malfunction of the P0715: input shaft speed sensor system
- Malfunction of the P0720: output shaft speed sensor system
- Malfunction of the P0748: line pressure linear solenoid valve system circuit
- Malfunction of the P0763: 3-5 reverse clutch linear solenoid valve system circuit
- Malfunction of the P0743: lock-up and low-reverse brake linear solenoid valve system circuit
- Malfunction of the P1758: low-reverse brake shift solenoid valve system circuit
- Malfunction of the 3-5 reverse clutch
- Malfunction of the low-reverse brake
- Malfunction of the valve body assembly

DIAGNOSIS

STEP 1. Check the DTC.
Check that P0715 (input shaft speed sensor) and P0720 (output shaft speed sensor) are set.

Q: Is the DTC set?

YES : Check and repair the relevant DTC system.
NO : Go to Step 2.

STEP 2. Check the DTC.
Check if the DTC other than P0736 (Reverse gear ratio) is set.

Q: Is the DTC set?

YES : Check and repair the relevant DTC system.
NO : Go to Step 3.

STEP 3. Check the transmission fluid properties.
Check the status of the transmission fluid properties (smell, color, fouling).

- Black: A/T inside damage, seizure
- Milky: Water intrusion

Q: Is the check result normal?

YES : Go to Step 4.
NO : Remove the A/T from the vehicle, then check and repair the inside.

STEP 4. Check the transmission fluid level.

Q: Is the check result normal?

YES : Adjust the transmission fluid level, and then go to Step 5.
NO : Go to Step 5.

STEP 5. Check the signals of input shaft speed sensor and output shaft speed sensor.
Check the signals of C-37 TCM connector terminal No. 37 and No. 38.
Refer to P.23C-159.

Q: Is the check result normal?

YES : Go to Step 6.
NO : Repair or replace the failure section.

STEP 6. Hydraulic pressure test
Refer to P.23C-24.

Q: Is the check result normal?

YES : Go to Step 7.
NO : Remove the A/T from the vehicle, then check and repair the inside.

STEP 7. Erase the DTC code, and drive the vehicle for a while.
Check that the normal code is displayed.

Q: Is the check result normal?

YES : The procedure is complete.
NO : Return to START.

DTC P0741: Torque Converter Clutch System (Stuck Off), P0742 Torque Converter Clutch System (Stuck ON)

DESCRIPTIONS OF MONITOR METHODS <P0741>

- When the input shaft speed sensor is normal, the engine speed signal is normal, and within the lock-up operation range, the slip speed of the torque converter exceeds the specified value. (P0741)

MONITOR EXECUTION <P0741>

- Driving with the lock-up activated

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR) <P0741>

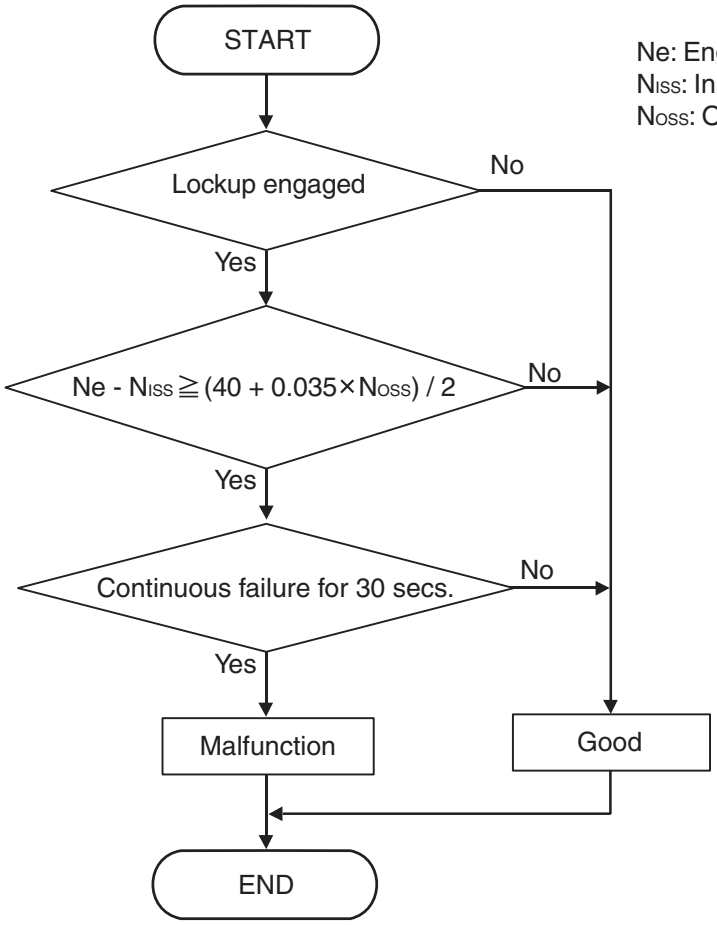
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence) <P0741>



Ne: Engine speed (r/min)
NISS: Input shaft speed (r/min)
NOSS: Output shaft speed (r/min)

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DTC SET CONDITIONS <P0741>

Check Conditions

- Lock-up status: engaging.
- Transmission range switch: D

Judgement Criteria

- Calculated slip (engine speed - input shaft speed): (40 + 0.035 × output shaft speed>)/2 or more. (30 seconds)

OBD-II DRIVE CYCLE PATTERN <P0741>

Driving at 55 km/h (34.2 mph) or more with the shift ranges of 3rd, 4th, 5th, and 6th gear. Maintain each shift range for 30 second or more.

DESCRIPTIONS OF MONITOR METHODS <P0742>

- When the input shaft speed sensor and the output shaft speed sensor are normal at the "D" range, the engine speed signal is normal, and within the non-lock-up operation range, the extremely low slip speed of the torque converter is detected continuously for a specified time. (P0742)

MONITOR EXECUTION <P0742>

- Transmission range: D range driving with the lock-up activated

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR) <P0742>

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

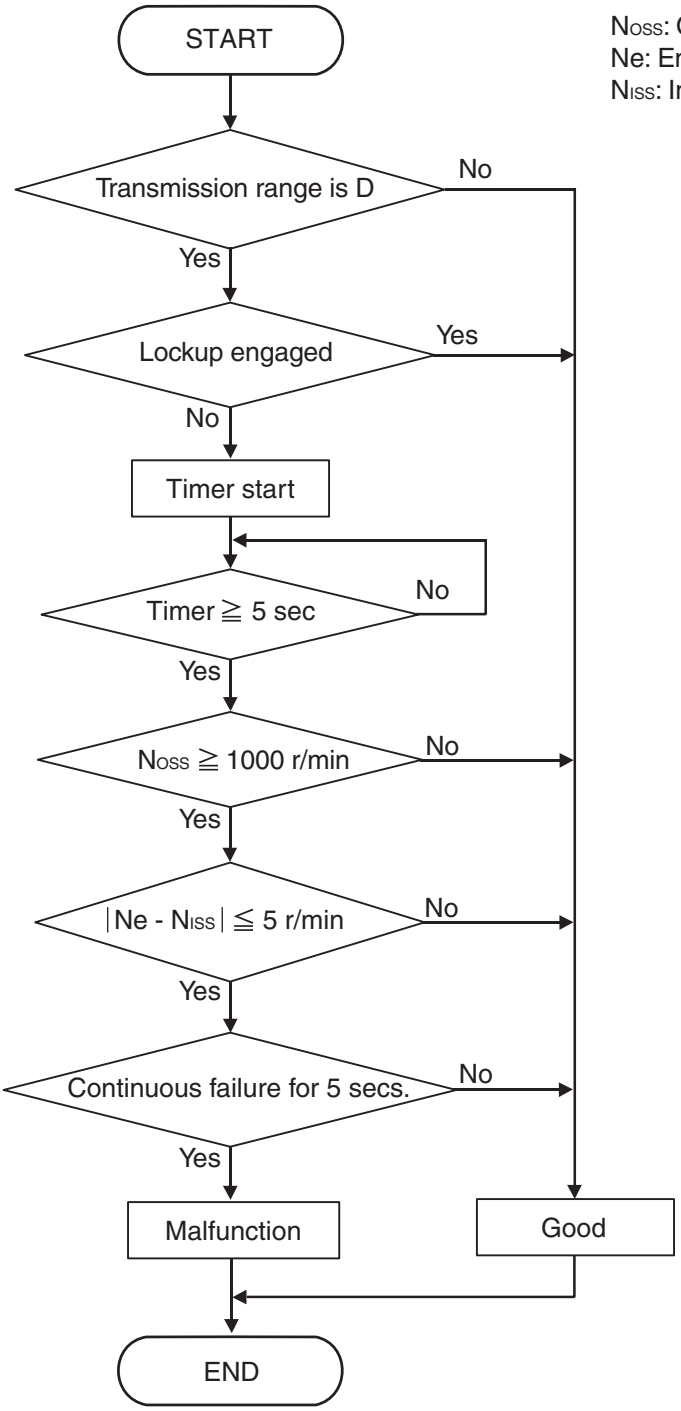
- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

TSB Revision

LOGIC FLOW CHARTS (Monitor Sequence) <P0742>



Noss: Output shaft speed (r/min)
Ne: Engine speed (r/min)
Niss: Input shaft speed (r/min)

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DTC SET CONDITIONS <P0742>

Check Conditions

- Output speed: more than 1,000 r/min.
- Lock-up status: disengaging.
- Transmission range switch position: D.

Judgement Criteria

- Calculated slip (engine speed - input shaft speed): 5 r/min or less. (5 seconds)

OBD-II DRIVE CYCLE PATTERN <P0742>

Driving at 55 km/h (34.2 mph) or less with the shift range of 3rd and 4th gear. Driving at 48 ± 2 km/h (29.8 ± 1.2 mph) with the 5th gear. Maintain each shift range for 1 second or more.

TSB Revision

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the P0743: lock-up and low-reverse brake linear solenoid valve system circuit
- Malfunction of the P0712: transmission fluid temperature sensor system (short circuit)
- Malfunction of the P0713: transmission fluid temperature sensor system (open circuit)
- Poor installation of the engine and A/T (deviation to the axial direction)
- Malfunction of the torque converter
- Malfunction of the valve body assembly

DIAGNOSIS

STEP 1. Hydraulic pressure test
Refer to P.23C-24.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair or replace the failure section.

STEP 2. Check the lock-up and low-reverse brake linear solenoid.
Check for P0743 (lock-up and low-reverse brake linear solenoid). Refer to P.23C-72.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair or replace the failure section.

STEP 3. Check the transmission fluid temperature sensor, input shaft speed sensor, and output shaft speed sensor.
Check the following DTCs: P0712 (transmission fluid temperature sensor (short circuit)), P0713 (transmission fluid temperature sensor (open circuit)), P0715 (input shaft speed sensor) and P0720 (output shaft speed sensor).
Refer to P.23C-39 <P0712>, P.23C-43 <P0713>, P.23C-46 <P0715>, P.23C-51 <P0720>.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair or replace the failure section.

STEP 4. Check the malfunction of CAN communication system.

Q: Are the DTC for CAN communication system malfunction (U0001, U0100, U0141, P1705, P1706) set?

YES : Repair or replace the failure section.
NO : Go to Step 5.

STEP 5. Check the TCM connector pin terminal and the connection status.

Q: Is the check result normal?

YES : Replace the TCM, and then go to Step 6.
NO : Repair or replace the failure section.

STEP 6. Erase the DTC code, and drive the vehicle for a while.

Check that the normal code is displayed.

Q: Is the check result normal?

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

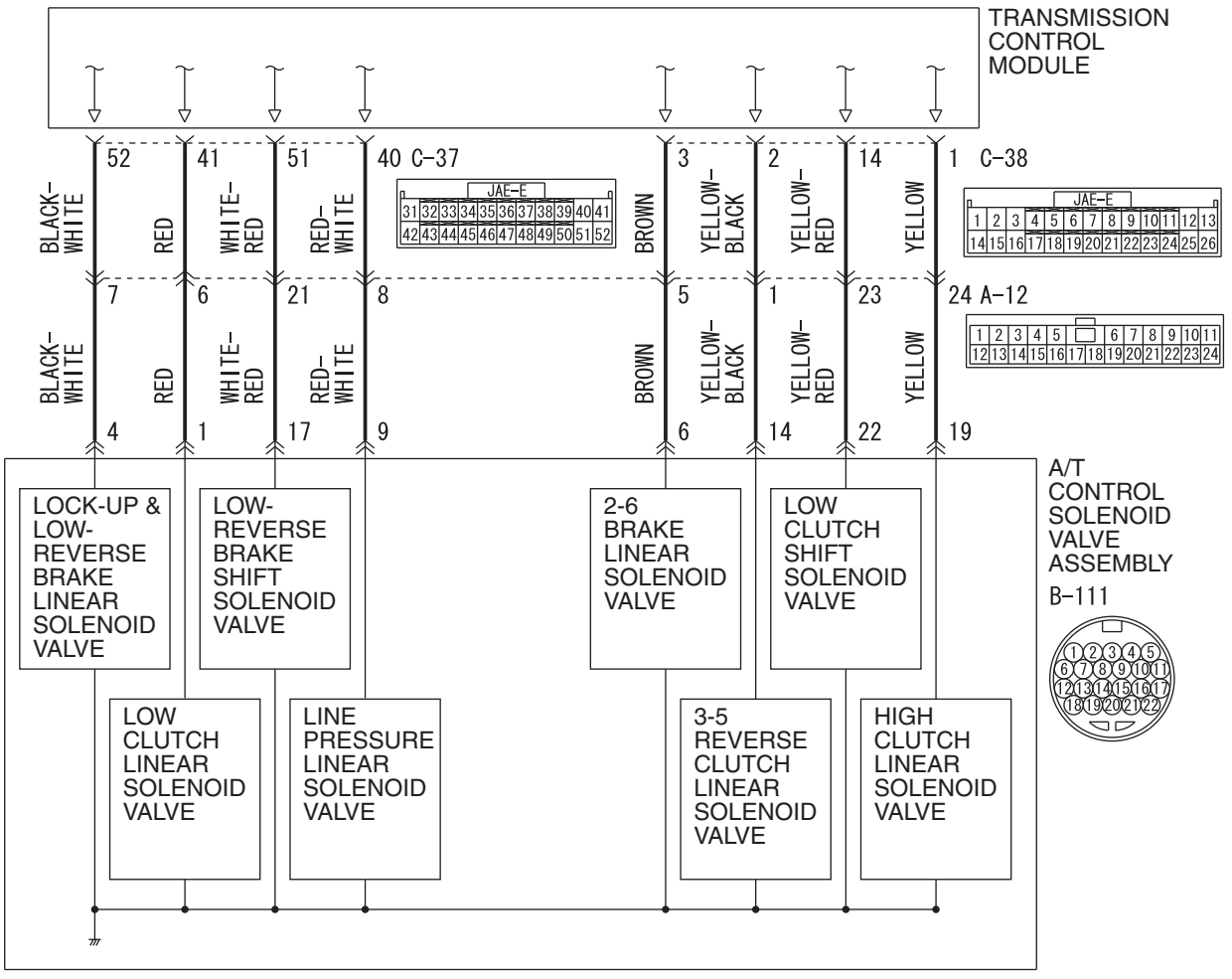
STEP 7. Check the installation position of the engine and A/T.

Q: Is the check result normal?

YES : Replace the transaxle assembly.
NO : Repair or replace the failure section.

DTC P0743: Lock-up and Low-reverse Brake Linear Solenoid Valve System

Solenoid valve system circuit



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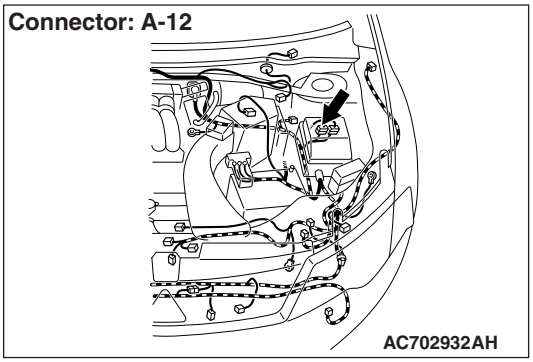
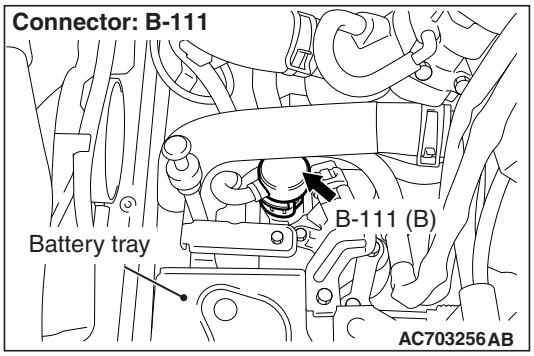
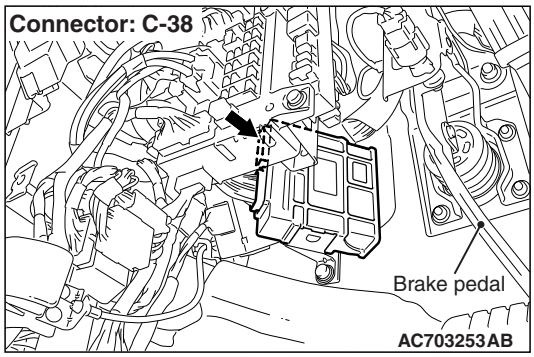






DESCRIPTIONS OF MONITOR METHODS

- While driving with the sport mode (1st gear) or lock-up activated (2nd to 6th gear), when open or short circuit is detected for 5 seconds
- The control current of solenoid valve is abnormally large or small.

MONITOR EXECUTION

- Sport mode: 1st gear driving
- Transmission range: D (lock-up activated)

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

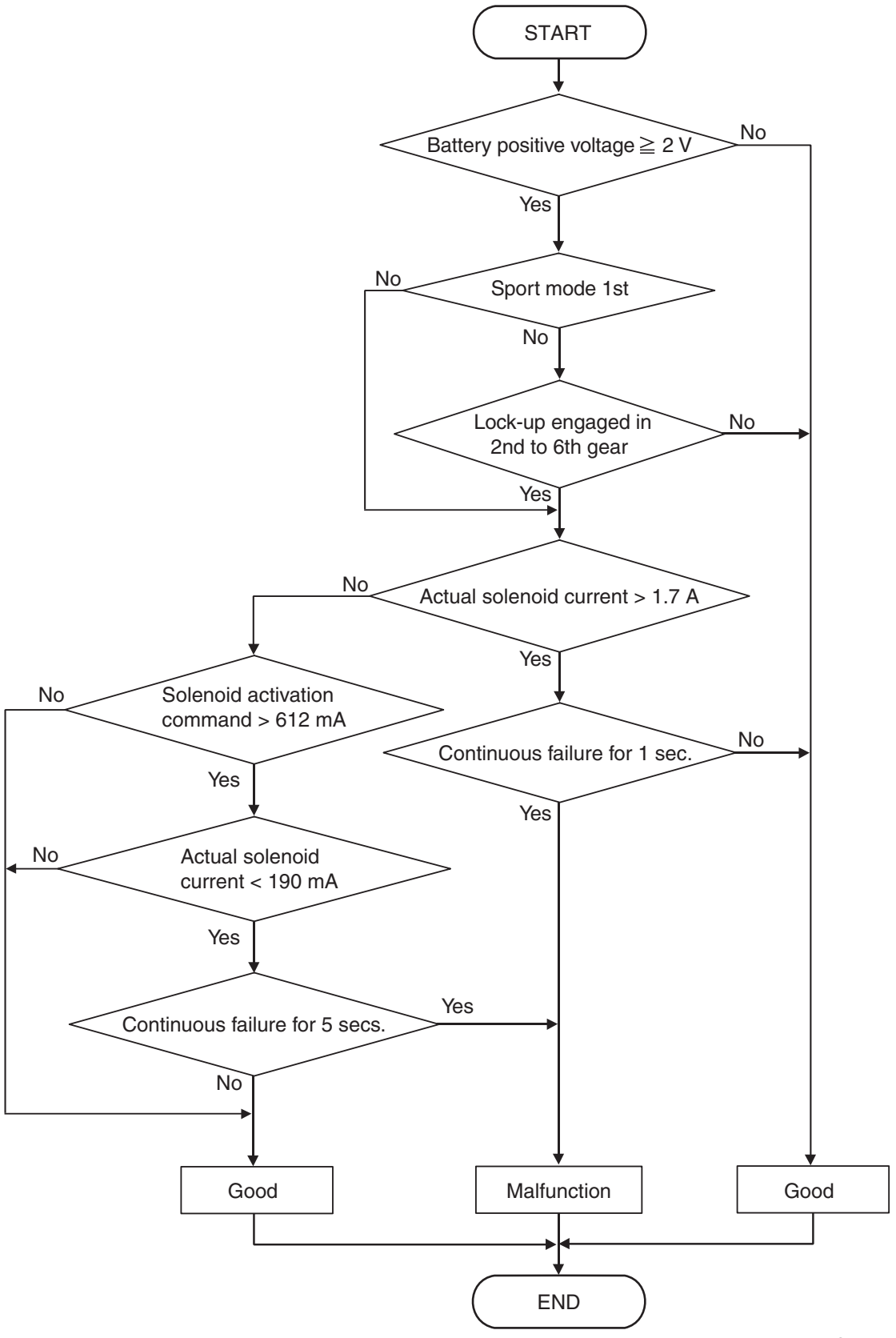
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0731: Malfunction of the 1st gear incorrect ratio
- P0732: Malfunction of the 2nd gear incorrect ratio
- P0733: Malfunction of the 3rd gear incorrect ratio
- P0734: Malfunction of the 4th gear incorrect ratio
- P0735: Malfunction of the 5th gear incorrect ratio
- P0729: Malfunction of the 6th gear incorrect ratio
- P0741: Malfunction of the Malfunction of the Torque converter clutch system (Stuck off)

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



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DTC SET CONDITIONS

Check Conditions <Circuit continuity ground>
- Sport mode: 1st or Lock-up status: engaging (2nd to 6th).

Judgment Criteria <Circuit continuity ground>
- Lock-up and low-reverse brake linear solenoid valve actual current: more than 1.7 A (1 second)

Check Conditions <Circuit continuity open>
- Sport mode: 1st or Lock-up status: engaging (2nd to 6th).
- Lock-up and low-reverse brake linear solenoid valve actual command: more than 612 mA

Judgment Criteria <Circuit continuity open>
- Lock-up and low-reverse brake linear solenoid valve actual current: less than 190 mA. (5 seconds)

OBD-II DRIVE CYCLE PATTERN

Drive with the sport mode (1st gear) for approximately 10 seconds, and then drive with the transmission range D, throttle valve opening 50% or less, and vehicle speed 60 km/h (37.3 mph) or more for approximately 10 seconds continuously.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the lock-up and low-reverse brake linear solenoid valve system circuit
- Damaged harness or connector
- Malfunction of the TCM
- Malfunction of the lock-up and low-reverse brake linear solenoid valve (valve body assembly)

DIAGNOSIS

STEP 1. Check the TCM terminal voltage.

[C-37 TCM connector (vehicle side, connected)]
Measure the voltage between the terminal No. 52 and body ground.
- Lock-up released: 0 V
- Lock-up engaged: 300 Hz

Q: Is the check result normal?

YES : Go to Step 5.
NO : Go to Step 2.

STEP 2. Check between the TCM connector and A/T control solenoid valve assembly connector.

Check for continuity between C-37 TCM connector and B-111 A/T control solenoid valve assembly connector.

NOTE: Prior to the wiring harness inspection, check the intermediate connectors A-12 and repair that if necessary.
- Between C-37 terminal No. 52 and B-111 terminal No. 4: Continuity exists.

When the continuity check result is OK, check that the wiring harness is not shorted to the body and other wiring harness.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair or replace the failure section.

STEP 3. Check the lock-up and low-reverse brake linear solenoid.

Refer to P.23C-275.

Q: Is the check result normal?

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

STEP 4. Check between the A/T control solenoid valve assembly connector and the lock-up and low-reverse brake linear solenoid valve connector.
Check for continuity between the A/T control solenoid valve assembly connector and the lock-up and low-reverse brake linear solenoid valve connector terminals.
- Between C-111 terminal No. 4 and the lock-up and low-reverse brake linear solenoid valve: Continuity exists.

Q: Is the check result satisfactory?
YES : Replace the valve body assembly.
NO : Repair or replace the failure section.

STEP 5. Check the TCM and A/T control solenoid valve assembly connector pin terminals and the connection status.

Q: Is the check result normal?
YES : Go to Step 7.
NO : Repair or replace the failure section.

STEP 6. Check the TCM and A/T control solenoid valve assembly connector pin terminals and the connection status.

Q: Is the check result normal?
YES : Replace the TCM.
NO : Repair or replace the failure section.

STEP 7. Erase the DTC code, and drive the vehicle for a while.
Check that the normal code is displayed.

Q: Is the check result normal?
YES : The procedure is complete.
NO : Return to START.

DTC P0748: Line Pressure Linear Solenoid Valve System

SOLENOID VALVE SYSTEM CIRCUIT
Refer to P.23C-72.

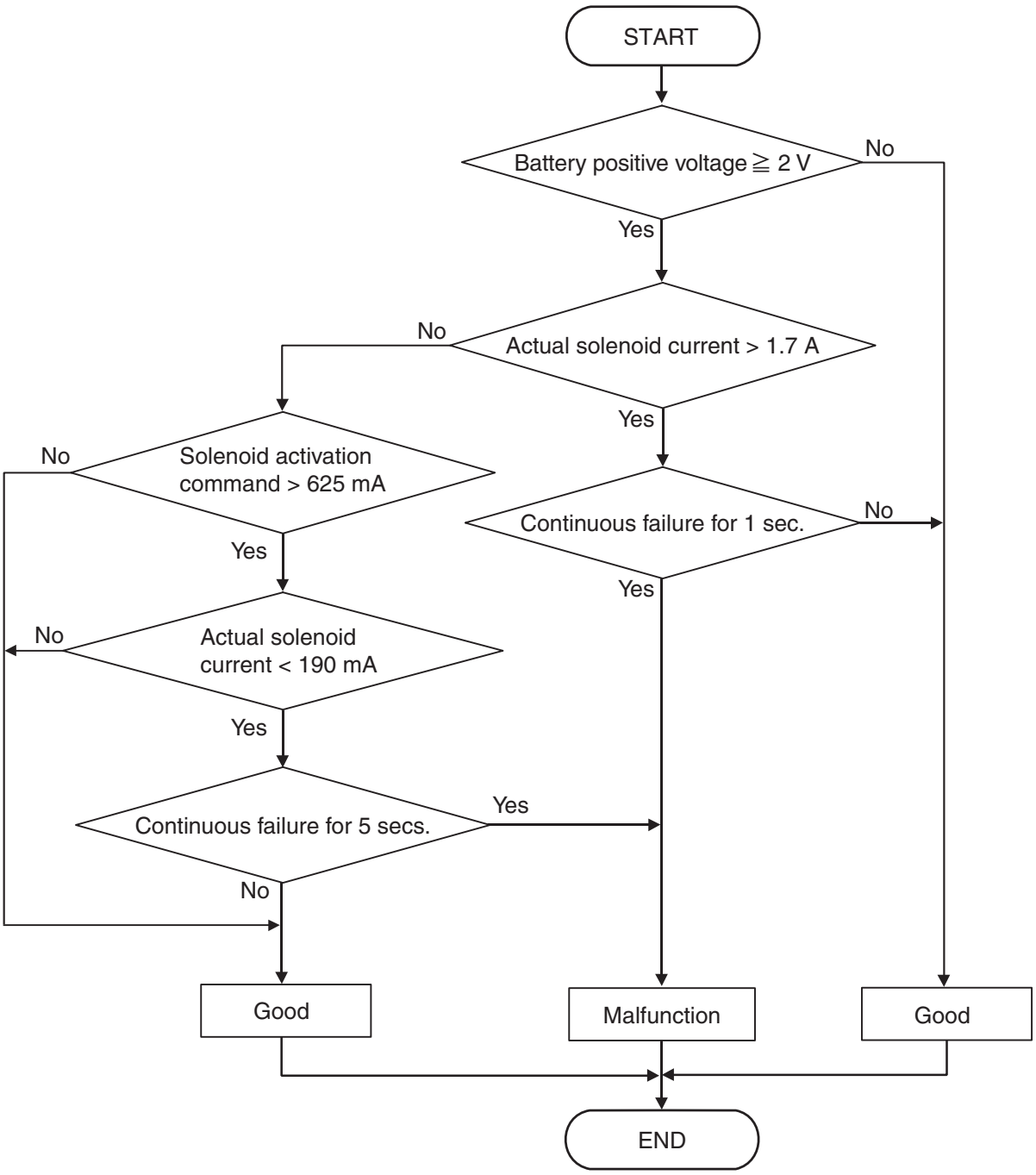
DESCRIPTIONS OF MONITOR METHODS
When the battery voltage is 2 V or more
- Open or short circuit is detected for 5 seconds.
- The control current of solenoid valve is abnormally large or small.

MONITOR EXECUTION
- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)
- Not applicable

Sensor (The sensor below is determined to be normal)
- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions <Circuit continuity ground>

- Voltage of battery: 2 volts or more.

Judgment Criteria <Circuit continuity ground>

- Line pressure linear solenoid valve actual current: more than 1.7 A (1 second)

Check Conditions <Circuit continuity open>

- Voltage of battery: 2 volts or more.
- Line pressure linear solenoid valve activation command: more than 625 mA

Judgment Criteria <Circuit continuity open>

- Line pressure linear solenoid valve actual current: less than 190 mA. (5 seconds)

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OBD-II DRIVE CYCLE PATTERN

Start the engine, and maintain the status for approximately 10 seconds. Then, turn the ignition switch from OFF to ON, restart the engine, and then maintain the status for approximately 10 seconds.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the line pressure linear solenoid valve system circuit
- Damaged harness or connector
- Malfunction of the TCM
- Malfunction of the line pressure linear solenoid valve (valve body assembly)

DIAGNOSIS

STEP 1. Check the TCM terminal voltage.

[C-37 TCM connector (vehicle side, connected)]

Measure the voltage between the terminal No. 40 and body ground.

- While driving: 300 Hz
- Other than above: 0 V

Q: Is the check result normal?

YES : Go to Step 5.
NO : Go to Step 2.

STEP 2. Check between the TCM connector and A/T control solenoid valve assembly connector.

Check for continuity between C-37 TCM connector and B-111 A/T control solenoid valve assembly connector.

NOTE: Prior to the wiring harness inspection, check the intermediate connectors A-12 and repair that if necessary.

- Between C-37 terminal No. 40 and B-111 terminal No. 9: Continuity exists.

When the continuity check result is OK, check that the wiring harness is not shorted to the body and other wiring harness.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair or replace the failure section.

STEP 3. Check the line pressure linear solenoid.

Refer to P.23C-275.

Q: Is the check result normal?

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

STEP 4. Check between the A/T control solenoid valve assembly connector and the line pressure linear solenoid valve connector.

Check for continuity between the A/T control solenoid valve assembly connector terminals and the line pressure linear solenoid valve connector terminals.

- Between C-111 terminal No. 9 and line pressure linear solenoid valve: Continuity exists.

Q: Is the check result satisfactory?

YES : Replace the valve body assembly.
NO : Repair or replace the failure section.

STEP 5. Check the TCM and A/T control solenoid valve assembly connector pin terminals and the connection status.

Q: Is the check result normal?

YES : Go to Step 7.
NO : Repair or replace the failure section.

STEP 6. Check the TCM and A/T control solenoid valve assembly connector pin terminals and the connection status.

Q: Is the check result normal?

YES : Replace the TCM.
NO : Repair or replace the failure section.

STEP 7. Erase the DTC code, and drive the vehicle for a while.

Check that the normal code is displayed.

Q: Is the check result normal?

YES : The procedure is complete.
NO : Return to START.

DTC P0753: Low Clutch Linear Solenoid Valve System

DESCRIPTIONS OF MONITOR METHODS

1st to 4th gear driving

- Open or short circuit is detected for 5 seconds.
- The control current of solenoid valve is abnormally large or small.

MONITOR EXECUTION

- 1st to 4th gear driving

SOLENOID VALVE SYSTEM CIRCUIT

Refer to P.23C-72.

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

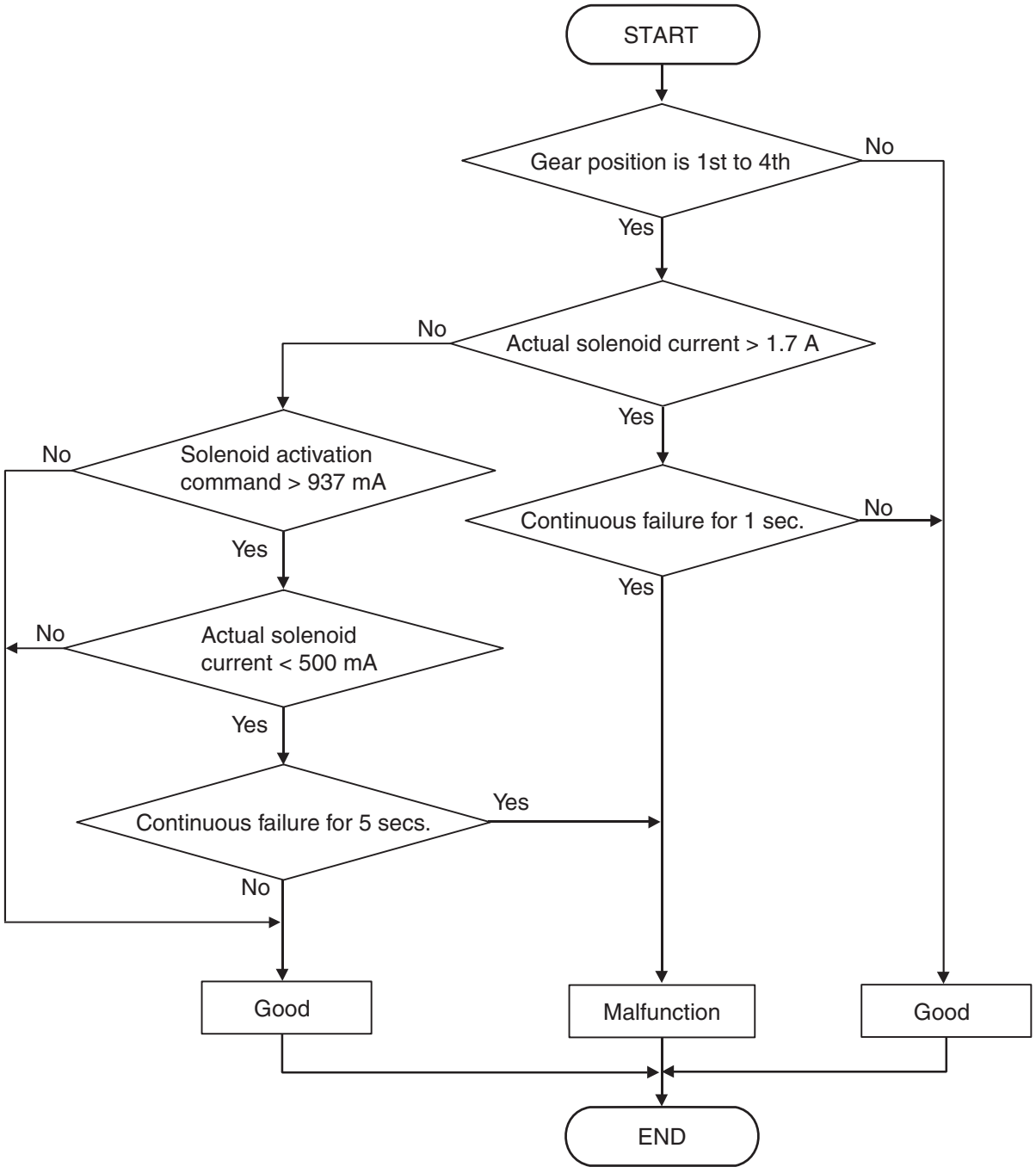
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0731: Malfunction of the 1st gear incorrect ratio
- P0732: Malfunction of the 2nd gear incorrect ratio
- P0733: Malfunction of the 3rd gear incorrect ratio
- P0734: Malfunction of the 4th gear incorrect ratio
- P0735: Malfunction of the 5th gear incorrect ratio
- P0729: Malfunction of the 6th gear incorrect ratio

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions <Circuit continuity ground>
- Gear position: 1st to 4th.

Judgment Criteria <Circuit continuity ground>
- Low clutch linear solenoid valve actual current: more than 1.7 A (1 second)

Check Conditions <Circuit continuity open>
- Gear position: 1st to 4th.
- Low clutch linear solenoid valve activation command: more than 937 mA

Judgment Criteria <Circuit continuity open>
- Low clutch linear solenoid valve actual current: less than 500 mA. (5 seconds)

OBD-II DRIVE CYCLE PATTERN

Drive in 1st to 4th gears. Maintain each shift range for approximately 10 seconds.

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TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the low clutch linear solenoid valve system circuit
- Damaged harness or connector
- Malfunction of the TCM
- Malfunction of the low clutch linear solenoid valve (valve body assembly)

DIAGNOSIS

STEP 1. Check the TCM terminal voltage.
[C-37 TCM connector (vehicle side, connected)]
Measure the voltage between the terminal No. 41 and body ground.

- Low clutch engaged: 300 Hz
- Other than above: 0 V

Q: Is the check result normal?

YES : Go to Step 5.
NO : Go to Step 2.

STEP 2. Check between the TCM connector and A/T control solenoid valve assembly connector.
Check for continuity between C-37 TCM connector and B-111 A/T control solenoid valve assembly connector.

NOTE: Prior to the wiring harness inspection, check the intermediate connectors A-12 and repair that if necessary.

- Between C-37 terminal No. 41 and B-111 terminal No. 1: Continuity exists.

When the continuity check result is OK, check that the wiring harness is not shorted to the body and other wiring harness.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair or replace the failure section.

STEP 3. Check the low clutch linear solenoid.
Refer to P.23C-275.

Q: Is the check result normal?

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

STEP 4. Check between the A/T control solenoid valve assembly connector and the low clutch linear solenoid valve connector.
Check for continuity between the A/T control solenoid valve assembly connector terminals and the low clutch linear solenoid valve connector terminals.

- Between C-111 terminal No. 1 and low clutch linear solenoid valve: Continuity exists.

Q: Is the check result satisfactory?

YES : Replace the valve body assembly.
NO : Repair or replace the failure section.

STEP 5. Check the TCM and A/T control solenoid valve assembly connector pin terminals and the connection status.

Q: Is the check result normal?

YES : Go to Step 7.
NO : Repair or replace the failure section.

STEP 6. Check the TCM and A/T control solenoid valve assembly connector pin terminals and the connection status.

Q: Is the check result normal?

YES : Replace the TCM.
NO : Repair or replace the failure section.

STEP 7. Erase the DTC code, and drive the vehicle for a while.

Check that the normal code is displayed.

Q: Is the check result normal?

YES : The procedure is complete.
NO : Return to START.

DTC P0758: 2-6 Brake Linear Solenoid Valve System

DESCRIPTIONS OF MONITOR METHODS

2nd or 6th gear driving

- Open or short circuit is detected for 5 seconds.
- The control current of solenoid valve is abnormally large or small.

MONITOR EXECUTION

- 2nd or 6th gear driving

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0731: Malfunction of the 1st gear incorrect ratio

SOLENOID VALVE SYSTEM CIRCUIT

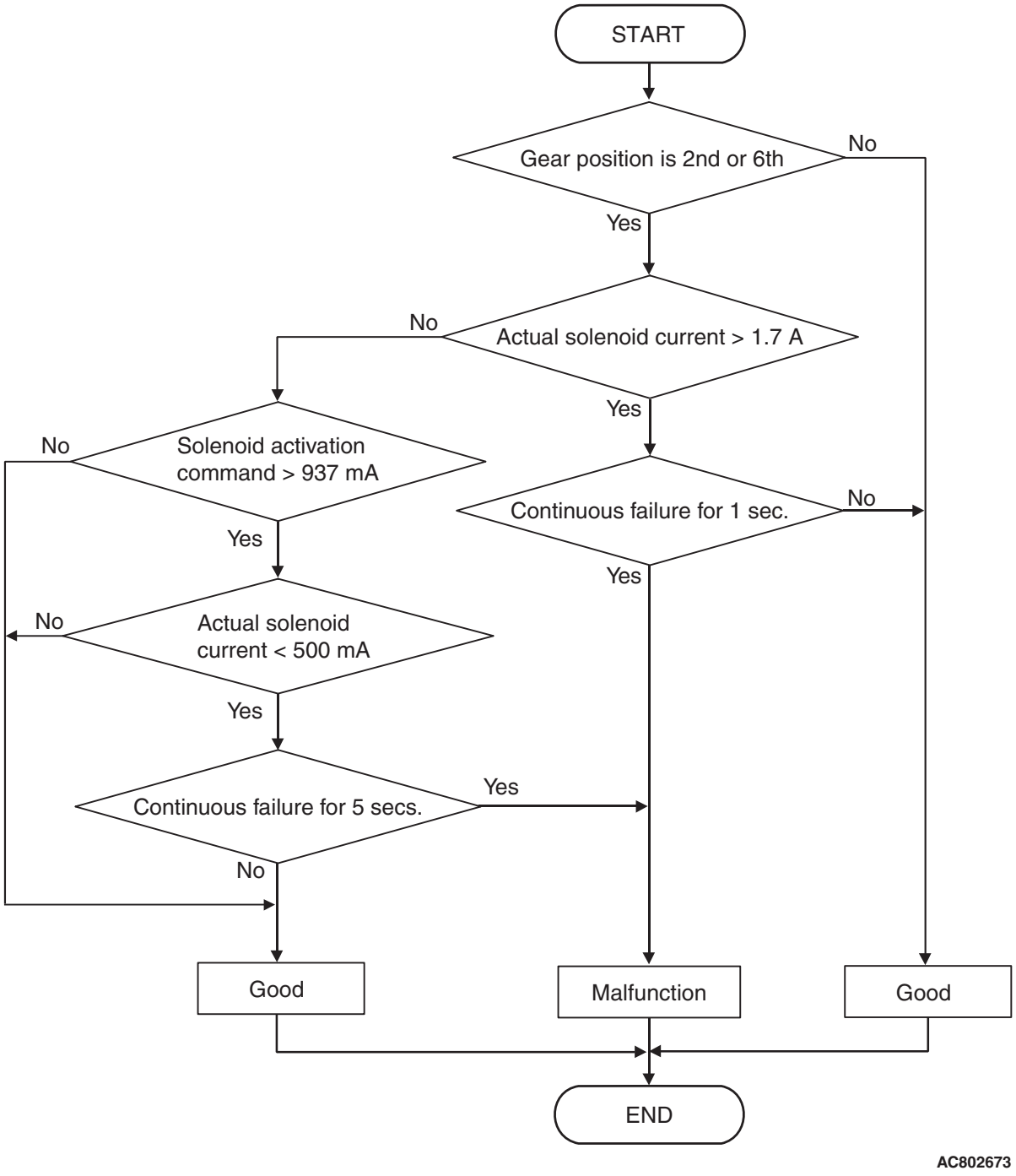
Refer to P.23C-72.

- P0732: Malfunction of the 2nd gear incorrect ratio
- P0733: Malfunction of the 3rd gear incorrect ratio
- P0734: Malfunction of the 4th gear incorrect ratio
- P0735: Malfunction of the 5th gear incorrect ratio
- P0729: Malfunction of the 6th gear incorrect ratio
- P0846: Malfunction of the 2-6 brake pressure switch system

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions <Circuit continuity ground>
- Gear position: 2nd or 6th.

Judgment Criteria <Circuit continuity ground>
- 2-6 brake linear solenoid valve actual current: more than 1.7 A (1 second)

Check Conditions <Circuit continuity open>
- Gear position: 2nd or 6th.
- 2-6 brake linear solenoid valve activation command: more than 937 mA

Judgment Criteria <Circuit continuity open>
- 2-6 brake linear solenoid valve actual current: less than 500 mA. (5 seconds)

OBD-II DRIVE CYCLE PATTERN

Drive in 2nd or 6th gear. Maintain each shift range for 10 second or more.

TSB Revision

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the 2-6 brake linear solenoid valve system circuit
- Damaged harness or connector
- Malfunction of the TCM
- Malfunction of the 2-6 brake linear solenoid valve (valve body assembly)

DIAGNOSIS

STEP 1. Check the TCM terminal voltage.
[C-38 TCM connector (vehicle side, connected)]
Measure the voltage between the terminal No. 3 and body ground.
- 2-6 brake engaged (2nd and 6th gear): 300 Hz
- Other than above: 0 V

Q: Is the check result normal?

YES : Go to Step 5.
NO : Go to Step 2.

STEP 2. Check between the TCM connector and A/T control solenoid valve assembly connector.
Check for continuity between C-38 TCM connector and B-111 A/T control solenoid valve assembly connector.

NOTE: Prior to the wiring harness inspection, check the intermediate connectors A-12 and repair that if necessary.
- Between C-38 terminal No. 3 and B-111 terminal No. 6: Continuity exists.

When the continuity check result is OK, check that the wiring harness is not shorted to the body and other wiring harness.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair or replace the failure section.

STEP 3. Check the 2-6 brake linear solenoid.
Refer to P.23C-275.

Q: Is the check result normal?

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

STEP 4. Check between the A/T control solenoid valve assembly connector and the 2-6 brake linear solenoid valve connector.
Check for continuity between the A/T control solenoid valve assembly connector terminals and the 2-6 brake linear solenoid valve connector terminals.
- Between C-111 terminal No. 6 and the 2-6 brake linear solenoid valve: Continuity exists.

Q: Is the check result satisfactory?

YES : Replace the valve body assembly.
NO : Repair or replace the failure section.

STEP 5. Check the TCM and A/T control solenoid valve assembly connector pin terminals and the connection status.

Q: Is the check result normal?

YES : Go to Step 7.
NO : Repair or replace the failure section.

STEP 6. Check the TCM and A/T control solenoid valve assembly connector pin terminals and the connection status.

Q: Is the check result normal?

YES : Replace the TCM.
NO : Repair or replace the failure section.

STEP 7. Erase the DTC code, and drive the vehicle for a while.

Check that the normal code is displayed.

Q: Is the check result normal?

YES : The procedure is complete.
NO : Return to START.

DTC P0763: 3-5 Reverse Clutch Linear Solenoid Valve System

DESCRIPTIONS OF MONITOR METHODS

1st, 2nd, 4th, or 6th gear driving

- Open or short circuit is detected for 5 seconds.
- The control current of solenoid valve is abnormally large or small.

MONITOR EXECUTION

- 1st, 2nd, 4th, and 6th gear driving

LINE PRESSURE LINEAR SOLENOID VALVE SYSTEM CIRCUIT

Refer to P.23C-72.

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

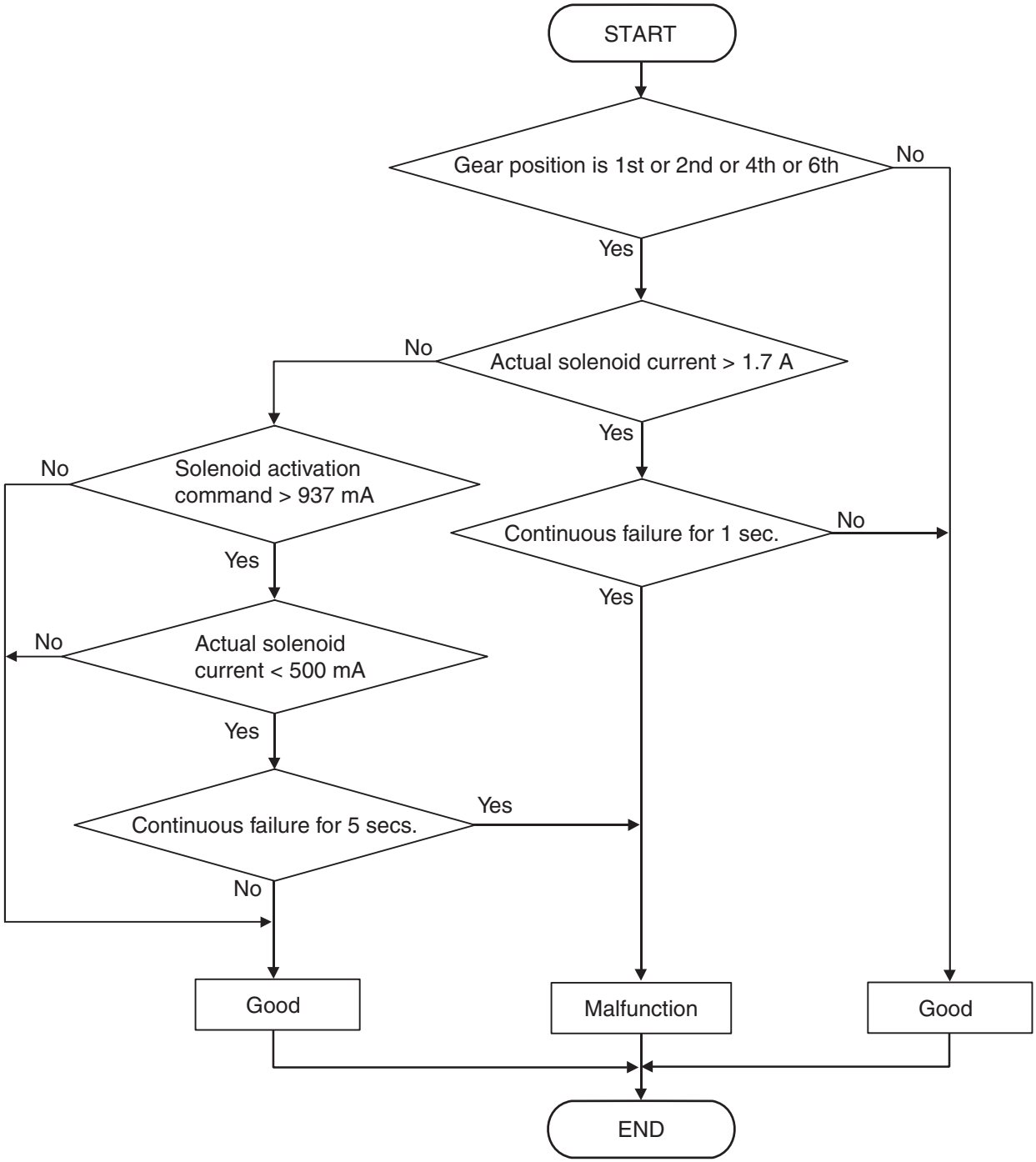
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0731: Malfunction of the 1st gear incorrect ratio
- P0732: Malfunction of the 2nd gear incorrect ratio
- P0733: Malfunction of the 3rd gear incorrect ratio
- P0734: Malfunction of the 4th gear incorrect ratio
- P0735: Malfunction of the 5th gear incorrect ratio
- P0729: Malfunction of the 6th gear incorrect ratio

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions <Circuit continuity ground>

- Gear position: 1st or 2nd or 4th or 6th.

Judgment Criteria <Circuit continuity ground>

- 3-5 reverse clutch linear solenoid valve actual current: more than 1.7 A (1 second)

Check Conditions <Circuit continuity open>

- Gear position: 1st or 2nd or 4th or 6th.
- 3-5 reverse clutch linear solenoid valve activation command: more than 937 mA

Judgment Criteria <Circuit continuity open>

- 3-5 reverse clutch linear solenoid valve actual current: less than 500 mA. (5 seconds)

OBD-II DRIVE CYCLE PATTERN

Drive in 1st, 2nd, 4th, and 6th gears. Maintain each shift range for 10 second or more.

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TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the 3-5 reverse clutch linear solenoid valve system circuit
- Damaged harness or connector
- Malfunction of the TCM
- Malfunction of the 3-5 reverse clutch linear solenoid valve (valve body assembly)

DIAGNOSIS

STEP 1. Check the TCM terminal voltage.
[C-38 TCM connector (vehicle side, connected)]
Measure the voltage between terminal No. 2 and body ground.
- When 3-5 reverse clutch engaged. (3rd, 5th, and reverse): 0 V
- Other than above: 300 Hz

Q: Is the check result normal?

YES : Go to Step 5.
NO : Go to Step 2.

STEP 2. Check between the TCM connector and A/T control solenoid valve assembly connector.
Check for continuity between C-38 TCM connector and B-111 A/T control solenoid valve assembly connector.

NOTE: Prior to the wiring harness inspection, check the intermediate connectors A-12 and repair that if necessary.
- Between C-38 terminal No. 2 and B-111 terminal No. 14: Continuity exists.

When the continuity check result is OK, check that the wiring harness is not shorted to the body and other wiring harness.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair or replace the failure section.

STEP 3. Check the 3-5 reverse clutch linear solenoid.
Refer to P.23C-275.

Q: Is the check result normal?

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

STEP 4. Check between the A/T control solenoid valve assembly connector and 3-5 reverse clutch linear solenoid valve connector.
Check for continuity between the A/T control solenoid valve assembly connector terminals and 3-5 reverse clutch linear solenoid valve connector terminals.
- Between C-111 terminal No. 14 and the 3-5 reverse clutch linear solenoid valve: Continuity exists.

Q: Is the check result satisfactory?

YES : Replace the valve body assembly.
NO : Repair or replace the failure section.

STEP 5. Check the TCM and A/T control solenoid valve assembly connector pin terminals and the connection status.

Q: Is the check result normal?

YES : Go to Step 7.
NO : Repair or replace the failure section.

STEP 6. Check the TCM and A/T control solenoid valve assembly connector pin terminals and the connection status.

Q: Is the check result normal?

YES : Replace the TCM.
NO : Repair or replace the failure section.

STEP 7. Erase the DTC code, and drive the vehicle for a while.

Check that the normal code is displayed.

Q: Is the check result normal?

YES : The procedure is complete.
NO : Return to START.

DTC P0768: High Clutch Linear Solenoid Valve System

DESCRIPTIONS OF MONITOR METHODS

1st to 3rd gear driving

- Open or short circuit is detected for 5 seconds.
- The control current of solenoid valve is abnormally large or small.

MONITOR EXECUTION

- 1st, 2nd, and 3rd gear driving

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0731: Malfunction of the 1st gear incorrect ratio

LINE PRESSURE LINEAR SOLENOID VALVE SYSTEM CIRCUIT

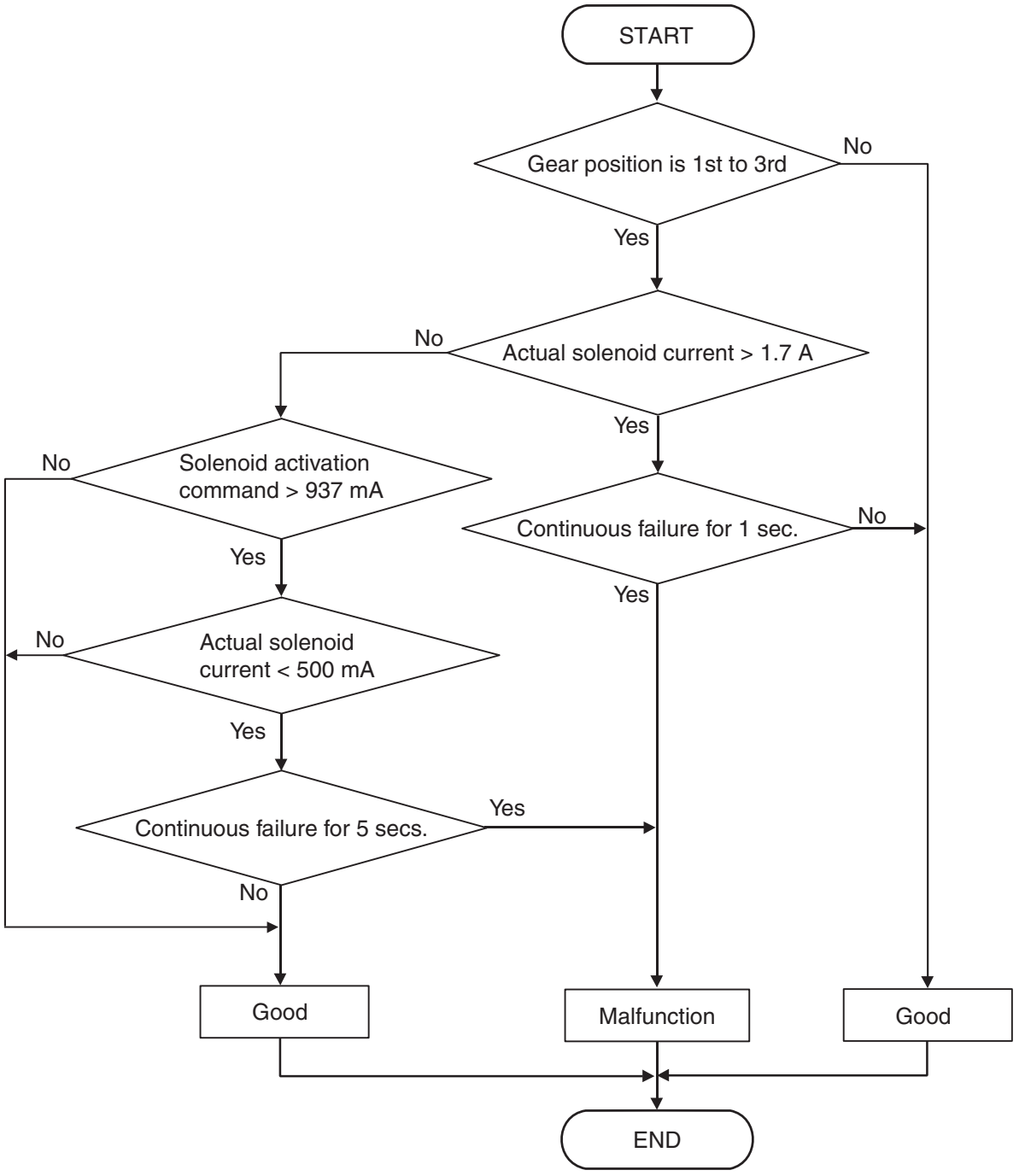
Refer to P.23C-72.

- P0732: Malfunction of the 2nd gear incorrect ratio
- P0733: Malfunction of the 3rd gear incorrect ratio
- P0734: Malfunction of the 4th gear incorrect ratio
- P0735: Malfunction of the 5th gear incorrect ratio
- P0729: Malfunction of the 6th gear incorrect ratio
- P0876: Malfunction of the High clutch pressure switch system

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions <Circuit continuity ground>
- Gear position: 1st to 3rd.

Judgment Criteria <Circuit continuity ground>
- High clutch linear solenoid valve actual current: more than 1.7 A (1 second)

Check Conditions <Circuit continuity open>
- Gear position: 1st to 3rd.
- High clutch linear solenoid valve activation command: more than 937 mA

Judgment Criteria <Circuit continuity open>
- High clutch linear solenoid valve actual current: less than 500 mA. (5 seconds)

OBD-II DRIVE CYCLE PATTERN

Drive in 1st, 2nd, and 3rd gears. Maintain each shift range for 10 second or more.

TSB Revision

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the high clutch linear solenoid valve system circuit
- Damaged harness or connector
- Malfunction of the TCM
- Malfunction of the high clutch linear solenoid valve (valve body assembly)

DIAGNOSIS

STEP 1. Check the TCM terminal voltage.
[C-38 TCM connector (vehicle side, connected)]
Measure the voltage between the terminal No. 1 and body ground.

- High clutch engaged: 0 V
- Other than above: 300 Hz

Q: Is the check result normal?

YES : Go to Step 5.
NO : Go to Step 2.

STEP 2. Check between the TCM connector and A/T control solenoid valve assembly connector.
Check for continuity between C-38 TCM connector and B-111 A/T control solenoid valve assembly connector.

NOTE: Prior to the wiring harness inspection, check the intermediate connectors A-12 and repair that if necessary.

- Between C-38 terminal No. 1 and B-111 terminal No. 19: Continuity exists.

When the continuity check result is OK, check that the wiring harness is not shorted to the body and other wiring harness.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair or replace the failure section.

STEP 3. Check the high clutch linear solenoid.
Refer to P.23C-275.

Q: Is the check result normal?

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

STEP 4. Check between the A/T control solenoid valve assembly connector and the high clutch linear solenoid valve connector.

Check for continuity between the A/T control solenoid valve assembly connector terminals and the high clutch linear solenoid valve connector terminals.

- Between C-111 terminal No. 19 and high clutch linear solenoid valve: Continuity exists.

Q: Is the check result satisfactory?

YES : Replace the valve body assembly.
NO : Repair or replace the failure section.

STEP 5. Check the TCM and A/T control solenoid valve assembly connector pin terminals and the connection status.

Q: Is the check result normal?

YES : Go to Step 7.
NO : Repair or replace the failure section.

STEP 6. Check the TCM and A/T control solenoid valve assembly connector pin terminals and the connection status.

Q: Is the check result normal?

YES : Replace the TCM.
NO : Repair or replace the failure section.

STEP 7. Erase the DTC code, and drive the vehicle for a while.

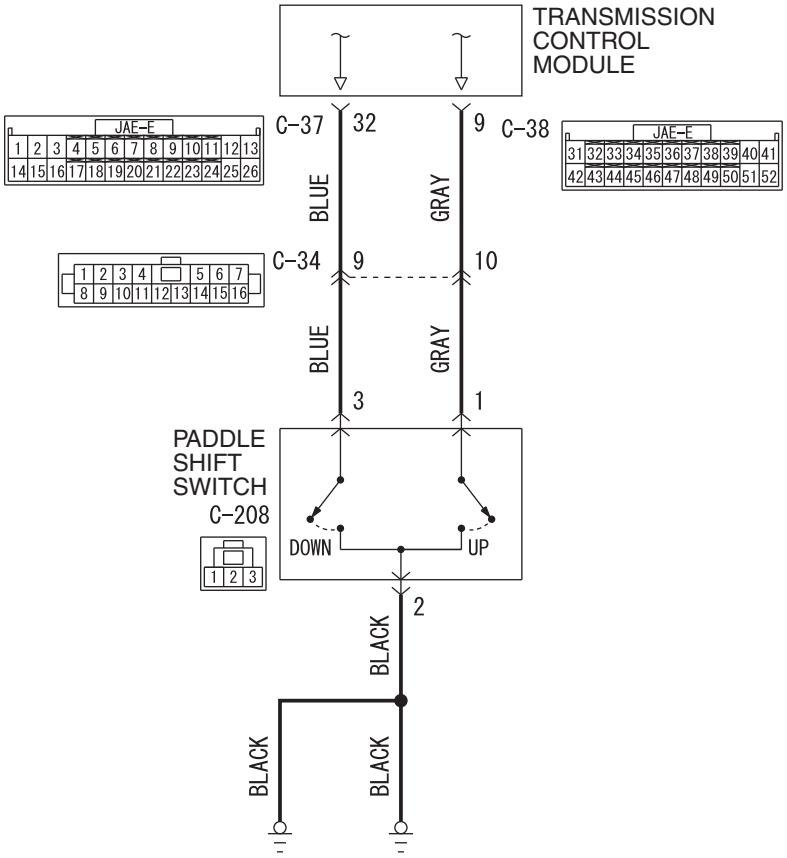
Check that the normal code is displayed.

Q: Is the check result normal?

YES : The procedure is complete.
NO : Return to START.

DTC P0815: Paddle Shift Switch (Up) System

Paddle shift switch system circuit



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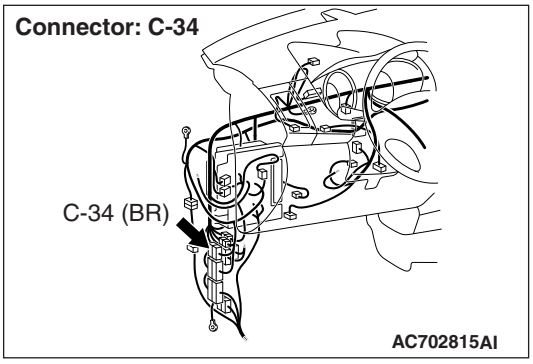
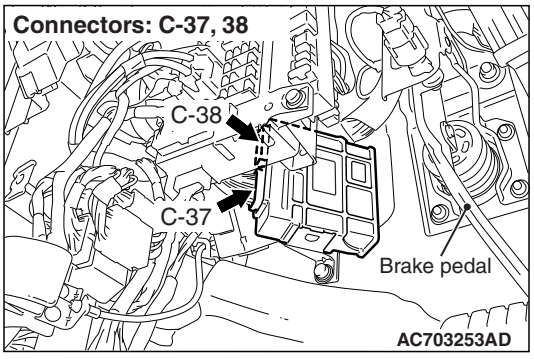
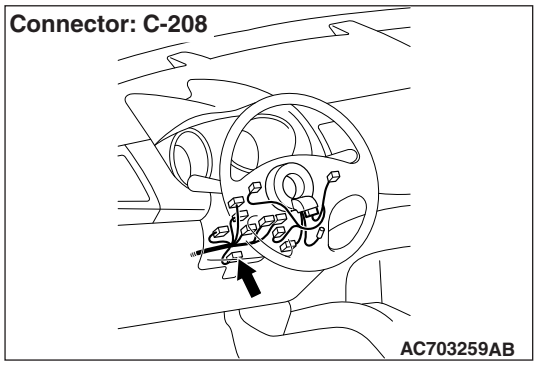




TSB Revision



DESCRIPTIONS OF MONITOR METHODS

- With the ignition switch ON, the paddle shift switch (up) status continues for 60 seconds.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the Paddle shift switch (up) system circuit
- Damaged harness or connector
- Malfunction of the TCM
- Malfunction of the paddle shift switch

DIAGNOSIS

STEP 1. Check the TCM terminal voltage.

[C-38 TCM connector (vehicle side, connected)]

Measure the voltage between C-38 No. 9 and body ground.

- Ignition switch: ON
- Paddle (ON) operated: 1V or less
- Other than above: battery positive voltage

Q: Is the check result normal?

YES : Go to Step 2.
NO : Go to Step 3.

STEP 2. Check the TCM connector, vehicle-side wiring harness connector pin terminal, and the connection status.

Q: Is the check result normal?

YES : Go to Step 6.
NO : Repair or replace the failure section.

STEP 3. Check between the TCM connector and the paddle shift switch (up).

Check for continuity between C-38 TCM connector terminal No. 9 and C-208 paddle shift switch (up).

NOTE: Prior to the wiring harness inspection, check the intermediate connectors C-34 and repair that if necessary.

- Between C-38 terminal No. 9 and C-208 terminal No. 1: Continuity exists.

When the continuity check result is OK, check that the wiring harness is not shorted to the body and other wiring harness.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair or replace the failure section.

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STEP 4. Check the paddle shift switch (up).
Refer to P.23C-276.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair or replace the failure section.

STEP 5. Check the TCM connector, vehicle-side wiring harness connector pin terminal, and the connection status.

Q: Is the check result normal?

YES : Replace the TCM.
NO : Repair or replace the failure section.

STEP 6. Erase the DTC code, and drive the vehicle for a while.
Check that the normal code is displayed.

Q: Is the check result normal?

YES : The procedure is complete.
NO : Return to START.

DTC P0816: Paddle Shift Switch (Down) System

DESCRIPTIONS OF MONITOR METHODS

- With the ignition switch ON, the paddle shift switch (down) status continues for 60 seconds.

PADDLE SHIFT SWITCH (DOWN) SYSTEM CIRCUIT

Refer to P.23C-93.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the Paddle shift switch (down) system circuit
- Damaged harness or connector
- Malfunction of the TCM
- Malfunction of the paddle shift switch

DIAGNOSIS

STEP 1. Check the TCM terminal voltage.
[C-37 TCM connector (vehicle side, connected)]
Measure the voltage between C-37 terminal No. 32 and body ground.

- Ignition switch: ON
- Paddle (ON) operated: 1V or less
- Other than above: battery positive voltage

Q: Is the check result normal?

YES : Go to Step 2.
NO : Go to Step 3.

STEP 2. Check the TCM connector, vehicle-side wiring harness connector pin terminal, and the connection status.

Q: Is the check result normal?

YES : Go to Step 6.
NO : Repair or replace the failure section.

STEP 3. Check between the TCM connector and the paddle shift switch (down).

Check for continuity between C-37 TCM connector and C-208 paddle shift switch (down).

NOTE: Prior to the wiring harness inspection, check the intermediate connectors C-34 and repair that if necessary.

- Between C-37 terminal No. 32 and C-208 terminal No. 3: Continuity exists.

When the continuity check result is OK, check that the wiring harness is not shorted to the body and other wiring harness.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair or replace the failure section.

STEP 4. Check the paddle shift switch (down).

Refer to P.23C-276.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair or replace the failure section.

STEP 5. Check the TCM connector, vehicle-side wiring harness connector pin terminal, and the connection status.

Q: Is the check result normal?

YES : Replace the TCM.
NO : Repair or replace the failure section.

STEP 6. Erase the DTC code, and drive the vehicle for a while.

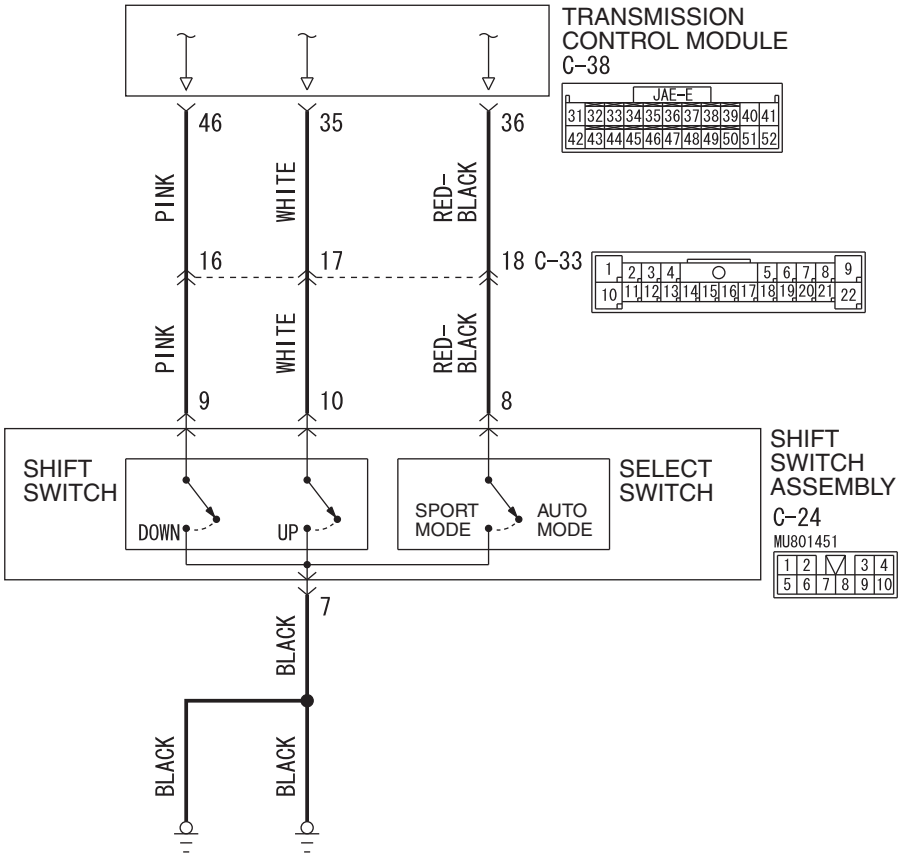
Check that the normal code is displayed.

Q: Is the check result normal?

YES : The procedure is complete.
NO : Return to START.

DTC P0826: Shift Switch Assembly System

Shift switch assembly system circuit



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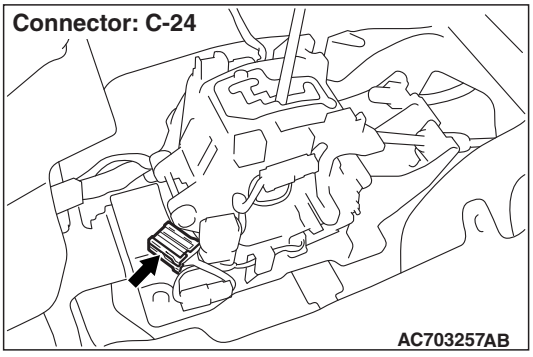
Connector: C-24



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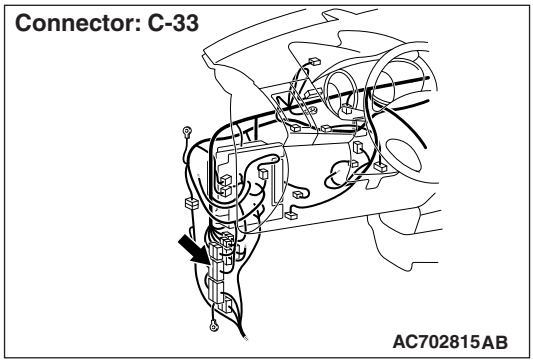
Connector: C-33



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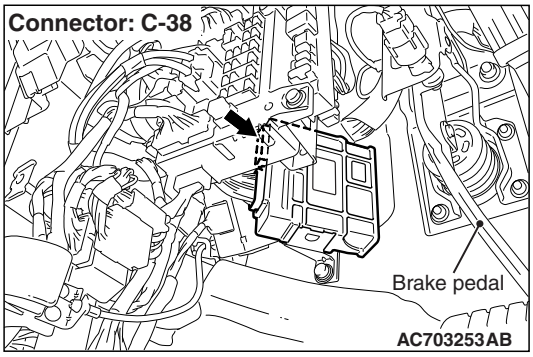


DESCRIPTIONS OF MONITOR METHODS

- With the ignition switch ON, an abnormal signal combination is detected for 2 seconds.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the shift switch assembly system circuit
- Damaged harness or connector
- Malfunction of the TCM
- Malfunction of the select switch
- Malfunction of the Shift switch (up)
- Malfunction of the Shift switch (down)

DIAGNOSIS

STEP 1. Check the TCM terminal voltage.
[C-38 TCM connector (vehicle side, connected)]
Measure the voltage between the TCM connector terminals and body ground.

- Ignition switch: ON
- Between C-38 terminal No. 36 and body ground
  Sport mode selected: 1 V or less
  Other than above: battery positive voltage
- Between C-38 terminal No. 35 and body ground
  Shift switch (up) operated: 1V or less
  Other than above: battery positive voltage
- Between C-38 terminal No. 46 and body ground
  Shift switch (down) operated: 1 V or less
  Other than above: battery positive voltage

Q: Is the check result normal?

YES : Go to Step 2.
NO : Go to Step 3.

STEP 2. Check the TCM connector, vehicle-side wiring harness connector pin terminal, and the connection status.

Q: Is the check result normal?

YES : Go to Step 9.
NO : Repair or replace the failure section.

STEP 3. Check between the TCM connector and the select switch.

Check for continuity between the C-38 TCM connector and the C-24 select switch.

NOTE: Prior to the wiring harness inspection, check the intermediate connectors C-33 and repair that if necessary.

- Between C-38 terminal No. 36 and C-24 terminal No. 8: Continuity exists.

When the continuity check result is OK, check that the wiring harness is not shorted to the body and other wiring harness.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair or replace the failure section.

STEP 4. Check between the shift switch assembly and body ground.

Check for continuity between the C-24 shift switch assembly (ground) and body ground.

- Between C-24 terminal No. 7 and body ground: Continuity exists.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair or replace the failure section.

STEP 5. Check between the TCM connector and the shift switch (up).

Check for continuity between the C-38 TCM connector and the shift switch (up).

- Between C-38 terminal No. 35 and C-24 terminal No. 10: Continuity exists.

When the continuity check result is OK, check that the wiring harness is not shorted to the body and other wiring harness.

Q: Is the check result normal?

YES : Go to Step 6.
NO : Repair or replace the failure section.

STEP 6. Check between the TCM connector and the shift switch (down).

Check for continuity between the C-38 TCM connector and the shift switch (down).

- Between C-38 terminal No. 46 and C-24 terminal No. 9: Continuity exists.

When the continuity check result is OK, check that the wiring harness is not shorted to the body and other wiring harness.

Q: Is the check result normal?

YES : Go to Step 7.
NO : Repair or replace the failure section.

STEP 7. Check the shift switch assembly as a single unit.
Refer to P.23C-284.

Q: Is the check result normal?

YES : Go to Step 8.
NO : Repair or replace the failure section.

STEP 8. Check the TCM, vehicle-side wiring harness connector pin terminal, and the connection status.

Q: Is the check result normal?

YES : Replace the TCM.
NO : Repair or replace the failure section.

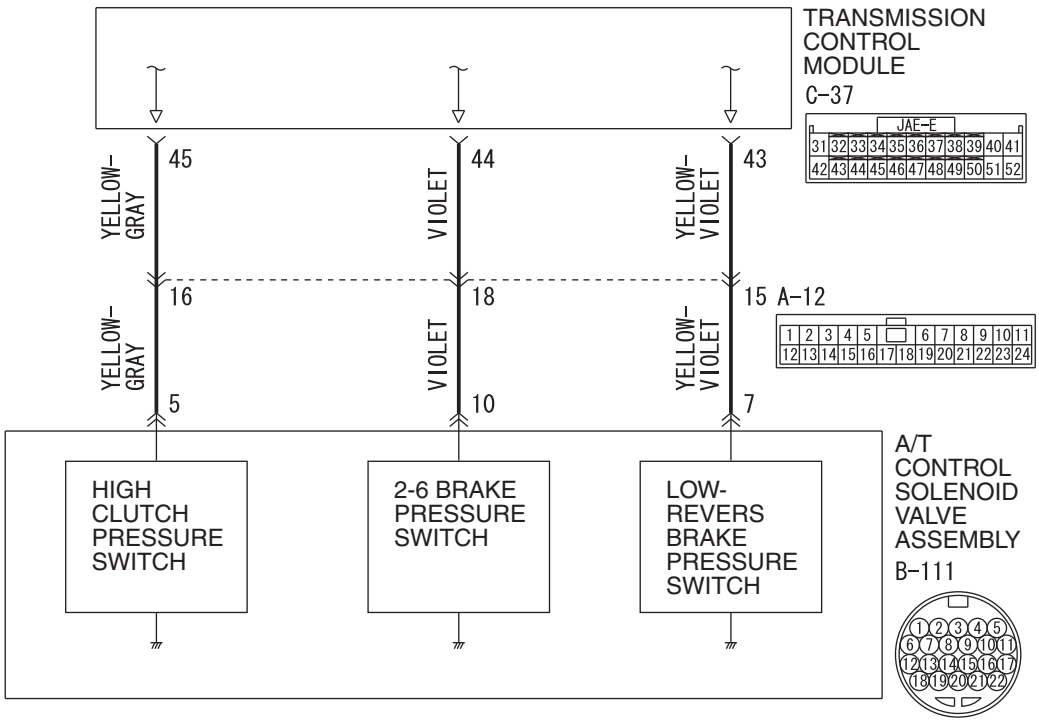
STEP 9. Erase the DTC code, and drive the vehicle for a while.
Check that the normal code is displayed.

Q: Is the check result normal?

YES : The procedure is complete.
NO : Return to START.

DTC P0846: 2-6 Brake Pressure Switch System

Pressure switch system circuit



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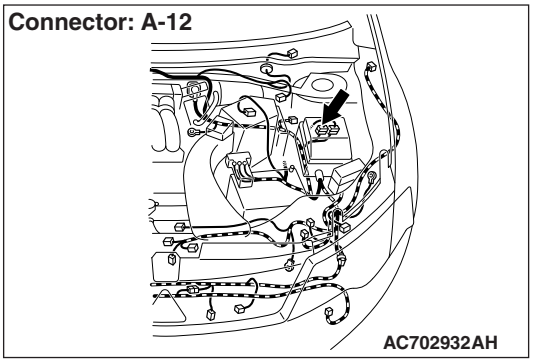
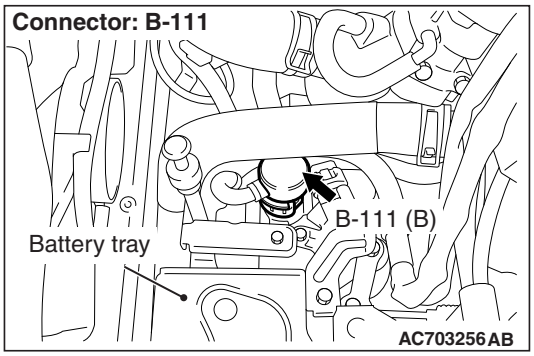
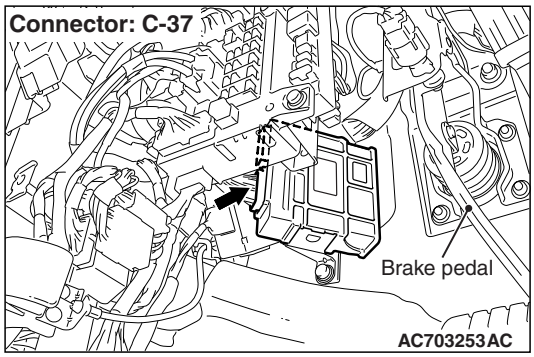






DESCRIPTIONS OF MONITOR METHODS

- With the solenoid failure not detected and during 2nd or 6th gear driving, the switch OFF status continues for 2 seconds. (The detection is achieved twice during 1 driving cycle[*1], and it continues for 2 driving cycles.)

  [*1]: Indicates the series of driving cycle "ignition key OFF →ON →drive →OFF." The "1 driving cycle," "2 driving cycle," and so on indicates how many cycles are required to detect a failure.

MONITOR EXECUTION

- 2nd or 6th gear driving

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

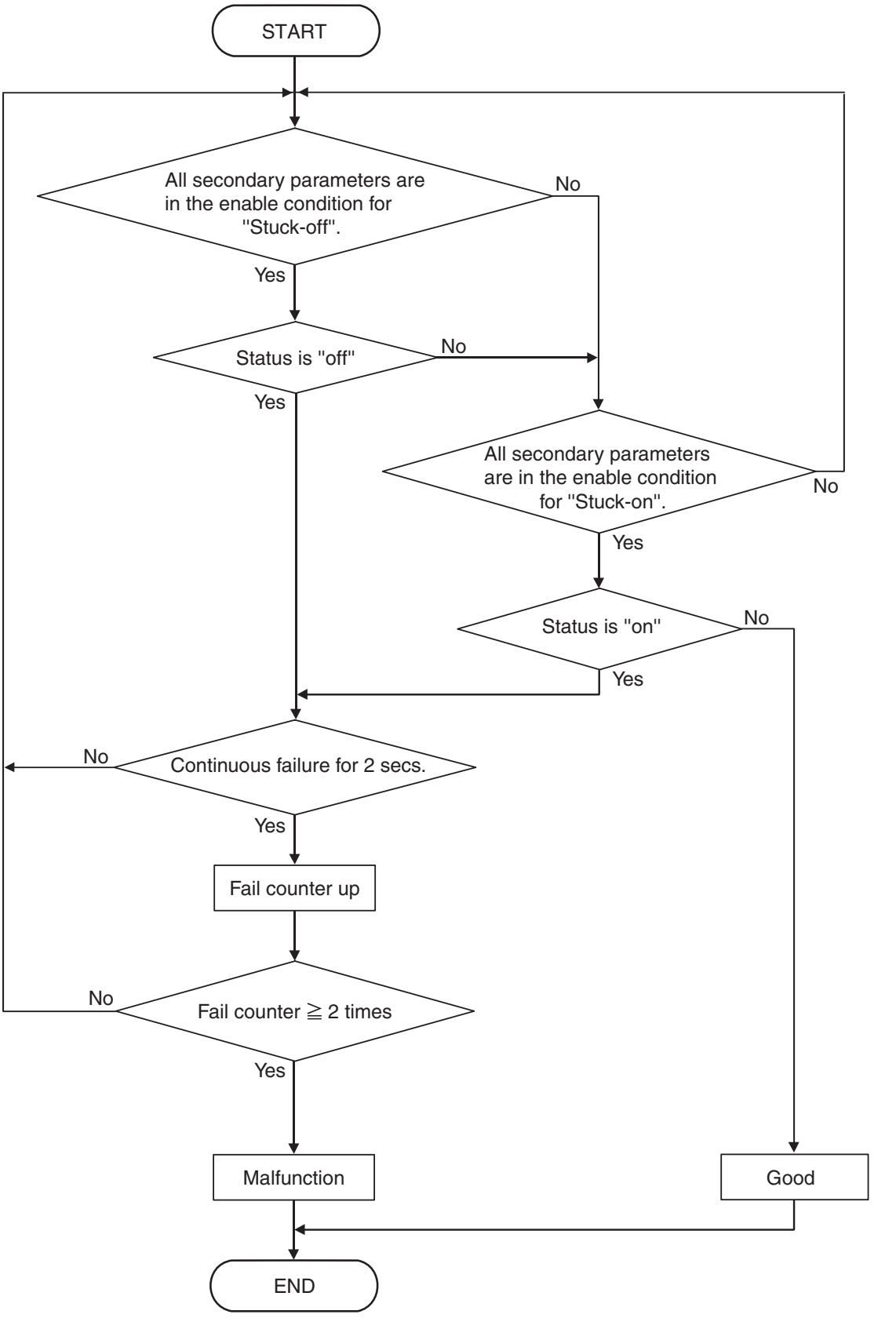
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



TSB Revision

DTC SET CONDITIONS

Check Conditions <Stuck-off>
- Transmission range switch position: D
- Gear position: 2nd, 6th
- Time after shift changing finish: 2 seconds or more

Judgment Criteria <Stuck-off>
- 2-6 brake pressure switch status: OFF (2 seconds × 2times)

Check Conditions <Stuck-on>
- Transmission range switch position: D or R
- Gear position: 1st, 3rd, 4th, 5th, reverse
- Time after shift changing finish: 2 seconds or more

Judgment Criteria <Stuck-on>
- 2-6 brake pressure switch status: ON (2 seconds × 2times)

OBD-II DRIVE CYCLE PATTERN

Drive in 2nd and 6th gears for 2 seconds or more.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the 2-6 brake pressure switch system circuit
- Damaged harness or connector
- Malfunction of the TCM
- Malfunction of the 2-6 brake pressure switch (valve body assembly)
- Malfunction of the valve body assembly, abnormal hydraulic circuit valve.

⚠ CAUTION
For the incomplete gear shifting and slippage, first refer to the SYMPTOM CHART P.23C-28.

DIAGNOSIS

STEP 1. Check the DTC.

Q: Is the DTC other than the pressure switch set? (Is the code other than P0846, P0876, and P0988 set?)

YES : Check and repair the relevant DTC system.
NO : Go to Step 2.

STEP 2. Check the TCM terminal voltage.

[C-37 TCM connector (vehicle side, connected)]
Measure the voltage between C-37 terminal No. 44 and body ground.
- 2-6 brake engaged: 0 V
- Other than above: Battery positive voltage

Q: Is the check result normal?

YES : Go to Step 3.
NO : Go to Step 7.

STEP 3. Check between the TCM connector and A/T control solenoid valve assembly.

Check for continuity between C-37 TCM connector and B-111 A/T control solenoid valve assembly connector.

NOTE: Prior to the wiring harness inspection, check the intermediate connectors A-12 and repair that if necessary.
- Between C-37 terminal No. 44 and B-111 terminal No. 10: Continuity exists.

When the continuity check result is OK, check that the wiring harness is not shorted to the body and other wiring harness.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair or replace the failure section.

STEP 4. Check the TCM, A/T control solenoid valve assembly connector pin terminals, and the connection status.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair or replace the failure section.

STEP 5. Check between the A/T control solenoid valve assembly connector and 2-6 brake pressure switch connector.

Check for continuity between the B-111 A/T control solenoid valve assembly connector terminals and 2-6 brake pressure switch connector terminals.

- Between B-111 terminal No. 10 and 2-6 brake pressure switch: Continuity exists.

When the continuity check result is OK, check that the wiring harness is not shorted to the body and other wiring harness.

Q: Is the check result normal?

YES : Go to Step 6.
NO : Repair or replace the failure section.

STEP 6. Check the 2-6 brake pressure switch body ground.

Check for continuity between the 2-6 brake pressure switch body and ground.

- Between the 2-6 brake pressure switch body and body ground: Continuity exists.

Q: Is the check result normal?

YES : Replace the valve body assembly, and then go to Step 8.
NO : Repair or replace the failure section.

STEP 7. Check the TCM, A/T control solenoid valve assembly connector pin terminals, and the connection status.

Q: Is the check result normal?

YES : Go to Step 9.
NO : Repair or replace the failure section.

STEP 8. Erase the DTC code, and drive the vehicle for a while.

Check that the normal code is displayed.

Q: Is the check result normal?

YES : The procedure is complete.
NO : Replace the TCM.

STEP 9. Erase the DTC code, and drive the vehicle for a while.
Check that the normal code is displayed.

Q: Is the check result normal?

YES : The procedure is complete.
NO : Return to START.

DTC P0876: High Clutch Pressure Switch System

PRESSURE SWITCH SYSTEM CIRCUIT

Refer to P.23C-100.

DESCRIPTIONS OF MONITOR METHODS

- With the solenoid failure not detected and with 4th to 6th gear driving, the switch OFF status continues for 2 seconds. (The detection is achieved twice during 1 driving cycle[*1], and it continues for 2 driving cycles.)

  [*1]: Indicates the series of driving cycle "ignition key OFF →ON →drive →OFF." The "1 driving cycle," "2 driving cycle," and so on indicates how many cycles are required to detect a failure.

MONITOR EXECUTION

- 4th, 5th, and 6th gear driving

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

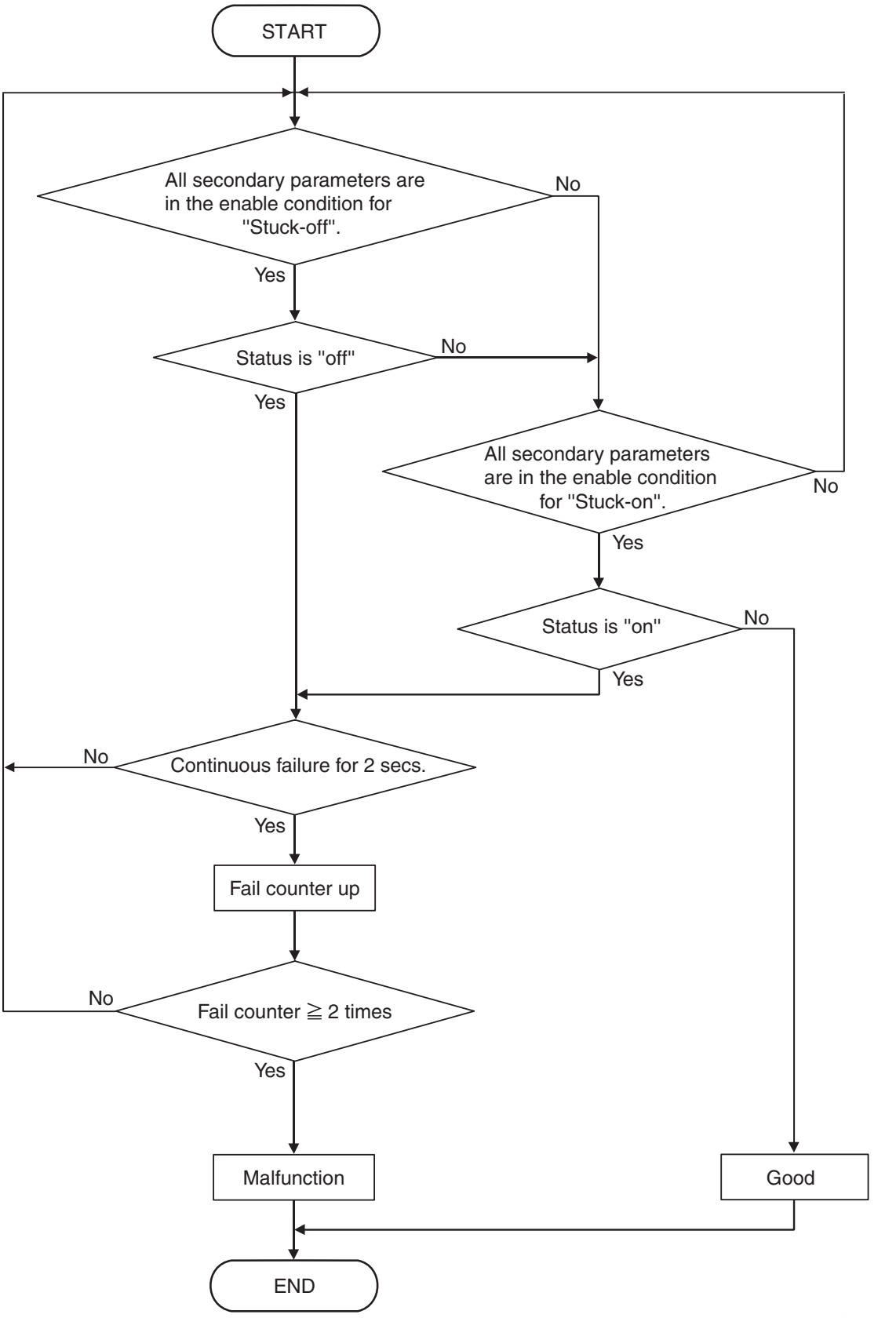
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



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DTC SET CONDITIONS

Check Conditions <Stuck-off>
- Transmission range switch position: D
- Gear position: 4th, 5th, 6th
- Time after shift changing finish: 2 seconds or more

Judgment Criteria <Stuck-off>
- High clutch pressure switch status: OFF (2 seconds × 2times)

Check Conditions <Stuck-on>
- Transmission range switch position: D or R
- Gear position: 1st, 2nd, 3rd, reverse
- Time after shift changing finish: 2 seconds or more

Judgment Criteria <Stuck-on>
- High clutch pressure switch status: ON (2 seconds × 2times)

OBD-II DRIVE CYCLE PATTERN

Drive in 4th, 5th, and 6th gears for 2 seconds or more.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the high clutch pressure switch system circuit
- Damaged harness or connector
- Malfunction of the TCM
- Malfunction of the high clutch pressure switch system (valve body assembly)
- Malfunction of the valve body assembly, abnormal hydraulic circuit valve.

⚠ CAUTION
For the incomplete gear shifting and slippage, first refer to the SYMPTOM CHART P.23C-28.

DIAGNOSIS

STEP 1. Check the DTC.

Q: Is the DTC other than the pressure switch set? (Is the code other than P0846, P0876, and P0988 set?)

YES : Check and repair the relevant DTC system.
NO : Go to Step 2.

STEP 2. Check the TCM terminal voltage.

[C-37 TCM connector (vehicle side, connected)]
Measure the voltage between C-37 terminal No. 45 and body ground.
- High clutch engaged: 0 V
- Other than above: Battery positive voltage

Q: Is the check result normal?

YES : Go to Step 3.
NO : Go to Step 7.

STEP 3. Check between the TCM connector and A/T control solenoid valve assembly.

Check for continuity between C-37 TCM connector and B-111 A/T control solenoid valve assembly connector.

NOTE: Prior to the wiring harness inspection, check the intermediate connectors A-12 and repair that if necessary.
- Between C-37 terminal No. 45 and B-111 terminal No. 5: Continuity exists.

When the continuity check result is OK, check that the wiring harness is not shorted to the body and other wiring harness.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair or replace the failure section.

STEP 4. Check the TCM, A/T control solenoid valve assembly connector pin terminals, and the connection status.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair or replace the failure section.

STEP 5. Check between the A/T control solenoid valve assembly connector and high clutch pressure switch.

Check for continuity between the B-111 A/T control solenoid valve assembly connector terminals and the high clutch pressure switch connector terminals.

- Between B-111 terminal No. 5 and high clutch pressure switch: Continuity exists.

When the continuity check result is OK, check that the wiring harness is not shorted to the body and other wiring harness.

Q: Is the check result normal?

YES : Go to Step 6.
NO : Repair or replace the failure section.

STEP 6. Check the high clutch pressure switch body ground.

Check for continuity between the high clutch pressure switch body and ground.

- Between the high clutch pressure switch body and body ground: Continuity exists.

Q: Is the check result normal?

YES : Replace the valve body assembly, and then go to Step 8.
NO : Repair or replace the failure section.

STEP 7. Check the TCM, A/T control solenoid valve assembly connector pin terminals, and the connection status.

Q: Is the check result normal?

YES : Go to Step 9.
NO : Repair or replace the failure section.

STEP 8. Erase the DTC code, and drive the vehicle for a while.

Check that the normal code is displayed.

Q: Is the check result normal?

YES : The procedure is complete.
NO : Replace the TCM.

STEP 9. Erase the DTC code, and drive the vehicle for a while.
Check that the normal code is displayed.

Q: Is the check result normal?

YES : The procedure is complete.
NO : Return to START.

DTC P0893: Interlock Detection

DESCRIPTIONS OF MONITOR METHODS

When sudden deceleration (2.5 m/s^2) exceeding the setting time is detected with combination as follows; Stoplight switch: correct, output shaft speed sensor: correct, hydraulic switch: incorrect.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

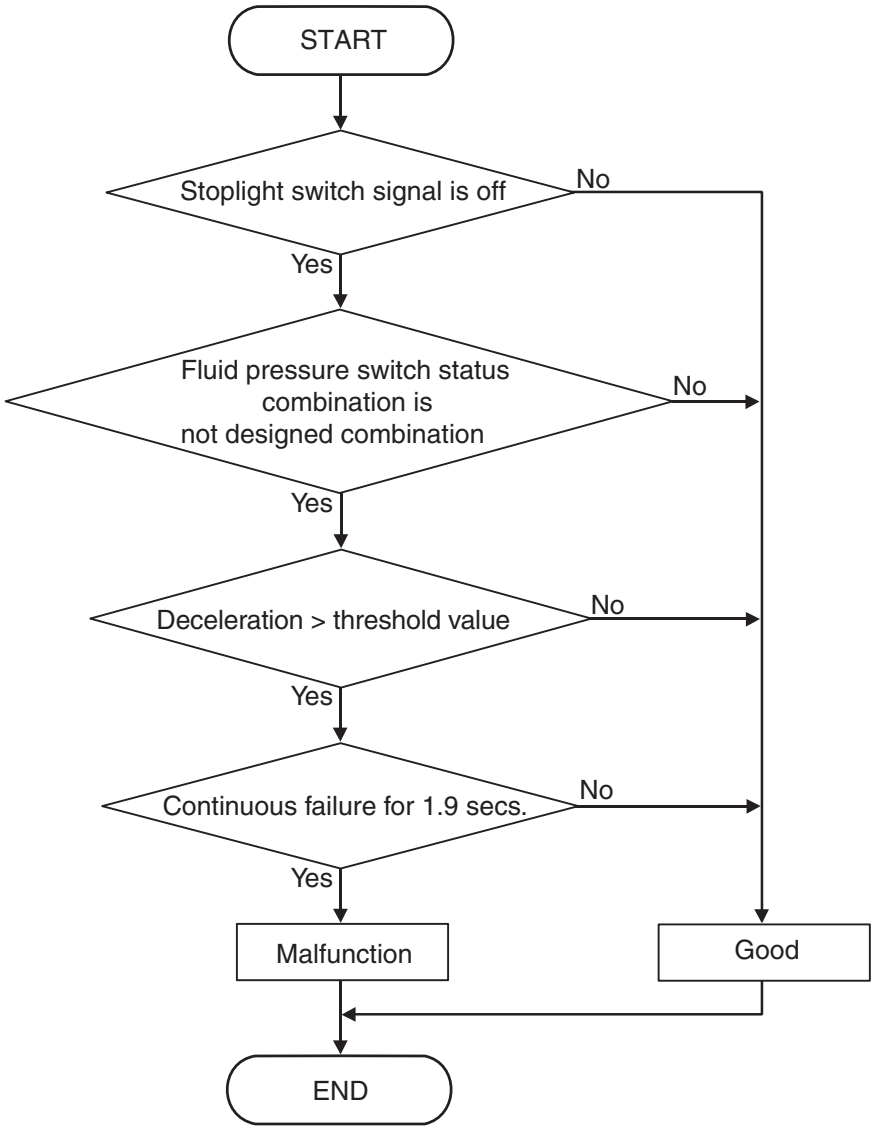
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



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DTC SET CONDITIONS

Check Conditions

- Fluid pressure switch status combination: not designed combination
- Stoplight switch signal: OFF.

Judgement Criteria

- Deceleration: more than threshold value. (1.9 second)

OBD-II DRIVE CYCLE PATTERN

Start the engine, drive at 60 km/h (37.3 mph) or more for 15 minutes in total.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the P0720: output shaft speed sensor system circuit
- Damaged harness or connector
- Malfunction of the P0743: lock-up and low-reverse brake linear solenoid valve system circuit
- Malfunction of the P0753: low clutch linear solenoid valve system circuit
- Malfunction of the P0758: 2-6 brake linear solenoid valve system circuit
- Malfunction of the P0763: 3-5 reverse clutch linear solenoid valve system circuit
- Malfunction of the P0768: high clutch linear solenoid valve system circuit

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- Malfunction of the P1753: low clutch shift solenoid valve system circuit
- Malfunction of the P1758: low-reverse brake shift solenoid valve system circuit
- Malfunction of the P0846: 2-6 brake pressure switch system circuit
- Malfunction of the P0876: high clutch pressure switch system circuit
- Malfunction of the P0988: low-reverse brake pressure switch system circuit

DIAGNOSIS

STEP 1. Check the DTC.

Check if the following DTCs are set.

- P0720 output shaft speed sensor
- P0743 lock-up and low-reverse brake linear solenoid valve
- P0753 low clutch linear solenoid valve
- P0758 2-6 brake linear solenoid valve
- P0763 3-5 reverse clutch linear solenoid valve
- P0768 high clutch linear solenoid valve
- P1753 low clutch shift solenoid valve
- P1758 low-reverse brake shift solenoid valve
- P0846 2-6 brake pressure switch
- P0876 high clutch pressure switch
- P0988 low-reverse brake pressure switch

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair or replace the failure section.

STEP 2. Check TCM related to the solenoid, pressure switch and output shaft speed sensor, the A/T control solenoid valve assembly connector pin terminals, and the connection status.

Q: Is the check result normal?

YES : Replace the TCM, and then go to Step 3.
NO : Repair or replace the failure section.

STEP 3. Erase the DTC code, and drive the vehicle for a while.

Check that the normal code is displayed.

Q: Is the check result normal?

YES : The procedure is complete.
NO : Replace the transaxle assembly.

DTC P0988: Low-Reverse Brake Pressure Switch System

PRESSURE SWITCH SYSTEM CIRCUIT

Refer to P.23C-100.

DESCRIPTIONS OF MONITOR METHODS

- During reverse driving, the switch OFF status continues for 2 seconds. (The detection is achieved twice during 1 driving cycle[*1], and it continues for 2 driving cycles.)

  [*1]: Indicates the series of driving cycle "ignition key OFF →ON →drive →OFF." The "1 driving cycle," "2 driving cycle," and so on indicates how many cycles are required to detect a failure.

MONITOR EXECUTION

- Reverse gear driving

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

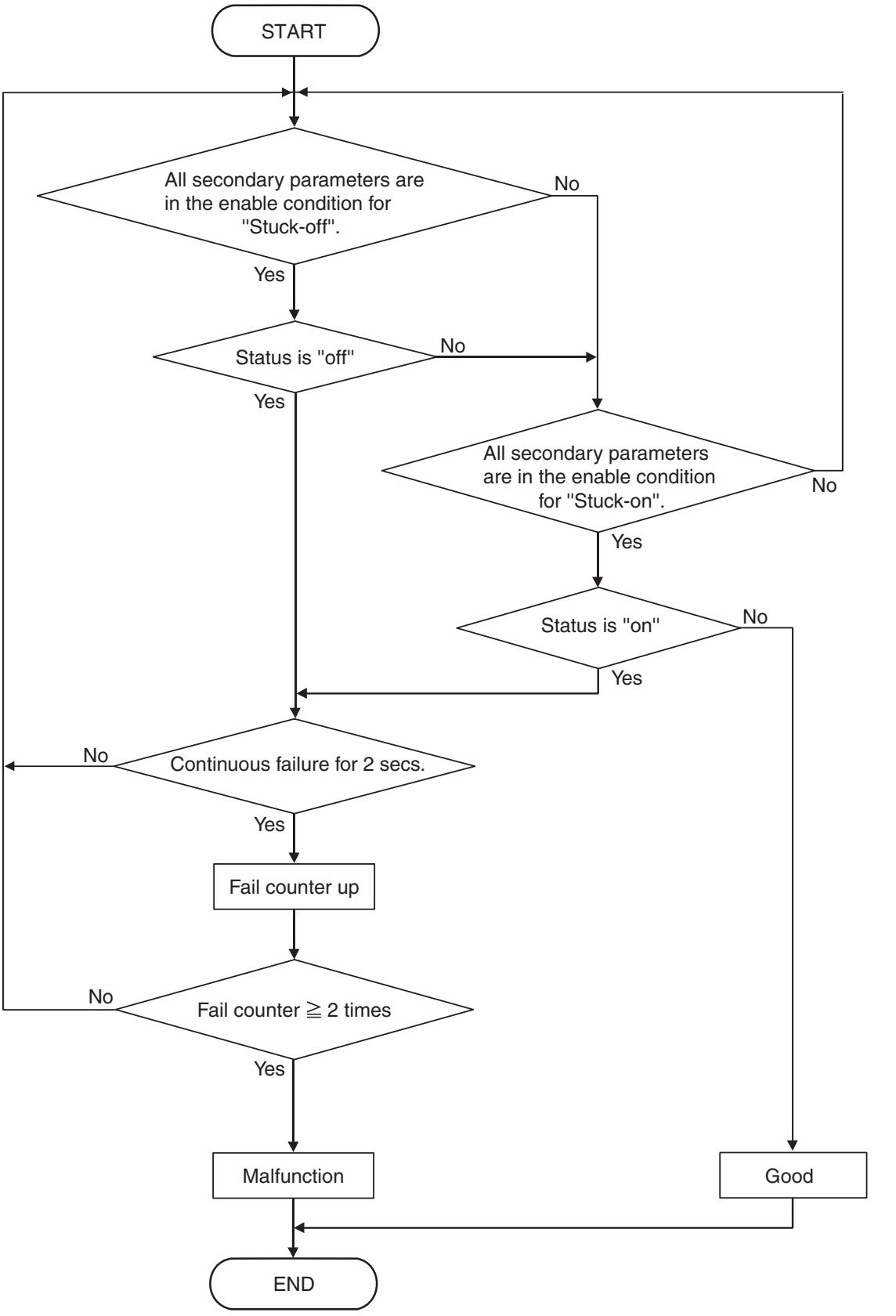
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



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DTC SET CONDITIONS

Check Conditions <Stuck-off>
- Transmission range switch position: R
- Gear position: reverse
- Time after shift changing finish: 2 seconds or more

Judgment Criteria <Stuck-off>
- Low-reverse brake pressure switch status: OFF (2 seconds × 2times)

Check Conditions <Stuck-on>
- Transmission range switch position: D
- Gear position: 1st, 2nd, 3rd, 4th, 5th, 6th
- Time after shift changing finish: 2 seconds or more

Judgment Criteria <Stuck-on>
- Low-reverse brake pressure switch status: ON (2 seconds × 2times)

OBD-II DRIVE CYCLE PATTERN

Reverse gear driving for 2 seconds or more

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the low-reverse brake pressure switch system circuit
- Damaged harness or connector
- Malfunction of the TCM
- Malfunction of the low-reverse brake pressure switch system (valve body assembly)
- Malfunction of the valve body assembly, abnormal hydraulic circuit valve.

⚠ CAUTION
For the incomplete gear shifting and slippage, first refer to the SYMPTOM CHART P.23C-28.

DIAGNOSIS

STEP 1. Check the DTC.

Q: Is the DTC other than the pressure switch set? (Is the code other than P0846, P0876, and P0988 set?)

YES : Check and repair the relevant DTC system.
NO : Go to Step 2.

STEP 2. Check the TCM terminal voltage.

[C-37 TCM connector (vehicle side, connected)]
Measure the voltage between C-37 terminal No. 43 and body ground.
- Low-reverse brake engaged: 0 V
- Other than above: Battery positive voltage

Q: Is the check result normal?

YES : Go to Step 3.
NO : Go to Step 7.

STEP 3. Check between the TCM connector and A/T control solenoid valve assembly.

Check for continuity between C-37 TCM connector and B-111 A/T control solenoid valve assembly connector.

NOTE: Prior to the wiring harness inspection, check the intermediate connectors A-12 and repair that if necessary.
- Between C-37 terminal No. 43 and B-111 terminal No. 7: Continuity exists.

When the continuity check result is OK, check that the wiring harness is not shorted to the body and other wiring harness.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair or replace the failure section.

STEP 4. Check the TCM, A/T control solenoid valve assembly connector pin terminals, and the connection status.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair or replace the failure section.

STEP 5. Check between the A/T control solenoid valve assembly connector and low-reverse brake pressure switch.

Check for continuity between the B-111 A/T control solenoid valve assembly connector terminals and the low-reverse brake pressure switch connector terminals.

- Between B-111 terminal No. 7 and low-reverse brake pressure switch: Continuity exists.

When the continuity check result is OK, check that the wiring harness is not shorted to the body and other wiring harness.

Q: Is the check result normal?

YES : Go to Step 6.
NO : Repair or replace the failure section.

STEP 6. Check the low-reverse brake pressure switch body ground.

Check for continuity between the low-reverse brake pressure switch body and ground.

- Between the low-reverse brake pressure switch body and body ground: Continuity exists.

Q: Is the check result normal?

YES : Replace the valve body assembly, and then go to Step 8.
NO : Repair or replace the failure section.

STEP 7. Check the TCM, A/T control solenoid valve assembly connector pin terminals, and the connection status.

Q: Is the check result normal?

YES : Go to Step 9.
NO : Repair or replace the failure section.

STEP 8. Erase the DTC code, and drive the vehicle for a while.

Check that the normal code is displayed.

Q: Is the check result normal?

YES : The procedure is complete.
NO : Replace the TCM.

STEP 9. Erase the DTC code, and drive the vehicle for a while.
Check that the normal code is displayed.

Q: Is the check result normal?

YES : The procedure is complete.
NO : Return to START.

DTC P1705: Throttle Position Sensor Information (Engine)

DESCRIPTIONS OF MONITOR METHODS

With the vehicle speed 5 km/h (3.1 mph) or more or the output shaft speed sensor normal, and after the A/T-ECU startup, when approximately 1 second has elapsed, if the TPS fail signal is received for 5 seconds, or the APS fail signal is received for 3 seconds from the engine ECU.

MONITOR EXECUTION

- Vehicle speed 5 km/h (3.1 mph) or more

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

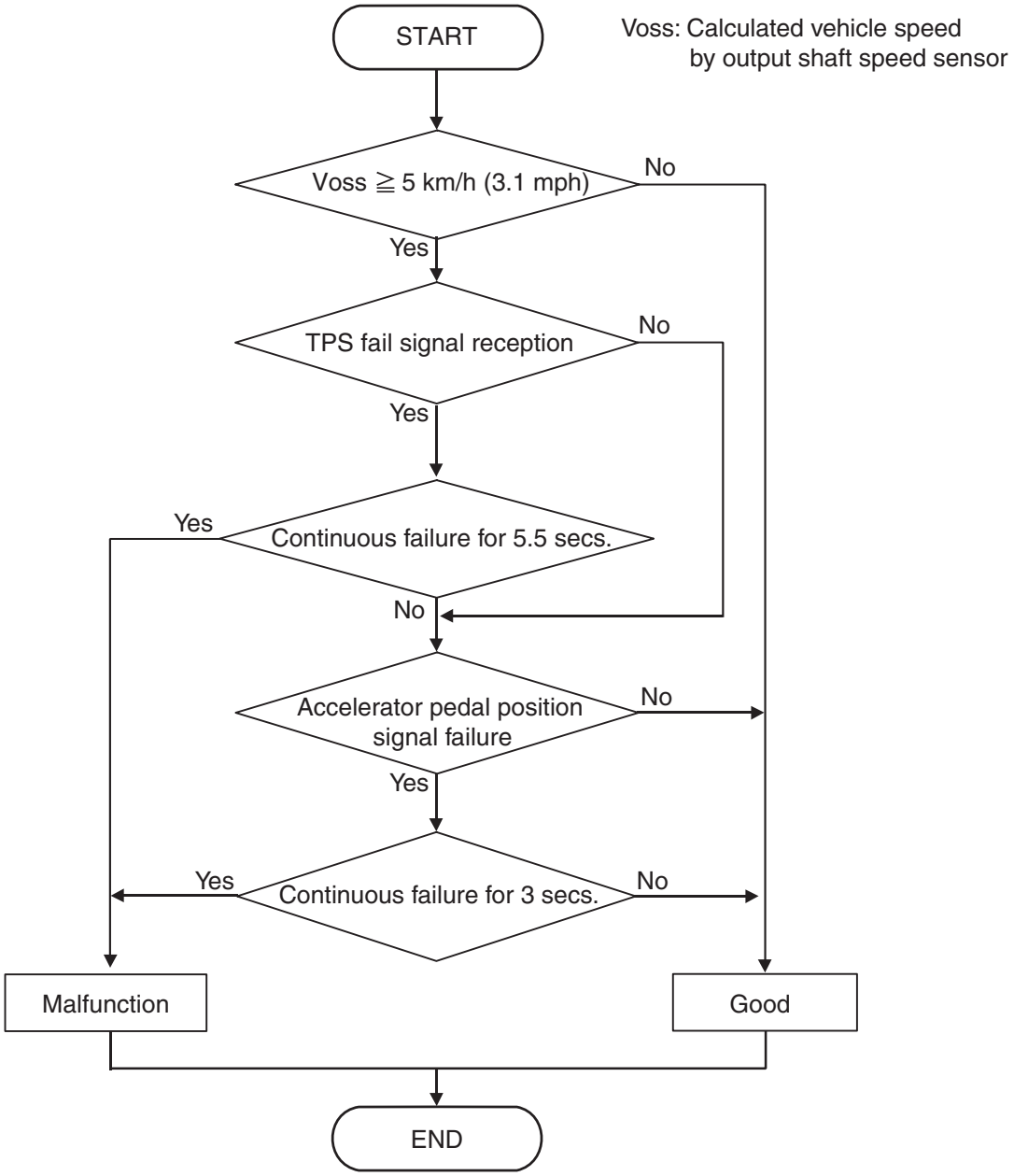
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



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DTC SET CONDITIONS

Check Conditions <Throttle position sensor>
- TCM is started: more than 1.05 seconds.
- Vehicle speed: 5 km/h(3.1 mph) or more.

Judgement Criteria <Throttle position sensor>
- Throttle position sensor signal: fail. (5.5 seconds)

Check Conditions <Accelerator pedal position sensor>
- TCM is started: more than 1.05 seconds.

Judgement Criteria <Accelerator pedal position sensor>
- Accelerator pedal position sensor signal: fail. (3 seconds)

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OBD-II DRIVE CYCLE PATTERN

Drive with the vehicle speed 5 km/h (3.1 mph) or more for 5 seconds or more.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the CAN
- Malfunction of the ECM
- Damaged harness or connector
- Malfunction of the throttle position sensor
- Malfunction of the TCM

DIAGNOSIS

STEP 1. Check for CAN communication system malfunction.

Q: Are the DTC U0001, U0100, U0141, P1705, P1706 set?

YES : Check and repair the CAN communication system.
NO : Go to Step 2.

STEP 2. Check the throttle position sensor and ECM-side main unit and connector wiring.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair or replace the failure section.

STEP 3. Erase the DTC code, and drive the vehicle for a while.

Check that the normal code is displayed.

Q: Is the check result normal?

YES : The procedure is complete.
NO : Replace the TCM.

DTC P1706: Accelerator Pedal Position Information

DESCRIPTIONS OF MONITOR METHODS

- When approx. 1 second has elapsed after TCM started, the throttle pedal position signal seizure is detected for 3 seconds.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

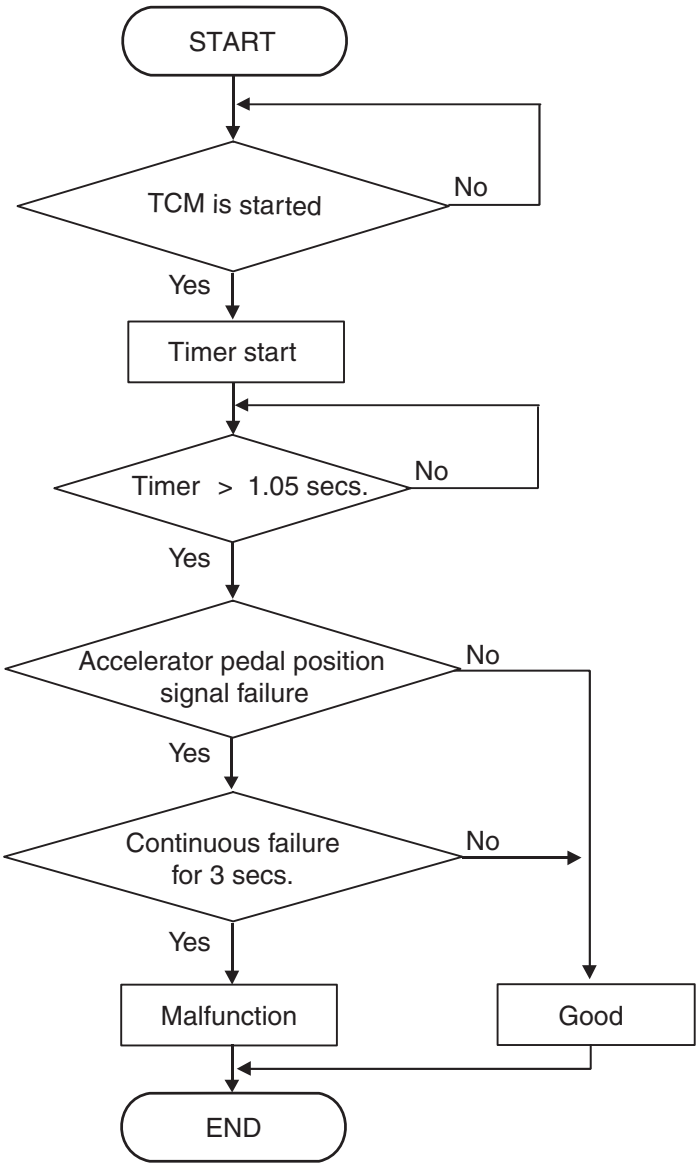
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0712: Malfunction of the transmission fluid temperature sensor (Short circuit)
- P0715: Malfunction of the Input shaft speed sensor system

Sensor (The sensor below is determined to be normal)

- Transmission fluid temperature sensor
- Input shaft speed sensor

LOGIC FLOW CHARTS (Monitor Sequence)



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DTC SET CONDITIONS

Check Conditions

- TCM is started: more than 1.05 seconds.

Judgement Criteria

- Accelerator pedal position sensor signal: fail. (3 seconds)

OBD-II DRIVE CYCLE PATTERN

With the ignition switch ON, maintain the status for 10 seconds or more.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the CAN
- Malfunction of the ECM
- Damaged harness or connector
- Malfunction of the throttle position sensor

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DIAGNOSIS

STEP 1. Is the DTC code for ECM displayed?
Check that the failure related to the engine does not occur.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair or replace the failure section.

STEP 2. Check the throttle position sensor and ECM-side main unit and connector wiring.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair or replace the failure section.

STEP 3. Erase the DTC code, and drive the vehicle for a while.
Check that the normal code is displayed.

Q: Is the check result normal?

YES : The procedure is complete.
NO : Return to START.

DTC P1731: 1st Engine Brake Detection

DESCRIPTIONS OF MONITOR METHODS

- With the mode other than SPORT MODE and with the accelerator angle is smaller than 6/8, the correlation between the lock-up and low-reverse brake linear solenoid valve control current and the low-reverse brake pressure switch ON/OFF is abnormal.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Transaxle assembly powertrain parts failure
- Malfunction of the valve assembly (Malfunction of hydraulic valve and hydraulic switch)
- Malfunction of the TCM
- Malfunction of the lock-up and low-reverse brake linear solenoid valve (valve assembly)
- Malfunction of the low-reverse brake pressure switch (valve assembly)
- Malfunction of the low clutch pressure switch (valve assembly)
- Malfunction of the low clutch linear solenoid valve (valve assembly)
- Malfunction of the low-reverse brake shift solenoid valve (valve assembly)
- Malfunction of the low clutch, low-reverse brake

DIAGNOSIS

STEP 1. Check the DTC.
Check that P0988 (Low-reverse brake pressure switch) is set.

Q: Is the DTC set?

YES : Check and repair the relevant DTC system.
NO : Go to Step 2.

STEP 2. Check the DTC.
Check that the DTC other than P1731 (1st engine brake detection) is set.

Q: Is the DTC set?

YES : Check and repair the relevant DTC system.
NO : Go to Step 3.

STEP 3. Check the transmission fluid properties.
Check the status of the transmission fluid properties (smell, color, fouling).

- Black: A/T inside damage, seizure
- Milky: Water intrusion

Q: Is the check result normal?

YES : Go to Step 4.
NO : Remove the A/T from the vehicle, then check and repair the inside.

STEP 4. Check the transmission fluid level.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Adjust the transmission fluid level, and then go to Step 5.

STEP 5. Check the wiring harness, connector, and sensor signal.

- Check the wiring harness and connectors of the low-clutch pressure switch and low-reverse brake pressure switch.
- Check the signals of C-37 TCM connector terminal No. 37 (output shaft speed sensor) and the terminal No. 38 (input shaft speed sensor).
  Refer to P.23C-159.

Q: Is the check result normal?

YES : Go to Step 6.
NO : Repair or replace the failure section.

STEP 6. Hydraulic pressure test
Refer to P.23C-24.

Q: Is the check result normal?

YES : Go to Step 7.
NO : Remove the A/T from the vehicle, then check and repair the inside.

STEP 7. Erase the DTC code, and drive the vehicle for a while.
Check that the normal code is displayed.

Q: Is the check result normal?

YES : The procedure is complete.
NO : Return to START.

DTC P1753: Low Clutch Shift Solenoid Valve System

SOLENOID VALVE SYSTEM CIRCUIT

Refer to P.23C-72.

DESCRIPTIONS OF MONITOR METHODS

- During 1st to 4th driving, and with the lock-up function deactivated, an open circuit is detected for 200 milliseconds.
- During the 5th to 6th driving, and with the lock-up function deactivated, a short circuit is detected for 200 milliseconds.

MONITOR EXECUTION

- During with the lock-up deactivated

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

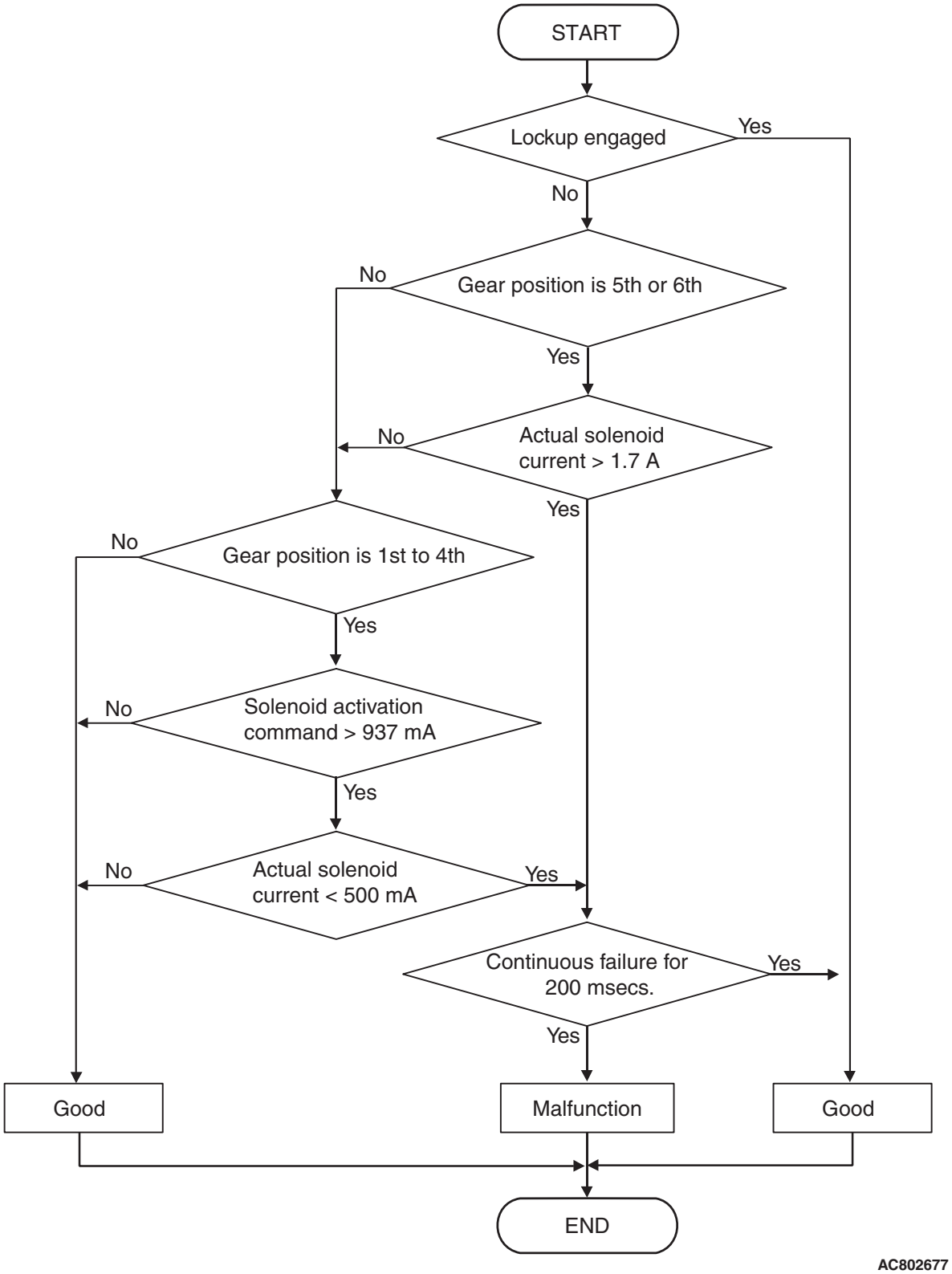
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0731: Malfunction of the 1st gear incorrect ratio
- P0732: Malfunction of the 2nd gear incorrect ratio
- P0733: Malfunction of the 3rd gear incorrect ratio
- P0734: Malfunction of the 4th gear incorrect ratio
- P0735: Malfunction of the 5th gear incorrect ratio
- P0729: Malfunction of the 6th gear incorrect ratio

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions <Circuit continuity ground>

- Lock-up status: engaged.
- Gear position: 5th or 6th.

Judgment Criteria <Circuit continuity ground>

- Low clutch shift solenoid valve actual current: more than 1.7 A

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Check Conditions <Circuit continuity open>
- Lock-up status: engaged.
- Gear position: 1st to 4th.
- Low clutch shift solenoid valve activation command: more than 937 mA

Judgment Criteria <Circuit continuity open>
- Low clutch shift solenoid valve actual current: less than 500 mA. (0.2 seconds)

OBD-II DRIVE CYCLE PATTERN

Drive at 55 km/h (34.2 mph) or less with the shift ranges of 1st, 2nd, 3rd, and 4th gear. Driving at 48 ± 2 km/h (29.8 ± 1.2 mph) with the 5th gear. Maintain each shift range for 1 second or more.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the low clutch shift solenoid valve system circuit
- Damaged harness or connector
- Malfunction of the TCM
- Malfunction of the low clutch shift solenoid valve (valve body Assembly)

DIAGNOSIS

STEP 1. Check the TCM terminal voltage.
[C-38 TCM connector (vehicle side, connected)]
Measure the voltage between terminal No. 14 and body ground.
- 5th and 6th: Battery positive voltage
- Other than above: 0 V

Q: Is the check result normal?

YES : Go to Step 5.
NO : Go to Step 2.

STEP 2. Check between the TCM connector and A/T control solenoid valve assembly connector.
Check for continuity between C-38 TCM connector and B-111 A/T control solenoid valve assembly connector.

NOTE: Prior to the wiring harness inspection, check the intermediate connectors A-12 and repair that if necessary.
- Between C-38 terminal No. 14 and B-111 terminal No. 22: Continuity exists.

When the continuity check result is OK, check that the wiring harness is not shorted to the body and other wiring harness.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair or replace the failure section.

STEP 3. Check the low clutch shift solenoid.
Refer to P.23C-275.

Q: Is the check result normal?

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

STEP 4. Check between the A/T control solenoid valve assembly connector and the low clutch shift solenoid valve connector.
Check for continuity between the B-111 A/T control solenoid valve assembly connector terminals and the low clutch shift solenoid valve connector terminals.
- Between B-111 terminal No. 22 and low clutch shift solenoid valve: Continuity exists.

Q: Is the check result satisfactory?
YES : Replace the valve body assembly.
NO : Repair or replace the failure section.

STEP 5. Check the TCM and A/T control solenoid valve assembly connector pin terminals and the connection status.

Q: Is the check result normal?
YES : Go to Step 7.
NO : Repair or replace the failure section.

STEP 6. Check the TCM and A/T control solenoid valve assembly connector pin terminals and the connection status.

Q: Is the check result normal?
YES : Replace the TCM.
NO : Repair or replace the failure section.

STEP 7. Erase the DTC code, and drive the vehicle for a while.
Check that the normal code is displayed.

Q: Is the check result normal?
YES : The procedure is complete.
NO : Return to START.

DTC P1758: Low-Reverse Brake Shift Solenoid Valve System

SOLENOID VALVE SYSTEM CIRCUIT
Refer to P.23C-72.

DESCRIPTIONS OF MONITOR METHODS
- With the ignition switch ON, the open or short circuit is detected for 200 milliseconds.

MONITOR EXECUTION
- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)
- P0731: Malfunction of the 1st gear incorrect ratio
- P0732: Malfunction of the 2nd gear incorrect ratio
- P0733: Malfunction of the 3rd gear incorrect ratio
- P0734: Malfunction of the 4th gear incorrect ratio
- P0735: Malfunction of the 5th gear incorrect ratio
- P0729: Malfunction of the 6th gear incorrect ratio

Sensor (The sensor below is determined to be normal)
- Not applicable

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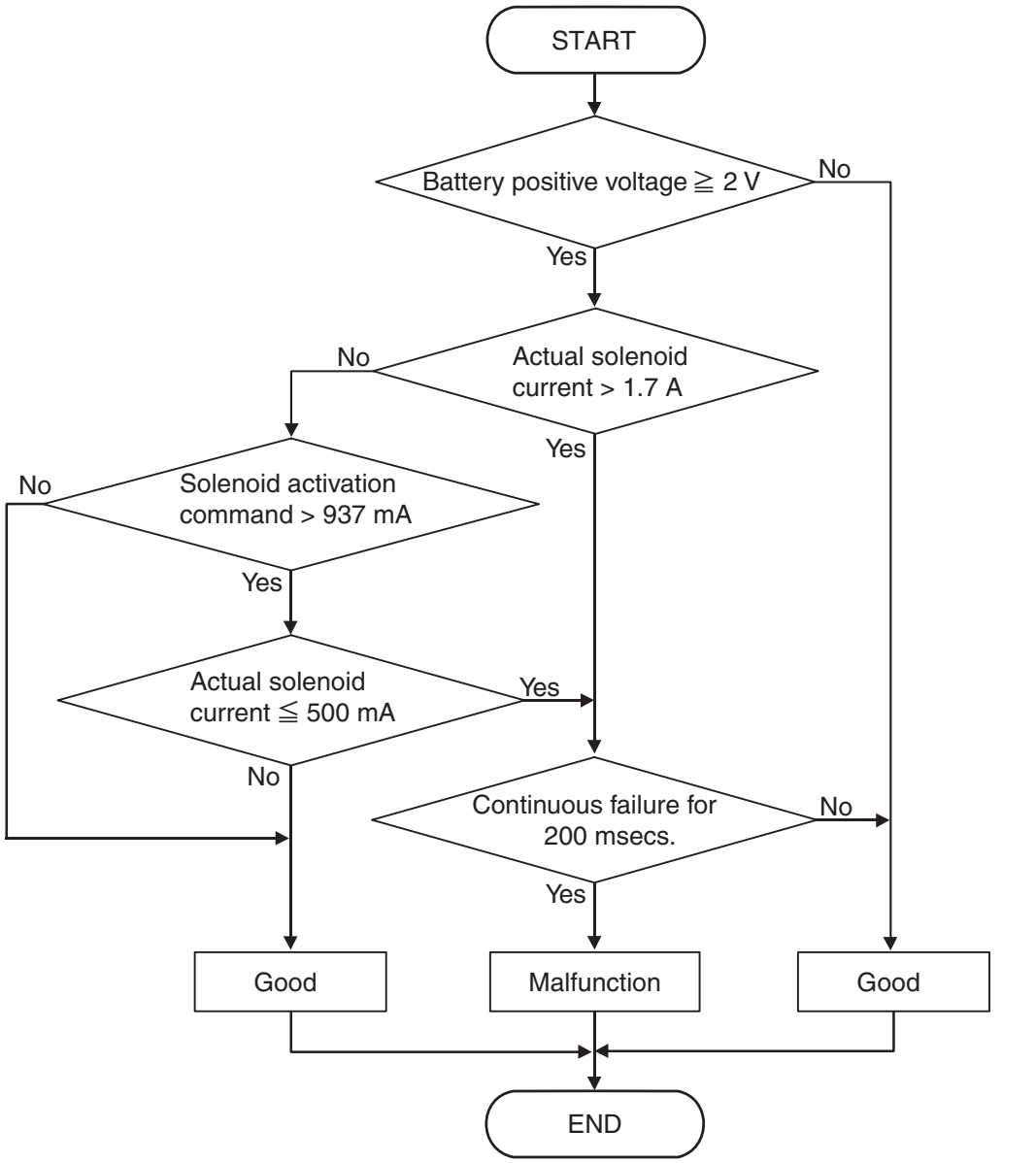
LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions <Circuit continuity ground>

- Voltage of battery: 2 volts or more.

Judgment Criteria <Circuit continuity ground>

- Low-reverse brake shift solenoid valve actual current: more than 1.7 A (0.2 second)

Check Conditions <Circuit continuity open>

- Voltage of battery: 2 volts or more.
- Low-reverse brake shift solenoid valve activation command: more than 937 mA

Judgment Criteria <Circuit continuity open>

- Low-reverse brake shift solenoid valve actual current: less than 500 mA. (0.2 seconds)

OBD-II DRIVE CYCLE PATTERN

With the ignition switch ON, maintain the status for 10 seconds or more.

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TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the low-reverse brake shift solenoid valve system circuit
- Damaged harness or connector
- Malfunction of the TCM
- Malfunction of the low-reverse brake shift solenoid valve (valve body assembly)

DIAGNOSIS

STEP 1. Check the TCM terminal voltage.
[C-37 TCM connector (vehicle side, connected)]
Measure the voltage between the terminal No. 51 and body ground.

- Reverse and 1st coast: Battery positive voltage
- Other than above: 0 V

Q: Is the check result normal?

YES : Go to Step 5.
NO : Go to Step 2.

STEP 2. Check between the TCM connector and A/T control solenoid valve assembly connector.
Check for continuity between C-37 TCM connector and B-111 A/T control solenoid valve assembly connector.

NOTE: Prior to the wiring harness inspection, check the intermediate connectors A-12 and repair that if necessary.

- Between C-37 terminal No. 51 and B-111 terminal No. 17: Continuity exists.

When the continuity check result is OK, check that the wiring harness is not shorted to the body and other wiring harness.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair or replace the failure section.

STEP 3. Check the low-reverse brake shift solenoid.
Refer to P.23C-275.

Q: Is the check result normal?

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

STEP 4. Check between the A/T control solenoid valve assembly connector and the low-reverse brake shift solenoid valve connector.
Check for continuity between the B-111 A/T control solenoid valve assembly connector terminals and the low-reverse brake shift solenoid valve connector terminals.

- Between B-111 terminal No. 17 and low-reverse brake shift solenoid valve: Continuity exists.

Q: Is the check result satisfactory?

YES : Replace the valve body assembly.
NO : Repair or replace the failure section.

STEP 5. Check the TCM and A/T control solenoid valve assembly connector pin terminals and the connection status.

Q: Is the check result normal?

YES : Go to Step 7.
NO : Repair or replace the failure section.

STEP 6. Check the TCM and A/T control solenoid valve assembly connector pin terminals and the connection status.

Q: Is the check result normal?

YES : Replace the TCM.
NO : Repair or replace the failure section.

STEP 7. Erase the DTC code, and drive the vehicle for a while.

Check that the normal code is displayed.

Q: Is the check result normal?

YES : The procedure is complete.
NO : Return to START.

DTC P1773: ABS Information (ABS/ASC)

DESCRIPTIONS OF MONITOR METHODS

- When approx. 1 second has elapsed after TCM started, the ABS/ASC abnormality signal is received via the CAN communication with vehicle speed at 55 km/h (34.4 mph) or more.

MONITOR EXECUTION

- Vehicle speed 55 km/h (34.4 mph) or more

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

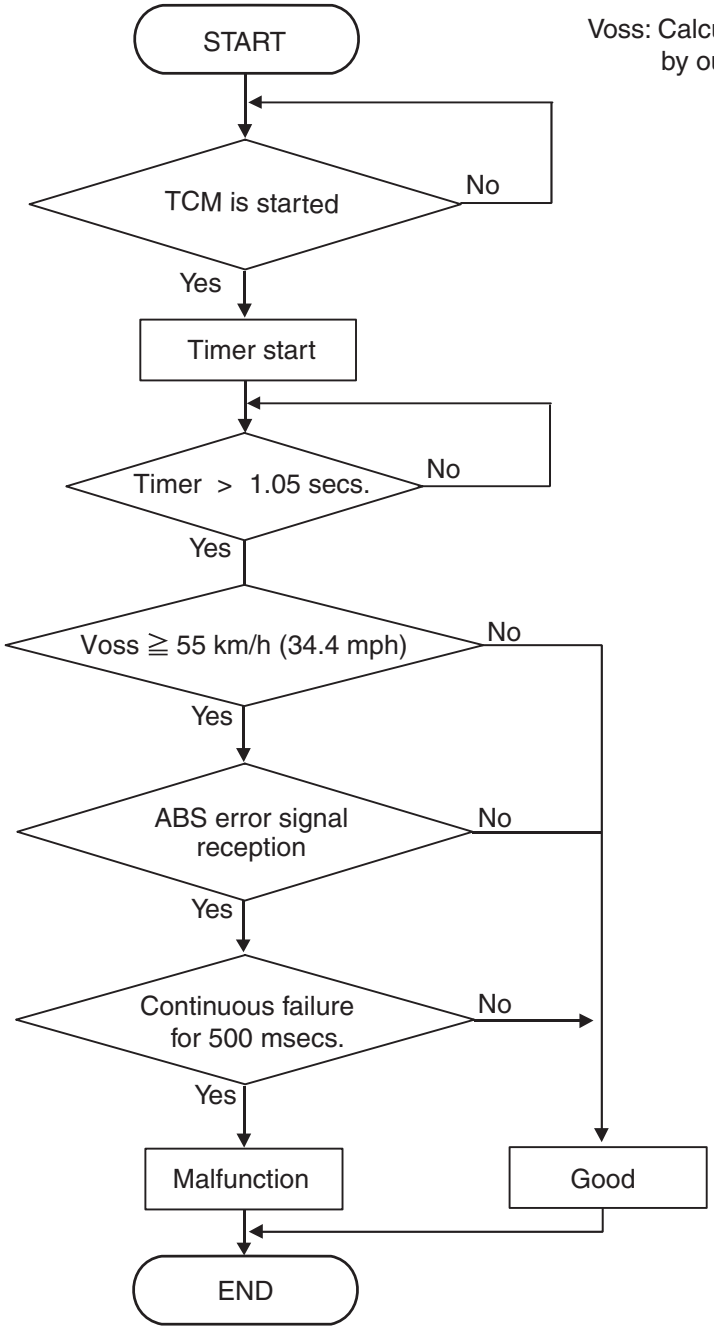
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- Not applicable

Sensor (The sensor below is determined to be normal)

- Not applicable

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- TCM is started: more than 1.05 seconds.
- Vehicle speed: more than 55 km/h (34.4 mph).

Judgement Criteria

- ABS status signal: fail. (0.5 second)

OBD-II DRIVE CYCLE PATTERN

Drive with the vehicle speed 5 km/h or more for 5 seconds or more.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the CAN
- Malfunction of the ABS/ASC-ECU

TSB Revision

DIAGNOSIS

STEP 1. Check the ABS/ASC-ECU.
Check if a failure related to ABS/ASC-ECU occurs.

Q: Is the check result satisfactory?

YES : Go to Step 2.
NO : Repair or replace the failure section.

STEP 2. Check the ABS/ASC-ECU connector pin terminal and the connection status.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair or replace the failure section.

STEP 3. Erase the DTC code, and drive the vehicle for a while.
Check that the normal code is displayed.

Q: Is the check result normal?

YES : The procedure is complete.
NO : Return to START.

Code No. P1796: Idle neutral control malfunction

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

- With the idle neutral control, the status that the "actual slip speed –target slip speed" is faster than 300 r/min continues for 10 seconds.
- 1.05 seconds after the TCM activation, the failure signal of longitudinal G-sensor is received.

PROBABLE CAUSES

- Malfunction of the CAN circuit
- Malfunction of the P0753: low clutch linear solenoid valve system
- Malfunction of the P0731: 1st gear incorrect ratio
- Malfunction of the TCM

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.
Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

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

STEP 2. Check the diagnostic trouble code.
Check the ASC diagnostic trouble code. (Refer to GROUP 35C –Troubleshooting P.35C-24).

Q: Is the diagnostic trouble code set?

YES : Check and repair the relevant diagnostic trouble code system.
NO : Go to Step 3.

STEP 3. Perform the troubleshooting for diagnostic trouble code No. P0753: low clutch linear solenoid valve and diagnostic trouble code No. P0731: 1st gear incorrect ratio.
Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.P1796 set?

YES : Replace the TCM.
NO : This diagnosis is complete.

DTC U0001: Can Bus Off

DESCRIPTIONS OF MONITOR METHODS

- Open circuit or short circuit occurs in the CAN communication line (CAN_H, CAN_L).
- The communication becomes impossible with all the control modules for 0.5 seconds or more.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

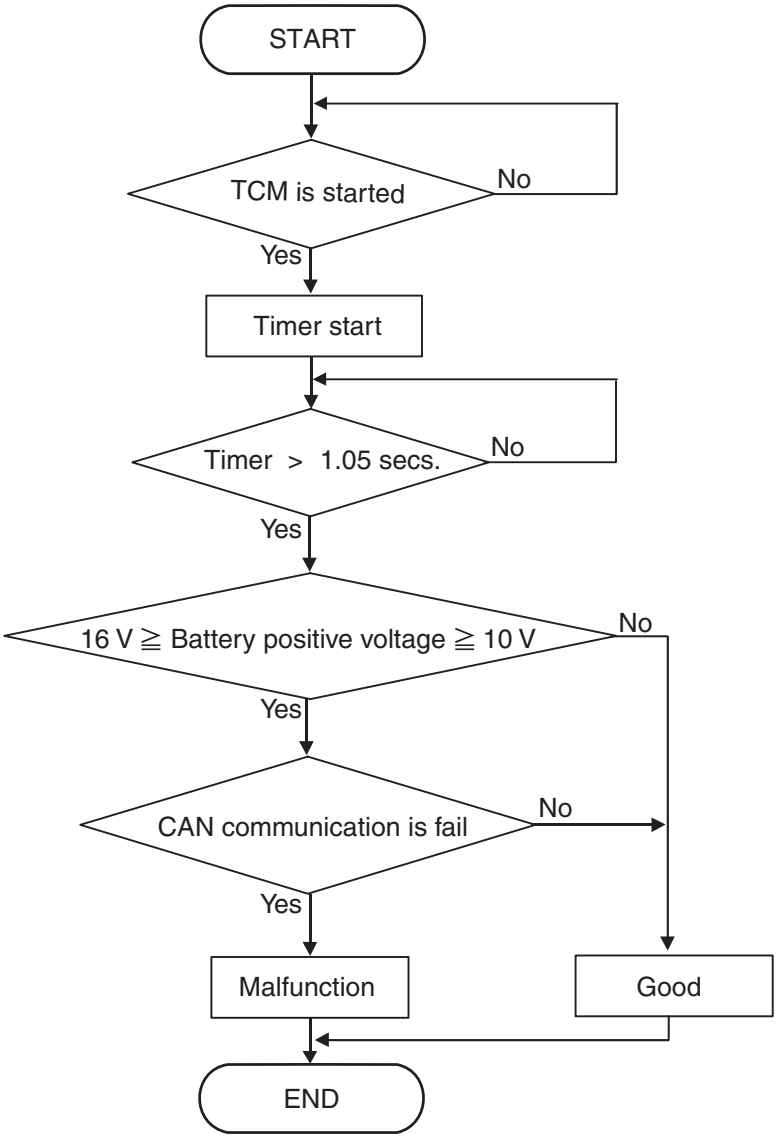
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0712: Malfunction of the transmission fluid temperature sensor (Short circuit)
- P0715: Malfunction of the Input shaft speed sensor system
- P0731: Malfunction of the 1st gear incorrect ratio
- P0732: Malfunction of the 2nd gear incorrect ratio
- P0733: Malfunction of the 3rd gear incorrect ratio
- P0734: Malfunction of the 4th gear incorrect ratio
- P0735: Malfunction of the 5th gear incorrect ratio
- P0729: Malfunction of the 6th gear incorrect ratio
- P0741: Malfunction of the Malfunction of the Torque converter clutch system (Stuck off)
- P0742: Malfunction of the Torque converter clutch system (Stuck on)
- P0846: Malfunction of the 2-6 brake pressure switch system
- P0876: Malfunction of the High clutch pressure switch system
- P0988: Malfunction of the Low-reverse brake pressure switch system
- P0893: Malfunction of the Interlock detection
- P1705: Malfunction of the Throttle position sensor information (engine)
- P1706: Malfunction of the Accelerator pedal position information
- P1773: Malfunction of the ABS information (ASC)
- U0100: Malfunction of the ECM time-out

Sensor (The sensor below is determined to be normal)

- Transmission fluid temperature sensor
- Input shaft speed sensor

LOGIC FLOW CHARTS (Monitor Sequence)



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DTC SET CONDITIONS

Check Conditions

- TCM is started: more than 1.05 seconds.
- A/T control relay voltage: 10 volts or more.
- A/T control relay voltage: 16 volts or less.

Judgement Criteria

- CAN communication: fail.

OBD-II DRIVE CYCLE PATTERN

With the ignition switch ON, maintain the status for 10 seconds or more.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the CAN circuit
- Malfunction of the TCM
- Damaged harness or connector
- Malfunction of the CAN system module

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DIAGNOSIS

STEP 1. Check the CAN communication system malfunction.

- Check that the CAN system-related DTC code other than U0001 is set.
- Check that the CAN-related DTC is set with other relevant modules.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair or replace the failure section.

STEP 2. Check the CAN communication lines.

[C-38 TCM connector (vehicle side, disconnected)]
Between C-38 terminal No. 10, 11 and the CAN communication lines of other ECU: Continuity exists.
When the continuity check result is OK, check that the wiring harness is not shorted to the body and other wiring harness. Also, check for a short circuit between the twisted pair cables.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair or replace the failure section.

STEP 3. Check the relevant ECUs and the TCM connector pin terminal, and the connection status.

Q: Is the check result normal?

YES : Repair or replace the failure section.
NO : Replace the TCM.

DTC U0100: ECM Time-out

DESCRIPTIONS OF MONITOR METHODS

- Open circuit or short circuit occurs in the CAN communication line (CAN_H, CAN_L).
- Reception from ECM becomes impossible for 0.5 seconds or more.

MONITOR EXECUTION

- Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

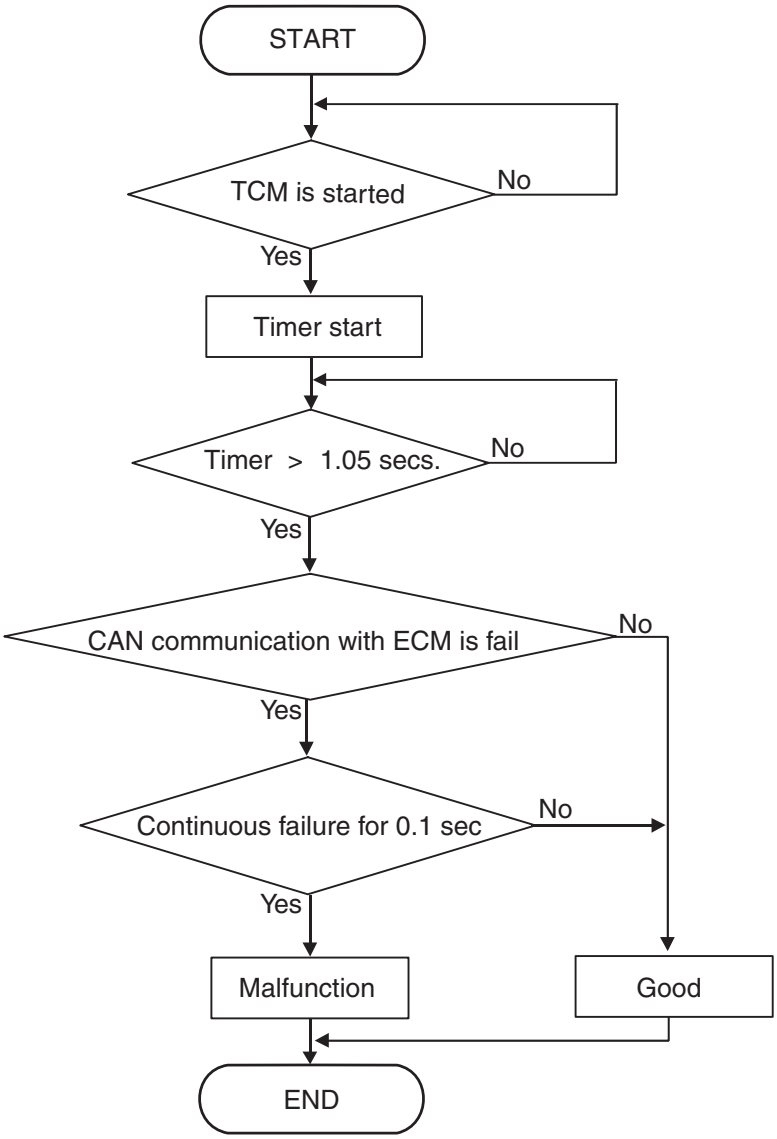
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- P0712: Malfunction of the transmission fluid temperature sensor (Short circuit)
- P0715: Malfunction of the Input shaft speed sensor system
- P0731: Malfunction of the 1st gear incorrect ratio
- P0732: Malfunction of the 2nd gear incorrect ratio
- P0733: Malfunction of the 3rd gear incorrect ratio
- P0734: Malfunction of the 4th gear incorrect ratio
- P0735: Malfunction of the 5th gear incorrect ratio
- P0729: Malfunction of the 6th gear incorrect ratio
- P0741: Malfunction of the Malfunction of the Torque converter clutch system (Stuck off)
- P0742: Malfunction of the Torque converter clutch system (Stuck on)
- P0846: Malfunction of the 2-6 brake pressure switch system
- P0876: Malfunction of the High clutch pressure switch system
- P0988: Malfunction of the Low-reverse brake pressure switch system
- P1705: Malfunction of the Throttle position sensor information (engine)
- P1706: Malfunction of the Accelerator pedal position information

Sensor (The sensor below is determined to be normal)

- Transmission fluid temperature sensor
- Input shaft speed sensor

LOGIC FLOW CHARTS (Monitor Sequence)



AC802918

DTC SET CONDITIONS

Check Conditions

- TCM is started: more than 1.05 seconds.

Judgement Criteria

- CAN communication with ECM: fail.

OBD-II DRIVE CYCLE PATTERN

With the ignition switch ON, maintain the status for 10 seconds or more.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Damaged harness or connector
- Malfunction of the CAN communication
- Malfunction of the ECM
- Malfunction of the TCM

DIAGNOSIS

STEP 1. Check the CAN communication system malfunction.

- Check that the CAN system-related DTC code other than U0100 is set.
- Check if the CAN-related DTC is set with ECM.
- Check if the failure related to the engine occurs.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair or replace the failure section.

STEP 2. Check the CAN communication lines.

[C-38 TCM connector (vehicle side, disconnected)]
Between C-38 terminal No. 10, 11 and the CAN communication lines of ECM: Continuity exists.
When the continuity check result is OK, check that the wiring harness is not shorted to the body and other wiring harness. Also, check for a short circuit between the twisted pair cables.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair or replace the failure section.

STEP 3. Check ECM, the TCM connector pin terminal, and the connection status.

Q: Is the check result normal?

YES : Repair or replace the failure section.
NO : Replace the TCM.

DTC U0121: ABS/ASC-ECU Time Out

DESCRIPTIONS OF MONITOR METHODS

- Open circuit or short circuit occurs in the CAN communication line (CAN_H, CAN_L).
- Reception from ABS/ASC-ECU becomes impossible for 0.5 seconds or more.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Damaged harness or connector
- Malfunction of the CAN communication
- Malfunction of the ABS/ASC-ECU
- Malfunction of the TCM

DIAGNOSIS

STEP 1. Check the CAN communication system malfunction.

- Check that the CAN system-related DTC code other than U0121 is set.
- Check if the CAN-related DTC is set with ABS/ASC-ECU.
- Check if the failure related to the ABS/ASC occurs.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair or replace the failure section.

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STEP 2. Check the CAN communication lines.
[C-38 TCM connector (vehicle side, disconnected)]
Between C-38 terminal No. 10, 11 and the CAN communication lines of ABS/ASC-ECU: Continuity exists.
When the continuity check result is OK, check that the wiring harness is not shorted to the body and other wiring harness. Also, check for a short circuit between the twisted pair cables.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair or replace the failure section.

STEP 3. Check the ABS/ASC-ECU, the TCM connector pin terminal, and the connection status.

Q: Is the check result normal?

YES : Repair or replace the failure section.
NO : Replace the TCM.

DTC U0141: ETACS-ECU Time Out

DESCRIPTIONS OF MONITOR METHODS

- Open circuit or short circuit occurs in the CAN communication line (CAN_H, CAN_L).
- Reception from ETACS-ECU becomes impossible for 0.5 seconds or more.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Damaged harness or connector
- Malfunction of the CAN communication
- Malfunction of the ETACS-ECU
- Malfunction of the TCM

DIAGNOSIS

STEP 1. Check the CAN communication system malfunction.

- Check that the CAN system-related DTC code other than U0141 is set.
- Check if the CAN-related DTC is set with ETACS-ECU.
- Check if the failure related to the ETACS occurs.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair or replace the failure section.

STEP 2. Check the CAN communication lines.
[C-38 TCM connector (vehicle side, disconnected)]
Between C-38 terminal No. 10, 11 and the CAN communication lines of ETACS-ECU: Continuity exists.
When the continuity check result is OK, check that the wiring harness is not shorted to the body and other wiring harness. Also, check for a short circuit between the twisted pair cables.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair or replace the failure section.

STEP 3. Check the ETACS-ECU, the TCM connector pin terminal, and the connection status.

Q: Is the check result normal?

YES : Repair or replace the failure section.
NO : Replace the TCM.

SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: The vehicle does not run at any range (including low power).

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CONDITION:)

- Malfunction of the engine
- Insufficient transmission fluid level
- Poor adjustment of transaxle control cable
- Malfunction of the torque converter
- Malfunction of the valve body assembly
- A/T failure: Hydraulic system (valve body assembly, oil pump), driving force transmission system (parking mechanism, clutch/brake, gears)

DIAGNOSIS

STEP 1. Check the engine performance.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the failure, and perform adjustment.

STEP 2. Check the transaxle control cable.
Check the installation status of transaxle control cable and transmission range switch.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Adjust the installation status of transaxle control cable and transmission range switch. Refer to P.23C-269.

STEP 3. Check the transmission fluid.
Check the transmission fluid for seizure, fouling, and foreign material.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Go to Step 7.

STEP 4. Check the transmission fluid level.
Check if the transmission fluid level is adequate.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Check and repair the leakage point of the transmission fluid, add the transmission fluid, and then go to Step 5.

STEP 5. Perform a hydraulic test.
Refer to P.23C-24.

Q: Is the check result normal?

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

STEP 6. Replace the torque converter.

Q: Is the failure resolved?

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

STEP 7. Remove the transaxle assembly from the vehicle.
Disassemble and check the transaxle assembly to check if there is a foreign material inside.

Q: Is the check result satisfactory?

YES : Replace the transaxle assembly.
NO : Replace the failure part.

INSPECTION PROCEDURE 2: The vehicle does not run at the "D" or the "R" range.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CONDITION:)

- Poor adjustment of transaxle control cable
- A/T failure: Hydraulic system (valve body assembly), driving force transmission system (clutch/brake)

DIAGNOSIS

STEP 1. Check the transaxle control cable.
Check the installation status of transaxle control cable and transmission range switch.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Adjust the installation status of transaxle control cable and transmission range switch. P.23C-269.

STEP 2. Check the transmission fluid.
Check the transmission fluid for seizure, fouling, and level.

Q: Is the check result normal?

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

STEP 3. Remove the transaxle assembly from the vehicle.
Disassemble and check the transaxle assembly to check if there is a foreign material inside.

Q: Is the check result satisfactory?

YES : Replace the transaxle assembly.
NO : Replace the failure part.

INSPECTION PROCEDURE 3: The acceleration is poor.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CONDITION:)

- Malfunction of the engine
- Malfunction of the TCM
- TCM power supply or ground failure
- Malfunction of the torque converter
- A/T failure: Hydraulic system (valve body assembly), driving force transmission system (clutch/brake)

DIAGNOSIS

STEP 1. Check the engine performance.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the failure, and perform adjustment.

STEP 2. Compare with another same model vehicle.

Q: Is there a difference from the same model vehicle?

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

STEP 3. Check the TCM power supply and ground.

Q: Is the check result satisfactory?

YES : Go to Step 4.
NO : Repair the wiring.

STEP 4. Replace the TCM.

Q: Is the failure resolved?

YES : The procedure is complete.
NO : Go to Step 5.

STEP 5. Check the transmission fluid.

Check the transmission fluid for seizure, fouling, and foreign material. Also, check that the fluid level is adequate.

Q: Is the check result normal?

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

STEP 6. Replace the torque converter.

Q: Is the failure resolved?

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

STEP 7. Remove the transaxle assembly from the vehicle.

Disassemble and check the transaxle assembly to check if there is a foreign material inside.

Q: Is the check result satisfactory?

YES : Replace the transaxle assembly.
NO : Replace the failure part.

INSPECTION PROCEDURE 4: The vehicle moves at the "N" range.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CONDITION:)

- Poor adjustment of transaxle control cable
- A/T failure: Hydraulic system (valve body assembly), driving force transmission system (clutch/brake)

DIAGNOSIS

STEP 1. Check the engine performance.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the failure, and perform adjustment.

STEP 2. Compare with another same model vehicle.

Q: Is there a difference from the same model vehicle?

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

STEP 3. Check the transaxle control cable.

Check the installation status of transaxle control cable and transmission range switch.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Adjust the installation status of transaxle control cable and transmission range switch. Refer to P.23C-269.

STEP 4. Check the transmission fluid.

Check the transmission fluid for seizure, fouling, and foreign material.

Q: Is the check result normal?

YES : The procedure is complete.
NO : Go to Step 5.

STEP 5. Remove the transaxle assembly from the vehicle.

Disassemble and check the transaxle assembly to check if there is a foreign material inside.

Q: Is the check result satisfactory?

YES : Replace the transaxle assembly.
NO : Replace the failure part.

INSPECTION PROCEDURE 5: Gears cannot be shifted at all, or a certain gear shift (1st to 2nd, 2nd to 3rd, etc.) is not made.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CONDITION:)

- Non-genuine device installation: TCM voltage drop
- Improper fixing of the electric wiring, poor insertion of the connector, poor contact of the inside PIN
- Poor adjustment of transmission range switch
- Failure of the transmission range switch main unit
- Malfunction of the TCM
- TCM power supply or ground failure
- A/T failure: Hydraulic system (valve body assembly), driving force transmission system (clutch/brake)

DIAGNOSIS

STEP 1. Check the electrical equipment.

Q: Is the non-genuine electrical equipment (car navigator, audio devices, etc.) installed?

YES : Remove the power supply wiring and signal lines of the equipment.
NO : Go to Step 2

STEP 2. Check the electric system.

Check if there is an improper fixing of the electric wiring, poor insertion of the connector, and poor contact.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Adjust and repair.

STEP 3. Check and adjust the transmission range switch.

Refer to P.23C-269, P.23C-269.

If the transmission range switch has a failure, replace it, and then check the trouble symptom again.

Q: Is the check result normal?

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

STEP 4. Check the TCM power supply and ground.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair the wiring.

STEP 5. Replace the TCM.

Q: Is the failure resolved?

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

STEP 6. Remove the transaxle assembly from the vehicle.
Disassemble and check the transaxle assembly to check if there is a foreign material inside.

Q: Is the check result satisfactory?

YES : Replace the transaxle assembly.
NO : Replace the failure part.

INSPECTION PROCEDURE 6: The torque converter is not locked up.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CONDITION:)

- Poor adjustment of transmission range switch
- Failure of the transmission range switch main unit
- Malfunction of the TCM
- Poor installation of A/T and engine
- Malfunction of the torque converter

DIAGNOSIS

STEP 1. Check and adjust the transmission range switch.
Refer to P.23C-269, P.23C-269.
If the transmission range switch has a failure, replace it, and then check the trouble symptom again.

Q: Is the check result normal?

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

STEP 2. Replace the TCM.

Q: Is the failure resolved?

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

STEP 3. Check the installation position of the transaxle assembly and the engine.
Is the installation of transaxle assembly and the engine normal? Compare and check the axial direction position with the same model vehicle.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair the installation.

STEP 4. Check the transmission fluid.
Check the transmission fluid for burning, fouling, and foreign material.

Q: Is the check result normal?

YES : Replace the torque converter.
NO : Replace the transaxle assembly..

INSPECTION PROCEDURE 7: The clutch slips when the vehicle starts or during gear shift.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CONDITION:)

- Poor adjustment of transaxle control cable
- Inadequate transmission fluid level
- A/T failure: Hydraulic system (valve body assembly), driving force transmission system (clutch/brake)

DIAGNOSIS

STEP 1. Check the transaxle control cable. <When the clutch slips at vehicle start>
Check the installation status of transaxle control cable and transmission range switch.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Adjust the installation status of transaxle control cable and transmission range switch. Refer to P.23C-269.

STEP 2. Check the transmission fluid.
Check the transmission fluid for seizure, fouling, and foreign material.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Go to Step 5.

STEP 3. Check the transmission fluid level.
Check if the transmission fluid level is adequate.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Check and repair the leakage point of the transmission fluid, add the transmission fluid, and then go to Step 4.

STEP 4. Perform a hydraulic test.
Refer to P.23C-24.

Q: Is the check result normal?

YES : The procedure is complete.
NO : Go to Step 5.

STEP 5. Remove the transaxle assembly from the vehicle.
Disassemble and check the transaxle assembly to check if there is a foreign material inside.

Q: Is the check result satisfactory?

YES : Replace the transaxle assembly.
NO : Replace the failure part.

INSPECTION PROCEDURE 8: The engine brake is not applied.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CONDITION:)

- Poor adjustment of transaxle control cable
- Inadequate transmission fluid level
- Malfunction of the TCM
- A/T failure: Hydraulic system (valve body assembly), driving force transmission system (clutch/brake)

DIAGNOSIS

STEP 1. Check the transaxle control cable.
Check the installation status of transaxle control cable and transmission range switch.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Adjust the installation status of transaxle control cable and transmission range switch. Refer to P.23C-269.

STEP 2. Check the transmission fluid.
Check the transmission fluid for burning, fouling, and foreign material.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Go to Step 7.

STEP 3. Check the transmission fluid level.
Check if the transmission fluid level is adequate.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Check and repair the leakage point of the transmission fluid, add the transmission fluid, and then go to Step 4.

STEP 4. Perform a hydraulic test.
Refer to P.23C-24.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Go to Step 7.

STEP 5. Replace the TCM.

Q: Is the failure resolved?

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

STEP 6. Compare with another same model vehicle.

Q: Is there a difference from the same model vehicle?

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

STEP 7. Remove the transaxle assembly from the vehicle.
Disassemble and check the transaxle assembly to check if there is a foreign material inside.

Q: Is the check result satisfactory?

YES : Replace the transaxle assembly.
NO : Replace the failure part.

INSPECTION PROCEDURE 9: The shift shock is large at a certain gear shift. (1st to 2nd, 2nd to 3rd, etc.)

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CONDITION:)

- Malfunction of the engine: Engine output change
- Malfunction of the TCM
- A/T failure: Hydraulic system (valve body assembly), driving force transmission system (clutch/brake)

NOTE: When the engine output is low, shock occurs. Care must also be taken during cold, after warm up, and temperature, humidity, and air pressure differences.

DIAGNOSIS

STEP 1. Check the engine performance.

- Check the ECM side especially for throttle signal-related abnormality.
- Check the stall speed (refer to P.23C-24). If the speed is low, check the engine side.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the failure, and perform adjustment.

STEP 2. Replace the TCM.

Q: Is the failure resolved?

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

STEP 3. Perform a hydraulic test.
Refer to P.23C-24.

Q: Is the check result normal?

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

STEP 4. Compare with another same model vehicle.

Q: Is there a difference from the same model vehicle?

YES : Go to Step 5.
NO : The procedure is complete.

STEP 5. Remove the transaxle assembly from the vehicle.
Disassemble and check the transaxle assembly to check if there is a foreign material inside.

Q: Is the check result satisfactory?

YES : Replace the transaxle assembly.
NO : Replace the failure part.

INSPECTION PROCEDURE 10: The select shock is large when the transmission range is shifted from "N" to "D", and "N" to "R."

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CONDITION:)

- Malfunction of the engine: Idle speed
- Poor adjustment of transmission range switch
- Malfunction of the TCM
- A/T failure: Hydraulic system (valve body assembly), driving force transmission system (clutch/brake)

DIAGNOSIS

STEP 1. Check the engine performance.
Especially check that the idle speed does not exceed the specified value.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the failure, and perform adjustment.

STEP 2. Check and adjust the transmission range switch.
Refer to P.23C-269, P.23C-269.
If the transmission range switch has a failure, replace it, and then check the trouble symptom again.

Q: Is the check result normal?

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

STEP 3. Replace the TCM.

Q: Is the failure resolved?

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

STEP 4. Compare with another same model vehicle.

Q: Is there a difference from the same model vehicle?

YES : Go to Step 5.
NO : The procedure is complete.

STEP 5. Remove the transaxle assembly from the vehicle.
Disassemble and check the transaxle assembly to check if there is a foreign material inside.

Q: Is the check result satisfactory?

YES : Replace the transaxle assembly.
NO : Replace the failure part.

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INSPECTION PROCEDURE 11: Abnormal sound occurs during idling.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CONDITION:)

- Malfunction of the engine: Abnormal sound of auxiliary parts
- Transmission fluid level
- Installation of torque converter
- A/T failure: Hydraulic system (valve body assembly, hydraulic circuit)

NOTE:

Inspection items for abnormal sound

1. *Check of sound source and incoming route (radiated sound, propagation sound, resonance, etc.), and measurement at driver's seat, front passenger's seat, and rear passenger's seat*
2. *Change of sound during cold and after warm up (Change of fluid, and hydraulic pressure)*
3. *Change of sound with the engine speed*
4. *Check of tone, and continuous/discontinuous sound*

DIAGNOSIS

STEP 1. Check the engine performance.
Check the sound of engine, auxiliary parts, and resonance/non-resonance.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the failure, and perform adjustment.

STEP 2. Check the transmission fluid level.
Check if the transmission fluid level is adequate.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Go to Step 3.

STEP 3. Check and repair the leakage point of the transmission fluid.
Check and repair the leakage point of the transmission fluid, and adjust the transmission fluid level. Then check if the abnormal sound is generated.

Q: Is the check result normal?

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

STEP 4. Check the transmission fluid.
Check the transmission fluid for burning, fouling, and foreign material.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Go to Step 8.

STEP 5. Retest the system.
Check if the abnormal sound during idling occurs with vibration.

Q: Is the check result normal?

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

STEP 6. Check the torque converter.
Check the torque converter installation, change the installation phase, and then check the trouble symptom.

Q: Is the check result normal?

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

STEP 7. Compare with another same model vehicle.

Q: Is there a difference from the same model vehicle?

YES : Go to Step 8.
NO : The procedure is complete.

STEP 8. Remove the transaxle assembly from the vehicle.
Disassemble and check the transaxle assembly to check if there is a foreign material inside.

Q: Is the check result satisfactory?

YES : Replace the transaxle assembly.
NO : Replace the failure part.

INSPECTION PROCEDURE 12: Abnormal sound occurs during driving.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CONDITION:)

- Engine- and body-related failures: Abnormal sound of auxiliary parts, drive shaft, wheel bearing
- Installation of non-genuine aeroparts to the body
- Abnormal incoming route of sound: Installation of transaxle control cable, damping device, sound isolation device
- Malfunction of the torque converter
- A/T failure: Driving force transmission system (gear), hydraulic system (valve body assembly, hydraulic circuit)

NOTE:

Inspection items for abnormal sound

1. *Check of sound source and incoming route (radiated sound, propagation sound, resonance, etc.), and measurement at driver's seat, front passenger's seat, and rear passenger's seat*
2. *Change of sound during cold and after warm up (Change of fluid, and hydraulic pressure)*
3. *Change of sound with the engine speed (r/min order change)*
4. *Change of sound with the vehicle speed (r/min order change, wind noise)*
5. *Change of sound with the throttle valve opening (engine output change, hydraulic pressure change)*

DIAGNOSIS

STEP 1. Check the body and engine performance.

- Check if a non-genuine aeropart is installed to the body.
- Check the engine auxiliary parts, drive shaft, and wheel bearing.
- Check if the abnormal sound changes in accordance with the engine speed, or the vehicle speed.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the failure, and perform adjustment.

STEP 2. Check the installation of the transaxle control cable, damping device, and sound isolation device.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the failure, and perform adjustment.

STEP 3. Check the abnormal sound.

Q: Does the abnormal sound change in accordance with the vehicle speed?

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

STEP 4. Check the abnormal sound.

Q: Does the abnormal sound change in accordance with the throttle valve opening? Or is it the transmission fluid sound especially caused at start-up?

YES : Replace the torque converter.
NO : Go to Step 5.

STEP 5. Compare with another same model vehicle.

Q: Is there a difference from the same model vehicle?

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

STEP 6. Remove the transaxle assembly from the vehicle.
Disassemble and check the transaxle assembly to check if there is a foreign material inside.

Q: Is the check result satisfactory?

YES : Replace the transaxle assembly.
NO : Replace the failure part.

INSPECTION PROCEDURE 13: Abnormal sound occurs during gear shift.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CONDITION:)

- Abnormal incoming route of sound: Installation of transaxle control cable, damping device, sound isolation device
- A/T failure: Driving force transmission system (gear), hydraulic system (valve body assembly, hydraulic circuit)

NOTE:

Inspection items for abnormal sound

1. *Check of sound source and incoming route (radiated sound, propagation sound, resonance, etc.), and measurement at driver's seat, front passenger's seat, and rear passenger's seat*
2. *Change of sound during cold and after warm up (Change of fluid, and hydraulic pressure)*
3. *Change of sound with the throttle valve opening (engine output change, hydraulic pressure change)*
4. *Change of sound on a flat road, upslope, and downslope*
5. *Check of tone*

DIAGNOSIS

STEP 1. Check the installation of the transaxle control cable, damping device, and sound isolation device.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the failure, and perform adjustment.

STEP 2. Compare with another same model vehicle.

Q: Is there a difference from the same model vehicle?

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

STEP 3. Remove the transaxle assembly from the vehicle.
Disassemble and check the transaxle assembly to check if there is a foreign material inside.

Q: Is the check result satisfactory?

YES : Replace the transaxle assembly.
NO : Replace the failure part.

INSPECTION PROCEDURE 14: Engine stall

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CONDITION:)

- Engine system failure
- Malfunction of the transmission fluid
- Malfunction of the torque converter
- A/T failure: Hydraulic system (valve body assembly), driving force transmission system (clutch/brake)

DIAGNOSIS

STEP 1. Check the engine performance.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the failure, and perform adjustment.

STEP 2. Check the transmission fluid.
Check the transmission fluid for burning, fouling, and foreign material.

Q: Is the check result normal?

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

STEP 3. Check the transmission fluid level.
Check if the transmission fluid level is adequate.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Check and repair the leakage point of the transmission fluid, add the transmission fluid, and then go to Step 4 .

STEP 4. Perform a hydraulic test.
Refer to P.23C-24.

Q: Is the check result normal?

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

STEP 5. Compare with another same model vehicle.

Q: Is there a difference from the same model vehicle?

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

STEP 6. Retest the system.
Does the engine stall occur again?

Q: Is the check result normal?

YES : Replace the transaxle assembly.
NO : The procedure is complete.

INSPECTION PROCEDURE 15: Oil leaks from the air breather.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CONDITION:)

- Poor adjustment of the transmission fluid level
- A/T failure: Driving force transmission system

DIAGNOSIS

STEP 1. Check the transmission fluid.
Check the transmission fluid for burning, fouling, and foreign material.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Replace the transaxle assembly.

STEP 2. Check the transmission fluid level.
Check if the transmission fluid level is adequate.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Check and repair the leakage point of the transmission fluid, add the transmission fluid, and then go to Step 3 .

STEP 3. Perform a hydraulic test.
Refer to P.23C-24.

Q: Is the check result normal?

YES : The procedure is complete.
NO : Replace the transaxle assembly.

INSPECTION PROCEDURE 16: The starter does not rotate at the "P" or "N" range. (The engine does not start.)

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CONDITION:)

- Engine system failure
- Poor adjustment of transaxle control cable
- Poor adjustment of transmission range switch
- Failure of the transmission range switch main unit
- The starter electric wiring
- Damaged harness or connector
- Malfunction of the TCM

DIAGNOSIS

STEP 1. Check the engine performance.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the failure, and perform adjustment.

STEP 2. Check the transaxle control cable.

Check the installation of the transaxle control cable.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Adjust the transaxle control cable Refer to P.23C-269.

STEP 3. Check and adjust the transmission range switch.

Refer to P.23C-269, P.23C-269.
If the transmission range switch has a failure, replace it, and then check the trouble symptom again.

Q: Is the check result normal?

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

STEP 4. Check the electric system.

Check the starter-related wiring for poor insertion of connector or open circuit.

Q: Is the check result normal?

YES : Replace the TCM.
NO : Repair the failure, and perform adjustment.

DATA LIST REFERENCE TABLE

M1231008100649

Item No.	Inspection item	Inspection requirement		Normal condition
1	Power supply voltage	Ignition switch: ON		Battery positive voltage
2	TFT sensor signal	Transmission fluid: 20° C (68° F)		Approximately 2.52 V
		Transmission fluid: 80° C (176° F)		Approximately 0.69 V
3	Input shaft speed sensor signal	Gear range: 4th gear	Driving at constant speed of 60 km/h (37 mph)	1,400 –1,700 r/min
4	Vehicle speed sensor signal	Transmission range: D	Driving at constant speed of 30 km/h (19 mph)	30 km/h
5	TFT sensor	Driving after engine has warmed up		Gradually increases.
6	Accelerator pedal position	• Ignition switch: ON • Engine: Stopped • Transmission range: P	Accelerator pedal: Release	0%
			Accelerator pedal: Depressed	Gradually rises from the above value
			Accelerator pedal: Fully depressed	100%
9	Engine revolution	• Engine: Idling (after the warming up) • Transmission range: P	Accelerator pedal: Release	600 –900 r/min
			Accelerator pedal: Depressed	Gradually rises from the above value
11	Slip revolution	Lock-up engaged	Driving at constant speed of 60 km/h (37 mph)	Max 70 r/min
13	Input shaft speed sensor	Gear range: 4th gear	Driving at constant speed of 60 km/h (37 mph)	1,400 –1,700 r/min
14	Real vehicle speed	Driving conditions		Nearly the same as the speedometer display
15	Vehicle speed (inference)	Driving conditions		Nearly the same as the speedometer display
16	Current gear	Gear range: 1st		1
		Gear range: 2nd		2
		Gear range: 3rd		3
		Gear range: 4th		4
		Gear range: 5th		5
		Gear range: 6th		6
17	L/U & Low & Rev. brake SOL. pressure	Transmission range: N		0 MPa
		Transmission range: R		1.58 MPa

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Item No.	Inspection item	Inspection requirement	Normal condition
18	2-6 brake solenoid pressure	Gear range: 1st, 3rd –5th	0 MPa
		Gear range: 2nd or 6th	1.58 MPa
19	Low clutch solenoid pressure	Gear range: 5th or 6th	0 MPa
		Gear range: 1st –4th	1.58 MPa
20	3-5 reverse clutch SOL. pressure	Transmission range: N	0 MPa
		Transmission range: R	1.58 MPa
21	High clutch solenoid pressure	Gear range: 1st –3rd	0 MPa
		Gear range: 4th –6th	1.58 MPa
22	Lock up difference pressure	Lock-up engaged (warmed up and constant speed driving)	0.8 MPa
		Lock-up disengaged	0.4 MPa
23	Line pressure	Depending on engine torque and A/T conditions	0 –1.58 MPa
24	Target gear	Gear range: 1st	1
		Gear range: 2nd	2
		Gear range: 3rd	3
		Gear range: 4th	4
		Gear range: 5th	5
		Gear range: 6th	6
25	L/U & Low & Rev. brake SOL. monitor	Lock-up engaged (warmed up and constant speed driving)	0 A
		Lock-up disengaged	Approximately 1 A
26	L/U & Low & Rev. brake SOL. output	Lock-up engaged (warmed up and constant speed driving)	0 A
		Lock-up disengaged	1 –3 A
27	2-6 brake solenoid monitor	Gear range: 1st, 3rd –5th	0 A
		Gear range: 2nd or 6th	Approximately 1 A
28	2-6 brake solenoid output	Gear range: 1st, 3rd –5th	0 A
		Gear range: 2nd or 6th	1 –3 A
29	Low clutch solenoid monitor	Gear range: 5th, 6th	0 A
		Gear range: 1st –4th	Approximately 1 A
30	Low clutch solenoid output	Gear range: 5th, 6th	0 A
		Gear range: 1st –4th	1 –3 A
31	3-5 reverse clutch SOL. monitor	Transmission range: N	Approximately 1 A
		Transmission range: R	0 A
32	3-5 reverse clutch SOL. output	Transmission range: N	1 –3 A
		Transmission range: R	0 A
33	High clutch solenoid monitor	Gear range: 1st –3rd	Approximately 1 A
		Gear range: 4th –6th	0 A
34	High clutch solenoid output	Gear range: 1st –3rd	1 –3 A
		Gear range: 4th –6th	0 A

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Item No.	Inspection item	Inspection requirement	Normal condition
35	Line pressure solenoid monitor	Depending on engine torque and A/T conditions	0 –1 A
36	Line pressure solenoid output	Depending on engine torque and A/T conditions	0 –3 A
37	Shift lock solenoid monitor	Transmission range: P Brake pedal: Depressed	ON
		Other than above	OFF
38	Shift lock solenoid output	Transmission range: P Brake pedal: Depressed	ON
		Other than above	OFF
39	Low clutch shift SOL. monitor	Transmission range: D Gear range: 5th, 6th	ON
		Transmission range: D Gear range: 1st –3rd, 4th	OFF
40	Low clutch shift SOL. output	Transmission range: D Gear range: 5th, 6th	ON
		Transmission range: D Gear range: 1st –3rd, 4th	OFF
41	Low & Rev. clutch shift SOL. monitor	Transmission range: D Gear range: 1st	ON
		Transmission range: D Gear range: 2nd –6th gear with lock-up engaged	OFF
42	Low & Rev. clutch shift SOL. output	Transmission range: D Gear range: 1st	ON
		Transmission range: D Gear range: 2nd –6th gear with lock-up engaged	OFF
43	Indicator D output	• Ignition switch: ON • Transmission range: D	ON
		• Ignition switch: ON • Transmission range: Other than D	OFF
45	Indicator SP mode output	• Ignition switch: ON • Transmission range: sport mode	ON
		• Ignition switch: ON • Transmission range: Other than sport mode	OFF
46	Indicator N output	• Ignition switch: ON • Transmission range: N	ON
		• Ignition switch: ON • Transmission range: Other than N	OFF
47	Indicator P output	• Ignition switch: ON • Transmission range: P	ON
		• Ignition switch: ON • Transmission range: Other than P	OFF

Item No.	Inspection item	Inspection requirement		Normal condition
48	Indicator R output	• Ignition switch: ON • Transmission range: R		ON
		• Ignition switch: ON • Transmission range: Other than R		OFF
49	ABS actuation signal	ABS is operating		ON
		ABS is not operating		OFF
50	Select switch (down)	Ignition switch: ON	Transmission range: D	OFF
			Selector lever operation: Select sport mode	OFF
			Selector lever operation: Upshift and hold the selector lever	OFF
			Selector lever operation: Downshift and hold the selector lever	ON
51	Paddle switch (Down)	Ignition switch: ON	Paddle shift lever operation: Downshift and hold the lever.	ON
			Paddle shift lever operation: Other than above	OFF
52	SP mode switch	Ignition switch: ON	Transmission range: D	OFF
			Selector lever operation: Select sport mode	ON
			Selector lever operation: Upshift and hold the selector lever	ON
			Selector lever operation: Downshift and hold the selector lever	ON
53	Shift position	Ignition switch: ON	Transmission range: P, N	P, N
			Transmission range: R	R
			Transmission range: D	D
54	TR switch	Ignition switch: ON	Transmission range: P	P
			Transmission range: R	R
			Transmission range: N	N
			Transmission range: D	D
55	Idle switch signal	Engine: idling		ON
		Other than above		OFF
56	Idle switch signal (soft)	Engine: idling		ON
		Other than above		OFF
57	TCL actuation signal	When TCL is operating		ON
		When TCL is not operating		OFF

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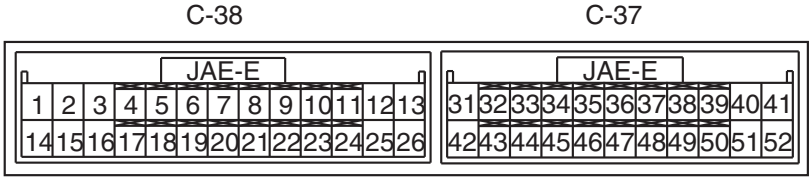
Item No.	Inspection item	Inspection requirement		Normal condition
58	Select switch (up)	Ignition switch: ON	Transmission range: D	OFF
			Selector lever operation: Select sport mode	OFF
			Selector lever operation: Upshift and hold the selector lever	ON
			Selector lever operation: Downshift and hold the selector lever	OFF
59	Paddle switch (Up)	Ignition switch: ON	Paddle shift lever operation: Upshift and hold the lever.	ON
			Paddle shift lever operation: Other than above	OFF
60	Brake switch	• Ignition switch: ON • Engine:Stopped	Brake pedal: Depressed	ON
			Brake pedal: Released	OFF

TCM TERMINAL VOLTAGE REFERENCE CHART FOR TRANSAXLE OPERATION

M1231039200040



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Terminal No.	Inspection item	Inspection requirement		Normal condition
1	High clutch linear solenoid valve	While driving	At high clutch engaged	1 V or less
			Other than above	300 Hz*
2	3-5 reverse clutch linear solenoid valve	While driving	At 3-5 reverse clutch engaged	1 V or less
			Other than above	300 Hz*
3	2-6 brake linear solenoid valve	While driving	At 2-6 brake engaged	300 Hz*
			Other than above	1 V or less
6	Transmission range switch: P	Ignition switch: ON	Transmission range: P	Battery positive voltage
			Other than above	1 V or less
7	Transmission range switch: R	Ignition switch: ON	Transmission range: R	Battery positive voltage
			Other than above	1 V or less
8	Transmission range switch: D	Ignition switch: ON	Transmission range: D	Battery positive voltage
			Other than above	1 V or less
9	Paddle shift switch (up)	Ignition switch: ON	Paddle shift lever position: Upshift and hold	1 V or less
			Paddle shift lever position: Other than above	Battery positive voltage
10	CAN_H	–		–
11	CAN_L	–		–
12	Power supply	Ignition switch: ON		Battery positive voltage
		Ignition switch: OFF		1 V or less
13	Ground	Always		1 V or less
14	Low clutch linear solenoid valve	While driving	Gear range: 5th or 6th	Battery positive voltage
			Other than above	1 V or less
16	Ground	Always		1 V or less
21	Transmission range switch: N	Ignition switch: ON	Transmission range: N	Battery positive voltage
			Transmission range: Other than above	1V or less
25	Power supply	Ignition switch: ON		Battery positive voltage
		Ignition switch: OFF		1 V or less
26	Ground	Always		1 V or less
31	Battery back up	Always		Battery positive voltage

Terminal No.	Inspection item	Inspection requirement		Normal condition
32	Paddle shift switch (down)	Ignition switch: ON	Paddle shift lever position: Downshift and hold	1 V or less
			Paddle shift lever position: Other than above	Battery positive voltage
33	Low clutch pressure switch	While driving	At low clutch engaged	1 V or less
			Other than above	Battery positive voltage
34	3-5 reverse clutch pressure switch	While driving	At 3-5 reverse clutch engaged	1 V or less
			Other than above	Battery positive voltage
35	Shift switch (up)	Ignition switch: ON Transmission range: sport mode	Transmission range: Upshift and hold the lever.	1 V or less
			Transmission range: Other than above	Battery positive voltage
36	Select switch	Ignition switch: ON	Transmission range: sport mode	1 V or less
			Transmission range: Other than above	Battery positive voltage
37	Output shaft speed sensor	Vehicle speed: 30 km/h (18.6 mph)		Approx. 588 Hz
38	Input shaft speed sensor	Engine speed: 700 r/min		Approx. 353 Hz
39	Transmission fluid temperature sensor	Ignition switch: ON	Transmission fluid temperature: 20° C (68° F)	Approx. 2.53 V
			Transmission fluid temperature: 80° C (176° F)	Approx. 0.69 V
40	Line pressure linear solenoid valve	Ignition switch: ON	While driving	Approx. 300 Hz*
			Other than above	1 V or less
41	Low clutch linear solenoid valve	While driving	At low clutch engaged	Approx. 300 Hz*
			Other than above	1 V or less
43	Low-reverse brake pressure switch	While driving	At low-reverse brake engaged	1 V or less
			Other than above	Battery positive voltage
44	2-6 brake pressure switch	While driving	At 2-6 brake engaged	1 V or less
			Other than above	Battery positive voltage
45	High clutch pressure switch	While driving	At high clutch engaged	1 V or less
			Other than above	Battery positive voltage
46	Shift switch (down)	Ignition switch: ON Transmission range: sport mode	Transmission range: Downshift and hold the lever.	1 V or less
			Transmission range: Other than above	Battery positive voltage
48	Output shaft speed sensor ground	Always		1 V or less

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Terminal No.	Inspection item	Inspection requirement		Normal condition
49	Input shaft speed sensor ground	Always		1 V or less
50	Transmission fluid temperature sensor ground	Ignition switch: ON		1 V or less
51	Low-reverse brake shift solenoid valve	While driving		Battery positive voltage
		Other than above		1 V or less
52	Lock-up and Low-reverse brake liner solenoid	Ignition switch: ON	At lock-up engaged	Approx. 300 Hz*
			Other than above	1 V or less

*NOTE: * The operation is performed at 300 Hz in a voltage range of 0 to 12 V when measured by an oscilloscope.*

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

TROUBLESHOOTING STRATEGY

M1235005100017

Refer to GROUP 00 –How to Use Troubleshooting/Inspection Service Points P.00-7.

PRECAUTIONS FOR DIAGNOSIS

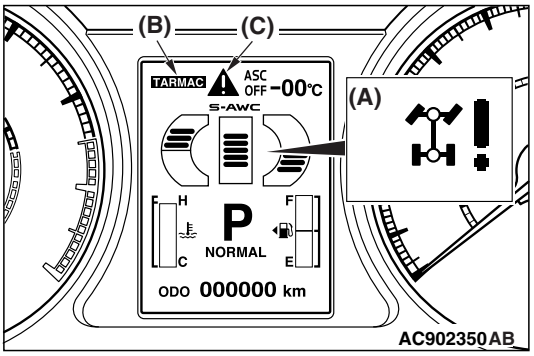
Before diagnosis, check that all the following items are normal.

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

DIAGNOSIS FUNCTION

M1231007700239

WARNING INDICATOR



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

FAIL-SAFE FUNCTION

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

FAIL-SAFE REFERENCE TABLE

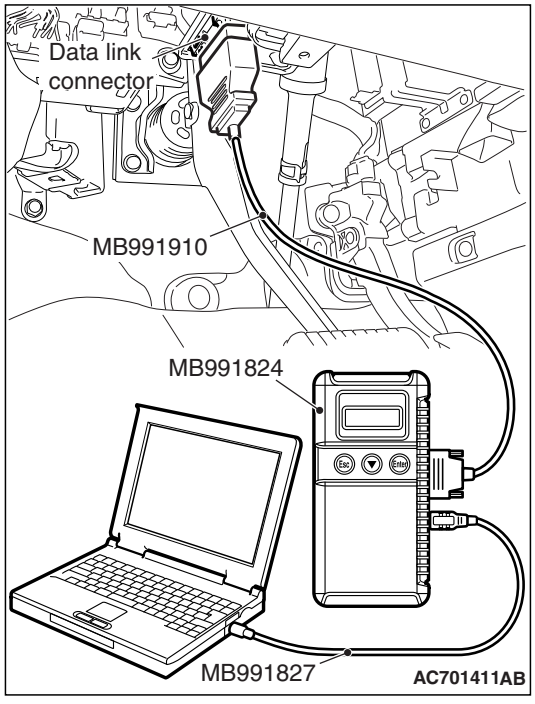
Diagnostic trouble code No.	Control content
C2203	The S-AWC control is continued with the code creation only.
C1614, C1624	A warning is given to the driver with the trouble displayed to the multi information display, but the S-AWC control is maintained because the vehicle behaviour is not affected.
C1629, C1630, C1631, C1632, C1633, C1219, C2205, C121A, C1460, C123C, C1242, U0428, U0401, U1425, U1428, U0126, U0100	A warning is given to the driver with the trouble displayed to the multi information display, and the front differential control is stopped. (The center differential control is continued.)
C161F, C1621, C145F	A warning is given to the driver by the flashing of multi information display S-AWC control mode, and the S-AWC control is stopped by the protection control.
Others (other than above)	A warning is given to the driver with the trouble displayed to the multi information display, and the S-AWC control is stopped.

NOTE: All the fail-safe functions are reset by turning OFF →ON the ignition switch.

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

Required Special Tools:

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



⚠ 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.

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CHECK OF THE FREEZE FRAME DATA

Various data of when the diagnostic trouble code has been set is obtained, and the status of that time is stored. By analysing each data using M.U.T.-III, troubleshooting can be carried out efficiently.
Display items of the freeze frame data are as follows.

DISPLAY ITEM LIST

Item No.	Item	Unit/display contents
1	Odometer	km
2	Ignition cycle	Count
4	Current trouble accumulative time	min
5	S-AWC control mode	• NORMAL • SNOW • OFF LOAD
6	ABS/ASC operation flag	• ON • OFF
7	Estimated vehicle speed	km/h
8	Stop lamp switch	• ON • OFF
9	Parking brake switch	• ON • OFF
10	Front electronic control coupling torque	Nm
11	Steering angle sensor	deg
12	Accelerator opening angle	%
13	Wheel speed sensor <FL>	km/h
14	Wheel speed sensor <FR>	km/h
15	Wheel speed sensor <RL>	km/h
16	Wheel speed sensor <RR>	km/h
17	center electronic control coupling torque	Nm
18	Yaw rate sensor	deg/s
19	Lateral G-sensor	m/s^2
20	Longitudinal G-sensor	m/s^2
21	Transfer temperature	°C
22	Front electronic control coupling fluid temperature	°C
23	center electronic control coupling fluid temperature	°C
24	Front electronic control coupling clutch temperature	°C
25	center electronic control coupling clutch temperature	°C

CHECK CHART FOR DIAGNOSTIC TROUBLE CODE

M1231007900932

⚠ CAUTION

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

Diagnostic trouble code No.	Item		Reference page
C100A	FL	Wheel speed sensor system (faulty circuit)	P.23C-166
C1015	FR		
C1020	RL		
C102B	RR		
C1011	FL	Wheel speed sensor system (faulty signal)	P.23C-167
C101C	FR		
C1027	RL		
C1032	RR		
C1014	FL	Wheel speed sensor system (characteristics abnormality)	P.23C-168
C101F	FR		
C102A	RL		
C1035	RR		
C1078	Tire turning malfunction		P.23C-169
C1219	Steering wheel sensor system (faulty signal)		P.23C-171
C121A	Steering wheel sensor system (neutral learning abnormality)		P.23C-173
C123C	G and yaw rate sensor system (faulty signal)		P.23C-174
C1242	G and yaw rate sensor system (abnormality of longitudinal G sensor output signal)		P.23C-177
C145F	System disable mode (over temperature)		P.23C-178
C1460	S-AWC control mode selector circuit malfunction		P.23C-181
C1610	AWC power supply electronic relay malfunction		P.23C-184
C1614	Parking brake switch system (stuck ON)		P.23C-187
C1616	Cranking signal system (stuck ON)		P.23C-190
C161F	AWC actuator protection 1		P.23C-192
C1621	AWC actuator protection 2		P.23C-194
C1624	AWC-ECU system (Internal Error)		P.23C-197
C1626	Actuator power supply voltage malfunction		P.23C-198
C1627	Abnormal electronic control solenoid (front) current		P.23C-202
C1628	Abnormal electronic control solenoid (center) current		P.23C-204
C1629	ASC CAN data (not received)		P.23C-206
C1630	Steering wheel sensor CAN data (not received)		P.23C-207
C1631	ETACS CAN data (not received)		P.23C-208
C1632	Engine CAN data (not received)		P.23C-209

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Diagnostic trouble code No.	Item	Reference page
C1633	A/T CAN data (not received)	P.23C-210
C2100	Battery voltage malfunction (low voltage)	P.23C-212
C2101	Battery voltage malfunction (high voltage)	P.23C-218
C2203	Chassis No. not recorded	P.23C-222
C2205	Steering wheel sensor system (internal error)	P.23C-223
U0001	Bus-off	P.23C-224
U0100	Engine time-out error	P.23C-225
U0101	Transaxle time-out error	P.23C-226
U0121	ASC time-out error	P.23C-227
U0126	Steering wheel sensor time-out error	P.23C-228
U0141	ETACS time-out error	P.23C-229
U0401	Engine data malfunction	P.23C-230
U0428	Steering wheel sensor data malfunction	P.23C-231
U0431	ETACS data malfunction	P.23C-232
U1415	Coding incomplete/fail	P.23C-234
U1417	Coding data malfunction	P.23C-235
U1425	Transaxle data malfunction	P.23C-236
U1427	Wheel speed sensor data malfunction	P.23C-237
U1428	G and yaw rate sensor data malfunction	P.23C-238

SYMPTOM CHART

M1231008000705

Trouble symptom	Inspection procedure No.	Reference page
Communication between the M.U.T.-III and AWC-ECU cannot be established	1	P.23C-240
The power supply circuit system has failure	2	P.23C-241
Shifting the S-AWC control mode selector does not change the mode	3	P.23C-248
The tight corner braking phenomenon (difficult to turn) appears frequently with the S-AWC control mode selector in the NORMAL or SNOW mode	4	P.23C-251

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DIAGNOSTIC TROUBLE CODE PROCEDURES

Code No.C100A <FL>, C1015 <FR>, C1020 <RL>, C102B <RR>: Wheel Speed Sensor System (Faulty Circuit)

⚠ CAUTION

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

OPERATION

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

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

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

PROBABLE CAUSES

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

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.

Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines (Refer to GROUP 54C – Troubleshooting P.54C-17). After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the diagnostic trouble code is reset.

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

YES : Go to Step 3.

NO : This diagnosis is complete.

STEP 3. M.U.T.-III diagnostic trouble code.

Check the ASC diagnostic trouble code. (Refer to GROUP 35C –Troubleshooting P.35C-24).

Q: Is the diagnostic trouble code set?

YES : Perform the relevant troubleshooting.

NO : Go to Step 4.

STEP 4. M.U.T.-III data list.
Check the data list of the relevant wheel speed sensor. (Refer to P.23C-254).
- Item No.21: Wheel speed sensor <FL>
- Item No.22: Wheel speed sensor <FR>
- Item No.23: Wheel speed sensor <RL>
- Item No.24: Wheel speed sensor <RR>

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).
NO : Replace the AWC-ECU. (Refer to P.23C-295).

Code No.C1011 <FL>, C101C <FR>, C1027 <RL>, C1032 <RR>: Wheel Speed Sensor System (Faulty Signal)

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

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

DIAGNOSTIC TROUBLE CODE SET CONDITIONS
When an irregular change in the wheel speed sensor is detected, the diagnostic trouble code of the relevant wheel speed sensor is set.

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

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.
Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17). After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the diagnostic trouble code is reset.

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

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

STEP 3. M.U.T.-III diagnostic trouble code.
Check the ASC diagnostic trouble code. (Refer to GROUP 35C –Troubleshooting P.35C-24).

Q: Is the diagnostic trouble code set?

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

STEP 4. M.U.T.-III data list.
Check the data list of the relevant wheel speed sensor. (Refer to P.23C-254).

- Item No.21: Wheel speed sensor <FL>
- Item No.22: Wheel speed sensor <FR>
- Item No.23: Wheel speed sensor <RL>
- Item No.24: Wheel speed sensor <RR>

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).
NO : Replace the AWC-ECU. (Refer to P.23C-295).

Code No.C1014 <FL>, C101F <FR>, C102A <RL>, C1035 <RR>: Wheel Speed Sensor System (characteristics abnormality)

⚠ CAUTION

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

OPERATION

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

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

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

PROBABLE CAUSES

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

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.
Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17). After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the diagnostic trouble code is reset.

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

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

STEP 3. M.U.T.-III diagnostic trouble code.

Check the ASC diagnostic trouble code. (Refer to GROUP 35C –Troubleshooting P.35C-24).

Q: Is the diagnostic trouble code set?

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

STEP 4. M.U.T.-III data list.

Check the data list of the relevant wheel speed sensor. (Refer to P.23C-254).

- Item No.21: Wheel speed sensor <FL>
- Item No.22: Wheel speed sensor <FR>
- Item No.23: Wheel speed sensor <RL>
- Item No.24: Wheel speed sensor <RR>

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).
NO : Replace the AWC-ECU. (Refer to P.23C-295).

Code No.C1078: Tire Turning Malfunction

⚠ CAUTION

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

OPERATION

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

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

The wheel speed is observed when the vehicle is driven straight ahead with the steering angle in the neutral position and if the wheel speed difference which is more than the specified value is continuously detected, this code is set.

PROBABLE CAUSES

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

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.
Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus line (Refer to GROUP 54C – Troubleshooting P.54C-17). After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C1078 set?

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

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

Q: Is the check result normal?

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

STEP 4. M.U.T.-III diagnostic trouble code.
Check the ASC diagnostic trouble code. (Refer to GROUP 35C –Troubleshooting P.35C-24).

Q: Is the diagnostic trouble code set?

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

STEP 5. M.U.T.-III data list.
Check the following data list. (Refer to P.23C-254).

- Item No.21: Wheel speed sensor <FL>
- Item No.22: Wheel speed sensor <FR>
- Item No.23: Wheel speed sensor <RL>
- Item No.24: Wheel speed sensor <RR>

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).
NO : Replace the AWC-ECU. (Refer to P.23C-295).

Code No.C1219: Steering Wheel Sensor System (Faulty Signal)

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the steering wheel sensor is replaced, calibrate the steering wheel sensor (Refer to GROUP 35C –On-vehicle Service P.35C-286), and reset the steering wheel sensor correction amount stored in the AWC-ECU. (Item No. 1: SAS adjusted value P.23C-257).**
- **Do not drop the G and yaw rate sensor or subject it to a shock.**
- **When G and yaw rate sensor is replaced, calibrate G and yaw rate sensor (refer to GROUP 35C –On-vehicle Service P.35C-285)**

OPERATION

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

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

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

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

PROBABLE CAUSES

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

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.

Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17). After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C1219 set?

YES : Go to Step 3.

NO : This diagnosis is complete.

STEP 3. M.U.T.-III diagnostic trouble code.

Q: Is diagnostic trouble code No.C2205 set?

YES : Perform the relevant troubleshooting.

NO : Go to Step 4.

STEP 4. M.U.T.-III diagnostic trouble code.
Check if the wheel speed sensor-related, G and yaw rate sensor-related, or steering wheel sensor-related diagnostic trouble code is set.

Q: Is the diagnostic trouble code set?

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

STEP 5. Check of steering wheel sensor installation status
Check that the steering wheel sensor is installed correctly. (Refer to GROUP 35C –Steering Wheel Sensor P.35C-296).

Q: Is the check result normal?

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

STEP 6. Wheel alignment check

Q: Is the check result normal?

YES : After checking the wheel alignment, calibrate the steering wheel sensor (Refer to GROUP 35C – On-vehicle Service P.35C-286), and reset the steering wheel sensor correction amount stored in the AWC-ECU.(Refer to P.23C-257). Then, go to Step 7.
NO : After adjusting the wheel alignment, calibrate the steering wheel sensor (Refer to GROUP 35C – On-vehicle Service P.35C-286), and reset the steering wheel sensor correction amount stored in the AWC-ECU.(Refer to P.23C-257). Then, go to Step 7.

STEP 7. M.U.T.-III data list.
Item 8: Steering angle sensor (refer to P.23C-254).

Q: Is the check result normal?

YES : Go to Step 8.
NO : Replace the steering wheel sensor. (Refer to GROUP 35C –Steering Wheel Sensor P.35C-296). Then, go to Step 9.

STEP 8. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C1219 set?

YES : Replace the AWC-ECU. (Refer to P.23C-295). Then, go to Step 9.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).

STEP 9. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C1219 set?

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

Code No.C121A: Steering Wheel Sensor System (neutral learning abnormality)

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the steering wheel sensor is replaced, calibrate the steering wheel sensor (Refer to GROUP 35C –On-vehicle Service P.35C-286), and reset the steering wheel sensor correction amount stored in the AWC-ECU. (Item No. 1: SAS adjusted value P.23C-257).**

OPERATION

Steering wheel sensor stores the neutral position learned by the M.U.T.-III. When the neutral position has not been learned, the steering wheel sensor outputs the signal indicating that the learning has not been performed.

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

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

PROBABLE CAUSES

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

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.
Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17). After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C121A set?

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

STEP 3. Steering wheel sensor calibration.
Perform calibration of the steering wheel sensor. (Refer to GROUP 35C –On-vehicle Service P.35C-286).

Q: Has the calibration succeeded?

YES : Go to Step 4.
NO : Replace the steering wheel sensor. (Refer to GROUP 35C –Steering Wheel Sensor P.35C-296). Then, go to Step 4.

STEP 4. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C121A set?

YES : Replace the AWC-ECU. (Refer to P.23C-295). Then, go to Step 5.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).

STEP 5. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C121A set?

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

Code No.C123C: G and Yaw Rate Sensor (Faulty Signal)

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the steering wheel sensor is replaced, calibrate the steering wheel sensor (Refer to GROUP 35C –On-vehicle Service P.35C-286), and reset the steering wheel sensor correction amount stored in the AWC-ECU. (Item No. 1: SAS adjusted value P.23C-257).**
- **Do not drop the G and yaw rate sensor or subject it to a shock.**
- **When G and yaw rate sensor is replaced, calibrate G and yaw rate sensor (Refer to GROUP 35C –On-vehicle Service P.35C-285.)**

OPERATION

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

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

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

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

PROBABLE CAUSES

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

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DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.
Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17). After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C123C set?

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

STEP 3. M.U.T.-III diagnostic trouble code.
Check the ASC diagnostic trouble code. (Refer to GROUP 35C –Troubleshooting P.35C-24).

Q: Is the check result normal?

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

STEP 4. M.U.T.-III diagnostic trouble code.
Check if the wheel speed sensor-related, or steering wheel sensor-related diagnostic trouble code is set.

Q: Is the diagnostic trouble code set?

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

STEP 5. Check of G and yaw rate sensor installation status.
Check that the G and yaw rate sensor is installed correctly. (Refer to GROUP 35C –G and Yaw Rate Sensor P.35C-295).

Q: Is the check result normal?

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

STEP 6. M.U.T.-III data list.
Check the following data list. (Refer to P.23C-254).

- Item No.25: Yaw rate sensor
- Item No.26: Lateral G sensor

Q: Is the check result normal?

YES : Go to Step 7.
NO : Replace the G and yaw rate sensor. (Refer to GROUP 35C –G and Yaw Rate Sensor P.35C-295). Then go to Step 11.

STEP 7. Check of steering wheel sensor installation status.
Check that the steering wheel sensor is installed correctly. (Refer to GROUP 35C –Steering Wheel Sensor P.35C-296).

Q: Is the check result normal?

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

STEP 8. Wheel alignment check.

Q: Is the check result normal?

YES : After checking the wheel alignment, calibrate the steering wheel sensor (Refer to GROUP 35C – On-vehicle Service P.35C-286), and reset the steering wheel sensor correction amount stored in the AWC-ECU.(Refer to P.23C-257). Then go to Step 9.
NO : After adjusting the wheel alignment, calibrate the steering wheel sensor (Refer to GROUP 35C – On-vehicle Service P.35C-286), and reset the steering wheel sensor correction amount stored in the AWC-ECU.(Refer to P.23C-257). Then go to Step 9.

STEP 9. M.U.T.-III data list.
Item 8: Steering angle sensor (refer to P.23C-254).

Q: Is the check result normal?

YES : Go to Step 10.
NO : Replace the steering wheel sensor. (Refer to GROUP 35C –Steering Wheel Sensor P.35C-296). Then go to Step 10.

STEP 10. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C123C set?

YES : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 11.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).

STEP 11. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C123C set?

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

Code No.C1242: G and Yaw Rate Sensor System (Abnormality of Longitudinal G Sensor Output Signal)

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**
- **Do not drop the G and yaw rate sensor or subject it to a shock.**
- **When G and yaw rate sensor is replaced, calibrate G and yaw rate sensor (refer to GROUP 35C –On-vehicle Service P.35C-285)**

OPERATION

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

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

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

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

PROBABLE CAUSES

- Malfunction of G and yaw rate sensor
- Improper installation of G and yaw rate sensor
- Malfunction of wheel speed sensor
- Malfunction of stoplight switch
- Stoplight switch circuit system malfunction
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.

Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17). After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C1242 set?

YES : Go to Step 3.

NO : This diagnosis is complete.

STEP 3. M.U.T.-III diagnostic trouble code.

Check the ASC diagnostic trouble code. (Refer to GROUP 35C –Troubleshooting P.35C-24).

Q: Is the check result normal?

YES : Perform the relevant troubleshooting.

NO : Go to Step 4.

STEP 4. M.U.T.-III diagnostic trouble code.
Check if the wheel speed sensor-related diagnostic trouble code is set.

Q: Is the diagnostic trouble code set?

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

STEP 5. Check of G and yaw rate sensor installation status.
Check that the G and yaw rate sensor is installed correctly. (Refer to GROUP 35C –G and Yaw Rate Sensor P.35C-295).

Q: Is the check result normal?

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

STEP 6. M.U.T.-III data list.
Item No.27: Longitudinal G sensor (refer to P.23C-254).

Q: Is the check result normal?

YES : Go to Step 7.
NO : Replace the G and yaw rate sensor. (Refer to GROUP 35C –G and Yaw Rate Sensor P.35C-295). Then go to Step 8.

STEP 7. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C1242 set?

YES : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 8.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).

STEP 8. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C1242 set?

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

Code No.C145F: System Disable Mode (over temperature)

⚠ CAUTION

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

OPERATION

The AWC-ECU calculates the transfer temperature by the information of the electronic control coupling (center) control amount, outside temperate, etc. If it is detected that the transfer temperature becomes extremely high, the high fluid temperature warning is displayed on the warning indicator.

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DIAGNOSTIC TROUBLE CODE SET CONDITIONS

This diagnostic trouble code is set when the control is suspended to protect the transfer.

PROBABLE CAUSES

- Transfer protection control status (overheat)
- Electronic control coupling (center) failure (clutch slippage, etc.)
- A/T fluid temperature signal failure
- Outside temperature signal failure
- Wheel speed signal failure
- Engine-related failure (engine speed signal failure)
- Ignition off time signal failure

DIAGNOSTIC PROCEDURE

STEP 1. Check whether the diagnostic trouble code is reset.

(1) To release the transfer protection control, leave the vehicle for 15 minutes or longer after the high fluid temperature warning on the warning indicator disappears.
(2) Erase the diagnostic trouble code.
(3) Carry out the test drive.

NOTE: Do not carry out the severe test drive.

(4) Check if the diagnostic trouble code is set.

Q: Is diagnostic trouble code No.C145F set?

YES : Go to Step 2.
NO : This diagnosis is complete.

STEP 2. M.U.T.-III CAN bus diagnostics.

Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17). After repairing the CAN bus line, go to Step 3.

STEP 3. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C145F set?

YES : Go to Step 4.
NO : This diagnosis is complete.

STEP 4. M.U.T.-III data list

Item 12: Engine speed (Refer to P.23C-254).

Q: Is the check result normal?

YES : Go to Step 5.
NO : Perform the troubleshooting for the engine control system. (Refer to GROUP 13B –Troubleshooting P.13B-51).

STEP 5. M.U.T.-III data list

Item 16: T/M oil temperature (Refer to P.23C-254).

Q: Is the check result normal?

YES : Go to Step 6.
NO : Perform the troubleshooting for the A/T. (Refer to P.23C-26).

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STEP 6. M.U.T.-III data list

Check the following data list. (Refer to P.23C-254).

- Item No.21: Wheel speed sensor <FL>
- Item No.22: Wheel speed sensor <FR>
- Item No.23: Wheel speed sensor <RL>
- Item No.24: Wheel speed sensor <RR>

Q: Is the check result normal?

YES : Go to Step 7.

NO : Perform the troubleshooting for the ASC. (Refer to GROUP 35C –Troubleshooting P.35C-24).

STEP 7. M.U.T.-III data list

Check the following data list. (Refer to P.23C-254).

- Item No.34: Ambient temperature (CAN input)
- Item No.35: Ignition off time (CAN input)

Q: Is the check result normal?

YES : Go to Step 8.

NO : Perform the troubleshooting for the ETACS. (Refer to GROUP 54A –ETACS, Troubleshooting P.54A-742).

STEP 8. Check of the electronic control coupling (center)

Refer to P.23C-273.

Q: Is the check result normal?

YES : Go to Step 9.

NO : Replace the electronic control coupling (center). (Refer to GROUP 27C –Electronic Control Coupling P.27C-94).

STEP 9. Check whether the diagnostic trouble code is reset.

(1) To release the transfer protection control, leave the vehicle for 15 minutes or longer after the high fluid temperature warning on the warning indicator disappears.
(2) Erase the diagnostic trouble code.
(3) Carry out the test drive.

NOTE: Do not carry out the severe test drive.

(4) Check if the diagnostic trouble code is set.

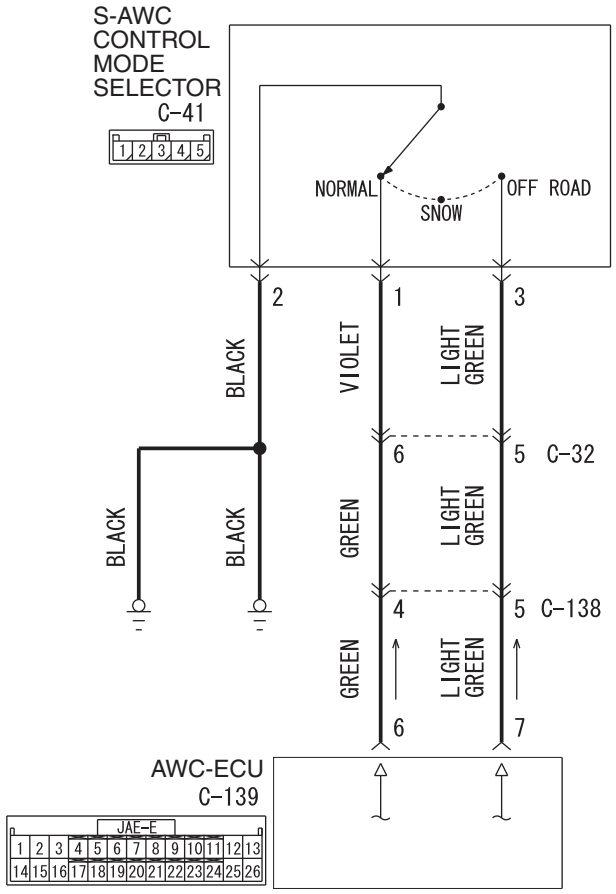
Q: Is diagnostic trouble code No.C145F set?

YES : Replace the AWC-ECU (Refer to P.23C-295).

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

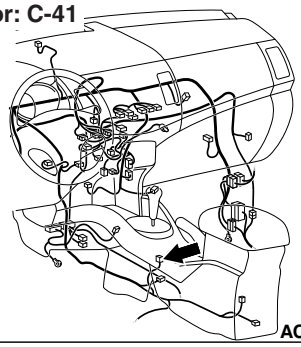
Code No.C1460: S-AWC control mode selector circuit malfunction

Drive mode selector system circuit



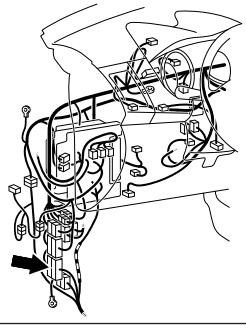
AC902485

Connector: C-41



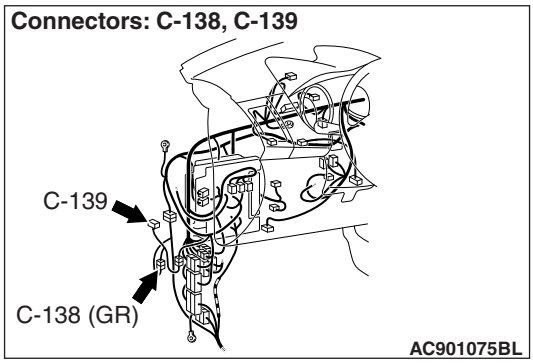
AC709494 AR

Connector: C-32



AC901075BK

TSB Revision



OPERATION

The AWC-ECU controls the driving mode by the signal from the S-AWC control mode selector.

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

This diagnostic trouble code is set when the AWC-ECU detects that both NORMAL and OFF-ROAD are in the ON status.

PROBABLE CAUSES

- S-AWC control mode selector malfunction
- Damaged harness wires and connectors
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III data list

Check the following data list. (Refer to P.23C-254).

- Item 41: SW1 status (NORMAL)
- Item 42: SW2 status (OFF-ROAD)

Q: Is the check result normal?

YES : Go to Step 5.
NO : Go to Step 2.

STEP 2. S-AWC control mode selector connector, intermediate connector, AWC-ECU connector check: C-41, C-32, C-138, C-139

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the defective connector. Then go to Step 6.

STEP 3. Check the wiring harness between C-41 S-AWC control mode selector connector terminal No.1 and C-139 AWC-ECU connector terminal No.6, and between C-41 S-AWC control mode selector connector terminal No.3 and C-139 AWC-ECU connector terminal No.7.

Check the output line for short circuit.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair the wiring harness. Then go to Step 6.

STEP 4. S-AWC control mode selector inspection

Refer to P.23C-296.

Q: Is the check result normal?

YES : Go to Step 5.

NO : Replace the S-AWC control mode selector (Refer to P.23C-296). Then go to Step 6.

STEP 5. Check whether the diagnostic trouble code is reset.

Q: Is the diagnostic trouble code No.C1460 set?

YES : Replace the AWC-ECU (Refer to P.23C-295). Then go to Step 6.

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

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

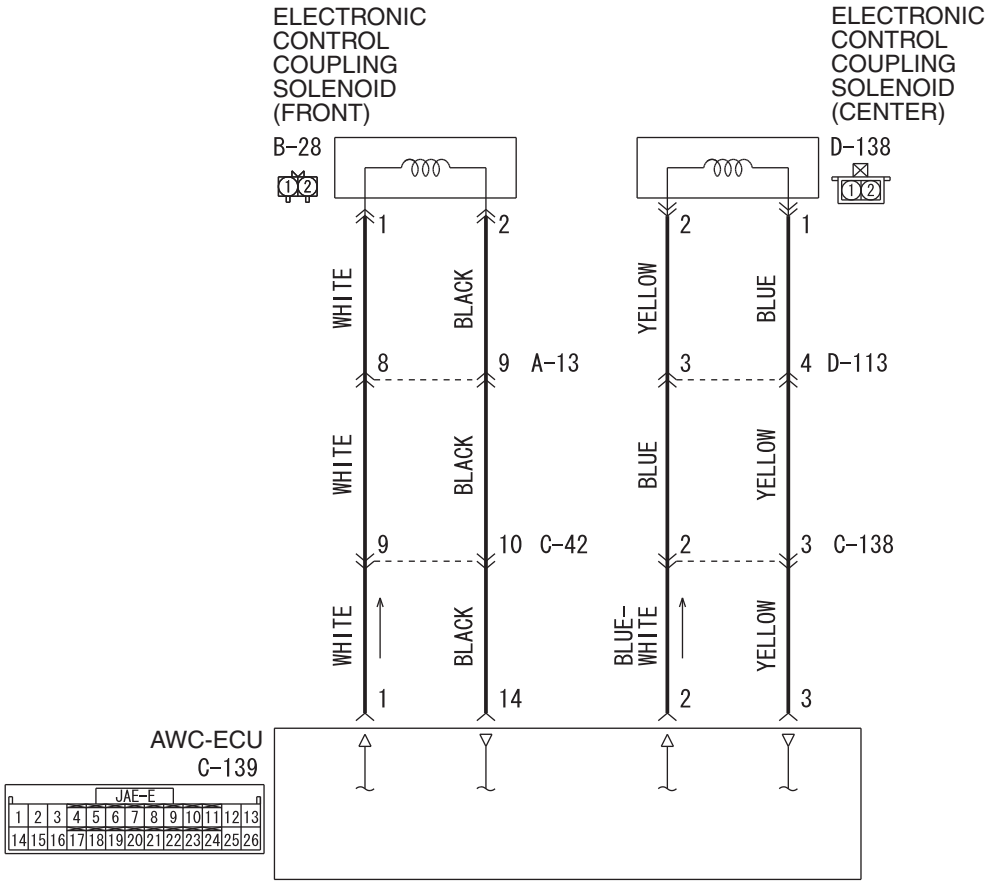
Q: Is the diagnostic trouble code No.C1460 set?

YES : Return to Step 1.

NO : This diagnosis is complete.

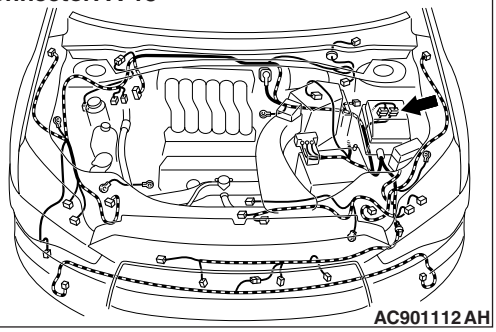
Code No.C1610: AWC Power Supply Electronic Relay Malfunction

Electronic control coupling solenoid system circuit



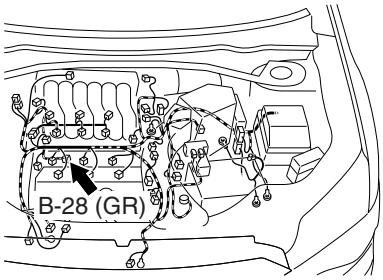
AC902486

Connector: A-13



AC901112AH

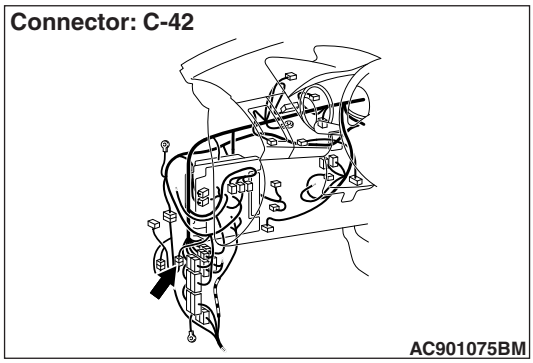
Connector: B-28



AC901598AD

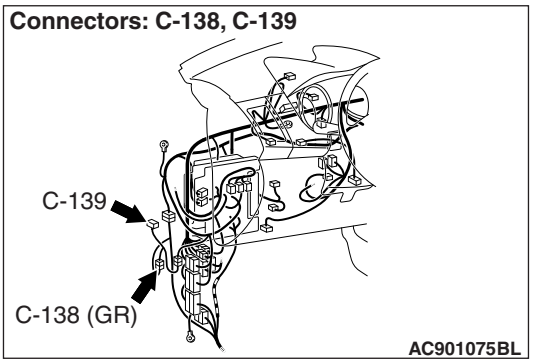
TSB Revision

Connector: C-42



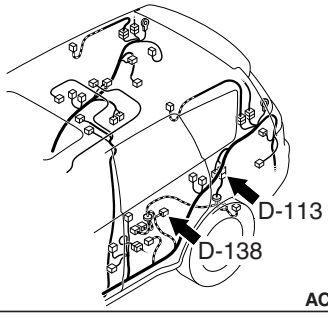
AC901075BM

Connectors: C-138, C-139



AC901075BL

Connectors: D-113, D-138



AC901080AQ

OPERATION

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

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

This diagnostic trouble code is set when the actuator power supply voltage is less than 6 V while the actuator power supply relay in the AWC-ECU is ON.

PROBABLE CAUSES

- Malfunction of AWC-ECU
- Malfunction of electronic control coupling solenoid (center)
- Malfunction of electronic control coupling solenoid (Front)
- Damaged harness wires and connectors

DIAGNOSTIC PROCEDURE

STEP 1. Electronic control coupling solenoid (front) connector, intermediate connector, AWC-ECU connector check: B-28, A-13, C-42, C-139

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the defective connector. Then go to Step 10.

STEP 2. Check the wiring harness between B-28 electronic control coupling solenoid (front) connector terminal No.1 and C-139 AWC-ECU connector terminal No.1.

Check the power supply line for short circuit.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the wiring harness. Then go to Step 10.

STEP 3. Check the wiring harness between B-28 electronic control coupling solenoid (front) connector terminal No.2 and C-139 AWC-ECU connector terminal No.14.
Check the ground line for short circuit.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair the wiring harness. Then go to Step 10.

STEP 4. Check of the electronic control coupling solenoid (Front)
Refer to P.23C-277.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Replace the transfer assembly (Refer to P.23C-292). Then go to Step 10.

STEP 5. Electronic control coupling solenoid (center) connector, intermediate connector, AWC-ECU connector check: D-138, C-138, D-113, C-139

Q: Is the check result normal?

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

STEP 6. Check the wiring harness between D-138 electronic control coupling solenoid (center) connector terminal No.2 and C-139 AWC-ECU connector terminal No.2.
Check the power supply line for short circuit.

Q: Is the check result normal?

YES : Go to Step 7.
NO : Repair the wiring harness. Then go to Step 10.

STEP 7. Check the wiring harness between D-138 electronic control coupling solenoid (center) connector terminal No.1 and C-139 AWC-ECU connector terminal No.3.
Check the ground line for short circuit.

Q: Is the check result normal?

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

STEP 8. Check of the electronic control coupling solenoid (center)
Refer to GROUP 27C –On-vehicle Service P.27C-91.

Q: Is the check result normal?

YES : Go to Step 9.
NO : Replace the electronic control coupling (center) (Refer to GROUP 27C –Electronic Control Coupling P.27C-94). Then go to Step 10.

STEP 9. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C1610 set?

YES : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 10.

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

STEP 10. Check whether the diagnostic trouble code is reset.

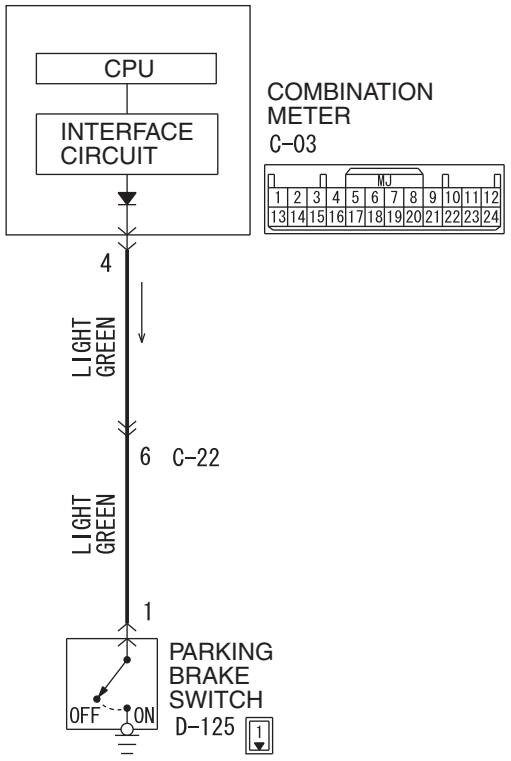
Q: Is diagnostic trouble code No.C1610 set?

YES : Return to Step 1.

NO : This diagnosis is complete.

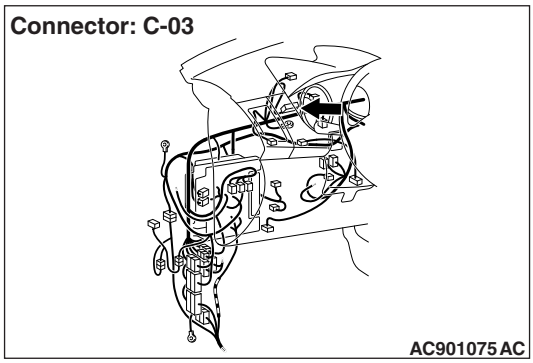
Code No.C1614: Parking Brake Switch System (Stuck On)

Parking brake switch system circuit



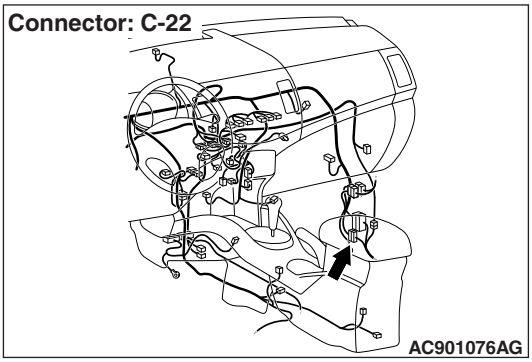
AC902487

Connector: C-03



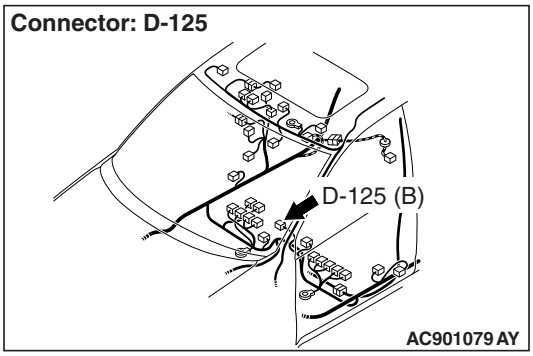
AC901075 AC

Connector: C-22



AC901076AG

Connector: D-125



AC901079 AY

⚠ CAUTION

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

OPERATION

The AWC-ECU receives the parking brake switch signal from the combination meter via CAN communication.

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

This diagnostic trouble code is set when the parking brake switch ON information is received continuously for long time during driving.

PROBABLE CAUSES

- Parking brake switch malfunction
- Damaged harness wires and connectors
- Combination meter malfunction
- Malfunction of AWC-ECU
- Driving with parking brake ON

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.

Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17). After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C1614 set?

YES : Go to Step 3.

NO : This diagnosis is complete.

TSB Revision

STEP 3. M.U.T.-III data list.
Item 29: Parking brake SW (CAN input) (Refer to data list reference table P.23C-254).

Q: Is the check result normal?

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

STEP 4. Check the parking brake switch.
Check the parking brake switch. (Refer to GROUP 36 – On-vehicle Service P.36-10).

Q: Is the check result normal?

YES : Go to Step 5.
NO : Replace the parking brake switch. (Refer to GROUP 36 –Parking Brake Lever P.36-11). Then go to Step 8.

STEP 5. Combination meter connector, intermediate connector, and parking brake switch connector check: C-03, C-22, D-125
Check the contact status of the terminals.

Q: Is the check result normal?

YES : Go to Step 6.
NO : Repair the defective connector. Then go to Step 8.

STEP 6. Check the wiring harness between C-03 combination meter connector terminal No.4 and D-125 parking brake switch connector terminal No.1.
Check the power supply line for short circuit.

Q: Is the check result normal?

YES : Replace the combination meter. (Refer to GROUP 54A –Combination Meter P.54A-123). Then go to Step 7.
NO : Repair the wiring harness. Then go to Step 7.

STEP 7. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C1614 set?

YES : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 8.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).

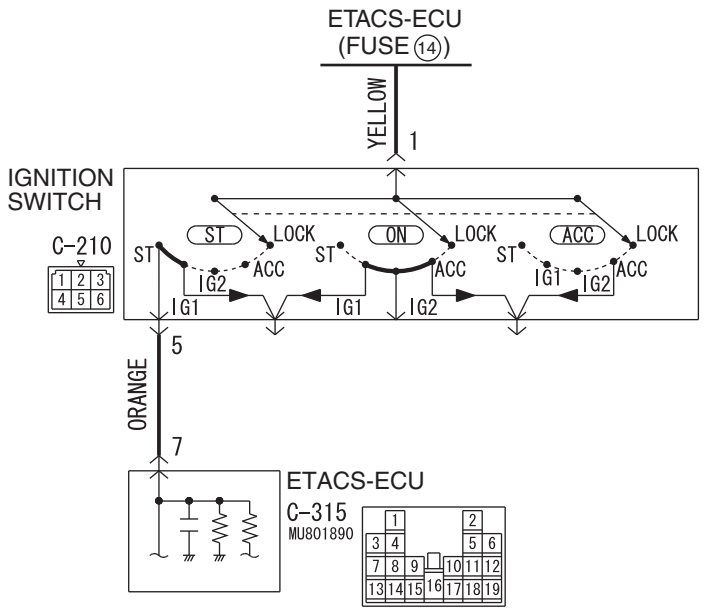
STEP 8. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C1614 set?

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

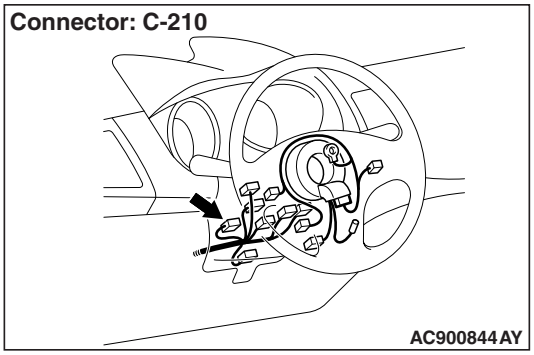
Code No.C1616: Cranking Signal System (stuck ON)

Cranking signal system circuit



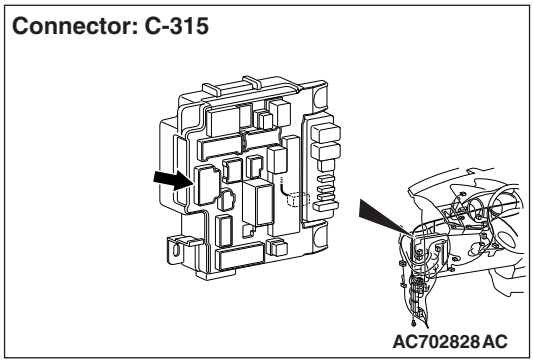
AC902488
W9H22E004A

Connector: C-210



AC900844AY

Connector: C-315



AC702828AC

⚠ CAUTION

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

OPERATION

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

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

This diagnostic trouble code is set when the cranking signal is continued for the specified time during driving.

PROBABLE CAUSES

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

TSB Revision

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.
Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17). After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C1616 set?

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

STEP 3. M.U.T.-III diagnostic trouble code.

- Check the KOS diagnostic trouble code. (Refer to GROUP 42B –Troubleshooting P.42B-31).
- Check the WCM diagnostic trouble code. (Refer to GROUP 42C –Troubleshooting P.42C-18).
- Check the ETACS diagnostic trouble code. (Refer to GROUP 54A –Troubleshooting P.54A-742).

Q: Is the diagnostic trouble code set?

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

STEP 4. M.U.T.-III data list.
Item 30: Ignition SW (CAN input) (Refer to data list reference table P.23C-254.)

Q: Is the check result normal?

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

STEP 5. Ignition switch check

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

OK: No continuity

Q: Is the check result normal?

YES : Go to Step 6.
NO : Replace the ignition switch. (Refer to GROUP 54A – Ignition Switch P.54A-22). Then go to Step 10.

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

Q: Is the check result normal?

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

TSB Revision

STEP 7. Check the wiring harness between C-210 ignition switch connector terminal No.5 and C-315 ETACS-ECU connector terminal No.7.
Check the power supply line for short (for short to the power supply) circuit.

Q: Is the check result normal?

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

STEP 8. M.U.T.-III data list.
ETACS item No.287: Starter switch (Refer to GROUP 54A – ETACS P.54A-787).

Q: Is the check result normal?

YES : Go to Step 9.
NO : Replace the ETACS-ECU. (Refer to GROUP 54A – ETACS-ECU P.54A-841). Then go to Step 9.

STEP 9. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C1616 set?

YES : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 10.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).

STEP 10. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C1616 set?

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

Code No.C161F: AWC actuator protection 1

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

OPERATION
The AWC-ECU calculates the electronic control coupling (front) temperature by the information of the electronic control coupling (front) control amount, outside temperate, etc. If it is detected that the electronic control coupling (Front) temperature becomes extremely high, the high fluid temperature warning is displayed on the warning indicator.

DIAGNOSTIC TROUBLE CODE SET CONDITIONS
This diagnostic trouble code is set when the control is suspended to protect the electronic control coupling (front).

PROBABLE CAUSES
- Electronic control coupling (front) protection control status
- Severe driving
- Electronic control coupling (front) failure (clutch slippage, etc.)
- Outside temperature signal failure
- Wheel speed signal failure
- Engine-related failure (engine speed signal failure)
- Ignition off time signal failure

TSB Revision

DIAGNOSTIC PROCEDURE

STEP 1. Check whether the diagnostic trouble code is reset.

(1) To release the electronic control coupling (front) protection control, leave the vehicle for 15 minutes or longer after the high fluid temperature warning on the warning indicator disappears.
(2) Erase the diagnostic trouble code.
(3) Carry out the test drive.

NOTE: Do not carry out the severe test drive.

(4) Check if the diagnostic trouble code is set.

Q: Is diagnostic trouble code No.C161F set?

YES : Go to Step 2.
NO : This diagnosis is complete.

STEP 2. M.U.T.-III CAN bus diagnostics.

Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17). After repairing the CAN bus line, go to Step 3.

STEP 3. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C161F set?

YES : Go to Step 4.
NO : This diagnosis is complete.

STEP 4. M.U.T.-III data list

Item 12: Engine speed (Refer to P.23C-254).

Q: Is the check result normal?

YES : Go to Step 5.
NO : Perform the troubleshooting for the engine control system. (Refer to GROUP 13B –Troubleshooting P.13B-51).

STEP 5. M.U.T.-III data list

Check the following data list. (Refer to P.23C-254).

- Item No.21: Wheel speed sensor <FL>
- Item No.22: Wheel speed sensor <FR>
- Item No.23: Wheel speed sensor <RL>
- Item No.24: Wheel speed sensor <RR>

Q: Is the check result normal?

YES : Go to Step 6.
NO : Perform the troubleshooting for the ASC. (Refer to GROUP 35C –Troubleshooting P.35C-24).

STEP 6. M.U.T.-III data list

Check the following data list. (Refer to P.23C-254).

- Item No.34: Ambient temperature (CAN input)
- Item No.35: Ignition off time (CAN input)

Q: Is the check result normal?

YES : Go to Step 7.

NO : Perform the troubleshooting for the ETACS. (Refer to GROUP 54A –ETACS, Troubleshooting P.54A-742).

STEP 7. Check of the electronic control coupling (Front)

Refer to P.23C-272.

Q: Is the check result normal?

YES : Go to Step 8.

NO : Replace the transfer assembly (Refer to P.23C-292).

STEP 8. Check whether the diagnostic trouble code is reset.

(1) To release the electronic control coupling (front) protection control, leave the vehicle for 15 minutes or longer after the high fluid temperature warning on the warning indicator disappears.
(2) Erase the diagnostic trouble code.
(3) Carry out the test drive.

NOTE: Do not carry out the severe test drive.

(4) Check if the diagnostic trouble code is set.

Q: Is diagnostic trouble code No.C161F set?

YES : Replace the AWC-ECU. (Refer to P.23C-295).

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

Code No.C1621: AWC actuator protection 2

⚠ CAUTION

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

OPERATION

The AWC-ECU calculates the electronic control coupling (center) temperature by the information of the electronic control coupling (center) control amount, outside temperate, etc. If it is detected that the electronic control coupling (center) temperature becomes extremely high, the high fluid temperature warning is displayed on the warning indicator.

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

This diagnostic trouble code is set when the control is suspended to protect the electronic control coupling (center).

PROBABLE CAUSES

- Electronic control coupling (center) protection control status
- Severe driving
- Electronic control coupling (center) failure (clutch slippage, etc.)
- Outside temperature signal failure
- Wheel speed signal failure
- Engine-related failure (engine speed signal failure)
- Ignition off time signal failure

TSB Revision

DIAGNOSTIC PROCEDURE

STEP 1. Check whether the diagnostic trouble code is reset.

(1) To release the electronic control coupling (center) protection control, leave the vehicle for 15 minutes or longer after the high fluid temperature warning on the warning indicator disappears.
(2) Erase the diagnostic trouble code.
(3) Carry out the test drive.

NOTE: Do not carry out the severe test drive.

(4) Check if the diagnostic trouble code is set.

Q: Is diagnostic trouble code No.C1621 set?

YES : Go to Step 2.
NO : This diagnosis is complete.

STEP 2. M.U.T.-III CAN bus diagnostics.

Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17). After repairing the CAN bus line, go to Step 3.

STEP 3. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C1621 set?

YES : Go to Step 4.
NO : This diagnosis is complete.

STEP 4. M.U.T.-III data list

Item 12: Engine speed (Refer to P.23C-254).

Q: Is the check result normal?

YES : Go to Step 5.
NO : Perform the troubleshooting for the engine. (Refer to GROUP 13B –Troubleshooting P.13B-51).

STEP 5. M.U.T.-III data list

Check the following data list. (Refer to P.23C-254).

- Item No.21: Wheel speed sensor <FL>
- Item No.22: Wheel speed sensor <FR>
- Item No.23: Wheel speed sensor <RL>
- Item No.24: Wheel speed sensor <RR>

Q: Is the check result normal?

YES : Go to Step 6.
NO : Perform the troubleshooting for the ASC. (Refer to GROUP 35C –Troubleshooting P.35C-24).

STEP 6. M.U.T.-III data list

Check the following data list. (Refer to P.23C-254).

- Item No.34: Ambient temperature (CAN input)
- Item No.35: Ignition off time (CAN input)

Q: Is the check result normal?

YES : Go to Step 7.

NO : Perform the troubleshooting for the ETACS. (Refer to GROUP 54A –ETACS, Troubleshooting P.54A-742).

STEP 7. Check of the electronic control coupling (center)

Refer to GROUP 27C –On-vehicle Service P.27C-91.

Q: Is the check result normal?

YES : Go to Step 8.

NO : Replace the electronic control coupling (center). (Refer to GROUP 27C –Electronic Control Coupling P.27C-94).

STEP 8. Check whether the diagnostic trouble code is reset.

(1) To release the electronic control coupling (center) protection control, leave the vehicle for 15 minutes or longer after the high fluid temperature warning on the warning indicator disappears.
(2) Erase the diagnostic trouble code.
(3) Carry out the test drive.

NOTE: Do not carry out the severe test drive.

(4) Check if the diagnostic trouble code is set.

Q: Is diagnostic trouble code No.C161F set?

YES : Replace the AWC-ECU. (Refer to P.23C-295).

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

Code No.C1624: AWC-ECU System (Internal Error)

OPERATION
AWC-ECU monitors the malfunction in the ECU.

DIAGNOSTIC TROUBLE CODE SET CONDITIONS
This diagnostic trouble code is set when RAM/ROM/EEPROM of AWC-ECU has a failure.

PROBABLE CAUSES
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C1624 set?

YES : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 2.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).

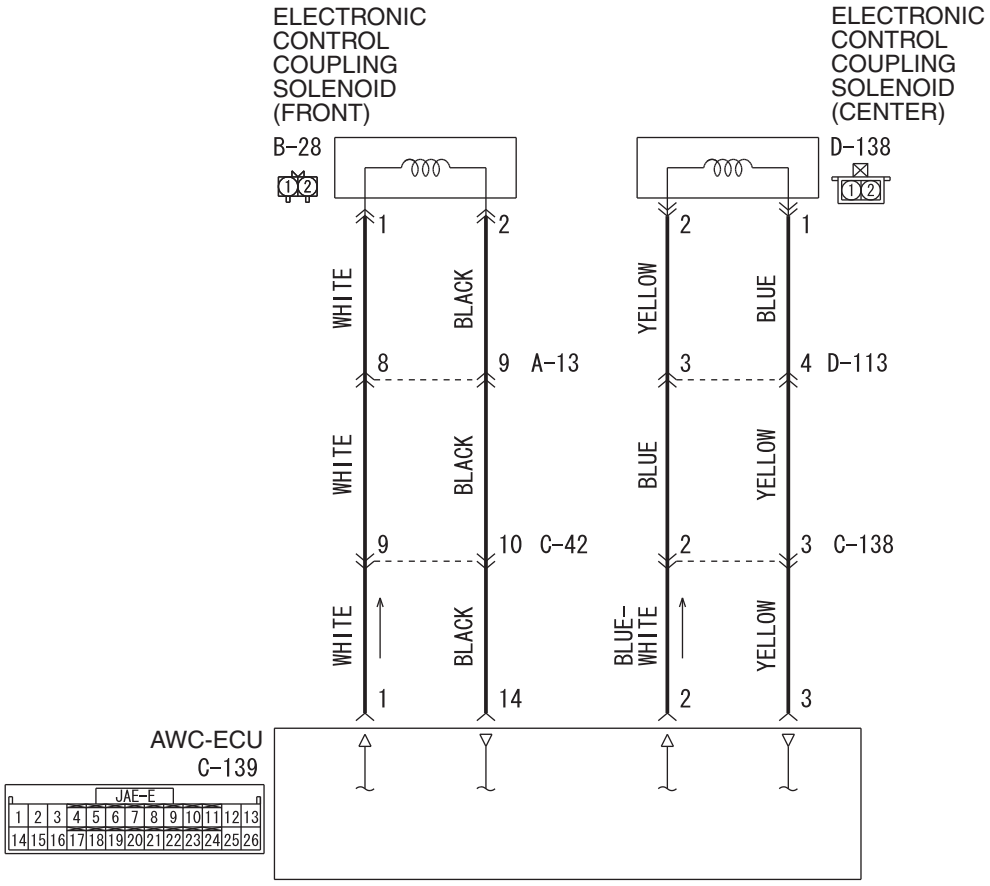
STEP 2. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C1624 set?

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

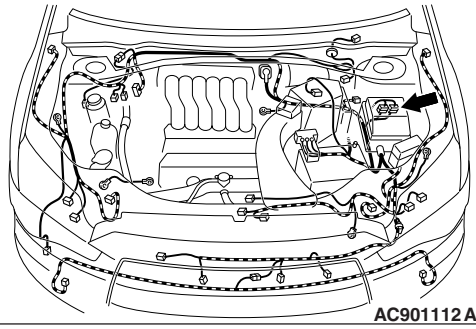
Code No. C1626: Actuator Power Supply Voltage Malfunction

Electronic control coupling solenoid system circuit



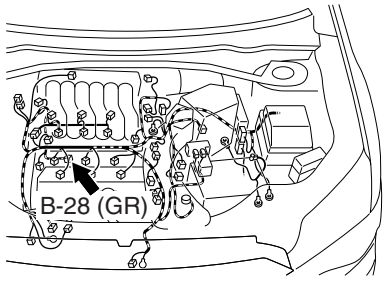
AC902486

Connector: A-13



AC901112AH

Connector: B-28



AC901598AD

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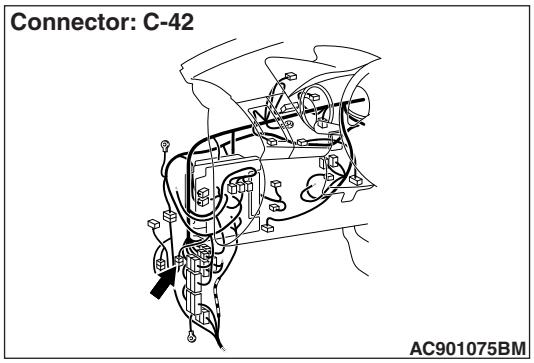
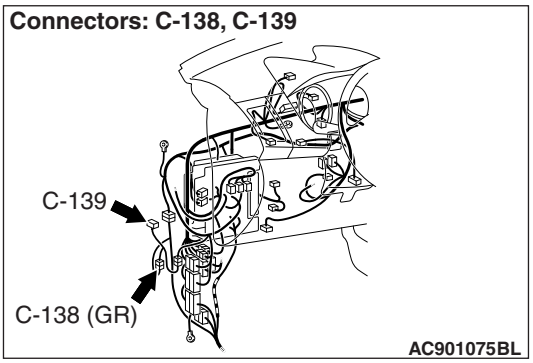
Connector: C-42



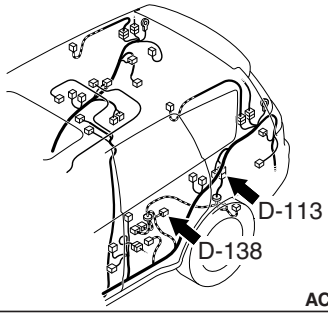
AC901075BM

Connectors: C-138, C-139



AC901075BL

Connectors: D-113, D-138



AC901080AQ

OPERATION

The AWC-ECU monitors the actuator power supply voltage.

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

The AWC-ECU monitors the actuator power supply voltage of immediately after the ignition is turned ON and when the abnormality of the actuator power supply voltage is detected, this diagnostic trouble code is set.

PROBABLE CAUSES

- Malfunction of electronic control coupling solenoid (center)
- Malfunction of electronic control coupling solenoid (Front)
- Damaged harness wires and connectors
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Electronic control coupling solenoid (front) connector, intermediate connector, AWC-ECU connector check: B-28, A-13, C-42, C-139

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the defective connector. Then go to Step 10.

STEP 2. Check the wiring harness between B-28 electronic control coupling solenoid (front) connector terminal No.1 and C-139 AWC-ECU connector terminal No.1.

Check the power supply line for short circuit (for short to the power supply).

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the wiring harness. Then go to Step 10.

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STEP 3. Check the wiring harness between B-28 electronic control coupling solenoid (front) connector terminal No.2 and C-139 AWC-ECU connector terminal No.14.
Check the ground line for short circuit (for short to the power supply).

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair the wiring harness. Then go to Step 10.

STEP 4. Check of the electronic control coupling solenoid (Front)
Refer to P.23C-277.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Replace the transfer assembly (Refer to P.23C-292). Then go to Step 10.

STEP 5. Electronic control coupling solenoid (center) connector, intermediate connector, AWC-ECU connector check: D-138, C-138, D-113, C-139

Q: Is the check result normal?

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

STEP 6. Check the wiring harness between D-138 electronic control coupling solenoid (center) connector terminal No.2 and C-139 AWC-ECU connector terminal No.2.
Check the power supply line for short circuit (for short to the power supply).

Q: Is the check result normal?

YES : Go to Step 7.
NO : Repair the wiring harness. Then go to Step 10.

STEP 7. Check the wiring harness between D-138 electronic control coupling solenoid (center) connector terminal No.1 and C-139 AWC-ECU connector terminal No.3.
Check the ground line for short circuit (for short to the power supply).

Q: Is the check result normal?

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

STEP 8. Check of the electronic control coupling solenoid (center)

Refer to GROUP 27C –On-vehicle Service P.27C-91.

Q: Is the check result normal?

YES : Go to Step 9.

NO : Replace the electronic control coupling (center) (Refer to GROUP 27C –Electronic Control Coupling P.27C-94). Then go to Step 10.

STEP 9. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C1626 set?

YES : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 10.

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

STEP 10. Check whether the diagnostic trouble code is reset.

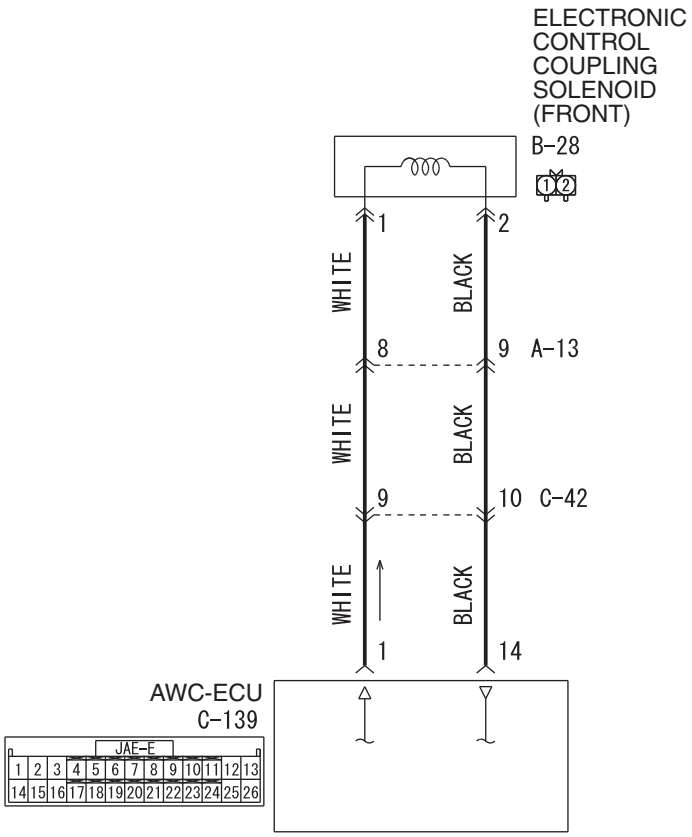
Q: Is diagnostic trouble code No.C1626 set?

YES : Return to Step 1.

NO : This diagnosis is complete.

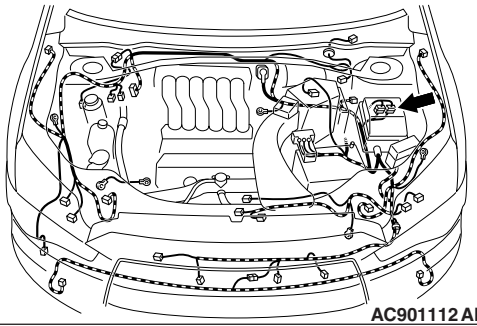
Code No. C1627: Abnormal Electronic Control Solenoid (Front) Current

Electronic control coupling solenoid (front) system circuit



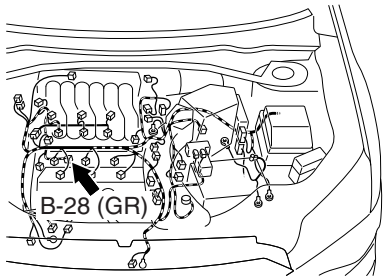
AC902489

Connector: A-13



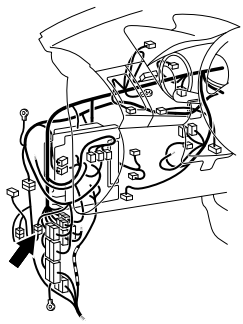
AC901112AH

Connector: B-28



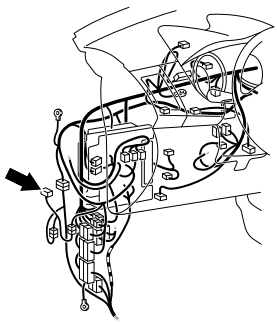
AC901598AD

Connector: C-42



AC901075BM

Connector: C-139



AC901075BN

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OPERATION

The AWC-ECU monitors the current value of the electronic control coupling solenoid (Front).

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

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

- By the monitored electronic control solenoid (front) current, the AWC-ECU judges the undercurrent failure.
- By the monitored electronic control solenoid (front) current, the AWC-ECU judges the overcurrent failure.
- The AWC-ECU judges the monitor circuit failure.

PROBABLE CAUSES

- Malfunction of electronic control coupling solenoid (Front)
- Damaged harness wires and connectors
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Electronic control coupling solenoid (front) connector, intermediate connector, AWC-ECU connector check: B-28, A-13, C-42, C-139

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the defective connector. Then go to Step 6.

STEP 2. Check the wiring harness between B-28 electronic control coupling solenoid (front) connector terminal No.1 and C-139 AWC-ECU connector terminal No.1.
Check the power supply line for open or short circuit.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the wiring harness. Then go to Step 6.

STEP 3. Check the wiring harness between B-28 electronic control coupling solenoid (front) connector terminal No.2 and C-139 AWC-ECU connector terminal No.14.
Check the ground line for open or short circuit.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair the wiring harness. Then go to Step 6.

STEP 4. Check of the electronic control coupling solenoid (Front)
Refer to P.23C-277.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Replace the transfer assembly (Refer to P.23C-292). Then go to Step 6.

STEP 5. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C1627 set?

YES : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 6.

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

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

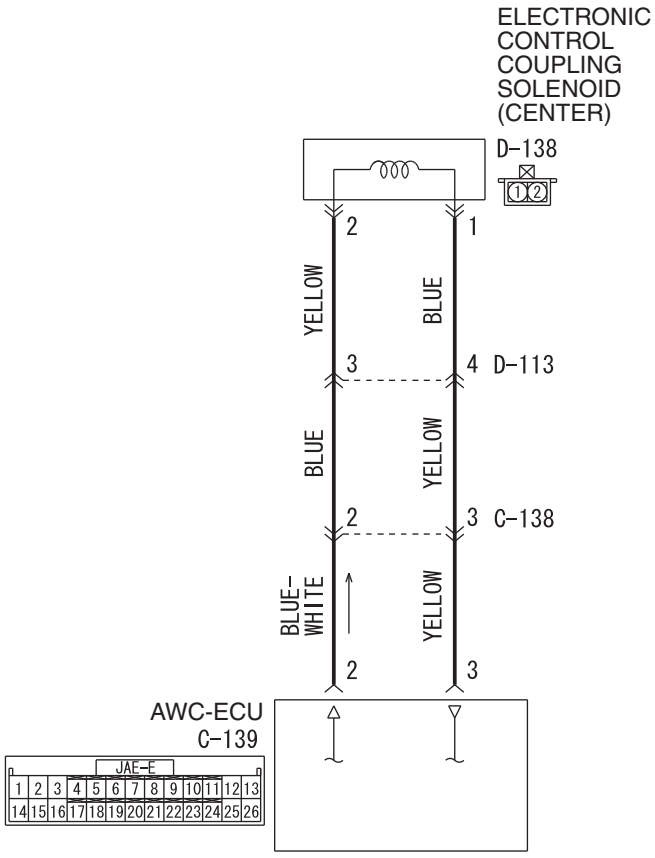
Q: Is diagnostic trouble code No.C1627 set?

YES : Return to Step 1.

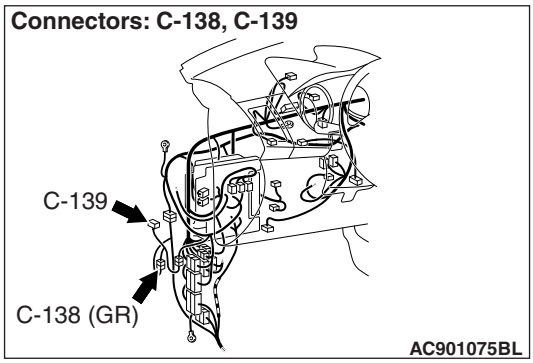
NO : This diagnosis is complete.

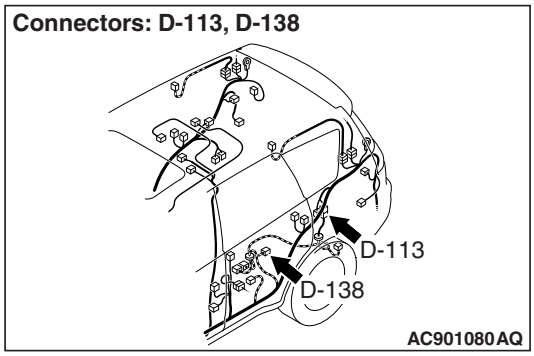
Code No. C1628: Abnormal Electronic Control Solenoid (center) Current

Electronic control coupling solenoid (rear) system circuit



AC902490





OPERATION

The AWC-ECU monitors the current value of the electronic control coupling solenoid (center).

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

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

- By the monitored electronic control solenoid (center) current, the AWC-ECU judges the undercurrent failure.
- By the monitored electronic control solenoid (center) current, the AWC-ECU judges the overcurrent failure.
- The AWC-ECU judges the monitor circuit failure.

PROBABLE CAUSES

- Malfunction of electronic control coupling solenoid (center)
- Damaged harness wires and connectors
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. Electronic control coupling solenoid (center) connector, intermediate connector, AWC-ECU connector check: D-138, C-138, D-113, C-139

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the defective connector. Then go to Step 6.

STEP 2. Check the wiring harness between D-138 electronic control coupling solenoid (center) connector terminal No.2 and C-139 AWC-ECU connector terminal No.2.

Check the power supply line for open or short circuit.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the wiring harness. Then go to Step 6.

STEP 3. Check the wiring harness between D-138 electronic control coupling solenoid (center) connector terminal No.1 and C-139 AWC-ECU connector terminal No.3.

Check the ground line for open or short circuit.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair the wiring harness. Then go to Step 6.

STEP 4. Check of the electronic control coupling solenoid (center)
Refer to GROUP 27C –On-vehicle Service P.27C-91.

Q: Is the check result normal?
YES : Go to Step 5.
NO : Replace the electronic control coupling (center) (Refer to GROUP 27C –Electronic Control Coupling P.27C-94). Then go to Step 6.

STEP 5. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C1628 set?
YES : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 6.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).

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

Q: Is diagnostic trouble code No.C1628 set?
YES : Return to Step 1.
NO : This diagnosis is complete.

Code No. C1629: ASC CAN Data (not received)

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

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

DIAGNOSTIC TROUBLE CODE SET CONDITIONS
This diagnostic trouble code is set when the CAN signal of the ASC-ECU cannot be received.

PROBABLE CAUSES
- Malfunction of the CAN bus line
- Damaged connectors (ASC-ECU)
- Malfunction of ASC-ECU
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.
Use scan tool to perform the CAN bus diagnosis.

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

STEP 2. M.U.T.-III diagnostic trouble code.
Check the ASC diagnostic trouble code. (Refer to GROUP 35C –Troubleshooting P.35C-24).

Q: Is the diagnostic trouble code set?

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

STEP 3. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C1629 set?

YES : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 4.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).

STEP 4. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C1629 set?

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

Code No. C1630: Steering Wheel Sensor CAN Data (not received)

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the steering wheel sensor is replaced, calibrate the steering wheel sensor (Refer to GROUP 35C –On-vehicle Service P.35C-286), and reset the steering wheel sensor correction amount stored in the AWC-ECU. (Item No. 1: SAS adjusted value P.23C-257).**

OPERATION

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

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

This diagnostic trouble code is set when the CAN signal of the steering wheel sensor cannot be received.

PROBABLE CAUSES

- Malfunction of the CAN bus line
- Damaged connectors (steering wheel sensor)
- Malfunction of the steering wheel sensor
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.
Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17).

STEP 2. M.U.T.-III data list.
Item No.8: Steering angle sensor (refer to P.23C-254).

Q: Is the check result normal?
YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).
NO : Replace the steering wheel sensor. (Refer to GROUP 35C –Steering Wheel Sensor P.35C-296). Then go to Step 3.

STEP 3. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C1630 set?
YES : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 4.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).

STEP 4. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C1630 set?
YES : Return to Step 1.
NO : This diagnosis is complete.

Code No. C1631: ETACS CAN Data (not received)

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

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

DIAGNOSTIC TROUBLE CODE SET CONDITIONS
This diagnostic trouble code is set when the CAN signal of the ETACS-ECU cannot be received.

PROBABLE CAUSES
- Malfunction of the CAN bus line
- Damaged connectors (ETACS-ECU)
- ETACS-ECU malfunction
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.
Use scan tool to perform the CAN bus diagnosis.

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

STEP 2. M.U.T.-III diagnostic trouble code.
Check the ETACS diagnostic trouble code. (Refer to GROUP 54A –Troubleshooting P.54A-742).

Q: Is the diagnostic trouble code set?

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

STEP 3. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C1631 set?

YES : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 4.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).

STEP 4. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C1631 set?

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

Code No. C1632: Engine CAN Data (not received)

⚠ CAUTION

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

OPERATION

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

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

This diagnostic trouble code is set when the CAN signal of the engine control module cannot be received.

PROBABLE CAUSES

- Malfunction of the CAN bus line
- Damaged connectors (Engine control module)
- Malfunction of engine control module
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.
Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17). After repairing the CAN bus line, go to Step 2.

STEP 2. M.U.T.-III diagnostic trouble code.
Check the engine diagnostic trouble code. (Refer to GROUP 13B –Troubleshooting P.13B-51).

Q: Is the diagnostic trouble code set?

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

STEP 3. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C1632 set?

YES : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 4.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).

STEP 4. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C1632 set?

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

Code No. C1633: A/T CAN Data (not received)

⚠ CAUTION

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

OPERATION

AWC-ECU communicates with A/T-ECU via the CAN bus lines.

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

This diagnostic trouble code is set when the CAN signal of the A/T-ECU cannot be received.

PROBABLE CAUSES

- Malfunction of the CAN bus line
- Damaged connectors (A/T-ECU)
- Malfunction of A/T-ECU
- Malfunction of AWC-ECU
- Coding failure (installation of M/T for a vehicle with A/T specification, failure coding of A/T for a vehicle with M/T specification)

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.
Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17).

STEP 2. M.U.T.-III diagnostic trouble code.
Check the A/T diagnostic trouble code. (Refer to P.23C-26).

Q: Is the diagnostic trouble code set?

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

STEP 3. ETACS-ECU coding data check.
Check the Transaxle coding data stored in ETACS-ECU for any abnormality. (Refer to GROUP 00 –Coding Reference Table P.00-35).

Q: Is the check result normal?

YES : Go to Step 4.
NO : Replace the ETACS-ECU. (Refer to GROUP 54A – ETACS-ECU P.54A-841). Then go to Step 5.

STEP 4. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.U0101 set?

YES : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 5.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).

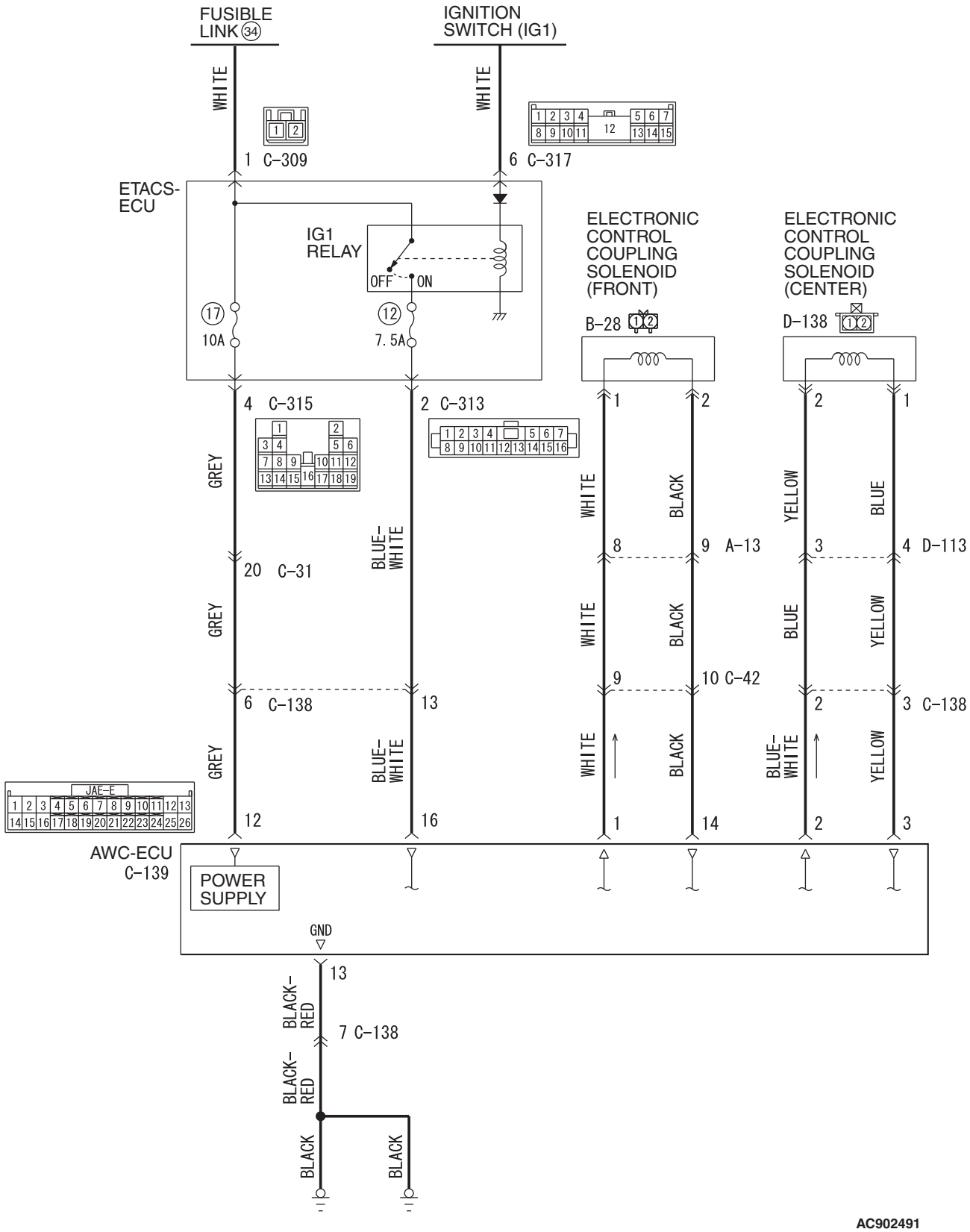
STEP 5. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.U0101 set?

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

Code No.C2100: Battery Voltage Malfunction (Low Voltage)

Power supply system circuit



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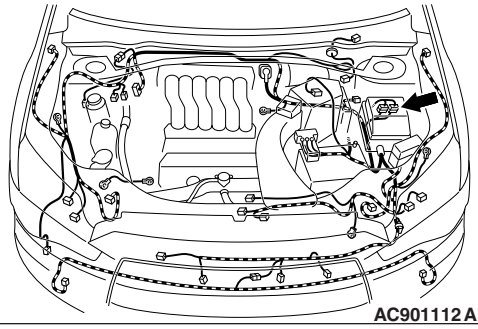
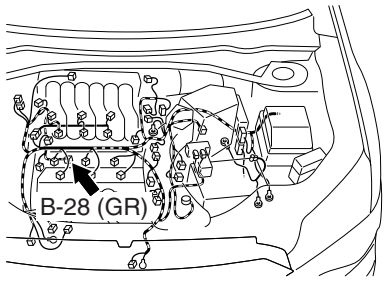
Connector: A-13



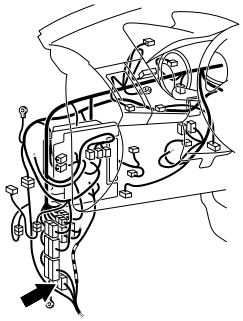
AC901112AH

Connector: B-28



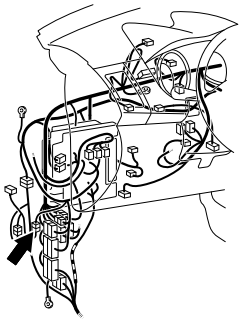
AC901598AD

Connector: C-31



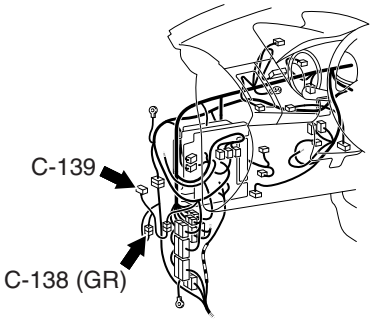
AC901075BO

Connector: C-42



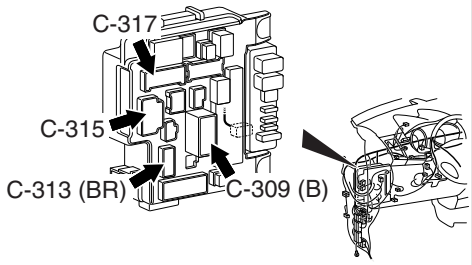
AC901075BM

Connectors: C-138, C-139



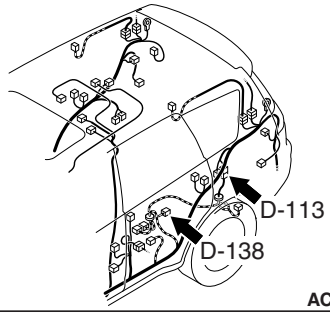
AC901075BL

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



AC702828BI

Connectors: D-113, D-138



AC901080AQ

OPERATION

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

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

This diagnostic trouble code is set when the AWC-ECU power supply voltage and the actuator power supply voltage are less than 9 V.

TSB Revision

PROBABLE CAUSES

- Battery failure
- Malfunction of charging system
- Malfunction of ETACS-ECU (power supply circuit system)
- Damaged harness wires and connectors
- Malfunction of electronic control coupling solenoid (Front)
- Malfunction of electronic control coupling solenoid (center)
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III diagnostic trouble code.
Check the ETACS diagnostic trouble code. (Refer to GROUP 54A –Troubleshooting P.54A-742).

Q: Is the diagnostic trouble code set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 2.

STEP 2. Check the battery.
Refer to GROUP 54A –Battery Test P.54A-8.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Charge or replace the battery. Then go to Step 3.

STEP 3. Check the charging system.
Refer to GROUP 16 –Charging System P.16-7.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair or replace the charging system component(s).

STEP 4. Voltage measurement at C-139 AWC-ECU connector
Disconnect the connector, and measure the voltage between terminal No.12 and ground at the wiring harness side.

OK: Battery positive voltage

Q: Is the check result normal?

YES : Go to Step 8.
NO : Go to Step 5.

STEP 5. AWC-ECU connector, ETACS-ECU connector check: C-139, C-315, C-138, C-31

Q: Is the check result normal?

YES : Go to Step 6.
NO : Repair the defective connector. Then go to Step 19.

STEP 6. Check the wiring harness between C-139 AWC-ECU connector terminal No.12 and C-315 ETACS-ECU connector terminal No.4.
Check the power supply line for short or open circuit.

Q: Is the check result normal?

YES : Go to Step 7.
NO : Check C-31, C-138 intermediate connector. When no problem is found, repair the wiring harness. Then go to Step 19.

STEP 7. M.U.T.-III data list.
Item No.31: Battery voltage (CAN input) (Refer to data list reference table P.23C-254).

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).
NO : Replace the ETACS-ECU. (Refer to GROUP 54A – ETACS-ECU P.54A-841). Then go to Step 19.

STEP 8. AWC-ECU connector check: C-138, C-139

Q: Is the check result normal?

YES : Go to Step 9.
NO : Repair the defective connector. Then go to Step 19.

STEP 9. Check the wiring harness between C-139 AWC-ECU connector terminal No.13 and body ground.
Check the ground line for open circuit.

Q: Is the check result normal?

YES : Go to Step 10.
NO : Repair the wiring harness. Then go to Step 19.

STEP 10. Electronic control coupling solenoid (front) connector, intermediate connector, AWC-ECU connector check: B-28, A-13, C-42, C-139

Q: Is the check result normal?

YES : Go to Step 11.
NO : Repair the defective connector. Then go to Step 19.

STEP 11. Check the wiring harness between B-28 electronic control coupling solenoid (front) connector terminal No.1 and C-139 AWC-ECU connector terminal No.1.
Check the power supply line for short circuit.

Q: Is the check result normal?

YES : Go to Step 12.
NO : Repair the wiring harness. Then go to Step 19.

STEP 12. Check the wiring harness between B-28 electronic control coupling solenoid (front) connector terminal No.2 and C-139 AWC-ECU connector terminal No.14.

Check the ground line for short circuit.

Q: Is the check result normal?

YES : Go to Step 13.
NO : Repair the wiring harness. Then go to Step 19.

STEP 13. Check of the electronic control coupling solenoid (Front)

Refer to P.23C-277.

Q: Is the check result normal?

YES : Go to Step 14.
NO : Replace the transfer assembly (Refer to P.23C-292). Then go to Step 19.

STEP 14. Electronic control coupling solenoid (center) connector, intermediate connector, AWC-ECU connector check: D-138, C-138, D-113, C-139

Q: Is the check result normal?

YES : Go to Step 15.
NO : Repair the defective connector. Then go to Step 19.

STEP 15. Check the wiring harness between D-138 electronic control coupling solenoid (center) connector terminal No.2 and C-139 AWC-ECU connector terminal No.2.

Check the power supply line for short circuit.

Q: Is the check result normal?

YES : Go to Step 16.
NO : Repair the wiring harness. Then go to Step 19.

STEP 16. Check the wiring harness between D-138 electronic control coupling solenoid (center) connector terminal No.1 and C-139 AWC-ECU connector terminal No.3.

Check the ground line for short circuit.

Q: Is the check result normal?

YES : Go to Step 17.
NO : Repair the wiring harness. Then go to Step 19.

STEP 17. Check of the electronic control coupling solenoid (center)

Refer to GROUP 27C –On-vehicle Service P.27C-91.

Q: Is the check result normal?

YES : Go to Step 18.

NO : Replace the electronic control coupling (center) (Refer to GROUP 27C –Electronic Control Coupling P.27C-94). Then go to Step 19.

STEP 18. M.U.T.-III data list.

Item No.31: Battery voltage (CAN input) (Refer to data list reference table P.23C-254).

Q: Is the check result normal?

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

NO : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 19.

STEP 19. Check whether the diagnostic trouble code is reset.

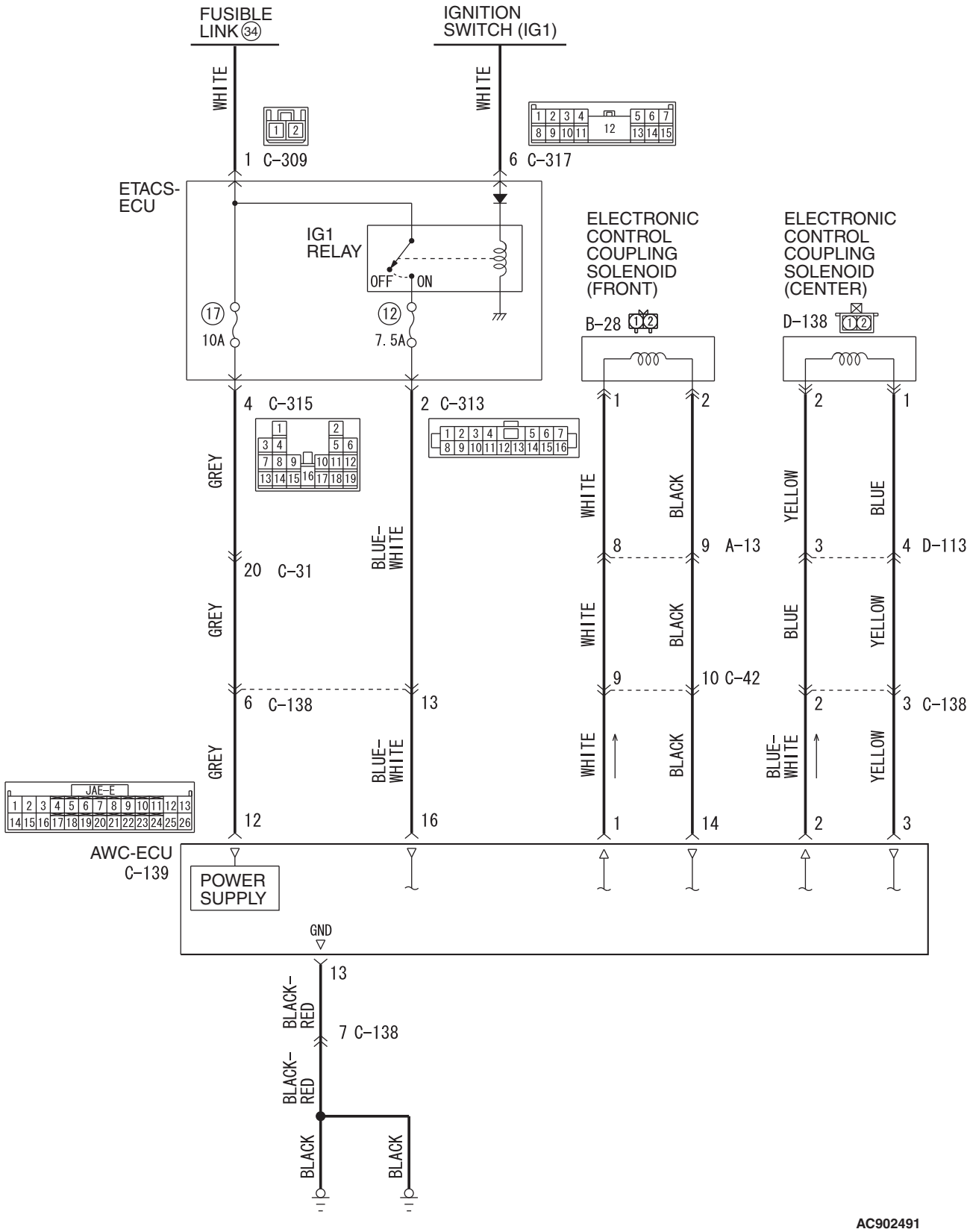
Q: Is diagnostic trouble code No.C2100 set?

YES : Return to Step 1.

NO : This diagnosis is complete.

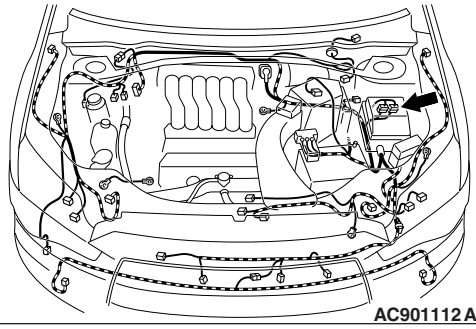
Code No.C2101: Battery Voltage Malfunction (High Voltage)

Power supply system circuit



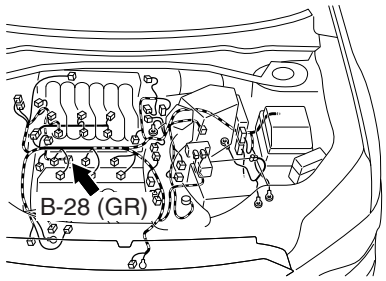
TSB Revision

Connector: A-13



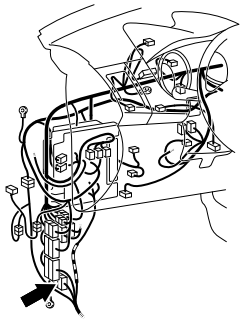
AC901112AH

Connector: B-28



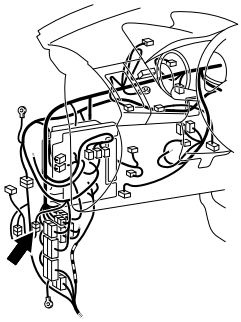
AC901598AD

Connector: C-31



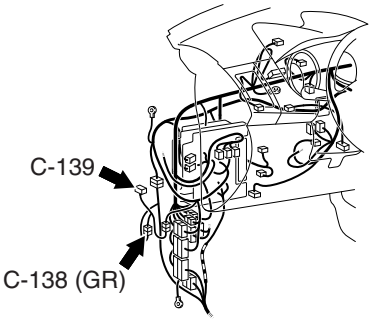
AC901075BO

Connector: C-42



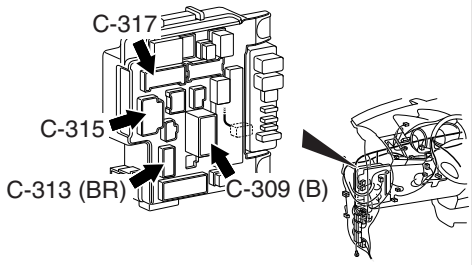
AC901075BM

Connectors: C-138, C-139



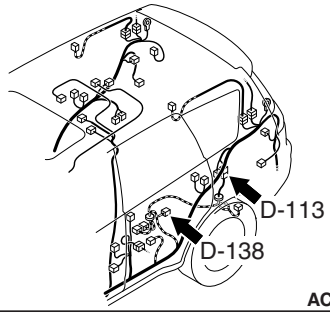
AC901075BL

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



AC702828BI

Connectors: D-113, D-138



AC901080AQ

OPERATION

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

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

This diagnostic trouble code is set when the AWC-ECU power supply voltage and the actuator power supply voltage are 18 V or more.

TSB Revision

PROBABLE CAUSES

- Malfunction of charging system
- Loose battery terminal
- Damaged harness wires and connectors
- Malfunction of AWC-ECU
- ETACS-ECU malfunction

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III diagnostic trouble code.
Check the ETACS diagnostic trouble code. (Refer to GROUP 54A –Troubleshooting P.54A-742).

Q: Is the diagnostic trouble code set?

YES : Perform the relevant troubleshooting.
NO : Go to Step 2.

STEP 2. Battery terminal check
Check that the battery terminal is not loose.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Securely install the battery terminal. Then go to Step 3.

STEP 3. Check the charging system.
Refer to GROUP 16 –Charging System P.16-7.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair or replace the charging system component(s).

STEP 4. Check the battery.
Refer to GROUP 54A –Battery Test P.54A-8.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Replace the battery. Then go to Step 5.

STEP 5. Voltage measurement at C-139 AWC-ECU connector
Disconnect the connector, and measure the voltage between terminal No.12 and ground at the wiring harness side.

OK: Battery positive voltage

Q: Is the check result normal?

YES : Go to Step 9.
NO : Go to Step 6.

STEP 6. AWC-ECU connector, ETACS-ECU connector, intermediate connector check: C-139, C-315, C-31, C-138

Q: Is the check result normal?

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

STEP 7. Check the wiring harness between C-139 AWC-ECUconnector terminal No.12 and C-315 ETACS-ECU connector terminal No.4.

Check the power supply line for short circuit.

Q: Is the check result normal?

YES : Go to Step 8.

NO : Check C-31, C-138 intermediate connector. When no problem is found, repair the wiring harness. Then go to Step 10.

STEP 8. M.U.T.-III data list.

Item No.31: Battery voltage (CAN input) (Refer to data list reference table P.23C-254).

Q: Is the check result normal?

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

NO : Replace the ETACS-ECU. (Refer to GROUP 54A – ETACS-ECU P.54A-841). Then go to Step 10.

STEP 9. M.U.T.-III data list.

Item No.31: Battery voltage (CAN input) (Refer to data list reference table P.23C-254).

Q: Is the check result normal?

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

NO : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 10.

STEP 10. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C2101 set?

YES : Return to Step 1.

NO : This diagnosis is complete.

Code No.C2203: Chassis No. Not Recorded

⚠ CAUTION

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

OPERATION

AWC-ECU receives chassis number information from the ECM.

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

This diagnostic trouble code is set when the chassis number is not written to the AWC-ECU.

PROBABLE CAUSES

- Malfunction of the CAN bus line
- Chassis number not written
- Malfunction of ECM
- Malfunction of AWC-ECU
- ETACS-ECU malfunction

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.

Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17). After repairing the CAN bus line, go to Step 2.

STEP 2. M.U.T.-III diagnostic trouble code.

Check whether engine-related diagnostic trouble code No.P0630 is set. (Refer to GROUP 13B –Troubleshooting P.13B-51).

Q: Is the diagnostic trouble code set?

YES : Perform the relevant troubleshooting.

NO : Go to Step 3.

STEP 3. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C2203 set?

YES : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 4.

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

STEP 4. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C2203 set?

YES : Return to Step 1.

NO : This diagnosis is complete.

TSB Revision

Code No.C2205: Steering Wheel Sensor System (Internal Error)

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the steering wheel sensor is replaced, calibrate the steering wheel sensor (Refer to GROUP 35C –On-vehicle Service P.35C-286), and reset the steering wheel sensor correction amount stored in the AWC-ECU. (Item No. 1: SAS adjusted value P.23C-257).**

OPERATION

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

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

This diagnostic trouble code is set when the AWC-ECU receives the failure status information by the self-diagnosis of the steering wheel sensor.

PROBABLE CAUSES

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

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.

Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17). After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C2205 set?

YES : Go to Step 3.

NO : This diagnosis is complete.

STEP 3. M.U.T.-III data list.

Item 8: Steering angle sensor (refer to P.23C-254).

Q: Is the check result normal?

YES : Go to Step 4.

NO : Replace the steering wheel sensor. (Refer to GROUP 35C –Steering Wheel Sensor P.35C-296). Then go to Step 5.

STEP 4. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C2205 set?

YES : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 5.

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

STEP 5. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.C2205 set?

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

Code No.U0001: Bus-Off

⚠ CAUTION

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

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

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

PROBABLE CAUSES

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

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.

Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17). After repairing the CAN bus line, go to Step 2.

STEP 2. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.U0001 set?

YES : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 3.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).

STEP 3. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.U0001 set?

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

Code No.U0100: Engine Time-out Error

⚠ CAUTION

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

OPERATION

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

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

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

PROBABLE CAUSES

- Malfunction of the CAN bus line
- Malfunction of power supply circuit system (ECM)
- Malfunction of ECU (ECM)
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.

Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17). After repairing the CAN bus line, go to Step 2.

STEP 2. M.U.T.-III diagnostic trouble code.

Check the engine diagnostic trouble code. (Refer to GROUP 13B –Troubleshooting P.13B-51).

Q: Is the diagnostic trouble code set?

YES : Perform the relevant troubleshooting.

NO : Go to Step 3.

STEP 3. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.U0100 set?

YES : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 4.

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

STEP 4. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.U0100 set?

YES : Return to Step 1.

NO : This diagnosis is complete.

Code No.U0101: Transaxle Time-out Error

⚠ CAUTION

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

OPERATION

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

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

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

PROBABLE CAUSES

- Malfunction of the CAN bus line
- Malfunction of power supply circuit system (TCM)
- Malfunction of ECU (TCM)
- Malfunction of AWC-ECU
- ETACS coding failure (coding of A/T specification for a vehicle with M/T specification)

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.
Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17).

STEP 2. M.U.T.-III diagnostic trouble code.
Check the A/T diagnostic trouble code. (Refer to P.23C-26).

Q: Is the diagnostic trouble code set?

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

STEP 3. ETACS-ECU coding data check.
Check the Transaxle coding data stored in ETACS-ECU for any abnormality. (Refer to GROUP 00 –Coding Reference Table P.00-35).

Q: Is the check result normal?

YES : Go to Step 4.
NO : Replace the ETACS-ECU. (Refer to GROUP 54A – ETACS-ECU P.54A-841). Then go to Step 5.

STEP 4. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.U0101 set?

YES : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 5.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).

STEP 5. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.U0101 set?

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

Code No.U0121: ASC Time-out Error

⚠ CAUTION

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

OPERATION

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

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

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

PROBABLE CAUSES

- Malfunction of the CAN bus line
- Malfunction of power supply circuit system (ASC-ECU)
- Malfunction of ECU (ASC-ECU)
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.

Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17).

STEP 2. M.U.T.-III diagnostic trouble code.

Check the ASC diagnostic trouble code. (Refer to GROUP 35C –Troubleshooting P.35C-24).

Q: Is the diagnostic trouble code set?

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

STEP 3. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.U0121 set?

YES : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 4.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).

STEP 4. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.U0121 set?

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

Code No.U0126: Steering Wheel Sensor Time-out Error

⚠ CAUTION

- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the steering wheel sensor is replaced, calibrate the steering wheel sensor (Refer to GROUP 35C –On-vehicle Service P.35C-286), and reset the steering wheel sensor correction amount stored in the AWC-ECU. (Item No. 1: SAS adjusted value P.23C-257).**

OPERATION

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

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

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

PROBABLE CAUSES

- Malfunction of the CAN bus line
- Malfunction of power supply circuit system (steering wheel sensor)
- Malfunction of the steering wheel sensor
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.
Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17).

STEP 2. M.U.T.-III data list.
Item No.8: Steering angle sensor (refer to P.23C-254).

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).
NO : Replace the steering wheel sensor. (Refer to GROUP 35C –Steering Wheel Sensor P.35C-296). Then go to Step 3.

STEP 3. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.U0126 set?

YES : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 4.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).

STEP 4. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.U0126 set?

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

Code No.U0141: ETACS Time-out Error

⚠ CAUTION

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

OPERATION

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

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

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

PROBABLE CAUSES

- Malfunction of the CAN bus line
- Malfunction of power supply circuit system (ETACS-ECU)
- Malfunction of ECU (ETACS-ECU)
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.
Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17).

STEP 2. M.U.T.-III diagnostic trouble code.
Check the ETACS diagnostic trouble code. (Refer to GROUP 54A –Troubleshooting P.54A-742).

Q: Is the diagnostic trouble code set?

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

STEP 3. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.U0141 set?

YES : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 4.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).

STEP 4. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.U0141 set?

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

Code No.U0401: Engine Data Malfunction

⚠ CAUTION

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

OPERATION

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

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

The code is set when abnormality is detected in the signal received from the ECM.

PROBABLE CAUSES

- Malfunction of the CAN bus line
- Engine malfunction
- Malfunction of ECM
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.

Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17).

STEP 2. M.U.T.-III diagnostic trouble code.

Check the engine diagnostic trouble code. (Refer to GROUP 13B –Troubleshooting P.13B-51).

Q: Is the diagnostic trouble code set?

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

STEP 3. M.U.T.-III data list.
Check the following data list. (Refer to P.23C-254).
- Item No.12: Engine speed
- Item No.13: Engine torque (Driver request value)

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

STEP 4. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.U0401 set?
YES : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 5.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).

STEP 5. Check whether the diagnostic trouble code is reset.

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

Code No.U0428: Steering Wheel Sensor Data Malfunction

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**
- **When the steering wheel sensor is replaced, calibrate the steering wheel sensor (Refer to GROUP 35C –On-vehicle Service P.35C-286), and reset the steering wheel sensor correction amount stored in the AWC-ECU. (Item No. 1: SAS adjusted value P.23C-257).**

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

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

PROBABLE CAUSES
- Malfunction of the CAN bus line
- Malfunction of the steering wheel sensor
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.
Use scan tool to perform the CAN bus diagnosis.

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

STEP 2. M.U.T.-III data list.
Item No.8: Steering angle sensor (refer to P.23C-254).

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).
NO : Replace the steering wheel sensor. (Refer to GROUP 35C –Steering Wheel Sensor P.35C-296). Then go to Step 3.

STEP 3. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.U0428 set?

YES : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 4.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).

STEP 4. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.U0428 set?

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

Code No.U0431: ETACS Data Malfunction

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

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

DIAGNOSTIC TROUBLE CODE SET CONDITIONS
The code is set when abnormality is detected in the signal received from ETACS-ECU.

PROBABLE CAUSES
- Malfunction of the CAN bus line
- Malfunction of ETACS-ECU power supply circuit system
- ETACS-ECU malfunction
- Malfunction of AWC-ECU
- Coding not implemented

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.
Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17).

STEP 2. M.U.T.-III diagnostic trouble code.
Check if the AWC diagnostic trouble code No.U1415 is set. (Refer to P.23C-164).

Q: Is the diagnostic trouble code set?

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

STEP 3. M.U.T.-III diagnostic trouble code.
Check the ETACS diagnostic trouble code. (Refer to GROUP 54A –Troubleshooting P.54A-742).

Q: Is the diagnostic trouble code set?

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

STEP 4. M.U.T.-III data list.
Check the ETACS data list below.(Refer to GROUP 54A – ETACS P.54A-787).

- Item No.252: Ambient temperature sensor
- Item No.254: IG voltage

Q: Is the check result normal?

YES : Go to Step 5.
NO : Replace the ETACS-ECU. (Refer to GROUP 54A – ETACS-ECU P.54A-841). Then go to Step 5.

STEP 5. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.U0431 set?

YES : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 6.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).

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

Q: Is diagnostic trouble code No.U0431 set?

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

Code No.U1415: Coding incomplete/fail

⚠ CAUTION

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

OPERATION

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

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

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

PROBABLE CAUSES

- Malfunction of the CAN bus line
- Coding not implemented
- ETACS-ECU malfunction
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.

Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 2.

NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17).

STEP 2. M.U.T.-III diagnostic trouble code.

Check the ETACS diagnostic trouble code. (Refer to GROUP 54A –Troubleshooting P.54A-742).

Q: Is the diagnostic trouble code set?

YES : Perform the relevant troubleshooting.

NO : Go to Step 3.

STEP 3. ETACS-ECU coding data check

Using the M.U.T.-III, check if there is any abnormality to the coding data stored in the ETACS-ECU. (Refer to GROUP 00 – Coding Reference Table P.00-35).

Q: Is the check result normal?

YES : Go to Step 4.

NO : Replace the ETACS-ECU. (Refer to GROUP 54A – ETACS-ECU P.54A-841). Then go to Step 5.

STEP 4. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.U1415 set?

YES : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 5.

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

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STEP 5. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.U1415 set?

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

Code No.U1417: Coding Data Malfunction

⚠ CAUTION

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

OPERATION

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

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

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

PROBABLE CAUSES

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

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.
Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17).

STEP 2. M.U.T.-III diagnostic trouble code.
Check the ETACS diagnostic trouble code. (Refer to GROUP 54A –Troubleshooting P.54A-742).

Q: Is the diagnostic trouble code set?

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

STEP 3. ETACS-ECU coding data check
Using the M.U.T.-III, check if there is any abnormality to the coding data stored in the ETACS-ECU. (Refer to GROUP 00 – Coding Reference Table P.00-35).

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair the coding data or replace ETACS-ECU. (Refer to GROUP 54A –ETACS-ECU P.54A-841). Then go to Step 6.

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STEP 4. Check the part number of ETACS-ECU
Check the part number of ETACS-ECU.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Replace the ETACS-ECU (Refer to GROUP 54A – ETACS-ECU P.54A-841), and then go to Step 6.

STEP 5. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.U1417 set?

YES : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 6.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).

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

Q: Is diagnostic trouble code No.U1417 set?

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

Code No.U1425: Transaxle Data Malfunction

⚠ CAUTION

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

OPERATION

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

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

The code is set when abnormality is detected in the gear shift signal received from the TCM.

PROBABLE CAUSES

- Malfunction of the CAN bus line
- Malfunction of TCM
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.
Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17).

STEP 2. M.U.T.-III diagnostic trouble code.
Check the A/T diagnostic trouble code. (Refer to P.23C-26).

Q: Is the diagnostic trouble code set?

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

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STEP 3. M.U.T.-III data list.
Item No.15: A/T Gear position (Refer to P.23C-254).

Q: Is the check result normal?

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

STEP 4. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.U1425 set?

YES : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 5.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).

STEP 5. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.U1425 set?

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

Code No.U1427: Wheel Speed Sensor Data Malfunction

⚠ CAUTION

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

OPERATION

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

DIAGNOSTIC TROUBLE CODE SET CONDITIONS

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

PROBABLE CAUSES

- Malfunction of the CAN bus line
- Malfunction of the wheel speed sensor
- Malfunction of ASC-ECU
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.
Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17).

STEP 2. M.U.T.-III diagnostic trouble code.
Check the ASC diagnostic trouble code. (Refer to GROUP 35C –Troubleshooting P.35C-24).

Q: Is the diagnostic trouble code set?
YES : Perform the relevant troubleshooting.
NO : Go to Step 3.

STEP 3. M.U.T.-III data list.
Check the data list of the relevant wheel speed sensor. (Refer to P.23C-254).
- Item No.21: Wheel speed sensor <FL>
- Item No.22: Wheel speed sensor <FR>
- Item No.23: Wheel speed sensor <RL>
- Item No.24: Wheel speed sensor <RR>

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

STEP 4. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.U1427 set?
YES : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 5.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).

STEP 5. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.U1427 set?
YES : Return to Step 1.
NO : This diagnosis is complete.

Code No.U1428: G and Yaw Rate Sensor Data Malfunction

⚠ CAUTION
- **If there is any problem in the CAN bus lines, an incorrect diagnostic trouble code may be set. Prior to this diagnosis, diagnose the CAN bus lines.**
- **Whenever the ECU is replaced, ensure that the CAN bus lines are normal.**
- **Do not drop the G and yaw rate sensor or subject it to a shock.**
- **When G and yaw rate sensor is replaced, calibrate G and yaw rate sensor (refer to GROUP 35C –On-vehicle Service P.35C-285)**

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

DIAGNOSTIC TROUBLE CODE SET CONDITIONS
The code is set when abnormality is detected in the G and yaw rate sensor signal received from the ASC-ECU.

PROBABLE CAUSES
- Malfunction of G and yaw rate sensor
- Malfunction of G and yaw rate sensor power supply

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- Damaged connector(s)
- Malfunction of the CAN bus line
- Malfunction of AWC-ECU
- Malfunction of ASC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.
Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 2.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17).

STEP 2. M.U.T.-III diagnostic trouble code.
Check the ASC diagnostic trouble code. (Refer to GROUP 35C –Troubleshooting P.35C-24).

Q: Is the diagnostic trouble code set?

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

STEP 3. M.U.T.-III diagnostic trouble code.
Check if the AWC diagnostic trouble code No.C123C, C1242 is set. (Refer to P.23C-164).

Q: Is the check result normal?

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

STEP 4. M.U.T.-III data list.
Check the data list below. (Refer to P.23C-254).

- Item No.25: Yaw rate sensor
- Item No.26: Lateral G sensor
- Item No.27: Longitudinal G sensor

Q: Is the check result normal?

YES : Go to Step 5.
NO : Replace the G and yaw rate sensor. (Refer to GROUP 35C –G and Yaw Rate Sensor P.35C-295). Then go to Step 6.

STEP 5. Check whether the diagnostic trouble code is reset.

Q: Is diagnostic trouble code No.U1428 set?

YES : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 6.
NO : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).

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

Q: Is diagnostic trouble code No.U1428 set?

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

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SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: Communication between scan tool and AWC-ECU cannot be established

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

SYMPTOMS
CAN bus line, AWC-ECU power supply circuit, or AWC-ECU may have a problem.

PROBABLE CAUSES
- Wrong M.U.T.-III wiring harness
- The CAN bus line is defective.
- AWC-ECU power supply circuit malfunction
- Malfunction of AWC-ECU
- ECU malfunction of other system

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.
Use scan tool to perform the CAN bus diagnosis.

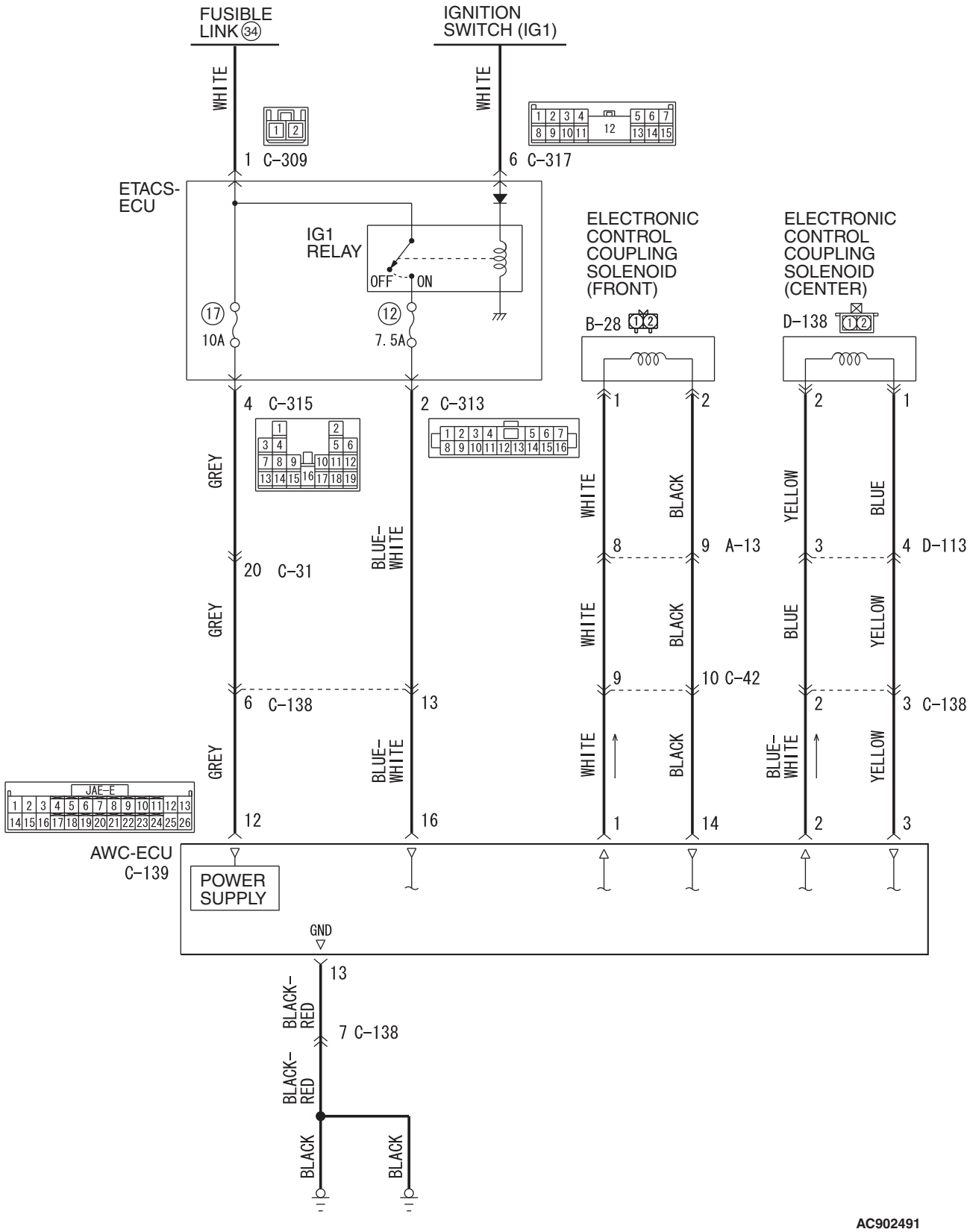
Q: Is the check result normal?

YES : Check/repair the AWC-ECU power supply circuit. (Refer to P.23C-241.)

NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17).

INSPECTION PROCEDURE 2 : Malfunction of power supply circuit system

Power supply system circuit



AC902491

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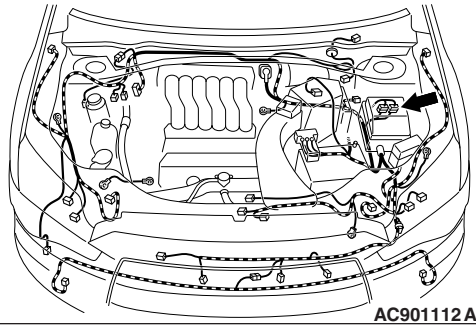
Connector: A-13



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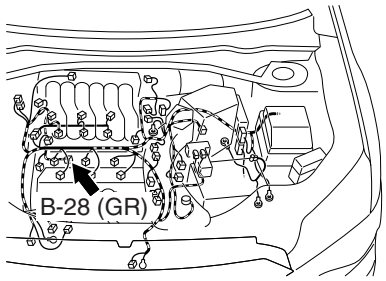
Connector: B-28



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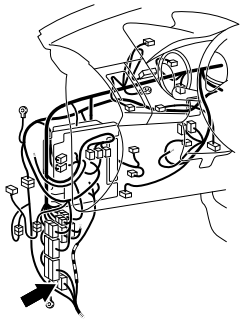
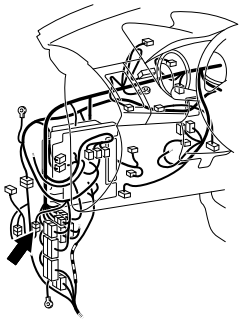
Connector: C-31



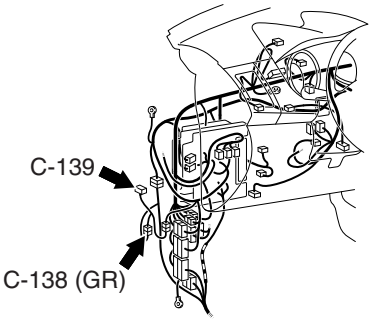
AC901075BO

Connector: C-42



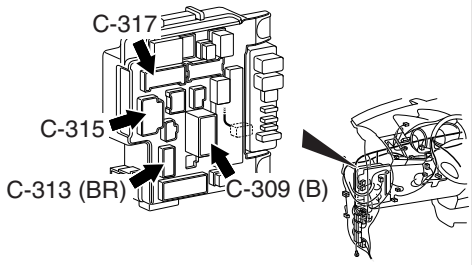
AC901075BM

Connectors: C-138, C-139



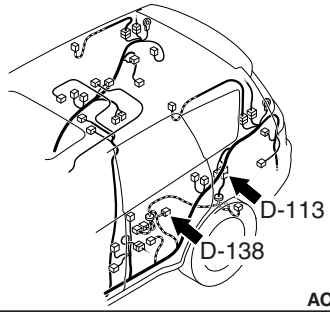
AC901075BL

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



AC702828BI

Connectors: D-113, D-138



AC901080AQ

COMMENTS ON TROUBLE SYMPTOM

AWC-ECU power supply circuit, ground circuit, or AWC-ECU may have a problem.

PROBABLE CAUSES

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

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DIAGNOSTIC PROCEDURE

STEP 1. Check the fuse No.12, No.17
Visually check for open circuit in the fuse No.12, No.17.

Q: Is the check result normal?

YES : Go to Step 14.
NO : Go to Step 2.

STEP 2. Electronic control coupling solenoid (front) connector, intermediate connector, AWC-ECU connector check: B-28, A-13, C-42, C-139

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the defective connector. Then go to Step 26.

STEP 3. Check the wiring harness between B-28 electronic control coupling solenoid (front) connector terminal No.1 and C-139 AWC-ECU connector terminal No.1.
Check the power supply line for short circuit.

Q: Is the check result normal?

YES : Go to Step 4.
NO : Repair the wiring harness. Then go to Step 26.

STEP 4. Check the wiring harness between B-28 electronic control coupling solenoid (front) connector terminal No.2 and C-139 AWC-ECU connector terminal No.14.
Check the ground line for short circuit.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Repair the wiring harness. Then go to Step 26.

STEP 5. Check of the electronic control coupling solenoid (Front)
Refer to P.23C-277.

Q: Is the check result normal?

YES : Go to Step 6.
NO : Replace the transfer assembly (Refer to P.23C-292). Then go to Step 26.

STEP 6. Electronic control coupling solenoid (center) connector, intermediate connector, AWC-ECU connector check: D-138, C-138, D-113, C-139

Q: Is the check result normal?

YES : Go to Step 7.
NO : Repair the defective connector. Then go to Step 26.

STEP 7. Check the wiring harness between D-138 electronic control coupling solenoid (center) connector terminal No.2 and C-139 AWC-ECU connector terminal No.2.

Check the power supply line for short circuit.

Q: Is the check result normal?

YES : Go to Step 8.
NO : Repair the wiring harness. Then go to Step 26.

STEP 8. Check the wiring harness between D-138 electronic control coupling solenoid (center) connector terminal No.1 and C-139 AWC-ECU connector terminal No.3.

Check the ground line for short circuit.

Q: Is the check result normal?

YES : Go to Step 9.
NO : Repair the wiring harness. Then go to Step 26.

STEP 9. Check of the electronic control coupling solenoid (center)

Refer to GROUP 27C –On-vehicle Service P.27C-91.

Q: Is the check result normal?

YES : Go to Step 10.
NO : Replace the electronic control coupling (center) (Refer to GROUP 27C –Electronic Control Coupling P.27C-94). Then go to Step 26.

STEP 10. Intermediate connector, AWC-ECU connector, ETACS-ECU connector check: C-31, C-138, C-139, C-315

Q: Is the check result normal?

YES : Go to Step 11.
NO : Repair the defective connector. Then go to Step 26.

STEP 11. Check the wiring harness between C-139 AWC-ECU connector terminal No.12 and C-315 ETACS-ECU connector terminal No.4.

Check the power supply line for short circuit.

Q: Is the check result normal?

YES : Go to Step 12.
NO : Repair the wiring harness, and then replace the fuse No.17. Then go to Step 26 .

STEP 12. Intermediate connector, AWC-ECU connector, ETACS-ECU connector check: C-138, C-139, C-313

Q: Is the check result normal?

YES : Go to Step 13.
NO : Repair the defective connector. Then go to Step 26.

STEP 13. Check the wiring harness between C-139 AWC-ECU connector terminal No.16 and C-313 ETACS-ECU connector terminal No.2.

Check the power supply line for short circuit.

Q: Is the check result normal?

YES : Replace the fuse No.12, No.17. Then go to Step 24.

NO : Repair the wiring harness, and then replace the fuse No.12. Then go to Step 26 .

STEP 14. Voltage measurement at C-309 ETACS-ECU connector

Disconnect the connector, and measure the voltage between terminal No.1 and ground at the wiring harness side.

OK: Battery positive voltage

Q: Is the check result normal?

YES : Go to Step 16.

NO : Go to Step 15.

STEP 15. ETACS-ECU connector check: C-309

Q: Is the check result normal?

YES : The short or open circuit may be present in the power supply circuit. Repair the wiring harness between the C-309 ETACS-ECU connector terminal No.1 and fusible link No.34. Then go to Step 26.

NO : Repair the defective connector. Then go to Step 26.

STEP 16. Voltage measurement at C-317 ETACS-ECU connector

(1) Disconnect the connector, and measure the voltage between terminal No.6 and ground at the wiring harness side.

(2) Turn the ignition switch to the "ON" position.

OK: Battery positive voltage

Q: Is the check result normal?

YES : Go to Step 18.

NO : Go to Step 17.

STEP 17. ETACS-ECU connector check: C-317

Q: Is the check result normal?

YES : The short or open circuit may be present in the power supply circuit. Repair the wiring harness between the C-317 ETACS-ECU connector terminal No.6 and ignition switch. Then go to Step 26.

NO : Repair the defective connector. Then go to Step 26.

STEP 18. Voltage measurement at C-139 AWC-ECU connector

Disconnect the connector, and measure the voltage between terminal No.12 and ground at the wiring harness side.

OK: Battery positive voltage

Q: Is the check result normal?

YES : Go to Step 20.
NO : Go to Step 19.

STEP 19. Intermediate connector, AWC-ECU connector, ETACS-ECU connector check: C-31, C-138, C-139, C-315

Q: Is the check result normal?

YES : The open circuit may be present in the power supply circuit. Repair the wiring harness between the C-139 AWC-ECU connector terminal No.12 and C-315 ETACS-ECU connector terminal No.4. Then go to Step 26.
NO : Repair the defective connector. Then go to Step 26.

STEP 20. Voltage measurement at C-139 AWC-ECU connector

(1) Disconnect the connector, and measure the voltage between terminal No.16 and ground at the wiring harness side.
(2) Turn the ignition switch to the "ON" position.

OK: Battery positive voltage

Q: Is the check result normal?

YES : Go to Step 22.
NO : Go to Step 21.

STEP 21. Intermediate connector, AWC-ECU connector, ETACS-ECU connector check: C-138, C-139, C-313

Q: Is the check result normal?

YES : The open circuit may be present in the power supply circuit. Repair the wiring harness between the C-139 AWC-ECU connector terminal No.16 and C-313 ETACS-ECU connector terminal No.2. Then go to Step 26.
NO : Repair the defective connector. Then go to Step 26.

STEP 22. Resistance measurement at C-139 AWC-ECU connector

Disconnect the connector, and measure the resistance between terminal No.13 and ground at the wiring harness side.

OK: Continuity (Less than 2 Ω)

Q: Is the check result normal?

YES : Go to Step 24.
NO : Go to Step 23.

STEP 23. Intermediate connector, AWC-ECU connector check: C-138, C-139

Q: Is the check result normal?

YES : The open circuit may be present in the ground circuit. Repair the wiring harness between the C-139 AWC-ECU connector terminal No.13 and body ground. Then go to Step 26.

NO : Repair the defective connector. Then go to Step 26.

STEP 24. Retest the system.

Q: Is the check result normal?

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

NO : Replace the ETACS-ECU. (Refer to GROUP 54A – ETACS-ECU P.54A-841). Then go to Step 25.

STEP 25. Retest the system.

Q: Is the check result normal?

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

NO : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 26.

STEP 26. Retest the system.

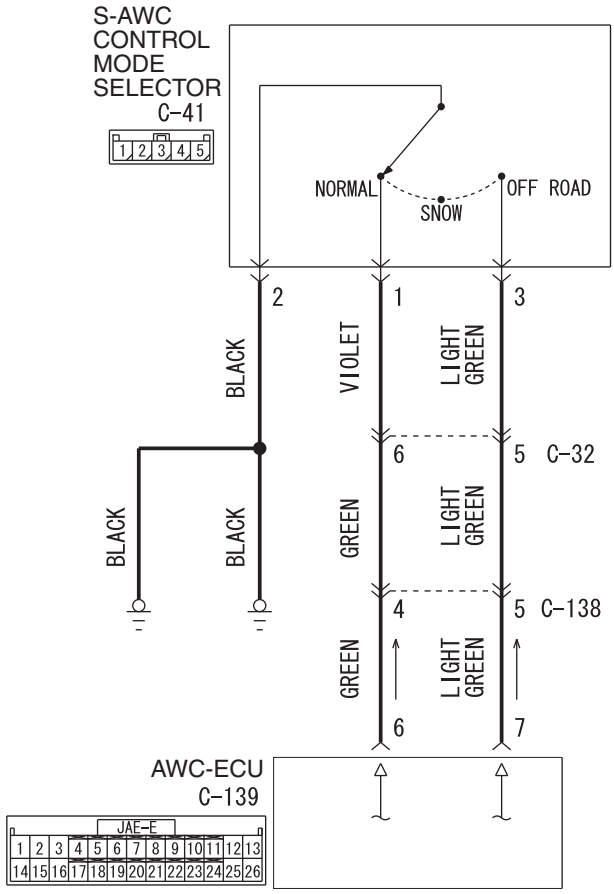
Q: Is the check result normal?

YES : This diagnosis is complete.

NO : Return to Step 1.

INSPECTION PROCEDURE 3: Shifting the S-AWC control mode selector does not change the mode

S-AWC drive mode selector system circuit



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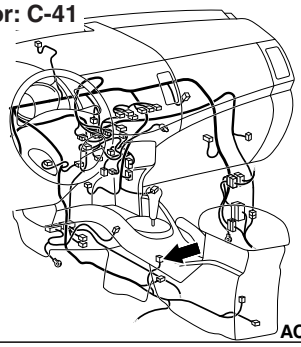
Connector: C-41



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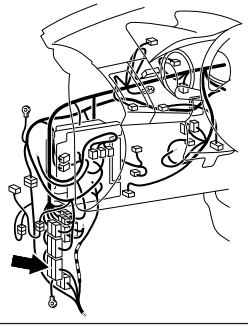
Connector: C-32



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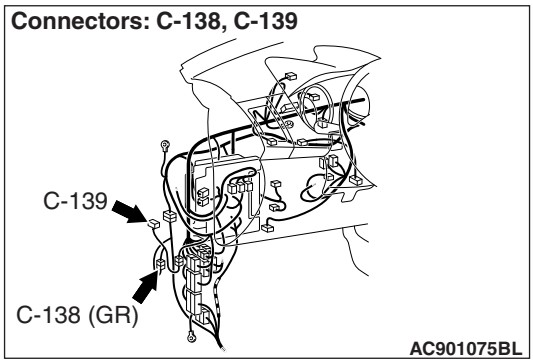


⚠ CAUTION

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

SYMPTOMS

S-AWC control mode selector or AWC-ECU may have a problem.

PROBABLE CAUSES

- S-AWC control mode selector malfunction
- Malfunction of the combination meter
- Damaged harness wires and connectors
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.

Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 3.

NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17). After repairing the CAN bus line, go to Step 2.

STEP 2. Retest the system.

Q: Is the check result normal?

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

NO : Go to Step 3.

STEP 3. M.U.T.-III actuator test.

Combination meter item No.2: LCD(AUTO) (Refer to GROUP 54A –Combination Meter P.54A-96).

Q: Is the check result normal?

YES : Go to Step 4.

NO : Replace the combination meter. (Refer to GROUP 54A –Combination Meter P.54A-123). Then go to Step 13.

STEP 4. S-AWC control mode selector inspection
Refer to P.23C-296.

Q: Is the check result normal?
YES : Go to Step 5.
NO : Replace the S-AWC control mode selector (Refer to P.23C-296). Then go to Step 13.

STEP 5. Measure the voltage at C-41 S-AWC control mode selector connector.
(1) Disconnect the connector, and measure the voltage between terminal No.1, No.3 and ground at the harness side.
(2) Turn the ignition switch to the "ON" position.
OK: Battery positive voltage

Q: Is the check result normal?
YES : Go to Step 8.
NO : Go to Step 6.

STEP 6. S-AWC control mode selector connector, intermediate connector, AWC-ECU connector check: C-41, C-32, C-138, C-139

Q: Is the check result normal?
YES : Go to Step 7.
NO : Repair the defective connector. Then go to Step 13.

STEP 7. Check the wiring harness between C-41 S-AWC control mode selector connector terminal No.1 and C-139 AWC-ECU connector terminal No.6, and between C-41 S-AWC control mode selector connector terminal No.3 and C-139 AWC-ECU connector terminal No.7.
Check the output line for short or open circuit.

Q: Is the check result normal?
YES : Go to Step 11.
NO : Repair the wiring harness. Then go to Step 13.

STEP 8. Measure the resistance at C-41 S-AWC control mode selector connector.
Disconnect the connector, and measure the resistance between terminal No.2 and ground at the harness side.
OK: Continuity (Less than 2 Ω)

Q: Is the check result normal?
YES : Go to Step 11.
NO : Go to Step 9.

STEP 9. S-AWC control mode selector connector check: C-41

Q: Is the check result normal?
YES : Go to Step 10.
NO : Repair the defective connector. Then go to Step 13.

STEP 10. Check the wiring harness between C-41 S-AWC control mode selector connector terminal No.2 and body ground.
Check the ground line for open circuit.

Q: Is the check result normal?

YES : Go to Step 11.
NO : Repair the wiring harness. Then go to Step 13.

STEP 11. M.U.T.-III data list.
Check the following data list. (Refer to P.23C-254).
- Item 41: SW1 status (NORMAL)
- Item 42: SW2 status (OFF LOAD)

Q: Is the check result normal?

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

STEP 12. Retest the system.

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).
NO : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 13.

STEP 13. Retest the system.

Q: Is the check result normal?

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

INSPECTION PROCEDURE 4: The tight corner braking phenomenon (difficult to turn) appears frequently with the S-AWC control mode selector in the NORMAL or SNOW mode

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

SYMPTOMS
The electronic control coupling (Front), electronic control coupling (center) or AWC-ECU may have a problem.

PROBABLE CAUSES
- Malfunction of electronic control coupling (Front)
- Malfunction of electronic control coupling (center)
- Damaged harness wires and connectors
- Malfunction of AWC-ECU

DIAGNOSTIC PROCEDURE

STEP 1. M.U.T.-III CAN bus diagnostics.
Use scan tool to perform the CAN bus diagnosis.

Q: Is the check result normal?

YES : Go to Step 3.
NO : Repair the CAN bus lines. (Refer to GROUP 54C – Troubleshooting P.54C-17). After repairing the CAN bus line, go to Step 2.

STEP 2. Retest the system.

Q: Is the check result normal?

YES : Intermittent malfunction. (Refer to GROUP 00 –How to Cope with Intermittent Malfunction P.00-15).
NO : Go to Step 3.

STEP 3. M.U.T.-III data list
Item 1: S-AWC control mode (Refer to P.23C-254).

Q: Is the check result normal?

YES : Go to Step 4.
NO : Check/repair the S-AWC control mode selector. (Refer to P.23C-248.) Then go to Step 9.

STEP 4. Check of the electronic control coupling (Front)
Refer to P.23C-272.

Q: Is the check result normal?

YES : Go to Step 5.
NO : Replace the transfer assembly (Refer to P.23C-292). Then go to Step 9.

STEP 5. Check of the electronic control coupling (center)
Refer to GROUP 27C –On-vehicle Service P.27C-91.

Q: Is the check result normal?

YES : Go to Step 6.
NO : Replace the electronic control coupling (center). (Refer to GROUP 27C –Electronic Control Coupling P.27C-94). Then go to Step 9.

STEP 6. M.U.T.-III data list
Item No.13: Engine torque (Driver request) (Refer to P.23C-254).

Q: Is the check result normal?

YES : Go to Step 7.
NO : Perform the troubleshooting for the engine. (Refer to GROUP 13B –Troubleshooting P.13B-51). Then go to Step 9.

STEP 7. M.U.T.-III data list

Check the following data list. (Refer to P.23C-254).

- Item No.8: Steering angle sensor
- Item No.21: Wheel speed sensor <FL>
- Item No.22: Wheel speed sensor <FR>
- Item No.23: Wheel speed sensor <RL>
- Item No.24: Wheel speed sensor <RR>
- Item No.25: Yaw rate sensor
- Item No.26: Lateral G sensor

Q: Is the check result normal?

YES : Go to Step 8.

NO : Perform the troubleshooting for the ASC. (Refer to GROUP 35C –Troubleshooting P.35C-24). Then go to Step 9.

STEP 8. Retest the system.

Q: Is the check result normal?

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

NO : Replace the AWC-ECU. (Refer to P.23C-295). Then go to Step 9.

STEP 9. Retest the system.

Q: Is the check result normal?

YES : This diagnosis is complete.

NO : Return to Step 1.

DATA LIST REFERENCE TABLE

M1235004600019

Item No.	Display on M.U.T.-III	Check conditions	Normal condition
1	S-AWC control mode	NORMAL is selected (displayed on multi information display).	NORMAL
		SNOW is selected (displayed on multi information display).	SNOW
		OFF ROAD is selected (displayed on multi information display).	OFF ROAD
2	Longitudinal drive force (Meter)	Perform a test run of the vehicle.	0 –5segment
3	Lateral drive force (Meter)	Perform a test run of the vehicle.	-5 –5segment
4	Front coupling torque	Perform a test run of the vehicle.	The torque changes
5	center coupling torque	Perform a test run of the vehicle.	The torque changes
6	S-AWC protection control	The S-AWC control mode on the multi information display flashes.	ON
		Other than above	OFF
7	S-AWC system fail	The trouble is displayed to the multi information display.	ON
		Other than above	OFF
8	Steering angle sensor	Steering wheel: Steered 90° to right	+90 deg
		Steering wheel: Steered 90° to left	-90 deg
9	Steering angle speed	Steering wheel: Without steering wheel operation	0 deg/s
		Steering wheel: With steering wheel operation	Changes depending on the turning speed.
10	Steering angle sensor (status)	Normal	Correct
		Faulty	Malfunction
		Neutral point not learned	Neutral not learned
		Neutral point not learned or failed	Neutral not learned and Malfunction
11	Accelerator position	Release the accelerator pedal	Approximately 0%
		Depress the accelerator pedal	0 –100%
		Accelerator pedal fully opened	Approximately 100%
12	Engine speed	Idling and test run	Nearly the same as the tachometer display
13	Engine torque (Driver request)	Perform a test run of the vehicle.	The torque changes
14	Engine torque (Effective)	Perform a test run of the vehicle.	The torque changes

Item No.	Display on M.U.T.-III	Check conditions	Normal condition
15	A/T gear position	Gear range: P	P
		Gear range: R	R
		Gear range: N	N
		Gear range: 1st	1st
		Gear range: 2nd	2nd
		Gear range: 3rd	3rd
		Gear range: 4th	4th
		Gear range: 5th	5th
		Gear range: 6th	6th
16	T/M oil temperature	Driving after engine has warmed up	Gradually increases.
17	FL wheel speed (raw value)	–(reference because of r/min)	–
18	FR wheel speed (raw value)		
19	RL wheel speed (raw value)		
20	RR wheel speed (raw value)		
21	FL wheel speed sensor	Perform a test run of the vehicle.	Nearly the same as the speedometer display
22	FR wheel speed sensor		
23	RL wheel speed sensor		
24	RR wheel speed sensor		
25	Yaw rate sensor	When the vehicle is stationary	Approximately 0 deg/s
		Perform a test run of the vehicle.	–90 –90 deg/s
26	Lateral G sensor	Vehicle is stopped (horizontal state).	–1.1 –1.1 m/s^2
		Perform a test run of the vehicle.	–10 –10 m/s^2
27	Longitudinal G sensor	Vehicle is stopped (horizontal state).	–1.1 –1.1 m/s^2
		Perform a test run of the vehicle.	–10 –10 m/s^2
28	Brake switch (CAN input)	Brake pedal: Depressed	ON
		Brake pedal: Released	OFF
29	Parking brake SW (CAN input)	Parking brake lever: Pulled	ON
		Parking brake lever: Released	OFF
30	Ignition SW (CAN input)	Ignition switch: ON	ON
		Ignition switch: START	START
31	Battery voltage (CAN input)	Ignition switch: ON	System voltage
32	IOD fuse (CAN input)	Fuse inserted	ON
		Fuse removed	OFF
33	Odometer (CAN input)	Ignition switch: ON	The same as the meter display
34	Ambient temperature (CAN input)	Ignition switch: ON	The same as the meter display

Item No.	Display on M.U.T.-III	Check conditions		Normal condition
35	Ignition off time (CAN input)	After ignition switch: OFF for one minute or more, ignition switch: ON		The same value as the last ignition switch : OFF time (min display)
36	ETACS coding status	Coding incomplete		Not complete
		Coding data requested		Data request
		Coding completed		Complete
37	T/M type (CAN input)	Always		Transaxle type is the same as the vehicle.
38	IG1	ON		ON
		OFF		OFF
39	ECU power supply voltage	Ignition switch: ON		10 – 16 V
40	Output load voltage	Ignition switch: ON		10 – 16 V
41	SW1 status	S-AWC control mode selector: NORMAL		ON
		S-AWC control mode selector : Other than above		OFF
42	SW2 status	S-AWC control mode selector: OFF ROAD		ON
		S-AWC control mode selector : Other than above		OFF
43	Yaw rate sensor (adjusted value)	Ignition switch: ON		-6 – 6 deg/s
44	SAS (adjusted value)	Ignition switch: ON		-15 – 15 deg
45	Chassis Number writing counter	Ignition switch: ON		Writing count
46	Chassis Number (original) lock	Ignition switch: ON	Locked	Lock
			Unlocked	Unlock
47	Mileage counter	Ignition switch: ON		Counter value
48	Coding counter	Ignition switch: ON		Coding count

SPECIAL FUNCTION

M1235004700016

RESET

Item No.	Display on M.U.T.-III	Initialization contents
1	SAS adjusted value	Resets the steering wheel sensor neutral position learned value.
2	Front coupling estimated temp.	Reset the estimated temperature of front coupling and transfer.
3	center coupling estimated temp.	Reset the estimated temperature of center coupling.

TEST

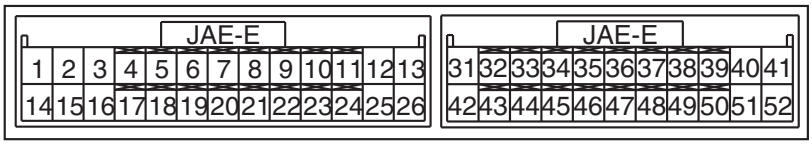
Item No.	Display on M.U.T.-III	Test content	Normal conditions
4	Control OFF	The electronic control coupling (front/center) operation stops	Refer to the electronic control coupling (front/center) operation check.
5	Front coupling operation check	The electronic control coupling (Front) maximum restraint	Refer to the electronic control coupling (Front) operation check.
6	center coupling operation check	The electronic control coupling (center) maximum restraint	The electronic control coupling (center) operation check.

1. The test can be performed only when all the following conditions are satisfied.
   - Every wheel speed sensor input is 20 km/h (12 mph) or less.
   - No system malfunction is detected.
   - The steering angle of steering wheel is within ±30° from the neutral position.
2. With the test, when any of the conditions below is met, the forced activation will be cancelled.
   - Any of the wheel speed sensors detects an input of 20 km/h (12 mph) or more (excluding item No. 4 "Control OFF").
   - A system malfunction is detected.
   - The forced activation time has elapsed.
   - M.U.T.-III is removed.
   - M.U.T.-III clear key is operated.

CHECK AT AWC-ECU TERMINAL

M1235004800013

C-139



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Terminal No.	Inspection Items	Inspection requirement		Normal Condition
1	Electronic control coupling solenoid (front)	Using M.U.T.-III, perform "Test Item No. 4: Control OFF" of "SPECIAL FUNCTION"		1 V or less
		Using M.U.T.-III, perform "Test Item No. 5: Front coupling operation check" of "SPECIAL FUNCTION"		Approximately 8 V
2	Electronic control coupling solenoid (center)	Using M.U.T.-III, perform "Test Item No. 4: Control OFF" of "SPECIAL FUNCTION"		1 V or less
		Using M.U.T.-III, perform "Test Item No. 6: center coupling operation check" of "SPECIAL FUNCTION"		Approximately 8 V
3	Electronic control coupling solenoid (center)	Always		1 V or less
6	S-AWC control mode selector signal1	Ignition switch: ON	S-AWC control mode selector: SNOW or OFF ROAD	Battery positive voltage
			S-AWC control mode selector: NORMAL	1 V or less
7	S-AWC control mode selector signal2	Ignition switch: ON	S-AWC control mode selector: SNOW or NORMAL	Battery positive voltage
			S-AWC control mode selector: OFF ROAD	1 V or less
12	Power supply	Always		Battery positive voltage
13	Ground	Always		1 V or less
14	Electronic control coupling solenoid (front)	Always		1 V or less
16	Ignition switch	Ignition switch: ON		Battery positive voltage
		Ignition switch: OFF		1 V or less
17	Back up power supply	Always		Battery positive voltage
23	CAN-H	–		–
24	CAN-L	–		–

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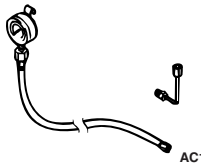
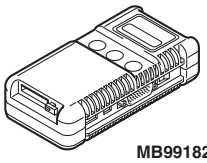
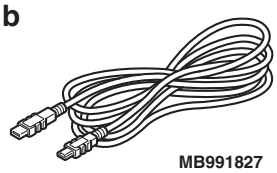
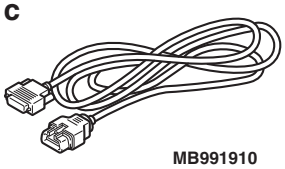
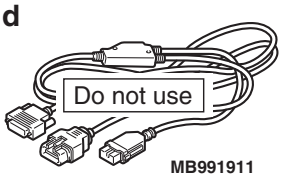
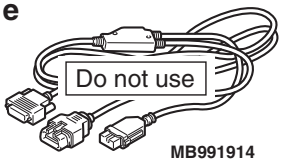
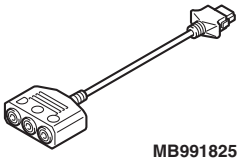
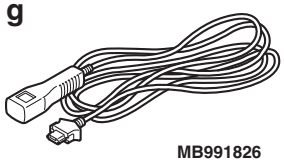
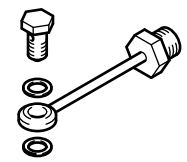
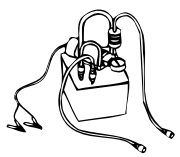
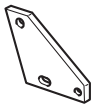
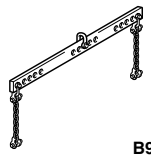
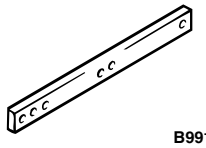
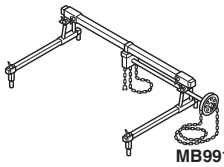
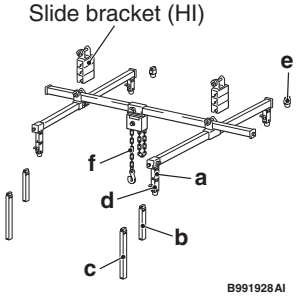
SPECIAL TOOLS

M1231000601115

Tool	Tool number and name	Supersession	Application
 AC103525	MD998330 (Includes MD998331) Oil pressure gauge (3.0 MPa, 427 psi)	MD998330-01	Measurement of hydraulic pressure
a  MB991824 b  MB991827 c  MB991910 d  MB991911 e  MB991914 f  MB991825 g  MB991826 MB991958	MB991958 a. MB991824 b. MB991827 c. MB991910 d. MB991911 e. MB991914 f. MB991825 g. MB991826 M.U.T.-III sub assembly a. Vehicle communication interface (V.C.I.) b. M.U.T.-III USB cable c. M.U.T.-III main harness A (Vehicles with CAN communication system) d. M.U.T.-III main harness B (Vehicles without CAN communication system) e. M.U.T.-III main harness C (for Chrysler models only) f. M.U.T.-III measurement adapter g. M.U.T.-III trigger harness	MB991824-KIT *NOTE: g: MB991826 M.U.T.-III Trigger Harness is not necessary when pushing V.C.I. ENTER key.*	**⚠ CAUTION** **M.U.T.-III main harness A (MB991910) should be used. M.U.T.-III main harness B and C should not be used for this vehicle.** A/T system check (Diagnostic trouble code, service data)
	MB992127 Adapter	-	Connection for oil pressure gauge

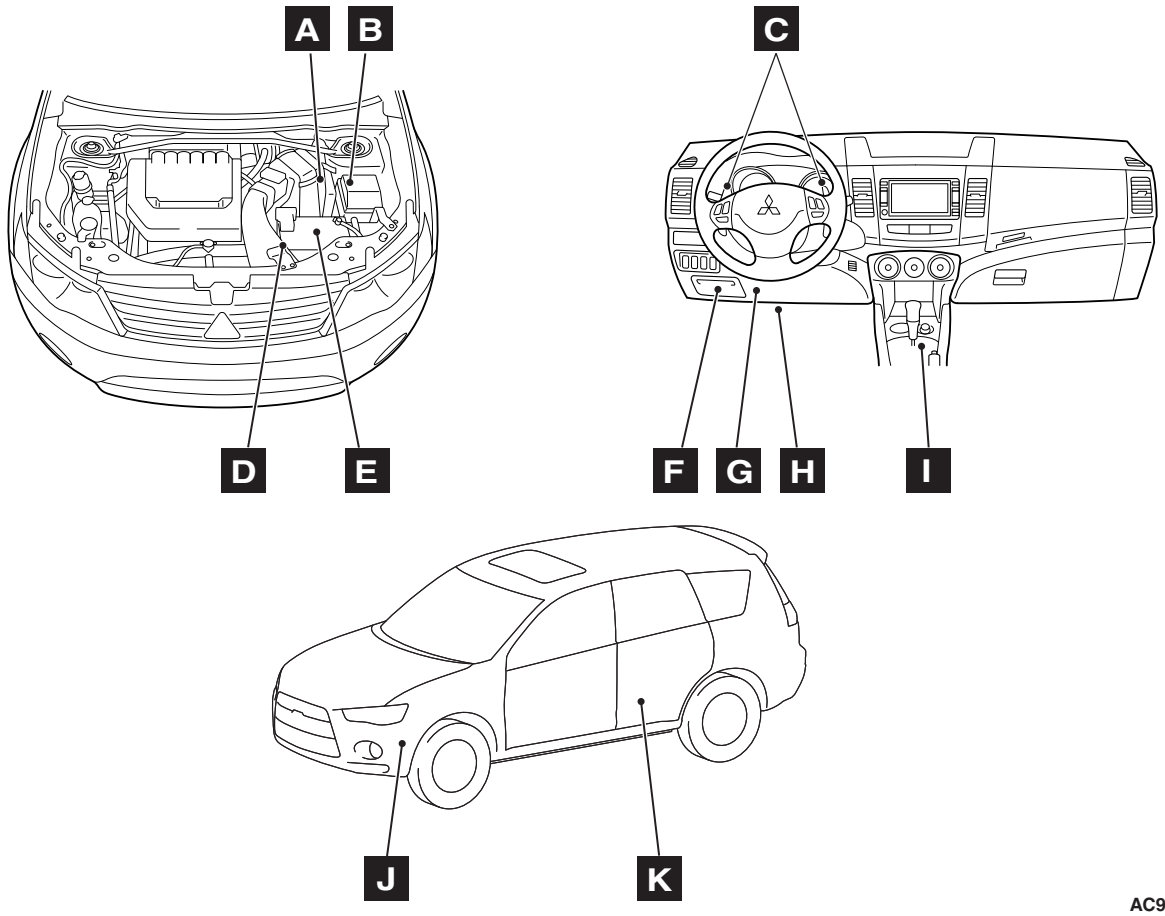
Tool	Tool number and name	Supersession	Application
	MB995062 Flushing tool	MLR-6906B or Equivalent	Flushing cooler and tube
 MB992208	MB992208 Engine hanger plate A	General Service Tool	Supporting the engine assembly during removal and installation of the transaxle assembly
 B991454	MB991454 Engine hanger balancer	MZ203827-01	When the engine hanger is used: Supporting the engine assembly during removal and installation of the transaxle assembly *NOTE: Special tool MB991454 is a part of engine hanger attachment set MB991453.*
 B991527	MB991527 Hanger	Tool not available	
 MB991895	MB991895 Engine hanger	Tool not available	
Slide bracket (HI)  B991928AI	MB991928 Engine hanger a: MB991929 Joint (50) x 2 b: MB991930 Joint (90) x 2 c: MB991931 Joint (140) x 2 d: MB991932 Foot (standard) x 4 e: MB991933 Foot (short) x 2 f: MB991934 Chain and fork assembly	Tool not available	

ON-VEHICLE SERVICE

A/T CONTROL COMPONENT LAYOUT

M1231008600730

Name	Symbol	Name	Symbol
A/T control relay	B	Paddle shift switch	C
A/T control solenoid valve assembly	D	Shift lock solenoid	I
AWC-ECU <Vehicles with S-AWC>	F	Stoplight switch	H
Data link connector	G	Shift switch assembly	I
Electronic control coupling solenoid (front) <Vehicles with S-AWC>	J	Transaxle control module (TCM)	F
Electronic control coupling solenoid (center) <Vehicles with S-AWC>	K	Transmission fluid temperature sensor	D
Input shaft speed sensor	E	Transmission range switch	D
Output shaft speed sensor	A		



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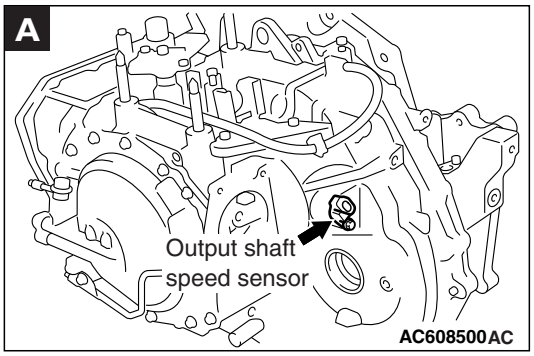

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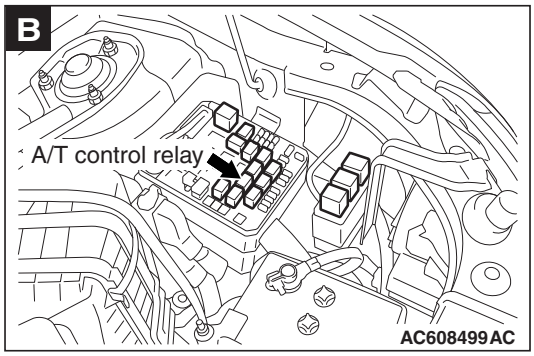

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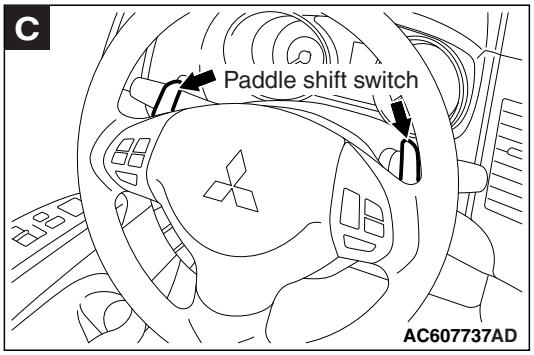

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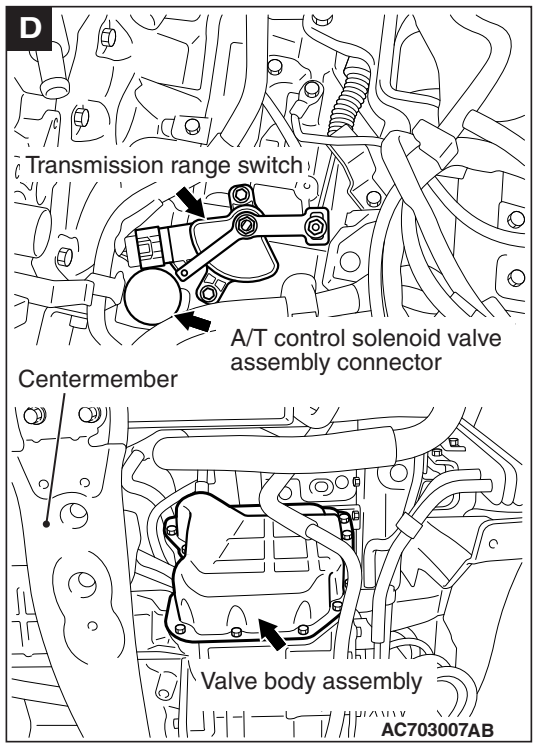

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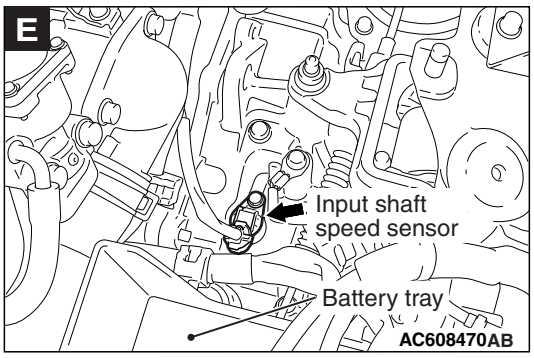

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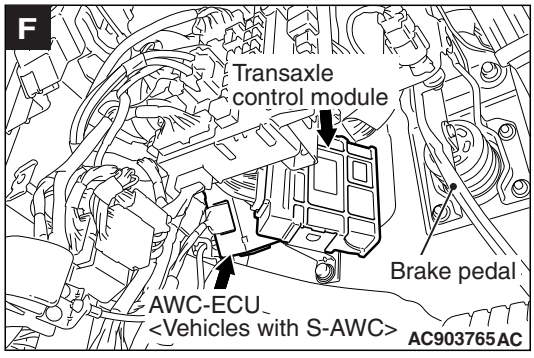

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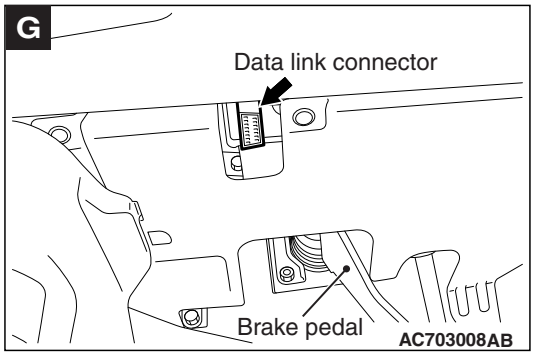

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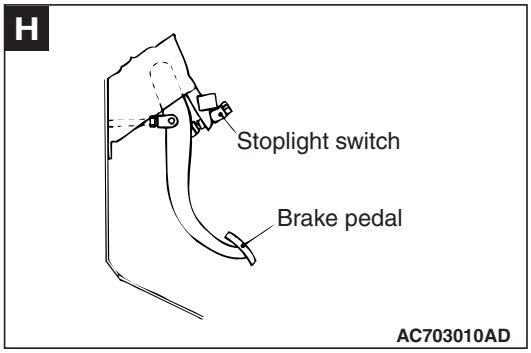

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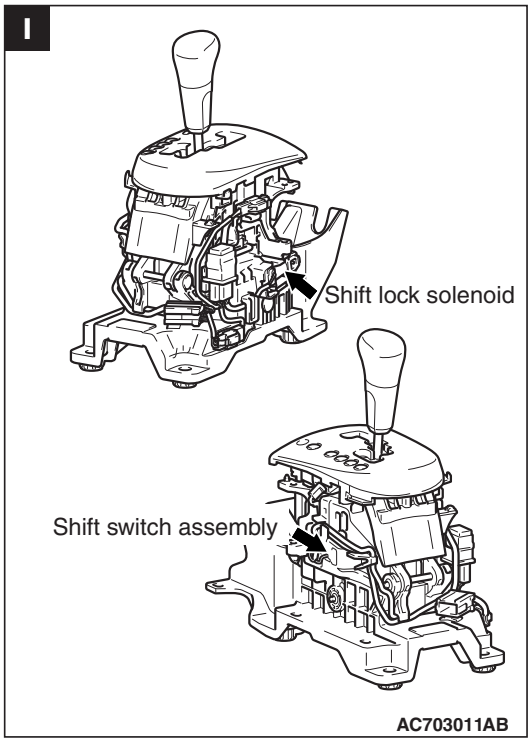

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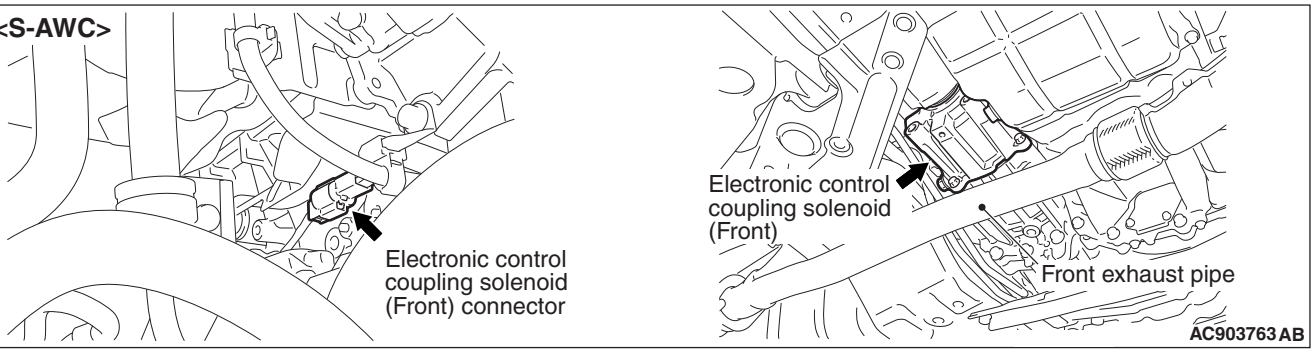

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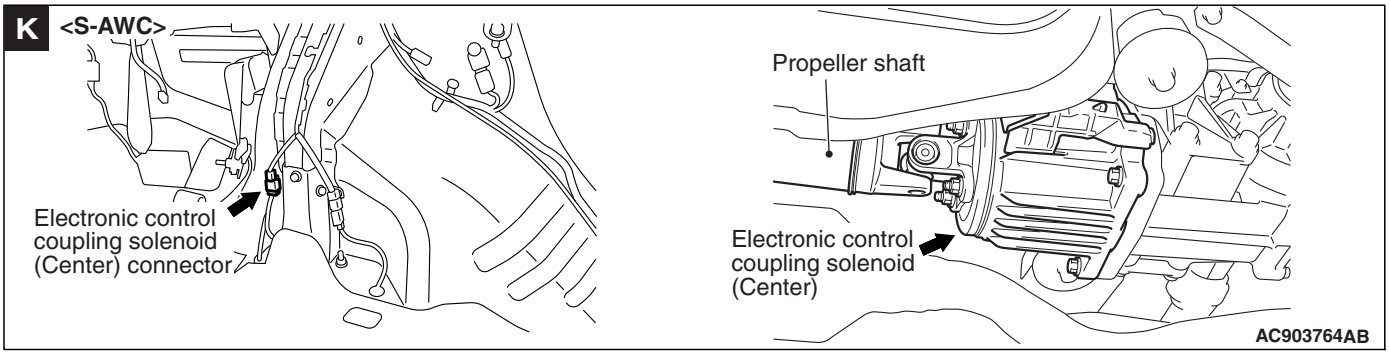

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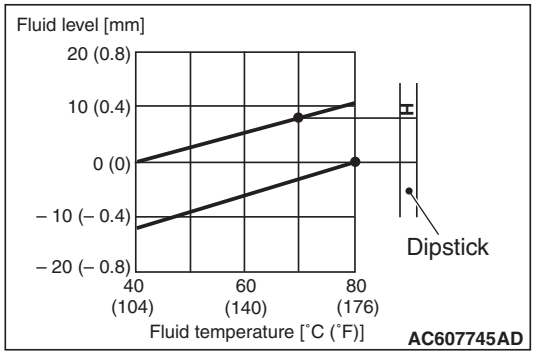
ESSENTIAL SERVICE

TRANSMISSION FLUID CHECK

M1231021400179

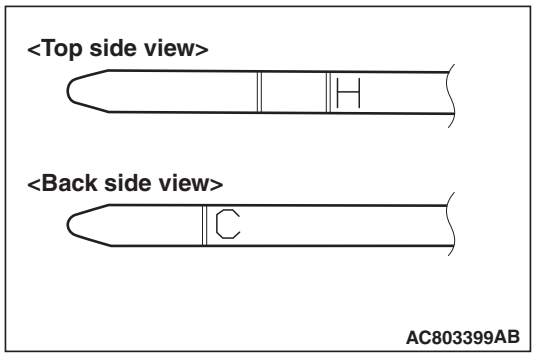


1. Drive the vehicle until the transmission fluid temperature rises to the normal operating temperature [70 –80° C (158 – 176° F)].

   NOTE: The transmission fluid temperature is measured with scan tool MB991958 (M.U.T.-III sub assembly).

   NOTE: If it takes some amount of time until the transmission fluid reaches its normal operating temperature [70 –80 °C (158 –176 °F)], check the transmission fluid level by referring to the left diagram.
2. Park the vehicle on a level surface.
3. Move the selector lever through all positions to fill the torque converter and the hydraulic circuits with fluid, and then move the selector lever to the "N" position.
4. After wiping off any dirt around the dipstick, remove the dipstick and check the condition of the transmission fluid.

   NOTE: If the transmission fluid smells as if it is burnt, it means that the transmission fluid has been contaminated by fine particles from the bushings and friction materials. Transaxle overhaul and cooler line flushing may be necessary.



5. Check transmission fluid level is at the "H" mark on the dipstick. If the transmission fluid level is less than this, add DIA QUEEN ATF- J3 until the level reaches the "H" mark.

   NOTE: If the transmission fluid level is too low, the oil pump will draw in air along with the transmission fluid, which will cause to form bubbles. If the transmission fluid level is too high, rotating components inside the transaxle will churn the fluid and air into a foamy liquid. Both conditions (level too low or too high) will cause the hydraulic pressure to drop, which will result in late shifting and slipping of the clutches and brakes.

   NOTE: In either case, air bubbles can interfere with normal valve, clutch, and brake operation. Also, foaming can cause transmission fluid to escape from the transaxle vent where it may be mistaken for a leak.
6. Securely insert the dipstick.

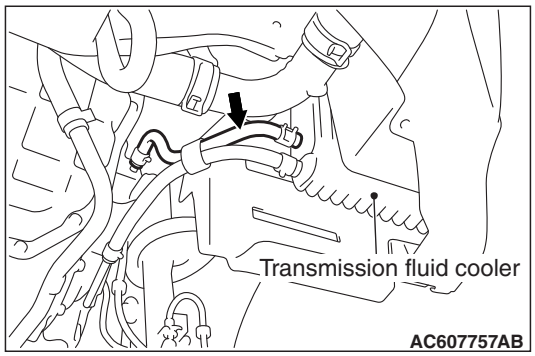
   NOTE: The transmission fluid should always be replaced under the following conditions:

   - *When troubleshooting the transaxle.*
   - *When overhauling the transaxle.*
   - *When the transmission fluid is noticeably dirty or burnt (driving under severe conditions).*

TRANSMISSION FLUID CHANGE

M1231021500187

If you have a transmission fluid changer, use this changer to replace the transmission fluid. If you do not have a transmission fluid changer, replace the transmission fluid by the following procedure.



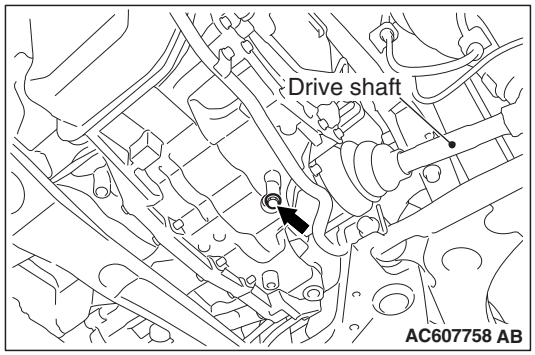
1. Disconnect the hose shown in the illustration which connects the transaxle and the oil cooler (inside the radiator). Place a container under the hose to collect the discharge.

⚠ CAUTION

The engine should be stopped within one minute after it is started. If all the transmission fluid has drained out before then, the engine should be stopped at that point.

2. Start the engine and let the transmission fluid drain out. (Running conditions: "N" range with engine idling)

   Approximately 3.5 dm^3 (3.7 quarts) of transmission fluid should be removed.



3. Remove the drain plug from the bottom of the transaxle case to drain the transmission fluid.

   Approximately 2.0 dm^3 (2.1 quarts) of transmission fluid should be removed.

4. Install the drain plug with a new gasket, and tighten it to the specified torque.

   Tightening torque: 7.4 ± 2.4 N· m (65 ± 21 in-lb)

⚠ CAUTION

Stop pouring if the full volume of transmission fluid cannot be added.

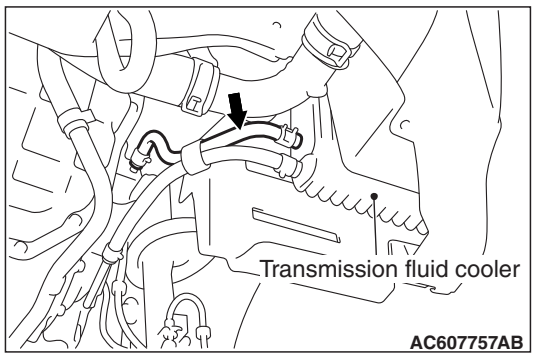
5. Add new transmission fluid (DIA QUEEN ATF- J3) through the oil filter tube.

   Approximately 5.5 dm^3 (5.8 quarts) of transmission fluid should be added.

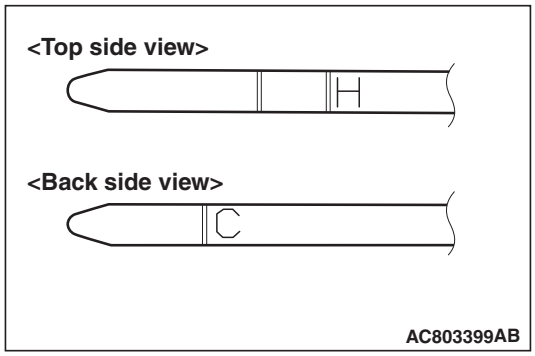
6. Repeat the procedure in Step 2. (to pump out the rest of the contaminated transmission fluid)
7. Add new transmission fluid (DIA QUEEN ATF- J3) through the oil filter tube.

   Approximately 3.5 dm^3 (3.7 quarts) of transmission fluid should be added.

   NOTE: Check for contamination or a burnt odor. If the transmission fluid is still contaminated or burnt, repeat Steps 6 and 7 before proceeding to Step 8.



8. Reconnect the hose which was disconnected in step 1 above, and firmly insert the dipstick.
9. Start the engine and run it at idle for one to two minutes.
10. Move the selector lever through all positions, and then move it to the "N" position.

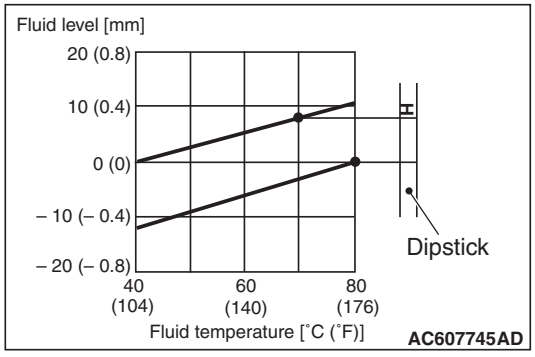


11. Check that the transmission fluid level is at the "C" mark on the dipstick. If the level is less than this, add transmission fluid.
12. Drive the vehicle until the transmission fluid temperature rises to the normal operating temperature [70 –80° C (158 – 176° F)], and then check the transmission fluid level again. The transmission fluid level must be at the "H" mark.

    NOTE: The transmission fluid temperature is measured with scan tool MB991958 (M.U.T.-III sub assembly).

    NOTE: The "C" level is for reference only; the "H" level should be regarded as the standard level.

    NOTE: If it takes some amount of time until the transmission fluid reaches its normal operating temperature [70 –80 °C (158 –176 °F)], check the transmission fluid level by referring to the left diagram.



13. When the transmission fluid is less than the specified level, add transmission fluid.

    When the transmission fluid is greater than the specified level, drain the excess fluid through the drain plug to adjust the transmission fluid to the specified level.
14. Firmly insert the dipstick into the oil filler tube.

FLUSHING COOLERS AND TUBES

M1231013000659

Required Special Tool:
MB995062: Flushing Tool

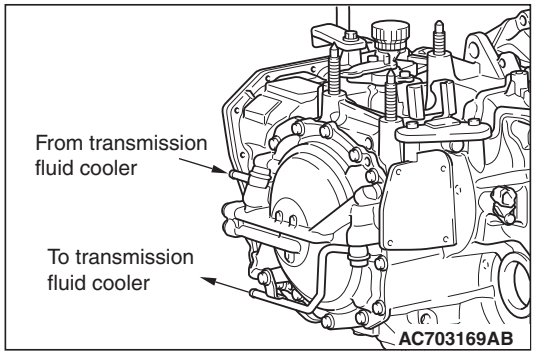
⚠ ***WARNING***

- ***Wear protective eyewear that meets the requirements of ANSI Z87.1 –1968 and OSHA. Wear standard industrial rubber gloves.***
- ***Keep lighted cigarettes, sparks, flames, and other ignition sources away from the area to prevent the ignition of combustible liquids and gases. Keep a class B fire extinguisher in the area where the flushing tool will be used. Keep the area well ventilated. Do not let flushing solvent come in contact with eyes or skin. If it does, flush with water for 15 to 20 seconds. Remove contaminated clothing and wash affected skin with soap and water. Seek medical attention.***

When a transaxle failure has contaminated the transmission fluid, the oil cooler(s) must be flushed. The cooler by-pass valve in the transaxle must also be replaced. The torque converter must also be replaced with an exchange unit. This will ensure that metal particles or sludged transmission fluid are not later transferred back into the reconditioned (or replaced) transaxle. There are two different procedures for flushing coolers and lines. The recommended procedure is to use special tool MB995062 Flushing Tool. The other procedure is to use a hand suction gun and mineral spirits.

1. Remove the cover plate filler plug on special tool MB995062. Fill the reservoir 1/2 to 3/4 full with fresh flushing solution. Flushing solvents are petroleum based solutions generally used to clean transaxle components. Do not use solvents containing acids, water, gasoline, or any other corrosive liquids.
2. Reinstall the filler plug on special tool MB995062.
3. Verify that the pump power switch is turned "OFF." Connect the red alligator clip to the positive battery terminal. Connect the black alligator clip to a good ground.
4. Disconnect the cooler lines at the transaxle.

   NOTE: When flushing the transaxle cooler and lines, always reverse flush.



5. Connect the pressure line to the OUTLET line (from cooler).
6. Connect the return line to the INLET line (to cooler).
7. Turn the pump "ON" for two to three minutes to flush the cooler(s) and lines. Monitor the pressure readings. Clear the return lines. Pressure readings should stabilize below 138 kPa (20 psi) for vehicles equipped with a single cooler and 208 kPa (30 psi) for vehicles equipped with dual coolers. If flow is intermittent or exceeds these pressures, replace the cooler(s).
8. Turn the pump "OFF."
9. Disconnect the suction line from the reservoir at the cover plate. Disconnect the return line at the cover plate and place it in a drain pan.

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10.Turn the pump "ON" for 30 seconds to purge flushing solution from the cooler(s) and lines. Turn the pump "OFF."
11.Place the suction line into a one quart container of DIA QUEEN ATF- J3 transmission fluid.
12.Turn the pump "ON" until all transmission fluid is removed from the one quart container and lines. This purges any residual cleaning solvent from the transaxle cooler(s) and lines. Turn the pump "OFF."
13.Disconnect the alligator clips from the battery. Reconnect the flusher lines to the cover plate, and remove the flushing adapters from the cooler lines. Reconnect the cooler lines.

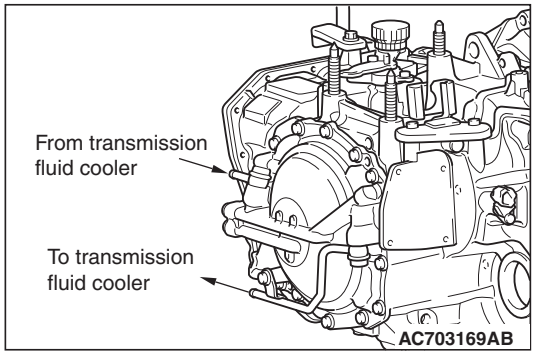
OIL COOLER FLOW CHECK

M1231013100300

After the new or repaired transaxle has been installed, fill to the proper level with DIA QUEEN ATF- J3. The flow should be checked using the following procedure:

⚠ CAUTION

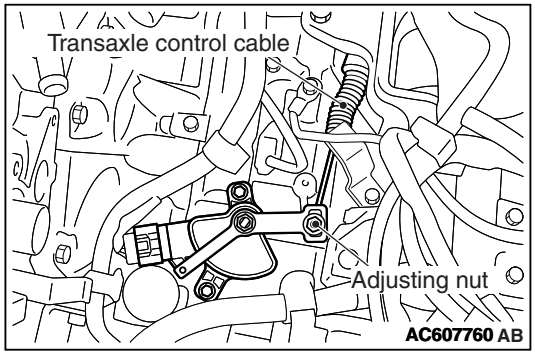
With the fluid set at the proper level, transmission fluid collection should not exceed one quart or internal damage to the transaxle may occur.



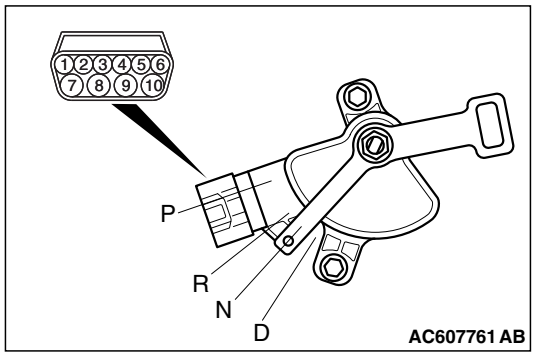
1. Disconnect the OUTLET line (from cooler) at the transaxle and place a collecting container under the disconnected line.
2. Run the engine at curb idle speed with the shift selector in neutral.
3. If transmission fluid flow is intermittent or it takes more than 20 seconds to collect one quart of transmission fluid, replace the cooler.
4. If flow is within acceptable limits, reconnect the cooler line. Then fill the transaxle to the proper level, using DIA QUEEN ATF- J3

TRANSMISSION RANGE SWITCH CHECK

M1231021600269

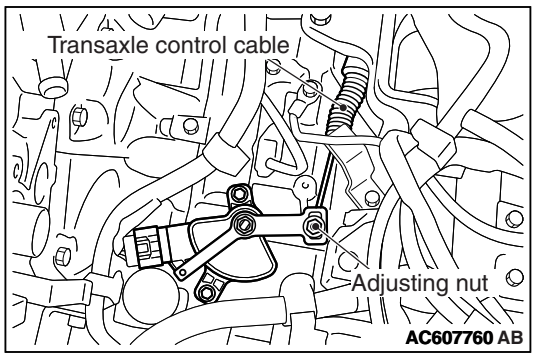


Transmission range	Terminal connection of tester	Specified condition
P	3 –2, 7 –10	Less than 2 ohms.
R	3 –9	
N	3 –8, 7 –10	
D	3 –5	

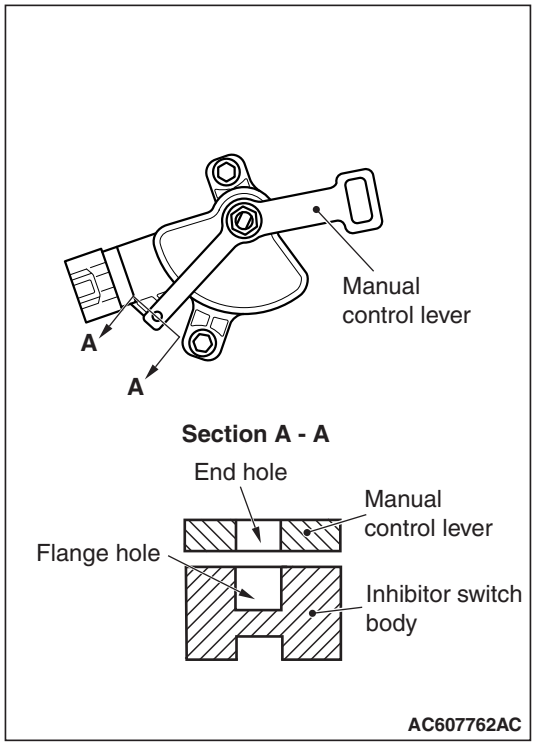


TRANSMISSION RANGE SWITCH AND CONTROL CABLE ADJUSTMENT

M1231021700192

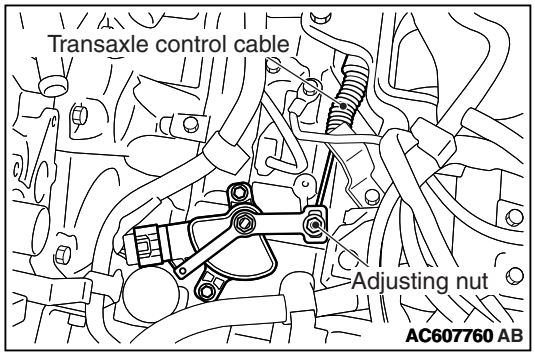


1. Set the selector lever to the "N" position.
2. Loosen the control cable to the manual control lever adjusting nut to free the cable and lever.
3. Set the manual control lever to the neutral position.



4. Align the hole at the end of the manual control lever and the hole in the Transmission range switch body flange (section A –A).

   NOTE: Insert a ϕ5 bar into the aligned holes in the Transmission range switch body flange and on the tip of the manual control lever to position the Transmission range switch body.



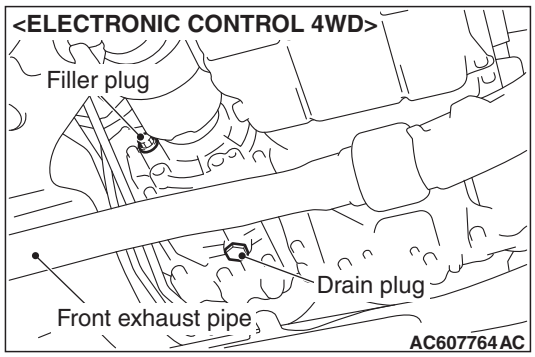
5. Tighten the transaxle control cable using the adjusting nut with the specified torque.

   Tightening torque: 9.5 ± 3.5 N· m (84 ± 30 in-lb)

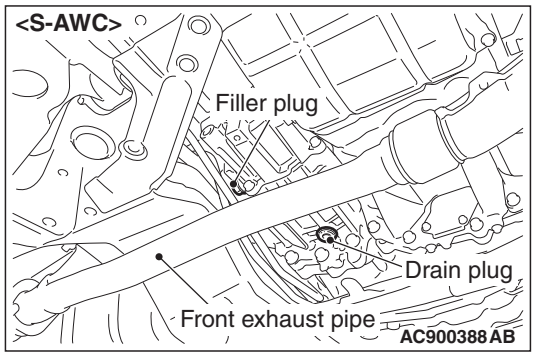
6. Check that the selector lever is in the N position.
7. Check that each position of the manual control lever matches each position of the selector lever using M.U.T.-III MB991958 (M.U.T.-III sub assembly).

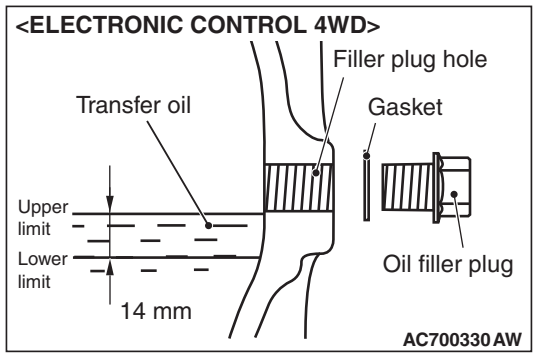
TRANSFER OIL LEVEL CHECK

M1231001100552



1. Remove the filler plug and gasket.



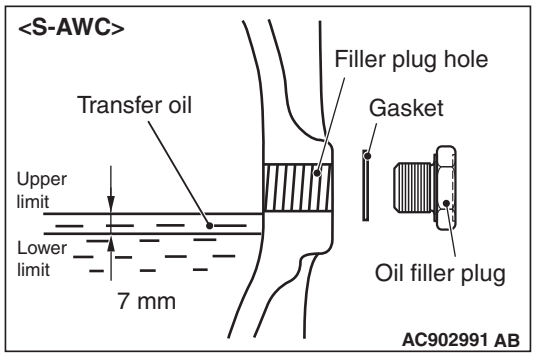


2. Check that the oil level is in between the upper limit (bottom of the filler plug hole) and the lower limit as shown.
3. Check that the oil is not excessively foul and has moderate viscosity.
4. If the oil level is not in between the upper limit and the lower limit, refill the specified gear oil to the bottom of the oil filler plug hole.

   Brand name: Hypoid gear oil API classification GL-5 SAE80

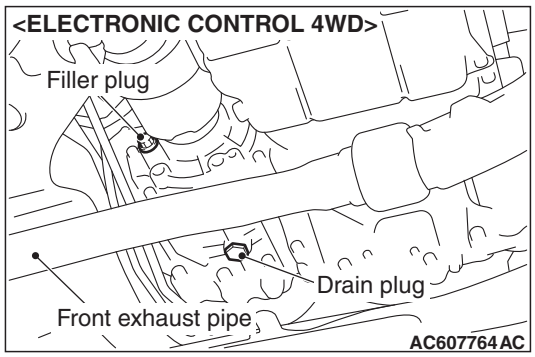
5. Install the filler plug and new gasket, then tighten them to the specified torque.

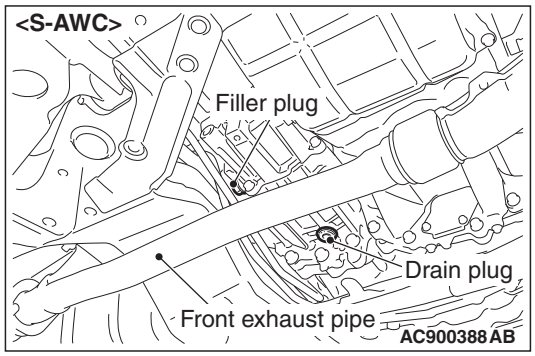
   Tightening torque : 32 ±2 N· m (24 ±1 ft-lb)

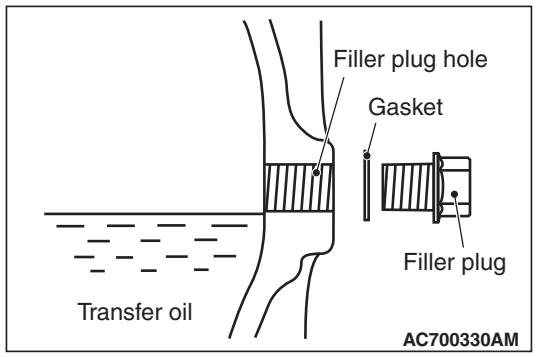


TRANSFER OIL REPLACEMENT

M1231001200504







1. Remove the drain plug and gasket, to drain the transfer oil.
2. Install the drain plug and new gasket, and tighten to the specified torque.

   Tightening torque: 32 ±2 N· m (24 ±1 ft-lb)
3. Remove the filler plug and gasket, and fill the transfer oil up to the lower edge of the filler plug hole.

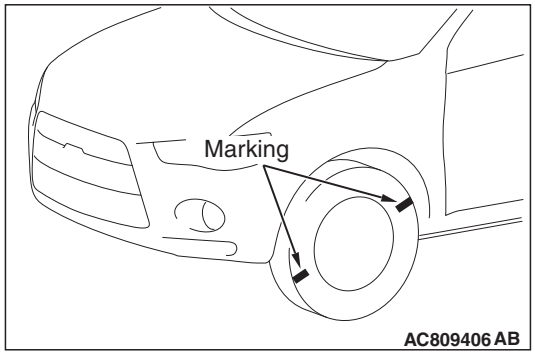
   Brand name: Hypoid gear oil API classification GL-5 SAE80

   Filling amount: 0.49 dm^3 (0.52 quarts)
4. Install the filler plug and a new gasket, and tighten them to the specified torque.

   Tightening torque: 32 ±2 N· m (24 ±1 ft-lb)

ELECTRONIC CONTROL COUPLING (FRONT) OPERATION CHECK <VEHICLES WITH S-AWC>

M1235004900010



1. Raise the vehicle.
2. For easy identification of tire rotation, mark the front and rear tires as shown in the figure.
3. Set the shift position to the P-position, and turn ON the ignition switch.
4. Set the wheel to the neutral position, and carry out the special function test No. 4 "Control OFF".
5. Rotate the left-front tire counterclockwise by your hand, and check that the right-front tire makes reverse rotation against the left-front tire.
6. Set the shift position to the N-position, and turn ON the ignition switch.
7. Set the wheel to the neutral position, and carry out the special function test No. 5 "Front coupling operation check".

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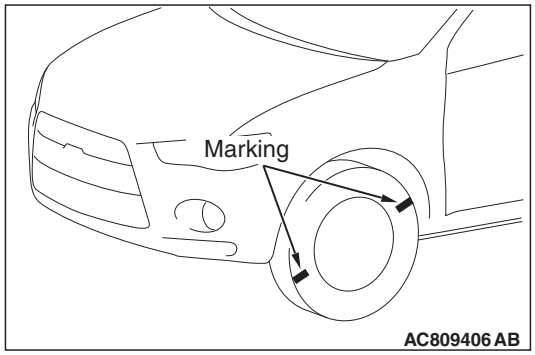
NOTE: Time limit for the special function test No. 5 "Front coupling operation check" is 1 minute.

8. Rotate the left-front tire counterclockwise by your hand, and check that the right-front tire rotates to the same direction, viewed from the left-front tire.

Carry out the check above. Then when the tire operates as mentioned, it is judged that the AWC-ECU control and electronic control coupling (front) are normal. If the tire does not operate as mentioned, replace the transfer assembly. (Refer to P.23C-292.)

ELECTRONIC CONTROL COUPLING (CENTER) OPERATION CHECK <VEHICLES WITH S-AWC>

M1235005900013



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: Applying the parking brake slightly prevents the drive force transferring to the rear wheels by a friction in the electronic control coupling. If it is checked without the parking brake apply, the drive force is transferred to the rear wheels by a friction in the electronic control coupling.
5. Turn the ignition switch to "ON" position and keep the steering wheel in the neutral position. Then carry out the special function test No. 4 "Control OFF".
6. Start the engine, and move the selector lever into D position.
7. Drive the vehicle straight with vehicle speed of less than 20 km/h.

⚠ CAUTION

In order to protect the AWD drive system parts, check must be finished within 1 minute in total.

8. Check if the rear wheels do not rotate.
9. Stop the engine.
10. Turn the ignition switch to "ON" position and carry out the special function test No. 6 "Center coupling operation check".

    NOTE: The limit time of "Center coupling operation check" is 1 minute.
11. Start the engine again, and move the selector lever into D position.
12. Drive the vehicle straight with vehicle speed of less than 20 km/h.

⚠ CAUTION

In order to protect the AWD drive system parts, check must be finished within 1 minute in total.

13. Check if the rear wheels rotate.

14. Carry out the check above. Then when the tire operates as mentioned, it is judged that the AWC-ECU control and electronic control coupling (Center) are normal. If the tire does not operate as mentioned, replace the electronic control coupling (Center). (Refer to GROUP 27C, Electronic control coupling P.27C-94.)

AUTOMATIC TRANSAXLE CONTROL COMPONENT CHECK

TRANSMISSION RANGE SWITCH CHECK

M1231021600270

Refer to P.23C-269.

STOPLIGHT SWITCH CHECK

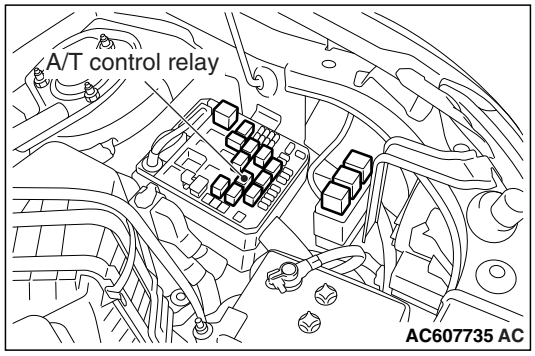
M1231009100255

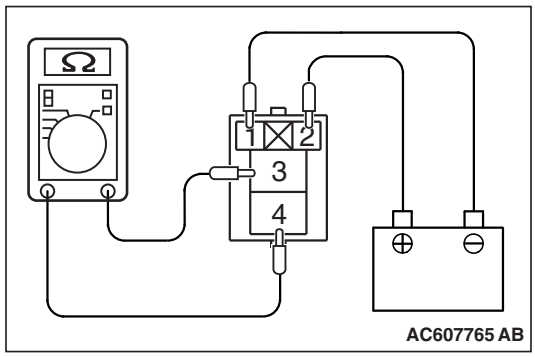
Refer to GROUP 35A, Brake Pedal –Brake Pedal Inspection P.35A-13.

A/T CONTROL RELAY CHECK

M1231009300378

1. Remove the A/T control relay.





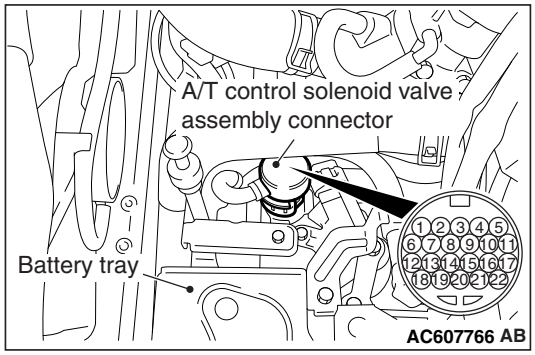
2. Use jumper wires to connect A/T control relay terminal No.1 to the negative battery terminal and terminal No.2 to the positive battery terminal.
3. Check for continuity between A/T control relay terminals No.3 and No.4 when the jumper wires are connected to and disconnected from the battery.

Jumper wire	Continuity between terminals No.3 and No.4
Connected	Continuity exists (2Ω or less)
Disconnected	No continuity

4. If there is any problem with the A/T control relay, replace it.

SOLENOID VALVE CHECK

M1231009400502



1. Disconnect the A/T control solenoid valve assembly connector.
2. Measure the resistance between the terminals of the applicable solenoid valves and terminal No.13.

Standard value:

Terminal No.	Applicable solenoid valve	Resistance value Ω
1	Low clutch linear solenoid valve	Approximately 5.3 {Transmission fluid temperature: 20° C (68° F)}
4	Lock-up and low reverse brake linear solenoid valve	
6	2-6 brake linear solenoid valve	
9	Line pressure linear solenoid valve	
14	3-5 reverse clutch linear solenoid valve	
19	High clutch linear solenoid valve	
17	Low-reverse brake shift solenoid valve	Approximately 28 {Transmission fluid temperature: 20° C (68° F)}
22	Low clutch shift solenoid valve	

3. When the resistance is within the standard value, check the power supply and the ground circuits.

⚠ CAUTION

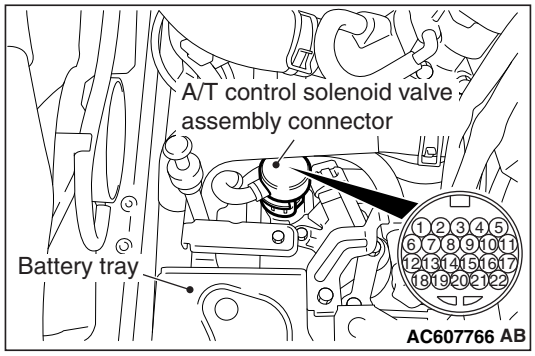
Each solenoid valve cannot be removed or replaced as a single unit. When replacement of any one of the solenoid valves is necessary, replace the valve body assembly.

4. When the resistance is outside the standard value, replace the valve body assembly and the harness.

TRANSMISSION FLUID TEMPERATURE SENSOR CHECK

M1231021800166

1. Disconnect the A/T control solenoid valve assembly connector.



2. Measure the resistance between the sensor-side connector terminal No. 2 and 3 of the A/T control solenoid valve assembly connector.

Standard value:

Fluid temperature °C (°F)	Resistance kΩ
10 (50)	Approx. 6.62
25 (77)	Approx. 3.51
80 (176)	Approx. 0.55
110 (230)	Approx. 0.25

NOTE: In the information screen on the multi-information display, the fluid temperature warning comes on when the transmission fluid temperature is approximately 140°C(284°F) or higher, and automatically goes out when the transmission fluid temperature dropped below approximately 135°C(275°F).

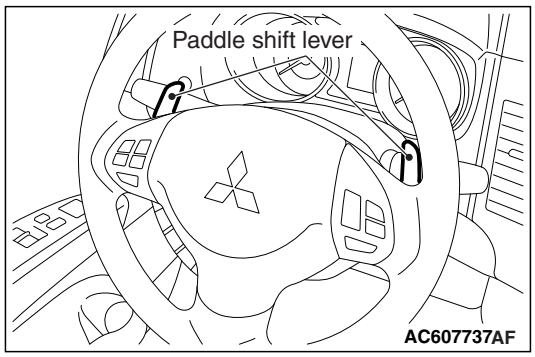
⚠ CAUTION

The transmission fluid temperature sensor cannot be removed or replaced as a single unit. When the transmission fluid temperature sensor needs to be replaced, replace the valve body assembly.

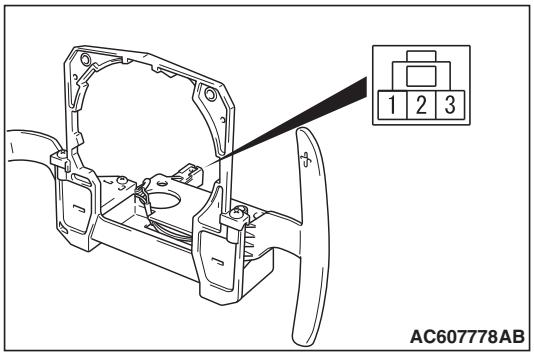
3. When the resistance of the transmission fluid temperature sensor is outside the standard value, and the transmission fluid temperature warning comes on/goes out at other than the specified temperatures, replace the valve body assembly and the harness.

PADDLE SHIFT SWITCH CHECK

M1231029200072



1. After operating the paddle shift levers (+ side, –side) by pulling them to the rearward of the vehicle, check that the levers are returned to the original positions quickly when released. Also, check that no looseness, friction or abnormal sound occurs.
2. Remove the paddle shift assembly. (Refer to GROUP 37 – Steering shaft P.37-32.)



3. Check for continuity between the paddle shift switch connector terminals.

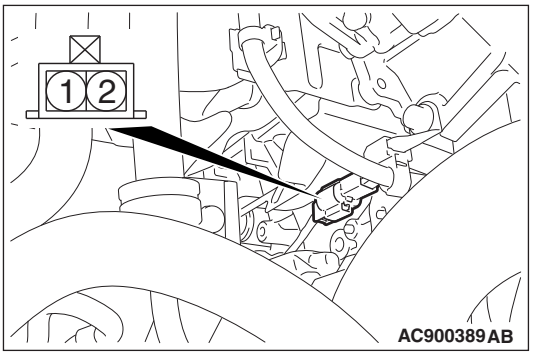
Standard value:

Paddle shift lever	Terminal number	Resistance value
Upshift and hold the lever.	1 –2	Continuity exists. (2 Ω or less)
Downshift and hold the lever.	2 –3	
No operation	No continuity between the terminals	

4. In the cases other than the above, replace the paddle shift assembly.

ELECTRONIC CONTROL COUPLING SOLENOID (FRONT) CHECK <VEHICLES WITH S-AWC>

M1235005000021



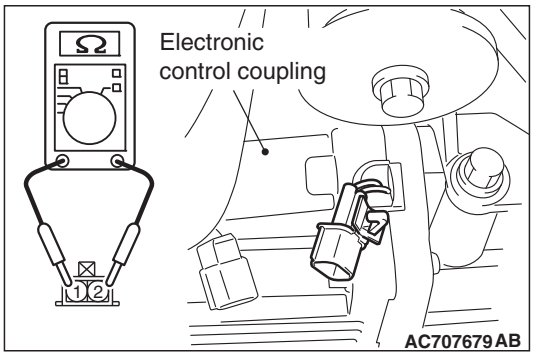
1. Disconnect the B-28 connector, and measure the resistance value between the connector terminals on the electronic control coupling side. If the measured resistance value is out of the standard value range, replace the transfer assembly (Refer to P.23C-292).

Standard value: 1.8 –4.0 Ω

2. Measure the resistance value between the connector terminal No.1 on the electronic control coupling side and the body ground. If the continuity exists, replace the transfer assembly (Refer to P.23C-292).

ELECTRONIC CONTROL COUPLING SOLENOID (CENTER) CHECK <VEHICLES WITH S-AWC>

M1235005200014



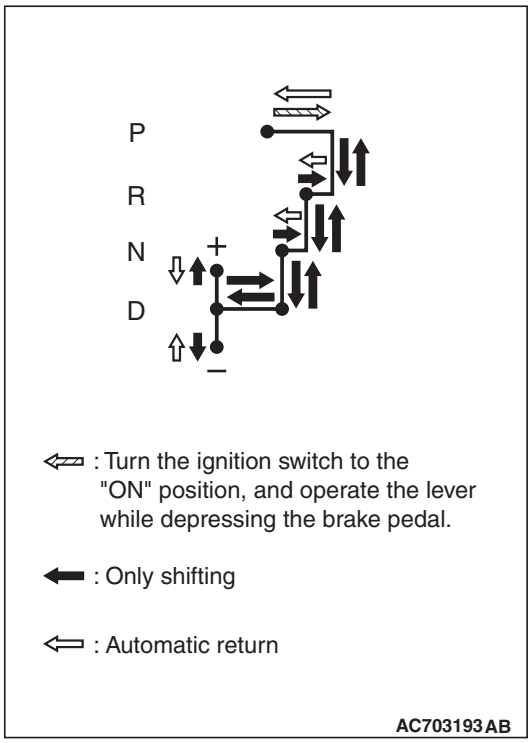
1. Disconnect the D-138 connector, and measure the resistance value between the connector terminals on the electronic control coupling side. If the measured resistance value is out of the standard value range, replace the electronic control coupling (Refer to P.27C-94).

Standard value: 1.6 –3.7 Ω

2. Measure the resistance value between the connector terminal No.1 on the electronic control coupling side and the body ground. If the continuity exists, replace the electronic control coupling (Refer to P.27C-94).

SELECTOR LEVER OPERATION CHECK

M1231001300824



1. Put on the parking brake.
2. Move the selector lever to every range and check that the lever moves smoothly with secure feel of engagement.
3. Make sure that the engine starts when the selector lever is in the "N" or "P" range, and does not start when the selector lever is in other range.
4. Start the engine. Release the parking brake.
5. Make sure that the vehicle moves forward when the selector lever is moved from the "N" range to "D" range, or to the 1st to 6th speed in the sport mode. Also make sure that the vehicle moves backward when the selector lever is moved from the "N" to "R" range.
6. Stop the engine.
7. Turn ON the ignition switch, and move the selector lever from the "P" to "R" range. Check that the backup light comes on and the tone alarm sounds at this time.

   NOTE: Since the vehicle is equipped with the A/T wrong-operation preventive device, the selector lever cannot be moved out of the "P" position without depressing the brake pedal after turning "ON" the ignition switch.

KEY INTERLOCK MECHANISM CHECK/ADJUSTMENT

M1231036000025

1. Carry out the following check.

Inspection procedure	Check conditions		Items to be checked (Normal conditions)
1	Brake pedal: Depress	Ignition switch position: "LOCK" (OFF) or removed	The selector lever cannot be moved out of "P" position.
2		Ignition switch position: "ON"	The selector lever can be moved from "P" position to other positions smoothly.
3	Transmission range: Other than P		The ignition switch cannot be turned to the "LOCK" (OFF) position.
4	Transmission range: P		The ignition switch can be turned to the "LOCK" (OFF) position smoothly.

2. If the normal conditions are not obtained after performing the above operations, install the key interlock cable in the following procedures. (Automatic adjustment)
   (1) Disconnect the key interlock cable connection (selector lever side).(Refer to P.23C-285.)

⚠ CAUTION

Leave the ignition switch in the "LOCK" (OFF) position until the key interlock cable installation is completed.

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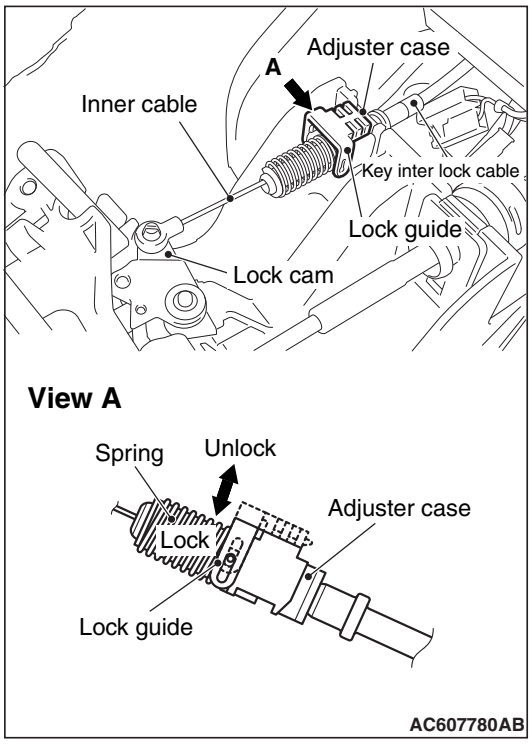


(2) Move the selector lever to the "P" position and turn the ignition switch to the "LOCK" (OFF) position.
(3) Install the tip of the key interlock cable to the lock cam of the selector lever assembly, taking care not to twist the inner cable.
(4) Install the adjuster case with its lock guide pulled up (unlocked).
(5) Securely push down the lock guide to lock it.

NOTE: The lock position of the key interlock cable is automatically adjusted by a spring.

SHIFT LOCK MECHANISM CHECK

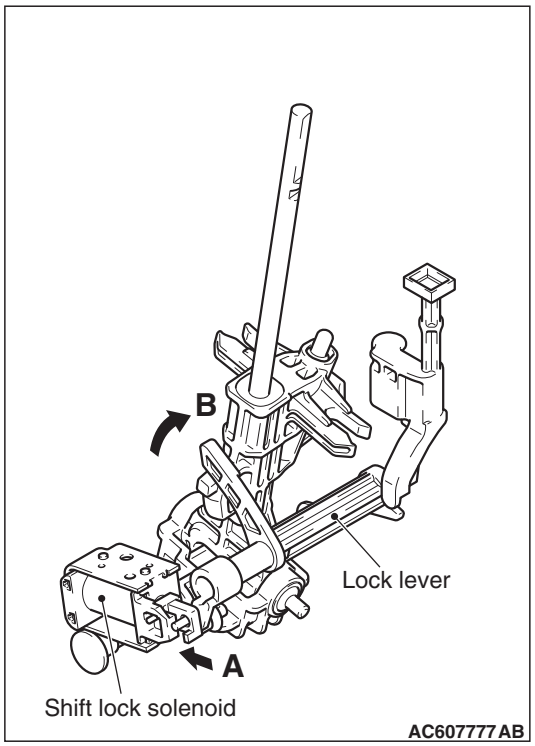
M1231036100141

SYSTEM CHECK

Inspection procedure	Check conditions		Items to be checked (Normal conditions)	Possible cause of abnormality
1	Brake pedal not depressed	Ignition switch: "LOCK", "ACC" or removed	The selector lever cannot be moved out of the "P" position	• Abnormality in the shift lock link (stuck, disengaged, broken, etc.) • Abnormality in the electrical circuit (short circuit in the switches or harnesses) • Abnormality in the key interlock mechanism
2	Brake pedal depressed			• Abnormality in the electrical circuit (short circuit in the switches or harnesses) • Abnormality in the key interlock mechanism
3	Brake pedal not depressed	Ignition switch: ON		• Abnormality in the shift lock link (stuck, disengaged, broken, etc.) • Abnormality in the electrical circuit (short circuit in the switches or harnesses)
4	Brake pedal depressed		The selector lever can be moved from the "P" position to other positions smoothly.	• Abnormality in the shift lock link (stuck, disengaged, broken, etc.) • Abnormality in the electrical circuit (short circuit in the switches or harnesses)
5	Shift lock release button pressed			• Abnormality in the shift lock link (stuck, disengaged, broken, etc.)
6	Brake pedal depressed / not depressed		The selector lever can be moved from the "R" position to the "P" position smoothly.	• Abnormality in the shift lock link (stuck, disengaged, broken, etc.)

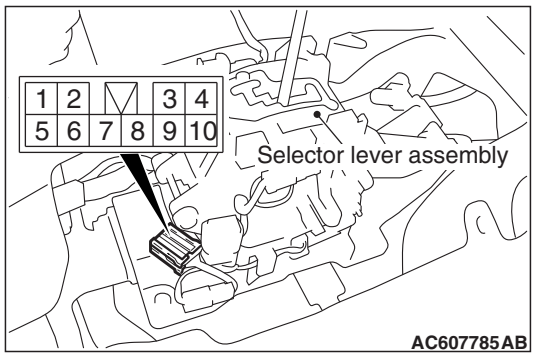
COMPONENT PARTS CHECK

SHIFT LOCK LINK



Check each part for damage and disengagement.
Check that the lock lever smoothly moves in the direction of arrow B in the figure when the shift lock solenoid plunger is pressed in the direction of arrow A, and smoothly moves back to the original position when the plunger is released.

ELECTRICAL CIRCUIT



Check for the following operations.

1. Shift the selector lever to P position.
2. Using a jumper wire, connect the battery (+) to the selector lever assembly connector terminals No. 3 and No. 4, and the battery (−) to the terminal No. 6. Then, check the operation of shift lock solenoid.

Jumper wire	Shift lock solenoid
Connect	Operate
Disconnect	Not operate

TRANSAXLE CONTROL

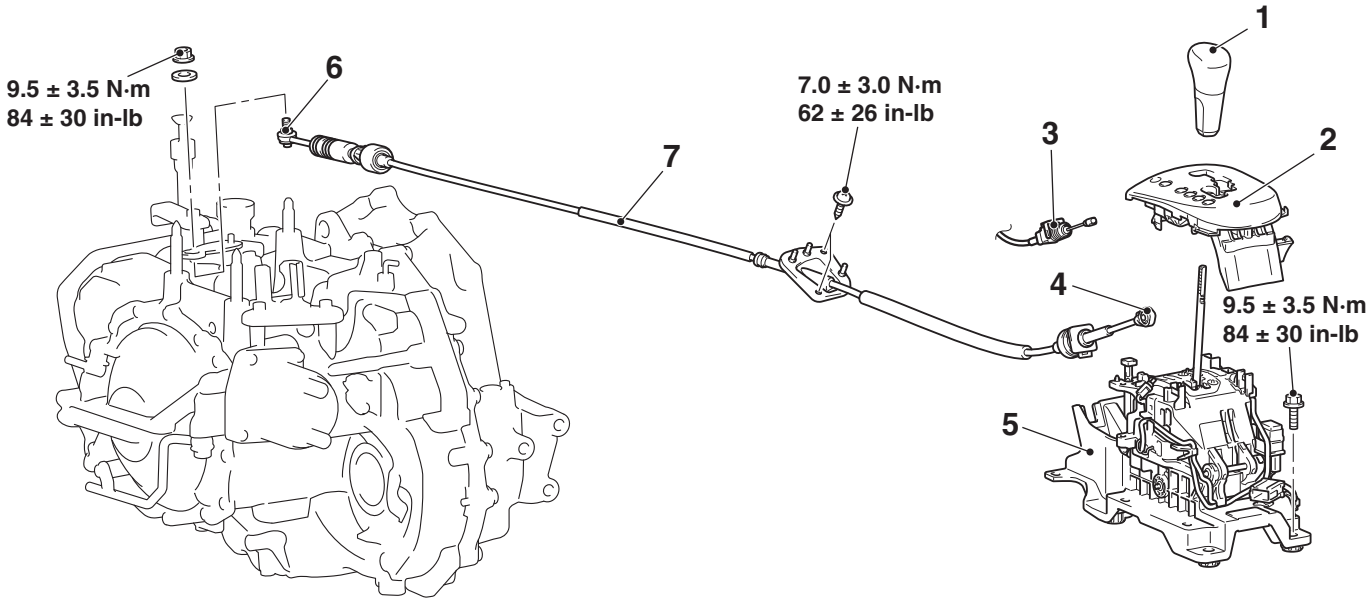
REMOVAL AND INSTALLATION

M1231006601050

⚠ ***WARNING***

When removing and installing the transaxle control cable and shift lock cable unit, be careful not to hit the SRS-ECU.

Pre-removal operation	Post-installation operation
• Front floor console assembly removal (Refer to GROUP 52A –Floor Console Assembly P.52A-7.)	• Front floor console assembly installation (Refer to GROUP 52A –Floor Console Assembly P.52A-7.) • Key interlock mechanism check (Refer to P.23C-278.) • Shift lock mechanism check (Refer to P.23C-280.) • Selector lever operation check (Refer to P.23C-278.)



AC607786AC

Selector lever assembly and transaxle control cable assembly removal steps

- Move the selector lever to the "N" position.

<<A>> 1. Selector lever knob

<<B>> 2. Shift indicator panel

>>B<< 3. Key interlock cable connection (selector lever side)

4. Transaxle control cable connection (selector lever side)

- Connectors and harnesses connections

5. Selector lever assembly

- Battery and battery tray

Selector lever assembly and transaxle control cable assembly removal steps

- Air Cleaner (Refer to GROUP 15 – Air Cleaner P.15-5.)

>>A<< 6. Transaxle control cable connection (transaxle side)

- Heater unit assembly (Refer to GROUP 55A - heater unit and front deck crossmember assembly removal and installation P.55A-119.)

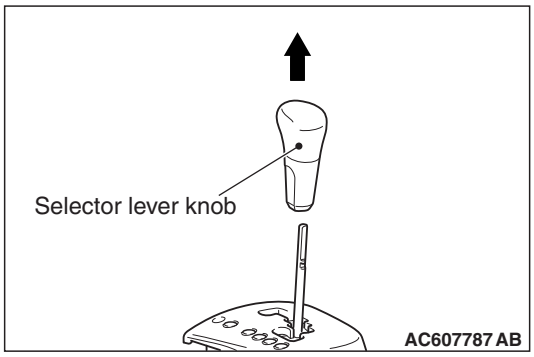
7. Transaxle control cable

TSB Revision

REMOVAL SERVICE POINTS

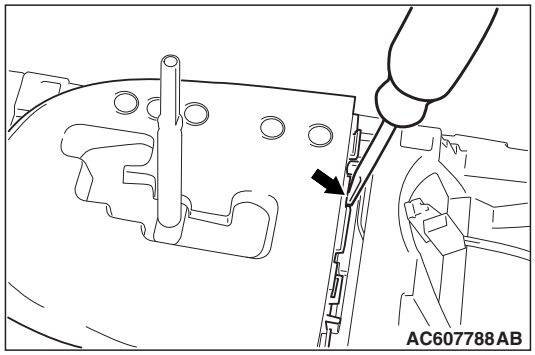
<<A>> SELECTOR LEVER KNOB REMOVAL

Pull out the selector lever knob to the direction of arrow shown in the figure.



<<B>> SHIFT INDICATOR PANEL REMOVAL

Insert the slotted head screwdriver into the arrow-indicated point as shown in the figure to pry the claw, and then remove the shift indicator panel.

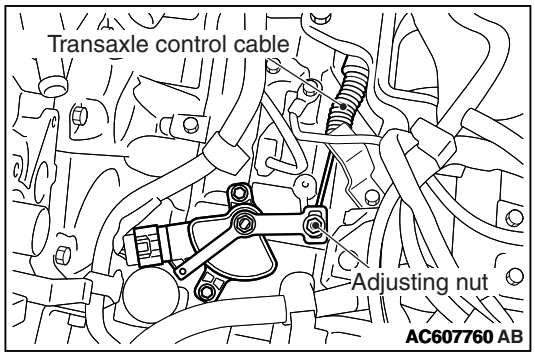


INSTALLATION SERVICE POINTS

>>A<< TRANSAXLE CONTROL CABLE (TRANSAXLE SIDE) INSTALLATION

1. Move the selector lever and manual control lever to the N position.
2. Use the adjusting nut to tighten the transaxle control cable to the specified torque.

   Tightening torque: 9.5 ±3.5 N•m (84 ±30 in-lb)

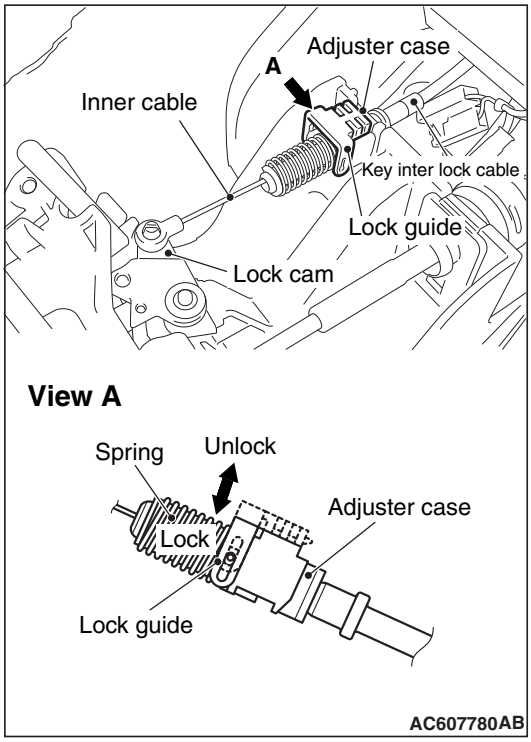


>>B<< KEY INTERLOCK CABLE INSTALLATION

⚠ CAUTION

Leave the ignition switch in the "LOCK" (OFF) position until the key interlock cable installation is completed.

1. Move the selector lever to the "P" position and turn the ignition switch to the "LOCK" (OFF) position.

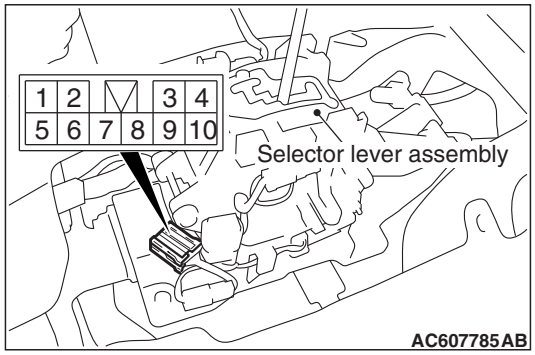


2. Install the tip of the key interlock cable to the lock cam of the selector lever assembly, taking care not to twist the inner cable.
3. Install the adjuster case with its lock guide pulled up (unlocked).
4. Securely push down the lock guide to lock it.

NOTE: The lock position of the key interlock cable is automatically adjusted by a spring.

SHIFT SWITCH ASSEMBLY CONTINUITY CHECK

M1231036200029



Shift switch assembly	Selector lever position	Terminal number
Select switch	Sport mode	7 –8
Shift switch (UP)	Upshift and hold	7 –10
Shift switch (DOWN)	Downshift and hold	7 –9

A/T KEY INTERLOCK AND SHIFT LOCK MECHANISMS

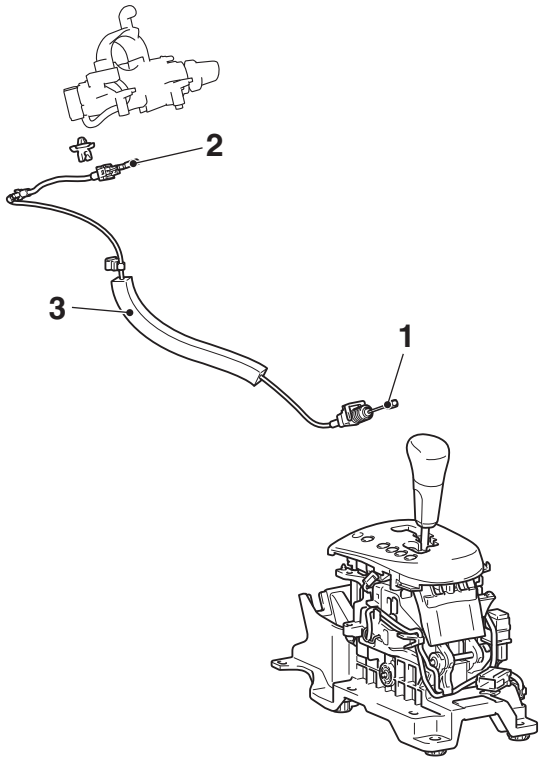
REMOVAL AND INSTALLATION

M1231036300112

⚠ WARNING

When removing and installing the transaxle control cable and shift lock cable unit, be careful not to hit the SRS-ECU.

Pre-removal operation	Post-installation operation
• Steering column lower cover and side lower panel assembly removal (Refer to GROUP 52A –Instrument Panel Assembly P.52A-2.) • Front floor console assembly removal (Refer to GROUP 52A –Floor Console Assembly P.52A-7.)	• Steering column lower cover and side lower panel assembly installation (Refer to GROUP 52A –Instrument Panel Assembly P.52A-2.) • Front floor console assembly installation (Refer to GROUP 52A –Floor Console Assembly P.52A-7.) • Key interlock mechanism check (Refer to P.23C-278.) • Shift lock mechanism check (Refer to P.23C-280.) • Selector lever operation check (Refer to P.23C-278.)



AC607789AB

Removal steps

>>B<< 1. Key interlock cable connection (selector lever side)

Removal steps (Continued)

<<A>> >>A<< 2. Key interlock cable connection (steering side)

3. Key interlock cable

TSB Revision

REMOVAL SERVICE POINT

<<A>> KEY INTERLOCK CABLE (STEERING SIDE) REMOVAL

Turn the ignition switch to the "ACC" position and then pull the key interlock cable out from the ignition key cylinder.

INSTALLATION SERVICE POINTS

>>A<< KEY INTERLOCK CABLE (STEERING LOCK CYLINDER SIDE) INSTALLATION

Turn the ignition switch to the "ACC" position and then install the key interlock cable to the ignition key cylinder.

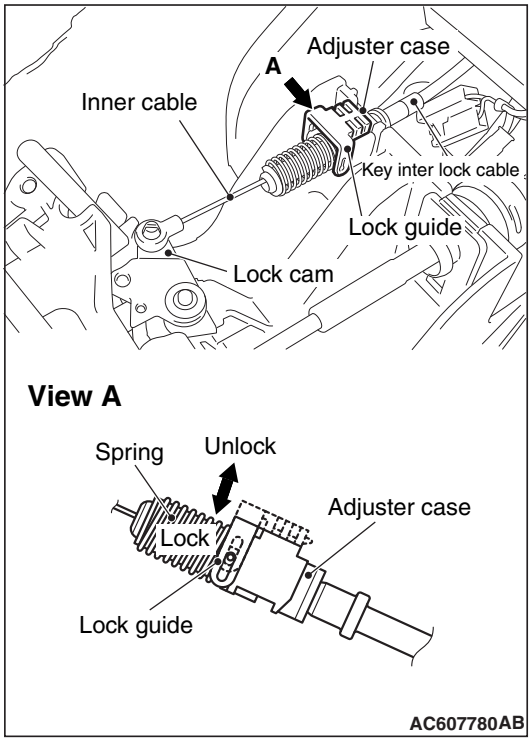
>>B<< KEY INTERLOCK CABLE INSTALLATION

⚠ CAUTION

Leave the ignition switch in the "LOCK" (OFF) position until the key interlock cable installation is completed.

1. Move the selector lever to the P position and turn the ignition switch to the "LOCK" (OFF) position.
2. Install the tip of the key interlock cable to the lock cam of the selector lever assembly, taking care not to twist the inner cable.
3. Install the adjuster case with its lock guide pulled up (unlocked).
4. Securely push down the lock guide to lock it.

NOTE: The lock position of the key interlock cable is automatically adjusted by a spring.

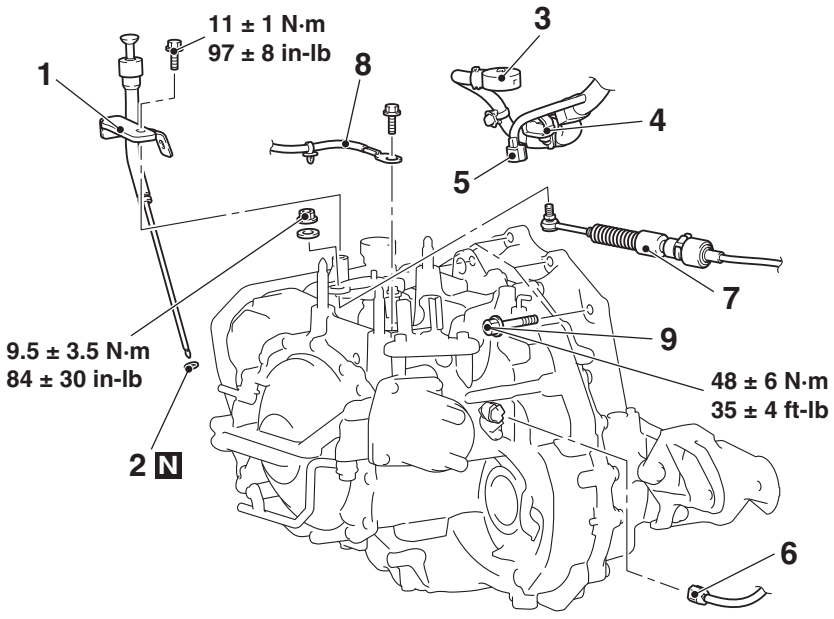


TRANSAXLE ASSEMBLY

REMOVAL AND INSTALLATION

M1231005701582

Pre-removal operation	Post-installation operation
• Engine compartment under cover and side cover removal (Refer to GROUP 51 –Under Cover P.51-22.) • Transmission fluid draining (Refer to P.23C-265.) • Air cleaner bracket removal (Refer to GROUP 15 –Air Cleaner P.15-5.) • Battery and Battery Tray Removal • ECM removal (Refer to GROUP 13B –ECM P.13B-894.) • Wiper arm · blade assembly and front deck garnish removal (Refer to GROUP 51 –Windshield Wiper P.51-76.) • Strut Tower Bar Removal (Refer to GROUP 42A –Strut Tower Bar P.42A-11.) • Drive shaft removal (Refer to GROUP 26 P.26-22.) • Starter assembly Removal (Refer to GROUP16, starter assembly P.16-32) • Transfer assembly Removal (Refer to P.23C-292 <Vehicles with S-AWC>, P.23C-293 <Vehicles without S-AWC>)	• Drive shaft installation (Refer to GROUP 26 P.26-22.) • Strut Tower Bar Installation (Refer to GROUP 42A –Strut Tower Bar P.42A-11.) • Wiper arm and blade assembly and front deck garnish installation (Refer to GROUP 51 –Windshield Wiper P.51-76.) • Battery and battery tray installation • ECM installation (Refer to GROUP 13B –ECM P.13B-894.) • Air cleaner assembly installation (Refer to GROUP 15 –Air Cleaner P.15-5.) • Engine compartment under cover and side cover installation (Refer to GROUP 51 –Under cover P.51-22.) • Transmission fluid refilling (Refer to P.23C-265.) • Starter assembly installation (Refer to GROUP16, starter assembly P.16-32) • Transfer assembly installation (Refer to P.23C-292 <Vehicles with S-AWC>, P.23C-293 <Vehicles without S-AWC>)



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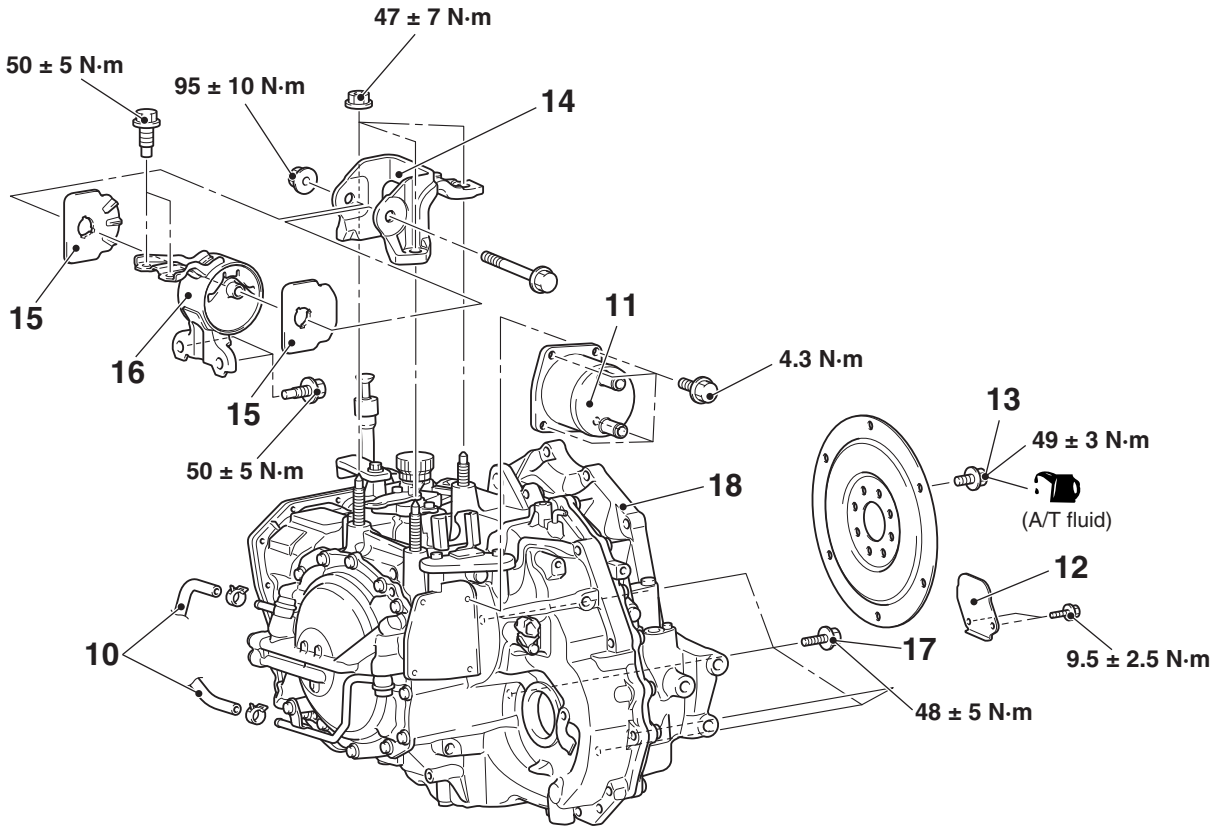
Removal steps

1. Transmission fluid filler tube assembly
2. O-ring
3. A/T control solenoid valve assembly connector
4. Input shaft speed sensor connector <<A>>
5. Transmission range switch connector

Removal steps (Continued)

6. Output shaft speed sensor connector
7. >>C<< Transaxle control cable connection
8. Battery ground
   - Harness clamp
9. Transaxle assembly upper part coupling bolt

TSB Revision



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Removal steps

10. Transmission fluid cooler hose assembly connection
    - Water return hose A, Water return tube, Water return hose B (Refer to P.23C-297)
11. Water-cooled transmission fluid cooler
12. Oil pan cover

<<B>>

13. Torque converter and drive plate coupling bolt
    - Air intake plenum (Refer to GROUP 15, Intake Manifold Plenum P.15-6)

<<C>>

>>B<<

15. Transaxle mounting insulator stopper
16. Transaxle mounting insulator

<<D>>

- Engine assembly holding

17. transaxle assembly lower part coupling bolt

>>A<<

18. transaxle assembly

Removal steps (Continued)

- Raise the engine and transaxle assembly to the position where the engine weight is not applied to the transaxle mounting insulator.

14. Transaxle mounting bracket

REMOVAL SERVICE POINTS

<<A>> TRANSAXLE ASSEMBLY UPPER PART COUPLING BOLT REMOVAL

Only loosen the bolts from the engine and transaxle assembly (do not remove).

<<B>> TORQUE CONVERTER AND DRIVE PLATE COUPLING BOLT REMOVAL

1. Remove the coupling bolts while turning the crankshaft.
2. Fully push the torque converter into the transaxle side so that it does not remain on the engine side.

<<C>> TRANSAXLE MOUNTING BRACKET REMOVAL

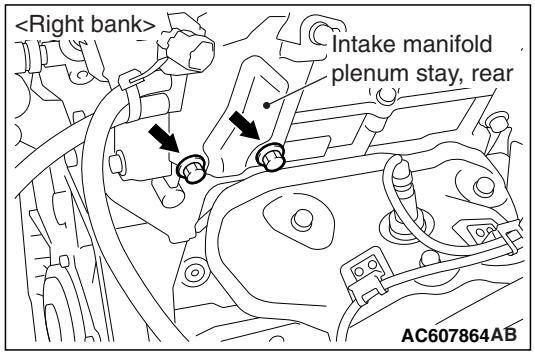
1. Place a garage jack against the transaxle case with a piece of wood in between to support the engine and transaxle assembly.
2. Operate a garage jack so that the weight of the engine and transaxle assembly is not applied to the transaxle mounting insulator, and remove the transaxle mounting bracket.

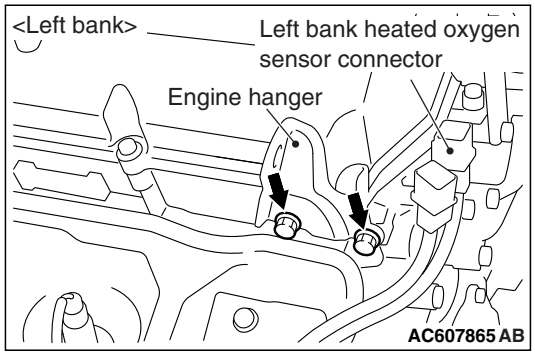
<<D>> ENGINE ASSEMBLY HOLDING

⚠ CAUTION

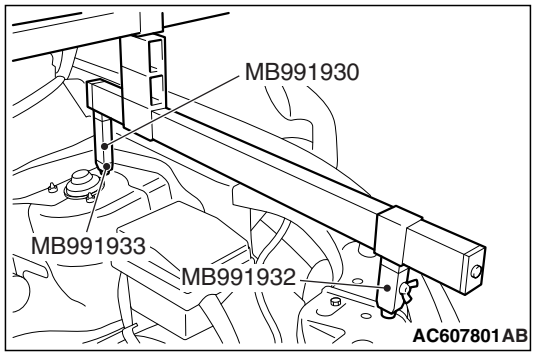
The engine hanger plate (special tool: MB992208)should be secured by tightening bolts with the engine hanger plate to the specified torque (If the other bolts are used, the engine assembly may fall down when it is raised.)

Tightening torque: 22 ±4 N· m (16 ±2 ft-lb)



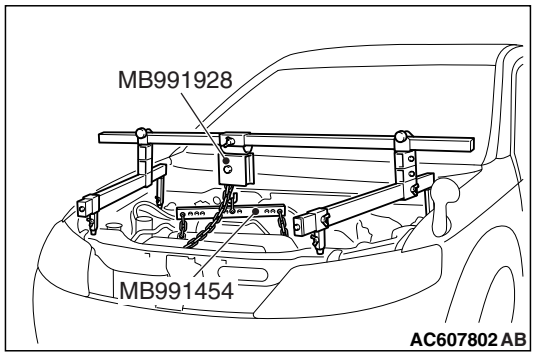


1. Remove the intake manifold plenum stay, rear on the right bank and the engine hanger on the left bank, and then install the engine hanger plate (Special tool: MB992208) to the place.
2. When engine hanger (Special tool: MB991928) is used
   (1) Assemble the engine hanger (Special tool: MB991928). (Set the components below to the base hanger.)
   - Slide bracket (HI)
   - Foot x 2 (standard) (MB991932)
   - Foot x 2 (short) (MB991933)
   - Joint x 2 (90) (MB991930)



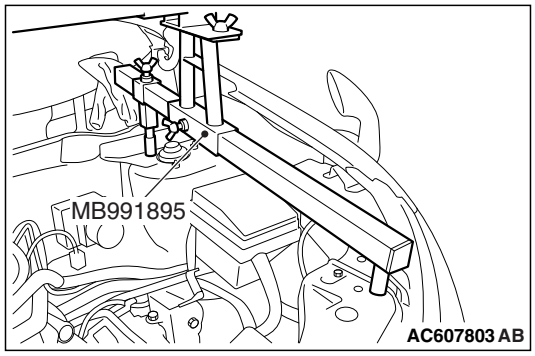
(2) Set the feet of the special tool as shown in the figure.

NOTE: Adjust the engine hanger balance by sliding the slide bracket (HI).



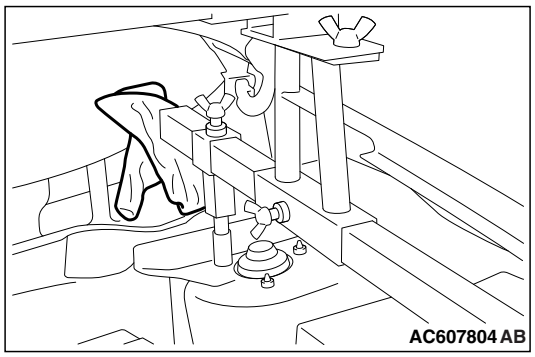
(3) Set the chains of the engine hanger (Special tool: MB991527) and the engine hanger balancer (Special tool: MB991454) to support the engine and transaxle assembly. Remove the garage jack and then remove the transaxle assembly upper part coupling bolts that have been loosened previously.

3. When using engine mechanical hanger (Special tool: MB991895)

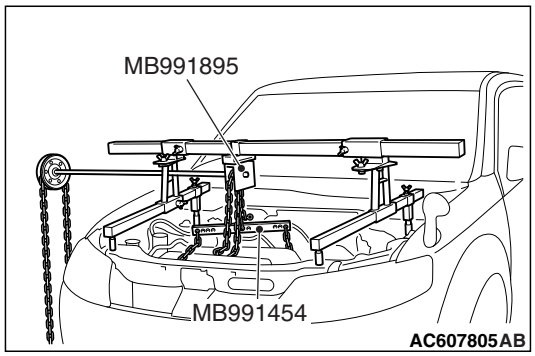


(1) Set the foot of the engine mechanical hanger (Special tool: MB991895) as shown in the figure.

NOTE: Slide the front foot of the engine mechanical hanger (Special tool: MB991895) to balance the engine hanger.



⚠ CAUTION
Place rag between the engine mechanical hanger (Special tool: MB991895) and the windshield to prevent the special tool from interfering with the windshield.

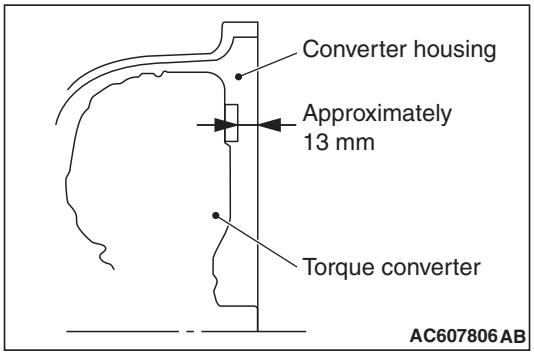


(2) Set the chains of the engine hanger (Special tool: MB991527) and the engine hanger balancer (Special tool: MB991454) to support the engine and transaxle assembly. Remove the garage jack and then remove the transaxle assembly upper part coupling bolts that have been loosened previously.

INSTALLATION SERVICE POINTS

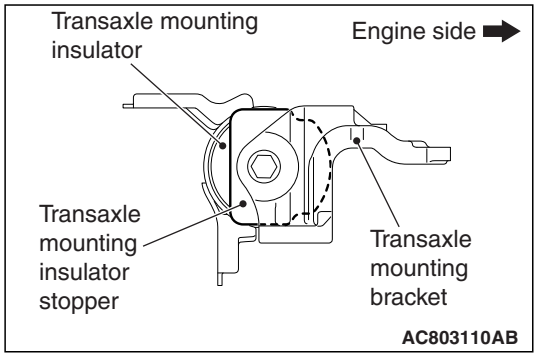
>>A<< TRANSAXLE ASSEMBLY INSTALLATION

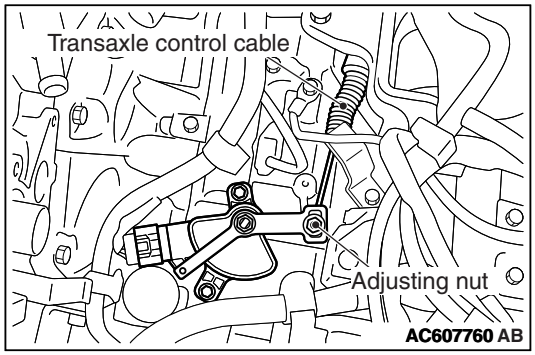
Fully push the torque converter into the transaxle side, and then assemble the transaxle assembly to the engine.



>>B<< TRANSAXLE MOUNTING INSULATOR STOPPER INSTALLATION

Install the transaxle mounting insulator stopper as shown in the figure.





>>C<< TRANSAXLE CONTROL CABLE (TRANSAXLE SIDE) INSTALLATION

1. Move the selector lever and manual control lever to the "N" position.
2. Use the adjusting nut to tighten the transaxle control cable to the specified torque.

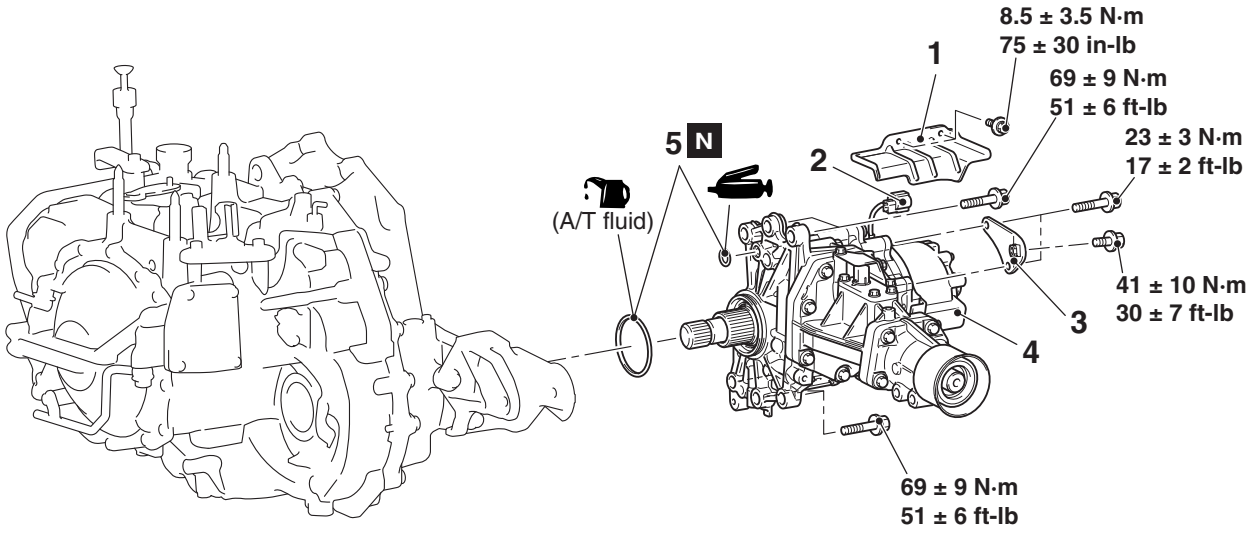
Tightening torque: 9.5 ±3.5 N· m (84 ±30 in-lb)

TRANSFER ASSEMBLY <AWD>

REMOVAL AND INSTALLATION <VEHICLES WITH S-AWC>

M1231006000549

Pre-removal and post-installation operation
- Under cover removal and installation (Refer to GROUP 51 P.51-22.)
- Transmission fluid draining and refilling (Refer to P.23C-265.)
- Transfer oil draining and refilling (Refer to P.23C-272.)
- Propeller shaft removal and installation (Refer to GROUP 25 P.25-6.)
- Front axle crossmember assembly removal and installation (Refer to GROUP 32 P.32-16.)
- Drive shaft assembly <RH> removal and installation (Refer to GROUP 26, Drive Shaft Assembly P.26-22.)



Removal steps
1. Heat protector
2. Connector connection
3. Exhaust manifold bracket

<<A>>

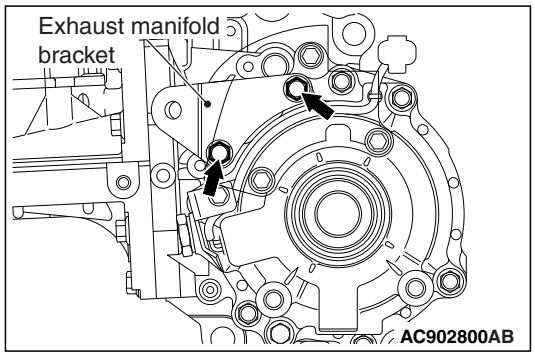
Removal steps (Continued)
4. Transfer assembly
5. O-ring

TSB Revision

REMOVAL SERVICE POINT

<<A>> EXHAUST MANIFOLD BRACKET

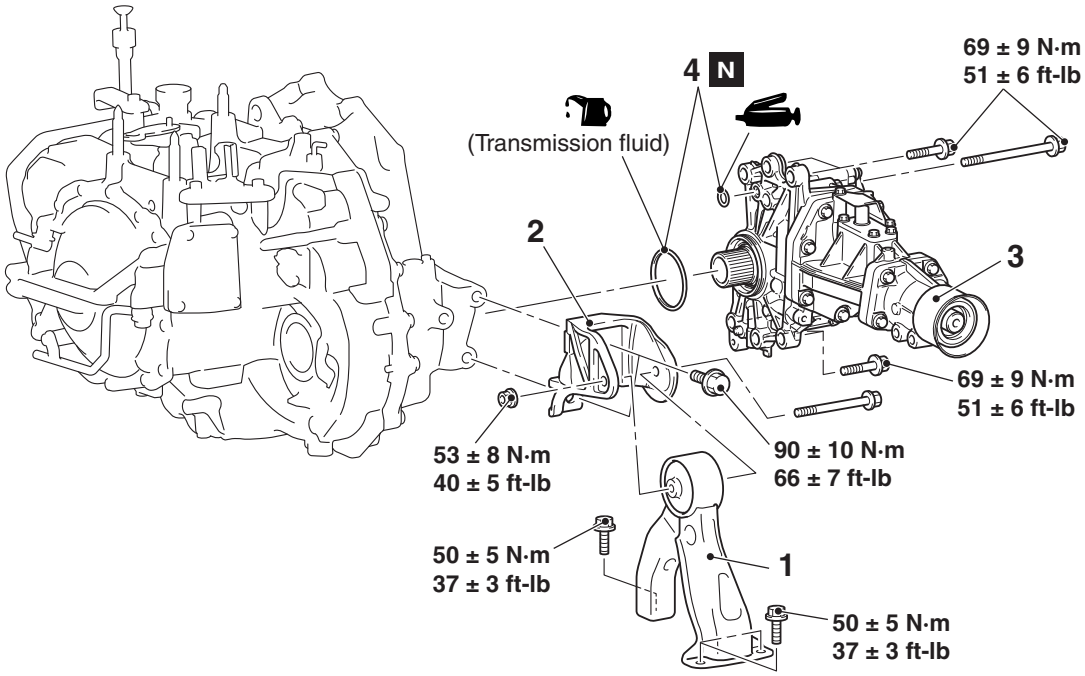
⚠ CAUTION
Do not loosen the bolts other than shown.



REMOVAL AND INSTALLATION <Vehicles without S-AWC>

M1231006000572

Pre-removal and post-installation operation
- Under cover removal and installation
- Transmission fluid draining and refilling (Refer to P.23C-265.)
- Transfer oil draining and refilling (Refer to P.23C-272.)
- Front exhaust pipe removal and installation (Refer to GROUP 15 P.15-26.)
- Propeller shaft removal and installation (Refer to GROUP 25 P.25-6.)
- Center member removal and installation (Refer to GROUP 32 P.32-11.)



Removal steps
- Pressure hose assembly, return tube B, Hose bracket (Refer to GROUP 37 P.37-51.)

1. Rear roll stopper
2. Transaxle case rear roll stopper bracket

>>A<<

Removal steps (Continued)
- Drive shaft RH and output shaft (Refer to GROUP 26 P.26-22.)

3. Transfer assembly
4. O-ring

TSB Revision

REMOVAL SERVICE POINT

>>A<< TRANSFER ASSEMBLY REMOVAL

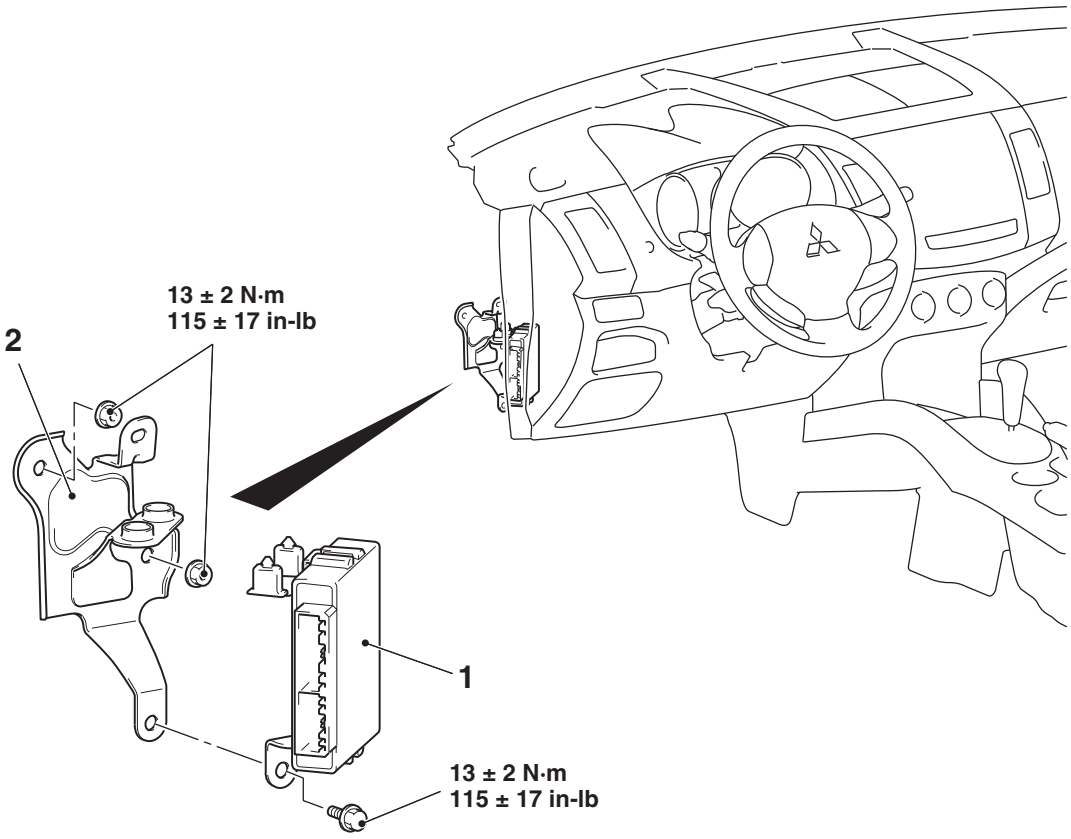
Move the engine and transaxle assembly toward the front of the vehicle to make a gap between the engine/transaxle assembly and the crossmember. Pull out the transfer assembly through this gap.

TRANSAXLE CONTROL MODULE (TCM)

REMOVAL AND INSTALLATION

M1231036600180

Pre-removal and post-installation operation
- Bottom cover assembly (driver's side) removal and installation (Refer to GROUP 52A –Instrument Panel Assembly P.52A-2.)
- Glove box assembly removal and installation (Refer to GROUP 52A –Instrument Panel Assembly P.52A-2.)



AC702849AE

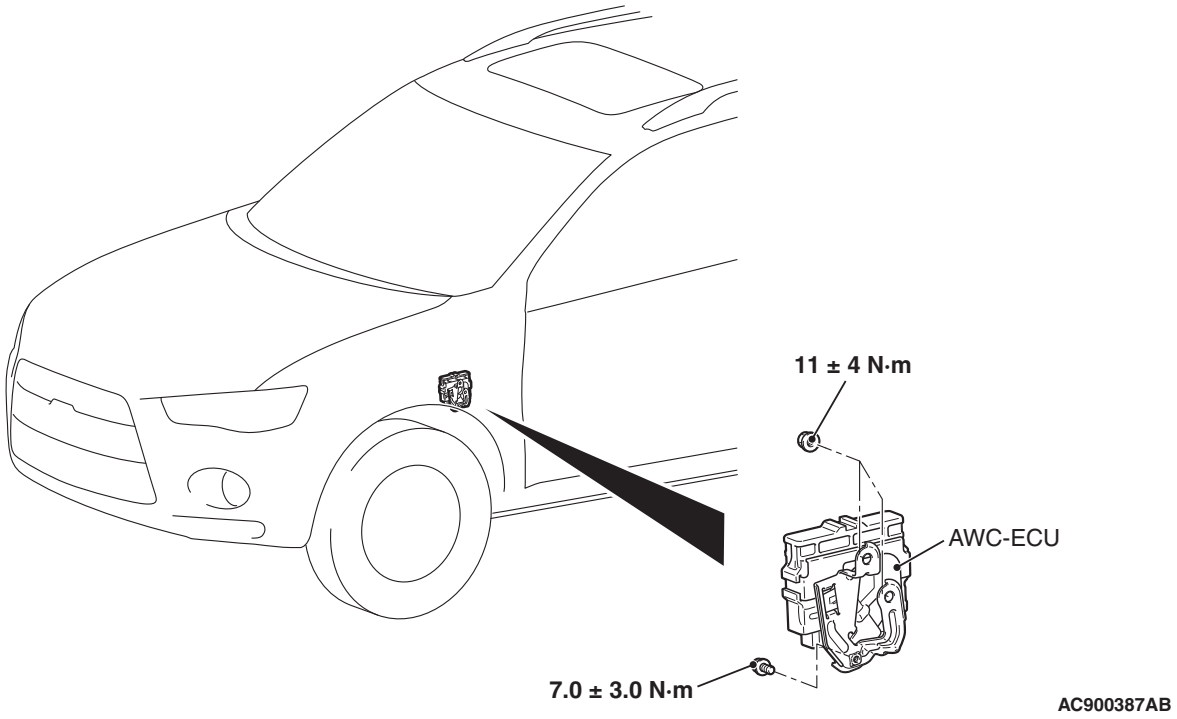
Removal steps
1. TCM
2. TCM bracket

AWC-ECU <Vehicles with S-AWC>

REMOVAL AND INSTALLATION

M1235005400018

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

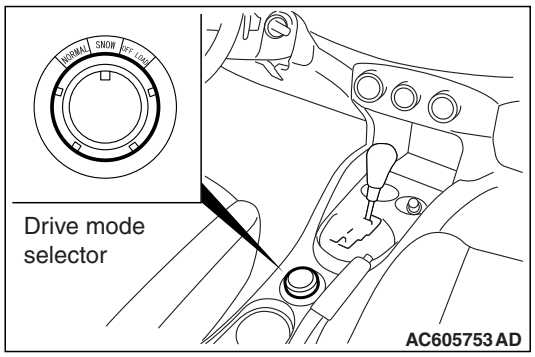


TSB Revision

S-AWC CONTROL MODE SELECTOR <Vehicles with S-AWC>

REMOVAL AND INSTALLATION

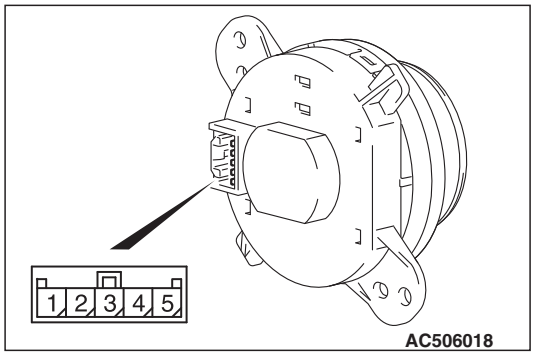
M1235005600012



Refer to GROUP 52A –Floor Console Assembly P.52A-8.

S-AWC CONTROL MODE SELECTOR INSPECTION

M1235005700019



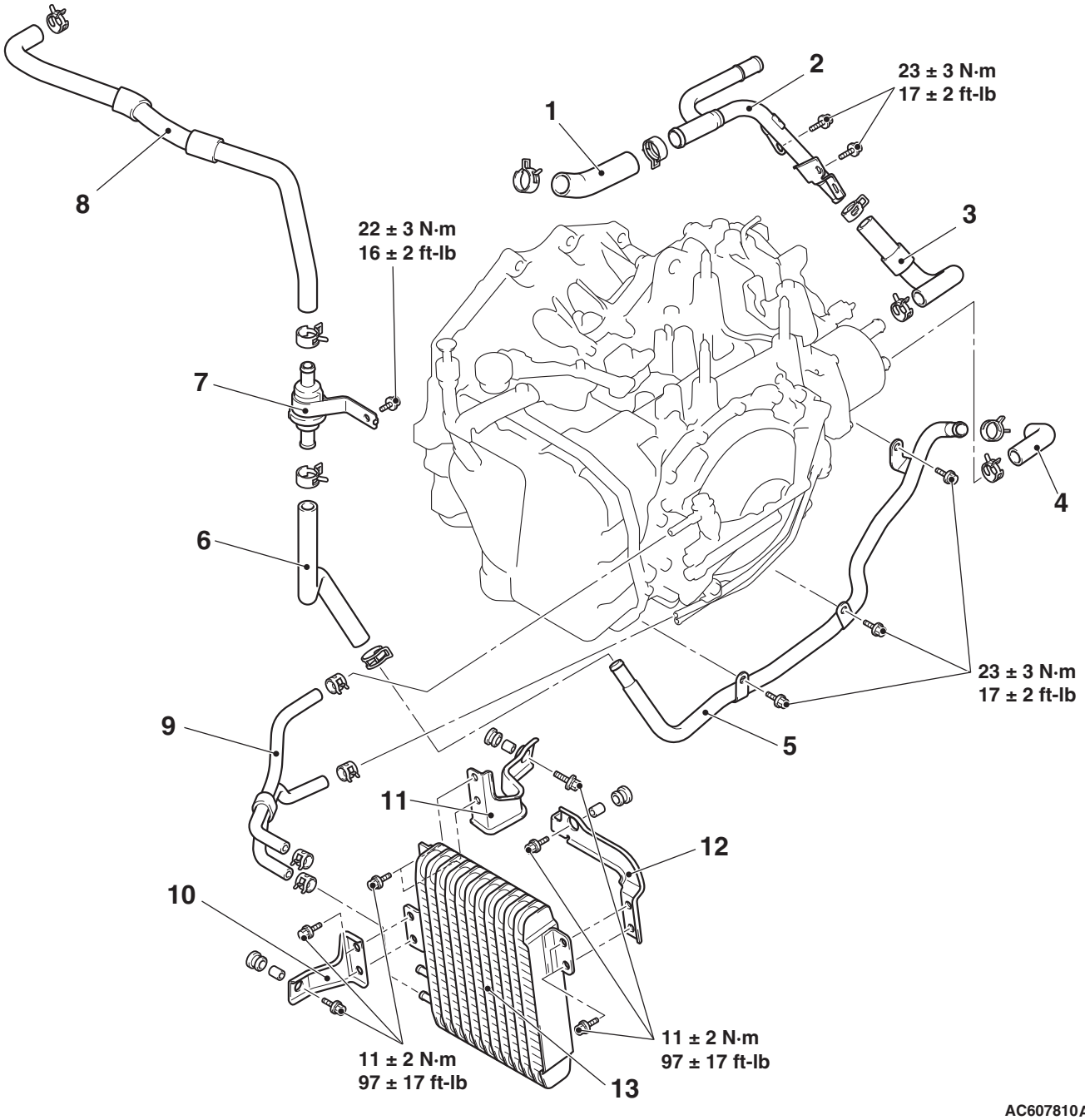
Switch position	Terminal number	Normal conditions
NORMAL	1 –2	Continuity exists (2 Ω or less).
	2 –3	No continuity
SNOW	1 –2	No continuity
	2 –3	
OFF ROAD	1 –2	No continuity
	2 –3	Continuity exists (2 Ω or less).

A/T FLUID COOLER LINE

REMOVAL AND INSTALLATION

M1231036800117

Pre-removal and post-installation operation
- Engine room under cover front, engine room side cover (Refer to GROUP 51 –Under Cover P.51-22.)
- Front bumper extension A, B, transmission fluid cooler duct (Refer to GROUP 51 –Front Bumper Assembly P.51-5.)
- Engine coolant draining and refilling (Refer to GROUP 14 –On-vehicle Service –Engine Coolant Replacement P.14-24.)
- Transmission fluid draining and refilling (Refer to P.23C-265.)



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TSB Revision

Removal steps
1. Water return hose A
2. Water return tube
3. Water return hose B
4. Water feed hose A
5. Water feed tube
6. Water feed hose B
7. Thermo valve assembly

Removal steps (Continued)
8. Water feed hose C
9. Transmission fluid cooler hose assembly
10. Transmission fluid cooler bracket A
11. Transmission fluid cooler bracket B
12. Transmission fluid cooler bracket C
13. Transmission fluid cooler assembly

THERMO VALVE CHECK

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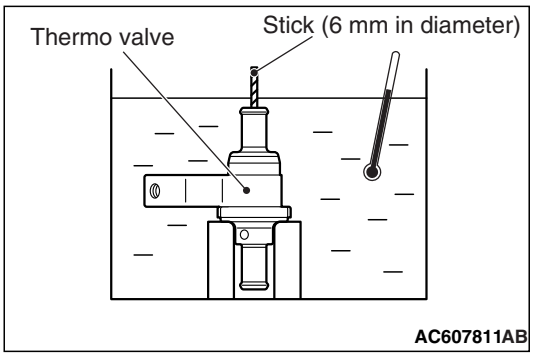

1. Obtain a container filled with water and place the thermo valve in it with a stick (approximately 6 mm in diameter) inserted. Gradually warm up the water while stirring, and check that the thermo valve opening temperature is within the standard value. The stick rises when the thermo valve opens.

   Standard value: 75 ± 1.5° C (167 ± 34.7 ° F)

2. Warm up the water to the full-open temperature of the thermo valve, and check that the valve lift amount is within the standard value.

   Standard value: Full-open temperature 95° C (203° F) or more
   Valve lift amount when it is fully opened: 3 mm or more

   NOTE: Measure the height of the fully closed valve in advance, and then measure the valve height at fully open temperature to calculate the lift amount.